Calcasieu Parish Sheriff's Office

Temporary Trailer Park

Lake Charles, LA

Bid Documents

Prepared by

ROYAL
engineeringpossibilities.

Royal Engineers & Consultants, LLC

1231 Camellia Blvd.

Lafayette, LA 70508

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Summary of Bid Requirements

- Completed Uniform Public Works Bid Form and Unit Price Bid Form
- Proof of Builder's Risk Insurance
- Bid Bond
- Contract Duration shall be **30 calendar days** from NTP
- **Stipulated Damages**: For each calendar day that the work remains uncompleted after expiration of the contract time, **$1500.00** will be deducted from payments for the work, not as a penalty but as stipulated damages. Permitting the Contractor to continue work after expiration of the contract will not operate as a waiver by the Owner of its rights under the contract. The amount of assessed stipulated damages will be deducted from payment for the work under the contract. The contractor and surety shall be solidarily liable for stipulated damages in excess of any remaining amounts due the contractor under the contract.

Scope of Work

SITE WORK

- CLEAR AND GRUB SITE, INCLUDING 4" DEGRASSING.
- GRADE THE SITE
    - TO BE PAID AS EXCAVATION AND EMBANKMENT BY THE LUMP SUM
    - GRADE SITE TO PROVIDE DESIRED 0.57% SLOPE TO DITCHES (SEE TYPICAL SECTION).
    - GRADE SITE IN ACCORDANCE WITH GRADING PLAN AND TO MINIMIZE EXCAVATION & EMBANKMENT REQUIRED. SOILS FOR EMBANKMENT SHOULD BE OBTAINED FROM THE DESIGNATED BORROW PIT LOCATION AND FROM OTHER EXCAVATION ACTIVITIES ON-SITE. NO DIRECT PAYMENT WILL BE MADE FOR SOILS HAULED IN TO GRADE SITE.
    - CUT DITCHES ALONG NORTH AND SOUTH BOUNDARIES OF SITE TO DIRECT DRAINAGE FLOW TO EXISTING DITCHES.
- INSTALL (2) 18" RIBBED PVC CULVERTS FOR DRIVEWAY ACCESS.
- INSTALL LIMESTONE SURFACING WHERE DESIGNATED.
    - INSTALL GEOTEXTILE FABRIC.
    - INSTALL GEOGRID.
    - ACCESS TO SITE AND DUMPSTER PAD SHALL HAVE MIN. 10" LIMESTONE THICKNESS, AND OTHER ROADWAY AND PARKING PAD AREAS SHALL HAVE 6" THICKNESS.
    - INSTALL 4 FT WIDE X 4 INCH THICKNESS LIMESTONE WALKWAY FROM EACH PARKING PAD TO TRAILER STEPS.
    - FINISHED GRADE SHALL HAVE 0.57% DESIRED SLOPE TO DITCHES (SEE TYPICAL SECTION AND GRADING PLAN).

WATER

- WATER SERVICE IS SUPPLIED BY CITY OF LAKE CHARLES WATER DIVISION.
- 6" PVC WATER SUPPLY WILL TIE-IN TO EXISTING WATER MAIN (SIZE NOT IDENTIFIED) NORTH OF THE SITE ALONG JAMES SUDDETH PKWY WHERE THE EXISTING WATER MAIN TERMINATES. 6"

SUPPLY SHALL BE INSTALLED BELOW GRADE UP TO THE LOCATION OF THE SITE'S ACCESS DRIVEWAY. A FIRE HYDRANT WITH 6" LEAD SHALL BE INSTALLED AT THIS LOCATION.

- WATER SUPPLY LINE SHALL REDUCE TO 4" PVC AFTER THE FIRE HYDRANT. A SERVICE METER AND GATE VALVE SHALL BE INSTALLED ADJACENT TO THE SITE ACCESS DRIVEWAY. 4" PVC WATER LINE SHALL CONTINUE BELOW GRADE UNTIL AFTER THE 2ND ROADWAY CROSSING. A RISER SHALL BE INSTALLED AT THIS LOCATION TO BRING THE WATER LINE ABOVE GRADE.
- INSTALL 4" PVC WATER SUPPLY ABOVE GRADE WITHIN THE UTILITY CORRIDOR.
- WHERE THE 4" PVC WATER SUPPLYI IS TO BE INSTALLED ABOVE GRADE, THE PIPE SHOULD BE SUPPORTED AT EACH JOINT LOCATION, AS DETAILED.
- INSTALL 1" HDPE SERVICE LINE TO EACH TRAILER, INCLUDING ALL FITTINGS, VALVES, ETC. REQUIRED BY THE PLANS AND REFERENCED SPECS.
- PIPE SPECIFICATIONS AND DRAWINGS TO BE PROVIDED FOR APPROVAL, PRIOR TO WORK BEING PERFORMED.
- NO EXCAVATIONS FOR WATER SERVICES WILL BE DONE.
- INSTALL HOUSE CONNECTION FROM EACH SERVICE LINE TO TRAILER HOUSE.

SEWER

- SEWER SERVICE IS PROVIDED BY CITY OF LAKE CHARLES WASTEWATER DIVISION.
- 8" PVC SEWER SERVICE WILL TIE-IN TO EXISTING 12" PVC SEWER LINE NORTH OF THE SITE ALONG JAMES SUDDETH PKWY WHERE THE EXISTING SEWER MAIN TERMINATES.
- 8" PVC SEWER SERVICE SHALL BE INSTALLED AT SPECIFIED SLOPES (0.4% MINIMUM).
- WHERE THE 8" SEWER SERVICE IS TO BE INSTALLED ABOVE GRADE, THE PIPE SHOULD BE SUPPORTED AT EACH JOINT LOCATION, AS DETAILED.
- INSTALL 6" PVC INDIVIDUAL SERVICE LINES TO EACH TRAILER, INCLUDING WYE FITTING AT CONNECTION TO 8" SEWER AND CLEANOUT AT UPPER END.
- PIPE SPECIFICATIONS AND DRAWINGS TO BE PROVIDED FOR APPROVAL, PRIOR TO WORK BEING PERFORMED.
- NO EXCAVATIONS FOR SEWER SERVICES WILL BE DONE.
- INSTALL HOUSE CONNECTION FROM EACH SERVICE LINE TO TRAILER HOUSE.

ELECTRIC

- ELECTRICITY TO BE PROVIDED BY ENTERGY.
- INSTALL POWER POLES AND OVERHEAD ELECTRIC LINES TO PROVIDE POWER TO SITE.
- INSTALL JUNCTION BOXES.
- INSTALL ELECTRICAL HOUSE CONNECTIONS VIA CONDUIT INSTALLED ABOVE GROUND.
- ELECTRIC UTILITIES TO BE DESIGNED BY OTHERS. DESIGN AND DETERMINATION OF REQUIREMENTS OF ALL ELECTRICAL WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.

MISC

- INSTALL FENCE AROUND PERIMETER OF SITE, INCLUDING GATED ENTRANCE.
- INSTALL FENCE AROUND PERIMETER OF UTILITY CORRIDOR, INCLUDING GATES AT EAST AND WEST ENDS OF CORRIDOR.

General Notes

GENERAL

1. ALL WORK PERFORMED MUST COMPLY WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION AND ALL REFERENCES THEREIN, EXCEPT AS MODIFIED BY THESE PLANS.
2. ALL REFERENCES TO THE LADOTD STANDARD SPECIFICATIONS SHALL BE THE CURRENT EDITION: THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.
3. ALL DRAWINGS/DETAILS/FIGURES INCLUDED IN THESE DOCUMENTS ARE STANDARD AND ARE SUBJECT TO ADJUSTMENTS DICTATED BY ENGINEER OR EXISTING FIELD CONDITIONS.
4. ACQUISITION OF ALL RELEVANT PERMITS AND APPROVALS PRIOR TO PERFORMING WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. BEFORE ANY WORK IS STARTED THE CONTRACTOR SHALL CALL "LOUISIANA ONE CALL" AT 1-800-272-3020.
6. CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION CONTAINED IN THESE DRAWINGS PRIOR TO COMMENCING CONSTRUCTION (NO DIRECT PAY). IN THE EVENT OF ANY DISCREPANCIES AND / OR ERRORS FOUND IN THE DRAWINGS, OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF ENGINEER IS NOT NOTIFIED, THE CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE COST OF ANY WORK AND MATERIALS USED.
7. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER TO PREVENT DAMAGE TO ALL EXISTING TRAFFIC SIGNS AND PROPERTY. DAMAGED OR MISSING SIGNS AND PROPERTY SHALL BE REPLACED AND REESTABLISHED BY THE CONTRACTOR IN KIND ACCORDING TO THE SPECIFICATIONS. ALL COSTS ASSOCIATED WITH REPLACEMENT AND REESTABLISHMENT OF THESE SIGNS AND PROPERTY IS AT NO COST TO THE OWNER.
8. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY OWNERS OF ALL UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCING WORK TO ENSURE ALL UTILITY OWNERS ARE AWARE OF THE PROJECT AND CONSTRUCTION ACTIVITIES IN THE VICINITY OF SAID UTILITIES.
9. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A CLEAN AND ORGANIZED JOB SITE AND SHALL CLEAN THE SITE OF TRASH DAILY - TO INCLUDE CLEANING ALL ROADWAYS AFFECTED BY THE PROJECT. (NO DIRECT PAY)
10. DAMAGES TO EXISTING STREETS, DRAINAGE, OTHER UTILITY STRUCTURES, AND RESIDENT PROPERTIES CAUSED BY CONTRACTOR SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR TO ORIGINAL CONDITIONS.
11. NOISE CONTROL - CONTRACTOR SHALL TAKE MEASURES TO AVOID UNNECESSARY NOISE APPROPRIATE FOR THE AMBIENT SOUND LEVELS IN THE AREA DURING WORKING HOURS.

ALL CONSTRUCTION MACHINERY AND VEHICLES SHALL BE EQUIPPED WITH PRACTICAL SOUND MUFFLING DEVICES AND OPERATED IN A MANNER TO CAUSE THE LEAST NOISES, CONSISTENT WITH EFFICIENT PERFORMANCE OF THE WORK.

12. DUST - CONTRACTOR SHALL TAKE MEASURES TO PREVENT UNNECESSARY DUST. EACH SURFACE SUBJECT TO DUSTING SHALL BE KEPT MOIST WITH WATER OR BY APPLICATION OF CHEMICAL DUST SUPPRESSANT. DUSTY MATERIALS IN PILES OR IN TRANSIT SHALL BE COVERED TO PREVENT BLOWING. (NO DIRECT PAY).

13. CONTRACTOR SHALL GIVE THOSE AFFECTED BY CONSTRUCTION 48 HOURS NOTICE PRIOR TO DISRUPTION OF DRIVEWAYS. DRIVEWAYS, OR TEMPORARY DRIVEWAYS SHALL BE OPEN AT ALL TIMES. CONTRACTOR WILL BE RESPONSIBLE FOR TRAFFIC CONTROL AND HANDOUTS TO RESIDENTS AFFECTED BY CONSTRUCTION. HANDOUTS TO THE AFFECTED RESIDENTS SHALL INCLUDE APPROPRIATE INFORMATION REGARDING DETOUR ROUTES, PROJECTS SCHEDULE, PROJECT LIMITS, TIMES OF OPERATIONS, DESCRIPTION OF WORK, AND OTHER PERTINENT INFORMATION. (NO DIRECT PAY)

14. THE CONTRACTOR SHALL PROVIDE FOR AND MAINTAIN THROUGH AND LOCAL TRAFFIC AT ALL TIMES AND SHALL CONDUCT OPERATIONS IN SUCH A MANNER AS TO CAUSE THE LEAST POSSIBLE INTERFERENCE WITH TRAFFIC AND BUSINESS. (NO DIRECT PAY)

15. NO TRENCH OR HOLES SHALL BE LEFT OPEN WHEN/WHERE THE CONTRACTOR IS NOT ACTIVELY WORKING.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT THE WORK AND VERIFYING ALL MEASUREMENTS AND GRADES PRIOR TO BEGINNING OF CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE PROJECT CENTERLINE AND ANY NECESSARY TEMPORARY BENCHMARKS FOR CONSTRUCTION PURPOSES BEFORE DESTROYING EXISTING MONUMENTS/NAILS/CROSS CUTS, ETC. (NO DIRECT PAY)

17. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT WATER LINE FAILURE DUE TO THRUST WHEN EXCAVATING NEAR WATER LINES AND FIRE HYDRANTS.

18. ANY MATERIALS REMOVED DURING CONSTRUCTION AND DEEMED UNUSABLE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND LEGALLY DISPOSED OF, OFF SITE, AT NO COST TO THE OWNER.

19. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING CONDITIONS THROUGHOUT THE CONSTRUCTION PERIOD AND CLEARING ANY DEBRIS AND SEDIMENT CAUSED BY CONSTRUCTION. CONTRACTOR SHALL MAINTAIN DRAINAGE AT ALL TIMES AND MAY BE REQUIRED TO CUT TEMPORARY DRAINAGE TRENCHES IN SHOULDER AS DIRECTED BY THE PROJECT ENGINEER. ANY MATERIAL DEPOSITED IN ANY DRAINAGE FEATURE (DITCHES, CROSS DRAINS, ETC.) DURING CONSTRUCTION SHALL BE CLEANED OUT AND RESTORED TO ORIGINAL CONDITION BEFORE FINAL ACCEPTANCE BY THE CONTRACTOR. (NO DIRECT PAY)

20. CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF ALL TESTING REQUIRED BY THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION, THE 2016 LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AND THESE

GENERAL NOTES, INCLUDING BUT NOT LIMITED TO DENSITY TESTS ON COMPACTED BACKFILL AND LIMESTONE, MATERIALS TESTING AND SOURCE APPROVAL, AND TESTING FOR ACCEPTANCE OF THE WATER AND SEWER SYSTEMS.

21. THE CONTRACTOR IS RESPONSIBLE FOR HIS AND SUBCONTRACTOR MEANS, METHODS AND SCHEDULING OF WORK AND TESTING SERVICES. CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR CANCELLATION OF TESTING SERVICES AND ANY SUBSEQUENT CHARGES, FOR ANY REASON, INCLUDING BUT NOT LIMITED TO, INCOMPLETENESS OF WORK OR QUALITY CONTROL ISSUES WITH WORK PERFORMED AND/OR WEATHER. CONTRACTOR IS SOLELY RESPONSIBLE FOR NOTIFYING THE TESTING AGENCY OF ANY DELAYS IN WORK AND RESULTING CANCELLATION OF TESTING SERVICES. CONTRACTOR SHALL MAINTAIN RECORDS OF CANCELLATION NOTIFICATIONS.

22. TESTING REQUIREMENTS: (SUBJECT TO ADJUSTMENT BY ENGINEER)

    a. ONE 610 LIMESTONE THICKNESS VERIFICATION PER 600 SQUARE YARDS OR FRACTION THEREOF.

    b. ONE DENSITY TEST ON SELECT BACKFILL AND 610 LIMESTONE PER 600 SQUARE YARDS OR FRACTION THEREOF.

23. ADDITIONAL DENSITIES, CORES, ETC., WILL BE REQUIRED FOR ISOLATED AREAS. ANY "FAILED" FIELD TEST MUST BE RETESTED AND THE COSTS ASSOCIATED WITH THE "FAILED" TEST ARE THE RESPONSIBILITY OF THE CONTRACTOR.

24. SITE GRADING TO ESTABLISH REQUIRED DRAINAGE SLOPES AND CUTTING DITCHES SHALL BE PAID AS EXCAVATION AND EMBANKMENT BY THE LUMP SUM. ANY SOILS HAULED IN FROM OFF-SITE SHALL BE OBTAINED AT NO DIRECT PAY.

25. LIMESTONE SURFACING FOR ROADWAY AND ALL OTHER SPECIFIED AREAS SHALL BE #610 LIMESTONE AND SHALL BE INSTALLED IN LOOSE LIFTS NO MORE THAN 8 INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D 1557.

26. GEOTEXTILE FABRIC FOR ROADWAY AND SURFACING SECTION SHALL BE PROPEX 315ST OR APPROVED EQUAL.

27. GEOGRID FOR ROADWAY AND SURFACING SECTION SHALL BE TRIAXIAL GEOGRID SUCH AS TENSAR TX160 OR APPROVED EQUAL.

28. 4 FT WIDE LIMESTONE WALKWAYS WITH 4” THICKNESS SHALL BE INSTALLED FROM EACH LIMESTONE PARKING PAD TO THE TRAILER STEPS. LIMESTONE FOR WALKWAYS SHALL BE 610 LIMESTONE. NO GEOGRID OR GEOTEXTILE FABRIC IS REQUIRED FOR WALKWAYS.

29. FENCING SHALL BE CHAIN LINK FENCE IN ACCORDANCE WITH SECTIONS 705 AND 1010 OF THE 2016 LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE.

30. GATES SHALL BE INSTALLED AT THE LOCATIONS SPECIFIED IN THE PLANS AND THESE BID DOCUMENTS. GATES SHALL BE OF THE SAME TYPE AS FENCING AND PAYMENT SHALL BE INCLUDED IN THE CONTRACT COST FOR FENCING. ACCESS GATE FOR THE PERIMETER FENCE

SHALL EXTEND THE FULL WIDTH OF THE ROADWAY. ACCESS GATES FOR THE UTILITY CORRIDOR SHALL BE MIN. 12 FT WIDE AT EACH END OF THE CORRIDOR.

31. 10 FT DRAINAGE EASEMENT SHALL BE HYDRO-SEEDED AT NO DIRECT PAY.

DRAINAGE

1. CONTRACTOR SHALL MAINTAIN DRAINAGE AT ALL TIMES. ANY MATERIAL DEPOSITED IN ANY DRAINAGE FEATURE (DITCHES, CROSS DRAINS, ETC.) DURING CONSTRUCTION SHALL BE CLEANED OUT BEFORE FINAL ACCEPTANCE BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH GRADES TO ASCERTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED TRAILER FOUNDATIONS TO THE NEAREST DITCH WITHOUT ACCUMULATION IN ROADWAYS, PARKING AREAS, UTILITY CORRIDORS, OR OTHER AREAS.
3. CONTRACTOR SHALL REGRADE ALL AREAS AFFECTED BY CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE. WORK SHALL BE IN ACCORDANCE WITH A/E REQUIREMENTS. IF CONTRACTOR DETERMINES THAT ANY AREAS AFFECTED BY CONSTRUCTION CANNOT BE REGRADED TO DRAIN, CONTRACTOR SHALL DOCUMENT (I.E. TAKE ELEVATIONS, PICTURES, ETC.) THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND RETURN THE AREA TO ITS PRE-CONSTRUCTION CONDITION.
4. ALL DRAINAGE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 701 OF THE DOTD STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.
5. PLASTIC PIPE SHALL BE RIBBED POLYVINYL CHLORIDE PIPE (RPVCP) AS SPECIFIED IN SUBSECTION 1006.07(A) OF THE LADOTD STANDARD SPECIFICATIONS.
6. PIPE SHALL BE INSTALLED BEGINNING AT THE DOWNSTREAM END. THE BELLS SHALL BE FACING UPSTREAM. PIPE SHALL BE LAID IN CONTACT WITH THE BEDDING ALONG THE ENTIRE LENGTH OF THE PIPE.
7. PIPE JOINTS SHALL BE WRAPPED IN GEOTEXTILE FABRIC A MINIMUM OF 12" ON EACH SIDE OF THE JOINT FOR PIPE 36" AND SMALLER AND 18" ON EACH SIDE OF THE JOINT FOR LARGER PIPE. THE ENDS OF THE FABRIC SHALL BE LAPPED A MINIMUM OF 10" AND FABRIC SHALL BE FIRMLY SECURED TO PIPE. GEOTEXTILE FABRIC USED FOR PIPE JOINTS IS NOT MEASURED FOR PAYMENT.
8. THE CONTRACTOR SHALL FIELD VERIFY THE LENGTH AND SIZE OF ALL REQUIRED DRAINAGE PIPE PRIOR TO ORDERING THE PIPE MATERIAL.

UTILITIES

1. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES (PRIVATE AND PUBLIC) (INCLUDING STORM DRAINAGE PIPES OR STRUCTURES) BEFORE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTH, AND SIZE OF ALL UNDERGROUND UTILITIES AND STRUCTURES AND SHALL BE LIABLE FOR ANY DAMAGE CAUSED BY FAILURE TO COMPLY WITH THESE INSTRUCTIONS (NO DIRECT PAY).

