

LEAGUE CITY

EST. 1893

MEMORANDUM

To: Ron Bavarian, P.E.
Executive Director of Capital Projects

From: Marcos Garcia, P.E.
Senior Project Manager

Date: March 4, 2026

RE: Lucas Construction – WCD No. 2
DR2203 Historic District Drainage Improvements

During a public meeting, prior to bidding, a resident discussed with Gauge Engineering concerns regarding 3rd Street drainage. Gauge Engineering validated the residents' concern and prepared revised drainage plan drawings for 3rd Street. The work includes additional catch basins, rcp laterals, road demolition and replacement. Lucas construction has submitted a change order in the amount of \$70,335 for this work. With additions and deductions, the net amount is \$32,965.

Funding in the amount of \$32,965 is available from the construction contingency with expenses charged to DR2203-CONSTRUCT-CONSTRUCT-RE CASH.

DocuSigned by:

Kristin Clark

Kristin Clark, Grants/CIP Administrator

3/5/2026

Date

Signed by:

Cara Davis

Cara Davis, Assistant Director of Project Management

3/6/2026

Date

Signed by:

Ron Bavarian

Ron Bavarian, P.E., Executive Director of Capital Projects

3/9/2026

Date

WORK CHANGE DIRECTIVE (WCD) NO. 2

PROJECT: DR2203 Historic District Drainage Improvements

OWNER: City of League City

ENGINEER: Gauge Engineering

CONTRACTOR: Lucas Construction

You are directed to make the following changes in the Contract:

DESCRIPTION AND REASON FOR THIS WCD:

- During a public meeting, prior to bidding, a resident discussed with Gauge Engineering concerns regarding 3rd Street drainage. Gauge Engineering validated the residents' concern and prepared revised drainage plan drawings for 3rd Street. Lucas construction has submitted a change order in the amount of \$70,335 for this work. With additions and deductions, the net amount is, \$32,965.

Council approved a work change directive budget of \$176,823 with Data Sheet dated March 11, 2025, item No. 25-0102.

DESCRIBE CONTRACT PRICE (INCREASE/DECREASE) CHANGE FOR THIS WCD:

DESCRIPTION OF CHANGES		AMOUNT	CONTRACT CHANGE	
		<u>AMOUNT</u>	<u>TIME</u>	
BID ITEM 6	Delete 49 SY - Plane Asphalt Paving	(\$245.00)		
BID ITEM 8	Add 49 SY - Remove Stab Base and Asphalt Pavement	\$1,078.00		
BID ITEM 18	Add 49 SY - Lime Treatment 6"	\$980.00		
BID ITEM 19	Add 0.72 Tons - Hydrated Lime 6%	\$252.00		
BID ITEM 20	Add 5 Tons - Dense Graded.....	\$850.00		
BID ITEM 21	Delete 4 Tons - Dense Graded HMA	(\$680.00)		
BID ITEM 24	Add 22 Tons - Type B Asphalt 8"	\$3,520.00		
BID ITEM 37	Add 3 EA - Catch Basin	\$10,500.00		
BID ITEM 48	Add 106 LF - RCP 24"	\$19,610.00		
BID ITEM 60	Add 3 CY - 4" Concrete RipRap	\$4,500.00		
BID ITEM 75	Add 63 LF - 8" Dia Waterline	\$11,970.00		
BID ITEM 76	Add 6 EA - 8" Dia Wet Connection	\$18,000.00		
BID ITEM 89	Delete 0.7474 - Allowance Approved by LC	(\$37,370.00)		
TIME	Add 21 Calendar Days	\$0.00	21	Days
NET TOTAL:		<u>\$32,965.00</u>	<u>21</u>	<u>Days</u>

ATTACHMENTS: Lucas Construction Change Order Proposal

CHANGES IN CONTRACT PRICE

ORIGINAL CONTRACT PRICE:	\$1,768,234.00
NET CHANGES FROM PREVIOUS WCDS:	\$0.00
CHANGE BY THIS WCD:	\$32,965.00
CONTRACT PRICE WITH ALL APPROVED WCDS:	\$1,801,199.00

CHANGES OR EXTENSIONS IN CONTRACT TIME

ORIGINAL CONTRACT TIME:	240 Calendar Days
INCREASED TIME FROM PREVIOUS WCDS:	22 Calendar Days
INCREASED TIME FROM THIS WCD:	21 Calendar Days
REVISED CONTRACT TIME:	283 Calendar Days

SUBMITTED BY:

Marcos Garcia
AF24ED783FF94A4
 Marcos Garcia, Senior Project Manager

DATE: 3/6/2026

[Signature]
DocuSigned by:
 Jimmy McGinnis, Vice President Construction

DATE: 3/5/2026

RECOMMENDED BY:

Derek St. John
DocuSigned by:
 Derek St. John, Garage Engineering

DATE: 3/5/2026

APPROVED BY:

Ron Bavarian
Signed by:
 Ron Bavarian, Executive Director of Capital Projects

DATE: 3/9/2026

John Baumgartner
Signed by:
 John Baumgartner, City Manager

DATE: 3/9/2026



August 18, 2025
Gauge Engineering
11750 Katy Fwy Suite 400
Houston, TX 77079
ATTN: Haidar Baidani
RE: League City Historic District Drainage CPR #2 – Drainage Revisions on 3rd Street

Mr. Baidani,

In response to the additional work requested in your email dated 7/31/2025, Lucas Construction Company, Inc. proposes to provide labor, materials, equipment, layout, supervision, and insurance to accomplish the additional work shown in the revised drawings for the following amounts:

Bid item 6 - Delete 49 SY	(\$245.00)
Bid item 8 - Add 49 SY	\$1,078.00)
Bid item 18 - Add 49 SY	\$980.00
Bid item 19 - Add .72 TONS	\$252.00
Bid item 20 - Add 5 TONS	\$850.00
Bid item 21 - Delete 4 TONS	(\$680.00)
Bid item 24 – Add 22 TONS	\$3,520.00
Bid item 37 – Add 3 EA	\$10,500.00
Bid item 48 – Add 106 LF	\$19,610.00
Bid item 60 – Add 3 CY	\$4,500.00
Bid item 75 – Add 63 LF	\$11,970.00
Bid item 76 – Add 6 EA	<u>\$18,000.00</u>

Change in Current Contract Amount = \$70,335.00

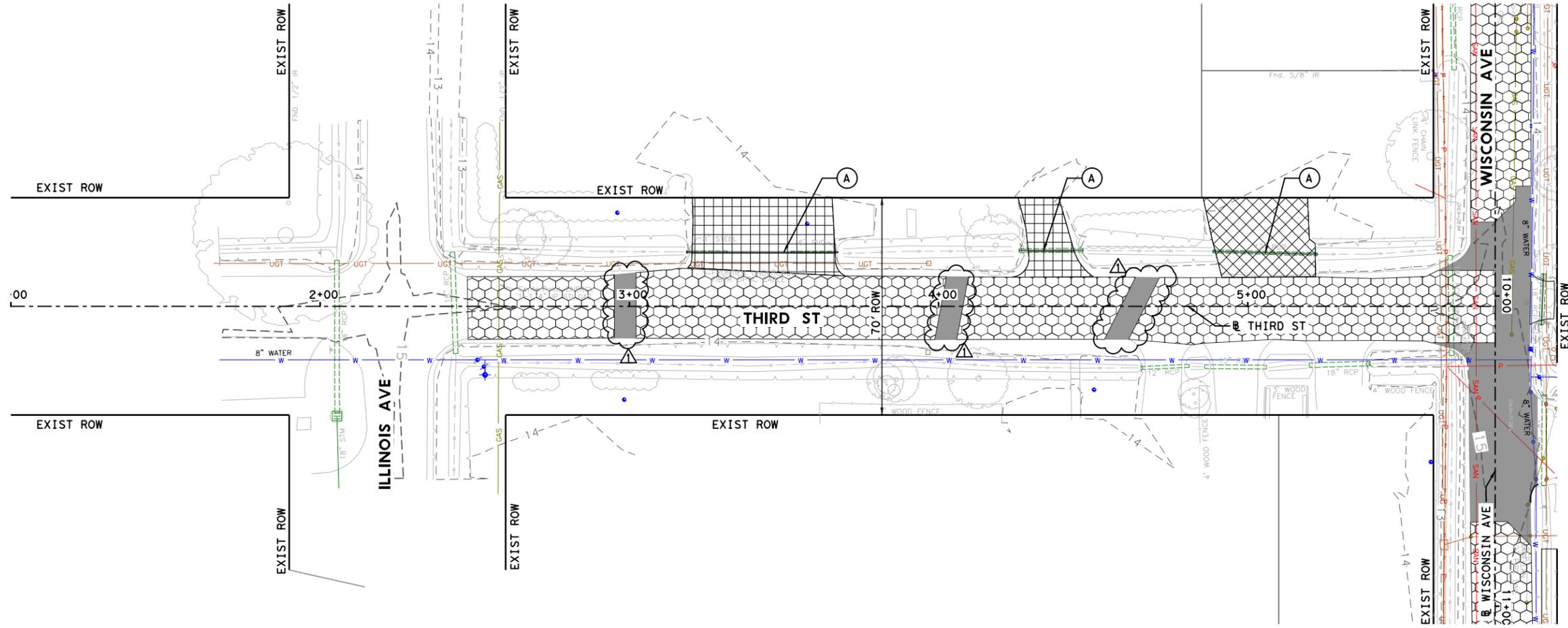
Additional days requested: 21 calendar days

Exclusions: Engineering, permitting, materials testing, well-pointing, and any utility adjustments/relocations that may be necessary. Please feel free to call me at 281-316-9990 with any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Jimmy McGinnis", is written over a faint, circular watermark or stamp.

