BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

COUNTY OF GALVESTON
SPECIFICATIONS AND CONTRACT DOCUMENTS

MOORE'S ADDITION

WATERLINE REHABILITATION
&
SANITARY SEWER REHABILITATION

GLO CONTRACT NO. 13-465-000-7974

PROJECT NO. P21462 & P21466

LJA PROJECT NO. E224-0010 & E224-0020

FEBRUARY, 2016

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
2-5-16

LJA ENGINEERING, INC. FRN F-1386
Engineer

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

CONTENTS

SECTION	I	Invitation to Bid Instruction to Bidders for Construction (TGLO)
SECTION	II	General Contract Conditions Bid Proposal Contract Award TGLO Documents Bonds – Bid , Payment and Performance Attorney's Review Certification
SECTION	III	General Provisions
SECTION	IV	Project Scope General Notes Certification of Section 3, HUD Section 3 Clause, and Section 3 Residents & Business Forms Copeland Act and Certification Regarding Lobbying Project Sign
SECTION	V	Project Specifications
SECTION	VI	Project Drawings
SECTION	VII	Project Exhibits

SECTION I

Invitation to Bid

Instruction to Bidders for Construction

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

INVITATION TO BID
GALVESTON COUNTY – *MOORE'S ADDITION WATERLINE REHABILITATION & SANITARY SEWER REHABILITATION*
GALVESTON COUNTY, TEXAS

The County of Galveston solicits bids on the following project funded through the Texas General Land Office, contract number **12-403-005-7975**, Hurricane Ike disaster recovery program funds.

Contract to furnish labor, equipment, materials and incidentals as required for:
Bid #B161009, Galveston County – *Moore's Addition Waterline Rehabilitation & Sanitary Sewer Rehabilitation*

Davis-Bacon rates will apply under this disaster recovery program.

Sealed bids in **sets of seven, (one (1) original and six (6) copies)** will be received in the office of the County Purchasing Agent, until **2:00 PM** on **03/10/2016** and opened immediately in that office in the presence of the County Auditor and the Purchasing Agent. **Bidders are specifically advised that any bid delivered after this time will be returned unopened.**

Submitted bids will be publicly opened on **03/10/2016 at 2:00 PM** in the Purchasing Agent's office located in the Galveston County Courthouse, 722 Moody Avenue (21st St), Fifth (5th) Floor, Galveston, Texas 77550, (409) 770-5372 www.co.galveston.tx.us/Purchasing/BidListing .

All bids must be marked on the outside of the envelope:
Bid #B161009, Galveston County – *Moore's Addition Waterline Rehabilitation & Sanitary Sewer Rehabilitation*

A mandatory pre-bid conference will be held on Thursday, February 18, 2016 at 10:00 a.m. in the Galveston County Purchasing Department located in the Galveston County Courthouse, 722 Moody Avenue (21st St), Fifth (5th) Floor, Galveston, Texas 77550.

Bidder's name and return address should be on the outside of the envelope.

Plans and specifications may be obtained from the office of ***LJA Engineering, Inc., 11821 East Freeway, Suite 400, Houston, TX 77029, 713-450-1300.***

A $150.00 non-refundable deposit shall be required for each set of plans and specifications. Bids will be completed on the forms and proposal sheets provided.

Each bid must be accompanied by a Cashier's Check or acceptable Bidder's Bond in the amount of 5% of bid as a guarantee that, if awarded the contract, within thirty (30) days from the date of bid opening, the bidder will enter into a contract and execute Performance and Payment Bonds statutorily required for public works projects. The county intends to award a contract within sixty (60) days.

Commissioners' Court reserves the right to waive any informality and to reject any and all bids, and to accept bid or bids which, in its opinion, is most advantageous to the County.

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

INSTRUCTION TO BIDDERS
FOR CONSTRUCTION

1. Use of Separate Bid Forms

These contract documents include a complete set of bid and contract forms which are for the convenience of the bidders and are not to be detached from the contract document, completed or executed. Separate bid forms are provided for your use.

2. Interpretations or Addenda

No oral interpretations will be made to any bidder. Each request for an interpretation shall be made in writing to the Grant Recipient or engineer no less than seven (7) days prior to the bid opening. Each interpretation made will be in the form of an Addendum to the contract documents and will be distributed to all parties holding contract documents no less than five (5) days prior to the bid opening. It is, however, the bidder's responsibility to make inquiry as to any addenda issued. All such addenda shall become part of the contract documents and all bidders shall be bound by such addenda, whether or not received by the bidders.

3. Inspection of Site

Each bidder should visit the site of the proposed work and fully acquaint himself with the existing conditions there and should fully inform himself as to the facilities involved, the difficulties and restrictions attending the performance of the contract. The bidder should thoroughly examine and familiarize himself with the drawings, technical specifications and all other contract documents. The contractor by the execution of the contract shall in no way be relieved of any obligation under it due to his failure to receive or examine any form or legal document or to visit the site or acquaint himself with the conditions there existing. The city/county will be justified in rejecting any claim based on lack of inspection of the site prior to the bid.

4. Alternate bid items

No alternate bids or bid items will be considered unless they are specifically requested by the technical specifications.

5. Bids

a. All bids must be submitted on the forms provided and are subject to all requirements of the Contract Documents, including the Drawings.

b. All bids must be regular in every respect and no interlineation, excisions or special conditions may be made or included by the bidder.

c. Bid documents, including the bid, the bid bond, and the statement of bidders' qualifications shall be sealed in an envelope and clearly labeled with the words "Bid Documents", the project number, name of bidder and the date and time of bid opening.

d. The Grant Recipient may consider as irregular any bid on which there is an alteration of or departure from the bid form and, at its option, may reject any irregular bid.

e. If a contract is awarded, it will be awarded to a responsible bidder on the basis of the lowest/best bid and the selected alternate bid items, if any. The contract will require the completion of the work in accordance with the contract documents.

6. Bid Modifications Prior to Bid Opening

a. Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Grant Recipient prior to the closing time, and provided further, the Grant Recipient is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition, subtractions or other modifications so that the final prices or terms will not be known by the Grant Recipient until the sealed bid is open. If written confirmation is not received within two (2) days from the closing time, no consideration will be given to the telegraphic modification.

b. Likewise, any bidder may modify a bid by submitting a supplemental bid in person prior to the scheduled closing time for receipt of bids. Such supplemental bid should mention only additions or subtractions to the original bid so as to not reveal the final prices or terms to the Grant Recipient until the sealed bid is open.

7. Bid Bond

a. A bid bond in the amount of 5% of the bid issued by an acceptable surety shall be submitted with each bid. A certified check or bank draft payable to the Grant Recipient or negotiable U.S. Government Bonds (as par value) may be submitted in lieu of the Bid Bond.

b. The bid bond or its comparable, will be returned to the bidder as soon as practical after the opening of the bids.

8. Statement of Bidders Qualifications

Each bidder shall submit on the form furnished for that purpose a statement of the bidder's qualifications. The Grant Recipient shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform his obligations under the contract, and the bidder shall furnish the Grant Recipient all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available data does not satisfy the Grant Recipient that the bidder is qualified to carry out properly the terms of the contract.

9. Unit Price

The unit price for each of the several items in the bid shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price bid represents the total bid. Any bid not conforming to this requirement may be rejected as informal. Special attention is drawn to this condition, as the unit prices will be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

10. Corrections:

Erasures or other corrections in the bid must be noted over the signature of the bidder.

11. Time for Receiving Bids

Bids received prior to the advertised hour of opening shall be kept securely sealed. The officer appointed to open the bids shall decide when the specified time has arrived and no bid received thereafter will be considered; except that when a bid arrives by mail after the time fixed for opening, but before the reading of all other bids is completed, and it is shown to the satisfaction of the Grant Recipient that the late arrival of the bid was solely due to delay in the mail for which the bidder was not responsible, such bid will be received and considered.

12. Opening of Bids

The Grant Recipient shall, at the time and place fixed for the opening of bids, open each bid and publicly read it aloud, irrespective of any irregularities therein. Bidders and other interested individuals may be present.

13. Withdrawal of Bids

Bidder may withdraw the bid before the time fixed for the opening of bids, by communicating his purpose in writing to the locatliy. Upon receipt fo such notice, the unopened bid will be returned to the bidder. The bid guaranty of any bidder withdrawing his bid will be returned promptly.

14. Award of Contract/Rejection of Bids

a. The contract will be awarded to the responsive, responsible Bidder submitting the lowest/best bid. The bidder selected will be notified at the earliest possible date. The Grant Recipient reserves the right to reject any or all bids and to waive any informality in bids received where such rejection or waiver is in its interest.

b. The Grant Recipient reserves the right to consider as unqualified to do the work any bidder who does not habitually perform with his own forces the major portions of the work involved in construction of the improvements embraced in this contract.

15. Execution of Agreement/Performance and Payment Bonds

a. Performance and Payment Bonds, Requires all prime contractors which enter into a formal contract in excess of $25,000 with the State, any department, board, agency, municipality, county, school district or any division or subdivision thereof, to obtain a Payment Bond in the amount of the contract before commencing with work and a performance bond for public works contracts in excess of $100,000.

b. The failure of the successful bidder to execute the agreement and supply the required bonds within ten (10) days after the prescribed forms are presented for signature, or within such extended period as the Grant Recipient may grant, shall constitute a default and the Grant Recipient may, at its option either award the contract to the next lowest responsible bidder, or re-advertise for bids. In either case, the Grant Recipient may charge against the bidder the difference between the amount of the bid, and the amount for which a contract is subsequently executed irrespective of whether this difference exceeds the amount of the bid bond. If a more favorable bid is received

through re-advertisement, the defaulting bidder shall have no claim against the Grant Recipient for a refund.

16. Wages and Salaries

Attention is particularly called to the requirement of paying not less than the prevailing Davis Bacon Related Acts (DBRA) wage rates specified in the Contract Documents. These rates are minimums to be paid during the life of the contract. It is therefore the responsibility of the Bidder to inform themselves as to local labor conditions.

17. Equal Employment Opportunity

Attention is called to the requirements for ensuring that employees and applicants for employment are not discriminated against because of their race, color, creed, sex, gender, or national origin.

SECTION II

General Contract Conditions

Bid Proposal

Contract Award

GENERAL CONTRACT CONDITIONS

1. Contract and Contract Documents

(a) The project to be constructed pursuant to this contract will be financed with assistance from the CDBG and is subject to all applicable Federal and State laws and regulations.

(b) The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth.

2. Definitions

Whenever used in any of the contract Documents, the following meanings shall be given to the terms here in defined:

(a) The term "Contract" means the Contract executed between the **Galveston County**, hereinafter called the Owner and **(Name of Construction Co.)**, hereinafter called Contractor, of which these GENERAL CONDITIONS, form a part.

(b) The term "Project Area" means the area within which are the specified Contract limits of the Improvements contemplated to be constructed in whole or in part under this contract.

(c) The term "Engineer" means **LJA Engineering, Inc.**, Engineer in charge, serving the Owner with architectural or engineering services, his successor, or any other person or persons, employed by the Owner for the purpose of directing or having in charge the work embraced in this Contract.

(d) The term "Contract Documents" means and shall include the following: Executed Contract, Addenda (if any), Invitation for Bids, Instructions to Bidders, Signed Copy of Bid, General Conditions, Special Conditions, Technical Specifications, and Drawings (as listed in the Schedule of Drawings).

3. Supervision By Contractor

(a) Except where the Contractor is an individual and gives his personal supervision to the work, the Contractor shall provide a competent superintendent, satisfactory to the Local Public Agency and the Engineer, on the work at all times during working hours with full authority to act for him. The Contractor shall also provide an adequate staff for the proper coordination and expediting of his work.

(b) The Contractor shall lay out his own work and he shall be responsible for all work executed by him under the Contract. He shall verify all figures and elevations before proceeding with the work and will be held responsible for any error resulting from his failure to do so.

4. Subcontracts

(a) The Contractor shall not execute an agreement with any subcontractor or permit any subcontractor to perform any work included in this contract until he has verified the subcontractor as eligible to participate in federally funded contracts.

(b) No proposed subcontractor shall be disapproved by the city/county except for cause.

(c) The Contractor shall be as fully responsible to the city/county for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them.

(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work and required compliance by each subcontractor with the applicable provisions of the Contract.

(e) Nothing contained in the Contract shall create any contractual relation between any subcontractor and the Owner.

5. Fitting and Coordination of Work

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, subcontractors, or material suppliers engaged upon this Contract.

6. Payments to Contractor

a. Partial Payments

1) The Contractor shall prepare his requisition for partial payment as of the last day of the month and submit it, with the required number of copies, to the Engineer for his approval. The amount of the payment due the Contractor shall be determined by adding to the total value of work completed to date, the value of materials properly stored on the site and deducting (1) five percent (5%) of the total amount, to be retained until final payment and (2) the amount of all previous payments. The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit prices contained in the agreement. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection of the Engineer.

2) Monthly or partial payments made by the Owner to the Contractor are moneys advanced for the purpose of assisting the contractor to expedite the work of construction. The Contractor shall be responsible for the care and protection of all materials and work upon which payments have been made until final acceptance of such work and materials by the Owner. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the Owner in all details.

b. Final Payment

1) After final inspection and acceptance by the Owner of all work under the Contract, the Contractor shall prepare his requisition for final payment which shall be based upon the careful inspection of each item of work at the applicable unit prices stipulated in the Agreement. The total amount of the final payment due the Contractor under this contract shall be the amount computed as described above less all previous payments.

2) The Owner before paying the final estimate, shall require the Contractor to furnish releases or receipts from all subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project) and services to the Contractor, if the Owner deems it necessary in order to protect its interest. The Owner may, if it deems such action advisable, make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments made shall in no way impair the obligations of any surety or sureties furnished under this Contract.

3) Any amount due the Owner under Liquidated Damages, shall be deducted from the final payment due the contractor.

c. Payments Subject to Submission of Certificates

Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all written certifications required of him and his subcontractors.

d. Withholding Payments

The Owner may withhold from any payment due the Contractor whatever is deemed necessary to protect the Owner, and if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his subcontractors or material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

7. Estimated Quantities

This Contract, including the specifications, plans and estimates, is intended to show clearly all the work to be done and material to be furnished hereunder. The estimated quantities of the various classes of work to be done and material to be furnished under this contract are approximate and are to be used as a basis for estimating the probable cost of the work and for comparing the proposals offered for the work. It is understood and agreed that the actual amount of work to be done and material to be furnished under this contract may differ somewhat from these estimates, and that the basis for payment under this contract shall be the plan quantity or actual amount of such work done whichever is specified. It is further understood that the County does not guarantee any minimum amount of work under this Contract.

Contractor agrees that it will make no claim for damages, anticipated profits or otherwise on account of any differences which may be found between the quantities of work actually done, the material actually furnished under this Contract and the estimated quantities contemplated and contained in the proposals.

8. Changes in the Work

(a) The Owner may make changes in the scope of work required to be performed by the Contractor under the Contract without relieving or releasing the Contractor from any of his obligations under the Contract or any guarantee given by him pursuant to the Contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such work shall be executed under the terms of the original Contract unless it is

expressly provided otherwise. Additionally, all such change orders must be approved by the CDBG staff prior to execution of same.

(b) Except for the purpose of affording protection against any emergency endangering health, life, limb or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the Owner authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract Price will be valid unless so ordered.

(c) It is agreed that Contractor shall perform all Extra Work under the direction of the Owner when presented with a Written Work Order signed by the Owner: subject, however, to the right of Contractor to require a written confirmation of such Extra Work Order by the County Commissioners' Court. It is also agreed that the compensation to be paid Contractor for performing said Extra Work shall be determined by one or more of the following methods:

Method (a) - By agreed unit prices; or
Method (b) - By agreed lump sum: or
Method (c) - If Neither Method (a) nor Method (b) can be agreed upon before the Extra Work is commenced, then Contractor shall be paid the "Actual field cost" of the work plus fifteen (15) percent.

In the event said Extra Work be performed and paid for under Method (c), then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost of all workmen, such as foremen, timekeepers, merchants, and laborers, and materials, supplies, teams, trucks, rentals on machinery and equipment for time actually employed or used on such Extra Work plus actual transportation charges necessarily incurred, if the kind of equipment or machinery is not already on the job, together with all power, fuel, lubricants, water and similar operating expenses, also all necessary incidental expenses incurred directly on account of such Extra Work including Social Security, Old Age Benefits and other payroll taxes, and a ratable proportion of premiums on Construction and Maintenance Bonds, Public Liability and Property Damage and Workmen's Compensation, and all other insurance as may be required by any law or ordinance, or directed by the Owner or by him agreed. The Owner may direct the form in which accounts of the "actual field cost" shall be kept and may also specify in writing, before the work commences, the method of doing the work and the type and kind of machinery and equipment to be used, otherwise these matters shall be determined by Contractor. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using the one hundred (100) percent of the actual hourly or daily rate (for the time used plus time in moving to and from Job) of the latest schedule of Equipment Ownership Expense adopted by the Association General Contractors of America. Where practicable the terms and prices for the use of Machinery and Equipment shall be incorporated in the Written Extra Work Order. The fifteen (15) percent of the "Actual Field Cost" to be paid Contractor shall cover and compensate him for his profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the 'actual field cost" as herein defined, save that where the Contractor's Camp or Field Office must be maintained primarily on account of such extra work, then the cost to maintain and operate same shall be included in the "actual field cost".

No claim for extra work of any kind will be allowed unless ordered in writing by the Owner. In case any orders or instructions, either oral or written appear to Contractor to involve extra work for which he should receive compensation, it shall make written request to the Program Administrator for written order authorizing Extra Work. Should a difference of opinion arise as to what does or does not constitute extra work, or as to the payment therefor, and the Owner insists upon its performance, Contractor shall proceed with the work after making written order and shall keep an

accurate account of the "actual field cost" thereof, as provided under Method (c) and by this action Contractor will thereby preserve the right to submit the matter of payment to litigation.

(d) Each change order shall include in its final form:

1) A detailed description of the change in the work.

2) The Contractor's proposal (if any) or a confirmed copy thereof.

3) A definite statement as to the resulting change in the contract price and/or time.

4) The statement that all work involved in the change shall be performed in accordance with contract requirements except as modified by the change order.

5) The procedures as outlined in this Section for a unit price contract also apply in any lump sum contract.

9. Claims for Extra Cost

(a) If the Contractor claims that any instructions by Drawings or otherwise involve extra cost or extension of time, he shall, within ten days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the Owner, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.

(b) Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work, than would be reasonably estimated from the Drawings and maps issued.

(c) Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall be reported at once to the Owner and work shall not proceed except at the Contractor's risk, until written instructions have been received by him from the Owner.

(d) If, on the basis of the available evidence, the Owner determines that an adjustment of the Contract Price and/or time is justifiable, a change order shall be executed.

10. Liquidated Damages

If the work is not completed within the time stipulated in the applicable bid for Lump Sum or Unit Price Contract provided, the Contractor shall pay to the Owner as fixed, agreed, and liquidated damages (it being impossible to determine the actual damages occasioned by the delay) the amount of *Five Hundred* dollars (*$500.00*) for each calendar day of delay, until the work is completed. The Contractor and his sureties shall be liable to the Owner for the amount thereof.

11. Disputes

(a) All disputes arising under this Contract or its interpretation except those disputes covered by FEDERAL LABOR STANDARDS PROVISIONS whether involving law or fact or both, or extra work, and all claims for alleged breach of contract shall, within ten (10) days of commencement of the dispute, be presented by the Contractor to the Owner for decision. Any claim not presented within the time limit specified in this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten (10) days of its

commencement, the claim will be considered only for a period commencing ten (10) days prior to the receipt of the Owner.

(b) The Contractor shall submit in detail his claim and his proof thereof.

(c) If the Contractor does not agree with any decision of the Owner, he shall in no case allow the dispute to delay the work but shall notify the Owner promptly that he is proceeding with the work under protest.

12. Technical Specifications and Drawings

Anything mentioned in the Technical Specifications and not shown on the Drawings or vice versa, shall be of like effect as if shown on or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in Drawings, or Technical Specifications, the matter shall be immediately submitted to the Owner, without whose decision, said discrepancy shall not be adjusted by the Contractor, save only at his own risk and expense.

13. Shop Drawings

(a) All required shop drawings, machinery details, layout drawings, etc. shall be submitted to the Engineer in 6 copies for approval sufficiently in advance of requirements to afford ample time for checking, including time for correcting, resubmitting and rechecking if necessary. The Contractor may proceed, only at his own risk, with manufacture or installation of any equipment or work covered by said shop drawings, etc. until they are approved and no claim, by the Contractor, for extension of the contract time shall be granted by reason of his failure in this respect.

(b) Any drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of contract price and/or time, otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the drawings have been approved.

(c) If a shop drawing is in accordance with the contract or involves only a minor adjustment in the interest of the Owner not involving a change in contract price or time; the engineer may approve the drawing. The approval shall not relieve the Contractor from his responsibility for adherence to the contract or for any error in the drawing.

14. Requests for Supplementary Information

It shall be the responsibility of the Contractor to make timely requests of the Owner for any additional information not already in his possession which should be furnished by the Owner under the terms of this Contract, and which he will require in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two weeks after Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be

fully responsible for any delay in his work or to others arising from his failure to comply fully with the provision of this section.

15. Materials and Workmanship

(a) Unless otherwise specifically provided for in the technical specifications, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds for the purpose. Where equipment, materials, articles or workmanship are referred to in the technical specifications as "equal to" any particular standard, the Engineer shall decide the question of equality.

(b) The Contractor shall furnish to the Owner for approval the manufacturer's detailed specifications for all machinery, mechanical and other special equipment, which he contemplates installing together with full information as to type, performance characteristics, and all other pertinent information as required, and shall likewise submit for approval full information concerning all other materials or articles which he proposes to incorporate.

(c) Machinery, mechanical and other equipment, materials or articles installed or used without such prior approval shall be at the risk of subsequent rejection.

(d) Materials specified by reference to the number or symbol of a specific standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Invitation for Bids, except as limited to type, class or grade, or modified in the technical specifications shall have full force and effect as though printed therein.

(e) The Owner may require the Contractor to dismiss from the work such employee or employees as the Owner or the Engineer may deem incompetent, or careless, or insubordinate.

16. Samples, Certificates and Tests

(a) The Contractor shall submit all material or equipment samples, certificates, affidavits, etc., as called for in the contract documents or required by the Engineer, promptly after award of the contract and acceptance of the Contractor's bond. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the contract time.

(b) Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information which will assist the Engineer in making a prompt decision regarding the acceptability of the sample. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.

(c) Approval of any materials shall be general only and shall not constitute a waiver of the Owner's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Engineer will have the right to cause their removal and

replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable.

(d) Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:

1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;

2) The Contractor shall assume all costs of re-testing materials which fail to meet contract requirements;

3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient;

4) The Owner will pay all other expenses.

17. Permits and Codes

(a) The Contractor shall give all notices required by and comply with all applicable laws, ordinances, and codes of the Local Government. All construction work and/or utility installations shall comply with all applicable ordinances, and codes including all written waivers. Before installing any work, the Contractor shall examine the drawings and technical specifications for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the Owner. Where the requirements of the drawings and technical specifications fail to comply with such applicable ordinances or codes, the Owner will adjust the Contract by Change Order to conform to such ordinances or codes (unless waivers in writing covering the difference have been granted by the governing body or department) and make appropriate adjustment in the Contract Price or stipulated unit prices.

(b) Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any applicable ordinance or code, including any written waivers (notwithstanding the fact that such installation is in compliance with the drawings and technical specifications), the Contractor shall remove such work without cost to the Owner.

(c) The Contractor shall at his own expense, secure and pay for all permits for street pavement, sidewalks, shed, removal of abandoned water taps, sealing of house connection drains, pavement cuts, buildings, electrical, plumbing, water, gas and sewer permits required by the local regulatory body or any of its agencies.

(d) The Contractor shall comply with applicable local laws and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the Project Area and commit no trespass on any public or private property in any operation due to or connected with the Improvements contained in this Contract.

(e) The Contractor will be required to make arrangements for and pay the water, electrical power, or any other utilities required during construction.

(f) During construction of this project, the Contractor shall use every means possible to control the amount of dust created by construction. Prior to the close of a day's work, the Contractor, if directed by the Owner, shall moisten the bank and surrounding area to prevent a dusty condition.

18. Care of Work

(a) The Contractor shall be responsible for all damages to person or property that occur as a result of his fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance.

(b) The Contractor shall provide sufficient competent watchmen, both day and night, including Saturdays, Sundays, and holidays, from the time the work is commenced until final completion and acceptance.

(c) In an emergency affecting the safety of life, limb or property, including adjoining property, the Contractor, without special instructions or authorization from the Owner is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act. He shall likewise act if instructed to do so by the Owner.

(d) The Contractor shall avoid damage as a result of his operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc., and he shall at his own expense completely repair any damage thereto caused by his operations.

(e) The Contractor shall shore up, brace, underpin, secure, and protect as maybe necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the improvements included in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of any work. The Contractor shall indemnify and save harmless the Owner from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the Owner may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

19. Accident Prevention

(a) No laborer or mechanic employed in the performance of this Contract shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety as determined under construction safety and health standards promulgated by the Secretary of Labor.

(b) The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work.

(c) The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor shall promptly furnish the Owner with reports concerning these matters.

(d) The Contractor shall indemnify and save harmless the Owner from any claims for damages resulting from property damage, personal injury and/or death suffered or alleged to have been suffered by any person as a result of any work conducted under this contract.

(e) The Contractor shall provide trench safety for all excavations more than five feet deep prior to excavation. All OSHA Standards for trench safety must be adhered to by the Contractor.

(f) The contractor shall at all times conduct his work in such a manner as to insure the least possible inconvenience to vehicular and pedestrian traffic. At the close of the work each day, all streets where possible in the opinion of the Owner, shall be opened to the public in order that persons living in the area may have access to their homes or businesses by the use of the streets. Barricades, warning signs, and necessary lighting shall be provided to the satisfaction of the Owner at the expense of the Contractor.

20. Sanitary Facilities

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

21. Use of Premises

(a) The Contractor shall confine his equipment, storage of materials, and construction operations to the contract limits as shown on the drawings and as prescribed by ordinances or permits, or as may be desired by the Owner, and shall not unreasonably encumber the site or public rights of way with his materials and construction equipment.

(b) The Contractor shall comply with all reasonable instructions of the Owner and all existing state and local regulations regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

22. Removal of Debris, Cleaning, Etc.

The Contractor shall, periodically or as directed during the progress of the work, remove and legally dispose of all surplus excavated material and debris, and keep the Project Area and public rights of way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris and unused materials provided for work, and put the whole site of the work and public rights of way in a neat and clean condition.

23. Inspection

(a) All materials and workmanship shall be subject to inspection, examination, or test by the Owner and Engineer at any and all times during manufacture or construction and at any and all places where such manufacture or construction occurs. The Owner shall have the right to reject defective material and workmanship or require its correction. Unacceptable workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the Project Area and replaced with material of specified quality without charge. If the Contractor fails to proceed at once with the correction of rejected workmanship or defective material, the Owner may by contract or otherwise have the defects remedied or rejected materials removed from the Project Area and charge the cost of the same against any Monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.

(b) The Contractor shall furnish promptly all materials reasonably necessary for any tests which may be required. All tests by the Owner will be performed in such manner as not to delay the work unnecessarily and will be made in accordance with the provisions of the technical specifications.

(c) The Contractor shall notify the Owner sufficiently in advance of back filling or concealing any facilities to permit proper inspection. If any facilities are concealed without approval or consent of the Owner, the Contractor shall uncover for inspection and recover such facilities at his own expense, when so requested by the Owner.

(d) Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed by uncovering the same, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any important or essential respect, due to fault of the Contractor or his subcontractors, the Contractor shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, shall be allowed the Contractor and he shall, in addition, if completion of the work of the entire Contract has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

(e) Inspection of materials and appurtenances to be incorporated in the improvements included in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such inspection and acceptance, unless otherwise stated in the technical specifications, shall be final, except as regards (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of materials as a whole or in part will be made at the Project Site.

(f) Neither inspection, testing, approval nor acceptance of the work in whole or in part, by the Owner or its agents shall relieve the Contractor or his sureties of full responsibility for materials furnished or work performed not in strict accordance with the Contract.

24. Review by Owner

The Owner and its authorized representatives and agents shall have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through its authorized representatives or agents.

25. Final Inspection

When the Improvements included in this Contract are substantially completed, the Contractor shall notify the Owner in writing that the work will be ready for final inspection on a definite date which shall be stated in the notice. The Owner will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as is practicable.

26. Deduction for Uncorrected Work

If the Owner deems it not expedient to require the Contractor to correct work not done in accordance with the Contract Documents, an equitable deduction from the Contract Price will be made by agreement between the Contractor and the Owner and subject to settlement, in case of dispute, as herein provided.

27. Warranty of Title

No material, supplies, or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease-purchase or other agreement by which

an interest is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed by him to the Owner free from any claims, liens, or charges. Neither the Contractor nor any person, firm, or corporation furnishing any material or labor for any work covered by this Contract shall have any right to a lien upon any improvement or appurtenance. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

28. Warranty of Workmanship and Materials

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the improvements included in this Contract by the Owner or the public shall constitute an acceptance of work

not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of __12____ months from the date of final acceptance of the work.

29. Compliance with Air and Water Acts

(a) In compliance with the Clean Air Act, as amended, 41 U.S.C. Sec. 7401 et. seq., and the regulations of the Environmental Protection Agency with respect thereto, the Contractor agrees that:

1) Any facility to be utilized in the performance of this contract or any subcontract shall not be a facility listed on the EPA List of Violating Facilities pursuant to 40 CFR 15.20.

2) He will comply with all requirements of Section 114 of the Clean Air Act, as amended.

3) Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

(b) If the Contractor encounters existing material on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for testing for and removal or disposition of hazardous materials on sites owned or controlled by the Owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposition of hazardous materials on sites owned or controlled by the Owner.

30. Section 109 of the Housing and Community Development Act of 1974

No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

31. The Provision of Local Training, Employment, and Business Opportunities

(a) To the greatest extent feasible opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to

business concerns which are located in, or owned in substantial part by persons residing in the area of the project.

(b) The Contractor will include this clause in every subcontract for work in connection with the project.

32. Non Segregated Facilities

The Contractor certifies that he does not and will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not and will not permit his employees any segregated facilities at any of his establishments, or permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. As used in this paragraph the term "segregated facilities" means any waiting rooms, work areas, rest rooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise.

33. Job Offices

(a) The Contractor and his subcontractors may maintain such office and storage facilities on the site as are necessary for the proper conduct of the work. These shall be located so as to cause no interference to any work to be performed on the site. The Owner shall be consulted with regard to locations.

(b) Upon completion of the improvements, or as directed by the Owner, the Contractors shall remove all such temporary structures and facilities from the site, and leave the site of the work in the condition required by the Contract.

34. Partial Use of Site Improvements

The Owner may give notice to the Contractor and place in use those sections of the improvements which have been completed, inspected and can be accepted as complying with the technical specifications and if in its opinion, each such section is reasonably safe, fit, and convenient for the use and accommodation for which it was intended, provided:

(a) The use of such sections of the Improvements shall in no way impede the completion of the remainder of the work by the Contractor.

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

(c) The period of guarantee stipulated in the Section 29 hereof shall not begin to run until the date of the final acceptance of all work which the Contractor is required to construct under this Contract.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

BID PROPOSAL

The bidder hereby proposes to furnish all labor, material, equipment and incidentals for:
Moore's Addition Waterline Rehabilitation & Sanitary Sewer Rehabilitation
Enclosed is a Cashier's Check or Bid Bond in the sum of 5% of the greatest amount bid.

Bidder agrees to perform in accordance with the requirements of the contract documents in consideration of payment by the County of the prices in this proposal.

IN CASE OF DISCREPANCY BETWEEN UNIT PRICES AND EXTENDED PRICES, UNIT PRICES WILL GOVERN.

This bid sheet must be completely filled out in ink or typewritten with any necessary supplemental information attached.

The undersigned hereby agrees to all of the foregoing terms and provisions and to all terms and provisions of the contract, if awarded, which includes all provisions of Sections I - VI of this bid package.

BIDDER _____

SIGNATURE _____

PRINT NAME _____

TITLE _____

ADDRESS _____

CITY, STATE _____

ZIP _____

TELEPHONE _____

FAX NO _____

DATE _____

TAX I.D. No. _____

E-MAIL ADDRESS _____

WATERLINE REHABILITATION BID FORM

BID FORM

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
1	8-Inch Waterline (PVC, AWWA C-900, DR-18) with Ductile Iron Fittings, Open Cut, Joint Restraints (as necessary), All Depths, Complete in Place.	9,150	LF	_____ Dollars _____ Cents	$_____	$_____
2	8-Inch Waterline, Augered Construction (PVC, AWWA C-900, DR-18) All Depths, Complete in Place.	4,040	LF	_____ Dollars _____ Cents	$_____	$_____
3	8-Inch Waterline, Augered & Encased Construction (PVC, AWWA C-900, DR-18) (1/4" Wall Thickness 18" Steel Casing), All Depths, Complete in Place.	285	LF	_____ Dollars _____ Cents	$_____	$_____
4	14-Inch Waterline Casing (PVC, AWWA C-900, DR-18) (18 L.F. Sections) at Sanitary Sewer Crossings, as Shown on Plans, All Depths, Complete in Place.	4	EA	_____ Dollars _____ Cents	$_____	$_____
5	6-Inch Waterline (PVC, AWWA C-900, DR-18) with Ductile Iron Fittings, Open Cut, Joint Restraints (as necessary), All Depths, Complete in Place.	1,200	LF	_____ Dollars _____ Cents	$_____	$_____
6	6-Inch Waterline, Augered Construction (PVC, AWWA C-900, DR-18) All Depths, Complete in Place.	30	LF	_____ Dollars _____ Cents	$_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
7	2-Inch Waterline (PVC, SCH 40) with PVC Fittings, Open Cut, All Depths, Complete in Place.	100	LF	_____ Dollars _____ Cents	$_____	$_____
8	8" Gate Valve (AWWA) with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	55	EA	_____ Dollars _____ Cents	$_____	$_____
9	6" Gate Valve (AWWA) with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	6	EA	_____ Dollars _____ Cents	$_____	$_____
10	Fire Hydrant Assembly, With Restrained Joints, 4-Foot Bury,Concrete Collar, Complete in Place	44	EA	_____ Dollars _____ Cents	$_____	$_____
11	Extra Depth Bury for Fire Hydrant, Complete in Place.	55	VF	_____ Dollars _____ Cents	$_____	$_____
12	Cut and Plug Existing Waterline (Open cut & Backfill), Complete in Place.	12	EA	_____ Dollars _____ Cents	$_____	$_____
13	Remove and Salvage Existing Fire Hydrant (Open cut & Backfill), Complete in Place.	8	EA	_____ Dollars _____ Cents	$_____	$_____
14	Close Existing Valve, Remove Box, Plug Valve Operator (Open cut & Backfill), Complete in Place.	26	EA	_____ Dollars _____ Cents	$_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
15	8-Inch Wet Connection, Including Valve Closures for Line Isolation and Cut & Plug Of Existing Line or Removal as Necessary, Complete in Place.	11	EA	_____ Dollars _____ Cents	$_____	$_____
16	6-Inch Wet Connection, Including Valve Closures for Line Isolation and Cut & Plug Of Existing Line or Removal as Necessary, Complete in Place.	11	EA	_____ Dollars _____ Cents	$_____	$_____
17	2-Inch Wet Connection, Including Valve Closures for Line Isolation and Cut & Plug Of Existing Line or Removal as Necessary, Complete in Place.	5	EA	_____ Dollars _____ Cents	$_____	$_____
18	12-Inch x 8-Inch Tapping Sleeve and Valve (AWWA) Full Body with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	7	EA	_____ Dollars _____ Cents	$_____	$_____
19	8-Inch x 8-Inch Tapping Sleeve and Valve (AWWA) Full Body with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	1	EA	_____ Dollars _____ Cents	$_____	$_____
20	Trench Safety System, Complete in Place.	10,350	LF	_____ Dollars _____ Cents	$_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
21	Construct New Polyethylene Tubing Service Connection (3/4-Inch to 1-Inch), Short Side, Including Tap, Pipe, Valves, and Connection to Meter, Complete in Place.	120	EA	_____ Dollars _____ Cents	$_____	$_____
22	Construct New Polyethylene Tubing Service Connection (3/4-Inch to 1-Inch), Long Side, Auger Beneath Road, Including Tap, Pipe, Valves, and Connection to Meter, Complete in Place.	73	EA	_____ Dollars _____ Cents	$_____	$_____
23	Construct New Polyethylene Tubing Service Connection (2-Inch), Short Side, Including Tap, Pipe, Valves, and Connection to Meter, Complete in Place.	1	EA	_____ Dollars _____ Cents	$_____	$_____
24	Construct New Polyethylene Tubing Service Connection (2-Inch), Long Side, Auger beneath Road, Including Tap, Pipe, Valves, and Connection to Meter, Complete in Place.	1	EA	_____ Dollars _____ Cents	$_____	$_____
25	Install Badger Water Meter (All Sizes) and Box on New Services, in Accordance with Details on Plans, Complete in Place.	195	EA	_____ Dollars _____ Cents	$_____	$_____
26	Turf Establishment, Hydro-mulch Seeding, Complete in Place.	10,350	SY	_____ Dollars _____ Cents	$_____	$_____
27	Surface Restoration, Asphalt Surface, Complete in Place.	50	SY	_____ Dollars _____ Cents	$_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
28	Surface Restoration, Concrete Surface, Complete in Place.	50	SY	_____ Dollars _____ Cents	$_____	$_____
29	Surface Restoration, Unpaved Surface (Gravel or Shell), Complete in Place.	630	SY	_____ Dollars _____ Cents	$_____	$_____
30	Traffic Control, as Necessary, Includes Acquiring Permits, Installation, Maintenance, & Removal of All Traffic Control Devices Required by Permit and as Shown on Project Plans, Complete in Place.	1	LS	_____ Dollars _____ Cents	$_____	$_____
31	SWPPP, Curb Inlet Protection Barrier, Installed, Maintained, And Removed, Complete in Place.	13	EA	_____ Dollars _____ Cents	$_____	$_____
32	SWPPP, Area Inlet Protection Barrier, Installed, Maintained, And Removed, Complete in Place.	9	EA	_____ Dollars _____ Cents	$_____	$_____
33	SWPPP, Reinforced Filter Fabric Barrier, Installed, Maintained, And Removed, Complete in Place.	865	LF	_____ Dollars _____ Cents	$_____	$_____

TOTAL AMOUNT BASE ITEMS _____
(Items 1 thru 33)

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
SUPPLEMENTARY ITEMS						
34	"Extra" Bank Sand, Complete in Place.	100	CY	_____ Dollars _____ Cents	(Minimum Bid $10.00) $_____	$_____
35	"Extra" Crushed Limestone Bedding, Complete in Place.	50	CY	_____ Dollars _____ Cents	(Minimum bid $25.00) $_____	$_____
36	"Extra" Cement Stabilized Sand, 2.0 Sacks per Ton, Complete in Place.	5	TON	_____ Dollars _____ Cents	(Minimum Bid $30.00) $_____	$_____
37	"Extra" Class A Concrete, Complete in Place.	25	CY	_____ Dollars _____ Cents	(Minimum bid $100.00) $_____	$_____
38	"Extra" Reinforcing Steel, Complete in Place.	250	LB	_____ Dollars _____ Cents	(Minimum Bid $1.00) $_____	$_____
39	"Extra" Turf Establishment, Full Sodding, Complete in Place.	10,350	SY	_____ Dollars _____ Cents	(Minimum bid $2.50) $_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
40	12-Inch Waterline (PVC, AWWA C-900, DR-18) with Ductile Iron Fittings, Open Cut, Joint Restraints (as necessary), All Depths, Complete in Place.	50	LF	_____ Dollars _____ Cents	(Minimum bid $65.00) $_____	$_____
41	Fill Abandoned 2-Inch Waterline with Cement Slurry within TxDOT ROW, All Depths, Complete in Place.	1,300	LF	_____ Dollars _____ Cents	(Minimum bid $7.50) $_____	$_____
42	6" Insertion Valve (AWWA) with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	2	EA	_____ Dollars _____ Cents	(Minimum bid $5,000.00) $_____	$_____
43	8" Insertion Valve (AWWA) with Adjustable Box, Joint Restraint (as necessary), Accessories, Concrete Collar, Complete in Place.	2	EA	_____ Dollars _____ Cents	(Minimum bid $6,000.00) $_____	$_____

TOTAL AMOUNT SUPPLEMENTARY ITEMS _____
(Items 34 thru 43)

TOTAL AMOUNT BASE BID AND SUPPLEMENTARY ITEMS _____
(Items 1 thru 43)

SANITARY SEWER REHABILITATION BID FORM

BID FORM

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
1	Clean 10-Inch and Smaller Gravity Sanitary Sewers, Complete in Place	12,180	LF	_____ Dollars _____ Cents	$_____	$_____
2	Television Inspection of 10-Inch and Smaller Gravity Sanitary Sewers, Complete in Place	12,180	LF	_____ Dollars _____ Cents	$_____	$_____
3	6-Inch Sewer Reconstruction by Pipe Bursting with 8.625-Inch O.D. Polyethylene Pipe (SDR 19), all Depths, Including By-pass Pumping, Trench Safety, Post TV Inspection, Etc., Complete in Place	305	LF	_____ Dollars _____ Cents	$_____	$_____
4	8-Inch Sewer Reconstruction by Pipe Bursting with 8.625-Inch O.D. Polyethylene Pipe (SDR 19), all Depths, Including By-pass Pumping, Trench Safety, Post TV Inspection, Etc., Complete in Place	11,875	LF	_____ Dollars _____ Cents	$_____	$_____
5	Normal Connection(4" or 6"), Complete in Place	330	EA	_____ Dollars _____ Cents	$_____	$_____
6	Short Service Connection(4 Inch) Including District Side Cleanout, Complete in Place	196	EA	_____ Dollars _____ Cents	$_____	$_____
7	Long Service Connection (4-Inch), Including District Side Cleanout, Complete in Place	134	EA	_____ Dollars _____ Cents	$_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
8	Manhole Reconstruction, Cementitious Liner, Complete in Place	176	VF	_____ Dollars _____ Cents	$_____	$_____
9	Turf Establishment, Full Sodding, Complete in Place	450	SY	_____ Dollars _____ Cents	$_____	$_____
10	Concrete Surface Replacement per Detail, Complete in Place	350	SY	_____ Dollars _____ Cents	$_____	$_____
11	2-Inch Asphalt Surface, Width Varies, Per Detail, Includes Saw-Cut and Removal, Including Replacement of 8-Inch Base and 2-Inch Surface, Type "D" per TxDot Item 340, Complete in Place	300	SY	_____ Dollars _____ Cents	$_____	$_____
12	Sanitary Sewer Cleanout per Detail, Complete in Place	7	EA	_____ Dollars _____ Cents	$_____	$_____
13	Standard Concrete Sanitary Sewer Manhole, 4-Foot Diameter, 0-8' Depth, As Directed by Owner's Representative Complete in Place	11	EA	_____ Dollars _____ Cents	$_____	$_____
				TOTAL AMOUNT BASE ITEMS	_____	
					(Items 1 thru 13)	

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
SUPPLEMENTARY ITEMS						
14	Reset-Up of Television Inspection Gravity Sanitary Sewers, As Directed by Owner's Representative, Complete in Place	10	EA	_____ Dollars _____ Cents	(Minimum Bid $80.00) $_____	$_____
15	Obstruction Removal by Excavation, As Directed by Owner's Representative, Complete in Place	10	EA	_____ Dollars _____ Cents	(Minimum Bid $300.00) $_____	$_____
16	Small Obstruction Removal, As Directed by Owner's Representative, Complete in Place	1	LS	_____ Dollars _____ Cents	(Minimum bid $250.00) $_____	$_____
17	Trench Safety System, As Directed by Owner's Representative, Complete in Place	200	LF	_____ Dollars _____ Cents	(Minimum bid $2.00) $_____	$_____
18	Short Service Connection (6-Inch), Including District Side Cleanout, As Directed by Owner's Representative, Complete in Place	4	EA	_____ Dollars _____ Cents	(Minimum Bid $450.00) $_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
19	Long Service Connection (6-Inch), Including District Side Cleanout, As Directed by Owner's Representative, Complete in Place	2	EA	_____ Dollars _____ Cents	(Minimum bid $750.00) $_____	$_____
20	Extra Depth Manhole (Over 8-Foot), As Directed by Owner's Representative, Complete in Place	10	VF	_____ Dollars _____ Cents	(Minimum Bid $100.00) $_____	$_____
21	Standard Concrete Sanitary Sewer Manhole, 5-Foot to 6-Foot Diameter, 0-8' Depth, As Directed by Owner's Representative, Complete in Place	1	EA	_____ Dollars _____ Cents	(Minimum bid $3,500.00) $_____	$_____
22	Slip Line Removal, As Directed by Owner's Representative, Complete in Place	4000	LF	_____ Dollars _____ Cents	(Minimum bid $3.00) $_____	$_____
23	Well Point Dewatering System, Installed, Operated and Removed, As Directed by Owner's Representative, Complete in Place	100	LF	_____ Dollars _____ Cents	(Minimum Bid $75.00) $_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
24	Turf Establishment, Hydro-Mulch Seeding, As Directed by Owner's Representative, Complete in Place	1.0	AC	_____ Dollars _____ Cents	(Minimum bid $2,000.00) $_____	$_____
25	"Extra" Bank Sand, As Directed by Owner's Representative, Complete in Place	100	CY	_____ Dollars _____ Cents	(Minimum bid $10.00) $_____	$_____
26	"Extra" Crushed Limestone, As Directed by Owner's Representative, Complete in Place	100	CY	_____ Dollars _____ Cents	(Minimum Bid $30.00) $_____	$_____
27	"Extra" Cement Stabilized Sand, As Directed by Owner's Representative, Complete in Place	100	TON	_____ Dollars _____ Cents	(Minimum bid $35.00) $_____	$_____
28	Obstruction Relocate and Replace, As Directed by Owner's Representative, Complete in Place	3	EA	_____ Dollars _____ Cents	(Minimum bid $500.00) $_____	$_____

ITEM NO.	DESCRIPTION	APPROX. QTY.	UNITS	UNIT PRICE IN WORDS	UNIT PRICE	TOTAL AMOUNT
29	10-Inch Sewer Reconstruction by Pipe Bursting with 10.750-Inch O.D. Polyethylene Pipe (SDR 19), all Depths, Including By-pass Pumping, Trench Safety, Post TV Inspection, Etc., Complete in Place	100	LF	_____ Dollars _____ Cents	(Minimum bid $30.00) $_____	$_____
30	6-Inch to 8-Inch Waterlline (PVC, AWWA C-900, DR-18) with Ductile Iron Fittings, Open Cut, Joint Restraints (as necessary) All Depths, As Directed by Owner's Representative, Complete in Place	100	LF	_____ Dollars _____ Cents	(Minimum bid $40.00) $_____	$_____
31	Deep Connection(4" or 6"), As Directed by Owner's Representative,Complete in Place	1	EA	_____ Dollars _____ Cents	(Minimum bid $500.00) $_____	$_____

TOTAL AMOUNT SUPPLEMENTARY ITEMS _____ **(Items 14 thru 31)**

TOTAL AMOUNT BASE ITEMS _____ **(Items 1 thru 13)**

TOTAL AMOUNT BASE BID AND SUPPLEMENTARY ITEMS _____ **(Items 1 thru 31)**

WATERLINE REHABILITATION

TOTAL AMOUNT BASE ITEMS _____
(Items 1 thru 33)

TOTAL AMOUNT SUPPLEMENTARY ITEMS _____
(Items 34 thru 43)

TOTAL AMOUNT BASE BID AND SUPPLEMENTARY ITEMS _____
(Items 1 thru 43)

SANITARY SEWER REHABILITATION

TOTAL AMOUNT BASE ITEMS _____
(Items 1 thru 13)

TOTAL AMOUNT SUPPLEMENTARY ITEMS _____
(Items 14 thru 31)

TOTAL AMOUNT BASE BID AND SUPPLEMENTARY ITEMS _____
(Items 1 thru 31)

GRAND TOTAL
WATERLINE REHABLITATION &
SANITARY SEWER REHABILITATION _____
(Items 1 thru 43) & (Items 1 thru 31)

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

State of Texas Tax Statement of Materials and other charges:

The cost of in-place materials to be

incorporated into the project $_____

The cost of labor, profit, materials

not in-place and all other charges $_____

TOTAL: (Must agree with bid) $_____

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

CONTRACT AWARD

CONTRACT FOR: MOORE'S ADDITION WATERLINE REHABILITATION & SANITARY SEWER REHABILITATION

THIS CONTRACT IS ENTERED INTO BETWEEN GALVESTON COUNTY AND THE CONTRACTOR NAMED BELOW PURSUANT TO SUBCHAPTER B, CHAPTER 271, TEXAS LOCAL GOVERNMENT CODE, AND THE REFERENCED INVITATION TO BID.

Contract No: **CM16501**

Bid No: **B161009**

Contractor: _____

The Specifications and Drawings are enumerated as follows:

Standard Specifications:	1400	Measurement and Payment Waterline Rehabilitation
	1400	Measurement and Payment Sanitary Sewer Rehabilitation
	1533	Barricades, Signs, and Traffic Handling – No TCP
	1541	Trench Safety Systems
	1584	Project Identification Signs
	1666	Cleaning and Television Inspection of Gravity Sanitary Sewer Lines
	1668	Bypass Pumping
	1671	Obstruction Removal
	2102	Clearing and Grubbing
	2107	Turf Establishment
	2221	Excavation, Trenching, and Backfilling for Utilities
	2223	Crushed Limestone Bedding
	2224	Encasing, Augering and Tunneling
	2227	Waste Material Disposal
	2317	Excavation and Backfill for Utilities
	2401	Dewatering and Drainage of Excavation
	2513	Hot-Mix Asphaltic Concrete Pavement
	2515	Concrete Pavement
	2526	Concrete Curb, Gutter, Curb and Gutter
	2555	Water Piping
	2560	Sanitary Sewers
	2566	Utilities Separation Distances
	2621	Point Repairs - Sanitary Sewers
	2628	Service Reconnections
	2629	Reconstruction of Sewers by the Pipe Bursting Method
	2701	Manhole Reconstruction (Cementitious Liner)
	3200	Concrete Reinforcement
	3310	Concrete
	3312	Cement-Stabilized Sand Backfill
	15061	Steel Piping and Fittings
	15062	Ductile Iron Pipe and Fittings
	15064	Plastic Piping and Fittings (4 Inches or Smaller)

Special Provisions: Special Provision No. 1 to Specification Item 2555 – Water Piping
Special Provision No. 2 to Specification Item 2560 – Sanitary Sewers

Special Items:

DRAWINGS:

Drawing Index

1. Cover Sheet
2. General Notes – Vicinity & Location Maps
3. Project Layout – Horizontal & Vertical Control – Sheet 1 of 2
4. Project Layout – Horizontal & Vertical Control – Sheet 2 of 2
5. Hill Avenue – Plan & Profile – Beginning to BL "A" Sta. 3+20
6. Hill Avenue – Plan & Profile – BL "A" Sta. 3+20 to End
7. Avenue B – Plan & Profile – Beginning to BL "B" Sta. 5+20
8. Avenue B – Plan & Profile – BL "B" Sta. 5+20 to BL "B" Sta. 9+20
9. Avenue B – Plan & Profile – BL "B" Sta. 9+20 to BL "B" Sta. 13+30
10. Avenue B – Plan & Profile – BL "B" Sta. 13+30 to BL "B" Sta. 17+50
11. Avenue B – Plan & Profile – BL "B" Sta. 17+50 to BL "B" Sta. 21+80
12. Avenue B – Plan & Profile – BL "B" Sta. 21+80 to BL "B" Sta. 25+30
13. Avenue B – Plan & Profile – BL "B" Sta. 25+30 to End
14. Avenue B – Plan & Profile – Beginning to BL "B2" Sta. 4+50
15. Avenue B – Plan & Profile – BL "B2" Sta. 4+50 to End
16. Avenue C – Plan & Profile – Beginning to BL "C" Sta. 5+60
17. Avenue C – Plan & Profile – BL "C" Sta. 15+20 to BL "C" Sta. 20+50
18. Avenue C – Plan & Profile – BL "C" Sta. 20+50 to BL "C" Sta. 24+70
19. Avenue C – Plan & Profile – BL "C" Sta. 24+70 to BL "C" Sta. 28+80
20. Avenue C – Plan & Profile – BL "C" Sta. 28+80 to BL "C" Sta. 33+10
21. Avenue C – Plan & Profile – BL "C" Sta. 33+10 to BL "C" Sta. 37+20
22. Avenue C – Plan & Profile – BL "C" Sta. 37+20 to BL "C" Sta. 41+00
23. Avenue C – Plan & Profile – BL "C" Sta. 41+00 to BL "C" Sta. 46+20
24. Avenue C – Plan & Profile – BL "C" Sta. 46+20 to BL "C" Sta. 50+50
25. Avenue C – Plan & Profile – BL "C" Sta. 50+50 to BL "C" Sta. 55+00
26. Avenue C – Plan & Profile – BL "C" Sta. 55+00 to End
27. Avenue D – Plan & Profile – Beginning to End
28. State Highway 3 – Plan & Profile – Beginning to BL "E" Sta. 4+80
29. State Highway 3 – Plan & Profile – BL "E" Sta. 4+80 to BL "E" Sta. 9+60
30. State Highway 3 – Plan & Profile – BL "E" Sta. 9+60 to End
31. 19TH Street – Plan & Profile – Beginning to End
32. 23RD Street – Plan & Profile – Beginning to BL "G" Sta. 4+00
33. 23RD Street – Plan & Profile – BL "G" Sta. 4+00 to End
34. 26TH Street – Plan & Profile – Beginning to End
35. 27TH Street – Plan & Profile – Beginning to End
36. 28TH Street – Plan & Profile – Beginning to End
37. 29TH Street – Plan & Profile – Beginning to End
38. Rose Street – Plan & Profile – Beginning to BL "L" Sta. 4+00
39. Rose Street – Plan & Profile – BL "L" Sta. 4+00 to BL "L" Sta. 7+50
40. Rose Street – Plan & Profile – BL "L" Sta. 7+50 to End
41. Daisy Street – Plan & Profile – Beginning to BL "M" Sta. 3+90
42. Daisy Street – Plan & Profile – BL "M" Sta. 3+90 to End
43. Standard Water Details – Sheet 1 of 2
44. Standard Water Details – Sheet 2 of 2
45. Miscellaneous Details
46. Storm Water Pollution Prevention – Plan & Details – Sheet 1 of 2

47. Storm Water Pollution Prevention – Plan & Details – Sheet 2 of 2
48. Standard Barricade Details

EXHIBITS:

Exhibit Index

1. Cover Sheet
2. General Notes – Vicinity & Location Maps
3. Project Layout
4. Standard Sanitary Sewer Details Sheet 1 of 2
5. Standard Sanitary Sewer Details Sheet 2 of 2
6. Traffic Control Plan Rolling Construction

ADDENDA:

_____

Contract Award (continued)

Sections I (Invitation to Bid; TGLOInstructions to Bidders;), II (General Conditions; Bid Proposal; Contract Award; TGLO Documents; Bonds-Bid, Payment, Performance; Including Addena Wage Rates & Affidavit and Surety Forms; Attorney's Review Certification), III (General Provisions), IV (Project Scope; General Notes; Certificatoin of Section 3 HUD Section 3 Clause, and Section 3 Residents & Business Forms; Copeland Act and Certification Regarding Lobbying; Project Sign), V (Specifications) and VI (Project Drawings;) VII (Project Exhibits) attached to this Contract Award are all made a part of this Contract and collectively evidence and constitute the entire contract. Contractor shall furnish all materials, perform all of the work required to be done and do everything else required by these documents.

Time of Completion: The Contractor shall complete the work within **210** Calendar Days of the issuance of the notice to proceed. The time set forth for completion of the work is an essential element of the Contract.

The Contract Sum: The County shall pay the Contractor for performance of the Contract, the sum of

_____

_____Dollars and No/100 ($_____),
payments to be made as described herein.

Performance Bond required: (x) yes ( ) no
Payment Bond required: (x) yes ( ) no

This Contract is issued pursuant to award made by Commissioners' Court on _____, 20___.

EXECUTED this _____ day of _____, 20___.

COUNTY OF GALVESTON, TEXAS

BY: _____
MARK HENRY, County Judge

ATTEST:

_____
DWIGHT SULLIVAN, County Clerk

CONTRACTOR

_____

BY: _____
Signature - Title

_____
Printed Name

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

Federal Labor Standards Provisions

U.S. Department of Housing
And Urban Development

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage rate and fringe benefits therefore only when the following criteria have been met.

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140).

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140).

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of an laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140).

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract, in the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates or contributions or costs anticipated for bona fide fringe benefits or cash equivalents there of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017).

(ii)(a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-0014-1), U. S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149).

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(i) and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph A.3.(ii)(b) of this section.

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph A.3.(i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.

(4) Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration. Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. the ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the David-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government

contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part "Whoever, for the purpose of ... influencing in any way the action of such Administration... makes, utters or publishes any statement, knowing the same to be false... shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat.96).

(3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

CONTRACTOR'S LOCAL OPPORTUNITY PLAN

(name of company) _____ agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and businesses within the (City/County) of _____.

A. To ascertain from the Grant Recipient's CDBG program official the exact boundaries of the project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
B. To attempt to recruit from within the city the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.
C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
D. To insert this plan in all bid documents and to require all bidders on subcontracts to submit an affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
E. To insure that subcontracts (greater than $10,000), which are typically let on a negotiated rather than a bid basis in areas other than the covered project area, are also let on a negotiated basis, whenever feasible, in a covered project area.
F. To formally contact unions, subcontractors, and trade associations to secure their cooperation in this effort.
G. To insure that all appropriate project area business concerns are notified of pending sub-contractual opportunities.
H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this plan.
J. To maintain records concerning the amount and number of contracts, subcontracts, and purchases which contribute to objectives.
K. To maintain records of all projected work force needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets these Local Opportunity objectives.

As officers and representatives of (name of company), we the undersigned have read and fully agree to this Plan, and become a party to the full implementation of the program and its provisions.

_____
Signature

_____ _____
Title Date

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

PROPOSED CONTRACTS BREAKDOWN

Type of Contracts	No. of Contracts	Approx. Total Dollar Amount	Estimated No. to local Business	Estimated $ Amount Local Business

ESTIMATED PROJECT WORKFORCE BREAKDOWN

Work Classifications	Total Estimated Positions	No. of Positions Currently Filled	No. of Positions not Filled	No. of Positions to fill with L/M Residents
Totals				

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

Name of Bidder:_____Date Organized:_____

Address:_____Date Incorporated_____

Number of Years in contracting business under present name_____:

CONTRACTS ON HAND:

Contract	Amount $	Completion Date

Type of work performed by your company: _____

Have you ever failed to complete any work awarded to you? _____
Have you ever defaulted on a contract?_____

List the projects most recently completed by your firm (include project of similar importance):

Project	Amount $	Mo/Yr Completed

Major equipment available for **this** contract: _____

Attach resume(s) for the principal member(s) of your organization, including the officers as well as the proposed superintendent for the project.

Credit available: $ _____ Bank reference: _____

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the _____ in verification of the recitals comprising this Statement of Bidder's Qualifications.

Executed this _____ day of _____, 19___.

By:(signature) _____ Title: _____

(print name) _____

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

CONTRACTOR CERTIFICATIONS

U.S. Department of Housing and Urban Development

CERTIFICATION OF BIDDER REGARDING CIVIL RIGHTS LAWS AND REGULATIONS

INSTRUCTIONS

CERTIFICATION OF BIDDER REGARDING Executive Order 11246 and Federal Laws Requiring Federal Contractor to adopt and abide by equal employment opportunity and affirmative action in their hiring, firing, and promotion practices. This includes practices related to race, color, gender, religion, national origin, disability, and veterans' rights.

NAME AND ADDRESS OF BIDDER (include ZIP Code)

CERTIFICATION BY BIDDER

Bidder has participated in a previous contract or subcontract subject to Civil Rights Laws and Regulations.

☐ Yes ☐ No

The undersigned hereby certifies that:

☐ The Provision of Local Training, Employment, and Business Opportunities clause (Section 3 provision) is included in the Contract. A written Section 3 plan (Local Opportunity Plan) was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $100,000).

☐ The Non Segregated Facilities clause (Section 109 provision) is included in the Contract. No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964.

☐ The Equal Employment Opportunity clause is included in the Contract (if bid equals or exceeds $10,000).

☐ The Affirmative Action for Handicapped Workers clause is included in the contract.

Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

☐ Yes ☐ No

NAME AND TITLE OF SIGNER (Please type)

SIGNATURE DATE

BID #
OPEN DATE
TIME

SECTION 504 CERTIFICATION

POLICY OF NONDISCRIMINATION ON THE BASIS OF DISABILITY

The _____ does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its federally assisted programs or activities.

(Name) _____

(Address) _____

_____

City State Zip

Telephone Number ( ) _____ - _____ Voice

( ) _____ - _____ TDD

has been designated to coordinate compliance with the nondiscrimination requirements contained in the Department of Housing and Urban Development's (HUD) regulations implementing Section 504 (24 CFR Part 8. dated June 2, 1988).

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM
CONTRACTOR'S CERTIFICATION

CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

TO (appropriate recipient)	DATE
	PROJECT NUMBER (if any)
C/O	PROJECT NAME

1. The undersigned, having executed a contract with _____ _____ for the construction of the above-identified project, acknowledges that:

   (a) The Labor Standards provisions are included in the aforesaid contract,

   (b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility.

2. He certifies that:

   (a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended.

   (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. He certifies that:

   (a) The legal name and the business address of the undersigned are:

   (b) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE STATE OF
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

   (c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

   (d) The names and addresses of all other persons having a substantial interest in the undersigned, and the nature of the interest are:

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are:

NAME	ADDRESS	TRADE CLASSIFICATION

_____
(Contractor)

Date _____

By _____

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)

County of _____)

_____, being first duly sworn, deposes and says that:

(1) He is _____ of _____, the Bidder that has submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the _____ (Local Public Agency) or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

_____
Title

Subscribed and sworn to me this _____ day of _____.

By: _____
Notary Public

My commission expires _____

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____ as PRINCIPAL, and _____, as SURETY are held and firmly bound unto _____ hereinafter called the "Owner", in the penal sum of _____ Dollars, ($_____), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the Accompanying Bid, dated _____, for _____

NOW, THEREFOR, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the same, or, if no period be specified, within thirty (30) days after the said opening, and shall within the period specified therefor, or if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Owner in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the Owner the difference between the amount specified in said Bid and the amount for which the local Public Agency may procure the required work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS THEREOF, the above-bounded parties have executed this instrument under their several seals this _____ day of _____, the name and corporate seal of each corporate party being hereto affixed and these present signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

_____

(SEAL)

Attest: By: _____

Affix Corporate Seal

Attest: By: _____

Affix Corporate Seal

Attest: By: _____

Countersigned

By _____

* Attorney-in-Fact, State of _____

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____, _____, Secretary of the Corporation named as Principal in the within bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed, and attested to, for and in behalf of said corporation by authority of this governing body.

Corporate Seal

Title: _____

* Power-of-attorney for person signing for surety company must be attached to bond.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor or Company)

_____
(Address)

a _____, hereinafter called Principal,
(Corporation / Partnership)

and _____
(Name of Surety Company)

_____
(Address)
hereinafter called Surety, are held and firmly bound unto

_____
(Name of Recipient)

_____
(Recipient's Address)

hereinafter called OWNER, in the penal sum of $ _____

Dollars, $ _____ in lawful money of the United States, for this payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONFIDENTIALITY OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

_____
(Project Name)
_____

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUB-CONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUB-CONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its

obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counter-parts, each on of (Number)
which shall be deemed an original, this the _____ day of _____.

ATTEST: _____
(Principal)

_____ By _____ (s)
(Principal Secretary)

(SEAL)

_____
(Witness as to Principal) (Address)

_____ _____
(Address)

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

_____ _____
(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor or Company)

_____
(Address)

a _____ hereinafter called Principal, and

_____
(Name of Surety Company

_____
(Address)

hereinafter called Surety, are held and firmly bound unto

_____
(Name of Recipient)

_____
(Recipient's Address)

hereinafter called OWNER, in the penal sum of $ _____Dollars ($ ____) in lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, successors, and assigns, jointly and severally, firmly in these presents.

THE CONDITION OF THIS OBBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER dated the _____ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

_____
_____
_____

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties in all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this the _____ day of _____.

ATTEST: _____
(Principal)

_____ By _____(s)
(Principal Secretary)

(SEAL)

_____ _____
(Witness as to Principal) (Address)

_____ _____
(Address)

_____

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

_____ _____
(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

ATTORNEY'S REVIEW CERTIFICATION

I, the undersigned, _____, the duly authorized and acting legal representative of the _____, do hereby certify as follows:

I have examined the attached contract(s) and surety bonds and am of the opinion that each of the agreements may be duly executed by the proper parties, acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties; and that the agreements shall constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Attorney's signature: _____ Date: _____

Print Attorney's Name: _____

Disaster Recovery Projects

Attention is called to the fact that not less than, the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, and contained in the contract documents, must be paid on this project. In addition, the successful bidder must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex age or national origin.

All contractors/subcontractors that are debarred, suspended or otherwise excluded from or ineligible for participation on federal assistance programs may not undertake any activity in part or in full under this project.

Funding for this project is covered under Section 3 of the Housing and Urban Development Act of 1968. All eligible bidders must comply with Section 3 requirements in regards to meeting or exceeding the required objectives for both hiring and subcontracting. In accordance with these objectives, contractors are required to direct their newly created employment and/or subcontracting opportunities to Section 3 Residents and Business Concerns.

General Decision Number: TX160094 01/08/2016 TX94

Superseded General Decision Number: TX20150094

State: Texas

Construction Type: Heavy

County: Galveston County in Texas.

HEAVY CONSTRUCTION PROJECTS Including Water and Sewer Lines
(Does Not Include Flood Control)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016

* SFTX0669-001 04/01/2015

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers)	$ 27.43	17.12

SUTX2005-021 08/05/2005

HEAVY Including Water and Sewer Lines (Excluding Flood Control)

	Rates	Fringes
Carpenter	$ 14.38	
Cement mason/concrete finisher	$ 11.37	1.13
Electrician	$ 18.40	1.34
FORM BUILDER/FORM SETTER	$ 13.35	1.17
IRONWORKER, REINFORCING	$ 11.29	
Laborers:		
Common	$ 10.70	
Landscape	$ 7.35	
Mason Tender Cement	$ 9.96	
Pipelayer	$ 10.07	
PIPEFITTER	$ 17.00	0.04
Power equipment operators:		
Excavator	$ 16.74	
Backhoe	$ 13.25	
Bulldozer	$ 14.00	
Crane	$ 14.91	0.58
Front End Loader	$ 11.75	0.92
Grader	$ 12.20	1.48
Tractor	$ 12.38	1.51
TRUCK DRIVER	$ 12.28	0.98

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

?

SECTION III

General Provisions

MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Table of Contents

GENERAL PROVISIONS

1. PROPOSAL PACKAGE 1
2. PROPOSER'S RESPONSIBILITY 1
3. TIME FOR RECEIVING PROPOSALS 1
4. PROPOSAL OPENING 1
5. COMMISSIONERS' COURT 1
6. REJECTION OF PROPOSALS/DISQUALIFICATION 2
A. Failure to use the proposal form(s) furnished by the County; 2
7. RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS 2
8. SUBSTITUTES/DESCRIPTION OF MATERIALS AND EQUIPMENT 2
9. EXCEPTIONS TO PROPOSAL 2
10. PRICING 3
11. PROCUREMENT CARD PROGRAM 3
12. PASS THROUGH COST ADJUSTMENTS 3
13. MODIFICATION OF PROPOSALS 4
14. SIGNATURE OF PROPOSALS 4
15. AWARD OF PROPOSALS – EVALUATION CRITERIA AND FACTORS 4
16. DISPUTE AFTER AWARD/PROTEST 5
17. PUBLIC INFORMATION ACT 5
18. PROPOSER'S EMAIL ADDRESSES 6
19. RESULTANT CONTRACT 6
20. CONTRACT TERM 6
21. TERMINATION FOR DEFAULT 6
22. TERMINATION FOR CONVENIENCE 7
23. FORCE MAJEURE 7
24. ESTIMATED QUANTITIES 7

MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

25. CONTRACTOR INVESTIGATION 7
26. NO COMMITMENT BY COUNTY OF GALVESTON 8
27. PROPOSAL COSTS BORNE BY BIDDER/PROPOSER 8
28. BEST AND FINAL OFFERS (BAFO) 8
29. SINGLE PROPOSAL RESPONSE 8
30. CHANGES IN SPECIFICATIONS 8
31. PROPOSAL IDEAS AND CONCEPTS 8
32. PROPOSAL DISCLOSURES 9
33. WITHDRAWAL OF PROPOSAL 9
34. INDEMNIFICATION 9
35. REQUIREMENT OF AND PROOF OF INSURANCE 9
36. BID/PROPOSAL GUARANTEE 10
37. PERFORMANCE AND PAYMENT BONDS 11
38. PATENT AND COPYRIGHT PROTECTION 11
39. CONFLICT OF INTEREST DISCLOSURE REPORTING 12
40. COMPETITIVENESS AND INTEGRITY 13
41. ENTIRETY OF AGREEMENT AND MODIFICATION 14
42. NON-COLLUSION AFFIDAVIT 14
43. SOVEREIGN IMMUNITY 14
44. CONTROLLING LAW AND VENUE 15
45. MERGERS, ACQUISITIONS 15
46. DELAYS 15
47. ACCURACY OF DATA 15
48. SUBCONTRACTING/ASSIGNMENT 15
49. INDEPENDENT CONTRACTOR 15
50. MONITORING PERFORMANCE 16
51. PROCUREMENT ETHICS 16
52. SUBJECT TO APPROPRIATION OF FUNDS 17
53. NOTICE 17

MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

54. NONDISCRIMINATION 18
55. RECORD RETENTION AND RIGHT TO AUDIT 19
56. TITLE VI ASSURANCES/TxDOT 19
57. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS 20
58. SECTION 231.006, FAMILY CODE/DELINQUENT CHILD SUPPORT 21
59. LABOR STANDARDS 21

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

1. PROPOSAL PACKAGE

The request for proposal, general and special provisions, drawings, specifications/line item details, contract documents and the proposal sheet are all part of the proposal package. Proposals must be submitted in sets of five (5), one (1) original and four (4) copies on the forms provided by the County, including the proposal sheets completed in their entirety and signed by an authorized representative by original signature. Failure to complete and sign the proposal sheets/contract page(s) may disqualify the proposal from being considered by the Commissioners' Court. Any individual signing on behalf of the proposer expressly affirms that he or she is duly authorized to tender this proposal and to sign the proposal sheet/contract under the terms and conditions in this proposal. Proposer further understands that the signing of the contract shall be of no effect unless subsequently awarded and the contract properly executed by the Commissioners' Court. All figures must be written in ink or typed. Figures written in pencil or with erasures are not acceptable. However, mistakes may be crossed out, corrections inserted, and initialed in ink by the individual signing the proposal. If there are discrepancies between unit prices quoted and extensions, the unit price will prevail. Each proposer is required to thoroughly review this entire proposal packet to familiarize themselves with the proposal procedures, the plans and specifications for the requested work as well as the terms, and conditions of the contract the successful proposer will execute with the County.

2. PROPOSER'S RESPONSIBILITY

The Proposer must affirmatively demonstrate its responsibility. The Proposer must also meet the following minimum requirements:

1. have adequate financial resources or the ability to obtain such resources as required;
2. be able to comply with all federal, state, and local laws, rules, regulations, ordinances and orders regarding this Request for Proposal;
3. have a satisfactory record of performance;
4. have a satisfactory record of integrity and ethics; and
5. be otherwise qualified and eligible to receive an award.

3. TIME FOR RECEIVING PROPOSALS

Proposals received prior to the submission deadline will be maintained unopened until the specified time for opening. If the proposer fails to identify the Proposal Number on the outside of the envelope as required, the Purchasing Agent will open the envelope for the sole purpose of identifying the proposal number for which the submission was made. The envelope will then be resealed. No liability will attach to a County office or employee for the premature opening of a proposal. If you do not submit a proposal, return this Request for Proposal and state reason, otherwise your name may be removed from the Purchasing Agent's mailing list.

4. PROPOSAL OPENING

Only the names of proposers will be read at the opening. The Purchasing Agent will examine proposals promptly and thoroughly. No proposal may be withdrawn for a period of sixty (60) calendar days of the proposal opening date.

5. COMMISSIONERS' COURT

No contract is binding on the County until it is properly placed on the Commissioners' Court agenda, approved in open Court, authorized to be executed by the County Judge, and fully executed by both parties.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Department heads and elected officials are not authorized to enter into any type of agreement or contract on behalf of the County. Only the Commissioners' Court acting as a body may enter into a contract on behalf of and contractually bind the County. Additionally, department heads and elected officials are not authorized to agree to any type of supplemental agreements or contracts for goods or services. Supplemental agreements are subject to review by the County Legal Department prior to being accepted and signed by the County's authorized representative.

6. REJECTION OF PROPOSALS/DISQUALIFICATION

Galveston County, acting through its Commissioners' Court, reserves the right to: reject any and all proposals in whole or in part received by reason of this request for proposal, to waive any informality in the proposals received, to disregard the proposal of any proposer determined to be not responsible, and/or to discontinue its efforts for any reason under this proposal package at any time prior to actual execution of contract by the County. Proposers may be disqualified and rejection of proposals may be recommended to the Commissioners' Court for any of (but not limited to) the following causes:

A. Failure to use the proposal form(s) furnished by the County;
B. Lack of signature by an authorized representative on the proposal form(s);
C. Failure to properly complete the proposal;
D. Proposals that do not meet the mandatory requirements; and/or
E. Evidence of collusion among proposers.

7. RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS

It is the responsibility of the prospective proposer to review the entire invitation to proposal packet and to notify the Purchasing Department if the specifications are formulated in a manner that would restrict competition or appear ambiguous. Any protest or question(s) regarding the specifications or proposal procedures must be received in the Purchasing Department not less than seventy-two (72) hours prior to the time set for proposal opening. Vendors are to submit proposal as specified herein or propose an approved equal.

8. SUBSTITUTES/DESCRIPTION OF MATERIALS AND EQUIPMENT

Any brand name or manufacturer reference used herein is intended to be descriptive and not restrictive, unless otherwise noted, and is used to indicate the type and quality of material. The term "or equal" if used, identifies commercially produced items that have the essential performance and salient characteristics of the brand name stated in the item description. All supplies, material, or equipment shall be new and of the most suitable grade for the purpose intended. It is not the County's intent to discriminate against any materials or equipment of equal merit to those specified. However, if Proposer desires to use any substitutions, prior written approval must be obtained from the County Purchasing Agent and sufficiently in advance such that an addendum may be issued. All material supplied must be one hundred percent (100%) asbestos free. Bidder/Proposer, by submission of its bid/proposal, certifies that if awarded any portion of this procurement, the bidder/proposer will supply only material and equipment that is 100% asbestos free.

9. EXCEPTIONS TO PROPOSAL

The proposer will list on a separate sheet of paper any exceptions to the conditions of the proposal. This sheet will be labeled, "Exceptions to Proposal Conditions", and will be attached to the proposal. If no exceptions are stated, it will be understood that all general and specific conditions will be complied with, without exception.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

The Proposer must specify in its proposal any alternatives it wishes to propose for consideration by the County. Each alternative should be sufficiently described and labeled within the proposal and should indicate its possible or actual advantage to the program being offered.

The County reserves the right to offer these alternatives to other proposers.

10. PRICING

Proposals will be either lump sum or unit prices as shown on the proposal sheet. The net price will be delivered to Galveston County, including all freight or shipping charges.

Cash discount must be shown on proposal, otherwise prices will be considered net. Unless prices and all information requested are complete, proposal may be disregarded and given no consideration.

In case of default by the contractor, the County of Galveston may procure the articles or services from other sources and may deduct from any monies due, or that may thereafter become due to the contractor, the difference between the price named in the contract of purchase order and the actual cost thereof to the County of Galveston. Prices paid by the County of Galveston shall be considered the prevailing market price at the time such purchase is made. Periods of performance may be extended if the facts as to the cause of delay justify such extension in the opinion of the Purchasing Agent and the Commissioners' Court.

11. PROCUREMENT CARD PROGRAM

The County of Galveston participates in a Procurement Card (P-Card) program that allows payments made to a vendor by credit card. This method normally results in substantially faster bill payments, sometimes within three (3) to five (5) days of the actual transaction date. If your company will accept payment via credit card (Visa, MasterCard), please notate this in your proposal submittal.

12. PASS THROUGH COST ADJUSTMENTS

Except in instances of extreme extenuating circumstances Vendor prices shall remain firm throughout the Contract period and any renewals. Examples of extreme extenuating circumstances include such situations as a nationwide rail strike, oil shortage or oil embargo.

In extreme extenuating circumstances Vendors may be allowed to temporarily "pass through" additional costs they are forced to incur through no fault of their own. A request for a pass through cost increase will not be considered unless a Vendor's cost for his product exceeds 10% over the original cost for the product. Also, the increase in cost must be nationwide and consistent for a minimum period of sixty (60) days. Costs that historically are anticipated to rise over a period of time (for example only, such as wages or insurance costs) do not qualify for pass through. If a Vendor thinks he will be asking for a pass through cost adjustment during the term of the contract, then the original cost of the product to Vendor must be stated in Vendor's original proposal.

A request for a pass through cost does not guarantee that one will be granted. Vendors must submit such information on each request as is required by the County Purchasing Agent. The County Purchasing Agent will review each request on a case by case basis and determine the appropriateness of each request as well as amount and duration of increase. Vendors will not be permitted any additional compensation for mark-ups or profits based on the increase in price. Rather, such additional compensation will be limited to the actual increase in original cost to the Vendor as such increase is reflected by the original cost stated in the proposal. But in no event will the amount of additional compensation exceed 25% increase in Vendor's original cost for his product as such cost is reflected in Vendor's

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

original proposal or the duration exceed a period of sixty (60) days. In addition, should, during the period of the pass through, cost return to normal or decrease to below pre pass through prices, appropriate downward adjustments will be made. No more than one pass through adjustment will be permitted per year.

13. MODIFICATION OF PROPOSALS

A proposer may modify a proposal by letter at any time prior to the submission deadline for receipt of proposals. Modification requests must be received prior to the submission deadline. Modifications made before opening time must be initialed by proposer guaranteeing authenticity. Proposals may not be amended or altered after the official opening with the single exception that any product literature and/or supporting data required by the actual specifications, if any, will be accepted at any time prior to the Commissioners' Court considering of same.

14. SIGNATURE OF PROPOSALS

Each proposal shall give the complete mailing address of the Proposer and be signed by an authorized representative by original signature with the authorized representative's name and legal title typed below the signature line. Each proposal shall include the Proposer's Federal Employer Identification Number (FEIN). Failure to sign the Contract page(s) and proposal response sheets may disqualify the proposal from being considered by the County. The person signing on behalf of the Proposer expressly affirms that the person is duly authorized to tender the proposal and to sign the proposal sheets and contract under the terms and conditions of this RFP and to bind the Proposer thereto and further understands that the signing of the contract shall be of no effect until it is properly placed on the Commissioners' Court agenda, approved in open Court, authorized to be executed by the County Judge, and fully executed by both parties.

15. AWARD OF PROPOSALS - EVALUATION CRITERIA AND FACTORS

The award will be made to the responsible proposer whose proposal is determined to be the best evaluated offer demonstrating the best ability to fulfill the requirements set forth in this Request for Proposal. **The proposed cost to the County will be considered firm and cannot be altered after the submission deadline, unless the County invokes its right to request a best and final offer.**

Each proposer, by submitting a proposal, agrees that if their proposal is accepted by the Commissioners' Court, such proposer will furnish all items and services upon which prices have been tendered and upon the terms and conditions in this proposal and contract.

The contractor shall commence work only after the transmittal of a fully executed contract and after receiving written notification to proceed from the County Purchasing Agent. The contractor will perform all services indicated in the proposal in compliance with this contract.

Neither department heads nor elected officials are authorized to sign any binding contracts or agreements prior to being properly placed on the Commissioners' Court agenda and approved in open court. Department heads and other elected officials are not authorized to enter into any type of agreement or contract on behalf of Galveston County. Only the Commissioners' Court, acting as a body, may enter into a contract on behalf of the County. Additionally, department heads and other elected officials are not authorized to agree to any type of supplemental agreements or contracts for goods or services. Supplemental agreements are subject to review by the County Legal Department prior to being signed by the County's authorized representatives.

The County of Galveston reserves the right to accept proposals on individual items listed, or group items, or on the proposal as a whole; to reject any and all proposals; to waive any informality in the proposals; and to accept the proposal that appears to be in the best interest of the County. The selection process may, however, include a request for

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

additional information or an oral presentation to support the written proposal.

In determining and evaluating the best proposal, the pricing may not necessarily be controlling, but quality, equality, efficiency, utility, general terms, delivery, suitability of the service offered, and the reputation of the service in general use will also be considered with any other relevant items. The Commissioners' Court shall be the sole judge in the determination of these matters.

The County reserves the right to reject any or all proposals in whole or in part received by reason of this RFP and may discontinue its efforts under this RFP for any reason or no reason or solely for the County's convenience at any time prior to actual execution of the contract by the County.

A Proposer whose proposal does not meet the mandatory requirements set forth in this RFP will be considered noncompliant.

The invitation to submit a proposal which appears in the newspaper, or other authorized advertising mediums, these general provisions, the specifications which follow, the proposal sheets, and any addenda issued are all considered part of the proposal.

Each Proposer, by submitting a proposal, agrees that if its proposal is accepted by the Commissioners' Court, such Proposer will furnish all items and services upon the terms and conditions in this RFP and the resultant contract.

Notice of contract award will be made within ninety (90) days of opening of proposals to the lowest responsive and responsible contractor, whose proposal complies with all the requirements in the Request for Proposals.

Contractor shall submit to the County, for approval, within ten (10) days from notice of contract award, all Certificates of Insurance evidencing the required coverage as described under Insurance in the schedule of the Requests for Proposals.

The contractor shall not commence work under these terms and conditions of the contract until all applicable Certificates of Insurance, Performance and Payment Bonds, and Irrevocable Letter of Credit (if required) have been approved by the County of Galveston and the Contractor has received notice to proceed in writing and an executed copy of the contract from the County Purchasing Agent.

16. DISPUTE AFTER AWARD/PROTEST

Any actual or prospective Proposer who is allegedly aggrieved in connection with the solicitation of this RFP or award of a contract resulting therefrom may protest. The protest will be submitted in writing to the Purchasing Agent within seven (7) calendar days after such aggrieved person knows of or should have known of the facts giving rise thereto. If the protest is not resolved by mutual agreement, the Purchasing Agent will promptly issue a decision in writing to the protestant. If the protestant wishes to appeal the decision rendered by the Purchasing Agent, such appeal must be made to the Commissioners' Court through the Purchasing Agent. The decision of the Commissioners' Court will be final. The Commissioners' Court need not consider protests unless this procedure is followed.

17. PUBLIC INFORMATION ACT

The parties agree that the County is a governmental body for purposes of the Public Information Act, codified as Chapter 552 of the Texas Government Code and as such is required to release information in accordance with the Public Information Act. Proposer agrees that it has **clearly and conspicuously** marked any information that it considers to be confidential, proprietary, and/or trade secret in its proposal. County agrees to provide notice to Proposer in accordance

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

with the Public Information Act in the event the County receives a request for information under the Public Information Act for information that the Proposer has marked as confidential, proprietary, and/or trade secret.

18. PROPOSER'S EMAIL ADDRESSES

Notwithstanding the foregoing Section 17, Proposer acknowledges and agrees that the confidentiality of any and all email addresses it uses or discloses in communicating with the County are open to the public in accordance with Section 552.137 of the Government Code and consents to the release of its email addresses.

19. RESULTANT CONTRACT

Proposer shall correctly and fully execute the resultant contract first – after this, the contract shall be set for consideration by the Commissioners' Court. If the Commissioners' Court authorizes the execution of the contract, then the resultant contract shall become effective upon the Commissioners' Court execution of same. Contract documents shall consist of the contract, the general and special provisions, the drawings, proposal package (including best and final offer(s) if such is utilized), any addenda issued, and any change orders issued during the work. If applicable to the attached bid/proposal, bidder/proposer must sign three (3) original contracts and return with their bid/proposal submittal.

Proposer should submit a proposed contract with its proposal or its sample material terms and conditions.

The criteria utilized for determining responsibility of proposer(s) includes, but is not limited to, the proposer's experience, skill, ability, business judgment, financial capacity, integrity, honesty, possession of the necessary facilities or equipment, previous performance, reputation, promptness, and any other factor deemed relevant by the County. The proposers shall furnish any information requested by the County in order for the County to determine whether a proposer is responsible.

20. CONTRACT TERM

The term of the resultant contract will begin on the date of execution by the Commissioners' Court and will terminate on the date specified in the resultant contract unless terminated earlier as herein set forth.

21. TERMINATION FOR DEFAULT

Failure of either party in the performance of any of the provisions of this contract shall constitute a breach of contract, in which case either party may require corrective action within ten (10) days from date of receipt of written notice citing the exact nature of such breach. Failure of the party being notified to take corrective action within the prescribed ten (10) days, or failure to provide written reply of why no breach has occurred, shall constitute a Default of Contract.

All notices relating to default by Proposer of the provisions of the contract shall be issued by County by its Legal Department, and all replies shall be made in writing to the County Legal Department. Notices issued by or issued to anyone other than the County Legal Department shall be null and void and shall be considered as not having been issued or received.

Galveston County reserves the right to enforce the performance of this contract in any manner prescribed by law in the event of breach or default of this contract, and may contract with another party, with or without solicitation of bids or proposals or further negotiations. At a minimum, Proposer shall be required to pay any difference in service or materials, should it become necessary to contract with another source, plus reasonable administrative costs and attorney fees.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

In the event of Termination for Default, Galveston County, its agents or representatives shall not be liable for loss of any profits anticipated to be made by Proposer.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

No waiver by either party of any event of default under this agreement shall operate as a waiver of any subsequent default under the terms of this agreement.

County reserves the right to terminate this contract immediately in the event Proposer:

- Fails to meet delivery or completion schedules; and/or
- Fails to otherwise perform in accordance with the accepted proposal and the contract.

22. TERMINATION FOR CONVENIENCE

County may terminate this contract upon at least thirty (30) calendar days prior written notice for its convenience or for any reason deemed by the County to serve the public interest. County may terminate this contract upon thirty (30) calendar days prior written notice for any reason resulting from any governmental law, order, ordinance, regulations, or court order. In no event shall County be liable for loss of any profits anticipated to be made hereunder by Proposer should this contract be terminated early.

23. FORCE MAJEURE

If by reason of Force Majeure either Party shall be rendered unable, wholly or in part, to carry out its responsibilities under this contract by any occurrence by reason of Force Majeure, then the Party unable to carry out its responsibility shall give the other Party notice and full particulars of such Force Majeure in writing within a reasonable time after the occurrence of the event, and such notice shall suspend the Party's responsibility for the continuance of the Force Majeure claimed, but for no longer period.

Force Majeure means acts of God, floods, hurricanes, tropical storms, tornadoes, earthquakes, or other natural disasters, acts of a public enemy, acts of terrorism, sovereign conduct, riots, civil commotion, strikes or lockouts, and other causes that are not occasioned by either Party's conduct which by the exercise of due diligence the Party is unable to overcome and which substantially interferes with operations.

24. ESTIMATED QUANTITIES

Any reference to quantities shown in the Request for Proposals is an estimate only. Since the exact quantities cannot be predetermined, the County reserves the right to adjust quantities as deemed necessary to meet its requirements.

25. CONTRACTOR INVESTIGATION

Before submitting a proposal, each proposer shall make all investigations and examinations necessary to ascertain all site conditions and requirements affecting the full performance of the contract and to verify any representations made by the County upon which the contractor will rely. If the contractor receives an award as a result of its proposal submission, failure to have made such investigations and examinations will in no way relieve the contractor from its obligation to comply in every detail with all provisions and requirements of the contract, nor will a plea of ignorance of such conditions and requirements be accepted as a basis for any claim whatsoever by the contractor for additional compensation.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

26. NO COMMITMENT BY COUNTY OF GALVESTON

This Request for Proposal does not commit the County of Galveston to award any costs or pay any costs, or to award any contract, or to pay any costs associated with or incurred in the preparation of a proposal in response to this Request for Proposal, and does not commit the County of Galveston to procure or contract for services or supplies.

27. PROPOSAL COSTS BORNE BY BIDDER/PROPOSER

Galveston County shall not be liable for any costs incurred by Bidder/Proposer in preparation, production, or submission of a bid/proposal and shall not be liable for any work performed by Bidder/Proposer prior to issuance of fully executed contract and properly issued notice to proceed. Galveston County shall not be liable for any costs incurred by Bidder/Proposer by reason of attending a pre-proposal conference. Galveston County shall not be liable for any costs incurred by Bidder/Proposer by reason of the County invoking use of best and final offers.

28. BEST AND FINAL OFFERS (BAFO)

In acceptance of proposals, the County of Galveston reserves the right to negotiate further with one or more of the proposers as to any features of their proposals and to accept modifications of the work and price when such action will be in the best interest of the County. This includes solicitation of a Best and Final Offer from one or more of the proposers. If invoked, this allows acceptable proposers the opportunity to amend, change or supplement their original proposal. Proposers may be contacted in writing requesting that they submit their Best and Final Offer. Any such Best and Final Offer must include discussed and negotiated changes.

29. SINGLE PROPOSAL RESPONSE

If only one proposal is received in response to the Request for Proposal, a detailed cost proposal may be requested of the single contractor. A cost/price analysis and evaluation and/or audit may be performed of the cost proposal in order to determine if the price is fair and reasonable.

30. CHANGES IN SPECIFICATIONS

If it becomes necessary to revise any part of this proposal, a written notice of such revision will be provided to all proposers in the form of addenda. The County is not bound by any oral representations, clarifications, or changes made in the written specifications by the County's employees, unless such clarification or change is provided to proposers in a written addendum from the Purchasing Agent.

The County of Galveston reserves the right to revise or amend the specifications up to the time set for opening of proposals. Such revisions and amendments, if any, shall be announced by amendments to the solicitation. Copies of such amendments shall be furnished to all prospective contractors. Prospective contractors are defined as those contractors listed on the County's Request for Proposal list for this material/service or those who have obtained documents subsequent to the advertisement. If revisions and amendments require changes in quantities or prices proposed, or both, the date set for opening of proposals may be postponed by such number of days as in the opinion of the County shall enable contractors to revise their proposals. In any case, the proposal opening shall be at least five working days after the last amendment, and the amendment shall include an announcement of the new date if applicable, for the opening or proposals.

31. PROPOSAL IDEAS AND CONCEPTS

The County reserves to itself the right to adopt or use for its benefit, any concept, plan, or idea contained in any proposal.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

32. PROPOSAL DISCLOSURES

The names of those who submitted proposals will not be made public information unless in conformity with the County Purchasing Act. No pricing or staffing information will be released. Proposers are requested to withhold all inquiries regarding their proposal or other submissions until after an award is made. No communication is to be had with any County employee or official, other than the County Purchasing Agent, regarding whether a proposal was received. Violations of this provision may result in the rejection of a proposal.

33. WITHDRAWAL OF PROPOSAL

Proposers may request withdrawal of a sealed proposal prior to the scheduled proposal opening time provided the request for withdrawal is submitted to the Purchasing Agent in writing. No proposals may be withdrawn for a period of sixty (60) calendar days after opening of the proposals.

34. INDEMNIFICATION

The contractor shall agree to assume all risks and responsibility for, and agrees to indemnify, defend, and save harmless, the County of Galveston, its elected and appointed officials and department heads, and its agents and employees from and against all claims, demands, suits, actions, recoveries, judgments, and costs and expenses including reasonable attorney's fees for the defense thereof in connection therewith on account of the loss of life, property or injury or damage to the person which shall arise from contractor's operations under this contract, its use of County facilities and/or equipment or from any other breach on the part of the contractor, its employees, agents or any person(s), in or about the County's facilities with the expressed or implied consent of the County. Contractor shall pay any judgment with cost which may be obtained against Galveston County resulting from contractor's operations under this contract.

Contractor agrees to indemnify and hold the County harmless from all claims of subcontractors, laborers incurred in the performance of this contract. Contractor shall furnish satisfactory evidence that all obligations of this nature herein above designated have been paid, discharged or waived. If Contractor fails to do so, then the County reserves the right to pay unpaid bills of which County has written notice direct and withhold from Contractor's unpaid compensation a sum of money reasonably sufficient to liquidate any and all such lawful claims.

35. REQUIREMENT OF AND PROOF OF INSURANCE

The successful proposer shall furnish evidence of insurance to the County Purchasing Agent and shall maintain such insurance as required hereunder or as may be required in the resultant contract, if different. Contractor shall obtain and thereafter continuously maintain in full force and effect, commercial general liability insurance, including but not limited to bodily injury, property damage, and contractual liability, with combined single limits of $1,000,000 or as may be required by State or Federal law, whichever is greater. Such insurance must be issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners of the State of Texas, with coverage provisions insuring the public from loss or damage that may arise to any person or property by reason of services rendered by Contractor. Insurance shall be placed with insurers having an A.M. Best's rating of no less than A. The County of Galveston shall be named as an additional insured on the commercial general liability insurance policy. Certificates of Insurance, fully executed by a licensed representative of the insurance company written or countersigned by an authorized Texas state agency, shall be filed with the County Purchasing Agent within ten (10) business days of issuance of notification from the County Purchasing Agent to Proposer that the contract is being activated as written proof of such insurance and further provided that proposer shall not commence work under this contract until it has obtained all insurance required herein, provided written proof as

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

required herein, and received written notice to proceed issued from the County Purchasing Agent. Proof of renewal/replacement coverage shall be provided upon expiration, termination, or cancellation of any policy. Said insurance shall not be cancelled, permitted to expire, or changed without thirty (30) days prior written notice to the County. Insurance required herein shall be maintained in full force and effect during the life of this contract and shall be issued on an occurrence basis. Contractor shall require that any and all subcontractors that are not protected under the Contractor's own insurance policies take and maintain insurance of the same nature and in the same amounts as required of Contractor and provide written proof of such insurance to Contractor. Proof of renewed/replacement coverage shall be provided upon expiration, termination, or cancellation of any policy. Contractor shall not allow any subcontractor to commence work on the subcontract until such insurance required for the subcontractor has been obtained and approved.

Successful proposer shall carry in full force Workers' Compensation Insurance Policy(ies), if there is more than one employee, for all employees, including but not limited to full time, part time, and emergency employees employed by the successful proposer. Current insurance certificates certifying that such policies as specified above are in full force and effect shall be furnished by successful proposer to the County.

Insurance is to be placed with insurers having a Best rating of no less than A. The Proposer shall furnish the County with certificates of insurance and original endorsements affecting coverage required by these insurance clauses within ten (10) business days of receiving notification from the County Purchasing Agent that the contract is being activated. The certificates and endorsements for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. The Proposer shall be required to submit annual renewals for the term of this contract prior to expiration of any policy.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

The County agrees to provide Proposer with reasonable and timely notice of any claim, demand, or cause of action made or brought against the County arising out of or related to utilization of the property. Proposer shall have the right to defend any such claim, demand, or cause of action at its sole cost and expense and within its sole and exclusive discretion. The County agrees not to compromise or settle any claim or cause of action arising out of or related to the utilization of the property without the prior written consent of the Proposer.

In no event shall the County be liable for any damage to or destruction of any property belonging to the Proposer.

Galveston County shall be listed as the additional insured on policy certificates and shall be provided with no less than thirty (30) calendar days prior notice of any changes to the policy during the contractual period.

36. BID/PROPOSAL GUARANTEE

Evidencing its firm commitment to engage in contract if Proposer is selected for award of contract, each Proposer is required to furnish with their proposal a Cashier's Check, Certified Check from any bank within the State of Texas, or an acceptable Proposer's Bond (in the event of requests for bids, this is called a Bidder's Bond), in the amount of five percent (5%) of the total contract price. The Proposer's Bond must be executed with a surety company authorized to do business in the State of Texas. Failure to furnish the bid/proposal guarantee in the proper form and amount, by the time set for opening of bids/proposals may be cause for rejection of the bid/proposal.

The Cashier's Check, Certified Check, or Proposer Bond (as applicable) will be returned to each respective unsuccessful proposer(s) subsequent to the Commissioners' Court award of contract, and shall be returned to the

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

successful proposer upon the completion and submission of all contract documents. Provided however, that the Cashier's Check, Certified Check, or Proposer Bond will be forfeited to the County as liquidated damages should successful proposer fail to execute the contract within thirty (30) days after receiving notice of the acceptance of its proposal.

37. PERFORMANCE AND PAYMENT BONDS

Successful proposer, before beginning work, shall execute a performance bond and a payment bond, each of which must be in the amount of the contract. The required payment and performance bonds must each be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1, Vernon's Texas Insurance Code).

The performance and payment bonds must clearly and prominently display on the bond or on an attachment to the bond:

a.) The name, mailing address, physical address, and telephone number, including the area code, of the surety company to which any notice of claim should be sent; or

b.) The toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521, Insurance Code, and a statement that the address of the surety company to which any notice of claim should be sent may be obtained from the Texas Department of Insurance by calling the toll free-telephone number.

The performance bond shall be solely for the protection of Galveston County, in the amount of the contract, and conditioned on the faithful performance of the work in accordance with the plans, specifications, and contract documents. The payment bond is solely for the protection and use of payment bond beneficiaries who have a direct contractual relationship with the prime contractor or a subcontractor to supply public work labor or material, and in the amount of the contract.

The payment and performance bonds required to be furnished herein must be furnished before the contractor begins work and are a requirement for issuance of a Notice to Proceed. Such bonds must be furnished to the Galveston County Purchasing Agent within ten (10) business days of receiving notice from the Purchasing Agent that the contract has been fully executed. Failure to provide the required payment and performance bonds within such 10 business days shall constitute an event of default under this contract. Contractor shall not commence work until all applicable certificates of insurance, performance bonds, and payment bonds have been received and approved by the County Purchasing Agent and the Contractor receives notice to proceed in writing that has been issued by the County Purchasing Agent.

Additionally, if this request for proposal is for the award of a public works contract, then compliance with Chapter 2253 of the Texas Government Code, which is known as the McGregor Act, is mandatory. Performance and payment bonds are required to be furnished in accordance with Chapter 2253 of the Texas Government Code. Proposer should familiarize itself with the entire provisions of Chapter 2253 of the Texas Government Code.

38. PATENT AND COPYRIGHT PROTECTION

The Proposer agrees at its sole expense to protect the County from claims involving infringement of patents or copyrights. **Proposer shall indemnify and save harmless the County of Galveston, its officers, employees, and agents, from liability of any nature and kind whatsoever, including without limitation cost and expenses, for or**

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

on account of any copyrighted, patented or un-patented invention, process, or article manufactured or used in the performance of the contract, including its use by the County. Proposer also agrees that if Proposer is awarded this contract, that no work performed hereunder shall be subject to patent, copyright, or other intellectual property by Proposer.

39. CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). The CIQ Form pertains to business relationship, gift giving, and family relationship reporting. If Proposer is required to file a CIQ Form, then the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

Business relationship. If Proposer has an employment or other business relationship with a local government officer of Galveston County or with a family member of a local government officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds $2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

Gift-giving. If Proposer has given a local government officer of Galveston County or a family member of a local government officer of Galveston County one or more gifts with an aggregate value of more than one-hundred dollars ($100.00) during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

For purposes of the business relationship and gift giving reporting requirements, a "family member" means a person related to another person within the first degree by consanguinity or affinity, as described by Subchapter B, Chapter 573, Texas Government Code. Examples of persons within the first degree by consanguinity or affinity include a son, daughter, father, mother, spouse, son-in-law, daughter-in-law, father-in-law, mother-in-law, stepson, stepdaughter, stepmother, and stepfather.

Family relationship. If Proposer has a "family relationship" with a local government officer of Galveston County then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County, regardless of whether Proposer has a business relationship or has given gifts to the local government officer or a family member of the local government officer. For this purpose, "family relationship" means Proposer is related within the third degree by consanguinity or the second degree by affinity, as those terms are defined under Chapter 573 of the Texas Government Code, to a local government officer of Galveston County. Examples of such relationships include a son, daughter, mother, father, brother, sister, grandchild, great-grandchild, grandparent, great-grandparent, niece, nephew, uncle, aunt, spouse, mother-in-law, father-in-law, daughter-in-law, son-in-law, spouse's grandchild, spouse's grandparent, grandparent's spouse, grandchild's spouse, stepson, stepdaughter, stepmother, and stepfather.

Proposer must file its original CIQ Form with the Galveston County Clerk. The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website – both of these websites are linked from the Galveston County homepage, at http://www.co.galveston.tx.us.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176 of the Local Government Code. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code, and the failure to file may be grounds to void the contract, if Proposer is awarded a contract.

If Proposer has any questions about compliance with Chapter 176, Proposer may wish to consult its' legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

40. COMPETITIVENESS AND INTEGRITY

To prevent biased evaluations and to preserve the competitiveness and integrity of such acquisition efforts, **proposers are to direct all communications regarding this proposal to the Galveston County Purchasing Agent,** unless otherwise specifically noted.

Do not contact the requesting department. Attempts by offering firms to circumvent this requirement will be viewed negatively and may result in rejection of the offer of the firm found to be in non-compliance.

All questions regarding this Request for Proposal must be submitted in writing to:

Rufus Crowder, CPPO CPPB, Purchasing Agent
722 Moody
Fifth (5th) Floor
Galveston, Texas 77550
Fax: (409) 621-7997
E-mail: rufus.crowder@co.galveston.tx.us

An authorized person from the submitting firm must sign all proposals. This signature acknowledges that the proposer has read the proposal documents thoroughly before submitting a proposal and will fulfill the obligations in accordance to the terms, conditions, and specifications.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Please carefully review this Request for Proposal. It provides specific information necessary to aid participating firms in formulating a thorough response.

41. ENTIRETY OF AGREEMENT AND MODIFICATION

This contract contains the entire agreement between the parties. Any prior agreement, promise, negotiation or representation not expressly set forth in this contract has no force or effect. Any subsequent modification to this contract must be in writing, signed by both parties.

An official representative, employee, or agent of the County does not have the authority to modify or amend this contract except pursuant to specific authority to do so granted by the Galveston County Commissioners' Court.

42. NON-COLLUSION AFFIDAVIT

Proposer certifies, by signing and submitting a proposal, that the proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the proposal is genuine and not collusive or sham; that the contractor has not directly or indirectly induced or solicited another contractor to put in a false or sham proposal, and has not directly or indirectly colluded, conspired, connived, or agreed with any contractor or anyone else to put in a sham proposal or that anyone shall refrain from bidding; that the contractor has not in any manner, directly or indirectly, sought by agreement, communications, or conference with anyone to fix the proposal price of the contractor of any other bidder, or to fix any overhead, profit or cost element of the proposal price, or that of any other contractor, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in the proposal are true; and further, that the contractor has not, directly or indirectly, submitted his or her proposal price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any cooperation, partnership, company association, organization, proposal depository, or to any member or agent thereof to effectuate a collusive or sham proposal.

A blank Non-Collusion Affidavit is included with this proposal packet. Proposer must enclose a truthful and fully executed original Non-Collusion Affidavit with the submission of its proposal. This is a mandatory requirement of this RFP. Failure to include the truthfully and fully executed Non-Collusion Affidavit in the submission of its proposal shall be considered non-compliance with the requirements of this RFP by the Proposer and grounds for the rejection of Proposer's submission.

No negotiations, decisions, or actions shall be initiated by any company as a result of any verbal discussion with any County employee prior to the opening of responses to this Request for Proposal.

No officer or employee of the County of Galveston, and no other public or elected official, or employee, who may exercise any function or responsibilities in the review or approval of this undertaking shall have any personal or financial interest, direct or indirect, in any contract or negotiation process thereof. The above compliance request will be part of all County of Galveston contracts for this service.

43. SOVEREIGN IMMUNITY

The County specifically reserves any claim it may have to sovereign, qualified, or official immunity as a defense to any action arising in conjunction with this contract.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

44. CONTROLLING LAW AND VENUE

Proposer acknowledges and agrees that the contract is and shall be governed and construed by the laws of the State of Texas and that venue shall lie exclusively in Galveston County, Texas.

45. MERGERS, ACQUISITIONS

The Proposer shall be required to notify the County of any potential for merger or acquisition of which there is knowledge at the time that a proposal is submitted.

If subsequent to the award of any contract resulting from this RFP the Proposer shall merge or be acquired by another firm, the following documents must be submitted to the County:

a.) Corporate resolutions prepared by the awarded Proposer and the new entity ratifying acceptance of the original contract, terms, conditions and prices;
b.) New Proposer's Federal Identification Number (FEIN); and
c.) New Proposer's proposed operating plans.

Moreover, Proposer is required to provide the County with notice of any anticipated merger or acquisition as soon as Proposer has actual knowledge of the anticipated merger or acquisition. The New Proposer's proposed plan of operation must be submitted prior to merger to allow time for submission of such plan to the Commissioners' Court for its approval.

46. DELAYS

The County reserves the right to delay the scheduled commencement date of the contract if it is to the advantage of the County. There shall be no additional costs attributed to these delays should any occur. Proposer agrees it will make no claims for damages, for damages for lost revenues, for damages caused by breach of contract with third parties, or any other claim by Proposer attributed to these delays, should any occur. In addition, Proposer agrees that any contract it enters into with any third party in anticipation of the commencement of the contract will contain a statement that the third party will similarly make no claim for damages based on delay of the scheduled commencement date of the contract.

47. ACCURACY OF DATA

Information and data provided through this Request for Proposal are believed to be reasonably accurate.

48. SUBCONTRACTING/ASSIGNMENT

Proposer shall not assign, sell, or otherwise transfer its contract in whole or in part without prior written permission of Commissioners' Court. Such consent, if granted, shall not relieve the Proposer of any of its responsibilities under this contract.

49. INDEPENDENT CONTRACTOR

Proposer expressly acknowledges that it is an independent contractor. Nothing in this agreement is intended nor shall be construed to create an agency relationship, an employer/employee relationship, a joint venture relationship, or any other relationship allowing County to exercise control or direction over the manner or method by which Proposer or its subcontractors perform in providing the requirements stated in the Request for Proposal.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

50. MONITORING PERFORMANCE

The County shall have the unfettered right to monitor and audit the Proposer's work in every respect. In this regard, the Proposer shall provide its full cooperation and insure the cooperation of its employees, agents, assigns, and subcontractors. Further, the Proposer shall make available for inspection and/or copying when requested, original data, records, and accounts relating to the Proposer's work and performance under this contract. In the event any such material is not held by the Proposer in its original form, a true copy shall be provided.

51. PROCUREMENT ETHICS

Galveston County is committed to the highest ethical standards. Therefore, it is a serious breach of the public trust to subvert the public purchasing process by directing purchases to certain favored vendors, or to tamper with the competitive bidding process, whether it's done for kickbacks, friendship or any other reason. Since misuse of the purchasing power of a local government carries criminal penalties, and many such misuses are from a lack of clear guidelines about what constitutes an abuse of office, the Code of Ethics outlined below must be strictly followed.