2. WARNING! CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING OVERHEAD AND SUBSURFACE UTILITIES IN AREA OF CONSTRUCTION. (NO DIRECT PAYMENT). ALL WORK IN THIS AREA SHALL BE THOROUGHLY COORDINATED WITH UTILITY COMPANY OWNER. COORDINATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING LA ONE CALL AND MAINTAINING LA ONE CALL REQUIREMENTS TO ENSURE THAT ALL EXISTING UTILITIES ARE PROPERLY LOCATED PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL ALSO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT SAID UTILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS BETWEEN PROPOSED IMPROVEMENTS AND EXISTING UTILITIES. (NO DIRECT PAY)

WATER

1. WATER DISTRIBUTION PRODUCTS, INSTALLATION, AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION EXCEPT AS MODIFIED HEREIN.
2. 4” AND 6” WATER SUPPLY LINES SHALL BE PVC, AWWA C900, SDR26.
3. 1” WATER SERVICE LINES SHALL BE HDPE, SDR9 AND MEET THE REQUIREMENTS OF AWWA C-901.
4. NO TRACER WIRE IS REQUIRED FOR SERVICE LINES.
5. TRACER WIRE IS REQUIRED FOR THE 6” WATER SUPPLY LINE, AS SPECIFIED IN THE LAKE CHARLES STANDARD SPECIFICATIONS.
6. WATER LINES INSTALLED UNDER LIMESTONE ROADWAYS SHALL HAVE MINIMUM 4’ OF COVER.
7. WHERE THE SEWER IS INSTALLED ABOVE GROUND, PIPE SUPPORTS SHALL BE PROVIDED AT THE LOCATION OF EACH JOINT, AT NO DIRECT PAY.
8. BACKFILL FOR BURIED WATER INSTALLATION SHALL BE AT NO DIRECT PAY.
9. CONTRACTOR SHALL MAKE EACH WATER SERVICE LINE TO TRAILER HOUSE CONNECTION, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS AND TRAILER HOUSE MANUFACTURER REQUIREMENTS.

SEWER

1. SEWER COLLECTION PRODUCTS, INSTALLATION, AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION EXCEPT AS MODIFIED HEREIN.
2. 6” AND 8” SEWER SERVICE LINES SHALL BE ANSI/ASTM D2241, SDR 26, 12454-B PVC CELL CLASSIFICATION IN ACCORDANCE WITH ASTM D 1784.
3. SEWER LINES INSTALLED UNDER LIMESTONE ROADWAYS SHALL HAVE MINIMUM 1’ OF COVER AND CASED IN STEEL CASING PIPE, AT NO DIRECT PAY. STEEL CASING PIPE SHALL BE WELDED STEEL PIPE MEETING ASTM A53, GRADE B, AND HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI. THE EXTERIOR OF THE CASING PIPE SHALL BE COATED WITH COAL TAR EPOXY OR BITUMINOUS ASPHALT.

4. WHERE THE SEWER IS INSTALLED ABOVE GROUND, PIPE SUPPORTS SHALL BE PROVIDED AT THE LOCATION OF EACH JOINT, AT NO DIRECT PAY.
5. SEWER MANHOLE SHALL BE CONCRETE SEWER MANHOLE IN ACCORDANCE WITH SECTION 2.04 OF THE CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION, SECTION 1 “SANITARY SEWER COLLECTION SYSTEM SPECIFICATIONS”.
6. BACKFILL FOR BURIED SEWER INSTALLATION SHALL BE AT NO DIRECT PAY.
7. CONTRACTOR SHALL MAKE EACH SEWER SERVICE LINE TO TRAILER HOUSE CONNECTION, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS AND TRAILER HOUSE MANUFACTURER REQUIREMENTS.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: Calcasieu Parish Sheriff's Office

(Owner to provide name and address of owner)

BID FOR: CPSO Temporary Trailer Park

(Owner to provide name of project and other identifying information)

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Royal Engineers and Consultants, LLC and dated: 9/28/2020

(Owner to provide name of entity preparing bidding documents)

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging)

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

Dollars ($)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 (*Owner to provide description of alternate and state whether add or deduct)* for the sum of:

N/A Dollars ($ **N/A**)

Alternate No. 2 (*Owner to provide description of alternate and state whether add or deduct)* for the sum of:

N/A Dollars ($ **N/A**)

Alternate No. 3 (*Owner to provide description of alternate and state whether add or deduct)* for the sum of:

N/A Dollars ($ **N/A**)

NAME OF BIDDER:

ADDRESS OF BIDDER:

LOUISIANA CONTRACTOR'S LICENSE NUMBER:

NAME OF AUTHORIZED SIGNATORY OF BIDDER:

TITLE OF AUTHORIZED SIGNATORY OF BIDDER:

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER:**

DATE:

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

****A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)5.

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

TO: Calcasieu Parish Sheriff's Office

(Owner to provide name and address of owner)

BID FOR: CPSO Temporary Trailer Park

(Owner to provide name of project and other identiying information)

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Clearing & Grubbing	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
1	**1**	**Lump Sum**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Excavation & Embankment	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
2	**1**	**Lump Sum**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Geogrid	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
3	**13237**	**SY**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Geofabric	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
4	**13237**	**SY**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		610 Limestone Surfacing	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
5	**2311**	**CY**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Cross Drain Pipe (18" Plastic)	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
6	**52**	**LF**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Fencing	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
7	**5338**	**LF**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Overhead Electric	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
8	**1**	**Lump Sum**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Water Line (4" PVC)	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
9	**1340**	**LF**		

Wording for "DESCRIPTION" is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Water Line (6" PVC)	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
10	**280**	**LF**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Fire Hydrant Assembly (6")	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
11	**1**	**EA**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Water Meter	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
12	**1**	**EA**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Sewer Line (8" PVC)	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
13	**1698**	**LF**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Concrete Sewer Manhole	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
14	**1**	**EA**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Electric House Connections	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
15	**50**	**EA**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Sewer Services (6" PVC) & House Connections	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
16	**50**	**EA**		

DESCRIPTION:	☑ Base Bid or ☐ Alt. #____		Furnish & Install Water Services (1" HDPE) & House Connections	
REF. NO.	QUANTITY	UNIT OF MEASURE	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*
17	**50**	**EA**		

CITY OF LAKE CHARLES
LOUISIANA

STANDARD SPECIFICATIONS
for
INFRASTRUCTURE CONSTRUCTION

LAST REVISED
December 12, 2017

SECTION 1
SANITARY SEWER COLLECTION SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. The work covered by this specification consists of furnishing labor, materials and services for the construction of a gravity sanitary sewer collection system and shall consist of furnishing and installing sanitary sewer manholes, PVC pipe designated for gravity flow sanitary sewers, service lines and riser pipes, in accordance with these specifications, and in conformity with the lines and grades shown on the plans or established by the Engineer. This item includes furnishing, transporting, excavations, bracing, bedding, dewatering, laying, jointing, testing, backfilling, and surface cleanup.

B. All Sanitary Sewer collection systems shall be designed such that the absolute minimum extents of the collection system are to be installed beneath paved surfaces. The City of Lake Charles Waste Water Department reserves the right to grant waivers on the basis of special conditions; however, no sanitary sewer collection system designed completely beneath the paved surfaces will be accepted.

C. Proposed developments not scheduled to be dedicated to the City of Lake Charles shall have permanent medallions affixed to all manhole lids and ductile iron cleanout covers. Medallions shall be stamped with the words “PRIVATE SYSTEM” designating the system as a private system not to be maintained by the City of Lake Charles.

1.02 REFERENCES

A. All materials and designs shall conform to the requirements of these specifications. They shall be new, free from defects, and they shall conform to the following standards where these organizations have set standards:

1. Louisiana Department of Health (LDH)
2. American Society for Testing and Materials (ASTM)
3. American Concrete Institute (ACI)
4. Concrete Reinforcing Steel Institute (CRSI)
5. American National Standards Institute (ANSI)
6. American Water Works Association (AWWA)
7. The Society for Protective Coatings (SSPC)
8. National Sanitation Foundation (NSF)

B. The same manufacturer shall supply all like materials and equipment of the same class, unless specified to the contrary.

1.03 SUBMITTALS

A. Submittals shall be made available to the City of Lake Charles Wastewater Division at any time during construction, at the request of the department.

B. Accurate construction record documents shall be submitted to the City of Lake Charles Wastewater Division for approval prior to acceptance of the sanitary sewer system. Project record documents shall accurately record locations of pipe runs, service connections, manholes, and invert elevation.

1.04 ACCEPTANCE

A. For acceptance by the City of Lake Charles, the sanitary sewer collection system must be:

1. Pre-authorized for construction and subsequent public dedication as part of an approved development plan or preliminary subdivision plat;

2. Constructed to City standards and specifications established by the Wastewater Division;

3. Approved upon completion for conformity with standards and specifications by appropriate city personnel or representatives;

4. Subject to satisfactory maintenance guaranty, as determined by the City;

5. Located on acceptable rights-of-way or readily accessible maintenance easements to be granted to the City; and

6. Accurately depicted in record documents to be submitted.

1.05 WARRANTY

A. The Contractor shall guarantee all materials furnished by him free from inherent defects for a period of one year from date of final acceptance, with the exception of where more stringent warrantees are stated herein.

B. Any repairs, including labor, made necessary by inherent defects, shall be rendered without cost to the Owner within the guarantee period.

PART 2 PRODUCTS

2.01 GENERAL

A. Where a certain pipe material is specified on the plans, only that material can be used. All pipe material used between consecutive manholes in the sewer line, including fittings, service connections, plugs, etc., shall be of the same kind unless otherwise provided by the plans.

B. No gravity sewer collection line shall be less than 8-inches in diameter.

C. No sanitary sewer service line shall be less than 6-inches in diameter, and all services shall be provided with independent clean-outs of like size and pipe material. All sewer service lines shall serve a single residence, or a single building with no interconnectivity.

D. Sanitary sewer manholes shall be either an approved fiberglass manhole or pre-cast concrete manholes complete with a multi-component stress panel liner system.

E. Manholes located outside of paved surfaces shall be constructed to provide a rim elevation extending 3-inches above finished grade, including the sodded grass line, to prevent excess inflow during rain events.

2.02 GRAVITY SANITARY SEWER PIPE

A. Polyvinyl Chloride (PVC) Pipe and Fittings

1. Pipe (diameters 6-inch through 15-inch): ANSI/ASTM D 2241, SDR 26, 12454-B PVC cell classification in accordance with ASTM D 1784; additives and fillers shall not exceed 10 parts (by weight) per hundred of PVC resin in the compound.

2. Pipe (diameters 18-inch through 27-inch): ANSI/ASTM D 3034, SDR 35, 12454-B PVC cell classification in accordance with ASTM D 1784; additives and fillers shall not exceed 10 parts (by weight) per hundred of PVC resin in the compound.

3. Joints: Push on type joint in accordance with ASTM D 3212; flexible elastomeric seals (gaskets) in accordance with ASTM F 477.

4. Fittings: Same material and cell classification as pipe.

5. PVC pipe and fittings shall be green in color.

B. Ductile Iron Pipe

1. Pipe shall be designed in accordance with ANSI Specification A21.50 (AWWA C-150) for 150 psi working pressure. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi (per AWWA M-41). Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150.

2. Pipe shall be manufactured in accordance with ANSI Specification A21.51 (AWWA C-151), latest revision.

3. All ductile iron pipe shall have a bituminous-coated exterior and ceramic epoxy lined interior, as well as, polyethylene wrap. The ceramic epoxy lining shall be a two component amine cured novalac epoxy of at least 87 percent solids. Lining material shall be Protecto 401 by Induron Coatings, Birmingham, AL or prior approved equal, and shall

be installed in accordance with the manufacturer's recommendations, but not less than a 40 mil DFT.

4. Polyethylene wrap shall be installed on all buried DI piping and fittings. Polyethylene encasement furnished under these Specifications shall conform to AWWA C-105 or ANSI A21.5. Film shall be Class "C" Black, with a minimum nominal thickness of 0.008 inches (8 mils).

5. UNRESTRAINED PIPE JOINTS: Ductile iron pipe joints shall be push-on rubber gasket type or rubber-gasket mechanical joint per AWWA C111 in unrestrained applications. Unrestrained pipe joints shall be by one of the following or an approved equal:

   a. "Tyton Joint Pipe" by US Pipe and Foundry Company.

   b. "Fastite Joint Pipe" by the American Cast Iron Pipe Company.

   c. "Tyton Joint Pipe" or "Fastite Joint Pipe" by McWane Company.

6. Ductile iron fittings for gravity systems shall be mechanical joint ductile Iron fittings manufactured in strict accordance with AWWA C153, AWWA C110 and AWWA C111. The rated working pressure shall be 350 psi for 24-inch and smaller and 250 psi for 30-in and larger. All fittings must be manufactured in the United States. All ductile iron fittings shall have a bituminous-coated exterior and ceramic epoxy lined interior, as well as, polyethylene wrap. The Epoxy ceramic lining shall be a two component amine cured novalac epoxy of at least 87 percent solids. Lining material shall be Protecto 401 by Induron Coatings, Birmingham, AL or prior approved equal, and shall be installed in accordance with the manufacturer's recommendations.

C. Differential Pipe Connections and In-Service Line Connections

1. Connect pipe of dissimilar material with manufactured adapters specifically intended for this purpose. Devices shall be manufactured by Fernco Systems or approved equal.

2. Service connections made on active, or completed sewer lines, shall be shall be established with gas tight, root-proof and leak-proof sewer service tapping saddles and shall conform to ASTM D5926. Sewer saddles shall be Flexible Tap Saddles, as manufactured by Fernco Systems, T-Flex Sewer Saddles, as manufactured by Mission Rubber Company, or approved equal.

2.03 CASING FOR JACKING AND BORING

A. Unless otherwise required by the agency having jurisdiction, the casing shall be welded steel pipe meeting ASTM A53, Grade B, and have a minimum yield strength of 35,000 psi. The exterior of the casing pipe shall be coated with coal tar epoxy or bituminous asphalt. Minimum wall thickness shall be as shown in the following table:

Table for minimum wall thickness for steel casing pipe for E72 loading		
Carrier Pipe Nominal Diameter (inches)	Min. Casing Pipe Diameter (O.D.) (inches)	Nominal Thickness (inches)

6	12	0.344
8	16	0.375
10	20	0.407
12	24	0.469
14	27	0.505
16	30	0.505
18	30	0.505
20	36	0.595
24	36	0.595
30	42	0.625
36	48	0.688
42	60	0.844

2.04 CONCRETE MANHOLES

A. Concrete Manholes

1. All manholes shall consist of precast concrete sections, including integral base section, riser sections, conical sections, and shall conform to ASTM C 478 and the dimensions shown on the Drawings. Conical sections shall be designed to support cast iron frames and covers under AASHTO HS-20 loading. Axial length sections shall be selected to provide correct total height required with the fewest joints. All conical sections shall be eccentric.

2. Base for precast manholes may be either pre-cast or cast-in-place. Cast-in-place bases shall be used exclusively for manholes built over existing sewer lines only.

3. All concrete manholes shall be coated with a multi-component stress panel liner system as further detailed herein.

B. Joint Gaskets

1. All pre-cast manhole joints shall be sealed with flexible watertight gaskets conforming to ASTM C 990 or C443. Gaskets shall be “RAM-NEK” or “RUB-R-NEK” gasketing material, or approved equal, installed as specified by the manufacturer.

C. Pipe Penetration Gaskets

1. All pipe penetrations shall be installed with watertight resilient gasket conforming to ASTM C923.

2. Gaskets cast into the manhole shall be Dura-Seal III, as manufactured by Dura-Tech, Inc., or prior approved equal. Field installed gaskets shall be Kor-N-Seal Cavity O-Ring as manufactured by, NPC Inc., or approved equal, installed as specified by the manufacturer.

D. Bench and Inverts

1. For benches and inverts not integrally formed with the manhole base, 4000 psi concrete bench and inverts shall be field installed by the contractor. Benches and inverts formed with grout or mortar shall not be permitted.

E. Concrete Manhole Exterior Joint Sealant

1. Prior to backfilling, exterior joints shall be waterproofed as provided below.

2. Concrete manhole exterior joints shall be sealed with an external rubber sleeve similar to the Infi-Shield Gator Wrap as manufactured by Sealing Systems Inc. The seal shall be made of a stretchable, self-shrinking, intra-curing halogenated based rubber with a minimum thickness of 30 mils and 18-inch width. The back side of each unit shall be coated with a cross-linked re-enforced butyl adhesive. The butyl adhesive shall be non-hardening sealant with a minimum thickness of 30 mils. The seal shall be designed to stretch around the joint and then overlapped creating a cross-link and fused bond between the rubber and butyl adhesive. Gator Wrap forms a continuous rubber seal on a manhole joint which prevents water and soil from infiltrating through the manhole, catch basin or concrete pipe joint. The exterior joint sealants shall be installed per the manufacturer's recommendations.

F. Multi-Component Stress Panel Interior Liner System

1. The multi-component stress panel lining system, shall be designed for sanitary sewer applications, and shall utilize a mechanical anchoring system at all terminations. Surface preparation and liner installation shall be completed according to the manufacturer's recommendations and by a manufacturer certified installer.

2. The total thickness of the liner system shall be a minimum of 500-mils DFT.

3. The complete coating system shall include a 10-year limited warranty covering both materials and installation, beginning at the date of final acceptance.

4. The multi-component stress panel interior lining system shall be SpectraShield, as manufactured by CCI Spectrum, Inc., or approved equal.

5. The liner shall be affixed with or stamped with a permanent, easily legible completion date.

2.05 FIBERGLASS MANHOLES

A. Fiberglass Manholes

1. Provide prefabricated fiberglass manholes which conform in shape, size, dimensions, and details shown on Drawings. Unless modified by Drawings, use manhole sections conforming to ASTM D 3753.

2. Provide fiberglass manholes manufactured by one of the following suppliers:
   a. LFM Manufacturing, Giddings, Texas.
   b. Containment Solutions, Conroe, Texas

c. City approved equal

3. Mark date of manufacture and name or trademark of manufacturer in 1-inch high stenciled letters on inside of barrel.

4. Unless larger size is required, provide 48-inch-diameter barrel for fiberglass manholes. Provide wall section thickness for depth of manhole according to ASTM D 3753, but not less than 0.48 inches in thickness.

1. Provide fabricated reducer bonded at factory to form one continuous unit at top of manhole barrel to accept concrete grade rings and cast iron frame and cover. Reducer design shall be of sufficient strength to safely support HS-20 loading in accordance with AASHTO. Manway reducers shall be eccentric with respect to the centerline of the manhole riser section.

5. Fiberglass manholes shall have a fiberglass-reinforced bottom plate. Fiberglass stiffening ribs shall be used, where required, to provide sufficient stiffness to bottom plate. All bottom plates shall have an external anti-flotation flange extending 2.5-inches (min) beyond manhole outside diameter. The manhole bottom shall be 0.5-inches thick (minimum).

B. Reinforced Concrete Manhole Base Section

1. Fiberglass manholes shall be set in a cast-in-place reinforced concrete slab base. Concrete slab base should be a minimum of 12” thick for up to 48” diameter manholes (16” thickness for larger diameter manholes). Concrete slab should extend a minimum of 12” beyond manhole outside wall for manholes up to 20’ in depth (24” up to 35’ in depth). The minimum reinforcement for the concrete slab shall be #5 rebar at 8-inches on-center-each-way. The fiberglass reinforced bottom plate shall be imbedded 3.5-inches into the reinforced concrete slab.

C. Pipe Connections

1. Pipe connections shall be pipe stub-outs or boot-type connections. Installation of PVC or FRP stub-outs shall be performed by sanding, priming, and using a fiberglass-reinforced laminate to bond the stub-out to the manhole wall. The resin and fiberglass shall be the same type and grade as used in the fabrication of the manhole. Boot-type pipe connections shall Kor-N-Seal, Press-Seal, Inserta-Tee or approved equal. Where required, Manufacturer shall use a fiberglass-reinforced sleeve to accommodate boot connections.

2. Doghouse manhole pipe connections shall not be permitted when using fiberglass manholes. Where the installation requires dog-house installation methods a reinforced concrete manhole shall be required.

D. Manhole Bench and Invert

1. Fiberglass enclosed bench and invert shall be installed by the Manufacturer, Manufacturer's agent or approved equal. The invert will be formed using a corrosion resistant material and completely enclosed in 0.25-inches (min) of fiberglass laminate.

2. For benches and inverts not integrally formed with the manhole base, 4000 psi concrete bench and inverts shall be field installed by the contractor. Benches and inverts formed with grout or mortar shall not be permitted. Concrete bench and invert shall be field installed by the installing contractor in accordance with fiberglass manhole manufacturer's requirements and these specifications.

2.06 MANHOLE APPURTENANCES

A. Riser Rings

1. Riser rings shall be standard product, manufactured particularly for use in manhole construction, sized to fit the cones on which they are placed, and the wall thickness shall be not less than that of the cones.

2. Concrete riser rings shall be not less than two inches high, nor more than four inches high. Concrete riser rings shall be free from cracks, voids, and other defects and shall conform to ASTM C478. Joints shall be provided with exterior waterproofing system as provided below.

3. Cast iron riser rings shall conform to the latest edition of AASHTO M306. Cast iron riser rings shall be used for adjustment of manhole frame and cover of less than four (4) inches. Joints shall be provided with exterior waterproofing system as provided below.

4. Cast-iron riser rings shall be completely coated with an environmentally safe, water-based asphaltic coating which is non-toxic, non-flammable, colorless, and dries to a hard black finish. The coating shall be applied to the casting prior to the installation of the external waterproofing.

