EMERGENCY WATER SUPPLY AGREEMENT

THE STATE OF TEXAS §

COUNTY OF GALVESTON §

This Agreement is made and entered into as of this _____ day of _____, 2020, by and between GALVESTON COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 12 ("WCID12") and CITY OF LEAGUE CITY ("CITY"), a municipal corporation.

RECITALS

WHEREAS, CITY and WCID12 each own and operate a public water supply system and intend to continue to operate their respective water supply systems; and

WHEREAS, WCID12 desires to develop an alternative source of potable water in the event of an emergency disrupting its capability to provide potable water to its customers; and

NOW, THEREFORE, for and in consideration of the mutual promises, obligations and benefits hereinafter set forth, WCID12 and CITY agreement and agree as follows:

TERMS

1. **Recitals.** The above-listed recitals are true and correct and hereby incorporated into this Agreement.

2. **Definitions.** When used herein the following terms shall have the meanings specified:

   2.1. The term "Emergency" shall mean a mechanical or electrical failure causing a loss of fifty percent (50%) or more of the productive capacity of a party's water system or a fire requiring immediate use of the other party's water system for firefighting purposes and activities related thereto.

   2.2. The term "Temporary Period" shall mean a period not to exceed thirty (30) days unless otherwise agreed in writing by CITY.

3. **Construction of Interconnection**

   3.1. Construction. WCID12 will construct, entirely at WCID12's expense, a water line (in accordance with plans reviewed and approved by the City of League, City Engineer) from WCID12's water supply system to tie in to the existing CITY waterline on the, as shown on Exhibit "A" attached hereto. A cut-off valve shall be located on said water line at the

point shown on Exhibit "A" (the "Point of Interconnect"). Each party shall be responsible for maintaining the interconnect line on its respective side of the Point of Interconnect (City of League City water meter) at its sole cost and expense throughout the term of this Agreement. Should WCID12 fail to make any needed repair to its interconnect line and backflow prevention device, CITY may make said repair, after reasonable notice to WCID12, and charge the actual cost thereof to WCID12. Likewise, should CITY fail to make any needed repair to its interconnect line, WCID12 may make said repair, after reasonable notice to CITY, and charge the actual cost thereof to CITY. Each party shall own and have title to its respective interconnect line, subject to each party's rights hereunder.

3.2. Cut-off Valve and Title to Water. WCID12 shall construct, at its sole cost and expense, a valve box with a locking mechanism at the Point of Interconnect. Both parties shall have keys to the lock and shall have the right of access to the valve box at all times. WCID12 will have title to and possession and control of all water on WCID12's side of the League City water meter and CITY will have title and possession and control of all water on CITY's side of the water meter.

3.3. Maintenance. WCID12 shall consistently maintain its water distribution system in good condition and shall immediately repair any leaks or breaks in such system. Every month, WCID12 shall flush the applicable line segment to ensure a safe transfer of water when the interconnect is utilized. In the event a leak, rupture or other defect occurs within WCID12's water distribution system which could either endanger or contaminate CITY's water distribution system or prejudice CITY's ability to provide water service to its customers, CITY shall have the right to valve off and discontinue service to WCID12 until such leak, rupture or defect has been remedied. In the event WCID12 fails to immediately repair or proceed with the repairs of such leak, rupture or defect, CITY may, at its option, repair same and charge WCID12 its actual cost of such repair. WCID12 shall provide CITY with a copy of an annual certification from licensed backflow-prevention-assembly tester stating that its reduced zone pressure device (RZP) is fully functional. WCID12 shall immediately notify CITY in the writing in the event WCID12 is not able to obtain its annual RZP certification. Each party shall be responsible for maintaining at its sole cost and expense the facilities which it owns. WCID is responsible for all necessary maintenance on the downstream side of League City's water meter including valves, lines and backflow prevention devices.

4. Delivery of Water

4.1. Normal Operations. During normal operating conditions of the parties' water systems, water will be prevented from flowing through the interconnection facilities and no water will be delivered by CITY to WCID12. If WCID12 wishes to draw water through the interconnection, except during an Emergency, it may do so only with the prior written consent of CITY.

4.2. Volume and Demand Limitations. The amount of water delivered by CITY to WCID12 and the rate of flow thereof shall not exceed the rated capacity of water facilities installed for delivery of emergency water service.

4.3. Emergency Supply Procedure.

4.3.1. During an Emergency, WCID12 shall request that CITY open the valve to allow water from CITY's supply to flow to WCID12.
4.3.2. After receiving such request, CITY shall evaluate whether CITY has sufficient water supply to accommodate both WCID12 supply needs and CITY's supply needs.
4.3.3. If CITY has sufficient water supply, CITY will open the valve to allow water to pass to WCID12.
4.3.4. A representative from CITY and WCID12 shall be physically present at the valve box when CITY opens the valve to allow water to pass to WCID12.
4.3.5. WCID12 shall continue to receive water during the Emergency provided; however, that CITY shall not be obligated to supply water hereunder for longer than a Temporary period without written consent of CITY.

4.4. Demand of CITY. CITY shall not be obligated to supply water hereunder in such amounts or under such circumstances as will impair CITY's ability to serve its own customers (including customers to whom CITY is supplying water on an emergency basis).

4.5. No 3rd Beneficiary. The obligation of CITY to deliver water to WCID12 shall run only to WCID12 and shall in no event create any obligation to or duty toward any other party or customer of WCID12.

4.6. Conservation Restrictions. WCID12 agrees to impose on its customers all voluntary and mandatory conservation and use restrictions imposed by CITY on its customers in such instances, provided, however, that WCID12 shall not be required to impose more stringent controls than CITY imposes on its own customers in such instances.

4.7. Ingress and Egress. The Parties agree to ensure the ingress and egress of each party to the points of delivery and the interconnection for all reasonable purposes incident to this Agreement including, without limitation, inspection, installation, operation, maintenance, repair or removal of the interconnection and all valves, meters and other equipment utilized therewith.

4.8. Simultaneous Emergencies. CITY shall not be obligated to supply water pursuant to this agreement if an Emergency exists for CITY. Consequently, during a period of simultaneous Emergencies, CITY shall not be obligated to deliver water to WCID12 but may do so pursuant to mutual agreement.

4.9. Billing and Payment. WCID12 agrees to pay CITY for emergency water service delivered under this Agreement at an initial rate of $3.75 per 1,000 gallons. The initial charge of $3.75 per 1,000 gallons for water delivered to WCID12 shall remain in effective for 12

months. The Parties agree that the compensation rate shall increase by 2.5% on October 1st of each year during the term of this Agreement, as seen on Table 4A below. In addition, WCID12 agrees to pay a monthly administration fee of $40 to CITY. In executing this Agreement, WCID12 acknowledges that CITY'S rates are just, reasonable and nondiscriminatory.

Table 4A

10YR Rate Schedule – Effective 1st day of October Rate per 1000 Gallons									
YR21	**YR22**	**YR23**	**YR24**	**YR25**	**YR26**	**YR27**	**YR28**	**YR29**	**YR30**
$3.84	$3.94	$4.04	$4.14	$4.24	$4.35	$4.46	$4.57	$4.68	$4.80

4.10. Billing Protocol. CITY shall bill WCID12 in a monthly itemized bill for water service based on the readings from the master meter at the interconnect point. Payment shall be made by WCID12 no later than thirty (30) days following the date of the bill for water consumed by WCID12.

4.11. Books and Records. Each party shall preserve for a period of at least five (5) years from the date of their respective origins, all books, records, test data, charts and other records pertaining to this agreement. Each party shall have the right, at all reasonable business hours, to inspect such records of the other party, to the extent necessary to verify the accuracy of any statement, charge or computation made pursuant to any provision of this agreement.

4.12. Force Majeure. If either party should be prevented, wholly or in part, from furnishing water to the other party under this Agreement by reason of any force majeure, including, without limitation, acts of God, a pandemic, unavoidable accident, acts of the public enemy, strikes, riots, floods, fires, government restraint or regulations, breaks in either party's pipelines, power failure, or for any other cause beyond either party's control, then the obligation of that party to deliver water to the other shall be suspended during the continuance of such force majeure.

5. Terms and General Provisions

5.1. Water Volume. The Parties neither represent nor agree to provide any particular volume of water at any specific time, and shall not be liable for refusal or failure to provide water through the interconnection, or for any losses or damages resulting or alleged to be the result of any refusal or failure to provide water through the interconnection. TO THE EXTENT ALLOWED BY LAW, WCID12 AGREES TO INDEMNIFY CITY, ITS SUCCESSORS AND ASSIGNS, AND HOLD IT FREE AND HARMLESS FROM AND AGAINST ANY AND ALL LIENS, CLAIMS, DEBTS, CHARGES, DAMAGES, LOSS, PENALTIES, AND EXPENSES, LIQUIDATED OR UNLIQUIDATED, EXECUTED OR EXECUTORY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, ACTUAL OR CONTINGENT, WHETHER OR NOT HEREBY EXPRESSLY LISTED OR DESCRIBED, BUT WHICH MAY BE ASSERTED NEVERTHELESS AGAINST

CITY, ITS SUCCESSORS OR ASSIGNS, RESULTING FROM DELIVERY OF WATER UPON PASSING THROUGH A POINT OF DELIVERY OCCURRING DURING OR IN CONNECTION WITH THE PROVISION OF WATER TO WCID12.

5.2. Special Conditions. This Agreement and CITY's obligation to deliver water to WCID12 as provided herein shall be subject to all present and future laws, orders, rules and regulations of the United States of America, the State of Texas, and any regulatory body having jurisdiction (and the parties agree to cooperate to obtain compliance therewith). In the event that CITY is required by any regulatory authority to pay any fee, service charge, penalty, or fine because of, or as a condition to, providing service to WCID12 pursuant to this Agreement, said fee, service charge, penalty, or fine may be billed to WCID12 as an expense of providing service pursuant hereto, in addition to all amounts due pursuant to this Agreement. It is further provided that when receiving water pursuant to this Agreement and supplying such water to its own residents and other water users, WCID12 acts in the capacity of owner and operator of a "public water system," as that term is used in the federal Safe Drinking Water Act and, in that regard, is solely responsible for complying with all governmental rules, regulations, and laws relating to the protection of the health and welfare of its users, including, but not limited to, keeping all necessary records and performing all necessary testing, monitoring and treatment, and the supplying party will have no responsibility with respect thereto.

5.3. Term. This Agreement shall be in force and effect from the date of its execution for a period of ten (10) years with an optional ten-year renewal. This Agreement may be terminated at any time for any reason. In the event the agreement is terminated, WCID12 shall be responsible for all fees and charges incurred under this agreement before the date of termination.

5.4. No Additional Waiver Implied. No waiver or waivers of any breach or default by either party hereto of any term, covenant, condition, or liability hereunder, or of performance by the other party of any duty or obligation hereunder, shall be deemed a waiver thereof in the future; nor shall any such waiver or waivers be deemed or construed to be a waiver of subsequent breaches or defaults of any kind, character or description, under any circumstances.

5.5. Address and Notice. Unless otherwise provided in Article III of this Agreement, any notice herein provided or permitted to be given, made, or accepted by either party must be in writing and may be given by depositing the same in the United States mail postage prepaid, or by delivering the same to an officer of such party. Notice deposited in the mail in the manner described above shall be conclusively deemed to be effective from and after the expiration of three (3) days after it is deposited. Notice given in any other manner shall be effective only if and when received by the party to be notified. For the purposes of notice, the addresses of the parties shall be as follows:

Galveston County WCID #12
524 Cien Street
Kemah, TX 77565

Attn: President

City of League City, Texas
300 West Walker Street
League City, Texas 77573
Attn: City Manager

The parties shall have the right from time to time and at any time to change their respective addresses and each shall have the right to specify as its address any other address in the State of Texas by at least fifteen (15) days written notice to the other party.

5.6. Modification. This Agreement shall be subject to change or modification at any time, but only with the mutual written consent of the parties hereto.

5.7. Assignability. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their successors, but this Agreement shall not be assignable by either party without the prior written consent of the other.

5.8. Parties in Interest. This Agreement is for the sole and exclusive benefit of WCID12 and CITY and shall not be construed to confer any benefit or right upon any other party.

5.9. Provisions Severable. The provisions of this Agreement are severable, and if any provision or part of this Agreement or the application thereof to any person or circumstance shall ever be held by any court of competent jurisdiction to be invalid or unconstitutional for any reason, the remainder of this Agreement and the application of such provision or part of this Agreement to other persons or circumstances shall not be affected thereby.

(signature blocks on next 2 pages)

IN WITNESS WHEREOF, this Agreement has been executed in multiple counterparts, each of equal dignity, as of the date and year first above written.

GALVESTON COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 12

Matt Wiggins, President

ATTEST:

Doug Meisinger, Secretary

(SEAL)

CITY OF LEAGUE CITY, TEXAS

_____

John, Baumgartner, ICMA-CM, P.E., City Manager

ATTEST:

_____

Diana Stapp, City Secretary

APPROVED AS TO FORM:

_____

Nghiem V. Doan, City Attorney

EXHIBIT A

GALVESTON COUNTY W.C. & I.D. No. 12

BOARD OF DIRECTORS

ED LINCK
PRESIDENT

LINDA MERRYMAN
VICE PRESIDENT

NANCY T. McDONALD
SECRETARY

GREGG COLLINS
ASST. SECRETARY

THERESA LORENE GALE
ASST. SECRETARY

Galveston County Water District
WCID #12

DRAWING LIST

1. COVER SHEET
2. GENERAL NOTES - VICINITY MAP & LOCATION MAP
3. F.M. 518 / DEKE SLAYTON HWY - PLAN & PROFILE - BEGINNING TO END
4. INTERCONNECT DETAILS
5. STANDARD WATER DETAILS
6. MISCELLANEOUS DETAILS
7. STORM WATER POLLUTION PREVENTION - DETAILS
8. TxDOT - TEMPORARY RUMBLE STRIPS
9. TxDOT - TRAFFIC CONTROL PLAN - CONVENTIONAL ROAD - SHOULDER WORK
10. STANDARD BARRICADE DETAILS

REVIEW SIGNATURES	DATE
ENGINEERING: [signature]	11-6-15
TRAFFIC: N/A	
FIRE MARSHAL: N/A	
~~UTILITY LINE REPAIR:~~ WATER PRODUCTION: [signature]	11-10-15
CONSTRUCTION MANAGEMENT: N/A	

The review signatures above for this set of plans in no way implies approval or acceptance and is purely a reflection of the City's review process.

[signature] 11/6/2015
EARL SMITH, P.E., CFM — DATE
DIRECTOR OF ENGINEERING
CITY OF LEAGUE CITY

The signer of this set of plans has no objection to the design of these plans. Through the review process these plans have been found to be in general compliance with League City's "General Design and Construction Standards" manual and Construction Details. It should be noted that all calculations, measurements and overall line work within these plans should be checked and verified. This approval is good for 1 (one) year from the date of signing as shown. The plans submitted have been prepared, signed and sealed by a professional engineer licensed to practice engineering in the state of Texas, which conveys the engineer's responsibility and accountability. Design Engineer assumes all responsibility for any inconsistencies or imperfections in these plans.

STATE OF TEXAS
WALLACE E. TROCHESSET
83421
LICENSED
PROFESSIONAL ENGINEER
11-3-15

CONSTRUCTION PLANS FOR:
EMERGENCY INTERCONNECT WITH LEAGUE CITY

FEBRUARY, 2016
LJA PROJECT No. E125-0920

A PRE-CONSTRUCTION MEETING WITH THE CITY OF LEAGUE CITY ENGINEERING DEPARTMENT IS REQUIRED AT LEAST 10 WORKING DAYS PRIOR TO ON SITE CONSTRUCTION ACTIVITIES. CALL 281-554-1439 FOR A MEETING DATE AND TIME. A PRE-CONSTRUCTION MEETING FOR THIS PROJECT MAY NOT BE SCHEDULED AND CONSTRUCTION OF THE PROJECT MAY NOT COMMENCE PRIOR TO APPROVAL OF THESE PLANS BY THE CITY ENGINEER AS EVIDENCED BY HIS SIGNATURE.