Galveston County also requires ethical conduct from those who do business with the County.

CODE OF ETHICS – Statement of Purchasing Policy

"Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of this Article, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here."

General Ethical Standards

It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in a procurement when the employee knows that:

- The employee or any member of the employee's immediate family, has a financial interest pertaining to the procurement;
- A business or organization in which the employee or any member of the employee's immediate family, has a financial interest pertaining to the procurement; or
- Any other person, business, or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Gratuities
It shall be a breach of ethics for any person to offer, give, or agree to give any employee or former employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor.

Kickbacks
It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or to any person associated therewith as an inducement for the award of a subcontract or order.

Contract Clause
The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

Confidential Information
It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any other person.

Prohibition against Contingent Fees
It shall be a breach of ethical standards for a person to be retained, or to retain a person, to solicit or secure a Galveston County contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business. Failure to abide by this section constitutes a breach of ethical standards.

Representation
Proposer represents and warrants, by signing and submitting its proposal, that it has not retained anyone in violation of this section prohibiting contingent fees.

Contract Clause
The representation prescribed above shall be conspicuously set forth in every contract and solicitation therefor.

52. SUBJECT TO APPROPRIATION OF FUNDS

State law prohibits the obligation and expenditure of public funds beyond the fiscal year for which a budget has been approved by the Commissioners' Court. Galveston County anticipates this to be an integral part of future budgets to be approved during the periods of this contract, except for unanticipated needs or events which may prevent such payments against this contract. However, Galveston County cannot guarantee the availability of funds, and enters into this contract only to the extent such funds are made available through appropriation (allocation) by the Commissioners' Court. This contract shall not be construed as creating any debt on behalf of the County of Galveston in violation of TEX. CONST. art. XI, § 7, and it is understood that all obligations of Galveston County are subject to the availability of funds.

53. NOTICE

All notices or other communications required or permitted under this contract shall be in writing and shall be deemed to have been duly given if delivered personally in hand, transmitted by facsimile, or mailed certified mail, return receipt requested with proper postage affixed and addressed to the appropriate party at the following address or at such other

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

address as may have been previously given in writing to the parties (Proposer shall provide its notice information with its proposal submission). If mailed, the notice shall be deemed delivered when actually received, or if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, duly certified, return receipt requested, with proper postage affixed. If delivered in person, notice shall be deemed delivered when receipted for by, or actually received by, the receiving Party. If transmitted by facsimile, notice shall be deemed delivered when receipt of such transmission is acknowledged.

To the County at:

Hon. Mark Henry,
County Judge of Galveston County
722 Moody, Second (2nd) Floor
Galveston, Texas 77550
Fax: (409) 765-2653

With copies to:

Rufus Crowder, CPPO CPPB,
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
Fax: (409) 621-7997

Robert Boemer, Director,
Galveston County Legal Department
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
Fax: (409) 770-5560

To the Contractor at:

(Proposer to provide its contact name, address, and facsimile number for notice hereunder.)

54. NONDISCRIMINATION

a. Equal Employment Opportunity. Proposer will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, disability, genetic information or veteran status. Proposer will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, national origin, sex, disability, genetic information or veteran status. Such action shall include, but not be limited to, the following: employment; upgrading; demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Proposer agrees to post in conspicuous places, available to employees and applicants for employment, notices of employment.

Proposer will, in all solicitation or advertisements for employees placed by or on behalf of Proposer, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, sex, disability, genetic information, or veteran status.

Proposer will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Agreement so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.

Proposer will include the provisions herein in every subcontract or purchase order unless exempted.

b. Drug Free Work Place Act. Proposer shall comply with all applicable requirements of the Drug-Free Workplace Act of 1988 and implementing regulations.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

c. Americans with Disabilities Act. Proposer shall comply with all applicable provisions of the Americans with Disabilities Act and implementing regulations.

d. OSHA Regulations. Proposer agrees to maintain and to display any applicable materials for its employees in accordance with OSHA regulations.

e. Compliance with Immigration Laws and use of E-Verify. Proposer agrees to comply with all requirements of the U.S. Immigration Reform and Control Act of 1986, as amended, and any implementing regulations thereto. Proposer further agrees to utilize the E-Verify system through the Department of Homeland Security on its employees. Proposer shall not employ unauthorized aliens, and shall not assign services to be performed to any supplier or subcontractor who are unauthorized aliens. If any personnel performing any services hereunder are discovered to be an unauthorized alien, then Proposer will immediately remove such personnel from performing services hereunder and shall replace such personnel with personnel who are not unauthorized alien(s).

f. Proposer agrees to comply with all other State and Federal laws and regulations applicable to the provision of services under this contract.

55. RECORD RETENTION AND RIGHT TO AUDIT

Proposer shall keep and maintain all records associated with this contract for a minimum of five (5) years from the close of the contract or as required by Federal or State law or regulation, whichever period is longer. If awarded this contract, Proposer shall allow the County reasonable access to the records in Proposer's possession, custody, or control that the County deems necessary to assist it in auditing the services, costs, and payments provided hereunder. If this contract involves the use of Federal or State funds, then Proposer shall also allow reasonable access to representatives of the Office of Inspector General, the General Accounting Office, and the other Federal and/or State agencies overseeing the funds that such entities deem necessary to facilitate review by such agencies and Proposer shall maintain fiscal records and supporting documentation for all expenditures in a manner that conforms with OMB Circular A-87 (relocated to 2 C.F.R. Part 225) and this contract.

56. TITLE VI ASSURANCES/TxDOT

The County is subject to Title VI of the Civil Rights Act of 1964 and the Federal and State laws and regulations of the United States Department of Transportation and Texas Department of Transportation (TxDOT). Pursuant to these requirements, the County must have its contractors provide required assurances on compliance with non-discrimination by itself and its subcontractors. The Title VI Assurances within this Subsection are not exhaustive – whenever any Federal, State, or Local requirement requires additional clauses, this list shall not be construed as limiting. Contractor agrees as follows:

(1) **Compliance with Regulations**. The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, DOT) Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are incorporated herein by reference and made a part of this contract.

(2) **Nondiscrimination**. The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the basis of race, color, national origin, religion, sex, age, disability or Veteran status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

(3) **Solicitations for Subcontractors, Including Procurement of Materials and Equipment.** In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, religion, sex, age, disability or Veteran status.

(4) **Information and Reports.** The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the Galveston County or the Texas Department of Transportation to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of the Contractor is in the exclusive possession of another who fails or refuses to furnish this information the Contractor shall so certify to Galveston County or the Texas Department of Transportation as appropriate, and shall set forth what efforts it has made to obtain the information.

(5) **Sanctions for Noncompliance.** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, Galveston County shall impose such contract sanctions as it or the Texas Department of Transportation may determine to be appropriate, including, but not limited to:

(a) withholding of payments to the Contractor under the contract until the Contractor complies, and/or
(b) cancellation, termination, or suspension of the contract, in whole or in part.

(6) **Incorporation of Provisions.** The Contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as Galveston County or the Texas Department of Transportation may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request Galveston County to enter into such litigation to protect the interests of Galveston County, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

57. **CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS**

Proposer certifies that neither it, nor any of its Principals, are presently debarred, suspended, proposed for debarment, disqualified, excluded, or in any way declared ineligible for the award of contracts by any Federal agency. Contractor agrees that it shall refund Galveston County for any payments made to Contractor while ineligible. Contractor acknowledges that Contractor's uncured failure to perform under this Agreement, if such should occur, may result in Contractor being debarred from performing additional work for the County, the GLO, the State, HUD, and other Federal and State entities. Further, Proposer has executed the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters and returned the fully completed and executed original certification with the submission of its proposal. **The truthful and fully completed and executed original of the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters must be included with the submission of Proposer's proposal and is a mandatory requirement of this RFP. Proposer's failure to include the fully completed and executed original of this Certification shall be considered non-compliance with the requirements of this RFP and grounds for the rejection of Proposer's proposal.** .

GENERAL PROVISIONS
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

58. **SECTION 231.006, FAMILY CODE/DELINQUENT CHILD SUPPORT**

Pursuant to Title 5, Section 231.006 of the Texas Family Code, as applicable, Proposer certifies that it, including all of its principals, is/are current in child support payments and therefore, that it is eligible to receive payments from State funds under a contract for property, materials, or services. Proposer acknowledges and agrees that if it is awarded this contract, then the ensuing agreement may be terminated and payment withheld if this certification is inaccurate. Finally, by the submission of its proposal, the Proposer certifies that it has included the names and social security numbers of each person with at least 25% ownership interest in Proposer within its response to the RFP and that all such persons are current in child support payments.

59. **LABOR STANDARDS**

Proposer acknowledges that the contract to be awarded pursuant to this RFP is on a grant program funded with Federal funds. Proposer shall comply with the requirements of 29 CFR Part 5 and CFR Part 30 and shall be in conformity with Executive Order 11246, entitled "Equal Employment Opportunity", Copeland, "Anti-Kickback" Act (29 C.F.R. Part 3), the Davis-Bacon and Related Acts (29 C.F.R. Parts 1,3, and 5), the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.), and all other applicable Federal, State, and local laws and regulations pertaining to labor standards, insofar as those acts apply to the performance of this Agreement. Proposer is also responsible for ensuring that all subcontractors comply with the requirements of 29 CFR Part 5 and CFR Part 30 and shall be in conformity with Executive Order 11246, entitled "Equal Employment Opportunity", Copeland "Anti-Kickback" Act, the Davis-Bacon and Related Acts (29 CFR Parts 1, 3 and 5), the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.), and all other applicable Federal, State, and local laws and regulations pertaining to labor standards, insofar as those acts apply to the performance of this Agreement.

Special Provisions begin on the next page
The remainder of this page intentionally left blank

RFP #B161009
OPEN: 03/10/2013
TIME 2:00 P.M.

REQUEST FOR PROPOSAL
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Sealed proposals in **sets of five (5), one (1) original and four (4) copies,** will be received in the office of the Galveston County Purchasing Agent **until 2:00 P.M. CST, on 03/10/2016,** and opened immediately in that office in the presence of Galveston County Auditor and the Purchasing Agent. Sealed qualifications are to be delivered to Rufus G. Crowder, CPPO CPPB, Galveston County Purchasing Agent at the Galveston County Courthouse, 722 Moody, (21st Street), Floor 5, Purchasing, Galveston, Texas 77550, (409) 770-5372. **The time stamp clock located in the Purchasing Agent's office shall serve as the official time keeping piece for this solicitation process. Any proposal received after 2:00 P.M., CST on the specified date will be returned unopened.**

Purpose:
Providing the necessary materials, equipment, supervision, labor and appurtenances to construct approximately 13,500' of 8-inch and 1,200' of 6-inch waterlines, including approximately 45 fire hydrants, 60 valves, and all appurtenances necessary for a complete waterline installation. The construction also includes approximately 200 service connections.

Providing the necessary materials, equipment, supervision, labor and appurtenances to construct approximately 12,180 linear feet of 8-inch sewerlines, including approximately 33 manholes to rehabilitate, 330 service connections, and all appurtenances necessary for a complete sewerline installation.

All proposals must be marked on the outside of the envelope:
RFP #B161009
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES

Proposer's name, return address, and the enclosed label should be prominently displayed on the proposal package for identification purposes.

Specifications can be obtained on application at the office of the Galveston County Purchasing Agent, located in the Galveston County Courthouse, 722 Moody, (21st Street), Floor 5, Purchasing, Galveston, Texas, 77550, or by visiting the Galveston County website @ http://www.galvestoncountytx.gov/pu/Pages/BidListings.aspx.

Submitted prices shall be either lump sum or unit prices as shown on proposal sheets, if applicable. The net price shall be delivered to Galveston County, including all freight, shipping, and license fees. Galveston County is tax exempt and no taxes should be included in proposal pricing.

A Mandatory Pre-Proposal Conference will be held on Thursday, February 18, 2016 at 10:00 a.m. in the Galveston County Purchasing Department located in the Galveston County Courthouse, 722 Moody Avenue (21st St), Fifth (5th) Floor, Galveston, Texas 77550

Upon satisfaction of contractual terms (e.g., goods delivered in promised condition, services rendered as agreed, etc.), contractor shall be paid via Galveston County's normal accounts payable process.

Bonding Requirements:

- **PROPOSAL GUARANTEE:** Evidencing its firm commitment to engage in the contract if Proposer is selected for award of contract, each Proposer is required to furnish with their proposal a Cashier's Check, or an acceptable Proposer's Bond (in the event of requests for bids, this is called a Bidder's Bond), in the amount of five percent (5%) of the total contract price. The Proposer's Bond must be executed with a surety company authorized to do business in the State of Texas. Failure to furnish the bid/proposal guarantee in the proper form and amount, by the time set for opening of proposals may be cause or rejection of the proposal.

- **PERFORMANCE AND PAYMENT BONDS:**
  Successful proposer, before beginning work, shall execute a performance bond and a payment bond, each of which must be in the amount of the contract. The required payment and performance bonds must each be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1, Vernon's Texas Insurance Code).

The Galveston County Commissioners' Court reserves the right to waive any informality and to reject any and all qualifications, and to accept the qualification which, in its opinion, is most advantageous to Galveston County with total respect the governing laws.

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

RFP #B161009
OPEN: 03/10/2016
TIME: 2:00 P.M.

PROPOSAL FORM
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
COUNTY OF GALVESTON, TEXAS

THE COMPANY OF: _____

Address: _____

_____

FEIN (TAX ID): _____

The following shall be returned with your proposal. Failure to do so may be ample cause for rejection of proposal as non responsive. It is the responsibility of the Proposer to ensure that Proposer has received all addenda.

Items:	Confirmed (X):
1. **References (if required)**	_____
2. **Addenda, if any**	#1_____ #2____ #3____ #4 ___
3. **One (1) original and four (4) copies of submittal**	_____
4. **Proposal Forms**	_____
5. **Vendor Qualification packet**	_____
6. **Debarment Certification**	_____
7. **Payment Terms:**	_____net 30 _____Other
8. **Non-Collusion Affidavit**	_____

Person to contact regarding this proposal: _____

Title: _____ Phone: _____ Fax: _____

E-mail address: _____

Name of person authorized to bind the Firm: _____

Signature: _____ Date: _____

Title: _____ Phone: _____ Fax: _____

E-mail address: _____

PROPOSER MUST SIGN HERE BELOW:

By signing here, the firm does hereby attest that it has fully read the instructions, conditions and general and special provisions and understands them.

Firm Name:_____

Authorized Signature:_____

Name & Title Printed:_____

Telephone No.:_____ FAX No.:_____

E-Mail Address:_____

Date:_____

EXCEPTIONS (if no exceptions are taken, state NONE):

_____

_____

The remainder of this page intentionally left blank

RFP #B161009
OPEN: 03/10/2016
TIME: 2:00 P.M.

PROPOSAL FORM
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

Proposer shall use this form to provide the information for notice.

1. Contact information for notice:

   Name:_____
   Address:_____
   _____
   Telephone Number:_____ Facsimile number:_____

2. If a copy of notice is requested, please complete below:

   Name:_____
   Address:_____
   _____
   Telephone Number:_____ Facsimile number:_____

3. If second or more copies are requested for notice, please supplement this form and clearly mark the supplement as "Supplementary Notice Information."

   Proposer to submit reference information. Proposer shall use this form to provide minimum required reference information. If Proposer wishes to provide more than the minimum, Proposer should supplement this form and should clearly mark the supplement as "Supplementary Reference Information."

1. References who can attest to the Proposer's capability to carry out the requirements set forth in this proposal:

   Business Name of Organization:_____
   Name of Person:_____
   Title of Individual within Organization, if applicable_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

   Business Name of Organization:_____
   Name of Person:_____
   Title of Individual within Organization, if applicable_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

   Business Name of Organization:_____
   Name of Person:_____
   Title of Individual within Organization, if applicable_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

RFP #B161009
OPEN: 03/10/2016
TIME: 2:00 P.M.

PROPOSAL FORM
MOORE'S ADDITIONAL WATER AND SEWER FACILITIES
GALVESTON COUNTY, TEXAS

References of major supplier of Proposer who can speak to the financial capability of the Proposer to carry out the requirements set forth in this proposal:

1. Business Name of Supplier_____
   Name of Person:_____
   Title of Individual within business:_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

2. Business Name of Supplier_____
   Name of Person:_____
   Title of Individual within business:_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

3. Business Name of Supplier_____
   Name of Person:_____
   Title of Individual within business:_____
   Business address:_____
   _____
   Telephone number:_____ Facsimile number:_____

The remainder of this page intentionally left blank

County of Galveston

ACKNOWLEDGMENT AND CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER INELIGIBLITY

Executive Orders 12549 & 12689 Certification, Debarment and Suspension

Solicitation Number: RFP #B161009

Solicitation Title: Moore's Additional Water and Sewer Facilities

Contractor hereby CERTIFIES that:

Contractor, and all of its principals, is not presently debarred, suspended, proposed for debarment, proposed for suspension, or declared ineligible under Executive Order 12549 or Executive Order 12689, Debarment and Suspension, and is not in any other way ineligible for participation in Federal or State assistance programs;

Contractor, and all of its principals, were not and have not been debarred, suspended, proposed for debarment, proposed for suspension, or declared ineligible under Executive Order 12549 or Executive Order 12689, Debarment and Suspension, and were not and have not been in any other way ineligible for participation in Federal or State assistance programs at the time its' proposal was submitted in the procurement identified herein and at any time since submission of its' proposal;

Contractor has included, and shall continue to include, this certification in all contracts between itself and any sub-contractors in connection with services performed under this contract; **and**

Contractor shall notify Galveston County in writing immediately, through written notification to the Galveston County Purchasing Agent, if Contractor is not in compliance with Executive Order 12549 or 12689 during the term of its contract with Galveston County.

Contractor **Represents** and **Warrants** that the individual executing this Acknowledgment and Certification on its behalf has the full power and authority to do so and can legally bind the Contractor hereto.

Name of Business	Date
By:	
Signature	Printed Name & Title

County of Galveston
Purchasing Department
Vendor Qualification Packet

(rev. 1.2, March 29, 2010)

All interested parties seeking consideration for qualified vendor status with the County of Galveston **should complete and return only the following attached forms to:**

Galveston County Purchasing Department
722 Moody Avenue, (21st Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 *office*
(409) 621-7987 *fax*

Form PEID: Person /Entity Information Data

Form W-9: Request for Taxpayer Identification Number and Certification
(please note that the included form may not be the latest revised form issued by the Internal Revenue Service. Please check the IRS website at http://www.irs.gov/pub/irs-pdf/fw9.pdf for the latest revision of this form.)

Form CIQ: Conflict of Interest Questionnaire
(please note that the included form may not be the latest revised form issued by the State of Texas Ethics Commission. Please check the Texas Ethics Commission website at for the latest revision of this form. Please note that Galveston County Purchasing Agent is not responsible for the filing of this form with the Galveston County Clerk per instructions of the State of Texas Ethics Commission).

Certificate(s) of Insurance: **If the person or entity seeking qualified vendor status with the County will be performing work at or on any County owned facility and/or property, Certificate(s) of Insurance are required to be submitted prior to performing any work.**

Insurance requirements are as follows:

Public Liability and Property Damage Insurance:

Successful vendor agrees to keep in full force and effect, a policy of public liability and property damage insurance issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners of the State of Texas, with coverage provisions insuring the public from any loss or damage that may arise to any person or property by reason of services rendered by vendor. Vendor shall at its own expense be required to carry the following minimum insurance coverages:

- For damages arising out of bodily injury to or death of one person in any one occurrence – one hundred thousand and no/100 dollars ($100,000.00);
- For damages arising out of bodily injury to or death of two or more persons in any one occurrence – three hundred thousand and no/100 dollars ($300,000.00); and
- For injury to or destruction of property in any one occurrence – one hundred thousand and no/100 dollars ($100,000.00).

This insurance shall be either on an occurrence basis or on a claims made basis. Provided however, that if the coverage is on a claims made basis, then the vendor shall be required to purchase, at the termination of this agreement, tail coverage for the County for the period of the County's relationship with the vendor under this agreement. Such coverage shall be in the amounts set forth in subparagraphs (1), (2), and (3) above.

Worker's Compensation Insurance:

Successful vendor shall also carry in full force Workers' Compensation Insurance policy(ies), if there is more than one employee, for all employees, including but not limited to full time, part time, and emergency employees employed by the vendor. Current insurance certificates certifying that such policies as specified above are in full force and effect shall be furnished by the vendor to the County.

The County of Galveston shall be named as additional insured on policies listed in subparagraphs above and shall be notified of any changes to the policy(ies) during the contractual period. Insurance is to be placed with insurers having a Best rating of no less than A. The vendor shall furnish the County with certificates of insurance and original endorsements affecting coverage required by these insurance clauses. The certificates and endorsements for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. The vendor shall be required to submit annual renewals for the term of any contractual agreement, purchase order or term contract, with Galveston County prior to expiration of any policy.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

The County agrees to provide vendor with reasonable and timely notice of any claim, demand, or cause of action made or brought against the County arising out of or related to utilization of the property. Vendor shall have the right to defend any such claim, demand, or cause of action at its sole cost and expense and within its sole and exclusive discretion. The County agrees not to compromise or settle any claim or cause of action arising out of or related to the utilization of the property without the prior written consent of the vendor.

In no event shall the County be liable for any damage to or destruction of any property belonging to the vendor unless specified in writing and agreed upon by both parties.

Procurement Policy - Special Note:

Understand that it is, according to Texas Local Government Code, Section 262.011, Purchasing Agents, subsections (d), (e), and (f), the sole responsibility of the Purchasing Agent to supervise all procurement transactions.

Therefore, be advised that all procurement transactions require proper authorization in the form of a Galveston County purchase order from the Purchasing Agent's office prior to commitment to deliver supplies, materials, equipment, including contracts for repair, service, and maintenance agreements. Any commitments made without proper authorization from the Purchasing Agent's office, pending Commissioners' Court approval, may become the sole responsibility of the individual making the commitment including the obligation of payment.

Code of Ethics - Statement of Purchasing Policy:

Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and

retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of these instructions, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here.

General Ethical Standards: It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in procurement when the employee knows that:

- The employee or any member of the employee's immediate family has a financial interest pertaining to the procurement.
- A business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement.
- Any other person, business or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Gratuities: It shall be a breach of ethics to offer, give or agree to give any employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any program requirement or a contract or subcontract, or to any solicitation or proposal therefore pending before this government.

Kickbacks: It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or any person associated therewith, as an inducement for the award of a subcontract or order.

Contract Clause: The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

Confidential Information: It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any person.

Questions/Concerns:
If you have any questions or concerns regarding the information or instructions contained within this packet, please contact any member of the Purchasing Department staff at **(409) 770-5371.**

CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). If so, the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

If Proposer has an employment or other business relationship with an officer of Galveston County or with a family member of an officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds $2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

If Proposer has given an officer of Galveston County or a family member of an officer of Galveston County one or more gifts with an aggregate value of more than $250.00 during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website – both of these web sites are linked to the Galveston County homepage, at http://www.co.galveston.tx.us.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code.

If you have questions about compliance with Chapter 176, please consult your own legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

COUNTY of GALVESTON
Purchasing Department

rev. 1.3, March 29, 2010

FORM PEID:	Request for Person-Entity Identification Data

Instructions: Please type or print clearly when completing sections 1 thru 4 and return completed form to:

Galveston County Purchasing Agent
722 Moody Avenue (21st. Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 *office*
(409) 621-7987 *fax*

1.

Business Name:	
Attention Line:	

2.

Physical Address:			
City:		State:	Zip+4:

3.

Billing / Remit Address:			
City:		State:	Zip+4

4.

Main Contact Person:	
Main Phone Number:	
Fax Number:	
E-mail Address:	

Areas below are for County use only.

Requested By:	Phone / Ext. #
Department:	Date:

Action Requested - Check One:	IFAS PEID Vendor Number:	
( ) Add New	( ) Change Data	( ) Re-activate
( ) Inactivate	( ) Employee	( ) Attorney
( ) Landlord	( ) Foster Parent	( ) Refund
( ) One Time	( ) Foster Child	

Form **W-9**
(Rev. October 2007)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership
☐ Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ .....
☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number
or
Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here Signature of U.S. person ▶ Date ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the Instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). Check the "Limited liability company" box only and enter the appropriate code for the tax classification ("D" for disregarded entity, "C" for corporation, "P" for partnership) in the space provided.

For a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Regulations section 301.7701-3, enter the owner's name on the "Name" line. Enter the LLC's name on the "Business name" line.

For an LLC classified as a partnership or a corporation, enter the LLC's name on the "Name" line and any business, trade, or DBA name on the "Business name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 7[2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting *www.irs.gov* or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt payees, see *Exempt Payee* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Disregarded entity not owned by an individual	The owner
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

Call the IRS at 1-800-829-1040 if you think your identity has been used inappropriately for tax purposes.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS personal property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.consumer.gov/idtheft* or 1-877-IDTHEFT(438-4338).

Visit the IRS website at *www.irs.gov* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____

Name of Officer

This section (item 3 including subparts A, B, C, & D) must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more?

☐ Yes ☐ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4

_____ _____

Signature of vendor doing business with the governmental entity Date

Adopted 8/7/2015

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

SECTION IV

Project Scope
General Notes
Certification of Section 3, HUD Section 3 Clause, and Section 3 Residents & Business Forms
Copeland Act and Certification Regarding Lobbying
Project Sign

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

PROJECT SCOPE

1. Project Scope

(a) Under this Contract, the Contractor shall furnish all materials, appliances, tools, equipment, transportation, services, and all labor and superintendence necessary for construction of the work as described in these Specifications and as shown on the Plans and/or Exhibits. The completed installation shall not lack any part which can be reasonably implied as necessary to its proper functioning nor any subsidiary item which is customarily furnished, and the Contractor shall deliver the completed and operating installation to the Owner.

(b) Work in general under this Contract includes, but is not limited to, the following:

Providing the necessary materials, equipment, supervision, labor and appurtenances to construct approximately 13,500' of 8-inch and 1,200' of 6-inch waterlines, including approximately 45 fire hydrants, 60 valves, and all appurtenances necessary for a complete waterline installation. The construction also includes approximately 200 service connections.

Providing the necessary materials, equipment, supervision, labor and appurtenances to construct approximately 12,180 linear feet of 8-inch sewerlines, including approximately 33 manholes to rehabilitate, 330 service connections, and all appurtenances necessary for a complete sewerline installation.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

GENERAL NOTES

1. General Notes

(a) CONTRACTOR SHALL CONTACT LJA ENGINEERING, INC. MR. LES DODSON AT (713) 450-1300 AT LEAST 24 HOURS PRIOR TO CONSTRUCTION FOR NOTIFICATION OF COMMENCEMENT.

(b) CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 FOR LOCATION OF CENTERPOINT ENERGY GAS AND CENTERPOINT ENERGY POWER FACILITIES, 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

(c) CONTACT GALVESTON COUNTY W.C.&I.D. No. 1, MR. KEITH MORGAN AT (281) 534-8330, REGARDING GALVESTON COUNTY W.C.&I.D. No. 1 WATER, SANITARY SEWER AND STORM SEWER FACILITIES, 48 HOURS PRIORS TO COMMENCEMENT OF CONSTRUCTION.

(d) CONTACT ATT TEXAS/SBC AT 1-800-344-8377, A MINIMUM OF 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

(e) ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL REQUIREMENTS.

(f) REMOVE AND REPLACE CULVERTS AT ROADWAYS OR ENTRY WAYS WHEN ENCOUNTERED BY OPEN CUT CONSTRUCTION. NO COMPENSATION, AS SEPARATE PAY, WILL BE MADE FOR REMOVING AND REPLACING CULVERTS. SHOULD CONTRACTOR DAMAGE CULVERTS, REPLACE WITH LIKE MATERIAL CULVERTS.

(g) MAILBOX RELOCATION IS INCIDENTAL TO INSTALLATION OF WATERLINE. CONTRACTOR MUST NOT INTERFERE WITH MAIL DELIVERY. MAILBOX TO BE RESTORED TO EXISTING OR BETTER CONDITION UPON COMPLETION OF WATERLINE ACTIVITY.

(h) LOCATION OF EXISTING UTILITY SERVICE LINES (WATER, SEWER, GAS, TELEPHONE, ELECTRICAL, CABLE TELEVISION, ETC.) ARE APPROXIMATE LOCATIONS AND WERE DETERMINED FROM AVAILABLE RECORDS WHICH ARE NOT GUARANTEED. CONTRACTOR TO LOCATE SERVICE LINES AND /OR OTHER OBSTRUCTIONS AHEAD OF EXCAVATION.

(i) CONTRACTOR SHALL COVER OPEN EXCAVATION IN TRAFFIC PATH WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS.

(j) CONTRACTOR TO MAKE ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANY FOR SECURING POLES, IF NECESSARY, WHILE CONSTRUCTION PASSES BY POLES. COSTS OF SECURING POLES WILL BE PAID FOR BY THE CONTRACTOR.

(k) CONSTRUCTION STAKING (ALIGNMENT AND GRADE) TO BE PROVIDED BY THE CONTRACTOR AT NO SEPARATE PAY.

(l) CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND FACILITIES DURING INSTALLATION OF PROPOSED WORK.

(m) CONTRACTOR TO USE CAUTION WHEN CROSSING ALL EXISTING FACILITIES. ANY DAMAGE TO BE REPAIRED AT THE CONTRACTORS EXPENSE WITH NO SEPARATE PAY.

(n) ALL WORK SHALL CONFORM TO THE STANDARDS OF THE LOCAL GOVERNMENTAL ENTITIES. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT AND /OR REPAIR OF ANY DAMAGE TO CONTROL MARKERS AND IRON RODS. THE CONTRACTOR WILL BE REQUIRED TO REPLACE THE DAMAGED CONTROL MARKERS OR IRON RODS BY OR UNDER THE SUPERVISION OF A REGISTERED PUBLIC SURVEYOR.

(o) WHERE CONTRACTOR'S WORK AND /OR EQUIPMENT CAUSES AN OBSTRUCTION TO TRAFFIC, CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC DEVICES" (TEXAS M.U.T.C.D., MOST RECENT EDITION, AS REVISED) DURING CONSTRUCTION.

(p) CONTRACTOR SHALL MAINTAIN SIGNING AND BARRICADES DURING CONSTRUCTION. REPLACEMENT OF DAMAGED SIGNS OR BARRICADES SHALL BE WITHIN 24 HOURS.

(q) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STREET PAVEMENT SURFACE DURING THE CONSTRUCTION PERIOD. THE STREET WILL BE KEPT CLEAN TO PREVENT DIRT OR MUD BUILDUP AND SUBSEQUENT RAINFALL PRODUCING SLICK STREETS, CAUSING UNSAFE DRIVING CONDITIONS.

(r) PAVED SURFACES SHALL BE PROTECTED FROM DAMAGE FROM TRACKED EQUIPMENT.

(s) NO STREET SHALL BE BLOCKED WITHOUT SPECIFIC WRITTEN APPROVAL OF THE APPROPRIATE GOVERNMENTAL ENTITY.

(t) NOTIFY ALL PROPERTY OWNERS A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO BLOCKAGE OF DRIVEWAYS OR ENTERING OF UTILITY EASEMENTS.

(u) INGRESS AND EGRESS SHALL BE PROVIDED AT DRIVEWAYS IMMEDIATELY AFTER INSTALLATION LINE WORK.

(v) CONTRACTOR SHALL MAINTAIN DRAINAGE TO ORIGINAL OR BETTER CONDITION THROUGHOUT THE CONSTRUCTION OF THE PROJECT. NO SEPARATE PAY.

(w) BACKFILLING AND CLEANUP SHALL IMMEDIATELY FOLLOW PIPE LAYING OPERATION, CONSTRUCTION SHALL BE SUSPENDED IF CLEANUP IS NOT SATISFACTORY.

(x) SURPLUS EXCAVATED MATERIAL SHALL BE REMOVED AND DISPOSED OFF SITE AS DIRECTED BY THE ENGINEER. IF THE ENGINEER NOTIFIES THE CONTRACTOR THAT THE OWNER DOES NOT HAVE USE FOR THIS MATERIAL, THE SURPLUS MATERIAL BECOMES THE PROPERTY OF THE CONTRACTOR AND HIS RESPONSIBILITY TO DISPOSE OF THE MATERIAL.

(y) OBTAIN ALL PERMITS, NOT PROVIDED BY OWNER, PRIOR TO STARTING CONSTRUCTION.

(z) THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN AN UPDATED REDLINED "AS BUILT" SET OF PLANS ON SITE.

(aa) WHERE NONMETALLIC PIPE IS INSTALLED, DURABLE WATERLINE TAPE SHALL BE INSTALLED CONCURRENTLY (APPROXIMATELY ONE FOOT ABOVE PIPE) FOR DETECTION PURPOSES.

(bb) PROPERTY OWNERS SHALL BE NOTIFIED, IN WRITING, BY CONTRACTOR, WITH DOOR HANGERS 2 WEEKS BEFORE CONSTRUCTION BEGINS. (PROPERTY OWNER SHALL BE PROVIDED THE MINIMUM FOLLOWING INFORMATION: WORK TO BE PERFORMED, STARTING AND ENDING DATES, AND THE NAME AND NUMBER OF CONTRACTOR'S REPRESENTATIVE & GALVESTON COUNTY W.C.&I.D. No. 1 OFFICIAL TO BE CONTACTED FOR QUESTIONS. WRITTEN NOTICES SHALL BE APPROVED BY GALVESTON COUNTY W.C.&I.D. No. 1 PRIOR TO DISTRIBUTION).

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

SECTION 3
RESIDENT EMPLOYMENT OPPORTUNITY DATA
ELIGIBLITY FOR PREFERENCE

Economic Opportunities for Low and Very Low-Income Persons

Grantee/Subrecipient:	Contract Number:	Date:

ELIGIBILITY FOR PREFERENCE

A Section 3 Resident seeking the preference in training and employment provided by this part shall certify, or submit evidence to the Subrecipient, Grantee, Contractor or Subcontractor, if requested, that the person is a Section 3 Resident, as defined in Section CFR 135.5. (An example of evidence of eligibility for the preference is evidence of receipt of public assistance, or evidence of participation in a public assistance program.)

Section 3 Resident Certification
for Worker Seeking Preference in Training
and Employment

RESIDENT COMPLETES THIS SECTION:

I, _____, am a legal resident of the _____

_____ and meet the income eligibility guidelines for a low- or very-low-income person as published on HUD'S income limits www.huduser.org/portal/datasets/il.html and documented on the reverse side of this form.

My permanent address is: _____

_____

I have attached the following documentation as evidence of my status:

- ☐ Copy of Lease
- ☐ Copy of receipt of public assistance
- ☐ Copy of Evidence of participation in a public assistance program
- ☐ Other Evidence

_____ _____
Resident Signature Date

_____
Print Name

SECTION 3 INCOME LIMITS

All residents of public housing developments of the Housing Authority of

_____

Qualify as Section 3 Residents.
Alternatively, individuals residing in the
City of _____
or County of

Who meet the income limits set forth below, can also qualify for Section 3 status.

A picture identification card and proof that illustrates applicant is a current resident of the subject area.

HUD updates area median income (AMI) annually and income limits vary by county. To find the latest income limits visit HUD's website: www.huduser.org/portal/datasets/il.html

Eligibility Guideline

Number in Household	Very Low Income (50% AMI)	Low Income (80%)
1 Individual		
2 Individuals		
3 Individuals		
4 Individuals		
5 Individuals		
6 Individuals		
7 Individuals		
8 Individuals		

_____ _____
Signature Field Date

_____
Print Name

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

CERTIFICATION FOR BUSINESS CONCERNS
Seeking Section 3 Preference in Contracting and Demonstration of Capability

Economic Opportunities for Low and Very Low-Income Persons

Grantee/Subrecipient:	Contract Number:	Date:

CONTRACTOR INFORMATION

Name of Business _____

Address of Business _____

Type of Business: ☐ Corporation ☐ Partnership ☐ Non-Profit
☐ Sole Proprietorship ☐ Joint Venture ☐ Consortium

Attach the following documentation as evidence of Section 3 eligible status:
(Definition of "Section 3 Business Concern" in 24 CFR 135 describes the three alternative qualifications.)

For Business claiming status as a Section 3 resident-owned enterprise:

☐ Copy of resident lease
☐ Copy of evidence of participation in a public assistance program
☐ Copy of receipt of public assistance
☐ Other evidence _____

For business entity as applicable:

☐ Copy of Articles of Incorporation
☐ Assumed Business Name Certificate
☐ List of owners/stockholders and % ownership of each appointed officers
☐ Organization chart with names and titles and brief function statement
☐ Certificate of Good Standing
☐ Partnership Agreement
☐ Corporation Annual Report
☐ Latest Board minutes
☐ Additional documentation

For business entity claiming Section 3 status by subcontracting 25 percent of the dollar awarded to qualified Section 3 business(es):

☐ List of subcontracted Section 3 business(es) and subcontract amount

For business claiming Section 3 status, by claiming at least 30 percent of their workforce are currently Section 3 residents or were Section 3 eligible residents within 3 years of date of first employment with the business:

☐ List of all current full-time employees
☐ PHA/IHA Residential lease less than 3 years from day of employment
☐ List of employees claiming Section 3 status
☐ Other evidence of Section 3 status less than 3 years from date of employment

Evidence of ability to perform successfully under the terms and conditions of the proposed contract:

☐ Current financial statement
☐ List of owned equipment
☐ List of all contracts for the past two years
☐ Statement of ability to comply with public policy

_____ _____
Authorized Name and Signature Date

(Corporate Seal)

Attested By: _____

Grantee/Subrecipient: _____
Include this document in all applicable bid packets.

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

Contractor Certification of Efforts to Fully Comply with Employment and Training Provisions of Section 3

Economic Opportunities for Low and Very Low-Income Persons

THE BIDDER REPRESENTS AND CERTIFIES AS PART OF ITS BID/OFFER THAT IT:

☐ Is a Section 3 Business Concern. A Section 3 Business Concern means a business concern:
1. That is 51% or more owned by Section 3 Resident(s); or
2. Whose permanent, full-time employees include persons, at least 30% of whom are currently Section 3 Residents, or
3. That provides evidence of a commitment to subcontract in excess of 25% of the dollar value of all subcontracts to be awarded to Section 3 Business Concerns, that meet the qualifications set forth in paragraphs 1 or 2 herein.

☐ Is NOT a Section 3 Business Concern, but who has and will continue to seek compliance with Section 3 by certifying the following efforts to be undertaken.

EFFORTS TO AWARD SUBCONTRACTOR TO SECTION 3 CONCERNS
(Check ALL that apply)

☐ By contacting business assistance agencies, minority contractors associations and community organizations to inform them of the contracting opportunities and requesting their assistance in identifying Section 3 businesses which may solicit bids for a portion of the work.

☐ By advertising contracting opportunities by posting notices, which provide general information about the work to be contracted and where to obtain additional information, in the common areas of the applicable development(s) owned and managed by the Housing Authority.

☐ By providing written notice to all known Section 3 Business Concerns of contracting opportunities. This notice should be in sufficient time to allow the Section 3 Business Concerns to respond to bid invitations

☐ By following up with Section 3 Business Concerns that have expressed interest in the contracting opportunities.

☐ By coordinating meetings at which Section 3 Business Concerns could be informed of specific elements of the work for which subcontract bids are being sought.

☐ By conducting workshops on contracting procedures and specific contracting opportunities in a timely manner so that Section 3 Business Concerns can take advantage of contracting opportunities.

☐ By advising Section 3 Business Concerns as to where to seek assistance to overcome barriers such as inability to obtain bonding, lines of credit, financing, or insurance and aiding Section 3 Businesses in qualifying for such bonding , financing, insurance, etc....

☐ Where appropriate, by breaking out contract work into economically feasible units to facilitate participation by Section 3 businesses.

☐ By developing and using a list of eligible Section 3 Business Concerns.

☐ By actively supporting and undertaking joint ventures with Section 3 Businesses.

EFFORTS TO PROVIDE TRAINING AND EMPLOYMENT TO SECTION 3 RESIDENTS

☐ By entering into a "first source" hiring agreements with organizations representing Section 3 Residents.

☐ By establishing training programs, which are consistent with the requirements of the Department of Labor, specifically for Section 3 Residents in the building trades.

☐ By advertising employment and training positions to dwelling units occupied by Category 1 and 2 residents.

☐ By contacting resident councils and other resident organizations in the affected housing development to request assistance in notifying residents of the training and employment positions to be filled.

☐ By arranging interviews and conducting interviews on the job site.

☐ By undertaking such continued job training efforts as may be necessary to ensure the continued employment of Section 3 Residents previously hired for employment opportunities.

☐ By posting job vacancies in Work-In-Texas or with my local Workforce Solutions Center.

Contractor Name/Business Name: **Date:**

Authorized Representative Name:

Signature:

Code of Federal Regulations
Title 24- Housing and Urban Development

Volume: 1
Date: 2003-04-01
Original Date: 2003-04-01
Title: Section 135.38- Section 3 Clause
Context: Title 24- Housing and Urban Development. Subtitle B- Relating to Housing and Urban Development . Chapter 1- Office of Assistant Secretary for Equal Opportunity, Department. Part 135 Economic Opportunities for Low-and Very Low-Income Persons. Subpart B- Economic Opportunities for Section 3 Residents and Section 3 Business Concerns.

§ 135.38 Section 3 clause.

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

CERTIFICATION OF BIDDER REGARDING SECTION 3 AND SEGREGATED FACILTIES

Name of Prime Contractor

Project Name & Number

The undersigned hereby certifies that

(a) Section 3 provisions are included in the Contract

(b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $10,000).

(c) No segregated facilities will be maintained.

Name

Name & Title of Signer (Print or Type)

Signature

Date

§ 135.38 Section 3 clause.

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

SECTION 3
RESIDENT EMPLOYMENT OPPORTUNITY DATA
ELIGIBLITY FOR PREFERENCE

Economic Opportunities for Low and Very Low-Income Persons

Grantee/Subrecipient:	Contract Number:	Date:

ELIGIBILITY FOR PREFERENCE

A Section 3 Resident seeking the preference in training and employment provided by this part shall certify, or submit evidence to the Subrecipient, Grantee, Contractor or Subcontractor, if requested, that the person is a Section 3 Resident, as defined in Section CFR 135.5. (An example of evidence of eligibility for the preference is evidence of receipt of public assistance, or evidence of participation in a public assistance program.)

Section 3 Resident Certification
for Worker Seeking Preference in Training
and Employment

RESIDENT COMPLETES THIS SECTION:

I, _____, am a legal resident of the _____ _____ and meet the income eligibility guidelines for a low- or very-low-income person as published on HUD'S income limits www.huduser.org/portal/datasets/il.html and documented on the reverse side of this form.

My permanent address is: _____
_____

I have attached the following documentation as evidence of my status:

- ☐ Copy of Lease
- ☐ Copy of receipt of public assistance
- ☐ Copy of Evidence of participation in a public assistance program
- ☐ Other Evidence

_____ _____
Resident Signature Date

_____
Print Name

SECTION 3 INCOME LIMITS

All residents of public housing developments of the Housing Authority of

Qualify as Section 3 Residents.
Alternatively, individuals residing in the
City of
or County of

Who meet the income limits set forth below, can also qualify for Section 3 status.

A picture identification card and proof that illustrates applicant is a current resident of the subject area.

HUD updates area median income (AMI) annually and income limits vary by county. To find the latest income limits visit HUD's website: www.huduser.org/portal/datasets/il.html

Eligibility Guideline

Number in Household	Very Low Income (50% AMI)	Low Income (80%)
1 Individual		
2 Individuals		
3 Individuals		
4 Individuals		
5 Individuals		
6 Individuals		
7 Individuals		
8 Individuals		

Signature Field

Date

Print Name

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

CERTIFICATION FOR BUSINESS CONCERNS
Seeking Section 3 Preference in Contracting and Demonstration of Capability

Economic Opportunities for Low and Very Low-Income Persons

Grantee/Subrecipient:	Contract Number:	Date:

CONTRACTOR INFORMATION

Name of Business _____

Address of Business _____

Type of Business: ☐ Corporation ☐ Partnership ☐ Non-Profit
☐ Sole Proprietorship ☐ Joint Venture Consortium

Attach the following documentation as evidence of Section 3 eligible status:
(Definition of "Section 3 Business Concern" in 24 CFR 135 describes the three alternative qualifications.)

For Business claiming status as a Section 3 resident-owned enterprise:

☐ Copy of resident lease
☐ Copy of evidence of participation in a public assistance program
☐ Copy of receipt of public assistance
☐ Other evidence _____

For business entity as applicable:

☐ Copy of Articles of Incorporation
☐ Assumed Business Name Certificate
☐ List of owners/stockholders and % ownership of each appointed officers
☐ Organization chart with names and titles and brief function statement
☐ Certificate of Good Standing
☐ Partnership Agreement
☐ Corporation Annual Report
☐ Latest Board minutes
☐ Additional documentation

For business entity claiming Section 3 status by subcontracting 25 percent of the dollar awarded to qualified Section 3 business(es):

☐ List of subcontracted Section 3 business(es) and subcontract amount

For business claiming Section 3 status, by claiming at least 30 percent of their workforce are currently Section 3 residents or were Section 3 eligible residents within 3 years of date of first employment with the business:

☐ List of all current full-time employees
☐ PHA/IHA Residential lease less than 3 years from day of employment
☐ List of employees claiming Section 3 status
☐ Other evidence of Section 3 status less than 3 years from date of employment

Evidence of ability to perform successfully under the terms and conditions of the proposed contract:

☐ Current financial statement
☐ List of owned equipment
☐ List of all contracts for the past two years
☐ Statement of ability to comply with public policy

_____ _____
Authorized Name and Signature Date

Attested By: _____ (Corporate Seal)

Grantee/Subrecipient: _____
Include this document in all applicable bid packets.

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

Contractor Certification of Efforts to Fully Comply with Employment and Training Provisions of Section 3

Economic Opportunities for Low and Very Low-Income Persons

THE BIDDER REPRESENTS AND CERTIFIES AS PART OF ITS BID/OFFER THAT IT:

☐ Is a Section 3 Business Concern. A Section 3 Business Concern means a business concern:
1. That is 51% or more owned by Section 3 Resident(s); or
2. Whose permanent, full-time employees include persons, at least 30% of whom are currently Section 3 Residents, or
3. That provides evidence of a commitment to subcontract in excess of 25% of the dollar value of all subcontracts to be awarded to Section 3 Business Concerns, that meet the qualifications set forth in paragraphs 1 or 2 herein.

☐ Is NOT a Section 3 Business Concern, but who has and will continue to seek compliance with Section 3 by certifying the following efforts to be undertaken.

EFFORTS TO AWARD SUBCONTRACTOR TO SECTION 3 CONCERNS
(Check ALL that apply)

☐ By contacting business assistance agencies, minority contractors associations and community organizations to inform them of the contracting opportunities and requesting their assistance in identifying Section 3 businesses which may solicit bids for a portion of the work.

☐ By advertising contracting opportunities by posting notices, which provide general information about the work to be contracted and where to obtain additional information, in the common areas of the applicable development(s) owned and managed by the Housing Authority.

☐ By providing written notice to all known Section 3 Business Concerns of contracting opportunities. This notice should be in sufficient time to allow the Section 3 Business Concerns to respond to bid invitations

☐ By following up with Section 3 Business Concerns that have expressed interest in the contracting opportunities.

☐ By coordinating meetings at which Section 3 Business Concerns could be informed of specific elements of the work for which subcontract bids are being sought.

☐ By conducting workshops on contracting procedures and specific contracting opportunities in a timely manner so that Section 3 Business Concerns can take advantage of contracting opportunities.

☐ By advising Section Business Concerns as to where they seek assistance to overcome barriers such as inability to obtain bonding, lines of credit, financing, or insurance and aiding Section 3 Businesses in qualifying for such bonding , financing, insurance, etc....

☐ Where appropriate, by breaking out contract work into economically feasible units to facilitate participation by Section 3 businesses.

☐ By developing and using a list of eligible Section 3 Business Concerns.

☐ By actively supporting and undertaking joint ventures with Section 3 Businesses.

EFFORTS TO PROVIDE TRAINING AND EMPLOYMENT TO SECTION 3 RESIDENTS

☐ By entering into a "first source" hiring agreements with organizations representing Section 3 Residents.

☐ By establishing training programs, which are consistent with the requirements of the Department of Labor, specifically for Section 3 Residents in the building trades.

☐ By advertising employment and training positions to dwelling units occupied by Category 1 and 2 residents.

☐ By contacting resident councils and other resident organizations in the affected housing development to request assistance in notifying residents of the training and employment positions to be filled.

☐ By arranging interviews and conducting interviews on the job site.

☐ By undertaking such continued job-training efforts as may be necessary to ensure the continued employment of Section 3 Residents previously hired for employment opportunities.

Contractor Name/Business Name: _____

Signature Field _____ **Date/Time Field** _____

[Code of Federal Regulations]
[Title 24, Volume 1]
[Revised as of April 1, 2003]
From the U.S. Government Printing Office via GPO Access
[CITE: 24CFR135.92]
[Page 704-707]

TITLE 24--HOUSING AND URBAN DEVELOPMENT
CHAPTER I--OFFICE OF ASSISTANT SECRETARY FOR EQUAL OPPORTUNITY, DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
PART 135--ECONOMIC OPPORTUNITIES FOR LOW- and VERY LOW-INCOME PERSONS

Table of Contents

Appendix to Part 135

I. EXAMPLES OF EFFORTS TO OFFER TRAINING AND EMPLOYMENT OPPORTUNITIES TO SECTION 3 RESIDENTS

(1) Entering into ``first source'' hiring agreements with organizations representing Section 3 residents.
(2) Sponsoring a HUD-certified ``Step-Up'' employment and training program for section 3 residents.
(3) Establishing training programs, which are consistent with the requirements of the Department of Labor, for public and Indian housing residents and other section 3 residents in the building trades.
(4) Advertising the training and employment positions by distributing flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) to every occupied dwelling unit in the housing development or developments where category 1 or category 2 persons (as these terms are defined in Sec. 135.34) reside.
(5) Advertising the training and employment positions by posting flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) in the common areas or other prominent areas of the housing development or developments. For HAs, post such advertising in the housing development or developments where category 1 or category 2 persons reside; for all other recipients, post such advertising in the housing development or developments and transitional housing in the neighborhood or service area of the section 3 covered project.
(6) Contacting resident councils, resident management corporations, or other resident organizations, where they exist, in the housing development or developments where category 1 or category 2 persons reside, and community organizations in HUD assisted neighborhoods, to request the assistance of these organizations in notifying residents of the training and employment positions to be filled.

(7) Sponsoring (scheduling, advertising, financing or providing in-kind services) a job informational meeting to be conducted by an HA or contractor representative or representatives at a location in the housing development or developments where category 1 or category 2 persons reside or in the neighborhood or service area of the section 3 covered project.

(8) Arranging assistance in conducting job interviews and completing job applications for residents of the housing development or developments where category 1 or category 2 persons reside and in the neighborhood or service area in which a section 3 project is located.

[[Page 705]]

(9) Arranging for a location in the housing development or developments where category 1 persons reside, or the neighborhood or service area of the project, where job applications may be delivered to and collected by a recipient or contractor representative or representatives.

(10) Conducting job interviews at the housing development or developments where category 1 or category 2 persons reside, or at a location within the neighborhood or service area of the section 3 covered project.

(11) Contacting agencies administering HUD Youthbuild programs, and requesting their assistance in recruiting HUD Youthbuild program participants for the HA's or contractor's training and employment positions.

(12) Consulting with State and local agencies administering training programs funded through JTPA or JOBS, probation and parole agencies, unemployment compensation programs, community organizations and other officials or organizations to assist with recruiting Section 3 residents for the HA's or contractor's training and employment positions.

(13) Advertising the jobs to be filled through the local media, such as community television networks, newspapers of general circulation, and radio advertising.

(14) Employing a job coordinator, or contracting with a business concern that is licensed in the field of job placement (preferably one of the section 3 business concerns identified in part 135), that will undertake, on behalf of the HA, other recipient or contractor, the efforts to match eligible and qualified section 3 residents with the training and employment positions that the HA or contractor intends to fill.

(15) For an HA, employing section 3 residents directly on either a permanent or a temporary basis to perform work generated by section 3 assistance. (This type of employment is referred to as ``force account labor'' in HUD's Indian housing regulations. See 24 CFR 905.102, and Sec. 905.201(a)(6).)

(16) Where there are more qualified section 3 residents than there are positions to be filled, maintaining a file of eligible qualified section 3 residents for future employment positions.

(17) Undertaking job counseling, education and related programs in association with local educational institutions.

(18) Undertaking such continued job training efforts as may be necessary to ensure the continued employment of section 3 residents previously hired for employment opportunities.

(19) After selection of bidders but prior to execution of contracts, incorporating into the contract a negotiated provision for a specific number of public housing or other section 3 residents to be trained or employed on the section 3 covered assistance.

(20) Coordinating plans and implementation of economic development (e.g., job training and preparation, business development assistance for residents) with the planning for housing and community development.

III. EXAMPLES OF PROCUREMENT PROCEDURES THAT PROVIDE FOR PREFERENCE FOR SECTION 3 BUSINESS CONCERNS

This Section III provides specific procedures that may be followed by recipients and contractors (collectively, referred to as the ``contracting party'') for implementing the section 3 contracting preference for each of the competitive procurement methods authorized in 24 CFR 85.36(d).

(1) Small Purchase Procedures. For section 3 covered contracts aggregating no more than $25,000, the methods set forth in this paragraph (1) or the more formal procedures set forth in paragraphs (2) and (3) of this Section III may be utilized.

(I) Solicitation.
(A) Quotations may be solicited by telephone, letter or other informal procedure provided that the manner of solicitation provides for participation by a reasonable number of competitive sources. At the time of solicitation, the parties must be informed of:
--the section 3 covered contract to be awarded with sufficient specificity;
--the time within which quotations must be submitted; and
--the information that must be submitted with each quotation.
(B) If the method described in paragraph (i) (A) is utilized, there must be an attempt to obtain quotations from a minimum of three qualified sources in order to promote competition. Fewer than three quotations are acceptable when the contracting party has attempted, but has been unable, to obtain a sufficient number of competitive quotations. In unusual circumstances, the contracting party may accept the sole quotation received in response to a solicitation provided the price is reasonable. In all cases, the contracting party shall document the circumstances when it has been unable to obtain at least three quotations.

(ii) Award.
(A) Where the section 3 covered contract is to be awarded based upon the lowest price, the contract shall be awarded to the qualified section 3 business concern with the lowest responsive quotation, if it is reasonable and no more than 10 percent higher than the quotation of the lowest responsive quotation from any qualified source. If no responsive quotation by a qualified section 3 business concern is within 10 percent of the lowest responsive quotation from any qualified source, the award shall be made to the source with the lowest quotation.
(B) Where the section 3 covered contract is to be awarded based on factors other than price, a request for quotations shall be issued by developing the particulars of the solicitation, including a rating system for the assignment of points to evaluate the merits of each quotation. The solicitation shall identify all factors to be considered, including price or cost. The rating system shall provide for a range of 15 to 25 percent of the total number of available rating points to

be set aside for the provision of preference for section 3 business concerns. The purchase order shall be awarded to the responsible firm whose quotation is the most advantageous, considering price and all other factors specified in the rating system.

(2) Procurement by sealed bids (Invitations for Bids). Preference in the award of section 3 covered contracts that are awarded under a sealed bid (IFB) process may be provided as follows:
[[Page 707]]

(I) Bids shall be solicited from all businesses (section 3 business concerns, and non-section 3 business concerns). An award shall be made to the qualified section 3 business concern with the highest priority ranking and with the lowest responsive bid if that bid-- (A) Is within the maximum total contract price established in the contracting party's budget for the specific project for which bids are being taken, and (B) Is not more than "X" higher than the total bid price of the lowest responsive bid from any responsible bidder. "X" is determined as follows:

---

x=lesser of:

When the lowest responsive bid is less than $100,000.	10% of that bid or $9,000.
When the lowest responsive bid is:	
At least $100,000, but less than $200,000.	9% of that bid, or $16,000.
At least $200,000, but less than $300,000.	8% of that bid, or $21,000.
At least $300,000, but less than $400,000.	7% of that bid, or $24,000.
At least $400,000, but less than $500,000.	6% of that bid, or $25,000.
At least $500,000, but less than $1 million.	5% of that bid, or $40,000.
At least $1 million, but less than $2 million.	4% of that bid, or $60,000.
At least $2 million, but less than $4 million.	3% of that bid, or $80,000.
At least $4 million, but less than $7 million.	2% of that bid, or $105,000.
$7 million or more.....	1-1/2% of the lowest responsive bid, with no dollar limit.

(ii) If no responsive bid by a section 3 business concern meets the requirements of paragraph (2)(i) of this section, the contract shall be awarded to a responsible bidder with the lowest responsive bid.

(3) Procurement under the competitive proposals method of procurement (Request for Proposals (RFP)).

(i) For contracts and subcontracts awarded under the competitive proposals method of procurement (24 CFR 85.36(d)(3)), a Request for Proposals (RFP) shall identify all evaluation factors (and their relative importance) to be used to rate proposals.

(ii) One of the evaluation factors shall address both the preference for section 3 business concerns and the acceptability of the strategy for meeting the greatest extent feasible requirement (section 3 strategy), as disclosed in proposals submitted by all business concerns (section 3 and non-section 3 business concerns). This factor shall provide for a range of 15 to 25 percent of the total number of available points to be set aside for the evaluation of these two components.

(iii) The component of this evaluation factor designed to address the preference for section 3 business concerns must establish a preference for these business concerns in the order of priority ranking as described in 24 CFR 135.36.

(iv) With respect to the second component (the acceptability of the section 3 strategy), the RFP shall require the disclosure of the contractor's section 3 strategy to comply with the section 3 training and employment preference, or contracting preference, or both, if applicable. A determination of the contractor's responsibility will include the submission of an acceptable section 3 strategy. The contract award shall be made to the responsible firm (either section 3 or non-section 3 business concern) whose proposal is determined most advantageous, considering price and all other factors specified in the RFP.

Code of Federal Regulations
Title 24- Housing and Urban Development

Volume: 1
Date: 2003-04-01
Original Date: 2003-04-01
Title: Section 135.38- Section 3 Clause
Context: Title 24- Housing and Urban Development. Subtitle B- Relating to Housing and Urban Development . Chapter 1- Office of Assistant Secretary for Equal Opportunity, Department. Part 135 Economic Opportunities for Low-and Very Low-Income Persons. Subpart B- Economic Opportunities for Section 3 Residents and Section 3 Business Concerns.

§ 135.38 Section 3 clause.

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

Texas General Land Office
Community Development Block Grant (CDBG)
Disaster Recovery Program

NEW HIRES SECTION 3
MONTHTLY COMPLIANCE REPORT

Reporting Month:

Economic Opportunities for Low and Very Low-Income Persons

This form is distributed to the General Contractor (GC) at the Pre-Construction Meeting. GC is also required to provide this form to any subcontractor firms that they anticipate hiring for this project.

CONTRACTOR INFORMATION

Name of Business:

Address of Business:

Authorized Representative for this contract:

Authorized Signatory:

ADDITIONALLY, PLEASE REVIEW AND COMPLY WITH STEPS 1 - 3 BELOW:

1. You must **sign and date** this form for the each applicable reporting month in connection with awarded project and deliver to:

2. When you **hire** a Section 3 resident in connection with this project, you must also complete this form and submit it to the Section 3 Coordinator identified above. Even if there were no new hires this form **must be completed and submitted to the Section 3 Coordinator identified above.**

☐ I have not hired any new employees during the reporting Month specified.

I have hired ☐ Section 3 employess and/or ☐ non-Section 3 employees during the reporting month shown here.

The following is a list of the new hires and the trades:

	New Hire Name	Job Category/Trade	Full-time? Yes or No
1.			
2.			
3.			
4.			

I have taken one or more of the following recruitment steps to hire a Section 3 Resident with the highest training and employment priority ranking. **Provide a brief description of actions taken:**

I have taken steps to find a Section 3 Resident in the applicable targeted areas where the project(s)/assistance will take place. **List areas:**

☐ Placed signs or posters at prominent places in each of the above listed areas. *Photographs were taken to document this action.*

I have advertised to fill vacancy(ies) at the site(s), where work is taking place, in connection with this project.
List advertisements (name publication, e.g. Work in Texas, Houston Chronicle, and/or website(s):

☐ Distributed employment flyers to the administrative office of the local Public Housing Authority.

☐ Provided notice of positions available to the Texas Workforce Commission for potential applicants. *Provide copy of notice.*

☐ Contacted employment referrals or Youthbuild Program referrals. **List contacts:**

☐ Contacted with applicable parties to ensure that any HUD Youthbuild programs currently operating in the project(s) area/ assistance will take place.

☐ Kept a log of all applicants and indicate the reasons why Section 3 Residents who applied were not hired.

☐ Retained copies of any employment applications completed by public housing, Section 8 certificate or voucher holders or other Section 3 Residents.

☐ Sent a notice about Section 3 training and employment requirements and opportunities to labor organizations or to worker representatives with whom our firm has a collective bargaining or other agreement.

3. Verification

☐ I have attached proof of all checked items.

Authorized Name and Signature

Date/Time Field

Text

Attested By:

Title 29 — LABOR

Subtitle A — Office of the Secretary of Labor

PART 3 — CONTRACTORS AND SUBCONTRACTORS ON PUBLIC BUILDING OR PUBLIC WORK FINANCED IN WHOLE OR IN PART BY LOANS OR GRANTS FROM THE UNITED STATES

Sec.

3.1 Purpose and scope
3.2 Definitions
3.3 Weekly statement with respect to payment of wages
3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.
3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.
3.6 Payroll deductions permissible with the approval of the Secretary of Labor.
3.7 Applications for the approval of the Secretary of Labor
3.8 Action by the Secretary of Labor upon applications.
3.9 Prohibited payroll deductions.
3.10 Methods of payment of wages.
3.11 Regulations part of contract.

AUTHORITY: The provisions of this Part 3 issued under R.S. 161, sec. 2, 48 Stat. §48; Reorg. Plan No. 14 of 1950, 64 Stat. 1267, 5 U.S.C. Appendix; 5 U.S.C. 301; 40 U.S.C. 276c.

SOURCE: The provisions of this Part 3 appear at 29 F.R. 97, Jan. 4, 1964, unless otherwise noted.

Section 3.1 Purpose and Scope.

This part prescribes "anti-kickback" regulations under section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis-Bacon Act and the various statutes dealing with Federally-assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No. 14 (e.g., the College Housing Act of 1950, the Federal Water Pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work.

Section 3.2 Definitions.

As used in the regulations in this part:

(a) The terms "building" or "work" generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, powerlines, pumping stations, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, clearing, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture or furnishing of materials, articles, supplies, or equipment (whether or not a Federal or State

agency acquires title to such materials, articles, supplies, or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a "building" or "work" within the meaning of the regulations in this part.

(b) The terms "construction," "prosecution," "completion," or "repair" mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.

(c) The terms "public building" or "public work" include building or work for whose construction, prosecution, completion, or repair, as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.

(d) The term "building or work financed in whole or in part by loans or grants from the Unites States" includes building or work for whose construction, prosecution, completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term includes building or work for which the Federal assistance granted is in the form of loan guarantees or insurance.

(e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or building or work financed in whole or in part by loans or grants from the United States is "employed" and receiving "wages," regardless of any contractual relationship alleged to exist between him and the real employer.

(f) The term "any affiliated person" includes a spouse, child, parent, or other close relative of the contractor or subcontractor; a partner or officer of the contractor or subcontractor; a corporation closely connected with the contractor or subcontractor as parent, subsidiary or otherwise, and an officer or agent of such corporation.

(g) The term "Federal agency" means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentality's of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentality's.

(29 FR 97, Jan. 4, 1964, as amended at 33 FR 32575, Nov. 27, 1973)

Section 3.3 Weekly statement with respect to payment of wages.

(a) As used in this section, the term "employee" shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.

(b) Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by 29 CFR Parts 3 and 5 during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer of employee of the contractor or subcontractor who supervises the payment of wages, and shall be on form WH 348, "Statement of Compliance," or on an identical form on the back of WH 347, "Payroll (For Contractors Optional Use)" or on any form with identical wording. Sample copies of WH 347 and WH 348 may be obtained from the Government contracting or sponsoring agency, and copies of these forms may be purchased at the Government Printing Office.

(c) The requirements of this section shall not apply to any contract of $2,000 or less.

(d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations,

tolerances, and exemptions from the requirements of this section subject to such conditions as the Secretary of Labor may specify.
(29 F.R. 95, Jan. 4, 1964, as amended at 33 F.R. 10166, July 17, 1968)

Section 3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.

(a) Each weekly statement required under §3.3 shall be delivered by the contractor or subcontractor, within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency in charge at the site of the building or work, or if there is no representative of a Federal or State agency at the site of the building or work, the statement shall be mailed by the contractor or subcontractor, within such time, to a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.

(b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll records shall set out accurately and completely the name and address of each laborer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor.

Section 3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor:

(a) Any deduction made in compliance with the requirements of Federal, State, or local law, such as Federal or State withholding income taxes and Federal social security taxes.

(b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A "bona fide prepayment of wages" is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.

(c) Any deduction of amounts required by court process to be paid to another, unless, the deduction is in favor of the contractor, subcontractor or any affiliated person, or when collusion or collaboration exists.

(d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing either from principal or income, or both, medical or hospital care, pensions, or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their families and dependents: Provided, however, That the following standards are met: (1) The deduction is not otherwise prohibited by law; (2) it is either: (i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or (ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; (3) no profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and (4) the deductions shall serve the convenience and interest of the employee.

(e) Any deduction contributing toward the purchase of United States Defense Stamps

and Bonds when voluntarily authorized by the employee.

(f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.

(g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.

(h) Any deduction voluntarily authorized by the employee for the making of contributions to Community Chests, United Givers Funds, and similar charitable organizations.

(i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments: Provided, however, That a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.

(j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and Part 531 of this title. When such a deduction is made the additional records required under §516.27(a) of this title shall be kept.

(k) Any deduction for the cost of safety equipment of nominal value purchased by the employee as his own property for his personal protection in his work, such as safety shoes, safety glasses, safety gloves, and hard hats, if such equipment is not required by law to be furnished by the employer, if such deduction is not violative of the Fair Labor Standards Act or prohibited by other law, if the cost on which the deduction is based does not exceed the actual cost to the employer where the equipment is purchased from him and does not include any direct or indirect monetary return to the employer where the equipment is purchased from a third person, and if the deduction is either (1) voluntarily consented to be the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance; or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees.

(38 F.R. 9770, May 28, 1971.)

Section 3.6 Payroll deductions permissible with the approval of the Secretary of Labor.

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under §3.5. The Secretary may grant permission whenever he finds that:

(a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;

(b) The deduction is not otherwise prohibited by law;

(c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; and

(d) The deduction serves the convenience and interest of the employee.

Section 3.7 Applications for the approval of the Secretary of Labor.

Any application for the making of payroll deductions under §3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

(a) The application shall be in writing and shall be addressed to the Secretary of Labor.

(b) The application need not identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions on all current and future contracts of the applicant for a period of

1 year. A renewal of permission to make such payroll deduction will be granted upon the submission of an application which makes reference to the original application, recites the date of the Secretary of Labor's approval of such deductions, states affirmatively that there is continued compliance with the standards set forth in the provisions of §3.6, and specifies any conditions which have changed in regard to the payroll deductions.
(36 F.R. 9770, May 28, 1971.)

(c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of §3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.

(d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.

(e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

Section 3.8 Action by the Secretary of Labor upon applications.

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of §3.6; and shall notify the applicant in writing of his decision.

Section 3.9 Prohibited payroll deductions.

Deductions not elsewhere provided for by this part and which are not found to be permissible under §3.6 are prohibited.

Section 3.10 Methods of payment of wages.

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

Section 3.11 Regulations part of contract.

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see §5.5(a) of this subtitle.

Certification Regarding Lobbying for
Contracts, Grants, Loans, and Cooperative Agreements

The undersigned _____ of _____
certifies, to the best of its knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more that $100,000 for each such failure.

Signed: _____ Date: _____

Title: _____

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

1. Type of Federal Action:	2. Status of Federal Action:	3. Report Type:
☐ a. contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	☐ a. bid/offer/application b. initial award c. post-award	☐ a. initial filing b. material change **For Material Change Only:** year _____ quarter _____ date of last report _____

4. Name and Address of Reporting Entity:	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:
☐ Prime ☐ Subawardee Tier _____, *if known*: **Congressional District**, *if known*:	 **Congressional District**, *if known*:
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CFDA Number, *if applicable*: _____
8. Federal Action Number, *if known*:	**9. Award Amount**, *if known*: $
10. a. Name and Address of Lobbying Entity (*if individual, last name, first name, MI*):	**b. Individuals Performing Services** (*including address if different from No. 10a*) (*last name, first name, MI*):

(attach Continuation Sheet(s) SF-LLLA, if necessary)

11. Amount of Payment (*check all that apply*):	13. Type of Payment (*check all that apply*):
$ _____ ☐ actual ☐ planned	☐ a. retainer ☐ b. one-time fee ☐ c. commission ☐ d. contingent fee ☐ e. deferred ☐ f. other; specify: _____
12. Form of Payment (*check all that apply*): ☐ a. cash ☐ b. in-kind; specify: nature _____ value _____	

14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s), or Member(s) contacted, for Payment Indicated in Item 11:

(attach Continuation Sheet(s) SF-LLLA, if necessary)

15. Continuation Sheet(s) SF-LLLA attached: ☐ Yes ☐ No

16. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less that $10,000 and not more than $100,000 for each such failure.

Signature: _____

Print Name: _____

Title: _____

Telephone No.: _____ Date: _____

Federal Use Only:

Authorized for Local Reproduction
Standard Form LLL (Rev. 7-97)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLLA Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.

12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.

13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.

14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.

15. Check whether or not a SF-LLLA Continuation Sheet(s) is attached.

16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

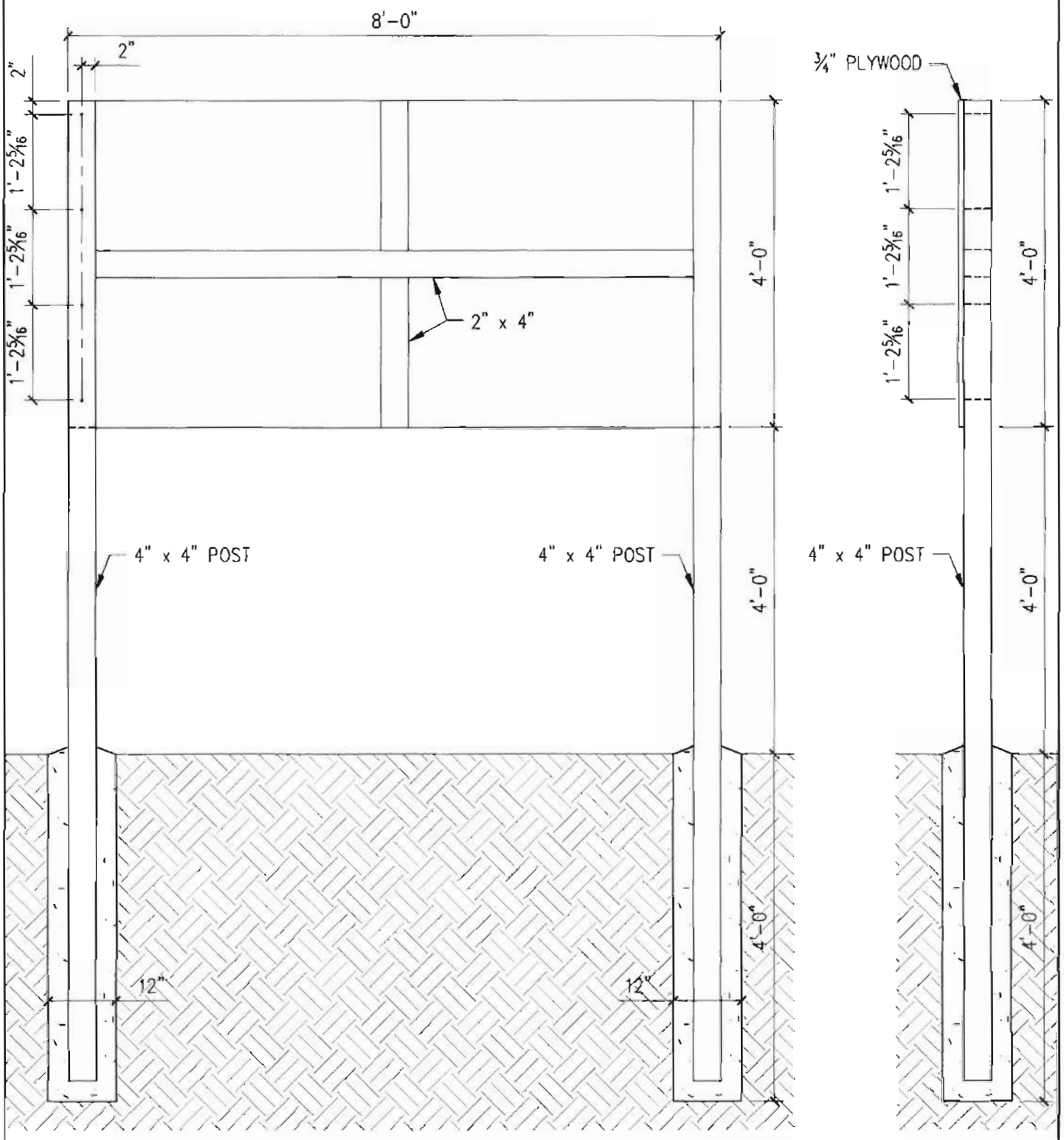
PROJECT SIGN REQUIREMENTS

Public buildings, facilities, and centers constructed with Texas General Land Office TxCDBG-DRS assistance shall have permanent signage placed in a prominent visible public area with the wording provided below. The formatting of such signage will be at local discretion to best fit the architectural design of the facility constructed but should be legible from at least three (3) feet distance. The Texas General Land Office and United States Department of Housing and Urban Development logos should be included on the sign.

Other construction projects, e.g., water transmission lines, sewer collection lines, drainage, roadways, housing rehabilitation, etc. utilizing Texas General Land Office TxCDBG-DRS funding shall have temporary signage erected in a prominent location at the construction project site or along a major thoroughfare within the locality as directed by the owner.

Project Sign Wording:

"This project is funded by the General Land Office of the State of Texas, to provide for disaster recovery and restoration of infrastructure for communities impacted by the 2008 hurricanes. Funds allocated by the United States Department of Housing and Urban Development through the Community Development Block Grant Program."



NOTE:
SEE NEXT SHEET FOR
SIGN INFORMATION.

CONSTRUCTION
OF
"PROJECT NAME"

HURRICANE RECOVERY PROJECT

THIS PROJECT IS FUNDED BY THE GENERAL LAND OFFICE OF THE STATE OF TEXAS, TO PROVIDE FOR DISASTER RECOVERY AND RESTORATION OF INFRASTRUCTURE FOR COMMUNITIES IMPACTED BY THE 2008 HURRICANES. FUNDS ALLOCATED BY THE UNITED STATES DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT THROUGH THE COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM.
WWW.GLO.TEXAS.GOV

8'-0"

4'-0"

08/12/13

TDLO PROJ SIGN 2 (8.5X11-1:20)

PROJECT SIGN GENERAL NOTES:

1. Design Requirements
   a. Design sign and structure to remain in place and withstand 60 miles-per-hour wind velocity.
   b. Sign Manufacturer/Maker/Painter: Experienced as a professional sign company.
   c. Finishes, Painting: Adequate to withstand weathering, fading and chipping for duration of construction.
   d. Appearance: Project signs shall present a fresh, new and neat look. All project signs shall be new or refurbished so as to look new.

2. Sign Materials
   a. Structure and Framing: Use new 4-inch by 4-inch wood posts to reach 8-feet above existing grade. Paint structural members white on all sides and edges to resist weathering. Set posts approximately 4-feet apart.
   b. Sign: For sign use 4-foot by 8-foot marine plywood, minimum ¾-inch thick. Use full size sheets for sign to minimize joints; do not piece wood to fabricate a sign face. Paint sign material white, two (2) coats, on all sides and edges to resist weathering.
   c. Paint and Primers: White paint used to prime surfaces and to resist weathering shall be an industrial grade, fast drying, oil-based paint with gloss finish. Paint all signs surfaces with two (2) coats of this weather-protective paint prior to adding any lettering.
   d. Sign Border: Add 2½-inch wide black border along the four edges of the project sign. For border use 3M Scotchcal Engineer Grade, Pressure Sensitive Sheeting (Black) or approved equal.
   e. Sign Lettering: Make lettering and symbols from 3M Scotchcal Pressure Sensitive Films or approved equal, or at Contractor's option, signs may be painted using approved paints. Whether film or paint is used, match color to 3M Scotchcal Pressure Sensitive Film, Black.
   f. Rough Hardware: Galvanized steel or brass for fasteners and other hardware.

3. Sign Components
   a. Sign
      (1). The 4-foot by 8-foot component of the sign has fields of information as indicated.
      (2). The Engineer will provide the project title to the Contractor for preparation of the sign.
   b. Sign Support Structure
      (1). Sign Posts: 4-inch by 4-inch sign posts 12-feet long minimum for post hole mounting to set top of posts at 8-feet above existing grade.
   c. Fasteners
      (1). ½-inch by 5½-inch button heads carriage bolts for posts with nuts and flat head washers. Cover button heads with white reflective film or paint to match sign background

PROJECT SIGN GENERAL NOTES:
(continued)

4. Installation
   a. Install project identification sign within fourteen (14) calendar days after date of Notice to Proceed.
   b. Erect at location designated by the Engineer or where shown on the Plans and/or Exhibits. In either case, position the sign in such a manner as to be fully visible and readable to the general public.
   c. Erect sign level and plumb.
   d. If post hole mounted, sink posts at least 4-feet below grade. Stabilize posts to minimize lateral motion.
   e. Erect sign so that the top edge of the sign is at a nominal 8-feet above existing grade.

5. Maintenance and Removal
   a. Maintain signs and supports clean. Repair deterioration and damage.
   b. Remove signs, framing, supports and foundations at completion of project and restore the area.

SECTION V

Project Specifications

LJA Project No. E224-0020

ITEM 1400

MEASUREMENT AND PAYMENT
WATERLINE REHABILITATION

MEASUREMENT AND PAYMENT: It is the intent of the Proposal and of the General and Supplementary Conditions that the total bid, as submitted, shall cover all work required by these Contract Documents. All costs in connection with the work, including furnishing of all materials, appliances, equipment, chemicals, supplies and appurtenances; providing all construction equipment and tools; and performing all necessary labor to fully complete the work shall be included in the unit prices in the Proposal. No item of work that is required by the Contract Documents for the proper and successful completion of the Contract will be paid for outside of or in addition to the prices submitted to the Proposal. All work not specifically set forth in the Proposal as a pay item shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices named in the Proposal.

The method of measurement and basis of payment shall be as stipulated in the following subparagraphs:

1. Waterline, Open Cut, Bid Items 1, 5, and 7:

   Measurement shall be "Per Linear Foot" along centerline of pipe without deductions for valves and fittings, from start to line terminus. The unit price shall be full compensation for layout, clearing and grubbing, trenching and incidentals thereto, bank sand bedding, pipe and fitting materials, steel pipe sections (as applicable), pipe placement, thrust blocking and normal backfill to existing grade, testing, disinfection, connections, trench backfill, maintenance, clean-up, trench dewatering, and all incidental work required for the complete contract not specifically included in another payment item.

2. Waterline in Augered Construction, Bid Items 2, and 6:

   Measurement shall be "Per Linear Foot" along centerline of pipe from start to the augered terminus. The unit price shall be full compensation for layout, grade, clearing and grubbing, boring and jacking of pipe and incidentals thereto, bedding, carrier pipe and materials, pipe placement, fittings, thrust blocking and normal backfill to existing surface elevations, connections, bore pit dewatering, testing, disinfection, trench backfill maintenance, and all incidental work.

3. Waterline in Augered & Encased Construction, Bid Item 3:

Measurement shall be "Per Linear Foot" along centerline of pipe from start to the augered terminus. The unit price shall be full compensation for layout, grade, clearing and grubbing, boring and jacking of encasement pipe and incidentals thereto, bedding, carrier pipe and materials, pipe placement, fittings, racci supports, thrust blocking and normal backfill to existing surface elevations, connections, bore pit dewatering, testing, disinfection, trench backfill maintenance, and all incidental work.

4. 14-Inch Waterline Casing (PVC, AWWA C-900, DR-18), Bid Item 4:

Measurement shall be "Per Each". The unit price shall be full compensation for an 18 linear foot minimum section of encasement pipe and incidentals thereto, materials, pipe placement, racci supports, and all incidental work.

5. Gate Valves; Bid Items 8 and 9:

Measurement "Per Each". Payment includes valve with resilient seats, manual operator of type specified, accessories, adjustable valve box, setting, valve blocking, and incidental work.

6. Fire Hydrant Assembly; Bid Item 10:

Measurement is to be "Per Each." Unit price shall be full compensation for tee (if required), piping, valve, elbow, new fire hydrant 4' bury, restrained joints, concrete block, drain gravel and backfill.

7. Extra Depth of Bury for Fire Hydrant, Bid Item 11:

Measurement is to be "Per Vertical Foot". Unit price shall be full compensation for addition in barrel length over 4-foot of bury fire hydrant, complete with drain gravel and backfill.

8. Cut & Plug Existing Waterline, Bid Item 12:

Measurement shall be "Per Each." Unit price shall be full compensation for excavation, dewatering, cutting and plugging existing waterline to be abandoned, manufactured plug, backfill, appurtenances and any incidentals necessary to complete the work.

9. Remove & Salvage Existing Fire Hydrant, Bid Item 13:

Measurement shall be "Per Each." Unit price shall be full compensation for excavation, dewatering, cutting, removal of existing fire hydrant including base elbow, delivery of fire hydrant for salvage to City designated location, backfill, cleanup, appurtenances and any incidentals necessary to complete the work.1

10. Close Existing Valve, Remove Box, Plug Valve Operator, Bid Item 14:

Measurement shall be "Per Each." Unit price shall be full compensation for excavation as necessary, closure of existing valve, removal of valve box, filling of valve operator nut cavity with concrete, backfill and surface restoration in accordance with plans, appurtenances and any incidentals necessary to complete the work.

11. Wet Connections, Bid Items 15, 16, and 17:

Measurement shall be "Per Each." Unit price shall be full compensation for excavation, dewatering, cutting, cleaning, fittings, blocking, appurtenances and any incidentals including locating and closing valves necessary for line isolation, and cutting and plugging of existing pipes to be abandoned necessary for a complete connection.

12. Tapping Sleeve and Valve; Bid Items 18 and 19:

Measurement shall be "Per Each". Unit price shall be full compensation for tapping through full body service saddle with gate valve, valve pressure tap, adjustable box, blocking, appurtenances and dewatering of trench and any incidentals necessary to complete the work.

13. Trench Safety System, Bid Item 20:

Measurement shall be "Per Linear Foot" along the centerline of the pipe without deductions for manholes, valves, or fittings from start to line terminus for gravity and/or pressure systems for all depths in excess of 5 foot. The unit price shall be full compensation for trench safety system, material construction, maintenance and inspection of any shoring related equipment.

14. Short Side Service Connections, Bid Items 21, and 23:

Measurement shall be "Per Each". Payment shall be full payment for tapping of the line through service saddle with corporation stop, temporary capping of stop, installing new service line (with or without casing as required in Bid Form), excavating trench for new service, laying new service tubing from new meter, to the new waterline, connecting new service line to the meter, backfilling trench, and clean-up. No adjustment in the unit price shall be made for varying service line footage.

15. Long Side Service Connections, Bid Items 22, and 24:

Measurement shall be "Per Each". Payment shall be full payment for tapping of the line through service saddle with corporation stop, temporary capping of stop, installing new service line (with or without casing as required in Bid Form), auger under road for new service, laying new service tubing from new meter, to the new waterline, connecting new service line to the meter, backfilling auger pit, and clean-up. No adjustment in the unit price shall be made for varying service line footage.

16. Install New Meter and Box, Bid Item 25:

Measurement shall be "Per Each". Payment shall be full payment for excavation, furnishing all labor, equipment, and materials to install Contractor furnished Badger water meter and box in accordance with details on plans, backfilling to finished grade, and turf establishment.

17. Turf Establishment, Hydro-mulch Seeding, Bid Item 26:

Measurement shall be "Per Square Yard". Payment is to be full compensation for the establishment of turf by hydro-mulch seeding in accordance with the Specifications in locations specified by the Engineer.

18. Surface Restoration, Bid Items 27, 28, and 29:

Measurement shall be "Per Square Yard". Payment is to be full compensation for the restoration of surfaces disturbed by open cut construction or auger pits in accordance with details on the plans.

19. Traffic Control, Bid Item 30:

Measurement is to be "Per Lump Sum". Payment to be full compensation for all necessary permits for flagmen necessary to assist in the unloading of construction materials (when and if necessary).The cost shall also include the installation, maintenance, and removal of all signs, temporary barricades along driveways, flagmen along adjoining streets during construction activities, along with all other appurtenances necessary.

20. SWPPP Curb Inlet Protection Barrier, Bid Item 31:

Measurement shall be "Per Each". The unit price shall be full compensation for supplying gravel bags for each curb inlet, installation of gravel bags, maintenance of barrier with removal of solids build up on upstream side, and removal of barrier at the end of construction, finish grading, clean-up, and all incidental work.

21. SWPPP Area Inlet Protection Barrier, Bid Item 32:

Measurement shall be "Per Each". The unit price shall be full compensation for supplying gravel bags for each curb inlet, installation of gravel bags, maintenance of barrier with removal of solids build up on upstream side, and removal of barrier at the end of construction, finish grading, clean-up, and all incidental work.

22. SWPPP Reinforced Filter Fabric Barrier, Bid Item 33:

Measurement shall be "Per Linear Foot". The unit price shall be full compensation for supplying the reinforced filter fabric barrier, installation of the barrier, maintenance of barrier with removal of solids build up on upstream side, and removal of barrier at the end of construction, finish grading, clean-up, and all incidental work.

SUPPLEMENTARY ITEMS

23. "Extra" Bank Sand, As Directed by Owner's Representative; Supplemental Bid Item 34:

Measurement shall be "Per Cubic Yard". Payment shall be full compensation for supplying all materials to deliver bank sand, labor to place bank sand as directed by the engineer.

24. "Extra" Crushed Limestone Bedding, As Directed by Owner's Representative; Supplemental Bid Item 35:

Measurement shall be "Per Cubic Yard". Payment shall be full compensation for supplying all materials to deliver crushed limestone bedding, labor to place crushed limestone bedding as directed by the engineer.

25. "Extra" Cement Stabilized Sand, 2.0 Sacks per Ton, As Directed by Owner's Representative; Supplemental Bid Item 36:

Measurement shall be "Per Ton". Payment shall be full compensation for supplying all materials to deliver cement stabilized sand, labor to place cement stabilized sand as directed by the engineer.

26. "Extra" Class A Concrete, As Directed by Owner's Representative; Supplemental Bid Item 37:

Measurement shall be "Per Cubic Yard". Payment shall be full compensation for supplying all materials to deliver class A concrete, labor to place class A concrete as directed by the engineer.

27. "Extra" Reinforcing Steel, As Directed by Owner's Representative; Supplemental Bid Item 38:

Measurement shall be "Per Pound". Payment shall be full compensation for supplying all materials to deliver Reinforcing Steel, and labor to place steel as directed by the engineer.

28. "Extra" Turf Establishment, Full Sodding, As Directed by Owner's Representative; Supplemental Bid Item 39:

Measurement shall be "Per Square Yard". Payment shall be full compensation for supplying all materials to deliver sodding, labor to place sodding, and water sodding as directed by the engineer.

29. 12-Inch Waterline, Open Cut, As Directed by Owner's Representative; Supplemental Bid Item 40:

Measurement shall be "Per Linear Foot" along centerline of pipe without deductions for valves and fittings, from start to line terminus. The unit price shall be full compensation for layout, clearing and grubbing, trenching and incidentals thereto, bank sand bedding, pipe and fitting materials, steel pipe sections (as applicable), pipe placement, thrust blocking and normal backfill to existing grade, testing, disinfection, connections, trench backfill, maintenance, clean-up, trench dewatering, and all incidental work required for the complete contract not specifically included in another payment item.

30. Fill Abandoned Waterlines with Cement Slurry, As Directed by Owner's Representative; Supplemental Bid Item 41:

Measurement shall be "Per Linear Foot" along the centerline of the abandoned line within TxDOT right-of-way. The unit price shall be full compensation for filling the abandoned line with a slurry style cement, clearing and grubbing, trenching and incidentals thereto, normal backfill to existing grade, clean-up, and all incidental work.

31. Insertion Valves, As Directed by Owner's Representative; Supplemental Bid Items 42, and 43:

Measurement shall be "Per Each". Payment includes valve with resilient seats, manual operator of type specified, accessories, adjustable valve box, setting, concrete collar, and incidental work.

ITEM 1400

MEASUREMENT AND PAYMENT
SANITARY SEWER REHABILITATION

MEASUREMENT AND PAYMENT: It is the intent of the Proposal and of the General and Supplementary Conditions that the total bid, as submitted, shall cover all work required by these Contract Documents. All costs in connection with the work, including furnishing of all materials, appliances, equipment, chemicals, supplies and appurtenances; providing all construction equipment and tools; and performing all necessary labor to fully complete the work shall be included in the unit prices in the Proposal. No item of work that is required by the Contract Documents for the proper and successful completion of the Contract will be paid for outside of or in addition to the prices submitted to the Proposal. All work not specifically set forth in the Proposal as a pay item shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices named in the Proposal.

The method of measurement and basis of payment shall be as stipulated in the following subparagraphs:

1. Cleaning of Gravity Sanitary Sewers; Bid Item 1:

   Measurement shall be "Per Linear Foot" along the centerline of the pipe without deductions for manholes and fittings from start to line terminus. The unit price shall be full compensation for layout, cleaning, waste disposal, bypass pumping, traffic control, trench safety, finish grading, clean-up and all appurtenances and work required for the complete cleaning of existing gravity sanitary sewers.

2. TV Inspection; Bid Item 2:

   Measurement shall be "Per Linear Foot" along the centerline of the pipe without deductions for manholes and fittings from start to line terminus. The unit price shall be full compensation for layout, bypass pumping, complete TV inspection, traffic control, trench safety, finish grading, clean-up, and all appurtenances and work required for the complete TV inspection of existing gravity sanitary sewers.

3. Sewer Reconstruction by Pipe Bursting; Bid Items 3 and 4:

Measurement shall be "Per Linear Foot" for all sizes along the centerline of the pipe without deductions for manholes and fittings from start to line terminus. The unit price shall be full compensation for layout, bypass pumping, trenching and incidental thereto, pipe bursting, liner material, liner placement, sealing when required, backfill to existing surface, post rehabilitation TV inspection, traffic control, trench safety for access pits and insertion pits, finish grading, clean-up and all incidental work for a complete project. If post rehabilitation TV inspection shows defects, TV inspection shall be repeated until defect is satisfactorily repaired. Post TV and relevant submittals shall be incidental to the project.

4. Normal Connection, Complete in Place; Bid Item 5:

Measurement shall be "Per Each". Payment shall be full compensation for removal and replacement of individual house (4-inch) or commercial (6-inch) services from the newly reconstructed sewers to the service lead. Work includes but is not limited to layout, trenching and incidental thereto, removal and excavation of pavement surface course, sealing, insert a tee and piping, boring or auguring for new connections, backfill to existing surface including required cement stabilized sand, testing, safety measures, finish grading, clean-up, excavation, obstruction removal and all incidental work no deeper than 8 feet. This item includes minimum 1–inch anchored steel plates used to cover excavations within roadway so as to not impede traffic flow while work is being performed in other locations as directed by the owner's representative at no extra pay.

6. Service Connection, Bid Items 6 and 7:

Measurement shall be "Per Each". Payment shall be full compensation for removal and replacement of individual house (4-inch) or commercial (6-inch) services from the new sewer under the street to the property line or easement line, including the connection to the new sewer line (deep connection or normal connection). Work includes but is not limited to layout, augering and incidental thereto, sealing, pipe, backfill to existing surface, testing, traffic control, safety measures, finish grading, clean-up, obstruction removal, required boring or auguring to install new service line, district side cleanout, and all incidental work required for a complete installation.

7. Manhole Reconstruction, Cementitious Liner; Bid Item 8:

Measurement shall be "Per Vertical Foot." The unit price shall be full compensation for manhole reconstruction per the specifications in locations shown on the Exhibits. The work includes but is not limited to layout, sealing, cleaning, bypass pumping, manhole preparation, system installation, testing, traffic control, safety measures, finish grading, clean-up, obstruction removal, and all incidental work. No adjustment in the unit price shall be made for changes in condition or diameters of manholes to be reconstructed.

8. Turf Establishment, Full Sodding, Bid Item 9:

Measurement shall be "Per Square Yard". Payment is to be full compensation for the establishment of turf by sodding in accordance with the Specifications in locations specified by the Engineer.

9. Concrete Surface Replacement; Bid Item 10:

Measurement shall be "Per Square Yard". Payment shall be full compensation for the base material, reinforced concrete, labor and all appurtenances required for concrete surface replacement. Sawcutting and excavation of existing area to be repaired is incidental to this item. Repair area shall not exceed area shown on Exhibits. Areas outside access pits damaged by equipment will be repaired at Contractor's expense.

10. Asphaltic Concrete Surface Replacement; Bid Item 11:

Measurement shall be "Per Square Yard". Payment shall be for furnishing all materials including prime coat, and asphalt base grade-2 PG-64, asphalt surface type "D", required equipment and labor. Sawcutting and excavation of existing area to be repaired is incidental to this item. Pavement shall be for repaired areas where removal was required for construction. Pavement replacement shall not exceed the areas shown on the details. Other damaged areas shall be repaired at Contractor's expense.

11. Sanitary Sewer Cleanout; Bid Item 12:

Measurement shall be "Per Each". Payment shall be full compensation for clearing and grubbing, excavation and incidentals thereto, removal and excavation of pavement surface course, removal and disposal of defective pipe, bedding, pipe materials, pipe placement, backfill, and all appurtenances for a complete Sanitary Sewer Cleanout per detail.

12. Standard Sanitary Sewer Manhole, 4-Foot Diameter; Bid Item 13:

Measurement is to be "Per Each". The unit price shall be full compensation for a 4-foot diameter concrete manhole 0 to 8 feet deep, sealed, per details on plans if necessary, complete in place concrete units including cone, rings, frame and cover, accessories, and backfill per details shown on Plans.

SUPPLEMENTARY ITEMS

13. Reset-Up of TV Inspection, As Directed by Owner's Representative; Supplemental Bid Item 14:

    Measurement shall be "Per Each" occurrence. The unit price shall be full compensation for removal of initial set-up, after Engineer's approval, and reinstalling in new location.

14. Obstruction Removal by Excavation, As Directed by Owner's Representative; Supplemental Bid Item 15:

    Measurement shall be "Per Each." Payment shall be for removal of obstruction by excavation to clear the sewer main from obstruction so as to allow for rehabilitation. Unit price to include all equipment, bypass pumping, traffic control, trench safety system, debris removal and disposal required to clear sewer. If obstructions are encountered, the Contractor shall ask the Engineer for approval. Removal of protruding taps will be paid for in this item.

15. Small Obstruction Removal, As Directed by Owner's Representative; Supplemental Bid Item 16:

    Measurement shall be "Lump Sum" Payment shall be for removal of small obstruction by steel mandrel or porcupines to clear the sewer main from obstruction so as to allow for rehabilitation with liner. Unit price to include all equipment, bypass pumping, traffic control, trench safety system, debris removal and disposal required to clear sewer. If obstructions are encountered, the Contractor shall ask the Engineer for approval. Small obstructions are small enough as to not need excavation.

16. Trench Safety System, As Directed by Owner's Representative; Supplemental Bid Item 17:

    Measurement shall be "Per Linear Foot" along the centerline of pipe without deductions for manholes, valves, or fittings from start to line terminus for gravity and/or pressure system for all depths in excess of 5 feet. The unit price shall be full compensation for trench safety system, material construction, maintenance, and inspection of any shoring-related equipment. This item applies to open cut construction for sag removal only or open cut construction.

17. Service Connection, As Directed by Owner's Representative; Supplemental Bid Items 18 and 19:

Measurement shall be "Per Each". Payment shall be full compensation for removal and replacement of individual house (4-inch) or commercial (6-inch) services from the new sewer under the street to the property line or easement line, including the connection to the new sewer line (deep connection or normal connection). Work includes but is not limited to layout, augering and incidental thereto, sealing, pipe, backfill to existing surface, testing, traffic control, safety measures, finish grading, clean-up, obstruction removal, required boring or auguring to install new service line, district side cleanout, and all incidental work required for a complete installation.

18. Extra Depth 4-Foot Manhole (Over 8'), As Directed by Owner's Representative; Supplemental Bid Item 20:

Measurement is "Per Vertical Foot". Payment to be per 12" increment of extra depth over 8 feet.

19. Standard Sanitary Sewer Manhole, 5-Foot to 6-Foot Diameter, As Directed by Owner's Representative; Supplemental Bid Item 21:

Measurement is to be "Per Each". The unit price shall be full compensation for a 5-foot diameter to 6-foot diameter manhole 0 to 8 feet deep, sealed, vented per details on plans if necessary, complete in place concrete units including cone, rings, frame and cover, accessories, and backfill per details shown on Plans.

20. Slip Line Removal, As Directed by Owner's Representative; Supplemental Bid Item 22:

Measurement shall be "Per Linear Foot". Payment shall be full compensation for clearing and grubbing, excavation and incidentals thereto, removal and disposal of pipe liner inside and encased in pipe that prevents pipebursting through liner, and all appurtenances necessary for work.

21. Well Point Dewatering System, Installed, Operated and Removed, As Directed by Owner's Representative; Supplemental Bid Item 23:

Measurement shall be "Per Linear Foot". Payment shall be full compensation for supplying all materials and pumping equipment necessary, for the purpose of dewatering any excavated trench at any depth, or to gain access to any necessary installation necessary for the completion of the work in the contract, and all appurtenances for a complete dewatering system complete in place.

22. Turf Establishment, Hydromulch Seeding, As Directed by Owner's Representative; Supplemental Bid Item 24:

Measurement shall be "Per Acre". Payment is to be full compensation for the establishment of Hydromulch Seeding in accordance with the Specifications in locations designated by the Exhibits as directed by the Engineer.

23. "Extra" Bank Sand, As Directed by Owner's Representative; Supplemental Bid Item 25:

Measurement shall be "Per Cubic Yard". Payment shall be full compensation for supplying all materials to deliver bank sand, labor to place bank sand as directed by the engineer.

24. "Extra" Crushed Limestone Bedding, As Directed by Owner's Representative; Supplemental Bid Item 26:

Measurement shall be "Per Cubic Yard". Payment shall be full compensation for supplying all materials to deliver crushed limestone bedding, labor to place crushed limestone bedding as directed by the engineer.

25. "Extra" Cement Stabilized Sand, 2 Sacks per Ton, As Directed by Owner's Representative; Supplemental Bid Item 27:

Measurement shall be "Per Ton". Payment shall be full compensation for supplying all materials to deliver cement stabilized sand, labor to place cement stabilized sand as directed by the engineer.

26. Obstruction Relocate and Replace, As Directed by Owner's Representative; Supplemental Bid Item 28:

Measurement shall be "Per Each". Payment shall be full compensation for removing and replacing portable buildings, landscaping, equipment and all appurtenances in order to gain access for the completion of the work in the contract.

27. Sewer Reconstruction by Pipe Bursting, As Directed by Owner's Representative; Supplemental Bid Item 29:

Measurement shall be "Per Linear Foot" for all sizes along the centerline of the pipe without deductions for manholes and fittings from start to line terminus. The unit price shall be full compensation for layout, bypass pumping, trenching and incidental thereto, pipe bursting, liner material, liner placement, sealing when required, backfill to existing surface, post rehabilitation TV inspection, traffic control, trench safety for access pits and insertion pits, finish grading, clean-up and all incidental work for a complete project. If post rehabilitation TV inspection shows defects, TV inspection shall be repeated until defect is satisfactorily repaired. Post TV and relevant submittals shall be incidental to the project.

28. Waterline, Open Cut, As Directed by Owner's Representative; Supplemental Bid Item 30:

Measurement shall be "Per Linear Foot" along centerline of pipe without deductions for valves and fittings, from start to line terminus. The unit price shall be full compensation for layout, clearing and grubbing, trenching and incidentals thereto, bank sand bedding, pipe and fitting materials, steel pipe sections (as applicable), pipe placement, thrust blocking, joint restraints, and normal backfill to existing grade, testing, disinfection, connections, trench backfill, maintenance, clean-up, trench dewatering, and all incidental.

29. Deep Connection, As Directed by Owner's Representative; Supplemental Bid Item 31:

Measurement shall be "Per Each". Payment shall be full compensation for removal and replacement of individual house services from the newly reconstructed sewers to the service lead (long or short service). Work includes but is not limited to layout, trenching and incidental thereto, sealing, insert a tee and piping, backfill to existing surface, testing, safety measures, finish grading, clean-up, obstruction removal and all incidental work.

Std. 2/22/96
Revised 10/29/15

ITEM 1533

BARRICADES, SIGNS, AND TRAFFIC HANDLING - NO TCP

I. GENERAL

A. Description

This Item shall consist of providing, installing, moving, replacing, maintaining, cleaning and removing from the site, all barricades, signs, lights, and all other devices for controlling and handling traffic as indicated in the Plans and/or Exhibits or as directed by the Engineer.

B. Related Work (if utilized in this project)

1. Item 2221 - Excavation, Trenching and Backfilling for Utilities

2. Item 2600 - Repair of Asphalt Paving

II. MATERIALS

All barricades, signs, lights and other types of devices used in this work shall conform to details shown in the Plans and/or Exhibits or those indicated in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

III. EXECUTION

For this project, a Traffic Control Plan (TCP) has not been established. Contractor will be required to prepare his own TCP and as necessary in coordination with local TxDOT office.

If Contractor's plan is approved by the Engineer, it may be used. Prior to beginning work, the Contractor shall designate in writing a competent person who will be responsible and available on the project site or in the immediate area to insure compliance with the TCP.

Std. 11/16/87
Revised 10/1/02

ITEM 1541

TRENCH SAFETY SYSTEMS

I. GENERAL

A. Description: The Contractor shall comply with the minimum requirements of this specification. Maintenance and inspection of any shoring and related equipment shall be the responsibility of the Contractor. Owner and/or Engineer reserves the right to require the Contractor to remove, repair and/or replace any portions of the shoring system deemed unsafe but the final responsibility for worker's safety remains with the Contractor.

The Contractor shall determine the safety system needed for the project within the minimum requirements of this specification. For any trench excavation in materials other than solid rock, greater than 5 feet in depth, or where shown on the Plans and/or Exhibits, the Contractor shall provide a trench safety system. The trench safety system shall be in accordance with the appropriate requirements established in the Occupational Safety and Health Administration (OSHA), Safety and Health Regulations, Part 1926, Sub-part P – "Excavations, Trenching and Shoring" (latest edition). The Contractor's responsibility shall be to provide a safe working place for his employees, and he agrees to hold harmless and defend the Owner and/or Engineer against any claim resulting from failure of the trench safety system or lack of one.

B. Definitions

1. Angle of Repose: The greatest angle above the horizontal plane at which a material will lie without sliding.

2. Bank: A mass of soil rising above a digging level.

3. Braces: The horizontal members of the shoring system whose ends bear against the uprights or stringers.

4. Excavation: Any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation. If installed forms or similar structures increase the depth-to-width relationship, an excavation may become a trench.

5. Hard Compact Soil: All earth materials not classified as running or unstable.

6. Kickouts: Accidental release or failure of a shore or brace.

7. Sheet Pile: A pile, or sheeting, that may form one of a continuous interlocking line, or a row of timber, concrete, or steel piles, driven in close contact to provide a tight wall to resist the lateral pressure of water, adjacent earth, or other materials.

8. Sides, Walls, Faces: The vertical or inclined earth surfaces formed as a result of excavation work.

9. Slope: The angle with the horizontal at which a particular earth material will stand indefinitely without movement.

10. Stringers, Wales: The horizontal members of a shoring system whose sides bear against the uprights or earth.

11. Trench: A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15-feet.

12. Trench Jack: Screw or hydraulic type jacks used as cross bracing in a trench shoring system.

13. Trench Shield: A shoring system composed of steel plates and bracing, welded or bolted together, which support the walls or a trench from the ground level to the trench bottom and which can be moved along as work progresses.

14. Unstable Soil: Earth material, other than running, that because of its nature or the influence of related conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

15. Uprights: The vertical members of a shoring system.

II. MATERIALS

A. Materials used for sheeting, sheet piling, cribbing, bracing, shoring, and underpinning shall be in good serviceable condition, and timbers shall be sound, free from large or loose knots, and of proper dimensions as called for in the

OSHA construction standards, Sub-part P, Table P-2. All materials which are found to be defective in any way shall be immediately removed from the job site. It shall be the responsibility of the Contractor to regularly check all trench safety equipment for soundness and adequacy.

B. Steel trench shields shall be constructed of steel plate sides, welded to a steel framework. All shields shall be constructed in order to provide protection equivalent to or greater than sheeting or shoring required for the trench. The Contractor shall provide proof of such before using any trench shield. Adjustable jacks may be used in order to adjust the shield to varying trench widths. An access ladder shall be provided at the midpoint. Pipe or flat steel runners or wheels shall be installed under the side walls for ease of movement of the shield during trenching operations. Substantial lifting eyes and/or rings shall be welded at proper points for moving of the shield. For adaptability to deep and shallow trenches, the shield may be made with top and bottom sections. When the sides of the trench extend above the top of the shield, a reinforced roof with hatches shall be provided. Forced ventilation shall be provided for fully-enclosed shields.

C. All maintenance of the trench safety equipment shall be the sole responsibility of the Contractor.

III. EXECUTION

All Contractors shall provide a trench safety system for all trench excavations which exceed a depth of 5-feet. Trench Safety system shall conform to the Occupational Safety and Health Administration (OSHA) standards latest revision along with the following additions and revisions. The types of trench safety systems currently allowed include shoring, bracing, solid shoring, sloping of the ground, and trench shields. The Contractor may submit an alternative method of trench safety, but may not use such until he has submitted to the Owner written approval by a Registered Professional Engineer. Should the Contractor decide to slope the sides of the trench, he shall have the angle of repose of the soil determined by an approved independent soils testing lab. Soil core samples taken to a depth of at least the depth of the trench shall be taken a minimum of every 700-feet. A minimum of two copies of the results of the lab tests shall be provided to the Engineer. The cost of the tests shall be included in the unit price bid for the trench safety system.

A. Each Contractor shall be responsible and liable for his own Trench Safety System, including self inspections, whether or not a project representative is present on the job site. The Contractor shall install additional safety equipment if requested to do so by the Engineer. The Engineer's decision shall be final. The cost of additional trench safety equipment required shall be the responsibility of the Contractor.