B. Manhole Frames and Covers

1. All manhole covers shall have the word "SEWER" cast into the top in letters approximately three inches high.

2. Manhole frames and covers shall be cast-iron, and conform to the design and dimensions shown on the Drawings and Standard Details. Grade shall be as designated in the Contract Drawings. Contact surfaces between frames and covers shall be machined to provide a uniform contact surface. When locking devices are specified, the CONTRACTOR shall submit Shop Drawings for approval by the ENGINEER.

3. For roadway applications the standard manhole frame and cover shall be East Jordan Iron Works Model V-1501 and Model V-1403, or approved equals.

4. For non-roadway applications the standard manhole frame and cover shall be East Jordan Iron Works 'Hinged Manhole Assembly, Catalog No. 24' ERGO (Product No. 00104175L02), or approved equal.

5. For watertight applications the standard sewer manhole frames and covers shall be East Jordan Iron Works Model V-2480-1, or approved equal.

6. Cast-iron frames and covers shall be completely coated with an environmentally safe, water-based asphaltic coating which is non-toxic, non-flammable, colorless, and dries to a hard black finish. The coating shall be applied to the casting prior to the installation of the external waterproofing.

C. Miscellaneous

1. Bentonite-Cement sealing plaster shall consist of two parts bentonite, one part Type 3 cement, and one part sand, with sufficient water to obtain workable consistency.

2. Mortar shall consist of one part Portland Cement to two parts clean, well-graded sand which will pass a No. 4 screen. Admixtures may be used not exceeding the following percentages of weight of cement; hydrated lime, 10%; diatomaceous earth or other inert material, 5%. Consistency of mortar shall be such that it will readily adhere to the surface. Mortar mixed for longer than thirty minutes shall not be used. A non-shrink mortar may be submitted for approval as a substitute.

3. Grout shall be non-shrink cementitous grout and shall meet or exceed the requirements of ASTM C1107, Grades B or C and CRD C-621. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.

D. Manhole Inflow Protector Insert

1. The completed manhole inflow protector and its associated valve body and components shall be manufactured from corrosion proof material suitable for atmospheres containing hydrogen sulfide and dilute sulfuric acid as well as other gases associated with wastewater collection systems.

2. The manhole insert body shall be designed with six equally spaced re-enforcement ribs (1 1/2" wide, 1/2" deep, and 6 1/2" long) in the bottom and will support a minimum uniform load of 800 pounds. The insert body shall have a recessed area in the center of the bottom for protection of the valve body. The insert body shall be fabricated from Acrylonitrile Butadiene-Stryrene (ABS) high impact, high grade material specifications under ASTM D-256 method A, D-638, D-790, D-785, D-648 method A and D-635.

3. The insert shall be provided with a gasket made of closed cell neoprene and have a pressure sensitive adhesive on one side and be placed under the insert body rim by the manufacturer. The adhesive shall be compatible with the insert body material so as to form a long lasting bond in either wet or dry conditions of use.

4. The gas relief valve shall be designed to relieve at a pressure of 1 psi and have a water leak down rate not to exceed 5 gallons per 24 hours. The valve shall be installed by means of a threaded hole tapped in the center of the insert body by the manufacturer

5. The insert shall be provided with a corrosion resistant handle or lifting strap which do

not interfere with the installation of the manhole lid. The handle or lifting straps shall have a minimum combined 1100 pound tensile strength and shall be attached to the insert, by the manufacturer, with corrosion resistant fasteners.

6. Manhole inflow protector inserts shall be Rain Guard Model LFN-SV, as manufactured by L.F.M. Manufacturing, Inc. Giddings, Texas, or approved equal.

2.05 CLEANOUTS

A. Cleanouts at the ends of sanitary sewer lines shall be constructed of the same quality pipe material and size (6-inch) as the service line. Cleanouts shall consist of 6-inch pipe, fittings, threaded cleanout adapter, threaded cleanout plug.

B. All new cleanouts shall be installed within a new concrete box. All new clean out boxes shall be model no. C.H. 5/8”x3/4” Concrete Boxes manufactured by Southern Meter Box, Inc., or approved equal. Concrete meter boxes shall be provided with a solid cast iron lid marked SEWER and shall be model No. T. 5/8”x3/4” Lid as manufactured by Southern Meter Box Inc., or approved equal.

2.06 CONCRETE

A. Cement shall be Type II Portland Cement conforming to ASTM C 150.

B. Concrete for Manholes and cast in place manhole bases: 4500 psi minimum at 28 days, 6.2 sacks of cement minimum per cubic yard.

C. Concrete for benches and inverts not integrally formed with the manhole base: 4000 psi minimum at 28 days, 5.8 sacks of cement per cubic yard.

D. Concrete for Embedment: 3000 psi minimum at 28 days, 5.2 sacks of cement minimum per cubic yard.

E. Test for compressive strength of concrete in accordance with ASTM C 39.

2.07 MORTAR SAND

A. Mortar sand shall be a non-plastic siliceous material conforming to the following gradation limits:

Sieve Size	Percent Finer By Weight
No. 4	100
No. 8	95 to 100
No. 100	0 to 25
No. 200	0 to 10

B. The percentage of foreign matter shall not exceed the following limits:

1. Coal of Lignite 0.25 percent
2. Clay lumps 0.50 percent

2.08 FOUNDATION, BEDDING, AND BACKFILL MATERIALS

A. Foundation Material

1. Crushed limestone or crushed Portland cement concrete shall be used for structure foundations and pipe foundation amendments as detailed herein. Crushed limestone or crushed Portland Cement Concrete foundation material shall meet the following #610 gradations.

Sieve Size	Percent Finer By Weight
1 – ½ in	100
1 - in	90 to 100
3/4 - in	70 to 95
3/8 - in	50 to 80
No. 4	35 to 65
No. 10	25 to 50
No. 40	10 to 26
No. 200	4 to 12

B. Bedding and Embedment Material

1. Crushed limestone or crushed Portland cement concrete shall be used for pipe bedding to the depths and heights identified on the project details. Crushed limestone or crushed Portland Cement Concrete bedding material shall meet the following #57 gradations.

Sieve Size	Percent Finer By Weight
1 – ½ in	100
1 - in	90 to 100
1/2 - in	25 to 60
No. 4	0 to 10
No. 8	0 to 5
No. 200	0 to 1

C. Backfill Material

1. Usable Native Excavated Soils for Trench Back Fill outside of paved surfaces shall meet the following requirements.

   a. Usable native excavated soils shall have a maximum PI of 25 and maximum organic content of five (5) percent. Soils with a silt content of fifty (50) percent or greater and also a PI of ten (10) or less will not be allowed. Any select material used to supplement or replace usable excavated soil shall meet these requirements and must be approved by the Engineer. Soil shall be tested at the Engineer and the Owner's option. Usable excavated material may be neatly stockpiled at the site where designated by the Engineer provided there is an area available that will not interfere with the Owner's access nor inconvenience traffic adjoining property owners.

b. When excavated soils do not meet the above stated requirements they shall be removed from the site, at the contractors expense, and replaced with Select Backfill Material.

2. Sand Backfill Material

a. Sand backfill material shall be used for trench backfill when the utility line is to be installed beneath any paved surface. Sand for backfilling trenches and structures shall be non-plastic siliceous material and shall conform to the following gradation limits:

Sieve Size	Percent Finer By Weight
½ - in	100
No. 10	75 to 100
No. 200	0 to 10

PART 3 EXECUTION

3.01 GENERAL

A. Coordinate with other utility providers to the fullest extent possible complete maximum spacing from all utilities for ease of access.

B. Sanitary Sewer lines shall be installed with wall to wall clear separations of not less than 6-feet horizontally and 18-inches vertically from potable water lines. Where these separations are not able to be met, the line shall be encased in concrete.

C. Any materials damaged during installation shall be removed and discarded.

3.02 ALIGNMENT AND GRADE

A. Prior to excavation, the Engineer will provide alignment and location of manholes.

B. The Engineer will establish the location of all sewer lines to be constructed and will set bench marks at prominent points adjacent to the work. He will set stakes at each manhole, off-set markers at 50’ centers along the lines, and will develop and present to the Contractor all necessary cut sheets. The Contractor shall develop all grades, slopes, etc., there from and shall be responsible for the conformity of the work to the layout, cut sheets, elevation, etc., provided him.

C. Uncover, relay and backfill installed pipe where horizontal and vertical alignment is determined by Engineer, or the City, to be unacceptable or erroneous.

3.03 TRENCHING AND EXCAVATION

A. Excavation

1. Excavation shall include the removal, handling, re-handling, refill or backfilling, and

disposal of any and all materials encountered in the work, and shall include all pumping, bailing, drainage and sheeting and bracing, and trench box. The work of excavation shall also include the responsibility of added expenses or other liability that may arise from quicksand, obstacles or conditions, foreseen or unforeseen, which may be encountered in the work. It includes clearing and the removal of pavements, curbs, sidewalks, shrubbery, and other obstructions not otherwise provided for.

B. Lines of Excavation

1. All excavation shall be made in such manner and to such widths as will give ample room for properly installing and inspecting the piping. All excavation necessary for laying pipe, constructing manholes, etc., shall be made to line and grade as indicated on the plans and as specified herein. Trenches shall be dug to the alignment and depth required and only so far ahead of the pipe laying as the Engineer will permit. The trench shall be braced and drained as may be required so that workmen may work therein safely and efficiently. A trench box may be used in lieu of sheeting and shoring.

2. Bottoms of trenches shall be excavated and formed to provide for pipe bedding or pipe foundations as hereinafter specified or as required by the plans or Special Provisions.

3. Bell holes, where necessary to make up the joints, shall be dug of sufficient size that the whole length of the pipe barrel be bedded as required, and to allow all of the joints to be properly made.

4. All excavation shall be open cuts with vertical sides except in special cases where the Engineer may permit sloping sides above a point two feet (2’) above the top of the pipe, or except where tunneling is permitted or required.

5. If tunnels are authorized or required, they shall be only as large as necessary for the installation of the pipe and as approved by the Engineer or as detailed on the plans.

6. The maximum width of trench or sewer pipe installation at a point two feet (2’) above the top of the pipe shall be the external diameter of the barrel of the pipe plus nine inches (9”) on each side of the pipe.

C. Methods of Excavation

1. The Engineer shall have the authority, at any time, to require the Contractor to discontinue the use of any excavating machine or other appliance which, in the Engineer’s judgment, is not adapted to the purpose for which it is used.

D. Dewatering

1. The trenches shall be maintained free of water at all times while work is in progress, and water shall not be allowed to flow over or rise upon earth foundations, pipe, concrete masonry, or other work, except as otherwise specified for bayou crossings and special "wet areas." The Contractor shall not open more trench than the available pumping facilities can dewater to the satisfaction of the Engineer.

2. The Contractor shall assume all responsibility for disposing of all water so as not to injure or interfere with normal drainage of the locality. In no case shall water pipe lines be used as drains for such water. The ends of water pipe lines shall be adequately and properly plugged during construction by the use of approved stoppers (a garbage bag is not an approved stopper), and all necessary precautions shall be taken to prevent the entrance of ground water, mud, sand, or any other objectionable materials into the pipe lines. If such materials enter the pipe lines, they shall be removed by the Contractor as soon as possible after discovery thereof.

3. The Contractor shall use due vigilance and care so that no water originating on his work or due to his work or which he is obligated to handle and dispose of under this contract shall discharge or be discharged on the work or into the trenches of another contractor unless a mutual agreement by the parties affected has been reached. Nothing in this section is to be construed as preventing the reasonable use by the Contractor of any ditch, channel, storm drain, or gutter which is designated and used for City or Parish drainage.

E. Maintenance of Excavation

1. The Contractor shall maintain all excavation in good order during the construction, so as not to hinder or injure the pipe laying, masonry, or other work. He shall take all reasonable precautions to prevent movement of the sides of such excavation, and shall remove at his own expense any material sliding into the excavation.

F. Sheeting and Bracing

1. The Contractor shall furnish and put in place such sheeting and bracing as may be required to support the sides of all trenches or other excavations and, where required, remove, or cut off, as directed, such sheeting at his own expense. A steel trench box, supplemented with additional sheeting, may be used in lieu of total sheeting and bracing.

G. Disposal of Excavated Material

1. All material excavated shall be placed so as to interfere as little as possible with public travel. In case the street is not wide enough to allow the dirt to be piled up without blocking the sidewalk, the Contractor shall, at his own expense, maintain an open passageway not less than two and one-half feet (2 ½') wide on the sidewalk and shall keep this passageway free from mud and slush.

2. The Contractor may deposit excavated materials directly in permanent position insofar as is consistent with the proper prosecution of the work. Materials that cannot be placed at once in permanent position shall be deposited in temporary storage piles. All this work shall be done with reasonable neatness and excavated materials shall not be carelessly strewn over the area.

3. Surplus excavated material over and above that required for backfilling, mounding over the pipe and making other fills and embankments to the finished lines and grades

indicated on the drawings shall be disposed of as directed by the Engineer. The Contractor shall be responsible for seeing that the material is dumped in an orderly manner within the limits designated. The surface of the dump shall be neatly graded to blend with the natural contours of the existing ground surface. If the City or Drainage Board has no use for the surplus material, it will be the responsibility of the Contractor to properly dispose of said surplus.

3.04 BEDDING

A. As soon as the excavation is complete to normal grade of the bottom of the trench, bedding shall be placed, compacted and graded to provide firm, uniform and continuous support for the pipe. Bell holes shall be excavated so that only the barrel of the pipe bears upon the bedding. The pipe shall be laid accurately to the lines and grades indicated on the Drawings. Blocking under the pipe will not be permitted. Bedding shall be placed evenly on each side of the pipe to mid diameter and hand tools shall be used to force the bedding under the haunches of the pipe and into the bell holes to give firm continuous support for the pipe.

B. Where the bottom of the excavation is not, in the opinion of the Engineer, of suitable material for the construction of required pipe foundation, the excavation shall be deepened and a limestone foundation shall be placed under the pipe as directed by the Engineer. This stone foundation is not to be included in the price bid for laying pipe and will be paid for as a separate item.

C. Where the Contractor exceeds the maximum trench width to the extent that excessive backfill loads are imposed on the pipe, or where the trench is over-excavated, as determined by the Engineer; the Contractor shall provide limestone or such additional pipe foundation as the Engineer may require without any additional compensation. Over-excavated trenches shall not be brought up to grade with excavated material.

3.05 MANHOLE INSTALLATION

A. Cast in place bases shall be constructed in a dry excavation on a six inch base of limestone foundation material compacted to 95% of the maximum density. Cast in place bases shall meet the requirements stated above. Concrete shall not be placed under water. Running water shall not be permitted over newly poured concrete. If base is cast-in-place, lowermost pre-cast unit shall be set in place at the time base is poured; additional precast units shall not be places until 24-hours after the base is poured. The excavation shall be kept dry until the concrete or mortar has developed sufficient strength to prevent rupture by groundwater pressure.

B. Precast bases sections shall be set on a level base of six inches of compacted (95% STP) No. 57 limestone, as shown in the Standard Details. Provisions shall be made to prevent flotation of the manhole.

C. Manhole inverts shall be formed as shown on the Drawings, either by laying pipe through and cutting out the top portion before completion of the base of the manholes, or by forming U-shaped channels in the concrete base section. Cut edges of pipe laid through the manhole shall be fully covered by 4000psi concrete when the manhole invert is complete. The finished invert shall be smooth and true to grade. No mortar or broken pieces of pipe shall be allowed to enter the sewers. Changes in direction of flow through the inlet shall be made to a true curve with as

large a radius as the size of the inlet will permit.

D. All lifting holes shall be plugged with Bentonite-Cement sealing plaster and sealed with a Miradri System patch, or approved equal, to a minimum of six inches from the edges of the opening, as required to prevent leakage.

E. After completion of the manhole, all plugs shall be completely removed from the sewers and all loose material shall be removed from the manhole.

F. Service connections shall not be installed into manholes unless otherwise shown on the Drawings or directed by the ENGINEER. Where service connections into manholes are allowed, the top of the service sewer pipe shall be 0.2 feet higher than the top of the downstream main sewer pipe. The manhole invert shall be channeled for the service connection sewers in the same manner as for main sewers.

G. Stubs for future construction shall consist of a section of pipe extending two feet outside the manhole wall, connected as shown on the Drawings and Standard Details. The manhole fillet shall be formed for future connection. The stubs shall be located as shown on the Drawings.

H. The top of manhole frame will be at the finished grade of pavement or at least 4-inches above the ground surface when not installed in pavement. In paved areas the frame and cover should match the slope and crown of the finished pavement.

I. Concrete riser rings shall be set in a full bed of mortar. Mortar shall be struck smooth on the inside of the manhole using a hard trowel followed by a sponge float. An epoxy system designed for metal-to-metal adhesion shall be used to connect individual cast iron riser rings and cast iron riser rings to the frame.

J. If inlet pipe enters the manhole two (2) feet above the manhole invert or higher, an internal or external drop line is required and shall comply with the drawings and Standard Details, unless otherwise stipulated by the City of Lake Charles Waste Water Department.

K. Exterior joints shall be sealed with an exterior joint waterproofing system and shall be installed as recommended by the system manufacturer.

L. The specified manhole interior lining system shall be FIELD APPLIED and shall be installed as recommended by the system manufacturer.

M. All manholes will be visually inspected by the ENGINEER; there shall be no evidence of leakage of water into any manhole from outside sources or any imperfections which may allow such leakage.

N. Manholes installed in pavement shall be provided with a cast-in-place concrete collar extending 1-foot out from the edge of the manhole rim.

O. Manholes located outside of paved surfaces shall be constructed to provide a rim elevation extending 3-inches above finished grade, including the sodded grass line.

P. Watertight manhole inserts shall be installed in all manholes, in accordance with manufacturer’s

specifications, following the completion of the manhole installation.

3.06 PIPE INSTALLATION

A. Laying Pipe

1. All pipe shall be laid with the use of a laser. Pipe shall be laid in the trench on bedding or cradle as called for on the plans or as ordered by the Engineer. After the sewer is completed, the interior surface on the bottom thereof shall conform accurately to the grade and alignment indicated on the plans or directed by the Project Engineer. At any stage of construction of a straight stretch between any two consecutive manholes, the starting end of the pipe shall be clearly visible on looking through the pipe from the other end, with full cross section of the interior of the pipe in clear view. Any pipe which is not true in alignment or which has shown settlement after laying, shall be taken up and re-layed at the Contractor's expense.

2. Before being set in place, each section of pipe shall be thoroughly cleaned and freed of dirt. All bells shall be laid on the upstream end.

3. Whenever pipe laying is stopped, either for the night or for any other cause, the end of the pipe shall be securely closed to prevent the entrance of water, mud or other matter, and shall be secured in such manner as to prevent the pipe from being dislodged by movement of backfill. While pipe laying is in progress, the Contractor shall keep the trench clear of water.

4. Wye and tee branches shall be placed in the sewer lines at points indicated by the Engineer. Riser pipe and service lines shall be laid at points and to grades indicated by the Engineer. Riser pipe shall be encased in crushed limestone as shown on the plans. Service lines will be laid in accordance with the requirements for sewer pipe. The ends of all service lines and other points for future connections are to be capped with a suitable watertight cap as manufactured for use with the type of pipe being used.

B. Jointing Pipe and Fittings

3. Thoroughly clean the bell or coupling end and the plain end of the pipe and apply the joint lubricant liberally, shove the plain end of the pipe into the bell and coupling end of the pipe until the pipe hits the bevel of the bell, fitting or coupling.

C. Service Cleanouts

1. All sewer services shall be provided with a 6-inch clean-out and serve only one (1) building structure; combined sewer services shall not be allowed.

2. Cleanouts shall be constructed such that the frame shall be jointed to the riser pipe so that groundwater will be prevented from entering the sewer. Cleanouts shall be tested for water tightness along with the sewers to which they are connected.

3.07 CONNECTION TO EXISTING MANHOLE

A. CONTRACTOR shall remove or plug existing pipe as applicable, drill hole at new location required for installation of sewer under this contract, install pipe, seal the pipe penetration, form channeled inverts, install drop connections as required, and backfill as require.

B. Connection to existing manholes shall be made in such a manner that the modified manhole is equal to a new manhole in appearance and performance. A channel, approximately two inches larger all around than the connecting pipe, shall be cut into the existing manhole base. The new pipe shall be connected as shown on the Drawings and Standard Details. The rough-cut channel shall be finished to its final smooth and uniform shape with mortar. The existing sewer(s) shall be maintained in service and the fresh concrete and mortar surface shall be protected from the flowing sewage for a minimum of 24 hours.

C. Connections to existing manholes shall be plugged upon establishment, to dis-allow the flow of sanitary sewer into the City of Lake Charles' collection system, until the new system has been inspected and accepted by the City of Lake Charles Waste Water department. Under no circumstances shall the plug be removed by prior to the acceptance by City of Lake Charles.

3.08 BACKFILL

A. General

1. No backfilling of trenches shall be done until the pipe work to be covered has been inspected. Where any sheeting or bracing is withdrawn as backfilling progresses, all voids or spaces left thereby shall be carefully and thoroughly filled and compacted with proper tools.

2. The Engineer shall have the right to reject compaction methods and/or equipment, which do not produce satisfactory results.

