Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

PERMIT APPLICATION REVIEW FORM FOR CABLE, CONDUIT, AND POLE LINE ACTIVITY IN FORT BEND COUNTY

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2017-17416

The following "Notice of Proposed Cable, Conduit, and/or Pole Line activity in Fort Bend County" and accompanying attachments have been reviewed and the notice conforms to appropriate regulations set by Commissioner's Court of Fort Bend County, Texas.

(1) COMPLETE APPLICATION FORM:

- [X] a. Name of road, street, and/or drainage ditch affected.
- [X] b. Vicinity map showing course of directions
- [X] c. Plans and specifications

(2) BOND:

- [ ] County Attorney, approval when applicable.
- [X] Perpetual bond currently posted. Bond No: [redacted] Amount: $50,000.00
- [ ] Performance bond submitted. Bond No: Amount:
- [ ] Cashier's Check Check No: Amount:

(3) DRAINAGE DISTRICT APPROVAL (WHEN APPLICABLE):

Drainage District Approval _____ Date _____

We have reviewed this project and agree it meets minimum requirements.

Charles O. Dy

Permit Administrator

12/20/2017

Date

Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2017-17416

Applicant: **Gonzalez Construction Enterprise, Inc.**

Job Location Site: **Spring Green Boulevard and Katy Flewellen Road, Katy , TX 77494**

Bond No. [redacted] **Date of Bond:** **7/30/2015** **Amount:** **$50,000.00**

The above applicant came to make use of certain Fort Bend County property subject to, "The Order Regulating the Laying, Construction, Maintenance, and Repair of Buried Cables, Conduits, and Pole Lines, In, Under, Across or Along Roads, Streets, Highways, and Drainage Ditches in Fort Bend County, Texas, Under the Jurisdiction of the Commissioners Court of Fort Bend County, Texas," as passed by the Commissioners Court of Fort Bend County, Texas, of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistant with Chapter 181, Vernon's Texas Statutes and Codes Annoted.

Notes:

1. Evidence of review by the Commissioners Court must be kept on the job site and failure to do so constitutes grounds for job shutdown.
2. Written notices are required:
    a. 48 hours in advance of construction start up, and
    b. When construction is completed and ready for final inspection, submit notification to Permit Administrator thru MyGovernmentOnline.org portal.
3. This permit expires one (1) year from date of permit if construction has not commenced.

On this 2nd day of January, 2018, Upon Motion of Commissioner _____, seconded by Commissioner _____, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Signature

By: Charles O. Dy
County Engineer

By: N/A
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded _____ Comm. Court No. _____

Clerk of Commissioners Court

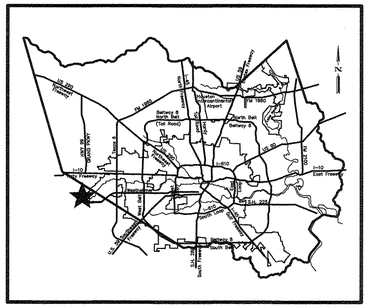
By: _____
Deputy

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

CONSTRUCTION PLANS OF PROPOSED
WATER DISTRIBUTION SYSTEM
SANITARY COLLECTION SYSTEM
STORM DRAINAGE SYSTEM
STREET PAVING

JULY 2017



LOCATION MAP

SHEET INDEX

NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL CONSTRUCTION SHEET
3	SANITARY SEWER AND WATER OVERALL ⚠1
4	STORM SEWER AND PAVING OVERALL ⚠1
5	DRAINAGE AREA MAP ⚠1
6	DRAINAGE CALCULATIONS
7	GRADING PLAN ⚠1
8	STORM SEWER POLLUTION PREVENTION PLAN ⚠1
9	PLAN AND PROFILE– SKYLARK BLUFF TRAIL (STA. 1+00 TO 7+61.58)
10	PLAN AND PROFILE– MARBLE LAKES DRIVE AND BRIGHTON WILLOW WAY (STA. 1+00 TO 8+08.54)
11	PLAN AND PROFILE– LAUREL HARVEST LANE (STA. 1+60 TO 5+85.05) ⚠1
12	PLAN AND PROFILE– EXISTING SPRING GREEN BOULEVARD ⚠1
13	WATER AND MISCELLANEOUS PAVING DETAILS
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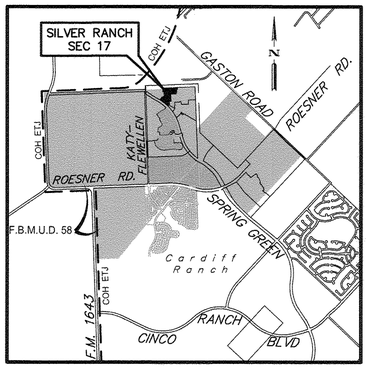
17	PAVING DETAILS (SHEET 2 OF 2)
18	PAVEMENT MARKING DETAILS (SHEET 1 OF 3)
19	PAVEMENT MARKING DETAILS (SHEET 2 OF 3)
20	PAVEMENT MARKING DETAILS (SHEET 3 OF 3)
21	STORM WATER POLLUTION PREVENTION PLAN DETAILS
22	TXDOT PEDESTRIAN FACILITIES CURB RAMP PED–12A (SHEET 1 OF 4)
23	TXDOT PEDESTRIAN FACILITIES CURB RAMP PED–12A (SHEET 2 OF 4)
24	TXDOT PEDESTRIAN FACILITIES CURB RAMP PED–12A (SHEET 3 OF 4)
25	TXDOT PEDESTRIAN FACILITIES CURB RAMP PED–12A (SHEET 4 OF 4)
25A	TRAFFIC CONTROL PLAN



VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

FORT BEND COUNTY MUD 58 WILL OWN AND MAINTAIN EXISTING DETENTION BASIN.

ONE–CALL NOTIFICATION SYSTEM
CALL BEFORE YOU DIG!!
DIAL 811 or 1–(800)–545–6005
AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION

FORT BEND COUNTY ENGINEER

ENGINEER: Paul J Stroglis, PE, PTOE
for RICHARD W. STOLLEIS, P. E.

DATE : 10/9/17 ⚠1 ⚠2 11/28/17

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVAL.

APPROVED: (SE) (SE)
DEVELOPMENT COORDINATOR

DATE : 9/20/17 10/5/17 ⚠1 11/6/17

PRIOR TO THE CONSTRUCTION OF THESE FACILITIES WITHIN OR BY THE DISTRICT, THE DISTRICT OR ITS ENGINEER WILL GIVE WRITTEN NOTICE BY REGISTERED OR CERTIFIED MAIL TO THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING, CITY OF HOUSTON STATING THE DATE SUCH CONSTRUCTION WILL BE COMMENCED.

CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING, OFFICE OF THE CITY ENGINEER, 48 HOURS BEFORE STARTING WORK ON THIS PROJECT. TELEPHONE NO. 832–394–9098, FAX NO. 832–395–4424

ETJ DETENTION PLANS INFORMATION:

1. STORM WATER DETENTION PLANS:
   IS PROVIDED IN: SILVER RANCH DETENTION PHASE SIX (TITLE)
   ENGINEERING FIRM: BGE (COMPANY NAME)
   DATE SIGNED AND APPROVED BY: FBC FEBRUARY 2, 2016 (AGENCY)

2. STORM WATER DRAINAGE DESIGN REPORT:
   REPORT TITLE: 469.5 AC SILVER RANCH DEVELOPMENT
   DATE: SEPT. 26, 2005 ENGINEERING FIRM: BGE
   DATE OF ACKNOWLEDGEMENT BY: FORT BEND COUNTY DRAINAGE DISTRICT

OFFSITE EASEMENTS WILL BE RECORDED SIMULTANEOUSLY WITH THE PLAT. PER LETTER DATED 10/12/17 BY DISTRICT ENGINEER, Mr. PHILIP MULLAN, P.E.

FIRM
Flood Insurance Rate Map
Panel(105) of (575)
Map# 48157C0105 L
BFE Elevation 125.2 (1988 Adjustment)

I, SHAWN L. PACHLHOFER, P.E., certify that this project is entirely located outside the area with 100–year flood frequency (Unshaded Zone X).

ILMS # 17052146
LOG NO. 17–0862
H.C.F.C. UNIT NO.

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
⚠3			
⚠2			
⚠1	10/12/17	UTILITIES EXTENDED	

BGE, Inc.
10777 Westheimer, Suite 400
Houston, Tx 77042
Tel: 281-558-8700 ● www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

SURVEYED BY: Brown & Gay Eng., Inc. FB NO.:

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER — 11-28-17 8/03/17
LCG 10/12/17 — TRAFFIC & TRANSPORTATION
WASTEWATER — 8/3/17
⚠1 MG 10/12/17 — STORM WATER QUALITY
STORM SEWER — Megan Sun 8/3/17
STREET & BRIDGE — FACILITIES

CITY ENGINEER — DATE 10/12/17
DIRECTOR OF PUBLIC WORKS AND ENGINEERING — DATE 10/12/17

FOR CITY OF HOUSTON USE ONLY
58779

SHEET NO: 1 OF 25

FORT BEND COUNTY M.U.D. 58\SILVER RANCH SEC 17\4818-00\4818-10

FORT BEND COUNTY M.U.D. 58\SILVER RANCH SEC 17\SHEET 1-25

GENERAL

1. THESE PLANS WERE PREPARED TO MEET OR EXCEED TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, FORT BEND COUNTY AND CITY OF HOUSTON RULES AND REGULATION AS CURRENTLY AMENDED.
2. WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING'S "STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING", DATED JANUARY, 2011, LATEST REVISION, AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING", DATED OCTOBER, 2002, LATEST REVISION, UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN IS CONSISTENT WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "INFRASTRUCTURE DESIGN MANUAL", DATED JULY, 2011, LATEST REVISION. CONTRACTOR SHALL USE CURRENT COPIES OF DESIGN MANUAL, STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD CONSTRUCTION DETAILS ISSUED BY THE CITY OF HOUSTON. COPIES CAN BE OBTAINED AT THE CITY OF HOUSTON, 1002 WASHINGTON.
3. CONTRACTOR SHALL COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS AND ANY OTHER FEDERAL, STATE AND LOCAL REGULATIONS REGARDING TRENCH SAFETY SYSTEMS FOR TRENCH EXCAVATION.
4. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING AT (713)863-1450 FOR INSPECTION AT LEAST 48 HOURS PRIOR TO COMMENCING THE CONSTRUCTION.
5. THIS PROJECT IS NOT TIED INTO THE OFFICIAL CITY OF HOUSTON SURVEY SYSTEM IN COMPLIANCE WITH ORDINANCE NO. 69-1978 BECAUSE A CITY SURVEY MARKER HAS NOT BEEN ESTABLISHED WITHIN 2,000 FEET OF THIS PROPERTY.
6. ENGINEER SHALL NOTIFY FORT BEND ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION AT %%UCONSTRUCTION@FORTBENDCOUNTYTX.GOV%%U AND GIVE WRITTEN NOTICE 48 HOURS IN ADVANCE. CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING, CONSTRUCTION DIVISION AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV 48 HOURS BEFORE STARTING WORK ON THIS PROJECT.
7. CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF FORT BEND, TEXAS FOR FLOOD PLAIN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION.
8. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE EXISTING PUBLIC UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO WITH NO COST TO THE PUBLIC. (NO ADDITIONAL PAY TO CONTRACTOR)
9. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND OTHER FACILITIES. CONTRACTOR SHALL VERIFY IN THE FIELD THE EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 1-800-545-6005 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION.
10. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE FINAL DRAFT OF STORMWATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES AS PREPARED BY HARRIS COUNTY/HCFCD, AND THE CITY OF HOUSTON ALL IN COMPLIANCE WITH THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) REQUIREMENTS.
11. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB, SHALL BE AS GOOD OR BETTER THAN CONDITION PRIOR TO STARTING WORK.
12. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO, WITH NO COST TO THE PUBLIC.
13. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
14. UNLESS SPECIFICALLY INDICATED OTHERWISE ON THE PLANS, UTILITIES WITHIN EASEMENTS SHALL BE LOCATED IN ACCORDANCE WITH STANDARDS OUTLINED BY THE MOST CURRENT UTILITY COORDINATING COMMITTEE DRAWINGS.
15. IF THE CONSTRUCTION DOES NOT BEGIN WITHIN A YEAR AFTER THE PLANS HAVE BEEN SIGNED, NEW SIGNATURES MUST BE OBTAINED AND LETTERS OF AVAILABILITY (IF NECESSARY) MUST BE UPDATED.

SANITARY SEWERS

GENERAL:

1. "SAN. S. E." INDICATES "SANITARY SEWER EASEMENT".
2. PRIOR TO SANITARY SEWER CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE ORGANIZATIONS AND COMPLY WITH ALL REQUIREMENTS FOR THE ISSUANCE OF NECESSARY PERMITS/WORK ORDERS.
3. CONTRACTOR SHALL OBTAIN (AND USE) A COPY OF THE DESIGN MANUAL, STANDARD SPECIFICATIONS AND STANDARD DETAILS FROM CITY OF HOUSTON, 1002 WASHINGTON.

TESTING:

4. DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF THE DEFLECTION TEST IS TO BE RUN USING A MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. NO BALL TYPE MANDRALS TO BE USED. THE TEST SHALL BE PERFORMED AS PER CITY OF HOUSTON 02533 2.01 TO 3.03 AND WITHOUT MECHANICAL PULLING DEVICES.
5. INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER 30 TAC 317.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS WHERE NOT COVERED BY CITY OF HOUSTON.

   A. INFILTRATION OR EXFILTRATION TEST: TOTAL LEAKAGE AS DETERMINED BY A HYDROSTATIC HEAD TEST SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF 2 FEET.

   B. LOW - PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6-90 OR OTHER APPROPRIATE PROCEDURES. FOR SECTIONS OF PIPE LESS THAN 36" (INCH) AVERAGE INSIDE DIAMETER, THE MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 PSIG TO 2.5 PSIG SHALL BE AS FOLLOWS:

   8": 454 SECONDS OR 1.520(L) FOR TEST LENGTHS GREATER THAN 298'.
   10": 567 SECONDS OR 2.374(L) FOR TEST LENGTHS GREATER THAN 239'.
   12": 680 SECONDS OR 3.419(L) FOR TEST LENGTHS GREATER THAN 199'.
   15": 850 SECONDS OR 5.342(L) FOR TEST LENGTHS GREATER THAN 159'.
   18": 1020 SECONDS OR 7.693(L) FOR TEST LENGTHS GREATER THAN 133'.
   WHERE L = LENGTH OF LINE OF SAME PIPE SIZE IN FEET.

MANHOLES:

6. ALL MANHOLES ARE TO BE PER CITY OF HOUSTON SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET. BRICK MANHOLES ARE NOT ACCEPTABLE AS SANITARY SEWERS. ONLY PRECAST MANHOLES ARE ALLOWED FOR THIS PROJECT.
7. SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING WITH SLOPED BACKFILL ADDED FOR STORMWATER DRAINAGE AWAY FROM MANHOLE RIM.
8. FOR MANHOLES LESS THAN 4' (FOUR FEET) DEEP USE SHALLOW MANHOLE PER DETAIL INCLUDED IN THIS PLAN SET. (C.O.H. DWG. NO. 02082-01)
9. SERVICE CONNECTIONS ENTERING A MANHOLE TWO-FEET AND ONE-HALF(2.5') OR MORE ABOVE THE FLOWLINE OF THE MANHOLE SHALL INCLUDE A DROP PIPE WITH FITTINGS OUTSIDE THE MANHOLE. THE DROP SHALL BE INSTALLED ADJOINING AND ANCHORED TO THE WALL OF THE MANHOLE UNLESS SPECIFICALLY APPROVED OTHERWISE.
10. WHEN MAKING A CONNECTION TO AN EXISTING SANITARY SEWER MANHOLE OR PIPE LINE THE CONTRACTOR SHALL PLUG DOWN STREAM END OF THE PROPOSED SANITARY SEWER. THE SEWER SHALL REMAIN PLUGGED UNTIL FINAL ACCEPTANCE BY TEXAS COMMISSION ON ENVIRONMENTAL QUALITY.

PIPE:

11. SANITARY SEWER PIPE TO BE SDR 26 P.V.C. PIPE MEETING ASTM SPECIFICATIONS D3034 WITH RUBBER GASKET JOINTS, UNLESS OTHERWISE NOTED.
12. SDR 26 P.V.C. PIPE USES "FULL BODIED" SDR 26 P.V.C. FITTINGS OR D.I.P. FITTINGS WITH APPROPRIATE ADAPTERS. AWWA C-900 DR-18 P.V.C. PIPE USES EITHER AWWA C900 DR-18 P.V.C. FITTINGS OR D.I.P. FITTINGS. SDR-26 P.V.C. PIPE SHALL HAVE A CELL CLASSIFICATION OF 12364-B AS DEFINED IN ASTM D-1784.
13. ALL DR P.V.C. PIPE IS TO HAVE D.I.P. SIZE O.D. AND RUBBER GASKETED BELL-AND-SPIGOT TYPE JOINT ENDS.
14. ALL SEWER LEADS AND STACKS SHALL BE MARKED WITH A 4" X 6' LONG P.V.C. MARKER AT THE TIME OF CONSTRUCTION. THE 4" P.V.C. PIPE SHALL EXTEND TWO FEET ABOVE FINISHED GRADE AND BE CAPPED. THE PAVING CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAIN-ING THESE 4" P.V.C. PIPES IN GOOD AND PLUMB CONDITION. IF PIPE IS DAMAGED, THE PAVING CONTRACTOR SHALL REPLACE THE 4" P.V.C. PIPE AT THE ENGINEERS DIRECTION. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR MAINTAINING THE 4" P.V.C. PIPE MARKINGS.
15. FORCE MAIN: 6-INCH FORCE MAIN TO BE AWWA C900, DR 18, CLASS 150 WITH RESTRAINED JOINTS AT REQUIRED LOCATIONS. (SEE PLANS).

WL CROSSING:

16. CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 9' (NINE FEET) BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
17. WHENEVER POSSIBLE CENTER 1 - 20' JOINT, GREEN C-900 DR-18 PVC PIPE, CLASS 150 SANITARY SEWER LINE AND/OR LEAD ON PROPOSED WATER LINE AND 1-20' JOINT, C-900 PVC WATER LINE PIPE ON PROPOSED SANITARY LINE AND/OR LEAD, 2' MINIMUM CLEARANCE BELOW WATER LINE. CONTRACTOR TO USE ADAPTER COUPLINGS AWWA C900 (OR ASTM D-2441) SS PRESSURE PIPE, FOR WL CROSSING, CONNECTING WITH THE ASTM D-3034 SS PIPE.
18. WHENEVER GRAVITY SEWER IS TO BE INSTALLED UNDER EXISTING WATER LINE WITH SEPARATION DISTANCE OF LESS THAN 2', INSTALL NEW SANITARY SEWER LINE USING PRESSURE-RATED PIPE MAINTAINING MINIMUM 12" SEPARATION DISTANCE.

BEDDING:

19. SANITARY SEWERS WILL HAVE BEDDING AND BACKFILL PER CITY OF HOUSTON SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET.
20. ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT 1 FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL HAVE BEDDING PER CITY OF HOUSTON SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET, WITH A MINIMUM 1 1/2 SACK CEMENT/TON (MIN. 100 PSI AT 48 HR.) STABILIZED SAND BACKFILL UP TO WITHIN ONE (1) FOOT OF PAVING SUBGRADE. TEST REPORTS TO BE SUBMITTED BEFORE PLACEMENT OF PAVEMENT. SAND SHALL BE PLACED WITHIN 4 HOURS OF BEING MIXED.
21. IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET.

WATER LINES

GENERAL:

1. CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 9'(NINE FEET) BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
2. "W.L.E." INDICATES "WATER LINE EASEMENT"
3. THIS PROJECT SHALL BE CONSTRUCTED BY MEANS OF OPEN CUT, EXCEPT WHERE NOTED ON THE DRAWINGS. THE CONTRACTOR WILL DETERMINE THE LOCATION OF BORE PITS IN THE FIELD, SUBJECT TO THE CITY ENGINEER'S APPROVAL.
4. ALL UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN AT THE APPROXIMATE LOCATIONS BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL FIELD DETERMINE THE EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION. HE SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE FAILURE TO EXACTLY LOCATE AND MAINTAIN THESE UNDERGROUND UTILITIES.
5. FLUSHING VALVES SHALL BE MUELLER SUPER CENTURION 250-A423, CENTERLINE OF STREAMER NOZZLE TO BE MINIMUM OF 18-INCHES FROM NATURAL GROUND.

PIPE:

5. 4" THRU 12" WATER LINES SHALL BE P.V.C. CLASS 150, DR-18, AWWA C-900.
6. ALL WATER LINES SHALL HAVE A 12" BOTTOM AND 12" SIDE BANK - SAND ENVELOPE AND SHALL BE BACKFILLED TO A MINIMUM COMPACTED DEPTH OF 12" OVER THE TOP OF THE PIPE TO PROVIDE A COMPACTED ENCASEMENT IN ACCORDANCE WITH CITY OF HOUSTON WATER DEPARTMENT SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET. (COH SECTION 02317)
7. ALL WATER PIPE AND RELATED PRODUCTS MUST CONFORM TO ANSI/NSF STANDARD 61.
8. PIPE SHALL NOT BE LAID IN WATER OR PLACED WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION IN COMPLIANCE WITH TAC 290.44(f)(1).
9. ALL PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST ALSO BEAR THE NATIONAL SANITATION FOUNDATION SEAL OF APPROVAL (NSF-pw) AS REQUIRED IN SECTION 290.44(a)(2) OF THE RULES.
10. 4" THROUGH 12" FITTINGS SHALL BE CEMENT MORTAR LINED COMPACT DUCTILE IRON PRESSURE FITTINGS PER ANSI A21.53 CONFORMING TO THE REQUIREMENTS OF SECTION 02528- POLYETHYLENE WRAP, OR PUSH ON FITTINGS PER ANSI A21.10 PRESSURE RATED AT 250 PSIG.

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\02_SR17_GCN.dwg

GENERAL CONSTRUCTION NOTES

BEDDING:

11. WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO WITHIN 1 FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" ABOVE PIPE AND BACKFILLED WITH 2 1/2 SACKS CEMENT/CY STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE.
12. ALL FILL AND COMPACTION TO 95% STANDARD PROCTOR DENSITY SHALL BE PERFORMED PRIOR TO CONSTRUCTION OF WATER LINES.

TESTING:

13. THE CONTRACTOR SHALL PROVIDE ADEQUATE CONCRETE THRUST BLOCKING TO WITHSTAND TEST PRESSURE AS SPECIFIED IN CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS & ENGINEERING SPECIFICATIONS.
14. ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C-651. A MINIMUM OF ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EACH 1,000 FEET OF COMPLETED WATERLINE TO CHECK EFFICIENCY OF DISINFECTION PROCEDURES AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.
15. HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH SECTION 02515. ALLOW THE WALL LINING TO ABSORB WATER AFTER PIPE HAS BEEN DISINFECTED (MINIMUM OF 24 HOURS). PRESSURIZE THE PIPE TO 125 PSI FOR SMALL DIAMETER PIPES AND 150 PSI FOR LARGE DIAMETER PIPES. RUN THE TEST FOR 8 HOURS. STOP THE TEST IF LARGE QUANTITIES OF WATER ARE REQUIRED TO MAINTAIN PRESSURE. NO LEAKAGE ALLOWED FOR SECTION OF WATER LINES CONSISTING OF WELDED JOINT. MAXIMUM ALLOWABLE LEAKAGE FOR WATER LINES WITH RUBBER GASKETED JOINTS SHALL BE CALCULATED USING THE FORMULA AS FOLLOWS:

L = (3.19)(D)(S)/126,720 WHERE L = ALLOWABLE LEAKAGE IN GAL./HR. S = LENGTH OF PIPE TESTED IN FEET D = INSIDE DIAMETER OF PIPE IN INCHES	OR	TCEQ (NON CITY OF HOUSTON) L = SxDx(P)^0.5/148,000 WHERE L = QUANITY OF MAKEUP WATER IN GAL./HR. D = DIAMETER IN INCHES P = PRESSURE IN POUNDS PER SQUARE INCH S = LENGTH OF PIPE SECTION BEING TESTED IN FEET

REPAIR VISIBLE LEAKS ON SURFACE AND REPLACE OR REPAIR FAILED LINE SEGMENTS. DISINFECT LINE AFTER REPAIR AND RETEST UNTIL PASSES HYDROSTATIC TEST.

STORM SEWERS

GENERAL:

1. CONTRACTOR SHALL PROVIDE 12" MINIMUM CLEARANCE AT STORM SEWER AND WATER LINE CROSSINGS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING AND RESTORING ANY BACKSLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF HIS WORK.
3. ALL DITCHES SHALL BE REGRADED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE REGRADED, SEEDED AND FERTILIZED.
4. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.
5. "STM. S. E." INDICATES "STORM SEWER EASEMENT".

MANHOLES/INLETS:

6. ADJUST MANHOLE COVERS TO GRADE CONFORMING TO REQUIREMENTS OF SECTION 02086-ADJUSTING MANHOLES, INLETS AND VALVE BOXES TO GRADE.
7. 24" TO 72" STORM SEWERS SHALL HAVE TYPE "C" M.H.'S.
8. ALL INLETS TO BE TYPE "B-B" UNLESS OTHERWISE NOTED.

PIPES:

9. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24" AND LARGER RCP (CLASS III, C-76) UNLESS OTHERWISE NOTED.
10. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINTS CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.
11. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
12. STORM SEWERS AND LEADS SHALL BE REINFORCED CONCRETE PIPE, C-76, CLASS III, AND SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATIONS AND DRAWINGS 02317-02, 02317-03, 02317-04, 02317-05, 02317-06 AND 02317-07 (OCT. 2002) AS APPLICABLE.
13. C.G.M.P. (CORRUGATED METAL PIPE) SHALL BE INSTALLED, BEDDED AND BACKFILLED ACCORDING TO FORT BEND COUNTY DETAILS.

BEDDING:

14. ALL SEWERS CONSTRUCTED IN SIDE LOT EASEMENTS SHALL BE R.C.P. (C-76 CLASS III) AND SHALL BE BEDDED IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATIONS AND DETAILS INCLUDED IN THIS PLAN SET AS APPLICABLE - MIN. 25' EASEMENT SHALL BE PROVIDED.
15. ALL SEWERS UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1 1/2 SACK CEMENT/TON STABILIZED SAND AS-PER DETAILS. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL IN 8 INCH LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS ON EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D-698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CEMENT-STABILIZED SAND SPECIFICATION, LATEST EDITION. ALTERNATE TO CEMENT STABILIZED SAND BACKFILL FOR PIPES 54-INCH AND LARGER, FROM 1-FOOT ABOVE THE TOP OF PIPE TO THE BOTTOM OF THE SUBGRADE. CONTRACTOR MAY BACKFILL WITH SUITABLE MATERIAL, PROVIDED THE BACKFILL MATERIAL IS PLACED IN 8-INCH LIFTS AND MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY. TESTS SHALL BE TAKEN AT 100-FOOT INTERVALS ON EACH LIFT. BEDDING AND BACKFILL TO 1-FOOT ABOVE THE TOP OF THE PIPE SHALL BE CEMENT STABILIZED SAND.

UTILITY BACKFILL

1. BACKFILL FOR UTILITIES SHALL BE IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATION 02317 AND PER CITY OF HOUSTON DETAILS INCLUDED IN THESE PLANS OR ANY OTHER APPLICABLE CITY OF HOUSTON DETAILS.
2. BACKFILL COMPACTION TO BE AT A MINIMUM OF 90 PERCENT (OUTSIDE OF PAVEMENT) AND 95 PERCENT (UNDER OR WITHIN ONE (1) FOOT OF PAVEMENT) OF THE MAXIMUM DRY DENSITY AND AT A MOISTURE CONTENT RECOMMENDED FROM GEOTECHNICAL INVESTIGATION.

PAVING

1. GUIDELINES SET FORTH IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
2. CLEAN EXPOSED STEEL AND TIE TO EXISTING PAVEMENT; IF NOT EXPOSED, SAW CUT AND BREAK OFF 24" TO EXPOSE STEEL.
3. ALL CURB RETURN RADII ARE 25', UNLESS OTHERWISE NOTED, AND HAVE A 1% MIN. GRADE.
4. PAVING SHALL BE IN ACCORDANCE WITH FORT BEND "REGULATIONS OF FORT BEND, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE", CITY OF HOUSTON SPECIFICATIONS, PAVEMENT DETAIL SHEET S/D-1 AND THE LATEST REVISIONS AND/OR AMENDMENTS OF SAME.
5. ALL STOP SIGNS SHALL BE T.M.U.T.C.D. STANDARD NO. MR-1-1 (30"X30"). STOP SIGN SHALL BE PLACED AS SHOWN AT RADIUS POINT CURB APPROXIMATELY TWO FEET BEHIND CURB.
6. ALL PROPOSED INLETS TO BE CONSTRUCTED TO AVOID CONFLICTS WITH ANY FUTURE DRIVEWAYS.

SPECIAL CONSTRUCTION NOTES:

1. SUITABLE SURPLUS EXCAVATED MATERIAL FROM CONSTRUCTION OF WATER LINE AND SEWERS SHALL BE: SPREAD AND COMPACTED IN MAXIMUM 8-LOOSE TO 95% STANDARD PROCTOR DENSITY IN ACCORDANCE WITH LOT GRADING LAYOUT.
2. SUITABLE SURPLUS EXCAVATED MATERIAL FROM CONSTRUCTION OF ROADWAY SHALL BE: SPREAD AND COMPACTED IN MAXIMUM 8-LOOSE TO 95% STANDARD PROCTOR DENSITY IN ACCORDANCE WITH LOT GRADING LAYOUT.
3. PRIOR TO CONNECTING PROPOSED SANITARY SEWER TO EXISTING SANITARY SEWER, CONTRACTOR SHALL REMOVE ALL WATER AND DEBRIS FROM PROPOSED SANITARY SEWER SYSTEMS. ENGINEER SHALL BE NOTIFIED 24 HOURS PRIOR TO CLEANING OF PROPOSED SANITARY SEWER SYSTEMS.
4. CONTRACTOR IS RESPONSIBLE FOR FILLING CONTRACTORS NOI AND NOT. INSPECTIONS SHALL BE A MINIMUM OF EVERY 14 CALENDAR DAYS OR AFTER 0.5-INCHES OF RAINFALL, WHICHEVER COMES FIRST. INSPECTOR REPORTS TO BE TURNED IN WITH MONTHLY PROGRESS PAYMENT REQUEST.
5. SHOULD YOU WISH TO UTILIZE THEIR SERVICES CONTACT TRUE GREEN AT 713-784-5555 (JON STANZ) FOR DISABLING AND RESTORING IRRIGATION SYSTEMS. (NO SEPARATE PAY)
6. SHOULD YOU NOT WISH TO UTILIZE TRUE GREEN'S SERVICES, PLEASE HAVE YOUR IRRIGATION SPECIALIST CONTACT TRUE GREEN FOR INSPECTION PRIOR TO BACKFILLING OF ALL RESTORED IRRIGATION INSTALLATION(S).
7. THERE MAY BE EXISTING IRRIGATION, SIDEWALKS AND/OR LANDSCAPING INSTALLED SINCE THE PREPARATION OF THESE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF EXISTING IRRIGATION, SIDEWALKS AND/OR LANDSCAPING PRIOR TO BID. UNLESS THERE IS A BID ITEM PROVIDED, THERE WILL BE NO SEPARATE PAY FOR REPAIR OR REPLACEMENT OF EXISTING IRRIGATION, SIDEWALKS AND/OR LANDSCAPING, INCLUDE COST OF SAME TO WHICH IT IS A COMPONENT PART. ANY REPAIR OR REPLACEMENT OF EXISTING IRRIGATION SYSTEMS AND LANDSCAPING MUST BE EQUAL TO OR BETTER CONDITIONS AND BE INSPECTED AND APPROVED BY OWNER PRIOR TO BACKFILLING.
8. WHEN BRICK PAVERS ARE REQUIRED, BRICK TO BE PAVESTONE "TERRA COTTA" LAID DIAGONALLY.

STORM SEWER CONSTRUCTION NOTES:

1. STORM SEWERS SHALL BE REINFORCED CONCRETE PIPE(C-76, CLASS III), AND SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 02317-02, 02317-03, 02317-05, 02317-06, AND 02317-07(OCT. 2002) AS APPLICABLE UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
2. ALL STORM SEWER CONSTRUCTED IN SIDELOT EASEMENT SHALL BE R.C.P.(C-76, CLASS III) AND SHALL BE BEDDED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS, 02317-02, 02317-03, 02317-05, 02317-06, AND 02317-07 AS APPLICABLE.
3. ALL SEWER UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1-1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.
4. ALL TRENCH BACKFILLS SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS ON EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM D-698/AASHTOT99).
5. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINTS CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.
6. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24-INCH AND LARGER R.C.P. (C-76, CLASS III).
7. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES AND INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL PROVIDE 12" MINIMUM CLEARANCE AT STORM SEWER AND WATER LINE CROSSINGS.
9. ADJUST MANHOLE COVERS TO GRADE CONFORMING TO REQUIREMENTS OF SECTION 02086-ADJUSTING MANHOLES, INLETS AND VALVE BOXES TO GRADE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ANY BACK SLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF HIS WORK.
11. ALL DITCHES SHALL BE REGRADED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE REGRADED, SEEDED, AND FERTILIZED.
12. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

FORT BEND COUNTY GENERAL NOTES

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.
2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV
3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.
4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS AND REQUIREMENTS" RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS AS CURRENTLY AMENDED.
5. ALL ROAD WIDTHS, CURB RADII AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB
6. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.

FORT BEND COUNTY GENERAL NOTES (CONT'D)

7. ALL CONCRETE PAVEMENT SHALL BE 5½ SACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.
8. ALL WEATHER ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
9. 4"X12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY. ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.
10. AT ALL INTERSECTION LOCATIONS, TYPE 7 RAMPS SHALL BE PLACE IN ACCORDANCE WITH TXDOT PED-12A STANDARD DETAIL SHEET. A.D.A. - HANDICAP RAMPS SHALL BE INSTALLED WITH STREET PAVING AT ALL INTERSECTIONS AND COMPLY WITH CURRENT A.D.A. REGULATIONS.
11. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.
12. ALL INTERSECTIONS UTILIZING TRAFFIC CONTROL MEASURES SHALL HAVE A.D.A. WHEEL CHAIR RAMPS INSTALLED.
13. GUIDELINES ARE SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION -BOTH DAY AND NIGHT.
14. ALL R1-1 STOP SIGNS SHALL BE 30"X30" WITH DIAMOND GRADE SHEETING PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
15. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/ REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING WITH UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POST.
16. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF OF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.
17. THE PROJECT AND ALL PARTS THEREOF SHALL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY INSPECTORS DESIGNATED BY FORT BEND COUNTY. NO SUCH INSPECTIONS SHALL RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, REQUIREMENT AND SPECIFICATIONS OF FORT BEND COUNTY OR ANY PROVISION OF THIS PROJECT SHALL BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR TO RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER.

*NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES

COMPACTION OF SITE FILL

1. ALL AREAS TO BE FILLED ARE TO BE FREE OF VEGETATION, DEBRIS, PONDED WATER, LOOSE SOILS, MUD & MUCK. (STRIP 3" MIN.).
2. THE PLACEMENT OF ANY FILL OR THE DISPOSAL OF ANY EXCESS MATERIAL ON ANY PORTION OF THIS PROJECT SHALL BE MADE IN EIGHT (8) INCH LOOSE LIFTS, UNIFORMLY SPREAD AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.

SOUTHCROSS ENERGY

ANY CONTRACTORS OR AGENTS SHALL NOT OPERATE NOR ALLOW THE OPERATION OF ANY EXCAVATING MACHINERY OR ANY OTHER EQUIPMENT UPON, OVER, OR WITHIN 10-FEET OF SOUTHCROSS' PIPELINE(S) OR ON EITHER SIDE THEREOF WITHOUT A SOUTHCROSS REPRESENTATIVE PRESENT.

THE MAXIMUM AXLE LOAD ALLOWABLE OVER THE PIPELINE, WITH 6-FOOT COVER FROM TOP GRADE TO TOP OF PIPE, IS 36,000 LBS./AXLE.

SOUTHCROSS FIELD PERSONNEL SHOULD BE ON SITE DURING CONSTRUCTION TO ENSURE PROPER SOUTHCROSS PROCEDURES ARE ADHERED TO BY CONSTRUCTION CREWS AND OBSERVE CONSTRUCTION EQUIPMENT CROSSING THE PIPELINE DOES NOT EXCEED THE MAXIMUM ALLOWABLE AXLE LOAD.

CONTRACTOR SHALL CONTACT MR. DEAN CRITENDON WITH SOUTHCROSS ENERGY AT 361-550-2707, 48-HOURS PRIOR TO ANY WORK PERFORMED NEAR THE PIPELINE EASEMENT CONTAINING THE SOUTHCROSS ENERGY PIPELINE.

AT NO COST TO THE CONTRACTOR, A SOUTHCROSS REPRESENTATIVE WILL ERECT TEMPORARY FLAGS MARKING THE PIPELINE LOCATION AND SHALL BE PRESENT DURING ALL ACTIVE WORK PERIODS AS DEFINED IN ITEM #12 BELOW TO OBSERVE EXCAVATION OR OTHER CONSTRUCTION ACTIVITIES NEAR THE PIPELINE.