B. Before beginning any excavation the Contractor shall make an inspection of the job site. He shall pay special attention to the type of soil or soils in which he will be working, any adjacent roads, highways, and railroads, and any previous excavations which may affect the integrity of trench excavations. All underground installations shall be located, including utility lines, pipelines, etc., before any excavation begins.

The trench safety system shall be installed in a true horizontal position, be spaced vertically and shall be secured to prevent sliding, falling, or kickouts. The trench safety system shall be effective to the bottom of the excavation. All trenches shall be provided with an adequate means of exit at all times with spacings of 25-feet or less. These means of exit shall be anchored in place in order to aid in the event a quick exit is necessary. During trench excavation, the excavated material shall be placed a minimum of 2-feet away from the edge of the trench.

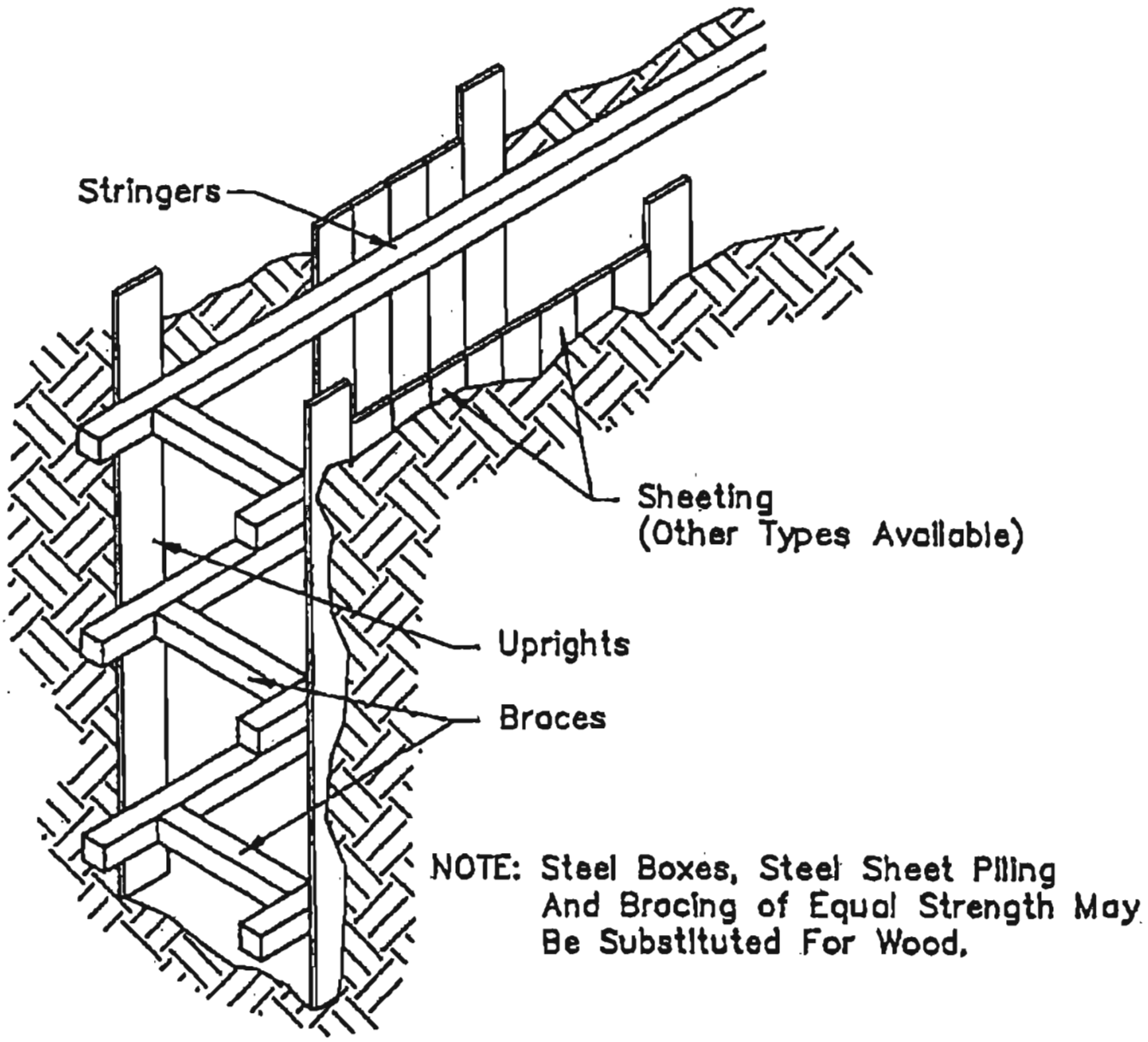
C. The Contractor shall make an inspection of all trench excavations. He shall check for any evidence of cave-ins, slides, etc. If any change in soil conditions or failure of the trench is found, the Contractor shall remedy such. All water shall be diverted by suitable means to prevent the entrance of same into any excavation. No water shall be allowed to accumulate in any excavation and shall be removed as soon as possible.

TABLE P-2

TRENCH SHORING - MINIMUM REQUIREMENTS

Depth of Trench	Kind of Condition of Earth	Size and Spacing of Members										
		Uprights		Stringers		Cross Braces: Width of Trench					Maximum Spacing	
		Minimum Dimension	Maximum Spacing	Minimum Dimension	Maximum Spacing	Up to 3 Feet	3 to 6 Feet	6 to 9 Feet	9 to 12 Feet	12 to 15 Feet	Vertical	Horizontal
Feet		Inches	Feet	Inches	Feet	Inches	Inches	Inches	Inches	Inches	Feet	Feet
5 to 10	Hard, Compact	3x4 or 2x6	6			2x6	4x4	4x6	6x6	6x8	4	6
	Likely-to-Crack	3x4 or 2x6	3	4x6	4	2x6	4x4	4x6	6x6	6x8	4	6
	Soft, Sandy, or Filled	3x4 or 2x6	Close Sheeting	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Hydrostatic Pressure	3x4 or 2x6	Close Sheeting	6x8	4	4x4	4x6	6x6	6x8	8x8	4	6
10 to 15	Hard	3x4 or 2x6	4	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Likely-to-Crack	3x4 or 2x6	2	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Soft, Sandy, or Filled	3x4 or 2x6	Close Sheeting	4x6	4	4x6	6x6	6x8	8x8	8x10	4	6
	Hydrostatic Pressure	3x6	Close Sheeting	8x10	4	4x6	6x6	6x8	8x8	8x10	4	6
15 to 20	All Kinds of Conditions	3x6	Close Sheeting	4x12	4	4x12	6x8	8x8	8x10	10x10	4	6
Over 20	All Kinds of Conditions	3x6	Close Sheeting	6x8	4	4x12	8x8	8x10	10x10	10x12	4	6

Trench jacks may be used in lieu of, or in combination with, cross braces.
Shoring is not required in solid rock, hard shale, or hard slag.
Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.



SHORING DETAIL

N.T.S.

Std. 9/3/96
Revised 10/1/02

ITEM 1584

PROJECT IDENTIFICATION SIGNS

I. GENERAL

A. Scope: This Item governs furnishing, installing and maintaining a project sign or signs as described below:

B. Design Requirements

1. Design sign and structure to remain in place and withstand 60 miles-per-hour wind velocity.

2. Sign Manufacturer/Maker/Painter: Experienced as a professional sign company.

3. Finishes, Painting: Adequate to withstand weathering, fading and chipping for duration of construction.

4. Appearance: Project signs shall present a fresh, new and neat look. All project signs shall be new or refurbished so as to look new.

C. Number and Location

1. Linear Projects: A linear project is one involving paving, overlay, sewer lines, storm drainage or water mains that run in the right-of-way over a distance. A linear project requires project signs at each end of the construction.

2. Single Site or Building Projects: Provide one project sign.

3. Multiple Sites: Provide one sign at each site at a location designated by the Engineer.

D. Unit Prices

1. Unless indicated in the Bid Form, no separate payment will be made for design, fabrication, installation and maintenance of project identification signs under this Item. Include cost of work performed under this Item in pay item of which this work is a component.

2. If changes to project identification signs are requested by the Engineer to keep them current, payment will be made on a cost plus overhead and profit through a change order.

II. MATERIALS

A. Sign Materials

1. Structure and Framing: Use new 4-inch by 4-inch wood posts to reach 8-feet above existing grade. Paint structural members white on all sides and edges to resist weathering. Set posts approximately 4-feet apart.

2. Sign: For sign use 4-foot by 8-foot marine plywood, minimum ¾-inch thick. Use full size sheets for sign to minimize joints; do not piece wood to fabricate a sign face. Paint sign material white, two (2) coats, on all sides and edges to resist weathering.

3. Paint and Primers: White paint used to prime surfaces and to resist weathering shall be an industrial grade, fast drying, oil-based paint with gloss finish. Paint all signs surfaces with two (2) coats of this weather-protective paint prior to adding any lettering.

4. Sign Border: Add 2½-inch wide black border along the four edges of the project sign. For border use 3M Scotchcal Engineer Grade, Pressure Sensitive Sheeting (Black) or approved equal.

5. Sign Lettering: Make lettering and symbols from 3M Scotchcal Pressure Sensitive Films or approved equal, or at Contractor's option, signs may be painted using approved paints. Whether film or paint is used, match color to 3M Scotchcal Pressure Sensitive Film, Black.

6. Rough Hardware: Galvanized steel or brass for fasteners and other hardware.

B. Sign Components

1. Sign

   a. The 4-foot by 8-foot component of the sign has fields of information as indicated on the Exhibits.

   b. Exhibit No. 1 will identify the name of the project. The Engineer will provide the project title and personnel names to the Contractor for preparation of the sign.

2. Sign Support Structure

a. Sign Posts: 4-inch by 4-inch sign posts, 8-feet long for skid mounting and 11-feet long minimum for post hole mounting to set top of posts at 8-feet above existing grade.

b. Skid Members: 2-inch by 6-inch framing material.

3. Fasteners

a. ½-inch by 5½-inch button heads carriage bolts for posts with nuts and flat head washers. Cover button heads with white reflective film or paint to match sign background.

III. EXECUTION

A. Installation

1. Install project identification sign within fourteen (14) calendar days after date of Notice to Proceed.

2. Erect at location designated by the Engineer or where shown on the Plans and/or Exhibits. In either case, position the sign in such a manner as to be fully visible and readable to the general public.

3. Erect sign level and plumb.

4. If post hole mounted, sink posts at least 3-feet below grade. Stabilize posts to minimize lateral motion. Leave minimum of 9-feet of post above existing grade for mounting of the sign.

5. Erect sign so that the top edge of the sign is at a nominal 8-feet above existing grade.

6. Skid mounted signs shall be allowed only when approved by the Engineer. Approval of the use of skid-mounted signs shall not release the Contractor from responsibility of maintaining a project sign on the project site and shall not make Owner responsible for the security of such signs.

B. Maintenance and Removal

1. Maintain signs and supports clean. Repair deterioration and damage.

2. Remove signs, framing, supports and foundations at completion of project

and restore the area.

IV. QUALITY ASSURANCE

A. Shop Drawings

1. Submit Shop Drawings prior to construction and installation of sign(s). Submit sufficient copies (three (3) copies will not be returned) to allow proper approval and fabrication.

2. Submittal will show content, layout, lettering style, lettering size and colors.

Std. 4/22/13
Revised 8/20/15

ITEM 1666

CLEANING AND TELEVISION INSPECTION OF GRAVITY SANITARY SEWER LINES

I. GENERAL

A. Scope

Extent of Work: The work covered by these specifications consists of furnishing all materials, labor, supervision, equipment, and performing all work necessary for the cleaning, and closed circuit televising of the gravity sanitary sewer lines and manholes as shown on Exhibit/Plans. Television inspection shall be performed on all lines. Television inspection shall not be performed for a minimum of three days after a rain.

1. Isolation of infiltration shall be accomplished between two adjacent manholes.

2. The cleaning shall be accomplished by hydraulically propelled cleaning equipment as specified.

3. The term "clean" as used in these specifications shall mean the removal of all sand, grease and all other solids or semi-solid material from the designated sewer lines.

4. The term "manhole section" as used in these specifications shall mean the length of pipe connecting two manholes.

5. Contractor to begin project at upstream manhole.

B. Related Work (if utilized in this project)

1. Item 2621 - Point Repairs - Sanitary Sewers

2. Item 2626 - Reconstruction of Sewers by Polyethylene Sliplining

C. Owner and Contractor Obligations

1. The Owner shall furnish at no cost to the Contractor, the following items during the entire project:

   a. Site Access

      Access to the site of work with sufficient area for the placement of the equipment and personnel. All work will be within easements and street rights-of-ways.

   b. Manhole Locations

      It shall be the Contractor's responsibility to locate and uncover all manholes under pavement or below grade. Contractor is responsible for barricading manholes during construction phase of the project. The Contractor will assume responsibility of adjusting or covering manholes after project is completed.

   c. Cleaning Water

      Owner will provide water for cleaning operation. This spec item precludes section Supplementary Conditions, Page 5, Paragraph 19.

2. Contractor shall furnish following services and incidental items, unless otherwise noted to the cleaning and televising:

   a. Waste Disposal Site

      Contractor shall contract with an approved sanitary landfill for the disposal for all material removed from the existing sanitary sewer.

   b. Hauling Material for Disposal

      Contractor will include in his price whatever is involved in transporting material to an approved sanitary landfill site.

   c. Bypass Pumping

      Contractor to provide any and all necessary bypass pumping. Pumping is incidental to the project.

   d. Traffic Handling and Control

Appurtenances including all barricades, signs, lights and other types of devices. All traffic handling and control shall conform to the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

II. MATERIALS

A. Hydraulic Cleaning Equipment

The equipment used may be of a movable dam type and be constructed in such a way that a portion of the dam be collapsed at any time during the cleaning operation to protect against flooding of the sewer. Sewer cleaning balls or other such equipment may be considered as acceptable cleaning equipment. The movable dam shall be of equal diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to insure total removal of greases. If a manhole section is found to be completely stopped up or plugged or heavily intruded with roots, then a self-propelling root cutter shall be used.

B. High Velocity Hydro-Cleaning Equipment

1. All high velocity sewer cleaning equipment shall be truck mounted for ease of operation. The equipment shall have minimum of 500-feet of 1-inch I.D. high pressure hose with a selection of two or more high velocity nozzles. The nozzles shall have a capacity of 60 gpm at a working pressure of 950 to 1,000 psi. The nozzles shall be capable of producing a scouring action from 15° to 45° in all size lines designated to be cleaned. Equipment shall also include a high velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing a long distance solid stream.

2. The equipment shall carry its own 1,000 gallon water tank capable of holding corrosive or caustic cleaning or sanitizing chemicals if required by the Engineer, auxiliary engines and pumps, and hydraulic driven hose reel. All controls shall be located so that the equipment can be operated above ground.

III. EXECUTION

A. Gravity Sanitary Sewer Cleaning

1. The designated sanitary sewer manhole sections and manholes may be cleaned using hydraulically propelled or high velocity sewer cleaning

equipment. Selections of the equipment shall be based on the conditions of the lines at the time the work commences.

2. Satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force or any tools which retard the flow of water in the sewer lines are used, precautions shall be taken to insure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section involved. The flow of sewage in the sewer lines shall be utilized whenever possible. When additional quantities of water from fire hydrants are necessary to avoid delay in normal working procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant.

3. All sludge, dirt, sand, rocks, grease and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section which could cause line stoppages, accumulations of sand in wet wells or damage pumping equipment shall not be permitted. When hydraulic cleaning equipment is used, a suitable sand trap, weir or dam shall be constructed in the downstream manhole in such a manner that the solids shall be trapped.

4. **UNDER NO CIRCUMSTANCES SHALL SEWAGE OR SOLIDS REMOVED THEREFROM BE DUMPED ONTO STREETS OR INTO DITCHES, CATCH BASINS OR STORM DRAINS.**

5. All solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed of at no additional cost to the owner.

B. Closed-Circuit Television Equipment and Procedure

1. A mobile trailer or van shall be provided which is large enough to accommodate representatives of Engineer and Contractor for purpose of viewing monitor while inspection is in progress. Trailer or van to be equipped with a self-contained closed circuit television camera, monitor, video tape recorder, Polaroid camera, film, winches (power and mechanical), cable, and cable reel, suitable metering device so that exact location of camera within the line being televised can be noted at all times, and all necessary equipment for successful completion of television inspection.

2. Television equipment shall consist of a self-contained camera and a monitoring unit connected by a coaxial cable. Camera shall be small enough to insure passage through a six-inch diameter sewer, shall be waterproof and shall have a self-continuous, clear picture showing the entire inside periphery of the pipe.

3. The television inspection shall be performed on one manhole section at a time. Each manhole section being inspected shall be isolated from the remainder of the line by the use of a line plug to insure total viewing of the inside periphery of the pipe. The inspection shall be performed by pulling the television camera through the line along the axis of the pipe. The inspection shall be performed in a forward and/or backward direction, according to line conditions at the time the inspection is made.

4. During the television inspection operation an inspection record shall be kept which will show clearly the exact location, in relation to the center line of the adjacent manhole, of each point of infiltration discovered by the television. To insure accurate measurement, the measurement shall be made from an object a fixed distance in front of the television camera; being positioned at the exact location of the leak or pipe failure. The measurement reading shall be made at ground level by means of a meter device. Marking on a cable or the like which would require the observer to be in the manhole or which would require interpolation for the depth of the manhole will not be used.

5. During the television inspection operation the Engineer reserves the right to request pictures of the television monitor. Such pictures shall be taken with a Polaroid oscilloscope film camera, a Bezel assemble and latching device. The oscilloscope camera shall have been modified to take pictures from the television monitor screen.

F. Records

1. As each manhole section is examined, a record shall be kept showing the location of the manhole section being examined, the type of test being performed, the results of the test and general notes as to any other pertinent information discovered. Furnish two (2) complete sets of records for all testing.

2. A record shall be kept of the locations of openings in the sewer using the distance from the nearest manhole so that the opening can be located at a later date.

3. In addition, an indication as to the severity of the opening shall be noted utilizing light, medium or heavy designation, a record of the house address along with the type of failure associated, including a colored photograph along with an indication of the severity of opening, utilizing light, medium or heavy designation shall be made. A colored 3" x 4" photograph shall be made which shall show clearly the location of the opening.

4. Records shall be kept of all cleaning performed. These records shall be a printed form showing the names of the Owner, date, manholes section cleaned, manhole section location, line size, length of the section, type of cleaning performed, and any special remarks concerning the condition of the line.

5. A television and work report, in log form, shall be maintained during the television inspection. This log shall show the exact location of each leak discovered by the television. The reference location shall include the distance away from the reference manhole and also the position of the leak as referenced to the axis of the pipe. The log shall record the location of service connections, together with a statement of opinion as to whether or not the service connection is leaking. It shall also contain notations on crushed or broken pipe and any irregularities of pipe alignment or grade. Copies of such records shall be furnished to the Engineer.

6. In addition to the logs and other records specified herein before, the Contractor shall furnish a complete video-DVD record of all lines televised. All video- DVD's shall have a continuous audio recording that reflects footage during the televising operations. At the completion of each recording, the video- DVD becomes the property of the Owner. All cost incurred in connection with the video-DVD operation to be included in the unit price bid for televising. All video shall use the DVD format.

Std. 3/12/14

ITEM 1668

BYPASS PUMPING

I. GENERAL

A. The work covered by this section consists of furnishing all labor, supervision, plant, equipment, appliances and materials to perform all operations in connection with bypass pumping of sewage flow. The Contractor will be required to provide adequate pumping equipment and force main in order to maintain continuous sewage flow. Under no circumstances shall said flow be interrupted or stopped. The location of the pump(s), force main, discharge point, etc., shall be approved by the Owner. Bypass pumping is incidental to the work.

B. Related Work (if utilized in this project)

1. Item 1666 - Cleaning and Television Inspection of Gravity Sanitary Sewer Lines

2. Item 1671 - Obstruction Removal

3. Item 2604 - Manhole Reconstruction

4. Item 2621 - Point Repairs - Sanitary Sewers

5. Item 2626 - Reconstruction of Sewers by Polyethylene Sliplining

II. EXECUTION

A. Methods

1. It shall be the responsibility of the Contractor to make provisions to meet all requirements of these Specifications and to correct any problems which may arise as a result of bypass pumping operations.

2. The primary purpose of bypass pumping is to provide reliable sewer service to the residents in the construction area. The secondary purpose of bypass pumping is to facilitate the rehabilitation or construction of the manhole within and upstream of the construction area and to prevent the overflow of sewage into the area waterway. Accordingly, if the Owner is operating and/or maintaining any bypass pumping in the construction area,

the Owner shall remove its pump(s) and force main(s) and the Contractor shall provide the pump(s) and force main(s) necessary to accomplish the two (2) purposes stated above. This shall be done within 24 hours after the Contractor begins work. The Contractor shall be responsible for any and all pumping being done at any and all locations within the project area throughout the length of the project. The project area shall be defined as the area described by a work order. In those instances where the Owner has bypass pumping in operation at only a few of the locations within the project area, the Contractor will be responsible for that bypass pumping even if he elects to begin his construction/rehabilitation activities at a location where there is no bypass pumping in operation. The Contractor shall be responsible for bypass pumping operations 24 hours per day, 7 days per week throughout the length of the project. Any bypass pumping which the Owner deems necessary at any time during the length of the project, at any location where bypass pumping is in operation within the area shall be covered by the work order by the Owner prior to the date of work order issue. The Owner shall also provide an estimate of the present flow in the line as well as an estimate of the size of the pump(s) and force main(s) needed. However, ultimate responsibility is upon the Contractor to ensure his pump(s) and/or force main(s) are adequate to handle the flow at any given time during the project. The Contractor may cease bypass pumping operations only with the approval of the Owner.

3. During bypass pumping, no sewage shall be leaked, dumped, or spilled in/on any area outside of the existing sanitary sewer system of the Owner. In the event sewage is spilled on public or private property, or any damage done to trees, shrubs, or other valuable vegetation, or to the sewer system as a result of the bypass operation, the Contractor shall restore the damaged items to their original condition, or better, at no extra cost to the Owner.

Std. 3/12/2014

ITEM 1671

OBSTRUCTION REMOVAL

I. GENERAL

A. Scope

The purpose of an obstruction removal is to clear the sewer main from obstructions so as to allow for rehabilitation by any method. Obstruction shall be removed by one of the following methods and will be paid as per bid item:

1. Small Obstruction removal.

2. Obstruction removal by excavation.

B. Related Work (if utilized in this project)

1. Item 1541 - Trench Safety Systems

2. Item 1666 - Cleaning and Television Inspection of Gravity Sanitary Sewer Lines

3. Item 1668 - Bypass Pumping

4. Item 2628 - Service Reconnections

II. EXECUTION

A. Small Obstruction Removal. This method of obstruction removal shall be performed prior to rehabilitation. During television inspection, if obstructions are encountered the Contractor shall ask the Engineer for approval for small obstruction removal. The small obstruction removal shall consist of solid steel mandrel, or porcupines winched from one manhole to another manhole. They shall be sized to remove the obstructions, to the satisfaction of the Engineer. Contractor may use bucket machine to break obstruction by this method without damaging sanitary sewer pipe.

B. Obstruction Removal by Excavation: This method of obstruction removal shall be performed while installing the liner in the sanitary sewer. During the liner

inspection operation, a collapsed sewer, off-set joint, or other obstruction is encountered which prevents or blocks the passage or insertion of any liner involved in the rehabilitation process, the Contractor shall notify the Engineer for approval to make an excavation to uncover and remove the obstruction in the following manner:

1. Excavate at the point where there is an obstruction. A trench safety system shall be required for all excavations over five (5) feet deep.

2. Break out the existing sanitary sewer pipe (carrier pipe), etc., as directed by the Owner. Remove only that amount of material which is causing the obstruction. The amount of "carrier pipe" to be removed shall be minimized.

3. When the liner is completely in place, it shall be encased with cement stabilized sand as per Class "AA" modified bedding.

Under such conditions, replacement of the carrier pipe is not required. The existing sewer bedding should not be disturbed by the excavation work. However, if said bedding is disturbed during the obstruction removal procedure, the Contractor shall place cement stabilized sand beneath the liner; the minimum compacted thickness shall be 12-inches.

Std. 1/22/96
Revised 10/1/02

ITEM 2102

CLEARING AND GRUBBING

I. GENERAL

A. Scope: Clearing and grubbing consists of removal and disposal of trees, stumps, brush, roots, vegetation, logs, rubbish, and other objectionable matter along the construction route within utility easements, access road easements right-of-way, and where designation within the boundaries of the plant site.

B. Measurement and Payment

1. No Separate Payment. Include cost of work in contract bid prices.

2. The Contractor shall not remove trees 6-inches in diameter or larger, unless said tree has been marked for removal.

C. Notification to Engineer: The Contractor will notify the Engineer at least three days before any clearing is begun so that all trees to be removed can be marked.

D. Related Work (if utilized in this project)

1. Item 2227 - Waste Material Disposal

II. MATERIALS

The Contractor shall use equipment and materials necessary to properly complete clearing and grubbing.

III. EXECUTION

A. Clearing: Remove all stumps, brush, vegetation, logs, rubbish, and other objectionable matter from designated areas. Trees to be saved shall be marked prior to execution of this Item.

B. Grubbing: Remove stumps and roots within pavement and foundation sections to depth of 2-feet below finish subgrade elevation. For areas outside pavement and foundation sections, remove stumps and roots to depth of 2 feet below finished surface of required cross sections.

C. Preservation: Protect trees unless designated for removal and those on adjacent property.

D. Removing Material: Unless otherwise specified, cleared and grubbed material becomes property of the Contractor, to be removed from the work site or disposed of in manner not to damage the Owner. Burning of cleared and grubbed material is not permitted.

Std. 2/26/96
Revised 8/20/15

ITEM 2107

TURF ESTABLISHMENT

I. GENERAL

This Item specifies requirements for preparation of the seedbed and planting of turfgrass.

II. MATERIALS

A. Seedbed (Top Soil): Topsoil may be from on-site or imported. All topsoil shall be easily cultivated, relatively free from objectionable material including, gravel, large roots, stumps, wood, brush, debris, hard clods, clay balls, hardpan, refuse or other deleterious materials, and be of reasonably uniform quality.

1. In the case of on-site or nearby source, topsoil is the surface layer of material containing decaying vegetable matter and roots. It is not necessary to strip all soil containing fine hair like roots, only soil containing moderate to heavy root mat.

2. Imported topsoil shall satisfy the following property values:

	TEST PROPERTY	TEST METHOD	UNIT	VALUE	
a.	Soil Reaction	ASTM D4972	pH	6-8	(a)
b.	Passing No. 4 Sieve	ASTM D422	%	95-100	(b)
c.	Sand Size, 2.0-0.05 mm	ASTM D422	%	10-70	(b)
d.	Silt Size, 0.05-0.005 mm	ASTM D422	%	0-40	(b)
e.	Clay Size, <0.005 mm	ASTM D422	%	20-50	(b)
f.	Easily Oxidizable Organic Matter	AASHTO T194	%	2.5-10	(b&c)

NOTES:

a) Determine pH by Method A, pH meter. In the event that the imported topsoil does not satisfy the specified pH range, Contractor shall achieve the desired pH by applying soil amendments as recommended by the certified agronomist's report of soil sample analysis.

b) Dry weight of sample.

c) Soil testing company shall identify test method used if different than listed.

d) Soil tests will be paid for by Owner.

B. Seed: Seed shall be applied in accordance with the following:

SEED PLAN	PLANTING DATES	PLANT SPECIES	PLS RATE (pounds/acre)
1	October 1	*"KY-31" Tall Fescue	15
	to	Hulled Common Bermuda grass	50
	March 31	*"Gulf" Annual Ryegrass	15
		Crimson Clover & Inoculant	20
2	April 1	*Foxtail Millet	15
	to	Hulled Common Bermuda grass	60
	Sept. 30		
3	April 1	*Foxtail Millet	15
	to	Hulled Common Bermuda grass	60
	Sept. 30	"Pensacola" Bahia grass	15
4	As directed	Hulled Common Bermuda grass	50
5	As directed	Crimson Clover & Inoculant	20

* - Indicates **MAXIMUM APPLICATION RATE ALLOWED**.

NOTES:

a) All planting dates are approximate. Engineer shall determine Seed Plan prior to the start of seeding.

b) Seed Plan 1 shall be used when the average maximum daylight air temperature for the preceding two calendar weeks is less than 75 degrees F.

c) Seeding rate is for "Pure Live Seed (PLS)." Percentage of purity, germination, and dormant seeds, as shown on the seed tag, shall be used to determine actual application rate of bulk material to obtain required amount of PLS per acre.

Pure Live Seed (PLS) = (% Germination + % Dormant seed) x % Purity.

d) Seed Plans 4 and 5 shall be used **only** as directed by the Engineer.

C. Sod

1. Sod shall consist of live, growing Bermudagrass or "Raleigh" St. Augustine grass, as required by the Engineer.

2. Sod shall be dark green and have a healthy vigorous system of dense, thickly matted roots throughout the soil of the sod for a minimum depth of 1-inch (± ¼ inch), excluding top growth and thatch.

3. Sod shall contain no more than 5% noxious weeds and other crop and weed contaminants. Sod shall be free of diseases and harmful insects.

4. Sod shall be cut in uniform panels. Broken panels or panels with torn or uneven ends will not be accepted.

5. Sod panels shall be strong enough to support their own weight and retain size and shape when suspended vertically from a firm grasp on the upper 10% of the panel.

6. Sod shall be harvested, delivered, and installed within a 36 hour period. Sod not planted within this time period shall be inspected and approved by the Engineer prior to installation.

7. Sod which has been allowed to dry out by exposure to the sun and air is unacceptable and shall be rejected.

D. Fertilizer

1. Fertilizer shall be a commercial type conforming to the fertilizer laws in effect as regulated by the Texas Department of Agriculture. A pelleted or granulated fertilizer shall be used which has the specified analysis. The guaranteed analysis represents the percent nitrogen (total N), percent water insoluble nitrogen (where applicable), percent phosphate (citrate soluble P as P_2O_5), and percent potash (water soluble K and K_2O) nutrients as determined by the methods of the Association of Official Analytical Chemists.

2. Contractor shall use a complete fertilizer with an analysis ratio of 3:1:2 (N:P:K), such as 15:5:10, or as directed by the Engineer.

3. Fertilizer shall be applied at a rate of 60 pounds N/acre, which is 400 pounds/acre of 15:5:10.

4. Fertilizer shall be delivered in bags or containers clearly labeled with name and address of the manufacturer, weight, and guaranteed analysis.

Bulk fertilizer shall be acceptable if accompanied by an invoice or label with the name and address of the manufacturer and guaranteed analysis and appropriate means to accurately measure and record weight of fertilizer used.

5. Fertilizer shall be in clean, unopened, and undamaged bags.

6. Fertilizer shall not contain objectionable material which may hinder proper distribution.

7. Fertilizer shall be dry and free-flowing. Caked fertilizer will be rejected.

III. EXECUTION

A. General

1. Turf establishment shall be performed as soon as practical after construction activities, but not later than 21 calendar days. Long term exposure of bare earth will not be permitted. Engineer may stop work on portions, or all, of the project until exposed areas receive the designated turf establishment.

2. Work shall not be performed on areas that are so wet that equipment operation causes tracking and compaction of the ground, or when the soil is in a non-tillable condition.

B. Seedbed

1. Seedbed Installation, Imported

   a. Imported Topsoil: Engineer may direct the Contractor to import topsoil if on-site seedbed is of insufficient quantity or quality.

   b. Topsoil Delivery, Storage and Handling: Topsoil shall be delivered, stockpiled and handled in such a way as to not contaminate the material with other soils or objectionable materials.

   c. Topsoil Excavation (On-Site): Contractor shall strip topsoil specified on the Plans and/or Exhibits or as directed by the Engineer from areas to be excavated or filled and stockpile it for use on the final designated area.

d. Topsoil Placement

1) Prior to placing topsoil, scarify the subgrade to a minimum depth of 4-inches until it is loose and uncompacted to provide bonding of topsoil layer to subgrade.

2) Top elevation of topsoil shall be placed at the design finish grade elevation shown on the Plans and/or Exhibits.

3) Topsoil shall not be spread when excessively wet or dry.

e. Disposal: Contractor shall dispose of excess topsoil only after approval by the Engineer and in accordance with Item 2227 - Waste Material Disposal.

2. Seedbed Preparation, On Site

a. Seedbed is defined as the soil designated to support turf grass and/or sod, approximately 6-inches in depth below the design surface.

b. Irregularities in finished seedbed surfaces shall be corrected to eliminate depressions.

c. Disc, harrow, rake and grade the seedbed until it is free of clods and roots.

d. Roots and woody plants over 1-inch diameter shall be removed.

e. Final surface shall be left in a roughened condition. Imprints from the equipment shall be left horizontally on the slope.

f. Surface crusting of the seedbed after rainfall or compaction, but prior to turf establishment, shall be broken up by disking, harrowing, or raking.

g. For areas receiving sod, grade the seedbed adjacent to existing turf, pavement, etc., to permit sod to be flush with adjacent surfaces.

h. Prepared seedbeds shall be protected from damage by pedestrian or vehicular traffic.

i. Prepared seedbeds shall be inspected and accepted by the Engineer prior to turf establishment.

C. Seeding Methods: Method of planting shall be as noted on the Bid Sheets or Plans and/or Exhibits, or as directed by the Engineer.

1. Dry Application

a. Fertilizer shall be spread evenly and uniformly and incorporated (disked, raked, or harrowed) into the seedbed prior to seeding.

b. Seeding

1) Plant seed with a broadcast seeder or a culti-packer seeder. Grass seed shall be planted no deeper than ¼-inch, and the distance between rows shall be 12-inches or less. Distribute seed uniformly.

2) Roll the planted seedbed with a culti-packer or rake immediately after seeding and prior to applying mulch cover.

3) Seed may be broadcast by hand for small areas or areas inaccessible to seeding equipment, as approved by the Engineer. Areas seeded by hand shall be rolled or lightly compacted, if possible.

c. Mulching

1) Immediately after application of seed, straw or hay mulch shall be applied to all seeded areas with a slope steeper than 6H:1V (Horizontal:Vertical).

2) Straw or hay mulch shall be applied at a rate of 2,500 pounds (dry weight) per acre.

3) The straw or hay mulch must be secured with hydromulch or other approved methods.

a) Hydromulch, consisting of an homogeneous aqueous mixture of recycled paper fiber, water, and tackifier, shall be applied to achieve a rate of 1,000 pounds of paper fiber mulch per acre over the straw mulch. Guar gum tackifier shall be applied at a minimum rate of 50 pounds (dry weight) per acre.

b) Application rate for other tackifier/soil binder compounds shall be in accordance with

manufacturer recommendations and approved by the Engineer.

d. Watering: After mulching, water the seedbed until the surface is uniformly moist to an approximate depth of ½-inch. Excessive watering pressure or quantity which would cause washing of mulch and seed, erosion, or rilling shall not be allowed.

2. Hydroseeding With Mulch

a. Hydroseeding with mulch is the application of an homogeneous aqueous mixture of seed, water, fertilizer, dye, wood fiber mulch, and tackifier/soil binder to the seedbed.

b. Fertilizer shall be added to the aqueous mixture no more than 30 minutes prior to application to prevent damage to the seed. Fertilizer shall be completely water soluble.

c. Guar gum tackifier shall be applied at a minimum rate of 50 pounds (dry weight) per acre.

d. Wood fiber mulch shall be applied at a rate of 2,000 pounds (dry weight) per acre.

e. Application rate for other tackifier/soil binder compounds shall be in accordance with manufacturer's recommendations and approved by the Engineer.

3. Overseeding

a. Overseeding is the application of an homogeneous aqueous mixture containing water, seed (per Seed Plan 4 or 5), and fertilizer to an area with existing vegetation.

b. At the direction of the Engineer, site shall be mowed prior to overseeding.

c. Soil surface shall be lightly disked no more than 1-inch deep.

d. Fertilizer shall be added to the aqueous mixture no more than 30 minutes prior to application to prevent damage to the seed. Fertilizer shall be completely water soluble.

e. Area shall be rolled with a culti-packer, or lightly harrowed or raked to cover seed with a ¼-inch of soil.

D. Sodding

1. Sod shall be placed in areas as shown on the Plans and/or Exhibits or as directed by the Engineer.

2. Fertilizer shall be spread evenly and uniformly and incorporated (disked, raked, or harrowed) into the seedbed prior to placing sod.

3. Prepared seedbed shall be lightly watered immediately prior to placing sod, as required.

4. Sod panels shall be placed tightly against each other in rows.

5. Lateral joints shall be staggered. Care shall be exercised to ensure the sod is not stretched or overlapped and that all joints are butted tightly with no spaces between strips.

6. Tamp or roll the sod to ensure good contact with the seedbed.

7. Lightly water sod during installation to prevent excessive moisture loss.

8. Immediately after installation of sod, remove extraneous clumps of sod or soil on sod, rake and wash off plant remnants on sod or adjacent pavements.

IV. QUALITY ASSURANCE

A. Engineer shall accept turf establishment when specified area is complete with an established growth on soil stabilized turf.

B. Contractor shall be responsible for repairing areas damaged until the turf establishment is accepted by the Engineer. Repairs include, but not limited to, damage due to erosion, rilling, traffic, or other causes.

C. Contractor shall replace all dead or dying sod panels.

Std. 1/16/89
Revised 11/02/15

ITEM 2221

EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES

I. GENERAL

A. Scope: This specification covers excavation and trenching work and shall include the necessary pavement removal and preparation of the site, removal and disposal of all debris, excavation, and trenching as required, handling, storage transportation, and disposal of all excavated material, all necessary sheeting, shoring, and protection work, preparation of sub-grades, pumping and dewatering as necessary or required, protection of adjacent property, backfilling, pipe embedment, pipe abandonment, backfill, maintenance, and other appurtenant work for the installation of underground utilities.

B. Related Work (if utilized in this project)

1. Item 2555 – Water Piping

2. Item 2560 – Sanitary Sewers

3. Item 2600 – Repair of Asphalt Paving

4. Item 15061 – Steel Piping and Fittings

5. Item 15062 – Ductile Iron Pipe and Fittings

6. Item 15064 – Plastic Piping and Fittings (4-Inches or Smaller)

C. Existing Utilities: The Plans and/or Exhibits show the approximate location of all known underground utilities, foreign pipe lines and structures. No guarantee is made that all such obstructions have been found and located, unknown lines may be encountered. The trench shall be excavated well ahead of the pipe laying operations to expose underground utilities, foreign pipe lines and structures. The Contractor shall employ skilled operators and proceed with caution at all times. Upon encountering such an obstruction the Contractor shall immediately notify the Engineer and the Owner. If the encounter results in damage of the nature that may endanger the public, he shall take such emergency measures as appropriate to notify the affected public, and to mitigate the danger. If the obstruction conflicts with the proposed work, he shall stop work until directions are given by the Engineer. Avoid damage to utilities and foreign pipe lines throughout all operations.

D. Pavement Protection: All tracked construction equipment shall have tracks fitted with suitable pads to minimize damage to pavement. Those not so fitted may be driven across pavement surfaces only when suitable planking or mats are interposed between track and pavement, or when pavement is protected by suitable layer of earth. All construction operations shall be conducted so to minimize damage to pavement other than that scheduled for removal. All such damage shall be repaired by the Contractor restoring damaged areas to as near original condition as practical.

E. Blasting will not be permitted without specific written approval from the Engineer.

II. MATERIALS

A. Earth Backfill (EF): Where no other backfill is specified, use suitable soils from the excavation as backfill material. Bedding and backfill material shall be free of roots, trash, mud balls and conform to the following limits for deleterious materials:

1. Clay Lumps: Less than 0.5 percent when tested in accordance with ASTM C142.

2. Lightweight Pieces: Less than 5 percent when tested in accordance with ASTM C123.

3. Organic Impurities: No color darker than standard color when tested in accordance with ASTM C40.

B. Sand Backfill (BS): Where sand backfill is required, Contractor may select, unless specified on Plans and/or Exhibits, sand backfill depending upon availability from the following:

1. Bank Run Sand: Durable bank run sand classified as SP, SW, or SM by the Unified Soil Classification System (ASTM D2487) meeting the following requirements:

a. Less than 15 percent passing the number 200 sieve when tested in accordance with ASTM C136.

b. Material passing the number 40 sieve shall meet the following requirements when tested in accordance with ASTM D4318:

1) Liquid limit not exceeding 25.

2) Plasticity index not exceeding 7.

2. Concrete Sand: Natural sand, manufactured sand, or a combination of natural and manufactured sand conforming to the requirements of ASTM C33 and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
3/8 inch	100
No. 4	95 to 100
No. 8	80 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10

3. Gem Sand: Sand conforming to the requirements of ASTM C33 for course aggregates specified for number 8 size and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
3/8 inch	95 to 100
¼ inch	60 to 80
No. 4	15 to 40
No. 10	0 to 5

C. Select Fill (ES): Select fill shall be lean clay to sandy, lean clay soil with a maximum liquid limit of 35 and a PI range of 8 to 20 and minimum of 60 percent passing the No. 200 sieve. Select fill may consist of lime stabilized soils excavated on site. Lime stabilization of 8-inch loose lifts should be performed by blending 25 pounds of hydrated lime per square yard into each 8-inch loose lift of fill soils.

D. Aggregate Bedding (AB): Where aggregate bedding is required, Contractor may select, unless specified on Plans and/or Exhibits, aggregate bedding for trench stabilization or backfill depending on availability from the following:

1. Pea Gravel: Durable particles composed of small, smooth, rounded stones or pebbles and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
½ inch	100
3/8 inch	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

2. Crushed Aggregates: All crushed aggregates consist of durable particles obtained from an approved source and meeting the following requirements:

   a. All materials of one product delivered for the same construction activity from a single source.

   b. Non-plastic fines

   c. Los Angeles abrasion test wear not exceeding 40 percent when tested in accordance with ASTM C131.

   d. Gradations, as determined in accordance with Tex-110-E.

Sieve	Percent Passing by Weight for Pipe Embedment By Ranges of Nominal Pipe Sizes		
	>15"	15" - 8"	<8"
1"	95 - 100	100	-
¾"	60 - 90	90 - 100	100
½"	25 - 60	-	90 - 100
3/8"	-	20 - 55	40 - 70
No. 4	0 - 5	0 - 10	0 - 15
No. 8	-	0 - 5	0 - 5

e. Crushed Stone: Produced from oversize quarried aggregate, sized by crushing from a naturally occurring single source. Crushed gravel or uncrushed gravel are not acceptable material for utility embedment.

f. Crushed Concrete: Crushed concrete is an acceptable substitute for crushed stone as utility backfill. Gradation and quality control test requirements are the same as crushed stone. Provide crushed concrete produced from normal weight concrete of uniform quality; containing particles of aggregate and cement material, free from other substances such as asphalt, base course material, reinforcing steel fragments, soil, debris, or deteriorated concrete fragments.

E. Cement Stabilized Backfill

1. Cement stabilized sand shall be used for backfill and bedding as called for on the Plans and/or Exhibits or as directed by the Engineer.

2. Cement shall consist of Type I portland cement conforming to ASTM C150.

3. Sand shall be clean, durable sand containing not more than the following:

   a. Deleterious Materials

      1) Clay lumps, ASTM C142; less than 0.5 percent

      2) Lightweight pieces, ASTM C123; less than 5.0 percent

      3) Organic impurities, ASTM C40; shall not show a color darker than the standard color.

   b. Plasticity index shall be six (6) or less when tested in accordance with ASTM D4318.

4. Water shall be potable, free of oils, acids, alkalis, organic matter or other deleterious substances.

5. Sand-cement mixture product shall consist of the proper percentage of cement per cubic yard or per ton of sand with sufficient water to hydrate the cement.

6. Mix in a pug mill using not less than 2 sacks of cement per ton of mixture with sufficient water to hydrate the cement.

III. EXECUTION

A. Preparation

1. Any clearing and grubbing required shall have been performed pursuant to the appropriate Item.

2. Where concrete or asphalt pavement is to be cut; true saw cuts defining the area to be removed shall have been made (a parallel pavement joint may be used as one boundary), and the pavement broken into pieces suitable for handling by excavating equipment.

3. Layout staking of the utility line shall have been made with adequate definition of alignment and grade of the particular portion to be laid.

4. Utility line materials (Pipe and fittings, conduits, etc.) shall be on site prior to excavation for its placement.

5. Bedding materials and any special backfill material shall be on site, or delivery arrangements definitely made with a reliable source.

6. Any permits pertinent to work to be performed are to be on site. All required notifications shall have been made and any special inspection forces on site or proper and arrangement therefore made.

B. Excavation

1. The trench for the utility line or appurtenance shall be excavated on the given alignment to the grade indicated on Plans and/or Exhibits, minimum cover requirements and construction to govern. Trench sides shall be as near vertical as practical considering wall stability and need for safety. From the bottom of the trench to the top at the proposed pipe, the wall shall be near vertical with slopes, if any, above this level. Where conditions require, vertical wall shall be shored or sheeted and braced. It is the Contractor's responsibility to fully comply with all OSHA safety requirements. Sheeting or sheet piling to be employed if necessary for trench wall stability.

2. Excavated material suitable for backfilling to be piled as far as practical from edge of ditch, to increase soil stability and allow working room for pipe-laying operations. Excess material is to be removed from the trench bank as soon as practical. Excess is to belong to Contractor and disposition is his responsibility. Placement of excavated material on adjacent private property without written consent of Owner is prohibited. The written consent shall specifically absolve the Owner and Engineer of

any liability in regard to such placement. Excavation material may be placed in existing drainage ditches subject to the following restrictions:

a. Bypass piping is to be provided.

b. Standing water in such ditch to be removed.

c. Rain does not appear to be imminent.

d. Ability is to be demonstrated that the earth can be removed in a short time if rain does occur during the day, including access for earth-moving equipment.

e. All such earth is to be removed before the working day is over and the drainage capacity of the ditch fully restored. Sidewalks are not to be blocked with earth unless approved substitute passage and access is provided.

3. Where trenches are scheduled to be partly or totally in the drainage ditch, the requirements given in the preceding paragraph shall apply. Work shall not be undertaken when rain is threatening. Should rain threaten during the work day, the drainage capacity of the ditch shall be immediately restored and maintained, and the trench backfilled. Full drainage capacity shall be restored at the end of each working day. Any liabilities resulting from drainage obstructions created by construction operations shall occur solely to the Contractor.

C. Trench Water

1. Where practical, ground surfaces shall be graded or diked to prevent the entry of surface water into the open trench.

2. Ground water entering the open trench from the walls and from a firm bottom in small quantities is to be promptly removed by trench pumps. Multiple pumps in good operating order shall be kept on the excavation site for such purposes at all times. Under such trench conditions, the rough excavation grades to drain to the pumps prior to under-bedding placement, with suitable screening to exclude sand from pump suction. Other methods may be employed by the Contractor to achieve the required results. The water level shall be maintained below the pipe invert until full compaction of the pipe bedding can be and is accomplished.

3. In the event that trench pumps are unable to maintain the required level, or, if the water entry is from the bottom of the excavation in such quantities as to make the bottom unstable, or, from the sides in such quantities as to make the walls unstable, then the Contractor shall provide

and operate an effective well point system to dewater the trench to the required pipe laying conditions.

4. Water removed from trenches, from drainage ditches and by well points shall be conveyed to the Owner's drainage system (pipe or ditch) and not discharged upon the roadway, sidewalk or private property in such a manner as not to create damages or public nuisance.

5. Dewatering or well point systems shall be placed and operated so as to minimize inconvenience and annoyance to public, mechanical equipment shall be housed or shielded to minimize noise; engines are to be provided with efficient noise mufflers. Points and headers shall not block pedestrian and vehicular access to adjacent property. Location of pumping units to be chosen for minimum disturbance. Site to be promptly restored to original condition after point removal.

D. Pipe Embedment, General: Pipe materials, handling and joining, cable and utility appurtenances are covered in other sections of these specifications. These work elements are to be closely coordinated with the trench excavation, trench backfill, and with embedment placement.

E. Pipe Embedment: Concrete Steel Cylinder, Corrugated Metal Pipe, Reinforced Concrete Pipe, Cast Iron, Ductile Iron, Vitrified Clay, PVC Pipe, Reinforced Plastic Mortar, Steel.

1. After trenching to rough grade, and trench water removal arrangements are made, the prescribed underbedment, using the dry material of type specified (stabilized sand, bank sand, etc.) and minimum depth shown on details this Item and/or specified herein, is to be placed across the width of the trench and approximately to the grade of the bottom of the pipe, with bell hole left open and additional material on sides. Additional dry, loose material is to be placed in uniformly spaced amounts along pipe (clearing sling points, if any, and bell holes) sufficient to support lower quadrant of pipe barrel for 30 percent or more of its length. The pipe is to be lowered into the trench, aligned, positioned so spigot end is just outside bell and lowered against sand. It is to be checked for vertical alignment of spigot vs. bell and for gradient. The length is to be worked into true alignment and gradient by "bumping", and/or adding or removing underbedment material, so pipe is uniformly supported, under its own weight, for the lower quadrant for not less than 80 percent of its length. The pipe piece is then to be moved horizontally (axially) to make up joint, and additional underbedment material promptly worked under the pipe and tamped to provide support for its lower $\pm$ for its entire length. Joint is to be checked for make-up, and exterior protection placement commenced. Pipe bedding material placement to continue, and pipe shall be solidly anchored against axial movement before next joint is made-up. Remaining bedding and

backfill placing to continue until complete. Trench water not to be allowed to rise appreciably until bedding level is above spring line of pipe.

2. Bedding placement on sides and top to be in layers of 8-inch maximum thickness and mechanically compacted. Placement shall be made on both sides of pipe in such a manner that pipe is not moved horizontally or vertically by placement or compaction.

3. Bank sand placement on sides and top to be in layers of 8-inch maximum thickness and mechanically compacted to not less than 90% of Texas State Department of Highways and Public Transportation test method TEX-113-E within ± 3 percent of optimum moisture content. Placement shall be made on both sides of pipe in such a manner that pipe is not moved horizontally or vertically by placement or compaction.

F. Pipe Embedment, 3-Inches and Smaller Water Lines: Small diameter pipe lines not shown to be on a specific grade may be laid on 2-inch loose fill in ditch bottom, and stabilized with loose materials placed sides and top to cover pipe not less than 6-inches, then backfilled.

G. Backfill (Normal, Select or Regular)

1. Where excavation has been by ladder or wheel trenchers, or:

2. Where excavation by other types of equipment has resulted in clods not larger than 10-inches in largest dimension, and where excavated materials have been separated into "suitable" and "non-suitable", the surface excavated material (or select imported substitute material) may be pushed into the trench in layers not thicker than 12-inches and compacted. Where excavation has resulted in large clods:

   a. The clods are to be removed from the trench area and select imported material substituted therefor, or

   b. The clods are to be reduced to not greater than allowed above, and adequate finer material sufficient to fill voids between large clods provided. Highly-organic excavated material is to be considered "unsuitable" and excluded from the backfill.

3. Each layer of the backfill is to be mechanically compacted, to densities per ASTM D698 (standard proctor) within ± 3 percent of optimum moisture content. Reopen trenches inadequately compacted and recompact.

4. Backfill shall be hand placed and compacted under lines crossing the trench, steep slopes, valves, valve boxes, service connections, manholes, inlets and other appurtenances and specials.

5. Any trench settlement to be promptly filled, all trenches to be given final dressing immediately after settlement.

6. Final clean-up to follow backfill operation within 48 hours of construction or earlier if directed by the Engineer.

H. Backfill (Under Roadways and Driveways)

1. Where utility line excavation is open cut across a roadway or driveway, the backfill from top of bedding to bottom of future pavement restoration to be made with cement stabilized sand. The material is to be fresh (mixed not more than 3 hours before final placement). It is to be placed in layers not exceeding 10-inches depth (loose measure) and mechanically compacted from the bottom to top to minimum density not less than 95 percent of optimum, ASTM D698.

2. The surface of the material is to be dampened and covered with polyethylene or otherwise prevented from drying, for 72 hours. Wood bridges or steel plates shall be positioned to permit vehicular traffic, with the remaining portion barricaded for the curing period. After 3 days, the space for future surfacing may be temporarily filled with limestone until pavement restoration is begun and/or restoration undertaken immediately.

I. Crossing Existing Utility and Foreign Lines

1. Where existing utility or pipe lines are found crossing the route of the proposed utility line and are one "main" diameter or more above the proposed utility on undisturbed soil, the Contractor shall "jump" the crossing main with the excavating machinery, leaving a minimum of 1 foot of undisturbed area on each side of the crossing pipe. An opening for the proposed utility is to be tunneled under the crossing pipe line, and the proposed utility carefully threaded through. The crossing line is to be protected from damage at all times. In the event the undisturbed soil is found to be unstable, or if the Engineer decides support is required because of the nature or configuration of the pipe, the Contractor shall:

   a. Excavate down to the crossing line;

   b. Provide a temporary strong-back support; and/or

   c. Provide a reinforced concrete cradle across trench adequately supported to carry crossing pipe and backfill.

2. Where existing utilities or pipe lines are encountered in grade, subject to the approval of the Engineer and conditions of paragraph 1 above, the Contractor shall:

a. Adjust the grade of the proposed utility to clear the existing utility.
b. Remove and replace the existing utility in a manner shown on the Plans and/or Exhibits or as approved by the Owner of the existing utility.

J. Removing and Replacing Culverts: Where it is necessary to remove culverts in order to install the proposed utility, the Contractor may at his option:

1. Remove and waste the existing pipe, replacing with new, equivalent pipe, or,

2. Salvage existing pipe in good condition and relay. New pipe shall be substituted for damaged pipe at the Contractor's expense. The re-laid culvert shall be of the same length, same depth, same location as original, and in no way inferior to the original. No extra pay will be allowed for replacement of damaged culvert pipe whether or not was caused by Contractor.

K. Miscellaneous Precautions, Restoration of Damages

1. Contractor shall at all times be vigilant in observing overhead electric power and communication equipment.

2. Damage to overhanging tree limbs shall also be avoided.

3. Damage to pavement curbing is to be avoided. If such are damaged, the damaged section from joint shall be removed and replaced with curb of like material, dimension, texture and finish.

L. Test for Displacement of Sewers: After the trench has been backfilled to 2-feet above the pipe and tamped as specified, check the alignment as follows. Flash a light through the sewer between manholes. Use a flashlight or reflect sunlight with a mirror. If the illuminated interior of the pipe line shows poor alignment, pipe displacement, or other defects, remedy them satisfactorily.

M. Deflection Test of Thermoplastic Pipe (PVC, etc.): Deflection test shall not be performed before 30 days have passed after backfill (installation), but must occur prior to final acceptance. All thermoplastic lines shall be tested by pulling a mandrel or approved deflectometer through the line. All sections indicating five percent (5%) deflection or more shall be removed, reinstalled, and retested for leakage and deflection. A drawing of a typical testing mandrel follows.

IV: PIPE ABANDONMENT

A. Description: This specification shall govern all work and materials required for grouting abandoned utility lines.

B. Materials:

1. Raw Soil: Soil shall be typical clayey soil of the area. It shall be from the project site or other approved source not suspected of being contaminated. The soil shall have a Plasticity Index over 15 and a Liquid Limit not to exceed 65.

2. Lime: Lime shall be hydrated lime, calcium hydroxide, in accordance with AASHTO M 216.

3. Water: Water shall be potable.

C. Construction Methods:

1. Mix Design: The following is given as a typical mix design for trial mix. The mix design is based on damp soil with initial water content of about 15%. The proportions of soil and lime shall not be altered. The Contractor shall determine the amount of water to be added as required to produce a mix at its liquid limit.

a. Trial Mix Design:

Damp Soil	1,000 lb.
Lime	50 lb.
Water (Approximate)	48 gal.

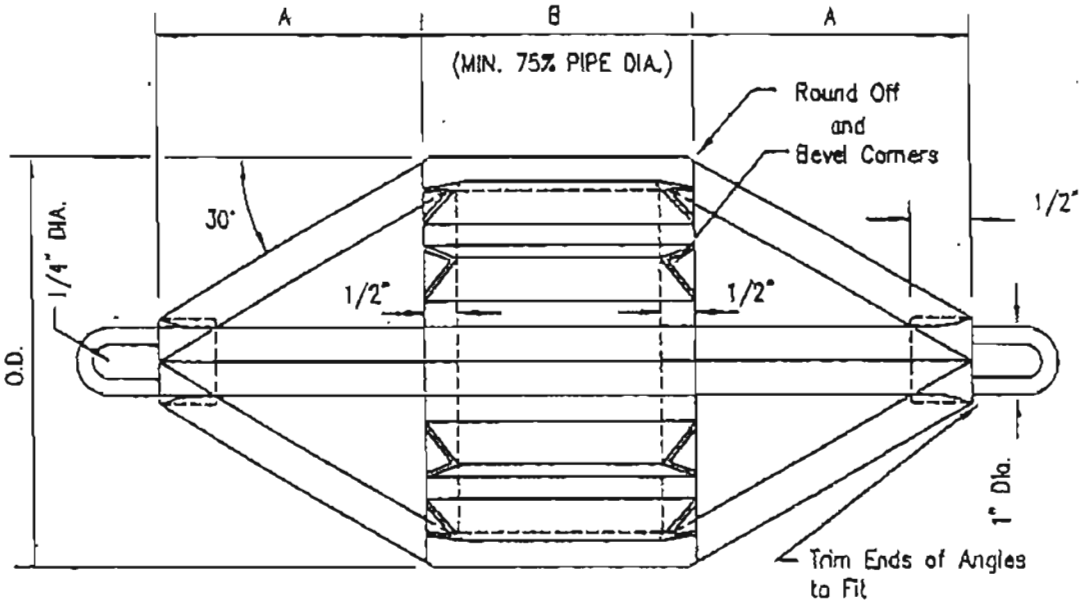
Consistency shall be checked with liquid limit apparatus.

2. Placement: The Contractor shall grout abandoned lines as indicated on the drawings. Temporary pumping and venting ports shall be placed as required to provide complete filling of the abandoned line and proper placement of the grout. If segregation or "sand packing" is experienced during pumping, the Contractor shall reduce water content of mix or obtain other soil source, as required. Any damage resulting from pumping operation shall be repaired at the Contractor's expense.

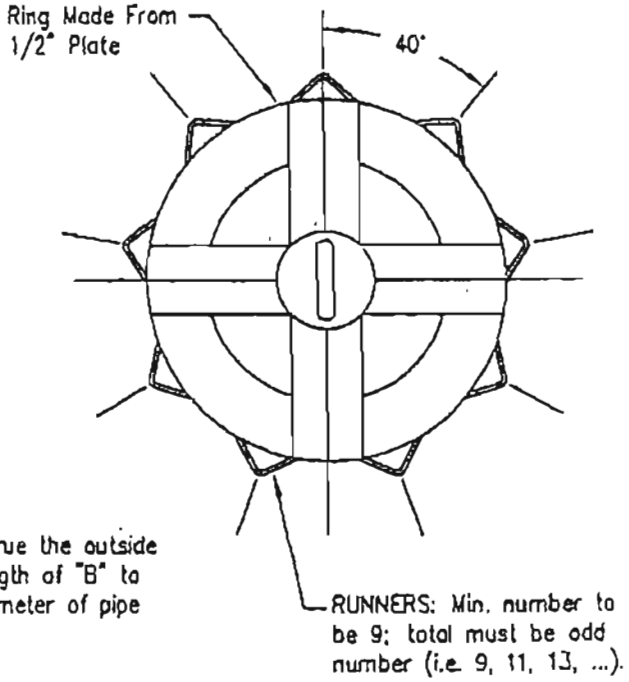
D. Measurement & Payment:

Unless indicated otherwise in the Proposal, Grouting Abandoned Utility Lines shall be measured by the linear foot. Payment shall include all equipment, materials and incidentals required to mix, transport, and place the grout and restore surface at pump ports.

TYPICAL
GO, NO-GO DEFLECTION TESTING MANDREL
CONSTRUCTED FROM 1/2-INCH ANGLE IRON



SIZE	A (inches)	B (inches)
4	3.0	4
6	4.0	4.5
8	5.3	6
10	6.7	7.5
12	8.0	9
15	10.0	11.5

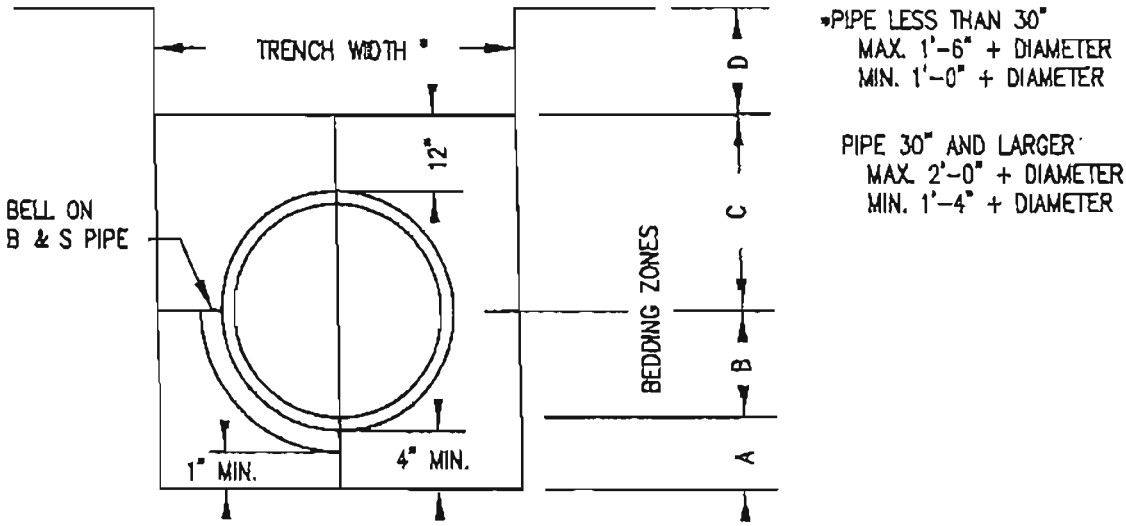


NOTE:
After welding is completed, true the outside diameter dimension for the full length of "B" to 95% ± 0.010" of original inside diameter of pipe being tested.

MANDREL
NOT TO SCALE

PIPE MATERIAL	BEDDING ZONES			
	A	B	C	D
CONCRETE STEEL CYLINDER	BS	BS	ES	EF
CORRUGATED METAL PIPE	BS	BS	BS	EF
REINFORCED CONCRETE PIPE	BS	BS	ES	EF
CAST IRON	BS	BS	BS	EF
DUCTILE IRON (PRESSURE)	BS	BS	BS	EF
DUCTILE IRON (GRAVITY)	CS	CS	CS	EF
VITRIFIED CLAY (ASTM C-12)	CS	CS	CS	EF
PVC (PRESSURE PIPE)	BS	BS	BS	EF
PVC (GRAVITY PIPE)	CS	CS	CS	EF
STEEL	BS	BS	BS	EF
CENTRIFUGALLY CAST FIBERGLASS (FRP)	CS	CS	CS	EF

BS- BANKSAND.
AB- AGGREGATE BEDDING.
ES- SELECT EARTH FILL PLACED SAME DAY AS PIPE IS LAID.
EF- EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID.
CS- CEMENT STABILIZED SAND.



ORDINARY TRENCH EMBEDMENT & BACKFILL DETAIL

N.T.S.

Std. 1/13/86
Revised 10/1/02

ITEM 2223

CRUSHED LIMESTONE BEDDING

I. GENERAL

A. Scope: Furnish and install crushed limestone bedding when ordered for stabilization of trench, or as shown on Plans and/or Exhibits.

B. Related Work (if utilized in this project)

1. Pipe: Per applicable Item

2. Item 2221 - Excavation, Trenching, and Backfilling for Utilities

II. MATERIALS

A. Use crushed stone with its natural binder or other approved fine aggregate. Crushed stone to have not more than 50 percent wear (AASHTO T-96-74). Gradation as follows:

Retained on	**Percent by Weight**
1-Inch Square Sieve	0 - 10
½-Inch Square Sieve	15 - 40
No. 4 Square Sieve	45 - 65
No. 40 Square Sieve	70 - 85

Aggregate to meet Texas Highway Department Wet Ball Mill Test, TEX-116-E.

B. Material passing No. 40 sieve to be soil binder and meet following requirements when tested by current ASTM Standards.

1. Plasticity index not to exceed 10.

2. Liquid limit not to exceed 35.

III. EXECUTION

A. Excavate trench to provide at least six inches clearance below pipe. Replace excavation below subgrade with crushed limestone bedding under barrel of pipe, and sufficient additional thickness of the bedding material for full width of trench on each side of pipe, to fit lower part of pipe exterior for at least 50 percent of pipe breadth. Tamp and grade bedding to assure uniform bearing of pipe barrel. After pipe is firmly installed on bedding to grade and alignment, carefully place crushed limestone bedding in layers of maximum 4" thick, compacting each to 85% Proctor Density (AASHTO T-99), up to a depth above top of pipe as shown on Plans and/or Exhibits. Complete backfill in accordance with other applicable specifications.

Std. 1/22/96
Revised 10/1/02

ITEM 2224

ENCASING, AUGERING, AND TUNNELING

I. GENERAL

A. Scope

1. This section provides for furnishing pipe and installing it by means of encasing, augering, or tunneling, as shown on the Plans and/or Exhibits and described in this specification. Areas where encasing, augering, or tunneling pipe is needed are shown on the plan.

2. Work performed under this item shall be completed the same day work is begun.

B. Submittals

1. Jacking: Furnish, for review, a plan showing the proposed method of operation. Include the design for the jacking head, the jacking support or back stop, the arrangement and position of jacks, pipe heads and other elements, complete, and in assembled position. Review of the plan does not relieve the Contractor of responsibility for obtaining the specified result. Jacking allowed for encasement pipe only.

2. Furnish wall thickness and schedule of encasement pipe to be used for review.

3. Tunneling: Submit proposed liner method for review. The Contractor remains responsible for the adequacy of the lining method.

C. Related Work (if utilized in this project)

1. Item 2221 - Excavation, Trenching and Backfilling for Utilities

2. Item 2227 - Waste Material Disposal

II. MATERIALS

A. Use encasement pipe of size shown on Plans and/or Exhibits.

B. Use carrier pipe of size shown on Plans and/or Exhibits.

III. EXECUTION

A. Jacking

1. If the grade of the pipe at the jacking end is below ground, excavate suitable pits or trenches for jacking and for placing the end joints of pipes. Obtain approval for the pit location. Securely sheet and brace any end trenches cut into the sides of the embankment or beyond, to prevent earth caving.

2. Install pipe required under railroad embankments or roads so as not to interfere with traffic or weaken the structure. Furnish and maintain barricades and lights to safeguard traffic until the backfill is complete. Then remove safety items from the site.

3. Provide heavy duty jacks suitable for forcing the pipe through the embankment. Apply even operating pressure. Provide a suitable jacking head, usually timber, and suitable bracing between jacks and jacking head. This assures uniform pressure on the perimeter. Provide a suitable jacking frame or back stop.

4. Set the pipe to be jacked on guides properly braced together to support the pipe section and direct it in the proper line and grade. Line up the jacking assembly with the direction and grade of the pipe.

5. Excavate embankment material just ahead of the pipe, and remove it through the pipe. Then force the pipe through the embankment with jacks, into the space thus provided.

6. Excavate beneath the pipe to conform to contour and grade for at least a of its circumference. A 2-inch maximum clearance above the pipe shall taper to zero at the point where the excavation conforms to the contour of the pipe.

7. Extend the excavation not more than 2-feet beyond the end of the pipe. This limit may be decreased, as permitted by the character of the material being excavated.

8. Jack the pipe from the low or downstream end. The final position of the pipe may vary only 1-inch in 100-feet, laterally or vertically. Such variation must be regular and in only one direction. The final grade of the flow line must be in the direction indicated by the Plans and/or Exhibits.

9. A cutting edge of steel plate may be installed around the head end of the pipe. It may extend a short distance beyond the end of the pipe. Angles or lugs are permitted inside the cutting edge to prevent its slipping back onto the pipe.

10. Once jacking is begun, the operation must continue without interruption, insofar as practicable, to prevent the pipe from becoming firmly set in the embankment.

11. Remove and replace without additional cost, any pipe damaged in jacking operations.

12. Backfill pits or trenches which have been excavated to aid jacking operations, just as soon as the jacking is complete.

B. Augering

1. Provide a pit for boring equipment and workmen. Obtain approval for the location of the pit. Excavate the pit and install shoring. Securely sheet and brace the pit to prevent earth caving.

2. First, bore a 2-inch pilot hole the entire length of the crossing. From the opposite end, check it for line and grade. The pilot hole will be the centerline for the larger diameter hole to be bored.

3. Bore the large diameter hole by mechanical means. Place excavated material near the top of the working pit and dispose of it as required. Use water or other fluids in boring only to lubricate cuttings. Jetting will not be permitted.

4. In unconsolidated soil formations, use a gel-forming colloidal drilling fluid containing at least 10 percent of high-grade carefully processed bentonite. The fluid will help to consolidate the cuttings of the bit, seal the hole walls, and later lubricate the removal of cuttings and the installation of the pipe immediately thereafter.

5. The final position of the pipe may vary only 1-inch in 100-feet, laterally or vertically. Such variation must be regular and in only one direction. Remedy overcutting of more than 1-inch by pressure grouting the entire length of the installation.

C. Tunneling

1. Tunneling is permissible when soil conditions, pipe size, or the use of monolithic sewer would make tunneling preferable to jacking or boring, or

where the Plans and/or Exhibits call for tunneling.

2. Provide a pit for tunneling equipment and workmen. Obtain approval for the location of the pit. Excavate pit and install shoring. Securely sheet and brace the pit to prevent earth caving.

3. Line the tunnel with steel strong enough to support the overburden.

4. Pressure grout or mud jacket the space between the liner plate and the limits of the excavation.

5. Space access holes for placing concrete no more than 10-feet apart.

D. Encasement

1. Auger or jacking shall be performed for encasement pipe as specified above.

2. Steel encasement pipe shall be of size and schedule shown and be installed with a full weld completely around the diameter of each successive joint of encasement pipe.

3. Concrete or corrugated metal encasement pipe shall have approved joints.

4. Encasement operations shall be completed the same day operations begin.

Std. 1/22/96
Revised 10/1/02

ITEM 2227

WASTE MATERIAL DISPOSAL

I. GENERAL

A. Scope: Waste material disposal consist of disposal of trees, stumps, logs, brush, roots, grass, vegetation, humus, rubbish and other objectionable matter from operations such as clearing and grubbing, excavation, grading and sanitary sewer cleaning. Unless otherwise specified, the Contractor is responsible for removal and disposal of waste material.

B. Payment: No separate payment will be made. Include cost of work in contract bid prices.

C. Related Work (if utilized in this project)

1. Item 2102 - Clearing and Grubbing

2. Item 2221 - Excavation, Trenching and Backfilling for Utilities

II. MATERIALS

Specific materials are not required. Use equipment and materials necessary to properly complete disposal of waste materials.

III. EXECUTION

Disposal Area: Waste materials must be removed from the work site and disposed of in a manner not to damage the Owner or other persons. All waste materials become the property of the Contractor.

ITEM 2317
EXCAVATION AND BACKFILL FOR UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavation, trenching, foundation, embedment, and backfill for installation of utilities, including manholes and other pipeline structures.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices

1. No additional payment will be made for trench excavation, embedment and backfill under this Section. Include cost in unit price for installed underground piping, sewer, conduit, or duct work.

2. When Project Manager directs Contractor to over excavate trench bottom, Contractor will be paid by unit price bid per linear foot under bid item - 6" Over Excavation of Trench Bottom.

a. No payment will be paid if Project Manager does not direct Contractor to over excavate trench bottom.

b. No over excavation will be measured or paid when unsuitable conditions result from dewatering system not in conformance with Item 2401 – Dewatering and Drainage of Excavation(if utilized in this project).

3. No additional payment will be made for performing Critical Location exploratory excavation. Include cost in unit price for installed underground piping, sewer, conduit, or duct work.

4. Refer to Item 1400 - Measurement and Payment for unit price procedures.

B. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price

1.03 DEFINITIONS

A. Pipe Foundation: Suitable and stable native soils that are exposed at trench subgrade after excavation to depth of bottom of bedding as shown on Drawings, or foundation backfill material placed and compacted in over-excavations.

B. Pipe Bedding: Portion of trench backfill that extends vertically from top of foundation up to level line at bottom of pipe, and horizontally from one trench sidewall to

opposite sidewall.

C. Haunching: Material placed on either side of pipe from top of bedding up to springline of pipe and horizontally from one trench sidewall to opposite sidewall.

D. Initial Backfill: Portion of trench backfill that extends vertically from springline of pipe (top of haunching) up to level line 12 inches above top of pipe, and horizontally from one trench sidewall to opposite sidewall.

E. Pipe Embedment: Portion of trench backfill that consists of bedding, haunching and initial backfill.

F. Trench Zone: Portion of trench backfill that extends vertically from top of pipe embedment up to pavement subgrade or up to final grade when not beneath pavement.

G. Unsuitable Material: Unsuitable soil materials are the following:

1. Materials that are classified as ML, CL-ML, MH, PT, OH, and OL according to ASTM D 2487.

2. Materials that cannot be compacted to required density due to gradation, plasticity, or moisture content.

3. Materials that contain large clods, aggregates, stones greater than 4 inches in any dimension, debris, vegetation, waste or any other deleterious materials.

4. Materials that are contaminated with hydrocarbons or other chemical contaminants.

H. Suitable Material: Suitable soil materials are those meeting specification requirements. Materials mixed with lime, fly ash, or cement that can be compacted to required density and meeting requirements for suitable materials may be considered suitable materials, unless otherwise indicated.

I. Backfill: Suitable material meeting specified quality requirements placed and compacted under controlled conditions.

J. Ground Water Control Systems: Installations external to trench, such as well points, eductors, or deep wells. Ground water control includes dewatering to lower ground water, intercepting seepage which would otherwise emerge from side or bottom of trench excavation, and depressurization to prevent failure or heaving of excavation bottom.

K. Surface Water Control: Diversion and drainage of surface water runoff and rain water away from trench excavation. Rain water and surface water accidentally entering trench shall be controlled and removed as part of excavation drainage.

L. Excavation Drainage: Removal of surface and seepage water in trench by sump pumping and using drainage layer, as defined in ASTM D 2321, placed on foundation beneath pipe bedding or thickened bedding layer of Class I material.

M. Trench Conditions are defined with regard to stability of trench bottom and trench walls of pipe embedment zone. Maintain trench conditions that provide for effective placement and compaction of embedment material directly on or against undisturbed soils or foundation backfill, except where structural trench support is necessary.

1. Dry Stable Trench: Stable and substantially dry trench conditions exist in pipe embedment zone as result of typically dry soils or achieved by ground water control (dewatering or depressurization) for trenches extending below ground water level.

2. Stable Trench with Seepage: Stable trench in which ground water seepage is controlled by excavation drainage.

   a. Stable Trench with Seepage in Clayey Soils: Excavation drainage is provided in lieu of or to supplement ground water control systems to control seepage and provide stable trench subgrade in predominately clayey soils prior to bedding placement.

   b. Stable Wet Trench in Sandy Soils: Excavation drainage is provided in embedment zone in combination with ground water control in predominately sandy or silty soils.

3. Unstable Trench: Unstable trench conditions exist in pipe embedment zone if ground water inflow or high water content causes soil disturbances, such as sloughing, sliding, boiling, heaving or loss of density.

N. Sub-trench: Sub-trench is special case of benched excavation. Sub-trench excavation below trench shields or shoring installations may be used to allow placement and compaction of foundation or embedment materials directly against undisturbed soils. Depth of sub-trench depends upon trench stability and safety as determined by Contractor.

O. Trench Dam: Placement of low permeability material in pipe embedment zone or foundation to prohibit ground water flow along trench.

P. Over-excavation and Backfill: Excavation of subgrade -soils with unsatisfactory bearing capacity or composed of otherwise unsuitable materials below top of foundation as shown on Drawings, and backfilled with foundation bedding.

Q. Foundation Bedding: Natural soil or manufactured aggregate of controlled gradation, and geotextile filter fabrics as required, to control drainage and material separation. Foundation bedding is placed and compacted as backfill to provide stable support for bedding. Foundation bedding materials may include

concrete seal slabs.

R. Trench Safety Systems include both protective systems and shoring systems as defined in Item 1541 - Trench Safety Systems(if utilized in this project).

S. Trench Shield (Trench Box): Portable worker safety structure moved along trench as work proceeds, used as protective system and designed to withstand forces imposed on it by cave in, thereby protecting persons within trench. Trench shields may be stacked if so designed or placed in series depending on depth and length of excavation to be protected.

T. Shoring System: Structure that supports sides of an excavation to maintain stable soil conditions and prevent cave-ins, or to prevent movement of ground affecting adjacent installations or improvements.

U. Special Shoring: Shoring system meeting special shoring as specified in Paragraph 1.08, Special Shoring Design Requirements, for locations identified on Drawings.

V. Vacuum Excavation: An excavation technique performed by an experienced subcontractor in which water or air jetting is used to slough off and vacuum away soil.

W. Large Diameter Water Line (LDWL): Water line that is 24-inches in diameter or larger.

X. Emergency Action Plan (EAP): The EAP document should include a discussion of procedures for timely and reliable detection, classification (level of emergency) and response procedure to a potential emergency condition associated with a large diameter water line.

Y. Subsurface Utility Exploration (SUE): Non-destructive excavation, unless otherwise approved by project manager.

1.04 REFERENCES

A. ASTM C 12 - Standard Practice for Installing Vitrified Clay Pipe Lines.

B. ASTM D 558 - Standard Test Methods for Moisture-Density Relations of Soil Cement Mixtures.

C. ASTM D 698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft).

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

E. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic

Pipe for Sewers and Other Gravity Flow Applications.

F. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes.

G. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

H. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

I. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

J. TxDOT Tex-101-E - Preparing Soil and Flexible Base Materials for Testing.

K. TxDOT Tex-110-E - Particle Size Analysis of Soils.

L. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).

M. ASTM C76- Standard Specification for Reinforced Concrete Culverts, Storm Drain, and Sewer Pipe.

1.05 SCHEDULING

A. Schedule work so that pipe embedment can be completed on same day that acceptable foundation has been achieved for each section of pipe installation, mole, or other structures.

B. For proposed utility adjacent to or across existing LDWL:

1. Conduct a meeting between contractor, Drinking Water Operations and Utility Maintenance Branch prior to beginning excavation to coordinate the EAP in the event a water line shut down becomes necessary.

2. Notify Drinking Water Operations a minimum of 1 week prior to beginning construction activities.

3. Notify Drinking Water Operations a minimum of 48 hours prior to beginning SUE work near LDWL.

4. Unless otherwise approved by City Engineer, perform construction activities between 7 AM and 7 PM, Monday through Friday. No work permitted around a LDWL on weekends or City Holiday.

5. A City Inspector must be present during SUE or construction activities occurring within four feet or one diameter of the LDWL, whichever is greater, from a LDWL or appurtenance.

1.06 SUBMITTALS

A. Conform to requirements of Section II – General Conditions – (13) Shop Drawings.

B. Submit planned typical method of excavation, backfill placement and compaction including:

1. Trench widths.

2. Procedures for foundation and pipe zone bedding placement, and trench backfill compaction.

3. Procedures for assuring compaction against undisturbed soil when pre-manufactured trench safety systems are proposed.

C. Submit backfill material sources and product quality information in accordance with requirements of Item 2221 – Excavation, Trenching, and Backfilling for Utilities (if utilized in this project).

D. Submit trench excavation safety program in accordance with requirements of Item 1541 - Trench Safety System (if utilized in this project). Include designs for special shoring meeting requirements defined in Paragraph 1.08, Special Shoring Design Requirements contained herein.

E. Submit record of location of utilities as installed, referenced to survey control points. Include locations of utilities encountered or rerouted. Give stations, horizontal dimensions, elevations, inverts, and gradients.

F. Submit 11 inch by 17 inch or 12 inch by 18 inch copy of Drawing with plotted utility or obstruction location titled "Critical Location Report" to Project Manager.

G. For installation of proposed utility adjacent to or across existing LDWL, prepare and submit the following to Drinking Water Operations prior to beginning construction activities. Obtain approval from Drinking Water Operations prior to commencing prelocate or utility work near LDWL.

1. Trench details, shoring system designs, installation sequences, and flowable fill mix designs.

2. Emergency Action Plan (EAP) to address contingency plans in the event of damage to or failure of LDWL. Include the following:

a. Contact personnel and agencies including primary and secondary telephone numbers,

b. Contractor's hierarchy of responsible personnel,

c. Traffic control measures, and

d. Identification of resources to be available on or near project site in event of damage to or failure of LDWL.

1.07 TESTS

A. Testing and analysis of backfill materials for soil classification and compaction during construction will be performed by an independent laboratory provided by City and as specified in this Section.

B. Perform backfill material source qualification testing in accordance with requirements of Item 2221 – Excavation, Trenching, and Backfilling for Utilities (if utilized in this project).

1.08 SPECIAL SHORING DESIGN REQUIREMENTS

A. Have special shoring designed or selected by Contractor's Professional Engineer to provide support for sides of excavations, including soils and hydrostatic ground water pressures as applicable, and to prevent ground movements affecting adjacent installations or improvements such as structures, pavements and utilities. Special shoring may be a premanufactured system selected by Contractor's Professional Engineer to meet project site requirements based on manufacturer's standard design.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Perform excavation with hydraulic excavator or other equipment suitable for achieving requirements of this Section.

B. Use only hand-operated tamping equipment until minimum cover of 12 inches is obtained over pipes, conduits, and ducts. Do not use heavy compacting equipment until adequate cover is attained to prevent damage to pipes, conduits, or ducts.

C. Use trench shields or other protective systems or shoring systems which are designed and operated to achieve placement and compaction of backfill directly against undisturbed native soil.

D. Use special shoring systems where required which may consist of braced sheeting, braced soldier piles and lagging, slide rail systems, or other systems meeting requirements as specified in Paragraph 1.08, Special Shoring Design Requirements.

2.02 MATERIAL CLASSIFICATIONS

A. Embedment and Trench Zone Backfill Materials: Conform to classifications and product descriptions of Item 2221 – Excavation, Trenching and Backfilling for

Utilities and Item 3312 – Cement-Stabilized Sand Backfill (if utilized in this project).

B. Concrete Backfill: Conform to requirements for Class B concrete as specified in Item 3310 – Concrete (if utilized in this project).

C. Geotextile (Filter Fabric): Conform to requirements of Section 02621- Geotextile (if utilized in this project).

D. Concrete for Trench Dams: Concrete backfill or 3 sack premixed (bag) concrete.

PART 3 EXECUTION

3.01 STANDARD PRACTICE

A. Install flexible pipe, including "semi-rigid" pipe, to conform to standard practice described in ASTM D 2321, and as described in this Section. Where an apparent conflict occurs between standard practice and requirements of this Section, this Section governs.

B. Install rigid pipe to conform to standard practice described in ASTM C 12 or C76 as applicable, and as described in this Section. Where an apparent conflict occurs between standard practice and requirements of this Section, this Section governs.

3.02 PREPARATION

A. Establish traffic control to conform to requirements of Item 1533 – Barricades, Signs, and Traffic Handling – No TCP (if utilized in this project). Maintain barricades and warning lights for streets and intersections affected by Work, and are considered hazardous to traffic movements.

B. Perform work to conform to applicable safety standards and regulations. Employ trench safety system as specified in Item 1541 - Trench Safety Systems (if utilized in this project).

C. Immediately notify agency or company owning any existing utility line which is damaged, broken, or disturbed. Obtain approval from Project Manager and agency for any repairs or relocations, either temporary or permanent.

D. Remove existing pavements and structures, including sidewalks and driveways, to conform to requirements of Section 02221 - Removing Existing Pavements and Structures (if utilized in this project), as applicable.

E. Install and operate necessary dewatering and surface-water control measures to conform to Item 2401 – Dewatering and Drainage of Excavation. Provide stable trench to allow installation in accordance with Specifications.

F. Maintain permanent benchmarks, monumentation, and other reference points. Unless otherwise directed in writing, replace those which are damaged or destroyed in accordance with Section 01725 - Field Surveying (if utilized in this project).

3.03 CRITICAL LOCATION INVESTIGATION

A. Horizontal and vertical location of various underground lines shown on Drawings, including but not limited to water lines, gas lines, storm sewers, sanitary sewers, telecommunication lines, electric lines or power ducts, pipelines, concrete and debris, are based on best information available but are only approximate locations. Unless otherwise approved by Project Manager, at Critical Locations shown on Drawings, perform vacuum excavation to field verify horizontal and vertical locations of such lines within a zone 2 feet vertically and 4 feet horizontally of proposed work exclude water jetting at PCCP water line.

1. Verify location of existing utilities minimum of 7 working days in advance of pipe laying activities based on daily pipe laying rate or prior to beginning installation of auger pit or tunnel shaft. Use extreme caution and care when uncovering utilities designated by Critical Locate.

2. Notify Project Manager in writing immediately upon identification of obstruction. In event of failure to identify obstruction in minimum of 7 days, Contractor will not be entitled to extra cost for downtime including, but not limited to, payroll, equipment, overhead, demobilization and remobilization, until 7 days has passed from time Project Manager is notified of obstruction.

B. Notify involved utility companies of date and time that investigation excavation will occur and request that their respective utility lines be marked in field. Comply with utility or pipeline company requirements that their representative be present during excavation. Provide Project Manager with 48 hours' notice prior to field excavation or related work.

C. Survey vertical and horizontal locations of obstructions relative to project baseline and datum and plot on 12 inch by 18 inch copy of Drawings. For large diameter water lines, submit to Project Manager for approval, horizontal and vertical alignment dimensions for connections to existing lines, tied into project baseline, signed and sealed by R.P.L.S.

D. LDWL Prelocate Requirements:

1. Field-locate LDWL, appurtenances and laterals connected directly to LDWL through use of non-probing method such as a vacuum truck (non-water jetting method) at no greater than 50 foot intervals. Locate upstream and downstream of proposed work or utility installation.

2. Record crown and side of LDWL adjacent to proposed work or utility installation. Record LDWL locations horizontally and vertically using same coordinate system employed on proposed utility drawings.

3. Tie horizontal and vertical coordinates into project baseline. Submit recordings performed by R.P.L.S to City a minimum of 14 days prior to mobilizing to site.

3.04 PROTECTION

A. Protect trees, shrubs, lawns, existing structures, and other permanent objects outside of grading limits and within grading limits as designated on Drawings.

B. Protect and support above-grade and below-grade utilities which are to remain.

C. Restore damaged permanent facilities to pre-construction conditions unless replacement or abandonment of facilities is indicated on Drawings.

D. Take measures to minimize erosion of trenches. Do not allow water to pond in trenches. Where slides, washouts, settlements, or areas with loss of density or pavement failures or potholes occur, repair, re-compact, and pave those areas at no additional cost to City.

E. Contingency plans for proposed work or utility installation adjacent to or across a LDWL:

1. Conduct on-site emergency drill prior to commencing proposed utility installation, and at three month intervals to assure EAP is current.

2. In the event a LDWL shut down becomes necessary, secure site and provide assistance to City personnel to access pipe and isolation valves as needed.

3.05 EXCAVATION

A. Except as otherwise specified or shown on Drawings, install underground utilities in open cut trenches with vertical sides.

B. Perform excavation work so that pipe, conduit, and ducts can be installed to depths and alignments shown on Drawings. Avoid disturbing surrounding ground and existing facilities and improvements.

C. Determine trench excavation widths using following schedule as related to pipe outside diameter (O.D.). Excavate trench so that pipe is centered in trench.

Nominal Pipe Size, Inches	Minimum Trench Width, Inches
Less than 18	O.D. + 18
18 to 30	O.D. + 24
36 to 42	O.D. + 36
Greater than 42	O.D. + 48

Do not obstruct sight distance for vehicles utilizing roadway or detours with stockpiled materials.

D. Use sufficient trench width or benches above embedment zone for installation of well point headers or manifolds and pumps where depth of trench makes it uneconomical or impractical to pump from surface elevation. Provide sufficient space between shoring cross braces to permit equipment operations and handling of forms, pipe, embedment and backfill, and other materials.

E. Upon discovery of unknown utilities, badly deteriorated utilities not designated for removal, or concealed conditions, discontinue work at that location. Notify Project Manager and obtain instructions before proceeding.

F. Shoring of Trench Walls.

1. Install Special Shoring in advance of trench excavation or simultaneously with trench excavation, so that soils within full height of trench excavation walls will remain laterally supported at all times.

2. For all types of shoring, support trench walls in pipe embedment zone throughout installation. Provide trench wall supports sufficiently tight to prevent washing trench wall soil out from behind trench wall support.

3. Leave sheeting driven into or below pipe embedment zone in place to preclude loss of support of foundation and embedment materials, unless otherwise directed by Project Manager. Leave rangers, walers, and braces in place as long as required to support sheeting, which has been cut off, and trench wall in vicinity of pipe zone.

4. Employ special methods for maintaining integrity of embedment or foundation material. Before moving supports, place and compact embedment to sufficient depths to provide protection of pipe and stability of trench walls. As supports are moved, finish placing and compacting embedent.

5. If sheeting or other shoring is used below top of pipe embedment zone, do not disturb pipe foundation and embedment materials by subsequent removal. Maximum thickness of removable sheeting extending into embedment zone shall be equivalent of 1-inch-thick steel plate. As sheeting is removed, fill in voids left with grouting material.

G. Use of Trench Shields. When trench shield (trench box) is used as worker safety device, the following requirements apply:

1. Make trench excavations of sufficient width to allow shield to be lifted or pulled freely, without damage to trench sidewalls.

2. Move trench shields so that pipe, and backfill materials, after placement and compaction, are not damaged nor disturbed, nor degree of compaction reduced. Re-compact after shield is moved if soil is disturbed.

3. When required, place, spread, and compact pipe foundation and bedding materials beneath shield. For backfill above bedding, lift shield as each layer of backfill is placed and spread. Place and compact backfill materials against undisturbed trench walls and foundation.

4. Maintain trench shield in position to allow sampling and testing to be performed in safe manner.

5. Conform to applicable Government regulations.

H. Voids under paving area outside shield caused by Contractor's work will require removal of pavement, consolidation and replacement of pavement in accordance with Contract Documents. Repair damage resulting from failure to provide adequate supports.

I. Place sand or soil behind shoring or trench shield to prevent soil outside shoring from collapsing and causing voids under pavement. Immediately pack suitable material in outside voids following excavation to avoid caving of trench walls.

J. Coordinate excavation within 15 feet of pipeline with company's representative. Support pipeline with methods agreed to by Pipeline Company's representative. Use small, rubber-tired excavator, such as backhoe, to do exploratory excavation. Bucket that is used to dig in close proximity to pipelines shall not have teeth or shall have guard installed over teeth to approximate bucket without teeth. Excavate by hand within 1 foot of Pipeline Company's line. Do not use larger excavation equipment than normally used to dig trench in vicinity of pipeline until pipelines have been uncovered and fully exposed. Do not place large excavation and hauling equipment directly over pipelines unless approved by Pipeline Company's representative.

K. When, during excavation to uncover pipeline company's pipelines, screwed collar or an oxy-acetylene weld is exposed, immediately notify Project Manager. Provide supports for collar or welds. Discuss with Pipeline Company's representative and determine methods of supporting collar or weld during excavation and later backfilling operations. When collar is exposed, request Pipeline Company to provide welder in a timely manner to weld ends of collar prior to backfilling of excavation.

L. Excavation and shoring requirements for proposed work or utility installation adjacent to or across a LDWL:

1. Identify LDWL area in field and barricade off from construction activities. Allow no construction related activities including, but not limited to, loading of dump trucks and material staging or storage, on top of LDWL.

2. Employ a groundwater control system when performing excavation activities within ten feet of LDWL to:

a. Effectively reduce hydrostatic pressure affecting excavations,

b. Develop substantially dry and stable subgrade for subsequent construction operations,

c. Prevent loss of fines, seepage, boils, quick condition or softening of foundation strata, and

d. Maintain stability of sides and bottom of excavations.

2. When edge of proposed trench or shoring is within a distance equal to one diameter of LDWL from outside of wall of LDWL, valve or appurtenance:

a. Maintain minimum of four (4) feet horizontal clearance and minimum of two (2) feet vertical clearance between proposed utility and LDWL.

b. Auger Construction

i. Maintain minimum of four (4) feet horizontal clearance between proposed utility and LDWL.
ii. Dry auger method required when auger hole is 12-inches and larger in diameter.

c. Open Cut Construction and Auger pits

i. Perform hand excavation when within four (4) feet of LDWL.
ii. Employ hydraulic or pneumatic shoring system. Do not use vibratory or impact driven shoring or piling.
iii. Expose no more than 30-feet of trench prior to backfilling.
iv. A maximum of one (1) foot of vertical trench shall be un-braced at a time to maintain constant pressure on face of excavated soil.
v. Upon removal of shoring system, inject flowable fill into void space left behind by shoring system.

d. When edge of utility excavation is greater than one diameter of LDWL from outside wall of LDWL, use a shielding system as required by Project Manager and proposed utility standards and practices.

3.06 HANDLING EXCAVATED MATERIALS

A. Use only excavated materials, which are suitable as defined in this Section and conforming to Item 2221 – Excavation, Trenching, and Backfilling for Utilities. Place material suitable for backfilling in stockpiles at distance from trench to prevent slides or cave-ins.

D. Do not place trench shields or shoring within height of embedment zone unless means to maintain density of compacted embedment material are used. If moveable supports are used in embedment zone, lift supports incrementally to allow placement and compaction of material against undisturbed soil.

E. Place geotextile to prevent particle migration from in-situ soil into open-graded (Class I) embedment materials or drainage layers.

E. Do not damage coatings or wrappings of pipes during backfilling and compacting operations. When embedding coated or wrapped pipes, do not use crushed stone or other sharp, angular aggregates.

F. Place haunching material manually around pipe and compact it to provide uniform bearing and side support. If necessary, hold small-diameter or lightweight pipe in place during compaction of haunch areas and placement beside pipe with sand bags or other suitable means.

G. Place electrical conduit, if used, directly on foundation without bedding.

I. Shovel in-place and compact embedment material using pneumatic tampers in restricted areas, and vibratory-plate compactors or engine-powered jumping jacks in unrestricted areas. Compact each lift before proceeding with placement of next lift. Water tamping is not allowed.

J. For water lines construction embedment, use bank run sand, concrete sand, gem sand, pea gravel, or crushed limestone as specified in Item 2221 – Excavation, Trenching, and Backfilling for Utilities (if utilized in this project). Adhere to the following subparagraph numbers 1 and 2.

1. Class I, II and III Embedment Materials:

   a. Maximum 6 inches compacted lift thickness.

   b. Compact to achieve minimum of 95 percent of maximum dry density as determined according to ASTM D 698.

   c. Moisture content to be within -3 percent to +5 percent of optimum as determined according to ASTM D 698, unless otherwise approved by Project Manager.

2. Cement Stabilized Sand (where required for special installations):

   a. Maximum 6 inches compacted thickness.

   b. Compact to achieve minimum of 95 percent of maximum dry density as determined according to ASTM D 698.

c. Moisture content to be on dry side of optimum as determined according to ASTM D 698 but sufficient for effective hydration.

K. For Sanitary Sewers adhere to subparagraph number 1 and 2. For Storm Sewers provide cement stabilized sand per paragraph 2. This provision does not apply to Storm Sewers constructed of HDPE pipe installed under pavement.

3. Class I Embedment Materials.

a. Maximum 6-inches compacted lift thickness.

b. Systematic compaction by at least two passes of vibrating equipment. Increase compaction effort as necessary to effectively embed pipe to meet deflection test criteria.

c. Moisture content as determined by Contractor for effective compaction without softening soil of trench bottom, foundation or trench walls.

4. Class II Embedment and Cement Stabilized Sand.

a. Maximum 6-inches compacted thickness.

b. Compaction by methods determined by Contractor to achieve minimum of 95 percent of maximum dry density as determined according to ASTM D 698 for Class II materials and according to ASTM D 558 for cement stabilized materials.

c. Moisture content of Class II materials within 3 percent of optimum as determined according to ASTM D 698. Moisture content of cement stabilized sands on dry side of optimum as determined according to ASTM D 558 but sufficient for effective hydration.

L. For Storm Sewers constructed of HDPE pipe and installed under pavement provide flowable fill pipe embedment.

M. Place trench dams in Class I embedment in line segments longer than 100 feet between manholes, and not less than one in every 500 feet of pipe placed. Install additional darns as needed to achieve workable construction conditions. Do not place trench dams closer than 5 feet from manholes.

3.09 TRENCH ZONE BACKFILL PLACEMENT AND COMPACTION

A. Place backfill for pipe or conduits and restore surface as soon as practicable. Leave only minimum length of trench open as necessary for construction.

B. For water lines, under pavement and to within one foot back of curb, use backfill materials described below:

1. For water lines 20 inches in diameter and smaller, use bank run sand or select backfill materials up to pavement base or subgrade.

2. For water lines 24 inches in diameter and larger, backfill with suitable on-site material (random backfill) up to 12 inches below pavement base or subgrade. Place minimum of 12 inches of select backfill below pavement base or subgrade.

C. For sewer pipes (Storm and Sanitary), use backfill materials described by trench limits. For "trench zone backfill" under pavement and to within one foot back of curb, use cement stabilized sand for pipes of nominal sizes 36 inches in diameter and smaller to level 12 inches below the pavement. For sewer pipes 42 inches in diameter and larger, under pavement or natural ground, in satisfactory soil conditions, backfill from 12 inches above top of pipe to 12 inches below pavement with suitable on-site material or select backfill. For sewer pipes 42 inches in diameter and larger? under pavement or natural ground, in unsatisfactory soil conditions, backfill from 12 inches above top of pipe to 12 inches below pavement with suitable on-site material or select backfill. Use select backfill for rigid pavements or flexible base material for asphalt pavements for 12- inch backfill directly under pavement. For backfill materials reference Item 2221 – Excavation, Trenching, and Backfilling for Utilities. This provision does not apply where aStorm Sewer is constructed of HDPE pipe.

D. For Storm Sewers constructed of HDPE pipe and installed under pavement provide flowable fill. For Storm Sewers constructed of HDPE pipe and not installed under pavement provide cement stabilized sand.

E. Where damage to completed pipe installation work is likely to result from withdrawal of sheeting, leave sheeting in place. Cut off sheeting 1.5 feet or more above crown of pipe. Remove trench supports within 5 feet from ground surface.

F. Unless otherwise shown on Drawings. Use one of the following trench zone backfills under pavement and to within one foot of edge of pavement. Place trench zone backfill in lifts and compact. Fully compact each lift before placement of next lift

1. Class I, II, or III or combination thereof :

   a. Place in maximum 12-inch thick loose layers.

   b. Compact by vibratory equipment to minimum of 95 percent of maximum dry density determined according to ASTM D 698.

   c. Moisture content within zero percent to 5 percent above optimum determined according to ASTM D 698, unless otherwise approved by Project Manager.

2. Cement-Stabilized Sand:

a. Maximum lift thickness determined by Contractor to achieve uniform placement and required compaction, but do not exceed 12 inches.

b. Compact by vibratory equipment to minimum of 95 percent of maximum dry density determined according to ASTM D 558.

c. Moisture content on dry side of optimum determined according to ASTM D 558 but sufficient for cement hydration.

3. Class IVA and IVB (Clay Soils):

a. Place in maximum 8-inch thick loose lifts.

b. Compaction by vibratory Sheepfoot roller to minimum of 95 percent of maximum dry density determined according to ASTM D 698.

c. . Moisture content within zero percent to 5 percent above optimum determined according to ASTM D 698, unless approved by Project Manager.

G. Unless otherwise shown on Drawings, for trench excavations not under pavement, random backfill of suitable material may be used in trench zone. This provision does not apply to HDPE storm sewers

1. Fat clays (CH) may be used as trench zone backfill outside paved areas at Contractor's option. When required density is not achieved, at any additional cost to City, rework, dry out, use lime stabilization or other approved methods to achieve compaction requirements, or use different suitable material.

2. Maximum 9-inch compacted lift thickness for clayey soils and maximum 12-inch lift thickness for granular soils.

3. Compact to minimum of 90 percent of maximum dry density determined according to ASTM D 698.

4. Moisture content as necessary to achieve density.

H. For electric conduits, remove form work used for construction of conduits before placing trench zone backfill.

3.10 MANHOLES, JUNCTION BOXES AND OTHER PIPELINE STRUCTURES

A. Below paved areas or where shown on Drawings, encapsulate manhole with cement stabilized sand; minimum of 2 foot below base, minimum 2 foot around walls, up to pavement subgrade or natural ground. Compact in accordance with Paragraph 3.09.F.2 of this Section

B. In unpaved areas, use select fill for backfill. Existing material that qualifies as select material may be used, unless indicated otherwise on Drawings. Deposit backfill in uniform layers and compact each layer as specified. Maintain backfill material at no less than 2 percent below nor more than 5 percent above optimum moisture content, unless otherwise approved by Project Manager. Place fill material in uniform 8-inch maximum loose layers. Compact fill to at least 95 percent of maximum Standard Proctor Density according to ASTM D 698.

C. For LDWL projects, encapsulate manhole with cement stabilized sand; minimum of 1 foot below base, minimum of 2 feet around walls, up to within 12 inches of pavement subgrade or natural ground. For manholes over water line, extend encapsulation to bottom of trench. Compact in accordance with Paragraph 3.09 F.2 of this Section.

3.11 FIELD QUALITY CONTROL

A. Test for material source qualifications as defined in Item 2221 – Excavation, Trenching, and Backfilling for Utilities (if utilized in this project).

B. Provide excavation and trench safety systems at locations and to depths required for testing and retesting during construction at no additional cost to City.

C. Tests will be performed on minimum of three different samples of each material type for plasticity characteristics, in accordance with ASTM D 4318, and for gradation characteristics, in accordance with Tex-101-E and Tex-110-E. Additional classification tests will be performed whenever there is noticeable change in material gradation or plasticity,or when requested by Project Manager.

D. At least three tests for moisture-density relationships will be performed initially for backfill materials in accordance with ASTM D 698, and for cement- stabilized sand in accordance with ASTM D 558. Perform additional moisture-density relationship tests once a month or whenever there is noticeable change in material gradation or plasticity.

E. In-place density tests of compacted pipe foundation, embedment and trench zone backfill soil materials will be performed according to ASTM D 1556, or ASTM D 2922 and ASTM D 3017, and at following frequencies and conditions.

1. For open cut construction projects and auger pits: Unless otherwise approved by Project Manager, successful compaction to be measured by one test per 40 linear feet measured along pipe for compacted embedment and two tests per 40 linear feet measured along pipe for compacted trench zone backfill material. Length of auger pits to be measured to arrive at 40 linear feet.

2. A minimum of three density tests for each full shift of Work.

3. Density tests will be distributed among placement areas. Placement areas are: foundation, bedding, haunching, initial backfill and trench zone.

4. The number of tests will be increased if inspection determines that soil type or moisture content are not uniform or if compacting effort is variable and not considered sufficient to attain uniform density, as specified.

5. Density tests may be performed at various depths below fill surface by pit excavation. Material in previously placed lifts may therefore be subject to acceptance/rejection.

6. Two verification tests will be performed adjacent to in-place tests showing density less than acceptance criteria. Placement will be rejected unless both verification tests show acceptable results.

7. Recompacted placement will be retested at same frequency as first test series, including verification tests.

8. Identify elevation of test with respect to natural ground or pavement.

F. Recondition, re-compact, and retest at Contractor's expense if tests indicate Work does not meet specified compaction requirements. For hardened soil cement with nonconforming density, core and test for compressive strength at Contractor's expense.

G. Acceptability of crushed rock compaction will be determined by inspection.

3.12 DISPOSAL OF EXCESS MATERIAL

A. Dispose of excess materials in accordance with requirements of Item 2227 – Waste Material Disposal (if utilized in this project).

END OF SECTION

ITEM 2401

DEWATERING AND DRAINAGE OF EXCAVATION

I. GENERAL

A. Scope

This section provides for furnishing all labor, materials, equipment, power, incidentals and for performing all operations necessary to dewater, drain, and maintain excavations and foundation beds as necessary for construction of structures and appurtenances. Maintain surface drainage, eliminate seepage from excavation or other work and protect work against rising waters and floods and repair of any resulting damage.

B. Contractor's Responsibility

Contractor shall have sole responsibility for dewatering systems and for all loss or damage resulting from partial or complete failure of protective measures, except as otherwise provided in the general and supplementary conditions of this manual.

C. Submittals

1. If requested, submit shop drawings and manufacturers data for proposed equipment and procedure. Do not start dewatering or other foundation drainage until the requested data has been submitted and reviewed.

2. Equipment Supplier: With submittals, provide the name of the supplier of well point or other foundation drainage equipment.

D. Related Work (if utilized in this project)

1. Division 2, Site Work

   a. Item 1541 - Trench Safety Systems

   b. Item 2220 - Structural Excavation and Backfill

II. MATERIALS

The necessary equipment and material for the dewatering and drainage systems shall be selected by contractor and submitted to the engineer for review.

III. EXECUTION

A. Dewatering Excavations

1. Furnish, install, operate, and maintain all necessary pumping for dewatering the various parts of the work and for maintaining free of water the foundations and such other parts of the work as required for construction operations and as required for inspections and safety.

2. Continue dewatering in all required areas until the concrete structure, the trench, the embankment, and scour protection have been completed for the excavation or to another designated level.

3. Provide a uniform diameter for each pipe drain run constructed for dewatering. Remove the pipe drain when it has served its purpose. If removal of the pipe is impractical, provide grout connections at 50-foot intervals and fill the pipe with clay grout or cement and sand grout when the pipe has served its purpose.

4. After completion of construction at the site, remove the drainage equipment and dispose of any material not needed.

B. Requirements for Well Points

1. Well points, where used, must be furnished, installed, and operated by a reputable contractor regularly engaged in this business and approved.

2. Submit the design of the well point system for review. Pre-drain by well point vacuum method.

3. Install sufficient piezometers to show that all trench excavation in sandy material is pre-drained prior to excavation.

4. Well points may be omitted for portions of underdrains or other trenches, only where auger borings and piezometers show that the soil is pre-drained by an exterior system.

C. Duration of Drainage

1. In areas where concrete is to be placed, carry out the foundation drainage, so that the required lowering of the water table will be effected prior to placing reinforcing steel. Keep foundation beds free from water to be same levels for 3 days after pouring concrete.

2. Operate pumps to keep each underdrain system drained to the approximate level of the top of the lowest pipe of the system until the removal or flooding of cofferdams.

D. Protection of Structures

Provide adequate protection for all structures to avoid damage to concrete.

E. Repair of Damage

Contractor shall have full responsibility for all loss and damage due to flood, rising water, or seepage in any part of the work. Repair any damage to partially completed work from these or other causes.

Std. 7/29/85
Revised 3/11/15

ITEM 2513

HOT-MIX ASPHALTIC CONCRETE PAVEMENT

I. GENERAL

This Item governs for hot-mix asphaltic concrete surfacing consisting of a base course, a leveling-up course, a surface course, or any combination of these courses; each course composed of a compacted mixture of mineral aggregate and asphaltic material and constructed on an approved subgrade, a subbase course, a base course, or in case of a bridge, on prepared floor slab. Construct in accordance with these specifications and in conformity with lines, grades, compacted thickness, and typical cross-sections shown on Plans and/or Exhibits or described in preceding special provision.