3. Material for backfill shall contain no rubble, trash, broken concrete, asphalt or other objectionable materials.

4. All backfill operations shall be subject to the approval of the Engineer. The Contractor shall be responsible for the stability of all backfill made under the contract until one year after final acceptance of the work and shall bear the expense of replacing any portions which have become displaced due to carelessness or negligent work on the part of the Contractor or to damages, resulting from natural causes, such as storms, and not attributable, in the opinion of the Engineer, to unavoidable movements on the ground upon which the backfill is made.

5. Backfilling trenches for sewer pipes shall start as soon as the Engineer considers the joints to be satisfactory. Sand shall be carefully placed in six inch (6") layers in the trench so as not to move the pipe or dislodge any of the jointing material and thoroughly, but carefully compacted under or to the level as directed by the Engineer, and around the pipe to 12" over the top of the pipe. The utmost care shall be taken not to disturb the pipe by stepping on or near it or by throwing earth upon it from the bank above, or not to shift a pipe from its proper position by careless or unskilled ramming around it or by unequal filling on the sides.

6. Equal and similar care shall be exercised in filling up above the top of the sewer pipe.

B. Compaction

1. Where a trench is in a highway or city street right of way, backfill for the balance of the trench above a point one foot (1') above the top of the sewer shall be compacted by placing in layers of not more than eight inches (8") thickness and compacting with mechanical tampers or by any satisfactory method or methods that will obtain density hereinafter specified. The density of compacted material in each layer of backfill shall not be less than ninety percent (95%) of the maximum density as measured by Method A of AASHO Designation T-180 (Modified AASHO Test). The Contractor shall maintain the backfill for a period of one year after final acceptance and shall restore any backfill that fails and repair any pavement or other structures, which may be damaged as a result of backfill failure.

2. Where a trench is in open ground and not in a highway or street right of way, the balance of the trench above a point one foot (1') above the top of the sewer may be filled and compacted by approved equipment or mechanical tampers to obtain density equal to that of the adjacent undisturbed soil, and the surface mounded over the top to provide for some after-settlement. About two months after completion of this type of backfilling, the Contractor shall go over the trench again with a roller, refill to the surface of the ground, and re-roll or tamp to a satisfactory condition. The final surface shall be left in a condition equal to that originally found at the start of the work.

3. In those portions of the backfill which are adjacent to structures, or are for other reasons, inaccessible to the equipment used, the Contractor shall use mechanical tampers approved by the Engineer to obtain the specified density. Backfill shall be carefully placed so as to be equally distributed on all sides of the structure and so as not to damage the structure in any way.

4. Laboratory services for backfill density shall be performed by a commercial laboratory approved by the Engineer, but paid for by the Contractor. If settlement occurs the trenches shall be refilled, compacted, and made to conform to the original ground surface. The Contractor shall maintain the trenches in good and safe condition until final acceptance of work by the Owner, and he will be held responsible for any accident or damage to persons or property during the period of construction and for one year following the date of acceptance.

5. The Contractor shall maintain the backfill for a period of one year after final acceptance and shall restore any backfill that fails and repair any pavement or other structures which may be damaged as a result of backfill failure.

6. Pavement repair shall otherwise be in accordance with the City of Lake Charles Paving Specifications.

C. Clean-Up and Removal of Excess Materials

1. The Contractor shall not, without the permission of the Engineer, remove from the line of work any earth excavated therefrom which may be suitable for backfilling or

surfacing until the excavation has been refilled and surfaced.

2. As soon as the backfilling of any excavation is completed, the Contractor must at once begin the removal of all surplus dirt except that actually necessary to provide for the settlement of all filling unless otherwise provided in the Special Provisions. He shall also remove all pipe and other material placed or left on the street by him except material needed for the replacement of the paving. The street shall be opened up and made passable for traffic and the City of Lake Charles shall be notified in writing to that effect at once. Following the above work, the repairing and complete restoration of the street surface, bridges, crossing all places affected by the work shall be done as promptly as possible.

3.09 JACKING AND BORING

A. Where pipe lines are permitted or required to be jacked under roadways or other locations (with or without a sleeve pipe), the sleeve pipe or pipe line shall be installed by means of a boring machine or auger and hydraulic jack, or by other means satisfactory to the Engineer. In the event subsurface operation results in injury or damage to the pavement, repairs to this pavement shall be made by the Contractor at no additional cost to the owner. In the event the paving cracks on either side of the pipe line, or is otherwise disturbed or broken due to the Contractor's operations, he shall repair or replace same at his own expense without further compensation.

B. Where the boring location crosses a State or Federal highway, installation of the casing shall also be in accordance with all the requirements of the D.O.T.D. project permit issued for that location and the Contractor shall bid accordingly.

C. Any pipeline installed through a casing shall be installed according to manufacturer's recommendation, including, but not limited to, the following:

1. Pipe line properly supported on skid

2. Sand bedding of pipe line in casing

3. Properly sealing ends of casing pipe

3.10 TESTING

A. Pipe Testing

1. All pipe may be inspected and representative tests made at the place of manufacture by representatives of the City of Lake Charles to verify conformity with the specifications. A close check will be made for correct dimensions in the joint. Pipe may be inspected and tested prior to delivery to the site of the work and shall be checked for joint tolerances on the site prior to laying. The City of Lake Charles, at its discretion, may select at random any number lengths of pipe up to one length per hundred lengths from each run of pipe to the routine tests made under ASTM or AWWA specifications. The results of these special tests will be a prime factor in the acceptance or rejection of any given run of pipe.

B. Infiltration Testing

1. At no point in new sanitary sewer line shall the leakage of ground water into the system exceed an amount calculated on the basis of 250 gallons per day per mile per inch of diameter of sewer mains contributing at the flow at the point in question. THE FULL LENGTH OF ALL SEWER PIPE WILL BE TESTED FOR INFILTRATION.

C. Leakage Testing

1. After the line between manholes has been properly cleaned and backfilled, plugs shall be placed in either end of the line and inflated. Low-pressure air shall be introduced into the sealed line to a pressure of 4 psig and allowed to stabilize (a minimum of two [2] minutes) to a minimum pressure of 3.5 psig. If the time required to drop the air pressure to 2.5 psig is less than the time scheduled as follows for the various diameters, then the test has failed. The test may be concluded if the pressure does not fall to 2.5 psig in the time scheduled.

2. Minimum holding time required for pressure to drop from 3.5 psig to 2.5 psig shall be 10 min. for 12” and 4 min. for 8” diameter sewer pipe.

3. If the ground water table is above the top of the sewer pipe, the test pressure shall be adjusted upward to give a net pressure differential of 3.5 psig.

4. Any obvious excessive leaks in the system shall be repaired immediately upon discovery. Costs for repairing faulty work, including re-excavating and re-backfilling and for making tests, shall be included in the price bid for installing sewers.

D. Deflection Testing

1. Pipe shall not exceed a deflection of more than 5%. After pipe has been backfilled for at least 30 days, a mandrel sized at 95% of the inside pipe diameter shall be pulled through pipe for verification testing.

E. Manhole Testing

1. At least 25% of the completed manholes, as selected by the ENGINEER, shall be tested for water-tightness by the CONTRACTOR. The test shall be made, with all connecting pipes plugged, by filling the manhole with clean water to within two inches of the bottom of the cast iron frame. The leakage rate shall not exceed three gallons per day per foot of depth, or fifty gallons per day, whichever is less, over a test period of not less than two hours when the water table is not an adverse factor. For every manhole that fails to meet the test, four additional manholes shall be tested.

2. If the water table is an adverse factor, the manhole shall be pumped completely dry, all pipes plugged, and then be checked for infiltration. The leakage rate shall not exceed three gallons per day per foot of depth, or fifty gallons per day, whichever is less, over a test period of not less than two hours.

3. The CONTRACTOR shall repair all imperfections and leaks disclosed by either visual

inspection or testing. The method of repair shall be subject to the ENGINEER's approval.

END OF SECTION

SECTION 3
WATER DISTRIBUTION SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. The work covered by this specification consists of furnishing labor, materials and services for the construction of water distribution lines complete with all necessary pipe, fittings, adapters, valves, valve boxes, thrust blocks, fire hydrants, service connections, meter boxes, complete and operable, pressure tested and disinfected. The requirements of these specifications shall govern any proposed connections to existing water infrastructure owned and operated by the City of Lake Charles. All work shall be in accordance with requirements of the Owner and Engineer. This item includes furnishing and transporting materials, excavating, bracing, bedding, dewatering, laying, jointing, testing, backfilling, and surface cleanup.

B. All distribution systems shall be designed such that the absolute minimum extents of the distribution system are to be installed beneath paved surfaces. The City of Lake Charles Water Department reserves the right to grant waivers on the basis of special conditions; however, no water distribution system designed completely beneath the paved surfaces will be accepted. Any and all joints and fittings installed beneath paved services shall be fully restrained.

C. Tracer wire shall be provided along the entire length of the water main, as well as all service lines, as further detailed herein.

1.02 REFERENCES

A. All materials and designs shall conform to the requirements of these specifications. They shall be new, free from defects, and they shall conform to the following standards where these organizations have set standards:

1. Louisiana Department of Health (LDH)
2. American Society for Testing and Materials (ASTM)
3. American Concrete Institute (ACI)
4. Concrete Reinforcing Steel Institute (CRSI)
5. American National Standards Institute (ANSI)
6. American Water Works Association (AWWA)

B. The same manufacturer shall supply all like materials and equipment of the same class, unless specified to the contrary.

1.03 SUBMITTALS

A. Submittals shall be made available to the City of Lake Charles Water Division during at any time during construction, at the request of the department.

B. Accurate construction record documents shall be submitted to the City of Lake Charles Water Division for approval prior to acceptance of the water distribution system. Project record documents shall accurately record locations of pipe runs, service connections, isolation valves, and air release valves.

1.04 ACCEPTANCE

A. For acceptance of the by the City of Lake Charles, the water distribution system must be:

1. Pre-authorized for construction and subsequent public dedication as part of an approved development plan or preliminary subdivision plat;

2. Constructed to City standards and specifications established by the Water Division;

3. Approved upon completion for conformity with standards and specifications by appropriate city personnel or representatives;

4. Subject to satisfactory maintenance guaranty, as determined by the City; and

5. Located on acceptable rights-of-way or readily accessible maintenance easements to be granted to the City.

6. Accurately depicted in record documents to be submitted

1.06 WARRANTY

A. The Contractor shall guarantee all materials furnished by him free from inherent defects for a period of one year from date of final acceptance, with the exception of where more stringent warrantees are stated herein.

B. Any repairs, including labor, made necessary by inherent defects, shall be rendered without cost to the Owner within the guarantee period.

PART 2 PRODUCTS

2.01 GENERAL

A. Where a certain pipe material is specified on the plans, only that material can be used. All materials shall be new and in good condition.

B. No water distribution line shall be less than 8-inches in diameter.

C. No water service line shall be less than 1-inch in diameter. All water service taps to the main shall service a single residence, or a single building with no interconnectivity.

2.02 WATER DISTRIBUTION PIPE

A. Polyvinyl Chloride (PVC) Pipe

1. Pipe (diameters 4-inch through 12-inch): AWWA C900, SDR 18, 235 psi pressure, NSF approved, 12454 B PVC compound conforming to ASTM Resin Specification D1784.

2. Pipe (diameters 14-inch through 24-inch): AWWA C905, SDR18 DIPS, 235 psi rating, NSF approved, 12454 B PVC compound conforming to ASTM Resin Specification D1784.

3. Pipe shall be new, homogeneous throughout, free of voids, cracks, inclusions, and other defects, uniform as commercially practical in color, density, and other physical properties.

4. All pipe shall be suitable for use as pressure conduit. Provisions must be made for expansion and contraction at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a locked-in, solid cross section elastomeric ring which meets the requirements of ASTM A3139 and ASTM F477. The bell section shall be designed to be at least as hydrostatically strong as the pipe wall and meet the requirements of AWWA C900. Installation shall be according to manufacturer's specifications.

5. All PVC pipe joints located within the limits of restrained joint sections, as well as those joints underneath existing or proposed pavement, shall be provided with restraining harnesses or approved integral restrained push on joints. Restraint harnesses shall be Series 2800 Megalug® restraint harness, manufactured by EBAA Iron, Inc., or approved equal.

6. PVC pipe shall be supplied in standard nominal laying lengths of 20 feet. The color of pipe shall be blue. The pipe shall be marked with the size, material code, dimension ratio (DR), AWWA pressure class and AWWA designation.

7. Fittings for PVC pipe shall be ductile iron and conform to Section 2.03.

B. Ductile Iron (DI) Pipe

1. Pipe shall be designed in accordance with ANSI Specification A21.50 (AWWA C-150) for 150 psi working pressure. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi (per AWWA M-41). Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150. Pipe shall be manufactured in accordance with ANSI Specification A21.51 (AWWA C-151), latest revision.

2. The pipe interior shall be standard cement lined and seal coated with an asphaltic coating in accordance with ANSI Specification A21.4 (AWWA C104) and ANSI A21.16, latest revision.

3. The exterior of the pipe shall be coated, with an asphaltic coating 3 mil minimum thickness in accordance with ANSI Specification A21.51 (AWWA C151), latest revision.

4. All ductile iron pipe shall be installed with polyethylene encasement conforming to AWWA C105, installed in accordance with the manufacturer's recommendations. Film shall be Class C-Black, minimum thickness of 0.008 inches (8 mils), and furnish a certificate of conformance of the material to the requirement of AWWA C105.

5. UNRESTRAINED PIPE JOINTS: Ductile iron pipe joints shall be push-on rubber gasket type or rubber-gasket mechanical joint per AWWA C111 in unrestrained applications. Unrestrained pipe joints shall be by one of the following or an approved equal:

   a. “Tyton Joint Pipe” by US Pipe and Foundry Company.

   b. “Fastite Joint Pipe” by the American Cast Iron Pipe Company.

   c. “Tyton Joint Pipe” or “Fastite Joint Pipe” by McWane Company.

6. RESTRAINED PIPE JOINTS: All ductile iron pipe joints located within the limits of restrained joint sections shall be provided with restraining harnesses or approved integral restrained push on joints. Location of restrained joints shall be subject to the approval of the Engineer and direct payment will be made per each restrained joint, regardless of the method of restraint. Restraints for ductile iron pipe joints shall be push on rubber gasket with integral proprietary restrained joint or a mechanical restraint harness manufactured for ductile iron push on joint pipe. Restraint harnesses shall be Series 1700 Megalug® restraint harness, manufactured by EBAA Iron, Inc., or approved equal. Restrained push on joints shall be by one of the following or an approved equal:

   a. "TR Flex" or “HP Lock” by US Pipe and Foundry Company.

   b. "Flex Ring (positive locking style)" by the American Cast Iron Pipe Company.

   c. "TR Flex" by McWane Company.

7. Fittings for ductile iron pipe shall be ductile iron and conform to Section 2.03.

8. Ductile iron pipe shall be manufactured in the United States by American Cast Iron Pipe Company, McWane Company, U.S. Pipe and Foundry Company, or approved equal.

C. High Density Polyethylene Pipe (HDPE Pipe)

1. HDPE Pipe shall be AWWA C906, DIPS, SDR11, PE 3408 High Density, DIPS, Cell Classification 345434C, in accordance with ASTM D3350.

2. The pipe shall have a blue stripe.

3. Transition Fittings shall be a mechanical joint adapter (Harvey Adapter) fabricated from HDPE pipe conforming to ASTM 3350. The adapter shall have a pre-positioned stainless steel stiffener and shall offer full axial restraint as manufactured by JCM Industries, or approved equal.

4. Butt-fusion of pipes and fittings shall be performed in accordance with the pipe manufacturer's recommendations as to equipment and technique. Fusion shall be accomplished by personnel certified as fusion technicians by a manufacturer of HDPE pipe and/or fusing equipment.

5. Fittings for HDPE pipe shall be ductile iron and conform to Section 2.03.

2.03 FITTINGS

A. Mechanical joint ductile Iron fittings shall be used for HDPE, PVC, and Ductile Iron Water Mains.

B. Ductile iron fittings shall be standard body ANSI A21.10/AWWA C110 or compact body ANSI A21.53/AWWA C153, as required by the construction documents. The rated working pressure shall be 350 psi for 24-inch and smaller and 250 psi for 30-in and larger.

C. The fitting interior shall be double cement lined and seal coated with an asphaltic coating in accordance with ANSI Specification A21.4 (AWWA C104) and ANSI A21.16, latest revision.

D. The exterior of the fitting shall be coated, with an asphaltic coating approximately 1 mil thick in accordance with ANSI Specification A21.51 (AWWA C151), latest revision.

E. All mechanical joint fittings shall be installed with restraining glands in addition to concrete thrust blocks. Restraining glands shall be Series 1300C by Uniflange; Megalug Series 1100 PV or Series 2000PV by EBAA Iron Sales, Inc, or approved equal.

F. All ductile iron fittings shall be installed with polyethylene encasement conforming AWWA C105, installed in accordance with the manufacturer's recommendations. Film shall be Class C-Black, minimum thickness of 0.008 inches (8 mils), and furnish a certificate of conformance of the material to the requirement of AWWA C105.

G. Bolts and nuts shall be alloy steel (Corten Type).

2.04 RESTRAINT HARNESS

A. All pipe joints located within the limits of restrained joint sections shall be provided with restraining harnesses or approved integral restrained push on joints. Location of restrained joints shall be subject to the approval of the Engineer. Restraints for joints shall be push on rubber gasket with integral proprietary restrained joint or a mechanical restraint harness manufactured for push on joint pipe. Restraint harnesses shall be Series 1700 or Series 2800 Megalug® restraint harness, manufactured by EBAA Iron, Inc., or approved equal.

B. Bolts and nuts shall be alloy steel (Corten Type).

2.05 RESILIENT SEATED GATE VALVES

A. Resilient wedge gate valves shall meet or exceed all applicable requirements of ANSI/AWWA C515 or ANSI/AWWA C509 standards, latest revision. They shall be UL listed, FM approved and certified to ANSI/NSF 61 and ANSI/NSF 372.

B. Valve type shall be non-rising stem (NRS), dual seal between gate and body, smooth closing gate and one piece cast-iron wedge with integral lugs. Valves shall have standard o-ring seals, two o-ring seals shall be set above the stem thrust collar and one below.

C. Valves shall have Type 304 stainless steel bolts and nuts for the stuffing box and bonnet.

D. The internal and external ferrous components of the valve shall be fusion bonded epoxy coated meeting ANSI/AWWA C550 Standard. Coating shall be applied prior to assembly to assure coverage of all exposed areas.

E. Valves shall have the manufacturer's name, size of the valve, and working pressure cast into the exterior of the valve.

F. Valves for buried service shall be mechanical joint as per AWWA C111 and shall be provided with a 2" square operating nut as standard. Buried gate valves shall be installed in the vertical position, unless otherwise directed by the Engineer and approved by the City of Lake Charles. Buried gate valves installed in the horizontal position shall have guides and/or rollers to the support the gate. Valves for buried service shall have an arrow cast on the ductile iron operating nut showing opening direction; direction to open shall be counter-clockwise. Bolts and nuts for direct bury mechanical joint assembly shall be alloy steel (Corten Type).

G. Valves for above grade service in meter vaults shall have flanged ends conforming to the AWWA C500, class 125. Above grade service valves shell be provided with a hand wheel showing opening direction; direction to open shall be counter-clockwise. Bolts and nuts for flange to flange assembly shall be low carbon steel conforming to ASTM A193, Grade B7.

H. Valves in buried service shall be Mueller Series A-2360 (AWWA C-509) or A-2361(AWWA C-515), American Flow Control Series 2500 (AWWA 515) or M&H Style 4067-01.

2.06 VALVE BOXES

A. Each buried gate valve shall be provided with a cast iron valve box and cover. Valve box shall be of the two-piece or three-piece screw sleeve adjustable type, suitable for the various line depths. The interior and exterior components of the valve box shall be bituminous coated. All valve boxes shall be provided with cast iron covers on which the word "WATER" shall be cast into the top. Valve box shall be Tyler Series 6850 or Series 6860, Sigma Corp. Model No. VB-262, or approved equal.

B. A 24-inch round, pre-cast concrete pad shall be provided on all valve boxes installed outside of paved surfaces. Round valve box pads shall be as manufactured by Southern Meter Box, Inc., or approved equal.

2.07 CASING FOR JACKING AND BORING

A. Unless otherwise required by the agency having jurisdiction, the casing shall be welded steel pipe meeting ASTM A53, Grade B, and have a minimum yield strength of 35,000 psi. The exterior of the casing pipe shall be coated with coal tar epoxy or bituminous asphalt. Minimum wall thickness shall be as shown in the following table:

Table for minimum wall thickness for steel casing pipe for E72 loading		
Carrier Pipe Nominal Diameter (inches)	Min. Casing Pipe Diameter (O.D.) (inches)	Nominal Thickness (inches)
6	12	0.344
8	16	0.375
10	20	0.407
12	24	0.469
14	27	0.505
16	30	0.505
18	30	0.505
20	36	0.595
24	36	0.595
30	42	0.625
36	48	0.688
42	60	0.844

2.08 TRACER WIRE

A. Tracer wire for horizontal directional drilling operations shall be 8 gauge, Copper Clad Steel, extruded with a 45 mil (minimum) HDPE coating, .219 inches (minimum) O.D. Rated break load 2,785 lbs., 30 volt, 21% IACS. The outside color of the wire shall meet the APWA color code of the buried utility line. Tracer wire shall be Pro-Trace HDD-CCS PE45 as manufactured by Pro-Line Safety Products Co., or approved equal.