ANY WORK PERFORMED NEAR THE PIPELINE WITHOUT THE PRESENCE OF A SOUTHCROSS REPRESENTATIVE WILL NECESSITATE THAT THE PIPELINE BE EXPOSED FOR INSPECTION AND NEEDED REPAIRS PERFORMED AT THE CONTRACTOR'S OR RESPONSIBLE PARTY'S COST.

1) ALL PIPELINES, UTILITY LINES AND OTHER UNDERGROUND FACILITIES CONSTRUCTED ACROSS A SOUTHCROSS OWNED OR OPERATED PIPELINE MUST BE INSTALLED WITH A MINIMUM VERTICAL SEPARATION OF 24 INCHES BETWEEN STRUCTURES. HORIZONTAL SEPARATIONS WILL BE DETERMINED ON A CASE-BY-CASE BASIS.

2) ALL UNDERGROUND ELECTRICAL CABLES SHALL BE INSTALLED WITH A MINIMUM VERTICAL SEPARATION OF 24 INCHES BETWEEN STRUCTURES WITH ALL PLANS AND WORK CONDUCTED IN A MANNER ACCEPTABLE TO SOUTHCROSS'S ON-SITE REPRESENTATIVE. THE ELECTRICAL CABLE MUST BE ENCLOSED IN CONDUIT (STEEL OR SCHEDULE 80 PVC). IT SHOULD BE COVERED WITH RED REINFORCED CONCRETE WITH A MINIMUM WIDTH OF 6 INCHES ON EACH SIDE AND ABOVE THE CONDUIT, FOR THE ENTIRE WIDTH OF SOUTHCROSS'S RIGHT OF WAY.

3) ALL UNDERGROUND FIBER OPTIC CABLES SHALL BE INSTALLED WITH A MINIMUM VERTICAL SEPARATION OF 24 INCHES BETWEEN STRUCTURES WITH ALL PLANS AND WORK CONDUCTED IN A MANNER ACCEPTABLE TO SOUTHCROSS'S ON-SITE REPRESENTATIVE. HORIZONTAL SEPARATIONS WILL BE DETERMINED ON A CASE-BY-CASE BASIS. IN ADDITION, THE FIBER OPTIC CABLE MUST BE ENCLOSED IN CONDUIT (STEEL OR SCHEDULE 80 PVC).

4) ALL PROPOSED ROADS, STREETS, OR DRIVEWAYS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 48 INCHES, INCLUDING THE SUB-GRADE, AS MEASURED FROM THE TOP OF THE SOUTHCROSS PIPELINE TO THE BOTTOM OF THE PAVEMENT (ROAD, STREET, OR DRIVEWAY). IF A SOUTHCROSS PIPELINE WILL REQUIRE ADJUSTMENT TO ACCOMMODATE A ROADWAY, STREET OR DRIVEWAY CROSSING, THE COST OF ANY SUCH LOWERING OR RELOCATION SHALL BE BORNE BY THE PARTY OR PARTIES REQUESTING THE ADJUSTMENT. WITH EACH REQUEST INVOLVING ROADS, STREETS OR DRIVEWAYS, SOUTHCROSS WILL RESERVE THE RIGHT TO EXCAVATE TO EXPOSE AND INSPECT ITS PIPELINE(S) TO DETERMINE THE NEED FOR PIPE REPLACEMENT, FULL ENCASEMENT, OR HEAVY WALL PIP. THE COST OF THIS ACTIVITY WILL BE AT THE EXPENSE OF THE REQUESTING PARTY.

PIPELINE MINIMUM COVER REQUIREMENTS:

- 48 INCHES FROM BOTTOM OF PAVEMENT UNDER A ROAD, STREET OR DRIVEWAY.
- 36 INCHES UNDER ALL OTHER SURFACES WITHIN THE RIGHT OF WAY.

5) ALL ROAD DITCH AND DRAINAGE CANAL/DITCH CROSSINGS SHALL BE CONSTRUCTED WITH A MINIMUM COVER, AND MEASURED FROM THE LOWEST POINT IN ROAD BAR DITCH, TO THE TOP OF PIPE, AS FOLLOWS:

- CONCRETE LINED - 12 INCHES
- UNLINED - 36 INCHES

ANY DRAINAGE CANALS SHALL BE CONSTRUCTED WITH A MINIMUM OF 60 INCHES OF COVER BELOW THE ULTIMATE FLOW LINE.

6) ALL PAVING (OTHER THAN FOR ROAD, DRIVEWAY OR STREET CROSSINGS OF A SOUTHCROSS PIPELINE, E.G., PARKING LOT) TO BE CONSTRUCTED OVER A SOUTHCROSS PIPELINE SHALL (A) BE REINFORCED, (B) NOT EXCEED 4 INCHES IN THICKNESS, (C) BE SECTIONED IN 10 FOOT BY 15 FOOT PANELS (15' DIMENSION SHALL BE PERPENDICULAR TO THE PIPELINE) WITH APPROPRIATE EXPANSION JOINTS, (D) CONTAIN LIFTING RINGS, AND (E) CONFORM TO THE MINIMUM COVER REQUIREMENTS STIPULATED ABOVE.

7) TEMPORARY (HAUL) ROAD CROSSINGS SHALL BE CONSTRUCTED WITH A MINIMUM GROUND COVER (AS MEASURED FROM THE SURFACE OF THE ROAD TO THE TOP OF THE PIPELINE) OF FIVE (5) FEET. A TEMPORARY EARTHEN BERM MAY BE CONSTRUCTED TO MEET THIS REQUIREMENT. WHERE IT IS NECESSARY FOR HEAVY EQUIPMENT TO CROSS THE PIPELINE, ADDITIONAL MEASURES MAY BE NEEDED TO EFFECTIVELY DISTRIBUTE THE WEIGHT OF SUCH EQUIPMENT, FOR EXAMPLE, INSTALLING ADDITIONAL COVER, TIMBER MATTING AND/OR A TEMPORARY BRIDGE FOR PASSAGE OVER THE PIPELINE.

8) LAKES OR OTHER BODIES OF WATER SHALL NOT BE CONSTRUCTED OVER THE PIPELINE OR WITHIN THE BOUNDARIES OF THE PIPELINE EASEMENT. ADDITIONALLY, THE SURFACE CANNOT BE DEVELOPED OR CHANGED IN A WAY THAT WOULD CAUSE RAINWATER OR RUNOFF TO COLLECT ON THE PIPELINE RIGHT-OF-WAY.

9) DIRECTIONAL DRILLING OR BORING SHALL REQUIRE ADDITIONAL DAMAGE PREVENTION MEASURES, WHETHER INSTALLING A CROSSING OR OTHERWISE CONDUCTING SUCH OPERATIONS WITHIN TWENTY (20) FEET OF THE PIPELINE. IT IS SOUTHCROSS'S OPTION WHETHER PEEPHOLES OR SHEET PILING BE INSTALLED TO AN ELEVATION LOWER THAN THE PIPELINE, BEFORE DRILLING/BORING TO HELP ENSURE ITS PROTECTION. SOUTHCROSS REQUIRES CONTINUOUS TRACKING OF THE DRILLING HEAD AS WELL AS USING A PHYSICAL TECHNIQUE (SUCH AS PROBING) TO ASCERTAIN THE EXACT LOCATION OF THE HEAD BEFORE IT CROSSES THE SOUTHCROSS PIPELINE. SOUTHCROSS MAY ALSO REQUIRE THAT THE PIPELINE BE EXPOSED WHEN NEAR DRILL/BORE ENTRY OR EXIT POINTS.

10) IF SOUTHCROSS DETERMINES IT IS NECESSARY TO LOWER, ENCASE OR OTHERWISE ADJUST A SOUTHCROSS PIPELINE BECAUSE OF THE LANDOWNER'S (DEVELOPER, ETC.) CONSTRUCTION ACTIVITY, THE LANDOWNER OR DEVELOPER SHALL REIMBURSE SOUTHCROSS FOR THE COST OF LOWERING, ENCASEMENT OR OTHER ADJUSTMENT.

11) PLEASE NOTIFY OUR GAS CONTROL @ 1-877-880-9022 AT LEAST 48 HOURS PRIOR TO COMMENCING ANY EXCAVATING OR CONSTRUCTION ACTIVITY IN THE VICINITY OF ANY SOUTHCROSS PIPELINE. EXCAVATORS ARE REQUIRED BY LAW TO CONTACT THE APPROPRIATE ONE-CALL CENTER FOR THEIR STATE. IN TEXAS, CALL 1-800-DIG-TESS, PRIOR TO COMMENCING EXCAVATION OR OTHER SUCH CONSTRUCTION ACTIVITY, WHICH MAY IMPACT AN UNDERGROUND UTILITY. IF YOU ARE UNABLE TO CONTACT THE ABOVE SOUTHCROSS REPRESENTATIVE, CONTACT THE PIPELINE CONTROL CENTER, AND THE INFORMATION WILL BE RELAYED. PIPELINE CONTROL CENTER, 24 HOURS, 1-877-880-9022

12) NO EXCAVATING OR OTHER CONSTRUCTION ACTIVITY THAT COULD IMPACT THE PIPELINE (E.G., DIRECTIONAL DRILLING, BORING, SHEET PILING, SETTING TRENCH BOXES, ETC.) SHALL BE CONDUCTED WITHIN FIVE (5) FEET OF ANY SOUTHCROSS PIPELINE IN THE ABSENCE OF A SOUTHCROSS REPRESENTATIVE. NOTICE SHALL BE GIVEN TO SOUTHCROSS AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCING EACH OCCURRENCE OF CONSTRUCTION ACTIVITY WITHIN FIVE (5) FEET OF ANY SOUTHCROSS PIPELINE.

13) ANY CONTRACTOR, DEVELOPER, ETC., PLANNING BLASTING OPERATIONS WITHIN 500 FEET OF ANY SOUTHCROSS PIPELINE SHALL SUBMIT A BLASTING PLAN TO SOUTHCROSS FOR APPROVAL. THIS PLAN WILL INCLUDE HOLE DEPTH, DIAMETER, SPACING, BURDEN, DELAY TIMES, MAXIMUM CHARGE WEIGHT PER DELAY, SEQUENCE, EXPLOSIVE TYPE AND BLAST ZONE LOCATION RELATIVE TO THE SOUTHCROSS PIPELINE. UNDER NO CIRCUMSTANCES WILL BLASTING OR SEISMIC SHOT HOLES BE ALLOWED WITHIN ONE HUNDRED (100) FEET OF ANY SOUTHCROSS PIPELINE.

14) NO SIGNS, MONUMENTS, BUILDING, STRUCTURES, MANHOLES, SHRUBBERY, OR TREES SHALL BE LOCATED WITHIN A SOUTHCROSS RIGHT OF WAY AND EASEMENT AREA SO THAT THE PIPELINE CAN BE MAINTAINED WITHOUT DAMAGING THESE STRUCTURES OR BEING IMPEDED BY THEM.

15) NO EXCAVATIONS SHALL BE MADE ON LAND ADJACENT TO ANY SOUTHCROSS PIPELINE WHICH WILL IN ANY WAY IMPAIR, WITHDRAW LATERAL SUPPORT, CAUSE SUBSIDENCE, CREATE THE ACCUMULATION OF WATER, OR CAUSE DAMAGE TO THE SOUTHCROSS PIPELINE OR RIGHT OF WAY.

16) NO FENCE SHALL BE PLACED ACROSS A SOUTHCROSS RIGHT OF WAY WITHOUT WRITTEN PERMISSION FROM SOUTHCROSS. IF FENCES ARE PERMITTED, 14 FOOT GATES MUST BE INSTALLED ON THE RIGHT OF WAY.

17) SIDE CUTTERS SHALL BE REMOVED FROM THE BUCKET OF EXCAVATION EQUIPMENT, AND A BAR SHALL BE INSTALLED ACROSS THE TEETH DURING EXCAVATION IN THE VICINITY OF ANY SOUTHCROSS PIPELINE.

18) NO PAVING IS TO BE PLACED OVER ANY SOUTHCROSS RIGHT OF WAY WITHOUT WRITTEN PERMISSION FROM SOUTHCROSS.

19) ANY DAMAGE TO EXISTING SOUTHCROSS PIPELINE MARKERS AND/OR SIGNS, TEST LEADS, VENT PIPES, FENCES, GATES AND/OR ANY OTHER ASSOCIATED PIPELINE APPARATUS RESULTING FROM ANY CONSTRUCTION OPERATIONS SHALL BE REPAIRED TO SOUTHCROSS'S SATISFACTION OR REPLACED AT THE SOLE COST AND EXPENSE BY THE DAMAGING PARTY WITH 15 DAYS AFTER THE DAMAGE HAS OCCURRED.

20) ALL WRITTEN REQUESTS SHOULD BE SUPPORTED WITH PLANS AND FORWARDED TO:

SOUTHCROSS ENERGY DEAN CRITENDON 15416 MUECK RD. NEEDVILLE, TX 77461	OR	SOUTHCROSS ENERGY JAMES WOOD 1908 NORTH LAURENT SUITE 560 VICTORIA, TX 77901

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY 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 under ground line can be marked. This verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

[signature] Date: 10-26-17
CenterPoint Energy/Natural Gas Facilities Verification 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: 10-26-17
CenterPoint Energy/UNDERGROUND Electric Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification.)
Signature Valid for six months.

[signature] Date: 10-26-17
Approval for CONSOLIDATED COMMUNICATION underground conduit facilities only. Signature Valid for One Year

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY.
UTILITY LINES APPROVED AS TO LOCATION ONLY.
AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: [signature]
DEVELOPMENT COORDINATOR

DATE: 9/20/17

PRIVATE UTILITY NOTES

CAUTION: AT&T TEXAS/SWBT CABLES

THE LOCATION OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.

THE CONTRACTOR SHALL CALL 1-800-344-8377 MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED. WHEN EXCAVATING WITH EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.

WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES IN THE AREA. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER MR. ROOSEVELT LEE JR. AT (713)567-4552 OR EMAIL HIM AT RL7259@ATT.COM. IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES **(TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE LLC. WHERE APPLICABLE)** ARE SHOWN 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 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713)945-8037(7:00 AM TO 4:30 PM). 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 ELECTRICAL LINES

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 AND 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 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) 207-6348 OR (713) 207-5769.

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
[signature] 7-20-17
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

GENERAL CONSTRUCTION SHEET

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

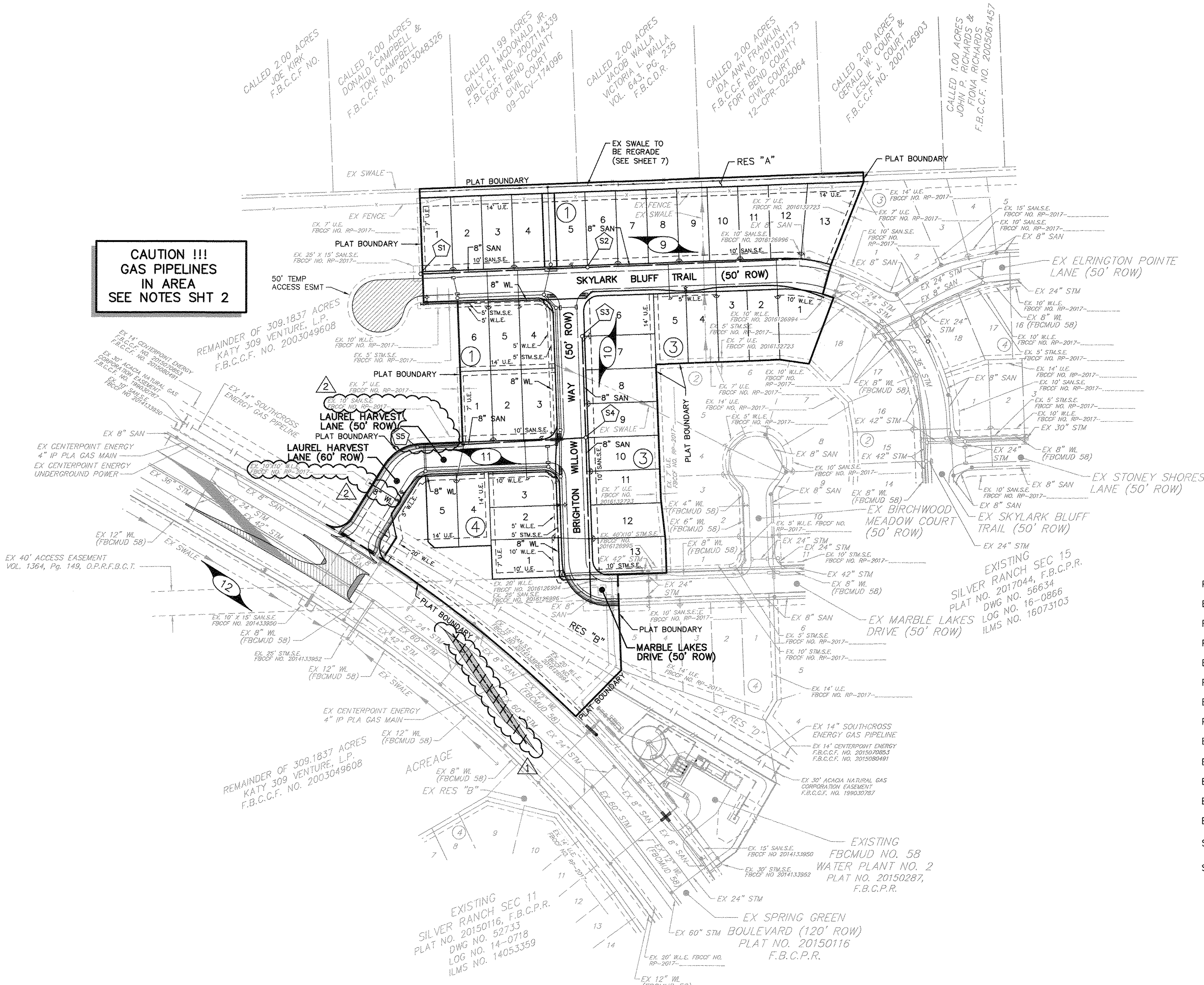
WATER [signature] 08/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER [signature] 8/3/17	STORM WATER QUALITY
STORM [signature] 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:

FOR CITY OF HOUSTON USE ONLY
58779

DRAWING SCALE
HORZ: N.T.S.
VERT:

SHEET No: 2 OF 25



BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

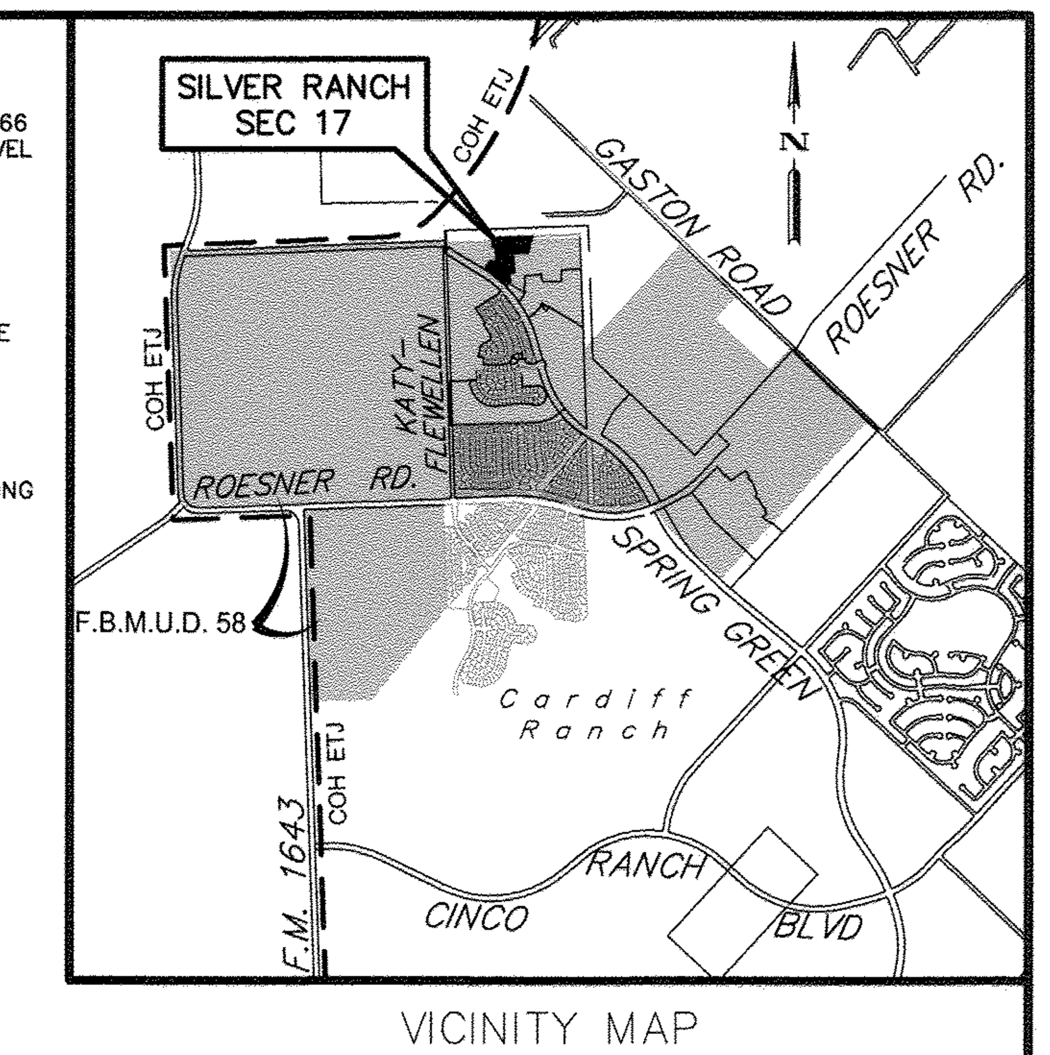
ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT



VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

NOTICE
FOR LOCATION OF UNDERGROUND UTILITY LINES, CALL 811, 48 HOURS BEFORE EXCAVATING.

PERMIT NOTES:

1. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY FORT BEND COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN COUNTY ROAD RIGHT-OF-WAY. THE PERMIT IS TO BE ISSUED IN THE OWNERS NAME.
2. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF FORT BEND COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.

WATER USAGE NOTE:
CONTRACTOR SHALL NOTIFY DISTRICT OPERATOR 24 HOURS PRIOR TO UTILIZING ANY AMOUNT OF DISTRICT WATER AND BEFORE OPERATING ANY VALVES, FIRE HYDRANTS OR APPURTENANCE OF THE DISTRICT WATER SUPPLY, STORAGE OR DISTRIBUTION SYSTEM.

GENERAL NOTES:

1. "U.E." INDICATES "UTILITY EASEMENT".
2. "W.L.E." INDICATES "WATER LINE EASEMENT".
3. "SAN.S.E." INDICATES "SANITARY SEWER EASEMENT".
4. "STM.S.E." INDICATES "STORM SEWER EASEMENT".
5. "D.E." INDICATES "DRAINAGE EASEMENT".
6. "TEMP.D.E." INDICATES "TEMPORARY DRAINAGE EASEMENT".
7. ALL 14 FOOT UTILITY EASEMENTS SHOWN EXTEND 7 FEET ON EACH SIDE OF A COMMON LOT LINE UNLESS OTHERWISE INDICATED.
8. ALL SANITARY SEWERS ARE 8" UNLESS OTHERWISE INDICATED.
9. ALL WATER LINES ARE 8" UNLESS OTHERWISE INDICATED.

LEGEND

PROPOSED WATER LINE, GV & BOX WITH FIRE HYDRANT
EXISTING WATER LINE, GV & BOX WITH FIRE HYDRANT
PROPOSED SANITARY SEWER LINE, MANHOLE AND STACK
PROPOSED FAR SIDE SERVICE LEAD WITH STACK
EXISTING SANITARY SEWER LINE, MANHOLE AND STACK
PROPOSED STORM SEWER LINE, MANHOLE AND B-B INLETS
EXISTING STORM SEWER LINE, MANHOLE AND B-B INLETS
PROPOSED FORCE MAIN
EXISTING FORCE MAIN
EXISTING CENTERPOINT ENERGY HL&P CONDUIT
EXISTING CENTERPOINT ENERGY HL&P OVERHEAD LINE
EXISTING CENTERPOINT ENERGY GAS LINE
EXISTING AT&T TEXAS/SBC CABLES
SANITARY SEWER MANHOLE (1S)
SHEET REFERENCE NUMBER (5)

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
2	10/10/17	EXTEND WATER LINE AND SANITARY SEWER	AP
1	10/4/17	REMOVED ASPHALT TRANSITION	

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Houston, TX 77042
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STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
10-12-17
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

SANITARY SEWER AND WATER OVERALL

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER 10-12-17	TRAFFIC AND TRANSPORTATION
WASTEWATER 10/12/17	STORM WATER QUALITY
STORM Megan Jan 10/12/17	FACILITIES
STREET & BRIDGE	

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: ____ DEVELOPMENT COORDINATOR

DATE: 11/6/17

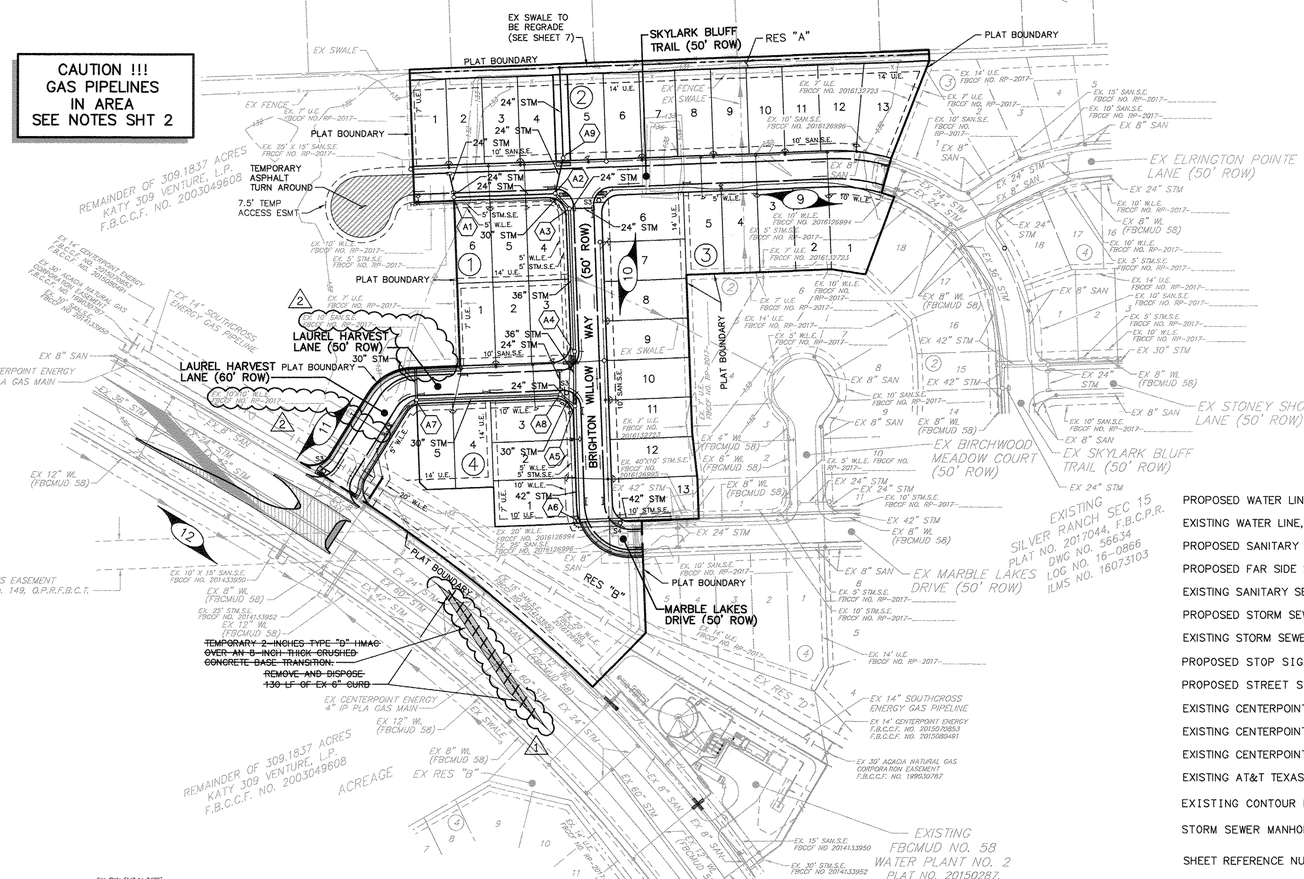
FILE NO:

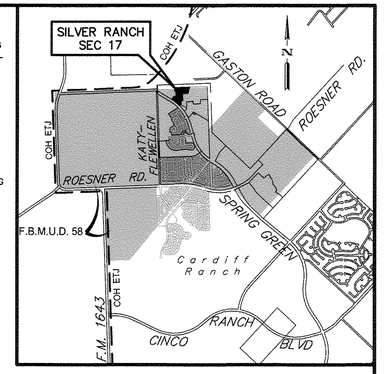
FOR CITY OF HOUSTON USE ONLY
58779

DRAWING SCALE
HORZ : 1"= 100'
VERT :

SHEET No: 3A OF 25

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\03_SR17_UTIL1.dwg





VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTICE
FOR LOCATION OF UNDERGROUND UTILITY LINES, CALL 811, 48 HOURS BEFORE EXCAVATING.

PERMIT NOTES:
1. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY FORT BEND COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN COUNTY ROAD RIGHT-OF-WAY. THE PERMIT IS TO BE ISSUED IN THE OWNERS NAME.
2. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF FORT BEND COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.

GENERAL NOTES:
1. "U. E." INDICATES "UTILITY EASEMENT".
2. "W. L. E." INDICATES "WATER LINE EASEMENT".
3. "SAN. S. E." INDICATES "SANITARY SEWER EASEMENT".
4. "STM. S. E." INDICATES "STORM SEWER EASEMENT".
5. "D. E." INDICATES "DRAINAGE EASEMENT".
6. "TEMP. D. E." INDICATES "TEMPORARY DRAINAGE EASEMENT".
7. ALL 14 FOOT UTILITY EASEMENTS SHOWN EXTEND 7 FEET ON EACH SIDE OF A COMMON LOT LINE UNLESS OTHERWISE INDICATED.
8. ALL RCP STORM SEWERS ARE 24" UNLESS OTHERWISE INDICATED.

LEGEND

- PROPOSED WATER LINE, GV & BOX WITH FIRE HYDRANT
- EXISTING WATER LINE, GV & BOX WITH FIRE HYDRANT
- PROPOSED SANITARY SEWER LINE, MANHOLE AND STACK
- PROPOSED FAR SIDE SERVICE LEAD WITH STACK
- EXISTING SANITARY SEWER LINE, MANHOLE AND STACK
- PROPOSED STORM SEWER LINE, MANHOLE AND B-B INLETS
- EXISTING STORM SEWER LINE, MANHOLE AND B-B INLETS
- PROPOSED STOP SIGN WITH STREET SIGN (S3)
- PROPOSED STREET SIGN (S4)
- EXISTING CENTERPOINT ENERGY HL&P CONDUIT
- EXISTING CENTERPOINT ENERGY HL&P OVERHEAD LINE
- EXISTING CENTERPOINT ENERGY GAS LINE
- EXISTING AT&T TEXAS/SBC CABLES
- EXISTING CONTOUR LINE
- STORM SEWER MANHOLE (A1)
- SHEET REFERENCE NUMBER (5)

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
2			
1	10/10/17	EXTEND WATER LINE AND SANITARY SEWER	AP
1	10/4/17	REMOVED ASPHALT TRANSITION	AP

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STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
10-12-17
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

STORM SEWER AND PAVING OVERALL

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	10-12-17	TRAFFIC AND TRANSPORTATION
WASTEWATER	10/19/17	STORM WATER QUALITY
STORM	10/12/17	FACILITIES
STREET & BRIDGE		

FILE NO:

DRAWING SCALE
HORZ :1"=100'
VERT :

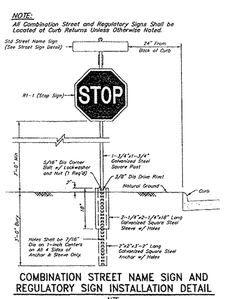
SHEET No: 4A OF 25

FOR CITY OF HOUSTON USE ONLY
58779

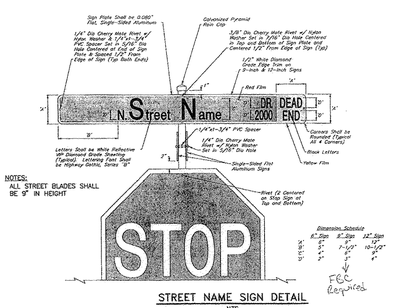
FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 11/6/17



COMBINATION STREET NAME SIGN AND REGULATORY SIGN INSTALLATION DETAIL
NTS



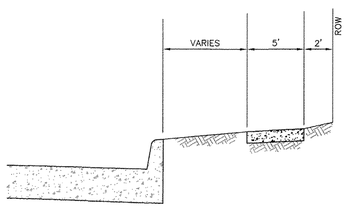
NOTES:
ALL STREET BLADES SHALL BE 9" IN HEIGHT

STREET NAME SIGN DETAIL
NTS

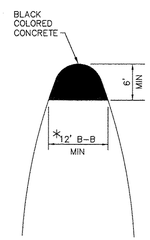
TABLE 1

REINFORCING STEEL BAR SIZES AND SPACINGS FOR VARIOUS PAVEMENT THICKNESSES (D) WITH: EXPANSION JOINT SPACING = 80 FT
fc' = 3,500 PSI AND fy = 60,000 PSI

PAVEMENT THICKNESS D (IN)	PAVEMENT WIDTH (FT)	LONGITUDINAL STEEL # 4 BARS NUMBER OF BARS	LONGITUDINAL STEEL # 4 BARS SPACING (IN)	TRANSVERSE STEEL # 4 BARS END BAR SPACING (IN)	TRANSVERSE STEEL # 4 BARS SPACING (IN)
6	28	17	20.50	4	36
7	25	17	18.25	4	36
7	41	29	18.00	3	36
7	45	31	17.25	3	36



SIDEWALK LOCATION
N.T.S.