LJA Engineering, Inc.
11821 East Freeway
Suite 400
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

01/07/16

GENERAL NOTES

1. CONTRACTOR SHALL CONTACT LJA ENGINEERING & SURVEYING INC., MR. LES DODSON AT (713) 450-1300 AT LEAST 24 HOURS PRIOR TO CONSTRUCTION FOR NOTIFICATION OF COMMENCEMENT.
2. LOCATION OF EXISTING UNDERGROUND UTILITIES AND SERVICE LINES (WATER, SEWER, GAS, TELEPHONE, ELECTRICAL, ETC.) ARE DETERMINED FROM AVAILABLE RECORDS AND ARE APPROXIMATE. CONTRACTOR TO LOCATE LINES AND/ OR OBSTRUCTIONS AHEAD OF EXCAVATION.
3. CONTRACTOR TO MAKE ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANY FOR SECURING POLES, IF NECESSARY, WHILE CONSTRUCTION PASSES BY POLES. COST OF SECURING POLES WILL BE PAID FOR BY THE CONTRACTOR.
4. BACKFILLING AND CLEAN-UP SHALL IMMEDIATELY FOLLOW PIPE LAYING OPERATION. PIPE LAYING SHALL BE SUSPENDED IF CLEAN-UP IS NOT SATISFACTORY.
5. CONSTRUCTION STAKING (ALIGNMENT AND GRADE) TO BE PROVIDED BY THE CONTRACTOR AT NO SEPARATE PAY.
6. CONTRACTOR TO USE CAUTION WHEN CROSSING ALL EXISTING FACILITIES. ANY DAMAGE TO BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO SEPARATE PAY.
7. SURPLUS EXCAVATED MATERIAL SHALL BE REMOVED AND DISPOSED OF OFF SITE AS DIRECTED BY THE ENGINEER. IF THE ENGINEER NOTIFIES THE CONTRACTOR THAT THE OWNER DOES NOT HAVE USE FOR THIS MATERIAL, THE SURPLUS MATERIAL BECOMES THE PROPERTY OF THE CONTRACTOR AND HIS RESPONSIBILITY TO DISPOSE OF THE MATERIAL.
8. WHERE CONTRACTOR'S WORK AND/ OR EQUIPMENT CAUSES AN OBSTRUCTION TO TRAFFIC, CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH PART IV OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TEXAS M.U.T.C.D., MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION.
9. ALL WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL REQUIREMENTS.
10. CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND FACILITIES DURING INSTALLATION OF PROPOSED WORK.
11. CONTRACTOR SHALL MAINTAIN DRAINAGE TO ORIGINAL OR BETTER CONDITION THROUGHOUT THE CONSTRUCTION OF THE PROJECT. NO SEPARATE PAY.
12. INGRESS AND EGRESS SHALL BE PROVIDED AT DRIVEWAYS IMMEDIATELY AFTER INSTALLATION LINE WORK.
13. REMOVE AND REPLACE CULVERTS AT DRIVEWAYS OR ENTRY WAYS WHEN ENCOUNTERED BY OPEN CUT CONSTRUCTION. NO COMPENSATION, AS SEPARATE PAY, WILL BE MADE FOR REMOVING AND REPLACING CULVERTS. SHOULD CONTRACTOR DAMAGE CULVERTS, REPLACE WITH LIKE MATERIAL CULVERTS.
14. PAVED SURFACES SHALL BE PROTECTED FROM DAMAGE FROM TRACKED EQUIPMENT.
15. OBTAIN ALL PERMITS, NOT PROVIDED BY OWNER, PRIOR TO STARTING CONSTRUCTION.
16. NOTIFY ALL PROPERTY OWNERS A MINIMUM OF TWENTY FOUR (24) HOURS PRIOR TO BLOCKAGE OF DRIVEWAYS OR ENTERING OF UTILITY EASEMENTS.
17. CONTRACTOR SHALL CONTACT GALVESTON COUNTY WC & ID No. 12 AT (281)334-3331 AT LEAST FORTY EIGHT (48) HOURS PRIOR TO CONSTRUCTION FOR NOTIFICATION OF COMMENCEMENT.
18. CONTRACTOR SHALL CONTACT GALVESTON COUNTY WC & ID No. 12 AT (281)334-3331 AT LEAST TWENTY FOUR (24) HOURS IN ADVANCE OF THE NEED TO CLOSE ANY VALVES AND THE UTILITY DISTRICT SHALL PERFORM CLOSINGS / OPENINGS.
19. MAILBOX RELOCATION IS INCIDENTAL. CONTRACTOR MUST NOT INTERFERE WITH MAIL DELIVERY.
20. CONTRACTOR SHALL COVER OPEN EXCAVATION IN TRAFFIC PATH WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS.
21. THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN AN UPDATED REDLINED "AS BUILT" SET OF PLANS ON SITE.

WATER NOTES

1. WATERLINE AND FITTING MATERIAL OF CONSTRUCTION

A. WATERLINES LESS THAN 4-INCH

PIPE: PVC, SCHEDULE 40 (UNLESS OTHERWISE DESIGNATED ON PLANS). FITTINGS: PVC, SCHEDULE 40 (UNLESS OTHERWISE DESIGNATED ON PLANS).
JOINTS: SOLVENT WELD.

B. WATERLINES 4-INCH TO 12-INCH

PIPE: PVC, AWWA C900, CLASS DR-18 (UNLESS OTHERWISE NOTED ON PLANS). FITTINGS: DUCTILE IRON, AWWA C110 OR AWWA C153, MINIMUM CLASS 250, EPOXY COATED (FUSION BONDED) INSIDE AND OUTSIDE PER AWWA C116.
JOINTS: PUSH-ON (RUBBER GASKETED) OR MECHANICAL (RUBBER GASKETED).
THRUST CONTROL: RESTRAINED JOINT, MEGA-LUG.

C. WATERLINE OFFSETS (USED ONLY IF DESIGNATED ON PLANS)

OFFSETS TO BE STEEL PIPE WITH STEEL FITTINGS WELDED TO PIPE OR PVC WITH RESTRAINED JOINT. STEEL PIPE AND STEEL FITTINGS TO MEET AWWA C200, STANDARD WALL THICKNESS, EPOXY COATED INSIDE AND OUTSIDE PER AWWA C210. PVC PIPE AND FITTING TO BE IN ACCORDANCE WITH MATERIALS IDENTIFIED BY SIZE ABOVE.

D. WATERLINE CASING

STEEL IN ACCORDANCE WITH AWWA C200, MINIMUM WALL THICKNESS 1/4", SIZE DESIGNATED ON PLANS.

CONTRACTOR SHALL INSTALL CASINGS PER DETAILS ON PLANS.

E. SERVICE LINES

SERVICE LINES TO BE CONSTRUCTED IN ACCORDANCE WITH THE PIPE MATERIALS AND DETAILS SHOWN ON PLANS.

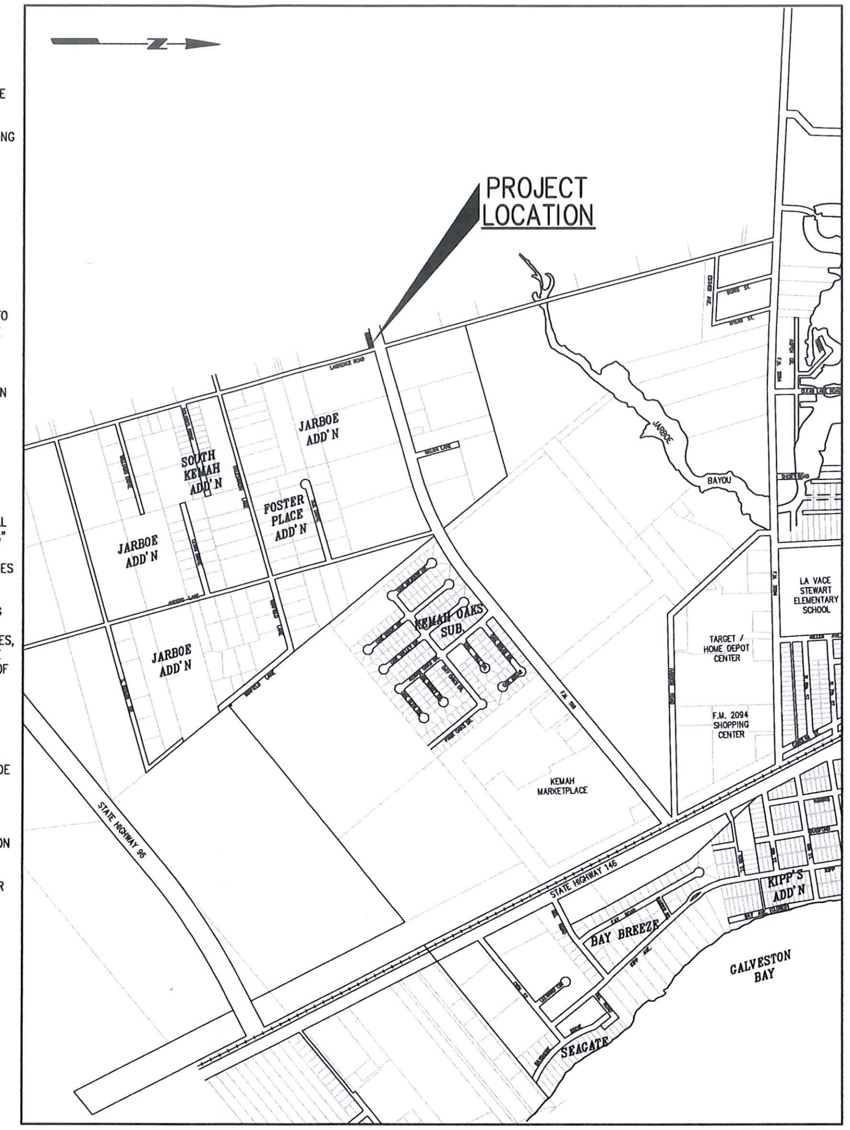
2. PIPE BEDDING TO MEET THE REQUIREMENTS SHOWN ON THE DETAIL SHEETS. TYPE AND DEPTH OF BEDDING IS DEPENDENT UPON PIPE MATERIAL, LOCATION, AND TYPE OF CONSTRUCTION OF THE PROPOSED LINE.
3. VALVE BOXES LOCATED IN DRAINAGE DITCHES OR IN BACK SLOPE SHALL BE FLUSH WITH THE FINISHED GRADE.
4. WATER LINE INSTALLATION AND TESTING SHALL COMPLY WITH AWWA AND THE TEXAS COMMISSION ENVIRONMENTAL QUALITY REQUIREMENTS. (TCEQ)
5. FLUSHING, DISINFECTION, AND BACTERIOLOGICAL SAMPLING OF WATER LINE SHALL BE DONE IN ACCORDANCE WITH TCEQ REGULATIONS AND AWWA STANDARDS.
6. DISINFECTION OF WATER LINE SHALL INCLUDE 50 PPM CHLORINE SOLUTION WHEN THE WATER LINE IS FLUSHED. BACTERIALOGICAL SAMPLES SHALL BE COLLECTED FOR EACH COMPLETED SECTION OF THE WATER LINE AND THESE SAMPLES MUST BE FOUND TO CONTAIN NO COLIFORM ORGANISMS PRIOR TO PLACING THE WATER LINE IN SERVICE. SAMPLES TO BE WITNESSED, ACCEPTED AND TRANSPORT TO THE LAB BY GALVESTON COUNTY W.C.&I.D. No. 1 PERSONNEL.
7. WATER LINE SHALL HAVE A MINIMUM OF (5) FIVE FEET OF COVER EXCEPT WHERE A CONFLICT EXISTS WITH AN UNDERGROUND UTILITY (30" MINIMUM).
8. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 6" CLEARANCE AT STORM SEWER CROSSINGS AND A MINIMUM OF (2) TWO FEET CLEARANCE BETWEEN THE PROPOSED WATERLINE AND ALL PIPELINES, UNLESS OTHERWISE NOTED ON PLANS.
9. ALL BURIED BOLTS SHALL BE 304 STAINLESS STEEL.
10. ALL FITTINGS TO BE MECHANICAL JOINT WITH MEGA-LUG.
11. GATE VALVES SHALL OPEN COUNTERCLOCKWISE, IN ACCORDANCE WITH GALVESTON COUNTY W.C.&I.D. No. 12 CRITERIA.
12. TAPPING SADDLES TO BE FULL CIRCLE STAINLESS STEEL; TAPPING VALVES TO BE FLANGED / MECHANICAL JOINT. VALVE TO OPEN COUNTERCLOCKWISE.
13. CONTRACTOR IS TO COORDINATE ANY WATER OUTAGES WITH EFFECTED PROPERTY OWNER AND THE CITY OF LEAGUE CITY.
14. WATER LINES MUST HAVE 2" CONNECTIONS FOR FLUSHING AND BACTERIOLOGIGAL (CHLORINATION).
15. FIRE HYDRANT LEADS TO BE PVC PER AWWA C-900, CLASS DR-18. THE LEADS SHALL HAVE MECHANICAL JOINT FITTINGS. (SEE DETAIL IN PLANS). MECHANICAL JOINT BOLTS AND NUTS TO BE "COR-TEN". ALL THREAD HARNESS BOLTS AND NUTS TO BE TYPE 304 S.S.. PLACE PEA GRAVEL AROUND WEEP HOLES.
16. FIRE HYDRANTS SHALL HAVE A MINIMUM (3) THREE INCH CLEARANCE AND A MAXIMUM (6) SIX INCH CLEARANCE BETWEEN NATURAL GROUND AND HYDRANT FLANGE.
17. ALL FIRE HYDRANTS SHALL BE AUDITED, SAND BLASTED, AND PAINTED PER GALVESTON COUNTY W.C.&I.D. No. 12 SPECIFICATIONS. INSTALLED WITH STRAPS NOT CHAINS. NO SEPARATE PAY.
18. AT ALL EXISTING VALVES ALONG ABANDONED WATERLINES, CONTRACTOR IS TO CLOSE VALVE, REMOVE VALVE BOX AND FILL OLD VALVE BOX CAVITY WITH NON-SHRINK EPOXY GROUT TO 6" BELOW SURFACE. SURFACE TO MATCH SURROUNDING AREA (GRASS IN GRASS, ETC.). BID ITEM COVERS ALL VALVE CLOSURES AND BOX REMOVALS.
19. WHEN WORKING ON PRIVATE PROPERTY TO RECONNECT EXISTING WATER SERVICES, CONTRACTOR IS TO USE EXTREME CARE TO PROTECT EXISTING FACILITIES. ANY DAMAGES TO EXISTING FENCES, SHRUBBERY, FLOWER BEDS, DRIVEWAYS, WALKWAYS, ETC. TO BE RESTORED TO ORIGINAL OR BETTER CONDITION. INCLUDE COST OF ANY DAMAGES ON PRIVATE PROPERTY IN UNIT PRICE BID FOR SERVICE CONNECTION ITEMS.
20. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
21. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY GALVESTON COUNTY W.C.&I.D. No. 12.
22. CONTRACTOR TO DELIVER SALVAGED FIRE HYDRANTS AND OTHER SALVAGED ITEMS TO GALVESTON COUNTY W.C.&I.D. No. 12.
23. DO NOT LOCATE FIRE HYDRANTS CLOSER THAN 3 FEET FROM CURBED DRIVEWAYS OR 5 FOOT FROM NONCURBED DRIVEWAYS.
24. BENDS OR OFFSETS IN FIRE HYDRANT BRANCH WILL NOT BE ALLOWED.

FLOOD PLAIN DATA:

ZONE "X"

MAP. NO. 48548810013D, REVISED SEPTEMBER22, 1999

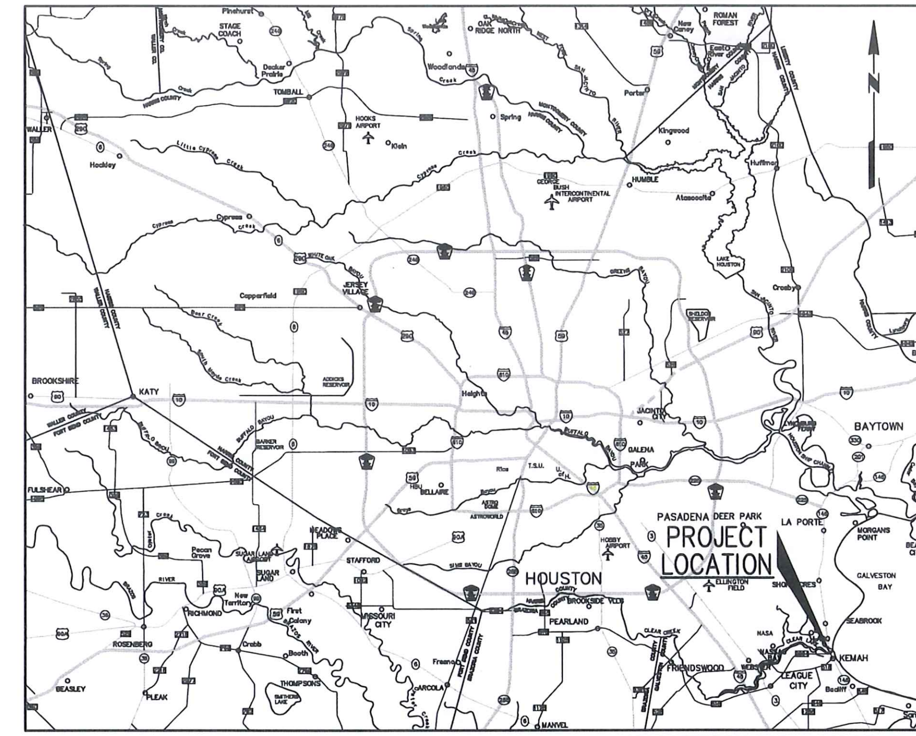
100 YR. FLOOD PLAN ELEV. - 11.0'



KeyMap 620X,T

LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.

SEPARATION DISTANCES

§290.44(E) LOCATION OF WATERLINES. THE FOLLOWING RULES APPLY TO INSTALLATIONS OF WATERLINES, WASTEWATER MAINS OR LATERALS, AND OTHER CONVEYANCES/APPURTENANCES IDENTIFIED AS POTENTIAL SOURCES OF CONTAMINATION. FURTHERMORE, ALL RATINGS SPECIFIED SHALL BE DEFINED BY ASTM OR AWWA STANDARDS UNLESS STATED OTHERWISE. NEW MAINS, SERVICE LINES, OR LATERALS ARE THOSE THAT ARE INSTALLED WHERE NO MAIN, SERVICE LINE, OR LATERAL PREVIOUSLY EXISTED, OR WHERE EXISTING MAINS, SERVICE LINES, OR LATERALS ARE REPLACED WITH PIPES OF DIFFERENT SIZE OR MATERIAL.