B. Tracer wire for direct bury shall be 12 gauge, Copper Clad Steel, extruded with a 45 mil (minimum) HDPE coating, .219 inches (minimum) O.D. Rated break load 713 lbs., 30 volt, 21% IACS. The outside color of the wire shall meet the APWA color code of the buried utility line. Tracer wire shall be Pro-Trace HF-CCS PE45 as manufactured by Pro-Line Safety Products Co., or approved equal.

C. The wire shall be held in place by tacking it to the top of the pipe using duct tape at approx. 10 foot centers and shall be continuous for the entire length of the water line. Sufficient slack shall be provided at each valve location in order that the wire can be pulled up into the valve box for easy access.

D. Attach wire to all fixtures and appurtenances to ensure continuous flow of electrical current.

E. Splices in detection wire shall be installed in a per the manufacturer's directions.

2.09 HYDRANTS

A. Fire hydrants shall be 3-way type, 5-1/4" valve opening, 6" mechanical joint shoe for a 4'-0" bury (or for the bury as called for in the proposal). Hydrants shall be standard AWWA Type, complete 2-1/2" hose nozzles and 4-1/2" Pumper nozzle, with Lake Charles special threads. The Contractor shall note that the finished elevation of the fire hydrant shall be so that it provides a minimum of 18 inches clear between the finished grade and the bottom of the pumper nozzle.

B. Hydrants shall Mueller Centurion model A-423, as manufactured by Mueller Company; American

Darling model B-84-B, as manufactured by American Cast Iron Pipe Company; M&H Model 129, as manufactured by M&H Valve Company; or approved equal.

2.10 TAPPING SLEEVES AND VALVES

A. Tapping sleeves shall be stainless steel and be provided with SST flanges. Tapping sleeves shall be ROMAC Stainless Steel Tapping Sleeve (SST), as manufactured by Romac Industries, Inc.; Ford All Stainless Tapping Sleeve (FAST), as manufactured by the Ford Meter Box Company, Inc., or approved equal. Tapping sleeves shall be provided with 304 Stainless Steel bolts, nuts and washers.

B. Tapping valves for 3-inch lines and larger shall be Resilient Seated Wedged Tapping valves with Flanged by Mechanical Joint Ends conforming to AWWA C509 or C515 as applicable. Tapping valves for 2-inch service lines shall be Resilient Seated Wedged Tapping valves with threaded ends compatible with the specified service saddles. Tapping valves shall be provided with a minimum 3/8-inch NPT pipe plug on the bonnet of the valve body for field testing. Tapping valves shall be Mueller Model T-2360-16 Resilient Wedge Tapping Valves as manufactured by Mueller Co.; American Series 2500 Resilient Wedge Tapping Valve, or approved equal. Tapping sleeves shall be provided with 304 Stainless Steel bolts, nuts and washers.

C. All tapping valves shall be provided with valve boxes as specified in part 2.06 of these standard specifications.

2.11 CONCRETE

A. Concrete for thrust blocks and pads shall be 3000 psi at twenty eight (28) days. Concrete shall be ready mix; Sakrete will not be acceptable.

2.12 COMBINATION AIR VALVES

A. Combination air valves shall be installed on high points along the water main, as well as, those locations, where in the opinion of the Engineer air may become trapped in the water main.

B. Combination air valves shall be Golden Anderson, Figure 950, as manufactured by Golden Anderson Industries, or approved equal.

C. Air Valves shall be installed in a Pre-Cast Concrete manhole in accordance with the City of Lake Charles specifications for concrete manholes.

2.13 SERVICE SADDLES

A. Service Saddles shall be ductile iron with a finish coat of fused nylon approx. 10-12 mils thick for service line sizes up to 2-inches. The straps, nuts, and bolts shall be stainless steel. Service saddles shall be one of the following as manufactured by ROMAC with I.P. threads, or approved equal.

1. 101NS for 1-inch taps on 12-inch and smaller PVC mains

2. 202NS for 1-inch taps on 14-inch and larger PVC mains

3. 202NS for 2-inch taps on all PVC main sizes

4. 101N-H for 1-inch taps on 12-inch and smaller HDPE mains

5. 202N-H for 1-inch taps on 14-inch and larger HDPE mains

6. 202N-H for 2-inch taps on all HDPE main sizes

B. Taps for service lines greater than 2-inches shall be completed with stainless steel tapping sleeves and tapping valves as specified in part 2.10 of these standard specifications.

2.14 CORPORATION STOPS

A. Corporation stops for 1-inch diameter service lines shall be provided with AWWA taper threaded inlet and compression connection for CTS tubbing outlet. Corporation stops shall be Mueller (CC) Thread Cat. #H-15008; Ford Meter Box Company Cat #F-1000-CC, or approved equal.

2.15 CURB STOPS

A. Curb stops shall be provided for all 1-inch and smaller service connections. Curb stops shall be 1-inch and manufactured with either compression connections or pack joints for 1-inch CTS OD tubing on both ends. Curb stops shall be Mueller Mark II Oriseal Cat# H15209, Ford Ball Valve Curb Stops Cat# B41-344-NL-W, or approved equal.

2.16 SERVICE LINE

A. Service pipe shall be high density polyethylene (HDPE), SDR9. Service pipe shall be 1" diameter minimum and shall be provide in CTS outside diameter sizing. Pipe shall meet the requirements of AWWA C-901, "Polyethylene Pressure Pipe, Tubing and Fittings, 1/2" through 3" for Water." CTS sized pipe shall have service identification stripes of longitudinal blue color stripes co-extruded into the pipe outside surface. Striping printed on the pipe exterior shall not be acceptable. All service pipe shall be installed with tracer wire. Stainless steel insert stiffeners shall be used where connections are made.

2.17 COMPRESSION COUPLINGS

A. Compression couplings shall be as manufactured by Rockwell Type 411 or Type 441, or JCM #212, or equal, with stainless steel bolts. PVC couplings are not allowed.

2.18 ADAPTERS AND FITTINGS

A. All adapters and fittings shall be bronze or brass. Galvanized adapters or fittings are not allowed.

2.19 LINE SETTERS

A. Linesetters , for 3/4" x 5/8" meters shall be Ford Meter Box Company Model LSVH 48-243W-AWT, 1" CTS inlet and 3/4" male swivel outlet, or approved equal.

B. Coppersetters for 1-1/2" meters shall be Ford Meter Box Company Model VH76-12B-11-66, or approved equal.

C. Coppersetters for 2" meters shall be Ford Meter Box Company Model VH77-12B-11-77, or approved equal.

2.20 METER BOXES

A. All new water meter boxes shall be pre-cast concrete with cast iron lid and cast iron reader as manufactured by Southern Meter Box, Inc. or Old Castle Precast, Inc. Meter boxes shall be of the make and model as provided below.

1. Southern Meter Box Company

   a. ¾-inch x 5/8-inch meter and linesetter (C.H.1-1/2" with T.H. 1-1/2" Lid)

   b. 1-1/2-inch meter and coppersetter (C.H. 2" with T.H. 2" Lid)

2. Old Castle Precast, Inc.

   a. ¾-inch x 5/8-inch meter and linesetter (B16 Box with B16CG Lid)

   b. 1-1/2-inch meter and coppersetter (B30 Box with B30CG Lid)

   c. 2-inch meter and coppersetter (B36 Box with B36CG Lid)

2.21 METERS

A. All water meters shall be provided by the City of Lake Charles Water Division, unless otherwise approved by the Water Division.

2.22 FOUNDATION, BEDDING AND BACKFILL MATERIAL

A. Foundation Material

1. Crushed limestone or crushed Portland cement concrete shall be used for structure foundations and pipe foundation amendments as detailed herein. Crushed limestone or crushed Portland Cement Concrete foundation material shall meet the following #610 gradations.

Sieve Size	Percent Finer By Weight
1 – ½ in	100
1 - in	90 to 100
3/4 - in	70 to 95
3/8 - in	50 to 80
No. 4	35 to 65
No. 10	25 to 50
No. 40	10 to 26
No. 200	4 to 12

B. Bedding and Embedment Material

a. Sand shall be used for bedding and initial backfill of the watermain and services as further detailed herein. Sand for embedment shall be non-plastic siliceous material and shall conform to the following gradation limits:

Sieve Size	Percent Finer By Weight
½ - in	100
No. 10	75 to 100
No. 200	0 to 10

C. Backfill Materials

1. Usable Native Excavated Soils shall be used for trench back fill when the entirety of the trench is located more than five (5) feet from the edge of the roadway or paved surface. Usable native excavated materials shall meet the following requirements.

a. Usable native excavated soils shall have a maximum PI of 25 and maximum organic content of five (5) percent. Soils with a silt content of fifty (50) percent or greater and also a PI of ten (10) or less will not be allowed. Any select material used to supplement or replace usable excavated soil shall meet these requirements and must be approved by the Engineer. Soil shall be tested at the Engineer and the Owner's option. Usable excavated material may be neatly stockpiled at the site where designated by the Engineer provided there is an area available that will not interfere with the Owner's access nor inconvenience traffic adjoining property owners.

b. When excavated soils do not meet the above stated requirements they shall be removed from the site, at the contractors expense, and replaced with Select or Sand Backfill Material.

2. Select or Sand Backfill Material shall be used for trench backfill when any portion of the trench is to be installed within five (5) feet from the edge of the roadway or paved surface.

a. Sand for backfilling trenches and structures shall be non-plastic siliceous material and shall conform to the following gradation limits:

Sieve Size	Percent Finer By Weight
½ - in	100
No. 10	75 to 100
No. 200	0 to 10

b. Select backfill material shall be natural soils with a maximum PI of 20, maximum Liquid Limit of 35, and a maximum organic content of 5 percent. Soils with a silt content of 50 percent or greater and also a PI of 10 or less shall not be allowed.

3. Crushed limestone or Crushed Portland Cement Concrete Backfill

a. Crushed limestone or crushed Portland Cement Concrete backfill material shall be used for trench backfill when the trench is to be installed beneath any paved surface, or as directed by the Engineer. Crushed limestone or crushed Portland Cement Concrete backfill material shall meet the requirements set forth above for Foundation material.

PART 3 EXECUTION

3.01 GENERAL

A. Coordinate with other utility providers to the fullest extent possible complete maximum spacing from all utilities for ease of access following installation.

B. Any materials damaged during installation shall be removed and discarded.

3.02 ALIGNMENT AND GRADE

A. The contractor shall use a chalk line to assist in alignment of the pipe line.

B. Whenever obstructions not shown on the plans are encountered, and the Engineer deems it necessary to change alignment to expedite the work, if the change in plans result in a change of the amount of work by the Contractor, such altered work will be allowed the Contractor on the basis of bid unit prices or extra work order, whichever the case may be.

C. The Contractor shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined, and he shall be held responsible for the repair of such structures when broken or otherwise damaged because of carelessness on his part. Unless specifically ordered by the Engineer, the minimum coverage of this pipe line shall be forty-eight inches (48").

3.03 TRENCHING AND EXCAVATION

A. Excavation

1. Excavation shall include the removal, handling, re-handling, refill or backfilling, and disposal of any and all materials encountered in the work, and shall include all pumping, bailing, drainage and sheeting and bracing, and trench box. The work of excavation shall also include the responsibility of added expenses or other liability that may arise from quicksand, obstacles or conditions, foreseen or unforeseen, which may be encountered in the work. It includes clearing and the removal of pavements, curbs, sidewalks, shrubbery, and other obstructions not otherwise provided for.

2. The trench shall be dug so that the pipe can be laid to the alignment and depth required and it shall be excavated no more than 500 feet in advance of pipe laying. If necessary, the trench shall be braced such that the men may work therein safely and efficiently. The trenches shall be free of water at the time of pipe laying. The minimum width of the unbraced trench shall be 18 inches or one foot greater than the outside diameter of the

pipe, whichever is greater. The pipe shall be laid on stable soil, free from rocks, clods, or sharp-edged objects. Any part of the trench excavated below grade shall be backfilled to grade with thoroughly compacted material approved by the Engineer. The maximum deflection per length of pipe shall be as recommended by the pipe manufacturer.

B. Methods of Excavation

1. The Engineer shall have the authority, at any time, to require the Contractor to discontinue the use of any excavating machine or other appliance which, in the Engineer's judgment, is not adapted to the purpose for which it is used.

C. Dewatering

1. The trenches shall be maintained free of water at all times while work is in progress, and water shall not be allowed to flow over or rise upon earth foundations, pipe, concrete masonry, or other work, except as otherwise specified for bayou crossings and special "wet areas." The Contractor shall not open more trench than the available pumping facilities can dewater to the satisfaction of the Engineer.

2. The Contractor shall assume all responsibility for disposing of all water so as not to injure or interfere with normal drainage of the locality. In no case shall water pipe lines be used as drains for such water. The ends of water pipe lines shall be adequately and properly plugged during construction by the use of approved stoppers (a garbage bag is not an approved stopper), and all necessary precautions shall be taken to prevent the entrance of ground water, mud, sand, or any other objectionable materials into the pipe lines. If such materials enter the pipe lines, they shall be removed by the Contractor as soon as possible after discovery thereof.

D. Maintenance of Excavation

1. The Contractor shall maintain all excavation in good order during the construction, so as not to hinder or injure the pipe laying, masonry, or other work. He shall take all reasonable precautions to prevent movement of the sides of such excavation, and shall remove at his own expense any material sliding into the excavation.

E. Sheeting and Bracing

1. The Contractor shall furnish and put in place such sheeting and bracing as may be required to support the sides of all trenches or other excavations and, where required, remove, or cut off, as directed, such sheeting at his own expense. A steel trench box, supplemented with additional sheeting, may be used in lieu of total sheeting and bracing.

F. Disposal of Excavated Material

1. All material excavated shall be placed so as to interfere as little as possible with public travel. In case the street is not wide enough to allow the dirt to be piled up without blocking the sidewalk, the Contractor shall, at his own expense, maintain an open passageway not less than two and one-half feet (2 ½') wide on the sidewalk and shall keep this passageway free from mud and slush.

2. The Contractor may deposit excavated materials directly in permanent position insofar as is consistent with the proper prosecution of the work. Materials that cannot be placed at once in permanent position shall be deposited in temporary storage piles. All this work shall be done with reasonable neatness and excavated materials shall not be carelessly strewn over the area.

3. Surplus excavated material over and above that required for backfilling, mounding over the pipe and making other fills and embankments to the finished lines and grades indicated on the drawings shall be disposed of as directed by the Engineer. The Contractor shall be responsible for seeing that the material is dumped in an orderly manner within the limits designated. The surface of the dump shall be neatly graded to blend with the natural contours of the existing ground surface. If the City or Drainage Board has no use for the surplus material, it will be the responsibility of the Contractor to properly dispose of said surplus.

3.04 BEDDING

A. Once the excavation is complete to the required grade of the bottom of the trench, sand bedding shall be placed, compacted and graded to provide firm, uniform and continuous support for the pipe. Bell holes shall be excavated so that only the barrel of the pipe bears upon the bedding. The pipe shall be laid accurately to the lines and grades indicated on the Drawings. Blocking under the pipe will not be permitted. Bedding shall be placed evenly on each side of the pipe to the springline and hand tools shall be used to force the bedding under the haunches of the pipe and into the bell holes to give firm continuous support for the pipe.

B. Where the bottom of the excavation is not, in the opinion of the Engineer, of suitable material for the construction of required pipe foundation, the excavation shall be deepened by a minimum of 6-inches and a limestone foundation shall be placed under the pipe as directed by the Engineer. This stone foundation is not to be included in the price bid for laying pipe and will be paid for as a separate item.

C. Where the Contractor exceeds the maximum trench width to the extent that excessive backfill loads are imposed on the pipe, or where the trench is over-excavated, as determined by the Engineer; the Contractor shall provide limestone or such additional pipe foundation as the Engineer may require without any additional compensation. Over-excavated trenches shall not be brought up to grade with excavated material.

3.05 PIPE INSTALLATION

A. Thoroughly clean interior of pipe before lowering into the trench while keeping pipe interior free of foreign matter during laying operations.

B. When work is not in progress, the ends of the pipe and fittings shall be plugged so foreign material cannot enter pipe.

C. Provide bell holes at each joint to permit proper joint assembly and uniform pipe support.

D. The pipe shall be installed and backfilled in accordance with the manufacturer’s specifications. Items of work not mentioned specifically herein shall be performed in compliance with the

current revision of AWWA C605, "Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water."

E. The trench shall provide continuous support for the pipe without voids or soft spots under the pipe.

F. Concrete thrust blocks shall be provided at all fittings where a change of direction occurs or as specified by the Engineer for all pipe three (3") in diameter or greater. Thrust blocks shall be poured against undisturbed soil and shall not cover the bolts or nuts on the fittings. A plastic barrier shall protect bolts or nuts from being covered.

G. The water main shall be installed in steel casing where indicated in the Drawings, typically under state highways, railroads, or as indicated by the Engineer.

H. Pipe shall be laid beneath all ditches, sewers, culverts, pipes, conduits, drainage canals, tracks and similar structures. Regular pipe laying methods shall be used in all such cases except where special crossings are indicated.

I. The Contractor shall not operate any valves that will allow water to flow or stop the flow of water. These valves will be operated by the City of Lake Charles Water Division exclusively.

J. Water service to customers shall be maintained without interruption as much as possible. Interruption of service shall be allowed only at times agreed to by the Owner and with proper notice to the customer (at least one hour in advance).

K. The Owner may require that major connections which require lengthy interruptions to service be made during periods of low water use or that temporary service lines be provided by the Contractor at no additional cost to the Owner.

L. Assembly of fittings and other preparatory work shall be done in advance to reduce the off time and to keep interruption to a minimum.

3.06 SETTING VALVES

A. Valves, fittings, plugs, caps, etc., shall be set and jointed to pipe in the manner specified in the preceding paragraphs for cleaning, laying, and jointing pipe.

B. Valve boxes shall be provided for every valve except as shown on the plans. Before placing in the trench, all valves shall be carefully inspected for possible damage.

C. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished pavement, or such other level as may be directed.

3.07 AIR VALVE INSTALLATION

A. Combination air valves shall be installed in a Pre-Cast concrete manhole in accordance with the City of Lake Charles manhole specifications.

B. The air valve shall be installed in accordance with the manufacturer's printed instructions.

C. The air valve shall be oriented in the vault for easy access and maintenance.

D. The manhole shall be installed on a foundation of 6-inches of No. 57 Limestone.

3.08 LEAKAGE TESTING:

A. All pipe lines shall be tested as specified herein and as otherwise required to demonstrate that they will successfully withstand 150 psi operating pressure without leakage in excess of the specified maximum in any test section of the pipe line, all as approved by the Engineer.

B. Whenever conditions will permit, in the opinion of the Engineer, the pipe lines shall be tested before the pipe joints are backfilled. All uncovered joints shall be examined during the tests and all visible leaks shall be entirely stopped. Joints which leak shall be re-made and re-tested until found to be satisfactory.

C. Water used for testing shall be reasonably clean and free from oil, silt, mud, sticks, vegetable matter, and other objectionable materials. All water required for testing shall be furnished by the Owner.

D. Corporation stops shall be provided at high places on the pipe line for expelling air from the line, except at the high points where air valves may be indicated on the plans. Also, one corporation stop shall be furnished and installed for each test pump location. No direct payment.

E. When a section of pipe line of a length deemed suitable by the Engineer is ready for testing, it shall be given the specified leakage test and, if defects are discovered, it shall be retested after replacement of all defective items found therein. On the water distribution system, where practicable, the test length preferably shall not exceed 2,000 feet, and it shall not exceed 4,000 feet unless specifically approved by the Engineer due to the location of valves or other pipe line conditions.

F. For leakage tests of pipe lines, prior to meters, the air shall be completely expelled from the section of pipe line to be tested, and the test shall be made at a hydrostatic pressure of not less than 150 psi for a duration of not less than four (4) hours, during which the leakage shall not exceed one (1) gallon per inch of nominal diameter per mile of pipe per hour. In all cases, the test period shall be of sufficient duration to permit proper examination of pipe joints and other items in the test section of pipe line.

G. For leakage tests of plumbing lines, lines which proceed the meter, the air shall be completely expelled from the section of pipe line to be tested, and the test shall be made at a hydrostatic pressure of not less than 150 psi for a duration of not less than four (4) hours, during which the leakage shall not exceed one (1) gallon per inch of nominal diameter per mile of pipe per hour. In all cases, the test period shall be of sufficient duration to permit proper examination of pipe joints and other items in the test section of pipe line.

H. All pipe, joints, fittings, valves, hydrants, and other items found to be cracked, leaking or otherwise defective, shall be removed and replaced, and the pipe lines shall be retested until the test requirements have been complied with.