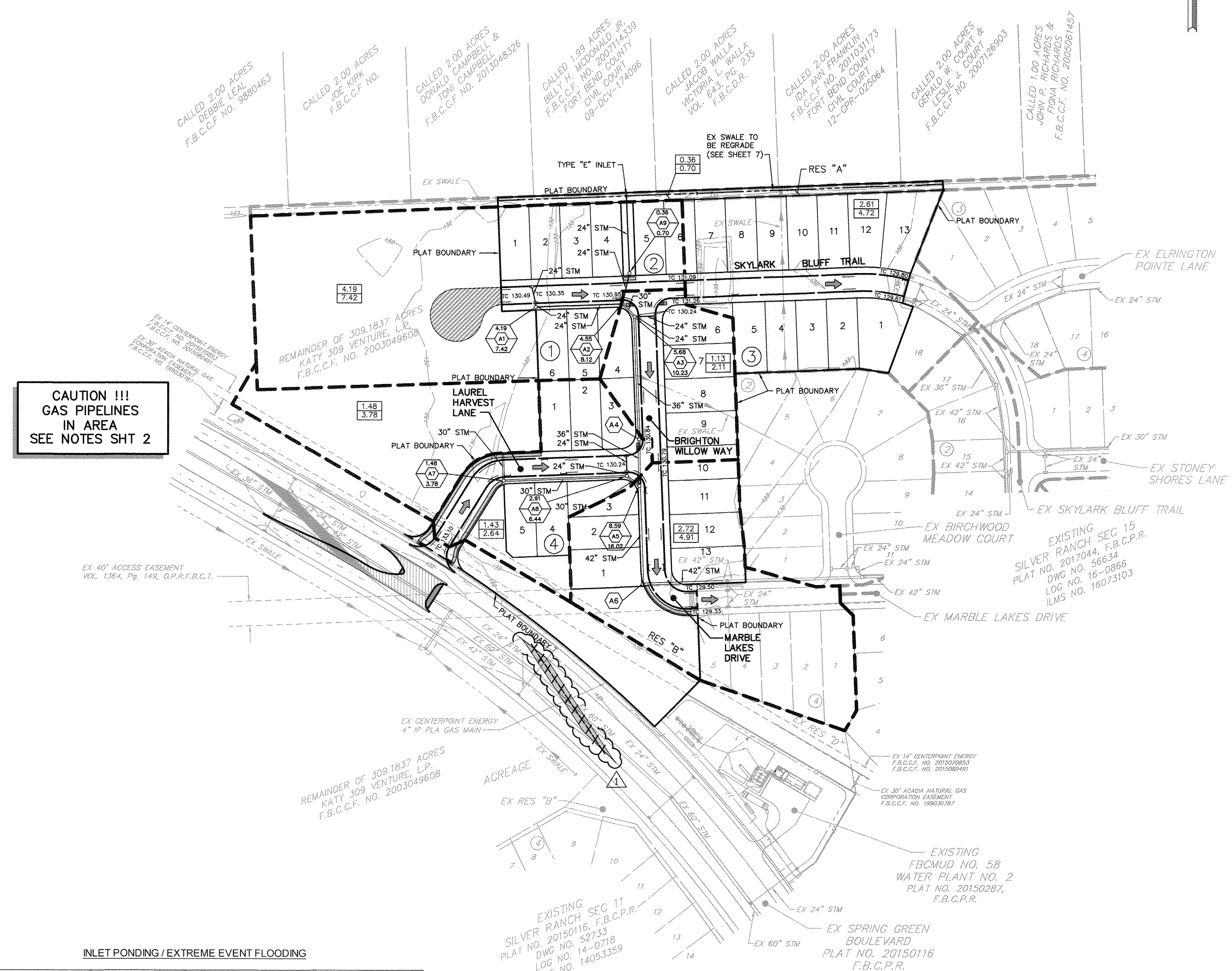


*IF NEEDED CONTINUE LENGTH OF MEDIAN NOSE UNTIL WIDTH IS A MINIMUM OF 12-FT B-B

**NO SEPARATE PAY

BLACK COLORED CONCRETE MEDIAN NOSE DETAIL
NTS

X:\Districts\FBCMUD058\Silver_Ranch_17-4818\GIS_CAD\01_Construction_Plans\01_Sheets\04_SR17_OTL2.dwg



BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

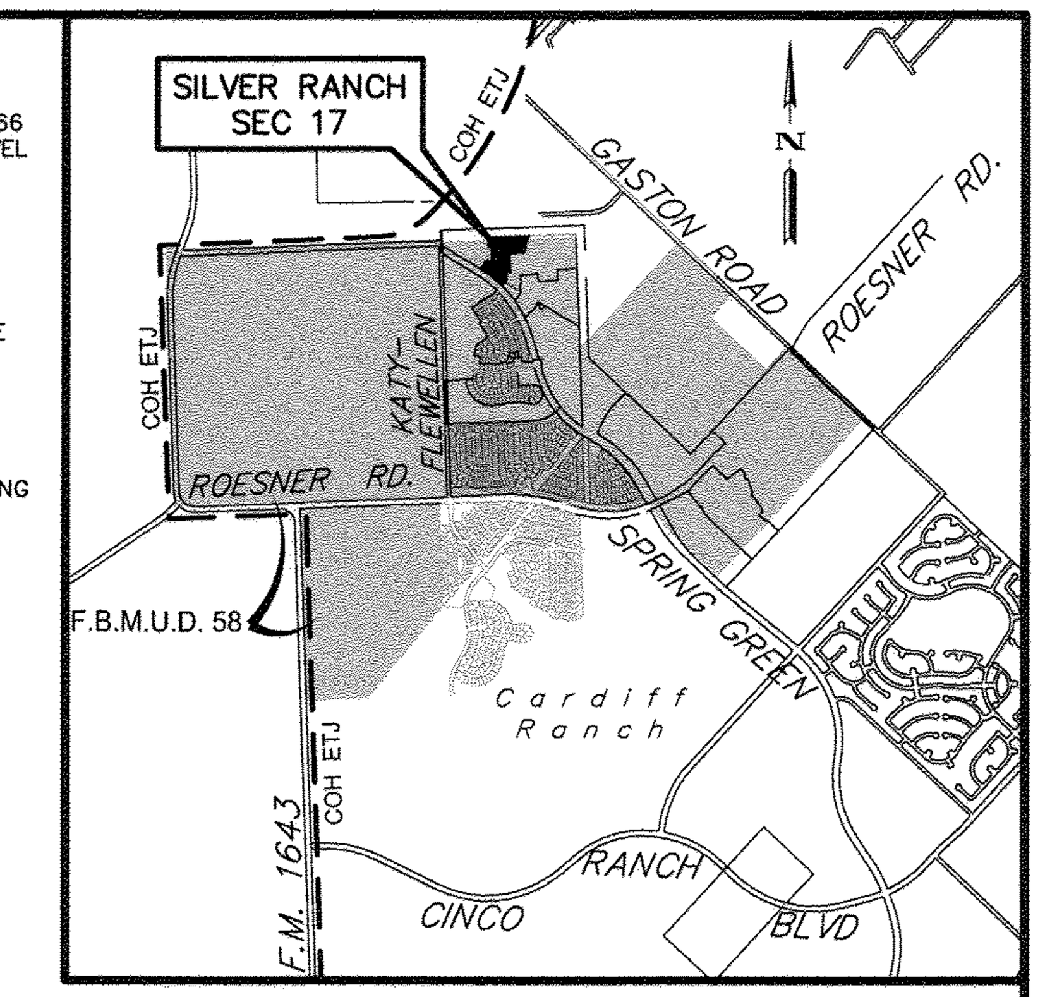
ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT



VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

LEGEND:

- DRAINAGE AREA BOUNDARY
- 1.85 / 2.56 — ACREAGE / CFS
- 1.85 / A1 / 2.56 — CUMULATIVE ACREAGE / MANHOLE NUMBER / CUMULATIVE CFS
- A10 — STORM MANHOLE NUMBER
- EXISTING STORM INLETS & MANHOLE
- PROPOSED STORM INLETS & MANHOLE
- EXTREME EVENT SHEET FLOW DIRECTION
- EXISTING CONTOUR LINE

SEE SHT 6 FOR DRAINAGE CALCULATIONS

INLET PONDING / EXTREME EVENT FLOODING

	Curb @ Inlet		Curb @ High Point		Ponding		
MH	Height (in)	TC	Height (in)	TC	Depth above TC @ Inlet	MAX ELEV.	100 YR WSE
A1	4	130.35	6	131.09	0.24	130.59	128.54
A3	4	130.24	4	130.79	0.22	130.46	128.54
A8	4	130.24	6	130.79	0.05	130.29	128.54

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1	10/4/17	REMOVED ASPHALT TRANSITION	AP

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10-12-17
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FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

DRAINAGE AREA MAP

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER 10-12-17
WASTEWATER 10/12/17
STORM 10/12/17
STREET & BRIDGE
TRAFFIC AND TRANSPORTATION
STORM WATER QUALITY
FACILITIES

FILE NO:

FOR CITY OF HOUSTON USE ONLY
58779

FORT BEND COUNTY ENGINEERING DEPARTMENT
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APPROVED: ____________
DEVELOPMENT COORDINATOR

DATE: 11/6/17

DRAWING SCALE
HORZ : 1" = 100'
VERT :

SHEET No: 5A OF 25

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\05_SR17_DAM.dwg

2-YEAR STORM CALCULATIONS

(CITY OF HOUSTON 2 YEAR STORM SEWER FREQUENCY - b=75.01 d=16.2 e=0.8315)

From MH	To MH	Sub Area (ac)	Sub Runoff Coeff. C	Total Area A (ac)	Sum of C A	Intensity I (in / hr)	Sum of Flows Q (cfs)	Time of Conc. TC (min)	LINE: Reach Length (ft)	LINE: Diameter (in) or span x rise (ft)	LINE: Slope (%)	LINE: Manning's "n"	DESIGN: Capacity Q (cfs)	DESIGN: Velocity V (fps)	Drop at Down stream Manhole	Actual Velocity (fps)	HYD. GRAD: Hydraulic Gradient (%)	HYD. GRAD: Change in Head (ft)	HYD. GRAD: Elev. Up Stream (ft)	HYD. GRAD: Elev. Down Stream (ft)	TC Upstream (ft)	TC Downstream (ft)	Flowline Upstream (ft)	Flowline Downstream (ft)
EX17	EX5	2.61	0.55	2.61	1.44	3.29	4.72	26.84	96	24	0.18	0.013	9.60	3.06		3.03	0.180	0.173	126.68	126.51	129.68	130.03	124.68	124.51
A1	A2	4.19	0.55	4.19	2.30	3.22	7.42	27.87	141	24	0.18	0.013	9.60	3.06	0.50	3.37	0.180	0.254	126.92	126.66	131.35	130.95	123.35	123.09
A2	A3	0.00	0.55	4.55	2.50	3.18	7.95	28.64	29	30	0.13	0.013	14.79	3.01	0.50	3.06	0.130	0.038	126.66	126.63	130.95	130.24	122.59	122.55
A3	A4	0.00	0.55	4.19	2.30	3.18	7.42	28.64	199	36	0.11	0.013	22.12	3.13		2.79	0.110	0.219	126.63	126.41	130.24	130.24	122.05	121.83
A4	A5	1.13	0.55	5.68	3.12	3.17	9.89	28.80	67	36	0.11	0.013	22.12	3.13	0.50	3.02	0.110	0.074	126.41	126.33	130.24	130.75	121.83	121.76
A5	A6	0.00	0.55	8.59	5.09	3.15	16.02	29.16	168	42	0.09	0.013	30.18	3.14	2.65	3.16	0.090	0.151	126.33	126.18	130.75	129.96	121.26	121.11
A6	EX18	0.00	0.55	8.59	5.09	3.09	16.02	30.05	138	42	0.09	0.013	30.18	3.14		3.16	0.090	0.124	126.18	126.06	129.96	129.33	118.46	118.34
EX18	EX19	2.72	0.55	11.31	6.59	3.05	20.13	30.78	220	42	0.09	0.013	30.18	3.14		3.35	0.090	0.198	126.06	125.86	129.33	129.88	118.34	118.14
EX19	EX20	2.35	0.55	13.66	7.88	2.99	23.59	31.95	133	42	0.09	0.013	30.18	3.14		3.46	0.090	0.120	125.86	125.74	129.88	129.20	118.14	118.02
EX20	EX21	0.25	0.55	13.91	8.02	2.96	23.71	32.66	25	42	0.09	0.013	30.18	3.14		3.46	0.090	0.022	125.74	125.72	129.29	129.40	118.02	118.00
STUB	A7	1.48	0.80	1.48	1.18	3.36	3.98	25.71	45	30	0.13	0.013	14.79	3.01		2.54	0.130	0.059	126.68	126.62	131.00	131.82	123.21	123.15
A7	A8	0.00	0.55	1.48	1.18	3.34	3.98	25.96	201	30	0.13	0.013	14.79	3.01		2.54	0.130	0.261	126.62	126.36	131.82	130.24	123.15	122.89
A8	A5	1.43	0.55	2.91	1.97	3.27	6.44	27.08	22	30	0.13	0.013	14.79	3.01		2.90	0.130	0.029	126.36	126.33	130.24	130.75	122.89	122.86
A INL	A9	0.36	0.55	0.36	0.20	3.52	0.70	23.35	45	24	0.18	0.013	9.60	3.06		1.76	0.180	0.081	127.35	127.27	131.60	130.95	125.35	125.27
A9	A2	0.00	0.55	0.36	0.20	3.51	0.70	23.60	22	24	0.18	0.013	9.60	3.06		1.76	0.180	0.040	127.27	127.23	130.95	130.95	125.27	125.23

ETJ DETENTION PLANS INFORMATION:

1. STORM WATER DETENTION PLANS:
   IS PROVIDED IN: SILVER RANCH DETENTION PHASE SIX (TITLE)
   ENGINEERING FIRM: BGE (COMPANY NAME)
   DATE SIGNED AND APPROVED BY: FBC FEBRUARY 2, 2016 (AGENCY)
2. STORM WATER DRAINAGE DESIGN REPORT:
   REPORT TITLE: 469.5 AC SILVER RANCH DEVELOPMENT
   DATE: SEPT. 26, 2005 ENGINEERING FIRM: BGE
   DATE OF ACKNOWLEDGEMENT BY: FORT BEND COUNTY DRAINAGE DISTRICT
3. INCREASED IMPERVIOUS COVER= 18.19 ACRES (DRAINAGE DISTRICT)
   DETENTION RATE REQUIRED= 0.69 ACRE-FEET/ACRE
   DETENTION RATE PROVIDED= 0.69 ACRE-FEET/ACRE

100-YEAR STORM CALCULATIONS

(CITY OF HOUSTON 100 YEAR STORM SEWER FREQUENCY - b=125.4 d=21.8 e=0.75)

From MH	To MH	Sub Area (ac)	Sub Runoff Coeff. C	Total Area A (ac)	Sum of C A	Intensity I (in / hr)	Sum of Flows Q (cfs)	Time of Conc. TC (min)	LINE: Reach Length (ft)	LINE: Diameter (in) or span x rise (ft)	LINE: Slope (%)	LINE: Manning's "n"	DESIGN: Capacity Q (cfs)	DESIGN: Velocity V (fps)	Drop at Down stream Manhole	Actual Velocity (fps)	HYD. GRAD: Hydraulic Gradient (%)	HYD. GRAD: Change in Head (ft)	HYD. GRAD: Elev. Up Stream (ft)	HYD. GRAD: Elev. Down Stream (ft)	TC Upstream (ft)	TC Downstream (ft)	Flowline Upstream (ft)	Flowline Downstream (ft)
EX17	EX5	2.61	0.55	2.61	1.44	6.81	9.77	26.84	96	24	0.18	0.013	**9.60**	3.06		3.11	0.187	0.179	127.94	127.76	129.68	130.03	124.68	124.51
A1	A2	4.19	0.55	4.19	2.30	6.70	15.45	27.87	141	24	0.18	0.013	**9.60**	3.06	0.50	4.92	0.466	0.657	128.70	128.04	131.35	130.95	123.35	123.09
A2	A3	0.00	0.55	4.55	2.50	6.63	16.58	28.64	29	30	0.13	0.013	**14.79**	3.01	0.50	3.38	0.163	0.047	128.04	127.99	130.95	130.24	122.59	122.55
A3	A4	0.00	0.55	4.19	2.30	6.63	15.45	28.64	199	36	0.11	0.013	22.12	3.13		3.37	0.110	0.219	127.99	127.77	130.24	130.24	122.05	121.83
A4	A5	1.13	0.55	5.68	3.12	6.61	20.65	28.80	67	36	0.11	0.013	22.12	3.13	0.50	3.55	0.110	0.074	127.77	127.70	130.24	130.75	121.83	121.76
A5	A6	0.00	0.55	8.59	5.09	6.58	33.50	29.16	168	42	0.09	0.013	**30.18**	3.14	2.65	3.48	0.111	0.186	127.70	127.51	130.75	129.96	121.26	121.11
A6	EX18	0.00	0.55	8.59	5.09	6.49	33.50	30.05	138	42	0.09	0.013	**30.18**	3.14		3.48	0.111	0.153	127.51	127.36	129.96	129.33	118.46	118.34
EX18	EX19	2.72	0.55	11.31	6.59	6.42	42.32	30.78	220	42	0.09	0.013	**30.18**	3.14		4.40	0.177	0.389	127.36	126.97	129.33	129.88	118.34	118.14
EX19	EX20	2.35	0.55	13.66	7.88	6.32	49.80	31.95	133	42	0.09	0.013	**30.18**	3.14		5.18	0.245	0.326	126.97	126.64	129.88	129.20	118.14	118.02
EX20	EX21	0.25	0.55	13.91	8.02	6.26	50.17	32.66	25	42	0.09	0.013	**30.18**	3.14		5.21	0.249	0.082	126.64	126.58	129.29	129.40	118.02	118.00
STUB	A7	1.48	0.80	1.48	1.18	6.93	8.20	25.71	45	30	0.13	0.013	14.79	3.01		3.09	0.130	0.059	128.05	127.99	131.00	131.82	123.21	123.15
A7	A8	0.00	0.55	1.48	1.18	6.90	8.20	25.96	201	30	0.13	0.013	14.79	3.01		3.09	0.130	0.261	127.99	127.73	131.82	130.24	123.15	122.89
A8	A5	1.43	0.55	2.91	1.97	6.78	13.37	27.08	22	30	0.13	0.013	14.79	3.01		3.41	0.130	0.029	127.73	127.70	130.24	130.75	122.89	122.86
A INL	A9	0.36	0.55	0.36	0.20	7.20	1.43	23.35	45	24	0.18	0.013	9.60	3.06		2.19	0.180	0.081	128.16	128.08	131.60	130.95	125.35	125.27
A9	A2	0.00	0.55	0.36	0.20	7.17	1.43	23.60	22	24	0.18	0.013	9.60	3.06		2.19	0.180	0.040	128.08	128.04	130.95	130.95	125.27	125.23

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1			
2			
3			
4			
5			

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS — SHAWN L. PACHLHOFER — 96539 — LICENSED PROFESSIONAL ENGINEER — 7-20-17

Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

DRAINAGE CALCULATIONS

DATE: JULY 2017

DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER: 8/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER: 8/3/17	STORM WATER QUALITY
STORM: Approved for Jan 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:

DRAWING SCALE
HORZ : N.T.S.
VERT :

SHEET No: 6 OF 25

FOR CITY OF HOUSTON USE ONLY

CITY OF HOUSTON PUBLIC WORKS AND ENGINEERING — 58779

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY.
UTILITY LINES APPROVED AS TO LOCATION ONLY.
AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 9/20/17

N:\Districts\FBC\MUD058\Silver_Ranch_17_4818\05_CAD\01_Construction_Plans\01_Sheets\SR_SH17_CALCS.dwg

BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

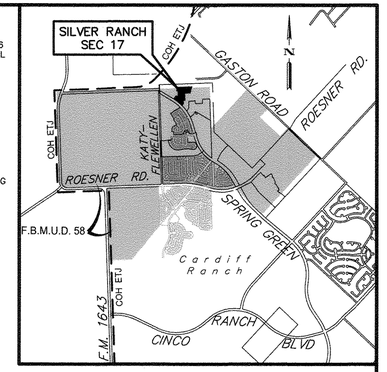
ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

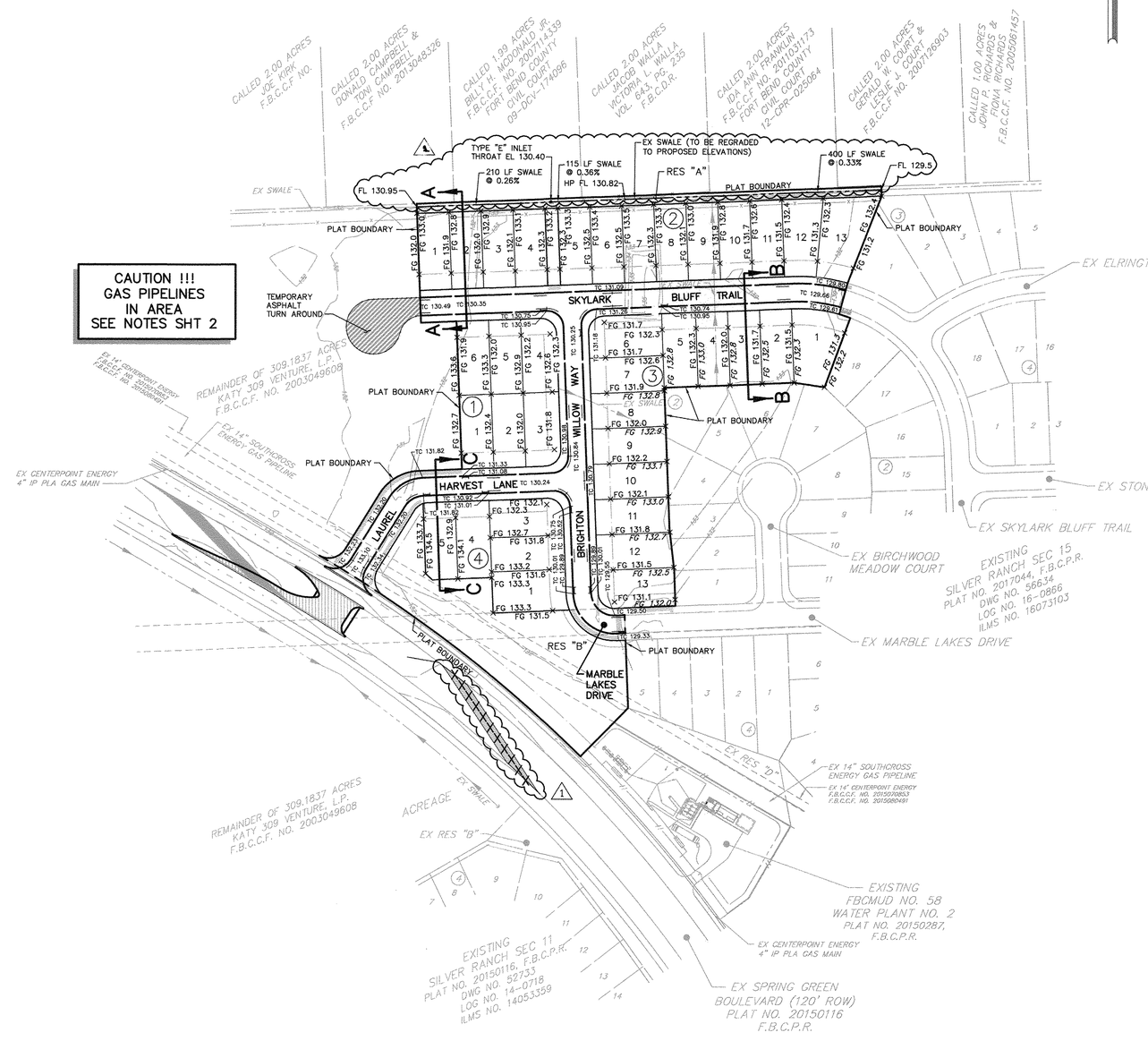
TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT



VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

CAUTION !!!
GAS PIPELINES
IN AREA
SEE NOTES SHT 2

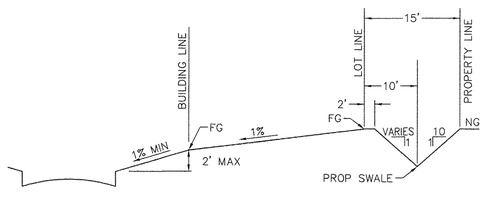


LEGEND

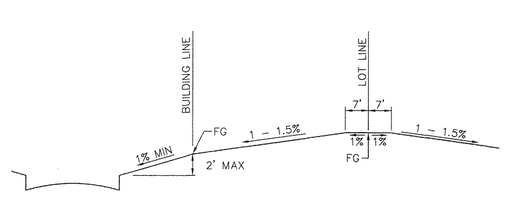
EXISTING CONTOUR LINE ----------

FINISHED GRADE ELEVATION ---------- × FG 77.5

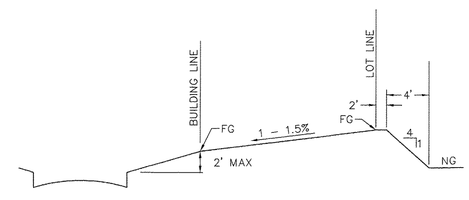
EXISTING FINISHED GRADE ELEVATION ---------- × FG 75.2



SECTION "A-A"
N.T.S.



SECTION "B-B"
N.T.S.



SECTION "C-C"
N.T.S.

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
2	10/10/17	REVISED SWALE ELEVATIONS	AB
1	10/4/17	REMOVED ASPHALT TRANSITION	AB

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
10-12-17
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

GRADING PLAN

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
WASTEWATER 10/12/17	STORM WATER QUALITY
STORM 10/12/17	FACILITIES
STREET & BRIDGE	

FILE NO:

DRAWING SCALE
HORZ :1" = 100'
VERT :

SHEET No: 7A OF 25

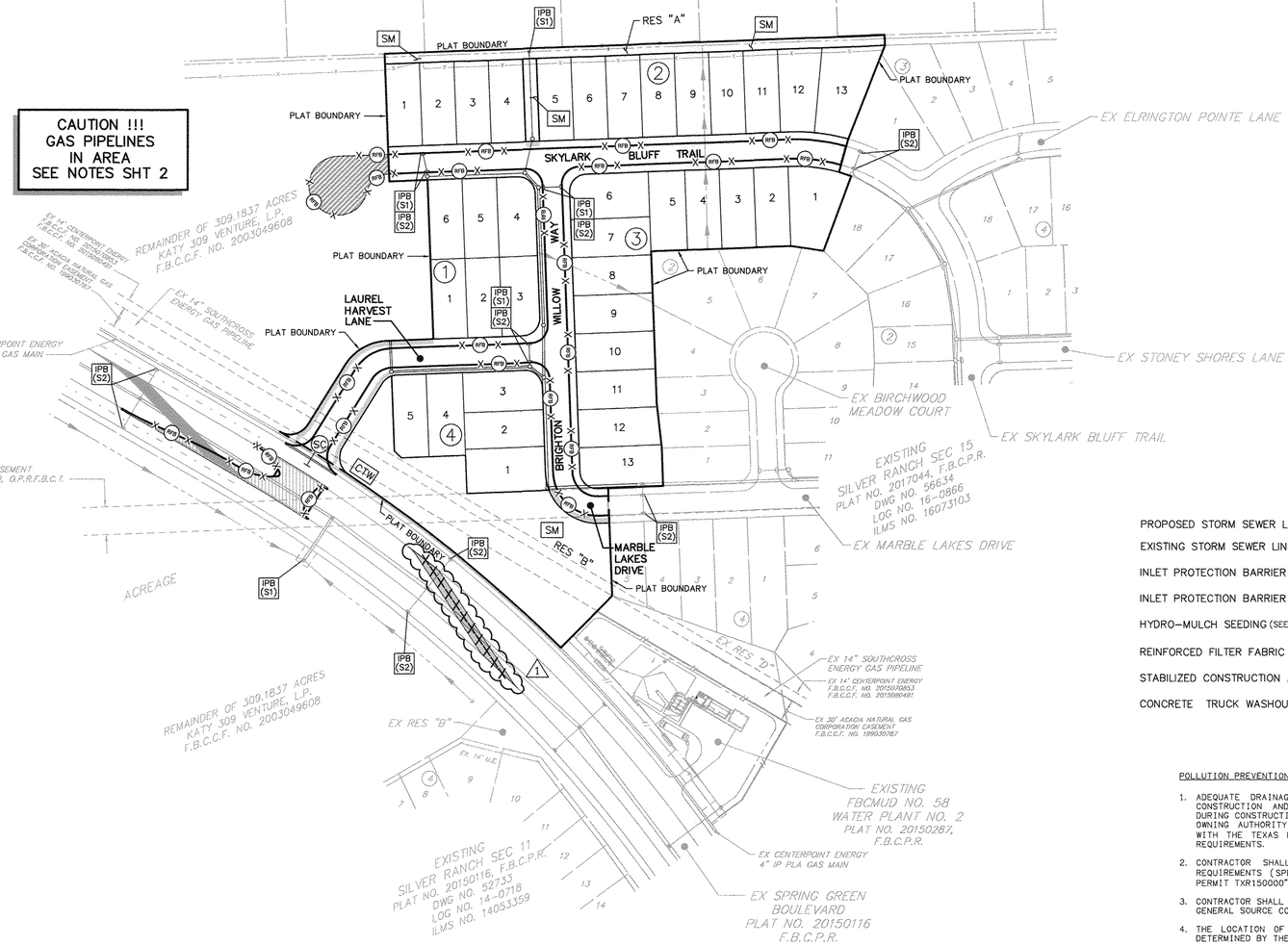
FOR CITY OF HOUSTON USE ONLY
5 8779

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 11/6/17

K:\Drawings\PBGM\0058\Silver_Ranch_17_4818\05_CAD\01_Construction_Plans\01_Sheets\07_SR17_GRADE.dwg



BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

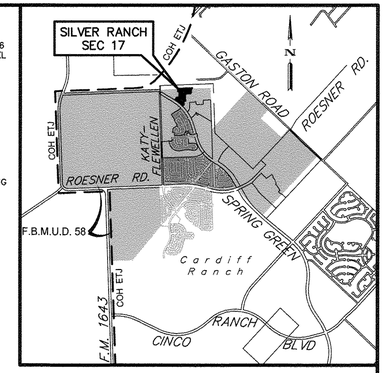
ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT



VICINITY MAP
SCALE: 1" = 2000'
FBC KEY MAP: 484 P
ZIP CODE: 77494
GIMS TILE: 4256D, 4255B, 4355A

LEGEND

PROPOSED STORM SEWER LINE, MANHOLE AND B-B INLETS
EXISTING STORM SEWER LINE, MANHOLE AND B-B INLETS
INLET PROTECTION BARRIER FOR STAGE I INLETS (SEE SPEC. ITEM 01580) — IPB (S1)
INLET PROTECTION BARRIER FOR STAGE II INLETS (SEE SPEC. ITEM 01580) — IPB (S2)
HYDRO-MULCH SEEDING (SEE SPEC. ITEM 02921) — SM
REINFORCED FILTER FABRIC BARRIER (SEE SPEC. ITEM 01574) — RFB
STABILIZED CONSTRUCTION ACCESS (SEE SPEC. ITEM 01575) — SC
CONCRETE TRUCK WASHOUT AREA — CTW

POLLUTION PREVENTION NOTES:

1. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE TEXAS POLLUTION DISCHARGE ELIMINATION SYSTEM (TPDES) REQUIREMENTS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ENFORCEMENT OF TPDES REQUIREMENTS (SPEC. ITEM 01571) PER "GENERAL REQUIREMENTS FOR PERMIT TXR150000".
3. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING GENERAL SOURCE CONTROLS PER SPECIAL SPEC. ITEM 01572.
4. THE LOCATION OF THE STABILIZED CONSTRUCTION ACCESS IS TO BE DETERMINED BY THE CONTRACTOR.
5. STORM WATER QUALITY PRE-CONSTRUCTION INSPECTION REQUIREMENTS: THE PROPERTY OWNER OR CONTRACTOR SHALL CONTACT THE HARRIS COUNTY STORM WATER QUALITY PERMITTING SECTION AT 713-956-3000 FOR A PRE-CONSTRUCTION INSPECTION PRIOR TO COMMENCING ANY CLEARING OR CONSTRUCTION ACTIVITIES ON THE SITE.
6. ALL RESERVES AND AREAS BETWEEN BACK-OF-CURB AND RIGHT-OF-WAY SHALL BE HYDRO-MULCHED SEEDED, PER SPEC. ITEM 02921. ALL LOTS AND OTHER AREAS DISTURBED DURING CONSTRUCTION SHALL BE BROADCAST SEEDED, PER SPEC ITEM 02920.
7. ANY AREAS DISTURBED WITHIN H. C. F. C. D. R. O. W. SHALL BE SEEDED PER H. C. F. C. D. SPECS.

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 11/6/17

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1	10/4/17	REMOVED ASPHALT TRANSITION	AP

BGE

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10777 Westheimer, Suite 400
Houston, TX 77042
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TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
10/12/17
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

STORM SEWER POLLUTION PREVENTION PLAN

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO:

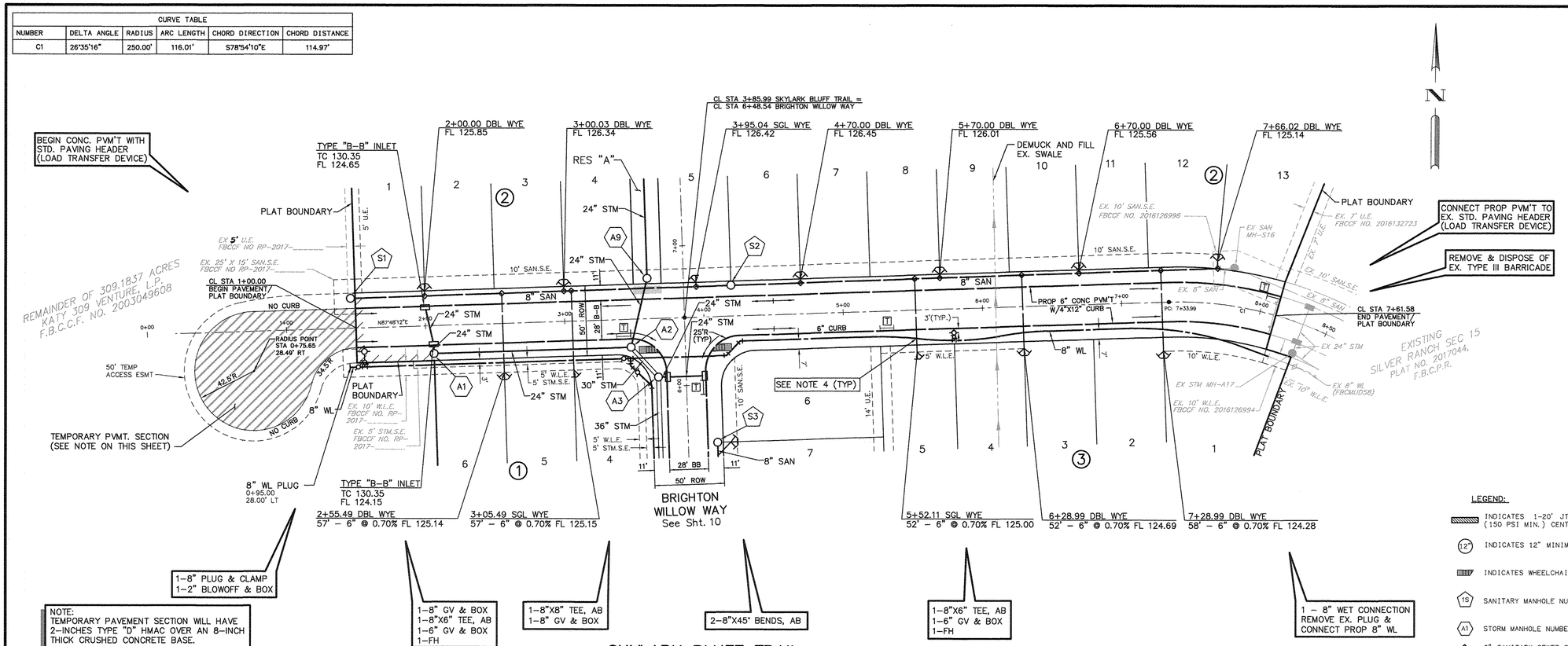
DRAWING SCALE
HORZ :1"= 100'
VERT :

SHEET No: 8A OF 25

FOR CITY OF HOUSTON USE ONLY
58779

X:\Projects\FBCMUD0058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\08_SW17_SWPPP.dwg

CURVE TABLE					
NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD DIRECTION	CHORD DISTANCE
C1	26°35'16"	250.00'	116.01'	S78°54'10"E	114.97'



BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTES:

1. SANITARY SEWERS SHALL BE PROPOSED SDR-26 PVC, UNLESS OTHERWISE INDICATED.
2. STORM SEWERS SHALL BE PROPOSED REINFORCED CONCRETE PIPE C-76, CLASS III, UNLESS OTHERWISE INDICATED. ALL JOINTS SHALL BE RUBBER GASKETED.
3. ALL WATER LINES TO BE PROPOSED PVC CLASS 235, DR-18, AWWA C-900 UNLESS OTHERWISE INDICATED.
4. WHENEVER POSSIBLE, CENTER 1- 20' JOINT C-900 PVC PIPE, CLASS 150 SANITARY SEWER LEAD ON PROPOSED WATER LINE AND 1 -20' JOINT, C-900 PVC WATER LINE PIPE ON PROPOSED SANITARY SEWER LEAD, 12" MIN. CLEARANCE.
5. ALL CURB RETURNS ARE NO GREATER THAN 2% UNLESS OTHERWISE NOTED.

