



**REVIEW BY FORT BEND COUNTY
COMMISSIONERS COURT**

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

- Right of Way Permit**
- Commercial Driveway Permit**

Permit No: 2018-24130

Applicant: Clearwater Utilities, Inc.

Job Location Site: W. Airport Boulevard, Richmond, TX 77407

Bond No. XXXXXXXXXX **Date of Bond:** 1/10/2018 **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 inconsistent with Chapter 181, Vernon's Texas Statutes and Codes Annotated.

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.
4. This permit applies to work performed within right-of-ways owned and maintained by Fort Bend County only, and it is the responsibility of the applicant to acquire all other necessary permits.

On this 13th day of November, 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: 
County Engineer

Presented to Commissioners Court and approved.

Date Recorded _____ Comm. Court No. _____

Clerk of Commissioners Court

By: N/A
Drainage District Engineer/Manager

By: _____
Deputy



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

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

- Right of Way Permit**
 Commercial Driveway Permit

Permit No: 2018-24130

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:

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

(2) BOND:

- County Attorney, approval when applicable.
- Perpetual bond currently posted. Bond No: 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.



Permit Administrator

11/5/2018

Date

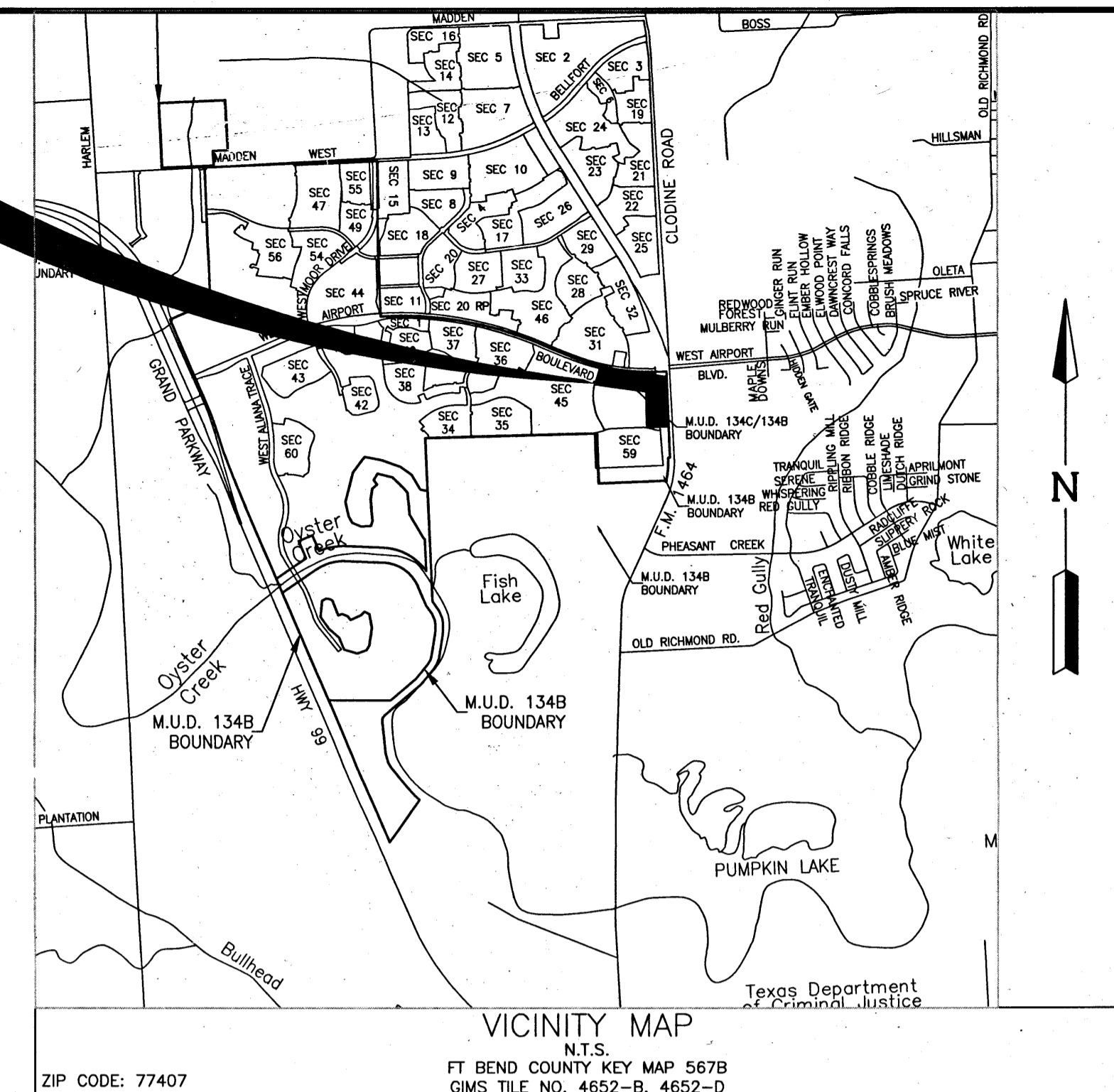
FORT BEND COUNTY MUNICIPAL UTILITY DISTRICT NO. 134B
FORT BEND COUNTY, TEXAS

CONSTRUCTION PLANS FOR
**WATER, SANITARY SEWER AND
DRAINAGE FACILITIES**

TO SERVE

**ALIANA COMMERCIAL TRACTS
C20, C21, C28, C29, C30**
CITY OF HOUSTON E.T.J.

PROJECT
LOCATION



- SHEET INDEX**
- COVER SHEET
 - GENERAL NOTES
 - WATER AND SANITARY SEWER LAYOUT
 - PAVING, DRAINAGE AND PERMANENT SIGNAGE LAYOUT
 - DRAINAGE AREA MAP
 - DRAINAGE CALCULATIONS (2-YR AND 100-YR. CITY OF HOUSTON)
(100-YR. FORT BEND COUNTY)
 - STORM WATER POLLUTION PREVENTION PLAN

- PLAN & PROFILE**
- STORM SYSTEM A/SANITARY SYSTEM STA. 0+00.00 TO 11+25.00
 - STORM SYSTEM A STA. 11+25.00 TO END
 - STORM SYSTEM B STA. 0+00.00 TO END
 - WATERLINE STA. 0+00.00 TO END

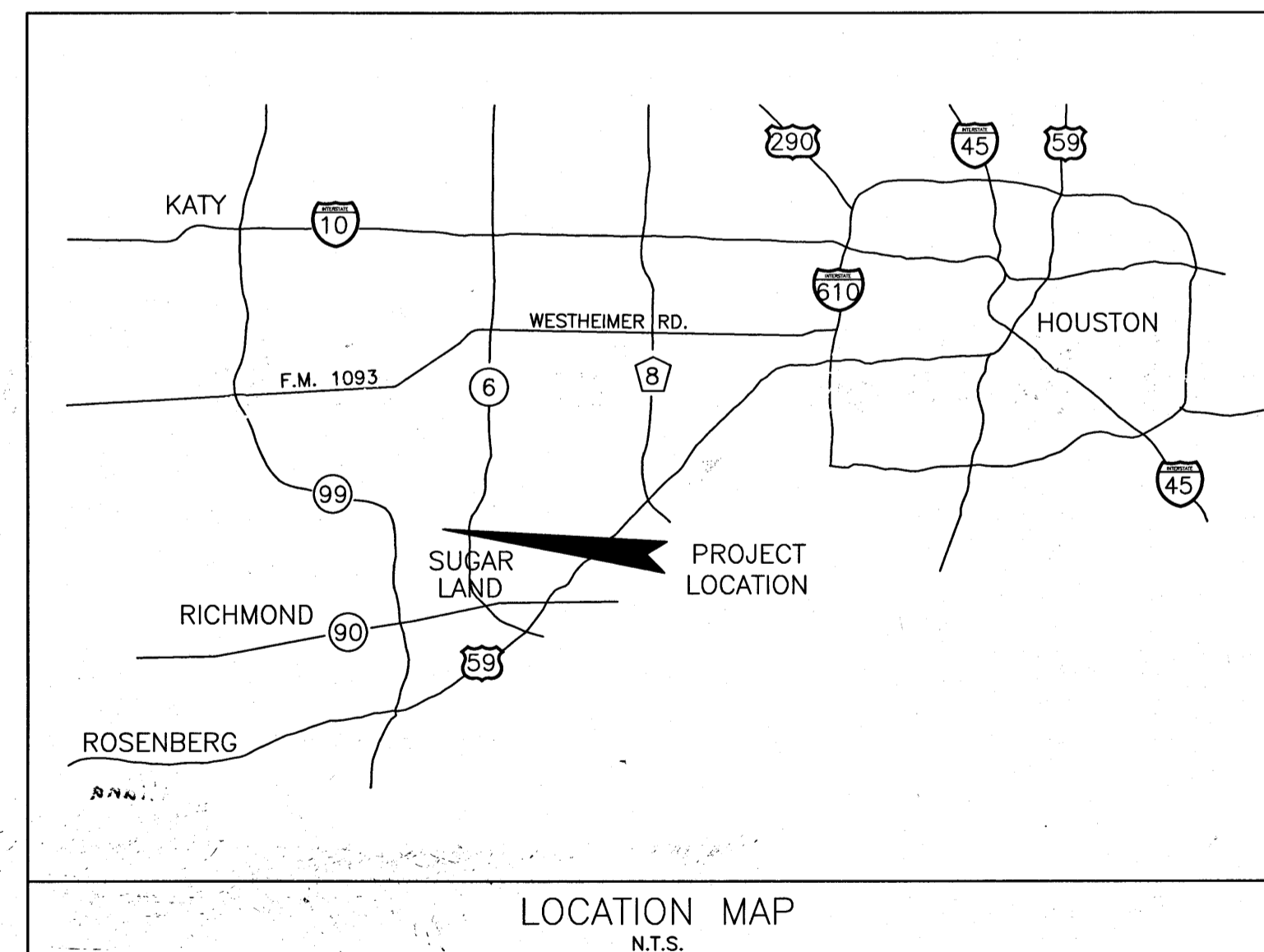
- DETAILS**
- WATER MAIN CONSTRUCTION DETAILS
 - SANITARY AND STORM SEWER DETAILS (SHEET 1 OF 3)
 - SANITARY AND STORM SEWER DETAILS (SHEET 2 OF 3)
 - SANITARY AND STORM SEWER DETAILS (SHEET 3 OF 3)
 - STORM WATER POLLUTION PREVENTION PLAN DETAILS

JOB NO. 1968-1064

DATE : JULY 2018

NOTES

- THESE PLANS WERE PREPARED TO MEET OR EXCEED FORT BEND COUNTY AND CITY OF HOUSTON SUBDIVISION RULES AND REGULATIONS (AS APPLICABLE) AS CURRENTLY AMENDED.
- CONSTRUCTION WILL BE MONITORED BY A PROFESSIONAL ENGINEER TO INSURE COMPLIANCE WITH THE CONSTRUCTION PLANS AND SPECIFICATIONS.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING ENTITIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
CITY OF HOUSTON PUBLIC WORKS DEPARTMENT (713) 837-0050
FORT BEND COUNTY DRAINAGE DISTRICT (DWAYNE GRIGAR) (231) 342-2863
ASSISTANT TO THE FORT BEND COUNTY ENGINEER construction@fortbendcountytx.gov
- ONLY AUTHORIZED INDIVIDUALS FROM EITHER THE TESTING COMPANY OR A REPRESENTATIVE OF LJA ENGINEERING, INC. HAVE THE AUTHORITY TO ADD WATER TO A CONCRETE TRUCK.
- CONTRACTOR SHALL CONTACT ANY PERTINENT UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF EXCAVATION OR CONSTRUCTION IN THE VICINITY OF THEIR EASEMENTS AND/OR RIGHT-OF-WAYS.
- THE OPENING AND CLOSING OF ALL VALVES ON EXISTING WATER LINES MUST BE PERFORMED EXCLUSIVELY BY THE DISTRICT OPERATOR.
- THE DISTRICT OPERATOR MUST PERFORM ALL WATER LINE BACTERIOLOGICAL TESTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE DISTRICT.
- PRIOR TO CONSTRUCTION OF THIS FACILITY WITHIN OR BY THE DISTRICT, THE DISTRICT OR THE ENGINEER WILL GIVE A WRITTEN NOTICE BY REGISTERED OR CERTIFIED MAIL TO THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING, CITY OF HOUSTON, STATING THE DATE SUCH CONSTRUCTION WILL COMMENCE.
- 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



ONE-CALL NOTIFICATION SYSTEM
CALL BEFORE YOU DIG!!!
(713)223-4567 (IN HOUSTON)
(NEW STATEWIDE NUMBER OUTSIDE HOUSTON)
1-800-344-8377

FIRM FLOOD INSURANCE MAP
PANEL 140 OF 575
MAP# 48157C0140L
FLOOD ZONE "X"

ETJ DETENTION PLANS INFORMATION
1) STORM WATER DETENTION PLANS IS PROVIDED IN RED GULLEY LAKES PH. 1&2, ALIANA DETENTION/AMENITY PHASE 2, OYSTER CREEK DRAINAGE IMPROVEMENTS PHASE 3, AND OYSTER CREEK DRAINAGE DRAINAGE IMPROVEMENTS PHASE 4-6
ENGINEERING FIRM LJA ENGINEERING & SURVEYING
DATE SIGNED MAY 2007, JANUARY 2012, DECEMBER 2013, FEBRUARY 2014, APRIL 2015
APPROVED BY FORT BEND COUNTY ENGINEERING DEPARTMENT
2) STORM WATER DRAINAGE DESIGN REPORT
REPORT TITLE MASTER DRAINAGE PLAN FOR ALIANA DEVELOPMENT
DATE APPROVED JULY 2018 (UPDATED AUG 2018) - ENGINEERING FORM REPORT
DATE OF ACKNOWLEDGEMENT BY FBC DRAINAGE DISTRICT, JULY 2018
3) INCREASED IMPERVIOUS COVER = 824.46 ACRES.
DETENTION RATE REQUIRED = 0.48 ACRE-FEET/ACRE
DETENTION RATE PROVIDED = 0.48 ACRE-FEET/ACRE
4) COH Drainage memo: Submittal of construction plans for Aliana Commercial Tracts C20, C21, C28, C29, C30
Dated: July 26, 2018 (UPDATED Aug. 2018)
Addressed to: Ivy Wong, P.E. FORT BEND COUNTY ENGINEER

SH No construction shall be allowed until the offsite easements have been recorded.

ENGINEER: Rick J. Stagle, P.E., PTOE
FOR RICHARD W. STAGLE, P.E.
DATE: 9/25/18
THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVAL.
APPROVED: [Signature]
DEVELOPMENT COORDINATOR
DATE: 9/25/18

DEVELOPER:
**ALIANA DEVELOPMENT
COMPANY**
20333 STATE HWY 249 SUITE 600
HOUSTON, TEXAS 77070

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____



APPROVED FOR CONSTRUCTION

BY _____ DATE _____

ENGINEER:
LJA Engineering, Inc.

2929 Briarpark Drive
Suite 600
Houston, Texas 77042

Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

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

ILMS # 18056037
COH LOG# 18-1051

 LJA Engineering, Inc.	
SURVEYED BY: FB NO.:	
CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	STREET & BRIDGE
TRAFFIC	TRAFFIC
STORM	STORM WATER QUALITY
FACILITIES	FACILITIES
CITY ENGINEER	FOR CITY OF HOUSTON USE ONLY CITY DWG NO.:
DIRECTOR OF HOUSTON PUBLIC WORKS 	
SHEET No: 1 OF 15	

GENERAL CONSTRUCTION NOTES:

- 1. Water lines, wastewater collection systems, and drainage systems shall be constructed and tested in accordance with the City of Houston, Department of Public Works and Engineering Standard Construction Specifications dated October 2002, and "Standard Construction Details for Wastewater Collection Systems, Water Lines, Storm Drainage and Street Paving" dated October 2002 unless otherwise noted and approved on these drawings. The design is consistent with the minimum standards established in the City of Houston Department of Public Works and Engineering Infrastructure Design Manual, dated January 2011. Note that plan signatures and the latest editions of design rules, specifications & manuals shall govern as of the date of resigning.

SANITARY SEWER CONSTRUCTION NOTES:

- 1. Manholes shall be City of Houston Standard Precast as per City of Houston Standard Drawings as currently amended. All manholes must be precast with the base slab reinforced with No. 5 re-bars (grade 40) at 8" on center, each way. Brick manholes are not allowed.

PAVING CONSTRUCTION NOTES:

- 1. All paving shall be constructed in accordance with City of Houston and Fort Bend County requirements as currently amended.

SPECIAL TRENCH BACKFILL NOTE:

All trench backfill for utilities shall be compacted to at least 95% of maximum density per ASTM D-698. Moisture content shall be within +/- 3% of optimum. Density shall be taken at approximate 100-foot intervals for each lift or as recommended by the testing lab or as otherwise directed by the Engineer.

WATERLINE CONSTRUCTION NOTES:

- 1. PRIOR TO WATER MAIN ADJUSTMENT, THE INSTALLATION OF WATER METERS AND LEADS OR UNMETERED SPRINKLER LINES, THE CONTRACTOR SHALL CONTACT WATER TAPS AND METERS SECTION AT 713-535-7675 FOR DETAILS OF PERMITS AND BONDS.