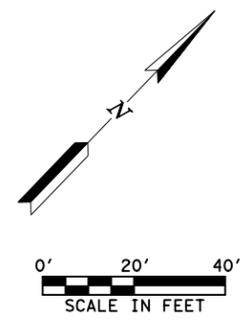
Jimmy McGinnis
Vice President
Lucas Construction



LEGEND

- MILL EXIST ASPHALT
- REMOVE ASPH PAV & BASE
- REMOVE ASPH DRWY
- REMOVE CONC PAV
- REMOVE CONC DRWY
- (A) REMOVE PIPE (RCP, PVC OR RCB)
- (B) REMOVE STRUCTURE
- (C) REMOVE FENCE
- (D) ADJUST TO GRADE
- EL- MAJOR CONTOUR
- EL- MINOR CONTOUR

- NOTES:**
- REFER TO ROADWAY PLAN SHEETS FOR ADDITIONAL INFORMATION.
 - REFER TO WATER & SANITARY SEWER PLAN & PROFILE SHEETS FOR ADDITIONAL INFORMATION.
 - CONTOUR SOURCE: TOPOGRAPHIC SURVEY



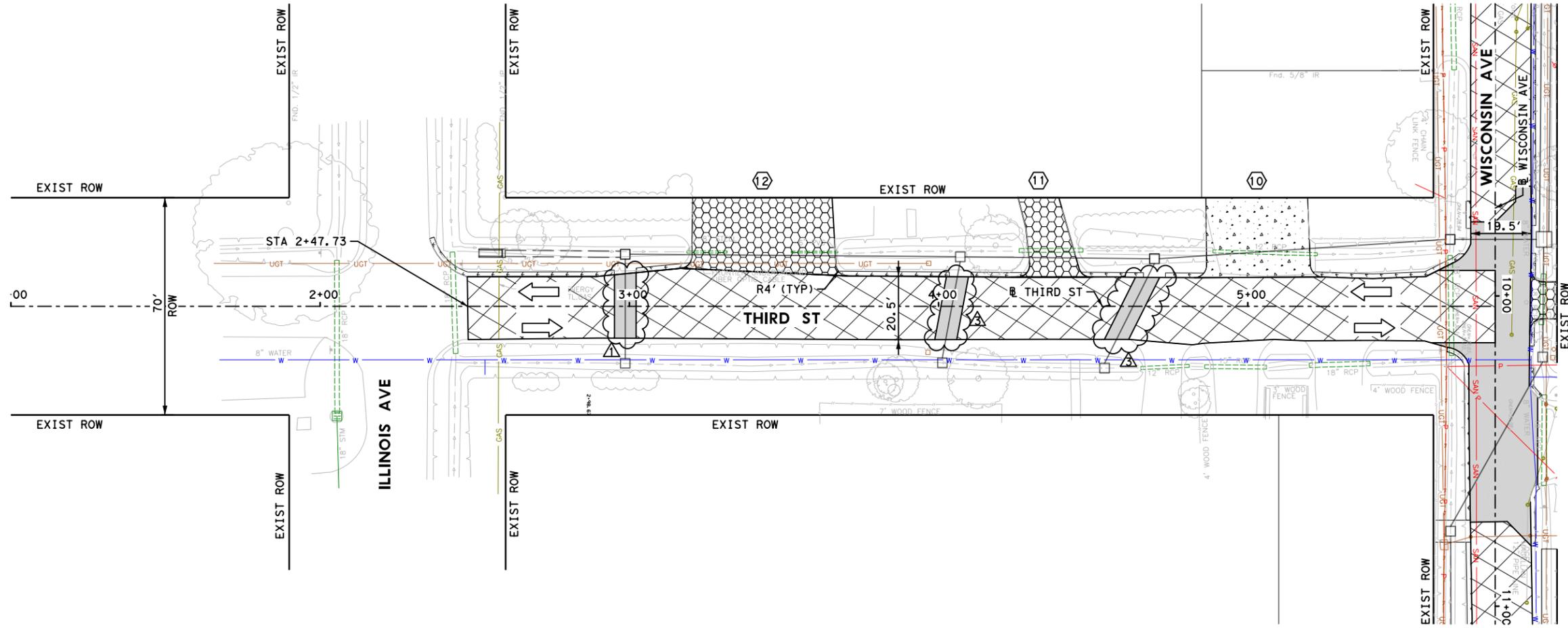
Gauge ENGINEERING
 TEXAS PE FIRM REG. # F-20017
 11750 KATY FREEWAY, #400
 HOUSTON, TX 77079

STATE OF TEXAS
 DAVID G. GREANEY
 125563
 LICENSED PROFESSIONAL ENGINEER
 Gauge Engineering, LLC
 Texas Registered Engineering Firm F-20017
 7/31/2025

CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
THIRD STREET DEMOLITION PLAN

PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY
DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
MARCOS GARCIA	
SHEET NO. 27 OF 134	

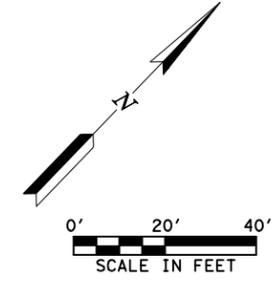
1	07/30/2025	DEMO LIMITS ADJUSTMENTS	DG
			APP.
		REVISIONS	
No.	DATE		



LEGEND

- EXIST LANE
- PROP ASPHALT PVMT
- PROP 1.5" HMAC
- PROP CONC PVMT/ DRWY
- PROP ASPHALT DRIVEWAY
- PROP SIDEWALK/TRAIL
- PROP SODDING
- PROP DRIVEWAY No.

- NOTES:**
- ENCROACHMENT TO BE REMOVED AND DISPOSED OR GIVEN TO HOMEOWNER. CONTRACTOR TO COORDINATE.
 - REMOVE AND REINSTALL MAILBOXES DURING CONSTRUCTION AS NEEDED. MAINTAIN ACCESS TO MAILBOXES AT ALL TIMES. CONTRACTOR TO COORDINATE WITH PROPERTY OWNER PRIOR TO REMOVING.
 - SEE LIMITS OF PAVEMENT RESTORATION FOR STORM INSTALLATION AND WATERLINE RELOCATIONS. CONTRACTOR TO MINIMIZE THE LIMITS OF PAVEMENT RESTORATION WHERE POSSIBLE.
 - ELEVATION OF RESTORED/REHABILITATED PAVEMENT TO MATCH EXISTING PAVEMENT ELEVATION. CONTRACTOR TO SURVEY EXISTING PAVEMENT CENTERLINE IF NECESSARY. NO SEPARATE PAY.



Gauge ENGINEERING
 TEXAS PE FIRM REG. # F-20017
 11750 KATY FREEWAY, #400
 HOUSTON, TX 77079

STATE OF TEXAS
 DAVID G. GREANEY
 125563
 LICENSED PROFESSIONAL ENGINEER

SURVEYED BY:
 LANDECH, INC.

Gauge Engineering, LLC
 Texas Registered Engineering Firm F-20017
 7/31/2025

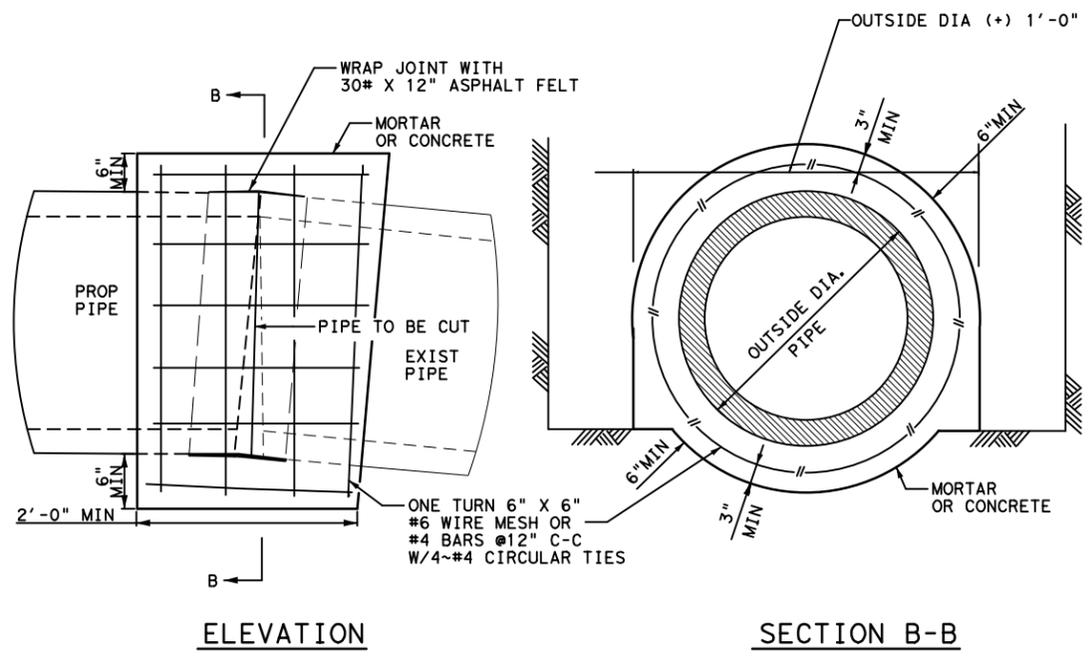
CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
THIRD STREET ROADWAY PLAN