LEGEND:

- INDICATES 1-20' JT. OF C-900 PVC (150 PSI MIN.) CENTERED ON CROSSING
- (12) INDICATES 12" MINIMUM CLEARANCE
- INDICATES WHEELCHAIR RAMP (TYPE 7)
- (1S) SANITARY MANHOLE NUMBER
- (A1) STORM MANHOLE NUMBER
- 6" SANITARY SEWER STACK

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY 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 under ground line can be marked. This verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date: 10-26-17
CenterPoint Energy/Natural Gas Facilities Verification 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: 10-26-17
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Date: 10/26/17
Approval for AT&T TEXAS/SWBT underground conduit facilities only. Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1			
2			
3			

BGE

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-2017
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE- SKYLARK BLUFF TRAIL (STA. 1+00 TO 7+61.58)

DATE: JULY 2017 | DESIGNED BY: DS | DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE 8/3/17	

FILE NO:

DRAWING SCALE
HORZ :1"= 40'
VERT : 1"= 4'

SHEET No: 9 OF 25

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
58779

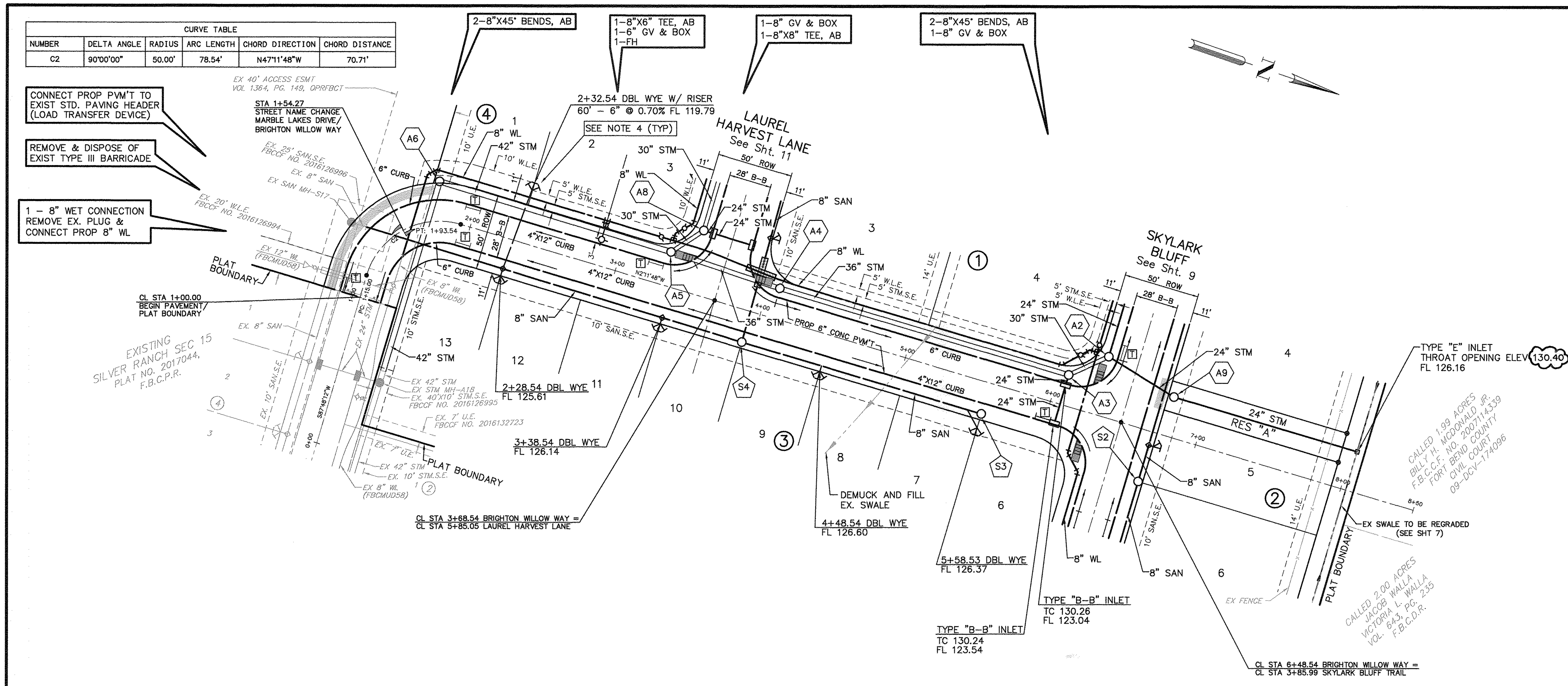
FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 9/20/17

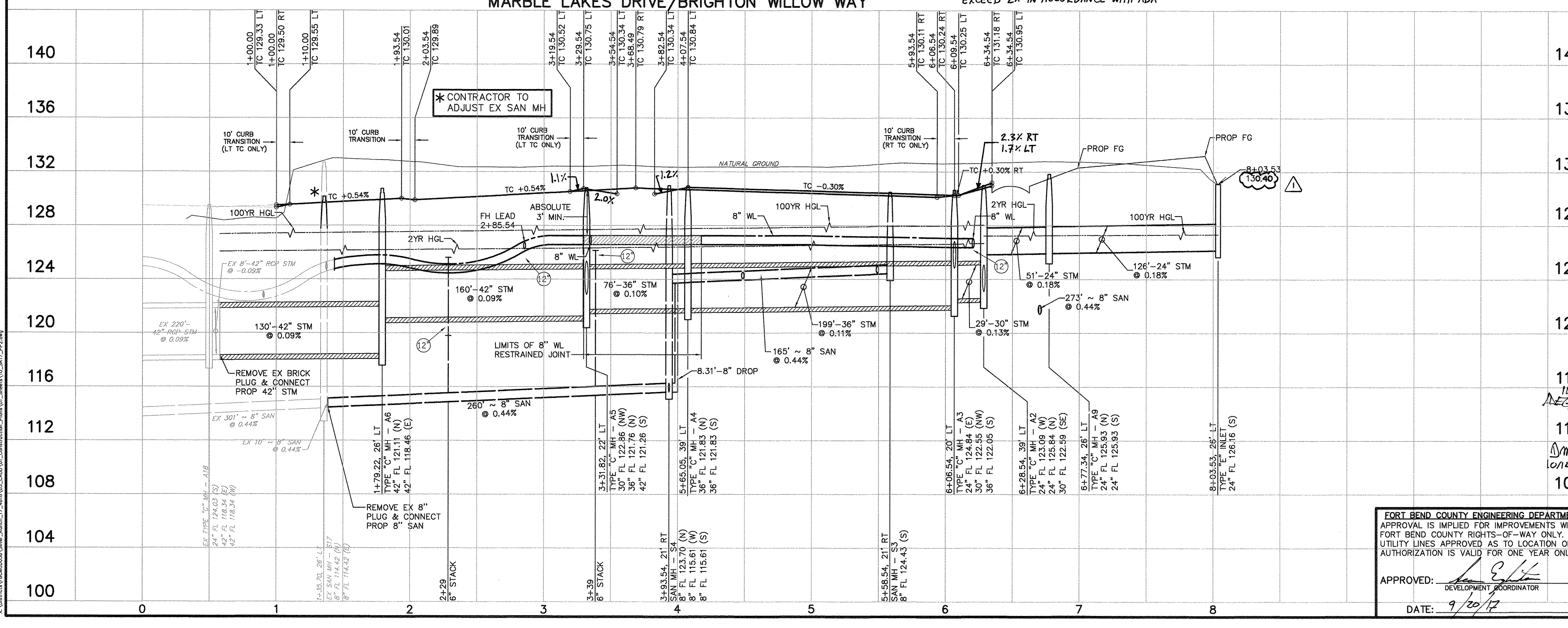
X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\09_SR17_PP1.dwg

CURVE TABLE					
NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD DIRECTION	CHORD DISTANCE
C2	90°00'00"	50.00'	78.54'	N47°11'48"W	70.71'



MARBLE LAKES DRIVE/BRIGHTON WILLOW WAY

NOTE: CROSS SLOPE THROUGH INTERSECTION SHALL NOT EXCEED 2% IN ACCORDANCE WITH ADA



BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTES:

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LEGEND:

- INDICATES 1-20' JT. OF C-900 PVC (150 PSI MIN.) CENTERED ON CROSSING
- (12") INDICATES 12" MINIMUM CLEARANCE
- INDICATES WHEELCHAIR RAMP (TYPE 7)
- [T] 10' CURB TRANSITION (SEE PLAN VIEW FOR CURB HEIGHTS)
- (1S) SANITARY MANHOLE NUMBER
- (A1) STORM MANHOLE NUMBER
- 6" SANITARY SEWER STACK

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

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Date: 10-26-17
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Date: 10/26/17
Approval for AT&T TEXAS/SWBT underground conduit facilities only. Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△1	10/10/17	REVISED SWALE FLOWLINE	KP

BGE

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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
7-2017
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE- MARBLE LAKES DRIVE AND BRIGHTON WILLOW WAY (STA. 1+00 TO 8+08.54)

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER 08/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM 8/3/17	FACILITIES
STREET & BRIDGE	

10-12-17
10/12/17

FILE NO:

FOR CITY OF HOUSTON USE ONLY
58779

DRAWING SCALE
HORZ :1"= 40'
VERT : 1"= 4'

SHEET No: 10 OF 25

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

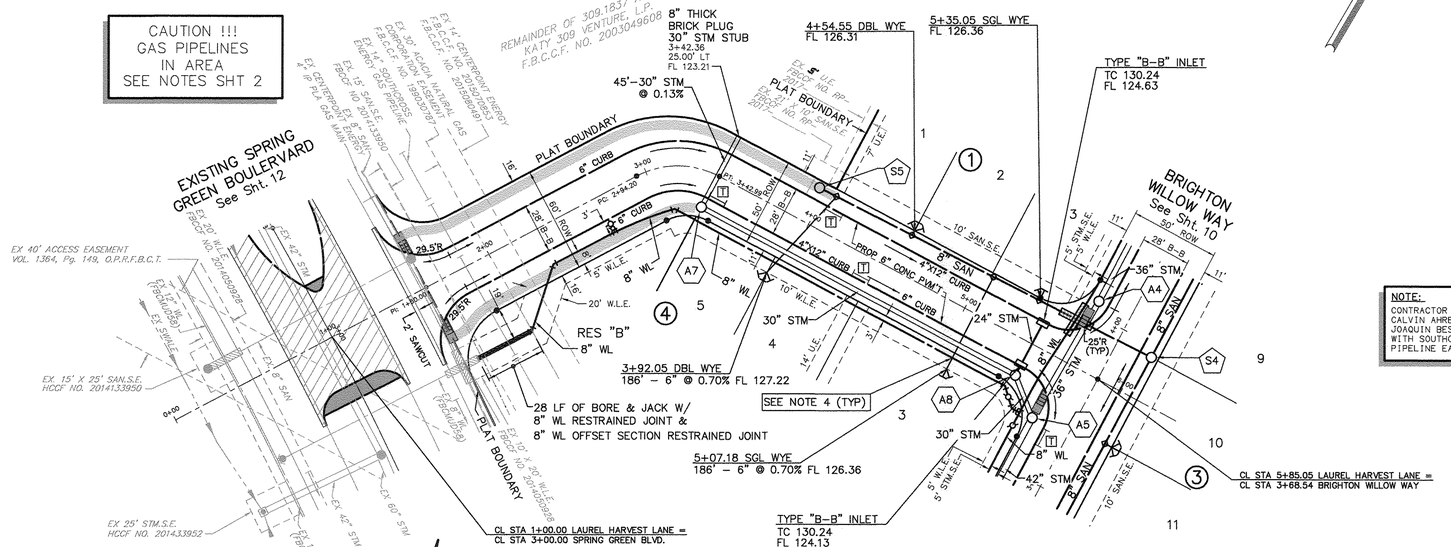
APPROVED: ______ DEVELOPMENT COORDINATOR

DATE: 9/20/17

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\10_SR17_PP2.dwg

CURVE TABLE					
NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD DIRECTION	CHORD DISTANCE

CAUTION !!!
GAS PIPELINES
IN AREA
SEE NOTES SHT 2



LAUREL HARVEST LANE

NOTE: CROSS SLOPE THROUGH INTERSECTION SHALL NOT EXCEED 2% IN ACCORDANCE WITH ADA

NOTE:
CONTRACTOR SHALL CONTACT:
CALVIN AHRENS AT (361) 550-4256 EMAIL: CALVIN.AHRENS@SOUTHCROSSENERGY.COM OR JOAQUIN BESERRA AT (281) 750-9874 EMAIL: JOAQUIN.BESERRA@SOUTHCROSSENERGY.COM WITH SOUTHCROSS ENERGY AT LEAST 48-HOURS PRIOR TO PERFORM ANY WORK NEAR THE PIPELINE EASEMENT CONTAINING THE SOUTHCROSS ENERGY PIPELINE.

LEGEND:

- INDICATES 1-20' JT. OF C-900 PVC (150 PSI MIN.) CENTERED ON CROSSING
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- INDICATES WHEELCHAIR RAMP (TYPE 7)
- (T) 10' CURB TRANSITION (SEE PLAN VIEW FOR CURB HEIGHTS)
- (1S) SANITARY MANHOLE NUMBER
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- 6" SANITARY SEWER STACK

BENCHMARKS:

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ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

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ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

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ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTES:

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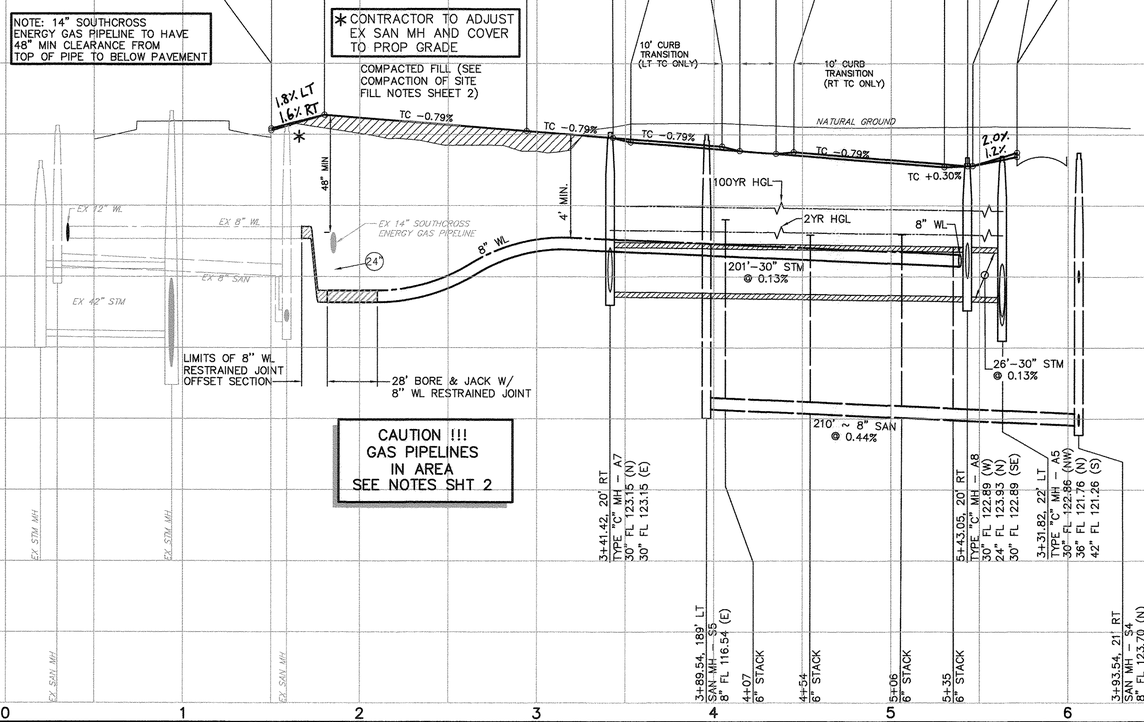
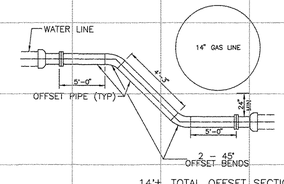


WATER LINE OFFSET NOTES:

1. ALL MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH WATER MAIN STANDARD SPECIFICATIONS.
2. RESTRAIN EXISTING PIPING BEYOND OFFSET SECTION AS REQUIRED TO PREVENT MOVEMENT.
3. INSULATED JOINT TO BE MADE UP USING INSULATING GASKETS, PLASTIC BOLT SLEEVES WASHERS OF INSULATING GASKET MATERIAL BACKED WITH CAD-PLATED WASHERS OR OTHER METHODS APPROVED BY THE ENGINEER.
4. SEE ADDITIONAL NOTES ON WATER LINE DETAIL 02511-01 INCLUDED ON WATER LINE DETAIL SHEET.



14'± TOTAL OFFSET SECTION

STA. 1+74.28
8" RESTRAINED JOINT OFFSET SECTION
N.T.S.

VOID

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.
APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 9/20/17

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

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Date: 10/26/17
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Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.

BGE

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STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
7-2017
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE-
LAUREL HARVEST LANE
(STA. 1+60 TO 5+85.05)

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
8/03/17	
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM	FACILITIES
8/3/17	
STREET & BRIDGE	

FILE NO:

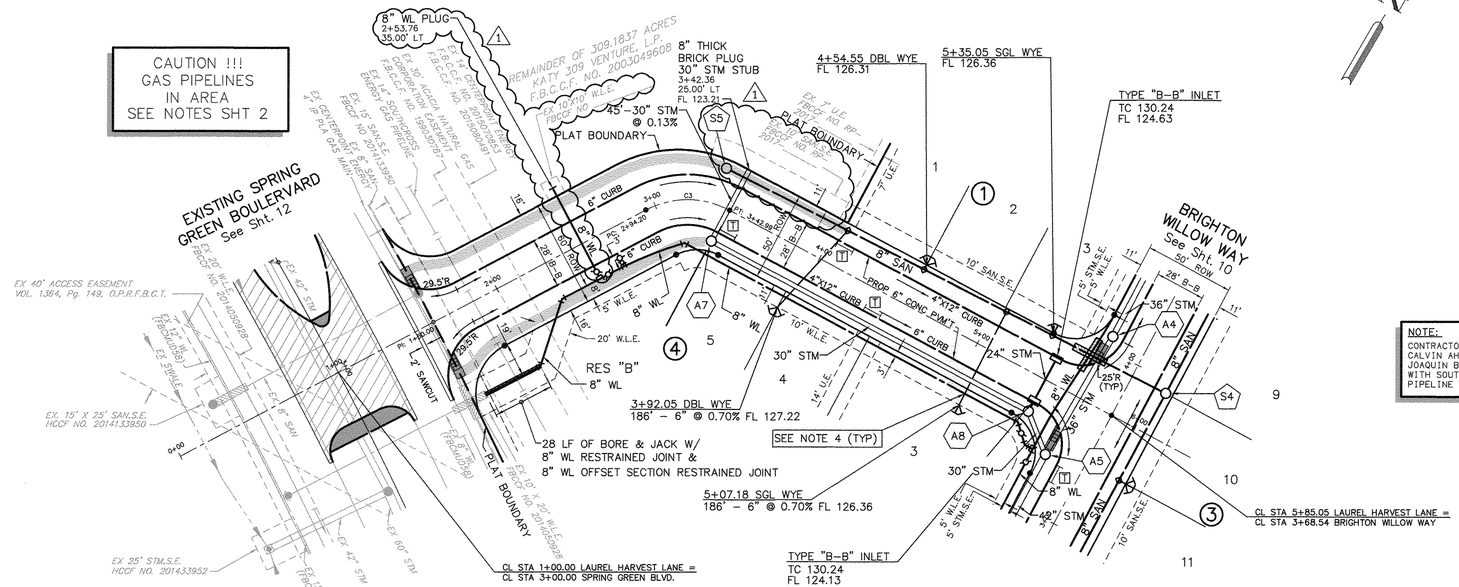
FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
HORZ : 1"= 40'
VERT : 1"= 4'

SHEET No: 11 OF 25

CURVE TABLE					
NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD DIRECTION	CHORD DISTANCE
C3	55°54'54"	50.00'	48.80'	N59°50'45"E	46.88'

CAUTION !!!
GAS PIPELINES
IN AREA
SEE NOTES SHT 2



1 – 8" WET CONNECTION
REMOVE EX. PLUG &
CONNECT PROP 8" WL

2–8"X45° BENDS, AB

1–8"X8" TEE, AB
2–8" GV'S & BOX

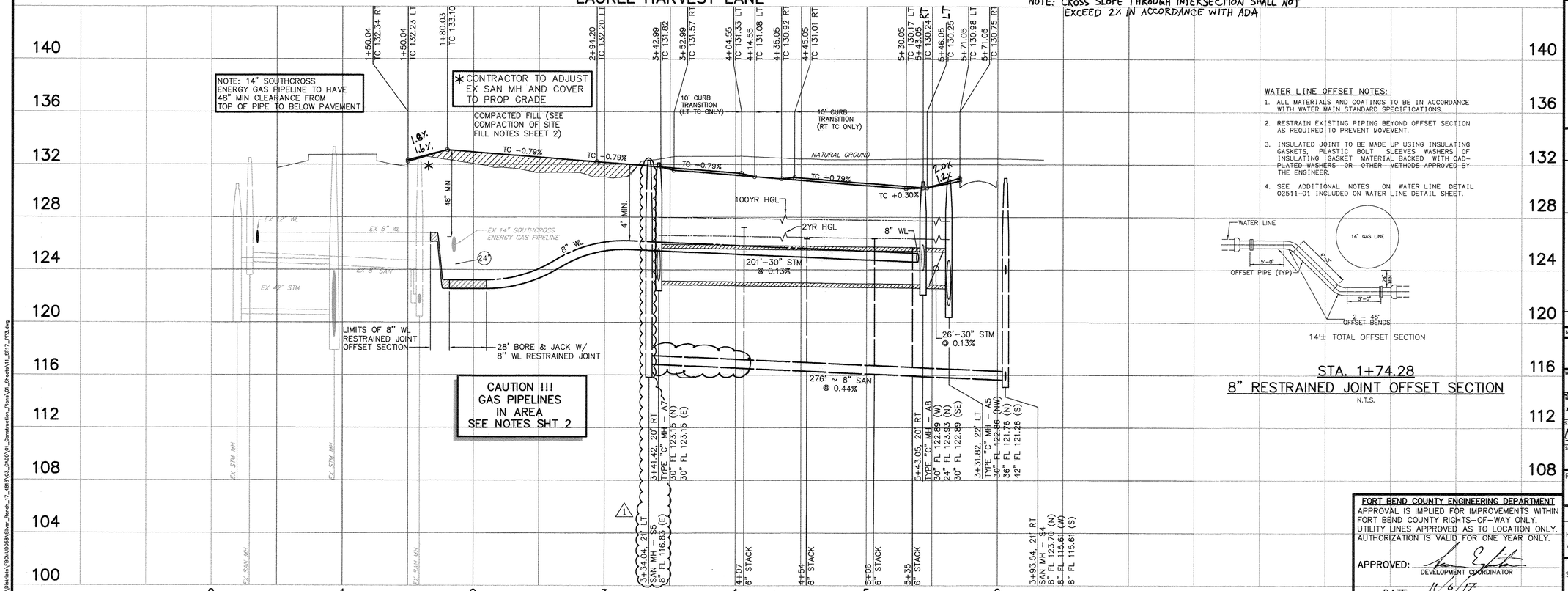
1–8"X6" TEE, AB
1–6" GV & BOX
1–FH

1–8"X45° BEND, AB

2–8"X45° BENDS, AB
1–8" GV & BOX

LAUREL HARVEST LANE

NOTE: CROSS SLOPE THROUGH INTERSECTION SHALL NOT EXCEED 2% IN ACCORDANCE WITH ADA



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ELEVATION: 136.32 FT. NAVD–88, 2001 ADJUSTMENT

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ELEVATION: 131.64 FEET NAVD–88, 2001 ADJUSTMENT

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ELEVATION: 128.58 FEET NAVD–88, 2001 ADJUSTMENT

NOTES:

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Date: 10/26/17
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Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1	10/4/17	EXTEND WATER LINE AND SANITARY SEWER	AP

BGE, Inc.
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Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
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LICENSED PROFESSIONAL ENGINEER
10-12-17
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE–
LAUREL HARVEST LANE
(STA. 1+60 TO 5+85.05)

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: SN
JOB NUMBER: 4818–00/4818–10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	10-12-17	TRAFFIC AND TRANSPORTATION
WASTEWATER	10/12/17	STORM WATER QUALITY
STORM	10/12/17	FACILITIES
STREET & BRIDGE		

FILE NO:

DRAWING SCALE
HORZ : 1"=40'
VERT : 1"= 4'

SHEET No: 11A OF 25

FOR CITY OF HOUSTON USE ONLY
58779

FORT BEND COUNTY ENGINEERING DEPARTMENT
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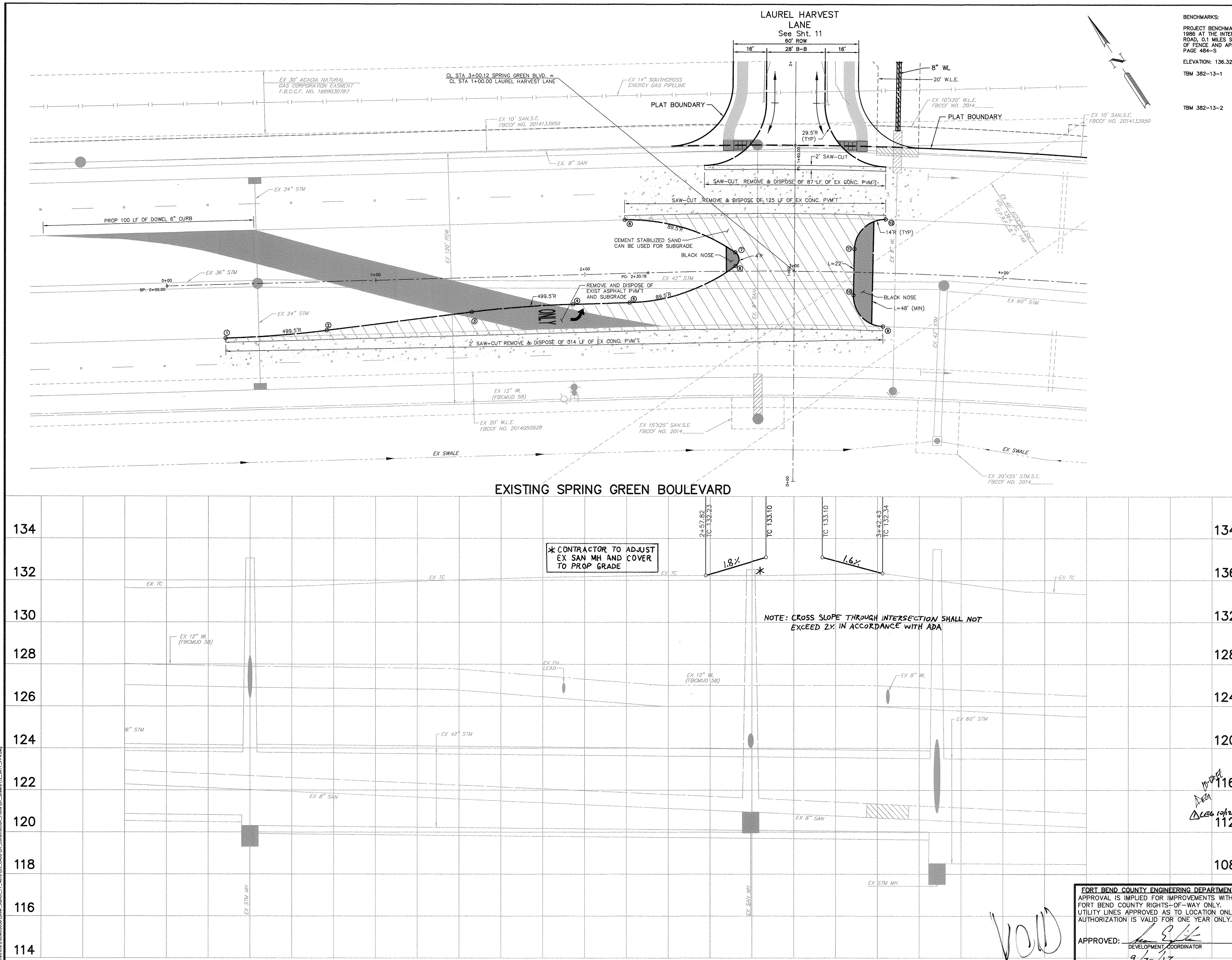
AUTHORIZATION IS VALID FOR ONE YEAR ONLY.
APPROVED: DEVELOPMENT COORDINATOR
DATE: 11/6/17

X:\Districts\TBG\GOOD\Silver_Ranch_17_4818\03_CAD\01_Construction_Plan\01_Sheets\11_SR17_PP3.dwg



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ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTES:

1. SANITARY SEWERS SHALL BE PROPOSED SDR-26 PVC, UNLESS OTHERWISE INDICATED.
2. STORM SEWERS SHALL BE PROPOSED REINFORCED CONCRETE PIPE C-76, CLASS III, UNLESS OTHERWISE INDICATED. ALL JOINTS SHALL BE RUBBER GASKETED.
3. ALL WATER LINES TO BE PROPOSED PVC CLASS 235, DR-18, AWWA C-900 UNLESS OTHERWISE INDICATED.
4. WHENEVER POSSIBLE, CENTER 1- 20' JOINT C-900 PVC PIPE, CLASS 150 SANITARY SEWER LEAD ON PROPOSED WATER LINE AND 1 -20' JOINT, C-900 PVC WATER LINE PIPE ON PROPOSED SANITARY SEWER LEAD, 12" MIN. CLEARANCE.
5. ALL CURB RETURNS ARE NO GREATER THAN 2% UNLESS OTHERWISE NOTED.

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY 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 under ground line can be marked. This verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

[illegible] Date: 10-26-17

CenterPoint Energy/Natural Gas Facilities Verification 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.

[illegible] Date: 10-26-17

CenterPoint Energy/UNDERGROUND Electric Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification.)
Signature Valid for six months.

[illegible] Date: 10/26/17

Approval for AT&T TEXAS/SWBT underground conduit facilities only.
Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			

BGE

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER

[illegible] 7-20-17

Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE-
EXISTING SPRING GREEN BOULEVARD

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: TAW

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER [illegible] 08/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER [illegible] 8/3/17	STORM WATER QUALITY
STORM [illegible] 8/3/17	FACILITIES
STREET & BRIDGE	

10-12-17 [illegible]
△ LEG 10/12/17

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY. UTILITY LINES APPROVED AS TO LOCATION ONLY. AUTHORIZATION IS VALID FOR ONE YEAR ONLY.

APPROVED: [illegible]
DEVELOPMENT COORDINATOR

DATE: 9/20/17

FILE NO:

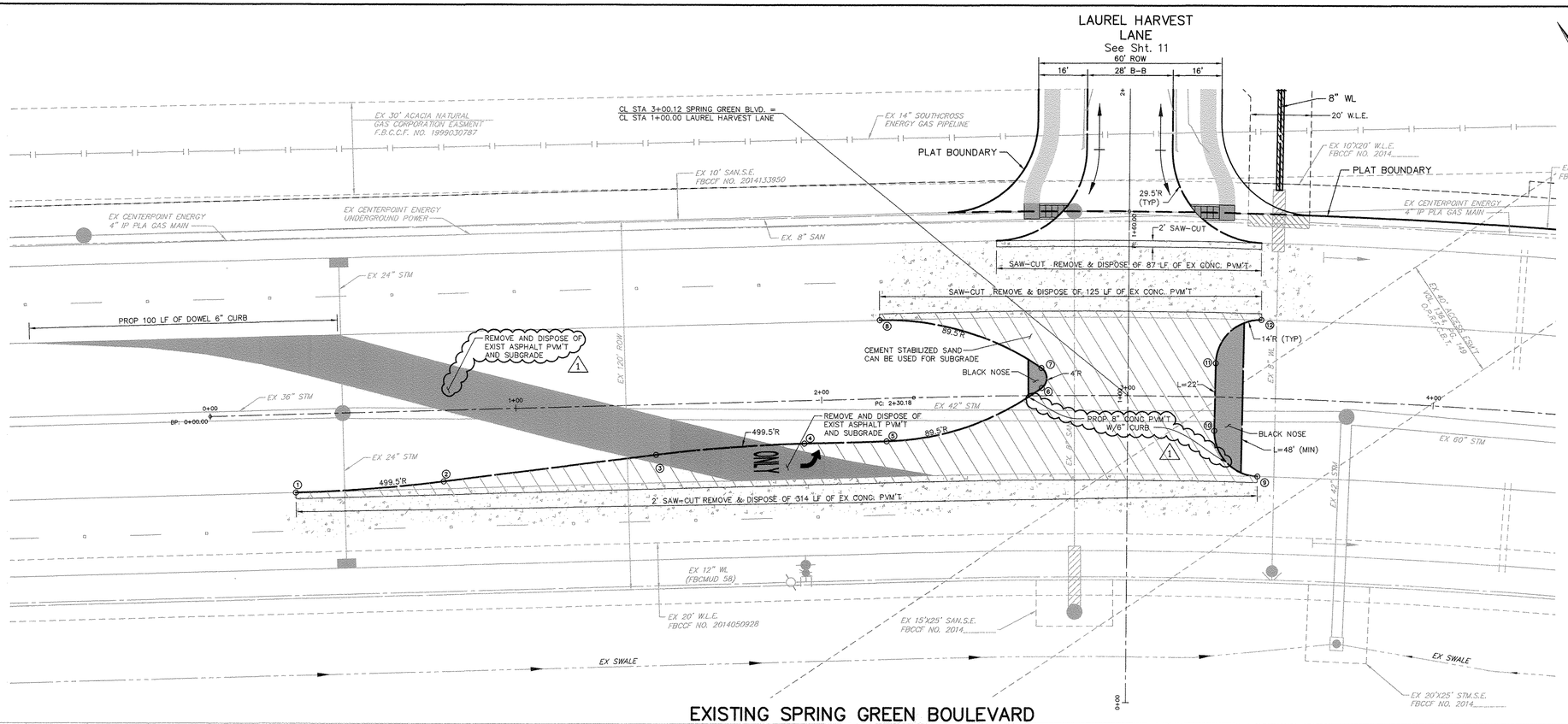
FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
ACCEPTED AS NOTED
58779

DRAWING SCALE
HORZ :1"= 20'
VERT : 1"= 2'

SHEET No: 12 OF 25

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\12_SR17_PP4.dwg



POINT TABLE		
NUMBER	STATION	OFFSET
1	0+27.34	25.50 RT
2	0+75.79	23.14 RT
3	1+45.41	16.36 RT
4	1+93.96	14.00 RT
5	2+20.88	14.00 RT
6	2+71.98	2.50 LT
7	2+71.90	9.02 LT
8	2+19.68	25.50 LT
9	3+43.19	25.50 RT
10	3+28.61	11.05 RT
11	3+28.61	10.95 LT
12	3+43.03	25.50 LT

FOR TRAFFIC CONTROL PLAN (SEE SHEET 25A)

BENCHMARKS:

PROJECT BENCHMARK: BENCHMARK IS A STAINLESS STEEL ROD STAMPED HGCSD 66 1986 AT THE INTERSECTION OF FM 1463 AND THE ENTRANCE OF A PRIVATE GRAVEL ROAD, 0.1 MILES SOUTH OF CORBITT ROAD, EAST SIDE OF FM1463, 15 FEET EAST OF FENCE AND APPROXIMATELY 10 FEET SOUTH OF A GRAVEL ROAD. KEY MAP PAGE 484-S

ELEVATION: 136.32 FT. NAVD-88, 2001 ADJUSTMENT

TBM 382-13-1 BOX CUT LOCATED ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 485 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 131.64 FEET NAVD-88, 2001 ADJUSTMENT

TBM 382-13-2 BOX CUT ON A "BB" INLET ON THE SOUTHWEST SIDE OF SPRING GREEN BOULEVARD APPROXIMATELY 975 FEET SOUTHEAST OF INTERSECTION WITH KATY-FLEWELLEN ROAD.

ELEVATION: 128.58 FEET NAVD-88, 2001 ADJUSTMENT

NOTES:

1. SANITARY SEWERS SHALL BE PROPOSED SDR-26 PVC, UNLESS OTHERWISE INDICATED.
2. STORM SEWERS SHALL BE PROPOSED REINFORCED CONCRETE PIPE C-76, CLASS III, UNLESS OTHERWISE INDICATED. ALL JOINTS SHALL BE RUBBER GASKETED.
3. ALL WATER LINES TO BE PROPOSED PVC CLASS 235, DR-18, AWWA C-900 UNLESS OTHERWISE INDICATED.
4. WHENEVER POSSIBLE, CENTER 1- 20' JOINT C-900 PVC PIPE, CLASS 150 SANITARY SEWER LEAD ON PROPOSED WATER LINE AND 1 -20' JOINT, C-900 PVC WATER LINE PIPE ON PROPOSED SANITARY SEWER LEAD, 12" MIN. CLEARANCE.
5. ALL CURB RETURNS ARE NO GREATER THAN 2% UNLESS OTHERWISE NOTED.

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY 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 under ground line can be marked. This verification does not fulfill your obligation to call 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date 10-26-17
CenterPoint Energy/Natural Gas Facilities Verification 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 10-26-17
CenterPoint Energy/UNDERGROUND Electric Facilities Verification ONLY.
(This signature verifies existing underground facilities – not to be used for conflict verification.)
Signature Valid for six months.