3.09 BACKFILL

A. After the pipe lines have been laid and approved, the trenches shall be backfilled with sand up to a foot above the top of the pipe. All trenches shall be backfilled by hand from the bottom of the trench to the springline of the pipe. The sand shall be carefully deposited on both sides of the pipe at the same time and thoroughly tamped and rammed under and around the pipe until enough fill has been placed to provide a cover of at least one foot above the pipe bells. The remainder of the backfill shall be with fine, loose, selected materials free from clods, clumps, sticks, stones, and foreign matter.

B. When the new water line is placed within public road right-of-way by open cut method, the trench shall be backfilled to grade by approved methods and uniformly compacted in 12" lifts to 95% Standard Proctor (ASTM D698), and tested at a minimum rate of two (2) tests per 100 feet of trench. When the new water line is placed by open cut method, within State or Federal road right-of-way or servitudes, the trench shall be backfilled according to Article 701.08, "Backfilling," of the LA. DOTD Standard Specifications for Roads and Bridges, latest revision. When the new water line is installed by open cut within easements or servitudes not directly influenced by vehicle movement, the backfilled density shall meet that of the adjacent soil, subject to Engineer's approval.

C. Laboratory services for backfill density shall be performed by a commercial laboratory approved by the Engineer. If settlement occurs the trenches shall be refilled, compacted, and made to conform to the original ground surface. The Contractor shall maintain the trenches in good and safe condition until final acceptance of work by the Owner, and he will be held responsible for any accident or damage to persons or property during the period of construction and for one year following the date of acceptance.

D. The Contractor shall maintain the backfill for a period of one year after final acceptance and shall restore any backfill that fails and repair any pavement or other structures which may be damaged as a result of backfill failure.

E. Pavement repair shall otherwise be in accordance with the City of Lake Charles Paving Specifications.

3.10 JACKING AND BORING

A. Where pipe lines are permitted or required to be jacked under roadways or other locations (with or without a sleeve pipe), the sleeve pipe or pipe line shall be installed by means of a boring machine or auger and hydraulic jack, or by other means satisfactory to the Engineer. In the event subsurface operation results in injury or damage to the pavement, repairs to this pavement shall be made by the Contractor at no additional cost to the owner. In the event the paving cracks on either side of the pipe line, or is otherwise disturbed or broken due to the Contractor’s operations, he shall repair or replace same at his own expense without further compensation.

B. Where the boring location crosses a State or Federal highway, installation of the casing shall also be in accordance with all the requirements of the D.O.T.D. project permit issued for that location and the Contractor shall bid accordingly.

C. Any pipeline installed through a casing will be installed according to manufacturer’s

recommendation, including, but not limited to, the following:

1. Pipe line properly supported on skid

2. Sand bedding of pipe line in casing

3. Properly sealing ends of casing pipe

3.11 DIRECTIONAL DRILLING:

A. The drilling shall be performed by a company with sufficient experience and expertise to perform the work in conformance with the drawings and these specifications. The contractor is responsible for all cleanup and disposal of debris, cuttings, soil, etc., and shall perform this portion of the work in an environmentally sound manner.

B. The Contractor shall clean up and dispose of excess drilling mud associated with the boring process. The mud shall be disposed of in a timely manner. All driveways, pavement, and walkways shall be cleaned at the end of each day. Excess mud in the roadside ditches shall be managed so as not to block drainage during the process of the work. This cleanup shall proceed with the work and not be left for the end of the project.

3.12 DISINFECTION

A. After satisfactory tests have been performed and before being placed in service, all pipe lines shall be disinfected. The expense involved shall be borne by the Contractor except for the water required which shall be furnished by the Owner from the waterworks system without charge to the Contractor.

B. Disinfecting the water mains shall be done according to the provisions of AWWA C651-86. This work shall be performed in segments of the pipe line in accordance with a schedule to be submitted by the Contractor and approved by the Engineer before any work is commenced. As segments are disinfected and put into service after the Louisiana State Board of Health approval, periodic samples shall be taken from completed sections as an added safety precaution until completion of the entire project.

C. The City of Lake Charles Water Division Laboratory is certified by the State Health Department to sample the new water lines for purposes of determining that the new lines are free from contamination by coliform bacteria. There is not a fee for this service, and Contractors can contact the City of Lake Charles Laboratory at 491-1599, or the laboratory directly at 491-1554 to coordinate the sampling. The line will not be accepted and placed in service until clear samples are received.

D. Samples shall be taken from corporation stops installed in the lines as directed by the Engineer, and installed for the sole purpose of testing the lines.

E. After thorough flushing, sufficient available chlorine shall be added to the water in the line to show a minimum residual of 50 PPM. This chlorinated water shall then be drawn off from each deadend until an orthotolidin test shows a strong indication of chlorine. As the water is drawn off and new water added, this new water shall be chlorinated. After all points show an indication of chlorine, the chlorinated water shall remain in the system for twenty-four (24) hours, after which

period it shall be flushed out with potable water. Should subsequent bacteriological tests show any pipe lines to be contaminated, the chlorination process shall be repeated in such pipe lines until satisfactory results of tests are obtained. No water from any pipe line shall be used for human consumption until bacteriological tests indicated that the water is entirely free of bacterial contamination.

F. Chlorine in liquid gas form, calcium hypochlorite, chlorinated lime, or sodium hypochlorite may be used, but the Engineer's approval of the material and procedure shall be given before any work is commenced.

END OF SECTION

SECTION 4
STORM DRAINAGE COLLECTION SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. The work covered by this specification consists of furnishing all labor, supervision, materials, equipment, tools, and supplies necessary for the installation of, pipe culverts, pipe arch culverts, storm drains and sewers, herein referred to as "conduit", and drainage structures in accordance with these specifications and in conformity with the lines and grades shown on the plans or established by the Engineer.

B. All work in this section shall be in accordance with the Louisiana Standard Specifications for Roads & Bridges, 2006 Edition, except as modified herein. When the term "Department" is utilized it shall mean "Engineer".

C. Where a certain pipe material and size is specified on the plans, only that material and size can be used. All pipe material used between consecutive structures in the storm sewer line shall be of the same kind unless otherwise provided by the plans.

1.02 REFERENCES

A. All materials and designs shall conform to the requirements of these specifications. They shall be new, free from defects, and they shall conform to the following standards where these organizations have set standards:

1. American Society for Testing and Materials (ASTM)
2. American Concrete Institute (ACI)
3. Concrete Reinforcing Steel Institute (CRSI)
4. American National Standards Institute (ANSI)
5. The Society for Protective Coatings (SSPC)
6. Louisiana Department of Transportation and Development (LADOTD)

B. The same manufacturer shall supply all like materials of the same class, unless specified to the contrary.

1.03 SUBMITTALS

A. Submittals and test reports shall be made available to the City of Lake Charles Engineering Department at any time during construction, at the request of the department.

B. Accurate construction record documents shall be submitted to the City of Lake Charles Engineering Department for approval prior to acceptance of the storm drainage collection system. Project record documents shall accurately record locations of pipe runs, manholes, and collection boxes with as-built invert elevations within rights-of-way or permanent easements.

1.04 ACCEPTANCE

A. For acceptance by the City of Lake Charles, the storm drainage collection system must be:

1. Pre-authorized for construction and subsequent public dedication as part of an approved development plan or preliminary subdivision plat;

2. Constructed to City standards and specifications described herein;

3. Approved upon completion for conformity with standards and specifications by appropriate city personnel or representatives;

4. Subject to satisfactory maintenance guaranty, as determined by the City; and

5. Located within acceptable rights-of-way to be dedicated to the City;

6. Accurately depicted in record documents to be submitted to the City.

1.05 QUALITY ASSURANCE

A. Laboratory Services: Laboratory services shall be performed by a commercial laboratory approved by and paid by the Engineer.

B. Duties: The laboratory will review the Contractor furnished design mix to determine compliance with these specifications. The laboratory will inspect and test all materials entering concrete, analyze aggregate for quality, durability, grading and free water content, take representative specimens of ingredients and mixes, and make test cylinders and measure compressive strength of same. The laboratory shall check the moisture content of aggregate and control the mix. It is the intent of these specifications to have batch plant and job site laboratory control. Job site laboratory control shall include job mixing, handling, and placing of concrete.

C. Test Procedures: All test specimens shall be taken and laboratory tests conducted in conformance with the latest standard test procedure of the ASTM, as amended to date of contract, and when not covered therein shall be sampled and tested in accordance with the "Standard Specifications for Roads and Bridges" of the Louisiana Department of Highways, 2006 Edition, with subsequent revisions to date of contract. All tests not covered by the above shall be performed as specified by the Engineer.

D. Test Reports: The laboratory shall furnish promptly to the Contractor and the Engineer written reports covering the results of all tests and inspections made.

E. Test Cylinders: A minimum of two (2) sets of four (4) cylinders each will be made for each day's pour for over 25 cubic yards, and one (1) set will be required for 25 cubic yards or less. Of each set of test cylinders, two (2) will be tested for compressive strength at the age of seven (7) days;

and two (2) will be tested at the age of twenty-eight (28) days. If any cylinder fails to meet the specified strength requirements, the Owner shall have the right to require changes in proportions, require additional curing time, and/or take other measures for enforcement of strength requirements.

F. Contractor's Responsibility: It shall be the responsibility of the Contractor to provide the concrete mix design, to produce concrete of the strength, durability, workability and finish specified, submit the mix design for approval, furnish representative material for specimens in quantities required by the testing laboratory; cooperate and assist in taking samples of materials for testing.

1.06 WARRANTY

A. The Contractor shall guarantee all materials furnished by him free from inherent defects for a period of one year from date of final acceptance, with the exception of where more stringent warrantees are stated herein.

B. Any repairs, including labor, made necessary by inherent defects, shall be rendered without cost to the City within the guarantee period.

PART 2 PRODUCTS

2.01 MATERIALS

A. All storm drainage materials shall conform to the following sections of Louisiana Standard Specifications for Roads and Bridges, 2006 Edition, except as modified by these specifications. All materials provided under this specification must be qualified under the LADOTD MATT SYSTEM.

1.	Portland Cement Concrete:	901
2.	Aggregates:	1003
3.	Reinforced Concrete Pipe:	1006.03
4.	Reinforced Concrete Pipe Arch:	1006.04
5.	Concrete Pipe Joints:	1006.05
6.	Gasket Materials:	1006.06
7.	Plastic Pipe:	1006.07
8.	Plastic Yard Drain Pipe:	1006.09
9.	Coal Tar Epoxy	1008.04
10.	Reinforcing Steel:	1009
11.	Curing Materials:	1011.01

12.	Precast Reinforced Drainage Units	1016
13.	Water	1018.01
14.	Frames, Grate and Manhole Covers	1018.04
15.	Form Release Agent:	1018.25
16.	Geotextile Fabric	1019

2.02 CULVERTS AND STORM DRAINS

A. Culverts and storm drains provided under this specification shall be in accordance with the Section 701 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition, with the following amendments.

B. Reinforced Concrete Pipe

1. Reinforced-Concrete Pipe shall comply with ASTM C 76 (ASTM C 76M). Pipe shall be Class III, Wall B, for O-Ring gasketed joints.

2. Reinforced Concrete Arch Pipe shall comply with ASTMC 506. Pipe shall be class A-III.

3. Pre-Cast Reinforced Concrete Box Culverts shall comply with ASTM C 1433, Table 1.

4. Joints:

   a. RCP: Joints shall be Type III bell and spigot end joints, as specified in subsection 1006.05(c) of LADOTD Standard Specifications, meeting the requirements of ASTM C 443.

   b. RCPA: Joints shall be Type III, as specified in subsection 1006.05(c) of LADOTD Standard Specifications, meeting the requirements of ASTM C 443.

   c. Pre-Cast Reinforced Concrete Box Culvert: Joints shall meet the requirements of ASTM C 990

5. Pre-Cast Concrete Culvert Gaskets:

   a. RCP: Rubber gaskets meeting the requirements of AASHTO M315 and ASTM C 443, Type A; lubricant as specified by manufacturer.

   b. RCPA: Rubber gaskets meeting the requirements of AASHTO M315 and ASTM C 443, Type A; lubricant as specified by manufacturer.

   c. Pre-Cast Reinforced Box Culvert: Pre-formed flexible joint sealant meeting the requirements of AASHTO M 198 and ASTM C 990.

C. Plastic Pipe

1. Plastic pipe shall be Ribbed Polyvinyl Chloride Pipe (RPVCP) as specified in subsection 1006.07(a) of the LADOTD Standard Specifications.

2. Plastic pipe shall only be allowed for use as side drains and only when outside of pavement.

3. Joints for plastic pipe shall be Type III, as specified in subsection 1006.07(d) of LADOTD Standard Specifications

2.03 MANHOLES, JUNCTION BOXES, CATCH BASINS, AND END TREATMENTS

A. Storm drainage manholes, junction boxes, catch basins, and end treatments provided under this specification shall be in accordance with the Section 702 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition, with the following amendments.

1. Curb inlets shall be provided with an LADOTD Type H Cast Iron Cover, Grate and Frame with the inscription "City of Lake Charles" in the center and "DUMP NO WASTE", "DRAINS TO LAKE" shall be inscribed on the perimeter.

2. Drop inlets shall be provided with an LADOTD Type E Steel Grate Frame and LADOTD Type C Riveted Reticuline Drain Grate.

3. Manholes shall be provided with LADOTD Type K Cast Iron Frame and Cover with the word "DRAIN" inscribed in the middle.

4. Structure Channels, Benches, and Concrete Collars: Factory or field formed from concrete.

    a. Include channels and benches in manholes.

        1) Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

            i. Invert Slope: 1 percent through manhole.

        2) Benches: Concrete, sloped to drain into channel.

            i. Slope: 8 percent.

    b. Include channels in catch basins.

        1) Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

            i. Invert Slope: 1 percent through catch basin.

5. ALL pre-cast storm drain structures shall be built with oversized pipe penetrations to allow for a minimum 12-inch concrete collar.

2.04 CONCRETE MIX DESIGN

A. Portland Cement Concrete provided under this specification shall be Minor Structure Class "M" concrete in accordance with the Section 901 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition.

2.05 NONPRESSURE TYPE PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443 (ASTM C 443M), rubber.

2. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

3. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

2.06 FOUNDATION, BEDDING, AND BACKFILL MATERIAL

A. Foundation Material

1. Crushed limestone or crushed Portland cement concrete shall be used for structure foundations and pipe foundation amendments as detailed herein.

Sieve Size	Percent Finer By Weight
1 – ½ in	100
1 - in	90 to 100
3/4 - in	70 to 95
3/8 - in	50 to 80
No. 4	35 to 65
No. 10	25 to 50
No. 40	10 to 26
No. 200	4 to 12

B. Bedding Material

1. Crushed limestone or crushed Portland cement concrete shall be used for pipe bedding to the depths and heights identified on the project details. Crushed limestone or crushed Portland Cement Concrete bedding material shall meet the requirements set forth above for Foundation material.

C. Backfill Material

1. Usable Native Excavated Soils shall be used for trench back fill when the entirety of the trench is located more than five (5) feet from the edge of the roadway or paved surface. Usable native excavated materials shall meet the following requirements.

    a. Usable native excavated soils shall have a maximum PI of 25 and maximum organic content of five (5) percent. Soils with a silt content of fifty (50) percent or greater and also a PI of ten (10) or less will not be allowed. Any select material used to supplement or replace usable excavated soil shall meet these requirements and must be approved by the Engineer. Soil shall be tested at the Engineer and the Owner's option. Usable excavated material may be neatly stockpiled at the site where designated by the Engineer provided there is an area available that will not interfere with the Owner's access nor inconvenience traffic adjoining property owners.

    b. When excavated soils do not meet the above stated requirements they shall be removed from the site, at the contractors expense, and replaced with Select Backfill Material.

2. Sand Backfill Material

    a. Sand backfill material shall be used for trench backfill when any portion of the trench is to be installed within five (5) feet from the edge of the roadway or paved surface. Sand for backfilling trenches and structures shall be non-plastic siliceous material and shall conform to the following gradation limits:

Sieve Size	**Percent Finer By Weight**
½ - in	100
No. 10	75 to 100
No. 200	0 to 10

3. Crushed limestone or Crushed Portland Cement Concrete Backfill

    a. Crushed limestone or crushed Portland Cement Concrete backfill material shall be used for trench backfill when the trench is to be installed beneath any paved surface, or as directed by the Engineer. Crushed limestone or crushed Portland Cement Concrete backfill material shall meet the requirements set forth above for Foundation material.

PART 3 EXECUTION

3.1 GENERAL

A. Storm Sewer lines shall be installed with wall to wall clear separations of not less than 6-feet horizontally and 18-inches vertically from potable water lines. Where these separations are not able to be met, the line shall be encased in concrete.

3.02 INSTALLATION OF CULVERTS AND STORM DRAINS

A. Construction requirements including, but not limited to excavation, forming pipe bed, laying pipe, joining pipe, backfilling, placement of bedding, storm inspection, and cleaning of storm drain pipes shall be in conformance with Sections 701 and 726 respectively, of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition, except as amended herein.

3.03 INSTALLATION OF MANHOLES, JUNCTION BOXES, CATCH BASINS AND END TREATMENTS

A. Construction requirements including, but not limited to the construction, bedding, placement, and backfill of manholes, junction boxes, catch basins and end treatments shall be in conformance with Sections 702 and 726 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition, except as amended herein.

END OF SECTION

SEWER ALIGNMENT START
N:630154.92
E:2712369.60

EXIST. SMH

0+00

REQ'D SEWER TIE-IN
(8" TIE-IN TO 12" EXIST.)

EXIST. FH & WATER METER

1+00

REQ'D WATER TIE-IN

JAMES SUPDUTH PKWY (STONE)

PP

OHE

2+00

REQ'D 6" WATER LINE

REQ'D 8" SEWER LINE

3+00

REQ'D DUMPSTER PAD

REQ'D FH WITH 6" LEAD

REQ'D 6" x 4" REDUCER

REQ'D WATER METER

PP

4+00

REQ'D GATED ENTRANCE TO SITE

REQ'D (2) 18" x 26' PLASTIC CULVERT

REQ'D SMH

5+00

REQ'D 90° BEND

REQ'D 4" WATER LINE

FLOOD ZONE "A"

6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

17+17

283' EXTENTS OF CLEARING & GRUBBING

263' EXTENTS OF LIMESTONE SURFACING

5'

85' BORROW PIT

10' DRAINAGE EASEMENT

24' ROADWAY

5' OFFSET TO BACK OF TRAILER

15' UTILITY CORRIDOR

5' OFFSET TO BACK OF TRAILER

24' ROADWAY

10' DRAINAGE EASEMENT

0.57 %

0.57 %

REQ'D FENCE

REQ'D FENCE

REQ'D FENCE

2:1

2:1

℄ SITE/ RIDGE LINE

SITE TYPICAL SECTION
(N.T.S.)

EXTENTS OF 10" THICK ROADWAY SECTION

EXTENTS OF 6" THICK SURFACING SECTION

4" LIMESTONE WALKWAY

15' UTILITY CORRIDOR

2.5' 5' 5' 2.5'

TYPICAL UTILITY CORRIDOR LAYOUT
(N.T.S.)

23'

4'

10'

40'

TYPICAL LIMESTONE PARKING PAD & WALKWAY
(N.T.S.)