II. MATERIALS

A. Mineral Aggregate: Composed of a course aggregate, a fine aggregate, and a mineral filler, and if approved by an Engineer a suitable mineral admixture which may or may not increase or decrease the quantity of asphaltic cement in mixture. Exact proportion of admixture, if approved to be determined by Engineer. Submit samples of coarse aggregate, fine aggregate, and mineral filler and test in accordance with prescribed methods. Approval of both materials and source of supply must be obtained prior to delivery of any material.

B. Coarse Aggregate: Consists of shell (max. 40% by weight), slag, or limestone, or a mixture therefore as hereinafter specified, of uniform quality throughout and free from dirt, organic, or other injurious matter occurring either freely in material or as a coating on aggregate. Abrasion of slag or limestone from which coarse aggregate is made of not more than 35 when subjected to Los Angeles Abrasion Test (AASHTO-96). Los Angeles Abrasion Test for shell, not more than 50 (AASHTO, T-96).

C. Fine Aggregate: Consists of sand or a combination of sand and stone, shell screenings, or slag screenings. Sand composed of sound, durable stone particles, free from loam or other injurious foreign matter. Screenings of same or similar materials as specified for coarse aggregate. Sand or combination of sand and screenings to meet the following requirements when tested by standard laboratory methods:

Percent by Weight	
Passing No. Sieve	100
Passing No. 200 Sieve	10-30

The plasticity index of that part of the fine aggregate passing the No. 40 sieve to be not more than 6.

D. Mineral Filler: Consists of thoroughly dry stone dust, slate dust, oyster shell dust, Portland cement, or other mineral dust approved in writing. Free from foreign, deleterious, and other injurious matter. Meet following grading requirements when tested by standard laboratory methods.

Percent by Weight	
Passing a No. 30 Sieve	95-100%
Passing a No. 80 Sieve	75%
Passing a No. 200 Sieve	55%

E. Asphalt: Grade of asphalt as designated by Engineer. If more than one type of asphaltic concrete mixture is specified for project, only one grade of asphalt will be required for all types of mixtures. Unless otherwise noted in the plans/exhibits asphaltic placement and or repair will consist of 8-inch thick asphalt base, Grade 2, PG-64 per TXDOT Standard Specification 292. Surface course asphaltic placement and or repair will consist of 2-inch thick surface course Type "D" per TXDOT Standard Specification 340.

Asphaltic materials, including tack coat, to meet requirements of the Item, "Asphalt, Oils, and Emulsions," of the Texas Highway Department Standard Specifications for Construction of Highways, Streets and Bridges, 2004 Edition or most current.

F. Paving Mixture: To consist of a uniform mixture of coarse aggregate, fine aggregate, asphaltic material and mineral filler if required.

Grading of each constituent such as to produce, when properly proportioned, a mixture conforming to limitations for grading for type specified. Exact proportions of each constituent producing total aggregate within these limits to be directed, and to conform to the requirements of Article 340.3, "Paving Mixtures," of the Texas Highway Department Standard Specifications for Construction of Highways, Streets and Bridges, 2004 Edition or most current.

G. Variation of percentage of bitumen in any mixture not more than one-half of one percent from proportion established by Engineer.

When required samples of hot mixture may be taken from trucks or from finished pavement. Determine minimum weight of test specimen in grams by multiplying 3,000 by maximum size aggregate in inches. Variation of specimen from grading proportions specified for mix, when tested by standard methods (in which benzol may be used as solvent), of not more than 5 percent.

III. EXECUTION

A. Proportions of various materials entering into asphaltic mixture as directed and in accordance with these specifications. Engineer or his authorized representative to have access at any time to all parts of paving plant. Use satisfactory equipment and construction methods as hereinafter specified.

B. Store or stockpile separately various sizes of mineral aggregate as received. Feed various sizes of mineral aggregate to dryer by means of mechanical device that will give a uniform and constant feed of each size incorporated to control temperature and grading of mineral aggregate.

C. Dry mineral aggregate in such manner that finer particles will not escape with furnace gases. Heat aggregate in a suitable apparatus which provides continuous agitation during heating. Provide efficient and positive control of temperature so that aggregate is not damaged and mixture produced has a temperature between 250 degrees F and 375 degrees F. Provide recording thermometer which will record temperature of aggregate as it leaves dryer. Equip recording thermometer with a double-pen in order to record both temperature of rock and temperature of asphalt incorporated in batch. Record temperatures on 24-hour charts. Furnish dryer or dryers of sufficient size to dry and heat amount of aggregate required to keep plant in continuous operation.

D. Bin sizes and screening capacity sufficient to screen and store amount of aggregate required to properly operate plant and keep plant in continuous operation at full capacity. Bins to continuous operation at full capacity. Bins to contain sizes of aggregate as specified in Article 340.4. "Equipment." Sub-article, "Screening and Proportioning," of the Texas Highway Department Standard Specifications for construction of Highways, Streets and Bridges, 2004 Edition or most current.

Provide bins with tight cut-off gates so that there is no leakage of mineral aggregate or mineral filler into weigh box. Weigh box for mineral aggregate of sufficient capacity to hold a complete batch of aggregate and mineral filler without wasting or leveling by hand, and so designed with opening in top that, if in charging, an excess of one size of mineral aggregate is introduced into box, it may be removed by operator. Provide weigh box with a close fitting and quick operating cut-off gate so that there is no leakage of mineral aggregate into mixer.

E. Scales: Scales for weighing mineral aggregate and asphaltic material shall equal the weighing equipment used at stationary commercial asphaltic concrete plants as approved by the Engineer.

Scales of multi-beam type to have sufficient weighing beams to weigh each grade of aggregate separately and also filter dust separately. Furnish scales with tare beam for balancing. Equip beam scales with a tell-tale dial indicator of springless dial type indicating over and under load of at least 50 pounds. Scales that are not accurate within 4 pounds per 1,000 pounds net load will be considered unsatisfactory. In case vibration of plant interferes with accurate weighing, insulate scales satisfactorily against shock or vibration.

F. Provide ample asphalt cement storage to meet requirements of Plans and/or Exhibits. Heat asphalt cement in storage by steam coils, absolutely tight to prevent leakage of moisture into asphalt. Temperature of steam for heating not in excess of 400 degrees F. No direct fire heating of asphalt permitted. Agitation of asphalt with steam or air not permitted.

Provide steam heating system of type and capacity as to insure maintaining asphalt cement at a uniform draw-off temperature at asphalt cement bucket of between 275 degrees F to 375 degrees F. Maintain temperature with an efficient and positive control of heat at all times. Any asphalt cement heated above 375 degrees F, either before or during mixing with mineral aggregate, will be rejected.

Use quick cut-off type draw-off valve at asphalt cement bucket that will not leak any asphalt into bucket after required weight of asphalt cement has been drawn. Asphalt supply line of circulating type, and equipped with recording thermometer indicating temperature of asphalt a draw-off valve. Recording thermometer may be combined with recording thermometer used in recording temperature of aggregate by using a double-pen recorder.

Asphalt cement weigh bucket of type from which asphalt will flow into mixer for approximately full width of mixer so as not to deposit asphalt cement in one place in mixer. Scales for weighing asphaltic cement of springless dial type arranged for quick adjustment at zero to provide for change in tare. Provide pointer to indicate weight of asphalt cement required in one batch.

G. Mixer of twin-pug-mill type and capacity of not less than 3,000 pounds in single batch. Number and position of blades such as to give a uniform and complete circulation of batch in mixer from center to four ends of mixer arms and back to center. Mixers which tend to segregate mineral aggregate or fail to secure thorough and uniform mixing with asphalt cement and filler dust will not be used. Determination of thorough and uniform mixing will be made by mixing standard

batch for required time and then dumping batch and taking samples form different parts of batch is uniform throughout, or otherwise mixer will be rejected.

Provide mixers with an automatic time lock on discharge gates of mixer and weight box and lock for a period of 45 seconds after all of mineral aggregate has been introduced into mixer. When discharged, mixture to have a temperature of 300 degrees F to 375 degrees F. Dump door or doors of mixer to be tight to dry mineral aggregate or dust so that there is no spilling from pug mill. In introducing batch into mixer, introduce mineral aggregate first, then thoroughly mix for a period of five to ten seconds before asphaltic cement is added. Continue mixing for required time, or longer if necessary to produce a mixture of uniform consistency.

H. Tack Coat: Thoroughly clean surface of base or surface of concrete bridge, as applicable, by brooming with wire brushes before asphaltic surface mixture is laid, when tack coat is shown, or if directed, give base an application of cut back asphalt applied as directed with an approved sprayer and at rate of application of 0.05 to 0.15 gallons per square yard. Cut-back asphalt as specified under Article II, Paragraph E, or made by combining 50 percent material (as specified) and 50 percent gasoline.

I. Laying Materials

1. Construct pavement on previously completed and approved subgrade, base, existing pavement, bituminous surface or in case of a bridge, on prepared floor slab.

2. Place no asphaltic mixture or tack coat when air temperature is below 45 degrees F and is falling. Asphaltic mixture or tack coat may be placed after air temperature is above 40 degrees F and is rising, provided temperature is taken in shade away from artificial heat. Place no asphaltic mixture or tack coat when weather conditions, in opinion of Engineer, are unsuitable.

3. Haul asphaltic concrete mixture, heated and prepared as specified, to site of work in tight vehicles previously cleaned of all foreign materials and, if considered necessary, covered with canvas of sufficient size to protect entire load. Arrange dispatching of vehicle so that all material delivered may be placed and receive its initial rolling in daylight. Lay mixture only on approved base course, which has been tack coated as previously specified and free from all foreign materials. Paint contact surfaces of curbs and structures and all joints with thin uniform coating of cut-back or emulsified asphalt as required for tack coating. Lay mixture at temperature of 250 degrees F to 375 degrees F and spread and compact,

using an approved finishing machine. Use finishing machine capable of producing finished surface that conforms to required typical sections and surfaces tests. Areas nor accessible for finishing machine may be hand spread and shaped when approved.

4. Use approved finishing machine of screeding and troweling type. Forms adequate to control lateral thrust due to rolling. If a finishing machine designed to run on forms is used, operate it on header curb, steel forms, or rigid steel faced forms approved by Engineer. Set forms to line and grade.

5. Oil or saturated solution of hydrated lime may be used for lubricating shovels and trucks to facilitate handling of asphaltic materials. Use of an excessive amount of either material not permitted.

6. Adjacent to flush curbs, gutters, liners, and structures, finish mix uniformly high so that when compacted it will be slightly above edge of curb or flush structure.

7. When Plans and/or Exhibits require application of a non-skid surface of asphaltic concrete pavement, spread Type "B", "Type "C", "Type "D" or Type "E" mix, as specified, so that after lightly rolling, it has a finished thickness of approximately 3/8-inch less than completed thickness of pavement shown. After this course has been laid, spread mixture specified as Type "F" with sufficient thickness so that, after receiving ultimate compression, compacted pavement complies with requirements of typical cross-sections shown, but in no case will weight of Type "F" mixture be less than 35 pounds nor more than 50 pounds per square yard of surfacing.

8. While still hot, and as soon as it will bear roller without undue displacement or hair cracking, compress surface thoroughly and uniformly with an acceptable power-driven 3-wheel roller weighing not less than 10 tons. Weight on two rear wheels of roller obtained by power-driven tandem roller weighing not less than eight tons.

   Rolling shall start longitudinally at the sides and proceed toward the center of the pavement, over- lapping on successive trips by at least one-half of the width of the rear wheels. Alternate trips of the roller shall be slightly different in length. If necessary, the pavement shall then be subject to diagonal rolling in each direction with a tandem roller, the second diagonal crossing the lines of the first.

   Rolling shall be continued until no further compression can be obtained and all roller marks are eliminated, and at a rate of not more than 20-tons of mixture per hour for each roller used.

The motion of the roller shall at all times be slow enough to avoid displacement of the hot mixture. Any displacement occurring as a result of reversing the direction of the roller, or by any other cause, shall at once be corrected by the use of rakes and of fresh mixture where required. The roller must not stand on the completed pavement which has not cooled to normal atmospheric temperature. To prevent adhesion of the surfacing mixture to the roller, the wheels shall be kept properly moistened with water but an excess of water will not be permitted.

The roller's drive wheel shall be ahead of the tiller wheel at all times during compaction. If a vibratory roller is used for compaction, a very low amplitude is to be used and the roller should be vibrating only when it is moving.

9. Time Limit vs Temperature

Cessation Requirements
Recommended Minimum Laydown Temperature

Base Temp Degrees F	½"	¾"	1"	1½"	2"	3" & **Greater**
20-32	---	---	---	---	---	285*
+32-40	---	---	---	305	295	280
+40-50	---	---	310	300	285	275
+50-60	---	310	300	295	280	270
+60-70	310	300	290	285	275	265
+70-80	300	290	285	280	270	265
+80-90	290	280	275	270	265	260
+90	280	275	270	265	260	255
Rolling time, Minutes	4	6	8	12	15	15

* Increase by 15 degrees when placement is on base or subbase containing moisture.

Base temperature is the temperature of the layer (Previous mat or base) on which the mat is placed.

The above chart gives a time limit in which the mat needs to be completely rolled for density before the mat cools to 175 degrees F. This temperature was selected as about the temperature below which rolling produces little compaction. The recommendations are, in effect, the "worst" conditions. These are only minimum requirements.

10. Along curbs, headers, and similar structures, and at places not accessible to roller, or in such positions as will not allow thorough compaction with roller, compact mixture thoroughly with lightly oiled tamps.

11. Surface of pavement after compression to be smooth and true and conform to line, grade and typical cross-sections shown. No deviation in excess of 1/8-inch per foot from nearest point of contact when surface is tested with a standard 10-foot straight-edge laid parallel to center line of roadway. Maximum ordinate measured from face of straight-edge not in excess of ¼-inch at any point. Immediately correct any areas of surface not meeting these requirements. Roll mixtures until course is unyielding and true to established grade and cross-section.

12. Place surface course as nearly continuous as possible. Allow roller to pass over unprotected end of freshly laid mixture only when laying of course is discontinued for such length of time as to permit mixture to become chilled. In such cases, when work is resumed, material laid must be either cut back so as to produce a slightly beveled edge for full thickness of course or make a suitable lap joint.

    Remove old material which has been cut away and lay new mix against fresh cut. If desired, a stout rope may be stretched across pavement where joint is to be made. When work is resumed, cut materials laid back to rope. Remove altogether with surplus material, and lay fresh mix against joint thus formed.

    Hot smoothing irons may be used for sealing joints, but in such cases exercise extreme care to avoid burning surface.

13. Except in an emergency, or where shown, open no portion of finished wearing course to traffic until twelve hours after completion of rolling.

Std. 8/12/85
Revised 07/24/14

ITEM 2515

CONCRETE PAVEMENT

I. GENERAL

A. This Item governs for construction of concrete pavement for roadways, driveways, turnouts, and concrete curbing. Unless specified otherwise in proceeding Special Provision or on Plans and/or Exhibits, pavement to conform to residential requirements.

B. Related Work (if utilized in this project)

1. Item 3310 - Concrete

2. Item 3200 - Concrete Reinforcement

II. MATERIALS

A. Concrete: Item 3310 - Concrete: Class as shown on Plans and/or Exhibits or in Proposal.

B. Reinforcing Steel: Item 3200 - Concrete Reinforcement: Bar size and type as shown on Plans and/or Exhibits.

C. Expansion Joint Material: To be in accordance with section and location as shown on Plans and/or Exhibits.

1. Fillers

a. Pre-molded

1) Asphalt filler board per ASTM D994-71.

2) Premolded joint material per ASTM D1751-73.

b. Wood

1) Redwood: Boards shall be heartwood and shall be free from sapwood, knots, clustered birdseye, checks & splits.

Maximum weight per cubic foot when oven dried to constant weight to be 30 pounds.

2) Other Woods: Cypress, Gum, Southern Yellow Pine, or Douglas Fir Timber may be used with prior approval of the Engineer. With the exception of Cypress, all boards shall have a creosote or penta chlorophenol treatment of 6 pounds per cubic foot. Maximum weight per cubic foot when oven dried shall not be greater than 30 pounds per cubic foot.

c. Joint Sealing Material

1) Per ASTM D1190-74. Also to be used in other types of joints as required.

2) Load Transmission Devices: To be of type and size as shown on Plans and/or Exhibits.

3) Metal Installing Devices: Such as welded wire bar chairs, bar stakes, marker channels, channel caps, deformed metal strips, etc. shall be as shown on Plans and/or Exhibits.

D. Forms

1. Pavement

a. Wood Forms: (Used only in residential construction to be 2X material, free from warps, bends, and kinks, and sufficiently true to provide a straight edge on concrete). Use precautionary methods to prevent leakage of mortar through or under side forms. Top of each form section, when tested with a straight edge, to conform to the requirements specified for the surface of completed pavement.

b. Metal Forms: Use metal forms of approved shape and section. Preferred depth of form to be equal to required edge thickness of pavement. Forms with depths greater or less than 1-inch of pavement thickness may be used. Forms with less depth than pavement thickness to be brought to required depth by securely attaching wooden planks of approved section and size to bottom of form. Use form section at least 10-feet in length, and provide for staking in position with not less than 3 pins. Use forms of adequate strength to withstand machine loads without visible springing or settlement. Use forms free from warps, bends and kinks, and sufficiently true to provide a straight edge on concrete.

Top of each form section, when tested with a straight edge, to conform to the requirements specified for the surface of the completed pavement. Use flexible or curved forms of wood or metal of proper radius for curves of 200-foot radius or less.

c. Slip Forms: Slip form equipment to be equipped with a longitudinal transangular finishing float adjustable to crown and grade. Float to extend across pavement to the side forms and/or slab.

2. Curbs

a. Wood or Metal: Wood or metal curb forms to be of approved section, straight and free of warp. Outside curb forms to have a depth at least ½- inch greater than height of curb. Rigidly attach inside curb forms (if desired) to outside forms.

b. Machine Laid: Equipment to conform to the requirements as specified under Article 111 Execution. Use flexible or curved forms of wood or metal of proper radius for curves but not to exceed radius recommended by curb machine manufacturer.

E. Metal Supports: Supports for reinforcing steel to be metal of approved shape and size, and spacing to conform to details shown on Plans and/or Exhibits.

F. Materials for Curing

1. Burlap: Mats to be in good condition, clean, and free of any substance which would have deleterious effect on concrete.

2. Cotton Mats: Mats to be in good, clean, and free of any substance which would have deleterious effect on concrete.

3. Waterproof Paper: Per ASTM C171-69.

4. Membrane Curing Compounds: Conform to ASTM C309-74.

5. White Polyethylene Sheeting: Sheet having thickness not less than 4 mils (.004-inch).

G. Grouting

1. Material and mixtures for grouting curb dowels.

a. Proportion by weight.

b. One part Portland cement, Type I or Type II.

c. One part clean, sharp sand.

d. Seven-tenths part nonshrinking grout aggregate.

e. No more than 5½ gals. water per sack cement.

2. Other: Use mixture by weight of one part Portland cement and two parts sand for general purposes. If space to be grouted is less than one inch and is impossible to tamp grout, use one-to-one mix. Where space to be filled with grout is large, use original concrete mixture. Use stiff mixture for grout to be tamped, produced by prolonged mixing. To obtain stiff grout, mix mortar using amount of water required to thoroughly mix ingredients, then continue mixing without additional water until grout is stiff enough to be compacted by tamping when placed. For grouting blockouts for embedded pipes and similar items, use grout to which 5 pounds of nonshrinking grout aggregate per sack of cement has been added.

III. EXECUTION

A. Subgrade: Excavate, shape, and compact subgrade to grades, sections and densities shown on Plans and/or Exhibits. Maintain drainage of subgrade at all times. Test subgrade section with an approved template, operated and maintained by Contractor. Wet down subgrade sufficiently in advance of placing pavement. No pavers, batch trucks, or other equipment to be permitted between forms during paving operations.

B. Wood and Steel Forms

1. Setting: Set forms on compacted subgrade, cut true to grade on that entire form section is supported by subgrade. Stake metal form sections with at least 3 pins per section, with a pin on each side of every joint. Adequately stake wood form sections to prevent bows in form and to keep form sections to grade. Join form sections to prevent displacement. Clean and oil forms with form oil each time they are used. Set forms to line and grade for at least 200-feet ahead of mixer. Check conformity of alignment and grade immediately prior to placing concrete.
2. Removal: Leave forms in place for at least 12 hours. Remove forms without injury to concrete. Immediately repair damage resulting from form removal. Point up all exposed honeycombed areas with approved mortar. As soon as curb forms are removed, backfill behind curbs with approved material and compact to 90 percent Standard Proctor density.

C. Slip Forms: Equipment to be provided with traveling side forms of sufficient dimensions, shape and strength to support concrete laterally for sufficient length of time during placement to produce pavement of required cross-section. Concrete to be distributed uniformly into final position by slip form paver and horizontal deviation in alignment of edges not to exceed 1¼-inches from established alignment.

D. Concrete Placing and Handling - Wood and Steel Forms

1. Deposit concrete on subgrade in such manner as to require as little rehandling as possible. Use shovels for hand spreading of concrete. Use of rakes will not be permitted. Place concrete in a rapid, continuous operation.

2. Consolidate all concrete placed for pavement by an approved mechanical vibratory unit designed to vibrate the concrete internally. A vibratory member equipped with synchronized vibratory units to extend across pavement practically to, but not to come in contact with, side forms. Space separate vibratory units at sufficiently close intervals to provide uniform vibration and consolidation to entire width of pavement. Mount mechanically operated with vibrators in such manner as not to come in contact with forms or reinforcement and not to interfere with transverse or longitudinal joints.

3. Furnish hand-manipulated mechanical vibrators in number required for provision of proper consolidation of concrete along forms, at joints, and in areas not covered by mechanically controlled vibrators.

E. Concrete Placing and Handling - Slip Forms

1. Concrete, for full paving width, to be effectively consolidated by internal vibration, with transverse vibrating units, or with a series of longitudinal vibrating units. Internal vibration to mean vibration by means of vibrating units loaded within the specified thickness of pavements section and at a minimum distance ahead of screed equal to pavement thickness.

2. When concrete is being placed adjacent to an existing pavement, that part of the equipment which is supported on the existing pavement to be equipped with protective pads on crawler tracks or rubber-tired wheels, offset to run a sufficient distant from edge of pavement to avoid breaking or cracking pavement edge.

3. After concrete has been given a preliminary finish by finishing devices incorporated in the slip-form paving equipment, surface of the fresh concrete to be checked with a straightedge to tolerances and finish required.

F. Concrete Placing and Handling - Wood or Metal Formed Curb: Curbing may be poured monolithic with pavement or may be added to pavement surface at a latter time. Place curb dowel bars while pavement is plastic. Provide expansion joint and contraction in curb opposite each expansion joint or contraction joint in pavement and at each curb inlet. Use same expansion joint material as used in pavement. Cut weakened plane joints with an approved grooving tool opposite each joint in pavement, as required. Apply finish coat of mortar on exposed surfaces of curb. Mortar composed of one part Portland cement and two parts sand. Apply mortar with a template or "mule" conforming to plan curb dimensions. Steel trowel finish all exposed surfaces of curb and brush to a smooth, uniform surface.

G. Concrete Placing and Handling - Machine-Laid Curb

1. Lay curbs by an extrusion-type machine. Immediately prior to placing of the curb, thoroughly clean the previously approved foundation.

2. Grade and alignment for top of curb to be as shown on Plans and/or Exhibits. The forming tube of the extrusion machine to be readily adjustable vertically curing the forward motion of the machine, to provide required variable height of curb necessary to conform to the established grade line.

3. Feed concrete into machine in such a manner and at such consistency that the finished curb will present a well-compacted mass with a surface free from voids and honeycomb and tree to established shape, line, and grade.

4. Perform any additional surface finishings specified and/or required immediately after extrusion. Construct joints as specified or as shown on Plans and/or Exhibits.

H. Finishing

1. Nonresidential Pavements: Finish concrete pavement by power-driven transverse finishing machines and longitudinal finishing machines. Provide transverse finishing machine with two screeds accurately adjusted to crown of pavement. Ride transverse finishing machine on forms, so designed and operated as to strike off and consolidate concrete. Make at least two trips over each area, or more if necessary. Provide longitudinal finishing machine with a longitudinal float not less than 10-feet in length, adjusted to a true plane. Ride longitudinal finishing machine on forms, so designed and operated as to finish pavement to required grade. Equip finishing machines with rubber tires to roll on concrete pavement. Just before concrete becomes non plastic, belt pavement surface with a canvas

or canvas-rubber composition belt of two-ply or four-ply construction, not less than 6-inches nor more than 10-inches wide, and at least 2-feet longer than width of pavement. Use short transverse strokes and rapid advance longitudinally to produce uniform surface of gritty texture.

2. Residential Pavements: Concrete pavement may be finished by machine or by hand. If by machine see Paragraph H1 above. If finished by hand thoroughly vibrate concrete around reinforcement and embedded fixtures. Tamp concrete with a tamping template made of 4-inch by 10-inch lumber or equivalent metal section at least 2-feet longer than width of pavement to conform to crown section of pavement. If wood tamping template is used it is to have a steel face not less than 3/8-inch in thickness. Strike off concrete with a strike-off screed made of 4-inch by 10-inch lumber or equivalent metal section at least 2-feet longer than width of pavement and conforming to crown section of pavement. Move strike-off screed forward with combined transverse and longitudinal motion in direction work is progressing, maintaining screed in contact with forms, and maintaining slight excess of materials in front of cutting edge. Use a longitudinal float not less 10-feet in length to level surface. Prior to concrete becoming nonplastic, belt pavement surface with canvas or canvas-rubber composition belt of two-ply or four-ply construction not less than 6 inches or more than 10-inches wide and at least 2-feet longer than width of pavement. Use short transverse strokes and rapid advance longitudinally to produce uniform surface of gritty texture.

3. Slip Form: If this method of construction is used all requirements of this Technical Specification in regard to subgrade and pavement tolerances, pavement depth, alignment, consolidation, finishing, workmanship, etc. to be met. Equip "slip form paver" with longitudinal triangular finishing float adjustable to crown and grade. Extend float across the pavement almost to the side form and/or the edge of slab.

I. Surface Tests

1. Test entire surface before initial set and correct irregularities or undulations to bring surface within requirements of following test, then finish.

2. Place approved 10-foot straight edge parallel to center of roadway so as to bridge any depressions and touch all high spots. Ordinates measured from face of straight edge to surface of pavement not to exceed 1/16-inch per foot from nearest point of contact, and in any case maximum ordinate to 10-foot straight edge to be no greater than 1/8-inch.

J. Joints: Place joints of types shown on Plans and/or Exhibits at required locations and at spacing shown.

1. Construction Joints: Place transverse construction joint when necessary to stop concrete placement for period of more than 30 minutes. Length of slab to be not less than 10-feet from nearest joint of complete slab. If closer than 10-feet Contractor to remove concrete from between forms back to nearest normal joint and place construction joint at bulkhead. Use longitudinal keyed construction joints at pavement edges where required.

2. Expansion Joints: Place expansion joint at radius points of curb returns for cross-street intersections, or as shown on Plans and/or Exhibits. Do not use boards less than 6-feet in length. When pavement is 24-feet or less in width, use not more than two lengths of board. Secure pieces to form straight joint. Shape board filler accurately to cross- section of concrete slab. Use premolded joint filler, accurately shaped, in curb section. Load transmission devices to be of type and size shown on Plans and/or Exhibits. Use joint sealing compound as required.

3. Contraction Joints: Make straight and place at spacings shown on Plans and/or Exhibits. Place asphalt-coated smooth dowels accurately and normal to joint. Tool edges of groove and seal with joint sealing compound.

4. Longitudinal Weakened Plane Joints: Form longitudinal weakened plane joint by an approved continuous metal shield or an asphalt impregnated felt strip placed continuously behind longitudinal float by a machine of the flex plane type.

K. Protection and Curing: Following requirements apply on alternate methods of curing. Cover concrete with burlap or cotton mats when concrete has hardened sufficiently to prevent marring of surfaces and keep wet continuously for 72 hours. Apply curing compound immediately after free water has disappeared and at rate specified. Keep polyethylene sheets or membrane curing film in place and intact for five days in lieu of 72 hours of curing. Cure concrete curbs and gutters to prevent checking while setting. After each day's run barricade street. No wheeling will be allowed on concrete during curing period. Do not open pavement to traffic until concrete is at least 7 days old. Clean off pavement and seal joints before opening pavement to any traffic.

L. Penalty for Deficient Concrete Pavement Thickness: It is the intent of this specification that the concrete pavement be constructed in strict conformity with the thickness and typical sections shown on the Plans and/or Exhibits. Where any such pavement is found not so constructed, the following rules relative to adjustment of payment for acceptable concrete pavement and to the replacement of faulty concrete pavement shall govern.

1. Pavement Thickness: The concrete pavement will be core drilled by a testing lab prior to final acceptance. The thickness of the pavement will be determined by measurement of the cores. At such points as the Engineer may select in each unit, one core will be taken for each 1000 square yards of concrete pavement, or fraction thereof, in the unit. However, a minimum of four cores are required for any pavement area. If the core so taken is not deficient more than 0.25-inch, full payment shall be made and the cores will be paid for by the Owner. If the core is deficient in thickness by more than 0.25-inch but not more than 0.5-inch, two additional cores will be taken from the area represented and the average of the three cores determined. If the average measurement of these three cores is not deficient more than 0.25-inch from the plan thickness, full payment will be made. If the average thickness of the three cores is deficient more than 0.25-inch, the sections having such deficiencies shall be removed and the concrete pavement shall be replaced to the specified plan depth.

2. No additional payment over Contract unit price to be made for pavement of thickness exceeding that required by Plans and/or Exhibits.

3. Additional 6-inch cores required to determine area of deficient thickness to be paid for by Contractor.

Std. 8/12/85
Revised 11/02/15

ITEM 2526

CONCRETE CURB, GUTTER, CURB AND GUTTER

I. GENERAL

A. This Item shall govern for curb, gutter, combined curb and gutter, with or without reinforcing steel, composed of Portland cement concrete constructed on approved subgrade, foundation material or finished surface in accordance with the lines and grades established by the Engineer and in conformance with details shown in Plans and/or Exhibits.

As used in this Item, the word "curb" refers to concrete curb, concrete gutter, and combined concrete curb and gutter.

B. Related Work (if utilized in this project)

1. Item 3310 – Concrete

2. Item 3200 – Concrete Reinforcement

II. MATERIALS

A. Item 3310 – Concrete: Class as shown on Plans and/or Exhibits or in proposal.

B. Reinforcing Steel

Item 3200 – Concrete Reinforcement: Bar size and type as shown on Plans and/or Exhibits.

C. Expansion Joint Material

To be in accordance with section and location as shown on Plans and/or Exhibits.

1. Fillers

Pre-molded

2. Asphalt filler board per ASTM D994-71.

3. Pre-molded joint material per ASTM D17151-73.

4. Wood:

a. Redwood: Boards shall be heartwood and shall be free from sapwood, knots, clustered birds-eye, checks, and splits. Maximum weight per cubic foot when oven dried to constant weight to be 30 pounds.

b. Other Woods: Cypress, Gum, Southern Yellow Pine, or Douglas Fir Timber may be used with prior approval of the Engineer. With the exception of Cypress, all boards shall have a creosote or penta chlorophenol treatment of 6 pounds per cubic foot. Maximum weight per cubic foot when oven dried shall not be greater than 30 pounds per cubic foot.

D. Forms

1. Curbs

a. Wood or Metal: Wood or metal curb forms to be of approved section, straight and free of warp. Outside curb forms to have a depth at least ½-inch greater than height of curb. Rigidly attach inside curb forms (if desired) to outside forms.

b. Machine Laid: Equipment to conform to the requirements as specified under ARTICLE III EXECUTE. Use flexible or curved forms of wood or metal of proper radius for curves but not to exceed radius recommended by curb machine manufacturer.

E. Materials for Curbing

1. Burlap: Mats to be in good condition, clean and free of any substance which would have deleterious effect on concrete.

2. Cotton Mats: Mats to be in good, clean and free of any substance which would have deleterious effect on concrete.

3. Waterproof Paper: Per ASTM C171-69

4. Membrane Curing Compounds: Conform to ASTM C309-74.

5. White Polyethylene Sheeting: Sheet having thickness not less than 4 mils (.004-inch).

F. Grouting

1. Material and mixtures for grouting curb dowels.

a. Proportion by weight.

b. One part Portland cement, Type I or Type II.

c. One part clean, sharp sand.

d. Seven-tenths part non-shrinking grout aggregate.

e. No more than 5½ gals. water per sack cement.

2 Other: Use mixture by weight of one part Portland cement and two parts sand for general purposes. If space to be grouted is less than 1-inch and is impossible to tamp grout, use one-to-one mix. Where space to be filled with grout is large, use original concrete mixture. Use stiff mixture for grout to be tamped, produced by prolonged mixing. To obtain stiff grout, mix mortar using amount of water required to thoroughly mix ingredients, then, continue mixing without additional water until grout is stiff enough to be compacted by tamping when placed. For grouting blockouts for embedded pipes and similar items, use grout to which 5 pounds of non-shrinking grout aggregate per sack of cement has been added.

III. EXECUTION

A. Subgrade

Excavate, shape and compact subgrade to grades, section, and densities shown on Plans and/or Exhibits. Maintain drainage of subgrade at all times. Test subgrade section with an approved template, operated and maintained by Contractor. Wet down subgrade sufficiently in advance of placing pavement. No pavers, batch trucks, or other equipment to be permitted between forms during paving operations.

B. Concrete Placing and Handling – Wood or Metal Formed Curb

Curbing may be poured monolithic with pavement or may be added to pavement surface at a later time. Place curb dowel bars while pavement is plastic. Provide expansion joint and contraction in curb opposite each expansion joint or contraction joint in pavement and at each curb inlet. Use same expansion joint material as used in pavement. Cut weakened plane joints with an approved grooving tool opposite each joint in pavement, as required. Apply finish coat of mortar on exposed surfaces of curb. Mortar composed of one part Portland cement and two parts sand. Apply mortar with a template or "mule" conforming to plan curb dimensions. Steel trowel finish all exposed surfaces of curb and brush to a smooth, uniform surface.

C. Concrete Placing and Handling – Machine-Laid Curb

1. Lay curbs by an extrusion-type machine. Immediately prior to placing of the curb, thoroughly clean the previously approved foundation.

2. Grade and alignment for top of curb to be as shown on Plans and/or Exhibits. The forming tube of the extrusion machine to be readily adjustable vertically curing the forward motion of the machine, to provide required variable height of curb necessary to conform to the established grade line.

3. Feed concrete into machine in such a manner and at such consistency that the finished curb will present a well-compacted mass with a surface free from voids and honeycomb and tree to established shape, line, and grade.

4. Perform any additional surface finishings specified and/or required immediately after extrusion. Construct joints as specified or as shown on Plans and/or Exhibits.

D. Finishing

After the concrete has been struck off and after it has become sufficiently set, the exposed surfaces shall be thoroughly worked with a wooden float. The exposed edges shall be rounded by the use of an edging tool to the radius indicated on Plans and/or Exhibits. Unless otherwise specified on the Plans and/or Exhibits, when the concrete has become sufficiently set, the inside form for curbs shall be carefully removed and surface shall be plastered with a mortar consisting of one part of Portland cement and two parts fine aggregate. The mortar shall be applied with a template made to conform to the dimensions as shown on Plans and/or Exhibits. All exposed surfaces shall be brushed to a smooth and uniform surface.

For extruded concrete construction, the concrete shall be placed by an extrusion machine approved by the Engineer. When placement is directly on subgrade or foundation materials the foundation shall be hand-tamped and sprinkled if considered necessary by the Engineer. If the concrete is placed directly on the surface material or pavement, such surface shall then be coated with an approved adhesive or other coating as specified at the rate of application shown.

E. Surface Tests

1. Test entire surface before initial set and correct irregularities or undulations to bring surface within requirements of following test, then finish.

2. Place approved 10-foot straight edge parallel to center of curb so as to bridge any depressions and touch all high spots. Ordinates measured from face to straight edge to surface of pavement not to exceed $^{1}/_{16}$-inch per foot from nearest point of contact, and in any case maximum ordinate to 10-foot straight edge to be no greater than c-inch.

F. Joints

Curbs, gutters, and curb and gutters shall be placed in sections of 50-feet maximum length unless otherwise shown on the Plans and/or Exhibits. Joints shall be constructed at such locations and of the type as directed and specified on the Plans and/or Exhibits.

G. Protection and Curing: Following requirements apply on alternate methods of curing. Cover concrete with burlap or cotton mats when concrete has hardened sufficiently to prevent marring of surfaces, and keep wet continuously for 72 hours. Apply curing compound immediately after free water has disappeared and at rate specified. Keep polyethylene sheets or membrane curing film in place and

intact for five days, in lieu of 72 hours of curing. Cure concrete curbs and gutters to prevent checking while setting. After each day's run, barricade street. No wheeling will be allowed on concrete during curing period. Do not open pavement to traffic until concrete is at least 7 days old. Clean off curb and seal joints before opening pavement and curb to any traffic.

SPECIAL PROVISION NO. 1

TO

SPECIFICATION ITEM 2555 – WATER PIPING

1. SECTION II – MATERIALS / SUBSECTION K – FIRE HYDRANTS

   Delete Subsection K – Fire Hydrants
   Replace with Attached – Hydrant Specifications for Galveston County WCID #1

HYDRANT SPECIFICATIONS FOR GALVESTON COUNTY WCID #1

A. GENERAL

All fire hydrants must conform to requirements and test of AWWA Standard for Dry Barrel Fire Hydrant – C502-94 or latest revision thereof, as they pertain to the design, component materials, construction and manufacture, except as modified or supplemented hereinafter.

1. Operating nut must be:
   - A. Bronze, one piece
   - B. Non-rising, pentagonal in shape, measuring 1-1/2" from point to flat.
   - C. Open counterclockwise

2. Hold-down nut must:
   - A. Incorporate an integral resilient weather seal and be e-coated epoxy.

3. Lubrication chamber must be provided:
   - A. Sealed top and bottom with "O" rings.
   - B. Filled with lubricant which shall be food grade grease.
   - C. The design shall be such that the thrust collar and the threaded operating parts are automatically lubricated each time the hydrant is cycled.
   - D. There must not be less than two (2) "O" rings separating the lubrications reservoir from the waterway and that portion of the stem contracting these "O" rings shall be sleeved with bronze.
   - E. An anti-friction device must be in place above the trust collar to further minimize operating torque.

4. Hydrants bonnet – must be attached to:
   - A. The upper barrel by not less than four (4) bolts and nuts, with an inserted flat rubber gasket as a pressure seal.

5. Hydrants must be:
   - A. "Three-way", having two (2) 2-1/2" hose nozzles and one (1) pumper nozzle, measuring 4-1/2" I.D. with National Standard Threads.
   - B. Nozzles must attach clockwise into hydrant barrel utilizing "O" ring pressure seals and be held in place by a ductile iron retaining ring.

C. "Traffic-model" having upper and lower barrels joined approximately 2" above the ground line by a separated and breakable "swivel" flange providing 360 degree rotation of upper barrel for proper nozzle facing. This flange must employee not less than eight (8) bolts.

D. Stem must be two-piece, 1" x 1" square (excluding threaded or machined areas) and must be connected by a breakable stem coupling that is e-coated epoxy near the ground line flange. Pins used in conjunction with the stem coupling must be stainless steel with stainless retaining pin.

6. Hydrant barrel casting must be:
   A. The inside diameter of the hydrant barrel shall not be less than six and one-eighth inches (6-1/8).
   B. Hydrant to be e-coated epoxy with a red polyurethane top coat.

7. Main valves must be:
   A. Compression type closing with the pressure and must be not less than 5-1/4 diameter.
   B. Composition of the main valve must be molded rubber or neoprene, having a durometer hardness of 95 (+) (-) 5 and must be not less than 1: thick.

8. Hydrants must be equipped:
   A. With 4 drain valves, which drain the barrel when the hydrant is closed, and seal shut when the hydrant is opened.
   B. Hydrant drain assembly shall utilize a spring to give positive shut off with a maximum of three complete turns of the operating nut. Hydrant must have throttling capability without causing damage to the drain mechanism.

9. Seat ring and drain ring must be:
   A. Bronze (ASTM B-62) and work in conjunction to form an all bronze drain way.
   B. Four (4) drain openings are required in bronze drain ring.
   C. Seat ring seals must be "O" rings. The 6" shoe connection must be specified (flanged, A/C, M.J., etc.).

HYDRANT SPECIFICATIONS FOR
GALVESTON COUNTY WCID #1

---

10. Hydrant must have:
    A. A working pressure rating of 250 PSIG and be tested at 500 PSIG.
    B. Have a manufacture's published warranty against defects in material or workmanship for a period of (10) years from date of manufacture.
    C. Must be American Flow Control, 5 ¼" B-84-B or pre-approved equal.

11. Upon request, supplier must furnish:
    A. Flow data, indicating friction loss in PSI at the flow of 1,000 GPM from the pumper nozzle, such friction loss must not exceed 3 PSI.
    B. Hydrants shall be warranted by the manufacturer against defects in material or workmanship for a period of ten (10) years from date of manufacture. The manufacturing facility for the hydrant must have current ISO 9001 certification.

Std. 5/19/87
Revised 9/16/15

ITEM 2555

WATER PIPING

I. GENERAL

A. Scope: This section specifies furnishing and installing new water mains including valves, valve boxes, flush valves, blocking, fittings, and other appurtenances.

B. Related Work (if utilized in this project)

1. Item 2221 - Excavation, Trenching and Backfilling for Utilities

2. Item 9901 - Painting and Coating

II. MATERIALS

A. Ductile Iron Pipe

1. Furnish ductile iron pipe manufactured in accordance with AWWA C-151/A21.50. Pipe to be of American manufacture. Ductile iron pipe to be of thickness class per Plans and/or Exhibits in accordance with AWWA C-150/A21.51. Manufacturer to furnish Certification of Compliance.

2. Unless shown otherwise on Plans and/or Exhibits or required herein, push-on joints to be considered standard.

3. Where Plans and/or Exhibits or specifications indicate cast iron fittings or ductile-iron fittings, the terms are to be considered interchangeable. Such fittings are to conform to AWWA C-110 for 200 psi working pressure. Joints shall be consistent with intended use as shown on drawing. Where no joint type is indicated in cast iron pipe runs, push-on is to be considered standard. Manufacturer to provide Certification of Compliance, "restrained" mechanical joints, to have welded ring on spigot, or other approved design.

4. "Flanged and flanged" and "flanged and plain end" pipe shall be in conformity with AWWA C-115.

5. All C.I. and D.I. pipe and fittings shall be furnished with cement-mortar

lining conforming to AWWA C-104-08, standard thickness.

6. All material to be approved by Underwriters' Laboratory and accepted without penalty by the Texas Fire Insurance Commission.

B. Steel Pipe

1. Provide steel pipe intended for use as underground carrier pipe, sizes 4-inches through 24-inches, conforming with AWWA C-200-12; 150 psi working pressure; cement-mortar lining per AWWA C-205-12.

2. Minimum wall thicknesses for carrier pipe must meet the following criteria:

Nominal Pipe Size (Inches)	**Outside Diameter (Inches)**	**Minimum Wall Thickness (Inches)**	**LBS Per Lineal Foot, Uncoated**
4	4.500	0.250	11.35
6	6.625	0.280	18.97
8	9.625	0.322	28.55
10	10.750	0.365	40.48
12	12.750	0.375	59.56
16	16.000	0.375	62.58
18	18.000	0.375	70.59
20	20.000	0.375	78.60
24	24.000	0.375	94.62

3. Furnish pipe with beveled ends for field butt welding.

4. Coat the pipe exterior in accordance with Item 9901 - Painting and Coating.

5. Furnish new and unused pipe manufactured in compliance with Underwriters' Laboratories, Inc. specifications, Steel Pipe Lines for Underground Water Service. Pipe must be acceptable, without penalty, to the Texas Fire Insurance Commission for use in water works distribution systems.

6. Where small diameter steel pipe is required, it is to be ASTM A-53 or 120, Schedule 40, galvanized.

C. Pre-tensioned Concrete Cylinder Pipe

1. Pipe scheduled for underground water main unless another material

specifically named, is to be reinforced concrete water pipe-steel cylinder type, pre-tensioned, conforming to AWWA C-303-08, unless shown otherwise on Plans and/or Exhibits. The concrete cylinder pipe is to also be approved by Underwriters' Laboratory and accepted by the State Fire Insurance Commission without penalty.

2. The manufacturer will be supplied all necessary data per Sec. 1.4 of said specification. He shall promptly submit, per Sec. 1.6 (C-303-08) detailed Plans and/or Exhibits and schedules and tabulated layout schedule. Each piece shall be marked thereon with an identification number, and each piece subsequently manufactured shall be so marked per Sec. 1.7 (C303-08).

3. Quality control test reports on steel, cylinder assembly, and concrete shall be submitted to the Owner through the Engineer. An Affidavit of Compliance shall be similarly provided.

4. The design working pressure of the pipe is to be 150 psi, the design transient pressure is to be 100 psi. The external loading condition is to be; Live Load-AASHO H20, Dead Load-30" cover to 15-feet saturated clay backfill; bedding as shown on details and described herein. Pipe to be considered rigid.

5. Joints, except where specifically otherwise designated to be compressed rubber "O" Ring" type. In general, thrust is to be transferred to earth by skin friction through tack-welded joints. All vertical fittings to be welded, as well as horizontal bends not noted on Plans and/or Exhibits as requiring blocking. Manufacturer to submit detail and incorporate in layout.

6. Flanges on steel cylinder pipe to conform to AWWA C-207-07, Class E, or ASA Series 150, flat-faced.

7. Spigot ends to match C.I. fittings to have O.D. matching cast iron.

8. All joints to be externally mortared in accordance with manufacturer's recommendations. All joints on 18-inch and larger to be internally mortared in accordance with manufacturer's recommendations.

9. Tapped or special connections to be mortared, no exposed metal pipe.

D. Polyvinyl-Chloride Pipe

1. PVC pressure pipe, 4-inch and larger diameter, to conform to AWWA C-900-07, or AWWA C-905-10, minimum 150 psi rated, elastomeric ring joints unless otherwise required.

2. PVC Pressure Pipe, 3-inch and smaller, is to conform to ASTM D-1785, and ASTM D-2241, Class 160. Class 160 in 1½-inch, 2-inch, and 3-inch diameters to have elastomeric seal joints, ASTM D- 3139. Smaller pipe to be solvent welded.

E. Copper Tubing

1. Provide Type K copper tubing for underground service where required in ¾-inch, 1-inch, 1½- inch, and 2-inch sizes. The tubing to be Type K, soft-annealed, with proper bending temper.

2. Tubing must meet requirements of ASTM B-88 and Federal Specification WW-T-799.

F. Polyethylene Pipe

1. Polyethylene pipe and tubing, hereinafter called PE pipe or tubing, shall conform to AWWA C-901-08, PE 3406 material, Class 160.

2. All coils of PE tubing shall be spirally wrapped in heavy water resistant paper or packaged in cardboard boxes. Each coil shall be labeled clearly to show the size, coil length and pressure rating of the tubing.

G. Fittings for Service Connections: Provide brass fittings in conformance with AWWA C-800-12.

H. Gate Valves: Resilient Wedge, NRS gate valves with iron body, fully encapsulated resilient wedge seats conforming to AWWA C-515-09. Valve ends to be of type indicated on Plans and/or Exhibits, or if not indicated, mechanical joint or hub or gasketed appropriate for the connecting piping. M.J. bolt holes to straddle centerline. Underground valves to be provided with 2-inch square operating nut, aboveground with handwheels. Stem seals to be "O" ring. Stem to turn counterclockwise to open. M.J. bolts to be cadmium plated.

I. Butterfly Valves: Furnish butterfly valves for locations shown on Plans and/or Exhibits conforming to AWWA C-504-10. Valve ends to be short body flanged or mechanical joint as indicated on Plans and/or Exhibits. Valve to have stainless steel body seat and 360 degrees rubber seat on vane. Seat to be site replaceable. "O" ring shaft seal. Valves for underground locations to be fitted with manual underground operator, 2-inch square nut, opening counterclockwise. Above ground valves to be fitted with crank operator, opening counterclockwise. M.J. bolts to be cadmium plated. Manufacturer to furnish Certificate of Compliance.

J. Flexible Component

1. Flanged Adapters: Up to 12-inches, to be Rockwell Type 912 or approved equal, larger than 12-inch diameter, to be Rockwell Type 913 or approved equal. For "lock" type furnish with locking studs for 12-inches and smaller; furnish harness assembly for larger adapters.

2. "Dresser" Couplings: Cast couplings for cast iron pipe; Dresser Style 38, 53, 153 or Rockwell Type 43D series.

K. Fire Hydrants: Fire hydrants shall meet or exceed the requirements specified in AWWA C502, latest revision, and shall comply with Factory Mutual Research Corporation and Underwriters' Laboratories UL Standard 246. The minimum rated working pressure shall be 200 psi with a minimum test pressure of 400 psi. Hydrants shall comply with the following specific design criteria:

1. Main valve closure shall be compression type, opening against the pressure and closing with the pressure.

2. Fire hydrants shall be traffic models, with breakable stem coupling. Traffic feature to be designed so the nozzle section of the hydrant can be rotated (by degree) to full 360 degree circle to face the nozzles in any direction. The internal hydrant rod shall be two piece, held together by a breakable coupling designed to snap upon vehicular impact. The hydrant barrel shall have a two piece breakable flange at the bottom of the upper barrel.

3. The main valve opening shall not be less than 5¼-inch. Unit to be designed so removable hard rubber seat, drain valve mechanism, internal rod, and all working parts can be removed through the top of the hydrant. These parts shall be removable without disturbing the ground line joint or the nozzle section of the hydrant. The bronze seat shall be threaded into matching threads of bronze for ease of field removal.

4. Hydrants shall be equipped with positive operating, non corrodible drain valves. The draining system shall be bronze and activated by the main stem without the use of an axillary rod, toggles, pins, etc. The drain mechanism shall be completely closed after no more than three turns of the operating nut in the opening direction. There shall be a minimum of two (2) inside ports and four (4) drain port outlets to the exterior of the hydrant. Drain shut-off to be direct compression closure. Sliding drain seals are not acceptable.

5. Hydrant shall be a dry-top type. There shall be an internal top housing with triple O-rings to seal operating threads from the waterway and accommodate an anti-friction washer.

6. The operating nut and stem shall be capable of withstanding an input torque of 200 ft-lbs in opening or closing directions.

7. Hydrant shall be equipped with sealed grease lubrication.

8. Hydrant shall have two (2) 2½-inch hose nozzles and one (1) 4½-inch 4½TPI pumper nozzle. All nozzles to be NST 2½ 7.5 TPI. Nozzle section of hydrant to be designed to permit field replacement of damaged threads without special tools, excavation, or disturbing the ground joint. Bronze nozzles are to be locked into hydrant barrel with locking lugs and sealed by heavy duty O-ring. Each nozzle to be equipped with weather cap with 1½-inch operating nut. Hydrant shall be a minimum of 18-inches from ground line to center of hose nozzle.

9. Hydrant to be equipped with 1½-inch operating nut. Direction of opening shall be counterclockwise, with appropriate markings plainly visible to so indicate.

10. Hydrants shall have 6-inch M.J. shoe connection.

11. Unless otherwise shown, depth of bury shall be 4-feet with a minimum weight of 500 pounds at this bury. Hydrants shall be designed to permit extension without excavation.

12. Friction loss through hydrant shall not exceed 3.0 psi at 1000 gpm through pumper nozzle. Flow testing and certification of this feature shall be conducted by an independent testing laboratory and be in accordance with AWWA C502-05.

13. Fire hydrants are to be Mueller or American Darling.

L. Valve Boxes: Furnish 3-piece cast iron valve boxes, with base sizes to fit valve bonnet. Shaft shall be 5¼-inch diameter. Lids marked "WATER." All pieces shall be asphalt-dipped. For valves located outside of roadway, Tyler Series 6860 screw type or 6" (PVC SDR-26) with cast iron section A and LID, to be furnished. For valves located within roadway, Tyler Series 6865 slip type, or equal. Extensions of proper length to be supplied.

III. EXECUTION

A. General: Except as required otherwise by these specifications or by Plans and/or Exhibits, piping is to be installed in accordance with the applicable provisions of the following:

1. Ductile cast iron water mains and appurtenances - AWWA C-600-10.

2. ASTM D-2321 - Recommended practice for underground installation of flexible thermoplastic pipe.

B. Pipe Handling

1. Pipe shipped to the job shall be properly protected against normal forces during transit from manufacturing site to project site.

2. Contractor shall provide and employ slings, lifting cables, strong backs, etc. as recommended by manufacturer in handling pipe, fittings and appurtenances on the job. Proper care against damage from rough handling shall be exercised at all times. Under no circumstances will pipe for fittings be dropped, nor will pipe be allowed to slam together.

3. Pipe is to be strung only on street right-of-way and easements; water pipe is never to be strung in drainage ditches. Strung pipe shall not be placed so as to prevent or unreasonably obstruct access of people or vehicles to residences or to businesses. Loose items such as joint assembly material are not to be left in street right-of-way. Delivery of piping materials is to be scheduled so that pipe is strung a maximum of 2 weeks prior to pipe laying.

4. Particular care is to be taken to avoid damage to pipe that is cement mortar lined.

5. Pipe will be strung so bells or belled couplings face in the direction of laying advancement.

C. Pipe Laying General

1. Use specified piping materials corresponding to the material, size, type, etc. indicated on Plans and/or Exhibits.

2. Do not lay pipe in water, or when trench or weather are unsuitable for work, except with permission of the Engineer. Keep water out of trench until jointing is complete. When work is not in progress, close ends of pipe and fittings securely so that no trench water, earth or other substance will enter pipes or fittings.

3. Keep the inside of the pipe free from foreign matter during operations by plugging or other approved method.

4. Place pipe so that the full length of each section rests solidly upon the pipe

bed, with recesses excavated to accommodate bells and joints. Take up and relay pipe when the grade or joint is disturbed after laying.

5. Locate no joints closer than 9-feet from sanitary sewers. Where possible, lay water lines 9-feet above sewers at crossings.

6. Where pipe ends are left for future connections, install valves, plugs or caps, as shown. Provide thrust blocking or joint restraint as necessary to prevent pipe or fitting movement.

7. Handle pipe and accessories so that all pipe placed in the trench is sound and undamaged. Take particular care not to injure pipe coating.

8. Cut cast iron neatly, using approved type mechanical cutter without damaging pipe. Cutting by cutting torch is strictly prohibited. Use wheel cutters when practical. Saw asbestos-cement and PVC with sharp saw with properly set teeth.

9. Before installation, inspect pipe for defects. Replace sections of pipe found to be defective, damaged or unsound.

10. Pipe barrels to be clean at time of joining. Swab as required to remove dirt, mud and other foreign matter.

D. Bedding and Pipe Placement: Refer to Item 2221 - Excavation, Trenching and Backfilling for Utilities

E. Joints

1. Make of joints generally to be in accordance with manufacturer's directions and referenced standards.

2. For pipes using a compressed elastomeric gasket joints, bell and spigot surfaces and gasket shall be clean. Area adjacent to gasket and gasket groove to be free of foreign particles. Spigot beveled as required. Gasket or spigot end lubricated per manufacturers directions. The two pieces to be joined are to be in axial alignment and restrained from rotating around the axis, until the pipe is "home." The position of the gasket is to be checked all around with a feeler gauge when so recommended, or other recommended checks made to insure proper gasket positioning, and/or pipe and end gap. Pipe ends are not to be butted. The force necessary to push the pipe "home" shall be closely controlled, applied in such a manner as not to displace nor damage piping being joined.

3. Mechanical joints and flexible couplings to be made up similar to "push"

joints. Pipe alignment to be within tolerance of joint. Gasket to positioned all bolts made up evenly using a torque wrench of the recommended rating, bolts and nuts positioned and tightened in every hole.

4. Flange Joints

   a. Flange faces to be clean. Pieces to be joined are to be in precise alignment and fit up to be snug without springing. Gasket to be carefully positioned and bolts pulled up evenly. Bolts or studs to be properly tightened in every hole. Closures shall not require pull up by bolting for fit. Special care to be taken at equipment, valve or fitting so that fit is good and flange makeup does not distort equipment.

   b. Use flat face companion flanges only with flat faced fittings, valves or equipment. Otherwise use raised face flanges.

   c. Install 1/16-inch asbestos gasket full-face excepting ring for raised face, suitable for intended service and factory cut to proper dimensions. Secure ring gaskets with a suitable gasket cement.

   d. Use ANSI nuts and bolts, galvanized or black to match flange material. Use cadmium plated nuts and bolts underground. Tighten bolts progressively to prevent unbalanced stress. Draw bolts tight to ensure proper seating of gaskets. Joints to be water tight.

   e. Keep flange covers on equipment and shop-fabricated piping until ready to install in system.

5. Plastic

   a. When using threaded joints provide sharp, clean pipe dies and Teflon thread tape. Make joints in strict accordance with manufacturer's recommendation.

   b. When gluing PVC, use solvent cement method in strict accordance with manufacturer's recommendations, and ASTM D- 2241. Allow proper drying time.

   c. Compressed elastomeric joints to be made up in accordance to manufacturer's recommendations.

F. Joint Deflection: Joint deflection shall in no case exceed the manufacturer's

recommendations. Push-on type joints shall have deflections taken only after pipe is "home." Mechanical type joints to be deflected prior to final tightening.

G. Thrust Resistance

1. Responsibility of thrust resistance shall be the responsibility of the Contractors.

2. Thrust blocking shall be provided at all fittings. The concrete shall bear on undisturbed firm soil. If unavailable at a particular installation, the absence shall be promptly brought to the Engineer's attention. Place concrete so that joints are left accessible.

3. Restrained Joints: Where flexible joints are shown as "lock" or "restrained," resistive restraint devices capable of being dismantled and with ample ability to transfer the thrust shall be engaged so as to positively prevent pipe separation.

H. Underground Protection, Cast and Ductile Iron

1. Where indicated on the Plans and/or Exhibits underground ductile and cast iron shall be wrapped in polyethylene film in accordance with AWWA C-105.

2. Where indicated on the Plans and/or Exhibits underground metal piping shall be cathodically protected.

I. Setting Underground Valves, Valve Boxes, and Flushing Valves

1. Prior to installing valves or flushing valves, remove foreign matter from within the valves. Inspect the valves in open and closed positions to verify that all parts are in satisfactory working condition. Refurbish existing valves to be used again, installing new seats and seals and generally repair the valves. Install fully closed.

2. Install valves, valve boxes, and flushing valves where shown or as located by the Owner. The gate valves and flushing valves plumb and as detailed on Plans and/or Exhibits. Set butterfly valve with shaft true horizontal. Center valve boxes on valves. Locate valves away from roads or streets. Carefully tamp earth around each valve box for a minimum radius of 4-feet or to undisturbed trench face if less than 4-feet. Set flushing valve 2-feet from the edge of the right-of-way, such that connecting pipe will not have less cover than distributing mains.

3. Place a concrete thrust block opposite pipe connections, set against the

vertical face of the trench to prevent the valve from moving. If the character of the soil is such that the flushing valve cannot be securely wedged in this manner, provide bridle rods and rod callars of not less than ¾-inch stock protected by a coat of acid- resisting paint.

4. Place pea gravel around the base of flushing valves to ensure drainage. Compact backfill thoroughly around the valve to grade line.

5. Valve boxes to be set vertical, with bases of proper size fitted over valve bonnets, slip type boxes to be used where box exposed to traffic. Boxes to be set with tops flush with finish grade. Slip type box top-piece shall not be on step. Backfill to be tamped around box to ensure stability of its placement.

J. Service Connections: Tubing to be made up slack in trench, free of kinks and crimps. Minimum radius for bends to be 12D. No connectors permitted under pavement. Connections to meter not to disturb or distort meter setting. Service piping to generally slope toward meter. Minimum cover under drainage ditches to be 18-inches. Where direct taps to the main are made, the tapping machine is to be secured on the main so that it does not wobble during drilling and tapping. Dies are to be sharp, and for tapered thread (Mueller). Where a service saddle is required; the saddle is to be securely tightened and a clean hole drilled in the main. Position the tap as indicated in the Plans and/or Exhibits. Corporation stops are to be made up tight and leakproof. The service line shall be kept clean at all times. Flaring shall be accomplished by the use of suitable flaring tools. Remove all burrs. All fittings shall have the proper "bite" on the tubing and be made tight. Tap to be perpendicular from main to meter box, or as near thereto as permitted by the joint. In general, taps to be made on new main at time of laying, (i.e. dry). Main to be flushed, disinfected and hydrostatically tested, then service tubing run. Prior to final connection to existing service or to meter or to existing service or to stop for future meter installation, service is to be thoroughly flushed. This is to be done through a large hose or pipe to drain into ditch or gutter, and including the stop, if any. Service tubing to be bedded and backfilled as per Item 2221 - Excavation, Trenching and Backfilling for Utilities.

K. Hydrostatic Testing and Disinfection Sequence: New sections of main being installed in many cases will be tied in one or more places to valves separating the new main from the operating system. In all instances, unless approved in writing by Engineer prior to testing, a zone of atmospheric pressure will be maintained between existing main and newly constructed main until new main has been disinfected and accepted. In most instances, use of temporary valve assemblies will permit hydrostatic testing to promptly follow main line completion of section, without the danger of pumping contaminated water back into the operating system through a leaking valve. In case that the particular circumstances do not permit effective isolation, the Contractor shall be obliged to reverse the usual order and

disinfect the new mains first, then hydrostatically test, redisinfect after any rejoins.

L. Hydrostatic Test: After each section of main is complete and can be isolated so high pressure cannot force test water into the operating system, it shall be hydrostatically tested. Such testing shall be in conformance with Section 4 of AWWA C-600, as modified herein:

1. Test section to be first flushed with open bleeds with flow controlled at feed from operating system so that flushing pressure is always well below operating system.

2. Pressure Testing: Pressure testing should be done when the trench is only partially backfilled to allow for repairs if necessary. The operator should follow this procedure:

   a. The pressure test should be performed after the main has been full of water for 24 hours. When filling the main, water should be admitted slowly to expel all air.

   b. Pressure should be obtained and maintained by pumping water into the line through a meter. Test pressure should be 1½ times as great as the normal operating pressure or 150 psi, whichever is greater.

   c. After two hours at test pressure, the leakage should be within limits for that type of line.

3. A test, to be successful, must be witnessed by the Engineer's field representative, minimum 2 hours in duration and conducted during reasonable hours.

4. The Contractor is to furnish all necessary equipment and calibrate to approved standards.

5. Allowable Leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\,(P^{1/2})}{133{,}200}$$

   in which L is the allowable leakage, in gallons per hour; in feet S is length of pipe line tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during leakage test, in pounds per square inch gauge. Allowable leakage is determined from Table 6A, AWWA C-600.

6. In case of failure, the Contractor shall find and repair the leaks until the

test section meets the minimum requirements.

7. When temporary inserts for hydrostatic testing are installed, upon removal the replacement piping shall be left exposed for visual inspection for leakage under normal pressure (after disinfection), before being backfilled.

8. The Owner will provide flushing and testing water only one time at no cost to Contractor. All retest costs, where additional water is required, will be borne by the Contractor. The Owner will, at Contractor's option, allow reimbursement or deduct these costs from the final estimate.

M. Disinfection: Disinfection for each section of the work shall be performed in accordance with AWWA C-651, as supplemented and modified below:

1. The Contractor shall provide taps within a few feet of the ends of the disinfection section and bleed so as to insure high strength solution to all parts of the section.

2. Unless otherwise approved, hypochlorite shall be used to supply the available chlorine.

3. Continuous feed methods to be used. The Owner will furnish the water one time only at no cost. The Contractor shall provide the chlorine solution tank and means of approximately proportioning its flow. Piping from hydrants of the dilutant water and all other piping and appurtenances to be furnished by the Contractor. Contractor to perform the disinfection and subsequent flushing.

   All retest costs, where additional water for biological testing is required, will be borne by Contractor. Owner will, at Contractor's option, allow reimbursement or deduct from final estimate these costs.

4. The strong chlorine solution must be flushed from the test section. The Contractor shall provide means to discharge into an open drainage ditch or, into a mixing box discharging to storm sewer. The flushed chlorine solution must not be a potential cause for environmental damage. Contractor must neutralize thoroughly any remaining chlorine residual within the water. Where applicable, Federal, State, and Local Regulatory Agencies must be contacted to determine special requirements for disposal of heavily chlorinated water.

5. The Owner will cause bacteriological samples to be taken and tested. If negative for coliform organisms, the Contractor may proceed with the next step of the work; otherwise the disinfection procedure is to be repeated.

6. The Contractor may place tablets in the main for his benefit, but such is not to be a substitute for the above procedure.

N. Wet Connection

1. Wet connections are to be made under the direction of the Engineer and in such a manner and at such hours as to least inconvenience the public. Notify Project Manager at least 72 hours in advance of making connections. Conduct connection operations when inspector is at job site. When the existing mains have been cut or a plug removed for a connection, then the work or making the connection shall progress without interruption until complete. The compensation for making wet connections will be based on the unit bid prices and no additional compensation will be granted for making connections at night or for having to complete a connection under unfavorable working conditions.

2. No compensation will be given for extra work or for damages occurring as result of incomplete shutoff.

3. Wet connections consist of isolating sections of pipe to be connected with existing valves, draining isolated sections, and completing connections. Tapping sleeve and valves, and service connections are **not** wet connections.

LJA Project No. E224-0010 & E224-0020

SPECIAL PROVISION NO. 2

TO

ITEM 2560 – SANITARY SEWERS

1. Delete paragraph II.B.2.d. in it's entirety and insert the following:

   d. Precast concrete manhole sections (base sections, risers, reducers, cones, slab tops, and grade rings) to conform to the requirements of ASTM C478. Provide bases, risers, and reducer sections having an inside diameter of 48 inches, 60 inches, 72 inches or 96 inches as shown on the Exhibits and details as required. The inside diameter of the access opening to be not less than 30-inches.

2. Delete paragraph II.B.2.f. in it's entirety and insert the following:

   f. The adjustment throat rings to be reinforced concrete rings having a thickness of 3 inches. The internal diameter to be not less than 30 inches and the width to be a minimum of 5 inches.

Std. 5/1/86
Revised 7/28/14

ITEM 2560

SANITARY SEWERS

I. GENERAL

A. Scope: This section specifies furnishing and installing sanitary sewer pipes, manholes, and appurtenances.

B. Related Work (if utilized in this project)

1. Item 2221 - Excavation, Trenching and Backfilling for Utilities

2. Item 2224 - Encasing, Augering and Tunneling

II. MATERIALS

A. Pipe

1. Vitrified Clay

a. Clay pipe shall conform to ASTM C700, extra strength. Pipe wye, tee and bend fittings shall be of the same strength as the adjacent joint of pipe and shall also conform to ASTM C700. The clay pipe shall be free of fractures, cracks, chips and etc.

b. Joint closures shall be in accordance with ASTM C425.

c. Joint lubricant shall be in accordance with the pipe manufacturer's recommendations.

2. Polyvinyl Chloride (PVC)

a. The plastic pipe and fittings shall meet the requirements of ASTM D3034, F949 or D2680, and the pipe shall have a minimum of 46 psi pipe stiffness when tested in accordance with ASTM D2412 and be of the nominal pipe size shown on the Plans and/or Exhibits. All PVC pipes shall be made of resins meeting ASTM D1784 cell classifications 12454B or 12454C.

b. The Contractor shall furnish manufacturer's certification that the pipe and fittings furnished to the project meet the ASTM requirements above.

c. Pipe and fittings shall be free from defects which, in the judgment of the Engineer, would hinder their ability to function as planned.

d. The dimensions of the PVC pipe shall be as shown on the Plans and/or Exhibits. The fittings supplied shall properly fit the pipe supplied and shall be the same color as the pipe.

e. Gaskets: Compression-type vulcanized high grade elastomeric compound gasket joints as per ASTM Specification D1869 or D3212.

f. Lubricant: Lubricant used for assembly to have no detrimental effect on gasket or pipe and to be according to pipe manufacturer's recommendations.

3. Hobas (Centrifugally, Cast, Fiberglass-Reinforced)

a. All pipes, joints and fittings shall be manufactured in accordance with the requirements of ASTM D3262. Pipes shall be centrifugally cast, fiberglass-reinforced polyester resin as manufactured by Hobas USA, Inc. Contractor shall furnish manufacturer's certification that the pipe and fittings furnished to the project meet the ASTM requirements above. Minimum pipe stiffness when tested in accordance with ASTM D2412 shall be 46 psi.

b. The Manufacturer shall use only approved polyester resin systems for which he can provide a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product. The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade of E-glass filaments with binder and sizing compatible with impregnating resins. Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

c. Pipe outside diameters shall be in accordance with AWWA Standards C151 and C950. For diameters larger than covered in those documents, OD's shall be approved by Engineer.
Pipe shall be supplied in nominal lengths of 20-feet. Actual laying length shall be the nominal ± 2 inches. At least 90% of the total

footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

d. Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets made of EPDM rubber compound as the sole means to maintain joint water tightness. The joints must meet the performance requirements of ASTM D4161.

4. High-Density Polyethylene Pipe (HDPE)

a. HDPE shall be produced from a high density, high molecular weight polyethylene pipe material meeting the requirements of type III, Class C, Grade P34, as defined in ASTM D1248. The pipe shall have a minimum pipe stiffness of 46 psi when tested in accordance with ASTM D2412.

b. The Contractor shall furnish manufacturer's certification that the pipe and fittings furnished to the project meet the ASTM requirements above.

c. The pipe shall be manufactured by the continuous winding of a special profile onto suitably sized mandrels. It shall be produced to constant internal diameters with a ring stiffness of 46 psi in accordance with ASTM F714. Standard shipping lengths shall be 20-feet, long, ± 2-inches.

Each pipe length shall be clearly marked. Marking information shall include pipe size, profile number and production code.

The pipe shall be free from visible cracks, holes or other defects. It shall be as uniform as commercially practical in color, density and other physical properties.

d. Joints: The pipe shall be produced with bell and spigot end construction. Joining will be accomplished by rubber gasket as determined in accordance with manufacturer's recommendations.

B. Manholes

1. Covers: Covers shall conform to ASTM 498-76, Class No. 30 cast iron. Make cast iron manhole frames and covers to dimensions shown on standard detail drawing. Castings free from sand or blow holes and other defects. Holes in cover to be free from plugs and burrs. Machine bearing surfaces of manholes, frames and covers to obtain even bearing. Cast

wording "Sanitary Sewer" or "Storm Sewer" as applicable; and name of Owner on cover as shown on standard detail Plans and/or Exhibits.

2. Precast Concrete

   a. Design Loads: Design loads shall consist of dead load, live load, impact and in addition loads due to water table and any other loads which may be imposed on the structure.

      Live load shall be H-20 and/or H-20-S16 per the AASHTO Standard Specifications for Highway Bridges, with revisions. Design wheel loads shall be 16 kips. The live load shall be that loading which produces the maximum shears and bending moments in the structure.

   b. All cement shall be Portland cement conforming to ASTM C150. Cement content shall be sufficient to produce minimum compression strengths of 4,000 psi in 28 days.

   c. Reinforcing steel shall be in accordance with the Item 3200 - Concrete Reinforcement. Reinforcing steel shall be Grade 60. The minimum steel requirement in the walls and cone of a cast-in-place manhole will be one or two lines of steel, the total area per vertical foot shall be not less than 0.0025 times the inside diameter in inches. The steel requirement in the base section shall have a minimum area of 0.12 square inches per linear foot in both directions.

   d. Precast concrete manhole sections (base sections, risers, reducers, cones, slab tops, and grade rings) to conform to the requirements of ASTM C478. Provide bases, risers, and reducer sections having an inside diameter of 48-inches, 60-inches, 72-inches or 96-inches as shown on the Plans and/or Exhibits and details as required. The inside diameter of the access opening to be not less than 30-inches.

   e. The precast concrete manhole riser sections, excepting grade rings, to be formed with male and female ends for use with O-ring gaskets. The male end to contain a recess for the gasket. The joints and gaskets in the base and riser sections to comply with the requirements of ASTM C443.

   f. The adjustment throat rings to be reinforced concrete rings having a thickness of 3-inches. The internal diameter to be not less than 30-inches and the width to be a minimum of 5-inches.

g. Resilient connectors for a watertight seal between precast concrete manholes and sewer pipe to be furnished of size and at location shown on the Plans and/or Exhibits. Resilient pipe to manhole connectors to conform to ASTM C923. Connectors to be embedded in the walls of precast concrete manhole sections. Resilient connectors to provide 10 degrees of omnidirectional deflection at the entrance of the pipe into the manhole wall. A-Loc Products or equal.

h. Flexible, watertight connector installed in formed holes with a compression ring. Connector to have take up clamp on gasket for mechanical compression on pipe. Press Seal Gasket or equal.

3. Fiberglass

a. Design loads: Same as presented in B. 2. a above.

b. Fiberglass manholes shall be mounted on precast concrete base meeting the requirements of B. 2 including gasketed pipe penetrations. Seal (make watertight) joint between concrete and fiberglass with Ram-nek, Volclay, or Synko Flex.

c. Fiberglass riser shall conform to material requirements of ASTM D3753.

C. Sewer Line Specials

1. Sewer line specials are sewer line appurtenances, such as; cleanout, deep cut connections for service lines, branch wye outlets for service lines, and wye outlets on deep cut connections.

2. Pipe and Fittings: Use pipe and fittings constructed of same material as specified for main sewer.

3. Cast Iron for Castings: Conform to ASTM A48, Class No. 20, gray cast iron.

4. Concrete for Blocking and Encasing: 1500 psi, 28 day compressive strength. Material and mix in accordance with applicable specification Item.

III. EXECUTION

A. Pipe

1. Vitrified Clay

a. Installation: Clay pipe shall be installed in accordance with ASTM C12, titled "Standard Practice for Installing Vitrified Clay Pipe Lines." Before laying pipe, prepare pipe ends by wiping the inside surface of bell or coupling and the outside surface of the spigot until clean and dry and apply joint lubricant in accordance with the manufacturer's recommendations. Cover the entire area with joint lubricant, then complete joint immediately.

b. The pipe joint shall be made in the following manner. Push the spigot end into the bell of the preceding pipe until it is properly seated. Apply moderate force by using a simple lever. Two or three joints may be joined on the bank and then lowered into the trench.

c. See detail sheet, Item 2221 - Excavation, Trenching and Backfilling for Utilities for bedding and backfill procedures, conform to ASTM C12.

2. Polyvinyl Chloride, Hobas, and HDPE

a. Backfill in Pipe Zone: Install pipe and fittings in accordance with ASTM Specification D2321 except as shown on detail sheet, Item 2221 - Excavation, Trenching and Backfilling for Utilities. Note: **Initial backfill over pipe to be 12-inches in all cases.** Avoid contact between pipe and compaction backfill equipment. Compaction of haunching, initial backfill, and backfill material should be done in a manner that compaction equipment is not used directly above pipe until sufficient backfill has been placed to ensure that equipment will have no damaging effect on pipe.

b. Joining: Use elastomeric gasket joints, providing a watertight seal. Assembly of joints to be per the manufacturer's recommendation.

c. Connections to Manholes and Other Rigid Structures: Manhole couplings corresponding to size of sewer pipe to be cast directly into a rigid structure such as manhole or manhole base.

d. Deflection Tests: All pipe to be satisfactorily tested for deflection by pulling a mandrel through pipe after backfilling is complete.

Mandrel to have an outside diameter equal to 95 percent of the original inside diameter of pipe being tested. See Item 2221 - Excavation, Trenching and Backfilling for Utilities for Mandrel requirements. Mandrel to be pulled by hand line. Should mandrel meet any resistance. Contractor may clean line and repeat test. Any pipe not meeting this test to be removed and replaced at Contractor's expense.

B. Manholes

1. Precast Concrete

a. Precast concrete manhole bases to be bedded on a minimum of 8-inches of cement-stabilized sand or crushed aggregate as used for pipe bedding. The dimensions of the bedding to be 12-inches greater than the precast manhole base in all directions. The bedding to be placed to provide a firm foundation for the manhole. Contractor to level and plumb the base section prior to setting the manhole riser sections on the precast concrete base.

b. All invert channels are to be constructed and shaped accurately so as to be smooth, uniform, and cause minimum resistance to the flow. The bench to be furnished smooth, with a slope of ½-inch per foot from the manhole walls to the edges of the invert channel.

c. Sewer Pipe joints **not** to be cast or constructed within the wall sections of manholes.

d. Gasket and pipe surface at resilient pipe to manhole connections to have a smooth, clean finish. Clean and lubricate pipe end a minimum of one-half the pipe diameter in length with a lubricant suitable for use with rubber O-ring concrete pipe joints. Lubricate the entire portion of the pipe which will slide through the resilient connector. If pipe is cut, no sharp edges to be allowed. A slight bevel is preferred as a lead and this should also be lubricated. No mortar to be placed around the connector on the outside of the structure and no mortar to be placed around the top half of the connector on the inside when completing the invert.

e. Install stub-outs, where shown, to line and grade. Use one full joint of pipe, of size indicated, for stub-out. Seal stub-out with plug. Install plug in such manner as to prevent seepage of leakage through stub-outs. Install plugs such that it may be easily removed in future without damaging bell or groove end of stub-out.

f. Where inlet leads, lateral sewer pipe, stub-outs, and drop connections enter manholes, cut off ends of protruding pipe flush with inside of manhole wall.

g. Where drop connections into manholes are required, construct drops of 6-inch pipe for 6-inch sewer lines, of 8-inch pipe for sewers 8-inches in diameter through 15-inches in diameter, and of 12-inch pipe for all larger sizes of sewer lines. Drop connections consist of tee in sewer line faced vertical down, riser stack, 90-degree cut elbow at base of stack and joint of pipe from elbow into manhole. Encase entire drop connection in Class "B" concrete extending at least 4 inches outside of bells on 3 sides away from manhole wall and extending to face of manhole wall on side adjacent to manhole. Join entire drop connection with wall of manhole in solid mass of concrete. Construct drop connection at time manhole is constructed. If lateral is not to be immediately connected into drop connection, plug outer end of tee in same manner as specified for plugging stub-outs.

h. Backfill - Place material in uniform layers of prescribed maximum thickness and wet or dry the material to no less than 3 percent below or more than 5 percent above optimum moisture content. Compact with power driven hand tampers to prescribed density. Laboratory field tests shall be taken at Engineers discretion. Either of the following backfill materials may be utilized at Contractors option:

1) Select Material: Material selected form excavation, or obtained from other sources, shall be free from stones (which interfere with compaction) and free from large lumps (which do not breakdown readily under compaction). Place in 8-inch maximum layers, loose measure. Mechanically compact to not less than 95 percent of maximum soil density.

2) Cement Stabilized Sand: Material to be in accordance with Specification Item 2221 - Excavation, Trenching and Backfilling for Utilities. Place in loose 8-inch thick layers and compact to a density of not less than 92 percent nor greater than 98 percent.

2. Fiberglass

a. Construct base in accordance with provision of paragraph B. 1. a. through B. 1. d. Contractor to level and plumb the base section

prior to setting the fiberglass riser section on the precast concrete base.

b. Base and riser to have joint made water tight. Joint material to be placed between the base and riser both inside and outside of joint. Joint seal to be Ram-nek, Volclay, or Synko-Flex.

c. Backfill - Fiberglass manholes to be backfilled with cement stabilized sand (Specification Item 2221 - Excavation, Trenching and Backfilling for Utilities) a minimum of 3' - 0" from outside of the manhole or from outside of manhole to undisturbed soil, whichever is less. Backfill shall be from the bottom of the concrete base to the top of the manhole. Place in loose 8-inch thick layers and compact to a density of not less than 92 percent nor greater than 98 percent.

d. Backfill around manholes and drop connections immediately after mortar and concrete, if applicable, have set. Place backfill in accordance with applicable Item.

C. Sewer Line Specials

1. Install wye and tee branches as sewer line is laid at locations shown or as directed. Correct omission of required specials during construction of sewer, at no extra expense to Owner. Do not cover specials until their locations have been recorded. Do not install permanent plugs in ends of branch openings or service lines until after a satisfactory exfiltration test is performed.

2. Installation of Branch Wye Outlets: Where ordered or shown, place branch wyes in pipe sewer at time pipe is laid. Unless Plans and/or Exhibits show service line to be constructed in this contract, plug branch opening with standard pipe plug. Install plug in such manner that will facilitate its future removal without damage to bell.

3. Installation of Deep Cut Connections: Unless otherwise directed, install deep cut connections only at locations where top of sewer is greater than 8-feet below surface of ground. Place tee in pipe sewer at base of deep cut connections at time pipe is laid and encase tee in concrete. Install c bend in branch opening tee. Install wye in bell of 1/8 bend if wye will raise height to within 5 to 8-feet of ground surface. If wye does not provide sufficient height, install run of pipe vertically between 1/8 bend and wye. Plug run of wye. Unless Plans and/or Exhibits show service lines to be constructed in this contract, plug branch opening with standard pipe plug. Install plug in such manner that will facilitate its future removal without

damage to bell. Encase deep cut connection in concrete in conforming with details shown.

4. Cleanouts: Install cleanouts at locations indicated and in conformity with details shown.

5. Service Line: Install service lines, when shown on Plans and/or Exhibits, from branch opening of fitting is sewer to property line. Terminate service line with hub. Install standard pipe plug in hub in such manner that will facilitate its future removal without damage to bell.

IV. QUALITY ASSURANCE

A. Testing Requirements: Contractor to furnish water and all testing equipment unless specified otherwise.

B. Testing Procedures

1. Testing of Installed Pipe: An infiltration, exfiltration or low-pressure air test shall be as specified below. Copies of all test results shall be made available to the executive director upon request. Tests shall conform to the following requirements:

a. Infiltration or Exfiltration Tests: The total exfiltration as determined by a hydrostatic head test, shall not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2-feet above the crown of the pipe at the upstream manhole. When pipes are installed below the groundwater level an infiltration test shall be used in lieu of the exfiltration test. The total infiltration, as determined by a hydrostatic head test, shall not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2-feet above the crown of the pipe at the upstream manhole, or at least 2-feet above existing groundwater level, whichever is greater. For construction within the 25 year flood plain, the infiltration or exfiltration shall not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, remedial action shall be undertaken in order to reduce the infiltration or exfiltration to an amount within the limits specified.

b. Low Pressure Air Test: The procedure for the low pressure air test shall conform to the procedures described in ASTM C-828, ASTM C-924, ASTM F-1417 or other appropriate procedures,

except for testing times. The test times shall be as outlined in this section. For sections of pipe less than 36-inch average inside diameter, the following procedure shall apply unless the pipe is to be joint tested. The pipe shall be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

T = 0.085 {DK} OVER Q

T = time for pressure to drop 1.0 pound per square inch gauge in seconds

K = 0.000419HDHL, but not less than 1.0

D = average inside pipe diameter in inches

L = length of line of same pipe size being tested, in feet

Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface shall be used

Since a K value of less than 1.0 shall not be used, there are minimum testing times for each pipe diameter as follows:

Pipe Diameter (inches)	Minimum Time (seconds)	Length for Minimum Time (feet)	Time for Longer Length (seconds)
6	340	398	0.855 (L)
8	454	298	1.520 (L)
10	567	239	2.374 (L)
12	680	199	3.419 (L)
15	850	159	5.342 (L)
18	1020	133	7.693 (L)
21	1190	114	10.471 (L)
24	1360	100	13.676 (L)
27	1530	88	17.309 (L)
30	1700	80	21.369 (L)
33	1870	72	25.856 (L)

The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined

above or until failure. Lines with a 27-inch average inside diameter and larger may be air tested at each joint. Pipe greater than 36-inch diameter must be tested for leakage at each joint. If the joint test is used, a visual inspection of the joint shall be performed immediately after testing. The pipe is to be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure has stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be 10 seconds.

c. Deflection Testing: Deflection tests shall be performed on all flexible pipes. For pipelines with inside diameters less than 27-inches, a rigid mandrel shall be used to measure deflection. For pipelines with an inside diameter 27-inches and greater, a method approved by the executive director shall be used to test for vertical deflections. Other methods shall provide a precision of ± two tenths of one percent (0.2%) deflection. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of five percent. If a pipe should fail to pass the deflection test, the problem shall be corrected and a second test shall be conducted after the final backfill has been in place an additional 30 days. The tests shall be performed without mechanical pulling devices.

1) Mandrel Sizing: The rigid mandrel shall have an outside diameter (O.D.) equal to 95% of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe, all dimensions shall be per appropriate standard. Statistical or other "tolerance packages" shall not be considered in mandrel sizing.

2) Mandrel Design: The rigid mandrel shall be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use. See Item 2221 - Excavation, Trenching and Backfilling for Utilities, Page 14 of 15 for typical mandrel.

3) Method Options: Adjustable or flexible mandrels are prohibited. A television inspection is not a substitute for the deflection test. A deflectometer may be approved for use on a case by case basis. Mandrels with removable legs or runners may be accepted on a case by case basis.

2. Manhole Testing: Manholes shall be tested for leakage separately and independently of the wastewater lines by hydrostatic exfiltration testing, vacuum testing, or other methods acceptable to the commission. If a manhole fails a leakage test, the manhole must be made water tight and retested.

a. Hydrostatic Exfiltration Test

1) The maximum leakage for hydrostatic testing shall be 0.025 gallons per foot diameter per foot of manhole depth per hour. Alternative test methods must ensure compliance with the above allowable leakage.

2) Hydrostatic exfiltration testing shall be performed as follows: All wastewater lines coming into the manhole shall be sealed with an internal pipe plug, then the manhole shall be filled with water and maintained full for at least one hour.

3) For concrete manholes a wetting period of 24 hours may be used prior to testing in order allow saturation of the concrete.

b. Vacuum Test

1) After completion of manhole construction, but prior to backfilling, test manholes for water tightness using vacuum testing procedures.

2) No grout shall be placed in horizontal joints before testing.

3) Plug influent and effluent lines, including service lines, with suitably-sized pneumatic or mechanical plugs. Ensure plugs are properly rated for pressures required for test; follow manufacturer's safety and installation recommendations. Place plugs a minimum of 6 inches outside of manhole walls. Brace inverts to prevent lines from being dislodged if lines entering manhole have not been backfilled.

4) Vacuum Testing

a) Install vacuum tester head assembly at top access point of manhole and adjust for proper seal on straight top section of manhole structure. Following manufacturer's instructions and safety precautions, inflate sealing element to the recommended maximum inflation pressure; do not over-inflate.

b) Manholes to be vacuum tested shall have 10-inches of mercury applied to the manhole and the time measured for the vacuum to drop from 10-inches to 9-inches of mercury. Vacuum equipment shall be approved by the Engineer prior to its use. Following are minimum allowable test times for manhole acceptance at the specified vacuum drop.

	Time (sec)		
Depth of Manhole	**Manhole Diameter (inches)**		
(feet)	**48"**	**60"**	**72"**
8	14	18	23
10	17	23	28
12	21	28	34
14	25	32	40
16	28	37	45
18	32	41	51
20	35	46	57
22	39	51	62
24	42	55	68
26	46	60	74
28	49	64	80
30	53	69	85

Test times for structures other than manholes will be based on the times for manholes of the nearest equivalent volume or as directed by the Engineer.

c) If the drop in vacuum exceeds 1-inch mercury (Hg) over the specified time period tabulated above, locate leaks, complete repairs necessary to seal manhole and repeat test procedure until satisfactory results are obtained.

Std. 3/22/96
Revised 10/1/02

ITEM 2566

UTILITIES SEPARATION DISTANCES

The following rules apply to separation distances between potable water and wastewater treatment plants, waterlines, and sanitary sewers.

A. Waterline/new sewer line separation. When new sanitary sewers are installed, they shall be installed no closer to waterlines than nine feet in all directions. Sewers that parallel waterlines must be installed in separate trenches. Where the nine foot separation distance cannot be achieved, the following guidelines will apply:

1. Where a sanitary sewer parallels a waterline, the sewer shall be constructed of cast iron, ductile iron or PVC meeting ASTM specifications with a pressure rating for both the pipe and joints of 150 psi. The vertical separation shall be a minimum of two feet between outside diameters and the horizontal separation shall be a minimum of four feet between outside diameters. The sewer shall be located below the waterline.

2. Where a sanitary sewer crosses a waterline and the sewer is constructed of cast iron, ductile iron or PVC with a minimum pressure rating of 150 psi, an absolute minimum distance of 6-inches between outside diameters shall be maintained. In addition the sewer shall be located below the waterline where possible and one length of the sewer pipe must be centered on the waterline.

3. Where a sewer crosses under a waterline and the sewer is constructed of ABS truss pipe, similar semi-rigid plastic composite pipe, clay pipe or concrete pipe with gasketed joints, a minimum two foot separation distance shall be maintained. The initial backfill shall be cement stabilized sand (two or more bags of cement per cubic yard of sand) for all sections of sewer within 9-feet of the waterline. This initial backfill shall be from one quarter diameter below the centerline of the pipe to one pipe diameter (but not less than 12-inches) above the top of the pipe.

4. Where a sewer crosses over a waterline all portions of the sewer within 9-feet of the waterline shall be constructed of cast iron, ductile iron, or PVC pipe with a pressure rating of at least 150 psi using appropriate adapters. In lieu of this procedure the new conveyance may be encased in a joint of

150 psi pressure class pipe at least 18-feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at 5-feet intervals with spacers or be filled to the springline with washed sand. The encasement pipe should be centered on the crossing and both ends sealed with cement grout or manufactured seal.

B. Water line/manhole separation. Unless sanitary sewer manholes and the connecting sewer can be made watertight and tested for no leakage, they must be installed so as to provide a minimum of nine feet of horizontal clearance from an existing or proposed waterline. Where the 9-foot separation distance cannot be achieved, a carrier pipe as described in subsection (a) (4) of this section may be used where appropriate.

Std. 3/10/14
Revised 07/24/14

ITEM 2621

POINT REPAIRS - SANITARY SEWERS

I. GENERAL

A. Scope: This Item covers the furnishing of all materials, equipment, labor, supervision and all work necessary for the replacement of sanitary sewer main failure, as approved by the Engineer. The Engineer will determine if a point repair is required, after the Contractor has demonstrated that after extensive cleaning the line cannot be pipe bursted.

B. Related Work (if utilized in this project)

1. Item 1541 - Trench Safety Systems

2. Item 1666 - Cleaning and Television Inspection of Gravity Sanitary Sewer Lines

3. Item 2629 - Reconstruction of Sewers by the Pipe Bursting Method

4. Item 3312 - Cement-Stabilized Sand Backfill

II. MATERIALS

A. Earth Backfill: Use suitable soils from the excavation as backfill material.

B. Sand Backfill: Use bank sand from an approved source. Sand must be free from large lumps of clay, rubbish, organic matter, or other deleterious substance. Not more than 12 percent by weight shall pass the 200 mesh sieve and plasticity index shall not exceed 4.0.

C. Cement Stabilized Sand

1. Cement stabilized sand shall be used for bedding.

2. Cement shall consist of Type I Portland Cement conforming to ASTM C150.

3. Mix in a pug mill or secure from approved supplier using not less than 1½

sacks of cement per ton of mixture with sufficient water to hydrate the cement.

III. EXECUTION

A. Preparation

1. All line materials (pipe and fittings) shall be on-site prior to excavation.

2. Bedding material shall be on-site, or delivery arrangements definitely made with a reliable source.

3. Provide bypass pumping as required. Bypass pumping is incidental to the work.

B. Excavation

Trench sides shall be as near vertical as practical considering wall stability and safety. Remove and dispose of defective pipe. Correct trench grade as required and stabilize trench with cement stabilized sand. From the bottom of the trench to the top at the new pipe, the wall shall be near vertical with slopes, if any, above this level. Where conditions require, vertical wall shall be shored or sheeted and braced. It is the Contractor's responsibility to fully comply with all OSHA safety requirements. Sheeting or sheet piling to be employed if necessary for trench wall stability.

Excavated material suitable for backfilling to be piled as far as practical from edge of ditch, to increase soil stability and allow working room for pipe removal and pipe-laying operations. Excess material is to be removed from the trench bank as soon as practical. Excess is to belong to Contractor and disposition is his responsibility. Placement of excavated material on adjacent private property without written consent of Owner is prohibited. The written consent shall specifically absolve the Owner and Engineer of any liability in regard to such placement.

C. Trench Water

1. Where practical, ground surfaces shall be graded or diked to prevent the entry of surface water into the open trench.

2. Ground water entering the open trench from the walls and from a firm bottom in small quantities shall be promptly removed by trench pumps. Multiple pumps in good operating order shall be kept on the excavation site for such purposes at all times. Under such trench conditions, the

rough excavation grades to drain to the pumps prior to under-bedding placement, with suitable screening to exclude sand from pump suction.

Other methods may be employed by the Contractor to achieve the required results. The water level shall be maintained below the pipe invert until full compaction of the pipe bedding can be and is accomplished.

3. In the event that trench pumps are unable to maintain the required level, or, if the water entry is from the bottom of the excavation in such quantities as to make the bottom unstable, or, from the sides in such quantities as to make the walls unstable, then the Contractor shall provide and operate an effective well point system to dewater the trench to the required pipe laying conditions.

4. Water removed from trenches, from drainage ditches and by well points shall be conveyed to the Owner's drainage system (pipe or ditch) and not discharged upon the roadway, sidewalk or private property in such a manner as not to create damages or public nuisance.

5. Dewatering or well point systems shall be placed and operated so as to minimize inconvenience and annoyance to public, mechanical equipment shall be housed or shielded to minimize noise; engines are to be provided with efficient noise mufflers. Points and headers shall not block pedestrian and vehicular access to adjacent property. Location of pumping units to be chosen for minimum disturbance. Site to be promptly restored to original condition after point removal.

D. Pipe Embedment: After defective pipe is removed cut or fill trench to rough grade. All fill shall be cement stabilized sand. Place embedment across the width of the trench and approximately to the grade of the bottom of the pipe, with bell hole left open and additional material on sides. Additional dry, loose material is to be placed in uniformly spaced amounts along pipe (clearing sling points, if any, and bell holes) sufficient to support lower quadrant of pipe barrel for 30 percent or more of its length. The pipe is to be lowered into the outside bell and lowered against sand. It is to be checked for vertical alignment of spigot vs. bell and for gradient. The length is to be worked into true alignment and gradient by "bumping", and/or adding or removing underbedment material, so pipe is uniformly supported, under its own weight, for the lower quadrant for not less than 80 percent of its length. The pipe piece is then to be moved horizontally (axially) to make up joint, and additional underbedment material promptly worked under the pipe and tamped to provide support for its lower 1/3 for its entire length. Joint is to be checked for make-up, and exterior protection placement commenced. Pipe bedding material placement to continue, and pipe shall be solidly anchored against axial movement before next joint is made-up.

Remaining bedding and backfill placing to continue until complete. Trench water not to be allowed to rise appreciably until bedding level is above spring line of pipe.

E. Backfill

1. Where excavation has resulted in clods not larger than 10-inches in largest dimension, the surface excavated material may be pushed into the trench in layers not thicker than 12-inches and compacted. Where excavation has resulted in large clods:

   a. The clods are to be removed from the trench area and select imported material substituted therefore, or

   b. The clods are to be reduced to not greater than allowed above, and adequate finer material sufficient to fill voids between large clods provided. Highly-organic excavated material is to be considered "unsuitable" and excluded from the backfill.

2. Each layer of the backfill is to be mechanically compacted, to densities per ASTM D698 (standard proctor) within ± 3 percent of optimum moisture content. Reopen trenches inadequately compacted and recompact.

3. Backfill shall be hand placed and compacted under lines crossing the trench, steep slopes, valves, valve boxes, service connections, manholes, inlets and other appurtenances and specials.

4. Any trench settlement to be promptly filled, all trenches to be given final dressing immediately after settlement.

5. Final clean-up to follow backfill operation within 48 hours of construction or earlier if directed by the Engineer.

F. Miscellaneous Precautions, Restoration of Damages

1. Contractor shall at all times be vigilant in observing overhead electric power and communication equipment.

2. Damage to overhanging tree limbs shall also be avoided.

3. All existing facilities (fencing, structures, pavement, drives, sidewalks, trees, gardens, etc.) damaged or removed to facilitate the point repairs shall be restored to former condition. All cost shall be borne by the Contractor.

Std. 6/25/14

ITEM 2628

SERVICE RECONNECTIONS

I. GENERAL

A. Scope

The exact location and number of service connections shall be determined from TV inspection tapes, and/or in the field. It shall be the Contractor's responsibility to accurately field locate all existing service connections, whether in service or not, along the sanitary sewer main which has been rehabilitated. The Contractor shall reconnect all buildings or houses or vacant lots, unless otherwise directed. Contractor shall be required to have all service lines reconnected within 12 hours after installation. Accordingly, each vacant lot shall have one existing sanitary sewer service reconnection left in service unless otherwise directed by the Owner. All services which are reconnected to the rehabilitated sanitary sewer shall be properly shown on the "As Rehabilitated" Plans and/or Exhibits with the exact distances from the nearest downstream manhole. All existing connections shall be properly disconnected from the existing sewer and then reconnected to the liner per instructions and procedures as outlined below or as approved by the Owner.

B. Related Work (if utilized in this project)

1. Item 1666 - Cleaning and Television Inspection of Gravity Sanitary Sewer Lines

2. Item 1668 - Bypass Pumping

3. Item 1671 - Obstruction Removal

4. Item 2621 - Point Repairs - Sanitary Sewers

5. Item 2625 - Reconstruction of Sewers by Cured-In-Place-Pipe (CIPP)

6. Item 2627 - Reconstruction of Sewers by Fold and Form Pipe

II. EXECUTION

A. Excavation for Reconnections

Some repairs may be in easements or right-of-ways where machine operated equipment cannot be employed due to accessibility, locations of building adjacent to or over easements, etc. When excavation for a service line repair cannot be done with power equipment, excavation shall be done by hand.

B. House or Building Service Reconnections

1. Saddle Method: After the line has been put into place and allowed to normalize to ambient temperature as well as recover from any imposed stretch, each existing service connection, shall be reconnected to the new liner. A portion of the existing sanitary sewer main, or "carrier pipe," around each service connection shall be removed to expose the liner pipe and to provide sufficient working space for installing a pre-fabricated polyethylene saddle or an approved alternate. The polyethylene saddle shall be a one-piece saddle equipped with a neoprene gasket so that a complete seal is accomplished when the strap-on saddle is tightened with two (2) stainless steel bands; one on each side. The stub-out attached to the saddle must protrude into the liner a distance equal to the wall thickness of the liner in place. The new 4-inch, or 6-inch stub-out, or lateral, shall be reconnected to the existing service line with a flexible PVC coupling, "Fernco" or an approved equal. A service reconnection shall consist of the removal and replacement of any cracked, offset or leaking existing service up to a distance of 8 feet from the center of the new liner, measured horizontally.

   The flexible coupling shall be secured to the existing service lateral, and new stub and/or stack, with stainless steel bands. The entire exposed service reconnection shall be encased in cement stabilized sand a minimum of 6-inch below, and 12-inch above and on the sides of the pipe at a cost incidental to service reconnections. The reconnection shall be tested and approved by the Owner before backfilling.

   Service reconnections on an existing sanitary sewer, shall be the same size as existing connection, unless directed otherwise by the Owner. Gasketed PVC sewer pipe (ASTM-D 3034, SDR 26) may be used for all stubs. PVC saddles with neoprene gasket may be used in lieu of polyethylene saddles (This is not intended for new connections).

2. Remote Cutting Method: Service reconnections (for cured-in-place method) made by remote cutting tools shall be done carefully and no blind holes shall be allowed. All service reconnections made by remote cutting shall be restored to greater than 90% of the existing service connection capacity. Post TV shall show the locations of all service reconnections. The Contractor shall be responsible for restoring without delay, all missed

or faulty reconnections, as well as the repair of blind drilled holes. If a remote cut service reconnection is later corrected by full excavation with saddle etc., only one payment shall be made as per bid item, whichever is higher. The Owner reserves the right to require service reconnections(s) by excavation.

C. Protruding Taps

Protruding taps or service connections which are to be reconnected and which obstruct the insertion of the liner and are removed to allow the liner to proceed shall be paid for as a service reconnection by excavation when connected. Abandoned taps/services which are protruding and must be removed to allow the liner to be inserted into the sewer shall be paid for as an obstruction removal or point repair as directed by the Owner.

Std. 6/14/2013
Revised 8/20/15

ITEM 2629

RECONSTRUCTION OF SEWERS BY THE PIPE BURSTING METHOD

I. GENERAL

A. Scope: This Item addresses the procedure employed for the reconstruction of existing sewer lines by the pipe bursting method followed by the replacement with an approved pipe material and diameter. This Item covers the furnishing of all material, equipment, labor, supervision and all appurtenances necessary to provide for the complete reconstruction of deteriorated gravity sewer lines.

B. Related Work (if utilized in this project)

1. Item 1541 - Trench Safety Systems

2. Item 1533 - Barricades, Signs, and Traffic Handling - No TCP

3. Item 1666 - Cleaning and Television Inspection of Gravity Sanitary Sewer Lines

4. Item 1668 - Bypass Pumping

5. Item 1671 - Obstruction Removal

6. Item 2600 - Repair of Asphalt Paving

7. Item 2621 - Point Repairs - Sanitary Sewers

C. Definition: The pipe bursting method is defined as the reconstruction of gravity sewer pipe by displacing the existing pipe and installing an approved pipe material. The process involves the use of a static, hydraulic or pneumatic hammer "moling" device, suitably sized to break out the old pipe. Forward progress of the "mole" may be aided by the use of hydraulic equipment or other apparatus. The replacement pipe is either pushed or pulled into the bore. The method allows for replacement pipe on size form 8-inches through 36-inches and/or upsizing in varying increments up to 36-inches.

II. MATERIALS

A. Solid Wall Polyethylene Pipe

The replacement pipe shall be manufactured from a high density, high molecular weight polyethylene compound which conforms to ASTM D1248 and meets the requirements for Type III, Class C, Grade P-34, Category 5, and has a PPI rating of PE 3408.

The pipe produced from this resin shall have a minimum cell classification of 335434C under ASTM D3350-80. A higher numbered cell classification limit which gives desirable higher primary property, per ASTM D3350-80, may also be acceptable by the Engineer at no cost to the Owner. The value for the Hydrostatic Design Basis shall not be less than 1600 psi (11.03Mpa) per ASTM D2837.

Before beginning work, the Contractor shall submit for approval, the vendor's specific technical data with complete information on resin, physical properties of pipe, and pipe dimensions pertinent to this job. A certificate of "Compliance With Specification" shall also be furnished for all materials to be supplied.

The Contractor will be responsible for all damage caused by, and the replacement of, failed, unspecified, or unapproved materials.

B. The Standard Dimension Ratio (SDR), which is the ratio of the outside diameter of the liner pipe to its minimum wall thickness, shall be as specified below. Dimensions and workmanship shall be in accordance with ASTM F714-81 and D2122. Minimum wall thickness (inches) = O.D./SDR.

TABLE I
POLYETHYLENE REPLACEMENT PIPE DIMENSIONS

IPS Nominal O.D. (inches)	**Minimum O.D. (inches)**	**Minimum Wall Thickness (inches)**			
		SDR 26	SDR 21	SDR 19	SDR 17
7	7.125	.274	.339	.375	.419
8	8.625	.332	.411	.454	.507
10	10.750	.413	.512	.566	.632

12	12.750	.490	.607	.671	.750
14	14	.538	.667	.737	.824
16	16	.615	.762	.842	.941
24	24	.923	1.143	1.263	1.412
36	36	1.385	1.714	1.895	2.118

C. The SDR Classification for various depths shall be as follows:

TABLE II
POLYETHYLENE REPLACEMENT PIPE SDR

HDPE PIPE SDR	MAXIMUM DEPTH (Feet)
26	8.0
21	14.0
19	19.0
17	26.0

Depth shall be measured from the upstream and downstream rim of the manhole to the invert of the existing sewer in the pipe segment to be replaced. The SDR shall be selected for the deeper of the two manholes for a given pipe segment.

D. The physical appearance of the replacement pipe having deformities such as concentrated ridges, discoloration, excessive spot roughness, pitting, varying wall thickness, etc., shall constitute sufficient basis for rejection. The replacement pipe shall be homogeneous throughout; free from visible cracks, foreign inclusions, and other injurious defects. Pipe with gashes, nicks, abrasions, or any such physical damage which may have occurred during storage and/or handling, which are larger/deeper than 10% of the wall thickness shall not be used and must be removed form the construction site.

In the case of any conflict with, or deviation from, these specifications, the Contractor shall either discuss the matter in the Pre-Bid Conference or report in writing to the Engineer for clarification, explanation, and/or approval. The Engineer's decision shall be final and all costs, if any, incurred due to the Contractor's use of an unapproved replacement pipe and the subsequent work to remove and replace this replacement pipe with an acceptable pipe as specified shall

be borne by the Contractor.

E. Clamps: Where excavations for the insertion of the polyethylene replacement pipe are made between two manholes, the ends of the polyethylene pipe will be joined with an all stainless steel (including bolts and lugs), full circle, Universal Clamp Coupling with a ¼-inch thick grid gasket similar to JCM Industries Type 108 or an approved equal. Clamps shall be selected to fit the outside diameter of the liner pipe. Minimum clamp lengths shall be selected from the following table:

Outside Diameter of the Liner Pipe (Inches)	**Minimum Length of Clamp (Inches)**
4.500	12
6.6255	12
8.625	18
10.750 and larger	30

III. EXECUTION

A. Pre-Installation Preparations: The following procedures shall be adhered to unless otherwise approved by the Engineer.

1. Safety: The Contractor shall carry out his operations in strict accordance with all applicable OSHA Standards.

2. Bypass Pumping: It shall be the Contractor's responsibility to provide all pumps, piping, and personnel to bypass wastewater around the section of sewer to be replaced by plugging an upstream manhole and pumping to a downstream manhole if site conditions require bypass pumping. Pumps shall be of adequate capacity to handle expected flow. See separate specification for details.

3. Pre-Installation Cleaning: The Contractor shall remove all debris, roots, etc. from the existing sewer before bursting and replacement. Cleaning shall be by the use of swabs, pigs, washing or other methods as determined by the Contractor.

4. Pre-Installation Inspection: The Contractor shall review existing video tapes and log of the sewer lines designated for replacement. It shall be the responsibility of the Contractor to conduct a television inspection of sewer

pipe not previously televised, immediately before the pipe bursting to assure that the pipe conditions are acceptable for pipe bursting. Location of all service connections shall be verified from tapes and log for reconnection following replacement.

5. Line Obstructions: If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, such as heavy solids, severely dropped joints, collapsed pipe that will prevent completion of the installation process or reinstallation of a service connection, then a point repair shall be made by the Contractor as approved by the Engineer. Protruding service connections are not considered line obstructions and removal is incidental to the work. See separate specifications for details.
6. Sags In Line: If Pre-installation video (TV) inspection reveals a sag in the existing sewer that is greater than one-half the diameter of the existing pipe, it shall be the Contractor's responsibility to install the replacement pipe to result in an acceptable grade without the sag. The Contractor shall take the necessary measures to eliminate these sags by the method of: pipe replacement, digging a sag elimination pit and bringing the bottom of the pipe trench to a uniform grade in line with the existing pipe invert or by other measures that shall be acceptable to the Engineer.