§290.44(E)(1) WHEN NEW POTABLE WATER DISTRIBUTION LINES ARE CONSTRUCTED, THEY SHALL BE INSTALLED NO CLOSER THAN NINE FEET IN ALL DIRECTIONS TO WASTEWATER COLLECTION FACILITIES. ALL SEPARATION DISTANCES SHALL BE MEASURED FROM THE OUTSIDE SURFACE OF EACH OF THE RESPECTIVE PIECES.

§290.44(E)(2) POTABLE WATER DISTRIBUTION LINES AND WASTEWATER MAINS OR LATERALS THAT FORM PARALLEL UTILITY LINES SHALL BE INSTALLED IN SEPARATE TRENCHES.

§290.44(E)(3) NO PHYSICAL CONNECTION SHALL BE MADE BETWEEN A DRINKING WATER SUPPLY AND A SEWER LINE. ANY APPURTENANCE SHALL BE DESIGNED AND CONSTRUCTED SO AS TO PREVENT ANY POSSIBILITY OF SEWAGE ENTERING THE DRINKING WATER SYSTEM.

§290.44(E)(4) WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING CRITERIA SHALL APPLY.

§290.44(E)(4)(A) NEW WATERLINE INSTALLATION--PARALLEL LINES.

§290.44(E)(4)(A)(I) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING, NON-PRESSURE OR PRESSURE RATED WASTEWATER MAIN OR LATERAL AND THE LICENSED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS IS ABLE TO DETERMINE THAT THE EXISTING WASTEWATER MAIN OR LATERAL IS NOT LEAKING, THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE EXISTING WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE EXISTING WASTEWATER MAIN OR LATERAL. EVERY EFFORT SHALL BE EXERTED NOT TO DISTURB THE BEDDING AND BACKFILL OF THE EXISTING WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(A)(II) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING PRESSURE RATED WASTEWATER MAIN OR LATERAL AND IT CANNOT BE DETERMINED BY THE LICENSED PROFESSIONAL ENGINEER IF THE EXISTING LINE IS LEAKING, THE EXISTING WASTEWATER MAIN OR LATERAL SHALL BE REPLACED WITH AT LEAST 150 PSI PRESSURE RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE NEW WASTEWATER LINE, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE REPLACED WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(A)(III) WHERE A NEW POTABLE WATERLINE PARALLELS A NEW WASTEWATER MAIN, THE WASTEWATER MAIN OR LATERAL SHALL BE CONSTRUCTED OF AT LEAST 150 PSI PRESSURE RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE WASTEWATER MAIN OR LATERAL.

§290.44(E)(4)(B) NEW WATERLINE INSTALLATION--CROSSING LINES.

§290.44(E)(4)(B)(I) WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL IS DISTURBED OR SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.

§290.44(E)(4)(B)(II) WHERE A NEW POTABLE WATERLINE CROSSES AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. IF THE EXISTING WASTEWATER MAIN OR LATERAL SHOWS SIGNS OF LEAKING, IT SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE.

§290.44(E)(4)(B)(III) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL AND THE STANDARD PIPE SEGMENT LENGTH OF THE WASTEWATER MAIN OR LATERAL IS AT LEAST 18 FEET, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (VI) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(E)(4)(B)(IV) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL AND A STANDARD LENGTH OF THE WASTEWATER PIPE IS LESS THAN 18 FEET IN LENGTH, THE POTABLE WATER PIPE SEGMENT SHALL BE CENTERED OVER THE WASTEWATER LINE. THE MATERIALS AND METHOD OF INSTALLATION SHALL CONFORM WITH ONE OF THE FOLLOWING OPTIONS.

§290.44(E)(4)(B)(IV)(I) WITHIN NINE FEET HORIZONTALLY OF EITHER SIDE OF THE WATERLINE, THE WASTEWATER PIPE AND JOINTS SHALL BE CONSTRUCTED WITH PIPE MATERIAL HAVING A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. AN ABSOLUTE MINIMUM VERTICAL SEPARATION DISTANCE OF TWO FEET SHALL BE PROVIDED. THE WASTEWATER MAIN OR LATERAL SHALL BE LOCATED BELOW THE WATERLINE.

§290.44(E)(4)(B)(IV)(II) ALL SECTIONS OF WASTEWATER MAIN OR LATERAL WITHIN NINE FEET HORIZONTALLY OF THE WATERLINE SHALL BE ENCASED IN AN 18-FOOT (OR LONGER) SECTION OF PIPE. FLEXIBLE ENCASING PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE ENCASING PIPE SHALL BE CENTERED ON THE WATERLINE AND SHALL BE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN THE WASTEWATER MAIN OR LATERAL. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT (OR LESS) INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. EACH END OF THE CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK CEMENT GROUT OR A MANUFACTURED WATERTIGHT SEAL. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF SIX INCHES BETWEEN THE ENCASEMENT PIPE AND THE WATERLINE SHALL BE PROVIDED. THE WASTEWATER LINE SHALL BE LOCATED BELOW THE WATERLINE.

§290.44(E)(4)(B)(IV)(III) WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR LATERAL, THE WATERLINE SHALL BE ENCASED AS DESCRIBED FOR WASTEWATER MAINS OR LATERALS IN SUBCLAUSE (II) OF THIS CLAUSE OR CONSTRUCTED OF DUCTILE IRON OR STEEL PIPE WITH MECHANICAL OR WELDED JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF ONE FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. BOTH THE WATERLINE AND WASTEWATER MAIN OR LATERAL MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED IN AWWA C600 STANDARDS.

§290.44(E)(4)(B)(V) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (VI) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(E)(4)(B)(VI) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.

§290.44(E)(5) WATERLINE AND WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SEPARATION. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.

§290.44(E)(6) LOCATION OF FIRE HYDRANTS. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.

VEGETATION PROTECTION AND REMOVAL NOTES

1. CONTRACTOR SHALL PROTECT ALL TREES ALONG THE RIGHT-OF-WAY LINE AND THE ADJACENT 5 FEET OUTSIDE THE RIGHT-OF-WAY (NO SEPARATE PAY).
2. CONTRACTOR SHALL RETURN THE CONSTRUCTION SITE TO THE ORIGINAL OR BETTER CONDITION (NO SEPARATE PAY).
3. LOCATE ALL BORE PITS OUTSIDE TREE CANOPY AREAS, AND USE THE NECESSARY AUGER LENGTH TO CLEAR THE TREE CANOPIES.

TRAFFIC CONTROL NOTE

1. CONTRACTOR TO COMPLY WITH ANY AND ALL TRAFFIC CONTROL REQUIREMENTS REQUESTED AND ENFORCED BY TEXAS DEPARTMENT OF TRANSPORTATION AND ANY OTHER APPLICABLE LOCAL AGENCY AND COST OF SUCH IS INCIDENTAL TO THE PROJECT, WITH NO SEPARATE PAY.
2. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD - LATEST EDITION WITH REVISIONS) DURING CONSTRUCTION.
3. NO LANES SHALL BE BLOCKED FROM 7AM TO 9AM AND 4PM TO 6PM, MONDAY THRU FRIDAY.

ADDITIONAL REQUIRED CONTACTS

1. CONTRACTOR SHALL CONTACT THE FOLLOWING A MINIMUM OF 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

A) CITY OF LEAGUE CITY PROJECT MANAGEMENT (281)-554-1439
B) CITY OF LEAGUE CITY FIRE MARSHALL (281)-554-1290
C) TEXAS ONE CALL SYSTEM 1-800-245-4545
D) LONE STAR NOTIFICATION CENTER 1-800-669-8344
E) TEXAS EXCAVATION SAFETY SYSTEM INC. 1-800-344-8377
F) EL PASO PIPELINE : MR. J.R. LOGAN (281)-331-4693
G) BP PIPELINE : MR. DARREL BARBO (409)-938-6995 (MOBIL) (281)-636-6747

UTILITY NOTES

1. LOCATION OF EXISTING UNDERGROUND UTILITY SERVICE LINES (WATER, SEWER, GAS, TELEPHONE, ELECTRICAL, ETC.) ARE DETERMINED FROM AVAILABLE RECORDS AND ARE APPROXIMATE. CONTRACTOR TO LOCATE LINES AND/OR OBSTRUCTIONS AHEAD OF EXCAVATION.
2. CONTRACTOR TO MAKE ARRANGEMENTS WITH APPROPRIATE UTILITY COMPANY FOR SECURING POLES, IF NECESSARY, WHILE CONSTRUCTION PASSES BY POLES. COSTS OF SECURING POLES WILL BE PAID FOR BY THE UTILITY COMPANIES.

CAUTION: VERIZON FACILITIES
THE LOCATION OF VERIZON FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. SERVICE LINES ARE NOT SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES. THE CONTRACTOR SHALL CONTACT DIGTESS @ 800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND TELEPHONE LINES FIELD LOCATED. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF VERIZON FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MUCHANIZED EXCAVATION PROCEDURES. WHENEVER VERIZON FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT SHOULD BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON CABLE AND/OR CONDUIT DUCTS. CONTACT NETWORK ENGINEERING @ 281-338-2221 FOR QUESTIONS REGARDING VERIZON FACILITES.

CAUTION: UNDERGROUND GAS FACILITIES
LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOW IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567, 1-800-669-8344 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

- WHEN CENTERPOINT ENERGY PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713) 945-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
- WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
- WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
- FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRIC FACILITIES
OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

- ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6248 OR (713) 207-5769.

CAUTION: UNDERGROUND PIPELINES
UNDERGROUND PIPELINES ARE SHOWN ACCORDING TO BEST AVAILABLE INFORMATION. CONTRACTOR TO PROCEED WITH CAUTION DURING EXCAVATION. CONTRACTOR TO COORDINATE WITH PIPELINE OWNER IN CASE OF CONFLICTS OR QUESTIONS.

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:
For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

[signature] DATE 11-3-15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly – not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

[signature] DATE 11-3-15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities – not to be used for conflict verification)
Signature Valid for six months

[signature] DATE 11/10/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
WALLACE E. TROCHESSET
83421
LICENSED PROFESSIONAL ENGINEER
11-3-15

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

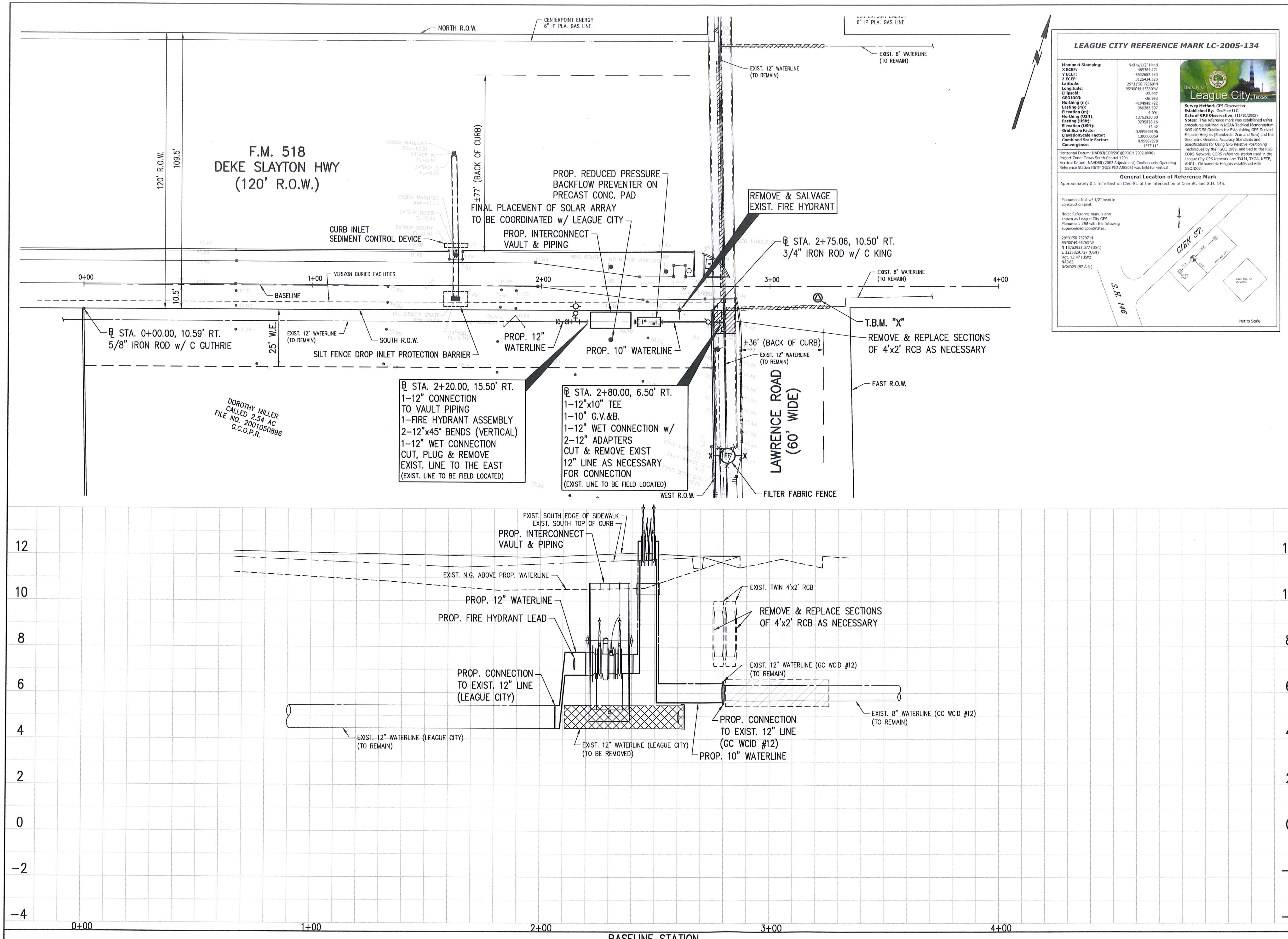
GENERAL NOTES
VICINITY MAP & LOCATION MAP

LJA Engineering, Inc.
11821 East Freeway
Suite 400
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 02 Of 10

H:\ACAD\Clients\125\092\Design\125-092-02 Notes.dwg (XREF: 125-092 Border)

11/03/15



NORTH R.O.W.
CENTERPOINT ENERGY 6" IP PLA. GAS LINE
EXIST. 12" WATERLINE (TO REMAIN)
EXIST. 8" WATERLINE (TO REMAIN)
F.M. 518
DEKE SLAYTON HWY
(120' R.O.W.)
120' R.O.W.
109.5'
±77' (BACK OF CURB)
PROP. REDUCED PRESSURE BACKFLOW PREVENTER ON PRECAST CONC. PAD
FINAL PLACEMENT OF SOLAR ARRAY TO BE COORDINATED w/ LEAGUE CITY
PROP. INTERCONNECT VAULT & PIPING
CURB INLET SEDIMENT CONTROL DEVICE
REMOVE & SALVAGE EXIST. FIRE HYDRANT
℄ STA. 2+75.06, 10.50' RT. 3/4" IRON ROD w/ C KING
0+00
1+00
2+00
3+00
4+00
VERIZON BURIED FACILITIES
BASELINE
10.5'
℄ STA. 0+00.00, 10.59' RT. 5/8" IRON ROD w/ C GUTHRIE
25' W.E.
EXIST. 12" WATERLINE (TO REMAIN)
SOUTH R.O.W.
SILT FENCE DROP INLET PROTECTION BARRIER
PROP. 12" WATERLINE
PROP. 10" WATERLINE
T.B.M. "X"
REMOVE & REPLACE SECTIONS OF 4'x2' RCB AS NECESSARY
±36' (BACK OF CURB)
EAST R.O.W.
LAWRENCE ROAD (60' WIDE)
WEST R.O.W.
FILTER FABRIC FENCE
DOROTHY MILLER CALLED 2.54 AC FILE NO. 2001050896 G.C.O.P.R.
℄ STA. 2+20.00, 15.50' RT.
1-12" CONNECTION TO VAULT PIPING
1-FIRE HYDRANT ASSEMBLY
2-12"x45° BENDS (VERTICAL)
1-12" WET CONNECTION
CUT, PLUG & REMOVE EXIST. LINE TO THE EAST
(EXIST. LINE TO BE FIELD LOCATED)
℄ STA. 2+80.00, 6.50' RT.
1-12"x10" TEE
1-10" G.V.&B.
1-12" WET CONNECTION w/ 2-12" ADAPTERS
CUT & REMOVE EXIST 12" LINE AS NECESSARY FOR CONNECTION
(EXIST. LINE TO BE FIELD LOCATED)
LEAGUE CITY REFERENCE MARK LC-2005-134
General Location of Reference Mark
CIEN ST.
S.H. 146
EXIST. SOUTH EDGE OF SIDEWALK
EXIST. SOUTH TOP OF CURB
EXIST. N.G. ABOVE PROP. WATERLINE
PROP. FIRE HYDRANT LEAD
PROP. CONNECTION TO EXIST. 12" LINE (LEAGUE CITY)
EXIST. TWIN 4'x2' RCB
EXIST. 12" WATERLINE (GC WCID #12) (TO REMAIN)
EXIST. 8" WATERLINE (GC WCID #12) (TO REMAIN)
EXIST. 12" WATERLINE (LEAGUE CITY) (TO REMAIN)
EXIST. 12" WATERLINE (LEAGUE CITY) (TO BE REMOVED)
PROP. CONNECTION TO EXIST. 12" LINE (GC WCID #12)
12
10
8
6
4
2
0
-2
-4
BASELINE STATION

11/03/15

CONTROL BENCHMARK
LEAGUE CITY RM LC-2005-134
BEING A MONUMENT NAIL WITH 1/2" HEAD IN CONSTRUCTION JOINT LOCATED APPROXIMATELY 0.1 MILE EAST ON CIEN ST. AT THE INTERSECTION OF CIEN ST. AMD S.H. 146.
ELEV. 4.091 (NAVD 1988, 2002 ADJ.)