BENCHMARK:

A-1212 - BRASS DISK, STAMPED A-1212 1973. SET IN THE TOP OF A CONCRETE HEADWALL ON WEST BOUND LANES OF HWY 90A APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/8 FOOT LOWER THAN THE ROAD.

ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ. T.M.

3/4" IRON ROD W/ LJA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.

ELEV. = 93.19 FEET 1973 ADJ.

NOTES:

- 1. UNMETERED SPRINKLER LINES, THE CONTRACTOR SHALL CONTACT WATER TAPS AND METERS SECTION AT 713-535-7675 FOR DETAILS OF PERMITS AND BONDS.

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

Table with columns: DATE, REVISION, BY. Row 1: 9-26-19, Added entry transfer note, JLC

C.O.H. LOG NO. 18-1051

F.B.C.M.U.D. NO. 134B

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30

GENERAL NOTES

LJA Engineering, Inc.

2929 Briarpark Drive Suite 600 Houston, Texas 77042 Phone 713.953.5200 Fax 713.953.5026 FRN-F-1386

LJA PROJECT NO.: 1968-1064

DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018

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

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER STREET & BRIDGE WASTEWATER TRAFFIC STORM WATER QUALITY FACILITIES

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE _____

SCALE: NONE

SHEET 2 OF 15

61356

127877

8-2-18

STORM DRAINAGE CONSTRUCTION NOTES:

- 1. Storm sewer shall be reinforced concrete pipe (ASTM 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.

ENERGY TRANSFER PIPELINE

- 1. ETC SHALL BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION OR MAINTENANCE ACTIVITY IN THE VICINITY OF ETC'S PIPELINE FACILITY. THE FOLLOWING PARTIES MUST BE CONTACTED: TEXAS811 (281) 850-1417 KORY PARTON (281) 850-1417

PERMIT NOTES

- 1. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF CITY OF HOUSTON AND FORT BEND COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.

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. CENTERPOINT SIGNATURES ON THESE PLANS ONLY INDICATES THAT ITS 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 PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR 713-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING. FOR EMERGENCIES REGARDING GAS LINES CALL (713) 658-3552 OR (713) 207-4200

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

WARNING: OVERHEAD ELECTRICAL FACILITIES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY: - ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX(6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND - OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN TEN FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222. ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY NO APPROVAL TO USE CENTERPOINT ENERGY TO USE CROSS EASEMENT PROPERTY IS GIVEN, IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6248 OR (713) 207-5769.

CAUTION: AT&T FACILITIES

THE LOCATION OF SOUTHWESTERN BELL TELEPHONE COMPANY UTILITY ARE NO LONGER PROVIDED BY AT&T AND ARE NOT SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF THESE UTILITIES PRIOR TO COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY ITS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES. TO HAVE THESE FACILITIES LOCATED CALL THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567, OR TOLL FREE AT 1-(800) 689-8344, AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.

WARNING: UNDERGROUND ELECTRICAL FACILITIES

UNDERGROUND ELECTRICAL FACILITIES EXIST IN THE AREA OF THIS PROJECT. DO NOT BEGIN CONSTRUCTION UNTIL THESE FACILITIES HAVE BEEN LOCATED AND STAKED. TO HAVE THESE UNDERGROUND FACILITIES STAKED CALL THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567, OR TOLL FREE AT 1-(800) 689-8344, AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.

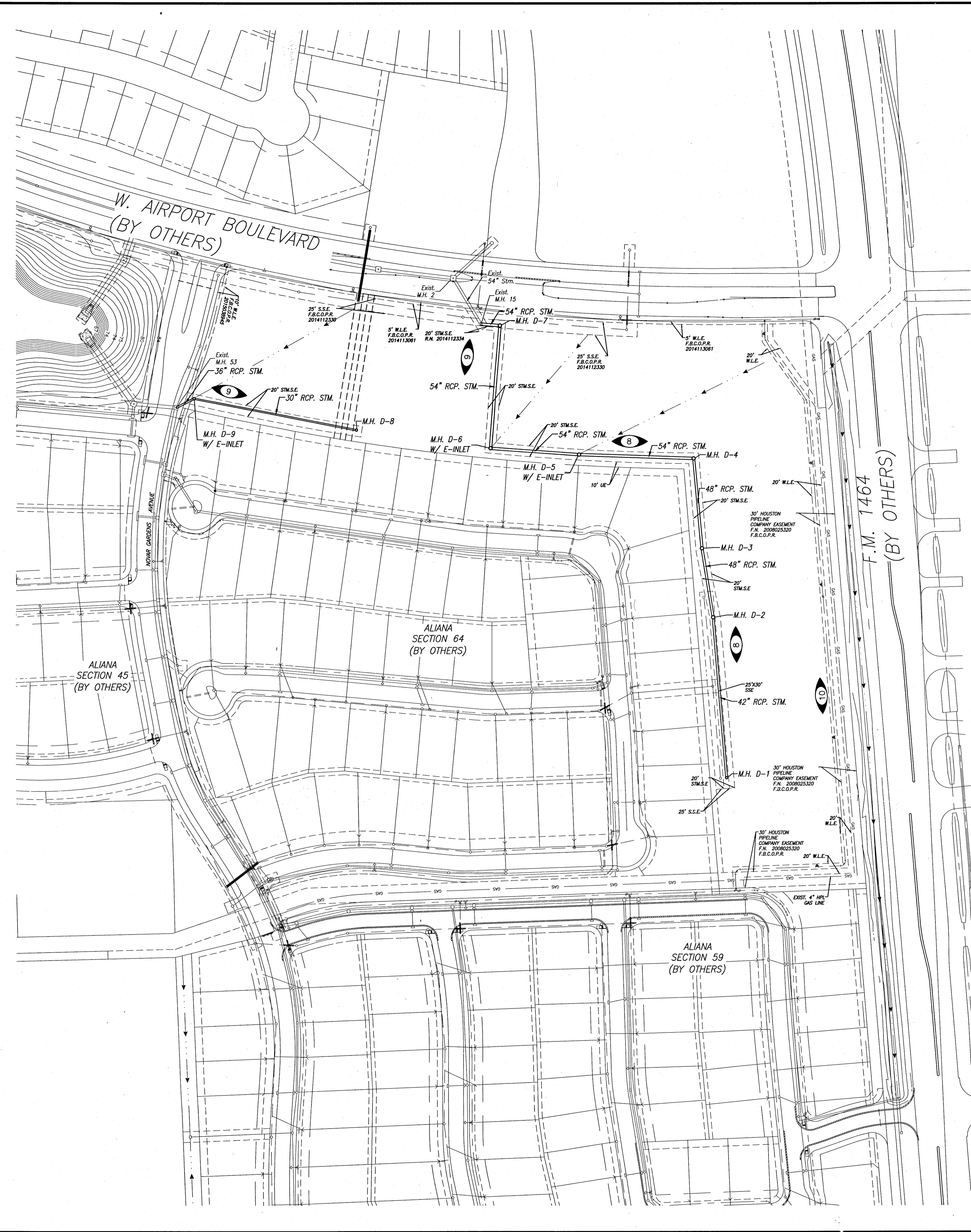
TRAFFIC NOTES

- 1. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TEXAS MUTCD, MOST RECENT EDITION WITH REVISIONS) DURING CONSTRUCTION.

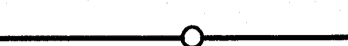
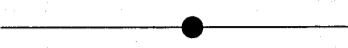
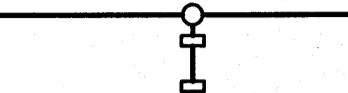
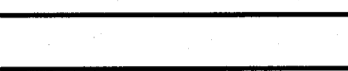
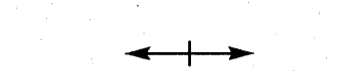
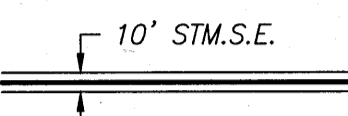
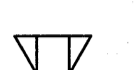
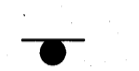


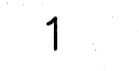
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ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 JOB NO. 1968-1064

Date/Time : Thu, 02 Aug 2018 10:40:32pm
 User Name : jforline
 Path Name : E:\Projects\1968\1064\1064.dwg
 Sheet File : Aliana Comm. Tracts - Pav-Stm.dwg



LEGEND

-  PROPOSED STORM SEWER & MANHOLE
-  EXISTING STORM SEWER AND MANHOLE
-  PROPOSED STORM SEWER, MANHOLE, AND "H-2" OR "C-1" INLETS
-  PROPOSED PAVEMENT
-  INDICATES PAVING SUMMIT
-  INDICATES STORM SEWER EASEMENT
-  INDICATES WHEELCHAIR RAMP
-  INDICATES STREET SIGNS
-  INDICATES SHEET REFERENCE NUMBER
-  INDICATES BLOCK NUMBER
-  INDICATES LOT NUMBER



BENCHMARK:
 A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/4 FOOT LOWER THAN THE ROAD.
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 IBM:
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NOTES:

RECORD DRAWING
 I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
 BY: _____ DATE: _____
 TITLE: _____

FORT BEND COUNTY ENGINEERING DEPARTMENT
 APPROVED: *[Signature]*
 DEVELOPMENT COORDINATOR
 DATE: 9/25/18

DATE	REVISION	BY

C.O.H. LOG NO. 18-1051
 F.B.C.M.U.D. NO. 134B
 ALIANA COMMERCIAL TRACTS
 C20, C21, C28, C29, C30

PAVING, DRAINAGE AND PERMANENT SIGNAGE LAYOUT

LJA Engineering, Inc.
 2929 Briarpark Drive Phone 713.953.5200
 Suite 600 Fax 713.953.5026
 Houston, Texas 77042 FRN - F-1386

LJA PROJECT NO.: 1968-1064
 DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018

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

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	STREET & BRIDGE
WASTEWATER	TRAFFIC
STORM	STORM WATER QUALITY
FACILITIES	

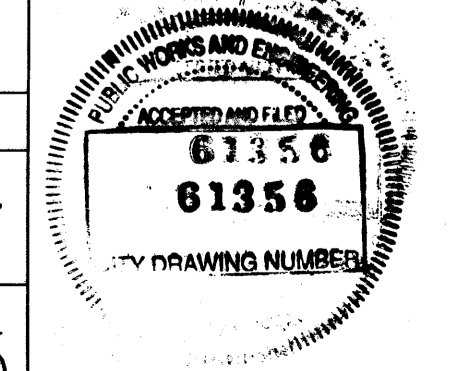
FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE: 1" = 100'

SCALE: 1" = 100'

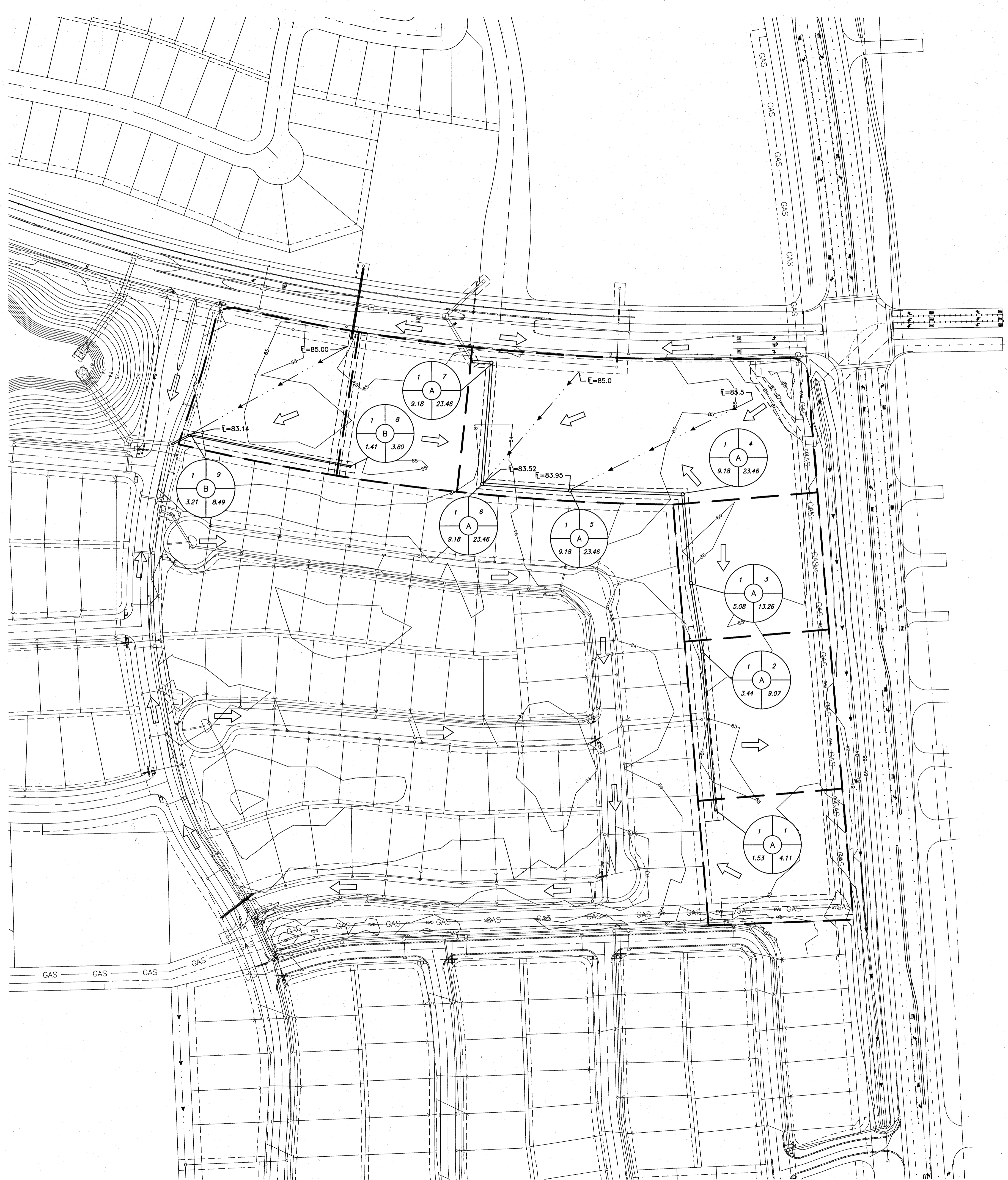
SHEET NO. 4 OF 15

[Signature]
 8.2.18



ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064

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 Plot Name : 1968\1064\CD\Sheet_Files\AS-Allana-Comm-Tracts-DAM.dwg



LEGEND

- PROPOSED STORM SEWER AND MANHOLE
- EXISTING STORM SEWER AND MANHOLE
-
- INDICATES PROPOSED PAVEMENT
- INDICATES DRAINAGE SYSTEM
- INDICATES ACCUMULATED RUN OFF IN C.F.S.
- INDICATES INLET NUMBER
- 100-YEAR PONDING IN FEET ABOVE TOP OF CURB AT LOW POINT BEFORE BREAK OVER
- INDICATES TOP OF CURB
- INDICATES DRAINAGE AREA IN ACRES
- INDICATES RUN OFF IN C.F.S.
- INDICATES PAVING SUMMIT
- INDICATES DRAINAGE AREA DIVIDE
- INDICATES SHEET FLOW
- INDICATES EXISTING SHEET FLOW
- INDICATES EXISTING NATURAL GROUND CONTOURS
- TOP OF CURB ELEVATION (BASED ON 6" CURB) AT HIGH POINT AND/OR INLET

BENCHMARK:
 A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 30A, APPROX. 4.1 MILES WEST ALONG HWY 30A FROM THE JUNCTION OF HWY 6 IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.
 ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
TBM:
 3/4" IRON ROD W/ LJA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.
 ELEV. = 93.19 FEET 1973 ADJ.

NOTES:

RECORD DRAWING
 I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
 BY _____ DATE _____
 TITLE _____

FORT BEND COUNTY ENGINEERING DEPARTMENT
 APPROVED: *Mary D. [Signature]*
 DEVELOPMENT COORDINATOR
 DATE: 9/25/18

DATE	REVISION	BY

C.O.H. LOG NO. 18-1051
 F.B.C.M.U.D. NO. 134B
 ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30

PROJECT DRAINAGE AREA	12.39	ACRES
OVERALL DETENTION BASIN DRAINAGE AREA	176.64	ACRES
EXISTING IMPERVIOUS COVER FOR DRAINAGE AREA	125.63	ACRES
PROPOSED IMPERVIOUS COVER FOR PROJECT AREA	12.39	ACRES
INCREASED IMPERVIOUS COVER FOR PROJECT AREA	12.39	ACRES
FINAL IMPERVIOUS COVER FOR PROJECT AREA	138.02	ACRES
DETENTION BASIN STORAGE RATE	0.54	ACRE-FEET/ACRE
OVERALL DETENTION STORAGE REQUIRED	97.15	ACRE-FEET
OVERALL DETENTION STORAGE PROVIDED	110.91	ACRE-FEET
OVERALL DETENTION STORAGE USED BY EXISTING DEVELOPMENT	66.10	ACRE-FEET
DETENTION STORAGE REQUIRED FOR PROJECT AREA	6.81	ACRE-FEET
DETENTION STORAGE PROVIDED FOR PROJECT AREA	44.81	ACRE-FEET
OVERALL DETENTION STORAGE REMAINING FOR FUTURE DEVELOPMENT	38.00	ACRE-FEET

OH
8-29-18

DRAINAGE AREA MAP

LJA Engineering, Inc.
 2929 Briarpark Drive Suite 600 Houston, Texas 77042
 Phone 713.953.5200 Fax 713.953.5026 FRN - F-1386

LJA PROJECT NO.: 1968-1064
 DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018

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

CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
WATER	STREET & BRIDGE
SEWER	TRAFFIC
STORM	STORM WATER QUALITY
FACILITIES	

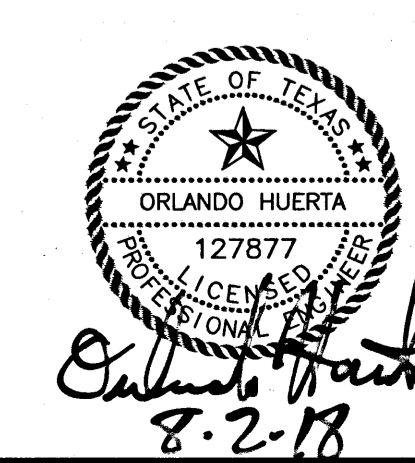
FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE _____

SCALE: 1" = 100'

SHEET NO. 5 OF 15

61356



ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064

LJA Engineering, Inc.