B. Installation: The Contractor shall submit information, in detail, of the procedure and the steps to be followed for the installation of the pipe bursting method. All such instructions and procedures submitted shall be carefully followed during installation. Any proposed changes in installation procedures shall require submittal of revised procedures and acceptance by the Engineer.

1. Process Limitations: Though the installation process may be licensed or proprietary in nature, the Contractor SHALL NOT change any material, thickness, design values or procedural matters stated or approved in the submittals, without the Engineer's prior knowledge and preapproval. The Contractor shall submit, in writing, full details about component materials, their properties and installation procedures and abide by them fully during the entire course of the project.

   All sewer rehabilitation by pipe bursting systems are being considered structurally equal processes as far as "end product" required by the Owner. The minimum required performance criteria, and/or standards, physical/structural properties, chemicals resistance tests, and the replacement pipe thicknesses as given in this specification shall be strictly complied. It shall be the responsibility of the Contractor to comply with the specifications in full without any request for any change after the award of

the contract. The Owner reserves the right to accept, reject, or modify any later requests for change at no additional cost to the Owner or even to the extent of asking credit for the Owner.

2. Finished Pipe: The installed replacement pipe shall be continuous over the entire length of each pipe segment from manhole to manhole and shall remain free from visual defects as specified in Section II, Paragraph D of this specification. The replacement pipe passing through or terminating in a manhole shall be carefully cut out in a shape and manner approved by the Engineer. The invert and benches shall be streamlined and improved for smooth flow. The installed pipe shall meet the leakage requirements of the pressure test in paragraph 8.

3. Insertion or Access Pits: The location and number or insertion, or access, pits shall be decided by the Contractor and approved by the Engineer prior to excavation. The pits shall be located such that their total number shall be minimized, and the footage of replacement pipe installed in a single pull shall be maximized.

   Before any excavation is done for any purpose, it will be the responsibility of the Contractor to locate water lines and taps and check with the various utility companies and determine the location of their facilities. Any necessary temporary construction easements and/or right-of-way areas will be arranged by the Contractor at no cost to the Owner.

   Any damage done to said utilities and the resulting repair, temporary service, cost, etc. and restoration of temporary easements and right-of-way areas shall be borne by the Contractor. Access pits shall be backfilled in accordance with Specification Item 2221 - Excavation, Trenching and Backfilling for Utilities of these specifications. Excavation shall comply with provisions of Items 1541- Trench Safety Systems and 2221 - Excavation, Trenching and Backfilling for Utilities.

   Existing clean-outs may be removed as required for pit excavation. After completion of pipe replacement and testing, clean-out shall be reinstalled and pit backfilled.

   All existing facilities (fencing, structures, drives, sidewalks, trees, gardens, etc.) damaged or removed to facilitate pipe bursting and pipe replacement shall be restored to former condition. All cost shall be borne by the Contractor.

4. Pipe Jointing: Sections of polyethylene replacement pipe shall be assembled and joined on the job site above ground. Jointing shall be accomplished by the heating and butt-fusion method in strict conformance with the manufacturer's recommendation.

   The butt-fusion method for pipe jointing shall be carried out in the field by operators with at least two (2) years prior experience of fusing polyethylene pipe with similar equipment using proper jigs and tools per standard procedures outlined by the pipe manufacturer. These joints shall have the acceptable appearance of a smooth, uniform, double roll back bead made while applying the proper melt, pressure and alignment. It shall be the sole responsibility of the Contractor to provide an acceptable butt-fusion joint in the field. All joints shall be inspected by the Engineer before insertion. The replacement pipe shall be joined on the job site in appropriate working lengths near the insertion pits. The maximum length of continuous replacement pipe which shall be assembled above ground and pulled on the jobsite at any one time shall be 600 linear feet unless approved by the Engineer.

5. Use of Clamp and Encasement: Where excavations for the insertion of the replacement pipe are made between two manholes, the ends of the HDPE pipe will be cut smooth and square to the axis, so that it can be joined in a workman like manner such that both ends meet and touch uniformly and continuously. An all stainless steel (including bolts and lugs) clamp with gasket as described in Section II. Paragraph E shall be used.

   In all excavations where the polyethylene pipe is exposed (i.e. insertion pits, sag elimination pits) a bedding shall be placed below the pipe and an encasement placed around and above the pipe using cement stabilized sand. The compacted thickness of this encasement shall be a minimum of 6-inches below the pipe and 12-inches above and on the sides of the pipe. It shall not be backfilled without the Engineer's approval.

6. House or Building Service Connections: The exact location and number of house or building service connections shall be determined from T.V. inspection tapes and/or in the field. Any and all such locations shown on the Plans and/or Exhibits are only approximate; as are the number of said connections in the bid proposal. It shall be the Contractor's responsibility to field locate all existing service connections, whether in service or not, along the sanitary sewer main which has been rehabilitated. The Contractor shall disconnect service connections prior to pipe bursting and reconnect all

service connections, including those that go to unoccupied or abandoned buildings or houses or vacant lots, as directed by the Engineer. Accordingly, each vacant lot shall have one existing sanitary sewer service connection left in service. All services which are reconnected to the rehabilitated sanitary sewer shall be properly shown on the "As Rehabilitated" Plans and/or Exhibits with the exact distances from the nearest downstream manhole. All existing connections shall be properly disconnected from the existing sewer and then reconnected to the replacement pipe per instructions and procedures as outlined below or as approved by the Engineer.

After the replacement pipe has been pulled into place and allowed to normalize to ambient temperature as well as recover from any imposed stretch, each existing service connection, as directed by the Engineer, shall be reconnected to the replacement pipe with a prefabricated polyethylene saddle or an approved alternate. The polyethylene saddle shall be a one-piece saddle equipped with a neoprene gasket so that a complete seal is accomplished when the strap-on saddle is tightened with two (2) stainless steel bands; one on each end. The stub-out attached to the saddle must protrude into the replacement pipe a distance equal to the wall thickness of the replacement pipe in place. The new 4-inch stub-out, or lateral, shall be connected to the existing service line with a flexible PVC coupling, "Fernco" or an approved equal.

The flexible coupling shall be secured to the existing service lateral and new stub and/or stack with stainless steel bands. The entire exposed service connection shall be encased in cement stabilized sand a minimum of 6-inches below, and 12-inches above and on the sides of, the pipe at a cost incidental to service connections. The connection shall be tested and approved by the Engineer before backfilling. A remote tap shall not be allowed.

Service connections on an existing sanitary sewer shall be 4-inch. Gasketed PVC sewer pipe (ASTM D-3034, SDR 26) may be used for all stubs. PVC saddles with neoprene gaskets may be used in lieu of polyethylene saddles. (This is not intended for new connections).

The Contractor shall utilize existing taps/service connections to reconnect the service lines to the replacement pipe unless approved otherwise by the Engineer.

7. Sealing and Benches in Manholes: The replacement pipe shall be installed

with a tight fitting seal with the existing or new manhole. Half-inch diameter activated oakum band soaked in Scotch seal 5600 or equal shall be applied circumferentially on the replacement pipe and encased with a cementitious mortar to prevent inflow at the manhole. The top half of the pipe within the manhole shall be neatly cut off and not broken or sheared off, at least four inches away from the manhole walls. The channel in the manhole shall be a smooth continuation of the pipe(s) and shall be merged with other lines or channels if any. Channel cross-section shall be U-shaped with a minimum height of half pipe diameter to three-fourths of the pipe diameter for fifteen inches and larger. The side of the channels shall be built up with mortar/concrete, as specified, to provide benches at a maximum of 1 in 12 pitch towards the channel.

Payment for above work shall be incidental to sewer rehabilitation by the pipe bursting method, since that payment is made from center line to center line of manhole(s). Separate payment shall be made if no line or manhole is rehabilitated but benches are required to be improved as above.

The replacement pipe in the manhole shall be sealed as specified above before proceeding on to the next manhole section and all manholes shall be individually inspected for replacement pipe cut-offs, benches and sealing works.

The replacement pipe shall be allowed to normalize to ambient temperatures as well as recover from any imposed stretch, usually 8 - 10 hours in the case of polyethylene, before being cut to fit between manholes and proceeding with reshaping and/or smoothing the manhole invert.

8. Testing of the Replacement Pipe: All costs for testing the replacement pipe by a pressure method will be incidental to the installation.

Two (2) types of testing will be required after the replacement pipe has been installed in the existing sanitary sewer main. The first test is a low pressure air test of the replacement pipe before it has been sealed in place at the manholes, and before any service connections have been made. The purpose of this test is to check the integrity of the joints that have been made and to verify that the replacement pipe has not been damaged by inserting it into the sanitary sewer. The second test is a service tap connection test. This test will be done after all sewer taps have been made for a particular sanitary sewer section. This test will verify the integrity of the tap at the point where it joins the replacement pipe.

a. Low Pressure Air Test Procedure: After a manhole-to-manhole section of sanitary sewer main has been rehabilitated and insertion pits backfilled and prior to any service lines being connected to the replacement pipe, the pipe shall be plugged at each manhole with pneumatic plugs. The design of the plugs shall be such that they will hold against the test pressure without requiring external blocking or bracing. One of the plugs shall have three air hose connections: one for the inflation of the plug, one for reading the air pressure in the sealed line, and one for introducing air into sealed line.

Low pressure air shall then be introduced into the sealed line. For sections of pipe less than 36-inch average inside diameter, the following procedure shall apply. The pipe shall be pressurized to 4.0 psi gauge greater than the pressure exerted by groundwater that may be over the pipe. At least two (2) minutes shall elapse to allow the pressure to stabilize.

Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

$$T = \frac{0.085xDxK}{Q}$$

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419xDxL, but not less than 1.0
D = average inside pipe diameter in inches
L = length of line of same pipe size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface shall be used

Since a *K* value of less than 1.0 shall not be used, there are minimum testing times for each pipe diameter as follows:

Pipe Diameter (Inches)	Minimum Time (Seconds)	Length For Minimum Time (Feet)	Time For Longer Length (Seconds)
6	340	398	0.855(L)
8	454	298	1.520(L)
10	567	239	2.374(L)
12	680	199	3.419(L)
15	850	159	5.342(L)
18	1020	133	7.693(L)
21	1190	114	10.471(L)
24	1360	100	13.676(L)
27	1530	88	17.309(L)
30	1700	80	21.369(L)
33	1870	72	25.856(L)

The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure.

b. Service Tap/Connection Smoke Test Procedure: A smoke test shall be performed on all service taps replaced in each rehabilitated sanitary sewer manhole section to determine if all existing service connections have been reconnected to the rehabilitated sewer and to check the integrity of the connection of the newly replaced service tap; both to the replacement pipe and to the existing private service connection. However, no taps shall be backfilled until completion of this test. Only those taps in one manhole section shall be tested at any one time to prevent having a large number of open excavations which could be a hazard to the public.

   The Contractor shall isolate the manhole section to be tested from the adjacent manhole sections to prevent smoke from migrating into those lines not being tested; as well as provide a concentration of smoke in the section of line to be tested.

   Prior to smoke testing, written notice(s) shall be given to the area residents no fewer than two (2) days, nor more than seven (7) days, prior

to the proposed testing. Notice shall also be given to the Police and Fire Departments 24 hours prior to actual smoke testing.

This test shall be conducted by forcing smoke from "smoke generators," as offered by Superior Signal Company or an approved equal, through the new lines of the sanitary sewer main. The "smoke generators" shall have a minimum duration of five (5) minutes.

Smoke shall be introduced, as per the manufacturer's recommendations and the Engineer's approval, into the upstream and/or downstream manhole as appropriate, and the tap/connection shall be monitored for smoke leaks. The Engineer, accompanied by the Contractor, shall check each tap/connection being tested. Sources of all leaks must be found and noted.

All taps/connections noted as leaking shall be repaired or replaced and then retested. The Contractor will be allowed to leave the tap/connection exposed in only one (1) manhole section at a time to minimize inconvenience and hazard to the residents. If tap/connection repair or replacement, testing or retesting, and backfilling of the excavation is not completed within the work day, the Contractor shall properly cover each excavation with plywood, or some other approved material, to the satisfaction of the Engineer.

On houses where smoke does not issue from the plumbing vent stacks to confirm the reconnection of the sewer service to the newly installed liner pipe, a dye test will be required to confirm the reconnection. Dye shall be introduced into all service lines and then each line is to be flooded with water. The Engineer shall then move to the downstream manhole to detect the dye coming out of the replacement pipe. This shall confirm a reconnection. If any more than one service connection is dye tested at a time, these dye tests shall be done with enough time allotted between each test to allow the dye to be purged from the line. Otherwise, different colored dyes shall be used.

ITEM 2701

MANHOLE RECONSTRUCTION (CEMENTITIOUS LINER)

I. GENERAL

A. Scope

This specifications shall govern all work, materials, and equipment required for manhole rehabilitation for the purpose of eliminating infiltration, providing corrosion protection, repair of voids, and restoration of the structural integrity of the manhole as a result of applying a monolithic fiber reinforced structural/structurally enhanced cement liner to the wall and bench surfaces of brick, concrete, or any other masonry construction material.

Described are procedures for manhole preparation, cleaning, application and testing. The applicator, approved and trained by the manufacturer, shall furnish all labor, equipment and materials for applying a cement mix to form a monolithic liner of a minimum 1-inch thickness, with machinery specially designed for the application. All aspects of the installation shall be in accordance with the manufacturer's recommendation and with the following specifications which includes the following:

- The removal of any loose and unsound material.
- Cleaning of the area to be sprayed by spraying with high pressure water.
- The repair and filling of voids.
- The repair and sealing of the invert and benches.
- The elimination of active infiltration prior to making the application.
- The spray application of a cement mix to form a structural/structurally enhanced monolithic liner.

B. Field Location of Manholes

1. Contractor is responsible for locating and uncovering all manholes in lines being rehabilitated. If difficulty is encountered in locating a manhole

covered by ground or pavement, notify the Engineer and await instructions.

2. Contractor is responsible for properly identifying manholes prior to initiation of cleaning and sealing operations.

C. Related Work

Item 1541 - Trench Safety

Item 2221 - Excavation, Trenching and Backfilling for Utilities

Item 2550 - Manhole Reconstruction (if used)

II. MATERIALS AND EQUIPMENT

A. Wall Cleaning

1. High Pressure Water: 3500 psi minimum force.

2. Water: Shall be clean and may be potable or non-potable. Water must be free of harmful materials to the systems applied below.

3. Cleaners: Detergent or muriatic acid capable of removing dirt, grease, oil and other matter which would prevent a good bond of sealing material to the wall. Refer to sealing manufacturer's recommendation.

B. Wall Repair Materials

1. Infiltration Control Mix (Hydraulic Cements)

A rapid setting cement product specifically formulated for leak control, shall be used to stop minor water infiltration, and shall be mixed and applied according to manufacturer's recommendations and shall have the following minimum requirements.

a.	Compressive Strength (ASTM C-109)	600 psi, 1 Hr. 1000 psi, 24 Hrs.
b.	Bond (ASTM C-321)	30 psi, 1 Hr.

2. Large Infiltration Control Mix (Hydraulic Cements)

A cement grout shall be used for stopping very active infiltration and filling very large voids and shall be mixed and applied according to manufacturer's recommendations. The cement grout shall be volume stable, and have a minimum 28 day compressive strength of 250 psi and a 1 day strength of 50 psi.

3. Patching Mix (Quick Set Mortar)

A quick setting cement material shall be used as a patching mix to repair wide cracks, holes, or disintegrated mortar. The material is to be mixed and applied according to manufacturer's recommendations and shall have the following minimum requirements:

a.	Compressive Strength (ASTM C-109)	6 Hrs. 1400 psi
b.	Shrinkage (ASTM C-596)	0% at 90% R.H.
c.	Bond (ASTM C-321)	28 Days, 150 psi
d.	Cement	Sulfate Resistant
e.	Density, when applied	105 $\pm$ 5 pcf 80 psi, 24 Hrs.

4. Concrete Liner Mix or Reliner MSP

a. Provide corrosion resistant concrete containing microsilica admixtures for use as a liner for manholes, as manufactured by Strong Seal or Standard Cement.

b. A cement liner shall be used to form a structural/structurally enhanced monolithic liner covering all interior manhole surfaces and shall have the following minimum requirements at 28 days.

1)	Compressive Strength (ASTM C-109)	3000 psi
2)	Tensile Strength (ASTM C-496)	300 psi
3)	Flexural Strength (ASTM C-293)	600 psi
4)	Shrinkage (ASTM C-596) @ 90% relative humidity	0%

5) Bond (ASTM C-321) 130 psi

6) Density, when applied 105 ± pcf

c. Liner mix shall be made with Calcium Aluminate Cement and shall be used according to manufacturer's recommendations.

5. Water: Water used in mixes shall be clean, free from harmful amounts of oils, acids, alkalis or other substances and meet the requirements of ASTM C94. Water may be potable or non-potable. Questionable non-potable water shall be tested by a testing laboratory in accordance with ASTM C-94. Potable water need not be tested.

6. Other Materials

a. Chemical admixtures (where applicable)

1) Water reducers: ASTM C494, Type A.

2) Water Reducing Retarders: ASTM 494, Type D

3) High Range Water Reducers (Superplasticizers): ASTM C494, Types F and G.

b. Polypropylene Fibers

1) Ratio: 1.5 pounds per cubic yard concrete

2) Physical Properties

a) Length: 3/4 Inch

b) Specific Gravity: 0.91

c) Adsorption: None

d) Tensile Strength: 70-110 Ksi

e) Modulus of Elasticity: 500 Ksi

c. No other material shall be used with the mixes described in II.B.1, II.B.2, II.B.3, and II.B.4 without prior approval or recommendation from the manufacturer.

C. Equipment

Specially designed machines consisting of an optimized progressive cavity pump capable of producing a minimum of 250 psi pumping pressure, contra-blend mixer with twin ribbon paddle with end discharge, and an air system for spray application of product where applicable. Equipment to be complete with water storage and metering system. Mixer and pump to be hydraulically powered. Equipment to be mounted to heavy duty construction tandem axle, road worthy trailer, complete with electric brakes and running lights. Internal combustion engine powers hydraulic system and air compressor.

III. EXECUTION

A. Protection

1. Provide barricades, warning lights, and signs for open manholes and/or excavations necessary for ring, cover, and frame replacement. Signs, barricades and enclosures shall conform to the requirements outlined in the "Texas Manual on Uniform Traffic Control Devices".

2. Place covers over invert to prevent extraneous material from entering the sewer lines. Do not allow sand, debris, or storm water runoff to enter the sanitary sewer system.

B. Excavation

1. All excavation to be in accordance with Specification Item 2221.

2. Perform all work in compliance with OSHA standards. Employ trench safety systems for excavation over 5 feet deep.

3. Contractor shall be responsible for the installation and operation of any and all necessary dewatering and surface control measures.

C. Bypass Pumping

1. Install and operate bypass pumping equipment to maintain sewage flow and to prevent backup or overflow.

2. Design all piping, joints, and accessories to withstand twice the maximum by pass system pressure or 50 psi, whichever is greater.

3. In the event of accidental spill or overflow, immediately stop the overflow and take action to clean up and disinfect the spillage. Promptly notify the Owner so that required reporting can be made to the TCEQ and USEPA.

D. Manhole Wall Cleaning

1. Clean the floor and interior walls by removing all deleterious material, including dirt, grease, and other debris. All remaining foreign material shall be removed from the manhole wall and bench using a high pressure water spray (minimum 3500 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick setting patching mix.

2. Preparation of the interior surfaces shall conform to the requirements of the wall sealing material manufacturer.

E. Manhole Wall Sealing

1. Leak Sealing

Active leaks shall be stopped using quick setting, specially formulated mixes according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application after which the weep holes shall be plugged with the quick setting mix prior to the final liner application. When severe infiltration is present, drilling may be required in order to pressure grout. Manufacturer's recommendations shall be followed when pressure grouting is required.

2. Invert Repair

a. After all preparation has been completed, remove all loose material and wash wall again.

b. Any bench, invert, or service line repairs shall be made at this time using the quick setting patching mix and shall be used per manufacturer's recommendations.

c. Invert repair shall be performed on all inverts with visible damage or infiltration. After thoroughly cleaning invert, the quick setting patch mix shall be applied to the invert in an expeditious manner. The mix shall be troweled uniformly onto the damaged invert extending out onto the base of the manhole sufficiently to tie into the structural/structurally enhanced monolithic liner to be applied. The finished invert surfaces shall be smooth and free of ridges.

The flow may be re-established in the manhole within 30 minutes after placement of the mix.

3. Mixing

   a. For each bag of product, use the amount of water specified by the manufacturer and mix using the approved equipment for 30 seconds to 1 minute after all materials have been placed in the mixing hopper. Follow manufactures recommended batching, mixing instructions, and method of additive addition.

   b. Place the mix into the holding hopper and prepare another batch with timing such that the material can be sprayed or troweled in a continuous manner without interruption until each application is complete.

4. Troweling

   Apply liner to thickness of one inch using a steel trowel to provide a smooth even surface.

5. Spraying

   a. 1st Application

      The surface prior to spraying shall be clean and must be free of all foreign material and shall be damp without noticeable free water droplets or running water, but totally saturated, just prior to application. Materials shall be spray applied from the bottom of the wall to the top, to a minimum uniform thickness to insure that all cracks, crevices, and voids are filled and a relatively smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.

   b. 2nd Application

      A second application is applied after the 1st application has begun to take an initial set (disappearance of surface sheen which could be 15 minutes to 1 hour depending up ambient conditions) to assure a minimum total finished thickness of 1-inch. Again, application shall be from the bottom up. The surface is then trowelled to a smooth finish being careful not to over trowel so as to bring additional water to the surface and weaken it. Manufacturer's recommendations shall be followed whenever more

than 24 hours have elapsed between applications. A brush finish is accepted and is applicators option.

6. Bench Application

The wooden covers shall be removed at this time and the bench sprayed or troweled such that a gradual slope is produced from the walls to the invert with the thickness at the edge of the invert being no less than 1-inch. The wall/bench intersection shall be rounded to a uniform radius the full circumference of the intersection.

7. Curing

Caution should be taken to minimize exposure of applied product to sunlight and air movement. If application of second coat is to be longer than 15 minutes after completion of application of 1st coat, the manhole cover shall be set back in place. At no time should the finished product be exposed to sunlight or air movement for longer than 15 minutes before replacing the manhole cover. In extremely hot and arid climates manhole should be shaded while reconstruction is in process.

a. The final application shall have a minimum of four (4) hours cure time before being subject to active flow.

b. Traffic shall not be allowed over manholes for 24 hours after reconstruction is complete.

IV. QUALITY ASSURANCE

A. Weather

No application shall be made to frozen surfaces or if freezing is expected to occur inside the manhole within 24 hours after application. If ambient temperatures are in excess of 95 degrees F, precautions shall be taken to keep the mix temperature at time of application below 90 degrees F. Mix water temperature shall not exceed 85 degrees F. Chill with ice if necessary.

B. Product Testing

Four - 2-inch cubes shall be cast each day or from every 50 bags of product used, and shall be properly labeled and sent in for testing in accordance with the Owner's or manufacturer's directions, for compression strength testing as described in ASTM C-109.

C. Final Acceptance Testing

At the direction of the Owner or his assignee, the rehabilitation manholes shall be tested as follows:

1. Visually verify the absence of leaks.

2. Perform a vacuum test.

   a) After completion of manhole reconstruction, but prior to backfilling, test manholes for water tightness using vacuum testing procedures.

   b) No grout shall be placed in horizontal joints before testing.

   c) Plug influent and effluent lines, including service lines, with suitably-sized pneumatic or mechanical plugs. Ensure plugs manufacturer's safety and installation recommendations. Place plugs a minimum of 6-inches outside of manhole walls.

   d) Vacuum Testing

      1) Install vacuum tester head assembly at top access point of manhole and adjust for proper seal on straight top section of manhole structure. Follow manufacturer's instructions and safety precautions, inflate sealing element to the recommended maximum inflation pressure; do not over-inflate.

      2) Manholes to be vacuum tested shall have 10-inches of mercury applied to the manhole and the time measured for the vacuum to drop from 10-inches to 9-inches of mercury. Vacuum equipment shall be approved by the Engineer prior to its use. Following are minimum allowable test times for manhole acceptance at the specified vacuum drop.

Depth of Manhole (Feet)	Time (Sec) per Manhole Diameter (Inches)		
	48"	60"	72"
8	14	18	23
10	17	23	28

Depth of Manhole (Feet)	Time (Sec) per Manhole Diameter (Inches) 48"	60"	72"
12	21	28	34
14	25	32	40
16	28	37	45
18	32	41	51
20	35	46	57
22	39	51	62
24	42	55	68
26	46	60	74
28	49	64	80
30	53	69	85

Test times for structures other than manholes will be based on the times for manholes of the nearest equivalent volume or as directed by the Engineer.

3) If the drop in vacuum exceeds 1-inch mercury (Hg) over the specified time period tabulated above, locate leaks, complete repairs necessary to seal manhole and repeat test procedure until satisfactory results are obtained.

D. Performance Requirements

1. Perform work needed to make manholes structurally sound, improve flow, prevent entrance of inflow or groundwater, prevent entrance of soil or debris, and provide protection against hydrogen sulfide gas attack.

2. Manufacturer's Product Support

a. Through the Contractor, manufacturer's of wall sealing or lining systems shall submit to Engineer for review and approval a detailed description of the proposed rehabilitation process. Describe surface preparation, independent laboratory test results, mix design procedures and method of controlling uniform thickness.

b. A representative employed by the manufacturer and having technical training in admixture and concrete mix design shall be named and available for consultation by telephone during business hours and on site upon 48 hours notices.

c. Manufacturer's representative on concrete lining systems shall provide technical assistance to concrete batch plant operators to ensure proper usage of dispensing equipment and accurate proportions of admixtures.

E. Submittals

1. Product Data: Submit product data, including surface preparation instructions and application instructions, from manufacturer of wall repair materials, hydraulic cements, quick-set mortars, specialized sealants, and grouts.

2. Installer Qualifications: Installers of liners and wall repair systems shall submit qualifications to Engineer at least 14 days prior to start of any material application. Submittal shall consist of:

   a. Manufacturer's approved equipment list, by name and model number for application of product and Contractor's equipment list showing approved equipment available for use in product application.

   b. List of Contractor's personnel who have satisfactorily completed manufacturer's training in product application within previous two years. Include date of certification for each person.

3. Progress Photographs

   a. After cleaning and sealing each manhole, submit 3" x 5" color photographs of manhole's interior walls for review by Engineer. Engineer may inspect the manhole before giving approval to begin lining.

   b. After liner installation of each manhole, submit a minimum of three additional 3" x 5" color photographs to show final condition of rehabilitated manhole.

   c. Provide photographs of sufficient quality and clarity so that interior condition can be readily determined by Engineer.

   d. Annotate each photograph. Give date, manhole number, material used, and appropriate remarks on the back using permanent ink.

F. Acceptable Manufacturers and Products

Products and techniques approved by Strong Seal (MS 2C) and Standard Cement (Reliner MSP) are acceptable for this project.

Std. 2/2/86
Revised 10/1/02

ITEM 3200

CONCRETE REINFORCEMENT

I. GENERAL

A. Scope: This section gives requirements for concrete reinforcement. Coordinate the requirements of this section with all other items dealing with concrete and concrete construction.

B. Reference Standards: The latest editions of reference standards listed below form a part of this specification and are applicable to this project.

1. American Society for Testing and Materials

   ASTM A 615, "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"

   ASTM A 185, "Specification for Welded Steel Wire Fabric for Concrete Reinforcement"

   ASTM A 306, "Specification for Carbon Steel Bars Subject to Mechanical Property Requirements"

2. American Concrete Institute

   ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures"

   ACI 318, "Building Code Requirements for Reinforced Concrete"

3. Concrete Reinforcing Steel Institute

   CRSI 163, "Recommended Practice for Placing Reinforcing Bars"

   CRSI 165, "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature"

C. Submittals

1. Certificates: Submit the manufacturer's certificates giving the properties of steel proposed for use. List the manufacturers test number and heat number, chemical analysis, yield point, tensile strength and percent elongation. Also identify on the certificates the proposed location of the steel in the work.

2. Bill of Materials: Submit bills of materials to be reviewed with shop drawings.

3. Shop Drawings

   a. Submit shop drawings according to the General Conditions. Show reinforcement fabrication, bar placement, location splices, spacing and bar designation, bar type, length, size, bedding, number of bars, location of bars to accommodate post-tensioning tendons and other pertinent information, including dimension. Information must correspond directly to data listed on the bill of materials.

   b. Provide sufficient detail to permit placement of reinforcement without use of design Plans and/or Exhibits. Reproduction of design Plans and/or Exhibits for use as shop drawings will not be allowed. Begin fabrication of reinforcing steel after shop drawings have been reviewed by the Engineer.

   c. Refer to ACI reference standards for detailing, location, placing, splicing, etc. of reinforcing steel to be shown on shop drawings.

   d. Scheduling: Schedule materials for delivery to the site so that items may be installed immediately upon delivery. Plan the schedule to accommodate other work especially post- tensioning. Place items in the proper sequence so that removal and replacement to accommodate other work is avoided.

   e. Handling and Storage: Store steel reinforcement above the ground on platforms, skids or other supports. Protect reinforcing, as far as practicable, from mechanical injury, surface deterioration and rusting caused by exposure to the weather.

   f. Inspection: Make storage and fabrication facilities of the supplier and fabricator available for inspection by the Engineer prior to and during fabrication.

g. Measurement and Payment: No separate payment. Include cost of work in applicable contract price.

II. MATERIALS

A. Reinforcement

1. Deformed Bars: Use deformed bars conforming to ASTM A 615, grade as specified on Plans and/or Exhibits, for all bars except column spirals and those shown on Plans and/or Exhibits to be smooth bars. Where grade is not specified on Plans and/or Exhibits, use Grade 60.

2. Smooth Bars: Use bars conforming to ASTM A 306, Grade 70, for all smooth bars including column spirals.

3. Marking: Clearly mark all bars with waterproof tags showing the number of bars, size, mark, length and yield strength. Mark steel with the same designation as the number in which it occurs. Key marks to be the concrete placement number as designated in the concrete placement sequence shown on the Plans and/or Exhibits.

4. Welded Wire Fabric: ASTM A 185, electrically-welded wire fabric of cold-drawn wire. Provide gauge and mesh size as shown.

B. Mechanical Bar Splices

1. G-Loc Splices: As manufactured by Gateway building Products, 3233 W. Grand Avenue, Chicago, Illinois, or approved equal.

2. Cadweld Splices: As manufactured by Erico Products, Inc., 2070 East 61st Place, Cleveland, Ohio, or approved equal.

C. Tie Wire: Use 18 gauge annealed steel for tie wire.

D. Accessories: Provide chairs, riser bars, ties and other accessories made of plastic or metal, except as otherwise specified. Where concrete surfaces are exposed to the weather in finished work, provide plastic accessories only. Use of galvanized or plastic tipped metal is not permitted in these locations. Use plastic accessories manufactured by W.H.C. Products, Inc., Houston, Texas, or approved equal.

E. Precast Concrete Bar Supports: Provide bar supports 3-inches wide, 6-inches long, and thick enough to allow the required cover. Embed tie wires in the 3-inch sides.

III. EXECUTION

A. Notification: Notify the Engineer at least 24 hours before concrete placement so that reinforcement may be inspected and errors corrected without delaying the work.

B. Fabrication

1. Cold Form Bent Bars: Fabricate cold-form bent bars to the shapes shown on the Plans and/or Exhibits. Do not straighten or rebend bars without specific approval. On the job, cut bars by shearing or sawing.

2. Splices: Use a minimum number of splices. Lap splices in strict accord with ACI 318 or as shown. Where it is necessary to splice reinforcement other than shown, the Engineer will determine the character of the splice. Do not make splices at points of maximum stress. Stagger splices in adjacent bars.

3. Fabrication Tolerances: Bars used for concrete reinforcement must conform to the following fabrication tolerances:

Measurement	Tolerance in Inches
Sheared length	+ - 1
Depth of truss bars to 8-Inch Depth	+ 0, - ¼
Depth of truss bars over 8-Inch Depth	+ 0, - ½
Stirrups, ties, and spirals	+ - ¼
All other bends	+ - 1

Std. 3/31/86
Revised 2/20/2014

ITEM 3310

CONCRETE

I. GENERAL

A. Scope: This Item governs for materials used; for storing, measuring, and handling of materials; and for proportioning and mixing of concrete. Use either ready-mixed concrete conforming to ASTM C94 or site mixed concrete. Contractor to assume responsibility for design of concrete mixtures. Furnish statement giving proportions of materials that will be used in each class of concrete that is to be incorporated into project. Furnish commercial laboratory reports showing that proportions and materials selected will produce laboratory mixed concrete of specified quality and having strengths twenty (20) percent greater than strengths specified herein.

B. Related Work (if utilized in this project)

1. Item 3200 - Concrete Reinforcement

II. MATERIALS

A. Cement: In accordance with ASTM C150 or C175. Conform to applicable ASTM Specifications for weight variations and length of storage. Cement which has become caked or lumped not permitted. Deliver in bags for site- mixed concrete. No Fly Ash Allowed.

B. Water: Clean and free of deleterious amounts of acid, alkali or organic matter. Water which is suitable for drinking or for ordinary household use may be accepted for use without being tested. Other water must be tested and determined to be in accordance with current "Standard Method of Test for Quality of Water to be Used in Concrete."

C. Coarse Aggregate: Consist of gravel or crushed stone.

1. Gravel: Consist of durable particles of gravel, crushed or uncrushed, having a wear of not more than forty (40) percent.

2. Crushed Stone: Consist of durable particles of rock of reasonably uniform quality throughout and having a wear of not more than forty (40) percent.

3. Deleterious Substances: Maximum permissible percentages of deleterious substances not to exceed following percentages by weight.

Material removed by decantation, ASTM C117	1.0%
Shale, slate, or similar materials	1.0%
Clay lumps	.25%
Soft fragments	3.0%
Others, including friable, thin, elongated or laminated pieces	3.0%

Sum of all deleterious ingredients, exclusive of material removed by decantation, not to exceed five (5) percent by weight. Aggregate to be free from an excess of salt, alkali, vegetable matter, or other objectionable materials either free or as adherent coating.

4. Graduation: Conform to following grading requirements. Screens are construed to have circular openings.

Class A Concrete and Class E Concrete:

Retained on 1½" screen	0 to 5%
Retained on ¾" screen	25 to 60%
Retained on ¼" screen	95 to 100%

Class B Concrete:

Retained on 2½" screen	0 to 5%
Retained on 1¼" screen	25 to 60%
Retained on ¾" screen	40 to 75%
Retained on ¼" screen	95 to 100%

Class C Concrete:

Retained on 3" screen	0 to 5%
Retained on 1½" screen	25 to 60%
Retained on 1" screen	40 to 75%
Retained on ¼" screen	95 to 100%

Class D Concrete:

Retained on 1" screen	0 to 5%
Retained on ½" screen	25 to 75%
Retained on ¼" screen	95 to 100%

D. Fine Aggregate: Consist of sand or a combination of sand and not more than fifty (50) percent of stone screenings.

1. Sand: Composed of cleaned, hard, durable, uncoated grains.

2. Stone Screenings: Consist of clean, hard durable, uncoated fragments resulting from crushing of stone.

3. Mineral Filler: Mineral filler may be combined with sand or sand and stone screenings specified above if such combination is necessary to meet grading requirement for fine aggregate. Filler consist of stone dust, clean crushed shell, crushed sand or other approved inert material. When subject to calorimetric test for organic impurities (ASTM C40), mixture of mineral filler and fine aggregate to be used in Portland Cement Concrete mixed in proportions proposed for use shall not show a color darker than standard color. Conform to following grading requirements (sieves are construed to have square opening).

Retained on 20 mesh sieve 0%
Retained on 30 mesh sieve ..... 0 to 5%
Retained on 100 mesh sieve .....0 to 30%

E. Concrete Admixtures

1. Air-Entraining: Air-entraining agent required. Conform to ASTM C260. Use between three (3) and five (5) percent for Classes A, B, D, and E concrete. Determine air content by ASTM C138 or C173. No air-entraining agent required for seal slabs.

2. Others: Contractor may, at his option, use Possolith (Type VIII) or Plastiment admixture to reduce water and cement content of Classes A, B, D, and E concrete. If admixture is used, maximum reduction in cement content not to exceed "one- quarter" bag per cubic yard; compressive strength laboratory reports, as required hereinabove, to include admixture. No additional compensation allowed for concrete containing mixture.

F. Storage of Materials

1. Cement: Unless otherwise provided, store cement in well ventilated, weather proof buildings which protect cement from dampness. Support cement clear from floor or ground to prevent absorption of moisture. Engineer may permit storage of cement in open for short periods of time (maximum of forty-eight (48) hours) if raised storage platform and adequate waterproof covering are provided.

2. Aggregate: Handling and storage of concrete aggregate such as to prevent mixing with foreign materials. When contract requires use of two (2) or more sizes of aggregate, store in such manner as to prevent intermixing. Handle materials in stockpiles of all weeds and grass.

Bottom layer of aggregate not to be used without recleaning. Stockpile all fine aggregate for at least twenty-four (24) hours prior to use in order to reduce free moisture content.

G. Measurement of Materials by Weight: Measure materials, except water, used in batches of concrete by weight, as outlined herein. Weigh fine aggregate, course aggregate, and mineral filler separately. Make allowances for water content when moist aggregates are used. Determine quantities of each component material of batch, as set forth, and make no change without approval. Base quantities of material per batch upon using full bags of cement. Batches involving use of fractional bags not permitted.

H. Weighing and Measuring Equipment: Capacity of weighing equipment adequate to permit required weighing of materials without delaying production of mixer. Following general requirements apply to all types of weighing equipment contemplated:

1. Weighing Container: Use weighing container of suitable size, shape, and tight enough to hold materials. Design and construct weighing container and its appurtenances such as to eliminate retentions of varying tare materials on any of its parts. Container capable of being fully and quickly discharged without shaking or jarring scales.

2. Scales: Provide scales, that is, balance or weighing mechanism of beam or springless dial type. Use product of nationally known and established manufacturer for this type of equipment. Scales of simple rugged design with minimum number of adjustments consistent with accuracy required and suited for supporting weighing containers. Maintain a maximum tolerance of one (1) percent of net load being weighted. Design and construct parts of weighing mechanism, such as beam, levers, pivots, connections, etc., of such materials as will be consistent with conditions of use and accuracy required. Mount scales on a firm foundation and keep level. Unless scale is equipped with multiple weight beam which permits weighing of more than one kind of material on same scale without changing settings on weight beams, furnish separate scale units for each kind of material.

I. Water: Provide device for measuring quantity of water which indicates in gallons and fractions thereof. Operating mechanism regulates quantity of water required for any given batch within one percent (1%). Cut-off supply inlet automatically when water is discharged into mixer.

J. Classification and Proportions: Proportion as determined by laboratory design reports, using methods outlined in Texas State Highway Bulletin C-1 for design of mixes by absolute volumes and in accordance with requirements hereinafter set forth. Minimum cement content, maximum allowable water content and maximum slump for various classes of mixes follows:

Class Type	Minimum Cement Bags Per Cubic Yard	Maximum Water Gallons Per Bags (net)	Maximum Slump Inches
A. Structural	5.25	6.25	2½ to 4½
B. Fill	4.25	8.00	2½ to 4
C. Pipe Blocking	3.00	10.5	3 to 5
D. Seal Slab	4.00	-----	6 to 8
E. Paving	5.50	6.25	1 to 3

During progress of work, Contractor will maintain a careful check of the quantity of cement used in each structural unit. Make such adjustments, with approval, in mix design to correct for any variations of more than two (2) percent from theoretical cement content when such variations are attributable to mix design. In calculations for theoretical quantity of cement required, make allowances for embedded reinforcing steel, embedded structural steel and all paneling or chambers more than 3-inches in width.

K. Consistency: In general, consistency of concrete mixtures as follows:

1. Mortar clings to coarse aggregate.

2. Concrete is not sufficiently fluid to segregate when transported to place of deposit.

3. Mortar shows no free water when removed from mixer.

4. Concrete settles into place when deposited in forms. When transported in metal chutes at an angle of thirty (30) degrees with horizontal, concrete slides (not flows) into place.

Any mix failing to meet above outlined consistency requirements, although meeting slump requirements, is unsatisfactory. Change mix, upon approval, to correct such unsatisfactory conditions. In cases when characteristics of aggregate furnished are such that, with maximum allowable amount of water, specified slumps and consistency requirements are not met, Contractor may provide aggregate of an improved grading, or modify mix design to meet the sump and consistency requirements by adding either mineral filler or cement, or both as may be necessary. In

case mineral filler is used, combined total quantity of mineral filler and fine aggregate passing 100 mesh sieve may not exceed twenty (20) percent of weight of fine aggregate. Perform slump test in accordance with methods outlined in ASTM C143.

L. Quality of Concrete

1. General: Concrete made of acceptable materials, of proportions specified, meeting strength requirements, and in complete accordance with requirements of construction methods and details specified will be considered as of satisfactory quality.

2. Test Cylinders: Engineer will cast test cylinders or beams of the number and type desired for testing to maintain a check on compressive and flexural strength of concrete actually being placed. Contractor provides curing facilities for purpose of curing concrete test specimens. Include cost of all materials used in test specimens. Include cost of all materials used in test specimens and cost of providing and maintaining curing facilities in Contract prices bid.

M. Mixing Conditions: Mix concrete in quantities required for immediate use. Do not use any concrete which is not placed within thirty (30) minutes after being discharged from mixer. Retempering of concrete not permitted. In threatening weather, which may result in conditions that will adversely affect quality of concrete to be placed, Engineer may order postponement of concrete placement. Where work has been started and changes in weather conditions required protective measures to be used, furnish adequate shelter to protect concrete against damage from rainfall or damage due to freezing temperatures. In case it is necessary to continue mixing operations during rainfall, provide protective coverings for material stock piles only to extent necessary to control moisture conditions in aggregates so as to maintain adequate control of consistency of concrete mix. Do not mix concrete, without approval when air temperature is at or below 40E F (taken in shade away from artificial heat) and falling. If authorized, concrete may be mixed when air temperature is at 35E F and rising. When permission is given for mixing at temperatures below 40E F, conform to following requirements:

Heat water used for mixing to a temperature of at least 70E F but not over 150E F. Heat aggregate by either steam or by dry heat to temperatures of at least 70E F but not over 150E F. Heating apparatus such as to heat mass of aggregates uniformly and preclude occurrence of hot spots which burn materials. Temperature of mixed concrete not to be less than 60E at time of placing in forms.

III. EXECUTION

A. Mixing and Mixing Equipment

1. Mix in batch mixer of approved type and size which insures uniform distribution of material throughout mass so that mixture is uniform in color and smooth in appearance. Use mixer of minimum rated size of five (5) cubic foot batch capacity for continuous placement of concrete involving fifteen cubic yards or less. For larger concrete placements, use mixer of at least fourteen cubic feet batch capacity. Use of two or more small mixers, operating simultaneously and continuously may be used in lieu of larger mixer. Size of mixer(s) governed by volume of concrete to be placed in one continuous pour.

2. Mix, after all ingredients are assembled in drum, for minimum time of one and one-half minutes for fourteen cubic foot mixers and smaller, and for minimum time of one minute for twenty-one cubic foot mixers and larger. Drum speed during mixing between fourteen and twenty revolutions per minute. Equip mixer with speed regulator to hold mixer to its normal speed of revolutions.

3. Discharge entire contents of drum before any materials for succeeding batch are placed therein. For first batch of concrete materials placed in mixer provide sufficient extra quantities of cement, sand, and water to coat inside surface of drum without diminishing mortar content of mix. Upon cessation of mixing for any considerable length of time, thoroughly clean and wash mixer out.

4. Equip concrete mixer with automatic timing device which is actuated when skip is raised to its full height and dumped. Arrange device to lock discharge mechanism to prevent emptying of mixer until all materials have been mixed together for minimum time required. Device to ring bell after specified time of mixing.

5. Arrange water tank so that amount of water can be accurately measured. Automatically shut-off inlet supply while tank is discharging.

6. Remove any concrete mixer from site of work which is not adequate or suitable for work or not in satisfactory state of repair. Provide suitable replacement mixer. Improperly mixed concrete not permitted.

B. Transit or Ready Mix Concrete: Proportion and prepare in accordance with requirements set forth hereinbefore. If central-mixed completely mix at central plant and then transport in agitator trucks; mixing time as specified hereinbefore. If transit-mix concrete is used, use truck mixer which is water-tight when closed.

Mix each batch of transit-mix concrete for one hundred (100) revolutions at mixing speed as specified by mixer manufacturer. Perform any additional mixing or agitation at rate specified for agitation.

1. Equip truck mixers with water tanks and measuring devices which permit positive measurement of mixing water.

2. Concrete delivered by truck mixers to be of consistency specified hereinbefore. Place transit or ready-mix concrete within one and one-half (1½) hours after introduction of cement into mixer. Placement of concrete over one and one-half (1½) hours of age not permitted.

C. Hand-Mixed Concrete: Hand mixing permitted only for small placements or in case of an emergency and then only on authorization. Perform mixing in water tight mixing box. Mix fine aggregate and cement thoroughly until mixture is uniform in color, then spread over bottom of mixing box in thin layer. Saturate coarse aggregate with water spread over whole mass of additional water is added. After all ingredients have been added, turn entire mass at least six times or more if necessary, so that mixture is uniform in color and smooth in appearance. Hand mixed batches not to exceed two (2) bag batch in volume.

Std. 3/17/14
Revised 10/23/14

ITEM 3312

CEMENT-STABILIZED SAND BACKFILL

I. GENERAL

Description: Furnish all plant, labor, equipment, supervision, and tools for the furnishing and installation of Cement-Stabilized Sand Backfill as shown on Plans and/or Exhibits or as indicated in other items of the Technical Specifications.

II. MATERIALS

A. Aggregate: Use sand containing deleterious materials not to exceed the following requirements by weight.

Material removed by decantation	5.0%
Clay lumps	0.5%
Other deleterious substances such as coal, shale, or coated grains of soft flaky particles	2.0%

Gradation Requirements:

Retained on ⅜-Inch Sieve	0%
Retained on ¼-Inch Sieve	0% - 5%
Retained on 20-Mesh Sieve	15% - 50%
Retained on 100-Mesh Sieve	80% - 100%

Color Test ASTM C40-73 - Color to be Darker than Standard Color.

B. Cement: ASTM C150-77, Type 1.

C. Water: Fresh and Clean.

III. EXECUTION

A. Mixing

Use not less than 2 sacks of cement per cubic yard of mixture or amount specified in proposal. Use amount of water required to provide mix suitable for mechanical hand tamping and mix in approved mixer. Material not in place within one and one-half hours after mixing or that has obtained an initial set will be rejected and removed from the site.

B. Placing: Place in 4-inch layers and compact each layer with approved power-driven hand tampers. Compact to dry density of 102 pounds per cubic foot.

Std. 2/21/89
Revised 10/1/02

ITEM 15061

STEEL PIPING AND FITTINGS

I. GENERAL

A. Scope: This Item applies to all sizes of seamless, butt-weld, and straight-seam mill pipe for water, air, gas service, and certain chemical services. Furnish all plant, labor, materials, equipment, supplies, supervision, and tools and all operations in connection with furnishing and installing, testing, disinfecting, and placing in service steel piping.

B. Dry Chlorine Piping: Conform to Chlorine Institute, Inc. Chlorine Manual, Fourth Edition.

C. Exceptions

1. Plans show system service, diameters, wall thickness, working pressures, type joint connections, flange classification, and protective coating and lining.

2. Requirements are minimum; pipe of greater strength or wall thickness may be furnished subject to prior approval.

3. Lap welded pipe is not acceptable; use butt welded or seamless.

4. Spiral weld not acceptable.

5. Steel ring or flat plate flanges not acceptable.

II. MATERIALS

A. Pipe Barrels

1. Steel Pipe 6-Inches and Larger

a. Fabricated electrically welded steel water pipe; AWWA C-200-97.

b. Mill-Type steel water pipe; AWWA C-200-97; includes ASTM A-53, Grades A and B.

2. Steel Pipe 4-Inches and Smaller; ASTM A-53, Grades A and B

   a. Water, Oil, Air, or Natural Gas: Seamless or Butt-Weld.

   b. Chlorine Gas: Seamless only, Schedule 80.

3. Diameters

   a. 12-Inches and Smaller: Nominal diameter in accordance with AWWA C-200-97.

   b. 14-Inches and Larger: Actual outside diameter - O.D.

4. Laying Lengths

   a. Mill Pipe: 20-Foot single lengths or 40-foot double lengths unless approved.

   b. Fabricated Pipe: Of proportions to facilitate transportation to job site.

5. Number Of Seams For Fabricated Pipe-16 Inches And Larger

   a. Girth: 20-Foot maximum spacing.

   b. Longitudinal: 16-Inch to 20-inch - one (1); 22-inch to 54-inch - two (2); 56-inch to 72-inch - three (3).

6. Anchor Rings

   4-Inches And Larger: Provide steel plate anchor rings on all pipe passing through concrete walls or anchor blocks where shown or thrust restraint required. Use continuous fillet welds, both sides. Dimensions as follows (in inches):

Pipe Size	Ring O.D.	Ring Thickness	Size Of Fillet Weld
4 To 12	Pipe O.D. Plus 4	½	3/16
14 To 18	Pipe O.D. Plus 4	¾	¼
20 To 24	Pipe O.D. Plus 6	¾	¼
26 To 42	Pipe O.D. Plus 8	1	5/16
48 & Larger	Pipe O.D. Plus 10	1¼	d

B. Fittings

1. 4-Inches and Smaller: 150-Pound bonded fittings conforming to ASTM A-197 (Use galvanized fittings with galvanized pipe).

   Dry Chlorine Gas: 3,000 pounds forged steel, ASTM A-103, Grade II.

2. 16-Inches and Smaller: Welded. AWWA C-208-96.

3. 18-Inches and Larger: Forged seamless steel, long radius, conforming to AWWA C-208-96. Minimum of 15 degrees angular change for mitre turns. Inside dimensions to match adjoining pipe; wall thickness same or greater than adjoining pipe.

C. Joints

1. 4-Inches and Smaller

   a. Screwed, unless noted otherwise.

   b. Where noted on Plans and/or Exhibits:

      1) Flanges: 150-Pound standard, slip-on or welded neck, ASTM A181 Grade I. Use welded neck unless otherwise designated.

      2) Screwed Unions: 150-Pound malleable iron, ground brass seat.

   c. Chlorine Gas: 2-Bolt 1,500-pound ammonia flange unions up to 1 inch; weld-neck 300-pound forged steel - 1¼-inches and larger, tongue and groove or 1/16-inch raised face.

2. 6-Inches and Larger: Hub type, slip-on, (flat faced if connected to cast or ductile iron) blind flanges same thickness as flange of hub-type, unless otherwise designated; dished-head blind flanges for 36-inches and larger when approved.

   Suction Piping: AWWA C-207-94, Class B.

   Discharge Piping: AWWA C-207-94, Class D.

D. Victaulic Joints

1. Victaulic Style 77 for flexible or Style 07 for rigid joints or equal are

acceptable as an option to flanged or welded joints.

2. Grooving per ANSI/AWWA C606-97 Table 4 or roll grooving per Table 5.

3. Gasket - Central cavity, pressure responsive molded of synthetic rubber.

E. Flexible Joint Connections

1. Victaulic Style 77 And 77-D: 28-Inches and Smaller: Type B - grooved collared end, or Type C - collared end with double fillet weld.

   30-Inches and Larger: Type D - grooved, collared end with double filled welds.

2. Dresser: Long sleeve unless shown otherwise, Style 38; equivalent by Smith-Blair or Baker. Harness when required for thrust restraint.

F. Bolting And Gaskets

1. Aboveground Flange Bolts And Nuts: ASTM A-307, Grade B. Bolts to extend past nut not more than heights of nut.

2. Belowground Flange Bolts And Nuts: 316 stainless steel per ASTM F-593 and ASTM F-594. Bolts to extend past nut not more than height of nut.

3. Gaskets: 16-Inches and Smaller - 1/16-Inch composition asbestos; ring type for raised face flanges; full-face for connection to iron flanges. 18-Inches and Larger: Composition asbestos or 1/16-inch or 1/8-inch red rubber, factory cut.

4. Dry Chlorine Gas: Bonded asbestos fiber per MIL A17472 B or 2-4 percent antimony lead.

G. Coating and Lining

1. Air Service

   a. 4-inches and Smaller Pipe

      1) Aboveground

         a) Exterior: galvanized.

         b) Interior: galvanized.

2) Underground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

b. 6-inches and Larger Pipe

1) Aboveground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. Final coat to be a minimum of 3 mils (DFT) of aliphatic urethane. Coating materials to be compatible by the same manufacturer. Note exterior color requirement to be in accordance with TCEQ regulations. Un-coated pipe utilized on project to be coated per Specification Item 9901.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

2) Underground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

2. Gas Service

a. 4-inches and Smaller Pipe

1) Aboveground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. Final coat to be a minimum of 3 mils (DFT) of aliphatic urethane. Coating materials to be compatible by the same manufacturer. Note exterior color requirement to be in accordance with TCEQ regulations. Un-coated pipe utilized on

project to be coated per Specification Item 9901.

b) Interior: oil wiped.

2) Underground

a) Exterior: hot applied coal tar enamel with single wrap of Kraft paper per AWWA C203-97 or liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

b. 6-inches and Larger Pipe

1) Aboveground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. Final coat to be a minimum of 3 mils (DFT) of aliphatic urethane. Un-coated pipe utilized on project to be coated per Specification Item 9901. Note exterior color requirement to be in accordance with TCEQ regulations.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

2) Underground

a) Exterior: hot applied coal tar enamel with single wrap of Kraft paper per AWWA C203-97 or liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: oil wiped.

3. Water or Wastewater Service

a. 4-inches and Smaller Pipe

1) Aboveground

a) Exterior: galvanized.

b) Interior: galvanized, if potable water in accordance with the NSF 61 requirements.

2) Underground

a) Exterior: hot applied coal tar enamel with single wrap of Kraft paper per AWWA C203-97 or liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

b. 6-inches and Larger Pipe

1) Aboveground

a) Exterior: liquid-epoxy coated, in accordance with AWWA C210-97. Final coat to be a minimum of 3 mils (DFT) of aliphatic urethane. Un-coated pipe utilized on project to be coated per Specification Item 9901. Note exterior color requirement to be in accordance with TCEQ regulations.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

2) Underground

a) Exterior: hot applied coal tar enamel with single wrap of Kraft paper per AWWA C203-97 or liquid-epoxy coated, in accordance with AWWA C210-97. During installation wrap with polyethylene in accordance with AWWA C105-99.

b) Interior: liquid-epoxy coated, in accordance with AWWA C210-97.

III. EXECUTION

A. Fabrication

1. All fabrication to be performed in fully equipped pipe fabrication shop which complies with the Steel Plate Fabricators Association (SPFA) and are members of the American Iron and Steel Institute (AISI). When field fabrication is permitted, same to be performed under controlled conditions.

2. Follow AWWA Standard Specification C-206-97 for qualifications, procedures, and tests.

3. No field welds except as shown on the Plans and as designated on Plans.

4. Galvanized 6-inches and larger (flanged) piping to be fitted and fabricated, then galvanized. Where field welds are permitted on galvanized piping, clean and coat welded area with GALVITE manufactured by ZRC Worldwide of Marshfield, Massachusetts (www.zrcworldwide.com).

5. Machine position work for manual operations wherever possible.

6. Use precision levels and steel scales to square and align flanges on pipe and fittings. Check bolt hole locations before fitting and tack welding.

B. Installation; Aboveground

1. General Requirements

a. Plans show sizes, elevations, and arrangement of piping.

b. Where connections to pumps are mentioned, specifications apply likewise to any item of equipment to which piping strains might be transferred.

c. When required, place ½-inch mesh wire cloth screens (¼-inch for 4-inches and smaller) at suitable point adjacent to pump in suction lines to trap debris. Remove same and clean out adjacent pipe after system has operated sufficient time to clear itself of debris.

d. For pipe having coal-tar enamel coating and wrapping, bring coating 6-inches above finished grade and seal or seal against penetrated structure with hot enamel. Use similar approved treatment for other coatings.

2. Handling

a. Take all necessary precautions to prevent damage to pipe and coating. Use only approved hoists, slings, or other means to avoid

damage.

b. Protect flange surfaces. Replace or repair any pieces having gouged or dented flanges.

c. Keep interiors free of all foreign matter.

3. Supports and Hangers

a. Use only commercial metallic hangers and supports (Elcen, Grinnel, or equal) or as shown on Plans and/or Exhibits.

b. Support piping as required to distribute the loads on structure, supports, and piping, such that excess stresses do not obtain.

c. Where concrete supports are shown, apply primer and finish coats of paint and place 15-pound building felt under pipe in way of concrete. Trim felt neatly.

d. Pitch piping to drain.

e. Grout ferrous support base flange or floor plate minimum ½-inch above finished concrete.

f. Do not clamp piping to building surfaces; use off-set supports.

4. Fittings and Installation, 4-Inches and Smaller

a. Cut and fit pipe accurately to measurements established at site. Run lines parallel to building lines.

b. Do Not spring or force pipe into place; weaken structural portions of building; caulk threaded joints to stop leaks; bury pipe in floor unless authorized; bush fittings.

c. Cut full threads after roaming and burring end of cut pipe. Make joint with approved graphite threaded joint compound or synthetic tape manufactured for that purpose, applied to male threads only. Leave no more than two threads showing when making up joints.

d. Provide unions, whether or not shown, to permit make up and removal of valves and all sections of the system without cutting pipe.

5. Installation - 6-Inches and Larger

a. Start with piping at "cast-in" wall fittings and work toward pumps. If "block-outs" are shown on Plans, grout same after pumps are grouted and grout set.

b. Clean each piece to remove dirt, rust, grease, and other foreign matter. Wire-brush flange faces.

c. Bring individual runs of piping to true grade and alignment by means of erection bolts and drift pins without forcing.

d. Align and make up discharge piping before grouting pumps to assure accurate alignment, then disconnect same during grouting.

e. After pumps are grouted and grout set, make up suction piping, making use of "flexible joints" provided for that purpose, or as otherwise shown. Correct alignment as necessary to prevent stresses in flexible joints. Refer to flexible coupling manufacturer's instructions for permissible limits of alignment.

f. In making up bolted connections

1) Wire-brush flange and clean inside of pipe before placing gasket.

2) Place bolts with heads all in same direction.

3) Tighten flange bolts, each in turn, at uniform rate around joint until all are tight.

C. Installation; Underground

1. Alignment and Grade

a. To Grade: As shown with joints centered.

b. Not to Grade: Minimum depth of cover 36-inches under finished grade; 18-inches under flow lines of drainage ditches; greater depth of cover at other locations as shown.

2. Excavation and Preparation of Trench

a. Bracing and Drainage: Brace trench and drain as necessary to accomplish work safely and efficiently; use dewatering system if necessary to keep trench clear of water. Deliver discharge from pumps to natural drainage ditches or to drains.

b. Width: Minimum of 6-inches and maximum of 9-inches outside pipe barrel. Maintain side of trench substantially vertical.

c. Earth Foundation: Lay pipe on sound earthen foundation; cut true and even so barrel of pipe will have full bearing width.

3. Pipe Handling and Laying

a. Care: Load and unload by use of approved hoist, skids, or other approved means to avoid damage. Keep interior of pipe free of foreign matter.

b. Inspection: Before lowering pipe into trench, inspect pipe for defects. Perform visual inspection on pipe coating.

c. Laying: Lay pipe flat; do not block under pipe; do not lay pipe in water; lay pipe only during approved weather conditions; use temporary plugs as necessary and otherwise keep interior of pipe clean.

d. Valve Boxes and Valves: Set valves and boxes plumb and centered. Provide firm support by tamping selected materials as directed. Set top of boxes at finished grade unless directed otherwise.

e. Deflection of Joints: Obtain approval before deflection pipe from straight line. For deflections of pipe, use sections of pipe with beveled ends for deflection not greater than five degrees. For deflections greater than five degrees, use fabricated or fittings as specified.

f. Thrust Blocking: The responsibility of thrust blocking shall be the Contractor's. Thrust blocking shall be provided at all fittings, points where reducers or changes in pipe diameter occurs, fire hydrants, or flushing valves, and all plugged openings. The concrete shall bear on undisturbed firm soil. If unavailable at a particular installation, the absence shall be promptly brought to the Engineer's attention. Place concrete so that joints are left accessible.

g. Bedding: Where required to stabilize trench, lay pipe on approved compacted bedding. Use only approved bedding. Excavate trench 6-inches below pipe. Replace excavation below subgrade with compacted bedding under barrel of pipe and sufficient additional thickness of bedding for full width of trench on each side of pipe to fit lower pare of pipe exterior for at least 50 percent of pipe breadth. Complete backfill as hereinafter specified.

h. Sand Encasement: Provide sand encasement on all lines unless deleted on Plans. Provide bank 6-inches below and 12-inches above pipe. Sand to be free of cinders, organic matter, and foreign material.

i. Timber Left In Trench: When so ordered, leave sheeting and bracing in trench. Cut timber minimum of 18-inches below surface of ground. Nail all whaler and cross braces sufficiently to prevent displacement during backfill operations.

4. Backfilling and Cleanup

a. Time Of Backfilling: Backfill as soon as practicable after completion of laying and jointing of pipe.

b. Backfill Procedure Above Pipe Zone: Compact thoroughly, succeeding layers which may contain coarser materials, by puddling with hose and long pipe nozzle, by flooding trench, or by tamping if material does not puddle readily. Exercise proper precautions to prevent floating of pipe when flooding trench; any damages resulting to be Contractor's responsibility.

c. Procedure Where Settlement Is Important: Where backfill must be made safe for vehicular traffic, place backfill above pipe zone in thin (approximate 4-inch) layers. Compact to density equal to undisturbed material in trench sides.

d. Procedure Under Structures: Bring bearing surface to required grade by placing thoroughly compacted, approved moist material in thin (about 4-inch) layers. Compact to density equal to undisturbed material in trench sides.

e. Removal of Excess Material: Remove from site, or use at site for fill as shown or approved.

f. Restoration: Replace walks, drives, shrubbery, trees, fences, sod, and any like obstructions removed or disturbed, where such are to be retained as a part or feature of a completed project.

D. Testing

1. General: Test all piping as provided herein. Provide all equipment, gauges, et cetera, necessary to the tests. Tests to be witnessed. Include all joints made up in field. Any leaks at flange threads to be corrected and retested in shop.

2. Pump Discharge Piping

   a. Test with hydrostatic pressure at 200 percent of maximum operating head of pumps, or to a minimum of 100 psi. Hold for sufficient time to permit inspection of all joints; do not release pressure until test is approved.

   b. Examine open end discharge lines visually for leaks during initial operation of pumps.

3. Pump Suction Piping

   a. Piping operating with negative pressure (suction lift conditions) to have hydrostatic test of 35 psi.

   b. Piping operating with positive pressure to have hydrostatic test of not less than 35 psi, but at least 200 percent of suction head.

4. Gas and Air Systems: Pneumatic test to 150 percent of system working pressure, not less than 50 psi. Test pressure shall hold with no pressure drop. Determine location of leaks with soap suds.

5. Dry Chlorine Gas: Clean and dry complete piping system; pressure test to 150 psig with dry air or nitrogen; check joints with soapy water; introduce chlorine gas gradually and test for leaks with aqua ammonia; purge piping with dry air prior to welding after checking with chlorine.

6. Open End Piping: Examine lines visually for leaks during initial operation of system.

7. Tank and Miscellaneous Connections: Perform hydrostatic test on all other piping as directed. Test pressure to be set at 200 percent of system operating pressure, but not in excess of mill test pressure rating of valve and fitting components.

E. Disinfection (Water Systems Only)

1. Description: Disinfection of all new piping and pumps, including connections to existing sections of work or work provided by others. Disinfection shall be performed in accordance with AWWA C-651 as supplemented and/or modified below.

2. The Contractor shall provide taps within a few feet of the ends of the disinfection section and bleed so as to insure high strength solution to all parts of the section.

3. Unless otherwise approved, hypochlorite shall be used to supply the available chlorine.

4. Continuous feed methods to be used. The Owner will furnish the water one time only at no cost. The Contractor shall provide the chlorine solution tank and means of approximately proportioning its flow. Piping from hydrants of the dilutant water and all other piping and appurtenances to be furnished by the Contractor. Contractor to perform the disinfection and subsequent flushing.

   All retest costs, where additional water for biological testing is required, will be borne by Contractor. Owner will, at Contractor's option, allow reimbursement or deduct from final estimate these costs.

5. The strong chlorine solution must be flushed from the test section. The Contractor shall provide means to discharge into an open drainage ditch or into a mixing box discharging to storm sewer. The flushed chlorine solution must not be a potential cause for environmental damage. Contractor must neutralize thoroughly any remaining chlorine residual within the water. Where applicable, Federal, State, and Local Regulatory Agencies must be contacted to determine special requirements for disposal of heavily chlorinated water.

6. The Owner will cause bacteriological samples to be taken and tested. If negative for coliform organisms, the Contractor may proceed with the next step of the work; otherwise the disinfection procedure is to be repeated with all costs borne by Contractor.

IV. QUALITY ASSURANCE

A. Submittals

1. Complete detail layout Plans showing fitting and pipe location, vertical and horizontal. Layout Plans to be minimum ¼-inch equals one foot.

2. Furnish sworn statement that inspection and all tests have been made and meet the requirements of AWWA C151-96.

3. Furnish certified test reports for flanged pipe in quadruplicate.

Std. 2/21/89
Revised 06/4/08

ITEM 15062

DUCTILE IRON PIPE AND FITTINGS

I. GENERAL

A. Scope: Includes piping 3-inches and larger for buried and exposed systems within the limits of lift stations, booster stations, and treatment facilities.

B. Related Work

1. Plans show pipe class, thickness class, type joints, and service pressure for flanged joints. Other Items in this Specification cover jointing, installation, testing, and sterilization.

2. Soil pipe and fittings not under this Item.

II. MATERIALS

A. Pipe Barrels

1. Ductile Iron: Per AWWA C115, AWWA C150, AWWA C151 and AWWA C606.

2. Certification: Pipe must bear mark of Underwriters Laboratories.

3. Thickness Class

a. Pressure Pipe - minimum thickness to be Class 50 or as shown on Plans.

b. Non-pressure Pipe - minimum thickness to be Class 52 or as shown on Plans.

4. Provide pipe sections in standard lengths, not less than 18-feet long, except for special fittings and closure sections.

B. Fittings, Flanges and Joint Material

1. Fittings

a. Use fittings of same size as pipe. Reducers are not permitted to facilitate an off-size fittings. Reducing bushings are also prohibited. Reduction in pipe size will be made by reducing fittings.

b. Below ground fittings to be push-on or mechanical joint per AWWA C110, or as shown on Plans, with gasketed joint per AWWA C111, fittings to be pressure rated at 250 psig. Provide restraint joints as shown on Plans.

c. Above ground fittings to be flanged per AWWA C115 or victaulic style per ASTM A-536, fittings to be pressure rated at 250 psig.

2. Flanges

a. Flanges to be per AWWA C115, screwed on threaded ends.

b. Shop threaded, machine tightened, and faced in machine shop for this type of work, and conforming to the requirements of AWWA C115.

c. Shop test, hydrostatically, each flanged pipe piece at 75 psig for pump suction pipe and at 150 psig for pump discharge piping.

3. Victaulic Style

a. Rubber Gaskets for Water and Sewage Service Per AWWA C111 and Appendix A C115.

b. Rubber Gaskets for Diffused Air Systems (10 psi and 190 degrees F Service): Use MIL-R-83248 fluoroelastomer such as Dupont's Viton or 3M's Fluorel.

4. Joint Material

a. Rubber Gaskets for Water and Sewage Service Per AWWA C111 and Appendix A C115.

b. Rubber Gaskets for Diffused Air Systems (10 psi and 190 degree F Service): Use MIL-R- 83248 fluoroelastomer such as Dupont's Viton or 3M's Fluorel.

c. For compressed air service (30psi and greater) use 1/16-inch full-face asbestos gaskets, factory cut.

d. Lead Joints: Use tarred or braided packing and 99.73 percent pure

lead conforming to AWWA C600. This type joint not to be utilized unless approved by Engineer for use with existing piping system connection.

e. Gasket: Gaskets shall be molded of synthetic rubber specially compounded to conform to ductile pipe surfaces in a central cavity, pressure-responsive configuration, conforming to the pipe outside diameter and coupling housing, of elastomers having properties as designated in ASTM D-2000. Reference shall always be made to the latest published Selection Guide for Victaulic Gaskets for proper gasket selection for the intended service. Gasket supplied for water and wastewater service from -20° F to +180° F on ductile iron pipe, from 4"-24" shall be a Grade "M" halogenated butyl, with brown color code, specially compounded to conform to ductile pipe surfaces.

5. Flange Bolts, Nuts and Washers: ASTM A307, Grade B, ANSI B18.2 bolts to extend past nut not more than height of nut. Use studs with nuts on each end for pipe sizes 54-inch and larger.

a. Aboveground: Black Steel

b. Underground: 316 SS for flange and Cor-Ten for mechanical joint connections

C. Coating and Lining

1. Aboveground

a. Exterior: Per Specification Item 9901 - Painting and Coating, Table 1, System Schedule, "Piping and Valves."

b. Interior

1) Air Service: Bituminous coated, not less than (1) mil thick

2) Water Service: Liquid epoxy coated in accordance with ANSI/AWWA C116/A 21.16

3) Sewage Service: Liquid epoxy coated in accordance with ANSI/AWWA C116/A 21.16

2. Underground

a. Exterior: Epoxy coated per ANSI/AWWA C116/A 21.16. Apply 8 mil polyethylene encasement in accordance with AWWA C105 to all

cast iron and ductile iron piping, including fittings and valves.

b. Interior

1) Air Service: Bituminous coated, not less than (1) mil thick.

2) Water Service: Liquid epoxy coated in accordance with ANSI/AWWA C116/A 21.16

3) Sewage Service: Liquid epoxy coated in accordance with ANSI/AWWA C116/A 21.16

D. Flexible Joint Connections

1. Dresser: Long Sleeve unless shown otherwise, style 38; equivalent by Smith-Blair or Baker. Harness when required for thrust restraint.

2. Other: Special or other type as shown on Plans.

III. EXECUTION

A. General

1. General Requirements

a. Plans show sizes, elevations, and arrangement of piping.

b. Where connections to pumps are mentioned, specifications apply likewise to any item of equipment to which piping strains might be transferred.

c. When required, place ½-inch mesh wire cloth screens (¼-inch for 4-inch and smaller) at suitable point adjacent to pump in suction lines to trap debris. Remove same and clean out adjacent pipe after system has operated sufficient time to clear itself of debris.

d. For pipe having coal-tar enamel coating and wrapping, bring coating 6-inches above finished grade and seal or seal against penetrated structure with hot enamel. Use similar approved treatment for other coatings.

2. Handling

a. Take all necessary precautions to prevent damage to pipe and coating.

Use only approved hoists, slings, or other means to avoid damage.

b. Protect flange surfaces. Replace or repair any pieces having gouged or dented flanges.

c. Keep interiors free of all foreign matter.

B. Installation; Underground

1. Alignment and Grade

a. To Grade: As shown on Plans with joints centered and spigots home.

b. Not to Grade: Minimum depth of cover 36-inches under finished grade; 18-inches under flow lines of drainage ditches; greater depth of cover at other locations as shown.

2. Excavation and Preparation of Trench

a. Bracing and Drainage: Brace trench and drain as necessary to accomplish work safely and efficiently; use dewatering system if necessary to keep trench clear of water. Deliver discharge from pumps to natural drainage ditches or to drains.

b. Width: Minimum of 6-inches and maximum of 9-inches outside pipe barrel. Maintain side of trench substantially vertical.

c. Earth Foundation: Lay pipe on sound earthen foundation; cut true and even so barrel of pipe will have full bearing width.

d. Correcting Faulty Grade: Correct any part of trench excavated below grade with approved, thoroughly compacted material.

e. Bell Holes: Provide bell holes of ample dimensions to permit proper jointing.

3. Pipe Handling and Laying

a. Care: Load and unload by use of approved hoist, skids, or other approved means to avoid damage. Keep interior of pipe free of foreign matter.

b. Inspection: Before lowering cast iron pipe into trench, inspect pipe for defects by tapping with light hammer to detect cracks. Perform visual inspection on pipe of other materials. Replace defective joints,

fittings, pipe, or coatings.

c. Apply 8 mil polyethylene encasement in accordance with AWWA C105-99 to all cast iron and ductile iron piping, including fittings and valves in buried service.

d. Laying: Lay bell and spigot pipe with bell ends facing direction of laying. Do not block under pipe. Do not lay pipe in water. Lay pipe only during approved weather conditions. Use temporary plugs as necessary and otherwise keep interior of pipe clean.

e. Valve Boxes and Valves: Set valves and boxes plumb and centered. Provide firm support by top of boxes at finished grade unless directed otherwise.

f. Deflection of Joints: Obtain approval before deflecting pipe from straight line. Follow manufacturer's recommendation for deflection at joints.

g. Thrust Blocking: The responsibility of thrust blocking shall be the Contractors. Thrust blocking shall be provided at all fittings, points where reducers or changes in pipe diameter occurs, fire hydrants, or flushing valves, and all plugged openings. The concrete shall bear on undisturbed firm installation, the absence shall be promptly brought to the Engineer's attention. Place concrete so that joints are left accessible.

h. Bedding: Where required to stabilize trench, lay pipe on approved compacted bedding. Use only approved bedding. Excavate trench 6-inches below pipe. Replace excavation below subgrade with compacted bedding under barrel of pipe and sufficient additional thickness of bedding for full width of trench on each side of pipe to fit lower part of pipe exterior for at least 50 percent of pipe breadth. Complete backfill as hereinafter specified.

i. Sand Encasement: Provide sand encasement on all lines unless deleted on Plans. Provide bank 6-inches below and 12-inches above pipe. Sand to be free of cinders, organic matter, and foreign material.

j. Timber Left in Trench: When so ordered, leave sheeting and bracing in trench. Cut timber minimum of 18-inches below surface of ground. Nail all whaler and cross braces sufficiently to prevent displacement during backfill operations.

4. Backfilling and Cleanup

a. Time of Backfilling: Backfill as soon as practicable after completion of laying and jointing of pipe.

b. Backfill Procedure Above Pipe Zone: Compact thoroughly, succeeding layers which may contain coarser materials, by puddling with hose and long pipe nozzle, by flooding trench, or by tamping if material does not puddle readily. Exercise proper precautions to prevent floating of pipe when flooding trench; any damages resulting to be Contractor's responsibility.

c. Procedure Where Settlement is Important: Where backfill must be made safe for vehicular traffic, place backfill above pipe zone in thin (approximately 4-inch) layers. Compact to density equal to undisturbed material in trench sides.

d. Procedure Under Structures: Bring bearing surface to required grade by placing thoroughly compacted, approved moist material in thin (about 4-inch layers). Compact to density equal to undisturbed material in trench sides.

e. Removal of Excess Material: Remove from site, or use at site for fill as shown or approved.

f. Restoration: Replace walks, drives, shrubbery, trees, fences, sod, and any like obstructions remove or disturbed, where such are to be retained as a part or feature of a completed project.

5. Joints

a. Bell and Spigot Boltless Gasketed Joints

1) Preparation of Pipe Ends: Remove from bell and spigot ends all lumps, blisters, excess coal-tar coating, oil and grease, then wire brush and wipe clean and dry before laying pipe.

2) Installation of Ring Gasket: Wipe gasket seat in socket with clean dry cloth. Place gasket with large end entering first. Spring gasket into seat in bell so that groove fits over head in seat. Apply thin film of lubricant to inside surface of gasket.

3) Setting Spigot: Align spigot with bell and start into bell so that it contacts gasket. Apply lubricant to engaging surface of spigot if necessary. Pipe six inches and smaller may be driven with a bar lever on end of pipe. For larger pipe, use only approved ratchet- type jacking tool to pull pipe "home."

b. Mechanical

1) Wash socket and plain end with soapy water, then slip gland and gasket over plain end. Face small side of gasket and lip of gland to bell.

2) Paint gasket with soapy water.

3) Push gasket into position, being sure it is evenly seated in socket.

4) Slide gland into position, insert bolts, and run nuts up finger tight.

5) Tighten bolts to uniform tightness with ratchet wrench. First tighten bottom bolt, then top, and on around in sequence of 180 degrees apart.

c. Flanged

1) Threading and Tightening Flanges: See paragraph II.B.2.

2) Setting Gasket: If non-graphited gaskets are used, apply graphite and water solution to gasket before placing on flange. Wire-brush flange and clean inside of pipe before placing gasket.

3) Tightening Bolts: After initial alignment, place flange bolts with all heads in same direction. Tighten flange bolts, each in turn, at uniform rate around joint until all are tight.

d. Victaulic: Couplings, fittings, and pipe shall be assembled in accordance with latest published instructions from Victaulic Company of America for the particular product installed.

1) Pipe: The outside surface of pipe between the groove and pipe end must be smooth and free from deep pits or swells to provide a leak tight seal for the Victaulic gasket. All rust, loose scale, oil, grease and dirt shall be removed. Peened surfaces may require corrective action in order to provide a leak tight gasket seal.

2) Gaskets: All gaskets shall be of the central cavity pressure-responsive design. Gasket Style and elastomeric material (Grade) shall be checked to be certain gasket

supplied is suited for the intended service-refer to latest Victaulic Gasket Selection Guide.

3) Lubrication: Lubrication shall always be used for proper coupling/fitting assembly as follows:

a) Thorough lubrication of the gasket exterior including the lips and/or pipe ends and housing interiors, is essential to prevent pinching the gasket. Lubrication assists proper gasket seating and alignment during installation.

b) Use Victaulic Lubricant for installation. Other compatible materials such as silicone or others may be used, however, petroleum based lubricants must not be used on Grade "M" gaskets.

C. Aboveground

1. Flanged: See Paragraph III.B.3.

2. Supports and Hangers

a. Use only commercial metallic hangers and supports (Elcen, Grinnel, or equal) or as shown on Plans and/or Exhibits.

b. Support piping as required to distribute the loads on structure, supports, and piping, such that excess stresses do not obtain.

c. Where concrete supports are shown, apply primer and finish coats of paint and place 15-pound building felt under pipe in way of concrete. Trim felt neatly.

d. Pitch piping to drain.

e. Grout ferrous support base flange or floor plate minimum ½-inch above finished concrete.

f. Do not clamp piping to building surfaces; use off-set supports.

3. Fitting and Installation (4-Inches and Smaller)

a. Cut and fit pipe accurately to measurements established at site. Run lines parallel to building lines.

b. **Do Not** spring or force pipe into place; weaken structural portions of building; caulk threaded joints to stop leaks; bury pipe in floor unless authorized; bush fittings.

c. Cut full threads after reaming and burring end of cut pipe. Make joint with approved graphite threaded joint compound or synthetic tape manufactured for that purpose, applied to male threads only. Leave no more than two threads showing when making up joints.

d. Provide unions, whether or not shown, to permit make up and removal of valves and all sections of the system without cutting pipe.

4. Fitting and Installation (6-Inches and Larger)

a. Start with piping at "cast-in" wall fittings and work toward pumps. If "block-outs" are shown on Plans, grout same after pumps are grouted and grout set.

b. Clean each piece to remove dirt, rust, grease, and other foreign matter. Wire-brush flange faces.

c. Bring individual runs of piping to true grade and alignment by means of erection bolts and drift pins without forcing.

d. Align and make up discharge piping before grouting pumps to assure accurate alignment, then disconnect same during grouting.

e. After pumps are grouted and grout set, make up suction piping, making use of "flexible joints" provided for that purpose, or as otherwise shown. Correct alignment as necessary to prevent stresses in flexible joints. Refer to flexible coupling manufacturer's instructions for permissible limits of alignment.

f. In making up bolted connections:

1) Wire-brush flange and clean inside of pipe before placing gasket.

2) If nongraphited gaskets are used, apply graphite and water solution before placing on flange.

3) Place bolts with heads all in same direction.

4) Tighten flange bolts, each in turn, at uniform rate around joint until all are tight.

D. Testing

1. General: Test all piping as provided herein. Provide all equipment, gauges, etc. necessary to the tests. Tests to be witnessed. Include all joints made up in field. Any leaks at flange threads to be corrected and retested in shop.

2. Pump Discharge Piping

   a. Test with hydrostatic pressure at 200 percent of maximum operating head of pumps, or to a minimum of 100 psi. Hold for sufficient time to permit inspection of all joints; do not release pressure until test is approved.

   b. Piping operating with positive pressure to have hydrostatic test of not less than 35 psi, but at least 200 percent of suction head.

   c. Gas and Air Systems: Pneumatic test to 150 percent of system working pressure, not less than 50 psi. Test pressure shall hold with no pressure drop. Determine location of leaks with soap suds.

   d. Open End Piping: Examine lines visually for leaks during initial operation of system.

   e. Tank and Miscellaneous Connections: Perform hydrostatic test on all other piping as directed. Test pressure to be set at 200 percent of system operating pressure, but not in excess of mill test pressure rating of valve and fitting components.

E. Disinfection (Water Systems Only)

1. Description: Disinfection of all new piping and pumps, including connections to existing sections of work or work provided by others. Disinfection shall be performed in accordance with AWWA C-651 as supplemented and/or modified below.

2. The Contractor shall provide taps within a few feet of the ends of the disinfection section and bleed so as to insure high strength solution to all parts of the section.

3. Unless otherwise approved, hypochlorite shall be used to supply the available chlorine.

4. Continuous feed methods to be used. The Owner will furnish the water one time only at no cost. The Contractor shall provide the chlorine solution tank and means of approximately proportioning its flow. Piping

from hydrants of the dilutant water and all other piping and appurtenances to be furnished by the Contractor. Contractor to perform the disinfection and subsequent flushing.

All retest costs, where additional water for biological testing is required, will be borne by Contractor. Owner will, at Contractor's option, allow reimbursement or deduct from final estimate these costs.

5. The strong chlorine solution must be flushed from the test section. The Contractor shall provide means to discharge into an open drainage ditch or into a mixing box discharging to storm sewer. The flushed chlorine solution must not be a potential cause for environmental damage. Contractor must neutralize thoroughly any remaining chlorine residual within the water. Where applicable, Federal, State, and Local Regulatory Agencies must be contacted to determine special requirements for disposal of heavily chlorinated water.

6. The Owner will cause bacteriological samples to be taken and tested. If negative for coliform organisms, the Contractor may proceed with the next step of the work; otherwise the disinfection procedure is to be repeated with all costs borne by Contractor.

IV. QUALITY ASSURANCE

A. Submittals

1. Complete detail layout Plans showing fitting and pipe location, vertical and horizontal. Layout Plans to be minimum ¼-inch equals one foot.

2. Furnish sworn statement that inspection and all tests have been made and meet the requirements of AWWA C151.

3. Furnish certified test reports for flanged pipe in quadruplicate.

Std. 1/7/86
Revised 10/1/02

ITEM 15064

PLASTIC PIPING AND FITTINGS (4-INCHES OR SMALLER)

I. GENERAL

A. Scope

1. Extent of Work: All plant, labor, materials, equipment, supplies, supervision, and tools for furnishing, installation, and testing of Polyvinyl Chloride piping systems (PVC or CPVC) or parts thereof.

2. Plans and/or Exhibits show required piping system, pipe schedule and valve schedule. All joints to be solvent weld unless otherwise designated on the Plans and/or Exhibits.

II. MATERIALS

A. Polyvinyl Chloride (PVC) Pipe

1. PVC Compounds: Compound for PVC to be manufactured as Type 1 Grade I (Cell Classification 12454-B) conforming to ASTM D-1784. Compound for CPVC to be manufactured as Type 4 Grade I (Cell Classification 23477-B) conforming to ASTM D-1784.

2. Pipe: Plastic pipe, PVC to conform to the requirements of ASTM D-1785 and CPVC to conform to the requirements of ASTM D-441.

3. Fittings and Flanges: Injection molded PVC threaded or socket-type flanges and fittings to conform to the requirements of ASTM D-2464, D-2466, or D-2467 as applicable.

4. Expansion Joints: CPVC (½" through 4") piston-Type joints with "Teflon" impregnated seal rings for service other than chlorine solution. Refer to Plans and/or Exhibits for chlorine service.

5. Bolting: Machine bolts and standard hexagon nuts with N.C. threads, galvanized by electro-plating unless otherwise designated on the Plans and/or Exhibits.

6. Gaskets: Full faced, factory cut, composition asbestos.

7. Joint Solvent: Use fast-drying solvent for 1½-inch sizes and smaller. Use heavy slow-drying type for 2-inch and larger sizes. Solvent to be furnished by manufacturer of pipe used. Material to be in accordance with ASTM D-2564.

8. Thread Lubricant - Liquid: Teflon based liquid. Use liquid lubricant on permanent joints and all instrument air lines.

9. Thread Lubricant - Tape: Teflon based tape as manufactured by DuPont, Manning, Maxwell & Moore, or equal. Use tape on all joints for valves or joints that may be disconnected often, except instrument air lines.

B. Valves

1. Ball Valves (True Union Ends): Chemtrol TU Series or GF Type 342. PVC or CPVC - match pipe material. All valves to be listed by NSF for use in potable water.

2. Check Valves (True Union Ends): Chemtrol BC Series or GF Type 360. PVC or CPVC - match pipe material. All valves to be listed by NSF for use in potable water.

3. Diaphragm Valves: Rigid unplasticized PVC body with "Teflon" diaphragms for chlorine service or Neoprene diaphragms in other service unless otherwise designated on the Plans and/or Exhibits.

4. Globe Valves (Angle or "Y"): Chemtrol AP or YP Series or GF Type 522, with teflon stem seal. PVC or CPVC - match pipe material. All valves to be listed by NSF for use in potable water.

5. Needle Valves: Chemtrol CN Series or GF Type 522 with teflon seals. PVC or CPVC - match pipe material. All valves to be listed by NSF for use in potable water.

III. EXECUTION

A. Polyvinyl Chloride (PVC) Pipe

1. Cut and fit pipe accurately to measurements established at the site. Use only methods of cutting, welding, and threading as recommended in instruction manuals published by the manufacturer of the materials being used. Use only strap wrenches for tightening threaded joints.

2. Provide unions or flanges to permit removal of all valves, equipment, and any section of pipe without cutting the installed pipe.

3. Provide expansion joints for temperature variations exceeding 30 degrees F or with straight runs longer than 50-feet.

4. Provide valved vent connections at high point and drain connections at low point of each section of the system such that all fluid or air may be removed from the piping.

5. Do not spring or force pipe in place.

B. Hangers and Supports

1. Use only commercial metallic hangers and supports as manufactured by Elcen, Grinnel, or equal for hangers and supports detailed to the Plans and/or Exhibits. All hangers to be galvanized unless otherwise designated on the Plans and/or Exhibits.

2. Pitch all horizontal runs of piping to drain.

3. Use spring hangers on vertical runs of piping when necessary to provide for expansion.

4. Use roller and sliding, guided supports on horizontal runs of piping when necessary to provide for expansion.

5. Anchor and brace pipe at expansion joints to force expansion and contraction within joint without buckling. Follow manufacturer's published instructions.

6. Minimum span to be as shown on the Plans and/or Exhibits or as recommended in the published manuals of the pipe manufacture for the sizes and weights being used. Use 90 degrees F for inside piping and 110 degrees F for outside piping when selecting span dimensions. Spans to be the shortest required or recommended in any case of conflict between the Plans and/or Exhibits and published data.

IV. QUALITY ASSURANCE

A. Testing

1. General: Test all piping systems. All equipment, gauges, pumps, and leak detectors to be provide by Contractor. All tests to be witnessed and approved by the Engineer.

2. Liquid Systems: Apply pneumatic test pressure at 150 percent of system working pressure, but not less than 75 psi. Test pressure shall hold with no pressure drop. Determine location of leaks with an approval detector or with soap suds. If leaks are evident, repair same and repeat tests until approved.

3. Gas or Air Systems: Apply pneumatic test pressure at 150 percent of system working pressure, but not less than 50 psi. Test pressure shall hold with no pressure drop. Determine location of leaks with an approval detector or with soap suds. If leaks are evident, repair same and repeat tests until approved.

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

SECTION VI

Project Drawings

BID #: B161009
OPEN DATE: 03/10/2016
TIME: 2:00 P.M.

See Waterline Rehabilitation Plan Set

SECTION VII

Project Exhibits

GALVESTON COUNTY

GLO CONTRACT No. 13-465-000
WORK ORDER No. 7974

COMMISSIONERS' COURT

MARK HENRY
COUNTY JUDGE

RYAN DENNARD
PRECINCT 1

JOE GIUSTI
PRECINCT 2

STEPHEN D. HOLMES
PRECINCT 3

KEN CLARK
PRECINCT 4

EXHIBIT INDEX

1. COVER SHEET
2. GENERAL NOTES – VICINITY & LOCATION MAPS
3. PROJECT LAYOUT
4. STANDARD SANITARY SEWER DETAILS – SHEET 1 OF 2
5. STANDARD SANITARY SEWER DETAILS – SHEET 2 OF 2
6. TRAFFIC CONTROL PLAN – ROLLING CONSTRUCTION

GALVESTON COUNTY WCID NO. 1

THE Water COMPANY

DANNENBAUM

iSani CONSULTANTS engineers | construction managers

Costello

CONSTRUCTION PLANS FOR:

MOORE'S ADDITION

SANITARY SEWER REHABILITATION

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

FEBRUARY, 2016
LJA PROJECT No. E224-0010

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

02/04/16

H:\ACAD\Clients\224-0010\Design\224-001-Ex01 COVER.dwg (*REF)

GENERAL NOTES

1. CONTRACTOR SHALL CONTACT LJA ENGINEERING, MR. LES DODSON AT (713) 450-1300 AT LEAST 24 HOURS PRIOR TO CONSTRUCTION FOR NOTIFICATION OF COMMENCEMENT.

2. CONTAC GALVESTON COUNTY W.C.& I.D. NO. 1, MR. KEITH MORGAN AT (281)-534-8330, REGARDING GALVESTON W.C. & I.D. NO. 1 WATER, SANITARY SEWER, AND STORM FACILITIES, 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

3. SHOULD CONTRACTOR'S WORK AND/ OR EQUIPMENT CAUSES AN OBSTRUCTION TO TRAFFIC, CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TEXAS M.U.T.C.D., MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION.

4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL REQUIREMENTS.

5. NO STREETS SHALL BE BLOCKED WITHOUT SPECIFIC WRITTEN APPROVAL OF THE CITY OF DICKINSON & GALVESTON COUNTY WATER CONTROL & IMPROVEMENT DISTRICT No. 1.

6. CONTRACTOR SHALL MAINTAIN DRAINAGE TO ORIGINAL OR BETTER CONDITION THROUGHOUT THE CONSTRUCTION OF THE PROJECT. NO SEPARATE PAY.

7. PAVED SURFACES SHALL BE PROTECTED FROM DAMAGE FROM TRACKED EQUIPMENT.

8. NOTIFY ALL PROPERTY OWNERS A MINIMUM OF TWENTY FOUR (24) HOURS PRIOR TO BLOCKAGE OF DRIVEWAYS. DRIVEWAYS MUST BE OPEN AT CLOSE OF WORK DAY.

9. LOCATION OF MANHOLES AND DISTANCES BETWEEN MANHOLES ARE APPROXIMATE. INFORMATION PROVIDED IS FROM BEST AVAILABLE RECORDS.

10. MANHOLE DEPTHS ARE APPROXIMATELY 6 TO 14 FEET. MANHOLES ARE TO BE BROKEN OUT PRIOR TO PIPE BURST ACTIVITY. CONTRACTOR IS NOT TO PIPE BURST INTO MANHOLES.

11. 6" AND 8" SEWERS WILL BE PIPEBURSTED WITH 8.625" HDPE, SDR 19.

12. ALL WORK IN THE TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION AND COUNTY RIGHT-OF-WAYS SHALL CONFORM TO THE STANDARDS OF THOSE GOVERNMENTAL ENTITIES. CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT AND/ OR REPAIR OF ANY DAMAGE TO SDHPT MARKERS.

13. MITIGATION: IF AN ASBESTOS-CONTAINING MATERIAL IS ENCOUNTERED DURING CONSTRUCTION AND IS TO BE REMOVED OR PREPARED FOR CONNECTION TO NEW VALVES, PIPES, AND/OR OTHER APPURTENANCES, ALL PROPER PROCEDURES AS DEEMED NECESSARY PER OSHA GUIDELINES/REQUIREMENTS WILL BE FOLLOWED.

14. ALL EXCESS MATERIAL/SPOILS TO BE DISPOSED OUTSIDE OF DISTRICT BOUNDARY AND THE CITY OF DICKINSON UNLESS OTHERWISE DIRECTED BY ENGINEER.

15. ALL CONCRETE SHALL BE HIGH EARLY STRENGTH AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 3 DAYS. THE CONCRETE SHOULD CONTAIN A MINIMUM OF 7 SACK OF PORTLAND CEMENT PER CUBIC YARD OF CONCRETE.

16. BACKFILLING AND CLEAN-UP SHALL IMMEDIATELY FOLLOW PIPE LAYING OPERATION. PIPE LAYING SHALL BE SUSPENDED IF CLEAN-UP IS NOT SATISFYING.

17. CONTRACTOR TO USE CAUTION WHEN CROSSING ALL EXISTING FACILITIES. ANY DAMAGE TO BE REPAIRED AT THE CONTRACTORS EXPENSE WITH NO SEPARATE PAY.

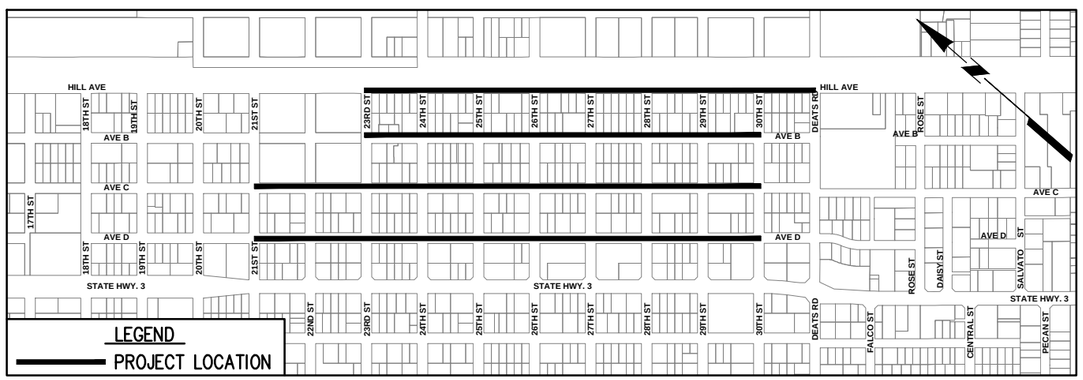
18. OBTAIN ALL PERMITS, NOT PROVIDED BY THE OWNER, PRIOR TO STARTING CONSTRUCTION (NO EXTRA PAY).

19. MAILBOX RELOCATION IS INCIDENTAL TO INSTALLATION OF WORK. CONTRACTOR MUST NOT INTERFERE WITH MAIL DELIVERY. MAILBOX TO BE RESTORED TO EXISTING OR BETTER CONDITION UPON COMPLETION OF CONSTRUCTION ACTIVITY.

20. THE CONTRACTOR SHALL RECONNECT ALL BUILDINGS OR HOUSES OR VACANT LOTS UNLESS OTHERWISE DIRECTED. CONTRACTOR SHALL BE REQUIRED TO HAVE ALL SERVICE LINES RECONNECTED WITHIN 12 HOURS AFTER INSTALLATION.

21. VIDEOS OF THE TELEVISION INSPECTION OF THE EXISTING LINES ARE TO BE REVIEWED BY THE CONTRACTOR, GALVESTON COUNTY WATER CONTROL & IMPROVEMENT DISTRICT No. 1, AND THE ENGINEER PRIOR TO MOVING TO THE NEXT PHASE OF CONSTRUCTION.

VICINITY MAP
N.T.S.



LOCATION MAP
N.T.S.

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

GALVESTON COUNTY
MOORE'S ADDITION
SANITARY SEWER REHABILITATION

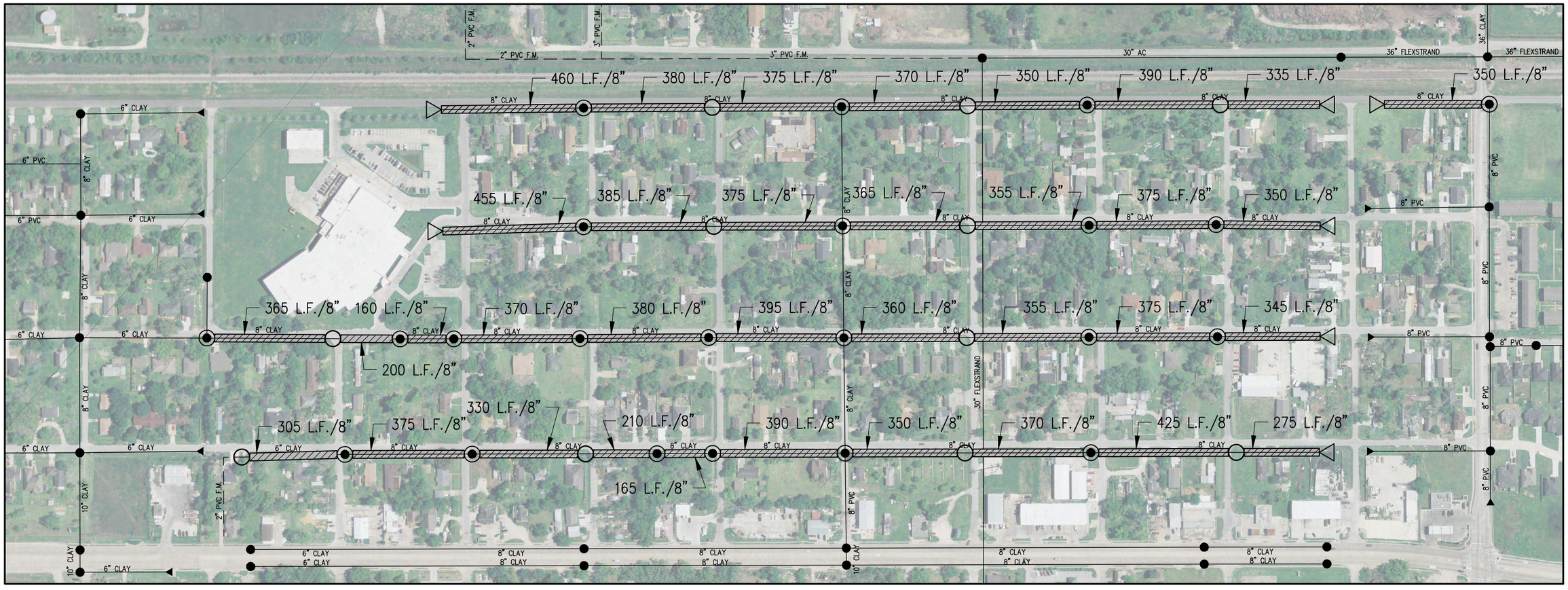
GENERAL NOTES
VICINITY & LOCATION MAPS

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

SCALE: N.T.S. | JOB No. E224-0010 | EXHIBIT No. 02

02/04/16

H:\ACAD\Clients\224\0010\Design\224-001-Ex02.dwg (XREF: 224-001 Border)



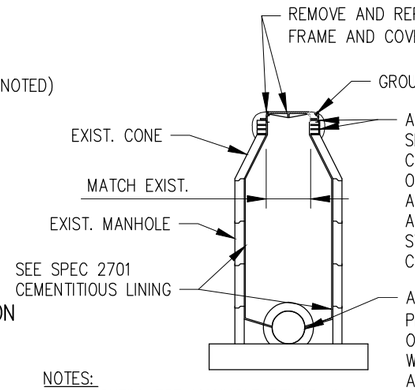
NOTES:
1. EXISTING PIPE MATERIALS OF ALL SANITARY SEWER FOR REHABILITATION ARE UNKNOWN.
2. CONTRACTOR IS RESPONSIBLE FOR LOCATING ENDS OF REHABILITATED LINES THAT DO NOT TERMINATE AT AN EXISTING MANHOLE AND INSTALLING PROPOSED CLEANOUTS WITH BOXES.
3. ALL SANITARY SERVICES WITHIN LIMITS OF SANITARY SEWER REHABILITATION SHALL BE REPLACED TO THE PROPERTY LINE. CONTRACTOR SHALL INSTALL CLEANOUT BOXES ON ALL REPLACED SERVICES.
4. APPROXIMATE LOCATION OF PROPOSED MANHOLE SHOWN. LOCATION TO BE APPROVED BY DISTRICT BEFORE CONSTRUCTION TO START.
5. MANHOLES THAT HAVE BEEN PIPEBURSTED SHALL BE REHABILITATED WITH CEMENTITIOUS LINER PER SPECIFICATIONS.
6. CONTRACTOR TO TELEVISE ALL SEWER POINT REPAIRS BEFORE WORK IS STARTED AND COORDINATE WITH DISTRICT ON HOW TO MAKE REPAIR.

EXISTING LEGEND

- SANITARY SEWER (SIZE AS NOTED)
- SANITARY SEWER MANHOLE
- LIFT STATION
- CLEANOUT

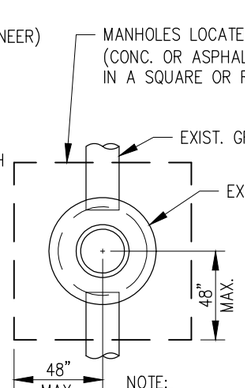
PROPOSED LEGEND

- MANHOLE REHABILITATION
- PROPOSED MANHOLE
- 200 L.F./ 8" — LENGTH/ PROPOSED SIZE
- EXIST. SEWER FOR REHABILITATION
- PROPOSED CLEANOUT



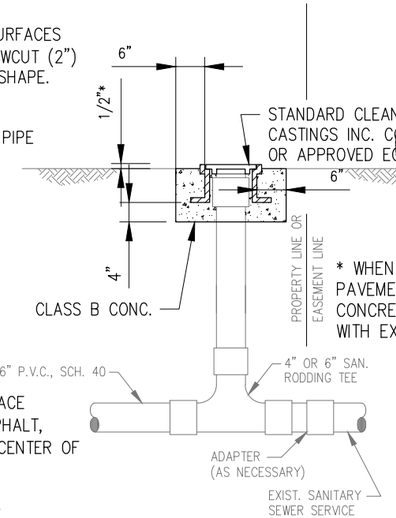
NOTES:
1. BACKFILL FOR MANHOLE REHAB. IN ROADWAY OR WITHIN 3' OF ROADWAY TO BE 1 1/2 SACK CEMENT STABILIZED SAND.
2. BACKFILL FOR MANHOLE REHAB. SET ELSEWHERE TO BE APPROVED BY ENGINEER.

MANHOLE REHABILITATION – CEMENTITIOUS LINER
N.T.S.



NOTE:
MAXIMUM PAYMENT FOR SURFACE RESTORATION (CONCRETE, ASPHALT, SODDING) WILL BE 48" FROM CENTER OF MANHOLE AS SHOWN.

TYPICAL SURFACE CUT & RESTORATION
N.T.S.



STANDARD CLEANOUT
N.T.S.

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

GALVESTON COUNTY
MOORE'S ADDITION
SANITARY SEWER REHABILITATION

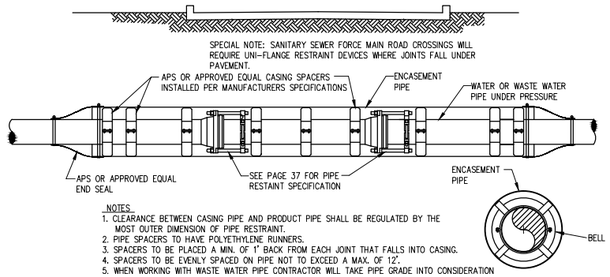
PROJECT LAYOUT

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

SCALE: 1" = 300' | JOB No. E224-0010 | EXHIBIT No. 03

02/04/16

H:\ACAD\Clients\224\0010\Design\224-001-Ex03 Project Location.dwg (XREF: 224-001 Base: 224-001 Border)



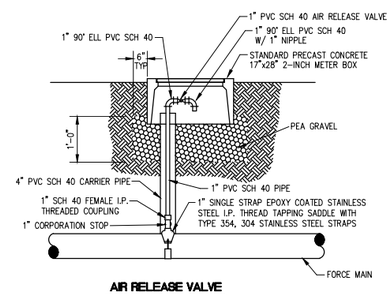
NOTES

1. CLEARANCE BETWEEN CASING PIPE AND PRODUCT PIPE SHALL BE REGULATED BY THE MOST OUTER DIMENSION OF PIPE RESTRAINT.
2. PIPE SPACERS TO HAVE POLYETHYLENE RUNNERS.
3. SPACERS TO BE PLACED A MIN. OF 1' BACK FROM EACH JOINT THAT FALLS INTO CASING.
4. SPACERS TO BE EVENLY SPACED ON PIPE NOT TO EXCEED A MAX. OF 12'.
5. WHEN WORKING WITH WASTE WATER PIPE CONTRACTOR WILL TAKE PIPE GRADE INTO CONSIDERATION SO THAT THE PROPER FALL IS MAINTAINED.
6. WHERE USING DUCTILE IRON FOR HIGHWAY CROSSINGS, CASING PIPE IS NOT REQUIRED.
7. JOINT RESTRAINTS ARE REQUIRED ON ALL JOINTS THAT FALL UNDER OR WITHIN 10' OF HIGHWAYS REGARDLESS OF PIPE MATERIAL, CASED OR NOT.
8. PIPE SHALL BE CENTERED WITHIN CASING WITH USE OF SPACERS; A MAX. TOLERANCE OF 1/2" TO BE MAINTAINED BETWEEN INSIDE WALL OF CASING PIPE AND RUNNER ON SPACER.
9. END CAPS TO BE USED ON ALL CASING PROJECTS.

SPECIAL NOTE: IN LIEU OF USING CASING ON SANITARY SEWER HIGHWAY CROSSINGS AND DITCH CROSSING CONTRACTOR MAY USE GRIFFIN-20, AMSTED, H2SEWER SAFE, DUCTILE IRON SEWER PIPE, WITH SEWPER COAT LINING.

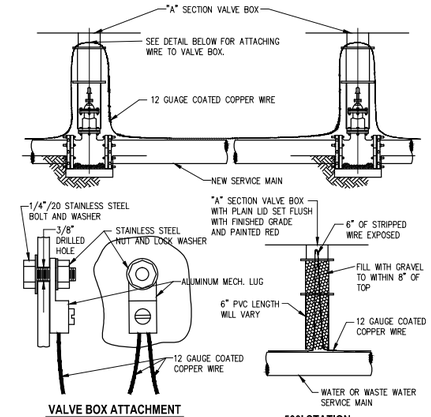
ENCASED CONSTRUCTION FOR HIGHWAY CROSSINGS

DATE: APRIL 2003



AIR RELEASE VALVE FOR SANITARY SEWER FORCE MAIN

DATE: APRIL 2003



VALVE BOX ATTACHMENT

500' STATION

NOTES

1. TRACER WIRE TO BE PLACED ON TOP OF ALL NEWLY CONSTRUCTED WATER AND WASTE WATER FORCE MAINS. WIRE MAY BE DUCT TAPED TO PIPE UNTIL BACKFILL IS COMPLETED.
2. END OF TRACER WIRE TO BE ATTACHED TO VALVE BOX, (SEE DETAIL ABOVE).
3. TRACER WIRE ON WASTE WATER FORCE MAINS OR WHERE VALVE BOXES ARE OVER 500' APPART, A TRACER WIRE RISER STATION WILL BE CONSTRUCTED.
4. TRACER WIRE TO BE 12 GUAGE COATED COPPER WIRE.
5. NO SPLICES BETWEEN TEMINAL RISERS OR VALVE BOXES.