NOTES:
1. CONTRACTOR IS TO PROVIDE PROTECTION AT OPEN TRENCH EXCAVATION AND BORE PITS TO PREVENT SILT RUN-OFF INTO EXISTING STORM SEWERS. FILTER FABRIC FENCING ADJACENT TO EXCAVATION OR GRAVEL BAGS AT INLETS MAY BE USED. INCLUDE COST OF FENCING AND/OR HAY BALES IN PRICE BID FOR MULTIPLE SWPPP ITEMS.
2. HYDROMULCH SEED ALL DISTURBED AREAS NOT COVERED BY DRIVEWAY SURFACE, UNLESS OTHERWISE DIRECTED BY THE DISTRICT OR ITS REPRESENTATIVE.

20 0 20 40
SCALE IN FEET

TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL CENTERPOINT AT 713-207-2222

NOTICE:
For your safety, you are required by Texas law to call 811 at least 48 hours before you dig so that underground lines can be marked. This Verification does not fulfill you obligation to call 811.

VERIFICATION OF PRIVATE UTILITIES

DATE 11-3-15
CenterPoint Energy/Natural Gas Facilities Verifications ONLY
(This Signature verifies that you have shown CNP Natural Gas lines correctly - not to be used for conflict verification) (Gas service lines are not shown)
Signature Valid for six months

DATE 11-3-15
CenterPoint Energy/UNDERGROUND Electrical Facilities Verifications ONLY
(This Signature verifies existing underground facilities - not to be used for conflict verification)
Signature Valid for six months

DATE 11/10/15
VERIZON
(Approved for Underground Facilities only)
Signature Valid for one year

STATE OF TEXAS
WALLACE E. TROCHESSET
83421
LICENSED PROFESSIONAL ENGINEER
11-3-15

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

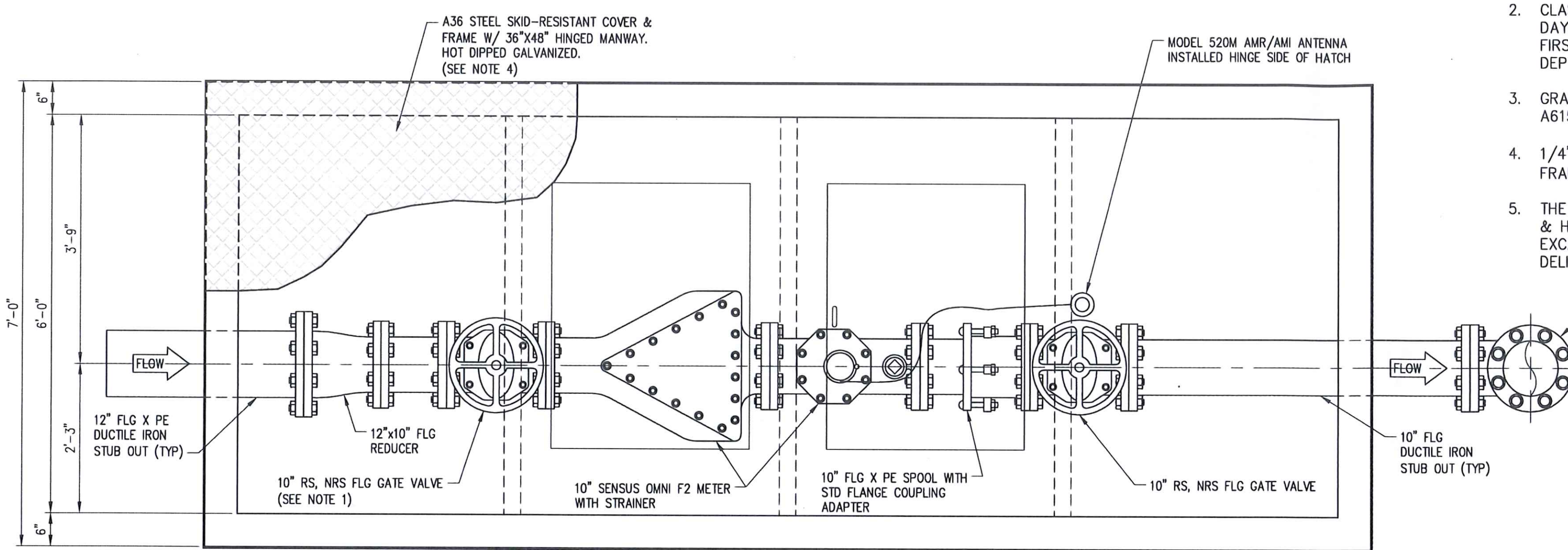
F.M. 518 / DEKE SLAYTON HWY
PLAN & PROFILE
BEGINNING TO END

LJA Engineering, Inc.
11821 East Freeway
Suite 400
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

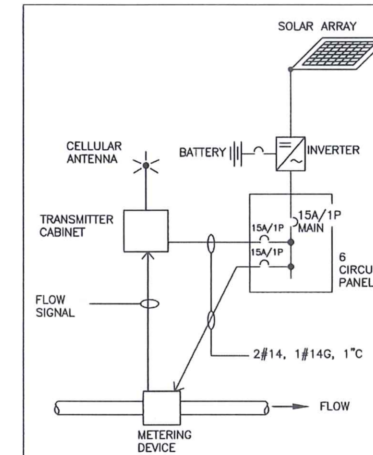
DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1"=20' HORIZ.; 1"=2' VER.
APPROVED:	SHEET No. 3 Of 10

NOTES:

1. UPON INSTALLATION OF WATER METER VAULT LEAGUE CITY PERSONNEL WILL VERIFY THAT THE BY-PASS VALVE AND VALVE BEFORE THE METER ARE IN THE OFF POSITION. A LEAGUE CITY WATER PRODUCTION OPERATOR WILL CHAIN AND PAD LOCK THE VALVES. WATER PRODUCTION PERSONNEL WILL LOCK METER PIT AND DESIGNATE EMPLOYEE TO OPERATE VALVE. ANY OPERATION OF THE VALVES WILL BE DONE ONLY BY DESIGNATED LEAGUE CITY EMPLOYEES.
2. CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.
3. GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
4. 1/4" STEEL SKID-RESISTANT FLOOR PLATE WELDED TO 3" ANGLE FRAME WITH (3) 3X3 I-BEAM SUPPORTS (300 PSF).
5. THE METER ASSEMBLY SHALL BE FACTORY ASSEMBLED IN VAULT & HYDROSTATICALLY TESTED PRIOR TO DELIVERY. FIELD EXCAVATION & PREPARATION SHALL BE COMPLETE PRIOR TO DELIVERY.



PLAN
SCALE: 3/4" = 1'-0"



NOTE:
RACK MOUNT SOLAR ARRAY, INVERTER, 120V POWER DISTRIBUTION, FLOWMETER AND CELLULAR SYSTEM AS REQUIRED TO SEND FLOW SIGNAL COMPATIBLE WITH CITY OF LEAGUE CITY'S EXISTING METERING SYSTEM. SIZE SOLAR ARRAY AND BATTERY TO ACCOMMODATE ELECTRICAL BURDEN OF THE ENTIRE SYSTEM + 25%. ALL EQUIPMENT NEMA 4X S.S. WHERE POSSIBLE. COORDINATE EXACT REQUIREMENTS WITH VENDOR DATA SUBMITTALS.

(2) ELECTRICAL SCHEMATIC	N.T.S.

① CONTRACTOR SHALL FOLLOW STANDARD LOCK-OUT/TAG-OUT PROCEDURES.
② CONTRACTOR SHALL FURNISH AS BUILT DRAWINGS AT THE END OF CONSTRUCTION TO THE ENGINEER.
③ CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.
④ CONTRACTOR SHALL NOTIFY OPERATOR 72 HOURS PRIOR TO STARTING WORK THAT WOULD DISRUPT NORMAL ACTIVITY
⑤ ALL WIRING SHALL BE THWN/THHN COPPER
⑥ ALL CONDUIT ABOVE GRADE RIGID STEEL
⑦ ALL CONDUIT BELOW GRADE RED CONCRETE ENCASED PVC

(1) ELECTRICAL NOTES	N.T.S.

Robert W. Young P.E.

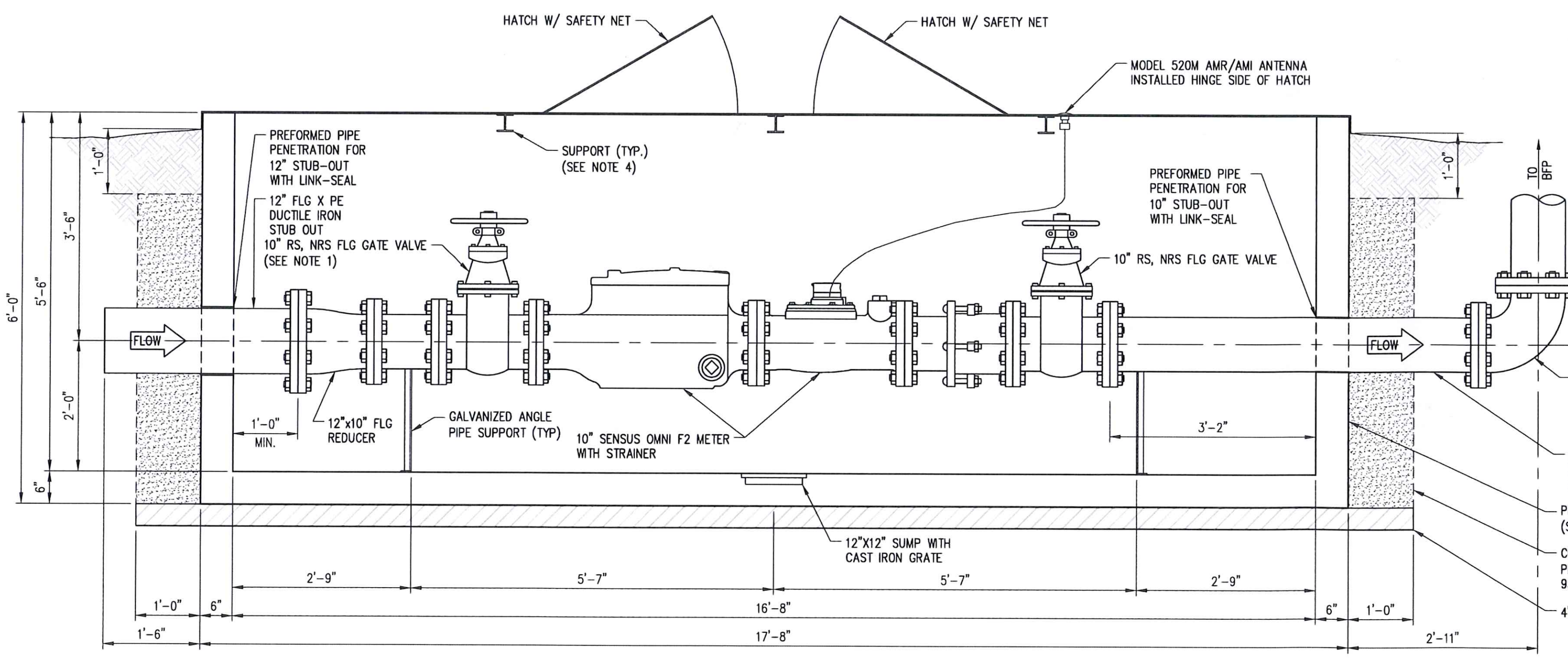
STATE OF TEXAS ROBERT W. YOUNG 56551 LICENSED PROFESSIONAL ENGINEER

The Seal appearing on this document was authorized by Robert W. Young. 56551 on 11/2, 2015

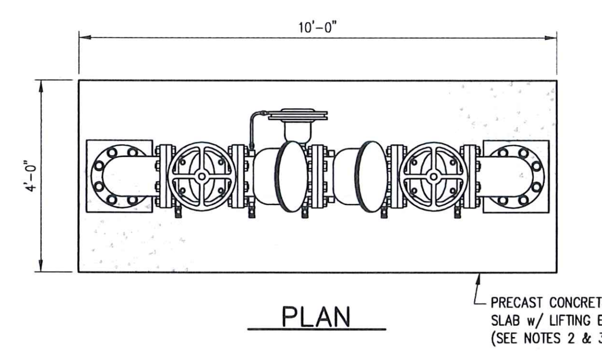
ROBERT W. YOUNG & ASSOCIATES, INC.

PROJECT:	PAGE:
GALVESTON CO. W.C.& I.D. PROPOSED INTERCONNECT ELECTRICAL SCHEMATIC	E.1
DATE NOV 2015	

RWYINC LJA 1507



ELEVATION
SCALE: 3/4" = 1'-0"



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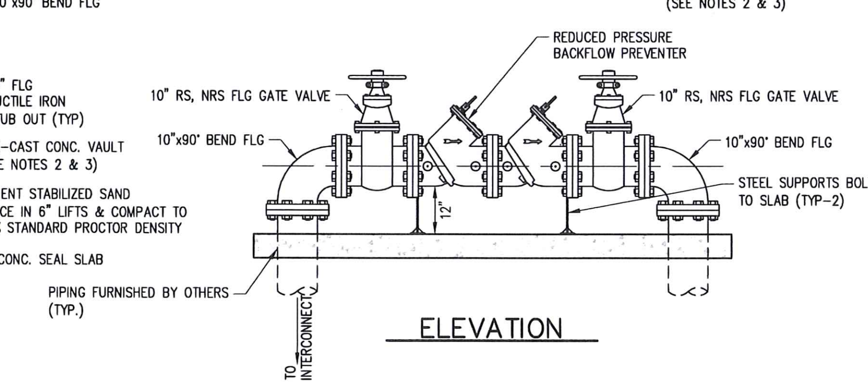


ELEVATION

REDUCED PRESSURE BACKFLOW PREVENTER ON CONCRETE PAD
SCALE: 1/2" = 1'-0"

STATE OF TEXAS WALLACE E. TROCHESSET 83421 LICENSED PROFESSIONAL ENGINEER 11-3-15

Revision	By	Chk.	Appr.	Date

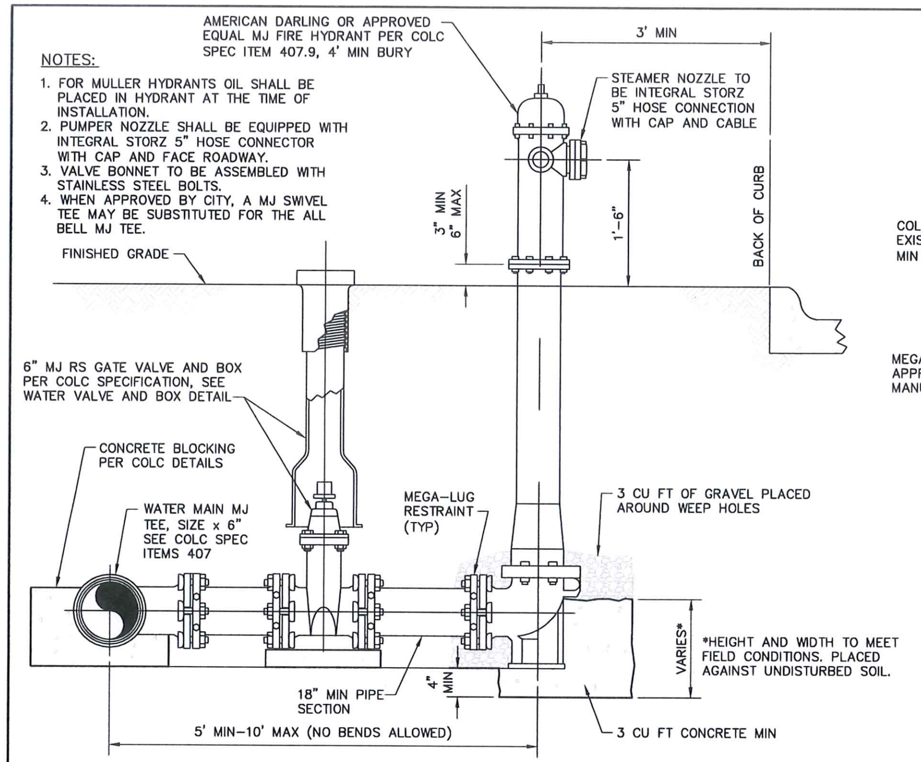
GALVESTON COUNTY W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

INTERCONNECT DETAILS

LJA Engineering, Inc.
11821 East Freeway
Suite 400
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: AS SHOWN
APPROVED:	SHEET No. 4 Of 10

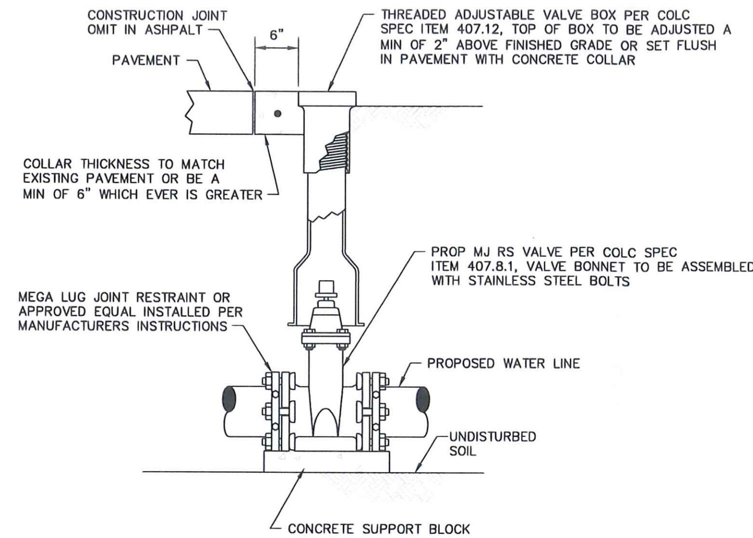
11/03/15



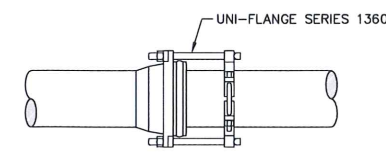
NOTES:

1. FOR MULLER HYDRANTS OIL SHALL BE PLACED IN HYDRANT AT THE TIME OF INSTALLATION.
2. PUMPER NOZZLE SHALL BE EQUIPPED WITH INTEGRAL STORZ 5" HOSE CONNECTOR WITH CAP AND FACE ROADWAY.
3. VALVE BONNET TO BE ASSEMBLED WITH STAINLESS STEEL BOLTS.
4. WHEN APPROVED BY CITY, A MJ SWIVEL TEE MAY BE SUBSTITUTED FOR THE ALL BELL MJ TEE.