Project: **Commercial Tracts**
 LJA Job No. 1968-1064
 System: Storm
 By: JLC Date: 4/17/2018
 Checked by: _____ Date: _____

COH 2 YR
 b= 75.01
 d= 16.2
 e= 0.8315

Pass **OH 8-24-18**

2 YR

FROM JUNCTION	TO JUNCTION	ADDED AREA	TOTAL AREA	TC	Intensity	C	CI	Additional Q	CUM Q(2 YR)	REACH	LINE/BOX	DESIGN	D.S.	OTHER	FLOWLINE	ACT.V	SLOPE	delta H	ELEV. HYD. GRAD.	TC	HG DIST	Maximum	Method 1	Maximum	Spread	Actual	Method 2						
		ac	ac	min				cfs	cfs	ft	SIZE	WIDTH	HEIGHT	FALL	LOSSES	UP- DOWN- STREAM	HYD. GRAD. (%)	ft	UP- DOWN- STREAM	UP- DOWN- STREAM	ft	Ponding	(Y/N)	Allowable	Width	Sheetflow	(Y/N)						
SYSTEM A																																	
LINE 1																																	
1	2	1.53	1.53	25.78	3.35	0.80	2.68	0.00	4.11	301	42		0.080	0.013	28.57	3.0	0.50		76.780	76.539	0.43	0.002	0.005	81.02	81.01	84.00	2.98	85.00	Yes	54.33	N/A	0.00	Method 1
2	3	1.91	3.44	27.43	3.25	0.80	2.60	0.00	9.07	131	48		0.070	0.013	38.16	3.0	0.00		76.039	75.947	0.72	0.004	0.005	81.01	81.01	84.00	2.99	85.00	Yes	54.33	N/A	0.00	Method 1
3	4	1.64	5.08	28.31	3.19	0.80	2.56	0.00	13.26	169	48		0.070	0.013	38.16	3.0	0.50		75.947	75.829	1.05	0.008	0.014	81.01	80.99	84.00	2.99	85.00	Yes	54.33	N/A	0.00	Method 1
4	5	4.10	9.18	29.78	3.11	0.80	2.49	0.00	23.46	215	54		0.060	0.013	48.36	3.0	0.00		75.329	75.199	1.47	0.014	0.030	80.99	80.96	84.00	3.01	85.00	Yes	54.33	N/A	0.00	Method 1
5	6	0.00	9.18	29.78	3.11	0.80	2.49	0.00	23.46	166	54		0.060	0.013	48.36	3.0	0.00		75.199	75.100	1.47	0.014	0.023	80.96	80.94	84.00	3.04	85.00	Yes	54.33	N/A	0.00	Method 1
6	7	0.00	9.18	29.78	3.11	0.80	2.49	0.00	23.46	230	54		0.060	0.013	48.36	3.0	0.00		75.100	74.961	1.47	0.014	0.032	80.94	80.91	84.00	3.06	85.00	Yes	54.33	N/A	0.00	Method 1
7	EXIST	0.00	9.18	29.78	3.11	0.80	2.49	0.00	23.46	36	54		0.060	0.013	48.36	3.0	0.00		74.961	74.940	1.47	0.014	0.005	80.91	80.90	84.00	3.09	85.00	Yes	54.33	N/A	0.00	Method 1
SYSTEM B																																	
LINE 2																																	
8	9	1.41	1.41	25.62	3.36	0.80	2.69	0.00	3.80	310	30		0.130	0.013	14.85	3.0	3.40		76.490	76.090	0.77	0.008	0.026	81.24	81.22	84.00	2.76	85.00	Yes	54.33	N/A	0.00	Method 1
9	Exist	1.80	3.21	27.28	3.26	0.80	2.61	0.00	8.49	37	36		0.100	0.013	21.18	3.0	0.00		72.690	72.653	1.20	0.016	0.006	81.22	81.21	84.00	2.78	85.00	Yes	54.33	N/A	0.00	Method 1

LJA Engineering, Inc.

Project: **Aliana Commercial Tracts**
 LJA Job No. 1968-1064
 System: Storm
 By: JLC Date: 4/30/2018
 Checked by: _____ Date: _____

COH 100 yr
 b= 125.4
 d= 21.8
 e= 0.75

Pass **OH 8-24-18**

100 YR

FROM JUNCTION	TO JUNCTION	ADDED AREA	TOTAL AREA	TC	Intensity	C	CI	Additional Q	CUM Q(2 YR)	REACH	LINE/BOX	DESIGN	D.S.	OTHER	FLOWLINE	ACT.V	SLOPE	delta H	ELEV. HYD. GRAD.	TC	HG DIST	Maximum	Method 1	Maximum	Spread	Actual	Method 2						
		ac	ac	min				cfs	cfs	ft	SIZE	WIDTH	HEIGHT	FALL	LOSSES	UP- DOWN- STREAM	HYD. GRAD. (%)	ft	UP- DOWN- STREAM	UP- DOWN- STREAM	ft	Ponding	(Y/N)	Allowable	Width	Sheetflow	(Y/N)						
SYSTEM A																																	
LINE 1																																	
1	2	1.53	1.53	25.78	6.92	0.80	5.54	0.00	8.47	301	42		0.080	0.013	28.57	3.0	0.50		76.780	76.539	0.88	0.007	0.021	81.52	81.50	84.00	2.48	85.00	Yes	54.33	N/A	4.37	Method 1
2	3	1.91	3.44	27.43	6.75	0.80	5.40	0.00	18.78	131	48		0.070	0.013	38.16	3.0	0.00		76.039	75.947	1.49	0.017	0.022	81.50	81.48	84.00	2.50	85.00	Yes	54.33	N/A	9.71	Method 1
3	4	1.64	5.08	28.31	6.66	0.80	5.33	0.00	27.52	169	48		0.070	0.013	38.16	3.0	0.50		75.947	75.829	2.19	0.036	0.062	81.48	81.42	84.00	2.52	85.00	Yes	54.33	N/A	14.26	Method 1
4	5	4.10	9.18	29.78	6.52	0.80	5.21	0.00	48.89	215	54		0.060	0.013	48.36	3.0	0.00		75.329	75.199	3.07	0.061	0.132	81.42	81.28	84.00	2.58	85.00	Yes	54.33	N/A	25.43	Method 1
5	6	0.00	9.18	29.78	6.52	0.80	5.21	0.00	48.89	166	54		0.060	0.013	48.36	3.0	0.00		75.199	75.100	3.07	0.061	0.102	81.28	81.18	84.00	2.72	85.00	Yes	54.33	N/A	25.43	Method 1
6	7	0.00	9.18	29.78	6.52	0.80	5.21	0.00	48.89	230	54		0.060	0.013	48.36	3.0	0.00		75.100	74.961	3.07	0.061	0.141	81.18	81.04	84.00	2.82	85.00	Yes	54.33	N/A	25.43	Method 1
7	EXIST	0.00	9.18	29.78	6.52	0.80	5.21	0.00	48.89	36	54		0.060	0.013	48.36	3.0	0.00		74.961	74.940	3.07	0.061	0.022	81.04	81.02	84.00	2.96	85.00	Yes	54.33	N/A	25.43	Method 1
SYSTEM B																																	
LINE 2																																	
8	9	1.41	1.41	25.62	6.94	0.80	5.55	0.00	7.83	310	30		0.130	0.013	14.85	3.0	0.50		76.490	76.090	1.59	0.036	0.112	81.61	81.50	84.00	2.39	85.00	Yes	54.33	N/A	4.03	Method 1
9	Exist	1.80	3.21	27.28	6.76	0.80	5.41	0.00	17.57	37	36		0.100	0.013	21.18	3.0	0.00		72.690	72.653	2.48	0.069	0.026	81.50	81.47	84.00	2.50	85.00	Yes	54.33	N/A	9.08	Method 1

COH 2 YR

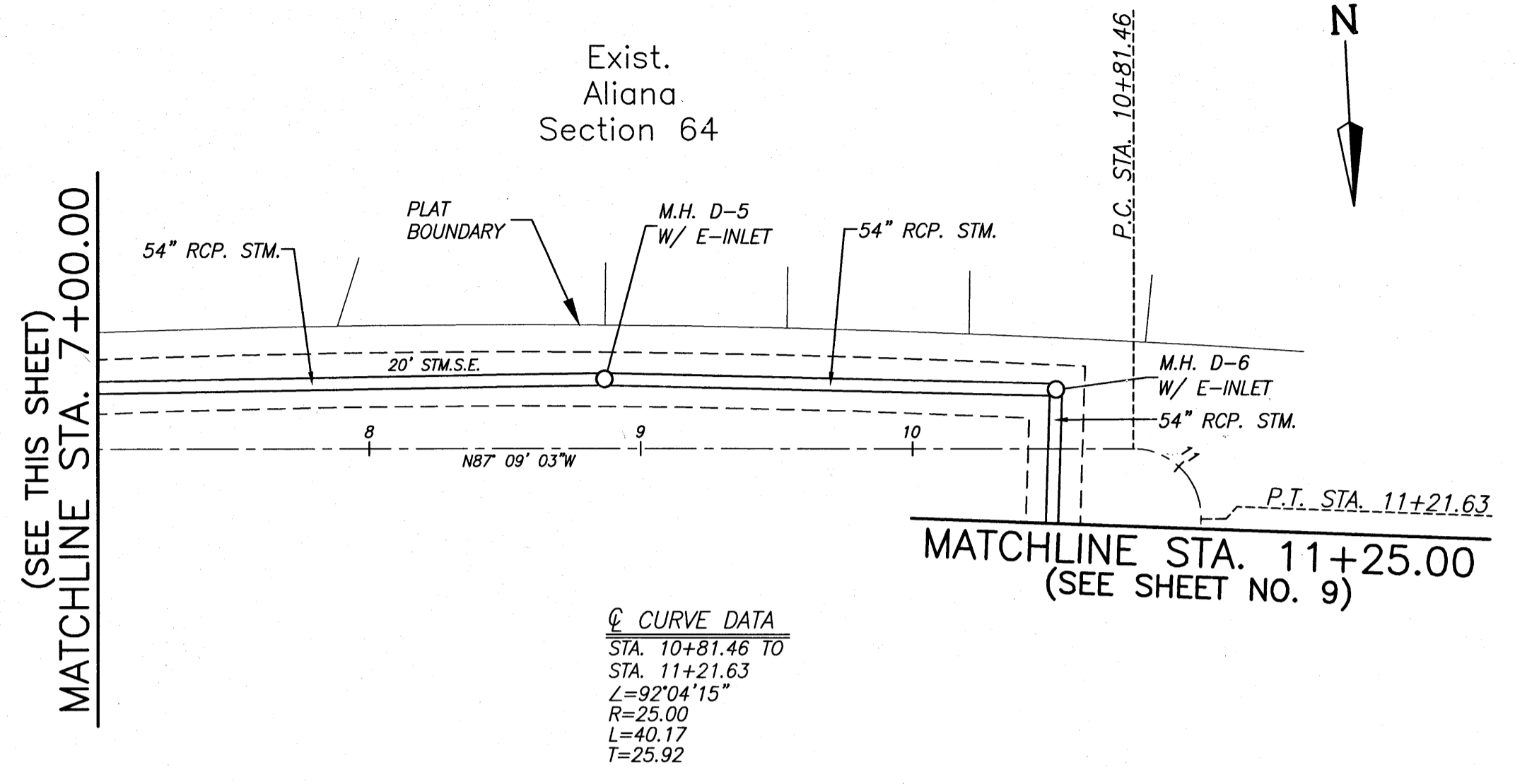
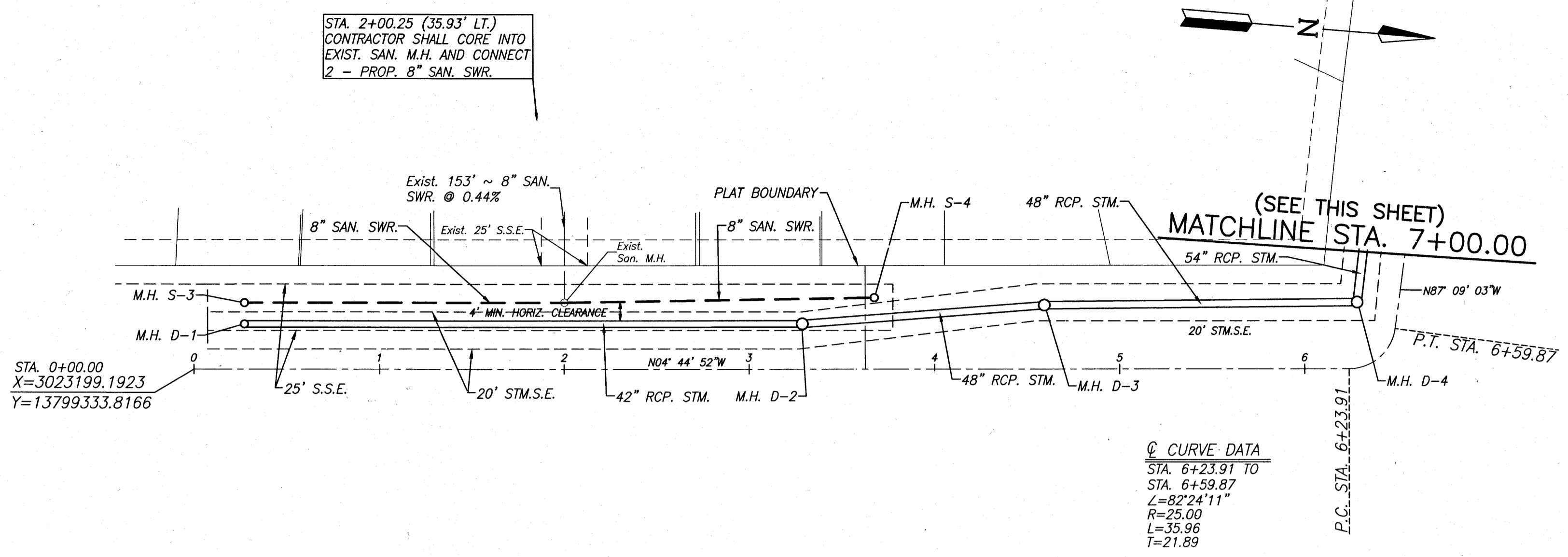
b= 75.01
 d= 16.2
 e= 0.8315

100 YR FBC

FROM JUNCTION	TO JUNCTION	ADDED AREA	TOTAL AREA	TC	Intensity	C	CI	Additional Q	CUM Q(2 YR)	REACH	LINE/BOX	DESIGN	D.S.	OTHER	FLOWLINE	ACT.V	SLOPE	delta H	ELEV. HYD. GRAD.	TC	HG DIST	Maximum	Method 1	Maximum	Spread	Actual	Method 2							
		ac	ac	min				cfs	cfs	ft	SIZE	WIDTH	HEIGHT	FALL	LOSSES	UP- DOWN- STREAM	HYD. GRAD. (%)	ft	UP- DOWN- STREAM	UP- DOWN- STREAM	ft	Ponding	(Y/N)	Allowable	Width	Sheetflow	(Y/N)							
SYSTEM A																																		
LINE 1																																		
1	2	1.53	1.53	25.78	3.35	0.80	2.68	0.00	14.08	18.19	301	42		0.080	0.013	28.57	3.0	0.50		76.780	76.539	1.89	0.032	0.098	82.67	82.57	84.00	1.33	85.00	Yes	54.33	N/A	18.19	Method 1
2	3	1.91	3.44	27.43	3.25	0.80	2.60	0.00	17.57	40.72	131	48		0.070	0.013	38.16	3.0	0.00		76.039	75.947	3.24	0.080	0.104	82.57	82.47	84.00	1.43	85.00	Yes	54.33	N/A	40.72	Method 1
3	4	1.64	5.08	28.31	3.19	0.80	2.56	0.00	15.09	60.00	169	48		0.070	0.013	38.16	3.0	0.50		75.947	75.829	4.77	0.173	0.293	82.47	82.18	84.00	1.53	85.00	Yes	54.33	N/A	60.00	Method 1
4	5	4.10	9.18	29.78	3.11	0.80	2.49	0.00	70.20	70.20	215	54		0.060	0.013	48.36	3.0	0.00		75.329	75.199	4.41	0.126	0.272	82.18	81.90	84.00	1.82	85.00	Yes	54.33	N/A	70.20	Method 1
5	6	0.00	9.18	29.78	3.11	0.80	2.49	0.00	70.20	166	54		0.060	0.013	48.36	3.0	0.00		75.199	75.100	4.41	0.126	0.210	81.90	81.69	84.00	2.10	85.00	Yes	54.33	N/A	70.20	Method 1	
6	7	0.00	9.18	29.78	3.11	0.80	2.49	0.00	37.72	107.92	230	54		0.060	0.013	48.36	3.0	0.00		75.100	74.961	6.78	0.299	0.687	81.69	81.01	84.00	2.31	85.00	Yes	54.33	N/A	107.92	Method 1
7	EXIST	0.00	9.18	29.78	3.11	0.80	2.49	0.00	107.92	36	54		0.060	0.013	48.36	3.0	0.00		74.961	74.940	6.78	0.299	0.107	81.01	80.90	84.00	2.99	85.00	Yes	54.33	N/A	107.92	Method 1	
SYSTEM B																																		
LINE 2																																		
8	9	1.41	1.41	25.62	3.36	0.80	2.69	0.00	12.97	16.77	310	30		0.130	0.013	14.85	3.0	0.50		76.490	76.090	3.41	0.166	0.513	81.84	81.33	84.00	2.16	85.00	Yes	54.33	N/A	16.77	Method 1
9	Exist	1.80	3.21	27.28	3.26	0.80	2.61	0.00	16.56	38.02	37	36		0.100	0.013	21.18	3.0	0.00		72.690	72.653	5.37	0.322	0.120	81.33	81.21	84.00	2.67	85.00	Yes	54.33	N/A	38.02	Method 1