SPECIAL NOTE

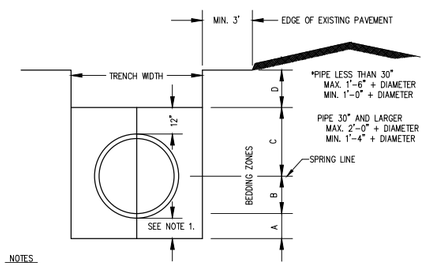
REPAIRS TO TRACER WIRE TO BE MADE WITH AN ALUMINUM KERNY DESIGNED FOR 12 GUAGE WIRE.

PRESSURE PIPE TRACER WIRE DETAIL

DATE: APRIL 2003

	BEDDING ZONES			
PIPE MATERIAL	A	B	C	D
PVC (PRESSURE PIPE)	BS	BS	BS	EF
PVC (GRAVITY PIPE)	BS	BS	BS	EF

BS- BANKSAND.
AB- AGGREGATE BEDDING.
ES- SELECT EARTH FILL PLACED SAME DAY AS PIPE IS LAID.
EF- EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID.
CS- CEMENT STABILIZED SAND.



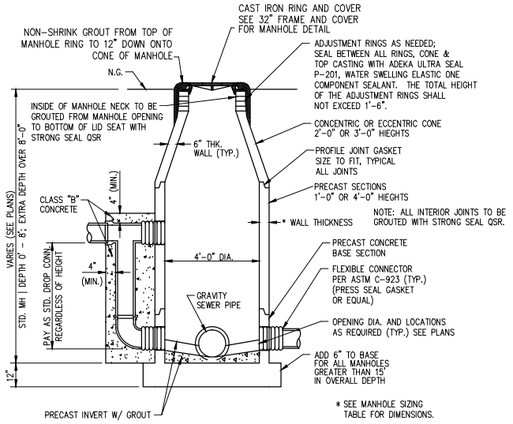
NOTES

1. BEDDING TO BE 1/4 OF PIPE DIAMETER OR 4", WHICHEVER IS GREATERST.
2. ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT TO BE 2 SACK STABILIZED MATERIAL; EXCAVATION WITHIN 3' OR LESS OF ANY CITY STREET SHALL BE 2 SACK STABILIZED SAND IN ZONE D. ALL STABILIZED SAND TO BE COMPACTED IN 12" LIFTS WITH VIBRATORY PLATE.

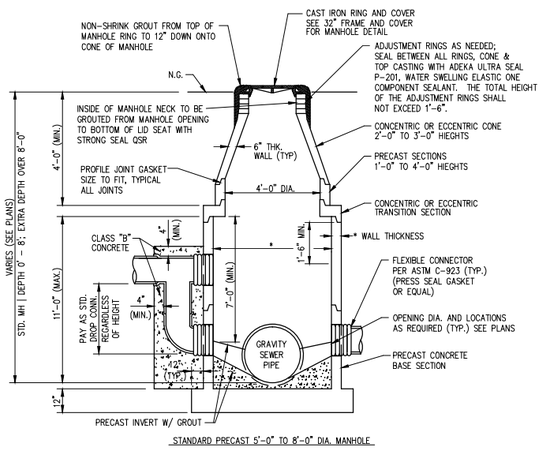
ORDINARY TRENCH EMBEDMENT + BACKFILL DETAIL

DATE: APRIL 2003

NOTE: INFLOW DISKS TO BE USED AS DIRECTED BY ENGINEER, AND AS REQUIRED, AND WILL BE MADE WILL BE MADE OF STAINLESS STEEL WITH A STAINLESS STEEL CABLE TETHERED TO MANHOLE AND WILL BE STAMPED "GALV. CNTY. WCID #1".



STANDARD PRECAST 4'-0" DIA. MANHOLE

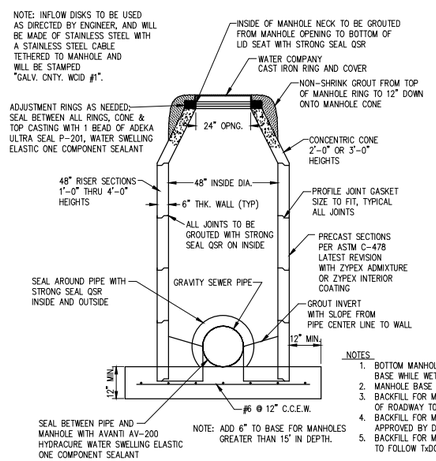


STANDARD PRECAST 5'-0" TO 8'-0" DIA. MANHOLE

DROP MANHOLE DETAIL

DATE: APRIL 2003

NOTE: INFLOW DISKS TO BE USED AS DIRECTED BY ENGINEER, AND WILL BE MADE OF STAINLESS STEEL WITH A STAINLESS STEEL CABLE TETHERED TO MANHOLE AND WILL BE STAMPED "GALV. CNTY. WCID #1".



NOTES

1. BOTTOM MANHOLE SECTION TO BE SET 6" INTO CONCRETE BASE WHILE WET. BASE TO BE CLASS "A" CONCRETE.
2. MANHOLE BASE TO BE SET IN UNDISTURBED SOIL.
3. BACKFILL FOR MANHOLES SET IN ROADWAY OR WITHIN 3' OF ROADWAY TO BE 2 SACKS OF STABILIZED SAND.
4. BACKFILL FOR MANHOLES SET ELSEWHERE TO BE APPROVED BY DISTRICT.
5. BACKFILL FOR MANHOLES SET NEAR OR IN HIGHWAYS TO FOLLOW TxDOT SPECIFICATIONS.

STANDARD PRECAST CONCRETE MANHOLE

DATE: APRIL 2003

GALVESTON COUNTY W.C.I.D. #1

STANDARD CONSTRUCTION DETAILS

CITY OF DICKINSON, TEXAS

STANDARD SANITARY SEWER DETAILS

GALVESTON COUNTY W.C.I.D. #1

DRAWN BY: | DATE: JULY 14, 2003 | CHECKED: | DATE: AUGUST 5, 2004 | SCALE: (H): - (V): | DRAWING NUMBER: SANITARYDETAIL

SHEET 1 OF 2

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

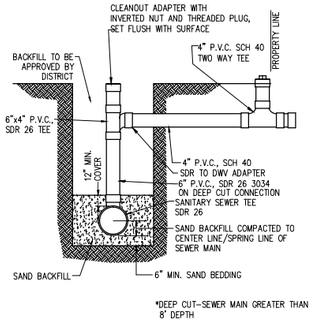
GALVESTON COUNTY
MOORE'S ADDITION
SANITARY SEWER REHABILITATION
STANDARD SANITARY SEWER DETAILS SHEET 1 OF 2

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

SCALE: N.T.S. | JOB No. E224-0010 | EXHIBIT No. 04

H:\ACAD\Clients\224\0010\Design\224-001-Ex04.dwg (XREF: 224-001 Border)

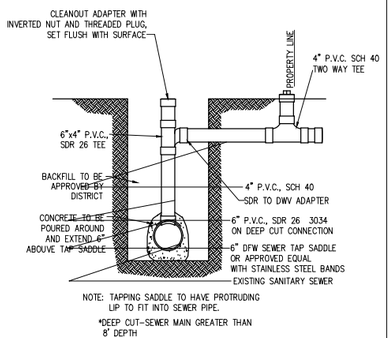
02/04/16



*DEEP CUT–SEWER MAIN GREATER THAN 8' DEPTH

•DEEP CUT CONNECTION FOR NEW CONSTRUCTION

DATE: APRIL 2003

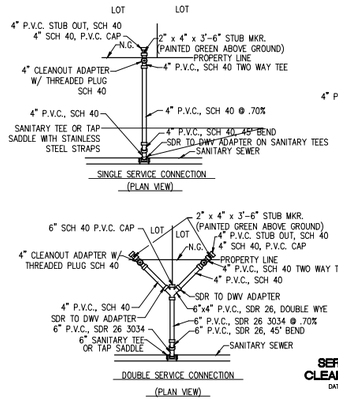


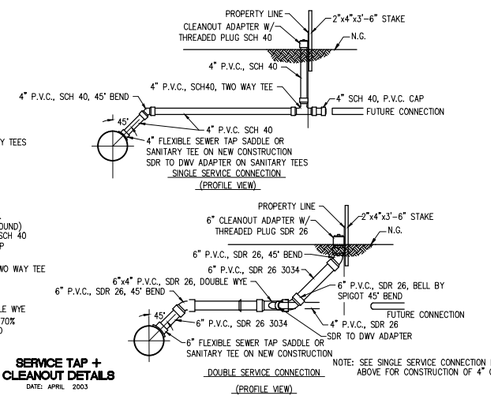
NOTE: TAPPING SADDLE TO HAVE PROTRUDING LIP TO FIT INTO SEWER PIPE.

*DEEP CUT–SEWER MAIN GREATER THAN 8' DEPTH

•DEEP CUT CONNECTION FOR EXISTING CONSTRUCTION

DATE: APRIL 2003



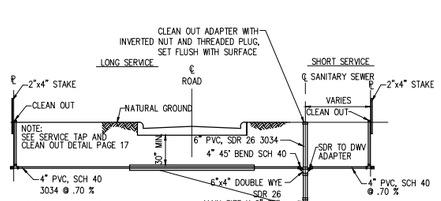


NOTE: SEE SINGLE SERVICE CONNECTION DETAIL ABOVE FOR CONSTRUCTION OF 4" CLEANOUT.

SERVICE TAP + CLEANOUT DETAILS

DATE: APRIL 2003

NOTES:
1. CONCRETE TO BE PLACED AROUND TAPPING SADDLES.
2. CLEANOUTS TO BE EXTENDED TO JUST ABOVE NATURAL GROUND OR FINISHED GRADE AT PROPERTY LINE.
3. 2"x4" GREEN STAKE ONLY REQUIRED WHEN CONNECTION IS NOT TO BE MADE WITHIN 30 DAYS.
4. ALL JOINTS TO BE GLUED, INCLUDING CAP.
5. 4" CAP PLUG MAY BE OMITTED IF HOUSE SERVICE IS READY FOR CONNECTION.

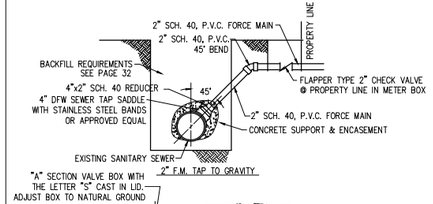


NOTES: 1. CASING REQUIRED FOR ALL HIGHWAY CROSSINGS AND STREETS DESIGNATED BY THE CITY.
2. SEWER MAINS WITH A DEPTH OF 8' OR MORE WILL BE CONSIDERED DEEP CUT.
3. SEE PAGE 17 FOR SERVICE LEAD CONNECTIONS.
4. CONCRETE TO PLACE AROUND TAPPING SADDLES.
5. HIGHWAY CROSSING THAT REQUIRE 6" SDR 26 3034 SHALL HAVE A CASSING OF 10".

SPECIAL NOTE: IN LIEU OF USING CASING ON HIGHWAY CROSSING AND DITCH CROSSING CONTRACTORS MAY USE GRIFFIN–20, AMSTED, H2SEWER SAFE, DUCTILE IRON SEWER PIPE, SEWPERCOAT LINED.

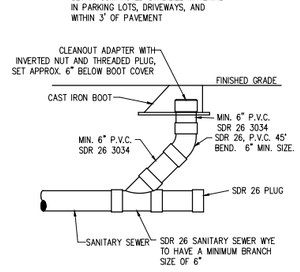
PROFILE RESIDENTIAL SERVICE CONNECTION

DATE: APRIL 2003



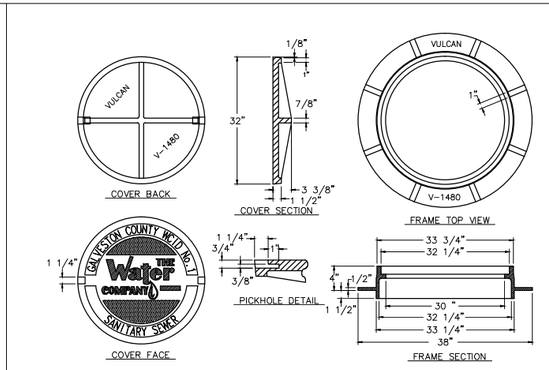
2" F.M. TAP TO GRAVITY
2" F.M. TAP TO LARGER F.M.

DATE: APRIL 2003



END OF SEWER MAIN CLEANOUT DETAIL

DATE: APRIL 2003



NOTES
1. MATERIAL SPECIFICATION SHALL BE ASTM A–48 CLASS 30.
2. COVER TO BE SOLID, WITHOUT HOLES AND WITH NON–PENETRATION RIM ACCESS RECESSES ONLY.
3. HORIZONTAL BEARING SURFACES TO BE MACHINED AND SEALED AT INSTALLATION WITH WATERPROOF GREASE COATING.
4. LOAD RATING TO BE HEAVY–DUTY.
5. PATTERN BREAKDOWN; V–1480 COVER, WEIGHT 130 lbs., V–1480 FRAME, WEIGHT 170 lbs.
6. MANHOLE FRAMES AND COVERS SET IN FARM TO MARKET ROADS OR HIGHWAYS SHALL FOLLOW TXDOT SPECIFICATIONS. (UNLESS OTHERWISE NOTED BY WCID #1)

SPECIAL 32" FRAME AND COVER FOR MANHOLE

DATE: APRIL 2003

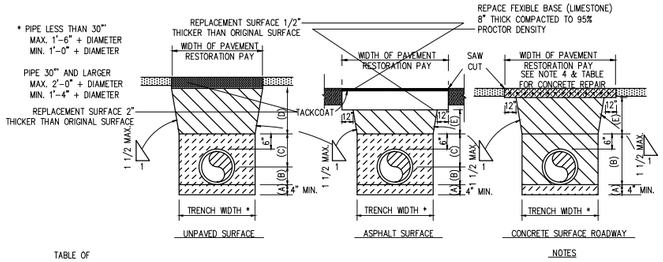


TABLE OF SLAB DEPTH & REINFORCEMENT

Min. Depth of Slab	Width of Trench	Size of Bar	Spacing	Length of Bar
8"	18"	4	9"	40"
8"	24"	4	8"	46"
8"	30"	4	7"	52"
8"	36"	4	6"	58"
10"	42"	4	8 1/2"	64"
10"	48"	4	7 1/2"	70"
10"	54"	4	7"	76"
10"	60"	4	6 1/2"	82"
10"	66"	5	9"	88"
10"	72"	6	8 1/2"	94"
10"	78"	6	8"	100"
10"	84"	6	7 1/2"	106"

SPECIAL NOTE: ALL CONCRETE DRIVEWAY REPAIR TO BE A MINIMUM OF 6" THK. WITH #3 REBAR ON 12" CENTERS WITH PLASTIC CHAIRS AS PER CITY OF DICKINSON STANDARDS.

	BEDDING ZONES				
PIPE MATERIAL	A	B	C	D	E
PVC (PRESSURE PIPE)	BS	BS	BS	EF	CS
PVC (GRAVITY PIPE)	BS	AB	AB	EF	CS

BS– BANKSAND.
AB– AGGREGATE BEDDING.
ES– SELECT EARTH FILL PLACED SAME DAY AS PIPE IS LAID.
EF– EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID.
CS– 2 SACK CEMENT STABILIZED SAND ONLY.

NOTES
1. PAVEMENT REPAIR SHALL BE MADE TO THE LIMITS OF EXISTING PAVEMENT SECTION WITH LIKE MATERIALS UNLESS NOTED OTHERWISE.
2. UNPAVED DRIVEWAYS, NOT SURFACED WITH ASPHALT, SHALL BE REPAIRED WITH MINIMUM 6" CRUSHED LIMESTONE.
3. NEW PAVEMENT SHALL BE SUPPORTED ON MINIMUM 12" EACH SIDE ON UNDISTURBED SOIL.
4. SAW CUT EXISTING CONCRETE PAVEMENT; BEND STEEL BACK OUT OF THE WAY & CONSTRUCT TRENCH. BEND STEEL BACK TO ORIGINAL POSITION AND SPLICE; SEE "TABLE OF SLAB DEPTHS & REINFORCEMENT" FOR BAR SIZE AND SPACING. REPLACE CONCRETE 2–INCHES THICKER THAN ORIGINAL.
5. ALL CONCRETE TO BE FIVE SACK MIX, 3,000 PSI MIN. AT 28 DAYS.
6. ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT EDGE OR CITY STREET SHALL REQUIRE 2 SACK CEMENT STABILIZED BACKFILL IN ZONE "D" OR ZONE "E". ALL STABILIZED BACKFILL TO BE COMPACTED IN 8" LIFTS WITH VIBRATORY PLATE.

PAVEMENT REPLACEMENT DETAIL

DATE: APRIL 2003

NOTES:

1. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION C–478. THE PRECAST SECTIONS SHALL HAVE RUBBER GASKET COMPRESSION JOINTS CONFORMING TO THE MATERIAL & PERFORMANCE REQUIREMENTS OF ASTM C–443. MANUFACTURER SHALL CERTIFY THAT THE PRECAST CONCRETE MANHOLE IS MANUFACTURED IN ACCORDANCE WITH ASTM C–478. ADDITIONALLY, MANUFACTURER SHALL PROVIDE DATA THAT CERTIFY COMPRESSIVE STRENGTH, IMPERMEABILITY, & CHEMICAL RESISTANCE. CERTIFICATION SHALL DOCUMENT CORROSION RESISTANCE OF THE DESIGN MIX TO FLUIDS WITH A pH OF 2 OR LESS IN ACCORDANCE WITH THE PERFORMANCE REQUIREMENTS OF ASTM C267–77. DESIGN MIX SHALL INCLUDE CATALYSTS WHICH GENERATE NON–SOLUBLE CRYSTALLINE FORMATION UTILIZING ZYPEX OR APPROVED EQUAL.
2. MANHOLE BASE TO BE SET ON UNDISTURBED SOIL.
3. BACKFILL FOR MANHOLES SET IN ROADWAY OR WITHIN 3' OF ROADWAY TO BE 2 SACK STABILIZED SAND
4. BACKFILL FOR MANHOLES SET ELSEWHERE TO BE APPROVED BY ENGINEER.
5. CLASS "A" CONCRETE SHALL CONSIST OF 5.25 BAGS OF CEMENT PER CU. YD., 6.25 GALLONS OF WATER PER BAG, AND A MAX. SLUMP OF 2 1/2" TO 4 1/2".
6. CLASS "B" CONCRETE SHALL CONSIST OF 4.25 BAGS OF CEMENT PER CU. YD., 8 GALLONS OF WATER PER BAG, AND A MAX. SLUMP OF 2 1/2" TO 4".

MANHOLE SIZING

MANHOLE DIA.	WALL THICKNESS	MAX. PIPE SIZE O.D. From Straight THRU TO 45° Defl.	MAX. PIPE SIZE O.D. if 90° Defl.
4 ft.	6 in.	31 1/2 in.	25 in.
5 ft.	6 in.	42 in.	32 in.
6 ft.	7 in.	51 in.	38 in.
7 ft.	7 in.	59 in.	44 in.
8 ft.	7 in.	73 1/2 in.	50 in.

MANHOLE SPECIFICATIONS

GALVESTON COUNTY W.C.I.D. #1
STANDARD CONSTRUCTION DETAILS
CITY OF DICKINSON, TEXAS

STANDARD SANITARY SEWER DETAILS

GALVESTON COUNTY W.C.I.D. #1

DRAWN BY | DATE: July 14, 2003 | REVISED: AUGUST 5, 2004 | SCALE: (N)– (V) | DRAWING NUMBER: SANITARY-DETAIL

SHEET 2 OF 2

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

GALVESTON COUNTY
MOORE'S ADDITION
SANITARY SEWER REHABILITATION

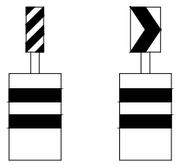
STANDARD SANITARY SEWER DETAILS SHEET 2 OF 2

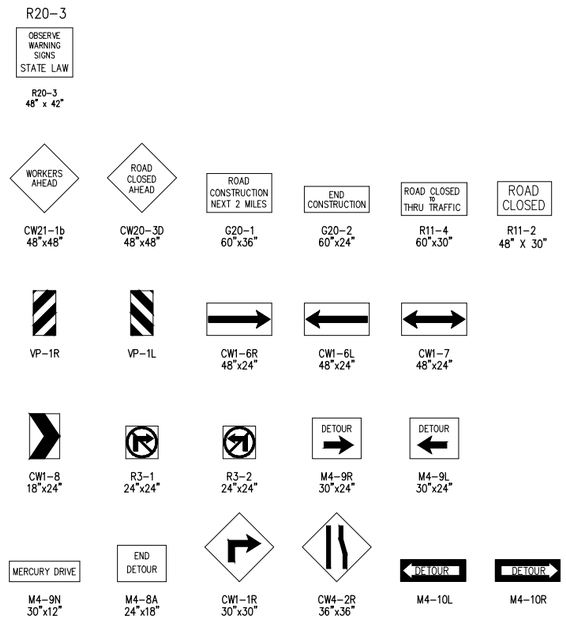
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

SCALE: N.T.S. | JOB No. E224–0010 | EXHIBIT No. 05

H:\ACAD\Clients\224\0010\Design\224–001–Ex05.dwg (XREF: 224–001 Border)

02/04/16

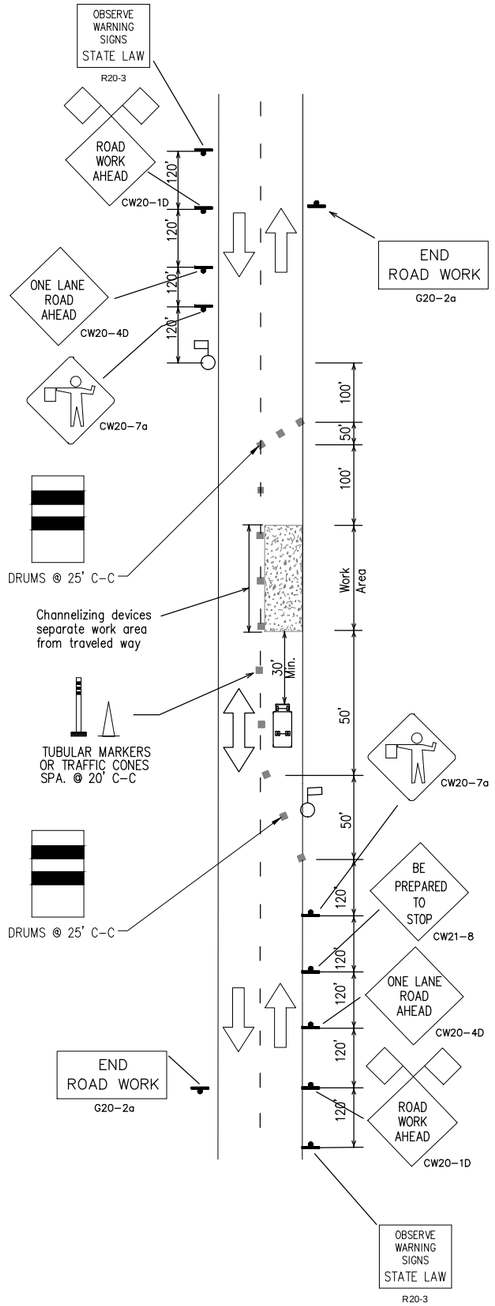




TRAFFIC NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD – LATEST EDITION WITH REVISIONS) DURING CONSTRUCTION.
2. NO LANES SHALL BE BLOCKED FROM 7 A.M. TO 9 A.M. AND 4 P.M. TO 6 P.M. MONDAY THRU FRIDAY.
3. OFF DUTY POLICE OFFICERS/FLAGGERS ARE REQUIRED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED.
4. CONTRACTOR SHALL COVER THE EXCAVATION WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS AND ALLOW NORMAL TRAFFIC TO FLOW. **IF COVERING IS NOT FEASIBLE, USE TRANTEX FR 336 EFX 36" DELINEATOR OR APPROVED EQUAL WITH SHEETING AND BASE EPOXIED TO PAVEMENT NEXT TO EXCAVATION DURING NON-WORKING HOURS.**
5. APPROVED COPIES OF "TRAFFIC CONTROL PLANS" SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES.
6. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF TRAFFIC CONTROL PLAN DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, (S)HE SHALL BE RESPONSIBLE TO PREPARE AND SUBMIT ALTERNATE PLANS* TO TRAFFIC SECTION OF GCPID FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION.

***THESE PLANS SHALL BE DRAWN TO SCALE ON REPRODUCIBLE MYLARS AND SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS. PLANS WILL BECOME A PART OF THE CONTRACT DRAWINGS.**



DAILY WORK AREA

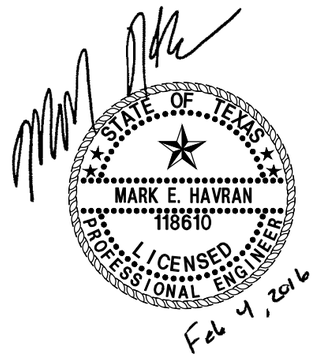
NOTE:
WORK TO BE ACCOMPLISHED BY CLOSURE OF 1/2 OF THE ROADWAY IN CONFORMANCE WITH DETAILS FOR "DAILY WORK AREA" AS SHOWN IN THIS SHEET. ROADWAY TO BE REOPENED TO TRAFFIC AT THE END OF EACH WORK DAY. CONTRACTOR WILL BE RESPONSIBLE FOR THE PROVISION AND MAINTENANCE OF PROPER SIGNING, CONSTRUCTION CONES, AND OTHER TRAFFIC CONTROL MEASURES. COORDINATE DAILY WORK AREA WITH GALVESTON COUNTY.

General Notes

1. WORKERS AHEAD Sign may be installed at two or more locations on the approach to the work zone if visibility or the work zone is less than 1500 feet. Sign R20-3 should preceed all signs.
2. Flaggers should use two-way radios or other method to communicate.
3. Length of work area should be based on the ability of flaggers to communicate.
4. Distance along curve or area of obstruction should be long enough to develop enough time for a motorist to identify and react to flagger signals.

LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER



GALVESTON COUNTY
MOORE'S ADDITION
SANITARY SEWER REHABILITATION
TRAFFIC CONTROL PLAN
ROLLING CONSTRUCTION

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

SCALE: N.T.S. | JOB No. E224-0010 | EXHIBIT No. 06

02/04/16

H:\ACAD\Clients\224\0010\Design\224-001-EX06.dwg (XREF: 224-001 Border)

GALVESTON COUNTY

GLO CONTRACT No. 13-465-000
WORK ORDER No. 7974

COMMISSIONERS' COURT

MARK HENRY
COUNTY JUDGE

RYAN DENNARD
PRECINCT 1

JOE GIUSTI
PRECINCT 2

STEPHEN D. HOLMES
PRECINCT 3

KEN CLARK
PRECINCT 4

GALVESTON COUNTY WCID NO. 1

THE Water COMPANY

CONSTRUCTION PLANS FOR:

MOORE'S ADDITION
WATERLINE REHABILITATION

FEBRUARY, 2016
LJA PROJECT No. E224-0020

DRAWING INDEX

1. COVER SHEET
2. GENERAL NOTES - VICINITY & LOCATION MAPS
3. PROJECT LAYOUT - HORIZONTAL & VERTICAL CONTROL - SHEET 1 OF 2
4. PROJECT LAYOUT - HORIZONTAL & VERTICAL CONTROL - SHEET 2 OF 2
5. HILL AVENUE - PLAN & PROFILE - BEGINNING TO BL "A" STA. 3+20
6. HILL AVENUE - PLAN & PROFILE - BL "A" STA. 3+20 TO END
7. AVENUE B - PLAN & PROFILE - BEGINNING TO BL "B" STA. 5+20
8. AVENUE B - PLAN & PROFILE - BL "B" STA. 5+20 TO BL "B" STA. 9+20
9. AVENUE B - PLAN & PROFILE - BL "B" STA. 9+20 TO BL "B" STA. 13+30
10. AVENUE B - PLAN & PROFILE - BL "B" STA. 13+30 TO BL "B" STA. 17+50
11. AVENUE B - PLAN & PROFILE - BL "B" STA. 17+50 TO BL "B" STA. 21+80
12. AVENUE B - PLAN & PROFILE - BL "B" STA. 21+80 TO BL "B" STA. 25+30
13. AVENUE B - PLAN & PROFILE - BL "B" STA. 25+30 TO END
14. AVENUE B - PLAN & PROFILE - BEGINNING TO BL "B2" STA. 4+50
15. AVENUE B - PLAN & PROFILE - BL "B2" STA. 4+50 TO END
16. AVENUE C - PLAN & PROFILE - BEGINNING TO BL "C" STA. 5+60
17. AVENUE C - PLAN & PROFILE - BL "C" STA. 15+20 TO BL "C" STA. 20+50
18. AVENUE C - PLAN & PROFILE - BL "C" STA. 20+50 TO BL "C" STA. 24+70
19. AVENUE C - PLAN & PROFILE - BL "C" STA. 24+70 TO BL "C" STA. 28+80
20. AVENUE C - PLAN & PROFILE - BL "C" STA. 28+80 TO BL "C" STA. 33+10
21. AVENUE C - PLAN & PROFILE - BL "C" STA. 33+10 TO BL "C" STA. 37+20
22. AVENUE C - PLAN & PROFILE - BL "C" STA. 37+20 TO BL "C" STA. 41+00
23. AVENUE C - PLAN & PROFILE - BL "C" STA. 41+00 TO BL "C" STA. 46+20
24. AVENUE C - PLAN & PROFILE - BL "C" STA. 46+20 TO BL "C" STA. 50+50
25. AVENUE C - PLAN & PROFILE - BL "C" STA. 50+50 TO BL "C" STA. 55+00
26. AVENUE C - PLAN & PROFILE - BL "C" STA. 55+00 TO END
27. AVENUE D - PLAN & PROFILE - BEGINNING TO END
28. STATE HIGHWAY 3 - PLAN & PROFILE - BEGINNING TO BL "E" STA. 4+80
29. STATE HIGHWAY 3 - PLAN & PROFILE - BL "E" STA. 4+80 TO BL "E" STA. 9+60
30. STATE HIGHWAY 3 - PLAN & PROFILE - BL "E" STA. 9+60 TO END
31. 19TH STREET - PLAN & PROFILE - BEGINNING TO END
32. 23RD STREET - PLAN & PROFILE - BEGINNING TO BL "G" STA. 4+00
33. 23RD STREET - PLAN & PROFILE - BL "G" STA. 4+00 TO END
34. 26TH STREET - PLAN & PROFILE - BEGINNING TO END
35. 27TH STREET - PLAN & PROFILE - BEGINNING TO END
36. 28TH STREET - PLAN & PROFILE - BEGINNING TO END
37. 29TH STREET - PLAN & PROFILE - BEGINNING TO END
38. ROSE STREET - PLAN & PROFILE - BEGINNING TO BL "L" STA. 4+00
39. ROSE STREET - PLAN & PROFILE - BL "L" STA. 4+00 TO BL "L" STA. 7+50
40. ROSE STREET - PLAN & PROFILE - BL "L" STA. 7+50 TO END
41. DAISY STREET - PLAN & PROFILE - BEGINNING TO BL "M" STA. 3+90
42. DAISY STREET - PLAN & PROFILE - BL "M" STA. 3+90 TO END
43. STANDARD WATER DETAILS - SHEET 1 OF 2
44. STANDARD WATER DETAILS - SHEET 2 OF 2
45. MISCELLANEOUS DETAILS
46. STORM WATER POLLUTION PREVENTION - PLAN & DETAILS - SHEET 1 OF 2
47. STORM WATER POLLUTION PREVENTION - PLAN & DETAILS - SHEET 2 OF 2
48. STANDARD BARRICADE DETAILS

DANNENBAUM

iSani CONSULTANTS
engineers | construction managers

Costello

STATE OF TEXAS
MARK E HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

02/04/16

H:\ACAD\Clients\224\0020\Design\224-0020-01 COVER.dwg (XREF)

GENERAL NOTES

1. CONTRACTOR SHALL CONTACT LJA ENGINEERING, INC. MR. LES DODSON AT (713) 450-1300 AT LEAST 24 HOURS PRIOR TO CONSTRUCTION FOR NOTIFICATION OF COMMENCEMENT.
2. CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 FOR LOCATION OF CENTERPOINT ENERGY GAS AND CENTERPOINT ENERGY POWER FACILITIES, 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. CONTACT GALVESTON COUNTY W.C.&I.D. No. 1, MR. KEITH MORGAN AT (281) 534-8330, REGARDING GALVESTON COUNTY W.C.&I.D. No. 1 WATER, SANITARY SEWER AND STORM SEWER FACILITIES, 48 HOURS PRIORS TO COMMENCEMENT OF CONSTRUCTION.
4. CONTACT ATT TEXAS/SBC AT 1-800-344-8377, A MINIMUM OF 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL REQUIREMENTS.
6. REMOVE AND REPLACE CULVERTS AT ROADWAYS OR ENTRY WAYS WHEN ENCOUNTERED BY OPEN CUT CONSTRUCTION. NO COMPENSATION, AS SEPARATE PAY, WILL BE MADE FOR REMOVING AND REPLACING CULVERTS. SHOULD CONTRACTOR DAMAGE CULVERTS, REPLACE WITH LIKE MATERIAL CULVERTS.
7. MAILBOX RELOCATION IS INCIDENTAL TO INSTALLATION OF WATERLINE. CONTRACTOR MUST NOT INTERFERE WITH MAIL DELIVERY. MAILBOX TO BE RESTORED TO EXISTING OR BETTER CONDITION UPON COMPLETION OF WATERLINE ACTIVITY.
8. LOCATION OF EXISTING UTILITY SERVICE LINES (WATER, SEWER, GAS, TELEPHONE, ELECTRICAL, CABLE TELEVISION, ETC.) ARE APPROXIMATE LOCATIONS AND WERE DETERMINED FROM AVAILABLE RECORDS WHICH ARE NOT GUARANTEED. CONTRACTOR TO LOCATE SERVICE LINES AND /OR OTHER OBSTRUCTIONS AHEAD OF EXCAVATION.
9. CONTRACTOR SHALL COVER OPEN EXCAVATION IN TRAFFIC PATH WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS.
10. CONTRACTOR TO MAKE ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANY FOR SECURING POLES, IF NECESSARY, WHILE CONSTRUCTION PASSES BY POLES. COSTS OF SECURING POLES WILL BE PAID FOR BY THE CONTRACTOR.
11. CONSTRUCTION STAKING (ALIGNMENT AND GRADE) TO BE PROVIDED BY THE CONTRACTOR AT NO SEPARATE PAY.
12. CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND FACILITIES DURING INSTALLATION OF PROPOSED WORK.
13. CONTRACTOR TO USE CAUTION WHEN CROSSING ALL EXISTING FACILITIES. ANY DAMAGE TO BE REPAIRED AT THE CONTRACTORS EXPENSE WITH NO SEPARATE PAY.
14. ALL WORK SHALL CONFORM TO THE STANDARDS OF THE LOCAL GOVERNMENTAL ENTITIES. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT AND /OR REPAIR OF ANY DAMAGE TO CONTROL MARKERS AND IRON RODS. THE CONTRACTOR WILL BE REQUIRED TO REPLACE THE DAMAGED CONTROL MARKERS OR IRON RODS BY OR UNDER THE SUPERVISION OF A REGISTERED PUBLIC SURVEYOR.
15. WHERE CONTRACTOR'S WORK AND /OR EQUIPMENT CAUSES AN OBSTRUCTION TO TRAFFIC, CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC DEVICES" (TEXAS M.U.T.C.D., MOST RECENT EDITION, AS REVISED) DURING CONSTRUCTION.
16. CONTRACTOR SHALL MAINTAIN SIGNING AND BARRICADES DURING CONSTRUCTION. REPLACEMENT OF DAMAGED SIGNS OR BARRICADES SHALL BE WITHIN 24 HOURS.
17. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STREET PAVEMENT SURFACE DURING THE CONSTRUCTION PERIOD. THE STREET WILL BE KEPT CLEAN TO PREVENT DIRT OR MUD BUILDUP AND SUBSEQUENT RAINFALL PRODUCING SLICK STREETS, CAUSING UNSAFE DRIVING CONDITIONS.
18. PAVED SURFACES SHALL BE PROTECTED FROM DAMAGE FROM TRACKED EQUIPMENT.
19. NO STREET SHALL BE BLOCKED WITHOUT SPECIFIC WRITTEN APPROVAL OF THE APPROPRIATE GOVERNMENTAL ENTITY.
20. NOTIFY ALL PROPERTY OWNERS A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO BLOCKAGE OF DRIVEWAYS OR ENTERING OF UTILITY EASEMENTS.
21. INGRESS AND EGRESS SHALL BE PROVIDED AT DRIVEWAYS IMMEDIATELY AFTER INSTALLATION LINE WORK.
22. CONTRACTOR SHALL MAINTAIN DRAINAGE TO ORIGINAL OR BETTER CONDITION THROUGHOUT THE CONSTRUCTION OF THE PROJECT. NO SEPARATE PAY.
23. BACKFILLING AND CLEANUP SHALL IMMEDIATELY FOLLOW PIPE LAYING OPERATION, CONSTRUCTION SHALL BE SUSPENDED IF CLEANUP IS NOT SATISFACTORY.
24. SURPLUS EXCAVATED MATERIAL SHALL BE REMOVED AND DISPOSED OFF SITE AS DIRECTED BY THE ENGINEER. IF THE ENGINEER NOTIFIES THE CONTRACTOR THAT THE OWNER DOES NOT HAVE USE FOR THIS MATERIAL, THE SURPLUS MATERIAL BECOMES THE PROPERTY OF THE CONTRACTOR AND HIS RESPONSIBILITY TO DISPOSE OF THE MATERIAL.
25. OBTAIN ALL PERMITS, NOT PROVIDED BY OWNER, PRIOR TO STARTING CONSTRUCTION.
26. THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN AN UPDATED REDLINED "AS BUILT" SET OF PLANS ON SITE.
27. WHERE NONMETALLIC PIPE IS INSTALLED, DURABLE WATERLINE TAPE SHALL BE INSTALLED CONCURRENTLY (APPROXIMATELY ONE FOOT ABOVE PIPE) FOR DETECTION PURPOSES.
28. PROPERTY OWNERS SHALL BE NOTIFIED, IN WRITING, BY CONTRACTOR, WITH DOOR HANGERS 2 WEEKS BEFORE CONSTRUCTION BEGINS. (PROPERTY OWNER SHALL BE PROVIDED THE MINIMUM FOLLOWING INFORMATION: WORK TO BE PERFORMED, STARTING AND ENDING DATES, AND THE NAME AND NUMBER OF CONTRACTOR'S REPRESENTATIVE & GALVESTON COUNTY W.C.&I.D. No. 1 OFFICIAL TO BE CONTACTED FOR QUESTIONS. WRITTEN NOTICES SHALL BE APPROVED BY GALVESTON COUNTY W.C.&I.D. No. 1 PRIOR TO DISTRIBUTION).

WATER NOTES

1. WATERLINE AND FITTING MATERIAL OF CONSTRUCTION

   A. WATERLINES LESS THAN 4-INCH

   PIPE: PVC, SCHEDULE 40 (UNLESS OTHERWISE DESIGNATED ON PLANS). FITTINGS: PVC, SCHEDULE 40 (UNLESS OTHERWISE DESIGNATED ON PLANS).
   JOINTS: SOLVENT WELD.

   B. WATERLINES 4-INCH TO 12-INCH

   PIPE: PVC, AWWA C900, CLASS DR-18 (UNLESS OTHERWISE NOTED ON PLANS). FITTINGS: DUCTILE IRON, AWWA C110 OR AWWA C153, MINIMUM CLASS 250, EPOXY COATED (FUSION BONDED) INSIDE AND OUTSIDE PER AWWA C116.
   JOINTS: PUSH-ON (RUBBER GASKETED) OR MECHANICAL (RUBBER GASKETED).
   THRUST CONTROL: RESTRAINED JOINT, MEGA-LUG.

   C. WATERLINE OFFSETS (USED ONLY IF DESIGNATED ON PLANS)

   OFFSETS TO BE STEEL PIPE WITH STEEL FITTINGS WELDED TO PIPE OR PVC WITH RESTRAINED JOINT. STEEL PIPE AND STEEL FITTINGS TO MEET AWWA C200, STANDARD WALL THICKNESS, EPOXY COATED INSIDE AND OUTSIDE PER AWWA C210. PVC PIPE AND FITTING TO BE IN ACCORDANCE WITH MATERIALS IDENTIFIED BY SIZE ABOVE.

   D. WATERLINE CASING

   STEEL IN ACCORDANCE WITH AWWA C200, MINIMUM WALL THICKNESS 1/4", SIZE DESIGNATED ON PLANS.

   CONTRACTOR SHALL INSTALL CASINGS PER DETAILS ON PLANS.

   E. SERVICE LINES

   SERVICE LINES TO BE CONSTRUCTED IN ACCORDANCE WITH THE PIPE MATERIALS AND DETAILS SHOWN ON PLANS.

2. PIPE BEDDING TO MEET THE REQUIREMENTS SHOWN ON THE DETAIL SHEETS. TYPE AND DEPTH OF BEDDING IS DEPENDENT UPON PIPE MATERIAL, LOCATION, AND TYPE OF CONSTRUCTION OF THE PROPOSED LINE.
3. VALVE BOXES LOCATED IN DRAINAGE DITCHES OR IN BACK SLOPE SHALL BE FLUSH WITH THE FINISHED GRADE.
4. WATER LINE INSTALLATION AND TESTING SHALL COMPLY WITH AWWA AND THE TEXAS COMMISSION ENVIRONMENTAL QUALITY REQUIREMENTS. (TCEQ)
5. FLUSHING, DISINFECTION, AND BACTERIOLOGICAL SAMPLING OF WATER LINE SHALL BE DONE IN ACCORDANCE WITH TCEQ REGULATIONS AND AWWA STANDARDS.
6. DISINFECTION OF WATER LINE SHALL INCLUDE 50 PPM CHLORINE SOLUTION WHEN THE WATER LINE IS FLUSHED. BACTERIALOGICAL SAMPLES SHALL BE COLLECTED FOR EACH COMPLETED SECTION OF THE WATER LINE AND THESE SAMPLES MUST BE FOUND TO CONTAIN NO COLIFORM ORGANISMS PRIOR TO PLACING THE WATER LINE IN SERVICE. SAMPLES TO BE WITNESSED, ACCEPTED AND TRANSPORT TO THE LAB BY GALVESTON COUNTY W.C.&I.D. No. 1 PERSONNEL.
7. WATER LINE SHALL HAVE A MINIMUM OF (5) FIVE FEET OF COVER EXCEPT WHERE A CONFLICT EXISTS WITH AN UNDERGROUND UTILITY (30" MINIMUM).
8. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 6" CLEARANCE AT STORM SEWER CROSSINGS AND A MINIMUM OF (2) TWO FEET CLEARANCE BETWEEN THE PROPOSED WATERLINE AND ALL PIPELINES, UNLESS OTHERWISE NOTED ON PLANS.
9. ALL BURIED BOLTS SHALL BE 304 STAINLESS STEEL.
10. ALL FITTINGS TO BE MECHANICAL JOINT WITH MEGA-LUG.
11. GATE VALVES SHALL OPEN COUNTERCLOCKWISE, IN ACCORDANCE WITH GALVESTON COUNTY W.C.&I.D. No. 1 CRITERIA.
12. TAPPING SADDLES TO BE FULL CIRCLE STAINLESS STEEL; TAPPING VALVES TO BE FLANGED / MECHANICAL JOINT. VALVE TO OPEN COUNTERCLOCKWISE.
13. CONTRACTOR IS TO COORDINATE ANY WATER OUTAGES WITH EFFECTED PROPERTY OWNER AND GALVESTON COUNTY W.C.&I.D. No. 1.
14. CONTRACTOR IS TO NOTIFY GALVESTON COUNTY W.C.&I.D. No. 1 24 HRS IN ADVANCE OF THE NEED TO CLOSE ANY VALVES AND THE DISTRICT SHALL PERFORM CLOSINGS / OPENINGS.
15. WATER LINES MUST HAVE 2" CONNECTIONS FOR FLUSHING AND BACTERIOLOGIAL (CHLORINATION).
16. FIRE HYDRANT LEADS TO BE PVC PER AWWA C-900, CLASS DR-18. THE LEADS SHALL HAVE MECHANICAL JOINT FITTINGS. (SEE DETAIL IN PLANS). MECHANICAL JOINT BOLTS AND NUTS TO BE "COR-TEN". ALL THREAD HARNESS BOLTS AND NUTS TO BE TYPE 304 S.S.. PLACE PEA GRAVEL AROUND WEEP HOLES.
17. FIRE HYDRANTS SHALL HAVE A MINIMUM (3) THREE INCH CLEARANCE AND A MAXIMUM (6) SIX INCH CLEARANCE BETWEEN NATURAL GROUND AND HYDRANT FLANGE.
18. ALL FIRE HYDRANTS SHALL BE AUDITED, SAND BLASTED, AND PAINTED PER GALVESTON COUNTY W.C.&I.D. No. 1 SPECIFICATIONS. INSTALLED WITH STRAPS NOT CHAINS. NO SEPARATE PAY.
19. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
20. WHEN WORKING ON PRIVATE PROPERTY TO RECONNECT EXISTING WATER SERVICES, CONTRACTOR IS TO USE EXTREME CARE TO PROTECT EXISTING FACILITIES. ANY DAMAGES TO EXISTING FENCES, SHRUBBERY, FLOWER BEDS, DRIVEWAYS, WALKWAYS, ETC. TO BE RESTORED TO ORIGINAL OR BETTER CONDITION. INCLUDE COST OF ANY DAMAGES ON PRIVATE PROPERTY IN UNIT PRICE BID FOR SERVICE CONNECTION ITEMS.
21. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
22. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY GALVESTON COUNTY W.C.&I.D. No. 1.
23. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO GALVESTON COUNTY W.C.&I.D. No. 1.
24. DO NOT LOCATE FIRE HYDRANTS CLOSER THAN 3 FEET FROM CURBED DRIVEWAYS OR 5 FOOT FROM NONCURBED DRIVEWAYS.
25. BENDS OR OFFSETS IN FIRE HYDRANT BRANCH WILL NOT BE ALLOWED.
26. SERVICE LEADS ARE INCLUDED IN THIS CONTRACT. AFTER PROPOSED WATERLINES HAVE BEEN COMPLETED, TESTED, AND ACCEPTED, CONTRACTOR IS TO CONNECT THE NEW SERVICE LEADS TO EXISTING METERS IN NEW BOXES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD ROUTE THE NEW SERVICE LEAD, LOCATE ALL EXISTING METERS, AND COORDINATE RECONNECTION OF METERS WITH GALVESTON COUNTY W.C.&I.D. No. 1.

VEGETATION PROTECTION AND REMOVAL NOTES

1. CONTRACTOR SHALL PROTECT ALL TREES ALONG THE RIGHT-OF-WAY LINE AND THE ADJACENT 5 FEET OUTSIDE THE RIGHT-OF-WAY (NO SEPARATE PAY).
2. CONTRACTOR SHALL RETURN THE CONSTRUCTION SITE TO THE ORIGINAL OR BETTER CONDITION (NO SEPARATE PAY).
3. LOCATE ALL BORE PITS OUTSIDE TREE CANOPY AREAS, AND USE THE NECESSARY AUGER LENGTH TO CLEAR THE TREE CANOPIES.

SEPARATION DISTANCES

§290.44(E) LOCATION OF WATERLINES. THE FOLLOWING RULES APPLY TO INSTALLATIONS OF WATERLINES, WASTEWATER MAINS OR LATERALS, AND OTHER CONVEYANCES/APPURTENANCES IDENTIFIED AS POTENTIAL SOURCES OF CONTAMINATION. FURTHERMORE, ALL RATINGS SPECIFIED SHALL BE DEFINED BY ASTM OR AWWA STANDARDS UNLESS STATED OTHERWISE. NEW MAINS, SERVICE LINES, OR LATERALS ARE THOSE THAT ARE INSTALLED WHERE NO MAIN, SERVICE LINE, OR LATERAL PREVIOUSLY EXISTED, OR WHERE EXISTING MAINS, SERVICE LINES, OR LATERALS ARE REPLACED WITH PIPES OF DIFFERENT SIZE OR MATERIAL.

§290.44(E)(1) WHEN NEW POTABLE WATER DISTRIBUTION LINES ARE CONSTRUCTED, THEY SHALL BE INSTALLED NO CLOSER THAN NINE FEET IN ALL DIRECTIONS TO WASTEWATER COLLECTION FACILITIES. ALL SEPARATION DISTANCES SHALL BE MEASURED FROM THE OUTSIDE SURFACE OF EACH OF THE RESPECTIVE PIECES.

§290.44(E)(2) POTABLE WATER DISTRIBUTION LINES AND WASTEWATER MAINS OR LATERALS THAT FORM PARALLEL UTILITY LINES SHALL BE INSTALLED IN SEPARATE TRENCHES.

§290.44(E)(3) NO PHYSICAL CONNECTION SHALL BE MADE BETWEEN A DRINKING WATER SUPPLY AND A SEWER LINE. ANY APPURTENANCE SHALL BE DESIGNED AND CONSTRUCTED SO AS TO PREVENT ANY POSSIBILITY OF SEWAGE ENTERING THE DRINKING WATER SYSTEM.

§290.44(E)(4) WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING CRITERIA SHALL APPLY.

§290.44(E)(4)(A) NEW WATERLINE INSTALLATION--PARALLEL LINES.

§290.44(E)(4)(A)(I) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING, NON-PRESSURE OR PRESSURE RATED WASTEWATER MAIN OR LATERAL AND THE LICENSED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS IS ABLE TO DETERMINE THAT THE EXISTING WASTEWATER MAIN OR LATERAL IS NOT LEAKING, THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE EXISTING WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE EXISTING WASTEWATER MAIN OR LATERAL. EVERY EFFORT SHALL BE EXERTED NOT TO DISTURB THE BEDDING AND BACKFILL OF THE EXISTING WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(A)(II) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING PRESSURE RATED WASTEWATER MAIN OR LATERAL AND IT CANNOT BE DETERMINED BY THE LICENSED PROFESSIONAL ENGINEER IF THE EXISTING LINE IS LEAKING, THE EXISTING WASTEWATER MAIN OR LATERAL SHALL BE REPLACED WITH AT LEAST 150 PSI PRESSURE RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE NEW WASTEWATER LINE, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE REPLACED WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(A)(III) WHERE A NEW POTABLE WATERLINE PARALLELS A NEW WASTEWATER MAIN, THE WASTEWATER MAIN OR LATERAL SHALL BE CONSTRUCTED OF AT LEAST 150 PSI PRESSURE RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(B) NEW WATERLINE INSTALLATION--CROSSING LINES.

§290.44(E)(4)(B)(I) WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL IS DISTURBED OR SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.

§290.44(E)(4)(B)(II) WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.

§290.44(E)(4)(B)(III) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL AND THE STANDARD PIPE SEGMENT LENGTH OF THE WASTEWATER MAIN OR LATERAL IS AT LEAST 18 FEET, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (VI) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(E)(4)(B)(IV) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL AND A STANDARD LENGTH OF THE WASTEWATER PIPE IS LESS THAN 18 FEET IN LENGTH, THE POTABLE WATER PIPE SEGMENT SHALL BE CENTERED OVER THE WASTEWATER LINE. THE MATERIALS AND METHOD OF INSTALLATION SHALL CONFORM WITH ONE OF THE FOLLOWING OPTIONS.

§290.44(E)(4)(B)(IV)(I) WITHIN NINE FEET HORIZONTALLY OF EITHER SIDE OF THE WATERLINE, THE WASTEWATER PIPE AND JOINTS SHALL BE CONSTRUCTED WITH PIPE MATERIAL HAVING A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. AN ABSOLUTE MINIMUM VERTICAL SEPARATION DISTANCE OF TWO FEET SHALL BE PROVIDED. THE WASTEWATER MAIN OR LATERAL SHALL BE LOCATED BELOW THE WATERLINE.

§290.44(E)(4)(B)(IV)(II) ALL SECTIONS OF WASTEWATER MAIN OR LATERAL WITHIN NINE FEET HORIZONTALLY OF THE WATERLINE SHALL BE ENCASED IN AN 18-FOOT (OR LONGER) SECTION OF PIPE. FLEXIBLE ENCASING PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE ENCASING PIPE SHALL BE CENTERED ON THE WATERLINE AND SHALL BE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN THE WASTEWATER MAIN OR LATERAL. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT (OR LESS) INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. EACH END OF THE CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK CEMENT GROUT OR A MANUFACTURED WATERTIGHT SEAL. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF SIX INCHES BETWEEN THE ENCASEMENT PIPE AND THE WATERLINE SHALL BE PROVIDED. THE WASTEWATER LINE SHALL BE LOCATED BELOW THE WATERLINE.

§290.44(E)(4)(B)(IV)(III) WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR LATERAL, THE WATERLINE SHALL BE ENCASED AS DESCRIBED FOR WASTEWATER MAINS OR LATERALS IN SUBCLAUSE (II) OF THIS CLAUSE OR CONSTRUCTED OF DUCTILE IRON OR STEEL PIPE WITH MECHANICAL OR WELDED JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF ONE FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. BOTH THE WATERLINE AND WASTEWATER MAIN OR LATERAL MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED IN AWWA C600 STANDARDS.

§290.44(E)(4)(B)(V) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (VI) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(E)(4)(B)(VI) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.

§290.44(E)(5) WATERLINE AND WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SEPARATION. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.

§290.44(E)(6) LOCATION OF FIRE HYDRANTS. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.

UTILITY NOTES

1. LOCATION OF EXISTING UNDERGROUND UTILITY SERVICE LINES (WATER, SEWER, GAS, TELEPHONE, ELECTRICAL, ETC.) ARE DETERMINED FROM AVAILABLE RECORDS AND ARE APPROXIMATE. CONTRACTOR TO LOCATE LINES AND/OR OBSTRUCTIONS AHEAD OF EXCAVATION.
2. CONTRACTOR TO MAKE ARRANGEMENTS WITH APPROPRIATE UTILITY COMPANY FOR SECURING POLES, IF NECESSARY, WHILE CONSTRUCTION PASSES BY POLES. COSTS OF SECURING POLES WILL BE PAID FOR BY THE CONTRACTOR AT NO SEPARATE PAY.

CAUTION: VERIZON FACILITIES
THE LOCATION OF VERIZON FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. SERVICE LINES ARE NOT SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES. THE CONTRACTOR SHALL CONTACT DIGTESS @ 800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND TELEPHONE LINES FIELD LOCATED. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF VERIZON FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MUCHANIZED EXCAVATION PROCEDURES. WHENEVER VERIZON FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT SHOULD BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON CABLE AND/OR CONDUIT DUCTS. CONTACT NETWORK ENGINEERING @ 281-338-2221 FOR QUESTIONS REGARDING VERIZON FACILITES.

CAUTION: UNDERGROUND PIPELINES
UNDERGROUND PIPELINES ARE SHOWN ACCORDING TO BEST AVAILABLE INFORMATION. CONTRACTOR TO PROCEED WITH CAUTION DURING EXCAVATION. CONTRACTOR TO COORDINATE WITH PIPELINE OWNER IN CASE OF CONFLICTS OR QUESTIONS.

CAUTION: UNDERGROUND CABLE FACILITIES
TELEPHONE AND TELEVISION CABLE EXISTS UNDERGROUND THROUGHOUT THE PROPOSED PROJECT AREA. CONTRACTOR TO CONTACT "DIG-TESS" AT 1-800-344-8377 AT LEAST 48 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION FOR LOCATION AND MARKING OF UNDERGROUND CABLE.

CAUTION: UNDERGROUND GAS FACILITIES
LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOW IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567, 1-800-669-8344 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

- WHEN CENTERPOINT ENERGY PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713) 945-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
- WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
- WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
- FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200.

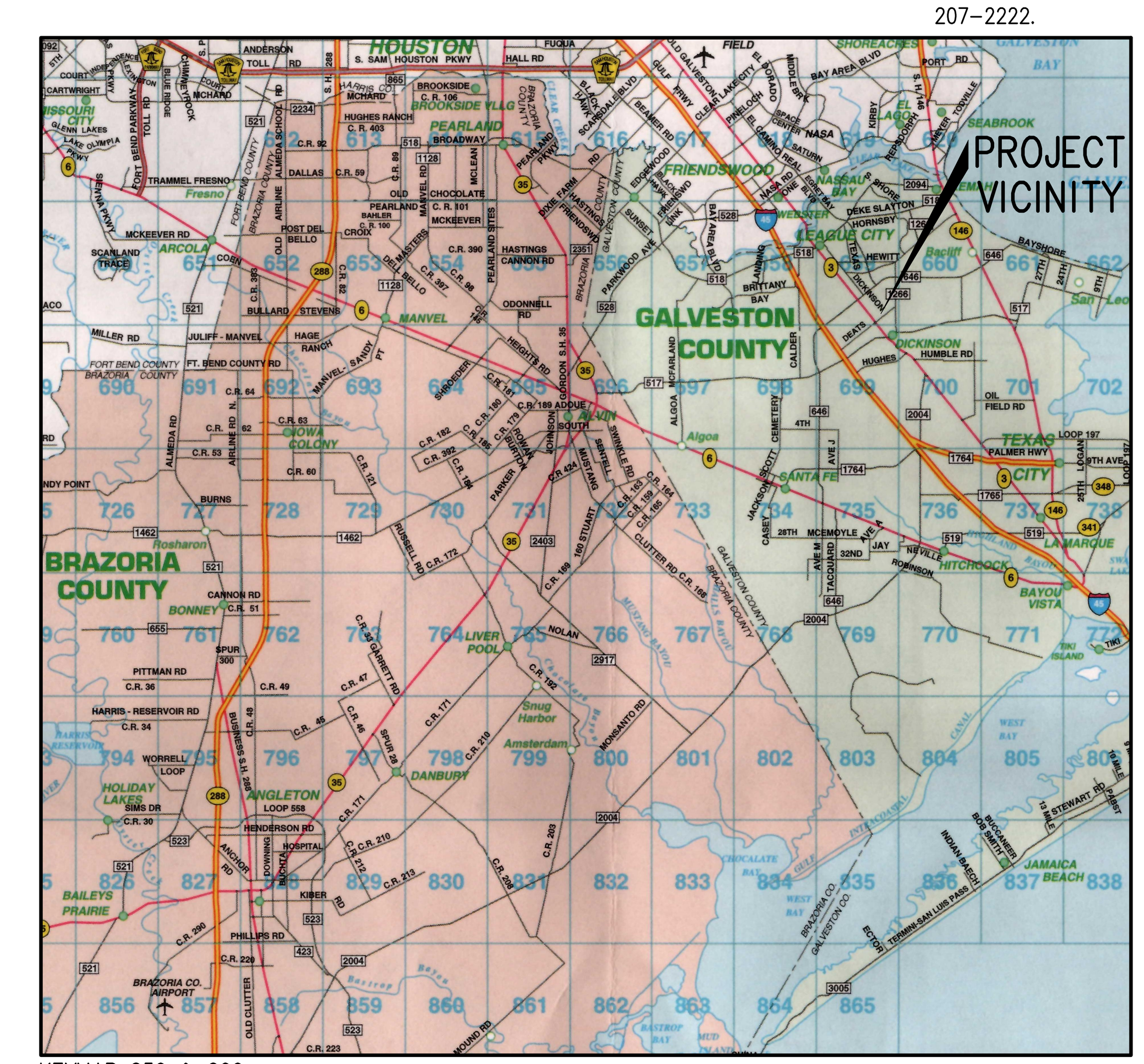
THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASMENT PROPERTY
NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6248 OR (713) 207-5769.

WARNING: OVERHEAD ELECTRIC FACILITIES
OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

- ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222.



KEYMAP 659 & 699

VICINITY MAP
N.T.S.

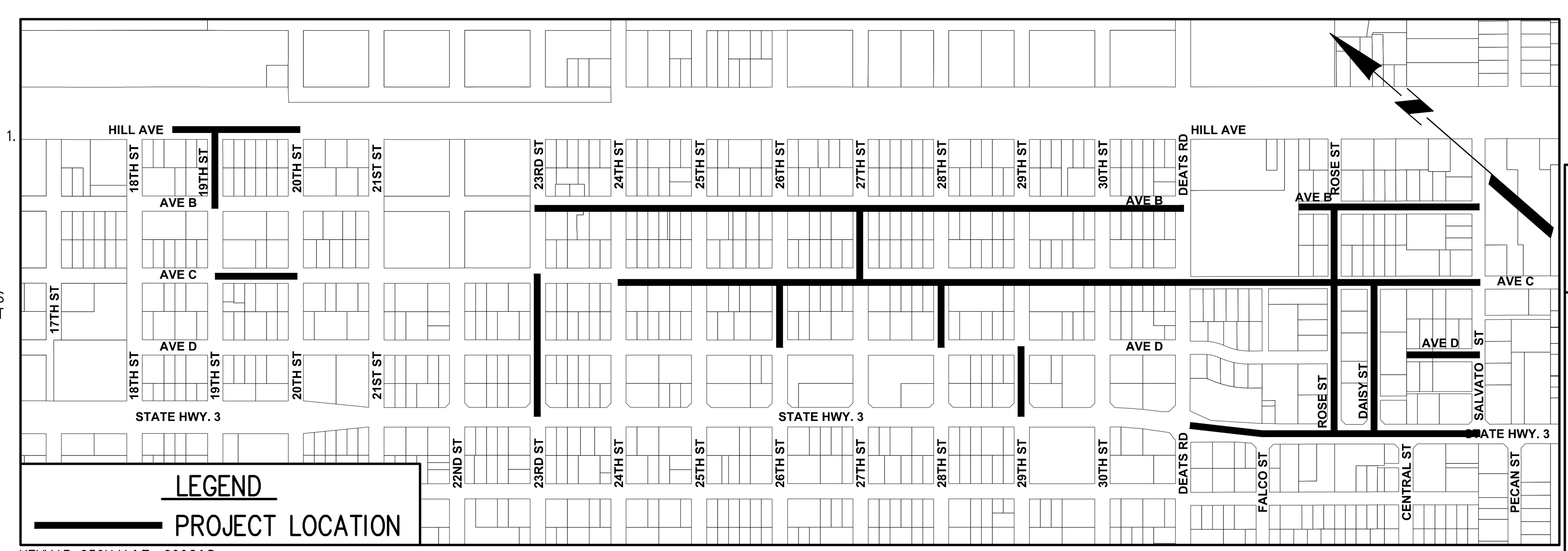
FLOOD PLAIN DATA:

FIRM PANEL 740 OF 1150.
ZONE "X".
MAP. NO. 48201C0740L, REVISE JUNE 18, 2007.
100 YR. FLOOD PLAN ELEV. – 12.0'

TRAFFIC CONTROL NOTE

1. CONTRACTOR TO COMPLY WITH ANY AND ALL TRAFFIC CONTROL REQUIREMENTS REQUESTED AND ENFORCED BY TEXAS DEPARTMENT OF TRANSPORTATION AND ANY OTHER APPLICABLE LOCAL AGENCY AND COST OF SUCH IS INCIDENTAL TO THE PROJECT, WITH NO SEPARATE PAY.
2. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD – LATEST EDITION WITH REVISIONS) DURING CONSTRUCTION.
3. NO LANES SHALL BE BLOCKED FROM 7AM TO 9AM AND 4PM TO 6PM, MONDAY THRU FRIDAY.

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016



KEYMAP 659U,Y,&Z; 699C&D

LOCATION MAP
N.T.S.

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

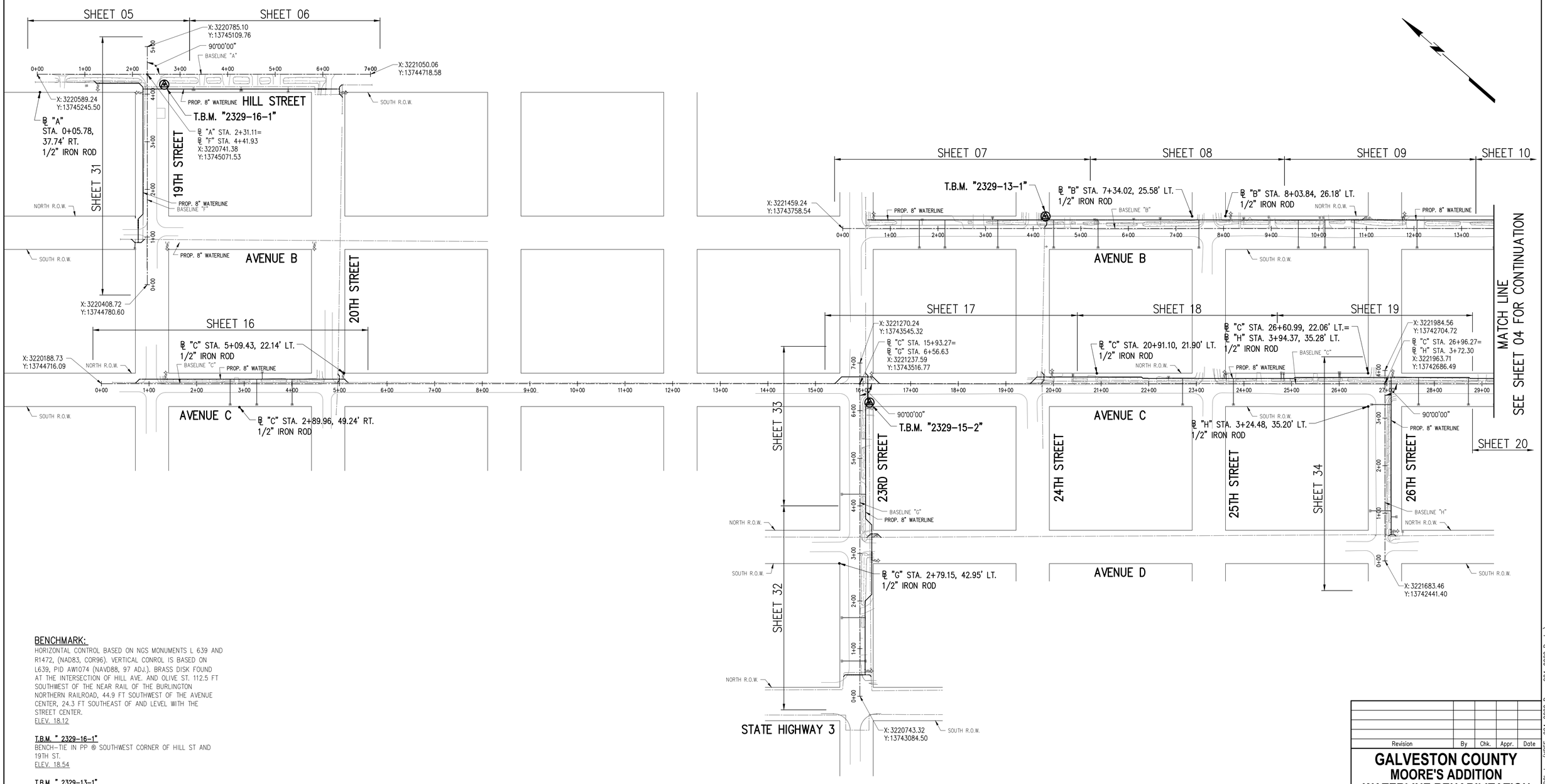
GENERAL NOTES
VICINITY & LOCATION MAPS

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 02 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-02 Notes.dwg (XREF: 224-0020 Border)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.
ELEV. 18.12

T.B.M. " 2329-16-1"
BENCH-TIE IN PP ® SOUTHWEST CORNER OF HILL ST AND 19TH ST.
ELEV. 18.54

T.B.M. " 2329-13-1"
BENCH-TIE IN PP ® SOUTHWEST CORNER OF AVENUE B AND 24TH ST.
ELEV. 17.84

T.B.M. " 2329-15-2"
BENCH-TIE IN PP ® SOUTHWEST CORNER OF AVENUE C AND 23 ST.
ELEV. 17.30

ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM (NAD83 CORS96), SOUTH CENTRAL ZONE. COORDINATES SHOWN ARE SURFACE VALUE AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING THE SURFACE VALUE BY A COMBINED SCALE FACTOR OF 1.00013.

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

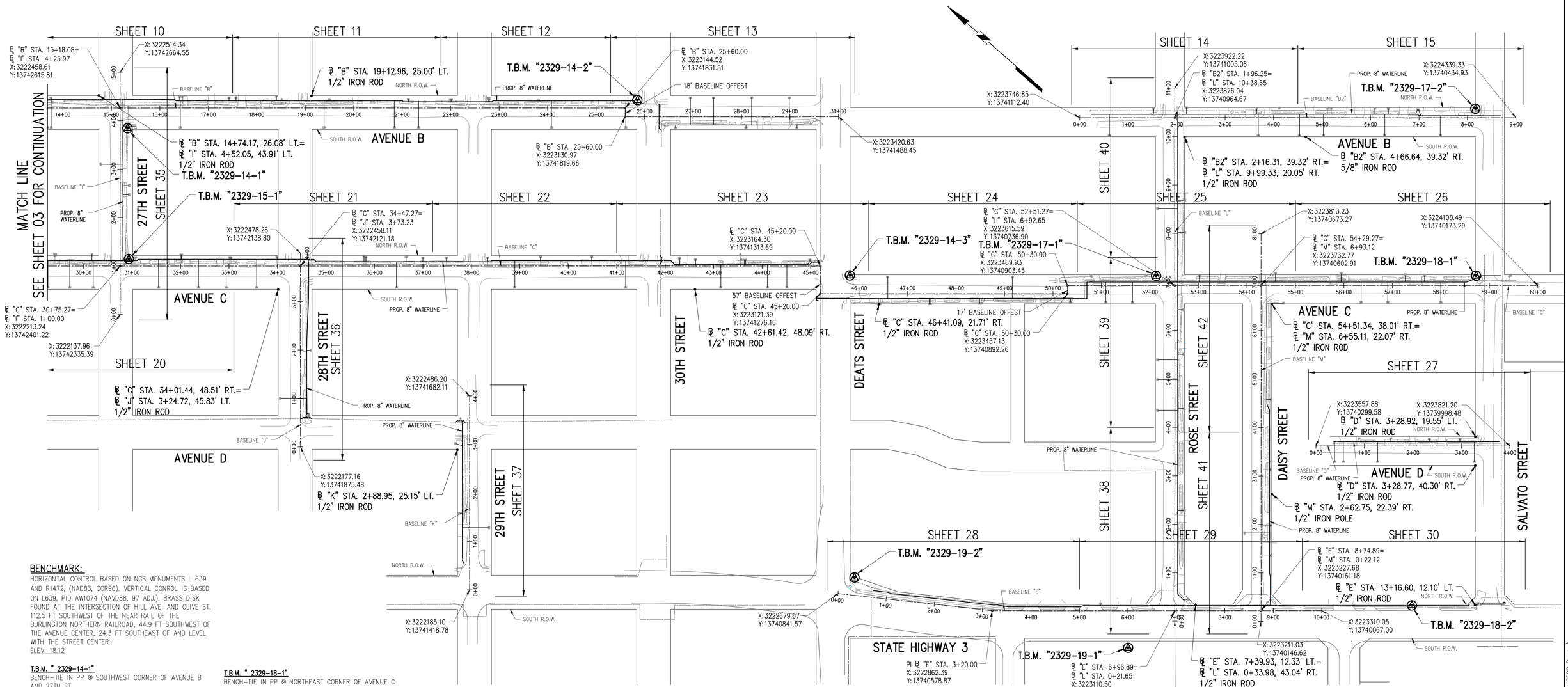
PROJECT LAYOUT
HORIZONTAL & VERTICAL CONTROL
SHEET 1 OF 2

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=100'
APPROVED:	SHEET No. 03 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-03 HV CONTROL.dwg (XREF: 224-0020 Base: 224-0020 Border)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.
ELEV. 18.12

T.B.M. " 2329-14-1"
BENCH-TIE IN PP @ SOUTHWEST CORNER OF AVENUE B AND 27TH ST.
ELEV. 17.17

T.B.M. " 2329-14-2"
BENCH-TIE IN PP @ NORTHEAST CORNER OF AVENUE B AND 30TH ST.
ELEV. 16.55

T.B.M. " 2329-14-3"
BENCH-TIE IN PP @ SOUTHEAST CORNER OF AVENUE C AND DEATS RD.
ELEV. 16.25

T.B.M. " 2329-15-1"
BENCH-TIE IN PP @ SOUTHEAST CORNER OF AVENUE C AND 27TH ST.
ELEV. 16.22

T.B.M. " 2329-17-1"
BENCH-TIE IN PP @ NORTHEAST CORNER OF AVENUE C AND ROSE ST.
ELEV. 15.08

T.B.M. " 2329-17-2"
BENCH-TIE IN PP @ NORTHEAST CORNER OF AVENUE B AND SALVATO ST.
ELEV. 15.68

T.B.M. " 2329-18-1"
BENCH-TIE IN PP @ NORTHEAST CORNER OF AVENUE C AND SALVATO ST.
ELEV. 14.48

T.B.M. " 2329-18-2"
BENCH-TIE IN 1ST PP NORTH OF SALVATO ST. EAST ROW HWY. 3.
ELEV. 14.94

T.B.M. " 2329-19-1"
RR SPIKE IN PP ±20' NORTH OF CI-118 WEST ROW HWY. 3.
ELEV. 14.40

T.B.M. " 2329-19-2"
BENCH-TIE IN PP @ SOUTHEAST CORNER OF DEATS RD. AND HWY. 3.
ELEV. 15.08

ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM (NAD83 CORS96), SOUTH CENTRAL ZONE. COORDINATES SHOWN ARE SURFACE VALUE AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING THE SURFACE VALUE BY A COMBINED SCALE FACTOR OF 1.00013.

TEXAS DEPARTMENT OF TRANSPORTATION
Specifications for Placing Utility Lines Within The Right-of-Way of State maintained Highways

1. All excavations within the right-of-way and not under surfacing shall be backfilled according to the Standard Specifications For Construction and Maintenance of Highways, Streets, and Bridges, Item 400.3, Section C. All surplus material shall be removed from the right-of-way and the excavation finished flush with surrounding natural ground.
2. Where sodding is disturbed by excavation or backfilling operations, such areas shall be replaced by seeding. Slopes 4:1 or steeper shall be replaced with block sodding. This work shall be in accordance with Texas Department of Transportation (TxDOT) specifications.
3. Highway crossings under surfaced roads and surfaced crossroads within the right-of-way shall be placed by boring. Boring shall extend from crown line to crown line.
4. Use of water or other fluids in connection with boring operations will be permitted only in sufficient quantity to lubricate boring bit and provide a smooth flow of cuttings. Jetting will not be permitted.
5. Pipeline material and design for high pressure lines must meet the minimum Federal Safety Standards for Liquid and Gas Pipelines.
6. Operations on the highways shall be performed in such a manner that operating equipment and excavated material are kept off the pavement at all times.
7. Barricades and warning signs, and flagmen when necessary, shall be provided by the contractor or owner. One-half the traveled portion of the roadway must be open to traffic at all times.
8. Work performed on railroad right-of-way is subject to the concurrence of the railroad company. Approval of this request by TxDOT does not relieve the utility owner or its agent of any obligation to also obtain the approval of the railroad company. Work performed within the waterways, such as rivers, creeks, bayous, and drainage ditches, is subject to the concurrence of appropriate regulatory agencies. The utility owner or its agent shall obtain overall environmental clearance with all appropriate regulatory agencies prior to beginning construction. Approval of this request by TxDOT does not relieve the utility owner or its agent of this obligation.
9. All manhole covers shall be installed flush with ground level. The roof of communications manholes shall be at least five feet below ground.
10. No raw sewage or effluence from septic tanks, car washes, or similar facilities shall be drained in State highway storm sewer systems.
11. Power transmission line crossings over highways shall be constructed and maintained a minimum of 22 feet above the surface of the traffic lanes. For power lines above 50,000 volts, the clearance shall be increased in accordance with National Electric Safety Code as published in the National Bureau of Standards, Handbook 30.
12. Communications lines crossing over the highway shall be constructed and maintained a minimum of 18 feet above the surface of traffic.
13. Fiber Optic communications lines greater than 500 feet in length must provide at least 50 feet of slack coil in an adjacent vault, manhole, and/or handhole.
14. Fiber Optic communications lines greater than 1,000 feet in length must provide at least 100 feet of slack coil in an adjacent vault, manhole, and/or handhole.
15. Work covered by this permit shall be so conducted that is will not interfere in any way highway construction or repair work, or any State maintenance work that may be done on this road. In the event such interference occurs, you will cease operations in the area until such time as the road work referred to above is completed.
16. The Grantee certifies that its storm water runoff to the State's right-of-way shall not be contaminated by any industrial processes or significant pollutants, and the State shall not be held liable for any pollutants entering State right-of-way through storm water connections.

ADDITIONAL SPECIAL PROVISIONS FOR UTILITY PERMITS

- Grantee shall request the location of underground utilities within the work area a minimum of 72 hours prior to any excavation by calling 811, and contacting local municipalities, utility districts, school districts, or any other utility owners operating within the work area. Grantee shall be responsible for relocating and/or adjusting any utilities within the work area. Grantee shall contact Michael C. K. Awa, P.E., TxDOT Houston District Traffic Signals Manager, at (713) 802-5661, for ITS, CTMS, or traffic signal locates.
- This permit is subject to a separate Traffic Control Plan being filed and approved by the Area Engineer. No work within the State right-of-way shall be performed until this approval has been granted. Traffic control shall conform to the Texas Manual on Uniform Traffic Control Devices, Part 6, as currently amended. It is mutually agreed and understood that the implementation and maintenance of the traffic control plan shall be the responsibility of the Grantee. Contractor is required to supply all sub-contractors with a copy of this permit and approved traffic control plan.
- The Grantee shall coordinate the sequence of construction and traffic control plan with any adjacent highway construction or maintenance projects. No overnight lane closures will be permitted, unless otherwise approved by the Area Engineer.
- Highway Crossings shall be bored or tunneled. Bored hole or tunnel shall not exceed the diameter of the casing by more than one inch, and shall extend the full width of the pavement plus ten feet on each side thereof or five feet behind the back of the curbs. Annular voids shall be filled with a slurry grout or flowable fill.
- Casing shall consist of smooth wall pipe with welded joints and seams, and shall be continuous, extending past the top of the back slope of the outermost ditches or five feet behind the back of the curbs.
- Any adjustment or relocation of this installation necessary because of future highway construction shall be accomplished without cost to the Texas Department of Transportation.
- This permit will become null and void if installation is not constructed within one (1) year from the issuance date of this permit.
- The grantee shall indemnify and save harmless the State from any and all damages or losses that may develop due to this project.
- The contractor or sub-contractor is required to contact the TxDOT Maintenance Supervisor a minimum of 72 hours prior to commencing any work.

TxDOT Maintenance Supervisors	Office Phone
Brazoria County	(979) 864-8550
Fort Bend County	(281) 238-7950
Galveston County	(409) 978-2553
Montgomery County	(936) 538-3351
Waller County	(979) 921-2401
Harris County, Inside IH 610 Loop	(713) 934-5900
Harris County, North	(281) 319-6450
Harris County, East	(713) 636-7400
Harris County, South	(281) 464-5500
Harris County, West	(713) 934-5900

Revision	By	Chk.	Appr.	Date

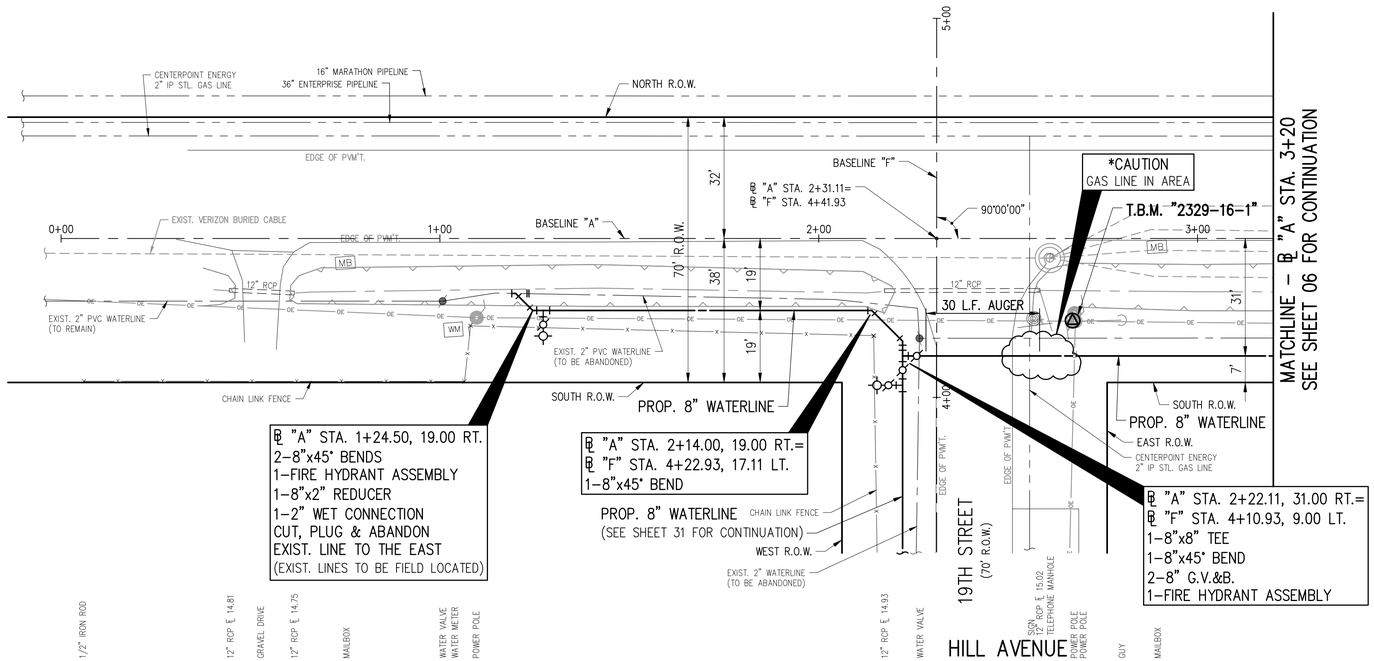
GALVESTON COUNTY
MOORE'S ADDITION WATERLINE REHABILITATION
PROJECT LAYOUT HORIZONTAL & VERTICAL CONTROL SHEET 2 OF 2

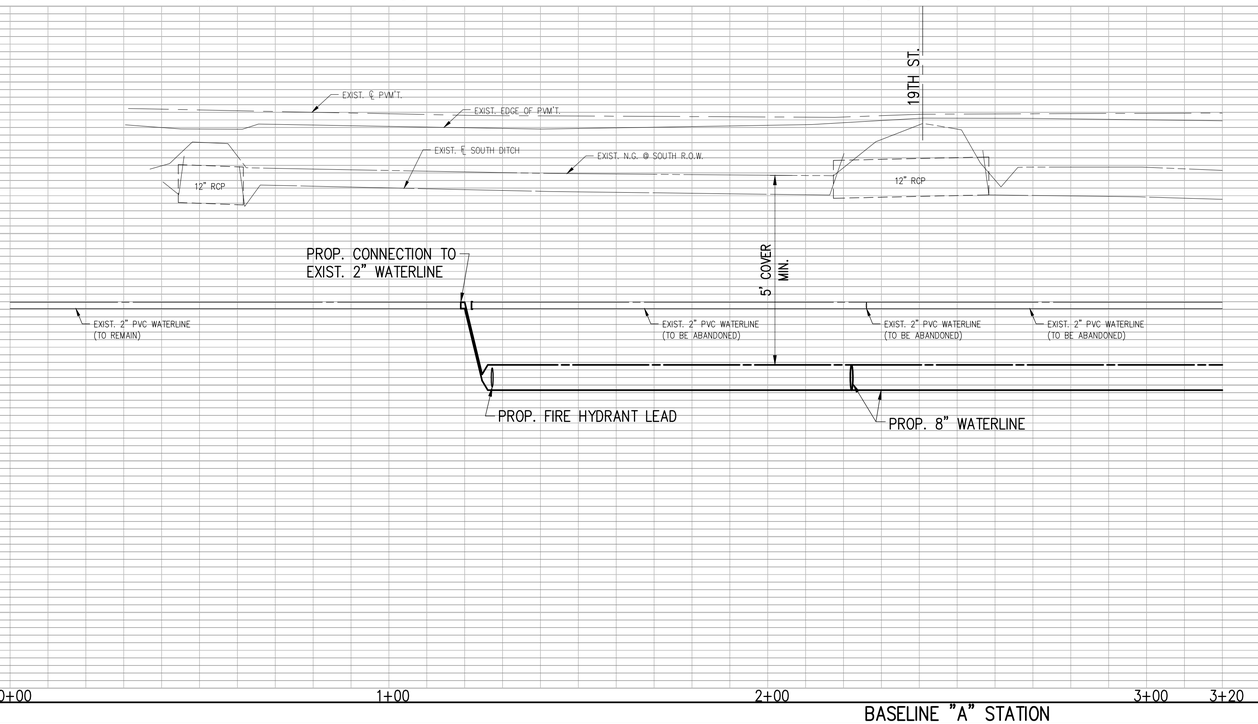
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=100'
APPROVED:	SHEET No. 04 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-04HV CONTROL2.dwg (XREF: 224-0020 Base: 224-0020 Border)

02/04/16





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

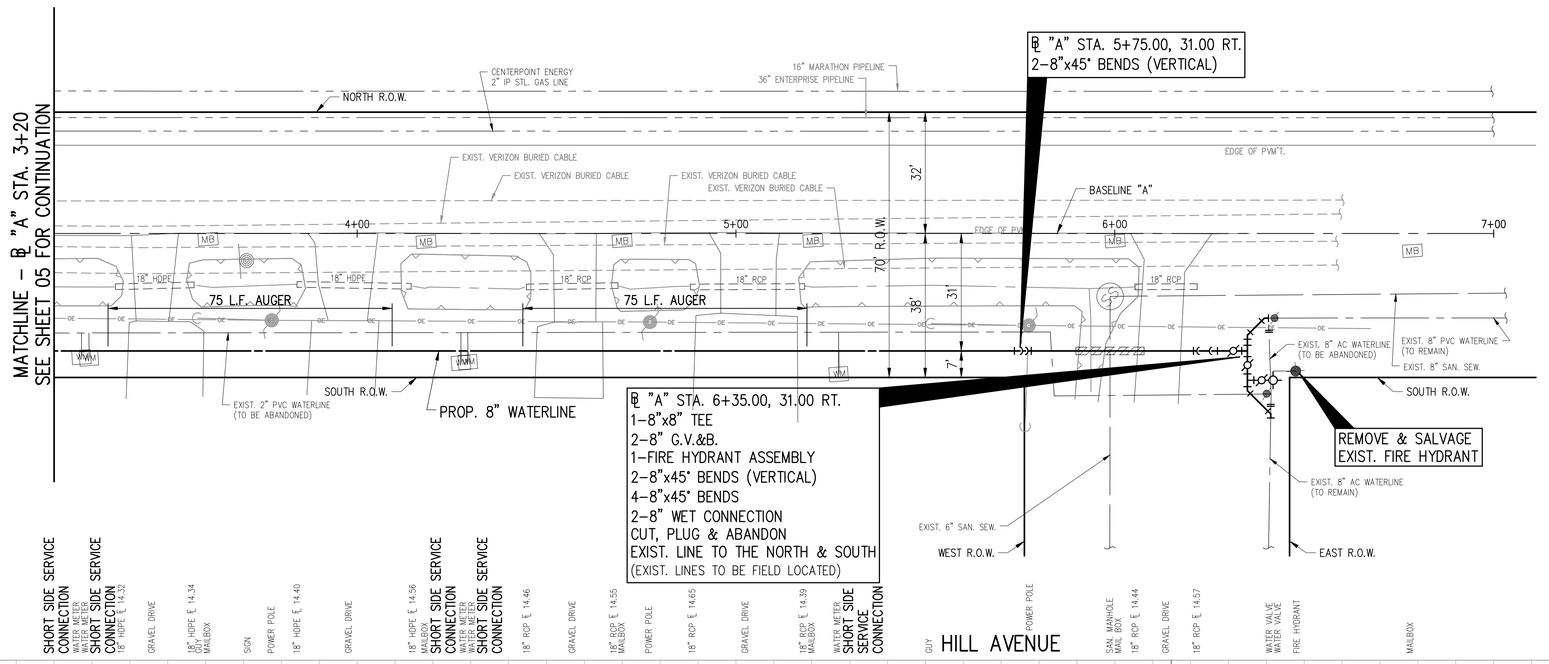
HILL AVENUE
PLAN & PROFILE
BEGINNING TO BL "A" STA. 3+20

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 05 Of 48

04/16/15

H:\ACAD\Clients\224\0020\Design\224-0020-05 PP01 HILL.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

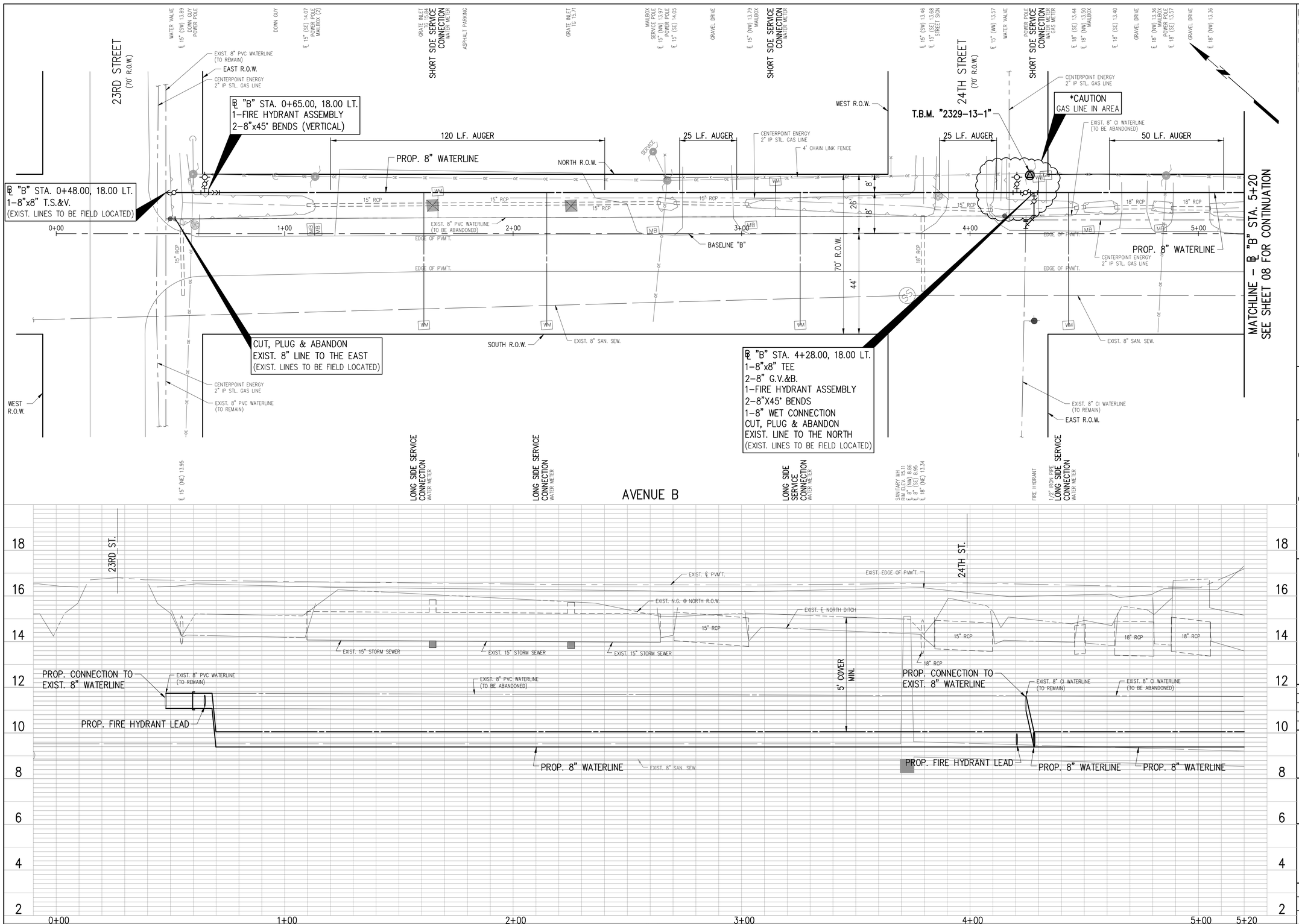
HILL AVENUE
PLAN & PROFILE
BL "A" STA. 3+20 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 06 Of 48

04/21/15

H:\ACAD\Clients\224\0020\Design\224-0020-06 PP02.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

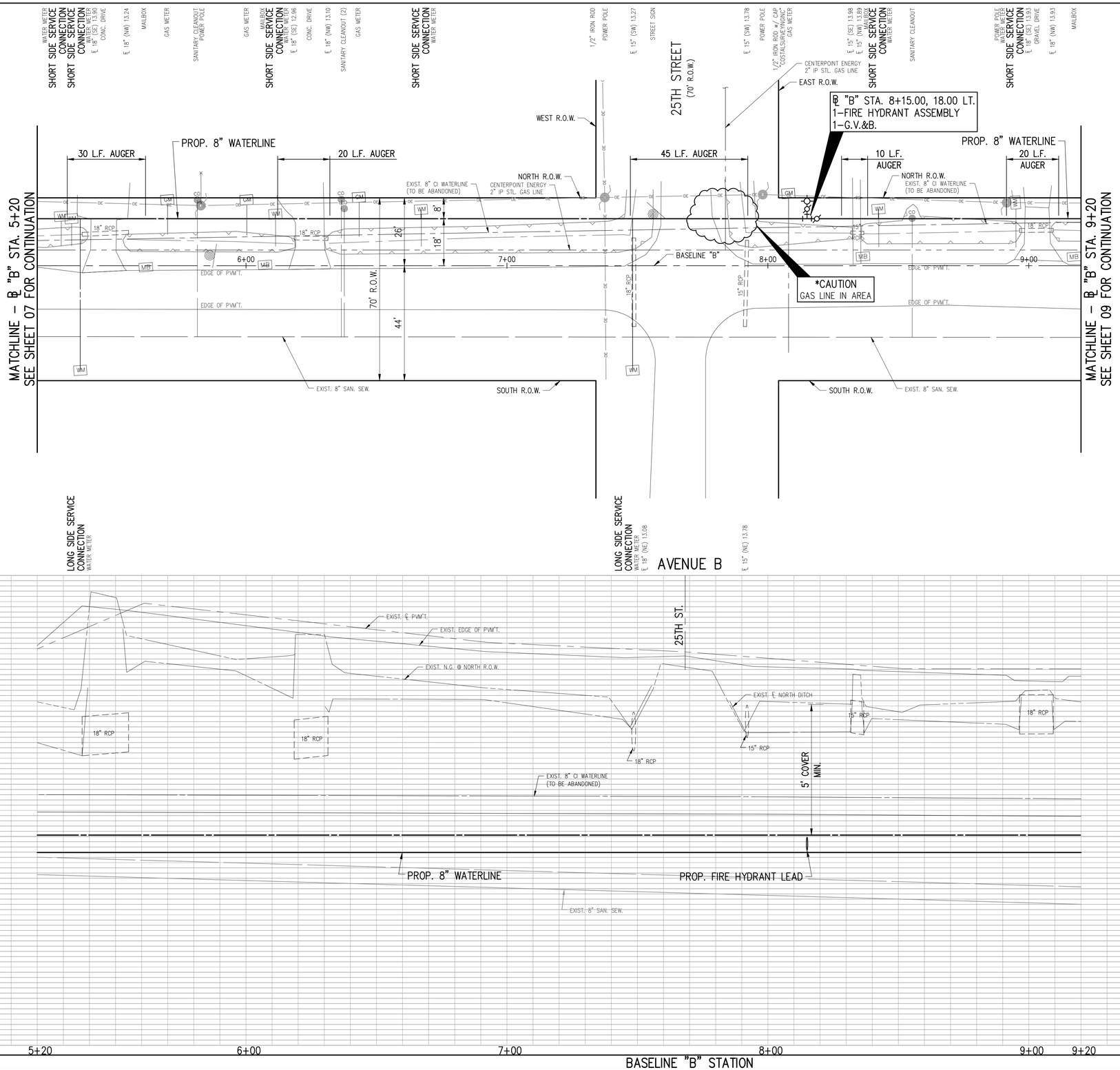
AVENUE B
PLAN & PROFILE
BEGINNING TO BL "B" STA. 5+20

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 07 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-07 PP03 B.dwg (XREF: 224-0020 Border 224-0020 Base 224-0020 Profile)

04/17/15



04/17/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

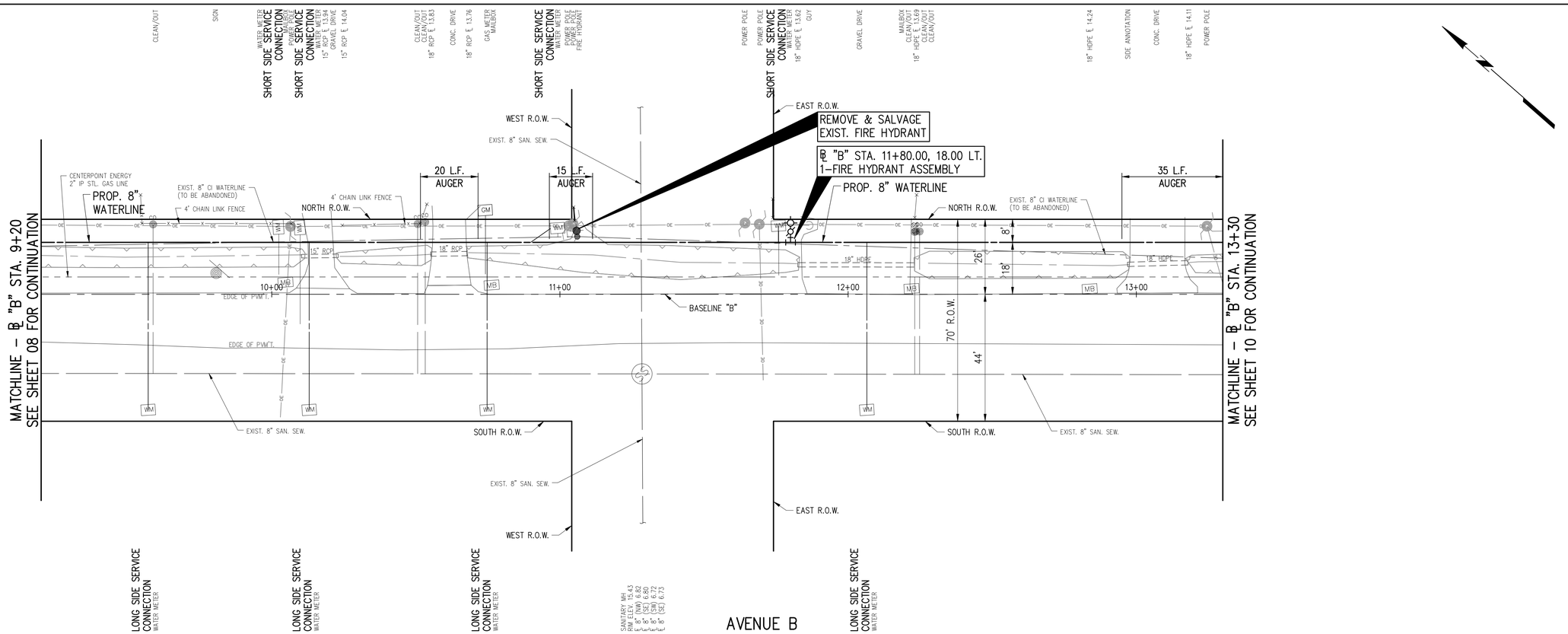
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE B
PLAN & PROFILE
BL "B" STA. 5+20 TO BL "B" STA. 9+20

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 08 Of 48

H:\ACAD\Clients\224\(0020)\Design\224-0020-08 PP04.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON–SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN–OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713–207–2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

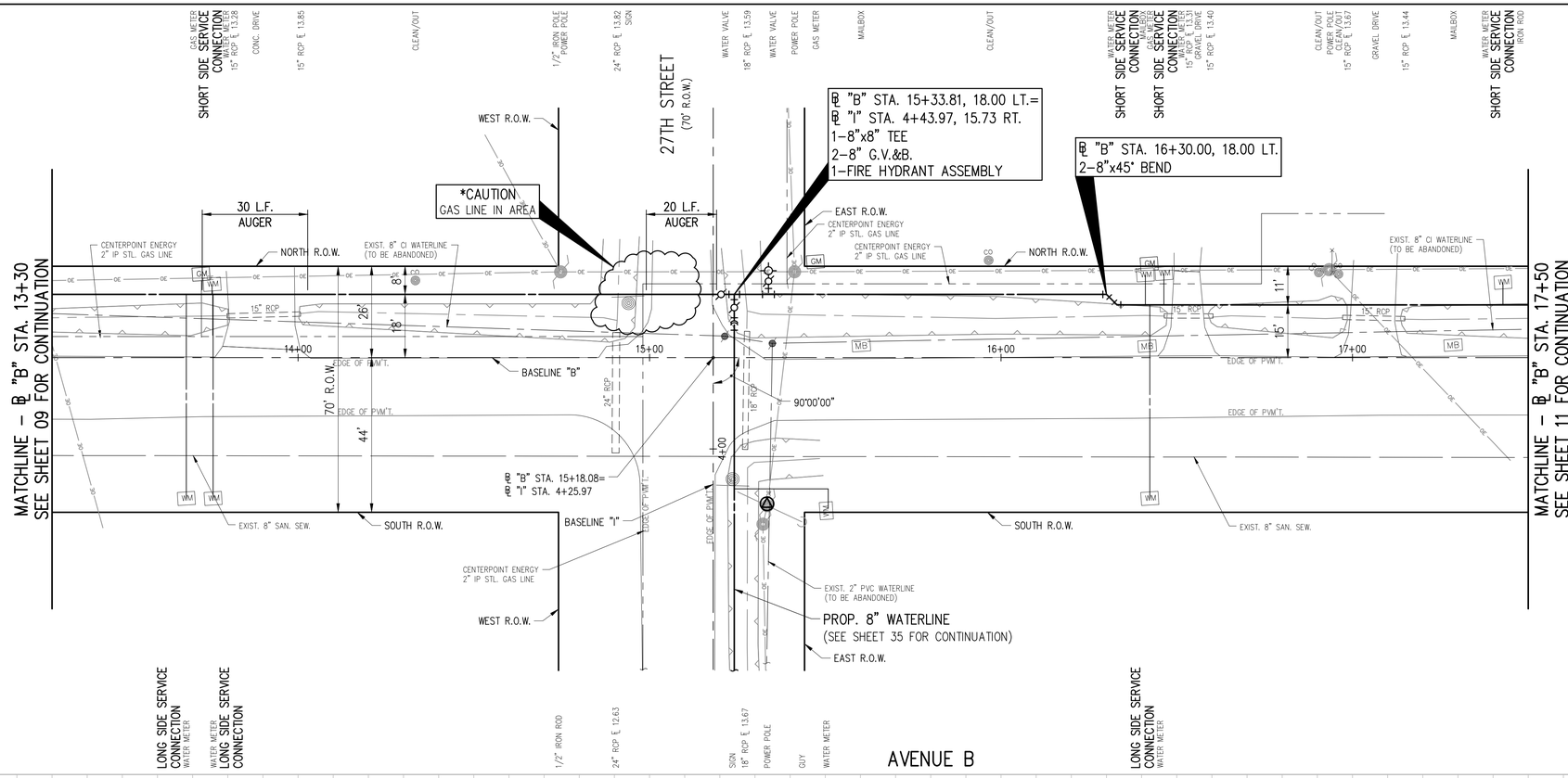
AVENUE B
PLAN & PROFILE
BL "B" STA. 9+20 TO BL "B" STA. 13+30

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224–0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 09 Of 48

04/21/15

H:\ACAD\Clients\224\(0020)Design\224-0020-09 PP05.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



04/21/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

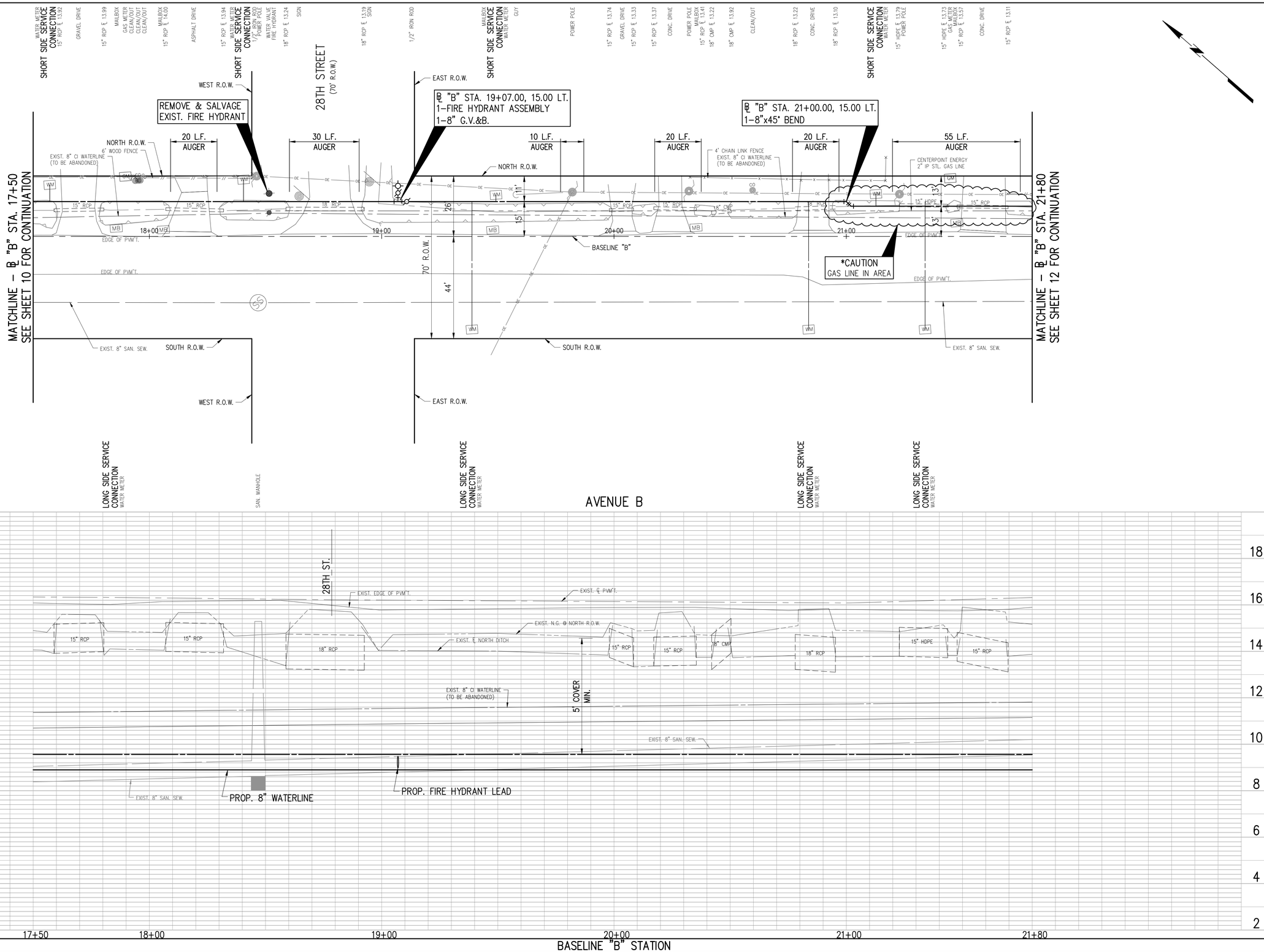
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE B
PLAN & PROFILE
BL "B" STA. 13+30 TO BL "B" STA. 17+50