PROJECT NUMBER	DR 2203
DRAWING SCALE	AS NOTED
CITY OF LEAGUE CITY PM	MARCOS GARCIA
SHEET NO.	33 OF 134

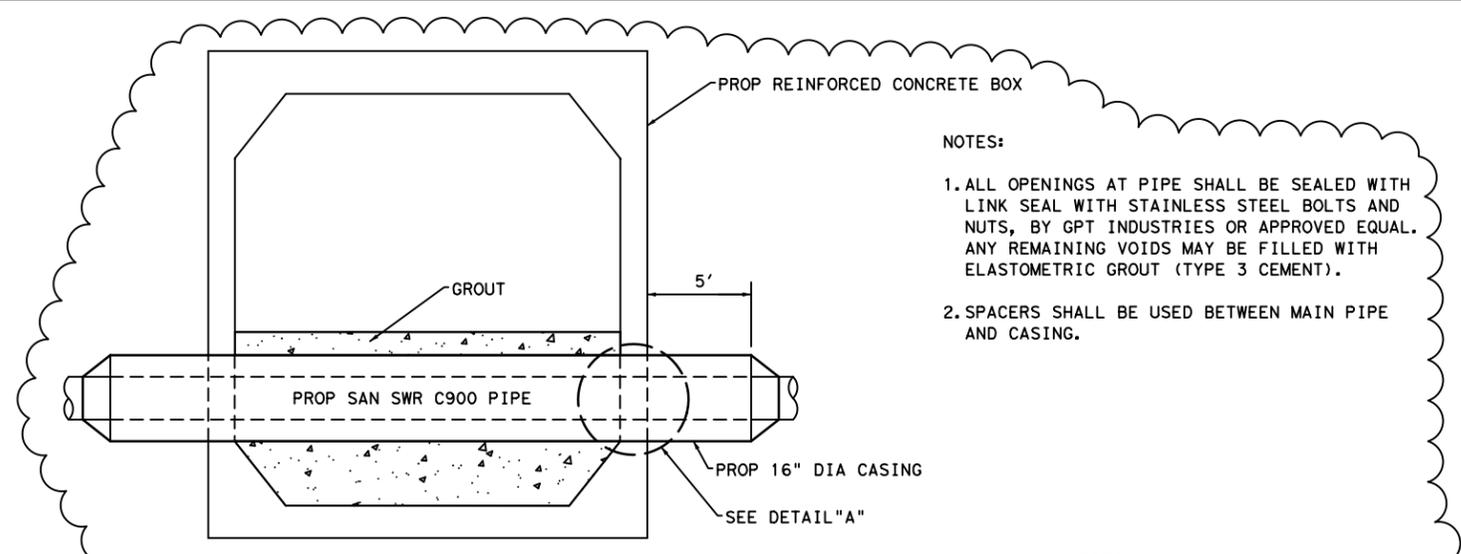
SHEET 1 OF 1
 FOR CITY OF LEAGUE CITY USE ONLY

No.	DATE	REVISIONS
1	07/30/2025	CONSTRUCTION LIMITS ADJUSTMENTS

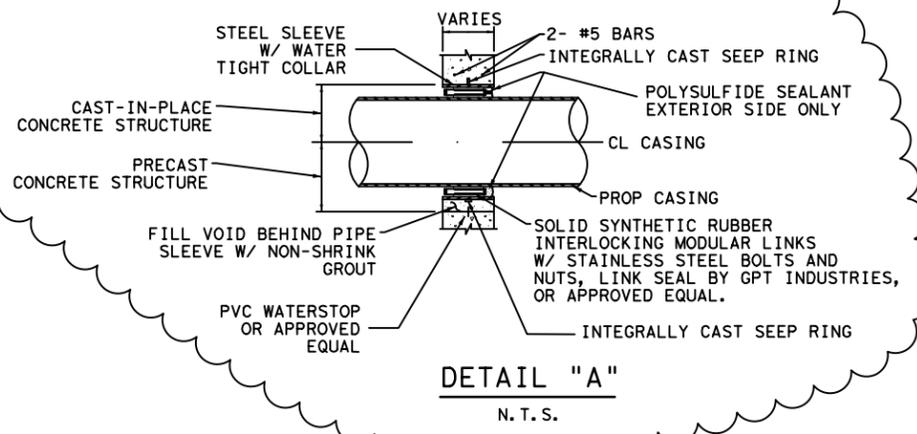
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PIPE COLLAR DETAIL
FOR HORIZONTAL OR VERTICAL PLACEMENT
N. T. S.

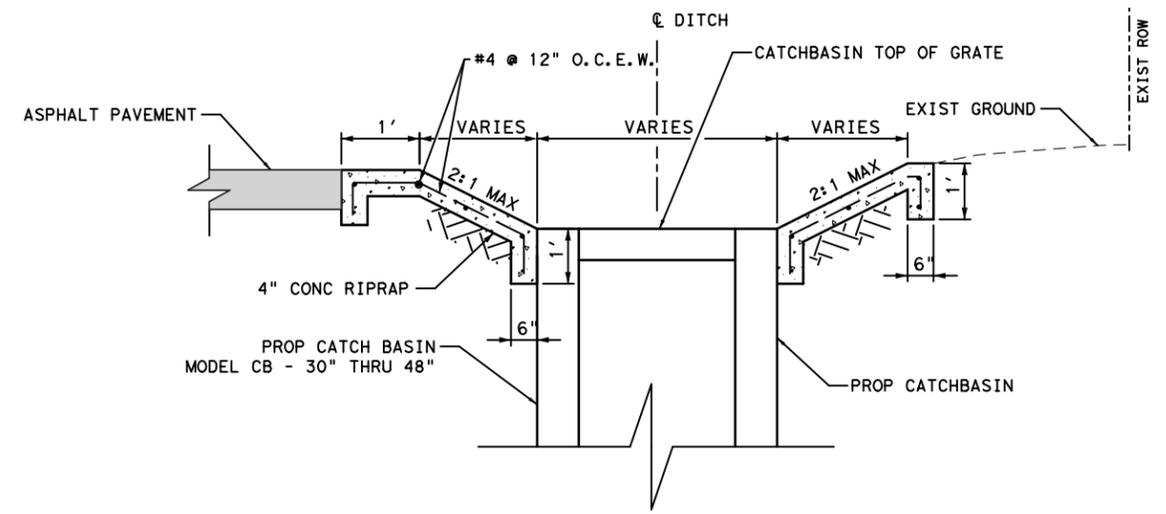


WALL PENETRATION DETAILS
N. T. S.

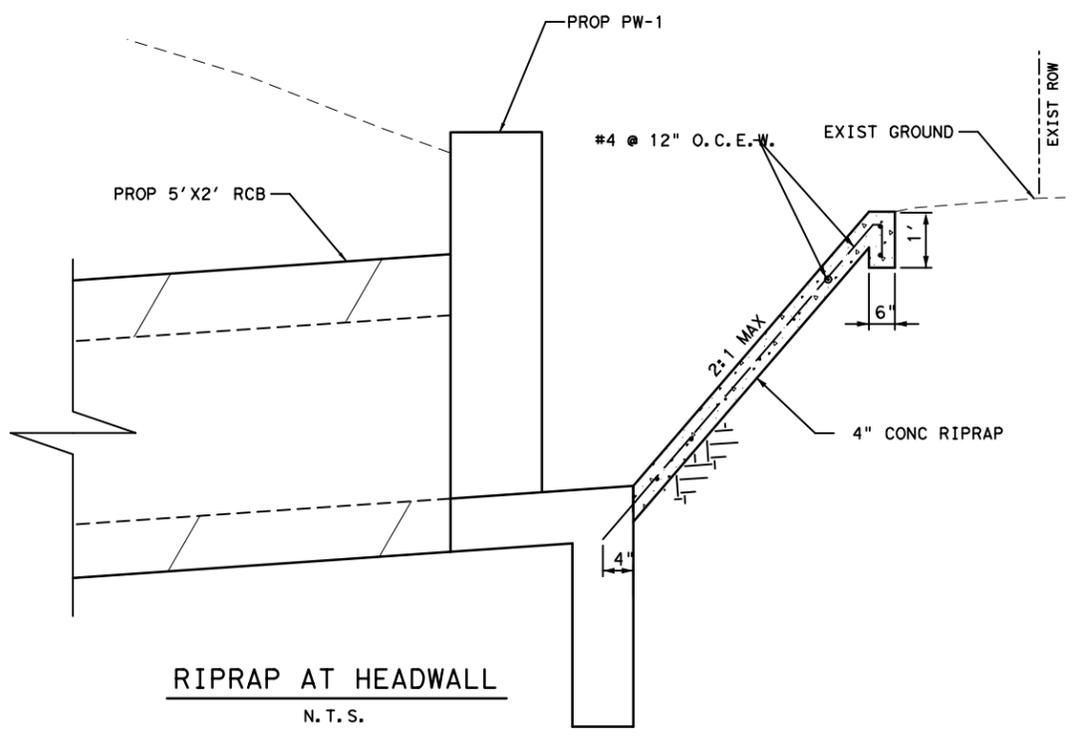


DETAIL "A"
N. T. S.

- NOTES:
1. ALL OPENINGS AT PIPE SHALL BE SEALED WITH LINK SEAL WITH STAINLESS STEEL BOLTS AND NUTS, BY GPT INDUSTRIES OR APPROVED EQUAL. ANY REMAINING VOIDS MAY BE FILLED WITH ELASTOMETRIC GROUT (TYPE 3 CEMENT).
 2. SPACERS SHALL BE USED BETWEEN MAIN PIPE AND CASING.



RIPRAP AROUND CATCHBASIN
N. T. S.