Date 10/26/17
Approval for AT&T TEXAS/SWBT underground conduit facilities only.
Signature Valid for One Year

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1	10/10/17	ADD POINT TABLE AND LABELS	

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10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
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10-12-17
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FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PLAN AND PROFILE– EXISTING SPRING GREEN BOULEVARD

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: TAW

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER 10-12-17	TRAFFIC AND TRANSPORTATION
WASTEWATER 10/12/17	STORM WATER QUALITY
STORM 10/12/17	FACILITIES
STREET & BRIDGE	

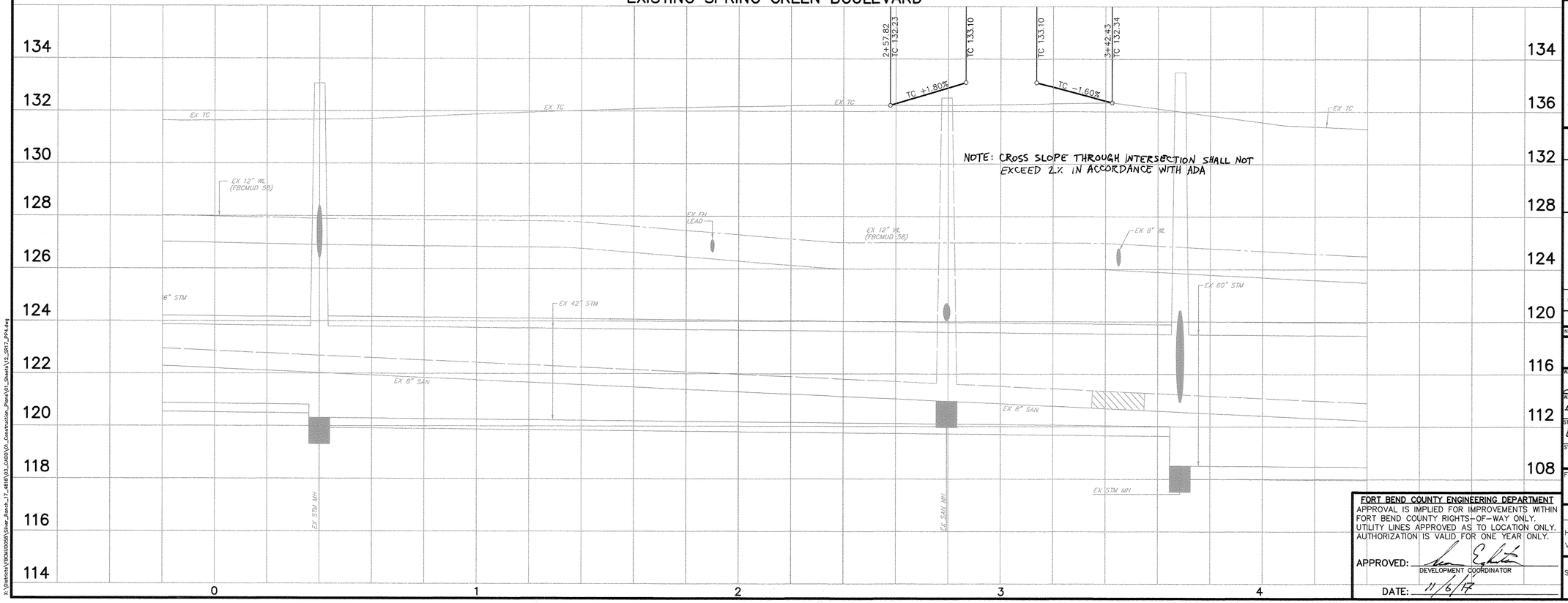
FILE NO:

DRAWING SCALE
HORZ :1"= 20'
VERT :1"= 2'

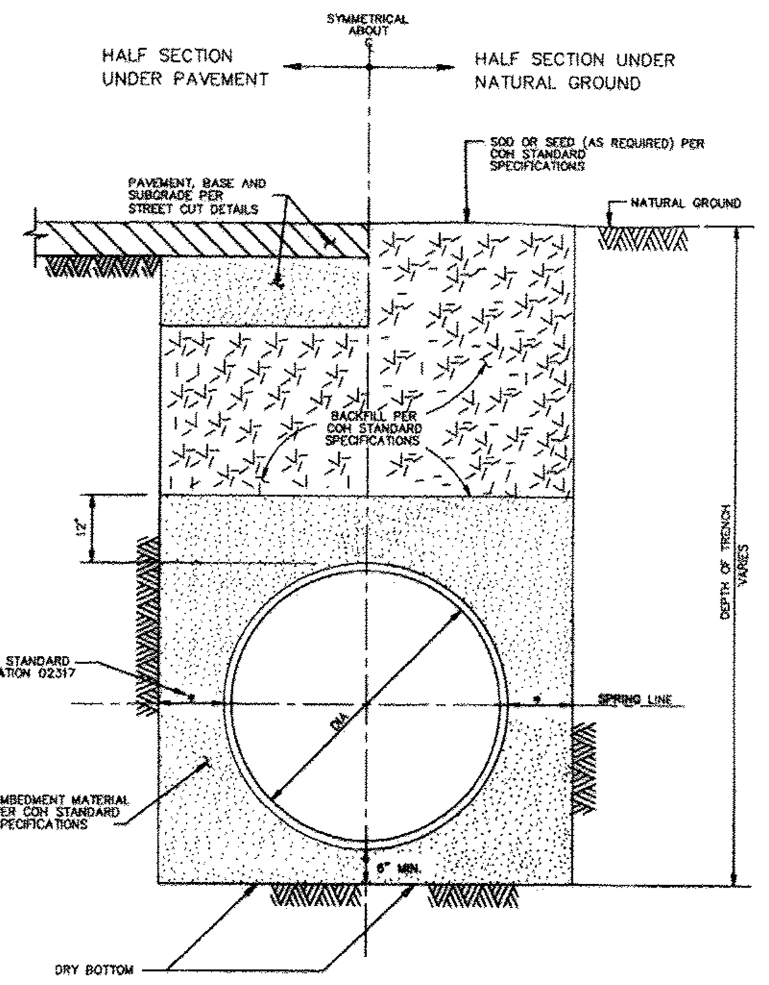
SHEET No: 12A OF 25

FOR CITY OF HOUSTON USE ONLY
58779

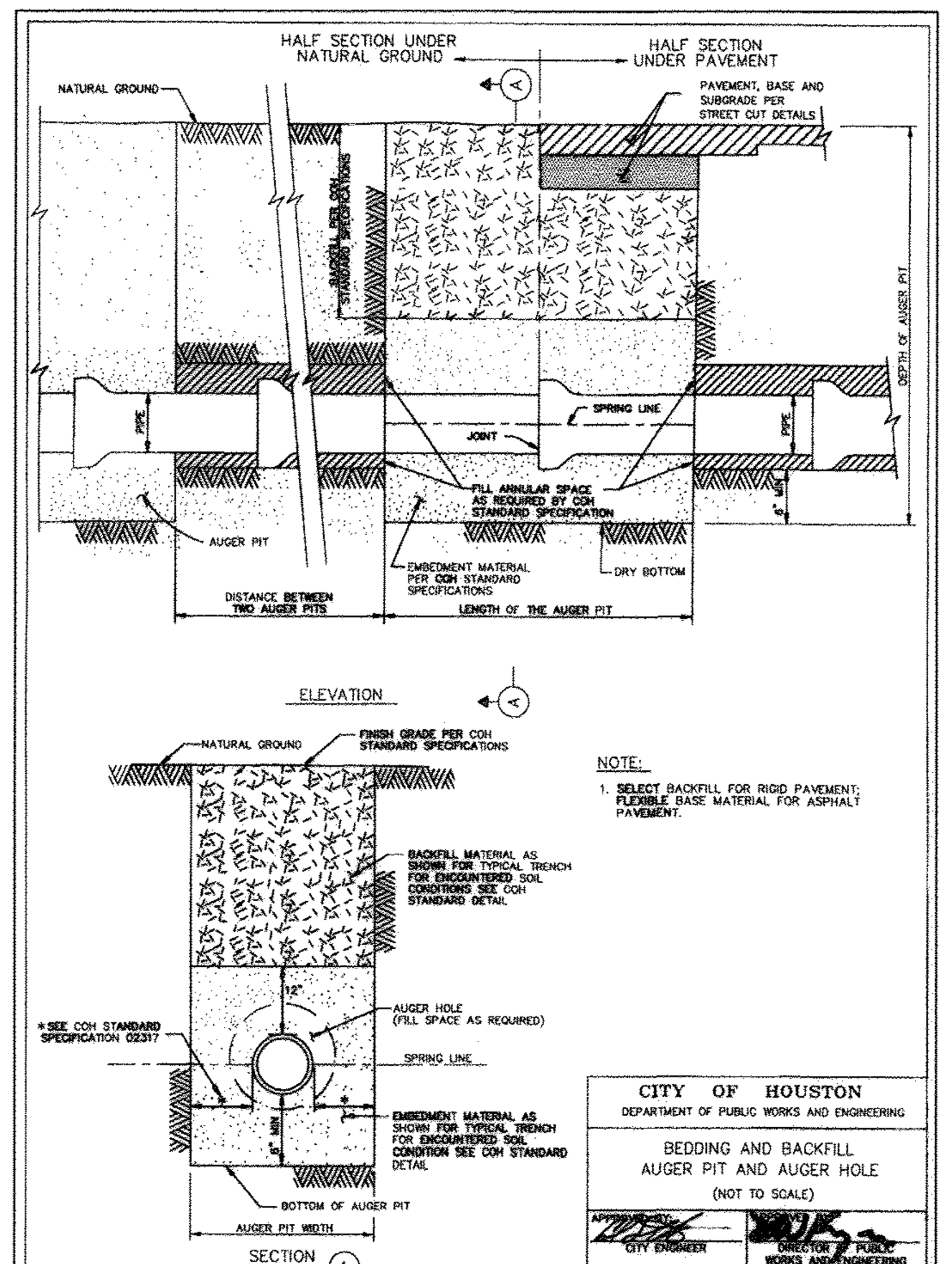
FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVAL IS IMPLIED FOR IMPROVEMENTS WITHIN FORT BEND COUNTY RIGHTS-OF-WAY ONLY.
UTILITY LINES APPROVED AS TO LOCATION ONLY.
AUTHORIZATION IS VALID FOR ONE YEAR ONLY.
APPROVED: DEVELOPMENT COORDINATOR
DATE: 11/6/17



X:\Districts\FBMUD058\Silver_Ranch_17_4818\03_CAD\01_Construction_Plans\01_Sheets\12_SR17_PP4.dwg



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
WATER DISTRIBUTION MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 | DWG NO: 02317-04



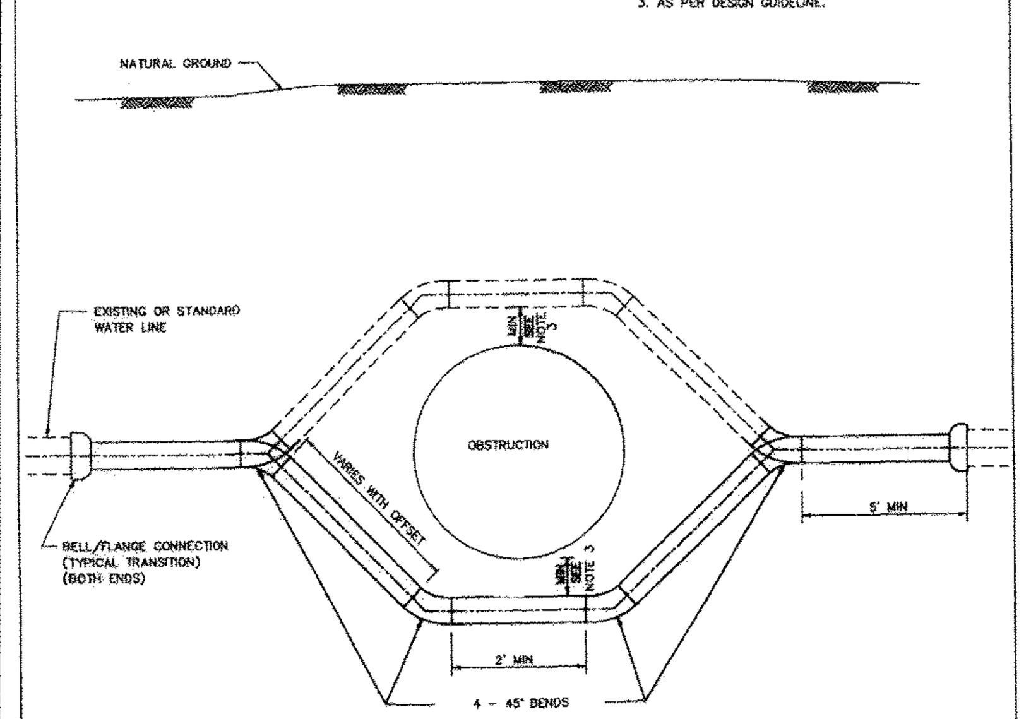
NOTE:

1. SELECT BACKFILL FOR RIGID PAVEMENT; FLEXIBLE BASE MATERIAL FOR ASPHALT PAVEMENT.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 | DWG NO: 02447-01

NOTE:

1. MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH WATER LINE STANDARD SPECIFICATIONS.
2. RESTRAIN EXISTING PIPING BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.
3. AS PER DESIGN GUIDELINE.



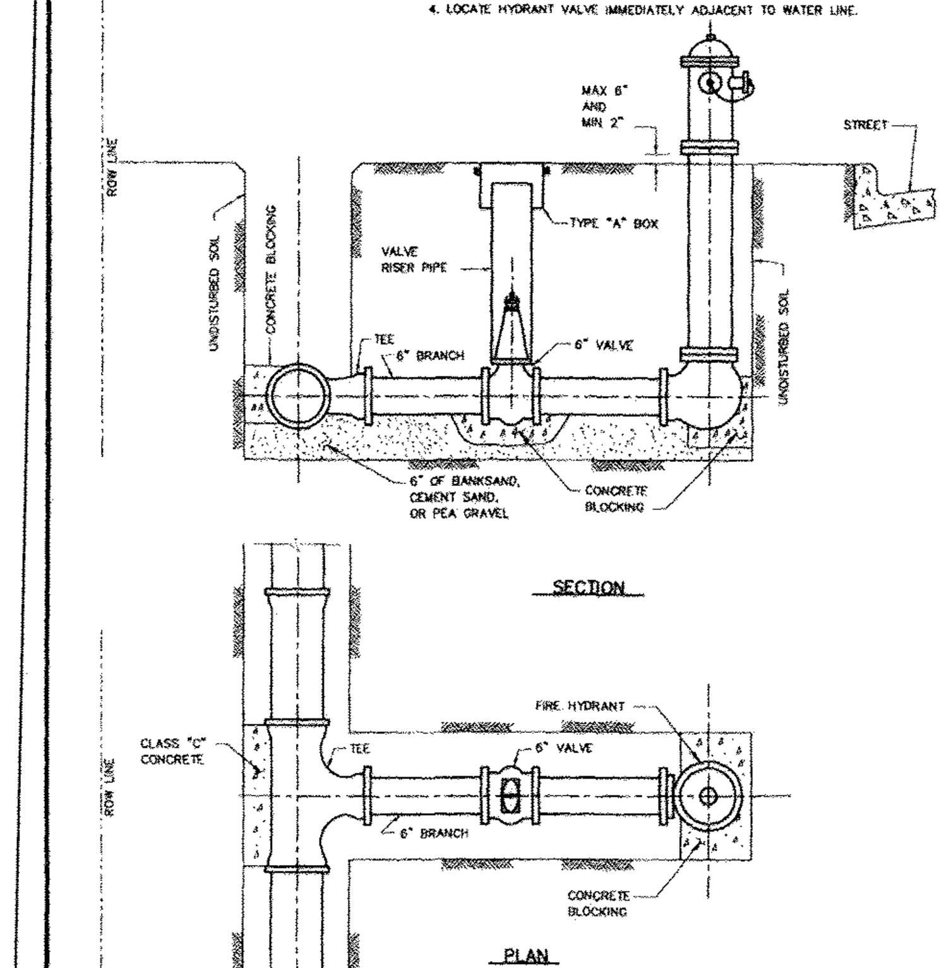
PIPE OFFSET ALTERNATES

1. DUCTILE IRON PIPE PRESSURE 250 PSI WITH APPROVED RESTRAINED JOINTS.
2. PVC PIPE WITH INTEGRAL RESTRAINED JOINT SYSTEM, OR DUCTILE - IRON RESTRINED JOINT FITTINGS, EPOXY LINED AND COATED. USE 250 PSI AWWA C900 DR 14 FOR PVC RESTRAINED JOINTS.
3. PVC NOT ALLOWED FOR GREATER THAN 20 FT OF COVER OR FOR DIAMETER LARGER THAN 20 IN.
4. USE ONLY DUCTILE IRON AND PVC PRODUCTS LISTED ON OCE DIVISION APPROVED PRODUCTS LIST AND IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

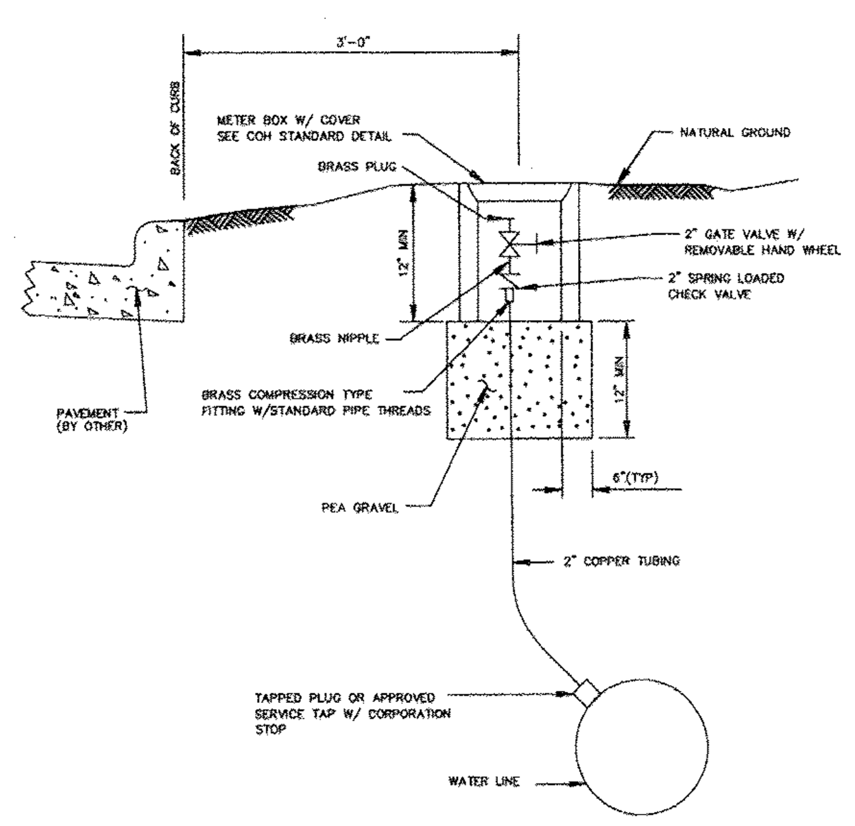
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
TYPICAL STEEL PIPE OFFSET SECTION FOR WATER LINES
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02511-01

NOTES:

1. LOCATE FIRE HYDRANTS AT PCs OF THE INTERSECTION CURB RADIUS, 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.
2. ON OPEN-DITCH ROADWAYS, SET THE FIRE HYDRANTS WITH IN 5 FEET OF RIGHTS-OF-WAY LINES.
3. FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.
4. LOCATE HYDRANT VALVE IMMEDIATELY ADJACENT TO WATER LINE.



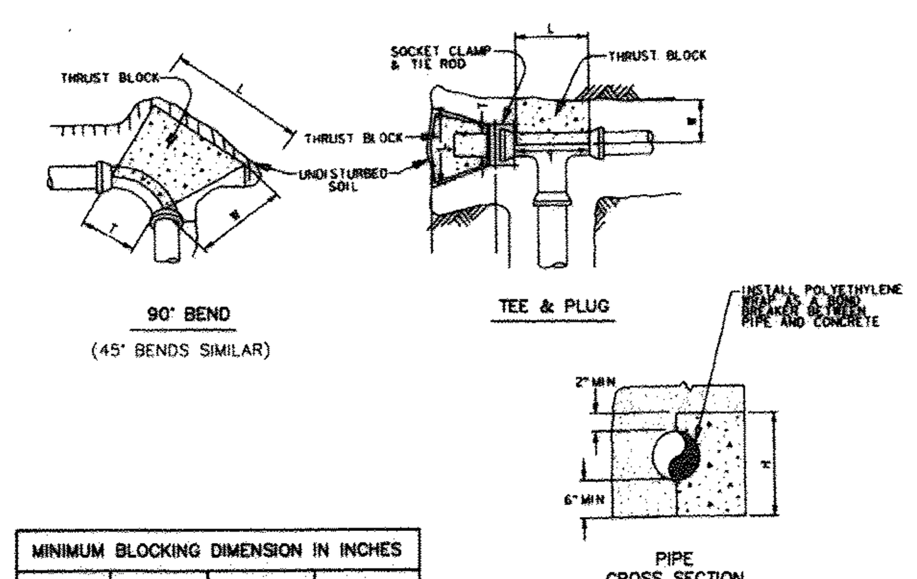
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STANDARD FIRE HYDRANT DETAIL
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02520-01



GENERAL NOTES:

1. PLACE GATE VALVE VERTICAL TO GROUND WITH END OF BRASS PLUG 3 INCHES FROM SURFACE
2. PLACE METER BOX CENTER AROUND GATE VALVE BOX WITH LONG SIDE PARALLEL TO VALVE.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
PERMANENT BLOW-OFF-DETAIL
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02524-01



MINIMUM BLOCKING DIMENSION IN INCHES												
PIPE SIZE	90° BEND				45° BEND				TEE/PLUG			
	W	H	L	T	W	H	L	T	W	H	L	T
4"	6	12	14	10	6	8	11	8	6	10	12	12
6"	8	14	26	12	8	14	14	12	8	14	19	19
8"	10	16	40	16	10	18	20	16	10	18	26	26
10"	12	24	42	18	12	22	25	18	12	24	30	30
12"	14	36	40	30	14	26	30	22	14	26	40	40

CORRECTION FACTORS		
SOIL TYPE	SOIL BEARING STRENGTH S_b (lb/ft²)	MULTIPLY "L" AND "H" BY
SOFT CLAY	1000	1.73
SILT	1500	1.41
SANDY SILT	3000	1.00
SAND	4000	0.87
SANDY CLAY	6000	0.71
HARD CLAY	9000	0.58

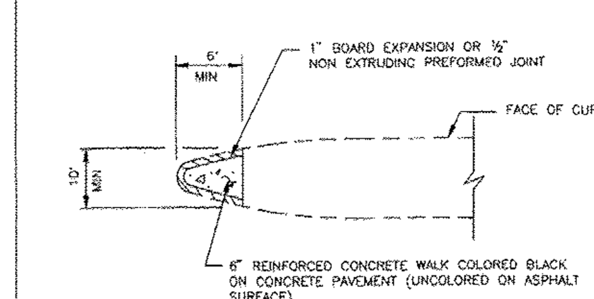
NOTES:

1. DEPTH "W" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE.
2. BLOCKING MUST BE PLACED AGAINST UNDISTURBED EARTH. WHERE THIS IS NOT POSSIBLE, THE FILL BETWEEN THE BEARING SURFACE AND UNDISTURBED SOIL MUST BE COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY.
3. PROVIDE CONCRETE IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 03315 - CONCRETE FOR UTILITY CONSTRUCTION.
4. BLOCKING DIMENSIONS SHOWN ARE BASED ON 3000 PSI SOIL BEARING STRENGTH AND 125 PSI INTERNAL WATER PRESSURE. FOR OTHER SOIL CONDITIONS, MULTIPLY DIMENSIONS "L" AND "H" BY THE APPROPRIATE CORRECTION FACTOR.

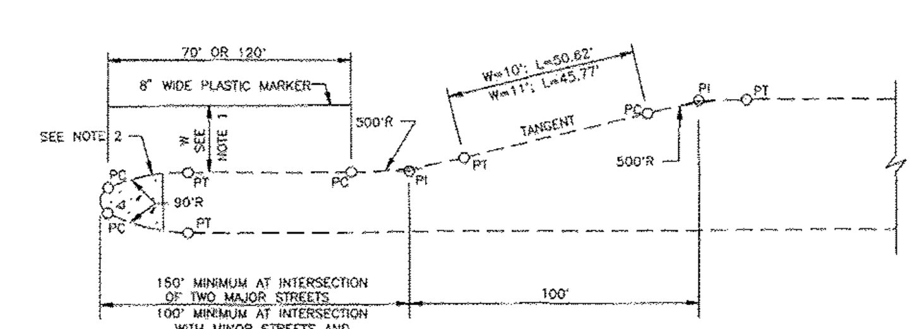
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
THRUST BLOCK DETAIL FOR WATER LINES (4-INCH TO 12 INCH)
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 | DWG NO: 02511-02

NOTES:

1. 10 FT FOR 80 FT ROW; 11 FT FOR 100 FT ROW.
2. FOR MEDIANS WITH BULLET NOSE CONFIGURATION, PAINT CURB WITH YELLOW REFLECTORIZED PAINT AROUND THE ESPLANADE NOSE TO THE PT OF THE 90 FT R. FOR MEDIANS WITHOUT BULLET NOSE CONFIGURATION, PAINT CURB FROM PC TO PT AND 30 FT BACK OF PC/PT.



ESPLANADE NOSE

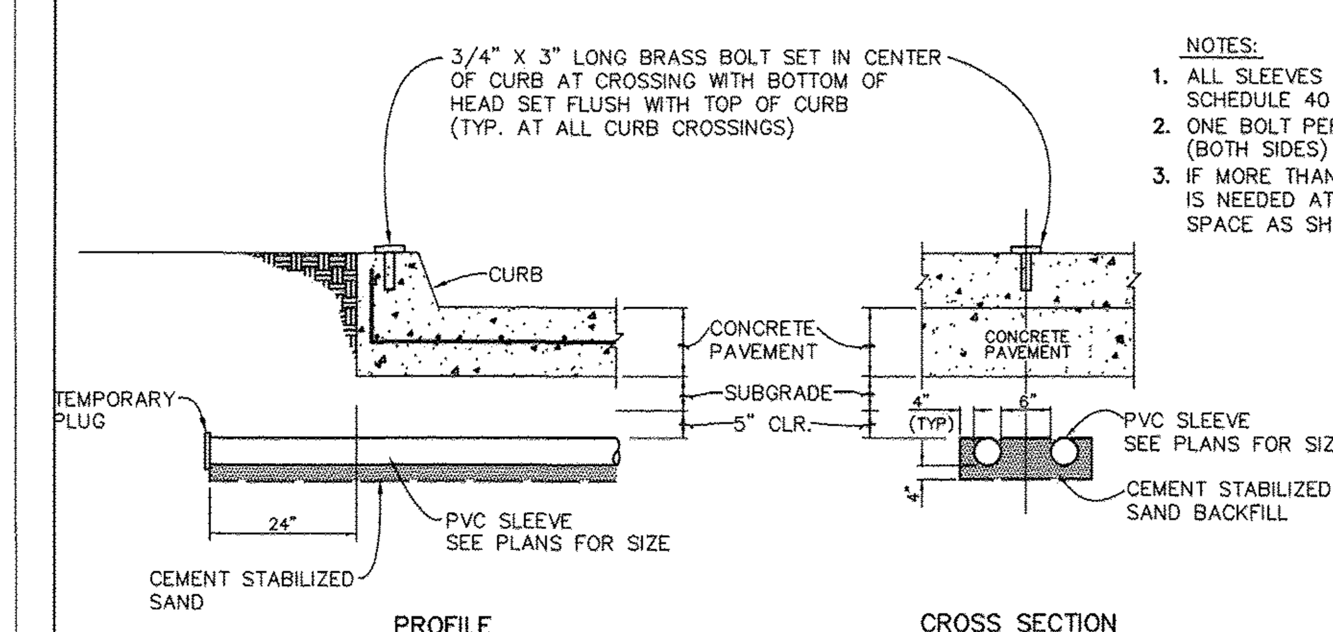


DETAIL OF LEFT TURN LANE

CURVE DATA

W=10' R=500' Δ = 5°42'38.14" L = 49.83' T=24.94'	W=11' R=500' Δ = 6°16'38.27" L = 54.78' T=27.42'

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
ESPLANADE NOSE AND LEFT TURN DETAILS
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER | APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 | DWG NO: 02772-01



NOTES:

1. ALL SLEEVES SHALL BE SCHEDULE 40 PVC
2. ONE BOLT PER CROSSING (BOTH SIDES)
3. IF MORE THAN ONE SLEEVE IS NEEDED AT CROSSING SPACE AS SHOWN BELOW

IRRIGATION SLEEVES

N.T.S.

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			

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7-20-17
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F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

WATER AND MISCELLANEOUS PAVING DETAILS

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER 08/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
ACCEPTED
58779

DRAWING SCALE
HORZ : N.T.S.
VERT :

SHEET No: 13 OF 25

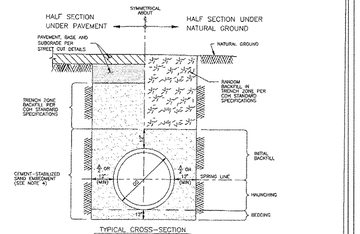
9/20/17

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\13_SR17_WTR.dwg

NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS PER COH STANDARD SPECIFICATIONS. SEE COH STANDARD DETAIL REQUIREMENTS IN OTHER CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE OF FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	
18" TO 30" INCLUSIVE	24"
OVER 30"	36"

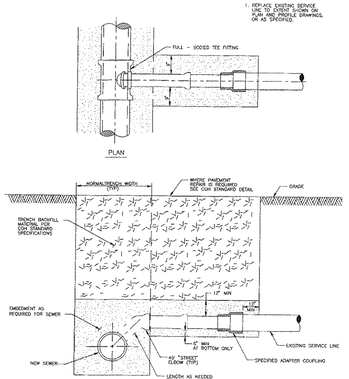
3. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE EMBEDMENT (BACKFILL) MATERIAL FOR FORCE MAINS MAY BE CONSIDERED PER COH STANDARD SPECIFICATIONS



TYPICAL CROSS-SECTION

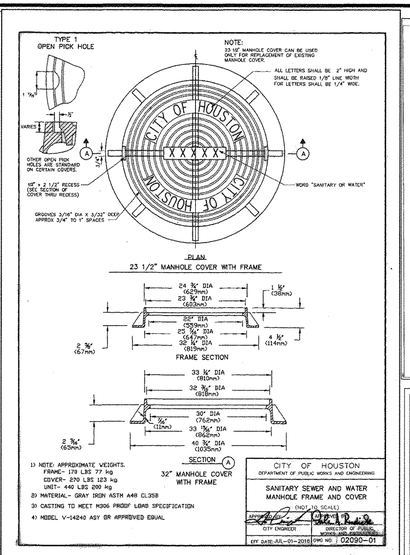
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SANITARY OR STORM SEWER
BEDDING AND BACKFILL
FOR DRY STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02317-03

NOTE:
1. REPLACE EXISTING SERVICE LINE AS SHOWN ON SEWER CAP PLAN AND PROFILE DRAWINGS, OR AS SPECIFIED.



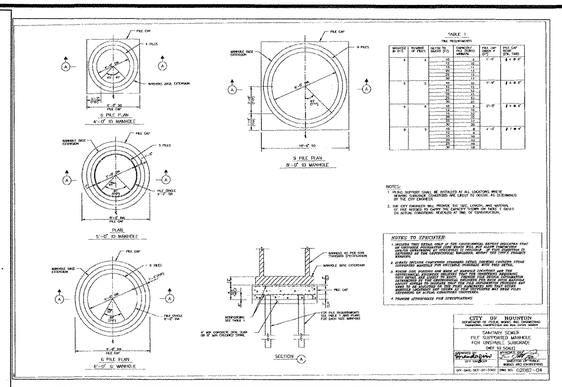
CROSS-SECTION OF SEWER AT SERVICE CONNECTION

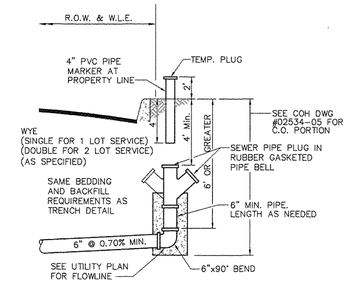
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
SANITARY SEWER
SERVICE RECONNECTION
ON NEW OR REPLACEMENT SEWER
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02534-04



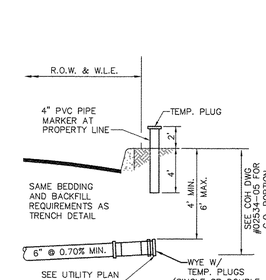
1) NOTE: APPROXIMATE WEIGHTS
FRAME- 170 LBS 77 kg
COVER- 270 LBS 123 kg
UNIT- 440 LBS 200 kg
2) MATERIAL - GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET MOSN PROOF LOAD SPECIFICATION
4) MODEL V-14240 ASY OR APPROVED EQUAL

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
SANITARY SEWER AND WATER
MANHOLE FRAME AND COVER
(NO-NO SEAL)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 DWG NO. 02090-01





RISER SERVICE LEAD TERMINATION
N.T.S.



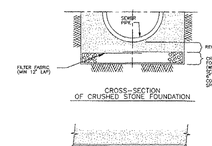
WYE SERVICE LEAD TERMINATION
N.T.S.

TYPICAL SANITARY SERVICE LEADS
N.T.S.

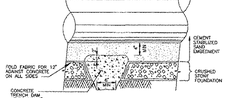
THE PAY ITEM FOR SANITARY SERVICE LEADS INCLUDES TRENCH SAFETY, ALL LABOR AND MATERIAL TO CONSTRUCT LEAD FROM MAIN, MANHOLE, OR STACK TO PLUGS. MANHOLE DROPS, ALL DEPTHS, INCIDENTAL TO SERVICE LEADS.

IN LIEU OF CRUSHED STONE FOUNDATION. CONTRACTOR MAY USE 6" THICK REINFORCED CONCRETE SEAL SLAB WITH #5 BARS @ 18" C.C, E.W.

NOTES:
1. ACTUAL SHAFT OF CONCRETE CYLINDER PIER FOUNDATION MAY BE DETERMINED BY CONTRACTOR W/ FIELD CONDITIONS AND SITE ENCOUNTERED AND KEY DEPTH REQUIREMENTS.
2. THIS DETAIL SHALL BE USED WITH CEMENT STABILIZED SAND EMBEDMENT OR STRIP CLASS B CONCRETE FOR STABLE TRENCH CONDITIONS.
3. PLACE TRENCH DAMS IN CLASS I ENCLOSURES AT THE MIDPOINT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES.



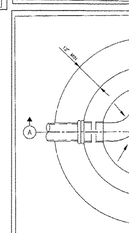
CROSS-SECTION OF CRUSHED STONE FOUNDATION



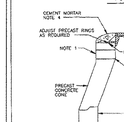
LONGITUDINAL SECTION ALONG PIPE ℄ AT FOUNDATION TRENCH DAM

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
SANITARY OR STORM SEWER
CRUSHED STONE FOUNDATION
FOR WET STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02317-02

NOTES:
1. A MINIMUM OF 3" PRECAST COVERSLAB OR CONE SECTION ADJUSTMENT RING SHALL BE PROVIDED. THE TOTAL HEIGHT OF THE ADJUSTMENT RING SHALL NOT EXCEED 1'.
2. MANHOLE INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWINGS.
3. SEAT MANHOLE FRAME IN SEALANT PER COH STANDARD SPECIFICATIONS.
4. DMT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
5. MINIMUM REINFORCING IN THE BASE SHALL BE # 5 @ 6 EW.



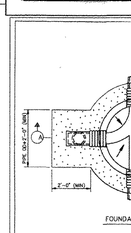
FOUNDATION PLAN



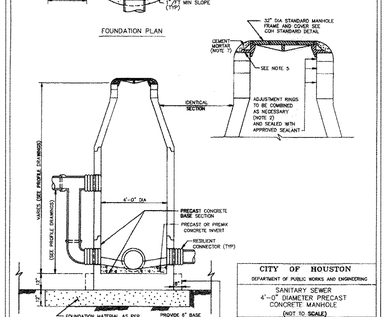
SECTION

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SANITARY SEWER
SHALLOW MANHOLE
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02082-01

NOTES:
1. DEPTH OF MANHOLE DETERMINES SECTIONS REQUIRED.
2. PRECAST CONCRETE RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF 4" AT 2'-0" AND 8" AT 4'-0" MANHOLE DEPTHS. ADJUSTMENT RINGS SHALL NOT EXCEED 1'.
3. MANHOLE WALL THICKNESS FOR DEPTH EXCEEDING 12'-0" SHALL BE DETERMINED TO MEET LOADING CONDITIONS AND THICKNESS 5".
4. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWINGS.
5. SEAT MANHOLE FRAME IN SEALANT PER COH STANDARD SPECIFICATION.
6. ECCENTRIC PRECAST CONCRETE MANHOLE MAY BE USED.
7. DMT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
8. MIN REINFORCING IN THE PRECAST CONCRETE BASE SHALL BE # 5 @ 6 EW.

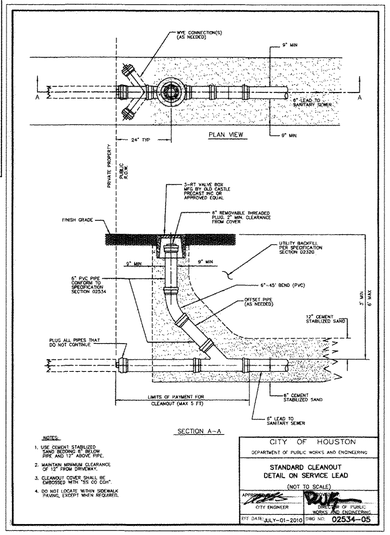


FOUNDATION PLAN



SECTION

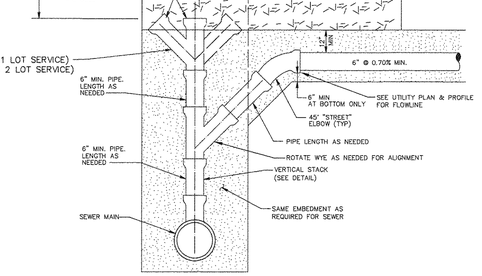
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
SANITARY SEWER
4'-0" DIAMETER PRECAST
CONCRETE MANHOLE
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO. 02082-02



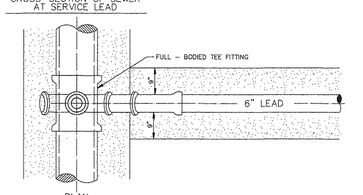
NOTES:
1. USE CEMENT STABILIZED SAND BEDDING 6" BELOW, 2FT AND 12" ABOVE PIPE.
2. MAINTAIN MINIMUM CLEARANCE OF 12" FROM DRIVEWAY.
3. CLEANOUT COVER SHALL BE EMBOSSED WITH "SS CO ON".
4. DO NOT LOCATE WITHIN SIDEWALK TRIANGLE, EXCEPT WHEN REQUIRED.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STANDARD CLEANOUT
DETAIL ON SERVICE LEAD
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO. 02534-05

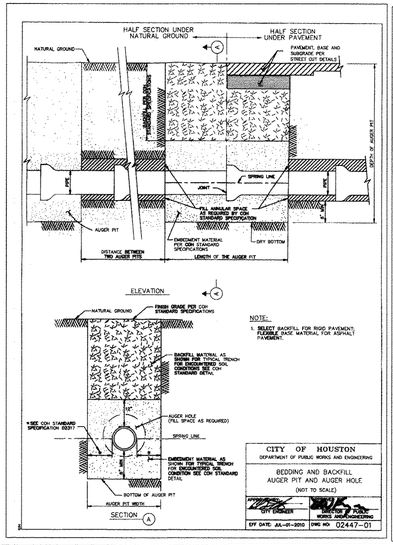
SANITARY SEWER STACK
N.T.S.