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 10 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-10 PP06.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



04/17/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

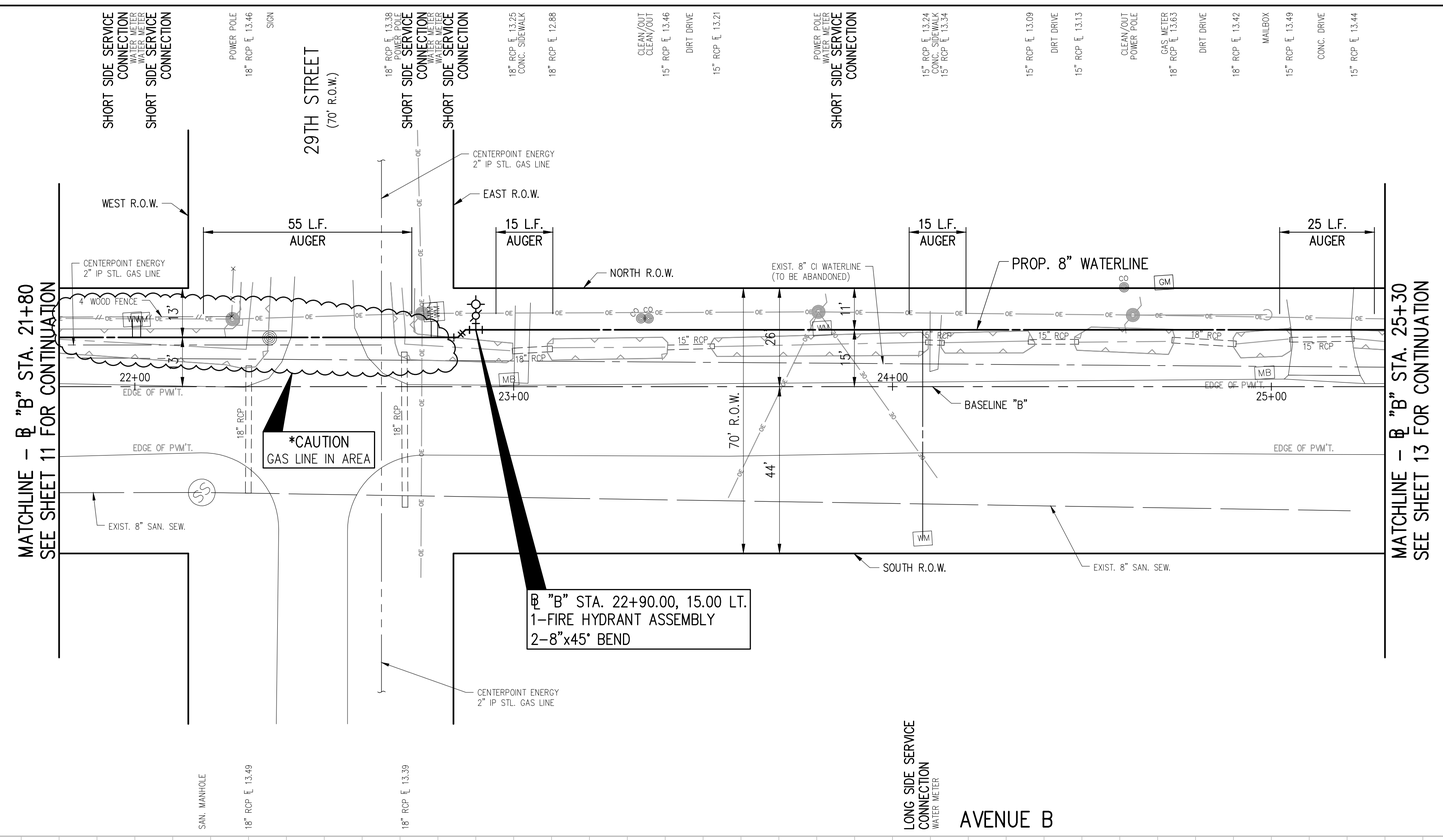
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE B
PLAN & PROFILE
BL "B" STA. 17+50 TO BL "B" STA. 21+80

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 11 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-11 PP07.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWAN
116610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

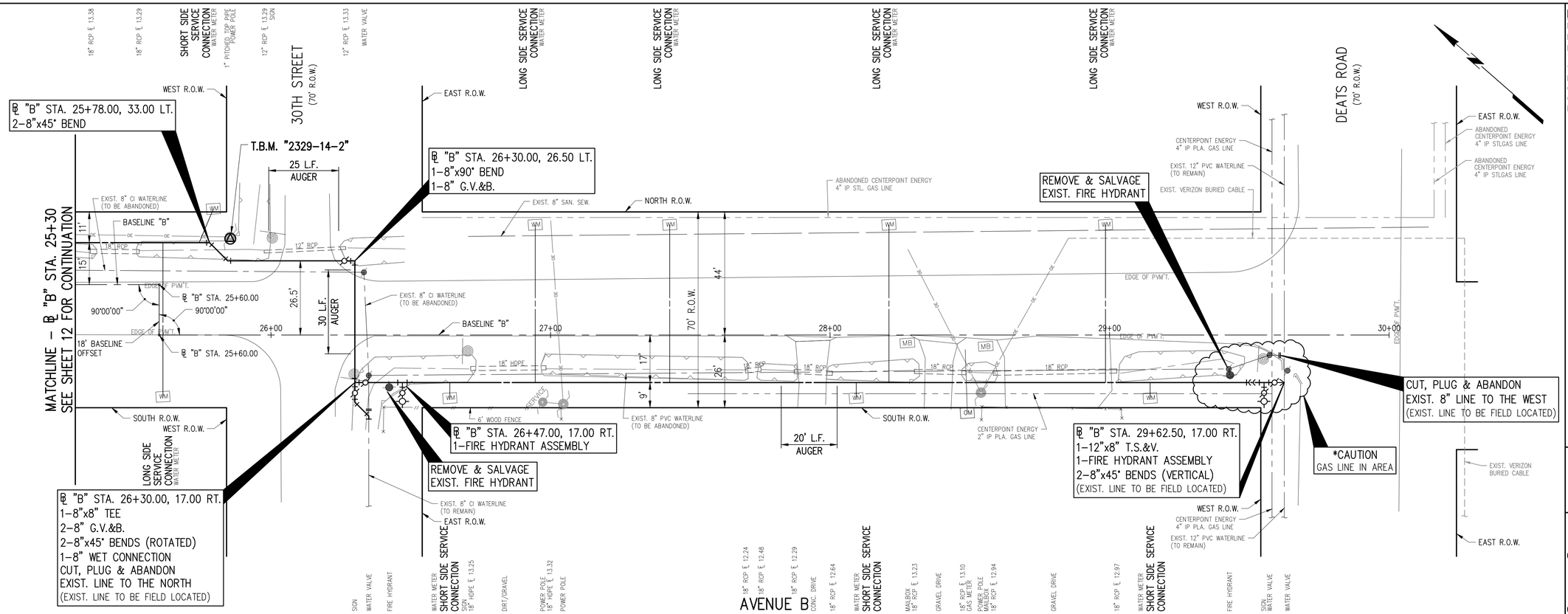
AVENUE B
PLAN & PROFILE
BL "B" STA. 21+80 TO BL "B" STA. 25+30

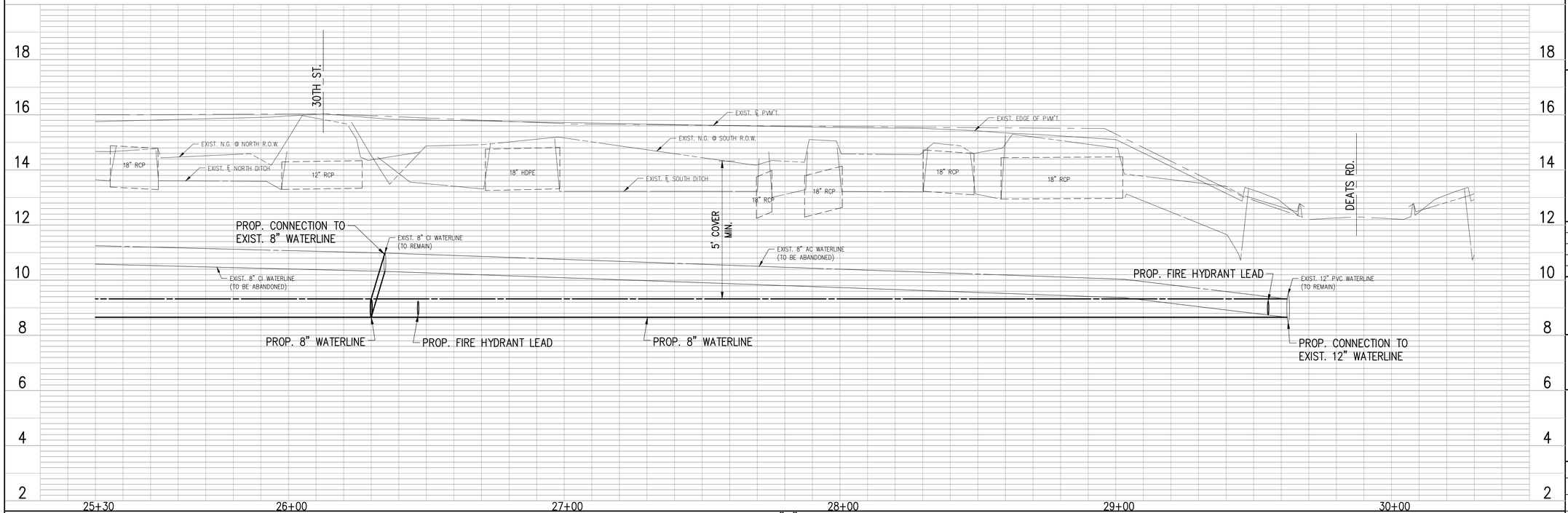
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 12 Of 48

04/17/15

H:\ACAD\Clients\224\0020\Design\224-0020-12 PP09.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

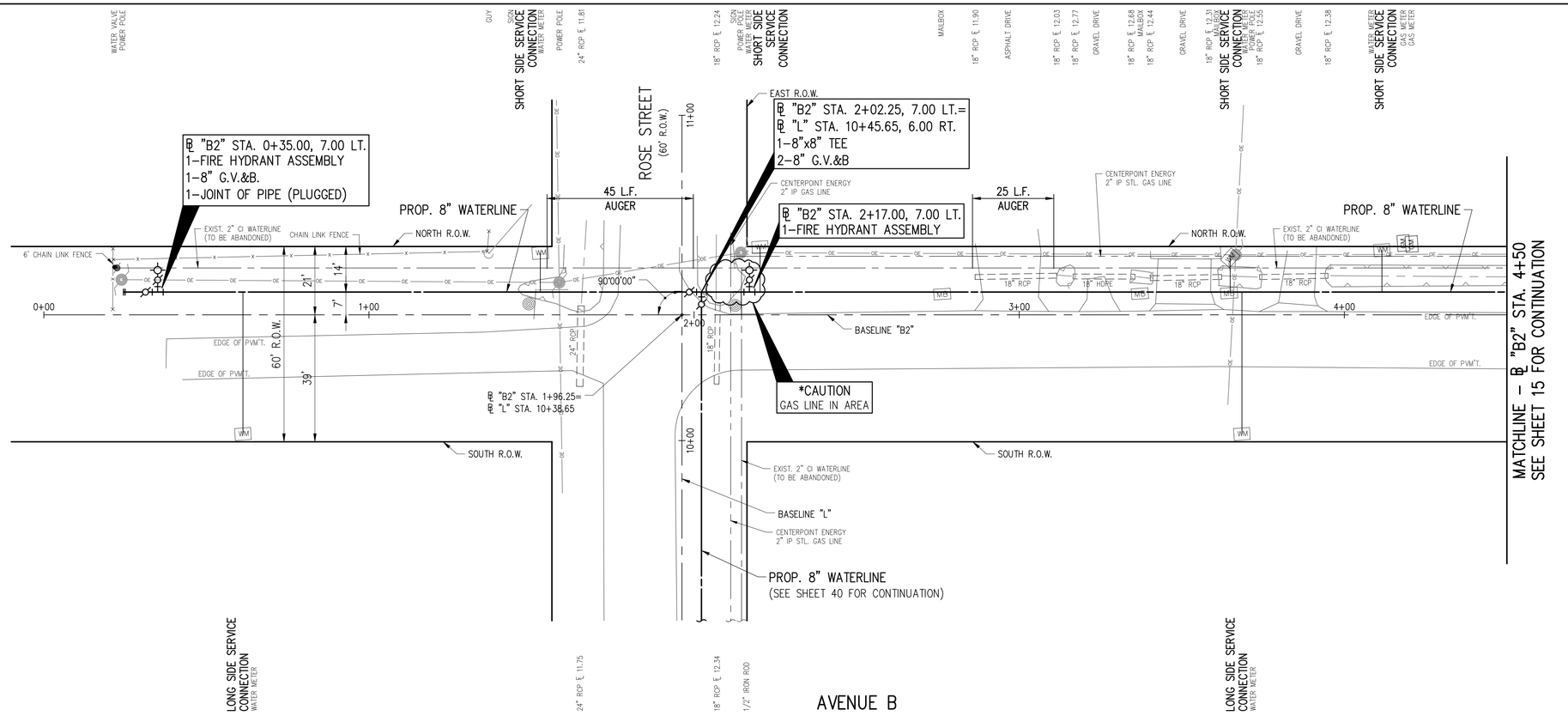
AVENUE B
PLAN & PROFILE
BL "B" STA. 25+30 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 13 Of 48

04/30/15

H:\LACAD\Clients\224\0020\Design\224-0020-13 PP10.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY

(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)

Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY

(This Signature verifies existing underground facilities - not to be used for conflict verification)

Signature Valid for six months

DATE 4/29/15

VERIZON

(Approved for Underground Facilities only)

Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNAM
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE B
PLAN & PROFILE
BEGINNING TO BL "B2" STA. 4+50

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 14 Of 48

04/21/15

H:\ACAD\Clients\224\0020\Design\224-0020-14 PP11 B2.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

MATCHLINE – ℄ "B2" STA. 4+50
SEE SHEET 14 FOR CONTINUATION

MAILBOX
18" RCP ℄ 12.57
GRAVEL DRIVE
18" RCP ℄ 12.33
MAILBOX
CLEAN/OUT
WATER METER
POWER POLE
1/2" IRON ROD
SHORT SIDE SERVICE CONNECTION
WATER METER
GUY
CLEAN/OUT
18" HDPE ℄ 12.61
GRAVEL DRIVE
18" HDPE ℄ 12.65
MAILBOX
MAILBOX
18" HDPE ℄ 12.34
GRAVEL DRIVE
18" HDPE ℄ 12.47
SHORT SIDE SERVICE CONNECTION
WATER METER
CLEAN/OUT
1/2" IRON ROD
SHORT SIDE SERVICE CONNECTION
WATER METER
CLEAN/OUT
18" RCP ℄ 12.61
GRAVEL DRIVE
18" RCP ℄ 12.61
MAILBOX
GAS METER
POWER POLE
WATER METER
SHORT SIDE SERVICE CONNECTION
WATER METER
SHORT SIDE SERVICE CONNECTION
WATER METER
18" RCP ℄ 12.25
GRAVEL DRIVE
CLEAN/OUT
GRAVEL DRIVE
18" RCP ℄ 12.40
12" TALLOW
POWER POLE
TELEPHONE MARKER
18" RCP ℄ 12.37

SALVATO STREET
(60' R.O.W.)

EXIST. 12" AC WATERLINE
(TO REMAIN)
EAST R.O.W.
EXIST. VERIZON BURIED CABLE
WEST R.O.W.
T.B.M. "2329-17-2"

℄ "B2" STA. 5+05.00, 7.00 LT.
1-FIRE HYDRANT ASSEMBLY

℄ "B2" STA. 6+97.00, 7.00 LT.
1-FIRE HYDRANT ASSEMBLY
2-8"x45° BENDS

℄ "B2" STA. 8+12.00, 4.00 LT.
1-FIRE HYDRANT ASSEMBLY

CUT, PLUG & ABANDON
EXIST. 2" LINE TO THE WEST
(EXIST. LINE TO BE FIELD LOCATED)

℄ "B2" STA. 8+72.91, 4.00 LT.
1-12"x8" T.S.&V.
2-8"x45° BENDS
(EXIST. LINE TO BE FIELD LOCATED)

PROP. 8" WATERLINE
4' WOOD FENCE
EXIST. 2" CI WATERLINE
(TO BE ABANDONED)
CENTERPOINT ENERGY
2" IP STL. GAS LINE
NORTH R.O.W.
30 L.F.
AUGER
4' CHAIN LINK FENCE
35 L.F.
AUGER
18" RCP
18" HDPE
5+00
6+00
7+00
8+00
9+00
EDGE OF PVM'T.
BASELINE "B2"
60' R.O.W.
39'
21'
14'
7'
17'
4'
SOUTH R.O.W.
*CAUTION
GAS LINE IN AREA
WEST R.O.W.
PROP. 8" WATERLINE
EXIST. 12" AC WATERLINE
(TO REMAIN)
CENTERPOINT ENERGY
2" IP STL. GAS LINE

LONG SIDE SERVICE CONNECTION
WATER METER
5/8" IRON ROD
LONG SIDE SERVICE CONNECTION
WATER METER
LONG SIDE SERVICE CONNECTION
WATER METER
LONG SIDE SERVICE CONNECTION
WATER METER
18" RCP ℄ 12.02

AVENUE B

EXIST. N.G. @ NORTH R.O.W.
EXIST. ℄ PVM'T.
EXIST. EDGE OF PVM'T.
SALVATO ST.
EXIST. ℄ NORTH DITCH
18" RCP
18" HDPE
5' COVER MIN.
EXIST. 2" CI WATERLINE
(TO BE ABANDONED)
PROP. CONNECTION TO
EXIST. 12" WATERLINE
EXIST. 12" AC WATERLINE
(TO REMAIN)
PROP. FIRE HYDRANT LEAD
PROP. 8" WATERLINE
PROP. FIRE HYDRANT LEAD

18
16
14
12
10
8
6
4
2
4+50
5+00
6+00
7+00
8+00
9+00
BASELINE "B2" STATION

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.
ELEV. 18.12

NOTES:
1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

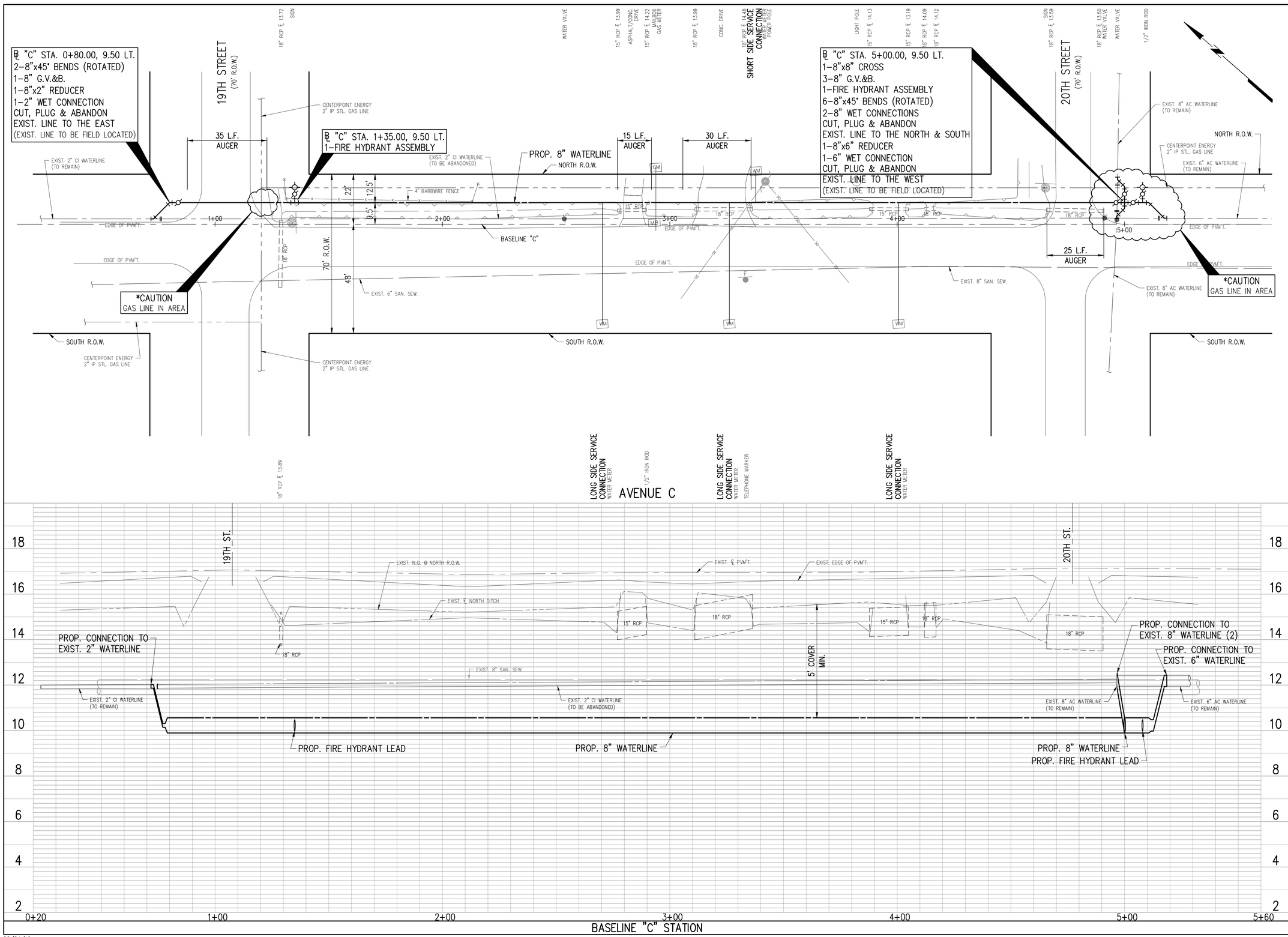
AVENUE B
PLAN & PROFILE
BL "B2" STA. 4+50 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 15 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-15 PP12.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/17/15



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE C
PLAN & PROFILE
BEGINNING TO BL "C" STA. 5+60

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 16 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-16 PP13 C.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

02/04/16

℄ "C" STA. 15+55.00, 14.37 LT.
2–6"x45° BENDS (ROTATED)
1–6" WET CONNECTION
CUT, PLUG & ABANDON
EXIST. LINE TO THE EAST
(EXIST. LINE TO BE FIELD LOCATED)

23RD STREET
(70' R.O.W.)

WEST R.O.W.

EDGE OF PVM'T.

30 L.F.
AUGER

EXIST. 8" PVC WATERLINE
(TO REMAIN)

CENTERPOINT ENERGY
2" IP STL. GAS LINE

EAST R.O.W.

*CAUTION
GAS LINE IN AREA

CENTERPOINT ENERGY
2" IP STL. GAS LINE

NORTH R.O.W.

*CAUTION
GAS LINE IN AREA

EXIST. 6" AC WATERLINE
(TO REMAIN)

16+00

17+00

BASELINE "C"

EXIST. 6" AC WATERLINE
(TO REMAIN)

18+00

19+00

22'

PROP. 6" WATERLINE

90°00'00"

℄ "C" STA. 15+93.27=
℄ "G" STA. 6+56.63

70' R.O.W.

48'

EDGE OF PVM'T.

BASELINE "G"

PROP. 8" WATERLINE

EXIST. 8" SAN. SEW.

CENTERPOINT ENERGY
2" IP STL. GAS LINE

T.B.M. "2329–15–2"

CENTERPOINT ENERGY
1–1/4" IP STL. GAS LINE

6+00

PROP. 8" WATERLINE
(SEE SHEET 33 FOR
CONTINUATION)

EXIST. 1" PVC WATERLINE
(TO BE ABANDONED)

SOUTH R.O.W.

℄ "C" STA. 16+10.00, 14.37 LT.=
℄ "G" STA. 6+71.00, 16.73 RT.
1–8"x6" CROSS
1–8" G.V.&B.
2–6" G.V.&B.
1–FIRE HYDRANT ASSEMBLY
2–6"x45° BENDS (ROTATED)
1–6" WET CONNECTION
CUT, PLUG & ABANDON
EXIST. LINE TO THE WEST
2–8"x45° BENDS (ROTATED)
1–8" WET CONNECTION
CUT, PLUG & ABANDON
EXIST. LINE TO THE SOUTH
(EXIST. LINES TO BE FIELD LOCATED)

SAN. MANHOLE

SIGN

POWER POLE

WATER METER

AVENUE C

℄ "C" STA. 19+80.00, 14.00 LT.
1–8"x8" CROSS
3–8" G.V.&B.
1–FIRE HYDRANT ASSEMBLY
1–8"x6" REDUCER
2–6"x45° BENDS (ROTATED)
1–6" WET CONNECTION
CUT, PLUG & ABANDON
EXIST. LINE TO THE EAST
4–8"x45° BENDS (ROTATED)
2–8" WET CONNECTION
CUT, PLUG & ABANDON
EXIST. LINES TO THE NORTH & SOUTH
(EXIST. LINES TO BE FIELD LOCATED)

18" RCP ℄ 12.68

WATER VLAVE
WATER VALVE
WATER METER

POWER POLE
1/2" IRON POLE

18" RCP ℄ 13.36

GRAVEL DRIVE

15" RCP ℄ 13.37
SHORT SIDE
SERVICE
CONNECTION
WATER METER
POWER METER
MAILBOX

EAST R.O.W.

EXIST. 8" CI WATERLINE
(TO REMAIN)

CENTERPOINT ENERGY
2" IP PLA. GAS LINE

PROP. 8" WATERLINE

8"

HMA

18" HDPE

14'

MB

20+00

EDGE OF PVM'T.

EXIST. 2" PVC WATERLINE
(TO BE ABANDONED)

*CAUTION
GAS LINE IN AREA

8"

6"

30°

EDGE OF PVM'T.

EXIST. 8" SAN. SEW.

EXIST. 8" CI WATERLINE
(TO REMAIN)

24TH STREET
(70' R.O.W.)

18" RCP ℄ 12.63

MATCHLINE – ℄ "C" STA. 20+50
SEE SHEET 18 FOR CONTINUATION

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713–207–2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

AVENUE C
PLAN & PROFILE
BL "C" STA. 15+20 TO BL"C" STA. 20+50

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224–0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 17 Of 48

02/04/16

H:\ACAD\Clients\224\0020\Design\224-0020-17 PP14.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

PROP. CONNECTION TO
EXIST. 6" WATERLINE

PROP. CONNECTION TO
EXIST. 8" WATERLINE

EXIST. 8" PVC WATERLINE
(TO REMAIN)

5' COVER
MIN.

PROP. CONNECTION TO
EXIST. 6" WATERLINE

EXIST. 6" AC
WATERLINE
(TO REMAIN)

EXIST. 6" AC WATERLINE
(TO BE ABANDONED)

PROP. FIRE HYDRANT LEAD

PROP. 8" WATERLINE

EXIST. 8" SAN. SEW.

23RD ST.

EXIST. ℄ PVM'T.

EXIST. 6" AC WATERLINE
(TO REMAIN)

EXIST. 8" SAN. SEW.

EXIST. EDGE OF PVM'T.

EXIST. ℄ NORTH DITCH

18" HDPE

18" RCP

EXIST. 8" PVC WATERLINE
(TO REMAIN)

PROP. CONNECTION TO
EXIST. 2" WATERLINE

EXIST. 6" AC WATERLINE
(TO BE ABANDONED)

PROP. CONNECTION TO
EXIST. 8" WATERLINE (2)

PROP. 8" WATERLINE

EXIST. 2" PVC WATERLINE
(TO BE ABANDONED)

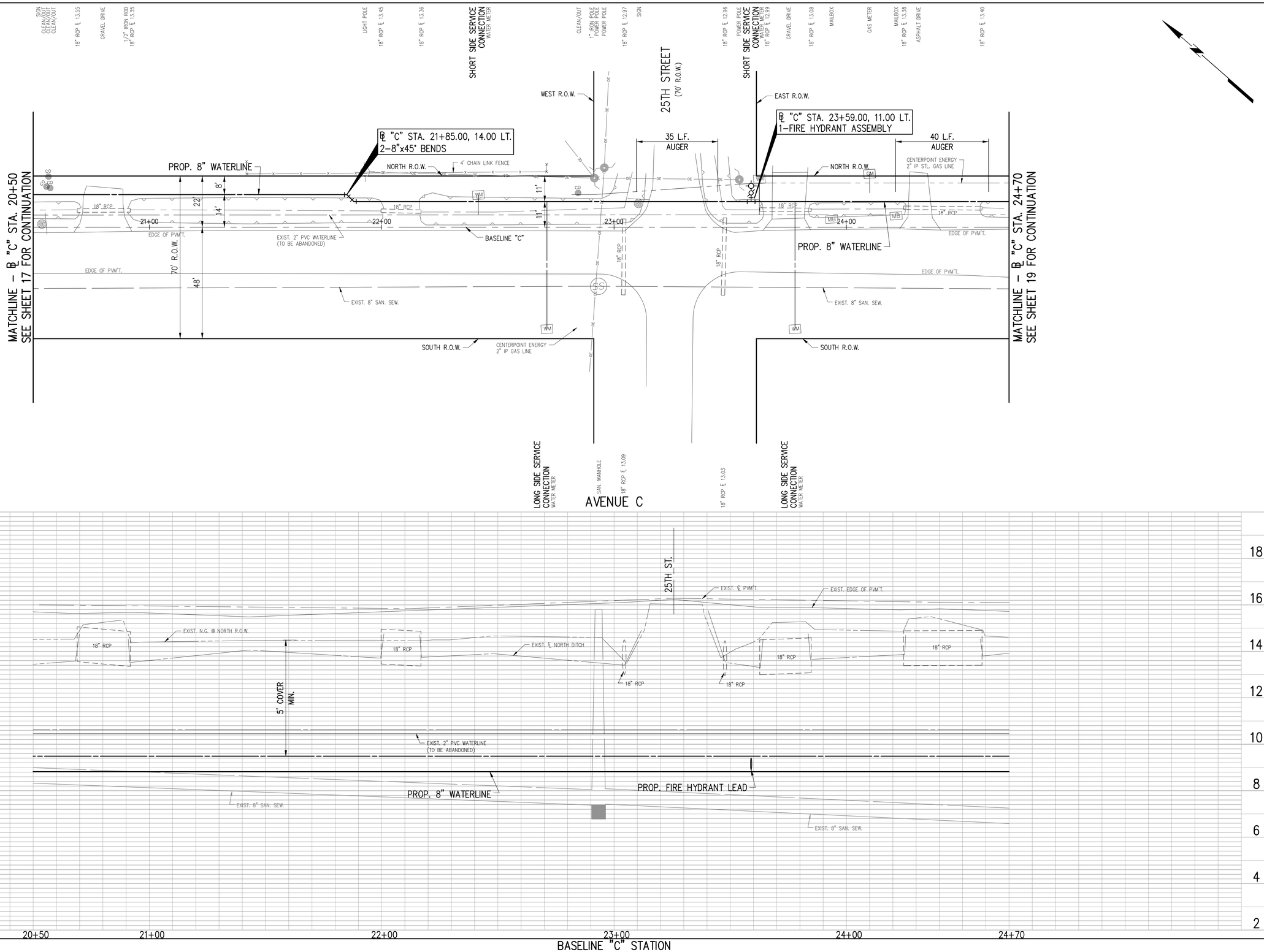
PROP. FIRE HYDRANT LEAD

PROP. 8" WATERLINE

18 16 14 12 10 8 6 4 2

15+20 16+00 17+00 18+00 19+00 20+00 20+50

BASELINE "C" STATION



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWAN
116610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

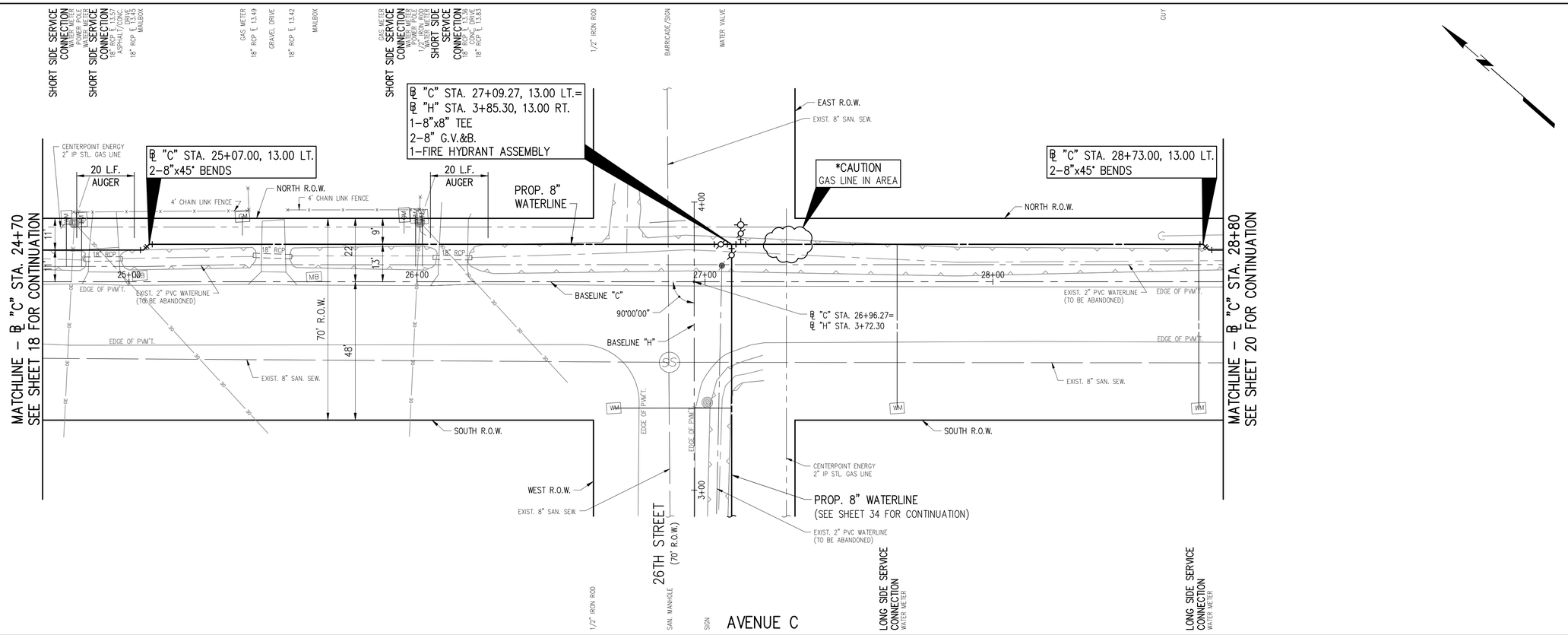
AVENUE C
PLAN & PROFILE
BL "C" STA. 20+50 TO BL"C" STA. 24+70

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 18 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-18 PP15.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

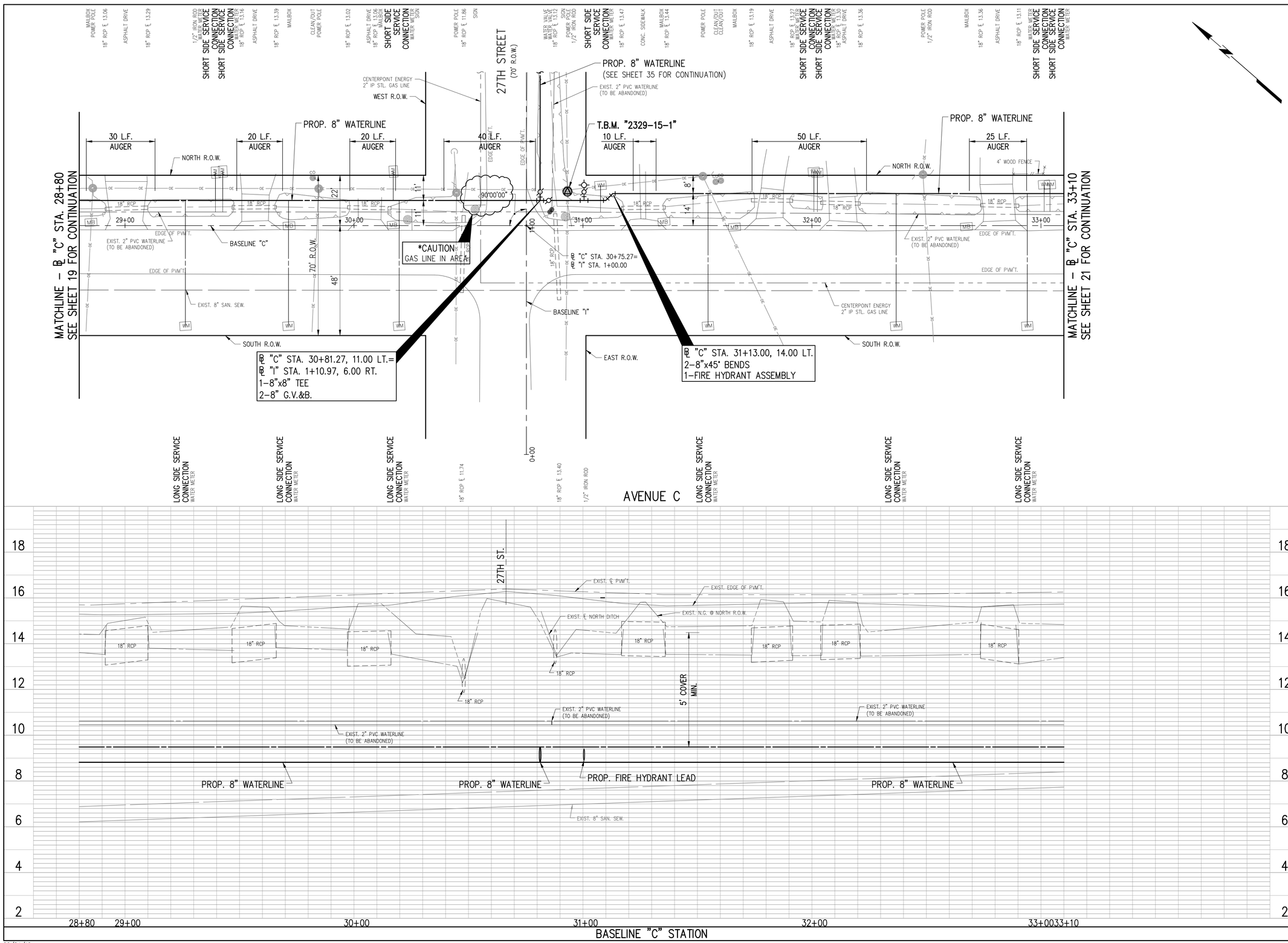
AVENUE C
PLAN & PROFILE
BL "C" STA. 24+70 TO BL"C" STA. 28+80

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 19 Of 48

H:\CAD\Clients\224\0020\Design\224-0020-19 PP16.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON–SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN–OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713–207–2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

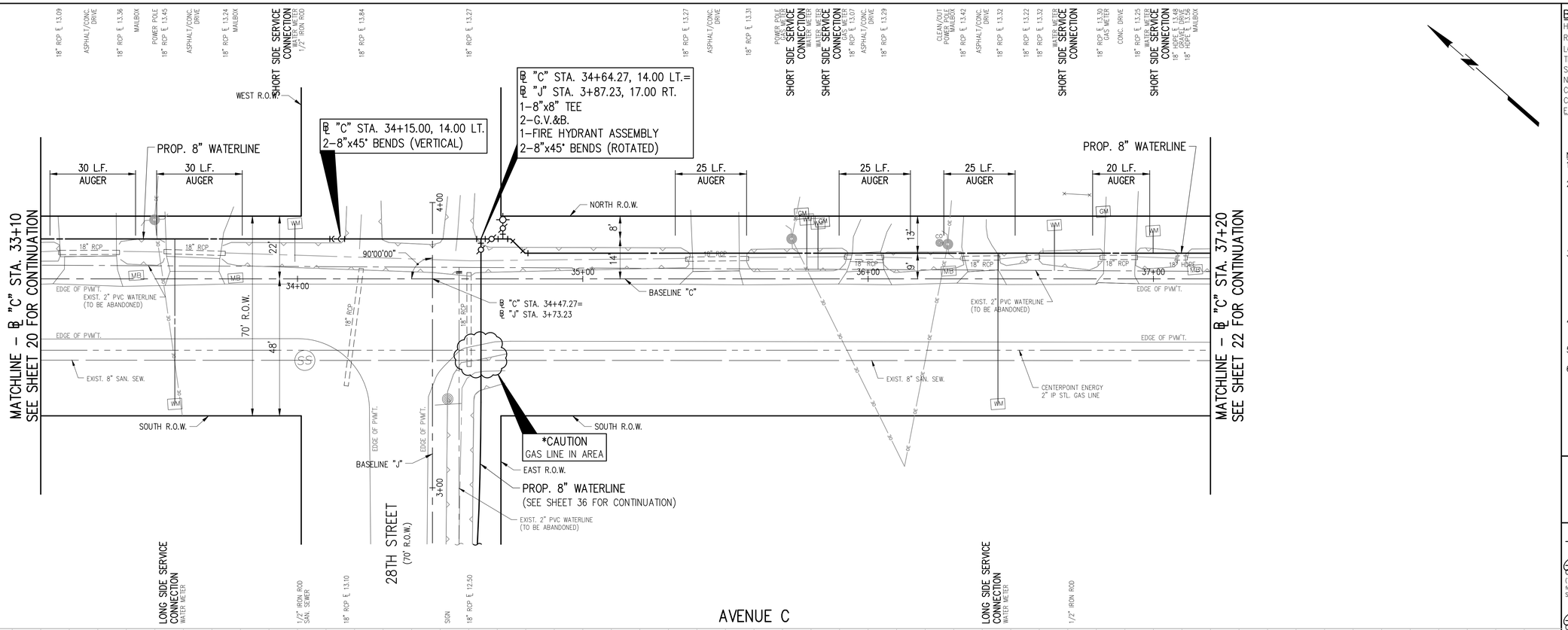
AVENUE C
PLAN & PROFILE
BL "C" STA. 28+80 TO BL"C" STA. 33+10

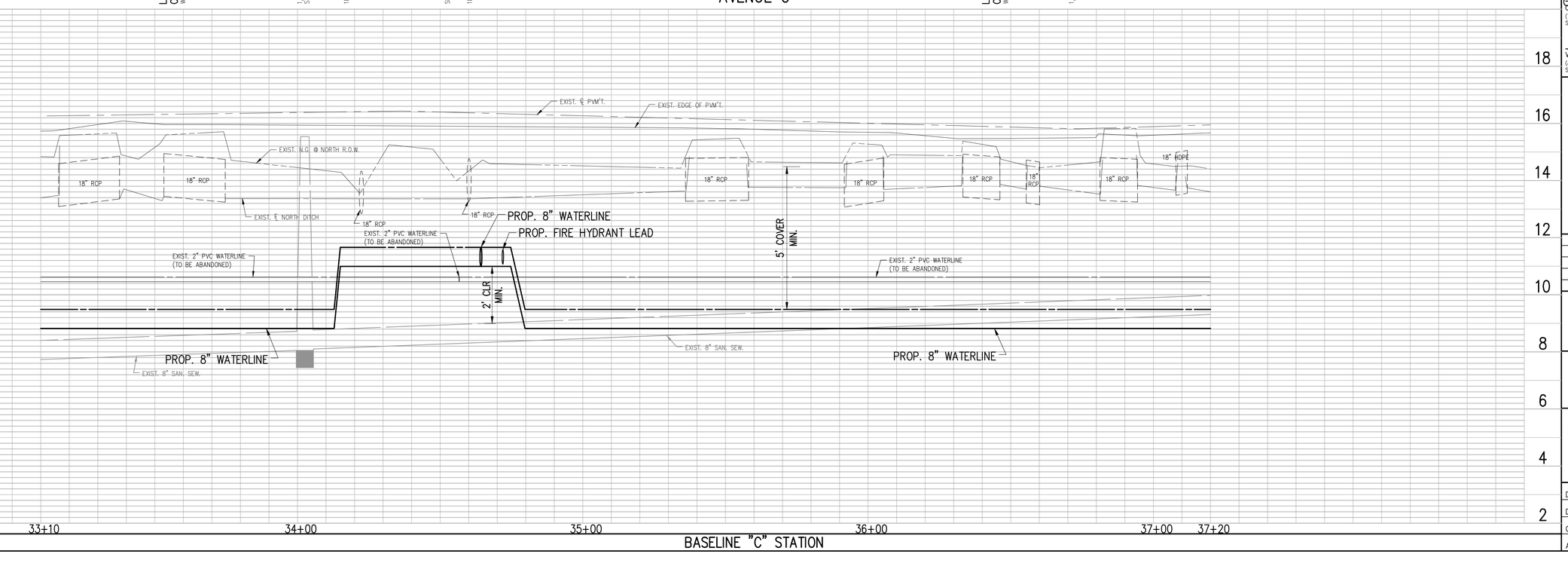
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224–0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 20 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-20 PP17.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)

02/04/16





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

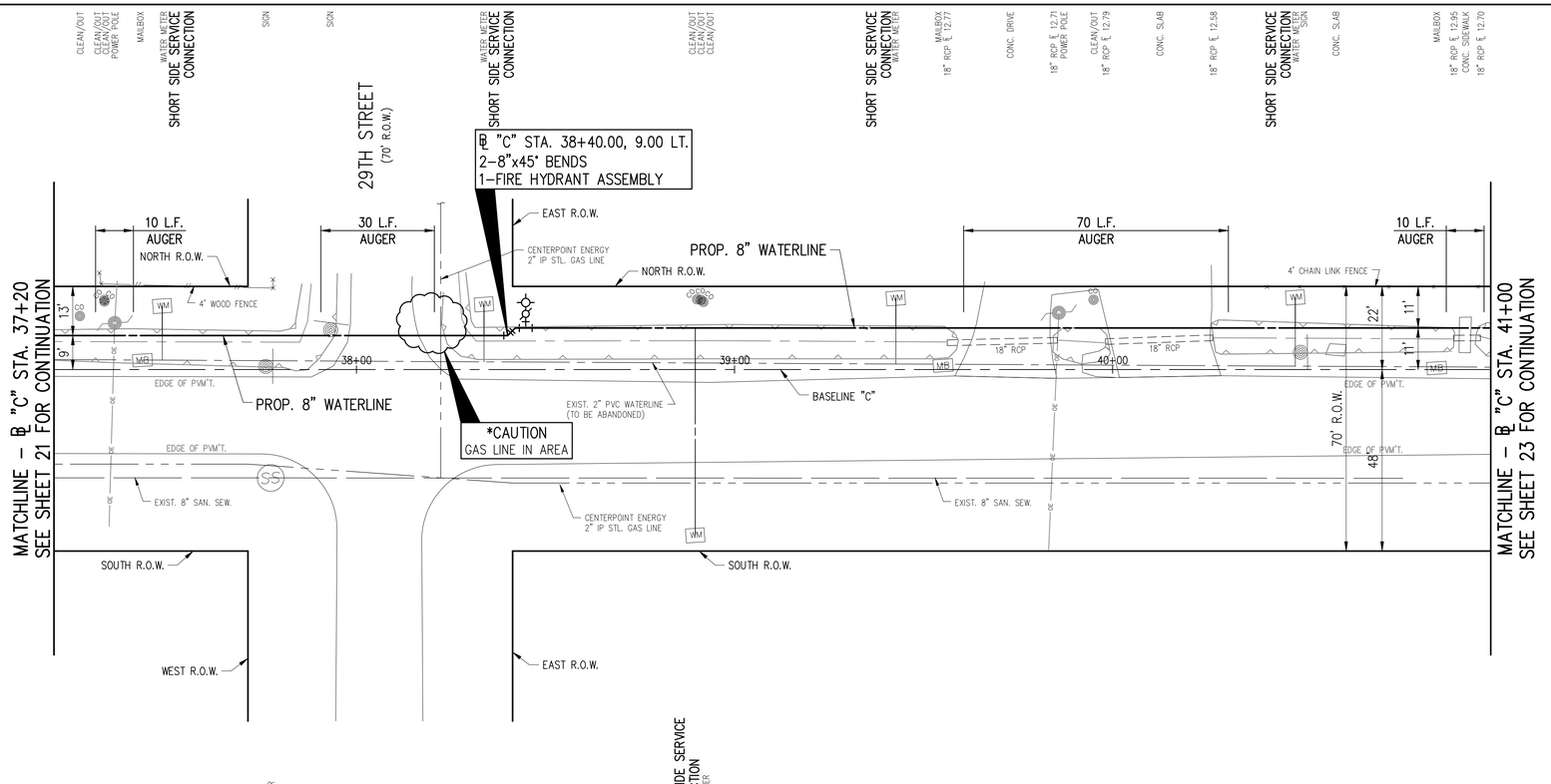
AVENUE C
PLAN & PROFILE
BL "C" STA. 33+10 TO BL"C" STA. 37+20

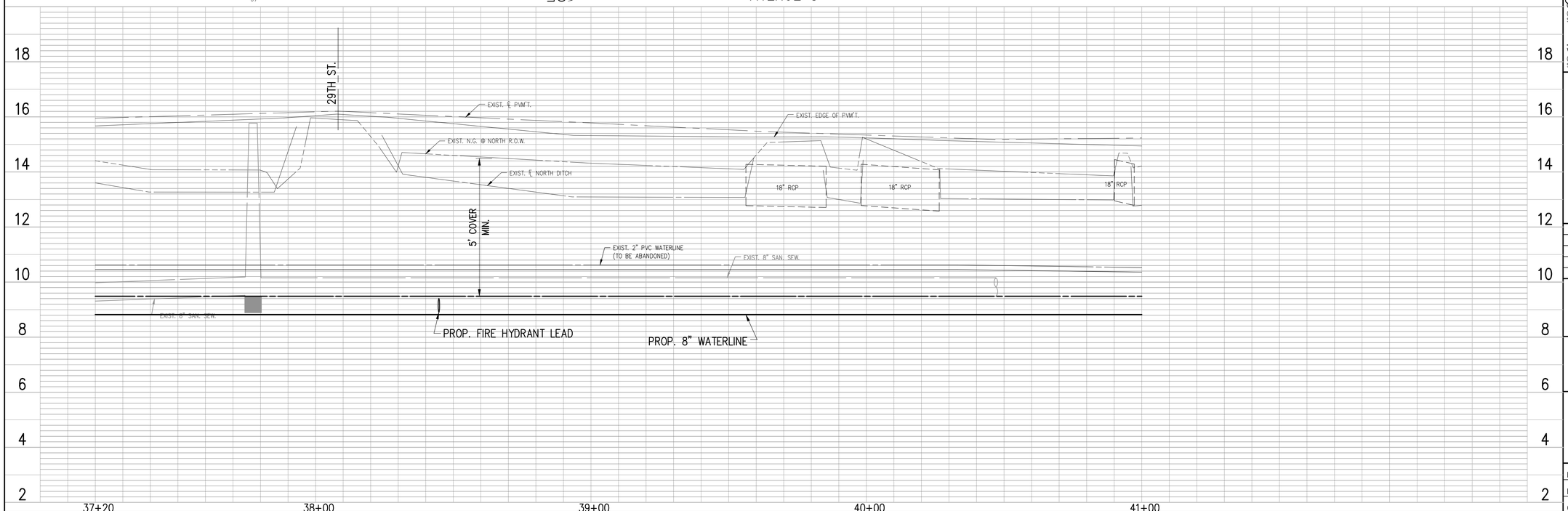
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 21 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-21 PP18.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

02/04/16





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

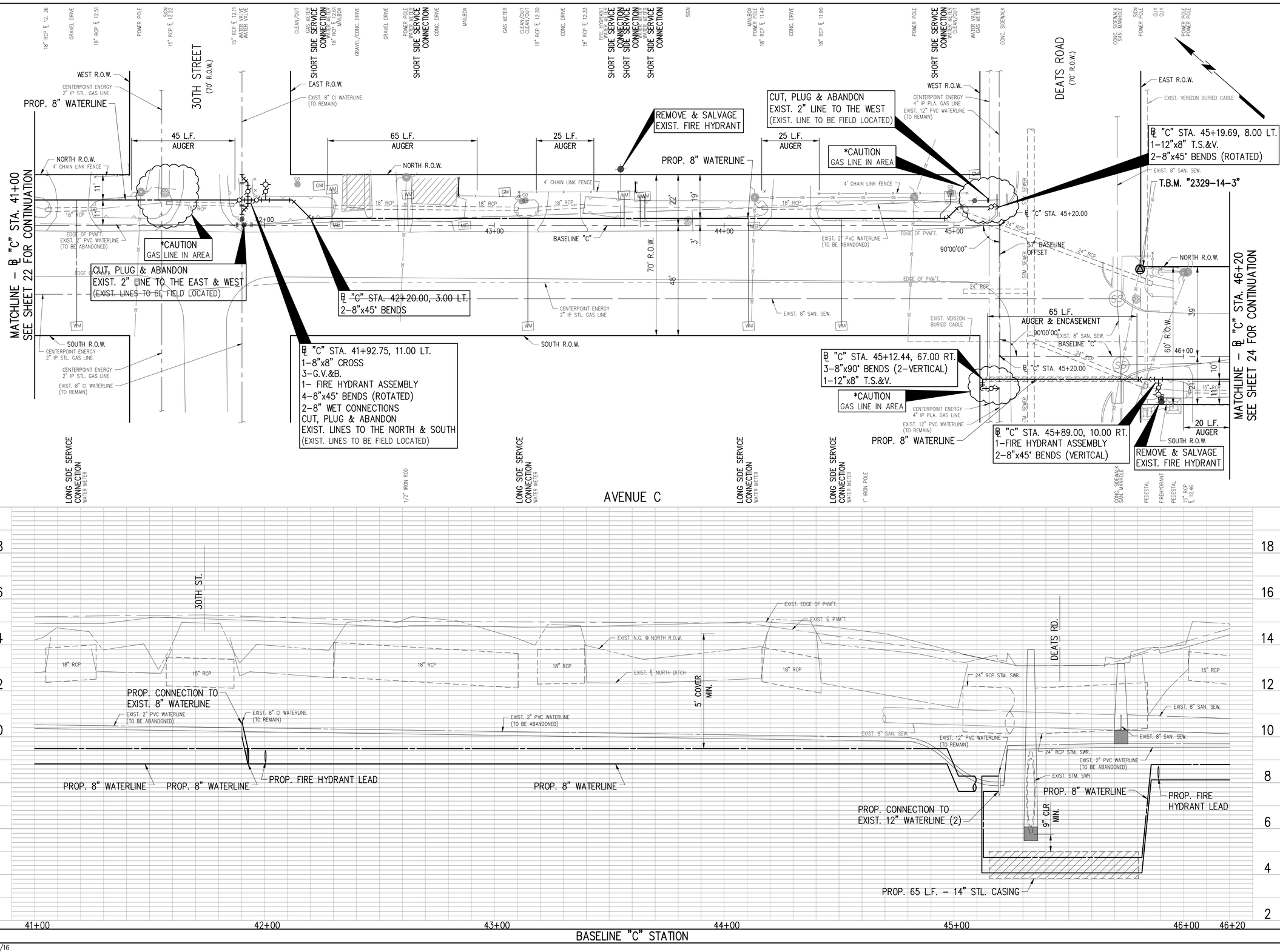
AVENUE C
PLAN & PROFILE
BL "C" STA. 37+20 TO BL"C" STA. 41+00

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 22 Of 48

02/04/16

H:\ACAD\Clients\224\0020\Design\224-0020-22 PP19.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNAR
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION WATERLINE REHABILITATION

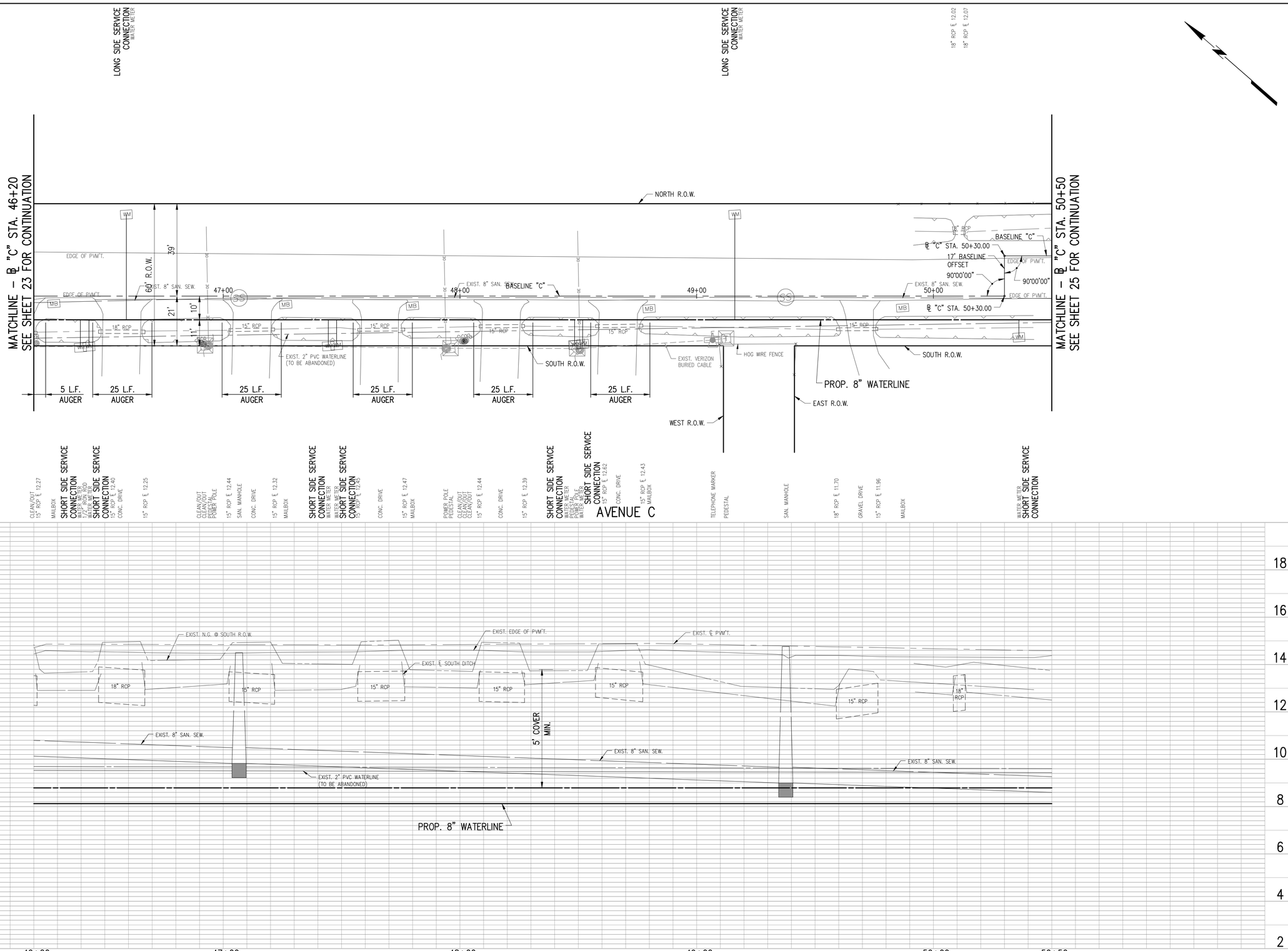
AVENUE C
PLAN & PROFILE
BL "C" STA. 41+00 TO BL"C" STA. 46+20

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 23 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-23 PP20.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAWKAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

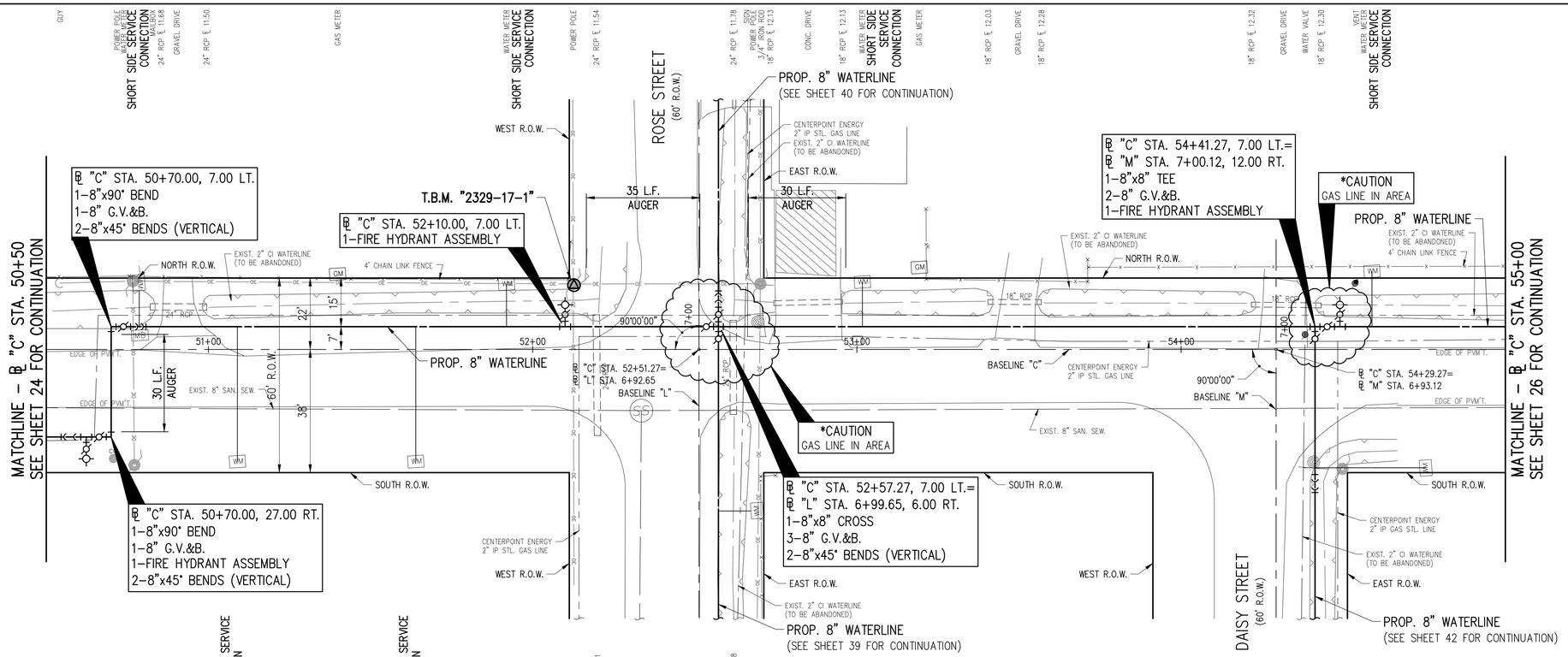
AVENUE C
PLAN & PROFILE
BL "C" STA. 46+20 TO BL"C" STA. 50+50

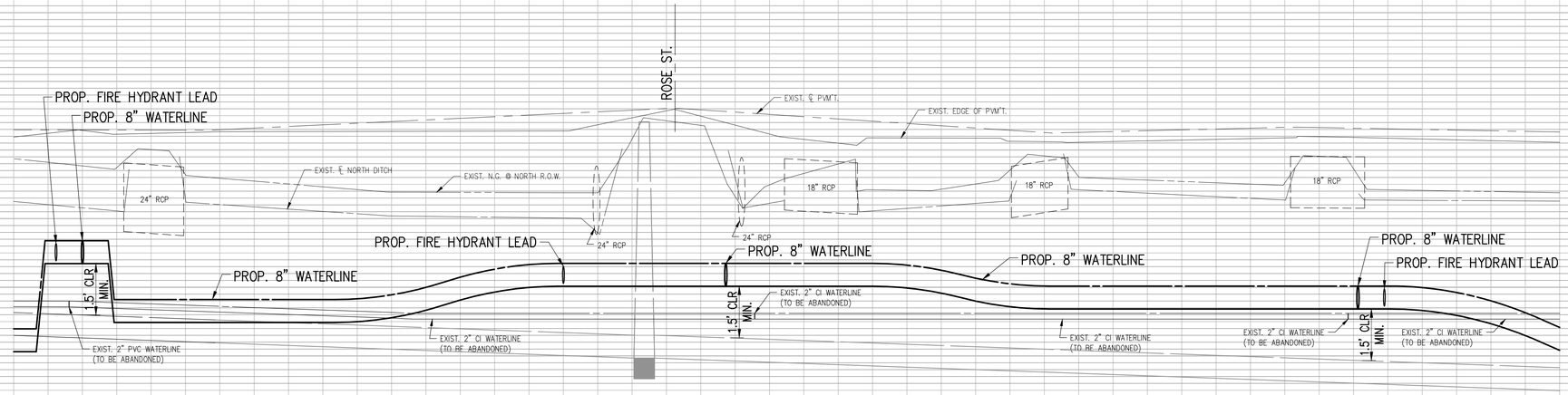
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 24 Of 48

H:\CAD\Clients\224\(0020)\Design\224-0020-24 PP21.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)

02/04/16





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

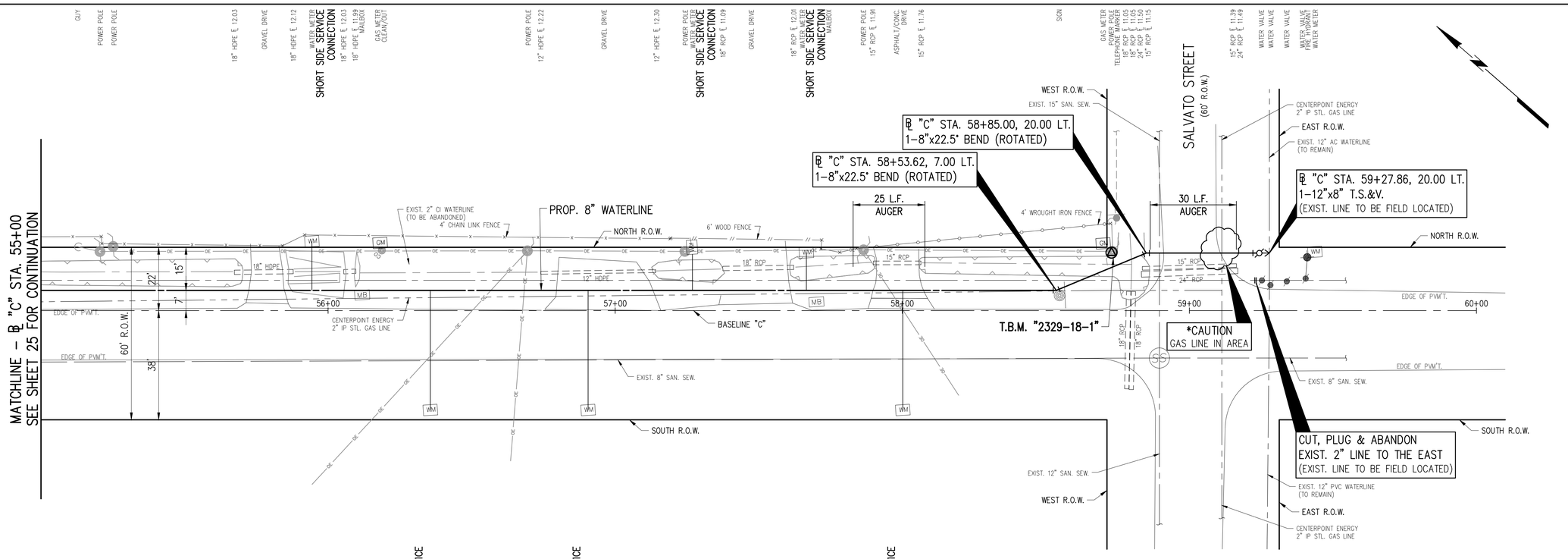
AVENUE C
PLAN & PROFILE
BL "C" STA. 50+50 TO BL"C" STA. 55+00

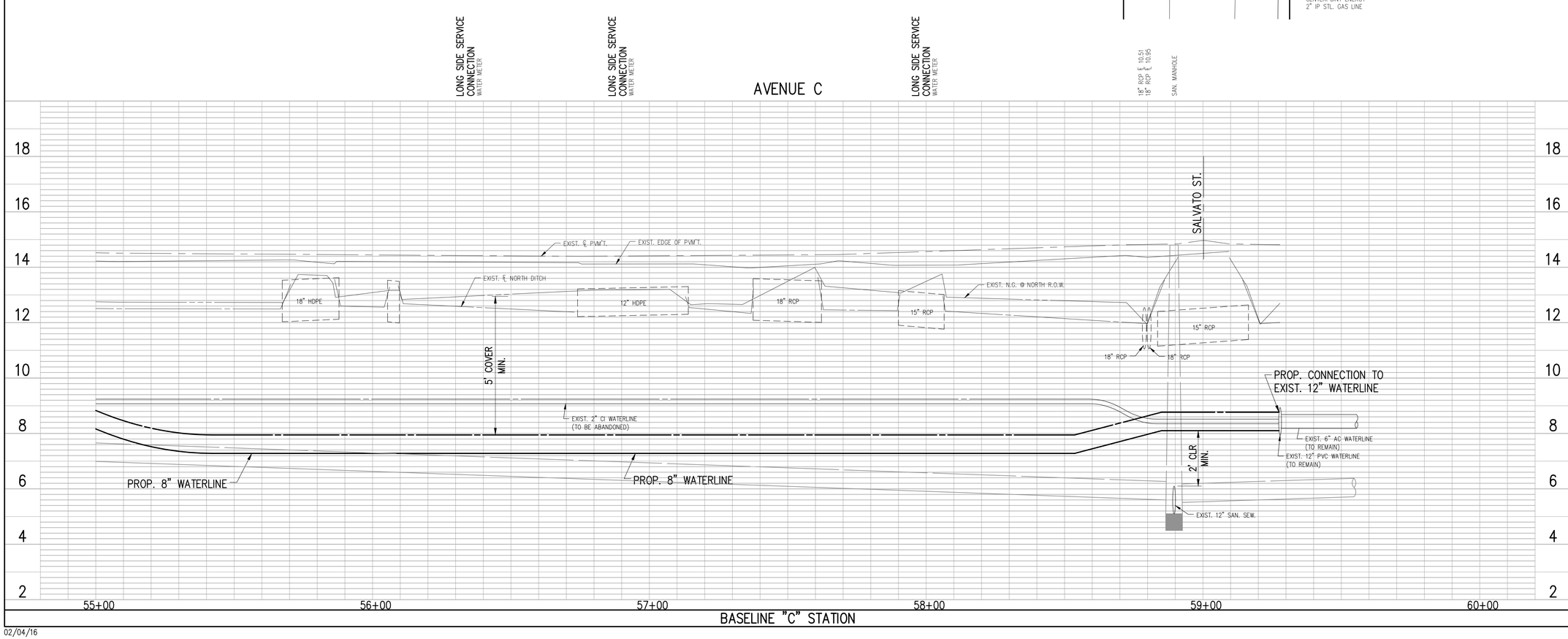
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 25 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-25 PP22.dwg (XREF: 224-0020 Border- 224-0020 Base- 224-0020 Profile)

02/04/16





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON–SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN–OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713–207–2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

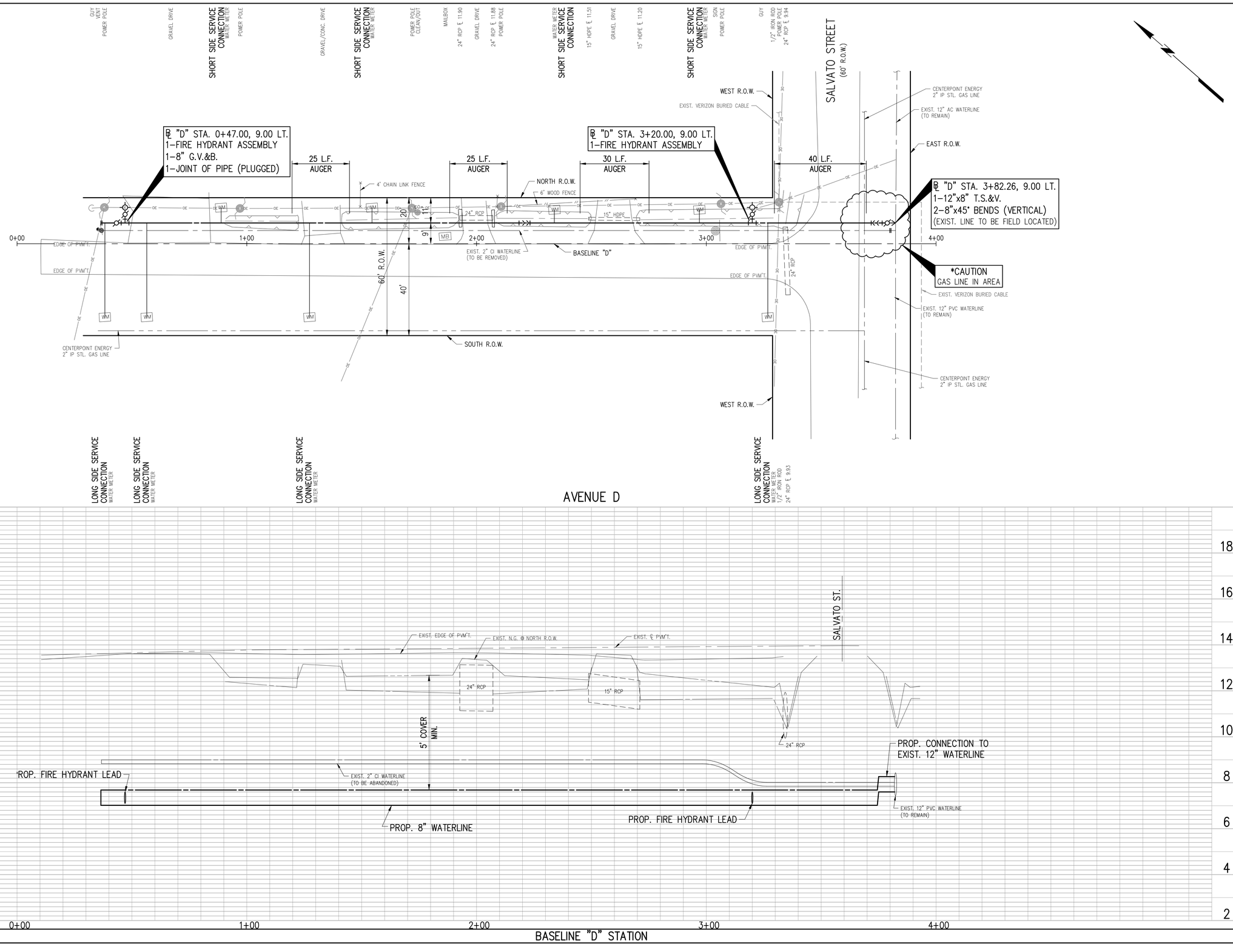
AVENUE C
PLAN & PROFILE
BL "C" STA. 55+00 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224–0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 26 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-26 PP23.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)

02/04/16



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

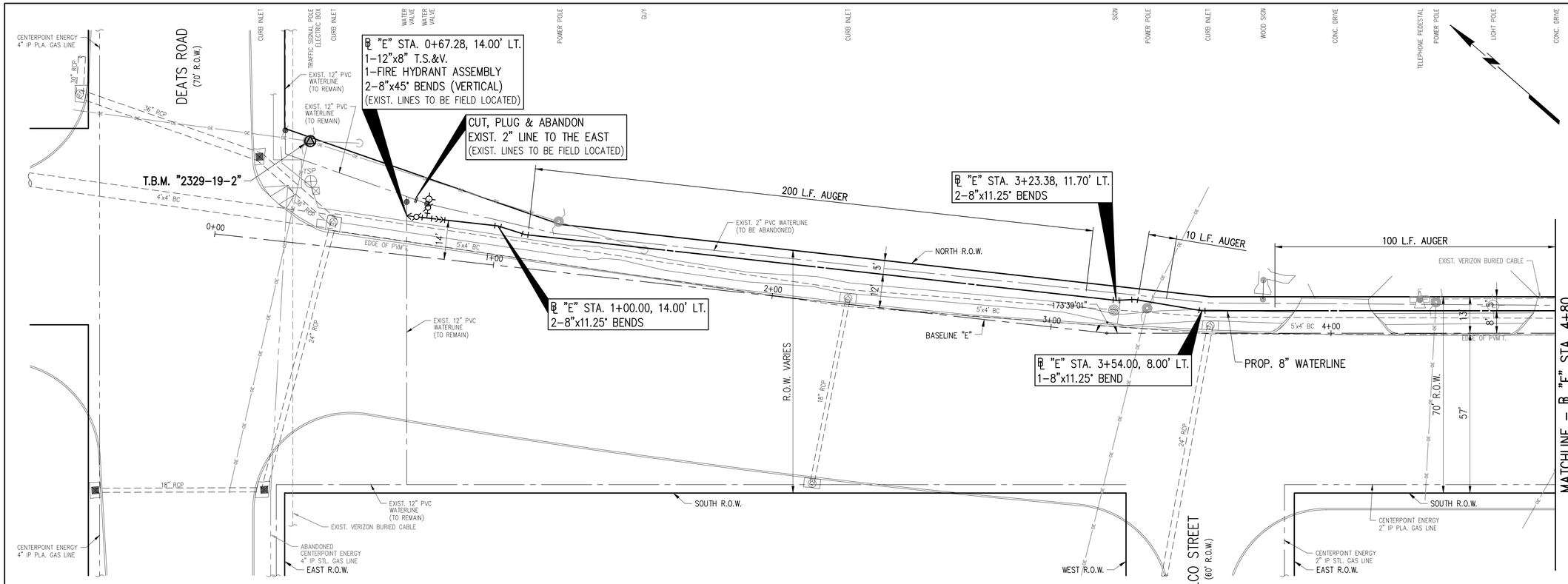
AVENUE D
PLAN & PROFILE
BEGINNING TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

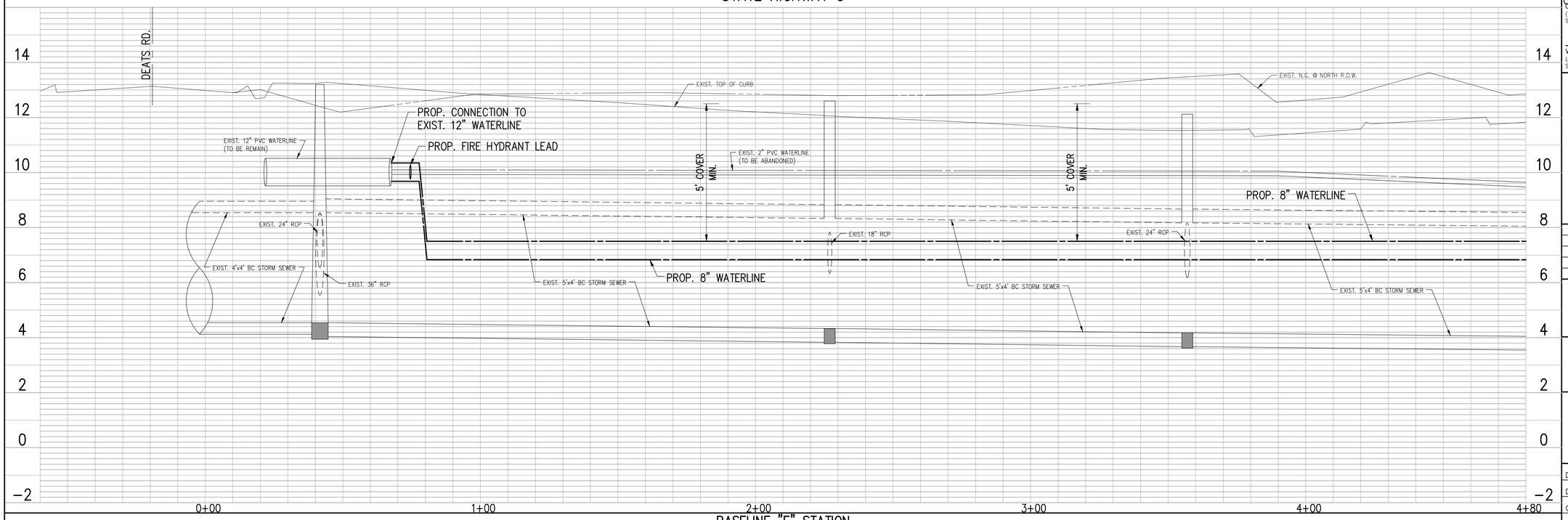
DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 27 Of 48

04/30/15

H:\ACAD\Clients\224\0020\Design\224-0020-27 PP24 D.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



STATE HIGHWAY 3



02/04/16

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

MARK E. HAVRAN
116610
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

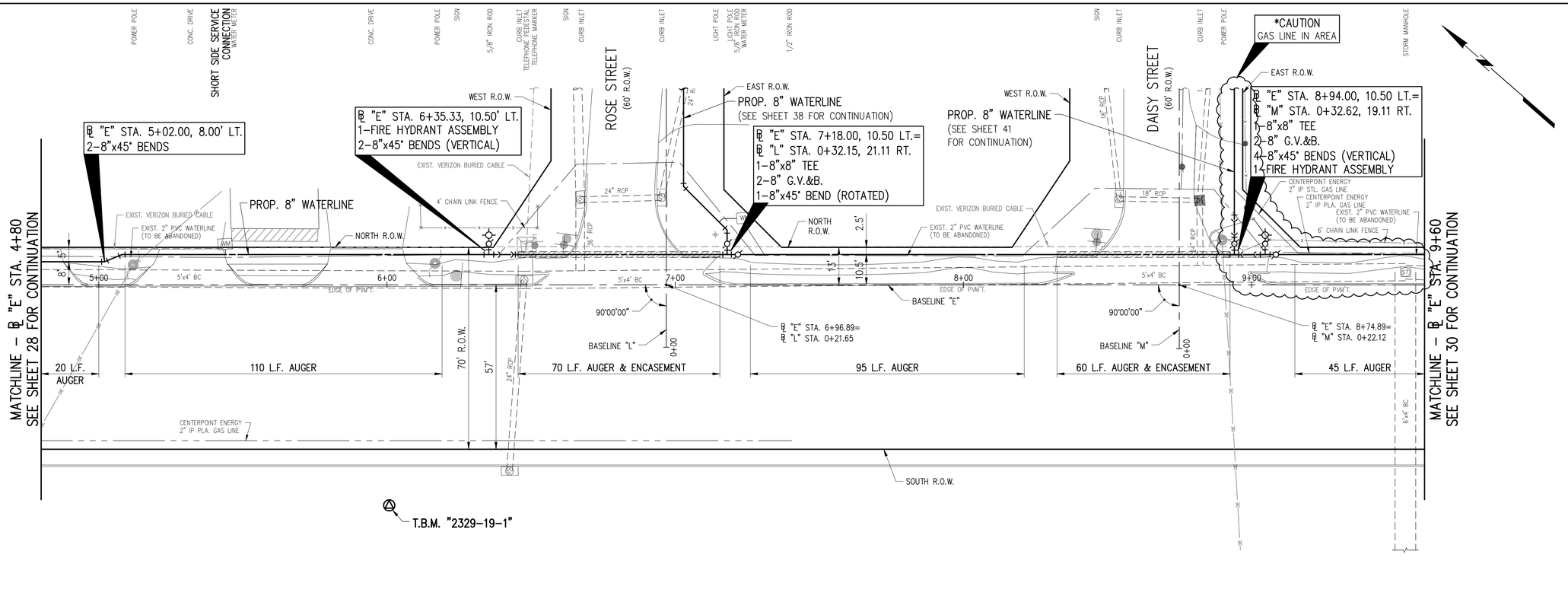
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

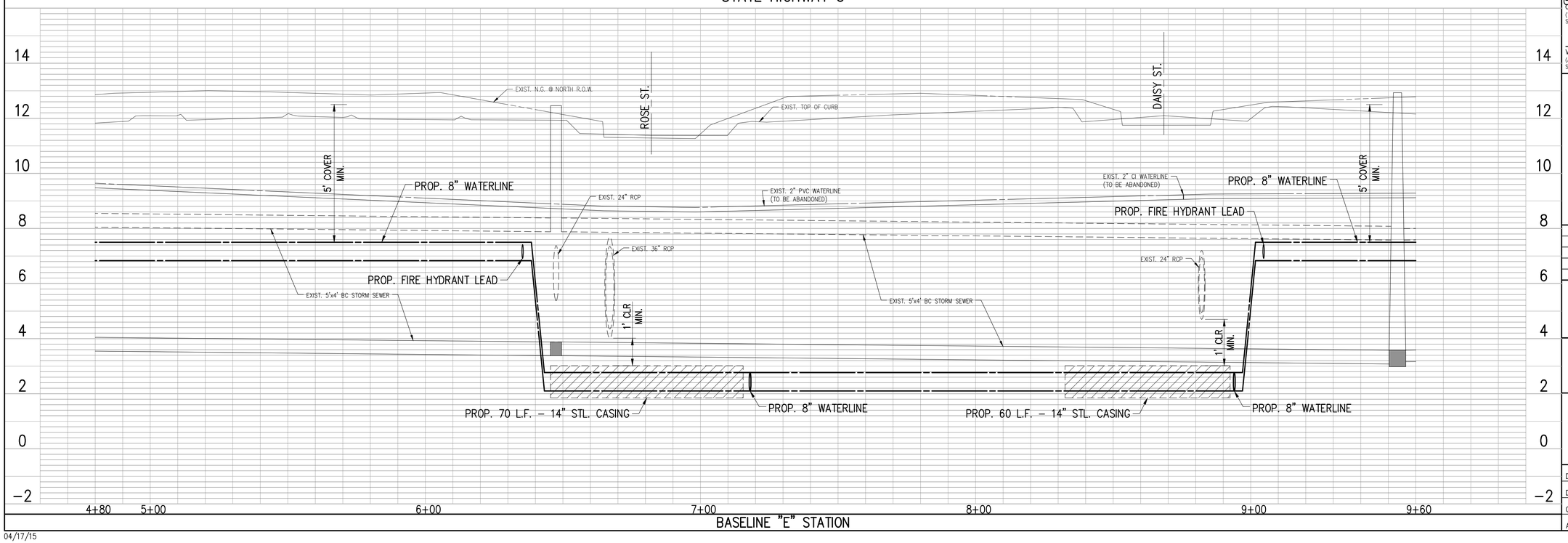
STATE HIGHWAY 3
PLAN & PROFILE
BEGINNING TO BL "E" STA. 4+80

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 28 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-28 PP25 SH3.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)





04/17/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

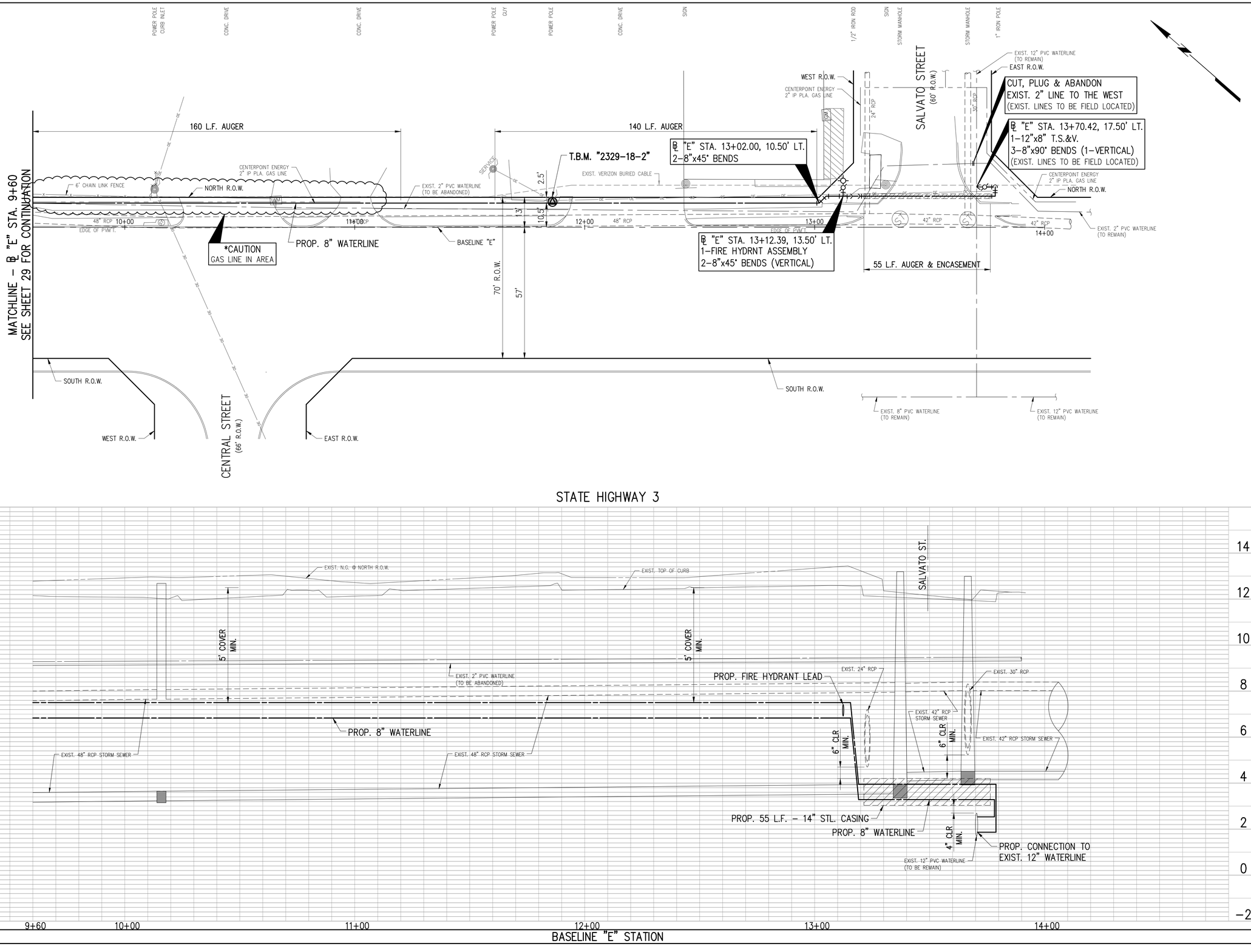
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STATE HIGHWAY 3
PLAN & PROFILE
BL "E" STA. 4+80 TO BL "E" STA. 9+60

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 29 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-29 PP26.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)



STATE HIGHWAY 3

BASELINE "E" STATION

02/04/16

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STATE HIGHWAY 3
PLAN & PROFILE
BL "E" STA. 9+60 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 30 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-30 PP27.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

℄ "F" STA. 0+88.43, 19.00 LT.
1-8"x8" TEE
2-8" G.V.&B.
1-FIRE HYDRANT ASSEMBLY
4-8"x45° BENDS (ROTATED)
2-8"x2" REDUCERS
2-2" WET CONECTION
CUT, PLUG & ABANDON
EXIST. LINES TO THE EAST & WEST
(EXIST. LINES TO BE FIELD LOCATED)

WATER METER
SHORT SIDE SERVICE CONNECTION
WATER VALVE
AVENUE B (70' R.O.W.)
SOUTH R.O.W.
NORTH R.O.W.
EXIST. 8" SAN. SEW.
EXIST. 2" PVC WATERLINE (TO REMAIN)
CENTERPOINT ENERGY 2" IP STL. GAS LINE
20 L.F. AUGER
℄ "F" STA. 1+48.00, 9.00 LT.
2-8"x45° BENDS
WEST R.O.W.
EDGE OF PVM'T.
EXIST. 2" PVC WATERLINE (TO BE ABANDONED)
PROP. 8" WATERLINE
CHAIN LINK FENCE
16'
25'
9'
19'
70' R.O.W.
45'
0+00
1+00
2+00
3+00
4+00
5+00
BASELINE "F"
CENTERPOINT ENERGY 2" IP STL. GAS LINE
EAST R.O.W.
*CAUTION
GAS LINE IN AREA
EXIST. 2" PVC WATERLINE (TO REMIAN)
SOUTH R.O.W.
NORTH R.O.W.