FIRE HYDRANT AND VALVE DETAIL
NTS 4-2014



WATER VALVE AND BOX DETAIL
NTS 4-2012



PVC BELL AND SPIGOT RESTRAINT

SPECIFICATIONS:

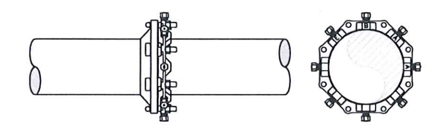
RESTRAINT DEVICES FOR P.V.C. (AWWA C-900) AND P.V.C. PRESSURE FITTINGS (AWWA C-907) SHALL CONSIST OF A SPLIT RING INSTALLED ON THE PIPE SPIGOT, CONNECTED TO A SPLIT BACK-UP RING SEATED BEHIND THE FITTING BELL.

THE SPLIT RESTRAINT RING SHALL INCORPORATE A SERIES OF MACHINED SERRATIONS (NOT "AS CAST") ON THE INSIDE DIAMETER TO PROVIDE POSITIVE RESTRAINT, EXACT FIT, AND 360° CONTACT AND SUPPORT OF THE PIPE WALL.

THE TWO HALVES OF THE SPLIT BACK UP RING SHALL INTER-LOCK WITHOUT THE NEED FOR ADDITIONAL BOLTS AND SHALL FORM A BEVELED LEADING EDGE TO ASSURE EXACT FIT BEHIND THE FITTING BELL.

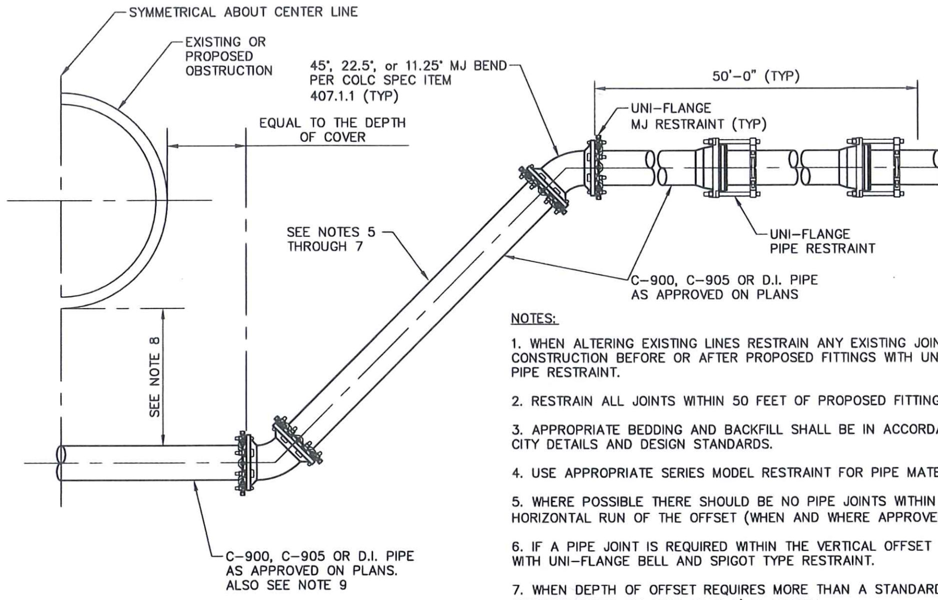
RESTRAINT DEVICES SHALL BE OF DUCTILE IRON, ASTM A536, GRADE 65-45-12 AND CONNECTING BOLTS SHALL BE OF HIGH STRENGTH, LOW ALLOY MATERIAL IN ACCORDANCE WITH ANSI/AWWA C111/21.11

RESTRAINT DEVICES SHALL BE UNI-FLANGE SERIES 1360 OR APPROVED EQUAL.



MECHANICAL JOINT RESTRAINT

PIPE RESTRAINT DETAIL
NTS 4-2012



NOTES:

1. WHEN ALTERING EXISTING LINES RESTRAIN ANY EXISTING JOINTS EXPOSED BY CONSTRUCTION BEFORE OR AFTER PROPOSED FITTINGS WITH UNI-FLANGE BELL AND SPIGOT PIPE RESTRAINT.

2. RESTRAIN ALL JOINTS WITHIN 50 FEET OF PROPOSED FITTINGS.

3. APPROPRIATE BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH CITY OF LEAGUE CITY DETAILS AND DESIGN STANDARDS.

4. USE APPROPRIATE SERIES MODEL RESTRAINT FOR PIPE MATERIAL.

5. WHERE POSSIBLE THERE SHOULD BE NO PIPE JOINTS WITHIN THE VERTICAL OR HORIZONTAL RUN OF THE OFFSET (WHEN AND WHERE APPROVED SEE NOTE 6 AND 7).

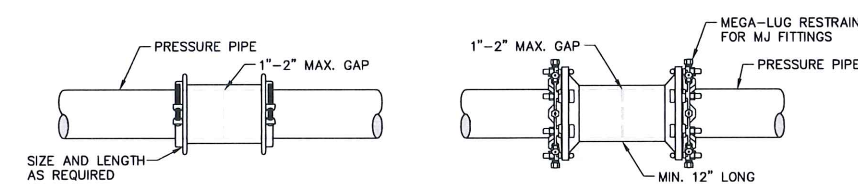
6. IF A PIPE JOINT IS REQUIRED WITHIN THE VERTICAL OFFSET IT SHALL BE RESTRAINED WITH UNI-FLANGE BELL AND SPIGOT TYPE RESTRAINT.

7. WHEN DEPTH OF OFFSET REQUIRES MORE THAN A STANDARD LENGTH OF PIPE NO SEGMENT SHALL BE LESS THAN 5' IN LENGTH.

8. THE MINIMUM CLEARANCE SHALL BE DETERMINED BY THE AMOUNT OF BEDDING AND BACKFILL REQUIRED BY THE PROSPECTIVE PIPE AND THEIR USAGE. SEE THE BEDDING AND BACKFILL DETAILS FOR DIMENSIONS.

9. A SOLID CONTINUOUS JOINT OF PIPE SHALL BE USED AT ALL TIMES FOR THE HORIZONTAL SECTION OF THE OFFSET. IF THE MINIMUM SIDE CLEARANCE DISTANCES PLUS THE DIMENSION OF THE OBSTRUCTION IS GREATER THAN A STANDARD JOINT OF PIPE AN APPROPRIATELY SIZED AND CONTINUOUS LENGTH OF HDPE SHALL BE USED WITH TRANSITION FITTING OR GASKETS AS SPECIFIED BY THE MANUFACTURER IF NEEDED.

RESTRAINED MECHANICAL JOINT VERTICAL OFFSET
NTS 9-2014



HYMAX COUPLING   RESTRAINED MECH. JOINT SOLID SLEEVE COUPLING

PIPE COUPLING DETAIL
NTS 8-2012

90° BEND	
PIPE SIZE	BEARING AREA
4"	2 S.F.
6"	4 S.F.
8"	8 S.F.
10"	12 S.F.
12"	16 S.F.
14"	22 S.F.
16"	29 S.F.
18"	36 S.F.
20"	44 S.F.
24"	64 S.F.
30"	100 S.F.
36"	103 S.F.

45° BEND	
PIPE SIZE	BEARING AREA
4"	1 S.F.
6"	3 S.F.
8"	4 S.F.
10"	6 S.F.
12"	9 S.F.
14"	12 S.F.
16"	16 S.F.
18"	20 S.F.
20"	24 S.F.
24"	36 S.F.
30"	54 S.F.
36"	72 S.F.

22 1/2° BEND	
PIPE SIZE	BEARING AREA
4"	1 S.F.
6"	1 S.F.
8"	2 S.F.
10"	3 S.F.
12"	5 S.F.
14"	6 S.F.
16"	8 S.F.
18"	10 S.F.
20"	12 S.F.
24"	18 S.F.
30"	28 S.F.
36"	38 S.F.

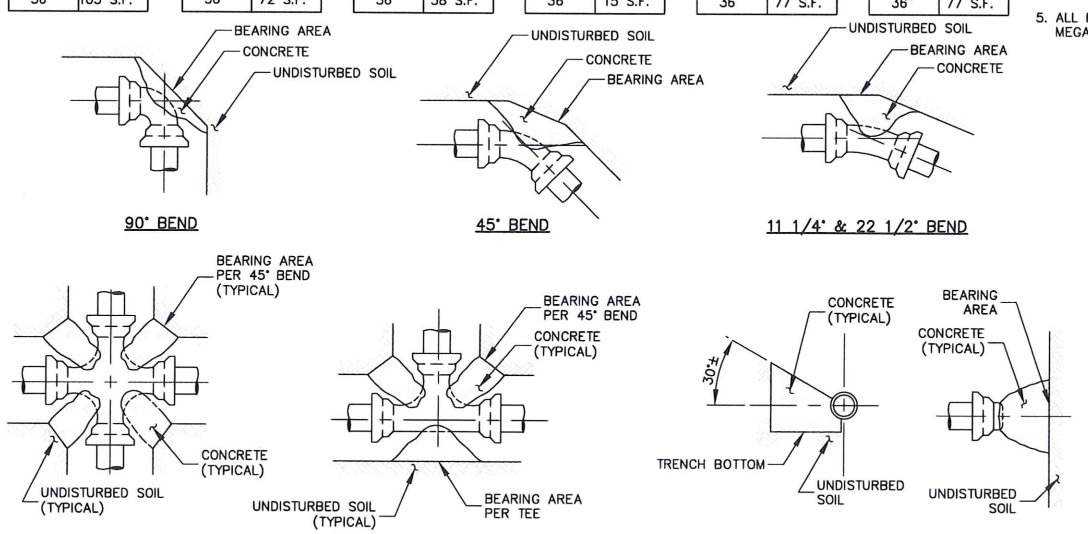
11 1/4° BEND	
PIPE SIZE	BEARING AREA
4"	1 S.F.
6"	1 S.F.
8"	1 S.F.
10"	2 S.F.
12"	2 S.F.
14"	3 S.F.
16"	4 S.F.
18"	5 S.F.
20"	6 S.F.
24"	9 S.F.
30"	12 S.F.
36"	15 S.F.

TEE	
PIPE SIZE	BEARING AREA
4"	2 S.F.
6"	3 S.F.
8"	5 S.F.
10"	8 S.F.
12"	12 S.F.
14"	15 S.F.
16"	20 S.F.
18"	25 S.F.
20"	32 S.F.
24"	45 S.F.
30"	71 S.F.
36"	77 S.F.

PLUG	
PIPE SIZE	BEARING AREA
4"	2 S.F.
6"	3 S.F.
8"	5 S.F.
10"	8 S.F.
12"	12 S.F.
14"	15 S.F.
16"	20 S.F.
18"	25 S.F.
20"	32 S.F.
24"	45 S.F.
30"	71 S.F.
36"	77 S.F.

THRUST BLOCKING NOTES:

1. SEE COLC SPECIFICATION ITEM 407.15 FOR CONCRETE.
2. PLACE CONCRETE AGAINST UNDISTURBED SOIL AND FITTING ONLY, CLEAR OF THE JOINT.
3. ALL IRON FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE FILM 8 MILS MIN THICKNESS MEETING ANSI 21.5 (AWWA C105) WITH ALL EDGES AND LAPS TAPED SECURELY TO PROVIDE A CONTINUOUS AND WATERTIGHT WRAP.
4. DIMENSIONS ARE BASED ON 150 PSI TEST PRESSURE AND SAFE SOIL BEARING LOAD OF 1100 PSI.
5. ALL FITTINGS TO BE MECHANICAL JOINT WITH MEGA-LUG RESTRAINTS OR APPROVED EQUAL.

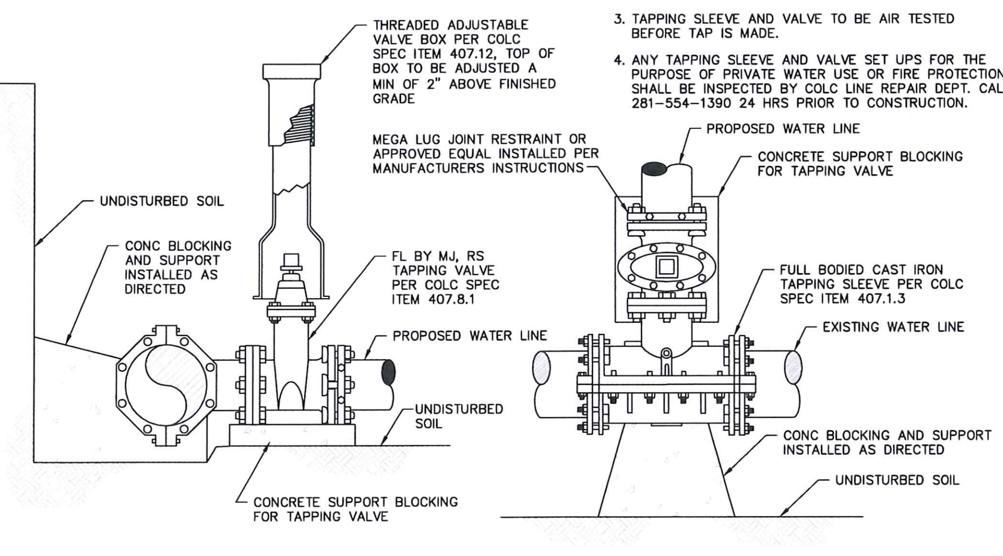


HORIZONTAL THRUST BLOCKING DETAILS
NTS 4-2012

NOTES:

1. VALVE AND TAPPING SLEEVE TO BE INSTALLED PER COLC SPECIFICATION WITH POLLY WRAP BEFORE ANY CONCRETE IS POURED.
2. VALVE BONNET TO BE ASSEMBLED WITH STAINLESS STEEL BOLTS.
3. TAPPING SLEEVE AND VALVE TO BE AIR TESTED BEFORE TAP IS MADE.
4. ANY TAPPING SLEEVE AND VALVE SET UPS FOR THE PURPOSE OF PRIVATE WATER USE OR FIRE PROTECTION SHALL BE INSPECTED BY COLC LINE REPAIR DEPT. CALL 281-554-1390 24 HRS PRIOR TO CONSTRUCTION.