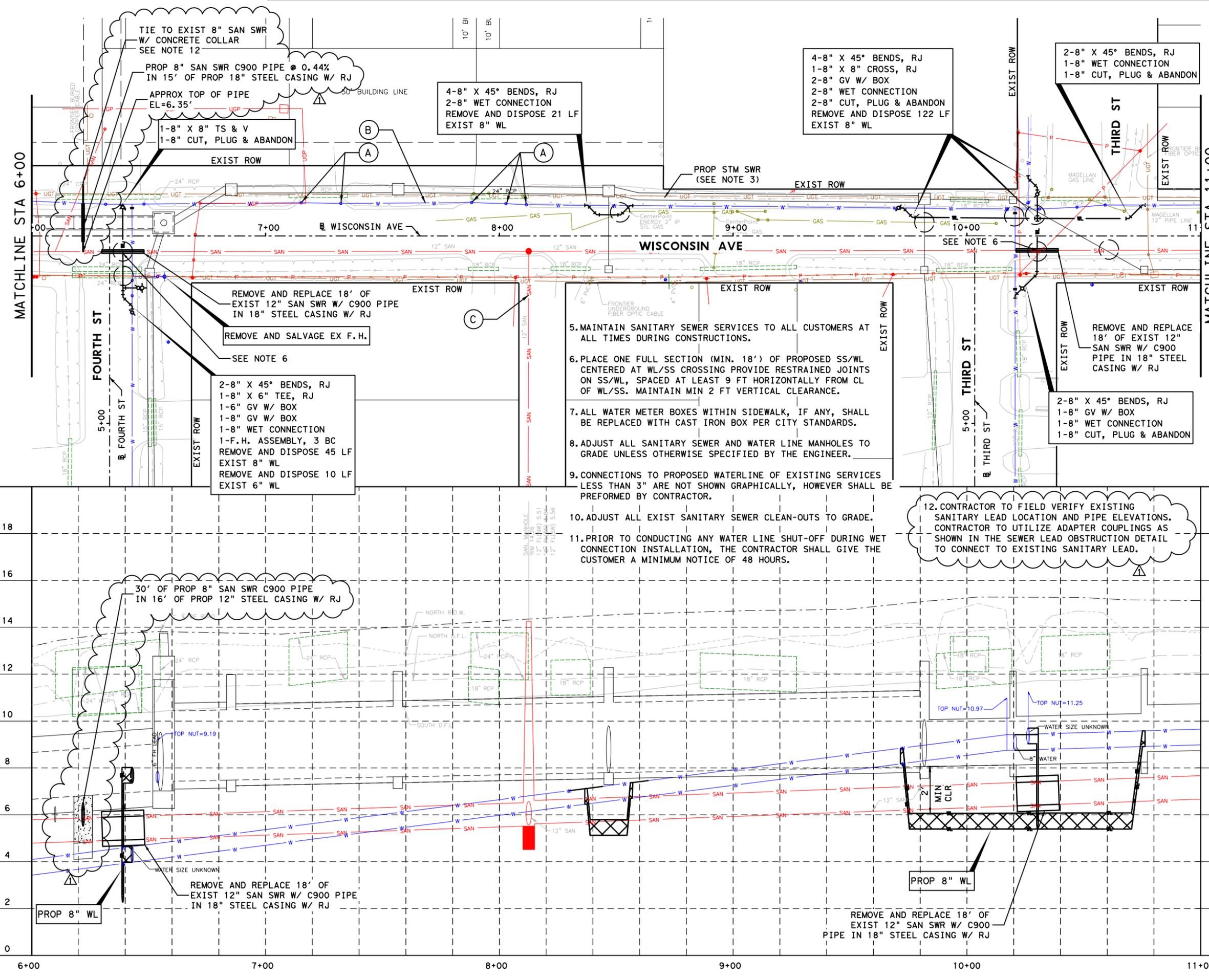
RIPRAP AT HEADWALL
N. T. S.

<p>Gauge ENGINEERING TEXAS PE FIRM REG. # F-20017 11750 KATY FREEWAY, #400 HOUSTON, TX 77079</p>		<p>DAVID G. GREANEY 125563 LICENSED PROFESSIONAL ENGINEER</p>
SURVEYED BY: LANDTECH, INC.		Gauge Engineering, LLC Texas Registered Engineering Firm F-20017 7/31/2025
CITY OF LEAGUE CITY HISTORIC DISTRICT DRAINAGE IMPROVEMENTS MISCELLANEOUS DRAINAGE DETAILS		
SHEET 1 OF 1		
PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY	
DR 2203		
DRAWING SCALE		
AS NOTED		
CITY OF LEAGUE CITY PM		
MARCOS GARCIA		
SHEET NO. 60 OF 134		

1	107/30/2025	ADDED WALL PEN DETAILS	DG
No.	DATE	DATE	APP.

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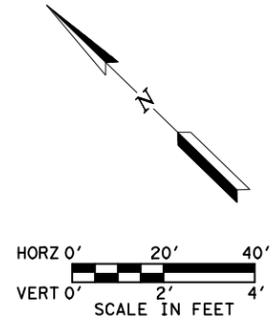


LEGEND:

- SAN — PROPOSED SAN SWR
- WL — PROPOSED WATER LINE
- SAN — EXIST SAN SWR LEADS
- WL — EXIST WATER LINE
- ▨ D.I.P. W RESTRAINED JOINTS
- CRITICAL LOCATION
- (A) ADJUST TO GRADE
- (B) EXIST WATER LINE TO REMAIN
- (C) EXIST SAN SWR TO REMAIN

NOTES:

1. MAINTAIN WATER SERVICES TO ALL CUSTOMER, FIRE HYDRANTS, AND INTERCONNECTIONS AT ALL TIME PROVIDE TEMPORARY CONNECTION AS NECESSARY FOR CONSTRUCTIONS. NO SEPARATE PAY.
2. SANITARY SEWER LEADS ARE SHOWN AT APPROXIMATE LOCATION. CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION, NO SEPARATE PAY.
3. REFER TO STM SWR SHEETS FOR MORE INFORMATION.
4. ALL CONNECTIONS TO EXISTING WATER LINES TO BE MADE WITHIN ROW LIMITS.



Gauge ENGINEERING
 TEXAS PE FIRM REG. # F-20017
 11750 KATY FREEWAY, #400
 HOUSTON, TX 77079

SURVEYED BY:
 LANDTECH, INC.

STATE OF TEXAS
 DAVID G. GREANEY
 125563
 LICENSED PROFESSIONAL ENGINEER
 Gauge Engineering, LLC
 Texas Registered Engineering Firm F-20017
 7/31/2025

CITY OF LEAGUE CITY

**HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
 N WISCONSIN AVENUE
 WATER AND SANITARY SEWER
 PLAN AND PROFILE
 STA 6+00 TO STA 11+00**

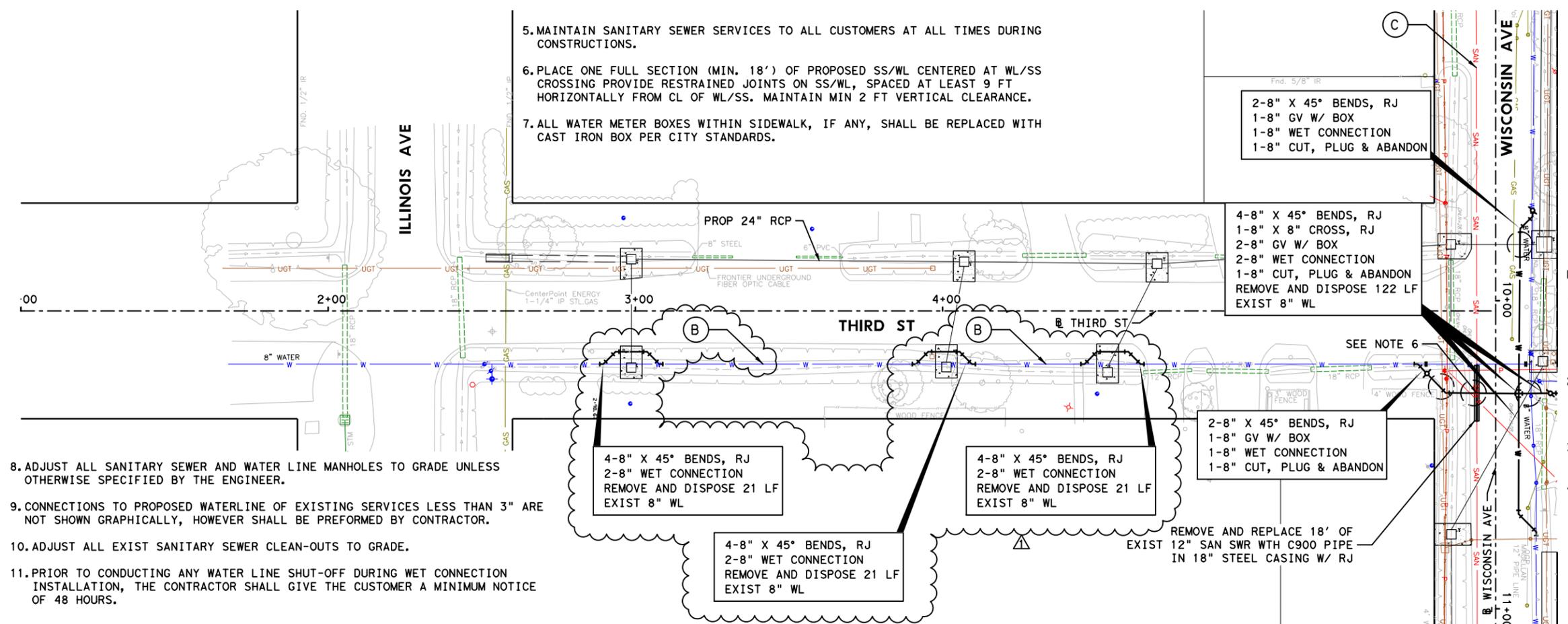
SHEET 2 OF 2

PROJECT NUMBER	DR 2203
DRAWING SCALE	AS NOTED
CITY OF LEAGUE CITY PM	MARCOS GARCIA
SHEET NO.	83 OF 134

NO.	DATE	REVISIONS	APP.
1	10/7/30/2025	PROP SS ADJUSTMENTS	DG

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5. MAINTAIN SANITARY SEWER SERVICES TO ALL CUSTOMERS AT ALL TIMES DURING CONSTRUCTIONS.
6. PLACE ONE FULL SECTION (MIN. 18') OF PROPOSED SS/WL CENTERED AT WL/SS CROSSING PROVIDE RESTRAINED JOINTS ON SS/WL, SPACED AT LEAST 9 FT HORIZONTALLY FROM CL OF WL/SS. MAINTAIN MIN 2 FT VERTICAL CLEARANCE.
7. ALL WATER METER BOXES WITHIN SIDEWALK, IF ANY, SHALL BE REPLACED WITH CAST IRON BOX PER CITY STANDARDS.
8. ADJUST ALL SANITARY SEWER AND WATER LINE MANHOLES TO GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
9. CONNECTIONS TO PROPOSED WATERLINE OF EXISTING SERVICES LESS THAN 3" ARE NOT SHOWN GRAPHICALLY, HOWEVER SHALL BE PERFORMED BY CONTRACTOR.
10. ADJUST ALL EXIST SANITARY SEWER CLEAN-OUTS TO GRADE.
11. PRIOR TO CONDUCTING ANY WATER LINE SHUT-OFF DURING WET CONNECTION INSTALLATION, THE CONTRACTOR SHALL GIVE THE CUSTOMER A MINIMUM NOTICE OF 48 HOURS.