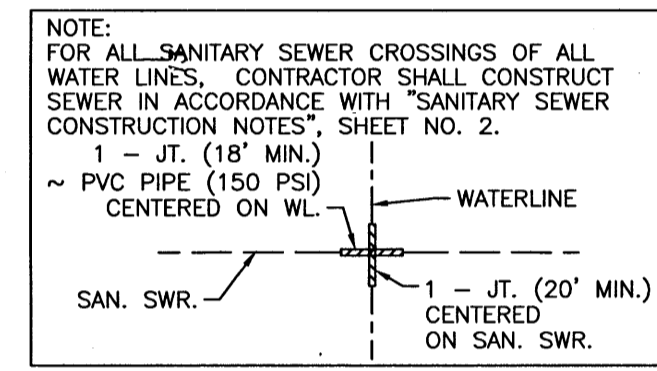
Distance (ft)	Slope (%)	Figure 2-6	(min)	I	"C" Factor	Area (Ac)	100 yr flow
239	0.40%	1.4	10.00	9.20	0.80	1.53	14.08
302	0.40%	1.4	10.00	9.20	0.80	1.91	17.57
262	0.40%	1.4	10.00	9.20	0.80	1.64	15.09
616	0.40%	1.4	10.00	9.20	0.80	4.10	37.72
226	0.40%	1.4	10.00	9.20	0.80	1.41	12.97
282	0.40%	1.4	10.00	9.20	0.80	1.80	16.56

BENCHMARK:

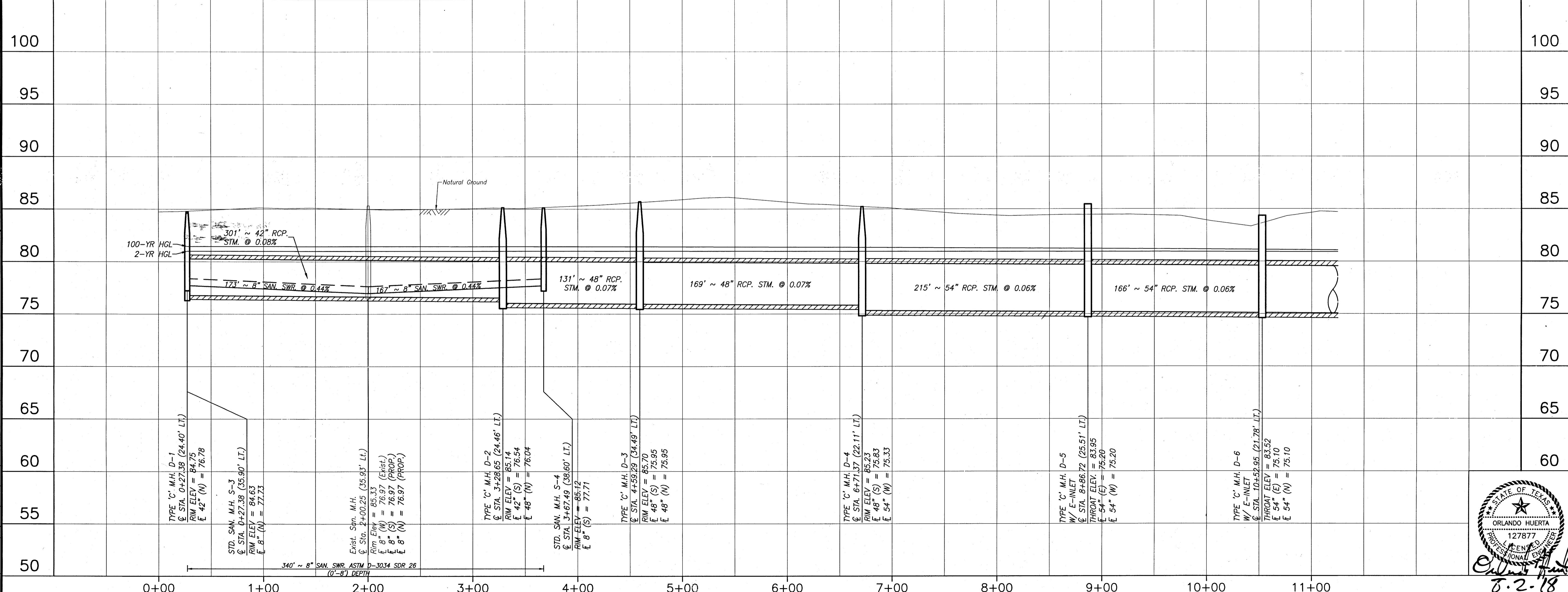


② CURVE DATA
 STA. 6+23.91 TO
 STA. 6+59.87
 L=82°24'11"
 R=25.00
 L=35.96
 T=21.89

② CURVE DATA
 STA. 10+81.46 TO
 STA. 11+21.63
 L=92°04'15"
 R=25.00
 L=40.17
 T=25.92



STORM SYSTEM A & SANITARY SYSTEM



BENCHMARK:
 A-1212 - BRASS DISK, STAMPED A-1212 1973, SET
 IN THE TOP OF A CONCRETE HEADWALL ON THE WEST
 BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST
 ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN
 SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET
 EAST OF THE WEST END OF THE NORTH CONCRETE
 HEADWALL, AND 27.0 FEET NORTH OF THE
 CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT
 LOWER THAN THE ROAD.
 ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
 TRM:
 3/4" IRON ROD W/ LJA CAP LOCATED APPROX.
 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER
 OF THE ALIANA PROPERTY AT THE INTERSECTION OF
 MADDEN ROAD AND FM 1464.
 ELEV. = 93.19 FEET 1973 ADJ.

NOTES:
 RECORD DRAWING
 I CERTIFY THAT THIS DRAWING REFLECTS THE
 IMPROVEMENTS CONSTRUCTED AS TO SIZE,
 LOCATION AND GRADE AND THAT THE
 CONSTRUCTION WAS IN FULL COMPLIANCE WITH
 THE CONTRACT DOCUMENTS
 BY _____ DATE _____
 TITLE _____
 FORT BEND COUNTY ENGINEERING DEPARTMENT
 APPROVED: *Meyda*
 DEVELOPMENT COORDINATOR
 DATE: 9/25/18

DATE	REVISION	BY

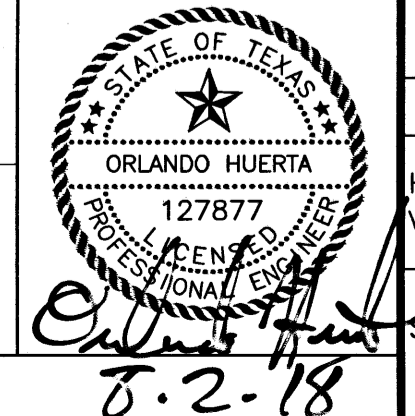
C.O.H. LOG NO. 18-1051
 F.B.C.M.U.D. NO. 134B
 ALIANA COMMERCIAL TRACTS
 C20, C21, C28, C29, C30
 STORM SYSTEM A &
 SANITARY SYSTEM
 STA. 0+00.00 TO 11+25.00

LJA Engineering, Inc.
 2929 Briarpark Drive Phone 713.953.5200
 Suite 600 Houston, Texas 77042 Fax 713.953.5028
 FRN - F-1386

LJA PROJECT NO.: 1968-1064
 DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018
 AFTER DATE OF SIGNATURES

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 STREET & BRIDGE
 TRAFFIC
 STORM WATER QUALITY
 FACILITIES

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY
 DRAWING SCALE
 HORZ: 1" = 50'
 VERT: 1" = 5'
 SHEET NO. 8 OF 15
 61356
 CITY DRAWING NUMBER



Date/Time : Thu, 26 Jul 2018 10:44am User Name : jcarline
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ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064

STA. 0+54.91 (5.00' RT.)
CONTRACTOR SHALL REMOVE EXISTING PLUG & CLAMP AND BLOW OFF VALVE AND CONNECT PROPOSED 8" WATER LINE TO EXISTING 8" WATER LINE
1-8" WET CONNECTION

STA. 2+52.96 (4.64' RT.)
1-8"x6" TEE
1-6" GATE VALVE & BOX
1-FLUSHING VALVE

STA. 4+93.62 (33.59' RT.)
1-8"x6" TEE
1-6" GATE VALVE & BOX
1-FLUSHING VALVE

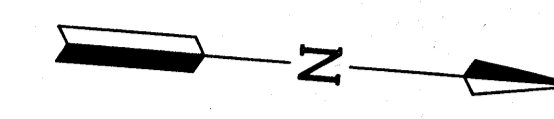
STA. 7+80.61 (33.01' RT.)
1-8"x6" TEE
1-6" GATE VALVE & BOX
1-FLUSHING VALVE

STA. 10+09.47 (33.58' RT.)
1-8"x6" TEE
1-6" GATE VALVE & BOX
1-FLUSHING VALVE

2-8"x22.5" BENDS

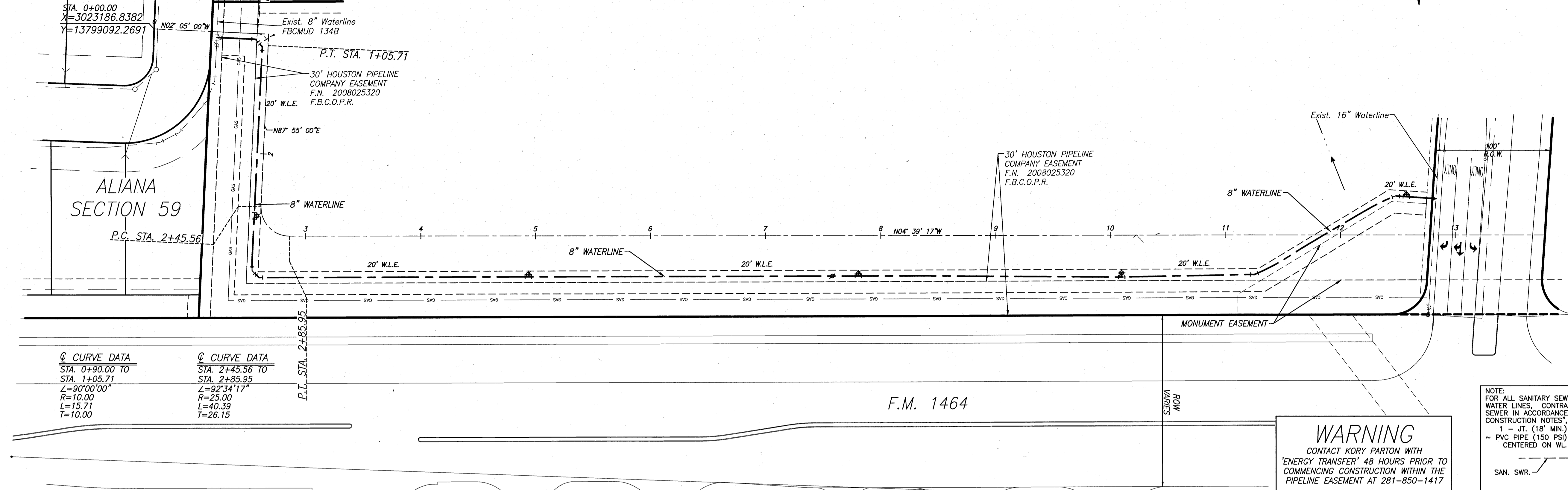
STA. 12+57.58 (35.35' LT.)
1-8"x6" TEE
1-6" GATE VALVE & BOX
1-FLUSHING VALVE

CONTRACTOR SHALL TAP INTO WATER LINE USING T.S.&V. AND CONNECT PROPOSED 8" WATERLINE TO EXISTING 16" WATERLINE
1-16"x8" T.S.&V. W/ BOX

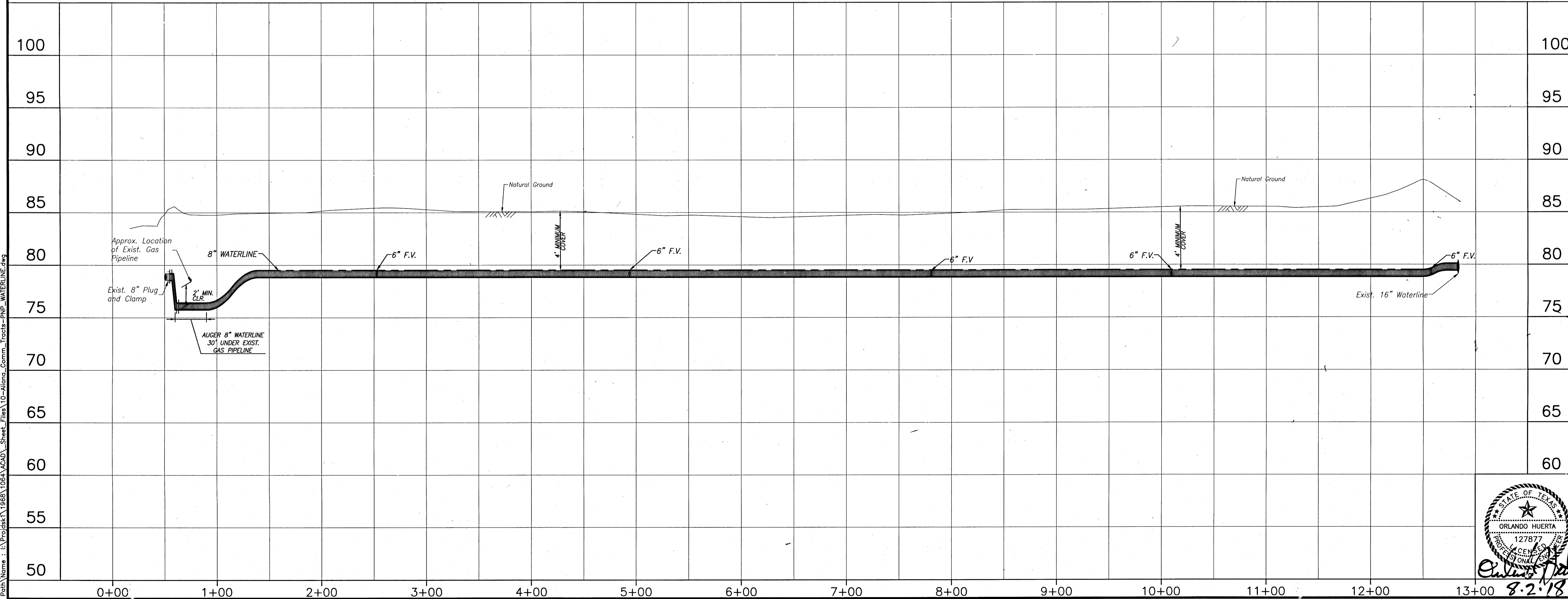
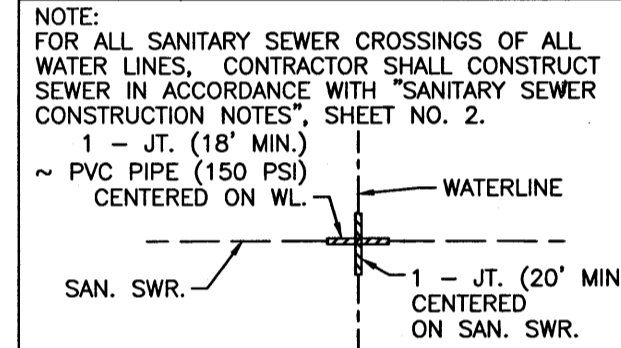


BENCHMARK:
A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END, OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.
ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
I.B.M.
1/4" IRON ROD W/ LIA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.
ELEV. = 93.19 FEET 1973 ADJ.