STATE OF TEXAS
WALLACE E. TROCHESSET
83421
LICENSED PROFESSIONAL ENGINEER
11-3-15



TAPPING SLEEVE AND VALVE DETAIL
NTS 4-2012

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

STANDARD WATER DETAILS

LJA Engineering, Inc.
11821 East Freeway
Suite 400
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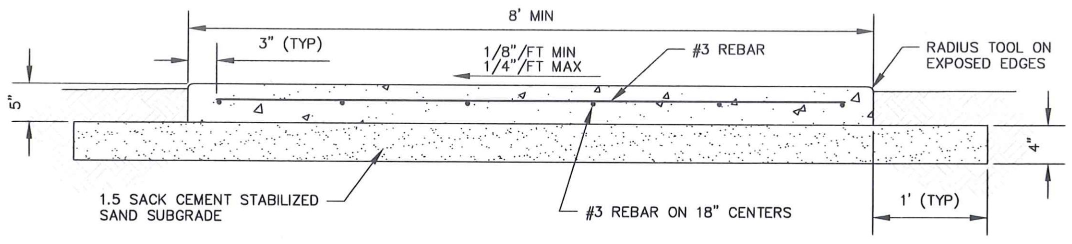
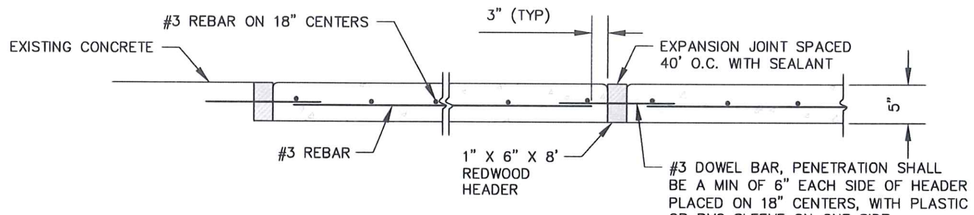
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 5 Of 10

11/03/15



SECTION



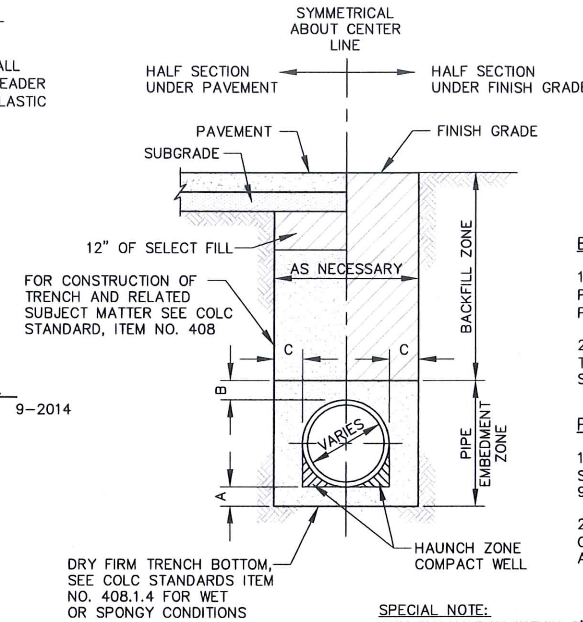
EXPANSION JOINT SECTION

NOTES:

1. 1" EXPANSION JOINTS TO BE PLACED EVERY 40' AND SAWED CONTROL JOINT EVERY 8'.
2. EXPANSION JOINTS SHALL BE PLACED WHERE NEW WALKS MEET EXISTING CONCRETE STRUCTURES, FIRE HYDRANTS AND UTILITY POLES.
3. CONSTRUCT SIDEWALKS WITH 5 1/2 SACK PORTLAND CEMENT.
4. ALL EXPANSION/CONSTRUCTION JOINT TO BE SEALED WITH HOT POURED ELASTIC TYPE SEALER MEETING ASTM D1190 OR APPROVED EQUIL.
5. PROVIDE A MIN OF 10" OVERLAP ON REINFORCING.
6. SIDEWALKS SHALL MAINTAIN A ONE FOOT CLEARANCE FROM OUTER EDGE OF SIDEWILK TO OUTER EDGE OF ALL UTILITY STRUCTURES (ie...VALVE BOXES, FIRE HYDRANT, MANHOLE, ETC.)

8 FT & LARGER SIDEWALK SECTION AND EXPANSION JOINT DETAIL

NTS 9-2014



SPECIAL NOTE:
ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT EDGE OR CITY STREET SHALL REQUIRE 1-1/2 SACK CEMENT STABILIZED BACKFILL UP TO ROAD BASE. COMPACTED IN 8" LIFTS WITH VIBRATORY PLATE.

WATER, SANITARY AND STORM BEDDING AND BACKFILL FOR DRY STABLE TRENCH

NTS 4-2012

DIMENSIONAL REQUIREMENTS

PIPE SIZE	A	B	C
20" AND SMALLER	6"	12"	9"
21" THRU 48"	6"	12"	12"
54" THRU 66"	9"	12"	15"
72" AND LARGER	12"	18"	15"

MATERIAL REQUIREMENTS

BACKFILL ZONE

1. IN PAVED AREAS, USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY, TO WITHIN 12" OF SUBGRADE.

2. IN UNPAVED AREAS, USE SOIL EXCAVATED FROM TRENCH, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

PIPE EMBEDMENT ZONE

1. FOR STORM AND SANITARY SEWERS, USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

2. FOR WATER LINES, USE SAND AS DESCRIBED IN THE COLC STANDARD, ITEM NO. 407.14.1. PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

SPECIAL NOTE: ALL CONCRETE DRIVEWAY REPAIR TO BE A MINIMUM OF 6" THK. WITH #3 REBAR ON 12" CENTERS WITH PLASTIC CHAIRS.

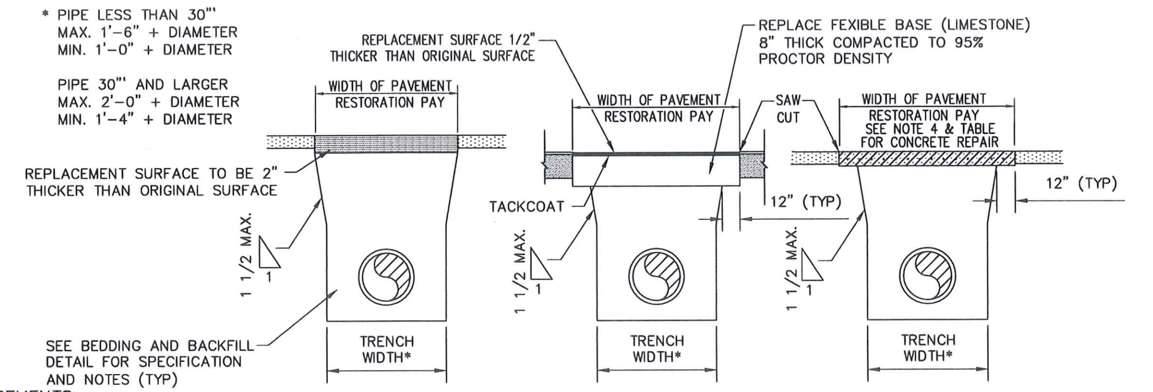


TABLE OF SLAB DEPTH & REINFORCEMENT

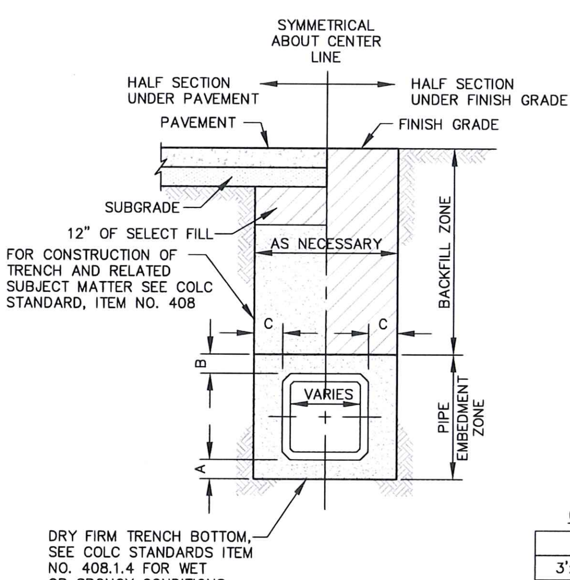
Min. Depth of Slab	Width of Trench	Size of Bar	Spacing	Length of Bar
8"	18"	4	9"	40"
8"	24"	4	8"	46"
8"	30"	4	7"	52"
8"	36"	4	6"	58"
10"	42"	4	8 1/2"	64"
10"	48"	4	7 1/2"	70"
10"	54"	4	7"	76"
10"	60"	4	6 1/2"	82"
10"	66"	5	9"	88"
10"	72"	6	8 1/2"	94"
10"	78"	6	8"	100"
10"	84"	6	7 1/2"	106"

NOTES

1. PAVEMENT REPAIR SHALL BE MADE TO THE LIMITS OF EXISTING PAVEMENT SECTION WITH LIKE MATERIALS UNLESS NOTED OTHERWISE.
2. UNPAVED DRIVEWAYS, NOT SURFACED WITH ASPHALT, SHALL BE REPAIRED WITH MINIMUM 6" CRUSHED LIMESTONE.
3. NEW PAVEMENT SHALL BE SUPPORTED ON MINIMUM 12" EACH SIDE ON UNDISTURBED SOIL.
4. SAW CUT EXISTING CONCRETE PAVEMENT EXPOSING 12" OF REBAR; BEND STEEL BACK OUT OF THE WAY & CONCRETE TRENCH. BEND STEEL BACK TO ORIGINAL POSITION AND SPLICE; SEE "TABLE OF SLAB DEPTHS & REINFORCEMENT" FOR BAR SIZE AND SPACING. WHERE REBAR IS REMOVED, THE CONTRACTOR SHALL DRILL 12" INTO THE CENTER OF EXISTING CONCRETE AND SECURE A 24", DEFORMED STEEL BAR ON 24" CENTERS WITH CEMENT GROUT OR SUITABLE EPOXY, THEN PLACE AND TIE IN REBAR. REPLACE CONCRETE 2" THICKER THAN ORIGINAL. ANY PAVEMENT REMOVED IN STATE R.O.W. SHALL BE REPLACED TO STATE SPECIFICATIONS.
5. ALL CONCRETE TO BE FIVE SACK MIX, 3,000 PSI MIN. AT 28 DAYS.
6. LIMITS OF SAW CUT TO BE VARIFIED BY CITY OF LEAGUE CITY OFFICIALS.

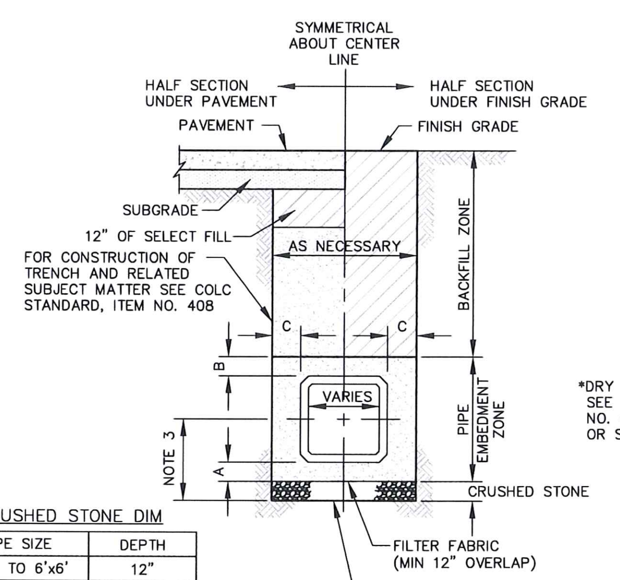
PAVEMENT REPLACEMENT DETAIL

NTS 4-2012



BOX CULVERT BEDDING AND BACKFILL FOR DRY STABLE TRENCH

NTS



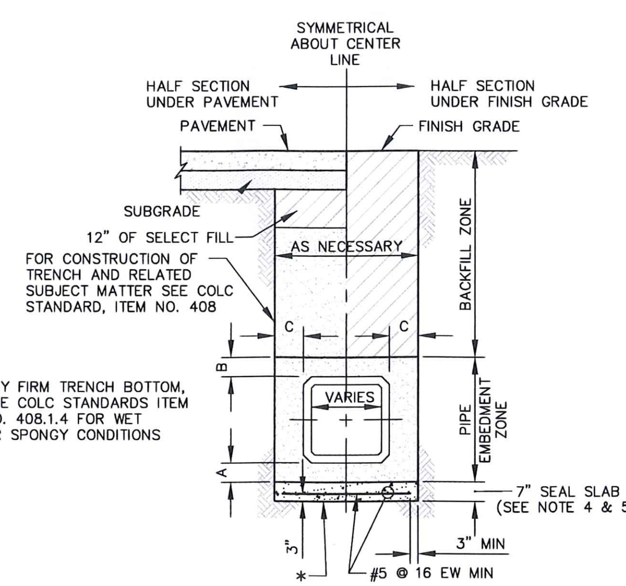
CRUSHED STONE DIM

PIPE SIZE	DEPTH
3'x2' TO 6'x6'	12"
> 6'X6'	18"

BOX CULVERT BEDDING AND BACKFILL FOR WET STABLE TRENCH

NTS

*DRY FIRM TRENCH BOTTOM, SEE COLC STANDARDS ITEM NO. 408.1.4 FOR WET OR SPONGY CONDITIONS



BOX CULVERT BEDDING AND BACKFILL WITH SEAL SLAB

NTS 4-2012

DIMENSIONAL REQUIREMENTS

PIPE SIZE	A	B	C
3'x2' AND LARGER	6"	6"	12"

MATERIAL REQUIREMENTS

BACKFILL ZONE

1. IN PAVED AREAS, USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY, TO WITHIN 12" OF SUBGRADE.

2. IN UNPAVED AREAS, USE SOIL EXCAVATED FROM TRENCH, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

PIPE EMBEDMENT ZONE

1. USE CEMENT STABILIZED SAND, PLACE IN 6" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

2. 2' WIDE FILTER FABRIC PLACED AT EACH JOINT ALL AROUND WITH 1' OVERLAP. FABRIC TO BE ARMCO TREVIRA S1115 OR APPROVED EQUAL.

NOTES:

1. ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT EDGE OR CITY STREET SHALL REQUIRE 1-1/2 SACK CEMENT STABILIZED BACKFILL UP TO ROAD BASE. COMPACTED IN 8" LIFTS WITH VIBRATORY PLATE.

2. WHERE MULTIBLE BOX SEWERS ARE USED IN THE SAME TRENCH, MIN OUTSIDE TO OUTSIDE BOX SEWER SEPERATION SHALL BE 6".

3. ALTERNATE TRENCH BOTTOM TREATMENT MAY BE USED AS APPROVED BY THE CITY ENGINEER AND AS PAID FOR IN THE PROPOSAL.

4. CONCRETE IN SLAB TO REACH MIN COMPRESSIVE STRENGTH OF 1000 PSI BASED ON MAX DESIGN BEFORE PIPE IS LAID.

5. PRECAST SEAL SLAB MAY BE USED AS APPROVED BY CITY ENGINEER.

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

MISCELLANEOUS DETAILS

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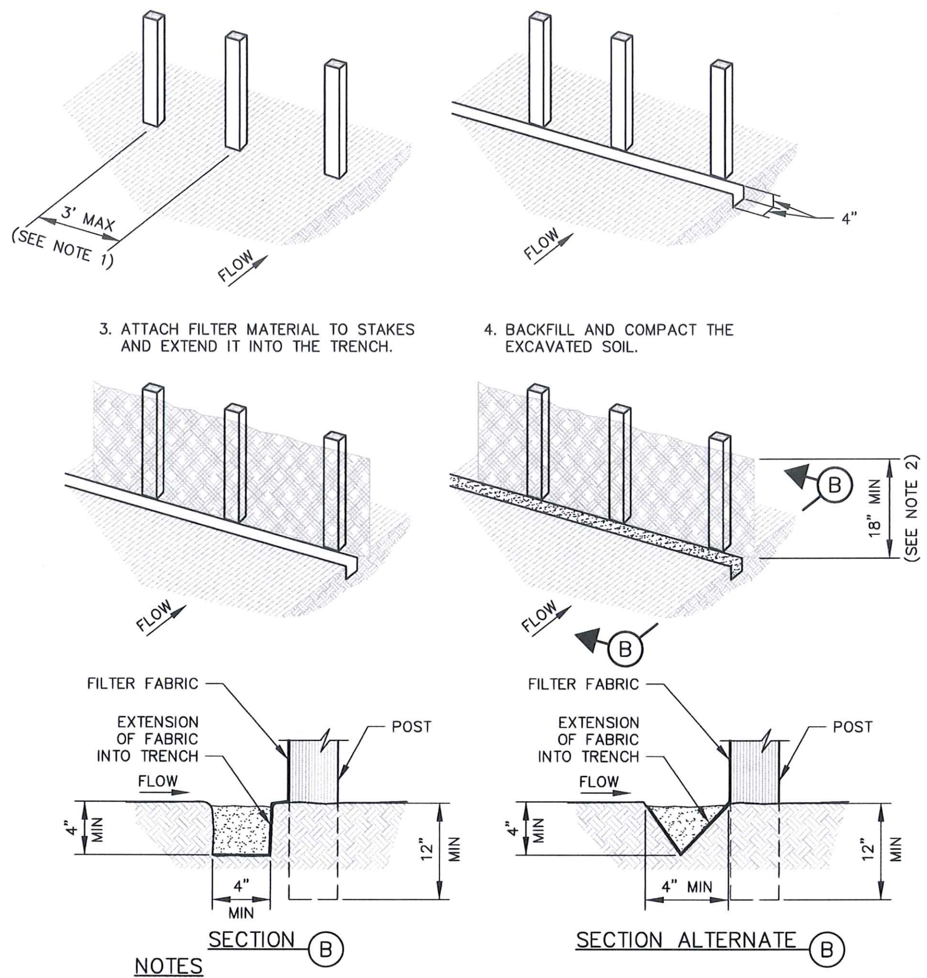
FRN - F-1386

DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 6 Of 10

04/05/18

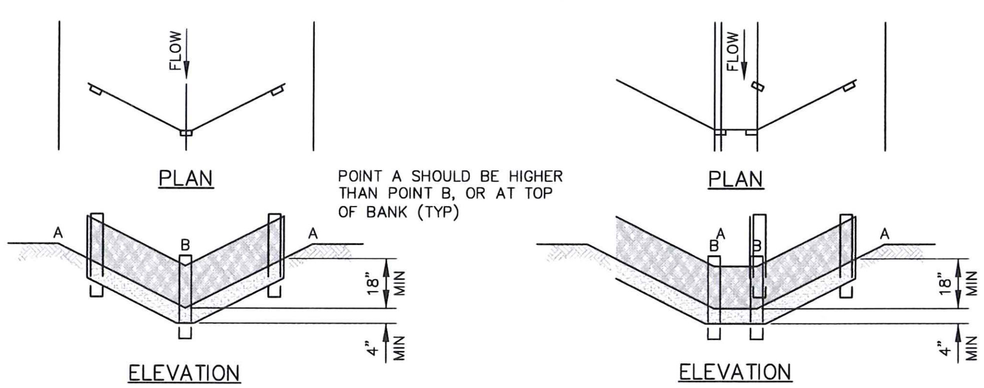


NOTES

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PRE ASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODED STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS AND FOLDED.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS AND FOLDED.