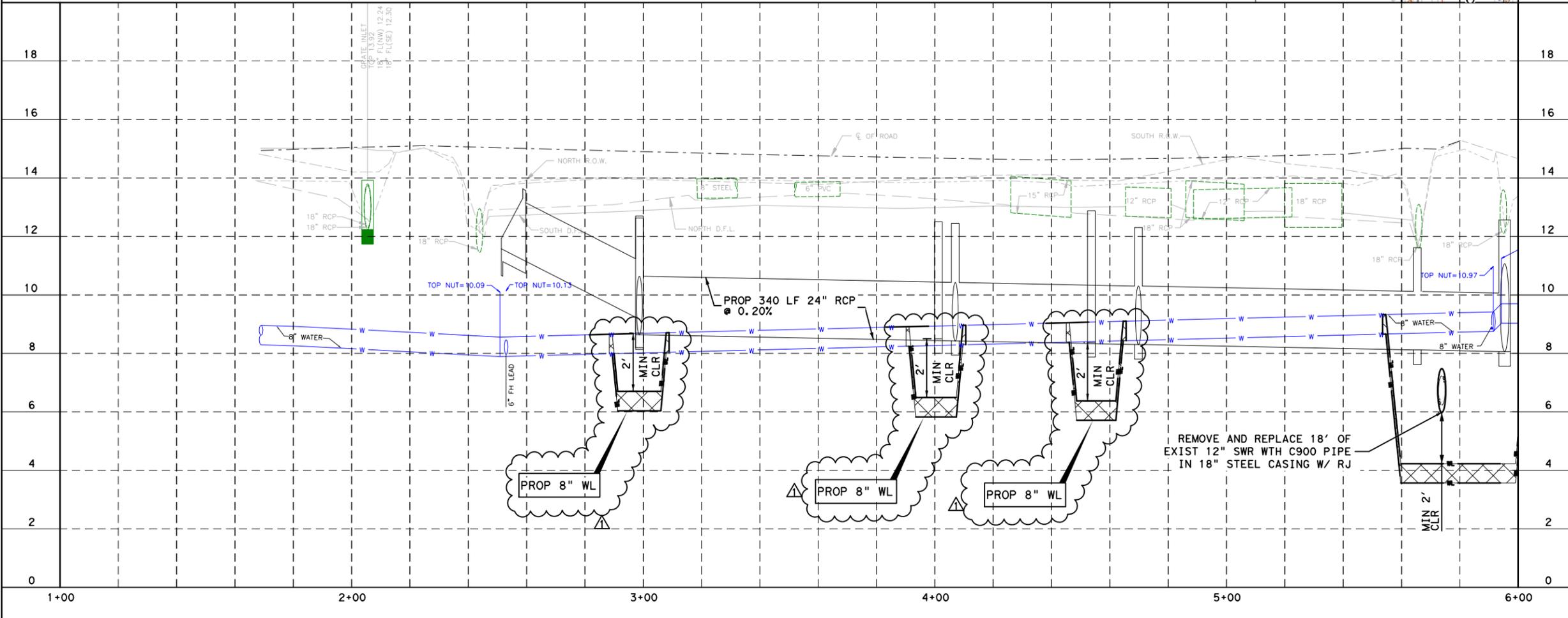
LEGEND:

- SAN — PROPOSED SAN SWR
- W — PROPOSED WATER LINE
- SAN — EXIST SAN SWR LEADS
- W — EXIST WATER LINE
- ▨ D. I. P. W RESTRAINED JOINTS
- CRITICAL LOCATION
- (A) ADJUST TO GRADE
- (B) EXIST WATER LINE TO REMAIN
- (C) EXIST SAN SWR TO REMAIN

NOTES:

1. MAINTAIN WATER SERVICES TO ALL CUSTOMER, FIRE HYDRANTS, AND INTERCONNECTIONS AT ALL TIME PROVIDE TEMPORARY CONNECTION AS NECESSARY FOR CONSTRUCTIONS. NO SEPARATE PAY.
2. SANITARY SEWER LEADS ARE SHOWN AT APPROXIMATE LOCATION. CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION, NO SEPARATE PAY.
3. REFER TO STM SWR SHEETS FOR MORE INFORMATION.
4. ALL CONNECTIONS TO EXISTING WATER LINES TO BE MADE WITHIN ROW LIMITS.

NO.	DATE	REVISIONS	APP.
1	10/7/30/2025	PROP WL ADJUSTMENTS	DG



Gauge ENGINEERING
 TEXAS PE FIRM REG. # F-20017
 11750 KATY FREEWAY, #400
 HOUSTON, TX 77079

SURVEYED BY:
 LANDTECH, INC.

STATE OF TEXAS
 DAVID G. GREANEY
 125563
 LICENSED PROFESSIONAL ENGINEER

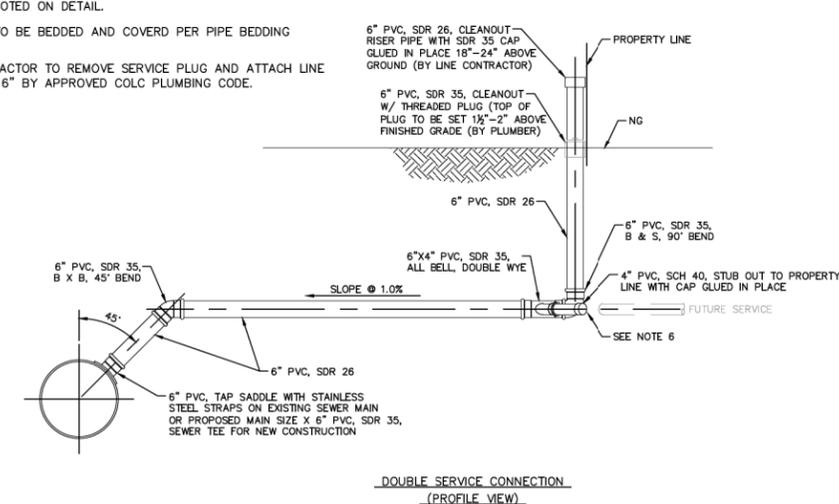
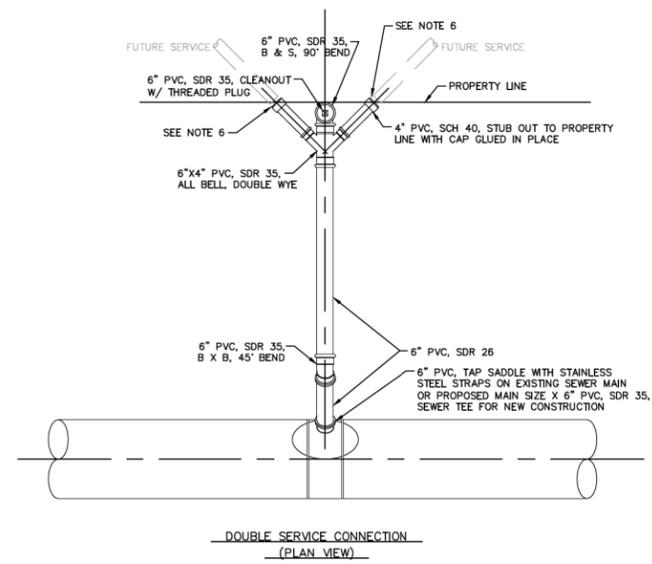
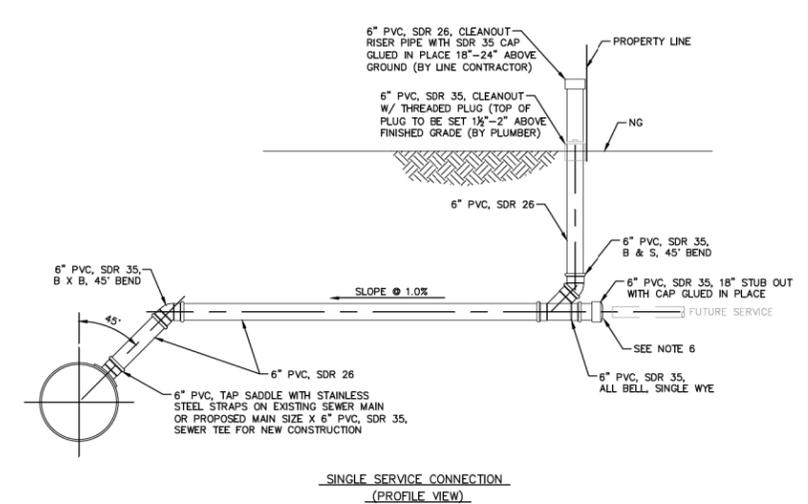
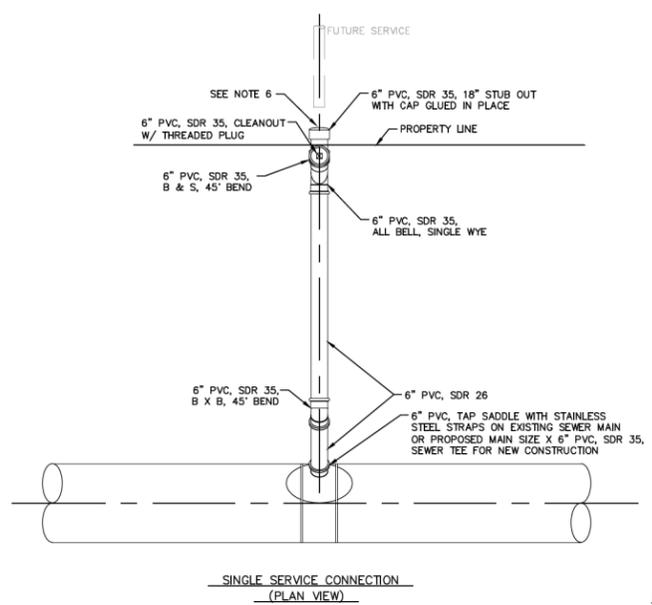
Gauge Engineering, LLC
 Texas Registered Engineering Firm F-20017
 7/31/2025

CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
THIRD STREET WATER AND SANITARY SEWER PLAN AND PROFILE

PROJECT NUMBER	DR 2203
DRAWING SCALE	AS NOTED
CITY OF LEAGUE CITY PM	MARCOS GARCIA
SHEET NO.	86 OF 134

SHEET 1 OF 1

Design File name: P:\City of League City\1276 - Historic District Wisconsin Design\4-0-Production-Working\4-1-CAD\Water\Rev-3\1276-WTR P&P - 04.dgn



- NOTES:**
1. CEMENT STABILIZED SAND TO BE PLACED AROUND TAPPING SADDLE OR SEWER TEE AT MAIN LINE.
 2. SEWER MAIN CONTRACTOR TO EXTEND 6" CLEAN OUT RISER PIPE 18" TO 24" ABOVE GRADE AT TIME OF CONSTRUCTION WITH CAP GLUED IN PLACE.
 3. PLUMBING CONTRACTOR TO SET TOP OF 6" THREADED ADAPTER CLEAN OUT WITH PLUG 1 1/2" TO 2" ABOVE FINISHED GRADE.
 4. ALL FITTINGS AND PIPE TO BE GASKETED BELL AND SPIGOT EXCEPT WHERE NOTED ON DETAIL.
 5. SERVICE LEADS TO BE BEDDED AND COVERD PER PIPE BEDDING DETAILS.
 6. PLUMBING CONTRACTOR TO REMOVE SERVICE PLUG AND ATTACH LINE FROM HOUSE TO 6" BY APPROVED COLC PLUMBING CODE.

SERVICE TAP, LEAD AND CLEAN OUT DETAILS
NTS 4-2012

DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING ACT". NO WARRANTY OF ANY KIND IS MADE BY COLC FOR ANY PURPOSE WHATSOEVER. COLC ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

SANITARY SERVICE TAP AND CLEAN OUT DETAILS
SHEET 1 OF 3



WW-01

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Scale	NTS	Date OCT 2011
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Gauge ENGINEERING
TEXAS PE FIRM REG. # F-20017
11750 KATY FREEWAY, #400
HOUSTON, TX 77079

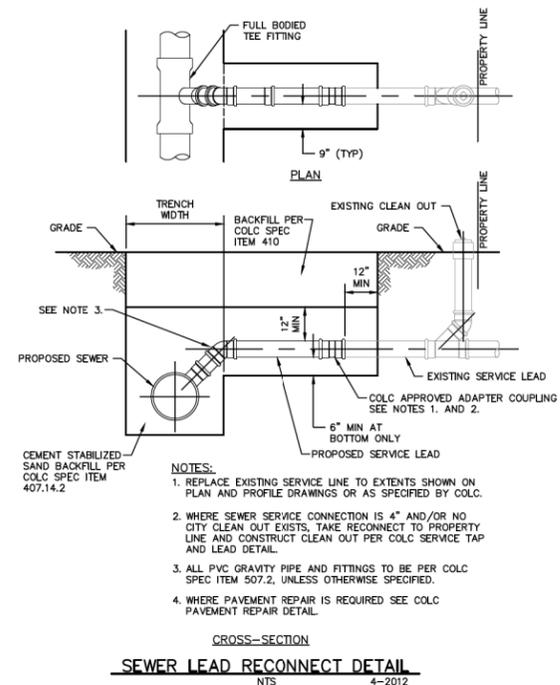
SURVEYED BY:
LANDTECH, INC.

CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
SANITARY SEWER STANDARD DETAILS

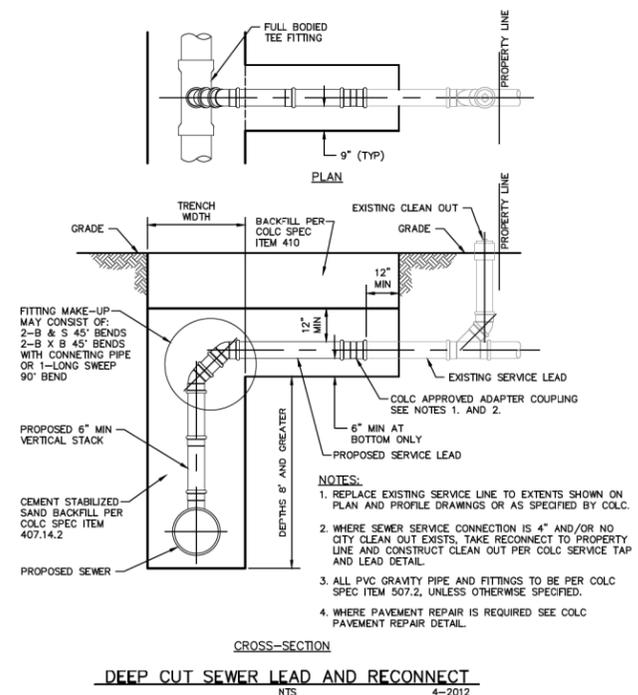
SHEET 1 OF 5

PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY
DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
MARCOS GARCIA	
SHEET NO. 96A	OF 134

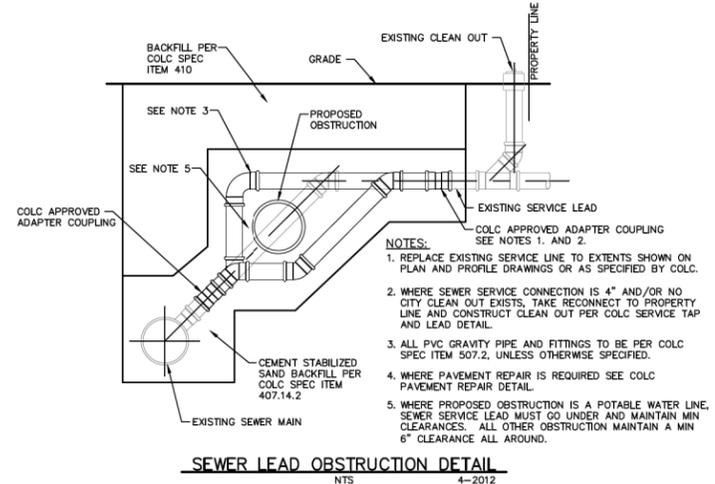
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SEWER LEAD RECONNECT DETAIL
NTS 4-2012



DEEP CUT SEWER LEAD AND RECONNECT
NTS 4-2012



SEWER LEAD OBSTRUCTION DETAIL
NTS 4-2012

DISCLAIMER:
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SANITARY SERVICE TAP AND CLEAN OUT DETAILS
SHEET 3 OF 3



WW-03

Project No.	00000		
Drawn	ARN	Checked	XXX
Scale	NTS	Date	OCT 2011
Sheet	0	of	00

Gauge ENGINEERING
 TEXAS PE FIRM REG. # F-20017
 11750 KATY FREEWAY, #400
 HOUSTON, TX 77079

SURVEYED BY:
 LANDTECH, INC.

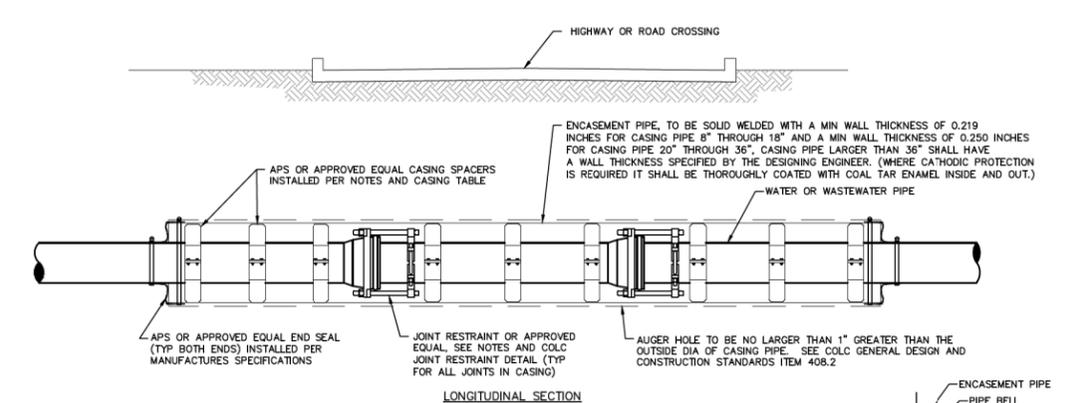
STATE OF TEXAS
 DAVID G. GREANEY
 125563
 LICENSED PROFESSIONAL ENGINEER
 Gauge Engineering, LLC
 Texas Registered Engineering Firm F-20017
 7/31/2025

CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
SANITARY SEWER STANDARD DETAILS

SHEET 2 OF 5

PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY
DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
MARCOS GARCIA	
SHEET NO. 96B OF 134	

Design File name: P:\City of League City\1276 - Historic District Wisconsin Design\4-0-Production-Working\4-1-CAD\Water\Rev-3\STANDARDS\1276 - SAN SWR STANDARD -2.dgn



LONGITUDINAL SECTION
NTS 4-2012

CROSS SECTION

ENCASEMENT PIPE, TO BE SOLID WELDED WITH A MIN WALL THICKNESS OF 0.219 INCHES FOR CASING PIPE 8" THROUGH 18" AND A MIN WALL THICKNESS OF 0.250 INCHES FOR CASING PIPE 20" THROUGH 36". CASING PIPE LARGER THAN 36" SHALL HAVE A WALL THICKNESS SPECIFIED BY THE DESIGNING ENGINEER. (WHERE CATHODIC PROTECTION IS REQUIRED IT SHALL BE THOROUGHLY COATED WITH COAL TAR ENAMEL INSIDE AND OUT.)