CROSS-SECTION OF SEWER AT SERVICE LEAD

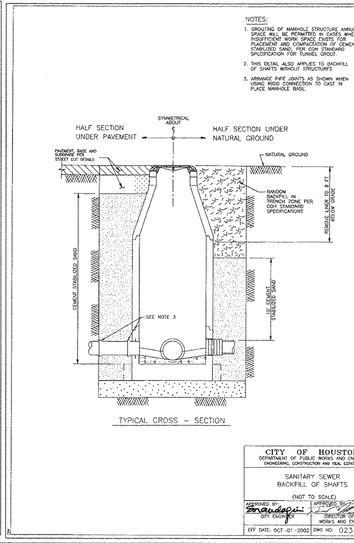


COMBINATION NEAR AND FAR SIDE SERVICE LEAD WITH STACK
N.T.S.



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
BEDDING AND BACKFILL
AUGER PIT AND AUGER HOLE
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: AA-01-2002 DWG NO. 02447-01

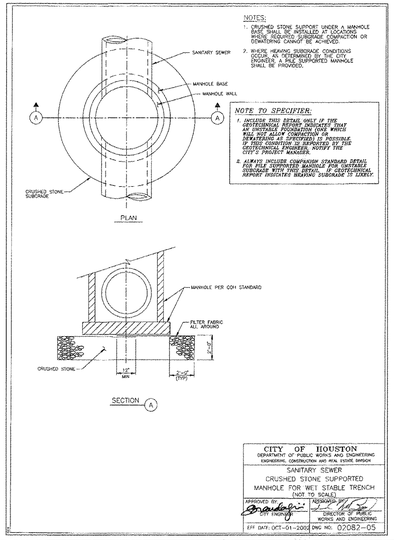
NOTES:
1. GROUTING OF MANHOLE STRUCTURE ANNULAR SPACE WILL BE PERMITTED IN LIEU OF WHERE INSUFFICIENT WORK SPACE EXISTS FOR PLACEMENT AND COMPACTION OF CEMENT STABILIZED SAND, PER COH STANDARD SPECIFICATION FOR TUNNEL GROUT
2. THIS DETAIL ALSO APPLIES TO BACKFILL OF SHAFTS WITHOUT STRUCTURES.
3. ARRANGE PIPE JOINTS AS SHOWN WHEN USING RIGID CONNECTION TO CAST IN PLACE MANHOLE BASE.



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SANITARY SEWER
BACKFILL OF SHAFTS
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02317-08

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

NOTE TO SPECIFIER:
1. UNLESS THIS DETAIL SHALL BE TYPE SPECIFIC, DESIGNER SHALL INSURE THAT ANY ENCOUNTERED EXCAVATION WHERE WORK WILL NOT ALLOW COMPACTION OF SUBGRADE, THAT CRUSHED STONE IS PROVIDED AT PRESCRIBED LOCATIONS AS DETERMINED BY GEOTECHNICAL ENGINEER, NOTIFY THE CITY'S PROJECT MANAGER.
2. ALWAYS INCLUDE COMPANION STANDARD DETAIL FOR CRUSHED STONE SUPPORTED MANHOLE. CONSULTANT SHALL REVISE DETAIL AS GEOTECHNICAL REPORT INDICATES BEARING SUBGRADE IS LIKELY.



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SANITARY SEWER
CRUSHED STONE SUPPORTED
MANHOLE FOR WET STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02082-05

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			
△			

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-6700 ▼ www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

SANITARY SEWER DETAILS

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.
JOB NUMBER: 4818-00/4818-10
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
8/3/17	
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:
DRAWING SCALE
HORZ :N.T.S.
VERT :
SHEET No: 14 OF 25

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
58779

9/20/17

X:\Districts\FBDA\0008\Silver_Ranch_17-4818\03_CAD\01_Construction_Plans\01_Sheets\14-_SR17_SDN.dwg

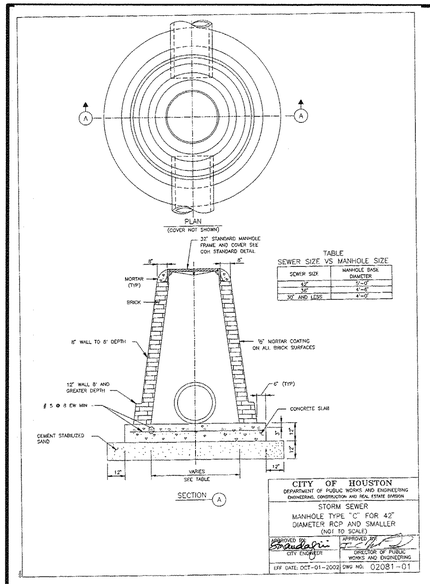


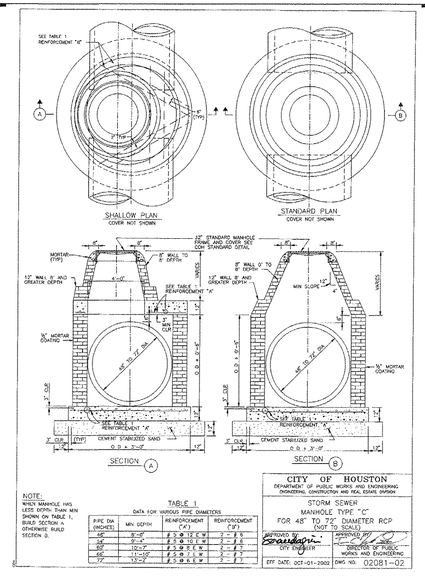
TABLE
SEWER SIZE VS MANHOLE SIZE

SEWER SIZE	MANHOLE DIAM.
15"	4'-0"
18"	4'-0"
21" AND LESS	4'-0"

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

STORM SEWER
MANHOLE TYPE "C" FOR 42" DIAMETER RCP AND SMALLER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02081-01



NOTE:
WHEN MANHOLE HAS LESS WIDTH THAN MIN SHOWN IN TABLE 1, BUILD SECTION AS OTHERWISE BUILD SECTION B.

TABLE 1
DATA FOR VARIOUS PIPE DIAMETERS

PIPE DIA (INCHES)	MIN DEPTH	REINFORCEMENT ("A")	REINFORCEMENT ("B")
18"	8'-0"	2 - #5 12" E W	2 - # 5
24"	9'-0"	2 - #5 10" E W	2 - # 5
30"	10'-0"	2 - #5 8" E W	2 - # 5
36"	11'-0"	2 - #5 7" E W	2 - # 5
42"	12'-0"	2 - #5 6" E W	2 - # 5

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

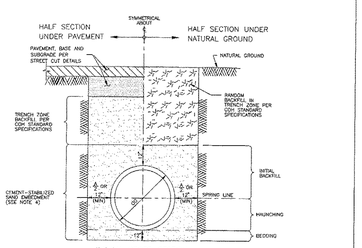
STORM SEWER
MANHOLE TYPE "C"
FOR 48" TO 72" DIAMETER RCP
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02081-02

NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR STABLE TRENCH CONDITIONS PER COH STANDARD. SEE COH STANDARD SPECIFICATION FOR REQUIREMENTS IN OTHER CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS 24 INCHES, UNLESS OTHERWISE NOTED FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
18" TO 30"	3'-0"
OVER 30"	3'-6"

3. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR PIPE MAINS MAY BE ALLOWED PER COH STANDARD SPECIFICATIONS.



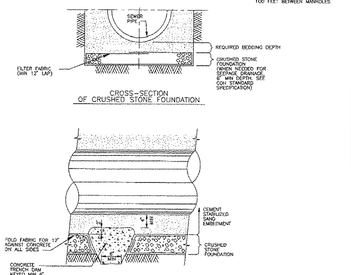
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY OR STORM SEWER
BEDDING AND BACKFILL
FOR DRY STABLE TRENCH
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02317-03

NOTE:
IN LIEU OF CRUSHED STONE FOUNDATION. CONTRACTOR MAY USE 6" THICK REINFORCED CONCRETE SEAL SLAB WITH #5 BARS @ 16" C.C. E.W. BROWN & GAY ENGINEERS, INC.

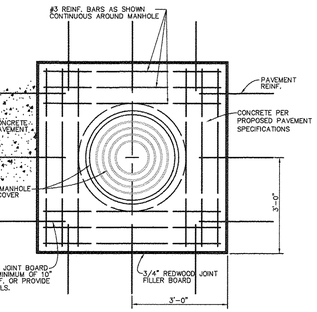
NOTES:
1. ACTUAL SHAPE OF CONCRETE TRENCH DAM CROSS SECTION MAY BE DETERMINED BY MASTER MINIMUM THICKNESS AND KEY DEPTH REQUIREMENTS.
2. THIS DETAIL SHALL BE USED WITH CEMENT STABILIZED SAND EMBEDMENT OR OTHER CLASS II EMBEDMENT IN A STABLE TRENCH CONDITIONS.
3. PLACE TRENCH DAMS IN CLASS I EMBEDMENTS AT THE MIDPOINT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES

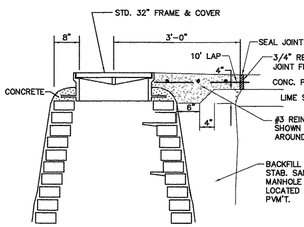


CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY OR STORM SEWER
CRUSHED STONE FOUNDATION
FOR WET STABLE TRENCH
(NOT TO SCALE)

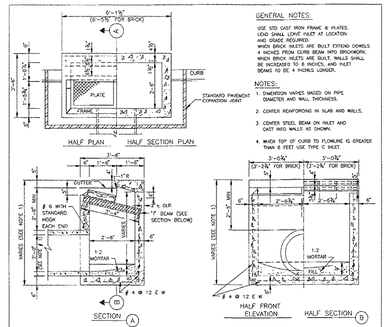
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02317-02





MANHOLE BLOCKOUT DETAIL

NOT C.O.H STANDARD DETAIL
JULY 1, 1999 N.T.S.



CURB BEAM MARK	SIZE	LENGTH	GRADE	SLOPE
1	#6	6'-0"	60	VERT
2	#6	6'-1 5/8"	60	VERT
3	#6	6'-3"	60	VERT

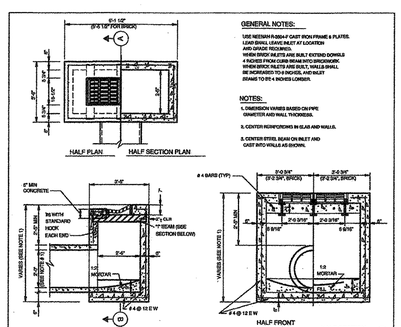
GENERAL NOTES:
USE STD CAST IRON FRAME & PLATES. LOAD SHALL LOWE INLET AT LOCATION AND GRADE REQUIRED.
WHEN BRICK INLETS ARE BUILT EXTEND DOWELS 4 INCHES FROM CURB BEAM INTO BRICKWORK. WHEN BRICK INLETS ARE BUILT, WALLS SHALL BE INCREASED TO 8 INCHES, AND INLET BEAMS TO BE 4 INCHES LONGER.

NOTES:
1. DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
2. CENTER REINFORCING IN SLAB AND WALLS.
3. CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.
4. WHEN TOP OF CURB TO FLOWLINE IS GREATER THAN 6 FEET USE TYPE C INLET.

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

STORM SEWER
TYPE "BB" INLET
(NOT TO SCALE)

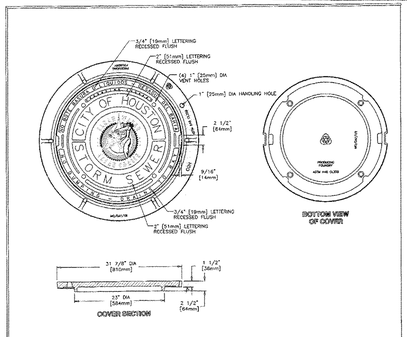
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 DWG NO. 02632-04



GENERAL NOTES:
USE NEENAH R-3504-F GRAY IRON FRAME & PLATES. LOAD SHALL LOWE INLET AT LOCATION AND GRADE REQUIRED.
WHEN BRICK INLETS ARE BUILT, EXTEND DOWELS 4 INCHES FROM CURB BEAM INTO BRICKWORK. WHEN BRICK INLETS ARE BUILT, WALLS SHALL BE INCREASED TO 8 INCHES, AND INLET BEAMS TO BE 4 INCHES LONGER.

NOTES:
4. DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
5. CENTER REINFORCING IN SLAB AND WALLS.
6. CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.

MODIFIED TYPE "B-B" INLET



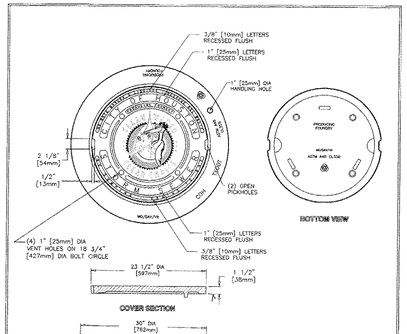
√ MACHINED SURFACE

1) NOTE: APPROXIMATE WEIGHTS.
FRAME- 270 LBS 123kg
COVER- 270 LBS 123kg
UNIT- 440 LBS 200kg
2) MATERIAL- GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-1420 ASY OR APPROVED EQUAL

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

STORM SEWER MANHOLE
FRAMS AND COVER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG. NO. 02084-02



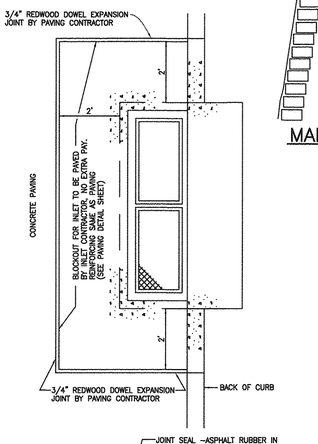
√ MACHINED SURFACE

1) NOTE: APPROXIMATE WEIGHTS.
FRAME- 120 LBS 48kg
COVER- 130 LBS 59kg
UNIT- 250 LBS 114kg
2) MATERIAL- GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-1814 ASY OR APPROVED EQUAL

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

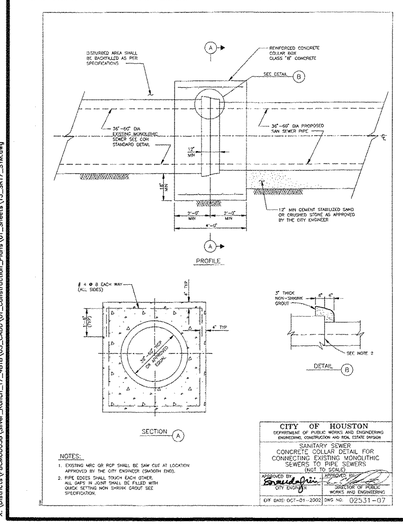
STORM SEWER TYPE "C-1", "C-2", "C-2A" AND "S-2" INLET FRAME AND COVER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG. NO. 02084-09



INLET BLOCKOUT

NOT C.O.H STANDARD DETAIL
JULY 1, 1999 N.T.S.

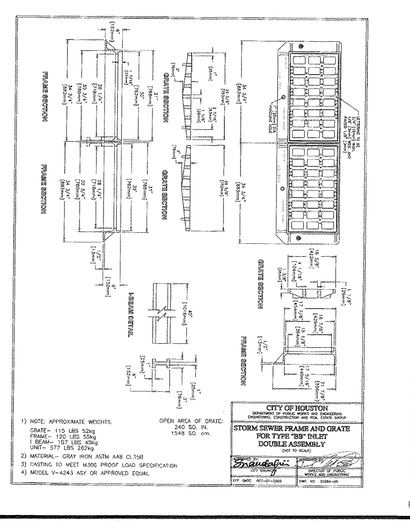


NOTES:
1. EXISTING MHC OR PCP SHALL BE SAW CUT AT LOCATION DESIGNATED BY THE CITY ENGINEER (DASHED LINE).
2. PIPE ENDS SHALL TOUCH EACH OTHER. ALL GAPS IN JOINT SHALL BE FILLED WITH QUICK SETTING NON SHRINK GROUT SEE SPECIFICATION.

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 RCP 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



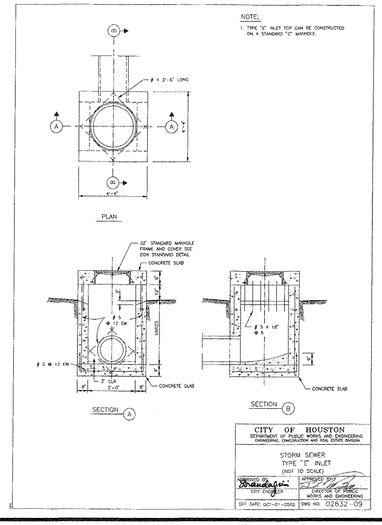
1) NOTE: APPROXIMATE WEIGHTS.
GRATE- 115 LBS 52kg
FRAME- 120 LBS 54kg
1 BEAM- 107 LBS 49kg
UNIT- 377 LBS 267kg
2) MATERIAL- GRAY IRON ASTM A48 CL35D
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-4243 ASY OR APPROVED EQUAL

OPEN AREA OF GRATE
240 SQ. IN.
1548 SQ. cm.

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

STORM SEWER FRAME AND GRATE
FOR TYPE "BB" INLET
DOUBLE ASSEMBLY
(NOT TO SCALE)

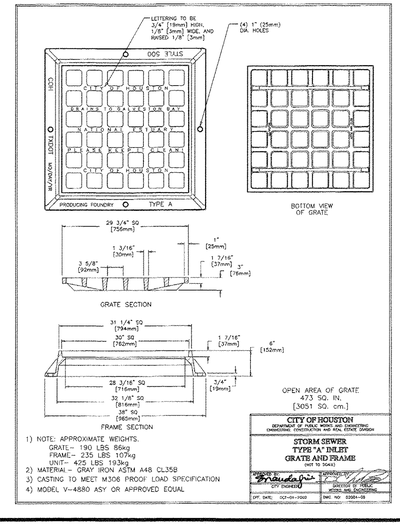
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG NO. 02632-09



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

STORM SEWER
TYPE "E" INLET
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG NO. 02632-08



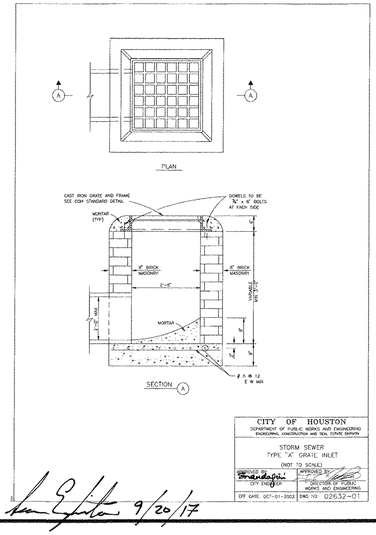
OPEN AREA OF GRATE
473 SQ. IN.
[3051 SQ. cm.]

1) NOTE: APPROXIMATE WEIGHTS.
GRATE- 190 LBS 86kg
FRAME- 235 LBS 107kg
UNIT- 425 LBS 193kg
2) MATERIAL- GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-4880 ASY OR APPROVED EQUAL

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

STORM SEWER
TYPE "A" INLET
GRATE AND FRAME
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG NO. 02685-08



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

STORM SEWER
TYPE "A" GRATE INLET
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 DWG NO. 02632-01

9/20/17

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			

BGE

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

STORM SEWER DETAILS

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM Megan Jan 8/3/17	FACILITIES
STREET & BRIDGE	

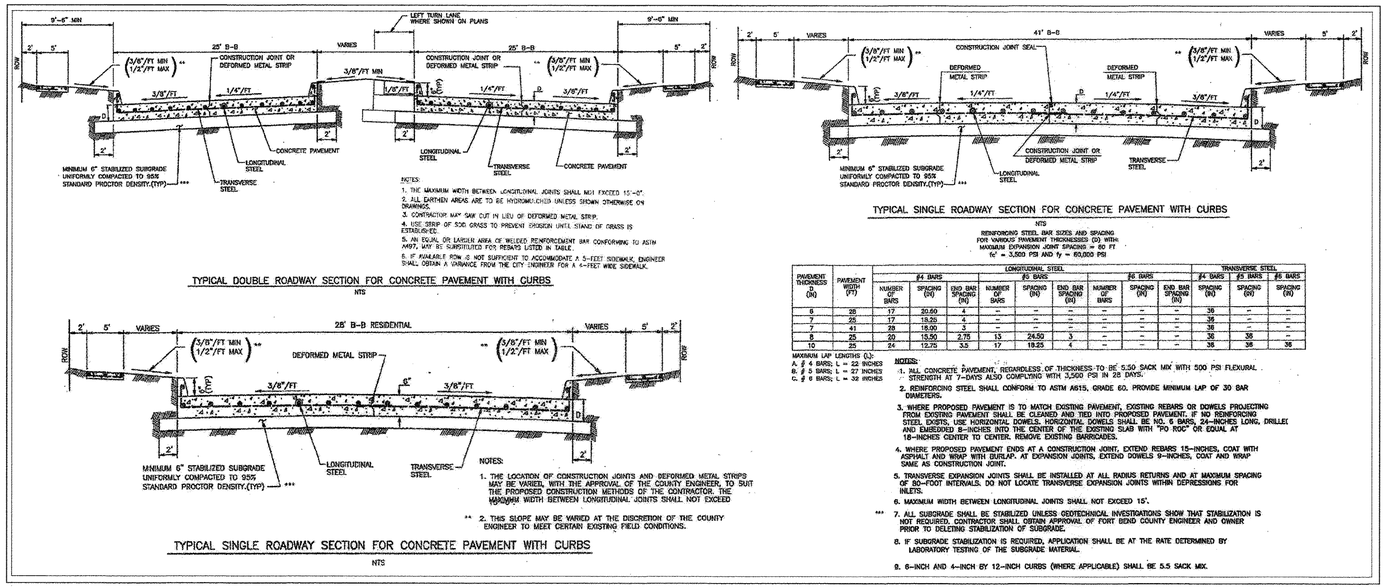
FILE NO:

DRAWING SCALE
HORZ :N.T.S.
VERT :

FOR CITY OF HOUSTON USE ONLY
PROFESSIONAL ENGINEER
59779

SHEET No: 15 OF 25

X:\Districts\FBDUD0058\Silver_Ranch_17_4818\05_CAD\01_Construction_Plans\01_Sheets\15_SR17_ST04.dwg

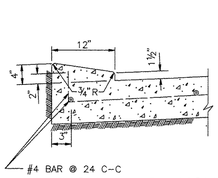


REINFORCING STEEL BAR SIZES AND SPACING FOR VARIOUS PAVEMENT THICKNESSES (D) WITH MAXIMUM EXPANSION JOINT SPACING = 80 FT
f'_c = 3,500 PSI AND f_y = 60,000 PSI

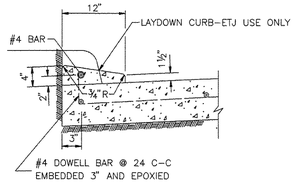
PAVEMENT THICKNESS (IN)	PAVEMENT WIDTH (FT)	LONGITUDINAL STEEL #4 BARS: NUMBER OF BARS	#4 BARS: SPACING (IN)	#4 BARS: END BAR SPACING (IN)	#5 BARS: NUMBER OF BARS	#5 BARS: SPACING (IN)	#5 BARS: END BAR SPACING (IN)	#6 BARS: NUMBER OF BARS	#6 BARS: SPACING (IN)	#6 BARS: END BAR SPACING (IN)	TRANSVERSE STEEL #4 BARS: SPACING (IN)	#5 BARS: SPACING (IN)	#6 BARS: SPACING (IN)
6	25	17	20.50	4	--	--	--	--	--	--	36	--	--
7	25	17	19.25	4	--	--	--	--	--	--	36	--	--
7	41	28	19.00	3	--	--	--	--	--	--	36	--	--
8	25	20	19.50	2.75	13	24.50	3	--	--	--	36	36	--
10	25	24	19.75	3.5	17	19.25	4	--	--	--	36	36	36

MAXIMUM LAP LENGTHS (L):
A. # 4 BARS; L = 22 INCHES
B. # 5 BARS; L = 27 INCHES
C. # 6 BARS; L = 32 INCHES

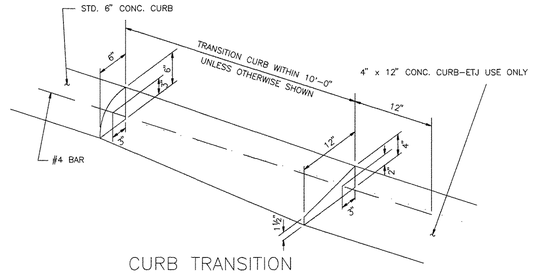
NOTES:
1. ALL CONCRETE PAVEMENT, REGARDLESS OF THICKNESS TO BE 5.50 SACK MIX WITH 500 PSI FLEXURAL STRENGTH AT 7-DAYS ALSO COMPLYING WITH 3,500 PSI IN 28 DAYS.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. PROVIDE MINIMUM LAP OF 30 BAR DIAMETERS.
3. WHERE PROPOSED PAVEMENT IS TO MATCH EXISTING PAVEMENT, EXISTING REBARS OR DOWELS PROJECTING FROM EXISTING PAVEMENT SHALL BE CLEANED AND TIED INTO PROPOSED PAVEMENT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE NO. 5 BARS, 24-INCHES LONG, DRILLED AND EMBEDDED 8-INCHES INTO THE CENTER OF THE EXISTING SLAB WITH "PO RDC" OR EQUAL AT 18-INCHES CENTER TO CENTER. REMOVE EXISTING BARRICADES.
4. WHERE PROPOSED PAVEMENT ENDS AT A CONSTRUCTION JOINT, EXTEND REBARS 15-INCHES, COAT WITH ASPHALT AND WRAP WITH BURLAP. AT EXPANSION JOINTS, EXTEND DOWELS 9-INCHES, COAT AND WRAP SAME AS CONSTRUCTION JOINT.
5. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT ALL RADIUS RETURNS AND AT MAXIMUM SPACING OF 80-FOOT INTERVALS. DO NOT LOCATE TRANSVERSE EXPANSION JOINTS WITHIN DEPRESSIONS FOR INLETS.
6. MAXIMUM WIDTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'.
*** 7. ALL SUBGRADE SHALL BE STABILIZED UNLESS GEOTECHNICAL INVESTIGATIONS SHOW THAT STABILIZATION IS NOT REQUIRED. CONTRACTOR SHALL OBTAIN APPROVAL OF FORT BEND COUNTY ENGINEER AND OWNER PRIOR TO DELETING STABILIZATION OF SUBGRADE.
8. SUBGRADE STABILIZATION IS REQUIRED, APPLICATION SHALL BE AT THE RATE DETERMINED BY LABORATORY TESTING OF THE SUBGRADE MATERIAL.
9. 6-INCH AND 4-INCH BY 12-INCH CURBS (WHERE APPLICABLE) SHALL BE 5.5 SACK MIX.



4-INCH x 12-INCH MONOLITHIC CURB



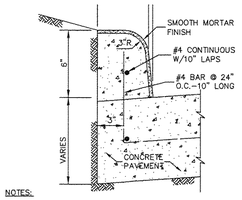
4-INCH x 12-INCH TRANSITION CURB



CURB TRANSITION

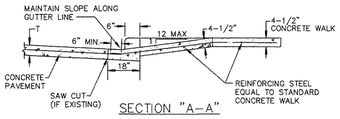
4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

1. 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS AND NON-RESIDENTIAL STREETS. RESIDENTIAL STREETS MAY BE CONSTRUCTED WITH EITHER 6-INCH CONCRETE CURB OR 4-INCH x 12-INCH CONCRETE CURB AS NOTED ON PLANS.
2. ALL 4-INCH x 12-INCH CONCRETE CURBS TO BE POURED MONOLITHICALLY WITH PROPOSED CONCRETE PAVEMENT.
3. TRANSITIONS FROM 6-INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-FOOT TRANSITION CURB IS NOT POURED MONOLITHICALLY WITH THE PAVEMENT, THEN REINFORCING STEEL AS SHOWN IN "4-INCH x 12-INCH TRANSITION CURB" IS TO BE INSTALLED.

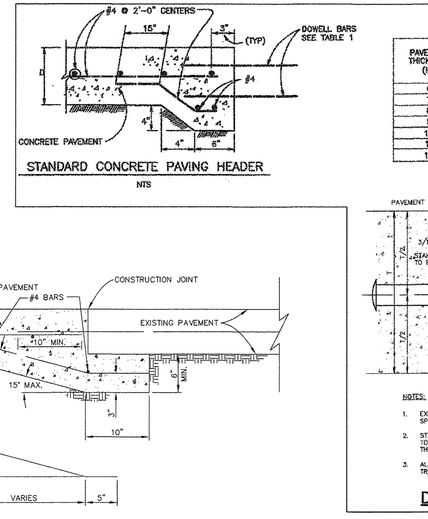


NOTES:
1. MORTAR FINISH NOT REQUIRED WHEN CURB IS POURED BY A MACHINE, BUT CURB WILL HAVE THE SAME OUTSIDE DIMENSIONS.
2. WHEN CONCRETE CURB IS TO BE PLACED ON EXISTING CONCRETE BASE, SET #4 DEFORMED BARS, 10" LONG, 24" O.C. DOWELLED AND SET IN QUICK SETTING CEMENT.
3. REDWOOD EXPANSION JOINTS SHALL BE INSTALLED AT ALL PAVEMENT EXPANSION JOINTS.

6" CONCRETE CURB



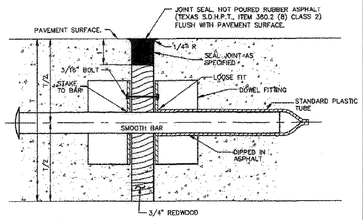
SECTION "A-A"



STANDARD CONCRETE PAVING HEADER
NTS

TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS: DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12

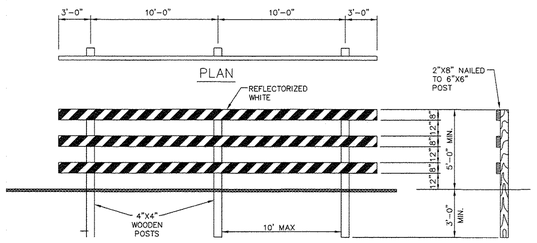


NOTES:
1. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED A MAXIMUM OF 60'-0" APART.
2. STAKES FOR TRANSVERSE JOINTS SHALL NOT BE PLACED CLOSER THAN 6" TO A LONGITUDINAL JOINT. THE TOP OF EACH STAKE SHALL NOT BE LESS THAN 1" BELOW THE FINISH SURFACE.
3. ALTERNATIVE DOWEL IS A CANTILEVER TYPE, CAST MALLEABLE IRON LOAD TRANSMISSION UNIT, STAR-LUG, MODEL D-27, OR EQUAL ON 22" C-C.

DOWEL TYPE EXPANSION JOINT

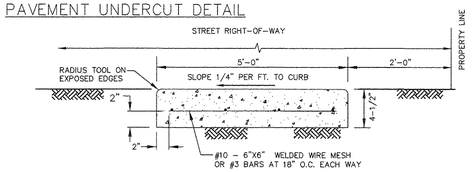
UNDERCUT BAR LAYOUT

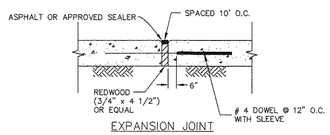
PAVEMENT UNDERCUT DETAIL



NOTE: FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND REFLECTIVE WHITE STRIPES IN SIDE FACING TRAFFIC.

TYPE III BARRICADE

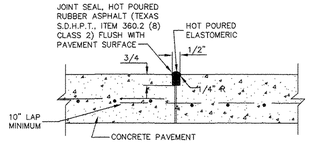




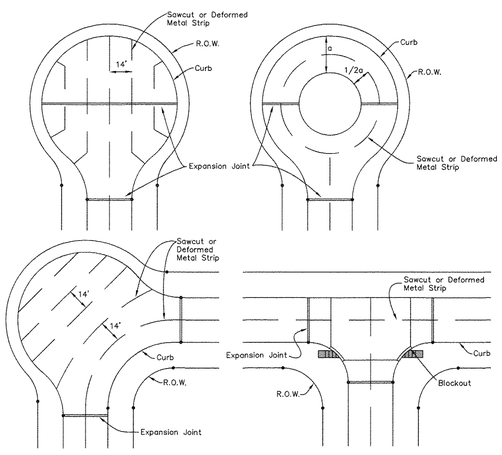
EXPANSION JOINT

EXPANSION JOINTS SHALL BE SPACED 10' O.C.
CONCRETE SHALL HAVE FIVE (5) SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
CONTROL JOINTS ARE TO BE CUT (1/4" x 1/2") AT NOT GREATER THAN 5' O-C SPAVING.

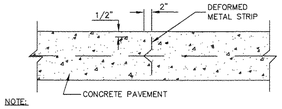
CONCRETE SIDEWALK DETAIL



CONSTRUCTION JOINT DETAIL



TYPICAL LOCATION OF EXPANSION JOINTS AND SAWCUTS OR DEFORMED METAL STRIPS
N.T.S.



NOTE:
THE LOCATION OF DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. MAXIMUM LONGITUDE SPACING FOR DEFORMED STRIPS IS 14'-0". DEFORMED METAL STRIPS SHALL BE PLACED VERTICALLY ALONG A STRAIGHT ALIGNMENT.

DEFORMED METAL STRIP

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
1			
2			
3			

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc. F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PAVING DETAILS (SHEET 1 OF 2)

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER: 8/03/17	TRAFFIC AND TRANSPORTATION
WASTEWATER: 8/3/17	STORM WATER QUALITY
STORM: 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:

DRAWING SCALE
HORZ :N.T.S.
VERT :

SHEET No: 16 of 25

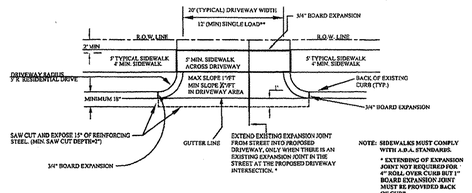
FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
58279

9/20/17

X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CAD\01_Construction_Plans\01_Sheets\16_SR17_PAV_SHT 1of2.dwg

WHEN A RESIDENTIAL SIDEWALK, DRIVEWAY, CURB OR GUTTER IS CONSTRUCTED, RECONSTRUCTED, REPAIRED OR REGRADED ON COUNTY RIGHT-OF-WAY. FOR USE WITH CONCRETE OR ASPHALT CURB TYPE STREETS, USE SECTIONS APPLICABLE.

A. USE FOR ALL PROPOSED EXISTING CURB REMOVAL FOR DRIVEWAYS (PLAN VIEW NOT TO SCALE)

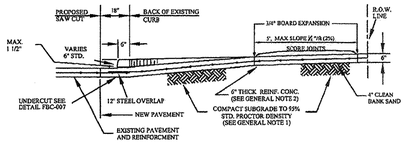


NOTE: SIDEWALKS MUST COMPLY WITH A.D.A. STANDARDS.

* EXTENDING OF EXPANSION JOINT NOT REQUIRED FOR 6" ROLL-OVER CURB BUT 1" BOARD EXPANSION JOINT MUST BE PROVIDED BACK OF CURB.

** ANY OTHER SIZE MUST BE APPROVED BY COUNTY ENGINEER

B. USE FOR ALL PROPOSED DRIVES ON CURBED TYPE STREETS



GENERAL NOTES:

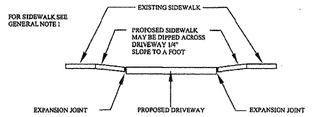
1. COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO R.O.W. LINE, COMPACT TO 95% OF STANDARD PROCTOR DENSITY(+/- 2% OPT. MOISTURE), THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TESTS TO BE CONDUCTED.
2. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE #4 DEFORMED REINFORCING BARS (ASTM A615, GRADE 60, UNLESS NOTED) SPACED AT 24" C.C., EACH WAY, WITH 12" MINIMUM LAP FROM PROPOSED SAW CUT TO R.O.W. LINE.
3. PROPOSED DRIVEWAY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 SACKS (3000 PSI) OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICTION 03301), 6" THICK, FROM PROPOSED SAW CUT TO R.O.W. LINE.
4. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 SACKS (3000 PSI) OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICTION 03301), 4" THICK.
5. FOR TYPICAL SIDEWALK DETAIL SEE FBC-011.

SIDEWALKS & DRIVEWAYS ON CURB TYPE STREETS RESIDENTIAL AREA	DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94	REVISED BY: J. NETARDUS DATE REVISED: 4-7-09
	APPROVED BY: L. HOOD DATE: 2-1-94	DRAWING NO. FBC-010A

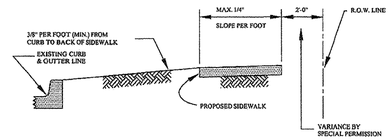
FORT BEND COUNTY ENGINEERING DEPARTMENT

WHEN A RESIDENTIAL SIDEWALK, DRIVEWAY, CURB OR GUTTER IS CONSTRUCTED, RECONSTRUCTED, REPAIRED OR REGRADED ON COUNTY RIGHT-OF-WAY. FOR USE WITH CONCRETE OR ASPHALT CURBED TYPE STREETS, USE SECTIONS APPLICABLE.