SITE RESERVED FOR USE BY ENTERGY

EXTENTS OF SITE DEDICATED TO CPSO

SEWER ALIGNMENT END
N:629651.32
E:2713583.39

E. WARD LINE RD. (HWY. 397)

SCALE 1" = 100'

REQ'D FENCE

±1,275'

APPROXIMATE EXTENTS OF REQUIRED BORROW PIT

±85'

EXIST. WATER SPIGOT

EXIST. FENCE

NOTE:
PROVIDE FENCE AROUND UTILITY CORRIDOR

STATE OF LOUISIANA
MICHAEL L. PERRY, JR.
License No. 30911
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
9/28/20

ROYAL ENGINEERS
& CONSULTANTS, LLC
1231 Camellia Boulevard
Lafayette, LOUISIANA 70508

REV.	DATE	DESCRIPTION	BY

CLIENT:

CALCASIEU PARISH
SHERIFF'S OFFICE

TITLE:

OVERALL SITE PLAN

PROJ. NAME: CPSO TRAILER PARK

DES:	KF	SCALE:	AS SHOWN		
DR:	REC	JOB No.	2020-12	SHEET NO. 1	REV.
CH:	MP	DATE:	SEPT. 2020		
APP:	MP				

14.50 PROPOSED ELEVATION

14.50 EXISTING ELEVATION

ME MATCH EXISTING ELEVATION

SCALE 1" = 100'

STATE OF LOUISIANA
MICHAEL L. PRICE, JR.
License No. 30911
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
9/28/20

JAMES SUPDUTH PKWY (STONE)

E. WARD LINE RD. (HWY. 397)

FLOOD ZONE "A"

CENTERLINE PROPOSED SWALE DITCH

CENTERLINE PROPOSED SWALE DITCH

EXTENTS OF REQ'D BORROW PIT

437 12.20 CL
439 12.34 CL
441 12.14 CL
443 12.26 CL
445 12.42 CL
447 12.76 CL
265 13.74 EL
174 13.73 EL
173 14.18 EL
162 14.10 EL
161 14.43 EL
150 14.42 EL
149 14.13 EL
138 13.93 EL
208 13.65 EL
247 10.18 CULVI
19 10.68 CL
196 13.37 EL
28 11.02 CL
38 11.02 CL
198 13.35 EL
47 10.91 CL
172 14.01 EL
171 14.65 EL
176 13.87 EL
175 13.67
171 14.08 EL
164 14.48 EL
159 14.60 EL
152 14.40 EL
147 14.14 EL
140 14.03 EL
206 13.65 EL
199 13.33 EL
57 10.86 CL
177 14.37 EL
170 14.52 EL
165 14.63 EL
158 14.66 EL
153 14.49 EL
146 14.22 EL
141 13.84 EL
205 13.91 EL
200 13.90 EL
66 11.23 CL

12.60 14.38 14.00 CL DITCH 14.83 EOR 14.01 13.00
14.25 15.13 15.46 15.61 15.58 15.20 14.97 14.75 14.41
13.50 14.38 14.83 EOR 14.01 13.5
14.0 13.50 14.11 CL DITCH 14.45 13.5
12.73 11.95
ME ME ME

ROYAL ENGINEERS
& CONSULTANTS, LLC
1231 Camellia Boulevard
Lafayette, LOUISIANA 70508

REV.	DATE	DESCRIPTION	BY

CLIENT:

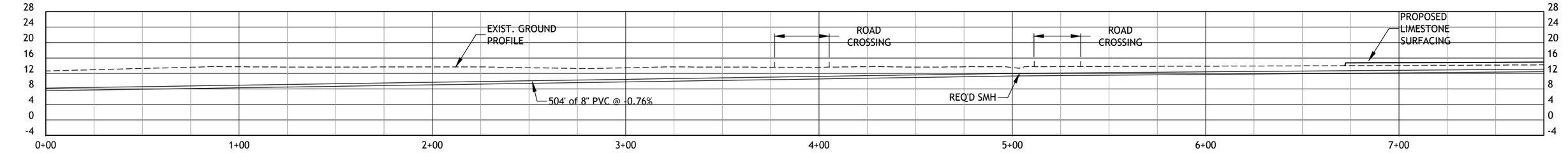
CALCASIEU PARISH
SHERIFF'S OFFICE

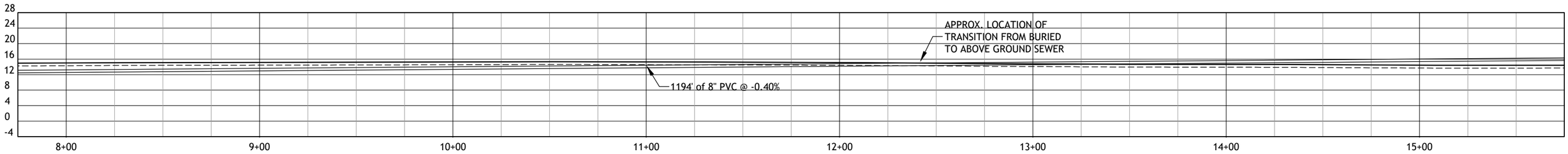
TITLE:

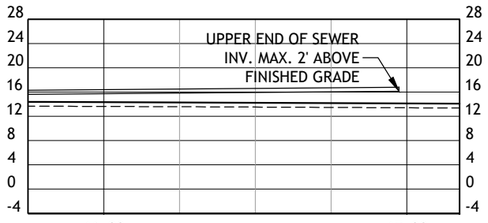
GRADING PLAN

PROJ. NAME: CPSO TRAILER PARK

DES:	KF	SCALE:	AS SHOWN		
DR:	REC	JOB No.	2020-12	SHEET NO. 2	REV.
CH:	MP	DATE:	SEPT. 2020		
APP:	MP				





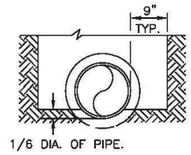


HORIZONTAL GRAPHIC SCALE

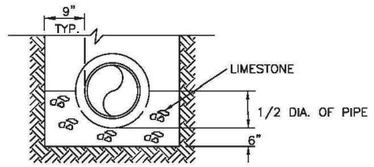
50' 0'

22.5' 0'

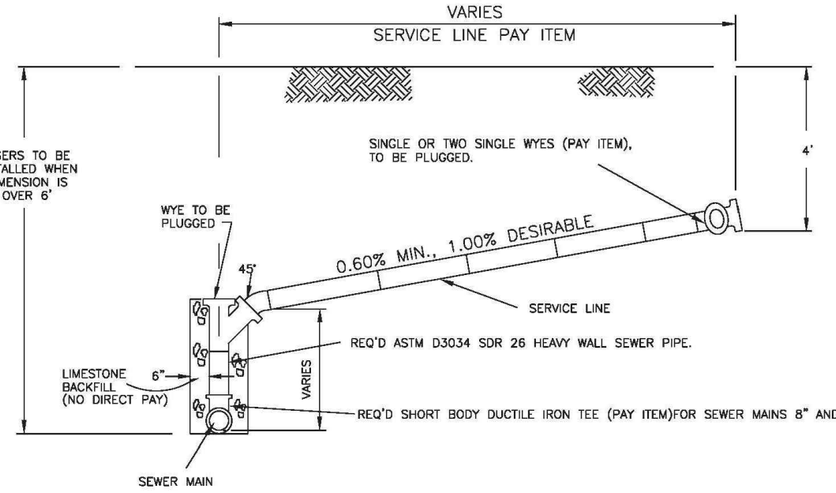
VERTICAL GRAPHIC SCALE



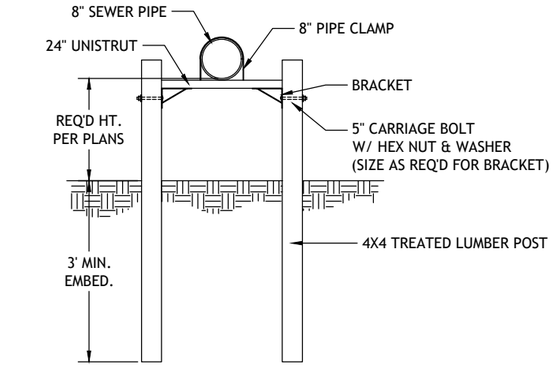
TYPE I



TYPE II

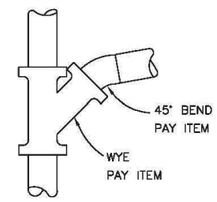


TYPICAL SEWER FOUNDATIONS

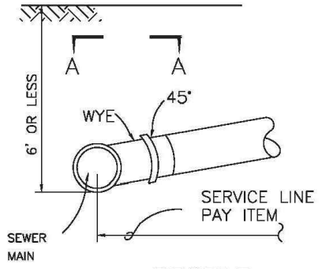


ABOVE-GROUND PIPE SUPPORT

NOTE: PROVIDE SUPPORT EVERY 14 FT, OR AT EACH JOINT LOCATION



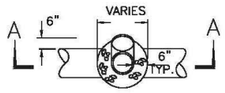
SECTION A–A



PROFILE

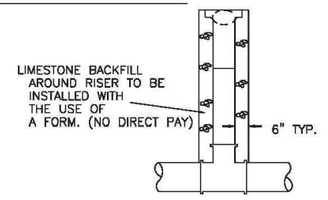
SEWER SERVICE CONNECTION (WITHOUT RISER)

SEWER SERVICE CONNECTION (WITH RISER)



PLAN VIEW

BACKFILL FOR 6" SERVICE RISER



SECTION A–A

ROYAL ENGINEERS & CONSULTANTS, LLC
1231 Camellia Boulevard
Lafayette, LOUISIANA 70508

REV.	DATE	DESCRIPTION	BY

CLIENT:

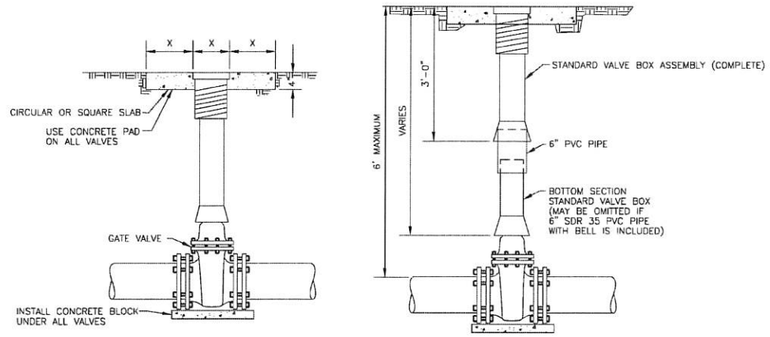
CALCASIEU PARISH SHERIFF'S OFFICE

TITLE:

SEWER PROFILE AND DETAILS

PROJ. NAME: CPSO TRAILER PARK

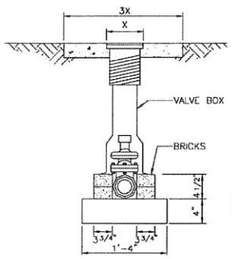
DES:	KF	SCALE:	AS SHOWN		
DR:	REC	JOB No.	2020-12	SHEET NO.	REV.
CH:	MP	DATE:	SEPT. 2020	3	
APP:	MP				



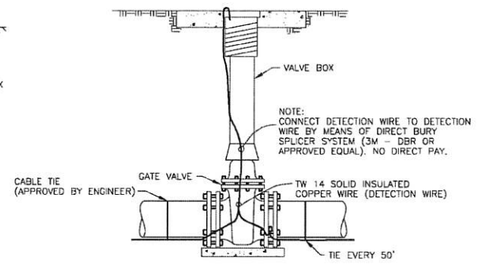
TYPICAL VALVE & BOX INSTALLATION

TYPICAL VALVE & BOX INSTALLATION BELOW NORMAL BURY

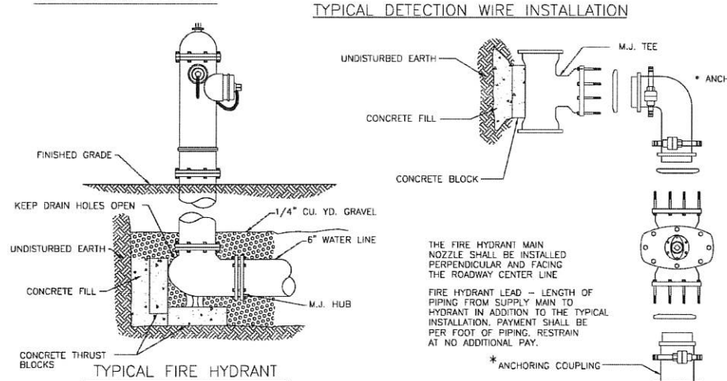
NO VALVE WILL BE INSTALLED ON A SECTION OF MAIN WITH GREATER THAN 6' OF COVER WITHOUT SPECIFIC APPROVAL FROM THE ENGINEER.



TYPICAL 2"VALVE & BOX INSTALLATION



TYPICAL DETECTION WIRE INSTALLATION



TYPICAL FIRE HYDRANT

TYPE I
TYPICAL FIRE HYDRANT INSTALLATION – M.J.

TYPE II
TYPICAL FIRE HYDRANT INSTALLATION – M.J.

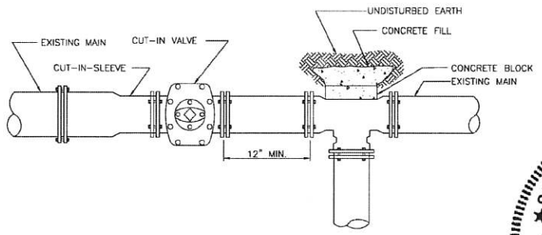
NOTES FOR WATER DETAILS:

GENERAL:

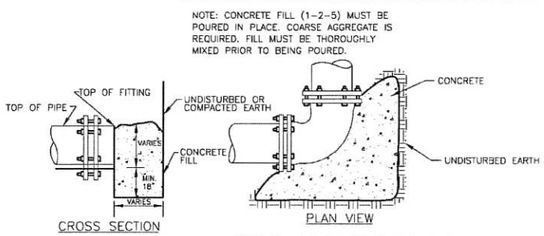
1. NO VALVE SHALL BE OPERATED TO ALLOW WATER TO BE TRANSMITTED FROM A CITY OF LAKE CHARLES WATER DIVISION SOURCE WITHOUT THE DIRECT SUPERVISION OF LUS. VIOLATORS WILL BE PROSECUTED.
2. DEAD END MAINS MUST BE RESTRAINED BY MEANS OF A CONCRETE DEADMAN

REQUIREMENTS:

1. ALL FIRE HYDRANTS AND VALVE BOXES SHALL BE INSTALLED TO MATCH THE FINISHED ELEVATION/GRADE.
2. ALL FITTINGS, VALVES AND FIRE HYDRANTS MUST BE SUPPORTED THROUGHOUT BY CONCRETE BLOCKING.
3. BOLTS MUST BE OPERABLE (FREE OF CONCRETE).
4. ALL FITTINGS, VALVES AND FIRE HYDRANTS, PIPE AND SERVICE TUBING MUST CONFORM TO THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION.
5. RESTRAIN FITTINGS TO CASINGS.
6. ALL INSTALLATIONS STANDARDS/METHODS NOT SPECIFICALLY STATED IN THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION MUST ADHERE TO THE STANDARD OF JURISDICTION (AWWA, NFPA, MANUFACTURER STANDARDS).



TYPICAL CUT IN SLEEVE & VALVE AND TEE

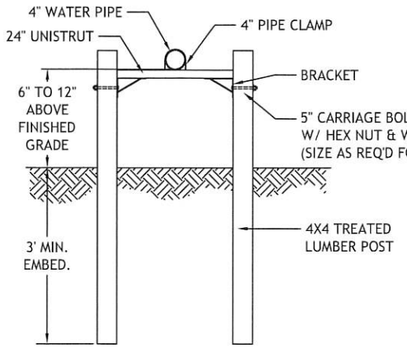


CROSS SECTION

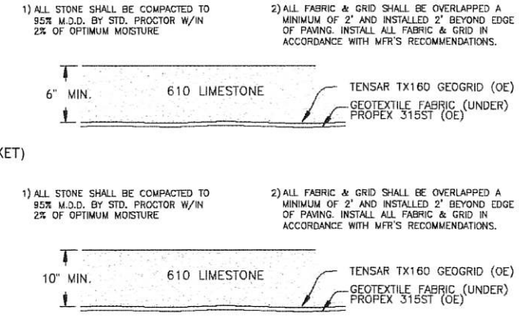
PLAN VIEW

TYPICAL THRUST BLOCKING FOR ALL BENDS 6" AND LARGER

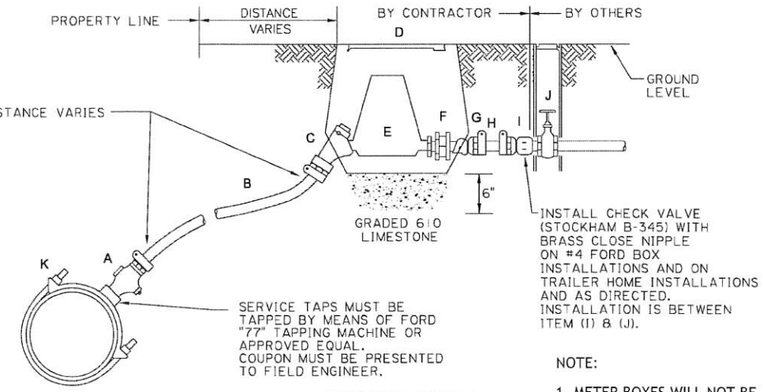
THRUST BLOCK BEARING AREA IN SQUARE FEET				
PIPE SIZE	PLUG OR 90° BEND	45° BEND	22-1/2° BEND	TEE
6"	3	2	1.5	3
8"	5	2.5	2	4
10"	7	4	3	5
12"	10	6	5	7
16"	14	8	7	10
18"	18	12	9	14



ABOVE-GROUND PIPE SUPPORT
NOTE: PROVIDE SUPPORT AT EACH JOINT LOCATION



THRUST BLOCKS AT TEES



NOTE:

1. METER BOXES WILL NOT BE INSTALLED AT INDIVIDUAL TRAILERS. ONE WATER METER SHALL BE INSTALLED FOR ENTIRE SITE. SEE SITE PLAN FOR LOCATION.

TYPICAL WATER SERVICE CONNECTION "NEW"

NOTE:
INSERTS MUST BE USED ON ALL TUBING CONNECTIONS.
NO DIRECT PAYMENT. (FORD #52)

ITEM DESCRIPTIONS

- * A - PACK JOINT CORPORATION (FORD F1000 OR APPROVED EQUAL).
- * B - HIGH DENSITY POLYETHYLENE PE3408 160 PSI (CELL CLASS 355434-C)
- * * C - YOKEBOX VALVE - PACK JOINT
- * * D - FORD YOKE BOX - YL244-244 OR APPROVED EQUAL. METER REQUIRES NO.4 FORD BOX.
- E - METER (INSTALLED BY THE WATER DISTRIBUTION COMPANY).
- * * F - EXPANSION CONNECTION
- * * G - PACK JOINT OUTLET
- H - PLASTIC PIGTAIL (HIGH DENSITY) POLYETHYLENE PE 3408 160PSI (CELL CLASS 355434-C)
- I - PACK JOINT FITTING TO PIPE THREAD (FORD CB4-330R APPROVED EQUAL)
- J - CUSTOMER'S VALVE AND BOX
- K - SERVICE SADDLE CLAMPS - FORD DOUBLE STRAP MODEL (F-202 OR APPROVED EQUAL)

* ITEMS A & B SIZE TO BE DETERMINED BY WATER DISTRIBUTION COMPANY.
* * ITEMS C, D, F & G FURNISHED AS ONE COMPOSITE UNIT AND SIZE TO BE PER WATER DISTRIBUTION COMPANY REQUIREMENTS.

STATE OF LOUISIANA
MICHAEL [illegible], JR.
License No. 30911
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
9/28/20

ROYAL ENGINEERS & CONSULTANTS, LLC
1231 Camellia Boulevard
Lafayette, LOUISIANA 70508

REV.	DATE	DESCRIPTION	BY

CLIENT:

CALCASIEU PARISH SHERIFF'S OFFICE

TITLE:

WATER DETAILS

PROJ. NAME: CPSO TRAILER PARK

DES:	KF	SCALE: AS SHOWN		
DR:	REC	JOB No. 2020-12	SHEET NO. 4	REV.
CH:	MP	DATE: SEPT. 2020		
APP:	MP			

SCOPE OF WORK FOR CPSO TRAILER PARK

SITE WORK

- CLEAR AND GRUB SITE, INCLUDING 4" DEGRASSING.
- GRADE THE SITE
  - TO BE PAID AS EXCAVATION AND EMBANKMENT BY THE LUMP SUM
  - GRADE SITE TO PROVIDE DESIRED 0.57% SLOPE TO DITCHES (SEE TYPICAL SECTION).
  - GRADE SITE IN ACCORDANCE WITH GRADING PLAN AND TO MINIMIZE EXCAVATION & EMBANKMENT REQUIRED. SOILS FOR EMBANKMENT SHOULD BE OBTAINED FROM THE DESIGNATED BORROW PIT LOCATION AND FROM OTHER EXCAVATION ACTIVITIES ON-SITE. NO DIRECT PAYMENT WILL BE MADE FOR SOILS HAULED IN TO GRADE SITE.
  - CUT DITCHES ALONG NORTH AND SOUTH BOUNDARIES OF SITE TO DIRECT DRAINAGE FLOW TO EXISTING DITCHES.
- INSTALL (2) 18" RIBBED PVC CULVERTS FOR DRIVEWAY ACCESS.
- INSTALL LIMESTONE SURFACING WHERE DESIGNATED.
  - INSTALL GEOTEXTILE FABRIC.
  - INSTALL GEOGRID.
  - ACCESS TO SITE AND DUMPSTER PAD SHALL HAVE MIN. 10" LIMESTONE THICKNESS, AND OTHER ROADWAY AND PARKING PAD AREAS SHALL HAVE 6" THICKNESS.
  - INSTALL 4 FT WIDE X 4 INCH THICKNESS LIMESTONE WALKWAY FROM EACH PARKING PAD TO TRAILER STEPS.
  - FINISHED GRADE SHALL HAVE 0.57% DESIRED SLOPE TO DITCHES (SEE TYPICAL SECTION AND GRADING PLAN).