WATER OR WASTEWATER PIPE

APPS OR APPROVED EQUAL CASING SPACERS INSTALLED PER NOTES AND CASING TABLE

APPS OR APPROVED EQUAL END SEAL (TYP BOTH ENDS) INSTALLED PER MANUFACTURERS SPECIFICATIONS

JOINT RESTRAINT OR APPROVED EQUAL SEE NOTES AND COLC JOINT RESTRAINT DETAIL (TYP FOR ALL JOINTS IN CASING)

AUGER HOLE TO BE NO LARGER THAN 1" GREATER THAN THE OUTSIDE DIA OF CASING PIPE. SEE COLC GENERAL DESIGN AND CONSTRUCTION STANDARDS ITEM 408.2

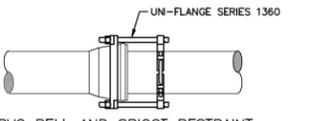
NOTES:

- SPACERS FOR CARRIER PIPE SHALL BE ADVANCE PRODUCTS AND SYSTEMS, INC., STAINLESS STEEL, NEOPRENE OR APPROVED EQUAL AND SHALL BE INSTALLED TO CENTER CARRIER PIPE WITHIN CASING WITH A MAX TOLERANCE OF 1/8" BETWEEN RUNNER AND CASING INSIDE AS WELL AS PREVENT THE CARRIER PIPE FROM RESTING ON THE BELLS WITHIN THE CASING. SEE CASING TABLE FOR SPACER DISTANCE AND NUMBER OF SPACERS.
- CONTRACTOR TO TAKE INTO CONSIDERATION THE SIZE AND LIMITS OF PIPE RESTRAINTS WHEN ORDER AND INSTALLING CASING PIPE TO ALLOW FOR ADEQUATE CLEARANCE.
- SPACERS TO BE PLACED A MIN OF 1' BACK FROM EACH JOINT THAT FALLS WITHIN CASING, A GREATER SET BACK MAY BE REQUIRED FOR LARGER PIPE. SEE CASING TABLE FOR ADDITIONAL INFO ON SPACING OF SPACERS.
- WHEN INSTALLING GRAVITY PIPE WITH CASING CONTRACTOR SHALL TAKE INTO CONSIDERATION PIPE GRADE SO THAT THE SEWER PIPE MAINTAINS THE PROPER FALL.
- JOINT RESTRAINTS ARE REQUIRED ON ALL JOINTS THAT FALL UNDER OR WITHIN 10' OF HIGHWAY CROSSINGS REGARDLESS OF PIPE MATERIAL, CASED OR NOT. SEE COLC PIPE RESTRAINT DETAIL. ALTERNATIVE RESTRAINT DEVICES OR PIPE WITH BUILT IN RESTRAINTS (i.e. CERTAINTED) MAY BE SUBMITTED BY DESIGN ENGINEER FOR APPROVAL.

SPECIAL NOTE: WHERE OPEN CUT GRAVITY SEWER, HIGHWAY, ROAD AND DITCH CROSSING CONSTRUCTION WILL BE DONE CONTRACTOR MAY USE GRIFFIN-20, AMSTED, H2SEWER SAFE, DUCTILE IRON SEWER PIPE, WITH SEWER COAT LINING.

CASING TABLE		
NOMINAL PIPE SIZE DIA IN INCHES	CASING SIZE INSIDE DIA IN INCHES	MAX SKID SUPPORT SPACING IN FEET
4	8-10	4.7
6	10-12	6.3
8	14-16	7.4
10	16-18	8.5
12	18-20	9.6
15	20-22	11.0
18	24-26	12.0
21	28-30	12.0
24	31-33	12.0
27	34-36	12.0

PIPE CASING DETAIL
NTS 4-2013



PVC BELL AND SPIGOT RESTRAINT

SPECIFICATIONS:

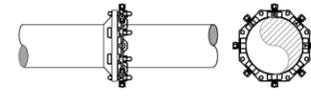
RESTRAINT DEVICES FOR P.V.C. (AWWA C-900) AND P.V.C. PRESSURE FITTINGS (AWWA C-907) SHALL CONSIST OF A SPLIT RING INSTALLED ON THE PIPE SPIGOT, CONNECTED TO A SPLIT BACK-UP RING SEATED BEHIND THE FITTING BELL.

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.

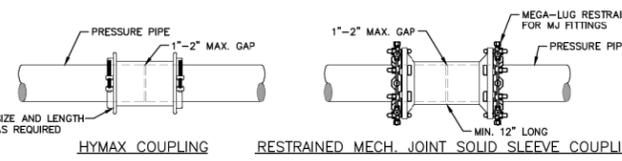
RESTRAINT DEVICES SHALL BE OF DUCTILE IRON, ASTM A536, GRADE 65-45-12 AND CONNECTING BOLTS SHALL BE OF HIGH STRENGTH, LOW ALLOY MATERIAL IN ACCORDANCE WITH ANSI/AWWA C111/21.11

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

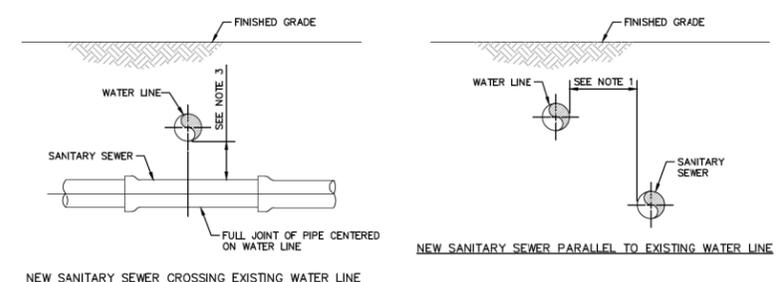


MECHANICAL JOINT RESTRAINT

PIPE RESTRAINT DETAIL
NTS 4-2012



PIPE COUPLING DETAIL
NTS 8-2012



SANITARY SEWER INSTALLATION CROSSING OR PARALLEL TO WATER LINE
NTS 4-2012

NOTES:

- ALL WATER AND SEWER LINE CONSTRUCTION RUNNING PARALLEL WITH EACH OTHER SHALL MAINTAIN A 9" HORIZONTAL SEPARATION, PIPE WALL TO PIPE WALL.
- SEPARATION REQUIREMENTS SHOWN HERE DO NOT APPLY TO SERVICE CONNECTIONS - REFER TO PLUMBING CODE FOR APPLICABLE REQUIREMENTS.
- ALL SEWER AND WATER LINE CROSSINGS SHALL COMPLY WITH THE TCEQ CHAPTER 290, PUBLIC DRINKING WATER SECTION 290.44 WATER DISTRIBUTION, SUB SECTION B, NEW WATERLINE INSTALLATION-CROSSIG LINES, PARAGRAPHS (I) THROUGH (VI) AND ALL SUB PARAGRAPHS THEREIN.

DISCLAIMER:
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COMBINATION WATER AND SANITARY DETAILS SHEET 1 OF 2



C-01

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Gauge ENGINEERING

TEXAS PE FIRM REG. # F-20017
11750 KATY FREEWAY, #400
HOUSTON, TX 77079

SURVEYED BY:
LANDTECH, INC.