WATER VALVE
12" RCP ℄ 14.93
EXIST. 2" WATERLINE (TO BE ABANDONED)
EXIST. VERIZON BURIED CABLE
PROP. 8" WATERLINE
(SEE SHEET 05 FOR CONTINUATION)
HILL AVENUE (70' R.O.W.)
CENTERPOINT ENERGY 4" IP STL. GAS LINE
36" ENTERPRISE PIPELINE
16" MARATHON PIPELINE
BASELINE "A"
NORTH R.O.W.
2+00
90°00'00"
3+00
5+00
209.2'
EDGE OF PVM'T.
℄ "F" STA. 4+41.93=
℄ "A" STA. 2+31.11
EXIST. VERIZON BURIED CABLE
EXIST. VERIZON BURIED CABLE
EXIST. VERIZON BURIED CABLE
EAST R.O.W.
℄ "F" STA. 4+10.93, 9.00 LT.=
℄ "A" STA. 2+22.11, 31.00 RT.
1-8"x8" TEE
2-8" G.V.&B.
1-FIRE HYDRANT ASSEMBLY
1-8"x45° BEND
PROP. 8" WATERLINE
(SEE SHEET 06 FOR CONTINUATION)
SOUTH R.O.W.
EXIST.
GRAVEL DRIVE
POWER POLE
POWER POLE
12" RCP ℄ 15.02
TELEPHONE MANHOLE
MAILBOX

19TH STREET

AVE. B
HILL AVE.
EXIST. ℄ PVM'T.
EXIST. EDGE OF PVM'T.
EXIST. N.G. @ WEST R.O.W.
12" RCP
PROP. CONNECTION TO EXIST. 2" WATERLINE (2)
EXIST. 2" PVC WATERLINE (TO REMAIN)
EXIST. 6" SAN. SEW.
1' CLR. MIN.
5' COVER MIN.
EXIST. 2" PVC WATERLINE (TO BE ABANDONED)
EXIST. 2" PVC WATERLINE (TO BE ABANDONED)
EXIST. 2" PVC WATERLINE (TO BE ABANDONED)
PROP. FIRE HYDRANT LEAD
PROP. 8" WATERLINE
PROP. 18 L.F. - 14" PVC C-900 CASING
PROP. 8" WATERLINE
PROP. 8" WATERLINE
PROP. 8" WATERLINE
18
16
14
12
10
8
6
4
2
0+00
1+00
2+00
3+00
4+00
5+00
BASELINE "F" STATION

04/17/15

BENCHMARK:
HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.
ELEV. 18.12

NOTES:
1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:
For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
11610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

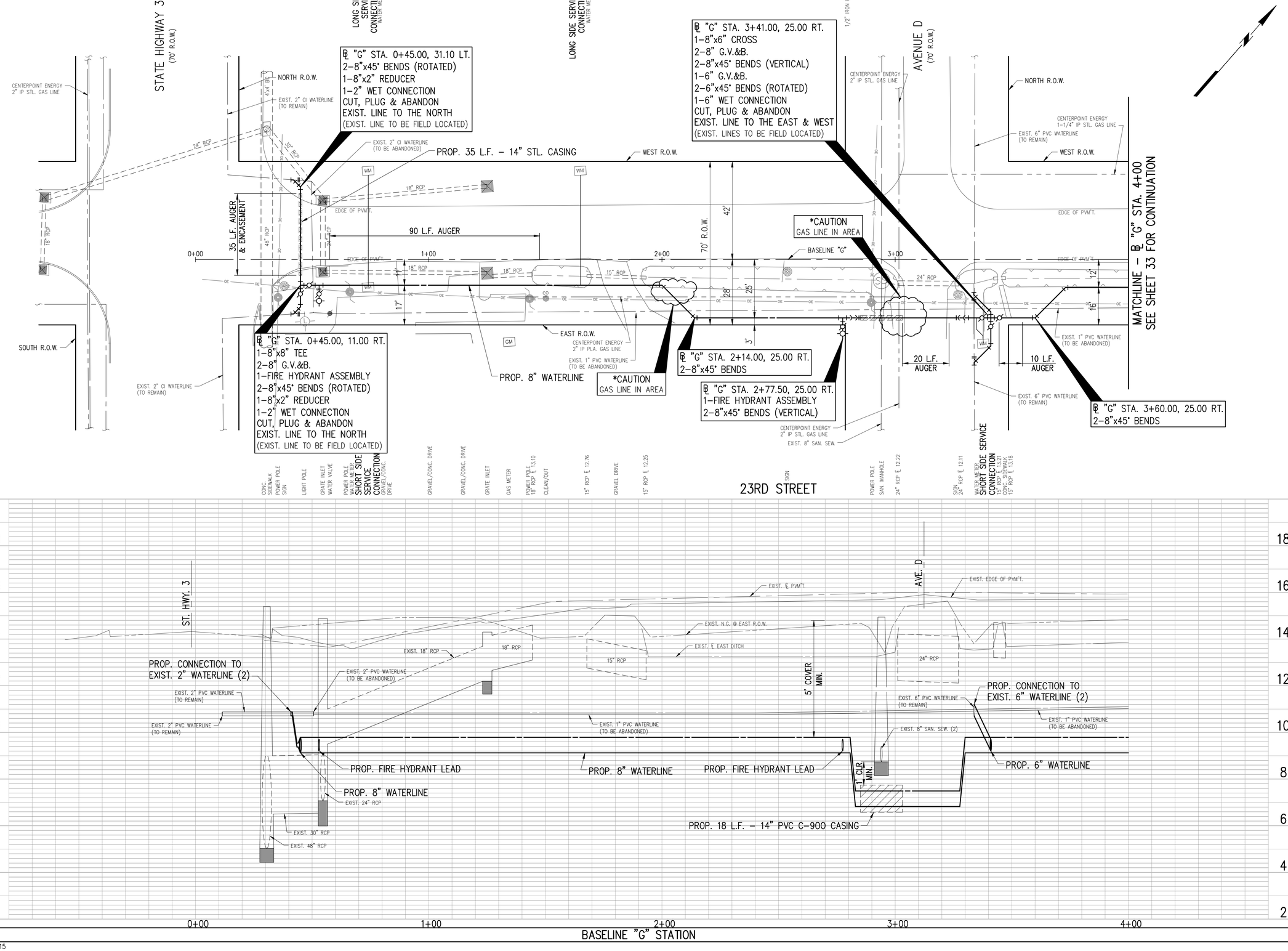
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

19TH STREET
PLAN & PROFILE
BEGINNING TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 31 Of 48

H:\CADD\Clients\224\0020\Design\224-0020-31 PP28 19TH.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)



04/17/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

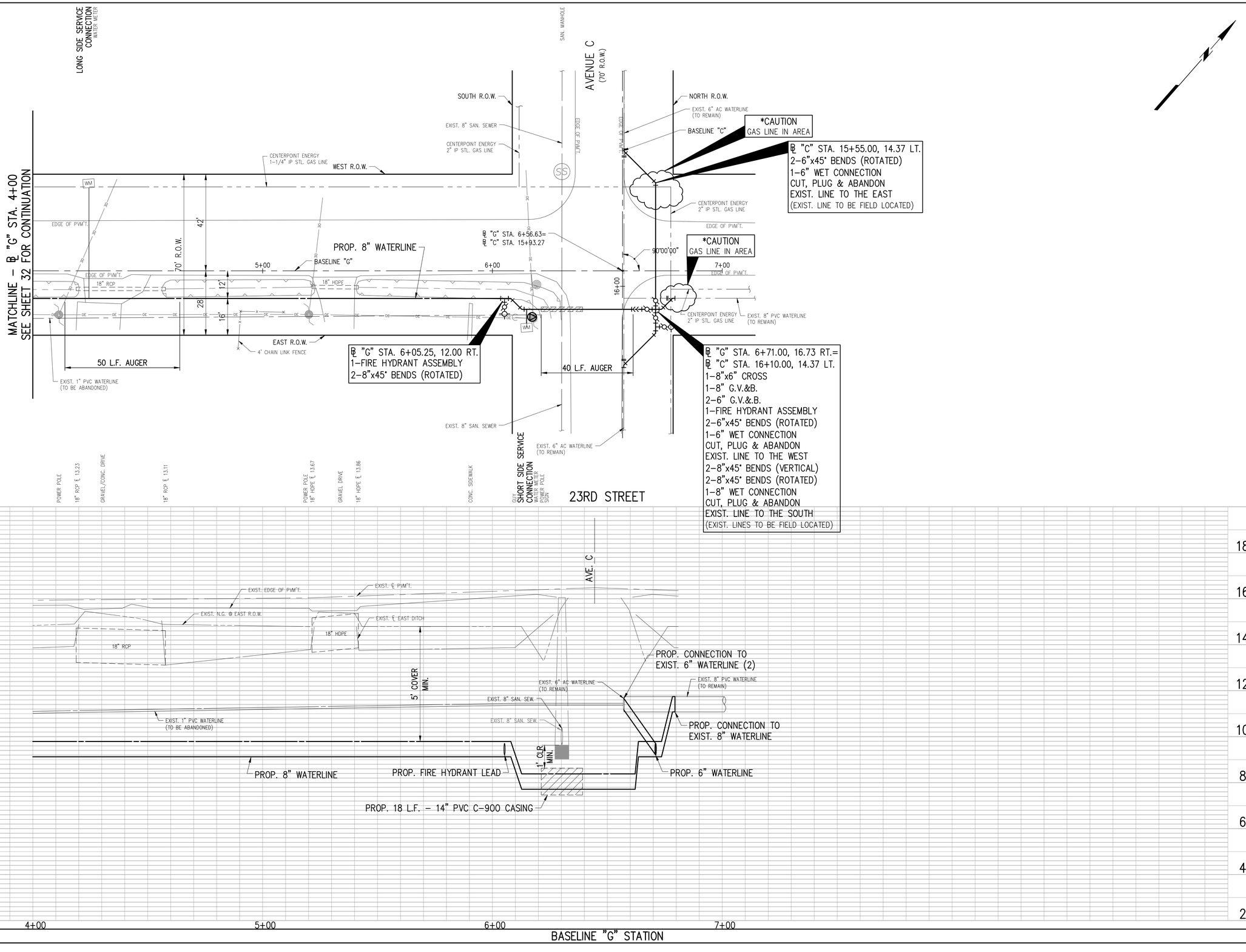
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

23RD STREET
PLAN & PROFILE
BEGINNING TO BL "G" STA. 4+00

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 32 Of 48

H:\LACAD\Clients\224\0020\Design\224-0020-32 PP29 23RD.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

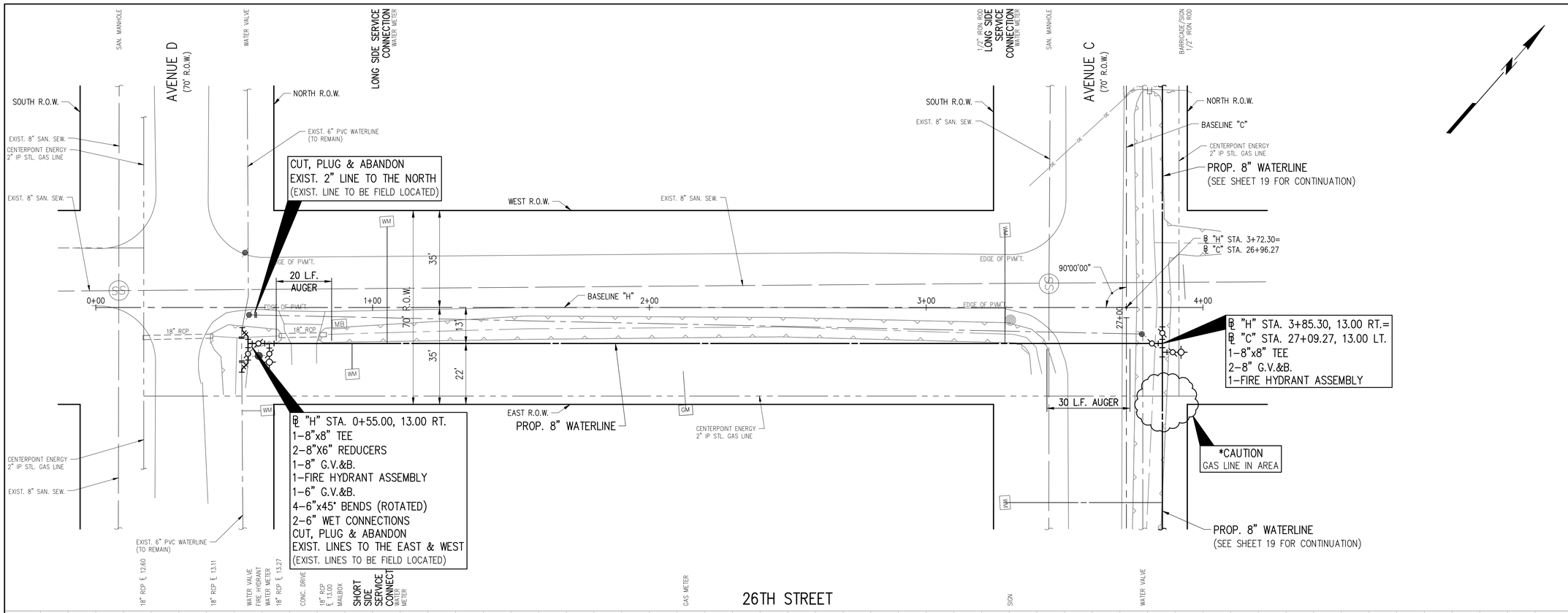
23RD STREET
PLAN & PROFILE
BL "G" STA. 4+00 TO END

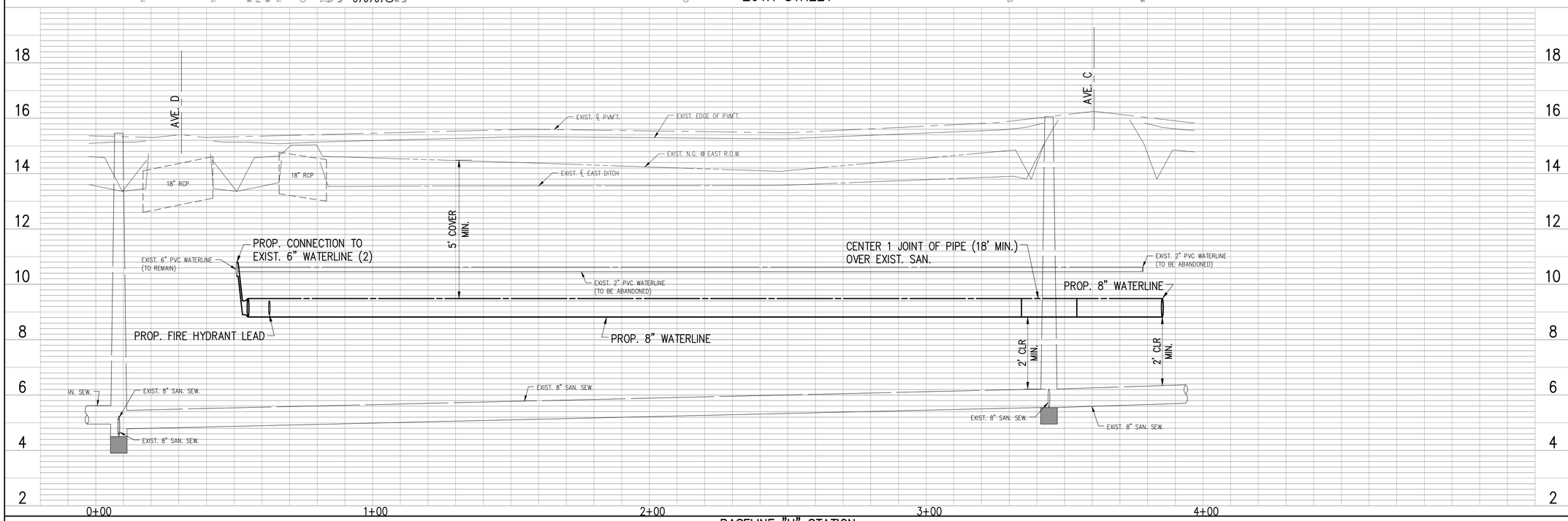
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 33 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-33 PP30.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/17/15





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

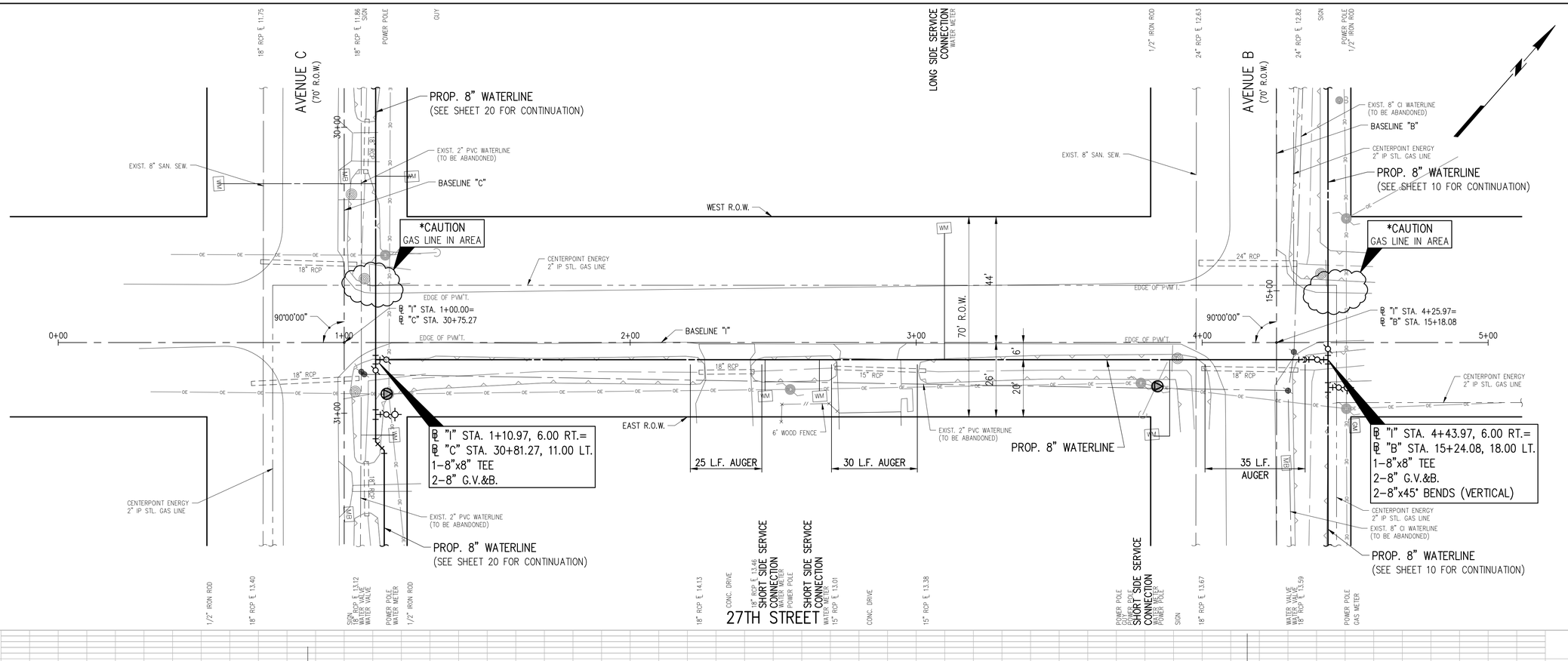
26TH STREET
PLAN & PROFILE
BEGINNING TO END

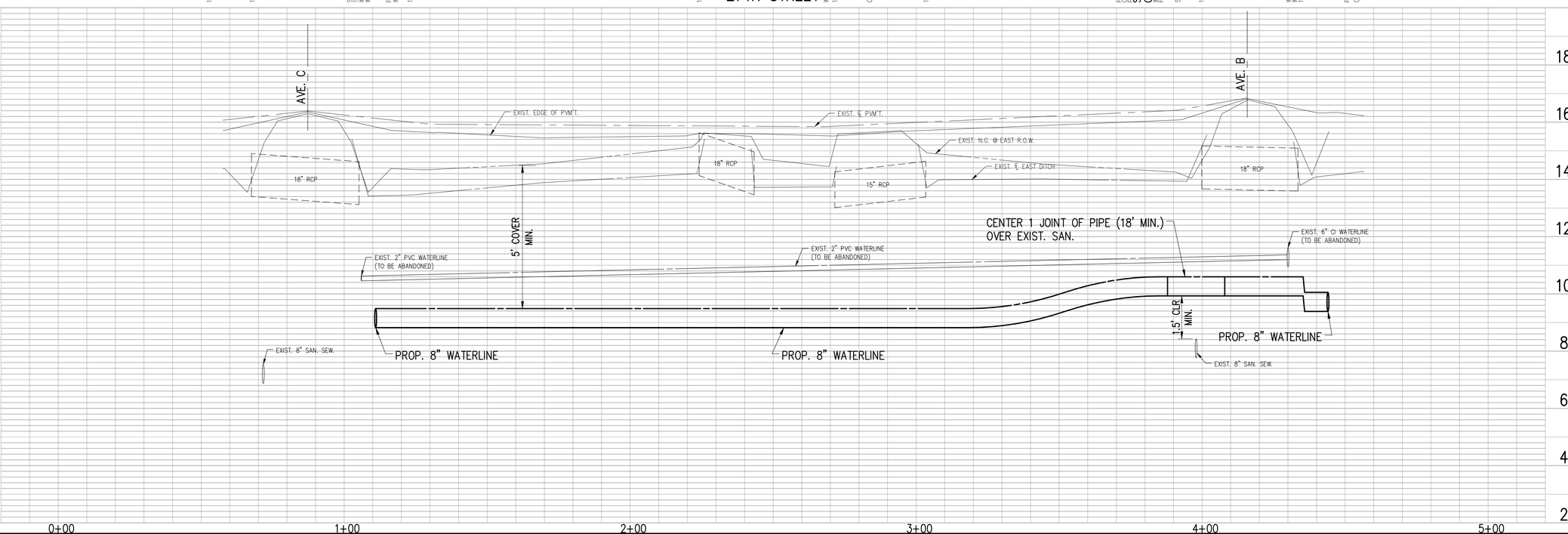
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 34 Of 48

H:\LACAD\Clients\224\0020\Design\224-0020-34 PP31 26TH.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/30/15





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

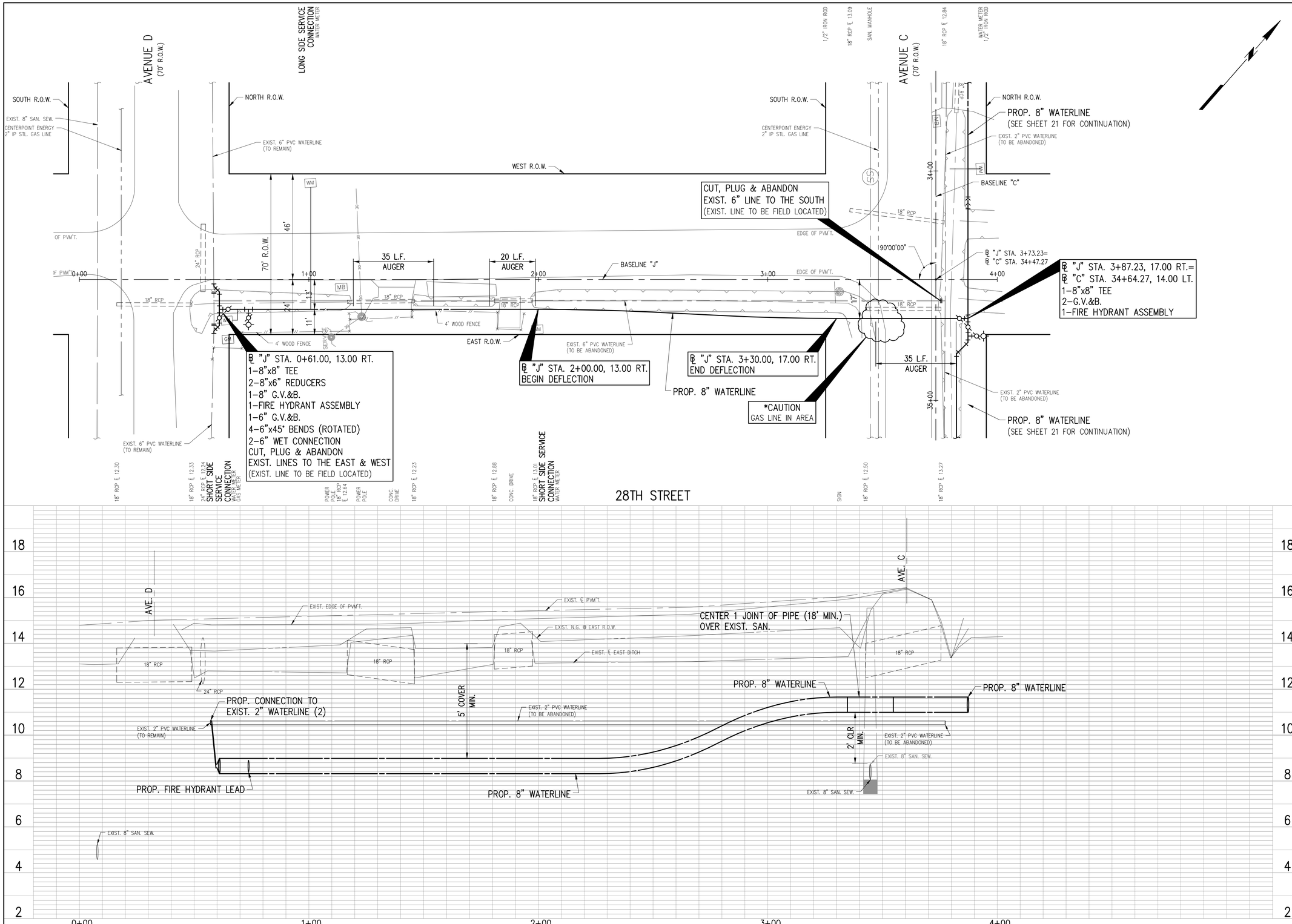
27TH STREET
PLAN & PROFILE
BEGINNING TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 35 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-35 PP32 27TH.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/30/15



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

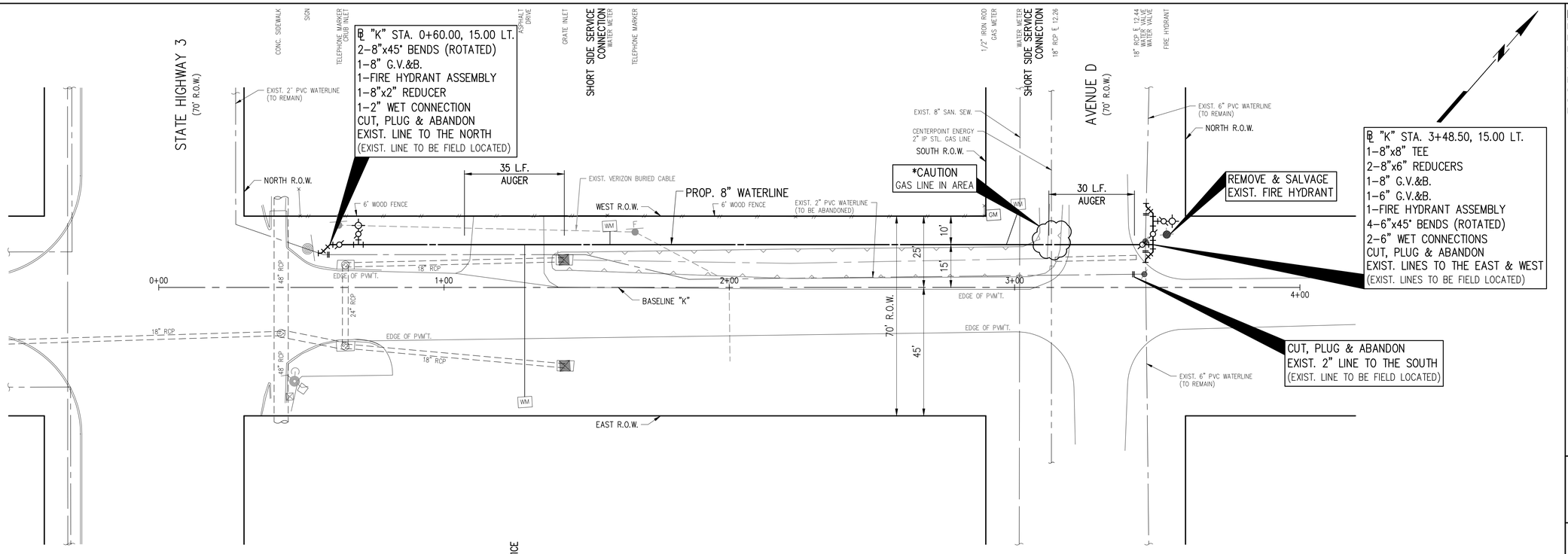
28TH STREET
PLAN & PROFILE
BEGINNING TO END

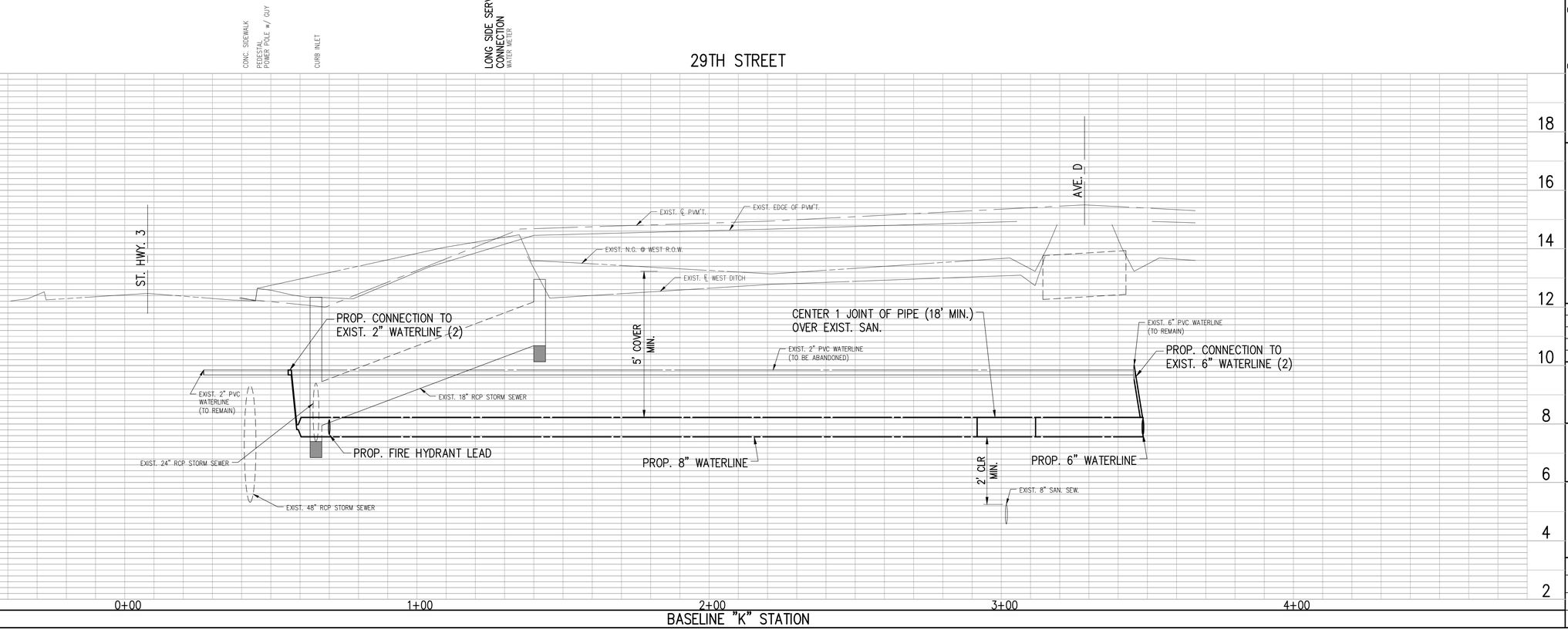
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 36 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-36 PP33 28TH.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/30/15





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

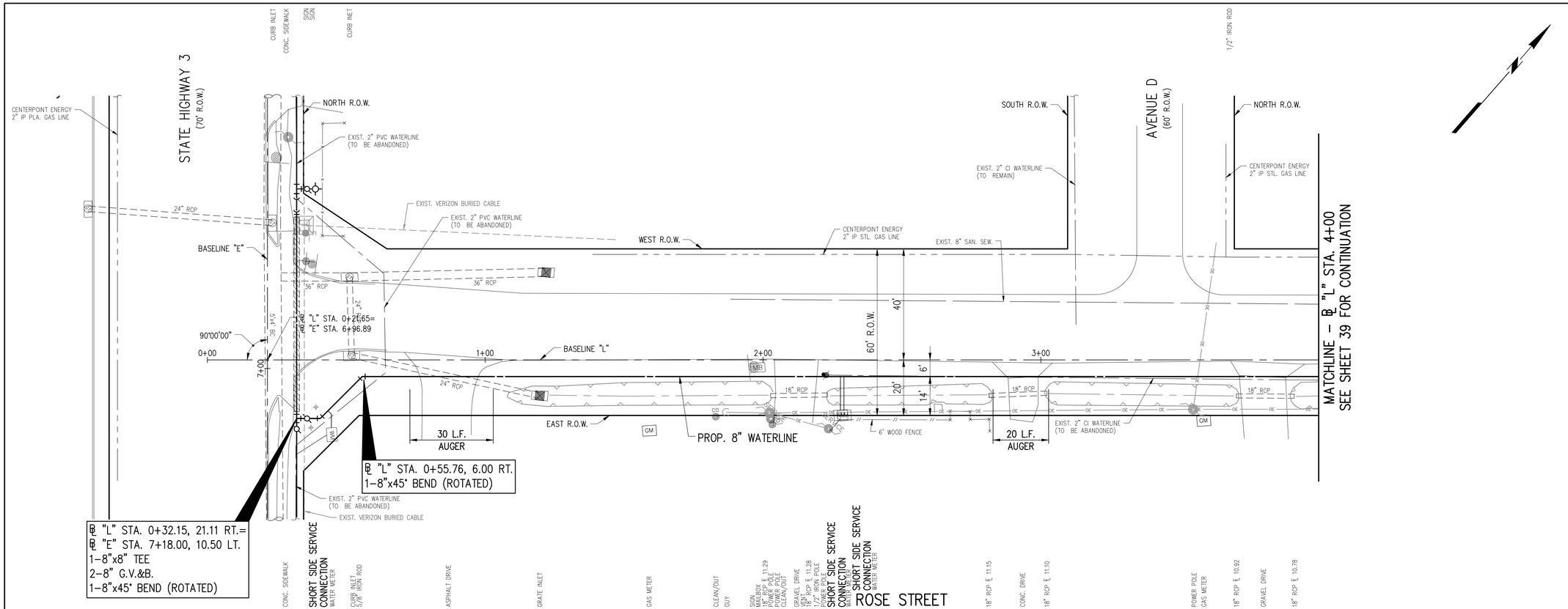
29TH STREET
PLAN & PROFILE
BEGINNING TO END

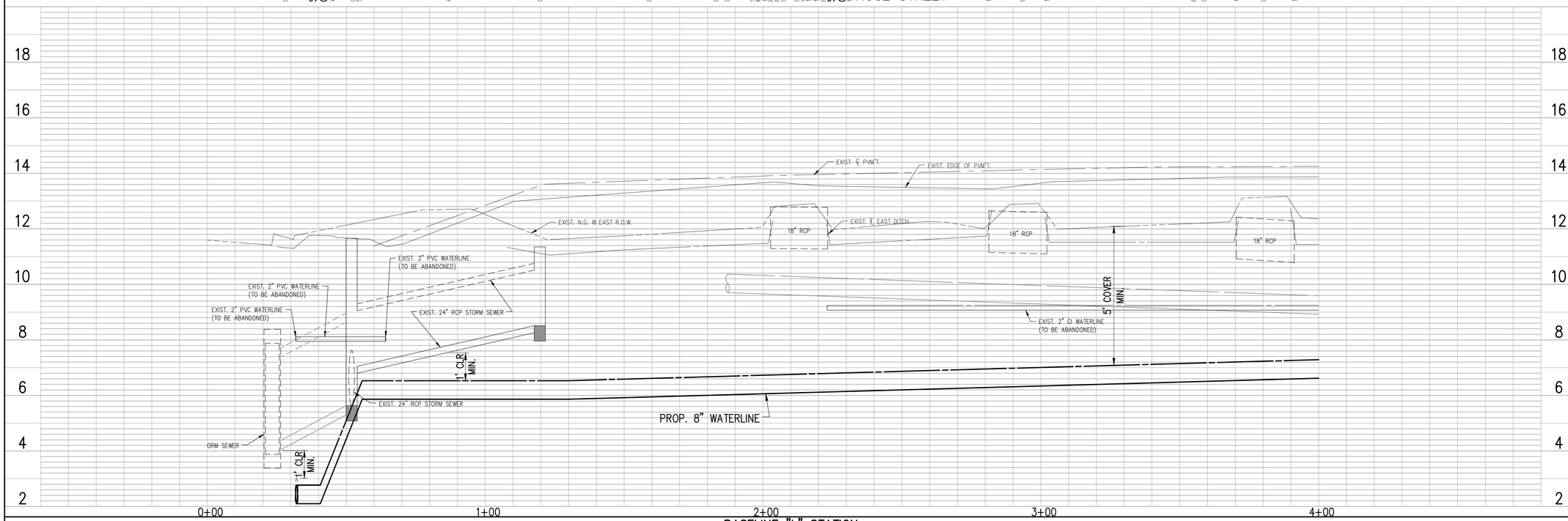
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 37 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-37 PP34 29TH.dwg (XREF: 224-0020 Border 224-0020 Base 224-0020 Profile)

04/17/15





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.
ELEV. 18.12

NOTES:
1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

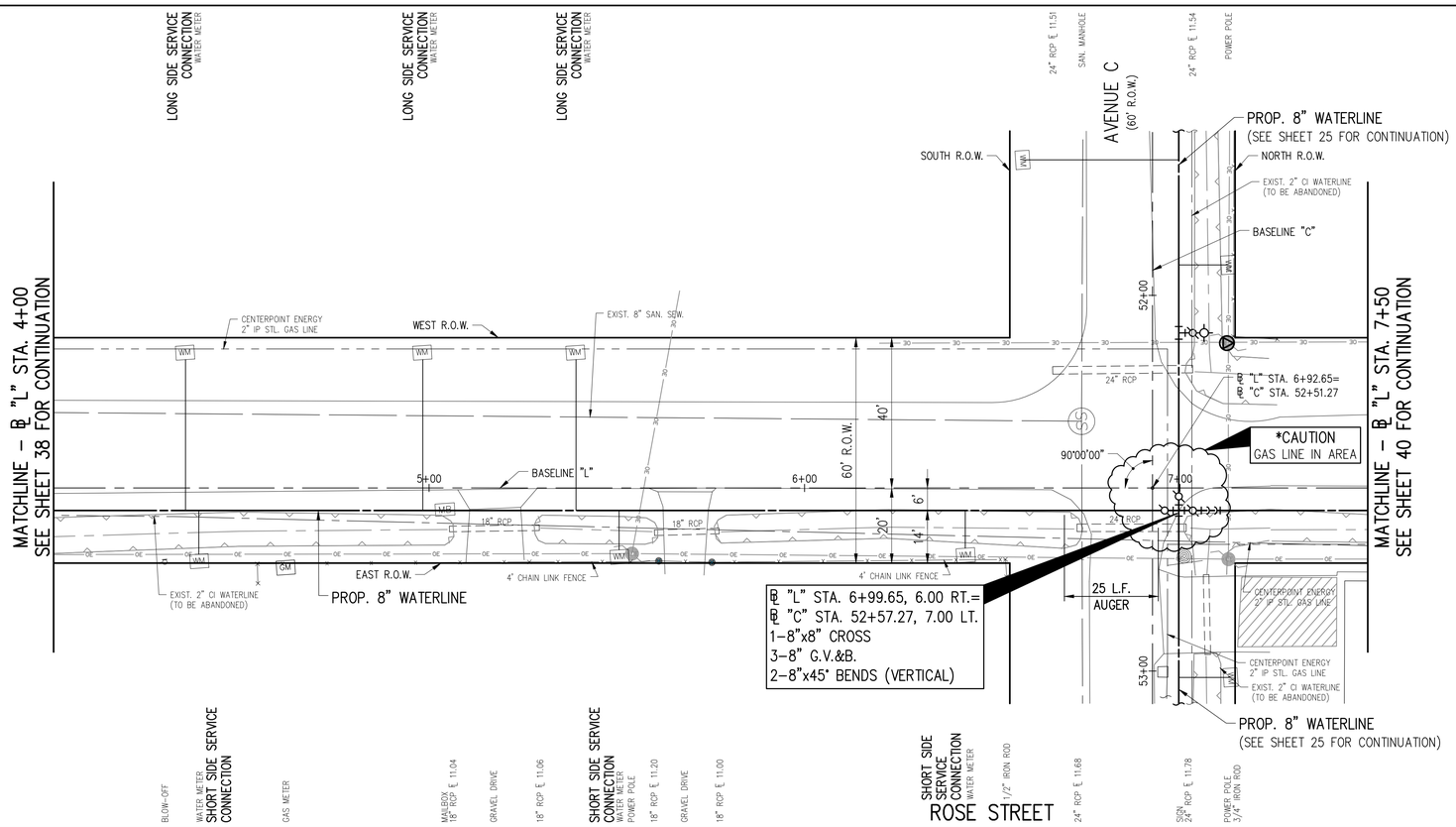
ROSE STREET
PLAN & PROFILE
BEGINNING TO BL "L" STA. 4+00

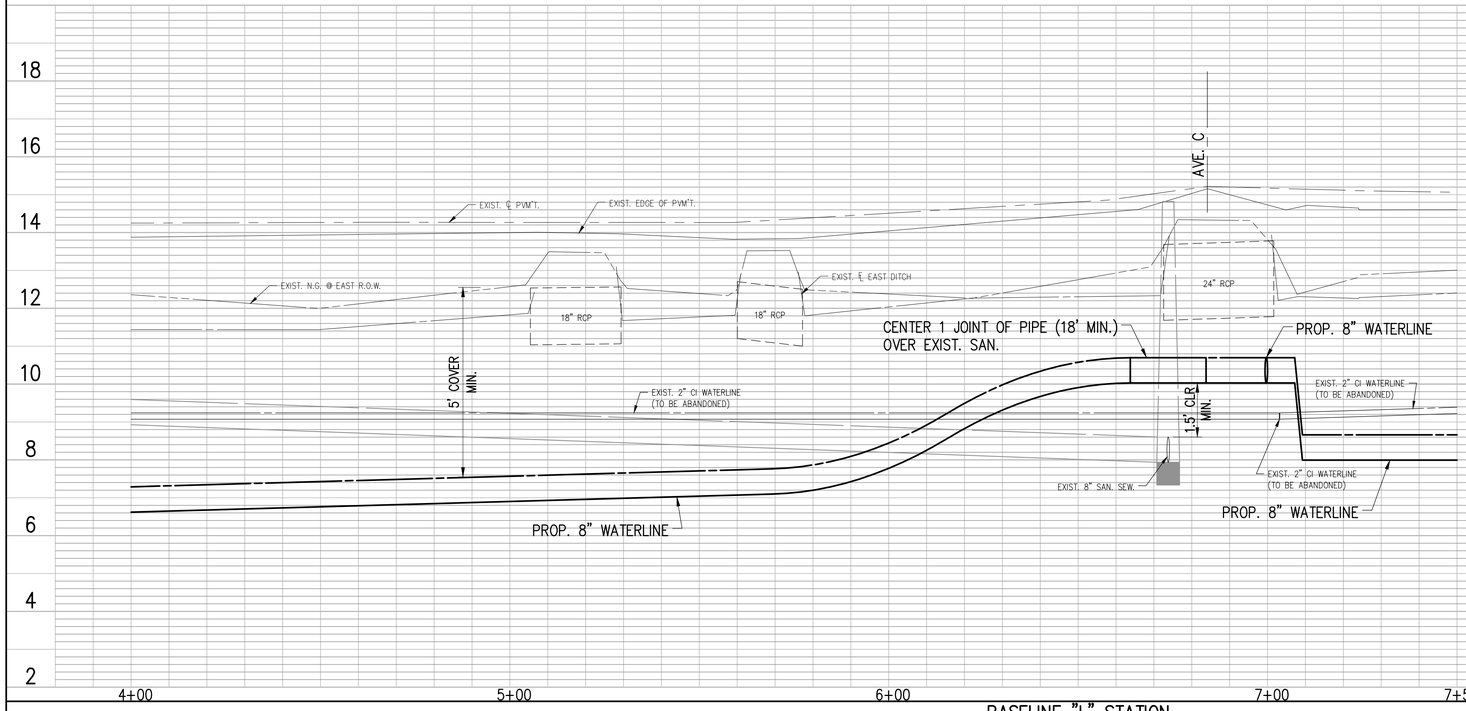
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 38 Of 48

04/30/15

H:\ACAD\Clients\224\0020\Design\224-0020-38 PP35 ROSE.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNIE
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

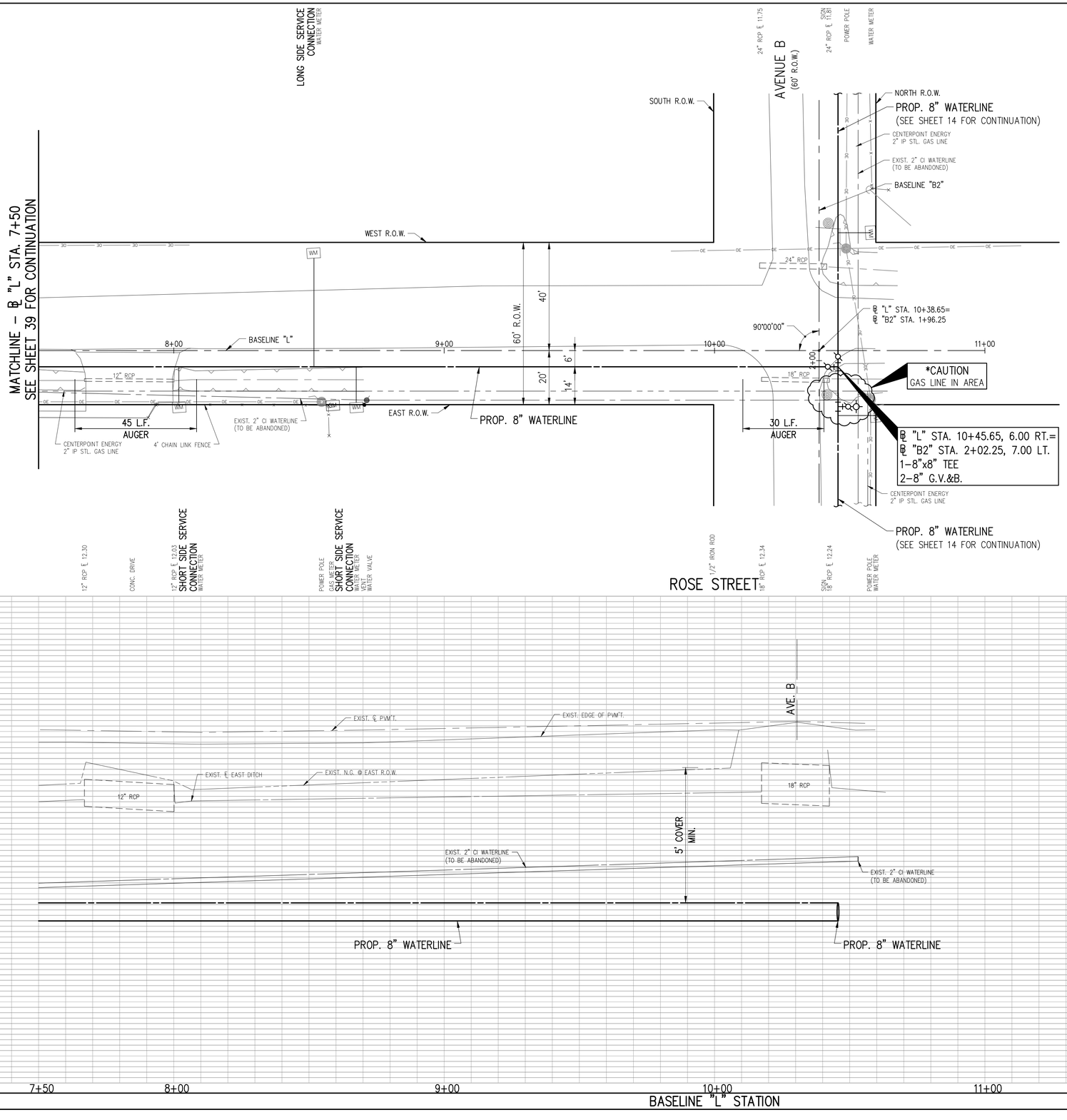
ROSE STREET
PLAN & PROFILE
BL "L" STA. 4+00 TO BL "L" STA. 7+50

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 39 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-39 PP36.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/17/15



BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, CORS96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAYNIE
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

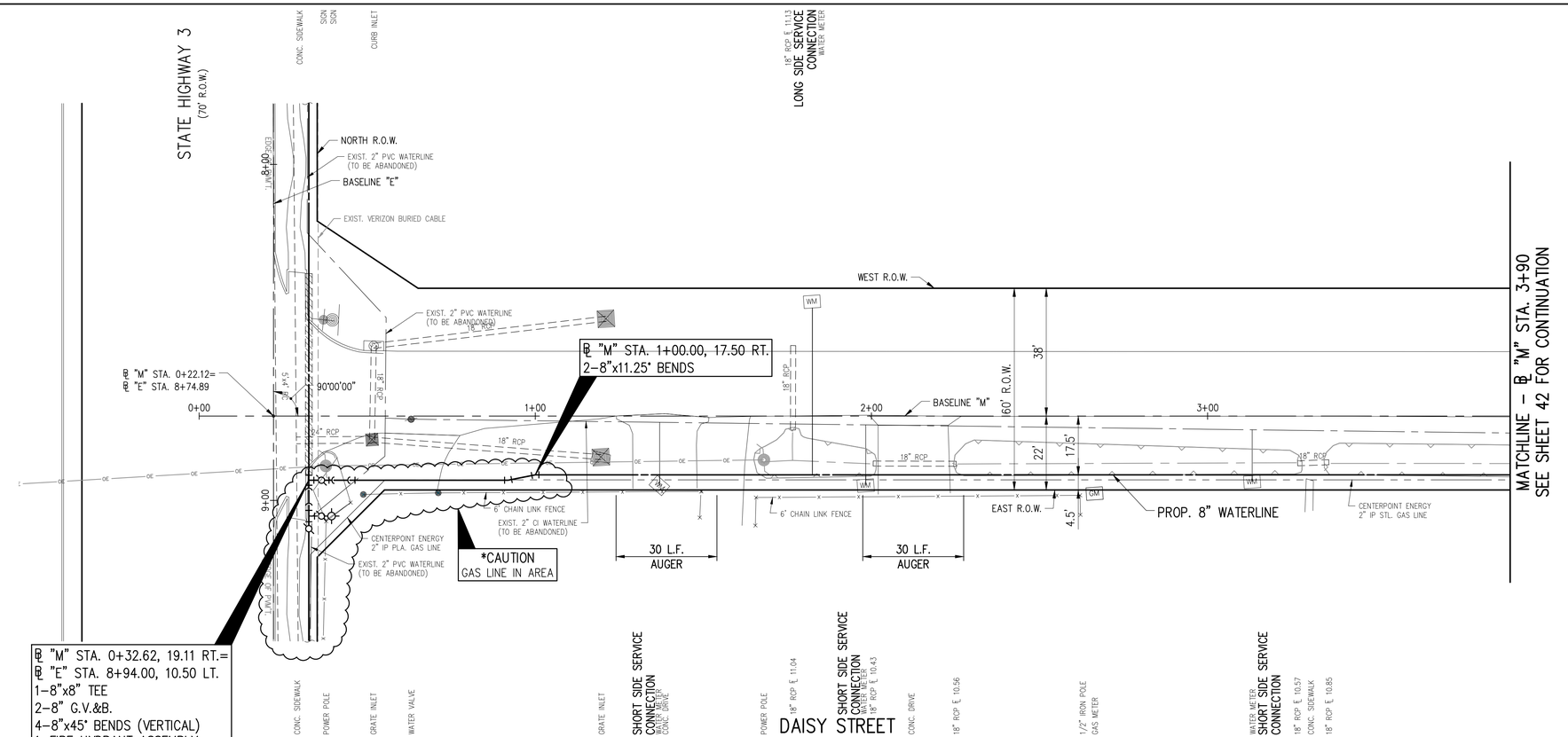
ROSE STREET
PLAN & PROFILE
BL "L" STA. 7+50 TO END

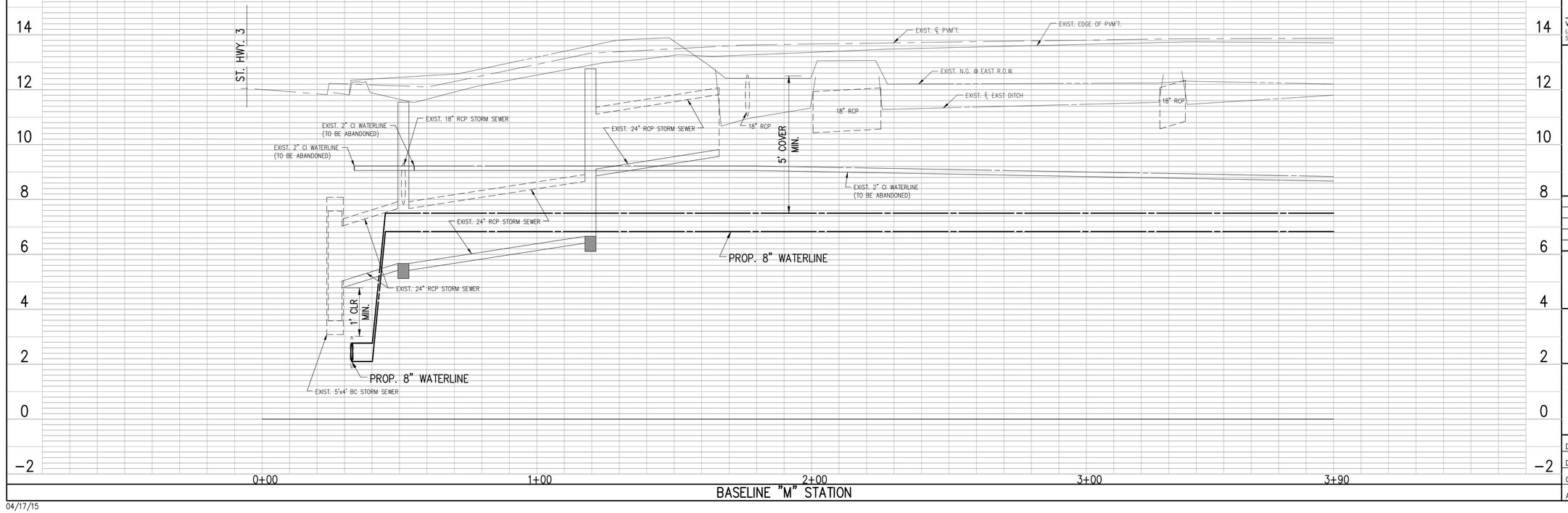
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 40 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-40 PP37.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)

04/30/15





04/17/15

BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED
PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

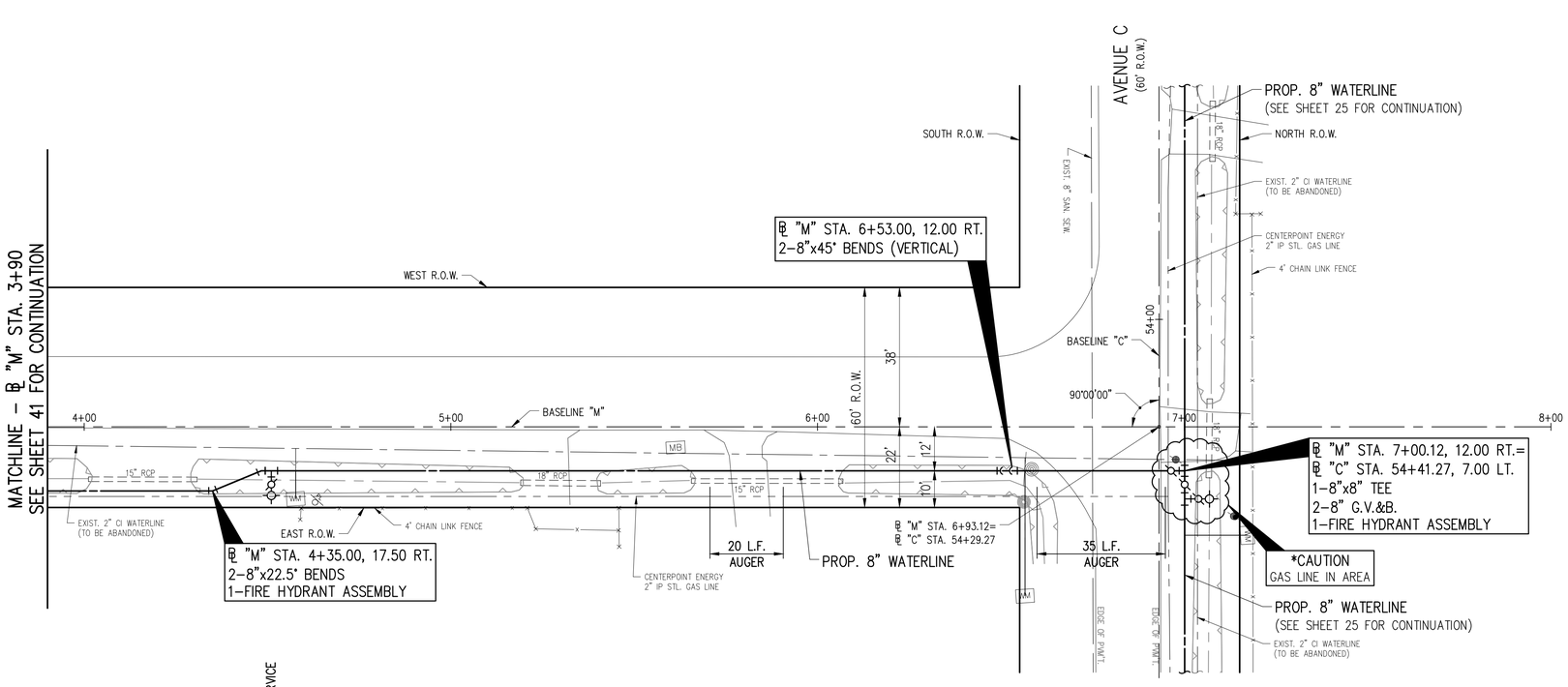
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

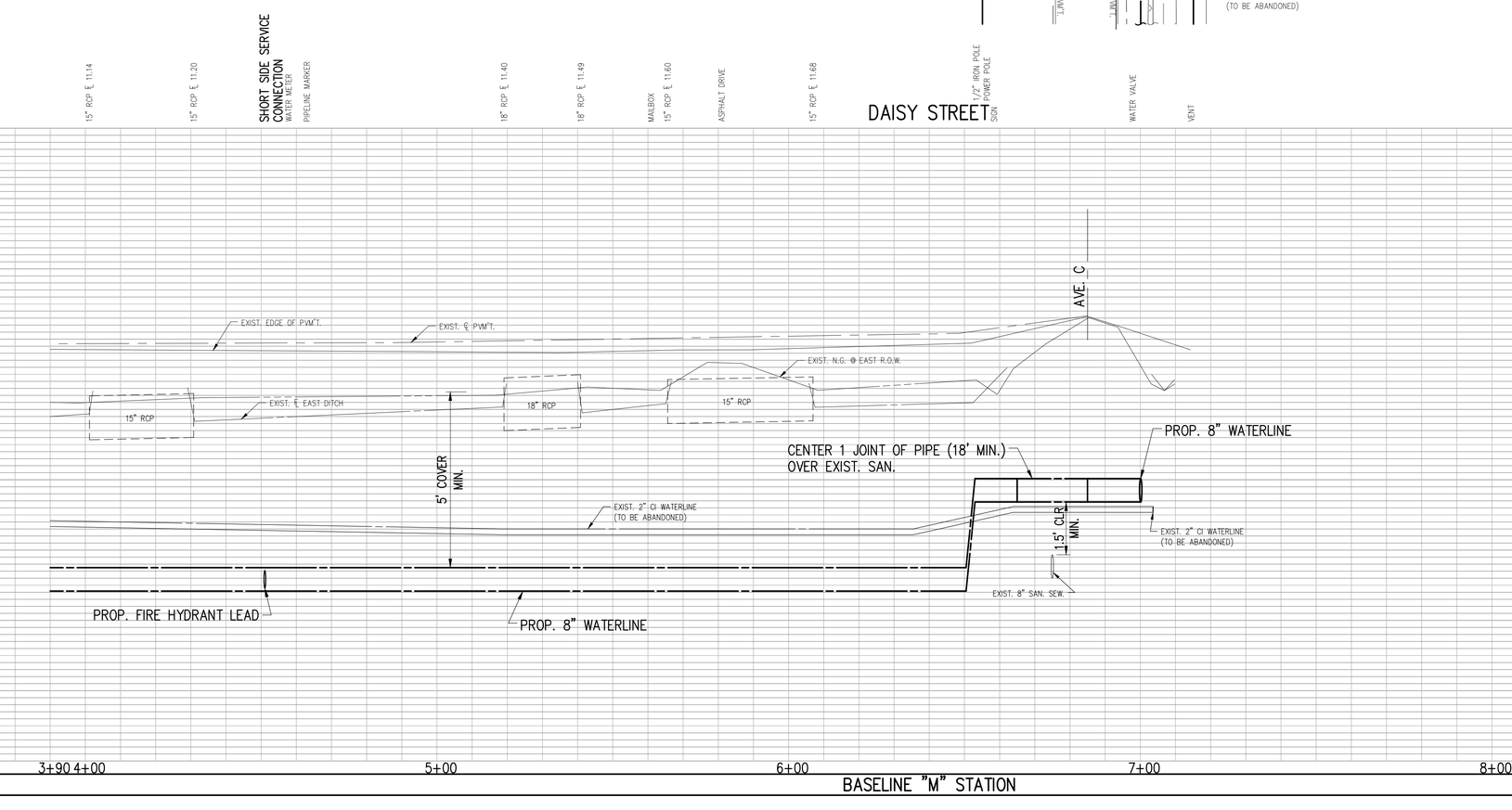
DAISY STREET
PLAN & PROFILE
BEGINNING TO BL "M" STA. 3+90

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 41 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-41 PP38 DAISY.dwg (XREF: 224-0020 Border: 224-0020 Base: 224-0020 Profile)





BENCHMARK:

HORIZONTAL CONTROL BASED ON NGS MONUMENTS L 639 AND R1472, (NAD83, COR96). VERTICAL CONROL IS BASED ON L639, PID AW1074 (NAVD88, 97 ADJ.). BRASS DISK FOUND AT THE INTERSECTION OF HILL AVE. AND OLIVE ST. 112.5 FT SOUTHWEST OF THE NEAR RAIL OF THE BURLINGTON NORTHERN RAILROAD, 44.9 FT SOUTHWEST OF THE AVENUE CENTER, 24.3 FT SOUTHEAST OF AND LEVEL WITH THE STREET CENTER.

ELEV. 18.12

NOTES:

1. NO DOUBLE SERVICE LEADS PERMITTED. CONTRACTOR TO INSTALL ONE SERVICE LEAD PER WATER METER.
2. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
3. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
4. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE CITY OR ITS REPRESENTATIVE.
5. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO G.C. W.C.I.D. No.1.
6. PROPOSED SERVICE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE NEW SERVICE LEAD.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:

For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 12/15/15

CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 12/15/15

CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

DATE 4/29/15

VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

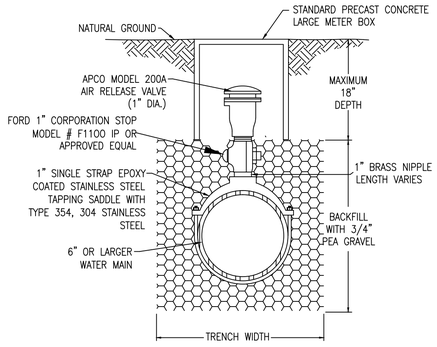
DAISY STREET
PLAN & PROFILE
BL "M" STA. 3+90 TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

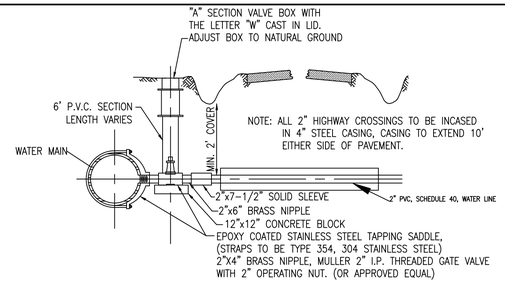
DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 42 Of 48

H:\CAD\Clients\224\0020\Design\224-0020-42 PP39.dwg (XREF: 224-0020 Border; 224-0020 Base; 224-0020 Profile)

04/17/15



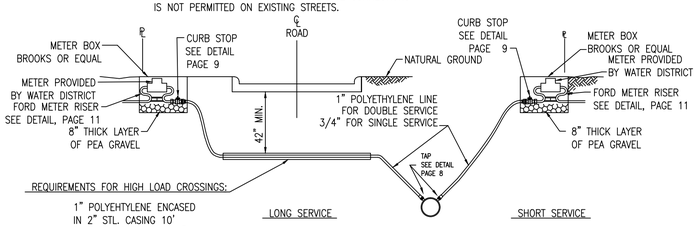
BELOW GROUND
AIR RELEASE VALVE DETAIL
DATE: APRIL 2003



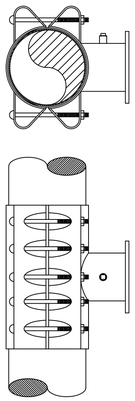
NOTE: TAPS ON 6" OR SMALLER LINES TO USE SINGLE STRAP TAP SADDLES.
TAPS ON LARGER THAN 6" LINES TO USE DOUBLE STRAP TAP SADDLES.

TYPICAL 2" LONGSIDE
CONNECTION TO LARGER MAINS
DATE: APRIL 2003

NOTE:
JETTING OR OPEN CUT FOR LONG SERVICE CONNECTIONS IS NOT PERMITTED ON EXISTING STREETS.

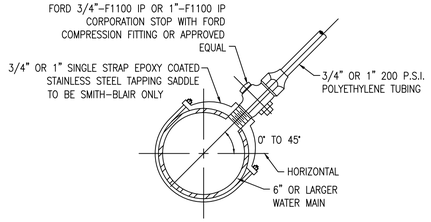


RESIDENTIAL SERVICE
CONNECTION DETAIL
DATE: APRIL 2003

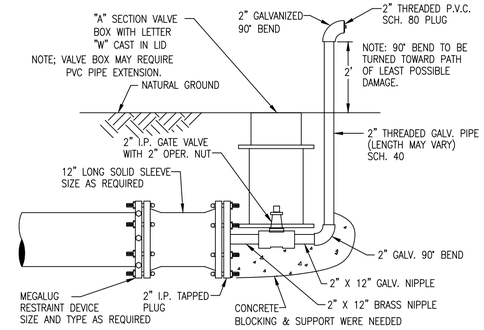


JCM 432 ALL STAINLESS STEEL TAPPING SLEEVE OR APPROVED EQUAL TO BE USED ON ALL SIZE TAPS OR WHERE DISIGNATED BY WATER DISTRICT.

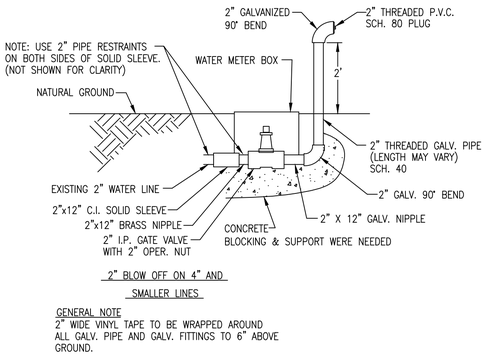
FULL CIRCLE
TAPPING SLEEVE DETAIL
DATE: APRIL 2003



3/4" OR 1" TAP DETAIL
DATE: APRIL 2003



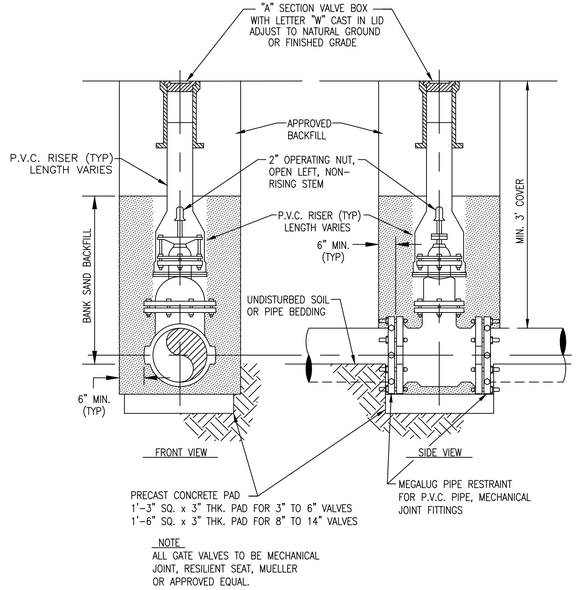
2" BLOW OFF ON 6" OR GREATER LINES



2" BLOW OFF ON 4" AND SMALLER LINES

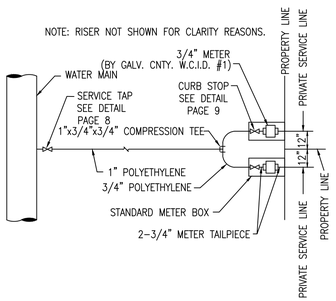
GENERAL NOTE
2" WIDE VINYL TAPE TO BE WRAPPED AROUND ALL GALV. PIPE AND GALV. FITTINGS TO 6" ABOVE GROUND.

BLOW OFF DETAIL
DATE: APRIL 2003



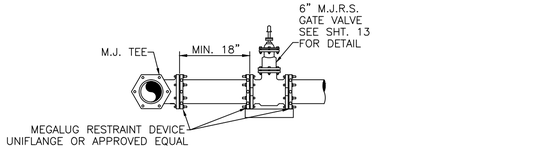
NOTE
ALL GATE VALVES TO BE MECHANICAL JOINT, RESILIENT SEAT, MUELLER OR APPROVED EQUAL.

RESILENT SEAT GATE VALVE
INSTALLATION DETAIL
DATE: APRIL 2003

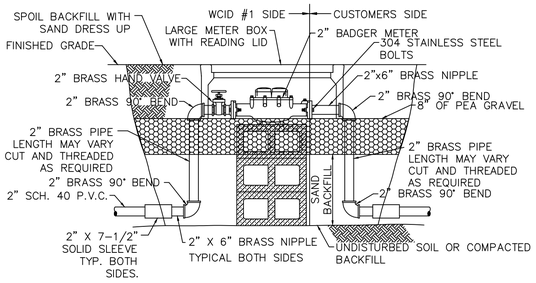


NOTES
1. LOCATION OF METER BOX ON SINGLE SERVICE LEADS SHALL BE THE SAME AS SHOWN FOR DOUBLE SERVICE LEADS.
2. TOP OF METER BOX TO BE SET LEVEL WITH TOP OF NATURAL GROUND.
3. SET METER BOX ON 8" LAYER OF PEA GRAVEL.
4. METER RISERS SHALL BE PLACED AT ALL RESIDENTIAL SERVICE CONNECTIONS.

RESIDENTIAL
DOUBLE SERVICE LEAD DETAIL
DATE: APRIL 2003

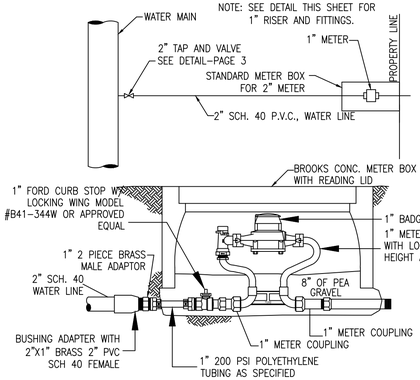


MECHANICAL JOINT DETAIL



NOTES: 1. SAND BEDDING TO BE WATER COMPACTED, DEPTH OF SAND WILL VARY WITH EACH INSTALLATION.
2. BLOCKING SUPPORT TO BE USED UNDER ALL 1-1/2" AND LARGER METERS. NOT TO EXCEED A MAXIMUM OF 3 CINDER BLOCKS. BLOCKING TO BE PLACED ON LEVEL COMPACTED OR UNDISTURBED SOIL.
3. CROSS CONNECTION DEVICE REQUIRED ON ALL COMMERCIAL CONNECTIONS INSTALLED BY LICENSED PLUMBER PER STATE CODES.
4. BY PASS PIPING REQUIRED ON ALL 3" AND LARGER INSTALLATIONS.

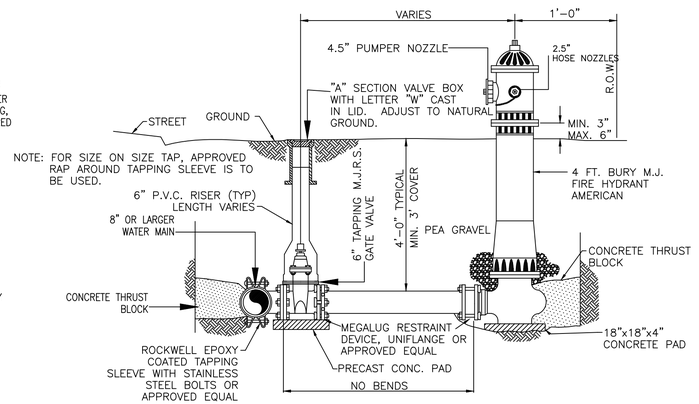
1-1/2" AND LARGER
METER DETAIL
DATE: APRIL 2003



SPECIAL NOTE: CUSTOMER/TENANT IS RESPONSIBLE FOR INSTALLATION OF APPROVED TESTABLE BACK FLOW PREVENTION DEVICE TO BE INSTALLED BY A LICENSED PLUMBER PER STATE PLUMBING CODE. CUSTOMER/TENANT WILL ALSO PROVIDE TEST RESULTS ANNUALLY TO THE WATER DISTRICT.

NOTES
1. TOP OF METER BOX TO BE SET LEVEL WITH TOP OF NATURAL GROUND.
2. SET METER BOX ON 8" LAYER OF PEA GRAVEL.
3. METER RISERS TO BE PLACED AT ALL 3/4" TO 1" METER SET UPS.

COMMERCIAL
2" SERVICE CONNECTION
WITH 1" METER DETAIL
DATE: APRIL 2003



NOTE: SEE SHEET 13 FOR M.J. GATE VALVE DETAIL.

FIRE HYDRANT
& TAPPING VALVE DETAIL
DATE: JAN. 2004

GALVESTON COUNTY W.C.I.D. #1
STANDARD CONSTRUCTION DETAILS
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STANDARD
WATER
DETAILS
SHEET 1 OF 2

GALVESTON COUNTY W.C.I.D. #1

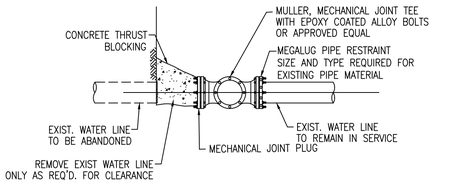
DRAWN BY:
DATE: July 14, 2003
REVISED: SEPT. 17, 2013
SCALE: N.T.S.
DRAWING NUMBER: WATER-DETAIL

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

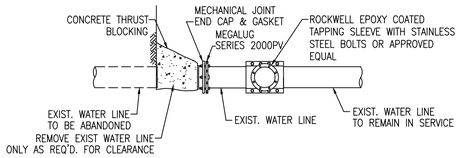
SHEET No. 43 Of 48

H:\ACAD\Clients\224\2020\Design\224-0020-43 WATER DET 1.dwg (XREF)

02/04/16



CUT AND PLUG DRY CONNECTION
WITH MECHANICAL JOINT TEE



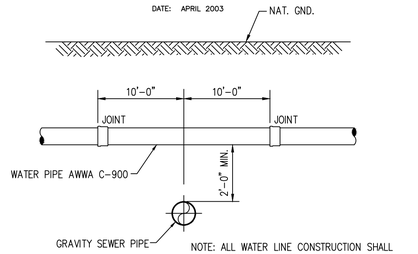
CUT AND PLUG WET CONNECTION
WITH TAPPING SLEEVE

NOTES
SEE PAGE 1 FOR VALVE CONNECTIONS TO TEES AND TAPPING SLEEVES.

FOR SIZE ON SIZE TAPPING, SEE PAGE 1 FOR SPEC. INFO ON FULL CIRCLE TAPPING SLEEVE.

CUT & PLUG CONNECTIONS
FOR MECHANICAL JOINT TEE
& TAPPING SLEEVE

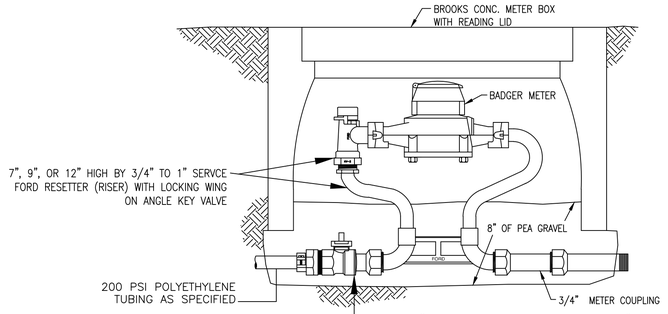
DATE: APRIL 2003



NOTE: ALL WATER LINE CONSTRUCTION SHALL COMPLY WITH SECTION 290.44 WATER DISTRIBUTION DESIGN AND STANDARDS OF THE WATER UTILITY RULES LAST REVISION, SET FORTH BY THE TCEQ.

SPECIAL WATER LINE
CONSTRUCTION AT SEWER LINE
CROSSING

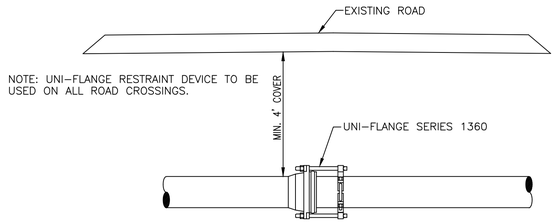
DATE: APRIL 2003



NOTE: 1" METER RISER WILL REQUIRE A 1" METER COUPLING TO CONNECT TO 1" CURB STOP.

METER RISER AND DUAL CHECK
BACKFLOW PREVENTER DETAIL

DATE: JAN. 2004

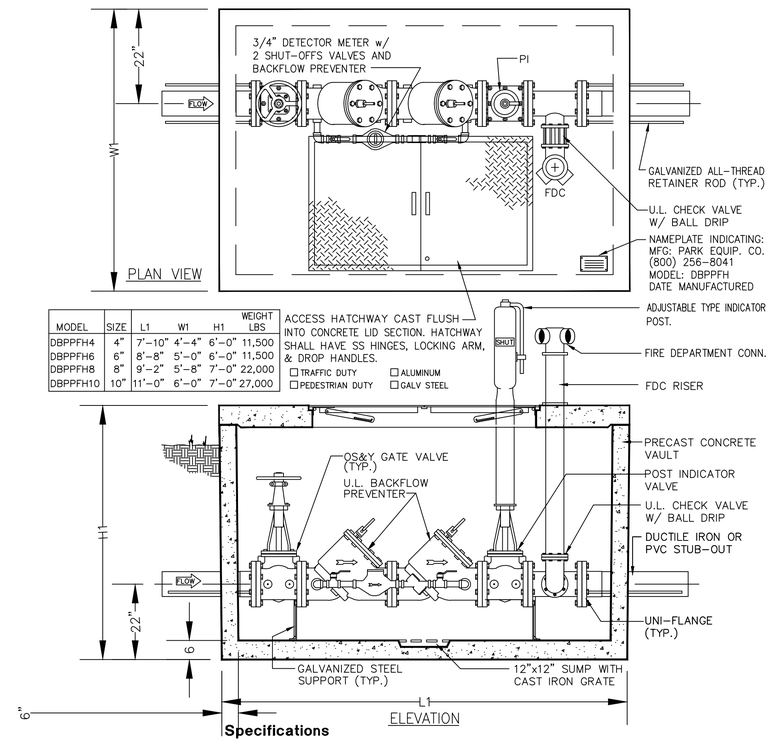


NOTE: UNI-FLANGE RESTRAINT DEVICE TO BE USED ON ALL ROAD CROSSINGS.

SPECIFICATIONS:
1. RESTRAINT DEVICES FOR P.V.C. (AWWA C-900) AND P.V.C. PRESSURE FITTINGS (AWWA C-907) SHALL CONSIST OF A SPLIT RING INSTALLED ON THE PIPE SPIGOT, CONNECTED TO A SPLIT BACK-UP RING SEATED BEHIND THE FITTING BELL.
2. THE SPLIT RESTRAINT RING SHALL INCORPORATE A SERIES OF MACHINED SERRATIONS (NOT "AS CAST") ON THE INSIDE DIAMETER TO PROVIDE POSITIVE RESTRAINT, EXACT FIT, AND 360° CONTACT AND SUPPORT OF THE PIPE WALL.
3. THE TWO HALVES OF THE SPLIT BACK UP RING SHALL INTER-LOCK WITHOUT THE NEED FOR ADDITIONAL BOLTS AND SHALL FORM A BEVELED LEADING EDGE TO ASSURE EXACT FIT BEHIND THE FITTING BELL.
4. RESTRAINT DEVICES SHALL BE OF DUCTILE IRON, ASTM A536, GRADE 65-45-12 AND CONNECTING BOLTS SHALL BE OF HIGH STRENGTH, LOW ALLOY MATERIAL IN ACCORDANCE WITH ANSI/AWWA C111/21.11
5. RESTRAINT DEVICES SHALL BE UNI-FLANGE SERIES 1360 OR APPROVED EQUAL.

UNI-FLANGE RESTRAINT
ROAD CROSSING DETAIL

DATE: APRIL 2003



MODEL	SIZE	L1	W1	H1	WEIGHT LBS
DBPPFH4	4"	7'-10"	4'-4"	6'-0"	11,500
DBPPFH6	6"	8'-8"	5'-0"	6'-0"	11,500
DBPPFH8	8"	9'-2"	5'-8"	7'-0"	22,000
DBPPFH10	10"	11'-0"	6'-0"	7'-0"	27,000

ACCESS HATCHWAY CAST FLUSH INTO CONCRETE LID SECTION. HATCHWAY SHALL HAVE SS HINGES, LOCKING ARM, & DROP HANDLES.
☐ TRAFFIC DUTY ☐ ALUMINUM
☐ PEDESTRIAN DUTY ☐ GALV STEEL

Specifications

CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

REINFORCEMENT : Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

HATCHWAY : 1/4" skid-resistant floor plate with structural memebers as required. Frame shall be angle type with concrete embeds. Hatch shall be hinged and have locking arm and drop handles.

FIREWATER BACKFLOW
PREVENTER VAULT DETAIL

DATE: APRIL 2003

GALVESTON COUNTY W.C.I.D. #1
STANDARD CONSTRUCTION DETAILS

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STANDARD
WATER
DETAILS
SHEET 2 OF 2

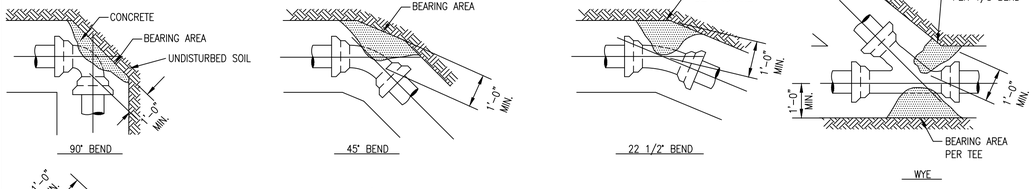
1/16 BEND (22 1/2°)	
PIPE SIZE	BEARING AREA
4"	1 S.F.
6"	2 S.F.
8"	3 S.F.
10"	4 S.F.
12"	6 S.F.
14"	8 S.F.
18"	13 S.F.
24"	24 S.F.

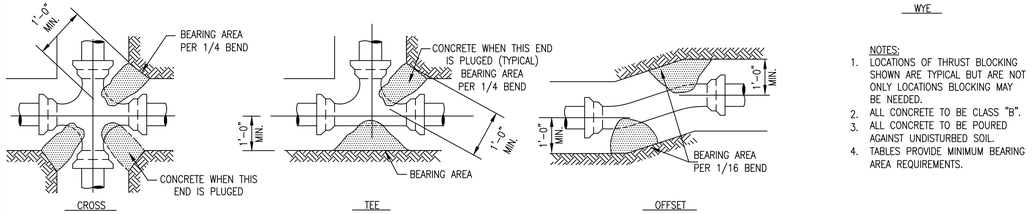
1/8 BEND (45°)	
PIPE SIZE	BEARING AREA
4"	1 S.F.
6"	3 S.F.
8"	5 S.F.
10"	8 S.F.
12"	12 S.F.
14"	16 S.F.
18"	26 S.F.
24"	47 S.F.

1/4 BEND (90°)	
PIPE SIZE	BEARING AREA
4"	3 S.F.
6"	6 S.F.
8"	10 S.F.
10"	16 S.F.
12"	22 S.F.
14"	30 S.F.
18"	49 S.F.
24"	87 S.F.

TEE	
PIPE SIZE	BEARING AREA
4"	2 S.F.
6"	4 S.F.
8"	7 S.F.
10"	11 S.F.
12"	15 S.F.
14"	21 S.F.
18"	34 S.F.
24"	62 S.F.

WATER PIPE RESTRAINT NOTE: DISTRICT REQUIRES MEGALUG RESTRIANT FLANGES ON ALL WATER FITTING INSTALLATIONS AND PIPE RESTRAINTS WITHIN 60 LINER FEET OF ALL IN GROUND FITTINGS. DISTRICT WILL ACCEPT CONCRETE THRUST BLOCKING ON AN AS NEEDED BASES, APPROVED BY DISTRICT.

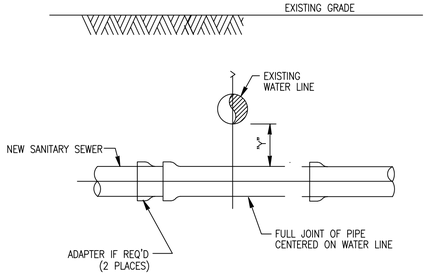




NOTES:
1. LOCATIONS OF THRUST BLOCKING SHOWN ARE TYPICAL BUT ARE NOT ONLY LOCATIONS BLOCKING MAY BE NEEDED.
2. ALL CONCRETE TO BE CLASS "B".
3. ALL CONCRETE TO BE POURED AGAINST UNDISTURBED SOIL.
4. TABLES PROVIDE MINIMUM BEARING AREA REQUIREMENTS.

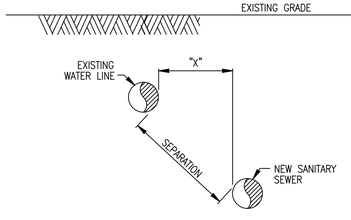
THRUST BLOCK DETAILS

DATE: APRIL 2003



NEW SANITARY SEWER CROSSING EXISTING WATER LINE

INSTALLATION REQUIREMENTS
1. IF "Y" IS GREATER THAN 6" AND "Y" IS LESS THAN 2', USE MINIMUM 18 FT JOINT OF PRESSURE-RATED PIPE PER COH STANDARD DRAWING.
2. IF "Y" IS GREATER THAN 2' AND "Y" IS LESS THAN 9', USE GRAVITY SEWER PIPE IN CEMENT-STABILIZED SAND EMBEDMENT.
3. IF "Y" IS GREATER THAN 9', USE STANDARD EMBEDMENT AND NORMAL JOINT SPACING.



NEW SANITARY SEWER PARALLEL TO EXISTING WATER LINE

INSTALLATION REQUIREMENTS
1. IF "X" IS LESS THAN 9' AND SEPARATION IS LESS THAN 9', USE PRESSURE-RATED PIPE MH TO MH. "X" MUST BE AT LEAST 4 FT.
2. IF "X" IS GREATER THAN OR EQUAL TO 4' AND SEPARATION IS 9' OR GREATER, USE STANDARD PIPE AND EMBEDMENT.

SANITARY SEWER
INSTALLING SANITARY SEWERS
CROSSING OR PARALLEL TO WATER LINES
(NOT TO SCALE)

NOTES:
1. SANITARY SEWER MUST BE BELOW WATER LINE WHEREVER POSSIBLE. WHEN WATERLINE IS BELOW THE SANITARY SEWER PROVIDE MINIMUM 2 FT SEPARATION AND INSTALL PIPE SAME AS FOR SEWER BELOW WATER.
2. WHEN PRESSURE-RATED PIPE IS REQUIRED, PROVIDE PIPE WITH MINIMUM 150 psi PRESSURE RATING.
3. ADAPTERS MUST BE FACTORY MOLDED OR FABRICATED, WITH RING STIFFNES AT LEAST EQUAL TO THE ADJOINING SANITARY SEWER PIPE, AND USING RESILIENT GASKET OR SEAL MATERIAL. FLEXIBLE RUBBER "BOOT" TYPE ADAPTERS WILL NOT BE ACCEPTED.
4. INSTALL FORCE MAINS SAME AS FOR GRAVITY SEWER, USING SPECIFIED PRESSURE PIPE.
5. "Y" MUST ALWAYS BE GREATER THAN OR EQUAL 6".
6. "X" MUST BE GREATER THAN OR EQUAL TO 4 FT.
7. ALTERNATIVES MAY BE SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
8. SEPARATION REQUIREMENTS SHOWN HERE DO NOT APPLY TO SERVICE CONNECTIONS - REFER TO PLUMBING CODE FOR APPLICABLE REQUIREMENTS.

TABLE 02730-04
SEWER LINE CROSSING BELOW WATER LINE WITHIN 2 FT SEPARATION

GRAVITY SANITARY SEWER PIPE SIZE	PRESSURE-RATED PIPE SIZE & TYPE (NOTE 2)	ADAPTERS REQUIRED
6" TO 12" (ASTM D3034)	SAME SIZE ASTM D2241, SDR 26	ASTM D3034 TO D2665 (SEWER TO D.W.V.) ADAPTER COUPLING
15" (ASTM D3034)	14" LINED DUCTILE IRON OR AWWA C905, DR25	NONE REQUIRED
18" AND 24"	SAME SIZE AWWA C905, PRESSURE-RATED FRP, OR LINED DUCTILE IRON, MANHOLE TO MANHOLE	NONE REQUIRED
21" AND 27"	PRESSURE PIPE NOT AVAILABLE. SEE CASING ALTERNATIVE	NOT APPLICABLE
30" AND LARGER	SAME SIZE PRESSURE-RATED FRP OR LINED DUCTILE IRON, MANHOLE TO MANHOLE	NOT APPLICABLE
CASING ALTERNATIVE: ANY SIZE AND TYPE	INSTALL AS CASING PIPE MIN 18 FT JOINT OF PRESSURE PIPE AT LEAST 2 NOMINAL SIZES LARGER THAN SAN. SEWER CARRIER PIPE. GROUT ANNULAR SPACE WITH TUNNEL GROUT	NOT APPLICABLE

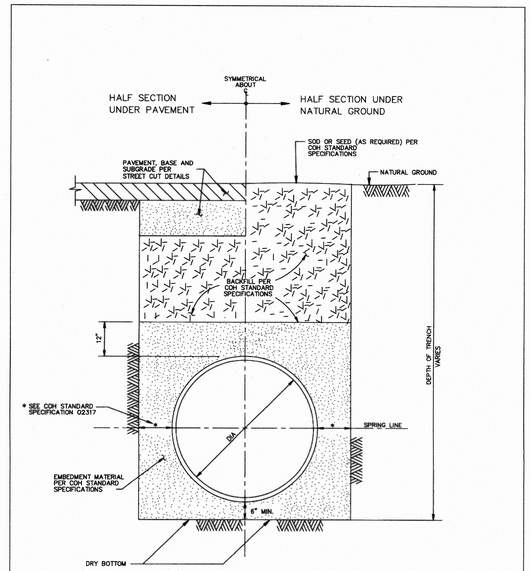
DRAWN BY:
DATE: July 14, 2003
REVISED: SEPT. 17, 2013
SCALE: N.T.S.
DRAWING NUMBER: WATER-DETAIL

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
4/2016

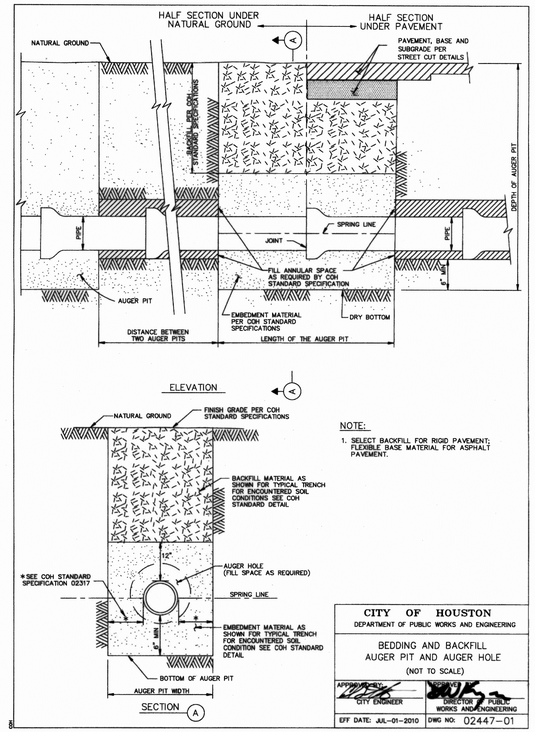
SHEET No. 44 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-44 WATER DET 2.dwg (XREF)

02/04/16

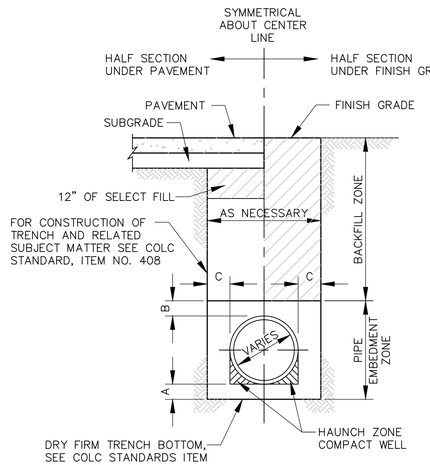


CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
WATER DISTRIBUTION MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES (NOT TO SCALE)	
APPROVED: CITY ENGINEER	APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010	DWG NO: 02317-04



NOTE:
1. SELECT BACKFILL FOR RIGID PAVEMENT; FLEXIBLE BASE MATERIAL FOR ASPHALT PAVEMENT.

CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE (NOT TO SCALE)	
APPROVED: CITY ENGINEER	APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010	DWG NO: 02447-01



DIMENSIONAL REQUIREMENTS

PIPE SIZE	A	B	C
20" AND SMALLER	6"	12"	9"
21" THRU 48"	6"	12"	12"
54" THRU 66"	9"	12"	15"
72" AND LARGER	12"	18"	15"

MATERIAL REQUIREMENTS

BACKFILL ZONE

1. IN PAVED AREAS, USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY, TO WITHIN 12" OF SUBGRADE.

2. IN UNPAVED AREAS, USE SOIL EXCAVATED FROM TRENCH, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

PIPE EMBEDMENT ZONE

1. FOR STORM AND SANITARY SEWERS, USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

2. FOR WATER LINES, USE SAND AS DESCRIBED IN THE COLC STANDARD, ITEM NO. 407.14.1. PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

SPECIAL NOTE:
ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT EDGE OR CITY STREET SHALL REQUIRE 1-1/2 SACK CEMENT STABILIZED BACKFILL UP TO ROAD BASE. COMPACTED IN 8" LIFTS WITH VIBRATORY PLATE.

WATER, SANITARY AND STORM BEDDING AND BACKFILL FOR DRY STABLE TRENCH

N.T.S.

Revision	By	Chk.	Appr.	Date

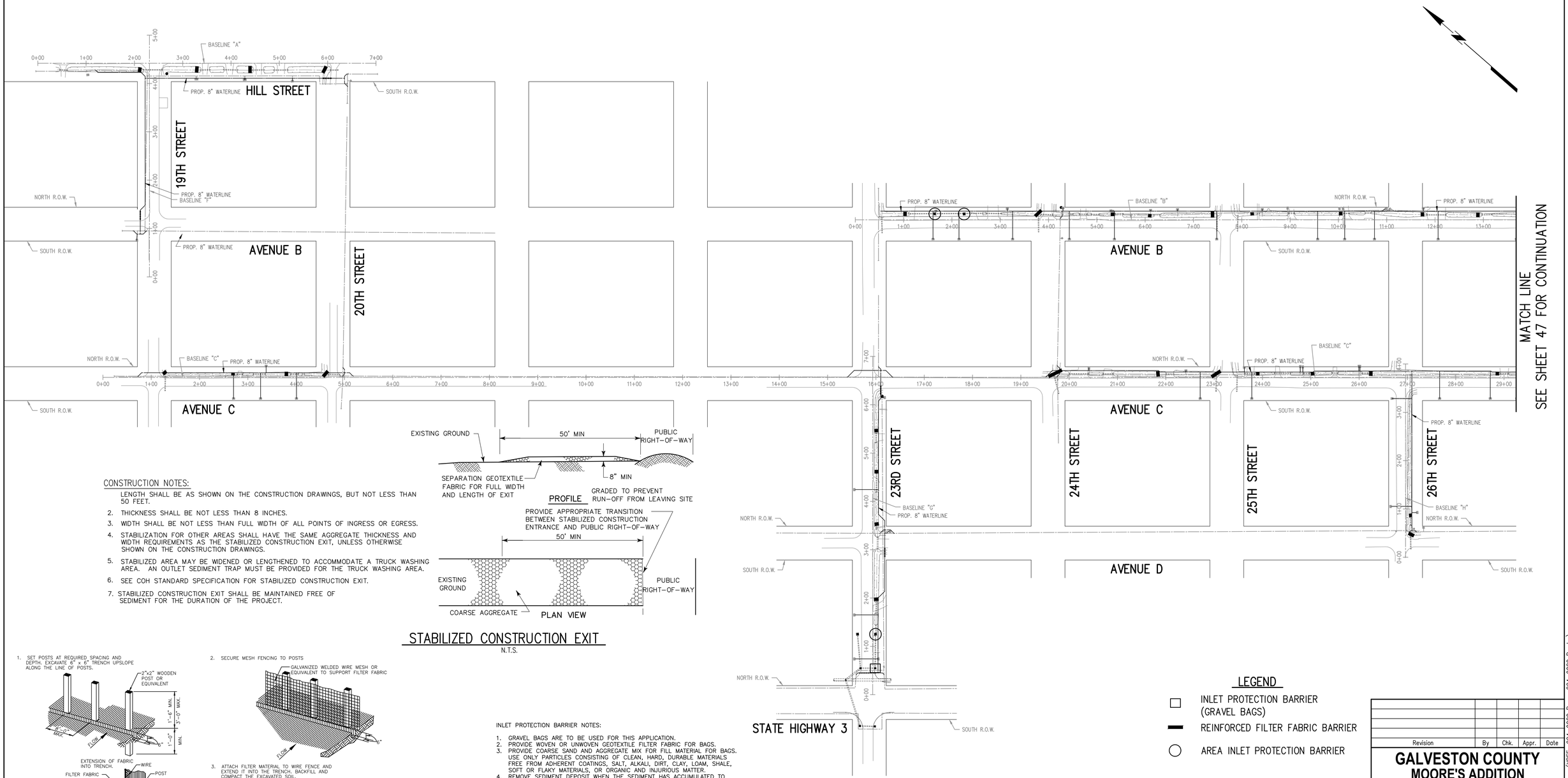
GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

MISCELLANEOUS DETAILS

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 45 Of 48

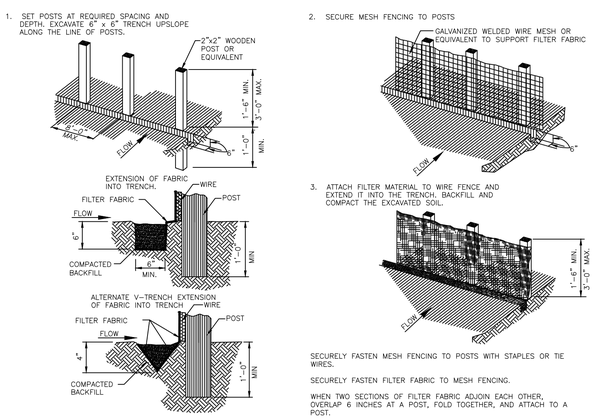
H:\ACAD\Clients\224\0020\Design\224-0020-45 MISC DET.dwg (XREF- 224-0020 Border)



CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE A TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
6. SEE COH STANDARD SPECIFICATION FOR STABILIZED CONSTRUCTION EXIT.
7. STABILIZED CONSTRUCTION EXIT SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

STABILIZED CONSTRUCTION EXIT
N.T.S.



SECURELY FASTEN MESH FENCING TO POSTS WITH STAPLES OR TIE WIRES.

SECURELY FASTEN FILTER FABRIC TO MESH FENCING.

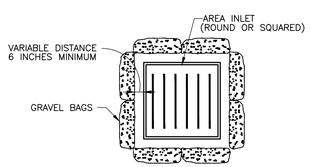
WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, OVERLAP 6 INCHES AT A POST, FOLD TOGETHER, AND ATTACH TO A POST.

REMOVE SEDIMENT DEPOSITS WHEN SILT REACHES ONE-THIRD OF THE HEIGHT OF THE FENCE IN DEPTH.

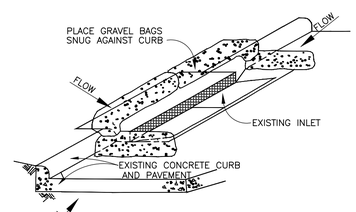
REINFORCED FILTER FABRIC BARRIER
N.T.S.

INLET PROTECTION BARRIER NOTES:

1. GRAVEL BAGS ARE TO BE USED FOR THIS APPLICATION.
2. PROVIDE WOVEN OR UNWOVEN GEOTEXTILE FILTER FABRIC FOR BAGS.
3. PROVIDE COARSE SAND AND AGGREGATE MIX FOR FILL MATERIAL FOR BAGS. USE ONLY PARTICLES CONSISTING OF CLEAN, HARD, DURABLE MATERIALS FREE FROM ADHERENT COATINGS, SALT, ALKALI, DIRT, CLAY, LOAM, SHALE, SOFT OR FLAKY MATERIALS, OR ORGANIC AND INJURIOUS MATTER.
4. REMOVE SEDIMENT DEPOSIT WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-THIRD THE HEIGHT OF THE BARRIER.



AREA INLET PROTECTION BARRIER
N.T.S.



INLET PROTECTION BARRIERS (GRAVEL BAGS)
N.T.S.

LEGEND

- INLET PROTECTION BARRIER (GRAVEL BAGS)
- REINFORCED FILTER FABRIC BARRIER
- AREA INLET PROTECTION BARRIER

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STORM WATER POLLUTION PREVENTION PLAN & DETAILS
SHEET 1 OF 2

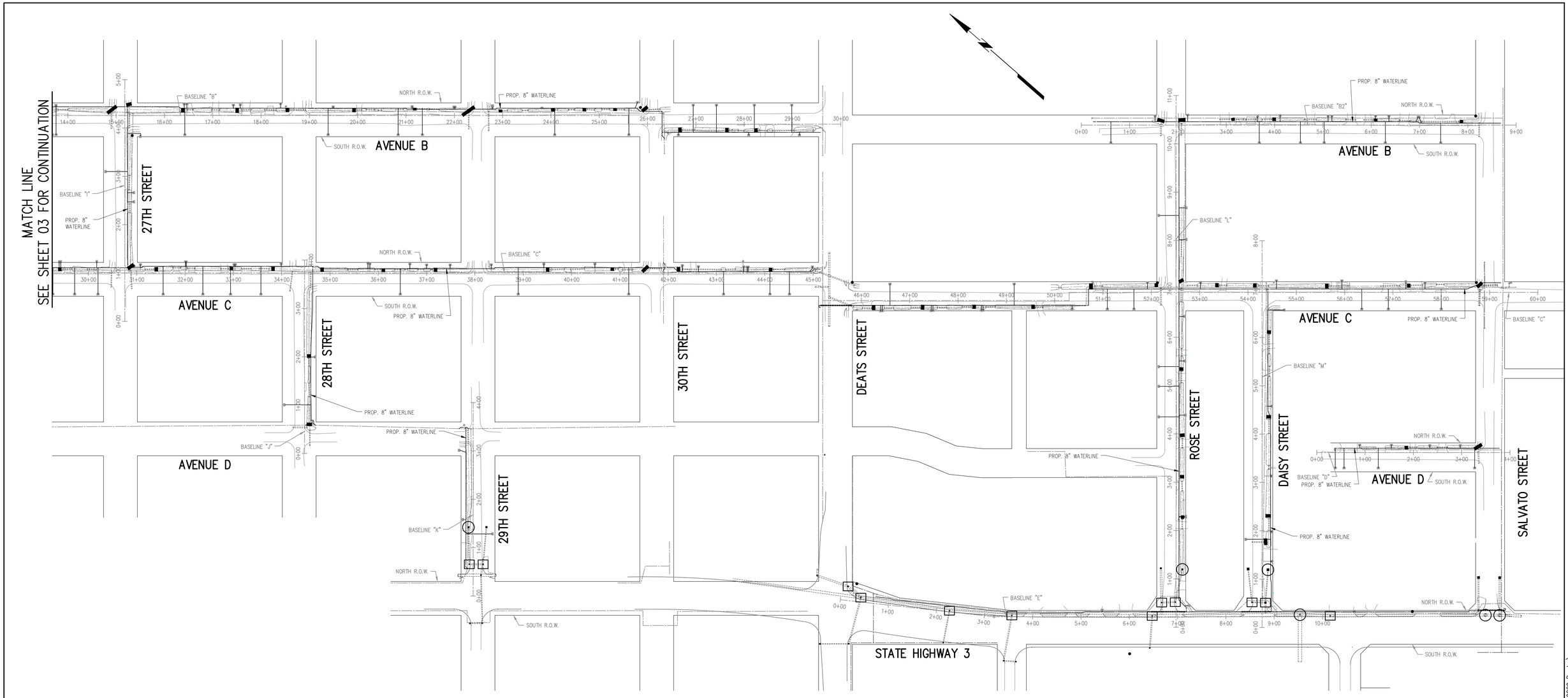
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 1, 2016

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=100'
APPROVED:	SHEET No. 46 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-46-SWPPP 1.dwg (XREF: 224-0020 Base: 224-0020 Border)

02/04/16



LEGEND

- INLET PROTECTION BARRIER (GRAVEL BAGS)
- REINFORCED FILTER FABRIC BARRIER
- AREA INLET PROTECTION BARRIER

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STORM WATER POLLUTION PREVENTION PLAN & DETAILS
SHEET 2 OF 2

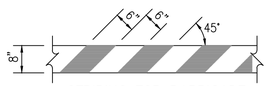
LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

STATE OF TEXAS
MARK E. HAVRAN
118610
LICENSED PROFESSIONAL ENGINEER
Feb 4, 2016

DESIGN: J.C.F.	JOB No. E224-0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=100'
APPROVED:	SHEET No. 47 Of 48

H:\ACAD\Clients\224\0020\Design\224-0020-47-SWPPP 2.dwg (XREF: 224-0020 Base: 224-0020 Border)

02/04/16



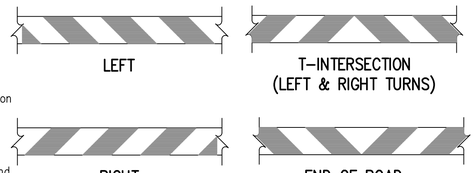
STRIPING FOR BARRICADE

For all types of barricades with rails less than 3'–0" long. Stripes 4" wide shall be used. Identification markings may be shown only on back side of barricade rails.

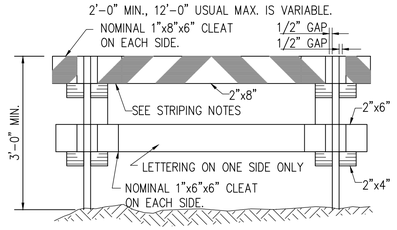
Striping should cover the full width of the rail striping of rails, panels, etc., should slope downward at an angle of 45 degrees in direction traffic is to pass.

Where a barricade extends entirely across a roadway, it is desirable that the stripes slope downward in the direction which traffic must turn in detouring. When both right and left turns are provided for, the chevron striping may slope downward in both directions from the center of the barricade.

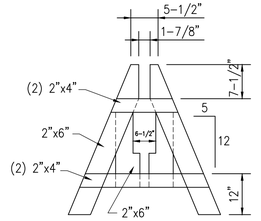
Barricades with stripes which begin at the upper right side and slope downward to the lower left side are to be designated as "Right" (R) Barricades. Barricades with stripes which begin at the upper left side and slope downward to the lower right side are to be designated as "Left" (L) Barricades.



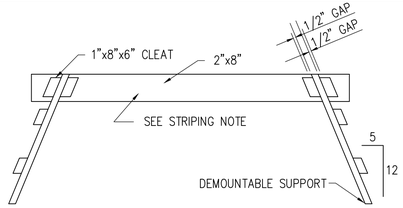
STRIPING DIRECTION DETAILS



STANDARD DETAIL

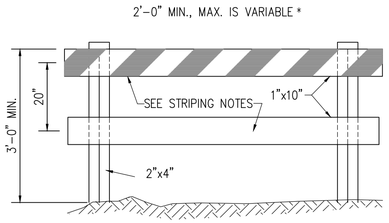


DEMOUNTABLE SUPPORT DETAIL



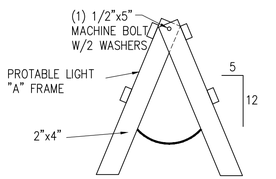
ALTERNATE DETAIL

TYPE I BARRICADE



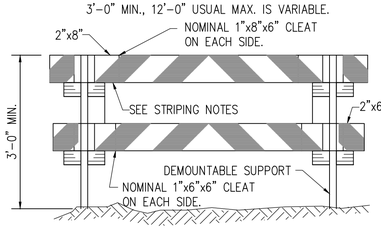
STANDARD DETAIL

* 3' MAX. WIDTH FOR "A" FRAME CONFIGURATION,
4' & LONGER USE DEMOUNTABLE SUPPORT SHOWN ABOVE.

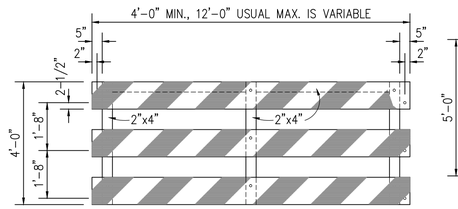


"A" FRAME SUPPORT DETAIL

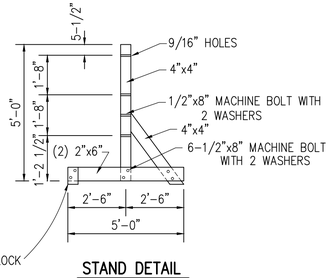
TYPE II BARRICADE



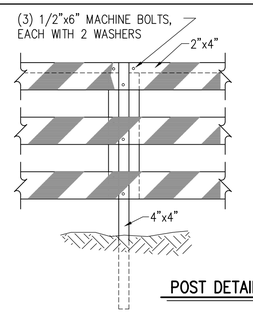
ALTERNATE DETAIL



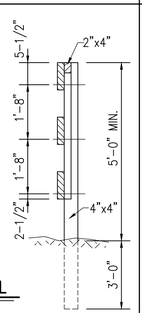
PANEL DETAIL

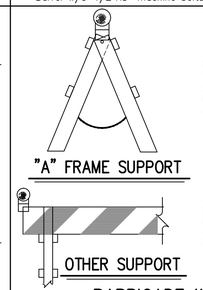


STAND DETAIL

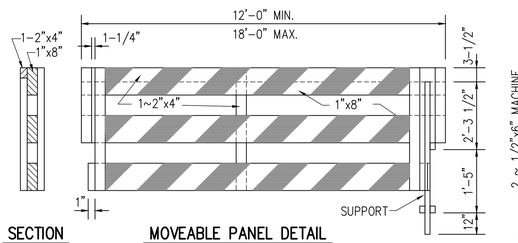


POST DETAIL



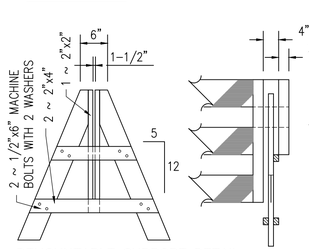


BARRICADE W/LIGHT DETAIL

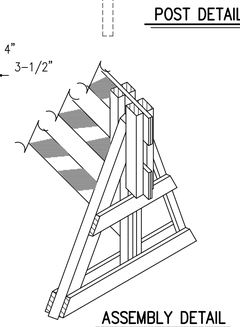


SECTION

MOVEABLE PANEL DETAIL

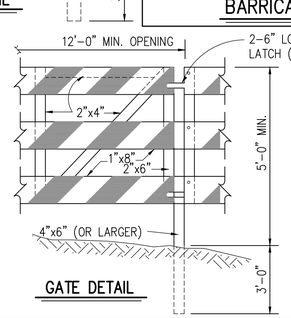


DEMOUNTABLE SUPPORT DETAIL

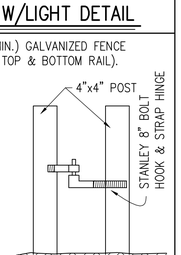


ASSEMBLY DETAIL

TYPE III BARRICADE



GATE DETAIL



GATE HINGE DETAIL

CONES

Traffic cones and tubular markers shall be a minimum of 24 inches in height with a broadened base and may be made of various materials to withstand impact without damage to themselves or to vehicles. Larger sizes should be used on freeways and other roadways where speeds are relatively high or wherever more conspicuous guidance is needed. Orange shall be the predominant color on cones and tubular markers. They should be kept clean and bright for maximum target value. For nighttime use they shall be reflectorized or equipped with lighting devices for maximum visibility. Reflectorized material shall have a smooth, sealed outer surface which will display the same approximate color day and night.

Reflectorization of tubular markers shall be a minimum of two three–inch bands placed a maximum of 2" from the top with a maximum of 6" between the bands. Reflectorization of cones shall be provided by a minimum 6" band placed a maximum of 3" from the top.

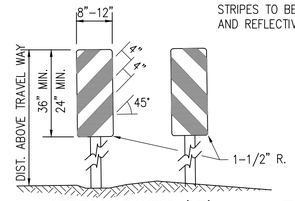
Cones or tubular markers are only suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels or barricades preferred for longer term usage. Care should be taken to insure that they remain in their proper location and in an upright position.

Wood or Metal panel required under metal drum when set on asphalt pavement unless otherwise directed by the Engineer.

DRUMS

Drums, set on end, and used for traffic warning or channelization shall be approximately 35" in height and minimum of 18" in diameter. The contractor, at his option, may use drums made from steel barrels or black polyethylene plastic drum liners weighing approximately eight pounds each. The markings on drums shall be horizontal, circumferential, reflectorized orange and reflectorized white stripes, 4 to 8 inches wide. The first reflectorized stripe should start within two (2) inches of the top of the drum. There shall be at least two orange and two white stripes on each drum. If there are non–reflectorized spaces between the horizontal orange and white stripes, they shall be no more than 2 inches wide. Metal drums shall be painted black or orange before reflectorized stripes are added. All drums on a project will be the same color. When drums are placed in the roadway, appropriate warning signs should be used. During hours of darkness, a flashing warning light should be placed on drums used singly as a warning device. Steady burn electric lights of channelization should be placed on drums used in series for traffic channelization. Drums shall be weighted with sand.

CW–8 CHEVRON signs, CW–6A ARROW signs or VP–1 Vertical Panels mounted above drums may be used as supplements to drum delineation. (Vertical Panels w/ post shall be bolted to Barrel w/3~1/2"X8" machine bolts w/2 washers on 9" spacing.



VERTICAL PANELS (VP)

TYPICAL PORTABLE VERTICAL PANEL OR DELINEATOR

Vertical Panels are normally used as channelizing devices to indicate tangent or nearly tangent roadway alignment where good target value of a device is needed in daytime as well as the nighttime. In addition, vertical panels should be used at the edge of shoulder drop–offs and other areas such as lane transitions where positive day and night delineation may be required. Vertical Panels should be mounted back to back if used at the edge of cuts adjacent to two–way two lane roadways. Stripes should always slope downward toward the traveled way.

CHANNELIZING DEVICES

BARRICADE NOTES

The most recent edition of the TEXAS Manual on Uniform Traffic Control Devices (MUTCD), and its revisions, shall govern the construction and use of all items herein described.

Channelizing devices other than barricades should normally be used for channelization purposes.

Barricades should be placed perpendicular to the traffic flow. Other channelizing devices, such as drums, vertical panels or portable barriers, should be used where needed to separate traffic from the work area. In all cases, the barricades should be located to warn and direct traffic.

Barricades may be designed and constructed from wolmanized wood or any other suitable material in a manner approved by the Owner/Engineer. The barricade shown hereon are typical and are suggested details for wood support systems. The details of rail width and striping, number and spacing of rails, minimum length and height (above pavement) of rails must be adhered to, whether or not the alternate designs are used. (See Detail This Sheet).

Barricades are to be constructed in a first–class workmanship manner of clean sound material. All surfaces above ground, which are not striped, shall be white except unpainted galvanized metal or aluminum components. Components made of lumber shall be painted with a minimum of two coats of an approved brand of exterior white paint to secure thorough coverage and a uniform white color.

The reflectorized white and reflectorized orange (reflectorized red) stripes for barricades, drums, and vertical panels shall be constructed of "High intensity sheeting and shall be maintained to meet the appearance, color, and reflectivity requirements set by the MUTCD.

The Contractor shall maintain each barricade in a clean and good condition.

Barricades shall be removed upon completion of the work and/or the elimination of the hazard on any section.

Type I Barricades shall consist of a striped upper horizontal rail mounted on demountable supports at either end and fabricated in such manner that the rail or rails can be assembled or disassembled to or from the supports with ease. The standard Barricade design has a lower rail not required on the alternate design. A Type I Barricade is intended for use where the hazard is relatively small, for minor maintenance and repair work or for the continuous marking of a restricted roadway. Type I rails that are striped on both sides should be striped in opposite directions.

Type II Barricades shall consist of an upper an lower rail fastened to a support. The support should be of an "A" frame configuration, hinged or otherwise fastened at the top to permit convenient folding and stacking for transporting from one work site to another. Since portability is a prime consideration, the materials chosen for the barricades should be as light weight as possible and structurally sound. Sandbags should be used for ballast when required. A Type II Barricade is intended for use where the area is quite confined such as on city streets, or the continuous marking of a restricted roadway, or for temporary daytime use.

Type III Barricades should consist of three striped horizontal rails and assembled as a panel for mounting to posts or skids. Type III Barricades are typically permanent in nature and are required to function in one location for a relatively long time. When the Type III (Moveable) Barricades are constructed on bases or skids instead of posts set into the ground, it may be desirable to ballast the bases with sandbags to provide added resistance to overturning during periods of high winds.

An orange flag may be mounted on Type I, Type II and Type III Barricades for increased daytime emphasis. For night time use, it is desirable to add flashing warning light when barricades are used singly and a steady burn light when barricades are used in a series for channelization.

CONSTRUCTION OF BARRICADES

The barricades may be fixed or moveable, depending on the location and application.

Movable barricades are appropriate where the construction or maintenance operations are of short duration, and/or are progressively shifted along a roadway. The design of movable mounting must be such as to resist overturning by ordinary strong winds or by chance contact with vehicles. Fixed barricades are justified only for major construction or reconstruction.

Movable Type III Barricades are generally of heavy construction with a heavy base.

BARRICADE CHARACTERISTICS

TYPE	I	II	III
WIDTH OF RAIL	8 IN. MIN. – 12 IN. MAX.	8 IN. MIN. – 12 IN. MAX.	8 IN. MIN. – 12 IN. MAX.
LENGTH OF RAIL	2 FT. MIN. – VARIABLE MAX.	2 FT. MIN. – VARIABLE MAX.	2 FT. MIN. – VARIABLE MAX.
WIDTH OF STRIPES *	6 IN.	6 IN.	6 IN.
HEIGHT	3 FT. MIN.	3 FT. MIN	3 FT. MIN.
NUMBER OF REFLECTORIZED RAIL FACES	2 (ONE EACH DIRECTION)	4 (TWO EACH DIRECTION)	3 (IF FACING TRAFFIC IN ONE DIRECTION) OR 6 (IF FACING TRAFFIC IN TWO DIRECTIONS)

FOR WOODEN BARRICADES, NOMINAL LUMBER DIMENSIONS WILL BE SATISFACTORY.

* FOR RAILS LESS THAN 3 FT. LONG, 4 IN. WIDE STRIPES MAY BE USED.

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
MOORE'S ADDITION
WATERLINE REHABILITATION

STANDARD BARRICADE DETAILS

LJA Engineering, Inc.
11821 East Freeway
Suite 360
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E224–0020 Cont. No.
DRAWN: J.C.F./P.R.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 48 Of 48

H:\ACAD\Clients\224\0020\Design\224–0020–48–STD BAR.dwg (XREF: 224–0020 Border)

04/30/15