NOTES:
RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY: _____ DATE: _____
TITLE: _____
FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVED: *M. Huerta*
DEVELOPMENT COORDINATOR
DATE: 9/25/18



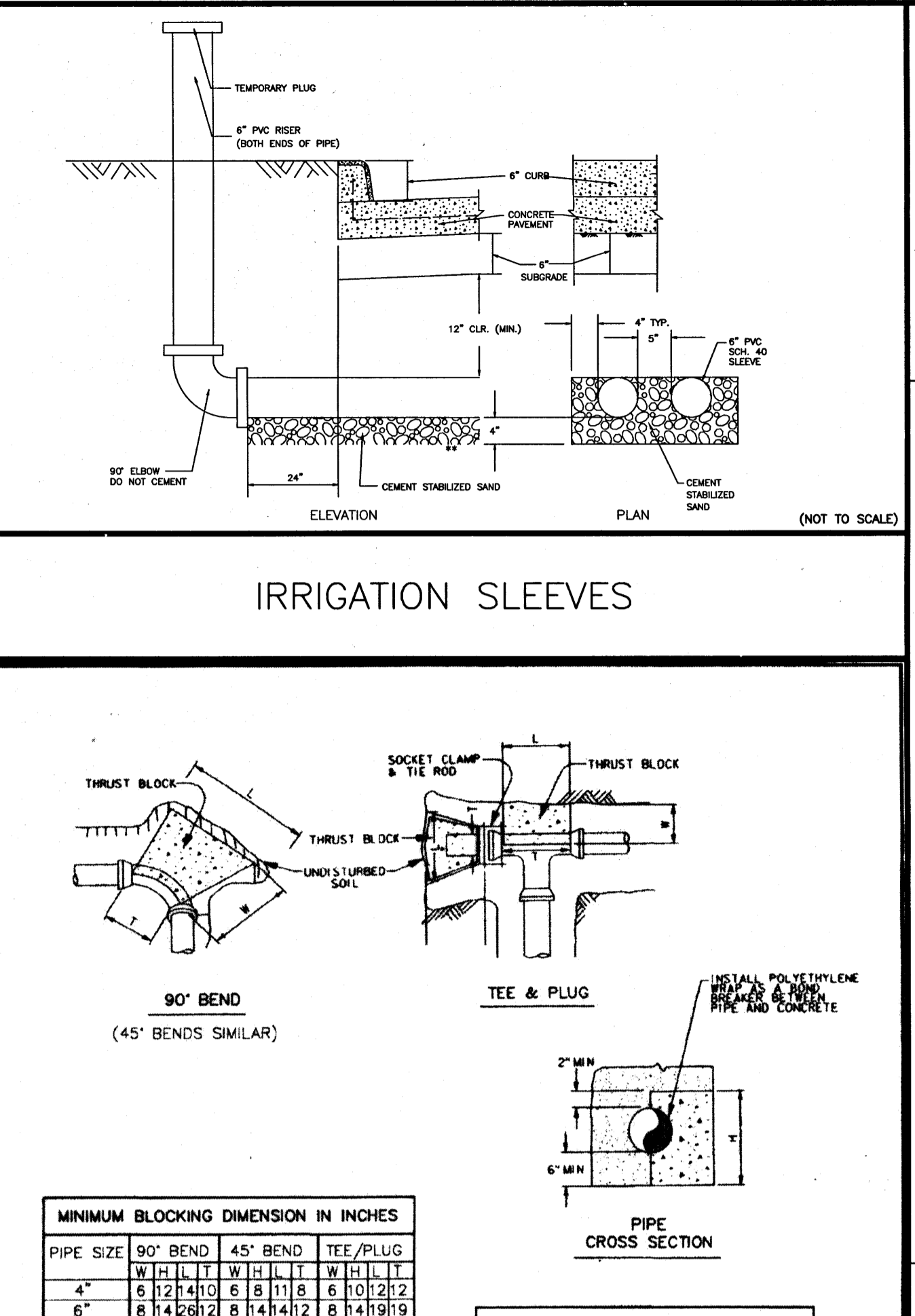
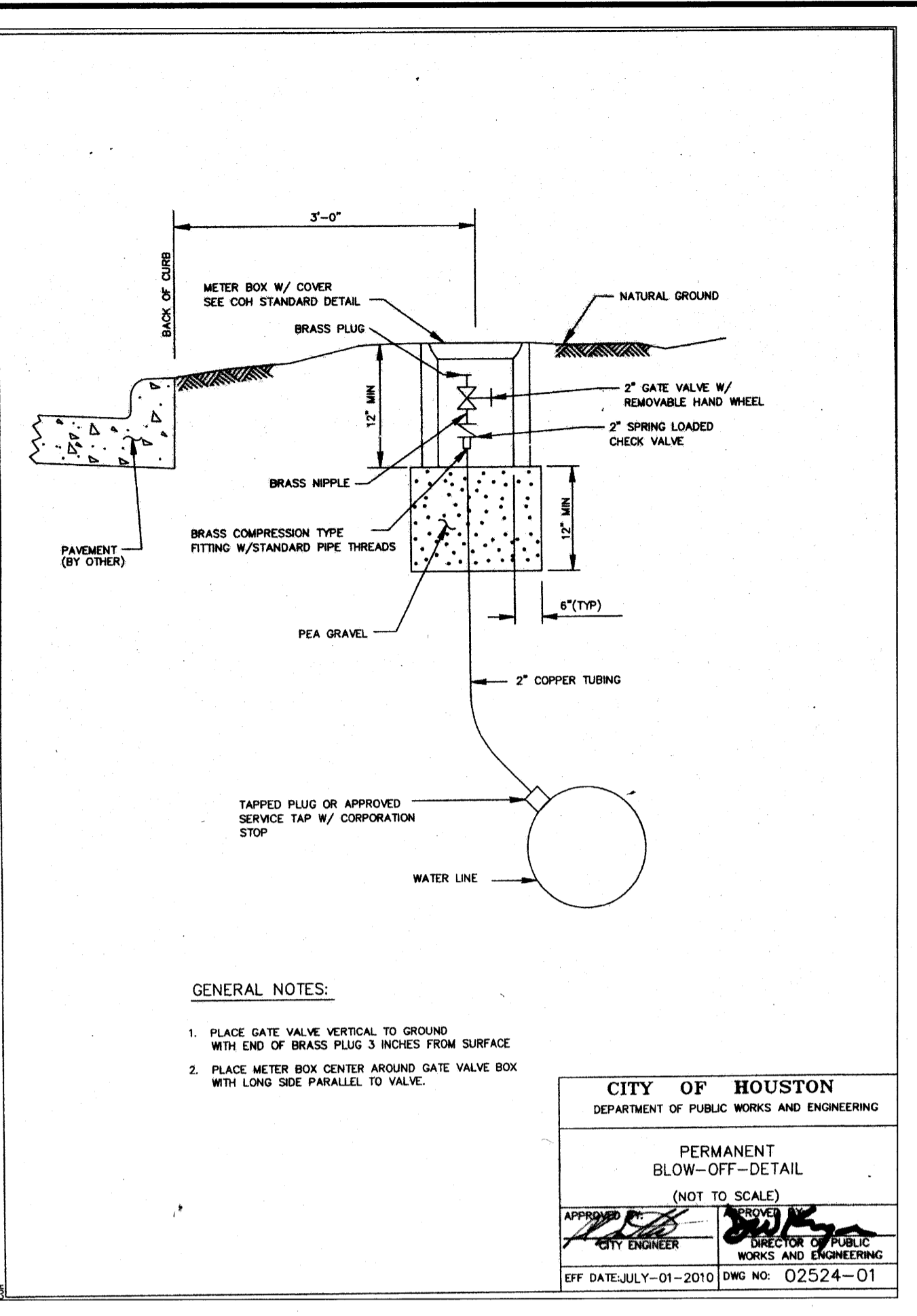
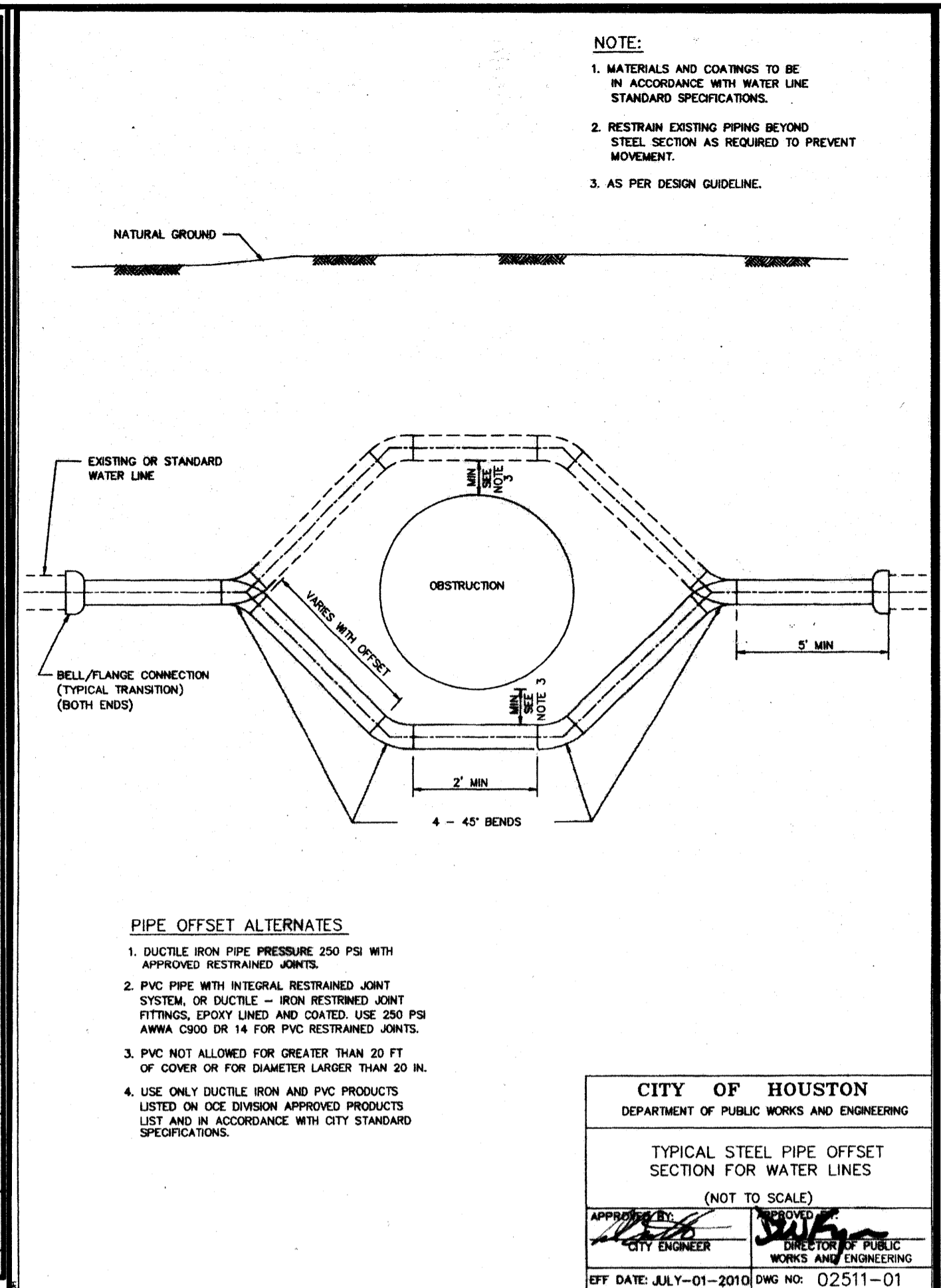
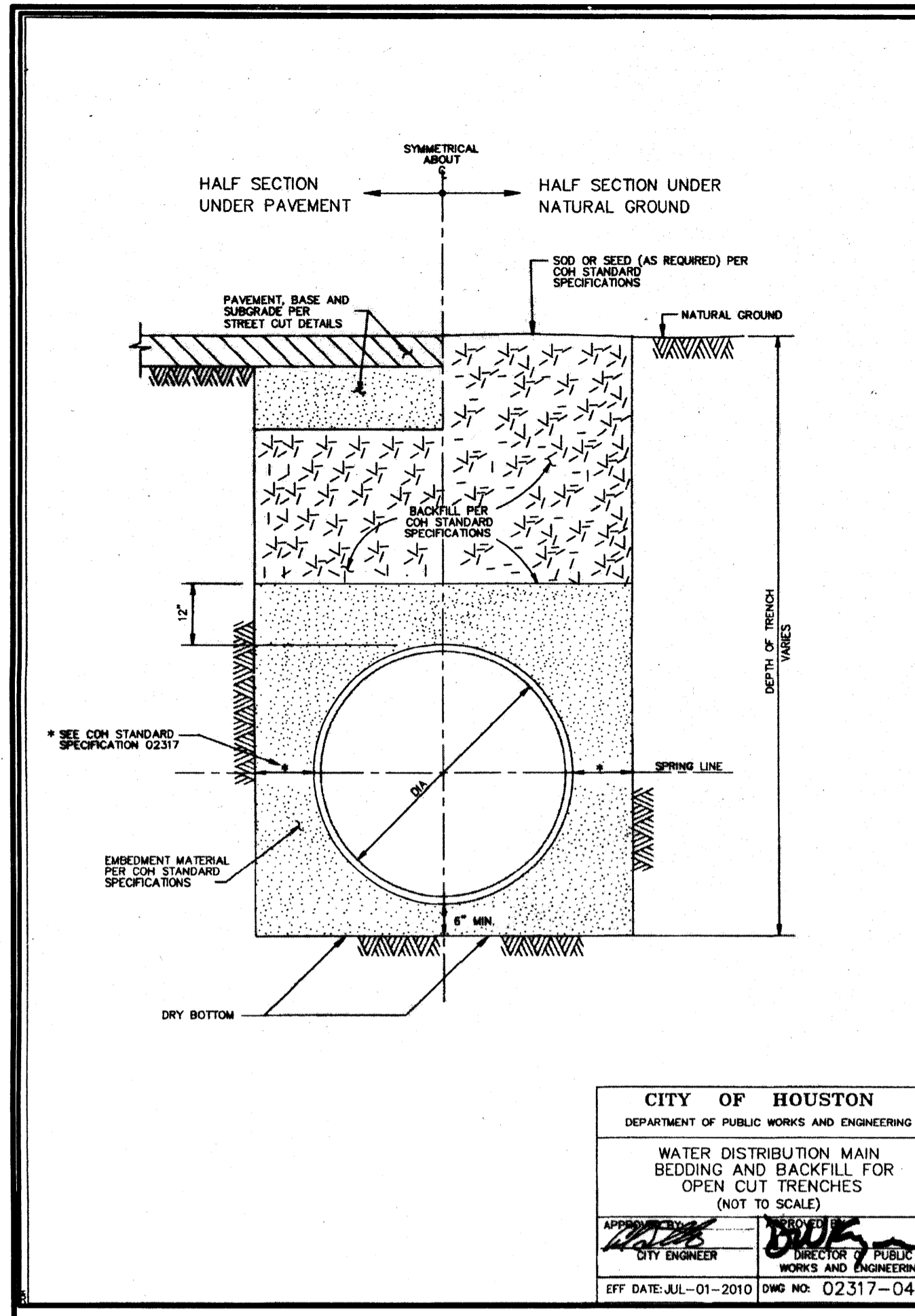
WARNING
CONTACT KORY PARTON WITH 'ENERGY TRANSFER' 48 HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE PIPELINE EASEMENT AT 281-850-1417



C.O.H. LOG NO. 18-1051
F.B.C.M.U.D. NO. 134B
ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30
WATERLINE
STA. 0+00.00 TO END
LJA Engineering, Inc.
2929 Briarpark Drive Phone 713.953.5200
Suite 600 Fax 713.953.5026
Houston, Texas 77042 FRN - F-1386
LJA PROJECT NO.: 1968-1064
DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
WATER: _____ STREET & BRIDGE: _____
SEWERAGE: _____ TRAFFIC: _____
STORM: _____ STORM WATER QUALITY: _____
FACILITIES: _____
FILE NO. _____ FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE
HORZ: 1" = 50'
VERT: 1" = 5'
SHEET NO. 10 OF 15
8-2-18

Date: 07 Aug 2018 10:01 PM User Name: jcarline Path: \\s:\projects\1968-1064\Drawings\Sheet\1968-1064-Waterline.dwg