WATER

- WATER SERVICE IS SUPPLIED BY CITY OF LAKE CHARLES WATER DIVISION.
- 6" PVC WATER SUPPLY WILL TIE-IN TO EXISTING WATER MAIN (SIZE NOT IDENTIFIED) NORTH OF THE SITE ALONG JAMES SUDDETH PKWY WHERE THE EXISTING WATER MAIN TERMINATES. 6" SUPPLY SHALL BE INSTALLED BELOW GRADE UP TO THE LOCATION OF THE SITE'S ACCESS DRIVEWAY. A FIRE HYDRANT WITH 6" LEAD SHALL BE INSTALLED AT THIS LOCATION.
- WATER SUPPLY LINE SHALL REDUCE TO 4" PVC AFTER THE FIRE HYDRANT. A SERVICE METER AND GATE VALVE SHALL BE INSTALLED ADJACENT TO THE SITE ACCESS DRIVEWAY. 4" PVC WATER LINE SHALL CONTINUE BELOW GRADE UNTIL AFTER THE 2ND ROADWAY CROSSING. A RISER SHALL BE INSTALLED AT THIS LOCATION TO BRING THE WATER LINE ABOVE GRADE.
- INSTALL 4" PVC WATER SUPPLY ABOVE GRADE WITHIN THE UTILITY CORRIDOR.
- WHERE THE 4" PVC WATER SUPPLY IS TO BE INSTALLED ABOVE GRADE, THE PIPE SHOULD BE SUPPORTED AT EACH JOINT LOCATION, AS DETAILED.
- INSTALL 1" HDPE SERVICE LINE TO EACH TRAILER, INCLUDING ALL FITTINGS, VALVES, ETC. REQUIRED BY THE PLANS AND REFERENCED SPECS.
- PIPE SPECIFICATIONS AND DRAWINGS TO BE PROVIDED FOR APPROVAL, PRIOR TO WORK BEING PERFORMED.
- NO EXCAVATIONS FOR WATER SERVICES WILL BE DONE.
- INSTALL HOUSE CONNECTION FROM EACH SERVICE LINE TO TRAILER HOUSE.

SEWER

- SEWER SERVICE IS PROVIDED BY CITY OF LAKE CHARLES WASTEWATER DIVISION.
- 8" PVC SEWER SERVICE WILL TIE-IN TO EXISTING 12" PVC SEWER LINE NORTH OF THE SITE ALONG JAMES SUDDETH PKWY WHERE THE EXISTING SEWER MAIN TERMINATES.
- 8" PVC SEWER SERVICE SHALL BE INSTALLED AT SPECIFIED SLOPES (0.4% MINIMUM).
- WHERE THE 8" SEWER SERVICE IS TO BE INSTALLED ABOVE GRADE, THE PIPE SHOULD BE SUPPORTED AT EACH JOINT LOCATION, AS DETAILED.
- INSTALL 6" PVC INDIVIDUAL SERVICE LINES TO EACH TRAILER, INCLUDING WYE FITTING AT CONNECTION TO 8" SEWER AND CLEANOUT AT UPPER END.
- PIPE SPECIFICATIONS AND DRAWINGS TO BE PROVIDED FOR APPROVAL, PRIOR TO WORK BEING PERFORMED.
- NO EXCAVATIONS FOR SEWER SERVICES WILL BE DONE.
- INSTALL HOUSE CONNECTION FROM EACH SERVICE LINE TO TRAILER HOUSE.

ELECTRIC

- ELECTRICITY TO BE PROVIDED BY ENTERGY.
- INSTALL POWER POLES AND OVERHEAD ELECTRIC LINES TO PROVIDE POWER TO SITE.
- INSTALL JUNCTION BOXES.
- INSTALL ELECTRICAL HOUSE CONNECTIONS VIA CONDUIT INSTALLED ABOVE GROUND.
- ELECTRIC UTILITIES TO BE DESIGNED BY OTHERS. DESIGN AND DETERMINATION OF REQUIREMENTS OF ALL ELECTRICAL WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.

MISC

- INSTALL FENCE AROUND PERIMETER OF SITE, INCLUDING GATED ENTRANCE.
- INSTALL FENCE AROUND PERIMETER OF UTILITY CORRIDOR, INCLUDING GATES AT EAST AND WEST ENDS OF CORRIDOR.

GENERAL

1. ALL WORK PERFORMED MUST COMPLY WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION AND ALL REFERENCES THEREIN, EXCEPT AS MODIFIED BY THESE PLANS.
2. ALL REFERENCES TO THE LADOTD STANDARD SPECIFICATIONS SHALL BE THE CURRENT EDITION: THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.
3. ALL DRAWINGS/DETAILS/FIGURES INCLUDED IN THESE DOCUMENTS ARE STANDARD AND ARE SUBJECT TO ADJUSTMENTS DICTATED BY ENGINEER OR EXISTING FIELD CONDITIONS.
4. ACQUISITION OF ALL RELEVANT PERMITS AND APPROVALS PRIOR TO PERFORMING WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. BEFORE ANY WORK IS STARTED THE CONTRACTOR SHALL CALL "LOUISIANA ONE CALL" AT 1-800-272-3020.
6. CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION CONTAINED IN THESE DRAWINGS PRIOR TO COMMENCING CONSTRUCTION (NO DIRECT PAY). IN THE EVENT OF ANY DISCREPANCIES AND / OR ERRORS FOUND IN THE DRAWINGS, OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF ENGINEER IS NOT NOTIFIED, THE CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE COST OF ANY WORK AND MATERIALS USED.
7. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER TO PREVENT DAMAGE TO ALL EXISTING TRAFFIC SIGNS AND PROPERTY. DAMAGED OR MISSING SIGNS AND PROPERTY SHALL BE REPLACED AND REESTABLISHED BY THE CONTRACTOR IN KIND ACCORDING TO THE SPECIFICATIONS. ALL COSTS ASSOCIATED WITH REPLACEMENT AND REESTABLISHMENT OF THESE SIGNS AND PROPERTY IS AT NO COST TO THE OWNER.
8. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY OWNERS OF ALL UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCING WORK TO ENSURE ALL UTILITY OWNERS ARE AWARE OF THE PROJECT AND CONSTRUCTION ACTIVITIES IN THE VICINITY OF SAID UTILITIES.
9. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A CLEAN AND ORGANIZED JOB SITE AND SHALL CLEAN THE SITE OF TRASH DAILY - TO INCLUDE CLEANING ALL ROADWAYS AFFECTED BY THE PROJECT. (NO DIRECT PAY)
10. DAMAGES TO EXISTING STREETS, DRAINAGE, OTHER UTILITY STRUCTURES, AND RESIDENT PROPERTIES CAUSED BY CONTRACTOR SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR TO ORIGINAL CONDITIONS.
11. NOISE CONTROL - CONTRACTOR SHALL TAKE MEASURES TO AVOID UNNECESSARY NOISE APPROPRIATE FOR THE AMBIENT SOUND LEVELS IN THE AREA DURING WORKING HOURS. ALL CONSTRUCTION MACHINERY AND VEHICLES SHALL BE EQUIPPED WITH PRACTICAL SOUND MUFFLING DEVICES AND OPERATED IN A MANNER TO CAUSE THE LEAST NOISES, CONSISTENT WITH EFFICIENT PERFORMANCE OF THE WORK.
12. DUST - CONTRACTOR SHALL TAKE MEASURES TO PREVENT UNNECESSARY DUST. EACH SURFACE SUBJECT TO DUSTING SHALL BE KEPT MOIST WITH WATER OR BY APPLICATION OF CHEMICAL DUST SUPPRESSANT. DUSTY MATERIALS IN PILES OR IN TRANSIT SHALL BE COVERED TO PREVENT BLOWING. (NO DIRECT PAY).
13. CONTRACTOR SHALL GIVE THOSE AFFECTED BY CONSTRUCTION 48 HOURS NOTICE PRIOR TO DISRUPTION OF DRIVEWAYS. DRIVEWAYS, OR TEMPORARY DRIVEWAYS SHALL BE OPEN AT ALL TIMES. CONTRACTOR WILL BE RESPONSIBLE FOR TRAFFIC CONTROL AND HANDOUTS TO RESIDENTS AFFECTED BY CONSTRUCTION. HANDOUTS TO THE AFFECTED RESIDENTS SHALL INCLUDE APPROPRIATE INFORMATION REGARDING DETOUR ROUTES, PROJECTS SCHEDULE, PROJECT LIMITS, TIMES OF OPERATIONS, DESCRIPTION OF WORK, AND OTHER PERTINENT INFORMATION. (NO DIRECT PAY)
14. THE CONTRACTOR SHALL PROVIDE FOR AND MAINTAIN THROUGH AND LOCAL TRAFFIC AT ALL TIMES AND SHALL CONDUCT OPERATIONS IN SUCH A MANNER AS TO CAUSE THE LEAST POSSIBLE INTERFERENCE WITH TRAFFIC AND BUSINESS. (NO DIRECT PAY)
15. NO TRENCH OR HOLES SHALL BE LEFT OPEN WHEN/WHERE THE CONTRACTOR IS NOT ACTIVELY WORKING.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT THE WORK AND VERIFYING ALL MEASUREMENTS AND GRADES PRIOR TO BEGINNING OF CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE PROJECT CENTERLINE AND ANY NECESSARY TEMPORARY BENCHMARKS FOR CONSTRUCTION PURPOSES BEFORE DESTROYING EXISTING MONUMENTS/NAILS/CROSS CUTS, ETC. (NO DIRECT PAY)
17. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT WATER LINE FAILURE DUE TO THRUST WHEN EXCAVATING NEAR WATER LINES AND FIRE HYDRANTS.
18. ANY MATERIALS REMOVED DURING CONSTRUCTION AND DEEMED UNUSABLE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND LEGALLY DISPOSED OF, OFF SITE, AT NO COST TO THE OWNER.
19. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING CONDITIONS THROUGHOUT THE CONSTRUCTION PERIOD AND CLEARING ANY DEBRIS AND SEDIMENT CAUSED BY CONSTRUCTION. CONTRACTOR SHALL MAINTAIN DRAINAGE AT ALL TIMES AND MAY BE REQUIRED TO CUT TEMPORARY DRAINAGE TRENCHES IN SHOULDER AS DIRECTED BY THE PROJECT ENGINEER. ANY MATERIAL DEPOSITED IN ANY DRAINAGE FEATURE (DITCHES, CROSS DRAINS, ETC.) DURING CONSTRUCTION SHALL BE CLEANED OUT AND RESTORED TO ORIGINAL CONDITION BEFORE FINAL ACCEPTANCE BY THE CONTRACTOR. (NO DIRECT PAY)
20. CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF ALL TESTING REQUIRED BY THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION, THE 2016 LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AND THESE GENERAL NOTES, INCLUDING BUT NOT LIMITED TO DENSITY TESTS ON COMPACTED BACKFILL AND LIMESTONE, MATERIALS TESTING AND SOURCE APPROVAL, AND TESTING FOR ACCEPTANCE OF THE WATER AND SEWER SYSTEMS.
21. THE CONTRACTOR IS RESPONSIBLE FOR HIS AND SUBCONTRACTOR MEANS, METHODS AND SCHEDULING OF WORK AND TESTING SERVICES. CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR CANCELLATION OF TESTING SERVICES AND ANY SUBSEQUENT CHARGES, FOR ANY REASON, INCLUDING BUT NOT LIMITED TO, INCOMPLETENESS OF WORK OR QUALITY CONTROL ISSUES WITH WORK PERFORMED AND/OR WEATHER. CONTRACTOR IS SOLELY RESPONSIBLE FOR NOTIFYING THE TESTING AGENCY OF ANY DELAYS IN WORK AND RESULTING CANCELLATION OF TESTING SERVICES. CONTRACTOR SHALL MAINTAIN RECORDS OF CANCELLATION NOTIFICATIONS.
22. TESTING REQUIREMENTS: (SUBJECT TO ADJUSTMENT BY ENGINEER)
    a. ONE 610 LIMESTONE THICKNESS VERIFICATION PER 600 SQUARE YARDS OR FRACTION THEREOF.
    b. ONE DENSITY TEST ON SELECT BACKFILL AND 610 LIMESTONE PER 600 SQUARE YARDS OR FRACTION THEREOF.
23. ADDITIONAL DENSITIES, CORES, ETC., WILL BE REQUIRED FOR ISOLATED AREAS. ANY "FAILED" FIELD TEST MUST BE RETESTED AND THE COSTS ASSOCIATED WITH THE "FAILED" TEST ARE THE RESPONSIBILITY OF THE CONTRACTOR.
24. SITE GRADING TO ESTABLISH REQUIRED DRAINAGE SLOPES AND CUTTING DITCHES SHALL BE PAID AS EXCAVATION AND EMBANKMENT BY THE LUMP SUM. ANY SOILS HAULED IN FROM OFF-SITE SHALL BE OBTAINED AT NO DIRECT PAY.
25. LIMESTONE SURFACING FOR ROADWAY AND ALL OTHER SPECIFIED AREAS SHALL BE #610 LIMESTONE AND SHALL BE INSTALLED IN LOOSE LIFTS NO MORE THAN 8 INCHES IN THICKNESS AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D 1557.
26. GEOTEXTILE FABRIC FOR ROADWAY AND SURFACING SECTION SHALL BE PROPEX 315ST OR APPROVED EQUAL.
27. GEOGRID FOR ROADWAY AND SURFACING SECTION SHALL BE TRIAXIAL GEOGRID SUCH AS TENSAR TX160 OR APPROVED EQUAL.
28. 4 FT WIDE LIMESTONE WALKWAYS WITH 4" THICKNESS SHALL BE INSTALLED FROM EACH LIMESTONE PARKING PAD TO THE TRAILER STEPS. LIMESTONE FOR WALKWAYS SHALL BE 610 LIMESTONE. NO GEOGRID OR GEOTEXTILE FABRIC IS REQUIRED FOR WALKWAYS.
29. FENCING SHALL BE CHAIN LINK FENCE IN ACCORDANCE WITH SECTIONS 705 AND 1010 OF THE 2016 LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE.
30. GATES SHALL BE INSTALLED AT THE LOCATIONS SPECIFIED IN THE PLANS AND THESE BID DOCUMENTS. GATES SHALL BE OF THE SAME TYPE AS FENCING AND PAYMENT SHALL BE INCLUDED IN THE CONTRACT COST FOR FENCING. ACCESS GATE FOR THE PERIMETER FENCES SHALL EXTEND THE FULL WIDTH OF THE ROADWAY. ACCESS GATES FOR THE UTILITY CORRIDOR SHALL BE MIN. 12 FEET WIDE AT EACH END OF THE CORRIDOR.
31. 10 FT DRAINAGE EASEMENT SHALL BE HYDRO-SEEDED AT NO DIRECT PAY.

DRAINAGE

1. CONTRACTOR SHALL MAINTAIN DRAINAGE AT ALL TIMES. ANY MATERIAL DEPOSITED IN ANY DRAINAGE FEATURE (DITCHES, CROSS DRAINS, ETC.) DURING CONSTRUCTION SHALL BE CLEANED OUT BEFORE FINAL ACCEPTANCE BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH GRADES TO ASCERTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED TRAILER FOUNDATIONS TO THE NEAREST DITCH WITHOUT ACCUMULATION IN ROADWAYS, PARKING AREAS, UTILITY CORRIDORS, OR OTHER AREAS.
3. CONTRACTOR SHALL REGRADE ALL AREAS AFFECTED BY CONSTRUCTION TO PROVIDE POSITIVE DRAINAGE. WORK SHALL BE IN ACCORDANCE WITH A/E REQUIREMENTS. IF CONTRACTOR DETERMINES THAT ANY AREAS AFFECTED BY CONSTRUCTION CANNOT BE REGRADED TO DRAIN, CONTRACTOR SHALL DOCUMENT (I.E. TAKE ELEVATIONS, PICTURES, ETC.) THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND RETURN THE AREA TO ITS PRE-CONSTRUCTION CONDITION.
4. ALL DRAINAGE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 701 OF THE DOTD STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.
5. PLASTIC PIPE SHALL BE RIBBED POLYVINYL CHLORIDE PIPE (RPVCP) AS SPECIFIED IN SUBSECTION 1006.07(A) OF THE LADOTD STANDARD SPECIFICATIONS.
6. PIPE SHALL BE INSTALLED BEGINNING AT THE DOWNSTREAM END. THE BELLS SHALL BE FACING UPSTREAM. PIPE SHALL BE LAID IN CONTACT WITH THE BEDDING ALONG THE ENTIRE LENGTH OF THE PIPE.
7. PIPE JOINTS SHALL BE WRAPPED IN GEOTEXTILE FABRIC A MINIMUM OF 12" ON EACH SIDE OF THE JOINT FOR PIPE 36" AND SMALLER AND 18" ON EACH SIDE OF THE JOINT FOR LARGER PIPE. THE ENDS OF THE FABRIC SHALL BE LAPPED A MINIMUM OF 10" AND FABRIC SHALL BE FIRMLY SECURED TO PIPE. GEOTEXTILE FABRIC USED FOR PIPE JOINTS IS NOT MEASURED FOR PAYMENT.
8. THE CONTRACTOR SHALL FIELD VERIFY THE LENGTH AND SIZE OF ALL REQUIRED DRAINAGE PIPE PRIOR TO ORDERING THE PIPE MATERIAL.

UTILITIES

1. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES (PRIVATE AND PUBLIC) (INCLUDING STORM DRAINAGE PIPES OR STRUCTURES) BEFORE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTH, AND SIZE OF ALL UNDERGROUND UTILITIES AND STRUCTURES AND SHALL BE LIABLE FOR ANY DAMAGE CAUSED BY FAILURE TO COMPLY WITH THESE INSTRUCTIONS (NO DIRECT PAY).
2. WARNING! CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING OVERHEAD AND SUBSURFACE UTILITIES IN AREA OF CONSTRUCTION. (NO DIRECT PAYMENT). ALL WORK IN THIS AREA SHALL BE THOROUGHLY COORDINATED WITH UTILITY COMPANY OWNER. COORDINATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING LA ONE CALL AND MAINTAINING LA ONE CALL REQUIREMENTS TO ENSURE THAT ALL EXISTING UTILITIES ARE PROPERLY LOCATED PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL ALSO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT SAID UTILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS BETWEEN PROPOSED IMPROVEMENTS AND EXISTING UTILITIES. (NO DIRECT PAY)

WATER

1. WATER DISTRIBUTION PRODUCTS, INSTALLATION, AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION EXCEPT AS MODIFIED HEREIN.
2. 4" AND 6" WATER SUPPLY LINES SHALL BE PVC, AWWA C900, SDR26.
3. 1" WATER SERVICE LINES SHALL BE HDPE, SDR9 AND MEET THE REQUIREMENTS OF AWWA C-901.
4. NO TRACER WIRE IS REQUIRED FOR SERVICE LINES.
5. TRACER WIRE IS REQUIRED FOR THE 6" WATER SUPPLY LINE, AS SPECIFIED IN THE LAKE CHARLES STANDARD SPECIFICATIONS.
6. WATER LINES INSTALLED UNDER LIMESTONE ROADWAYS SHALL HAVE MINIMUM 4' OF COVER.
7. WHERE THE SEWER IS INSTALLED ABOVE GROUND, PIPE SUPPORTS SHALL BE PROVIDED AT THE LOCATION OF EACH JOINT, AT NO DIRECT PAY.
8. BACKFILL FOR BURIED WATER INSTALLATION SHALL BE AT NO DIRECT PAY.
9. CONTRACTOR SHALL MAKE EACH WATER SERVICE LINE TO TRAILER HOUSE CONNECTION, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS AND TRAILER HOUSE MANUFACTURER REQUIREMENTS.

SEWER

1. SEWER COLLECTION PRODUCTS, INSTALLATION, AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION EXCEPT AS MODIFIED HEREIN.
2. 6" AND 8" SEWER SERVICE LINES SHALL BE ANSI/ASTM D2241, SDR 26, 12454-B PVC CELL CLASSIFICATION IN ACCORDANCE WITH ASTM D 1784.
3. SEWER LINES INSTALLED UNDER LIMESTONE ROADWAYS SHALL HAVE MINIMUM 1' OF COVER AND CASED IN STEEL CASING PIPE, AT NO DIRECT PAY. STEEL CASING PIPE SHALL BE WELDED STEEL PIPE MEETING ASTM A53, GRADE B, AND HAVE A MINIMUM YUIELD STRENGTH OF 35,000 PSI. THE EXTERIOR OF THE CASING PIPE SHALL BE COATED WITH COAL TAR EPOXY OR BITUMINOUS ASPHALT.
4. WHERE THE SEWER IS INSTALLED ABOVE GROUND, PIPE SUPPORTS SHALL BE PROVIDED AT THE LOCATION OF EACH JOINT, AT NO DIRECT PAY.
5. SEWER MANHOLE SHALL BE CONCRETE SEWER MANHOLE IN ACCORDANCE WITH SECTION 2.04 OF THE CITY OF LAKE CHARLES STANDARD SPECIFICATIONS FOR INFRASTRUCTURE CONSTRUCTION, SECTION 1 "SANITARY SEWER COLLECTION SYSTEM SPECIFICATIONS".
6. BACKFILL FOR BURIED SEWER INSTALLATION SHALL BE AT NO DIRECT PAY.
9. CONTRACTOR SHALL MAKE EACH SEWER SERVICE LINE TO TRAILER HOUSE CONNECTION, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS AND TRAILER HOUSE MANUFACTURER REQUIREMENTS.

ROYAL ENGINEERS
& CONSULTANTS, LLC
1231 Camellia Boulevard
Lafayette, LOUISIANA 70508

REV.	DATE	DESCRIPTION	BY

CLIENT:

CALCASIEU PARISH
SHERIFF'S OFFICE

TITLE:

GENERAL NOTES

PROJ. NAME: CPSO TRAILER PARK

DES:	KF	SCALE: AS SHOWN		
DR:	REC	JOB No. 2020-12	SHEET NO. 5	REV.
CH:	MP	DATE: SEPT. 2020		
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