—(FF)— SYMBOL

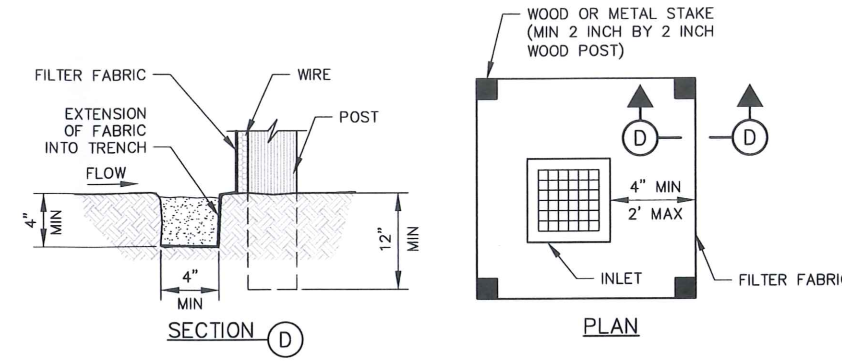
FILTER FABRIC FENCE
NTS



POINT A SHOULD BE HIGHER THAN POINT B, OR AT TOP OF BANK (TYP)

"V-DITCH" SECTION
NTS

TRAPEZOIDAL SECTION
NTS



IPB
SYMBOL

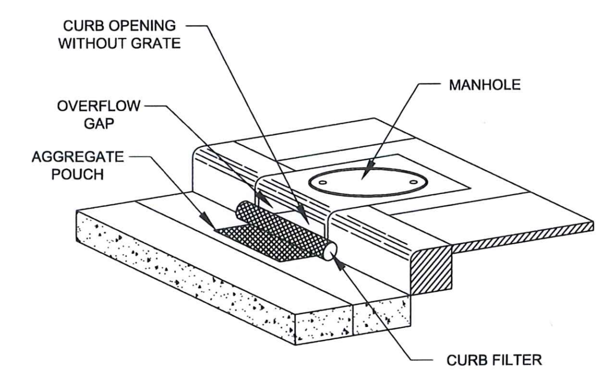
NOTE
SEE CONSTRUCTION NOTES FOR REINFORCED FILTER FABRIC BARRIER

SILT FENCE DROP INLET PROTECTION BARRIER
NTS

CONTRACTOR NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DEVELOPING, IMPLEMENTING AND ADHERING TO THE CONTRACTOR DEVELOPED STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
2. CONTRACTOR SHALL PREPARE ALL NOTICE OF INTENT FORMS FOR THE WORK AND OBTAIN THE NECESSARY CERTIFICATES AND SIGNATURES FROM THE OWNER, APPLICABLE SUBCONTRACTORS AND OTHERS AS REQUIRED.

4-2012



NOTES:
1. REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM THE VICINITY OF THE UNIT AFTER EACH STORM EVENT.
2. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE UNIT. IF UNIT IS MORE THAN 1/3 FULL OF ACCUMULATED SEDIMENT, THE UNIT MUST BE EMPTIED.
3. EMPTY THE UNIT IN A LOCATION WHERE IT WILL NOT ENTER THE STORM SEWER SYSTEM.
4. INLET PROTECTION SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

TYPICAL DETAIL OF CURB INLET SEDIMENT CONTROL DEVICE WITH CURB FILTER

Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

STORM WATER POLLUTION PREVENTION DETAILS

LJA Engineering, Inc.
11821 East Freeway
Suite 400
Houston, Texas 77029
Phone 713.450.1300
Fax 713.450.1385
FRN - F-1386

DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: 1" = 20'
APPROVED:	SHEET No. 7 Of 10

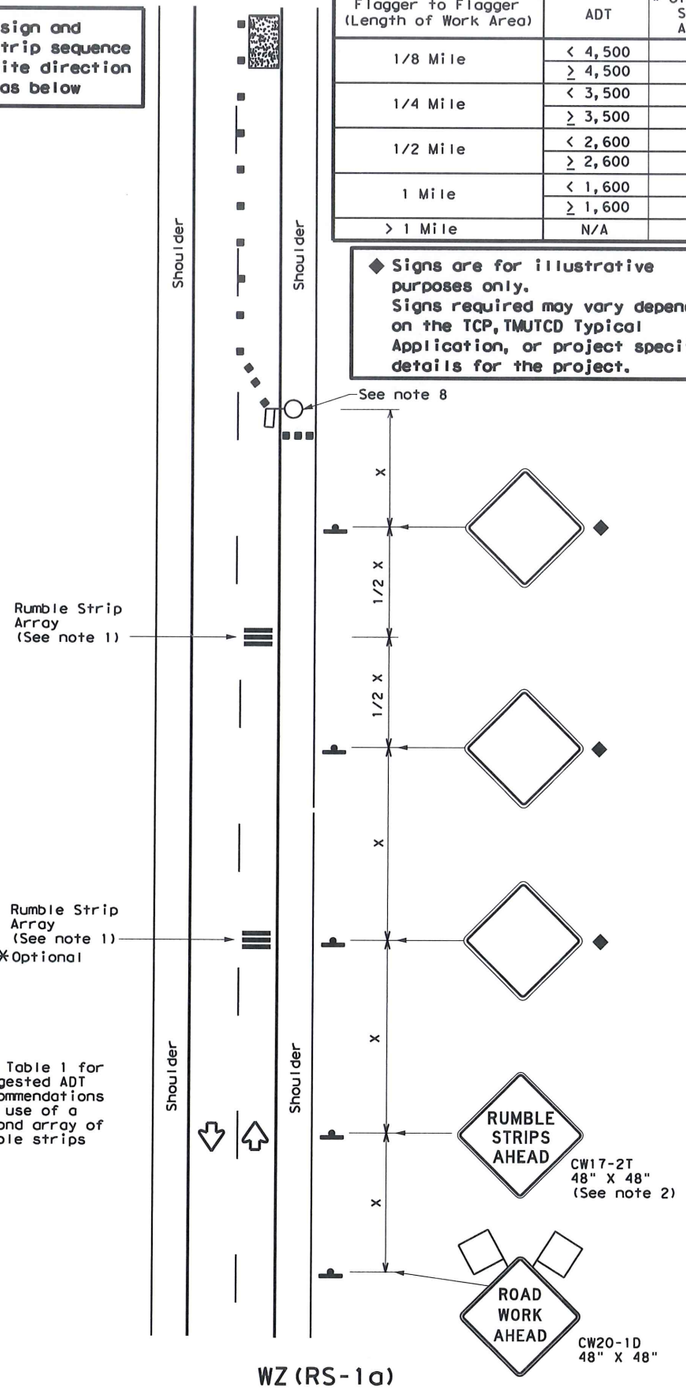
10/30/15

DATE:
FILE:

Warning sign and rumble strip sequence in opposite direction is same as below

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2

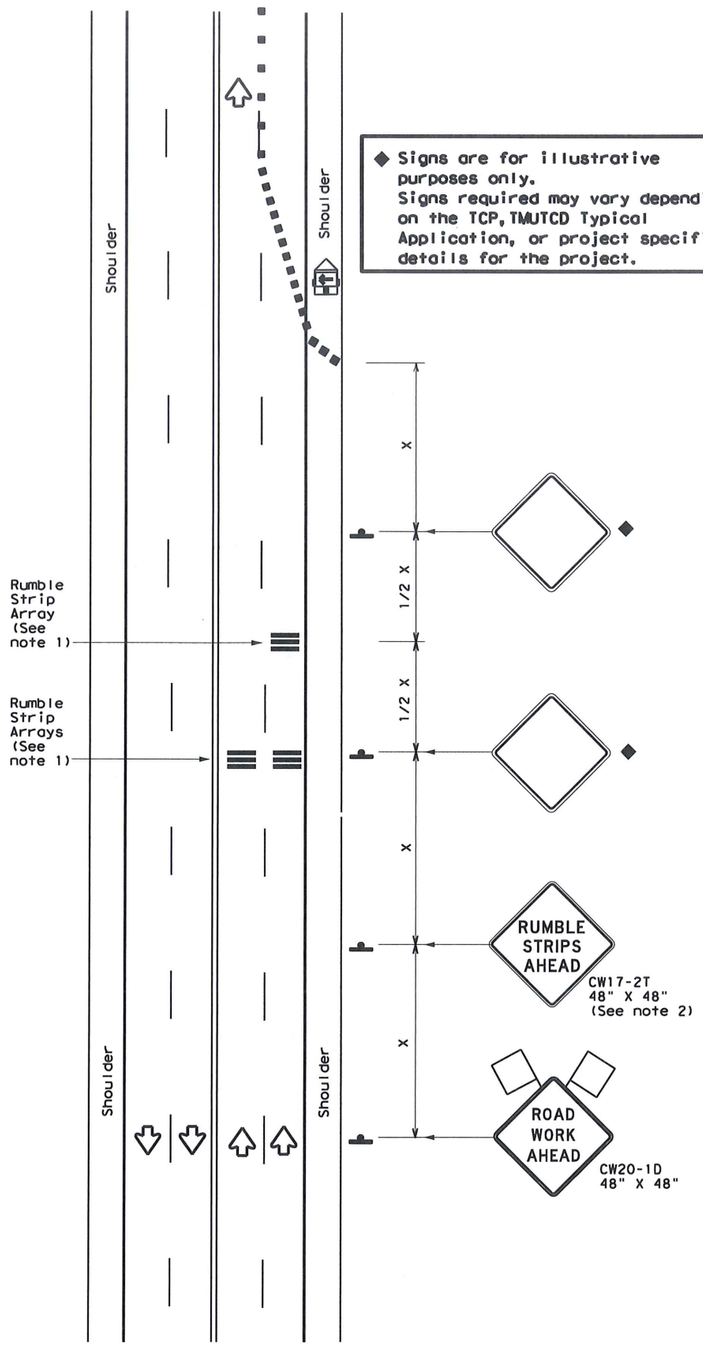
◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced at approximately 5' center to center, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

Texas Department of Transportation | Traffic Operations Division Standard

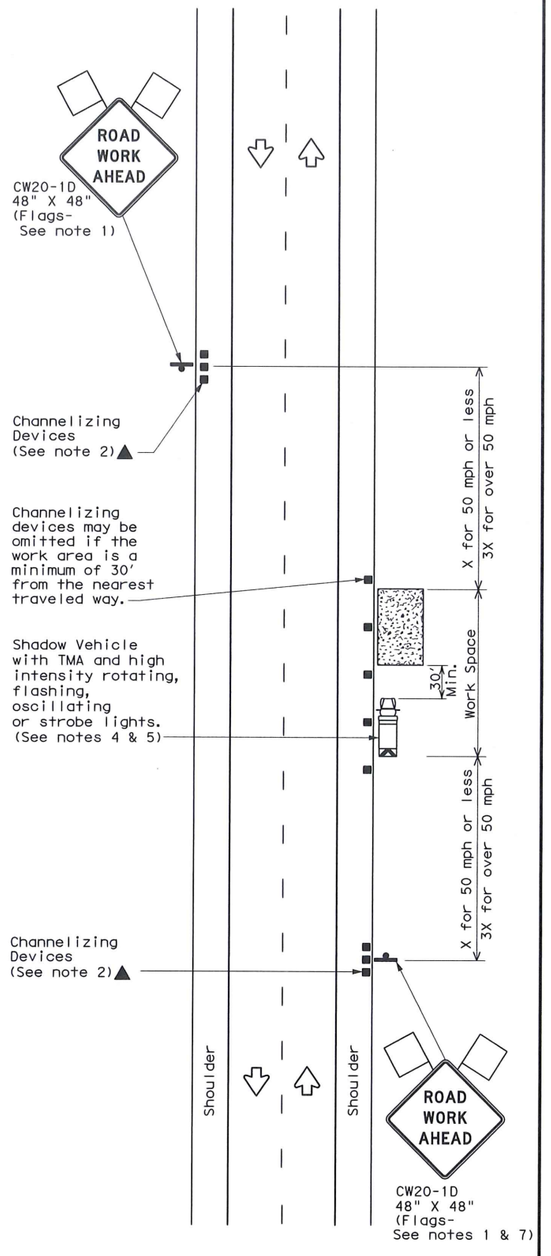
TEMPORARY RUMBLE STRIPS

WZ(RS)-14

FILE: wzrs14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14	DIST	COUNTY		SHEET NO. 8 OF 10

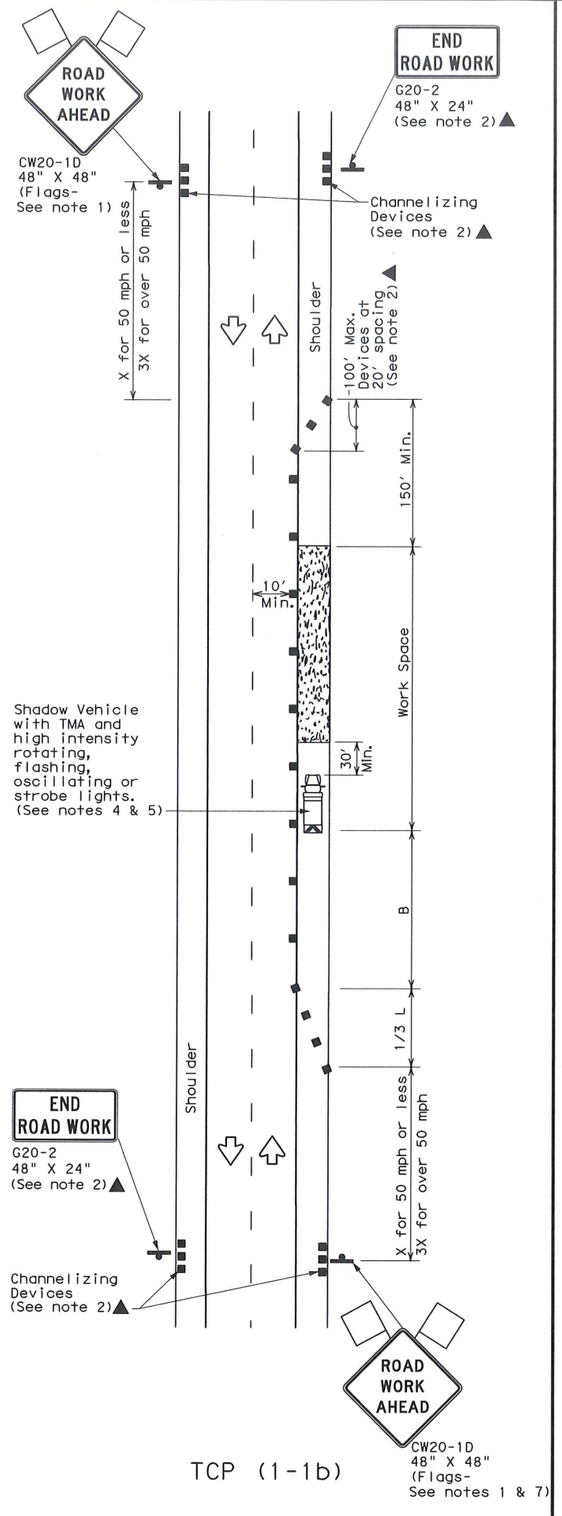
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