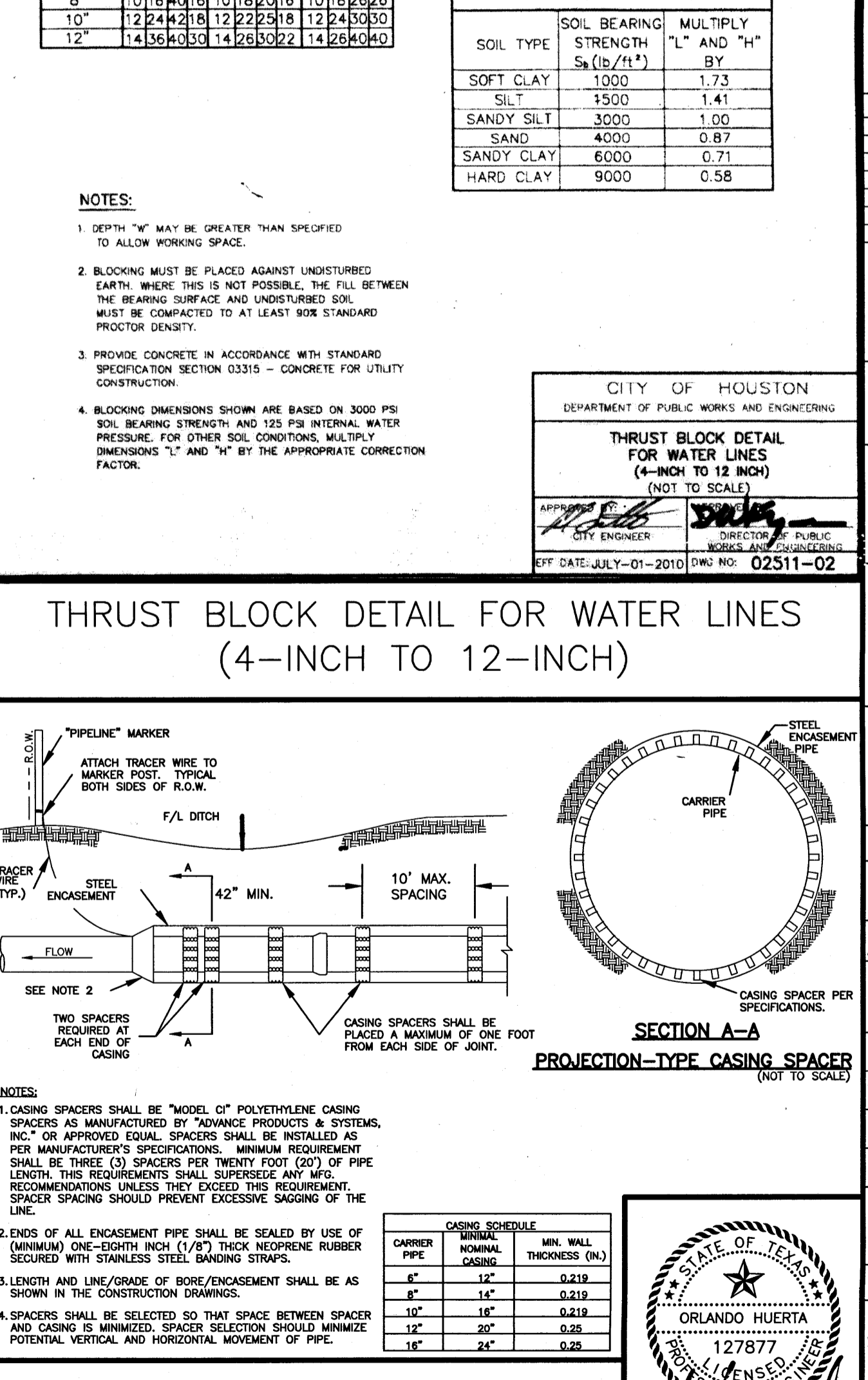
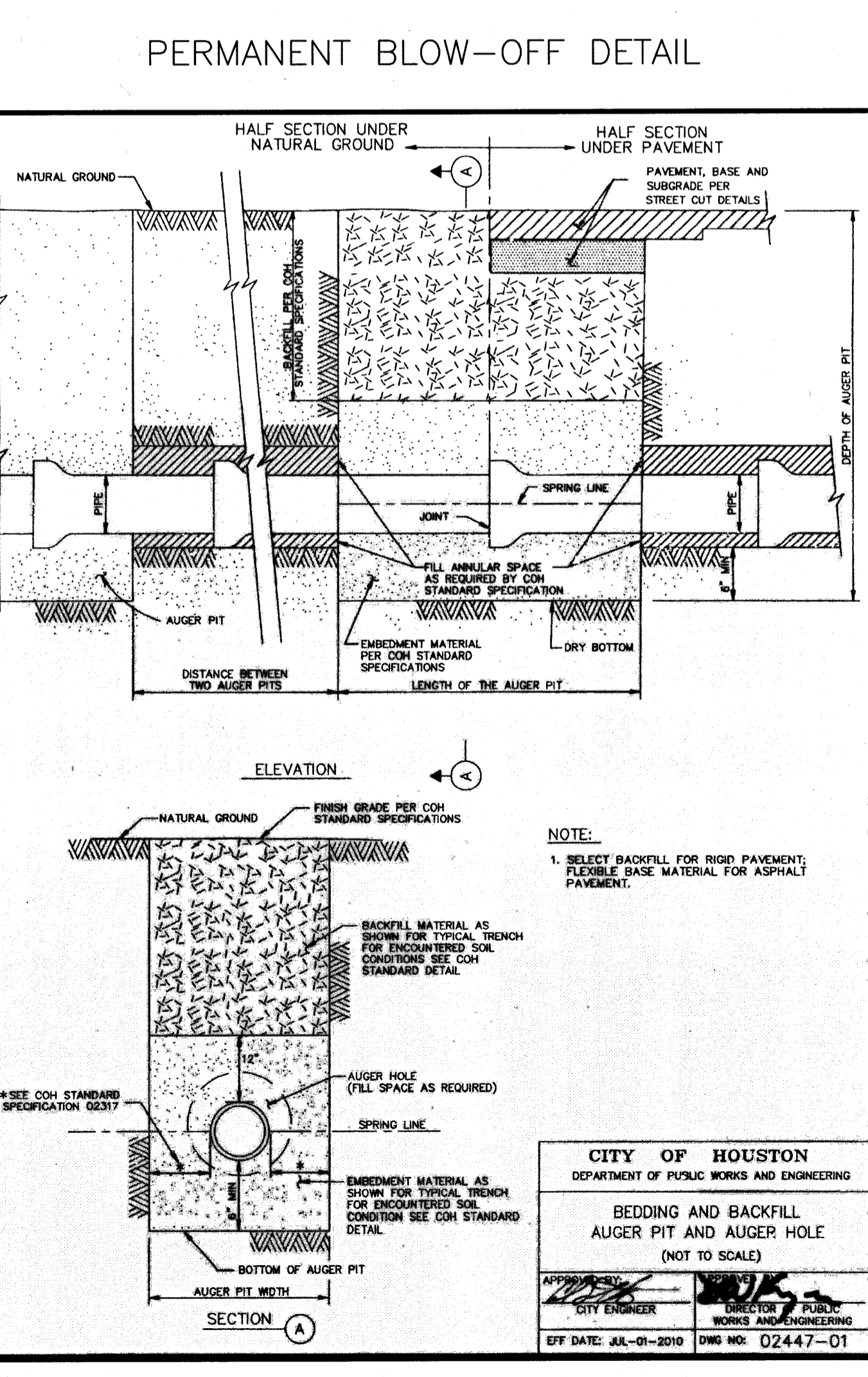
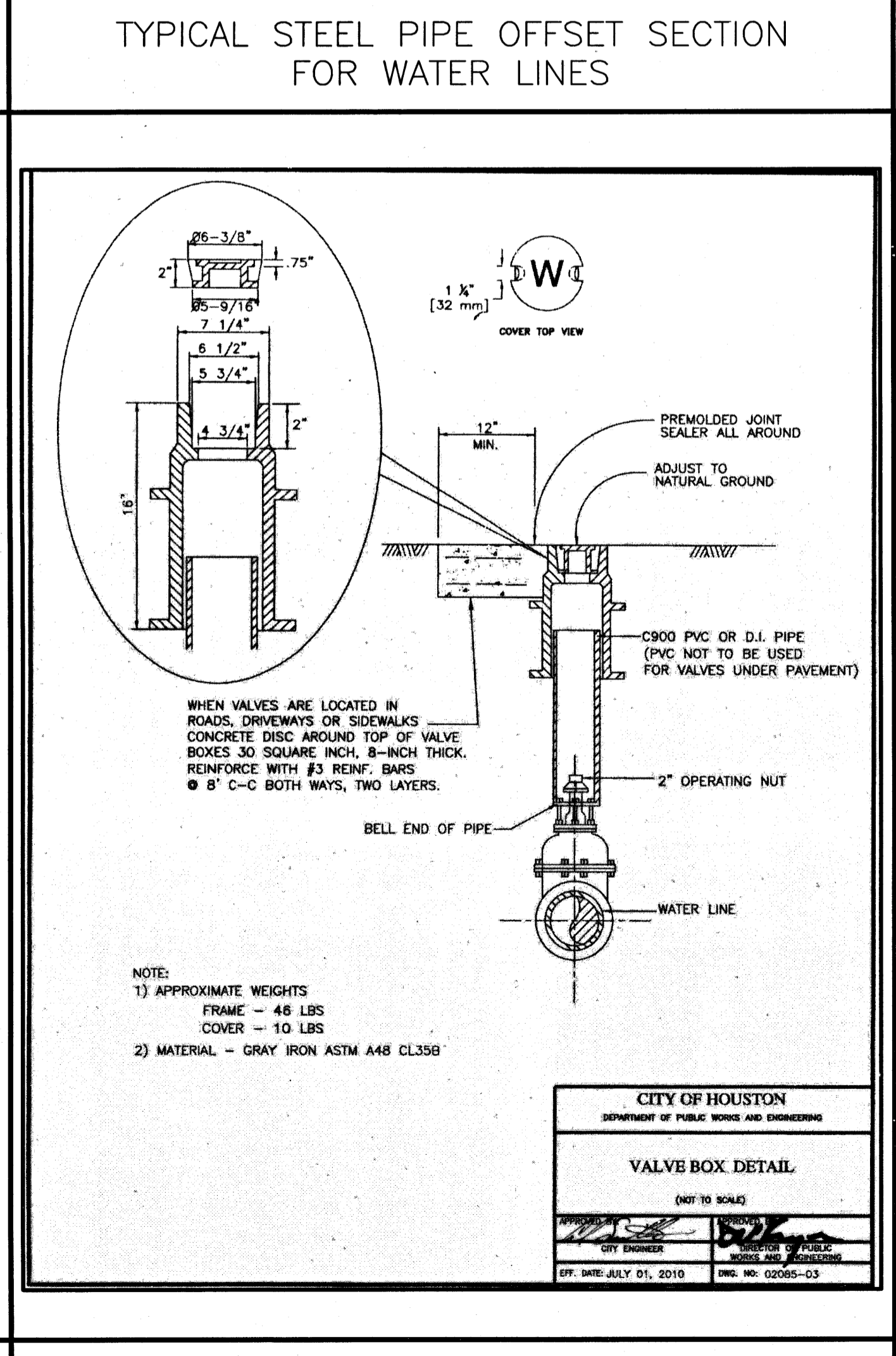
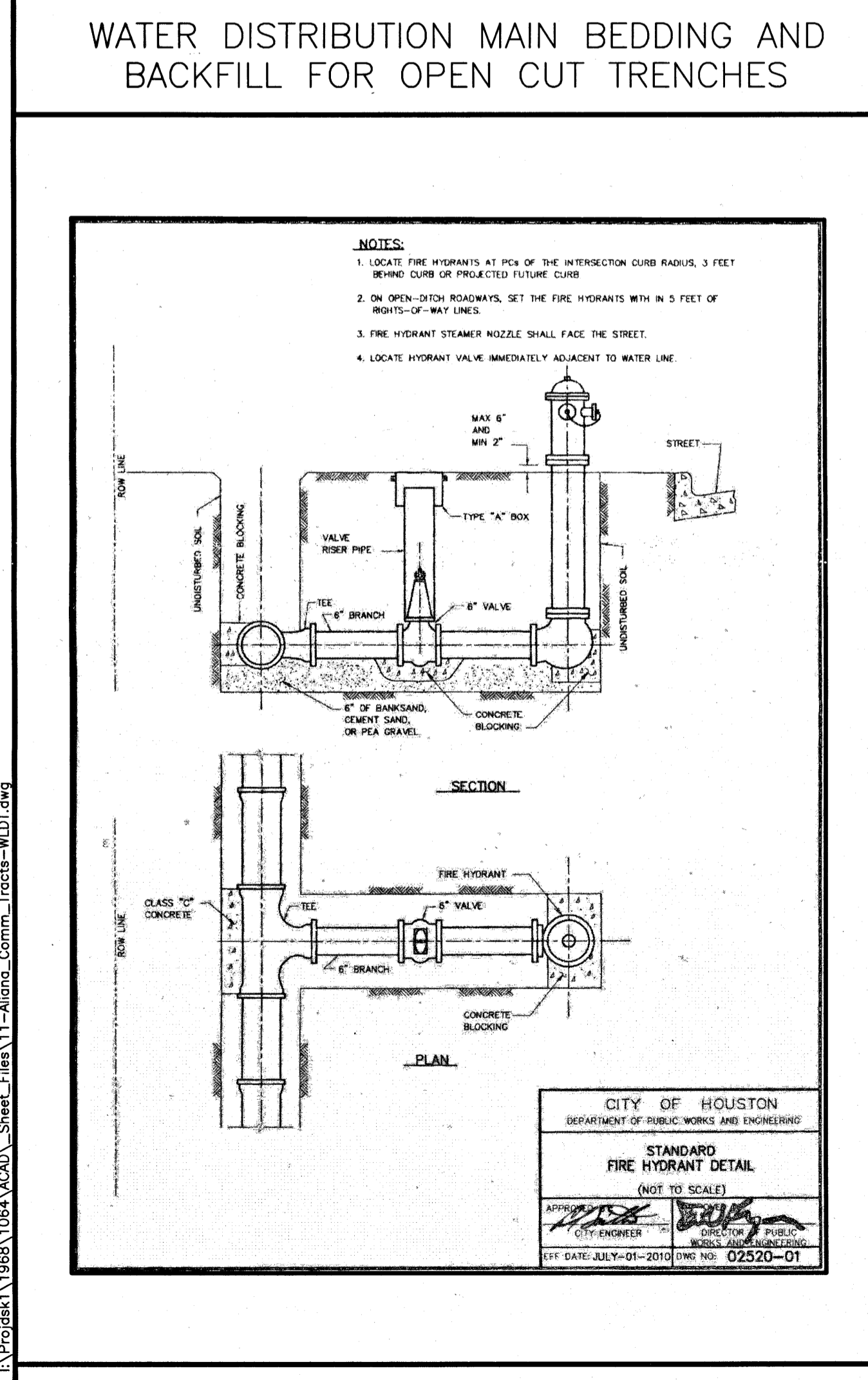
ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064



BENCHMARK:
 A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.
 ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
 IBM:
 3/4" IRON ROD W/ L/A CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.
 ELEV. = 93.19 FEET 1973 ADJ.

NOTES:

RECORD DRAWING
 I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS.
 BY: _____ DATE: _____
 TITLE: _____
 FORT BEND COUNTY ENGINEERING DEPARTMENT
 APPROVED: [Signature]
 DEVELOPMENT COORDINATOR
 DATE: 9/25/18
 C.O.H. LOG NO. 18-1051
 F.B.C.M.U.D. NO. 134B
 ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30



RECORD DRAWING
 I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS.
 BY: _____ DATE: _____
 TITLE: _____
 FORT BEND COUNTY ENGINEERING DEPARTMENT
 APPROVED: [Signature]
 DEVELOPMENT COORDINATOR
 DATE: 9/25/18
 C.O.H. LOG NO. 18-1051
 F.B.C.M.U.D. NO. 134B
 ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30

WATER MAIN CONSTRUCTION DETAILS

LJA Engineering, Inc.
 2929 Briarpark Drive
 Suite 600
 Houston, Texas 77042
 Phone 713.953.5200
 Fax 713.953.5026
 FRN - F-1386
 LJA PROJECT NO.: 1968-1064
 DESIGNED BY: JLC
 DRAWN BY: JLC
 DATE: JULY 2018
 NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