DAVID G. GREANEY
125563
LICENSED PROFESSIONAL ENGINEER
Gauge Engineering, LLC
Texas Registered Engineering Firm F-20017
7/31/2025

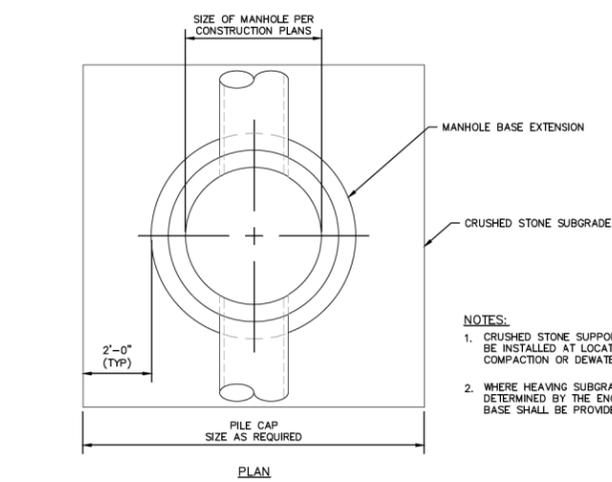
CITY OF LEAGUE CITY

HISTORIC DISTRICT DRAINAGE IMPROVEMENTS

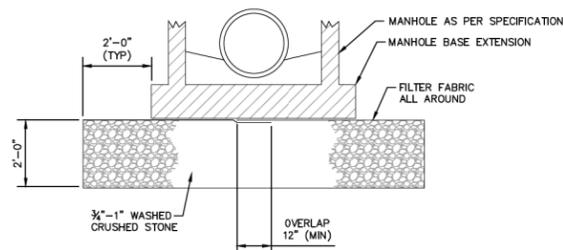
SANITARY SEWER STANDARD DETAILS

SHEET 3 OF 5

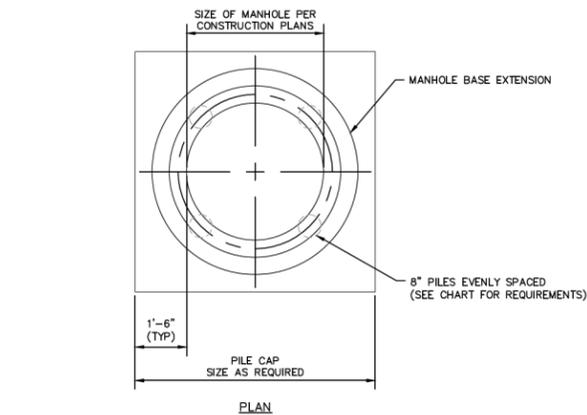
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DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
MARCOS GARCIA	
SHEET NO. 96C OF 134	



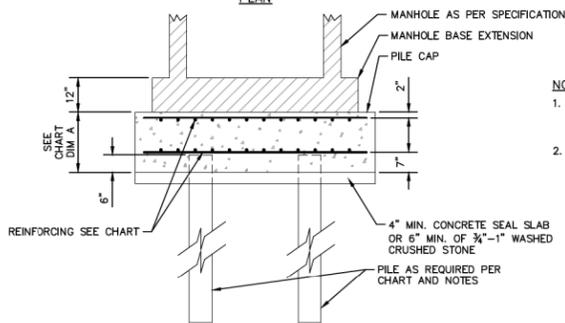
- NOTES:**
1. CRUSHED STONE SUPPORT UNDER A MANHOLE BASE SHALL BE INSTALLED AT LOCATIONS WHERE REQUIRED SUBGRADE COMPACTION OR DEWATERING CANNOT BE ACHIEVED.
 2. WHERE HEAVING SUBGRADE CONDITIONS OCCUR, AS DETERMINED BY THE ENGINEER, A PILE SUPPORT MANHOLE BASE SHALL BE PROVIDED.



SECTION
CRUSHED STONE MANHOLE SUPPORT FOR WET STABLE TRENCH
NTS 4-2012



PILE CHART					
MANHOLE ID (FT)	NUMBER OF PILES	DEPTH TO INVERT (FT)	CAPACITY/PILE (TONS) MIN.	PILE CAP DIM. A (FT)	PILE CAP REIN. (E.W. T&B)
4	4	10	9	1'-9"	#6 @ 6"
		12	10		
		15	11		
		20	13		
		25	15		
5	5	10	10	1'-9"	#6 @ 6"
		12	11		
		15	12		
		20	15		
		25	17		
6	6	10	9	2'-0"	#6 @ 6"
		12	10		
		15	12		
		20	15		
		25	17		
8	8	10	8	2'-0"	#6 @ 6"
		12	9		
		15	10		
		20	13		
		25	16		



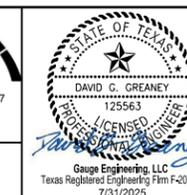
SECTION
MANHOLE PILE SUPPORT FOR UNSTABLE SUBGRADE
NTS 4-2012

- NOTES:**
1. PILING SHALL BE INSTALLED AT ALL LOCATION WHERE HEAVING SUBGRADE CONDITIONS ARE LIKELY TO OCCUR, AS DETERMINED BY THE ENGINEER.
 2. THE ENGINEER WILL PROVIDE THE SIZE, LENGTH AND MATERIAL NEEDED TO CARRY THE CAPACITY SHOWN ON THE PILE CHART BASED ON ACTUAL CONDITIONS REVEALED AT TIME OF CONSTRUCTION.

COMBINATION STORM AND SANITARY SPECIAL BASE DETAILS
SHEET 2 OF 2



SURVEYED BY:
LANDTECH, INC.



CITY OF LEAGUE CITY
HISTORIC DISTRICT DRAINAGE IMPROVEMENTS
SANITARY SEWER STANDARD DETAILS

C-02

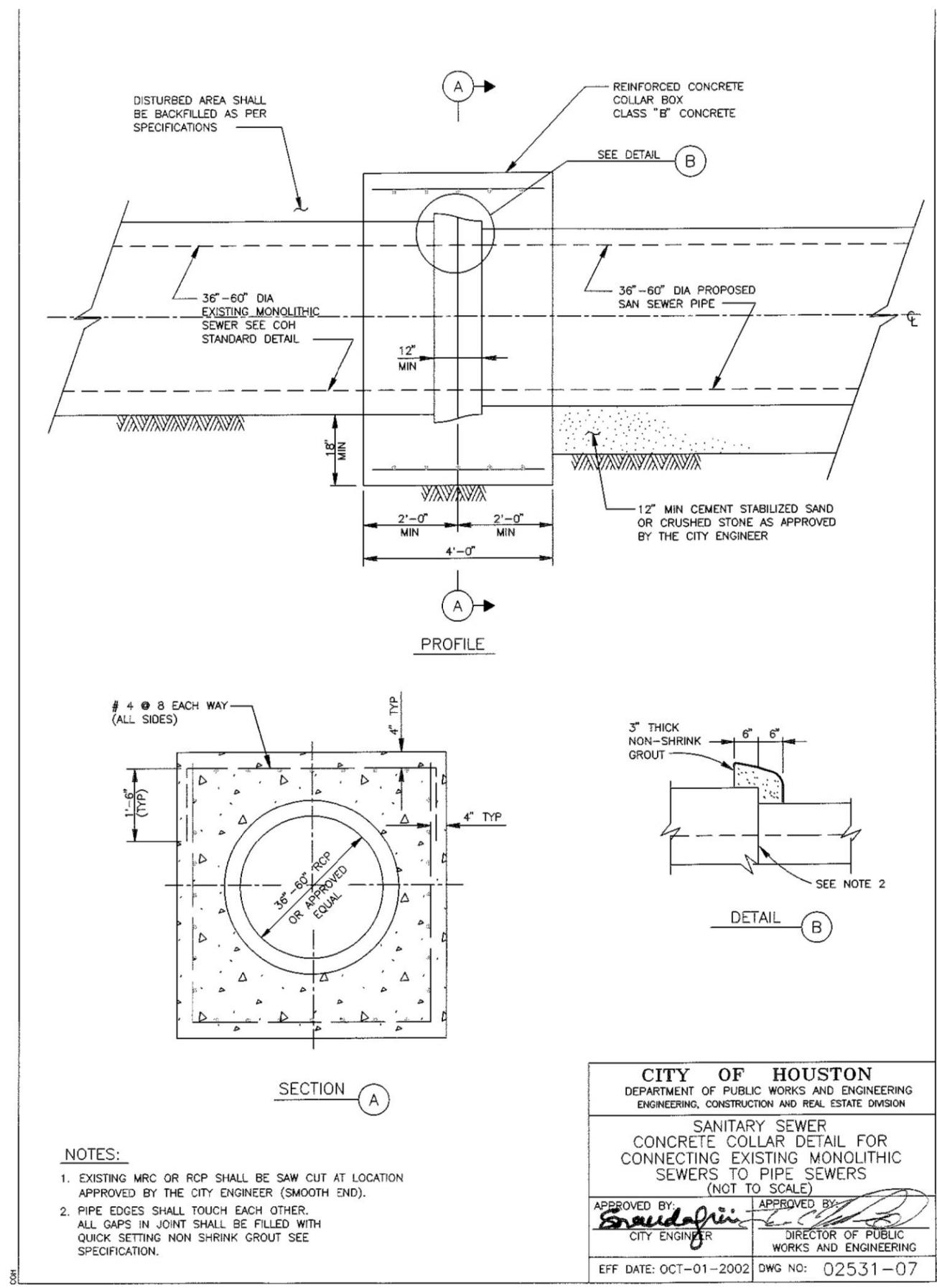
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SHEET 4 OF 5

PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY
DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
MARCOS GARCIA	
SHEET NO. 96D OF 134	

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- NOTES:**
- EXISTING MRC OR RCP SHALL BE SAW CUT AT LOCATION APPROVED BY THE CITY ENGINEER (SMOOTH END).
 - PIPE EDGES SHALL TOUCH EACH OTHER. ALL GAPS IN JOINT SHALL BE FILLED WITH QUICK SETTING NON SHRINK GROUT SEE SPECIFICATION.

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

**SANITARY SEWER
 CONCRETE COLLAR DETAIL FOR
 CONNECTING EXISTING MONOLITHIC
 SEWERS TO PIPE SEWERS
 (NOT TO SCALE)**

APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02531-07

Gauge ENGINEERING TEXAS PE FIRM REG. # F-20017 11750 KATY FREEWAY, #400 HOUSTON, TX 77079	DAVID G. GREANEY 125563 LICENSED PROFESSIONAL ENGINEER Gauge Engineering, LLC Texas Registered Engineering Firm F-20017 7/31/2025
SURVEYED BY: LANDTECH, INC.	
CITY OF LEAGUE CITY HISTORIC DISTRICT DRAINAGE IMPROVEMENTS SANITARY SEWER STANDARD DETAILS	
SHEET 5 OF 5	
PROJECT NUMBER	FOR CITY OF LEAGUE CITY USE ONLY
DR 2203	
DRAWING SCALE	
AS NOTED	
CITY OF LEAGUE CITY PM	
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SHEET NO. 96E OF 134	

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