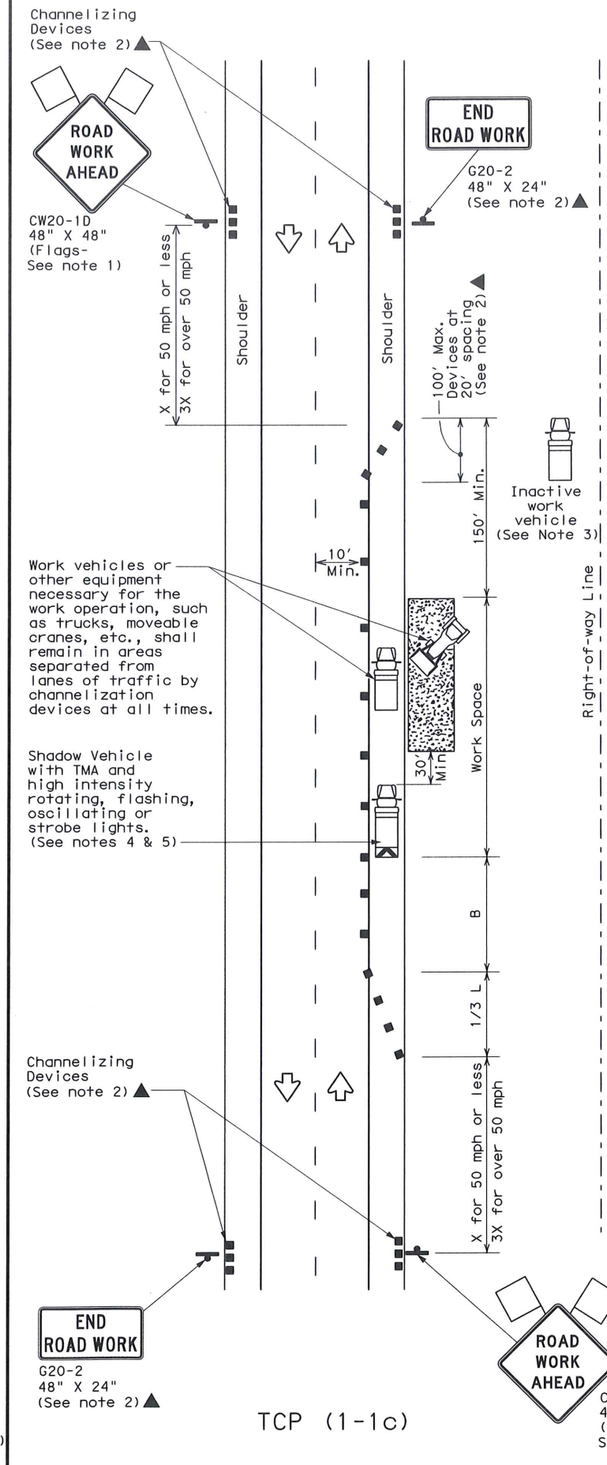
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
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55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
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70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

STATE OF TEXAS
WALLACE E. TROCHESSET
93421
LICENSED
PROFESSIONAL ENGINEER

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			9 OF 10

REVISIONS
2-94 1-12
8-95
1-97
4-98

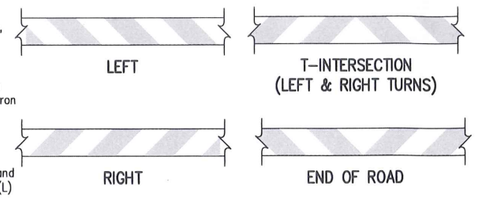
STRIPING FOR BARRICADE

For all types of barricades with rails less than 3'-0" long. Stripes 4" wide shall be used. Identification markings may be shown only on back side of barricade rails.

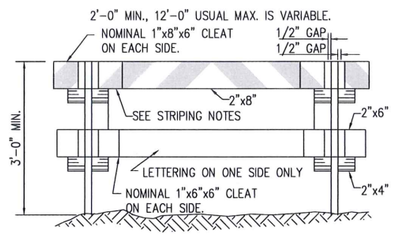
Striping should cover the full width of the rail striping of rails, panels, etc., should slope downward at an angle of 45 degrees in direction traffic is to pass.

Where a barricade extends entirely across a roadway, it is desirable that the stripes slope downward in the direction which traffic must turn in detouring. When both right and left turns are provided for, the chevron striping may slope downward in both directions from the center of the barricade.

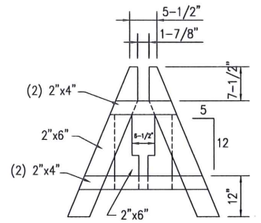
Barricades with stripes which begin at the upper right side and slope downward to the lower left side are to be designated as "Right" (R) Barricades. Barricades with stripes which begin at the upper left side and slope downward to the lower right side are to be designated as "Left" (L) Barricades.



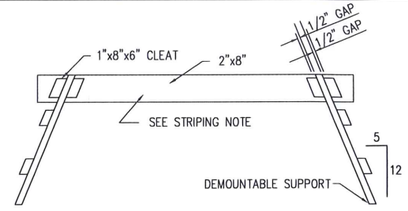
STRIPING DIRECTION DETAILS



STANDARD DETAIL

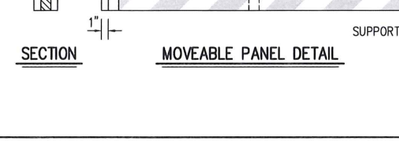


DEMOUNTABLE SUPPORT DETAIL



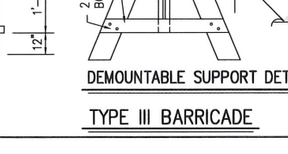
ALTERNATE DETAIL

TYPE I BARRICADE

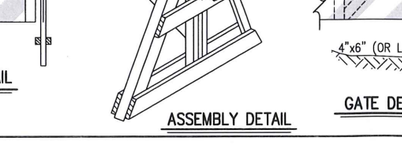


STANDARD DETAIL

* 3' MAX. WIDTH FOR "A" FRAME CONFIGURATION,
4' & LONGER USE DEMOUNTABLE SUPPORT SHOWN ABOVE.

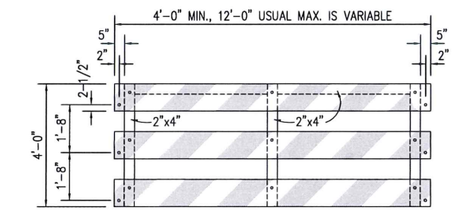


"A" FRAME SUPPORT DETAIL

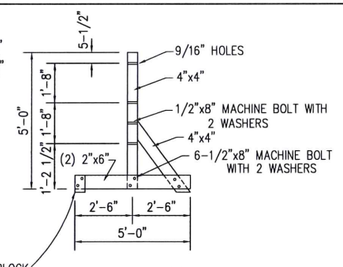


ALTERNATE DETAIL

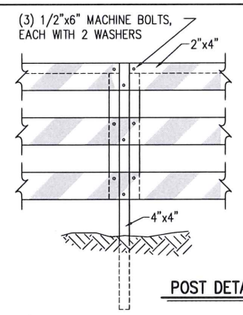
TYPE II BARRICADE



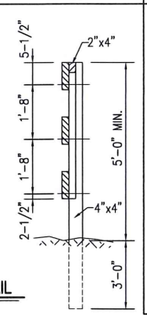
PANEL DETAIL

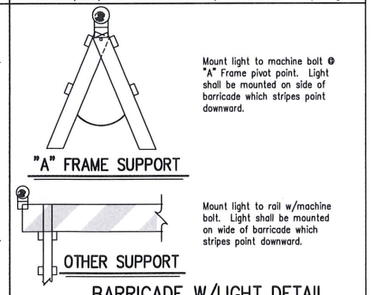


STAND DETAIL

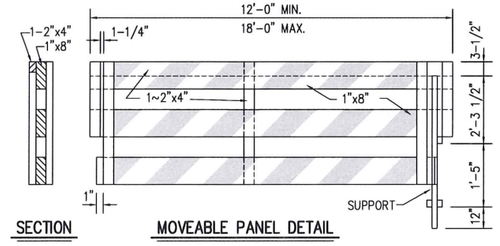


POST DETAIL



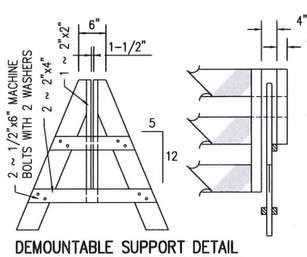


BARRICADE W/LIGHT DETAIL

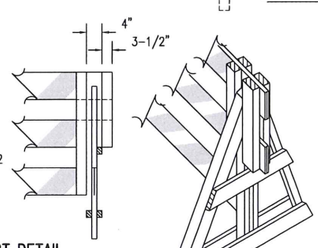


SECTION

MOVEABLE PANEL DETAIL

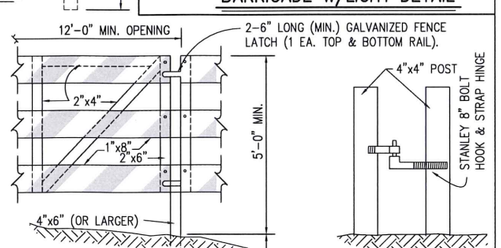


DEMOUNTABLE SUPPORT DETAIL



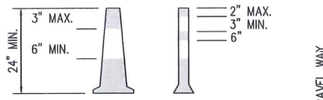
ASSEMBLY DETAIL

TYPE III BARRICADE



GATE DETAIL

GATE HINGE DETAIL

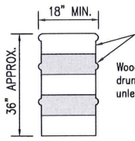


CONES

Traffic cones and tubular markers shall be a minimum of 24 inches in height with a broadened base and may be made of various materials to withstand impact without damage to themselves or to vehicles. Larger sizes should be used on freeways and other roadways where speeds are relatively high or wherever more conspicuous guidance is needed. Orange shall be the predominant color on cones and tubular markers. They should be kept clean and bright for maximum target value. For nighttime use they shall be reflectorized or equipped with lighting devices for maximum visibility. Reflectorized material shall have a smooth, sealed outer surface which will display the same approximate color day and night.

Reflectorization of tubular markers shall be a minimum of two three-inch bands placed a maximum of 2" from the top with a maximum of 6" between the bands. Reflectorization of cones shall be provided by a minimum 6" band placed a maximum of 3" from the top.

Cones or tubular markers are only suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels or barricades preferred for longer term usage. Care should be taken to insure that they remain in their proper location and in an upright position.

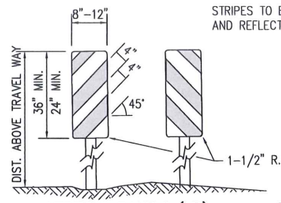


Wood or Metal panel required under metal drum when set on asphalt pavement unless otherwise directed by the Engineer.

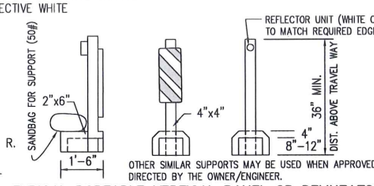
DRUMS

Drums, set on end, and used for traffic warning or channelization shall be approximately 35" in height and minimum of 18" in diameter. The contractor, at his option, may use drums made from steel barrels or black polyethylene plastic drum liners weighing approximately eight pounds each. The markings on drums shall be horizontal, circumferential, reflectorized orange and reflectorized white stripes, 4 to 8 inches wide. The first reflectorized stripe should start within two (2) inches of the top of the drum. There shall be at least two orange and two white stripes on each drum. If there are non-reflectorized spaces between the horizontal orange and white stripes, they shall be no more than 2 inches wide. Metal drums shall be painted black or orange before reflectorized stripes are added. All drums on a project will be the same color. When drums are placed in the roadway, appropriate warning signs should be used. During hours of darkness, a flashing warning light should be placed on drums used singly as a warning device. Steady burn electric lights of channelization should be placed on drums used in series for traffic channelization. Drums shall be weighted with sand.

CW1-8 CHEVRON signs, CW1-6A ARROW signs or VP-1 Vertical Panels mounted above drums may be used as supplements to drum delineation. (Vertical Panels w/ post shall be bolted to Barrel w/3-1/2"X8" machine bolts w/2 washers on 9" spacing.



VERTICAL PANELS (VP)



OTHER SIMILAR SUPPORTS MAY BE USED WHEN APPROVED OR DIRECTED BY THE OWNER/ENGINEER.

TYPICAL PORTABLE VERTICAL PANEL OR DELINEATOR

Vertical Panels are normally used as channelizing devices to indicate tangent or nearly tangent roadway alignment where good target value of a device is needed in daytime as well as the nighttime. In addition, vertical panels should be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive day and night delineation may be required. Vertical Panels should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes should allways slope downward toward the traveled way.

CHANNELIZING DEVICES

BARRICADE NOTES

The most recent edition of the TEXAS Manual on Uniform Traffic Control Devices (MUTCD), and its revisions, shall govern the construction and use of all items herein described.

Channelizing devices other than barricades should normally be used for channelization purposes.

Barricades should be placed perpendicular to the traffic flow. Other channelizing devices, such as drums, vertical panels or portable barriers, should be used where needed to separate traffic from the work area. In all cases, the barricades should be located to warn and direct traffic.

Barricades may be designed and constructed from wolmanized wood or any other suitable material in a manner approved by the Owner/Engineer. The barricade shown hereon are typical and are suggested details for wood support systems. The details of rail width and striping, number and spacing of rails, minimum length and height (above pavement) of rails must be adhered to, whether or not the alternate designs are used. (See Detail This Sheet).

Barricades are to be constructed in a first-class workmanship manner of clean sound material. All surfaces above ground, which are not striped, shall be white except unpainted galvanized metal or aluminum components. Components made of lumber shall be painted with a minimum of two coats of an approved brand of exterior white paint to secure thorough coverage and a uniform white color.

The reflectorized white and reflectorized orange (reflectorized red) stripes for barricades, drums, and vertical panels shall be constructed of "High intensity sheeting and shall be maintained to meet the appearance, color, and reflectivity requirements set by the MUTCD.

The Contractor shall maintain each barricade in a clean and good condition.

Barricades shall be removed upon completion of the work and/or the elimination of the hazard on any section.

Type I Barricades shall consist of a striped upper horizontal rail mounted on demountable supports at either end and fabricated in such manner that the rail or rails can be assembled or disassembled to or from the supports with ease. The standard Barricade design has a lower rail not required on the alternate design. A Type I Barricade is intended for use where the hazard is relatively small, for minor maintenance and repair work or for the continuous marking of a restricted roadway. Type I rails that are striped on both sides should be striped in opposite directions.

Type II Barricades shall consist of an upper an lower rail fastened to a support. The support should be of an "A" frame configuration, hinged or otherwise fastened at the top to permit convenient folding and stacking for transporting from one work site to another. Since portability is a prime consideration, the materials chosen for the barricades should be as light weight as possible and structurally sound. Sandbags should be used for ballast when required. A Type II Barricade is intended for use where the area is quite confined such as on city streets, or the continuous marking of a restricted roadway, or for temporary daytime use.

Type III Barricades should consist of three striped horizontal rails and assembled as a panel for mounting to posts or skids. Type III Barricades are typically permanent in nature and are required to function in one location for a relatively long time. When the Type III (Moveable) Barricades are constructed on bases or skids instead of posts set into the ground, it may be desirable to ballast the bases with sandbags to provide added resistance to overturning during periods of high winds.

An orange flag may be mounted on Type I, Type II and Type III Barricades for increased daytime emphasis. For night time use, it is desirable to add flashing warning light when barricades are used singly and a steady burn light when barricades are used in a series for channelization.

CONSTRUCTION OF BARRICADES

The barricades may be fixed or moveable, depending on the location and application.

Movable barricades are appropriate where the construction or maintenance operations are of short duration, and/or are progressively shifted along a roadway. The design of movable mounting must be such as to resist overturning by ordinary strong winds or by chance contact with vehicles. Fixed barricades are justified only for major construction or reconstruction.

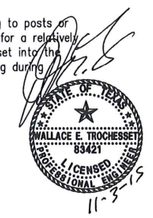
Movable Type III Barricades are generally of heavy construction with a heavy base.

BARRICADE CHARACTERISTICS

TYPE	I	II	III
WIDTH OF RAIL	8 IN. MIN. - 12 IN. MAX.	8 IN. MIN. - 12 IN. MAX.	8 IN. MIN. - 12 IN. MAX.
LENGTH OF RAIL	2 FT. MIN. - VARIABLE MAX.	2 FT. MIN. - VARIABLE MAX.	2 FT. MIN. - VARIABLE MAX.
WIDTH OF STRIPES *	6 IN.	6 IN.	6 IN.
HEIGHT	3 FT. MIN.	3 FT. MIN	3 FT. MIN.
NUMBER OF REFLECTORIZED RAIL FACES	2 (ONE EACH DIRECTION)	4 (TWO EACH DIRECTION)	3 (IF FACING TRAFFIC IN ONE DIRECTION) OR 6 (IF FACING TRAFFIC IN TWO DIRECTIONS)

FOR WOODEN BARRICADES, NOMINAL LUMBER DIMENSIONS WILL BE SATISFACTORY.

* FOR RAILS LESS THAN 3 FT. LONG, 4 IN. WIDE STRIPES MAY BE USED.



Revision	By	Chk.	Appr.	Date

GALVESTON COUNTY
W.C. & I.D. No. 12
EMERGENCY INTERCONNECT WITH LEAGUE CITY

STANDARD BARRICADE DETAILS

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DESIGN: J.C.F.	JOB No. E125-0920 Cont. No.
DRAWN: J.C.F.	DATE: FEBRUARY, 2016
CHECKED:	SCALE: N.T.S.
APPROVED:	SHEET No. 10 Of 10

H:\CAD\Projects\125\002\Design\125_002-10 STD BAR.dwn (YREF: 125_002 Border)

11/03/15