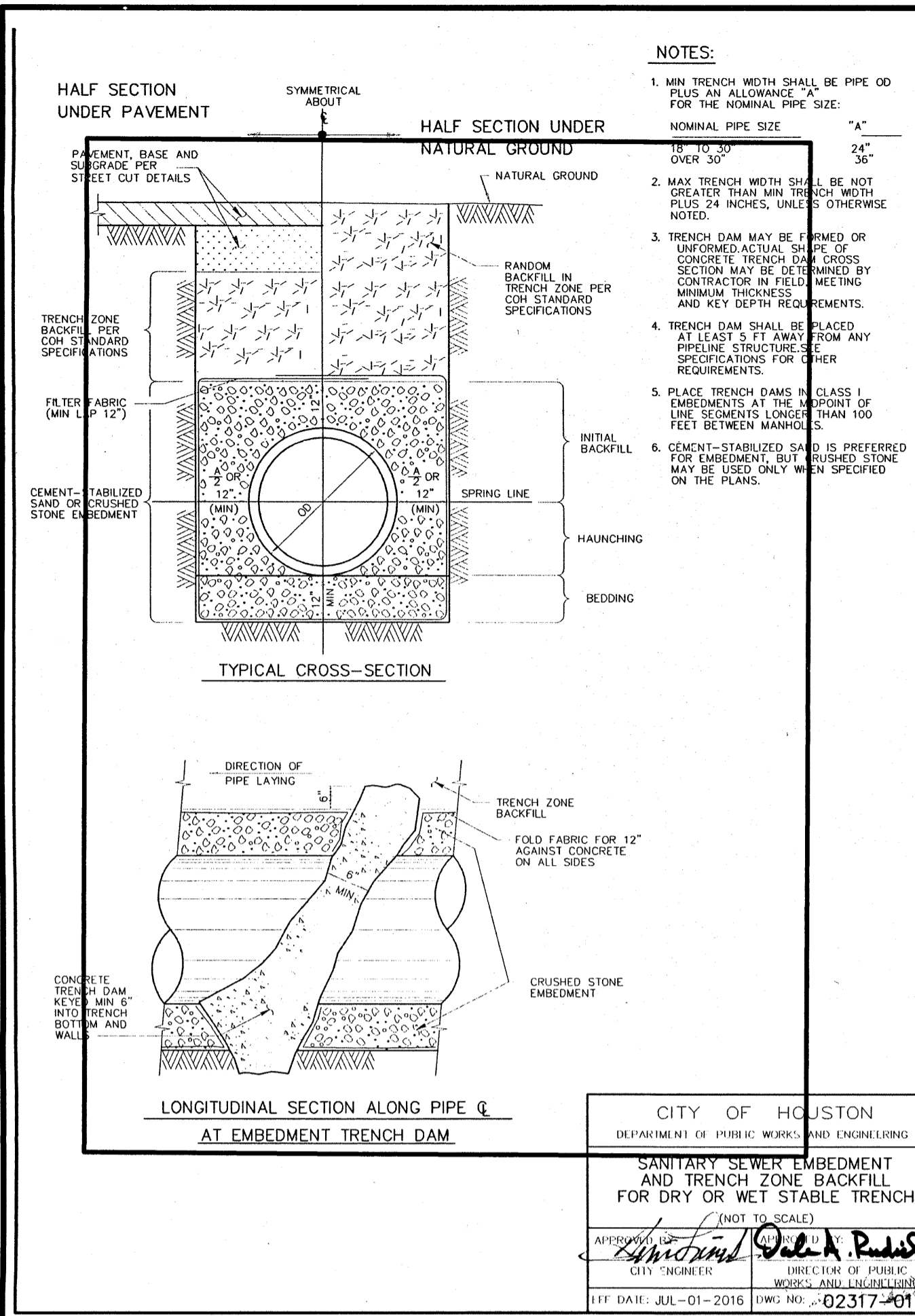
CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 WATER MAIN CONSTRUCTION DETAILS (NOT TO SCALE)
 APPROVED BY: [Signature]
 CITY ENGINEER: [Signature]
 EFF. DATE: JULY-01-2010 DWG. NO. 02511-02

STATE OF TEXAS
 127877
 ORLANDO HUERTA
 8.2.18

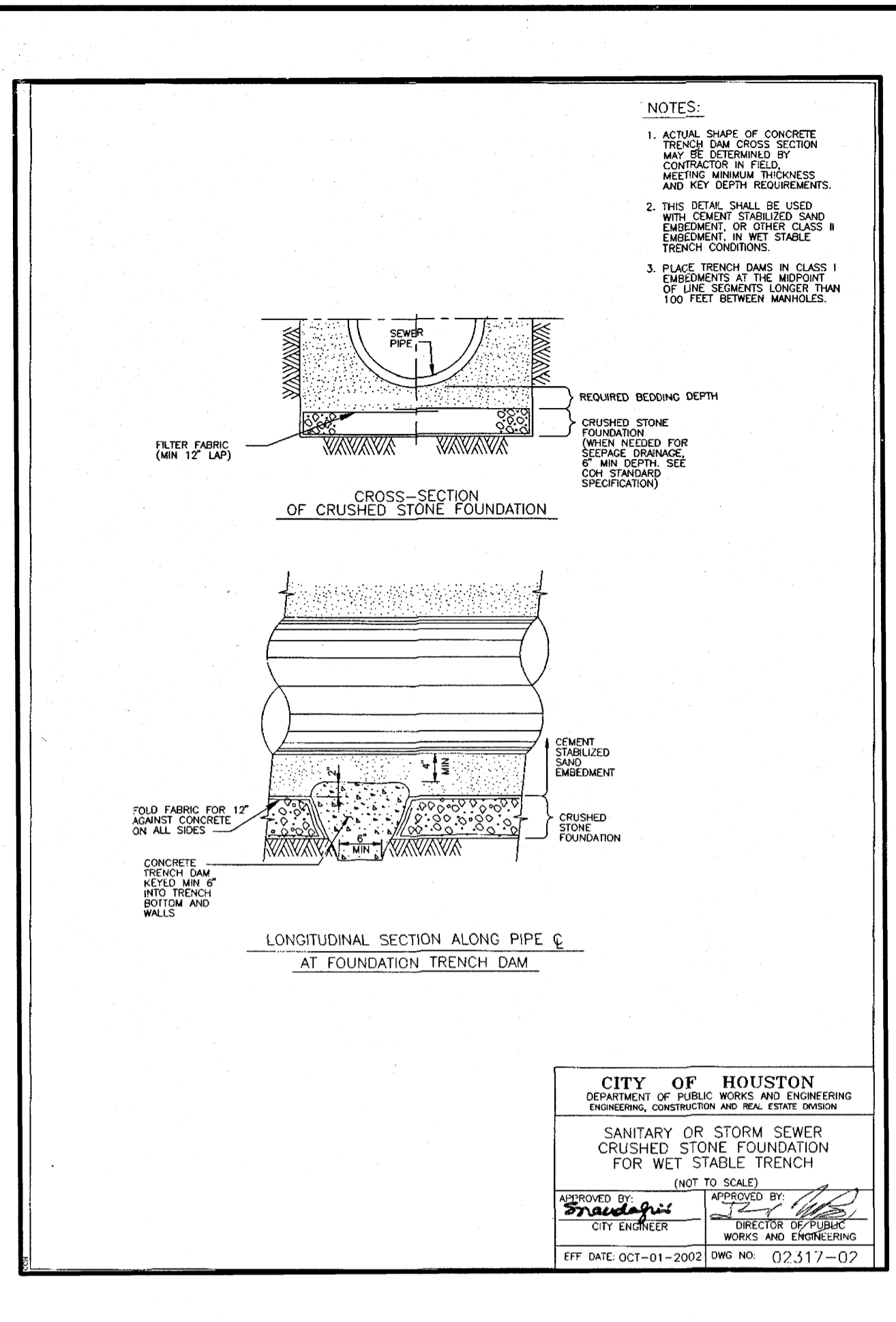
FILE NO. _____ FOR CITY OF HOUSTON USE ONLY
 DRAWING SCALE: NONE
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 CITY DRAWING NUMBER: 61356

User Name : jcarline
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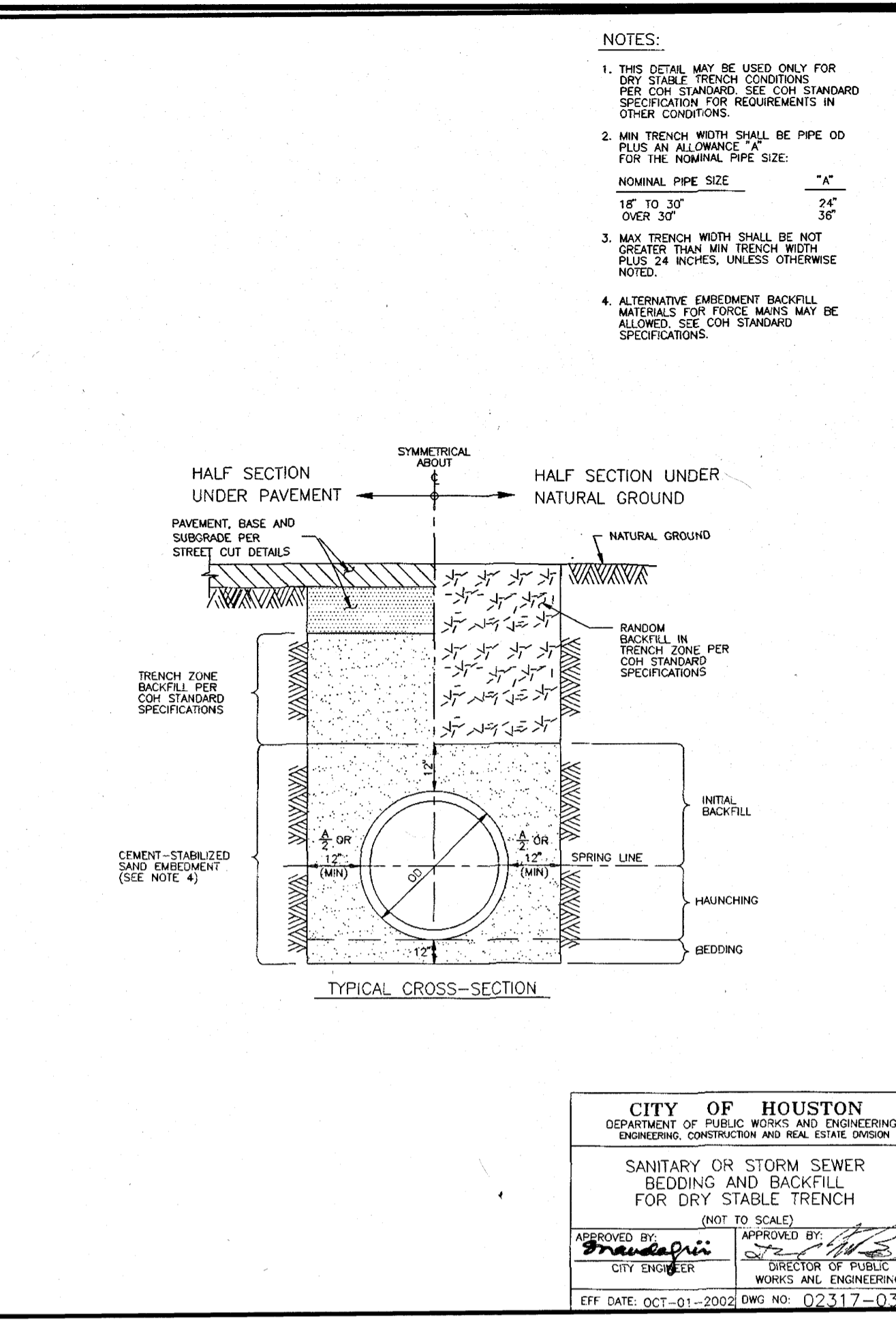
ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064