C. USE WHEN PROPOSED DRIVEWAY IS TO BE BUILT WITH EXISTING SIDEWALKS WITH EXCESSIVE GRADE:



D. USE WHEN SIDEWALK TO BE BUILT OTHER THAN DRIVEWAY:



GENERAL NOTES:

1. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 SACKS (3000 PSI) OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 4" THICK AND MINIMUM 4' WIDTH.

SIDEWALKS & DRIVEWAYS ON CURB TYPE STREETS RESIDENTIAL AREA	DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94	REVISED BY: R. GOMEZ DATE REVISED: 11-1-05
	APPROVED BY: L. HOOD DATE: 2-1-94	DRAWING NO. FBC-010B

FORT BEND COUNTY ENGINEERING DEPARTMENT

GENERAL NOTES FOR SIDEWALKS AND DRIVEWAYS

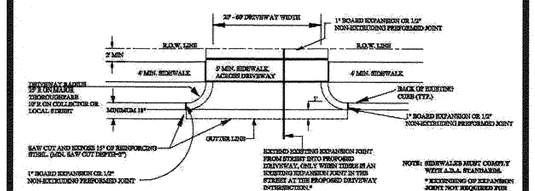
1. PROPOSED DRIVEWAY, SIDEWALK, CURB, GUTTER LINE AND GRADE SHALL MATCH EXISTING STREET.
2. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT, CLASS A STRUCTURAL (REFER TO SPECIFICATION 03301), 4 INCHES THICK AND 4 FEET MINIMUM WIDTH.
3. PROPOSED DRIVEWAY AND CURB SHALL BE BUILT WITH PORTLAND CEMENT CONCRETE, CLASS A STRUCTURAL (REFER TO SPECIFICATION 03301), 6 INCHES THICK, FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO RIGHT-OF-WAY LINE AND TO BE REINFORCED WITH #4 DEFORMED REINFORCING BARS (MINIMUM, ASTM A615 GRADE 60, UNLESS NOTED) SPACED AT 24 INCHES C.C., EACH WAY, WITH 10 INCHES MINIMUM LAP.
4. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE TIED TO EXISTING ROADWAY REINFORCING STEEL WITH A MINIMUM 12 INCHES LAP.
5. PROPOSED GUTTER LINE IS TO BE MAINTAINED AT FACE OF EXISTING CURB.
6. SAW CUT EXISTING CURB AT EACH END OF PROPOSED DRIVEWAY AND KNOCK OUT EXISTING CURB.
7. SAW CUT EXISTING PAVEMENT MINIMUM 2 INCHES AND BREAK OUT TO EXPOSE EXISTING REINFORCEMENT STEEL AT LEAST 12 INCHES AT PROPOSED DRIVEWAY INTERSECTION. FULL DEPTH CUT IS ACCEPTABLE PROVIDING 18" LONG DRILL IN DOWELS ARE INSTALLED AT A SPACING TO MATCH EXISTING WITH A MIN. 6" EMBEDMENT.
8. COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO RIGHT-OF-WAY LINE, COMPACT TO 95% OF STANDARD PROCTER DENSITY (+/- 2% OPT. MOISTURE). THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TESTS IF HE DEEMS THEM NECESSARY.
9. PLACE AND COMPACT 4 INCH CLEAN BANK SAND.
10. PROPOSED AREA FROM BACK OF CURB TO SIDEWALK AND FROM SIDEWALK TO RIGHT-OF-WAY LINE MAY BE CONCRETE OR DIRT (ROADWAYS WITH CURBS AND SIDEWALKS).
11. IF MORE THAN ONE PROPOSED DRIVEWAY IS BUILT ON THE SAME PROPERTY, SAID DRIVE WAYS SHALL SEPERATED BY A MINIMUM DISTANCE OF AT LEAST 20 FEET (ROADWAYS WITH CURBS AND SIDEWALKS).
12. SIDEWALKS SHALL HAVE 3/4 INCH REDWOOD BOARD EXPANSION JOINTS EVERY 20 FEET ON CENTER
13. PLACE ONE-INCH BOARD EXPANSION JOINT AT RIGHT-OF-WAY LINE.
14. EXPANSION JOINT FILLER SHALL BE PRE FORMED CONFORMING TO AASHTO M-33 OR M-213 BETWEEN SIDEWALK AND CURB, AROUND FIRE HYDRANTS AND UTILITY POLES.

CONSTRUCTION NOTES FOR SIDEWALKS & DRIVEWAYS ON CURB TYPE STREETS RESIDENTIAL AREA	APPROVED BY: LOUIS E. HOOD, P.E.	DRAWN BY: L. BRDECKA
	DATE DRAWN: 10-4-95 REVISED:4-7-09	DRAWING NO.: FBC-010C

FORT BEND COUNTY ENGINEERING DEPARTMENT

WHEN A COMMERCIAL SIDEWALK, DRIVEWAY, CURB OR GUTTER IS CONSTRUCTED, RECONSTRUCTED, REPAIRED OR REGRADED ON COUNTY RIGHT-OF-WAY. FOR USE WITH CONCRETE OR ASPHALT CURB TYPE STREETS, USE SECTIONS APPLICABLE.

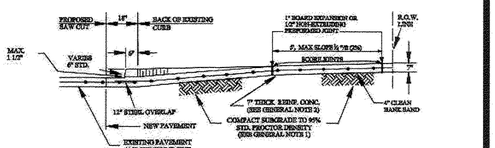
A. USE FOR ALL PROPOSED EXISTING CURB REMOVAL FOR DRIVEWAYS (PLAN VIEW NOT TO SCALE)



NOTE: SIDEWALKS MUST COMPLY WITH A.D.A. STANDARDS.

* EXTENDING OF EXPANSION JOINT NOT REQUIRED FOR 6" ROLL OVER CURB BUT 1" BOARD EXPANSION JOINT MUST BE PROVIDED BACK OF CURB

B. USE FOR ALL PROPOSED DRIVES ON CURBED TYPE STREETS



GENERAL NOTES:

1. COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO R.O.W. LINE, COMPACT TO 95% OF STANDARD PROCTOR DENSITY(+/-2% OPT. MOISTURE), THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TESTS TO BE CONDUCTED.
2. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE #4 DEFORMED REINFORCING BARS (ASTM A615, GRADE 60, UNLESS NOTED) SPACED AT 24" C.C., EACH WAY, WITH 12" MINIMUM LAP FROM PROPOSED SAW CUT TO R.O.W. LINE.
3. PROPOSED DRIVEWAY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 ½ SACKS OF CEMENT PER CUBIC YARD OF CONCRETE, CLASS "A" STRUCTURAL (REFER TO SPECIFICTION 03301), 7" THICK, FROM PROPOSED SAW CUT TO R.O.W. LINE.
4. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 ½ SACKS OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICTION 03301), 4 ½ " THICK.

SIDEWALKS & DRIVEWAYS ON CURB TYPE STREETS COMMERCIAL AREA	DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94	REVISED BY: R. GOMEZ DATE REVISED: 11-1-05
	APPROVED BY: L. HOOD DATE: 2-1-94	DRAWING NO. FBC-025A

FORT BEND COUNTY ENGINEERING DEPARTMENT

REV. NO.	DATE	DESCRIPTION	P.E. APPR.
△			
△			
△			

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-6700 ● www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

FORT BEND COUNTY M.U.D. 58

SILVER RANCH SEC 17

PAVING DETAILS (SHEET 2 OF 2)

DATE: JULY 2017
DESIGNED BY: DS
DRAWN BY: B.G.E.

JOB NUMBER: 4818-00/4818-10

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC AND TRANSPORTATION
8/03/17	
WASTEWATER 8/3/17	STORM WATER QUALITY
STORM 8/3/17	FACILITIES
STREET & BRIDGE	

FILE NO:

DRAWING SCALE
HORZ :N.T.S.
VERT :

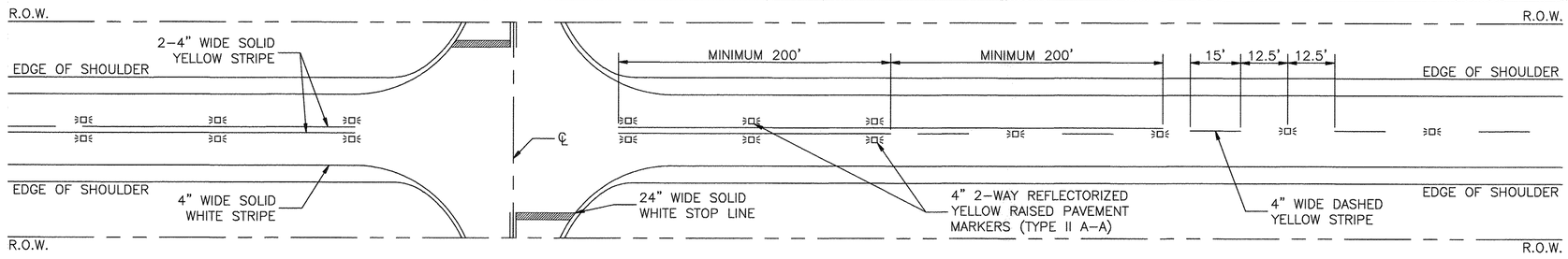
SHEET No: 17 OF 25

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
58779

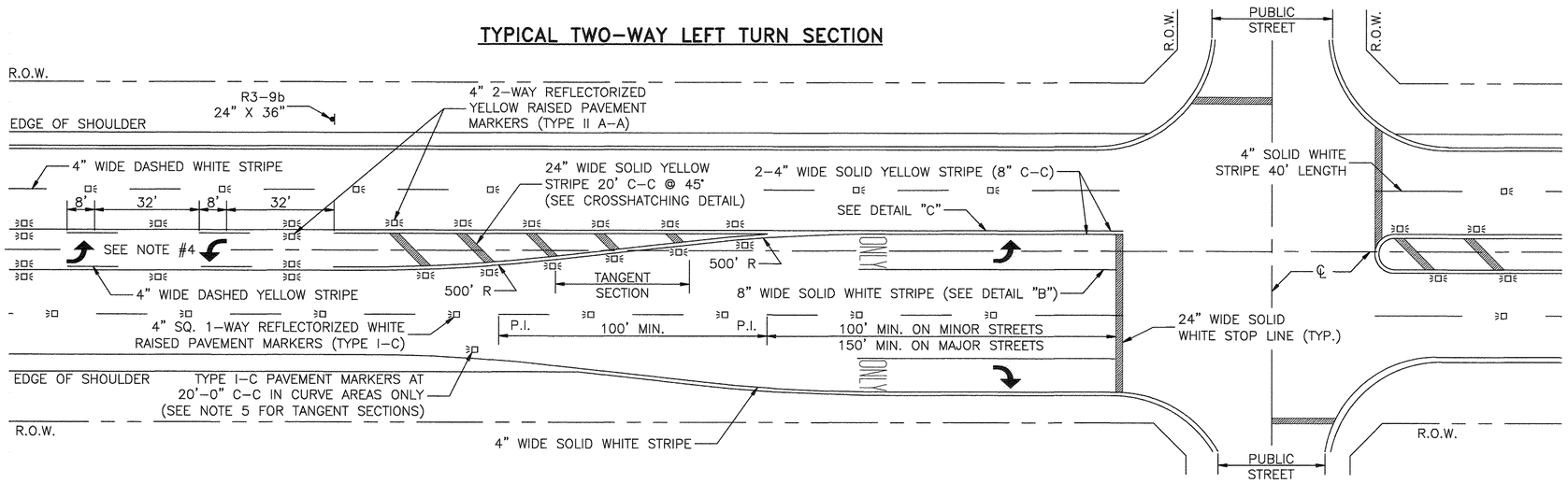
9/20/17

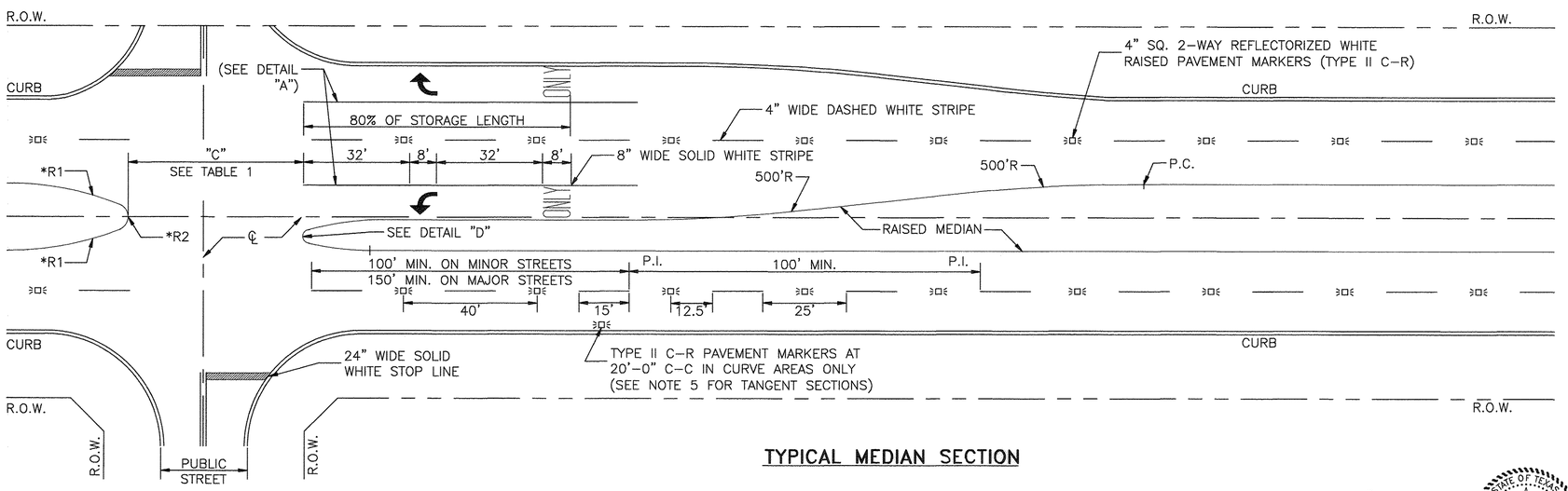
X:\Districts\FBCMUD058\Silver_Ranch_17_4818\03_CADD\01_Construction_Plans\01_Sheets\17_SR17_PAV_SHT 2of2.dwg



TYPICAL TWO LANE TWO–WAY ROAD

TYPICAL TWO–WAY LEFT TURN SECTION



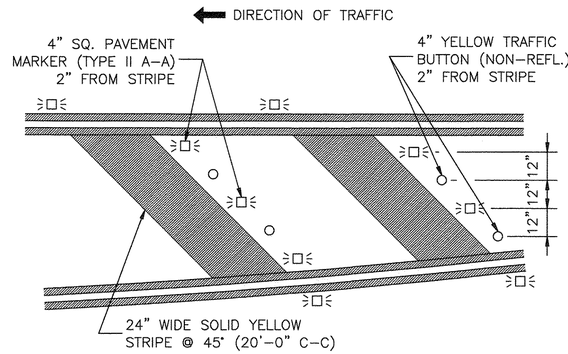


TYPICAL MEDIAN SECTION

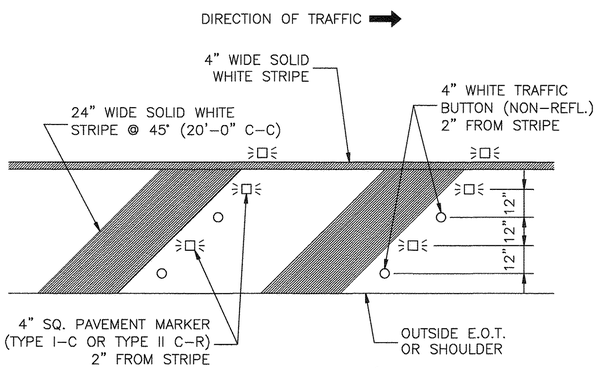
NOTES:

1. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
2. ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES (APPROXIMATELY 2").
3. LEFT TURN STORAGE BAYS SHALL BE A MIN. OF 100' ON MINOR STREETS AND A MIN. 150' ON MAJOR STREETS.
4. REPEAT ARROWS AT APPROXIMATELY 1000' INTERVALS WITHIN TWO–WAY LEFT TURN SECTION.
5. WITHIN A TANGENT SECTION THE TYPE I–C PAVEMENT MARKERS SHALL BE PLACED AT 40' C–C ON ROADWAYS WITHOUT CURB AND GUTTERS.
6. WHEN PAVEMENT MARKINGS EXTEND INTO OR CONTINUE THROUGH AN INTERSECTION AREA, THEY SHALL BE THE SAME COLOR AND AT LEAST THE SAME WIDTH AS THE LINE MARKINGS THEY EXTEND.
7. WHEN CROSSWALK MARKINGS ARE USED WITHIN AN ESTABLISHED SCHOOL ZONE AREA, CONTINENTAL TYPE MARKINGS SHALL BE USED.
8. ADDITIONAL SET OF "WORD" AND "ARROW" PAVEMENT MARKINGS SHALL BE USED WHEN TURN LANE STORAGE LENGTH IS 160 FEET OR GREATER.

CROSSHATCHING DETAIL



OUTSIDE EDGE CROSSHATCHING DETAIL



9/20/17

NO.	REVISIONS	DATE	NAME
1			
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3			
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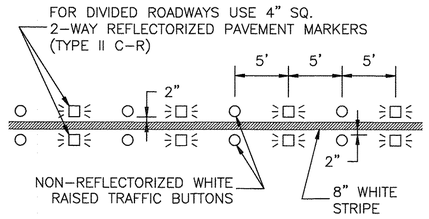
STATE OF TEXAS — DEPT. OF WORKS AND ENGINEERING — 58779

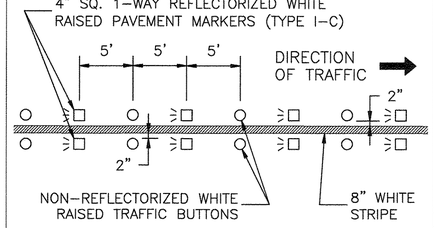
STATE OF TEXAS — SHAWN L. PACHLHOFER — 96539 — LICENSED PROFESSIONAL ENGINEER — 7-20-17
Brown & Gay Engineers, Inc. F–1046

PROJECT TITLE: SILVER RANCH SEC 17		
DRAWN BY: JDZ		HCPID, A&E STANDARD
CK'D BY: BH	SHEET DESCRIPTION: PAVEMENT MARKING DETAILS	21
SCALE: NONE	(SHEET 1 OF 3)	SHEET NO: 18 / 25
DATE: 6/7/13	APPROVED BY:	

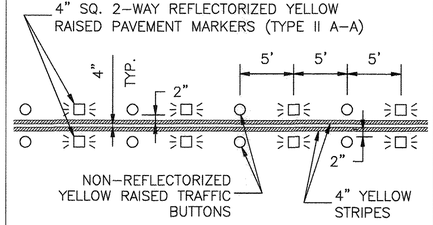
DETAIL "A"
(FOR DIVIDED ROADWAYS)



DETAIL "B"
(FOR UNDIVIDED ROADWAYS)



DETAIL "C"



PAVEMENT MARKER LEGEND

SYMBOL	DESCRIPTION
≥□≤	4" x 4" REFLECTORIZED RAISED PAVEMENT MARKER
□≤	INDICATED DIRECTION OF TRAFFIC FLOW
○	NON-REFLECTIVE 4" DIA. RAISED TRAFFIC BUTTON

RADIUS DIMENSIONS

MEDIAN	*R1	*R2
≤10'	N/A	W/2
>10' ≤40'	90'	W/5
>40'	N/A	N/A

TABLE 1

TYPICAL MEDIAN OPENING "C"

MEDIAN INTERRUPTION	(1) NO LTB	(1) 1 LTB	(1) 2 LTB
PRIVATE DRIVE	45'	52.5'	60'
UNDIVIDED STREET <40'	45'	52.5' (2)	60'
UNDIVIDED STREET 44'	50'	55' (2)	60'
DIVIDED STREET	D+22'	D+22'	D+22'

NOTES:

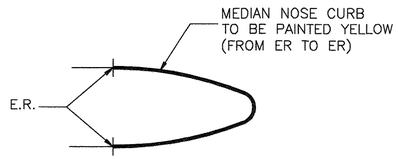
(1) LTB = LEFT TURN BAY

(2) DISTANCE FROM CENTERLINE OF OPENING TO MEDIAN NOSE WITH LEFT TURN LANE IS 30' FOR RIGHT ANGLE INTERSECTIONS, FOR INTERSECTIONS OTHER THAN 90', APPLY DESIGN VEHICLE TURNING TEMPLATE TO DETERMINE DIMENSION TO MEDIAN NOSE CUT OFF.

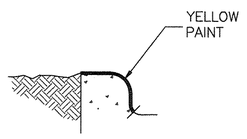
(3) D = WIDTH OF DIVIDED STREET

DETAIL "D"

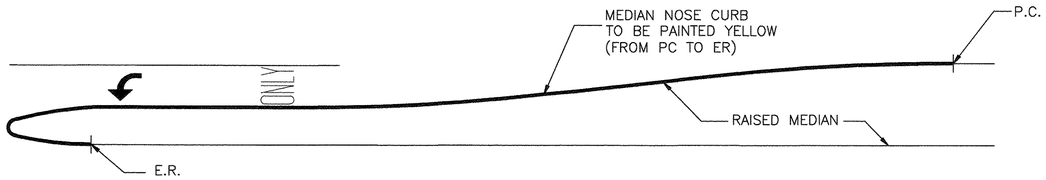
* PAINT FROM THE BACK OF CURB TO THE GUTTER LINE



TYPICAL MEDIAN NOSE



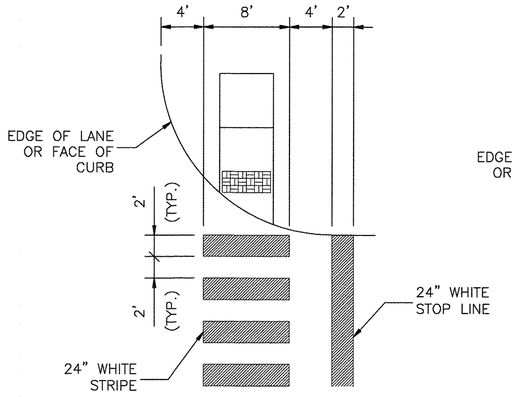
TYPICAL CURB SECTION



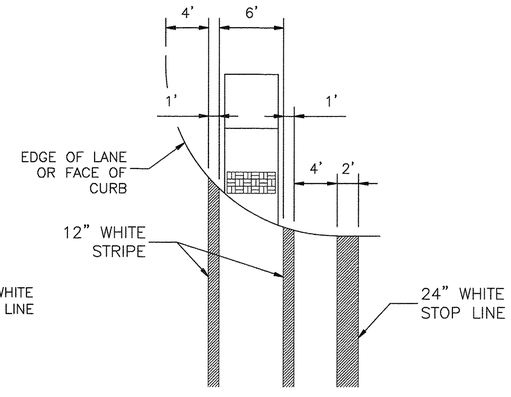
RAISED MEDIAN WITH TURN BAY

TYPICAL CROSSWALK PLACEMENT

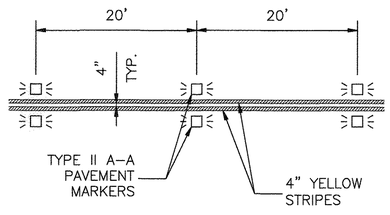
CONTINENTAL TYPE



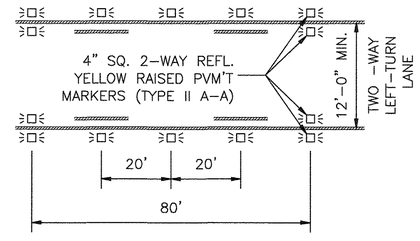
STANDARD TYPE



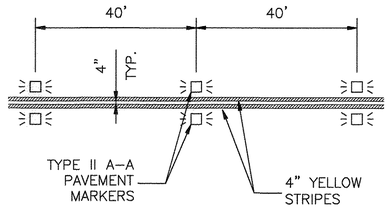
CENTER LINE DETAIL CURVE SECTION



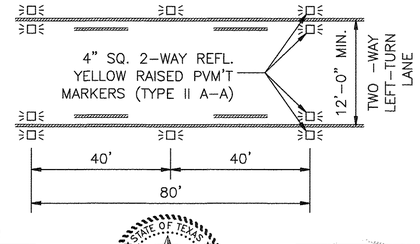
TWO-WAY LEFT TURN CURVE SECTION



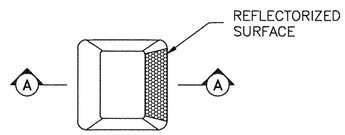
CENTER LINE DETAIL TANGENT SECTION



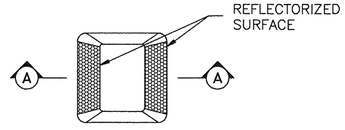
TWO-WAY LEFT TURN TANGENT SECTION



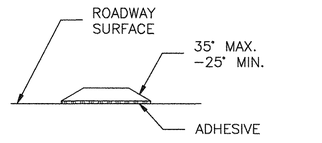
RAISED PAVEMENT MARKERS



TYPE I (TOP VIEW)



TYPE II (TOP VIEW)



SECTION A-A

9/20/17

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

58779

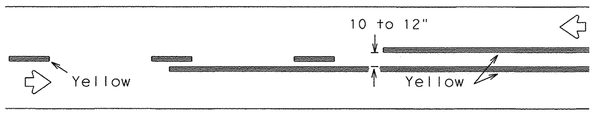
STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER

7-20-17

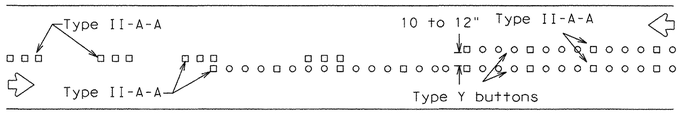
Brown & Gay Engineers, Inc.
F-1046

PROJECT TITLE:	SILVER RANCH SEC 17		
DRAWN BY: JDZ		HCPID, A&E STANDARD	
CK'D BY: BH	SHEET DESCRIPTION: PAVEMENT MARKING DETAILS	22	
SCALE: NONE	(SHEET 2 OF 3)	SHEET NO:	
DATE: 6/7/13	APPROVED BY:	19 / 25	

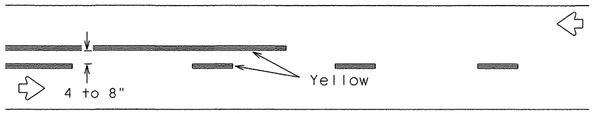
PAVEMENT MARKING PATTERNS



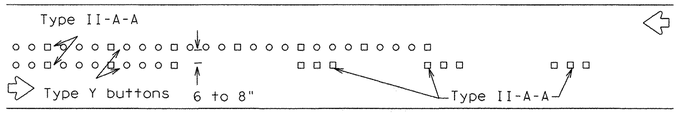
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



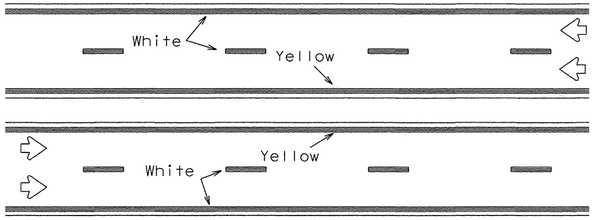
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



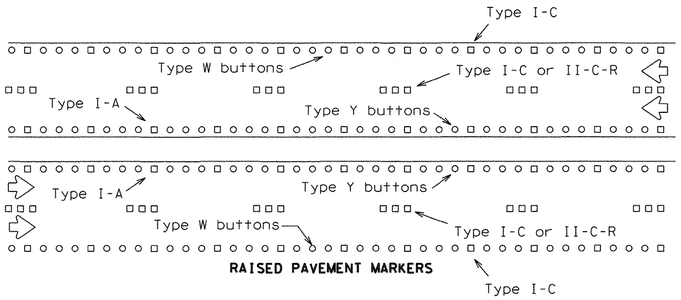
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



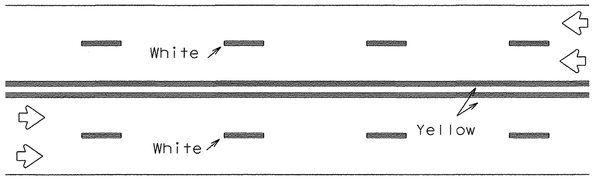
REFLECTORIZED PAVEMENT MARKINGS



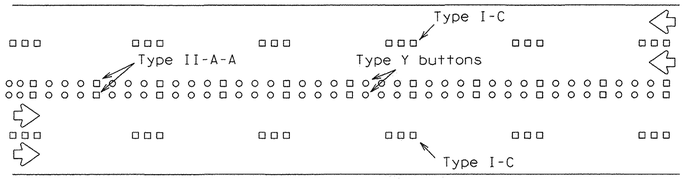
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



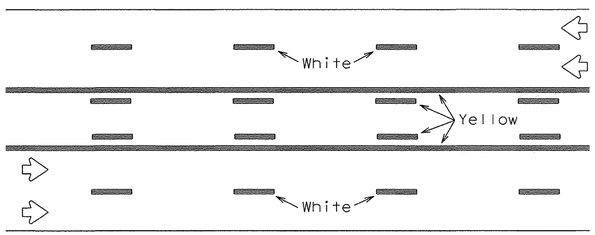
REFLECTORIZED PAVEMENT MARKINGS



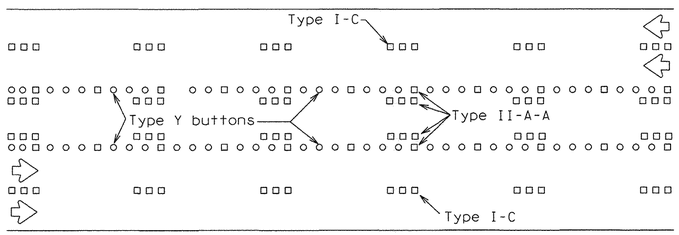
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

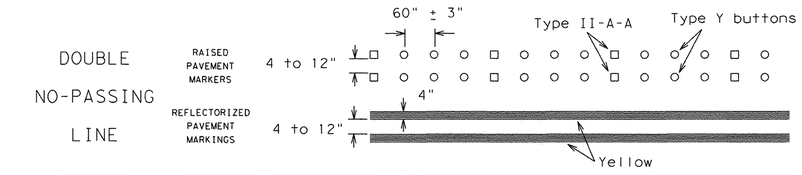
Prefabricated markings may be substituted for reflectorized pavement markings.

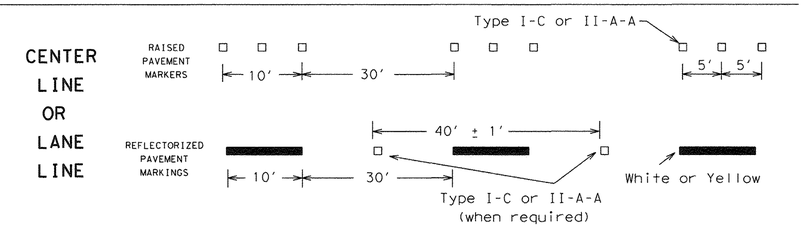
TWO-WAY LEFT TURN LANE

9/20/17

DATE:
FILE:

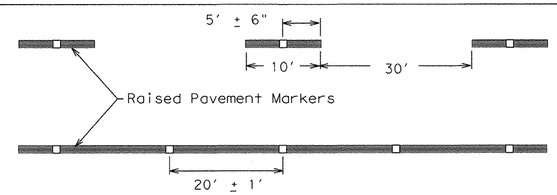
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



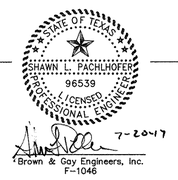


REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines



Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

58779

SILVER RANCH SEC 17
PAVEMENT MARKING DETAILS
SHEET 3 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		17	4818-00	
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	058	FORT BEND		20 OF 25
11-02 8-14				

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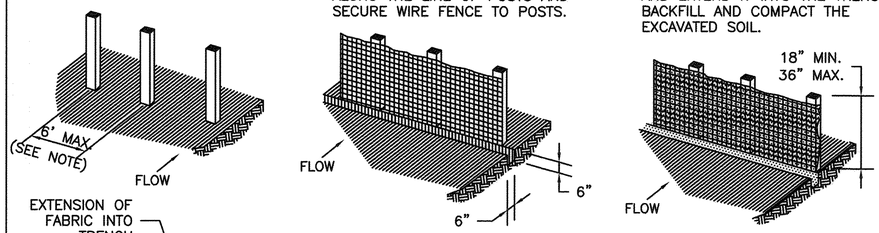
1. SET POSTS AT REQUIRED SPACING
2. EXCAVATE A 6"x6" TRENCH UPSLOPE ALONG THE LINE OF POSTS AND SECURE WIRE FENCE TO POSTS.
3. ATTACH FILTER FABRIC TO POSTS AND EXTEND IT INTO THE TRENCH. BACKFILL AND COMPACT THE EXCAVATED SOIL.

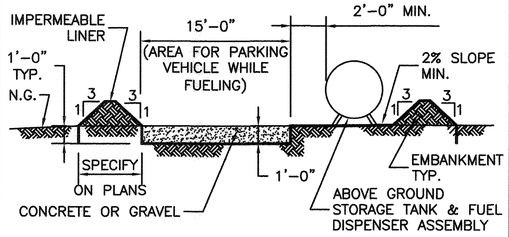


REINFORCED FILTER FABRIC BARRIER

RFB — SYMBOL

GENERAL NOTES:

1. SECURELY FASTEN MESH FENCING TO POSTS WITH STAPLES OR TIE WIRES.
2. SECURELY FASTEN FILTER FABRIC TO MESH FENCING.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, OVERLAP 6 INCHES AT A POST, FOLD TOGETHER, AND ATTACH TO A POST.
4. REMOVE SEDIMENT DEPOSITS WHEN SILT REACHES ONE-THIRD OF THE HEIGHT OF THE FENCE IN DEPTH.

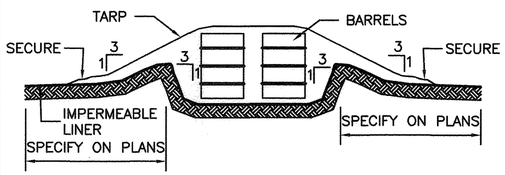


ABOVE GROUND TEMP. VEHICLE & EQUIPMENT FUELING AREA WITH TANK

TFA — SYMBOL

GENERAL NOTES:

1. THE SIZE OF TANK FOUNDATION AREA DEPENDS ON THE SIZE OF ABOVE GROUND STORAGE TANK AND DISPENSER ASSEMBLY.
2. PROVIDE A MINIMUM SLOPE OF 2 % TOWARD THE SUMP PIT.
3. INSTALL IMPERMEABLE LINER AS PER MANUFACTURER'S RECOMMENDATIONS.

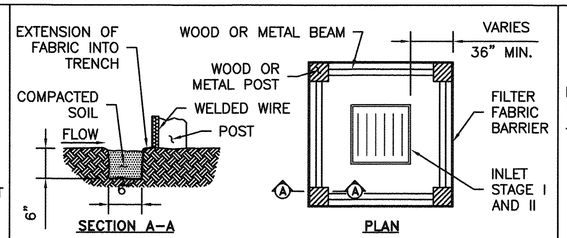


BARREL STORAGE AREA

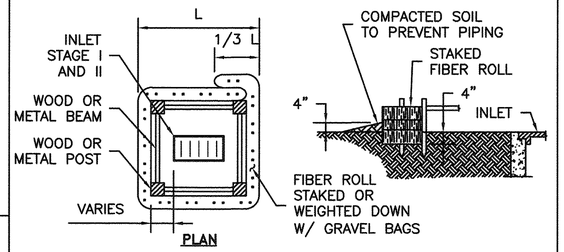
BSA — SYMBOL

GENERAL NOTES:

1. ALTERNATIVELY, STORE BARRELS IN AN ENCLOSED BUILDING OR SHED.
2. INSTALL IMPERMEABLE LINER AS PER MANUFACTURER'S RECOMMENDATIONS. 60 mil MINIMUM.
3. CONSTRUCT BERMED AREA WITH VOLUME GREATER THAN OR EQUAL TO 110% VOLUME OF BARRELS.



INLET PROTECTION BARRIER WITH REINFORCED FILTER FABRIC



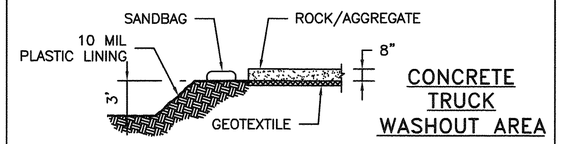
INLET PROTECTION BARRIER WITH FILTER ROLLS

GENERAL NOTES:

1. FIBER ROLLS WILL BE UTILIZED ONLY WHEN SITE CONDITIONS DO NOT PERMIT THE USE OF FILTER FABRIC BARRIER, AND AS APPROVED BY THE ENGINEER.

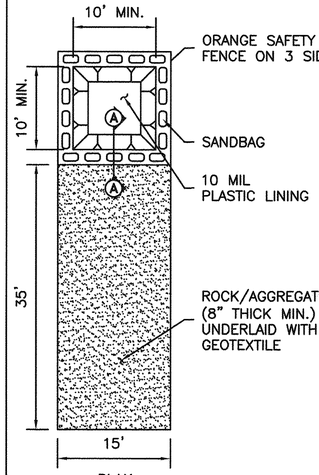
INLET PROTECTION BARRIERS FOR STAGE I INLETS

IPB — SYMBOL



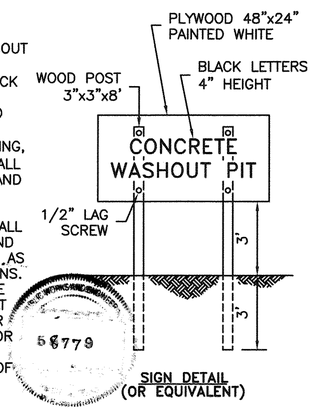
CONCRETE TRUCK WASHOUT AREA

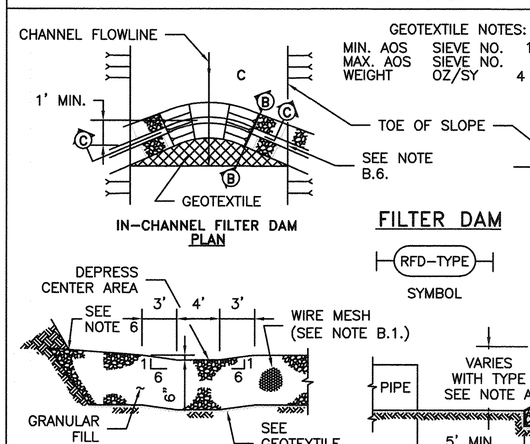
CTW — SYMBOL



GENERAL NOTES:

1. POST A SIGN READING "CONCRETE WASHOUT PIT" NEXT TO THE PIT.
2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASHOUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
3. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASHOUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
4. CONCRETE WASHOUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.



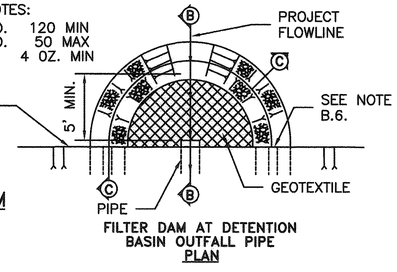


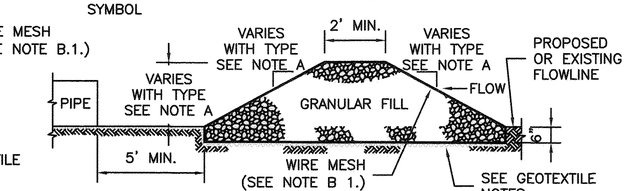
GEOTEXTILE NOTES:

MIN. AOS	SIEVE NO.	120 MIN
MAX. AOS	SIEVE NO.	50 MAX
WEIGHT	OZ/SY	4 OZ. MIN

FILTER DAM

RFD-TYPE — SYMBOL





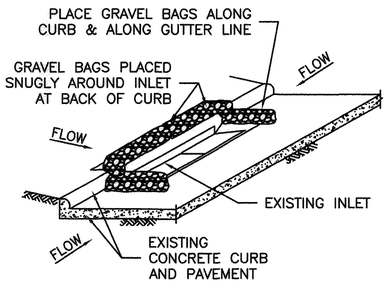
NOTE: ONLY APPLIES FOR DETENTION BASIN OUTFALL PIPE PROTECTION.

A. TYPES OF FILTER DAMS

1. TYPE 1 (NON-REINFORCED)
   a. HEIGHT – 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH – 2 FEET (MINIMUM)
   c. SLOPES – 2:1 (MAXIMUM).
2. TYPE 2 (REINFORCED).
   a. HEIGHT – 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH – 2 FEET (MINIMUM).
   c. SLOPES – 2:1 (MAXIMUM).
3. TYPE 3 (REINFORCED)
   a. HEIGHT – 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH – 2 FEET (MINIMUM).
   c. SLOPES – 3:1 (MAXIMUM).
4. TYPE 4 (GABION)
   a. HEIGHT – 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH – 2 FEET (MINIMUM).
5. TYPE 5. AS SHOWN ON THE PLANS.

B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.

1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
2. PLACE GRANULAR FILL ON THE WIRE MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
   a. 3-5 INCHES FOR ROCK FILTER DAM TYPES 1, 2 AND 4.
   b. 4-8 INCHES FOR ROCK FILTER DAM TYPE REFER TO GRANULAR FILL IN SPECIFICATION SECTION No. 02378 RIPRAP AND GRANULAR FILL.
3. FOLD WIRE MESH AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
4. IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
5. SEE HCFCD SPECIFICATION SECTION NO. 02364-FILTER DAMS.
6. EMBED ONE FOOT MINIMUM INTO SLOPE AND RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA AT SLOPE.

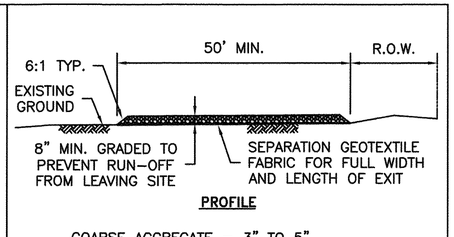


INLET PROTECTION BARRIERS FOR STAGE II INLETS

IPB-II — SYMBOL

GENERAL NOTES:

1. REMOVE SEDIMENT DEPOSIT WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-THIRD THE HEIGHT OF THE BARRIER.
2. GRAVEL BAGS SHALL NOT BLOCK THROAT OF INLET UNLESS DIRECTED BY ENGINEER.



STABILIZED CONSTRUCTION ACCESS

SC-1 — SYMBOL

GENERAL NOTES:

1. MINIMUM LENGTH IS AS SHOWN ON CONSTRUCTION DRAWINGS OR 50 FEET, WHICHEVER IS MORE.
2. CONSTRUCT AND MAINTAIN CONSTRUCTION EXIT WITH CONSTANT WIDTH ACROSS ITS LENGTH, INCLUDING ALL POINTS OF INGRESS OR EGRESS.
3. UNLESS SHOWN ON THE CONSTRUCTION DRAWINGS, STABILIZATION FOR OTHER AREAS WILL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT.
4. WHEN SHOWN ON THE CONSTRUCTION DRAWINGS, WIDEN OR LENGTHEN STABILIZED AREA TO ACCOMMODATE A TRUCK WASHING AREA. PROVIDE OUTLET SEDIMENT TRAP FOR THE TRUCK WASHING AREA.
5. PROVIDE PERIODIC TOP DRESSING WITH ADDITIONAL COARSE AGGREGATE TO MAINTAIN THE REQUIRED DEPTH OR WHEN SURFACE BECOMES PACKED WITH MUD.
6. PERIODICALLY TURN AGGREGATE TO EXPOSE A CLEAN DRIVING SURFACE.
7. MINIMUM 14' WIDTH FOR ONE WAY TRAFFIC AND 20' WIDTH FOR TWO WAY TRAFFIC.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

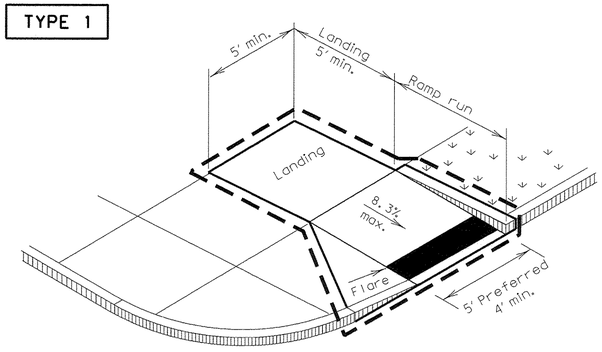
9/20/17

BGE, Inc.
10777 Westheimer, Suite 400
Houston, TX 77042
Tel: 281-558-8700 • www.bgeinc.com
TBPE Registration No. F-1046

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

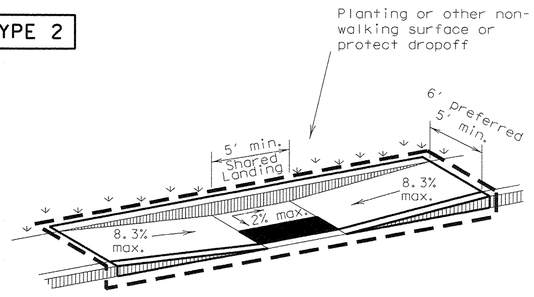
PROJECT TITLE:	SILVER RANCH SEC 17
DRAWN BY: JDZ	HCPID, A&E STANDARD
CK'D BY: NR	SHEET DESCRIPTION: STORM WATER POLLUTION PREVENTION PLAN DETAILS
SCALE: NONE	29
DATE: 04/25/14	APPROVED BY:
	SHEET NO: 21/25

TYPE 1



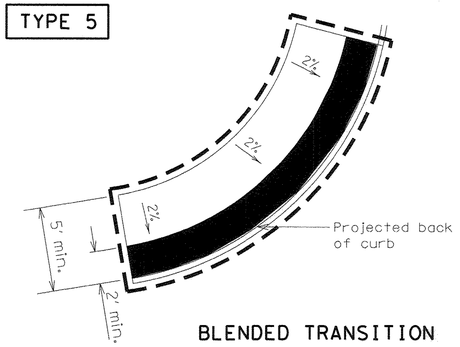
PERPENDICULAR CURB RAMP

TYPE 2



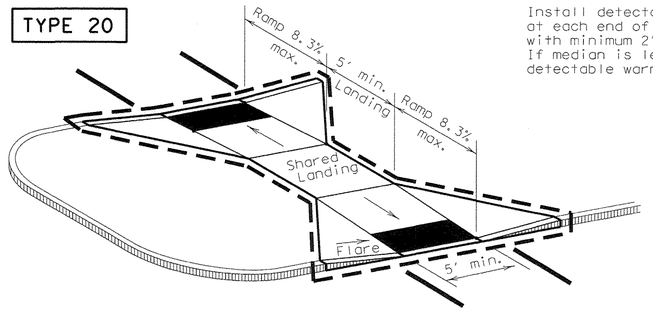
PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)

TYPE 5



BLENDED TRANSITION

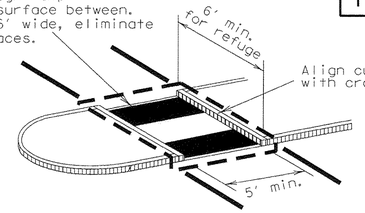
TYPE 20



Install detectable warning surface at each end of cut-through ramp with minimum 2' smooth surface between. If median is less than 6' wide, eliminate detectable warning surfaces.

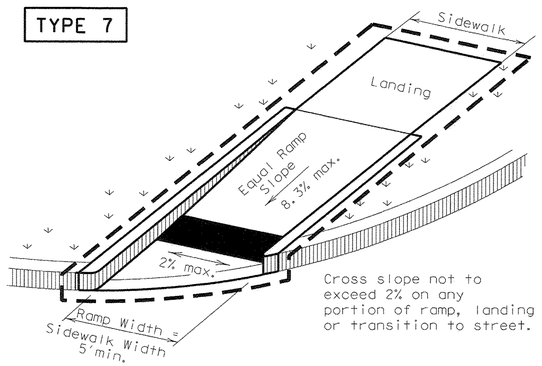
CURB RAMPS AT MEDIAN ISLANDS

TYPE 21



Curb details are shown elsewhere in the plans.

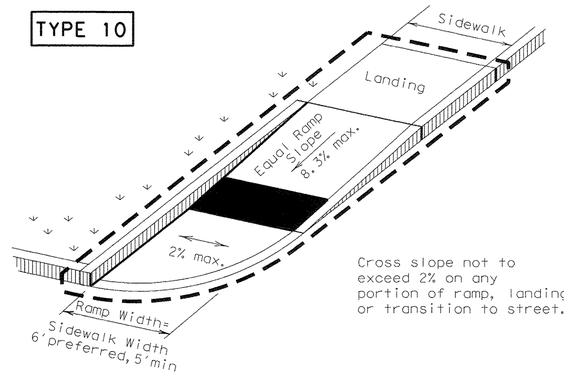
TYPE 7



Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk set back from curb)

TYPE 10

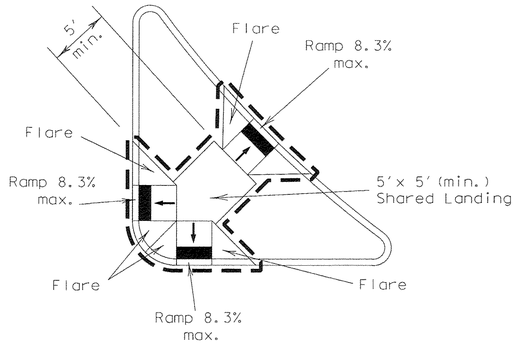


Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk adjacent to curb)

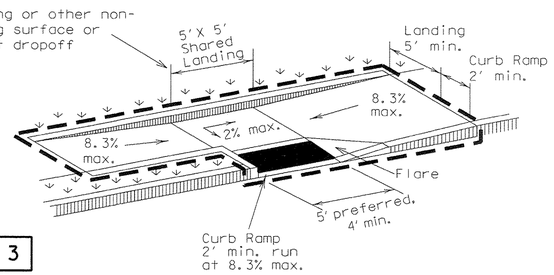
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 22

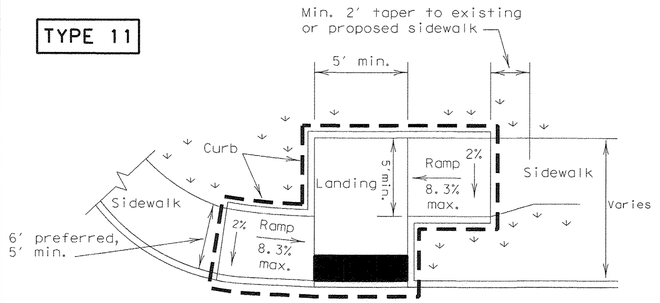


COMBINATION ISLAND RAMPS

TYPE 3

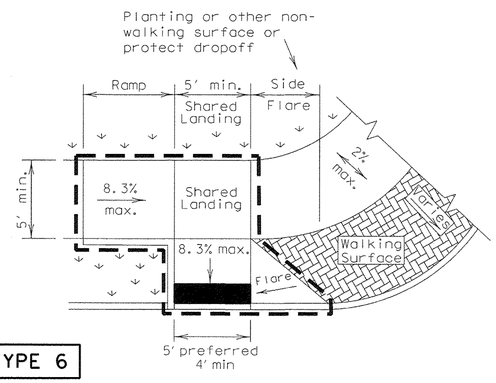


TYPE 11



OFFSET PARALLEL CURB RAMP

TYPE 6



COMBINATION CURB RAMPS

NOTES / LEGEND:

See General Notes on sheet 2 of 4 for more information.

Denotes planting or non-walking surface not part of pedestrian circulation path.

Ramp Limits of Payment

Detectable Warning Surface

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP
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REVISIONS		17	4818-00	
VP June 13, 2012	DIST	COUNTY		SHEET NO.
	058	FORT BEND		22 OF 25

9/20/17

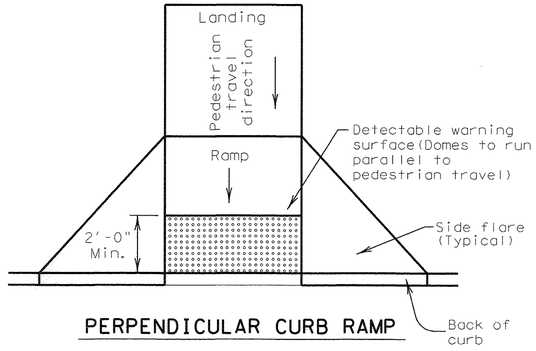
General Notes

Curb Ramps

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Lesser slopes that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
4. Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.
5. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
6. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC 68.102.
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Handrails are not required on curb ramps. Provide curb ramps wherever on accessible route crosses (penetrates) a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Provide a smooth transition where the curb ramps connect to the street.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

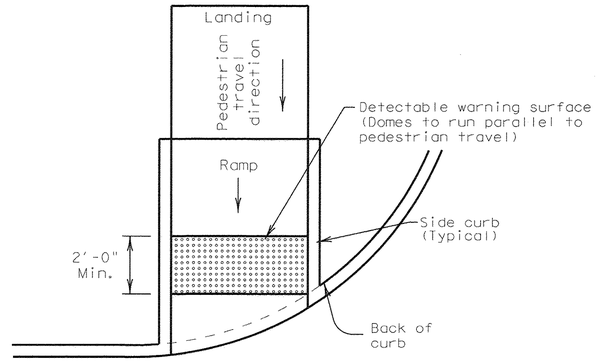
Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
19. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.
23. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.



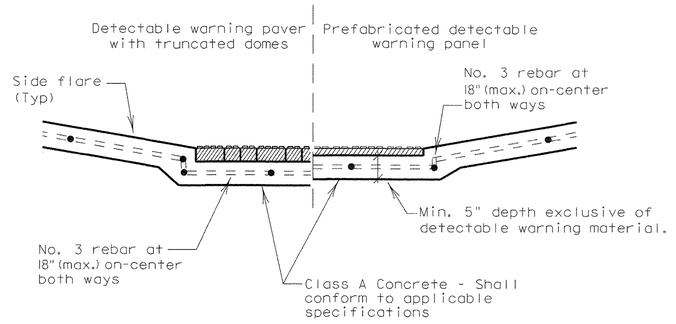
PERPENDICULAR CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.

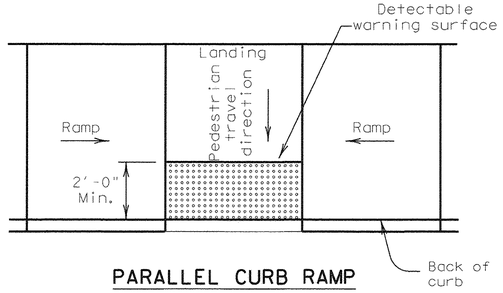


DIRECTIONAL CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.



SECTION: CURB RAMP AT DETECTABLE WARNING



PARALLEL CURB RAMP

Typical placement of detectable warning surface on landing at street edge.

DETECTABLE WARNINGS

Detectable Warning Pavers

24. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
25. Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.

Sidewalks

26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
28. Street grades and cross slopes shall be as shown elsewhere in the plans.
29. Changes in level greater than 1/4 inch are not permitted.
30. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with TAS 505.
31. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
32. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
33. Sidewalk details are shown elsewhere in the plans.

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

58779

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP		
©TxDOT March 2002	CONT	SECT	JOB		HIGHWAY	
REVISIONS		17	4818-00			
VP June 13, 2012	DIST	COUNTY			SHEET NO.	
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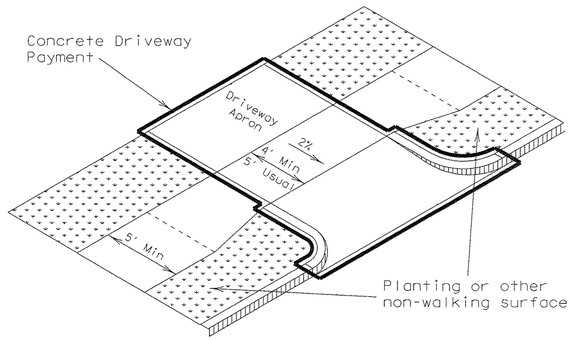
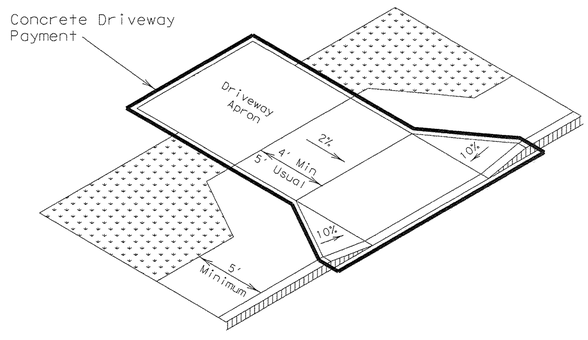
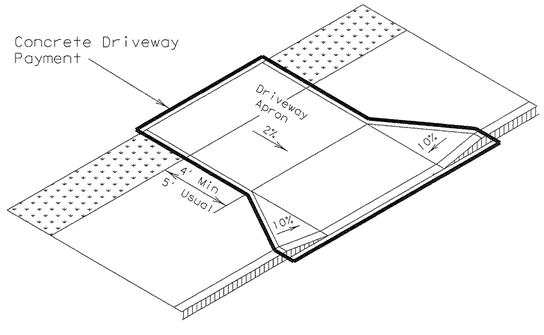


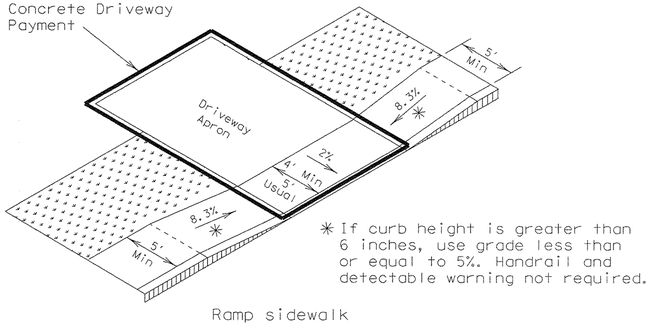
Setback sidewalk



Apron offset sidewalk



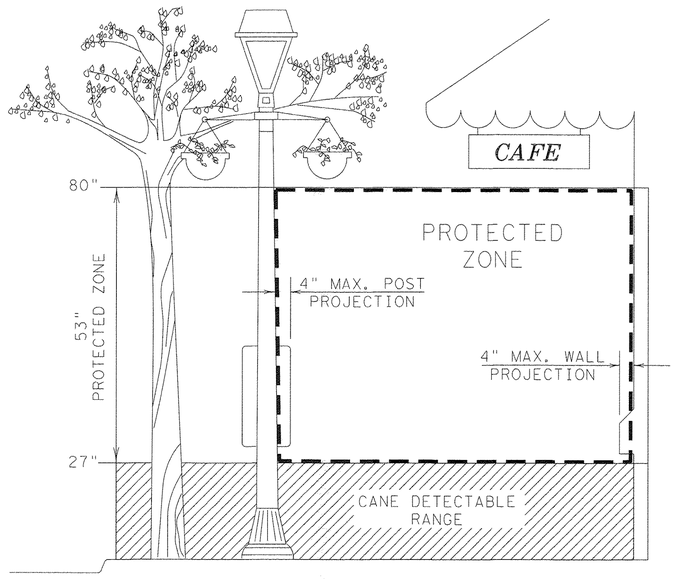
Wide sidewalk



* If curb height is greater than 6 inches, use grade less than or equal to 5%. Handrail and detectable warning not required.

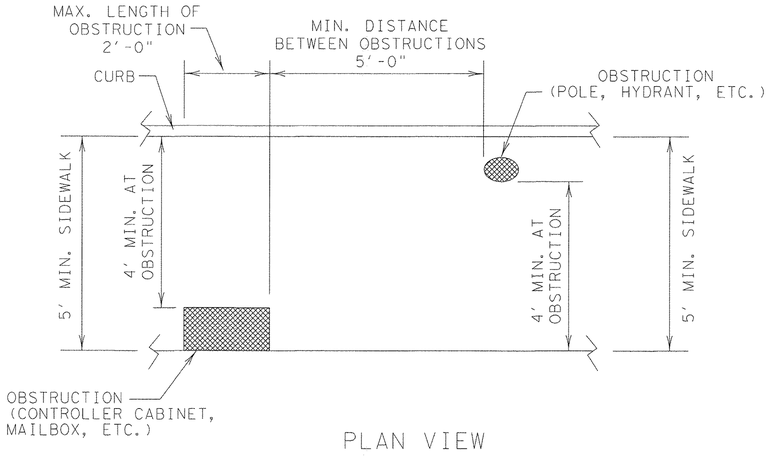
Ramp sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS



PROTECTED ZONE

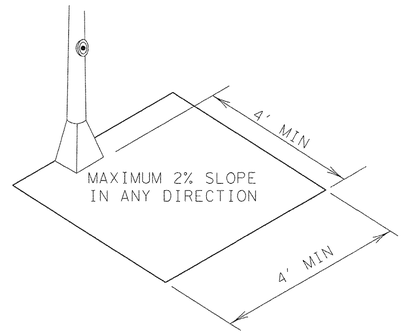
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



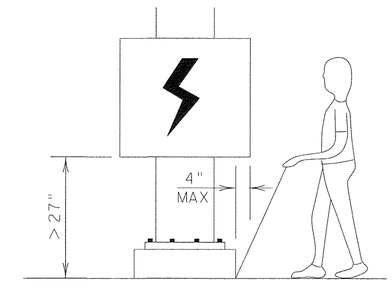
PLAN VIEW

PLACEMENT OF STREET FIXTURES

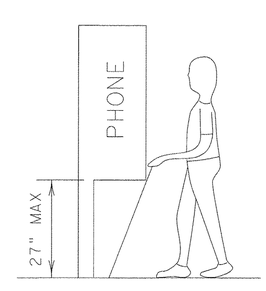
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height ≤ 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED PROFESSIONAL ENGINEER
7-20-17
Brown & Gay Engineers, Inc.
F-1046

9/20/17

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP
© TxDOT March 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS VP June 13, 2012		17	4818-00	
	DIST	COUNTY		SHEET NO.
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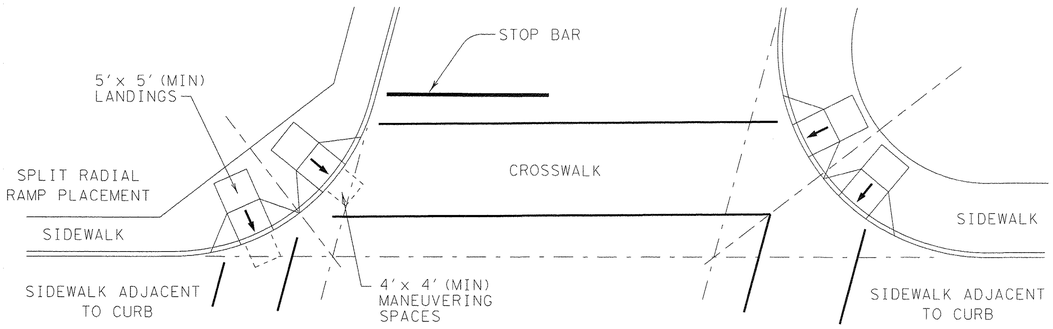
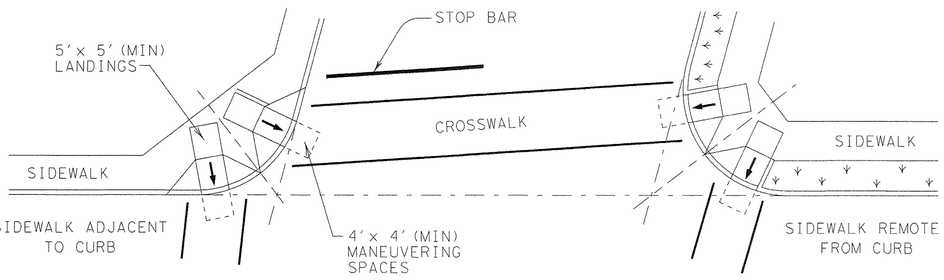
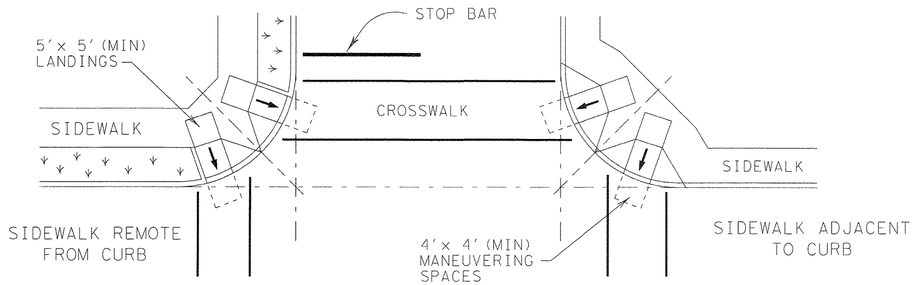


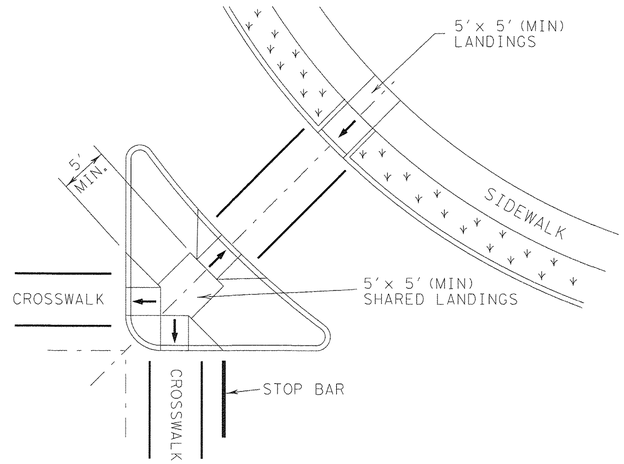
SKEWED INTERSECTION WITH "LARGE" RADIUS



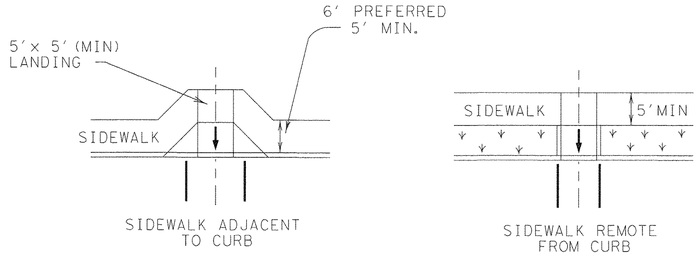
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

TYPICAL CROSSING LAYOUTS

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
7-20-17
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SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PUBLIC WORKS AND ENGINEERING
ACCEPTED
5879

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP	
© TxDOT March 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS		17	4818-00		
VP June 13, 2012	DIST	COUNTY		SHEET NO.	
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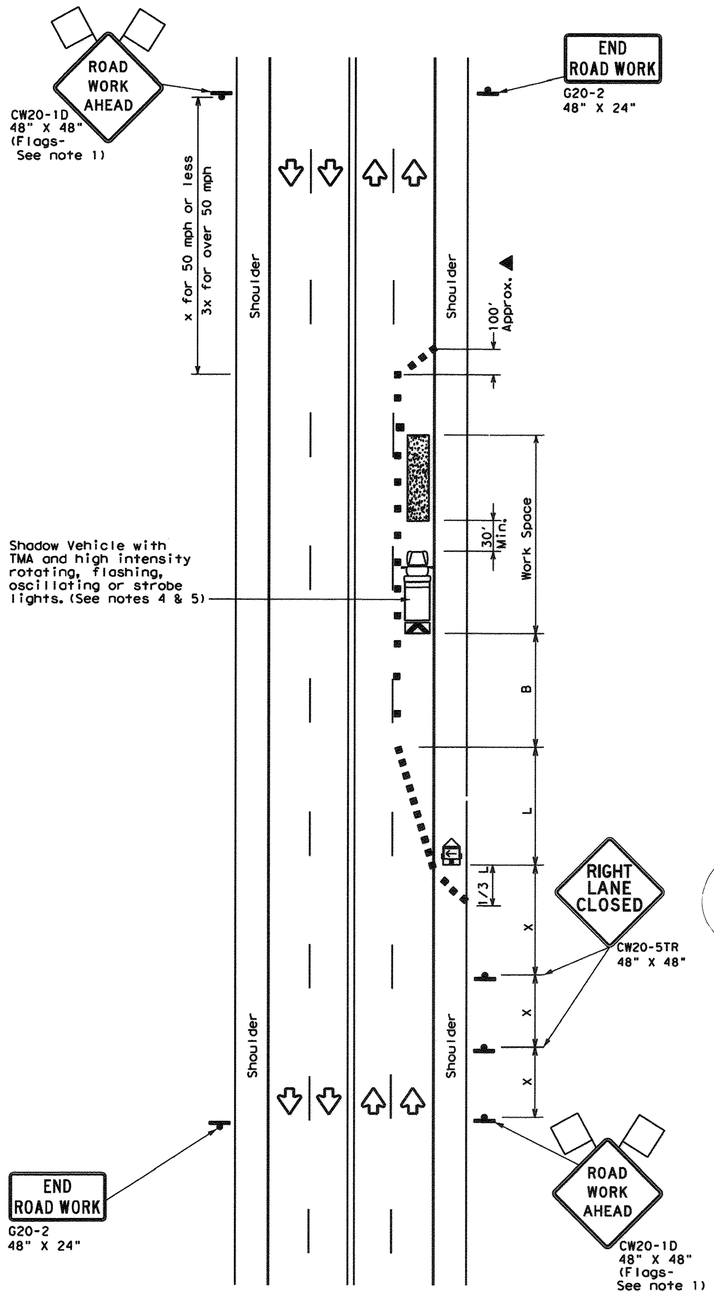
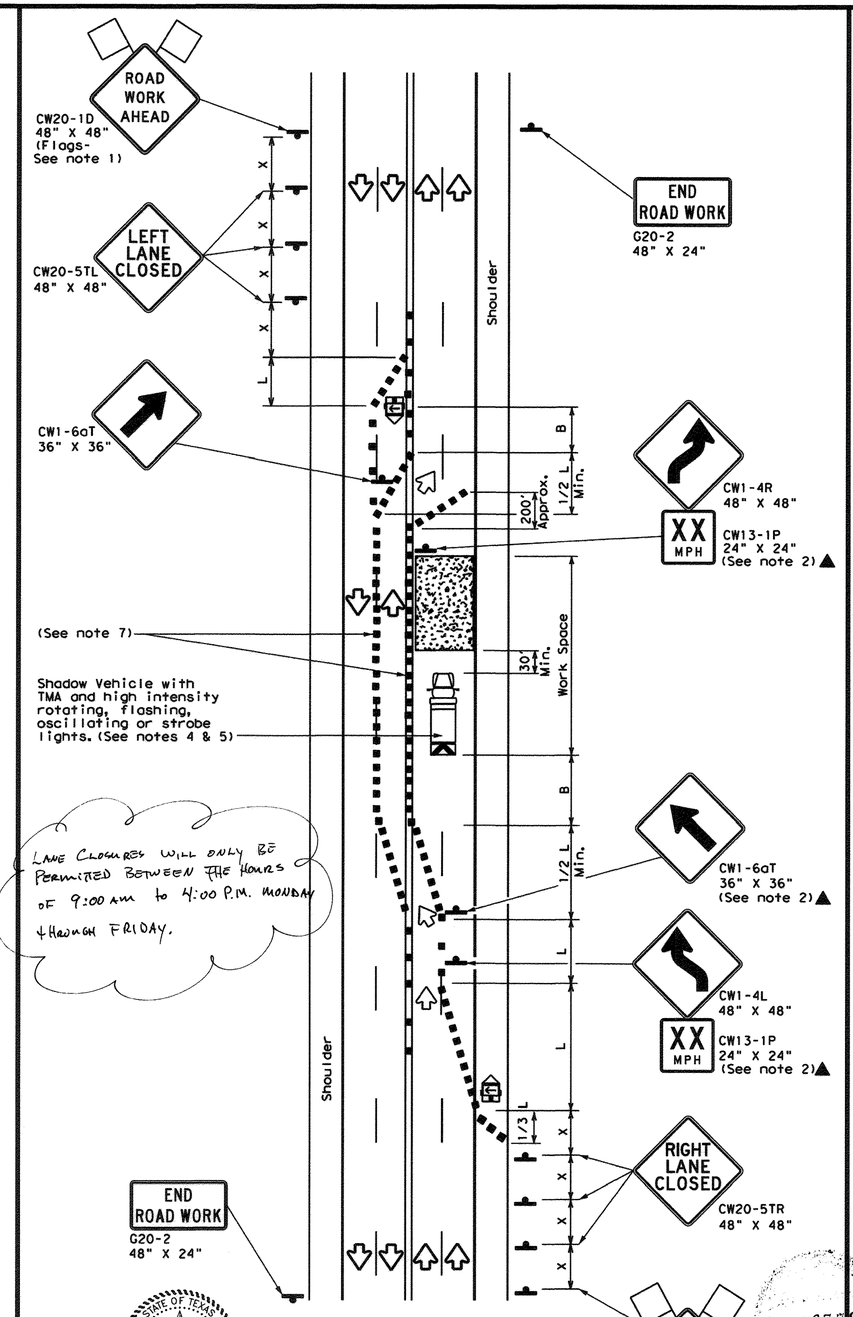
DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



LANE CLOSURES WILL ONLY BE PERMITTED BETWEEN THE HOURS OF 9:00 AM to 4:00 P.M. MONDAY THROUGH FRIDAY.

TCP (1-4b)

TWO LANES CLOSED

STATE OF TEXAS
SHAWN L. PACHLHOFER
96539
LICENSED
PROFESSIONAL ENGINEER
10-5-17
Brown & Gay Engineers, Inc.
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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'
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. 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. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
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.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

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.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 2-12		17	4818-00	
8-95	DIST	COUNTY		SHEET NO.
1-97	058	FORT BEND		25A
4-98				

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10/5/17