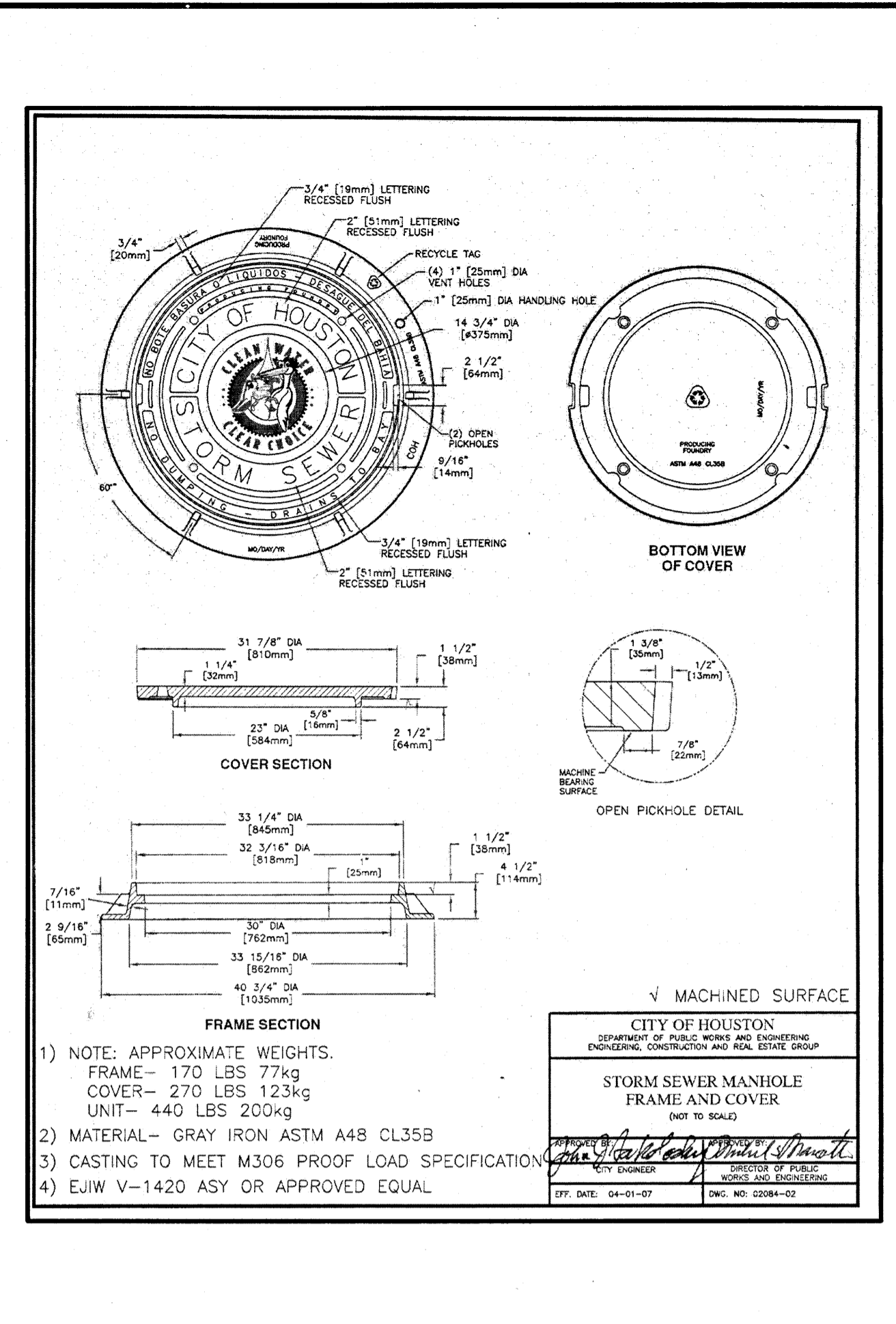
SANITARY SEWER EMBEDMENT AND TRENCH ZONE BACKFILL FOR DRY OR WET STABLE TRENCH



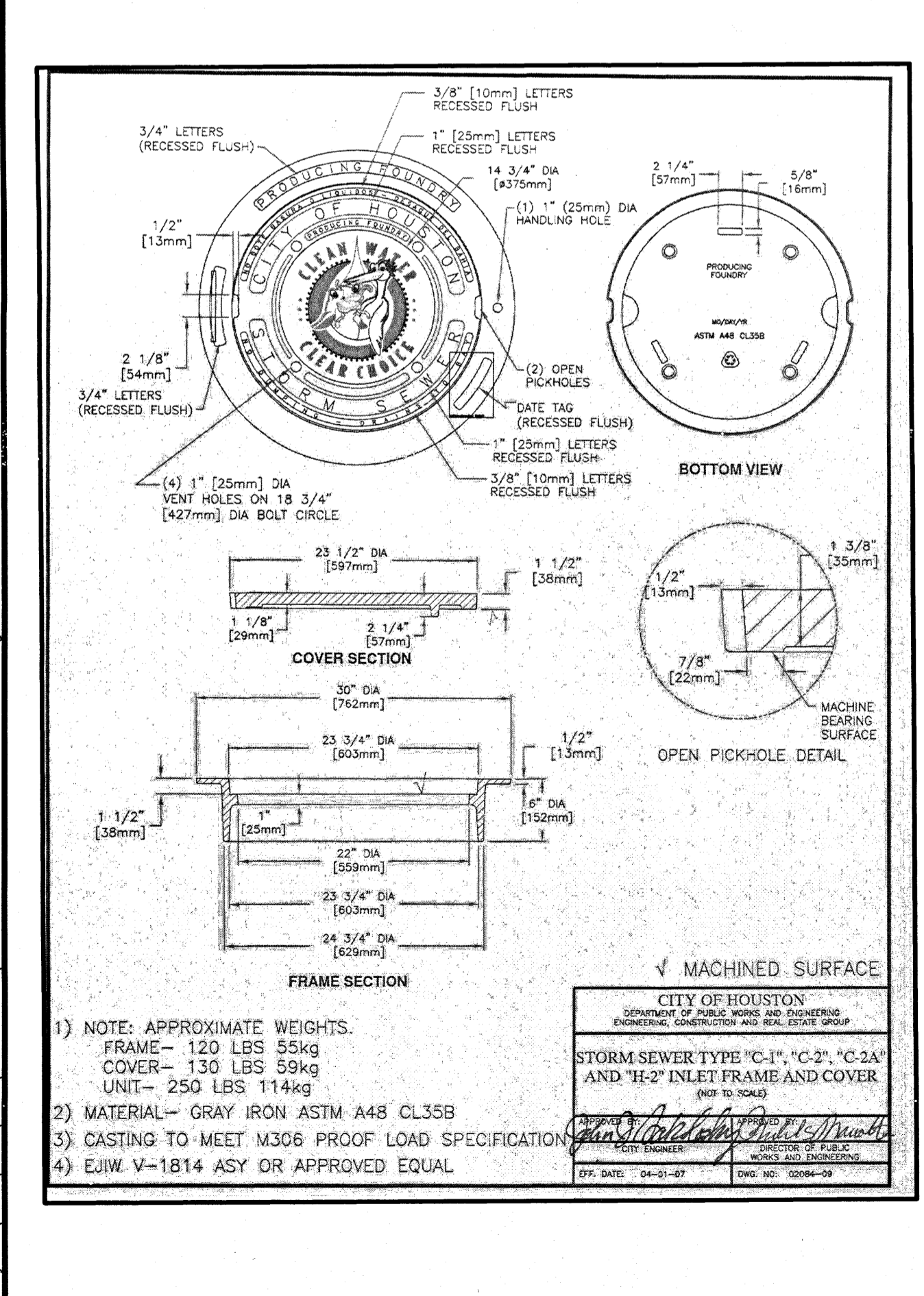
SANITARY OR STORM SEWER CRUSHED STONE FOUNDATION FOR WET STABLE TRENCH



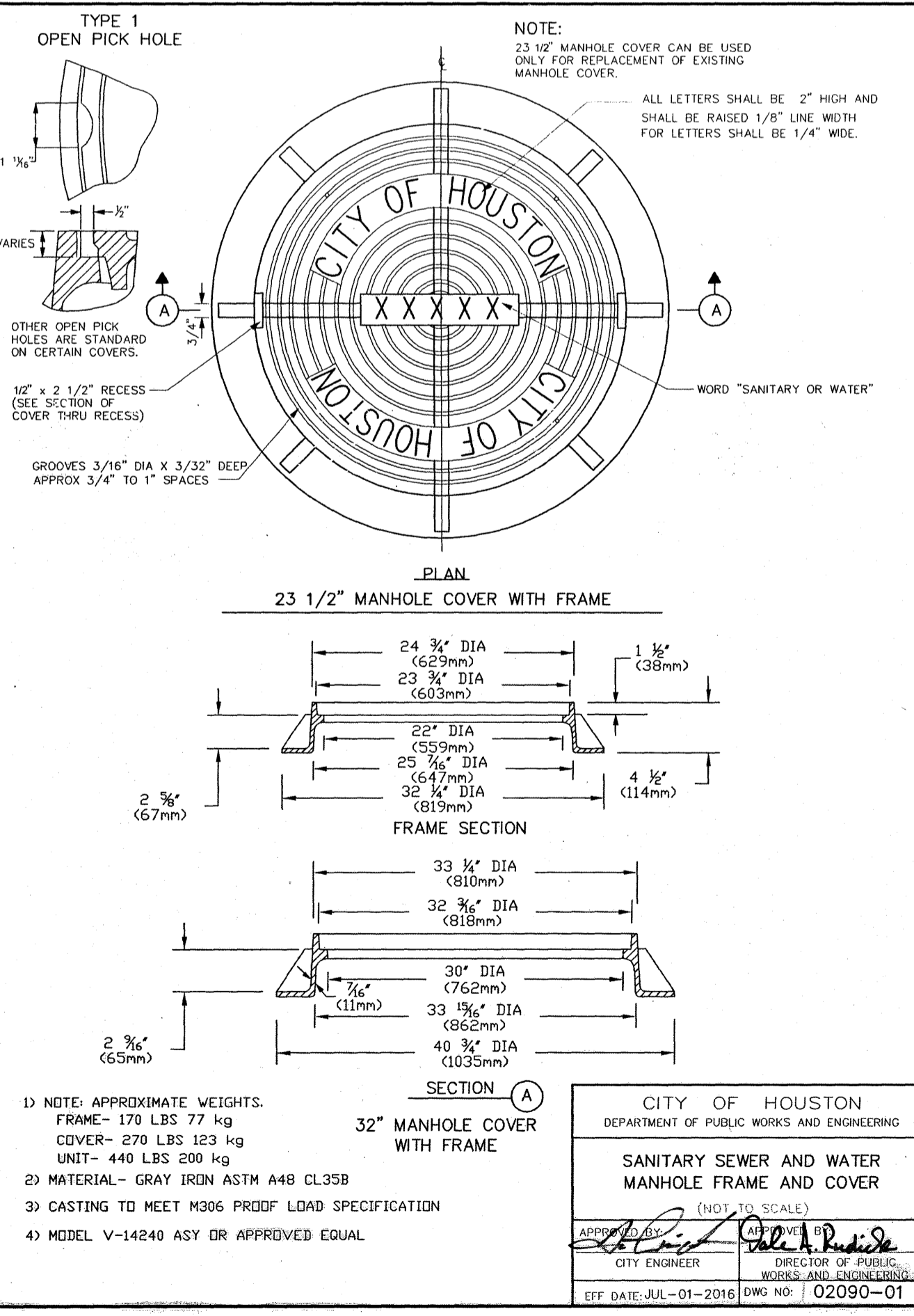
SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH



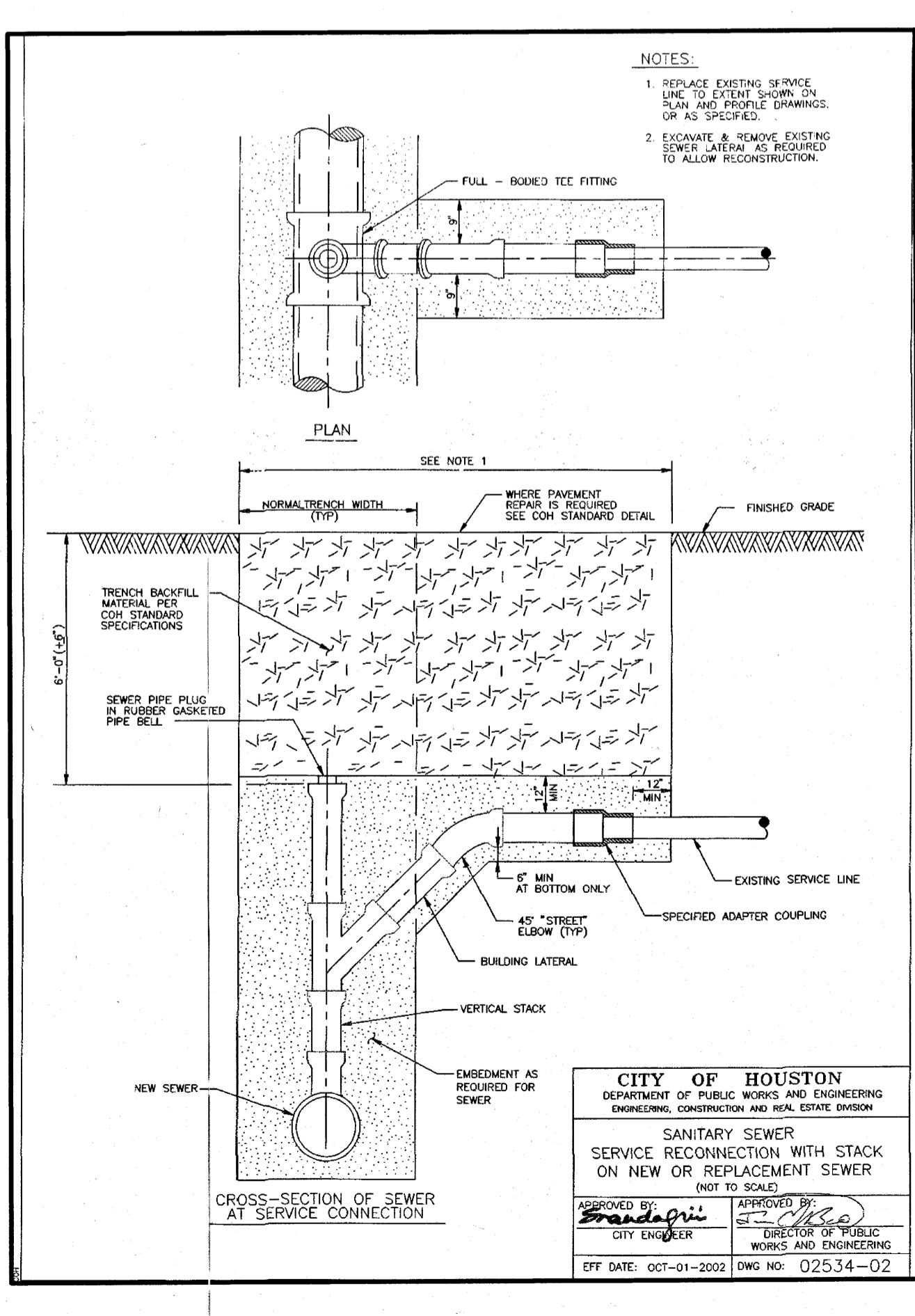
STORM SEWER MANHOLE FRAME AND COVER



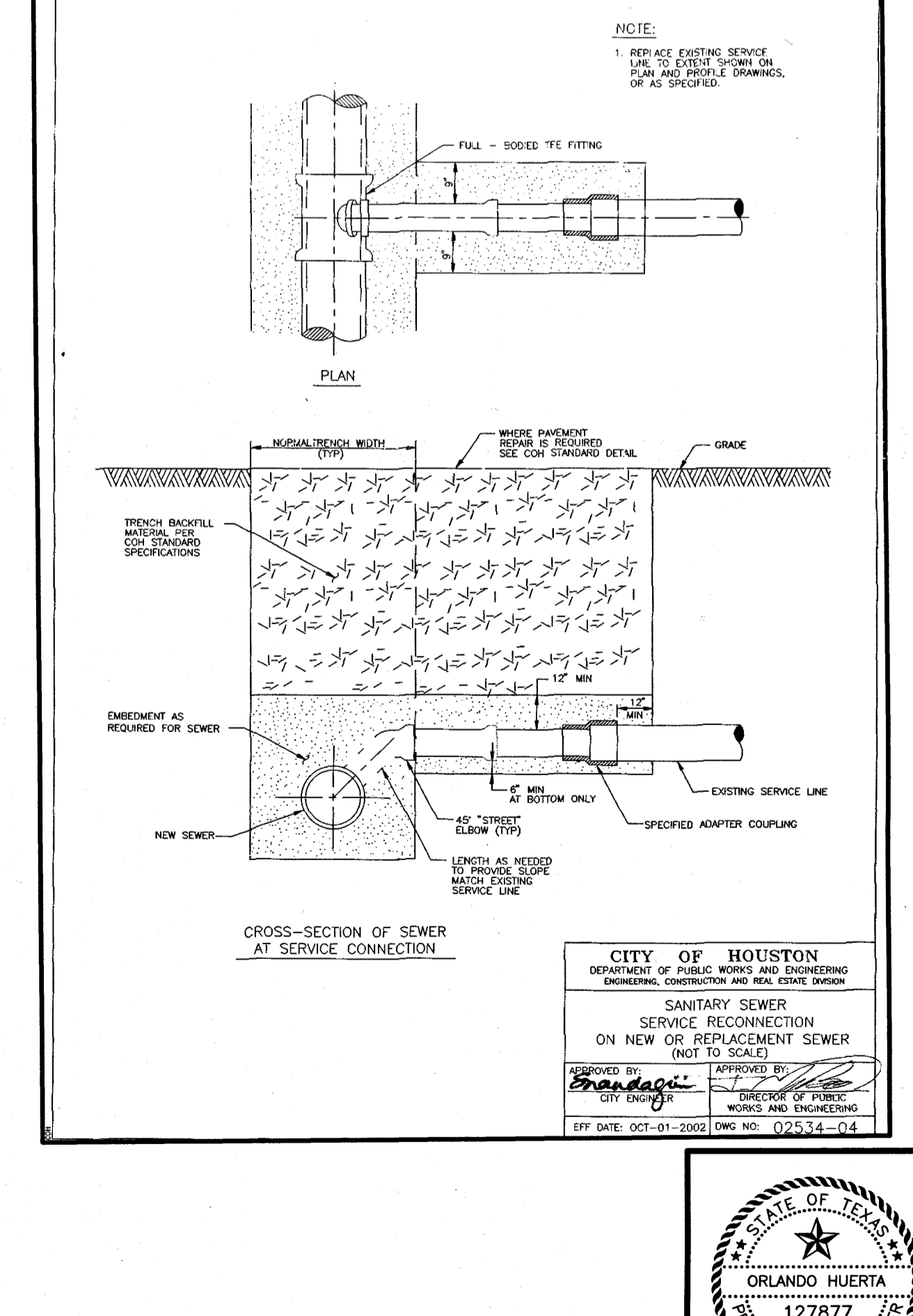
STORM SEWER TYPE "C-1", "C-2", "C-2A" AND "H-2" INLET FRAME AND COVER



SANITARY SEWER AND WATER MANHOLE FRAME AND COVER



SANITARY SEWER SERVICE RECONNECTION WITH STACK ON NEW OR REPLACEMENT SEWER



SANITARY SEWER SERVICE RECONNECTION ON NEW OR REPLACEMENT SEWER

BENCHMARK:
A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.

ELEV. = 78.65 FEET (NOVD-29) 1973 ADJ.
TBM:
3/4" IRON ROD W/ LIA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 146A.
ELEV. = 93.19 FEET 1973 ADJ.

NOTES:

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY: _____ DATE: _____
TITLE: _____

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVED: *Myra D. ...*
DEVELOPMENT COORDINATOR
DATE: 9/25/18

DATE	REVISION	BY

C.O.H. LOG NO. 18-1051

F.B.C.M.U.D. NO. 134B

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30

SANITARY AND STORM SEWER DETAILS
(SHEET 1 OF 3)

LJA Engineering, Inc.
2929 Briarpark Drive Phone 713.953.5200
Suite 600 Fax 713.953.5026
Houston, Texas 77042 FRN - F-1386

LJA PROJECT NO.: 1968-1064
DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018

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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STREET & BRIDGE
WATER: *10/20/18*
SEWER: *10/20/18*
STORM WATER QUALITY: *10/20/18*

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

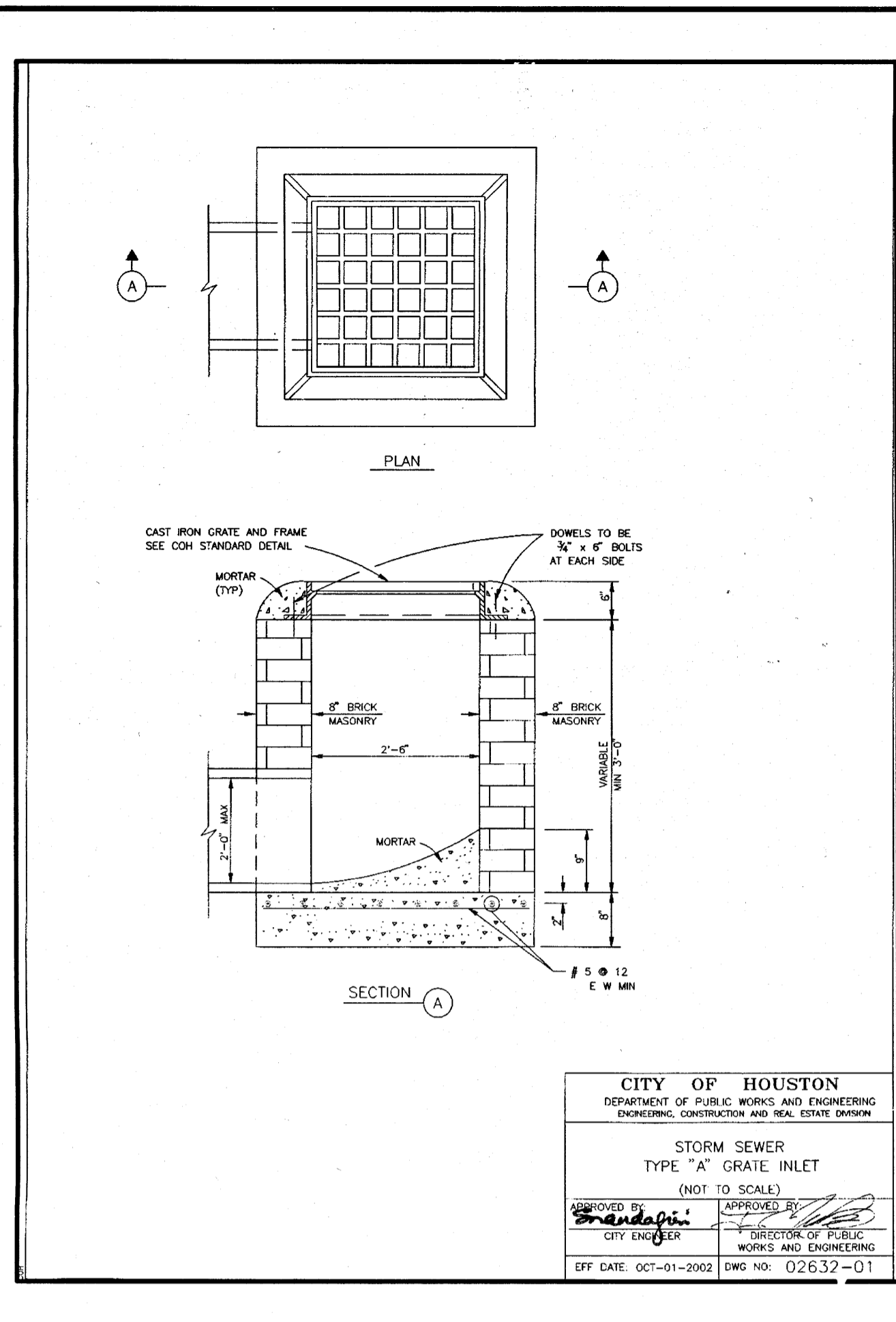
DRAWING SCALE _____

SCALE: NONE

SHEET NO. 12 of 15

STATE OF TEXAS
ORLANDO HUERTIA
1278777
LICENSED PROFESSIONAL ENGINEER
8-2-18

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064



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

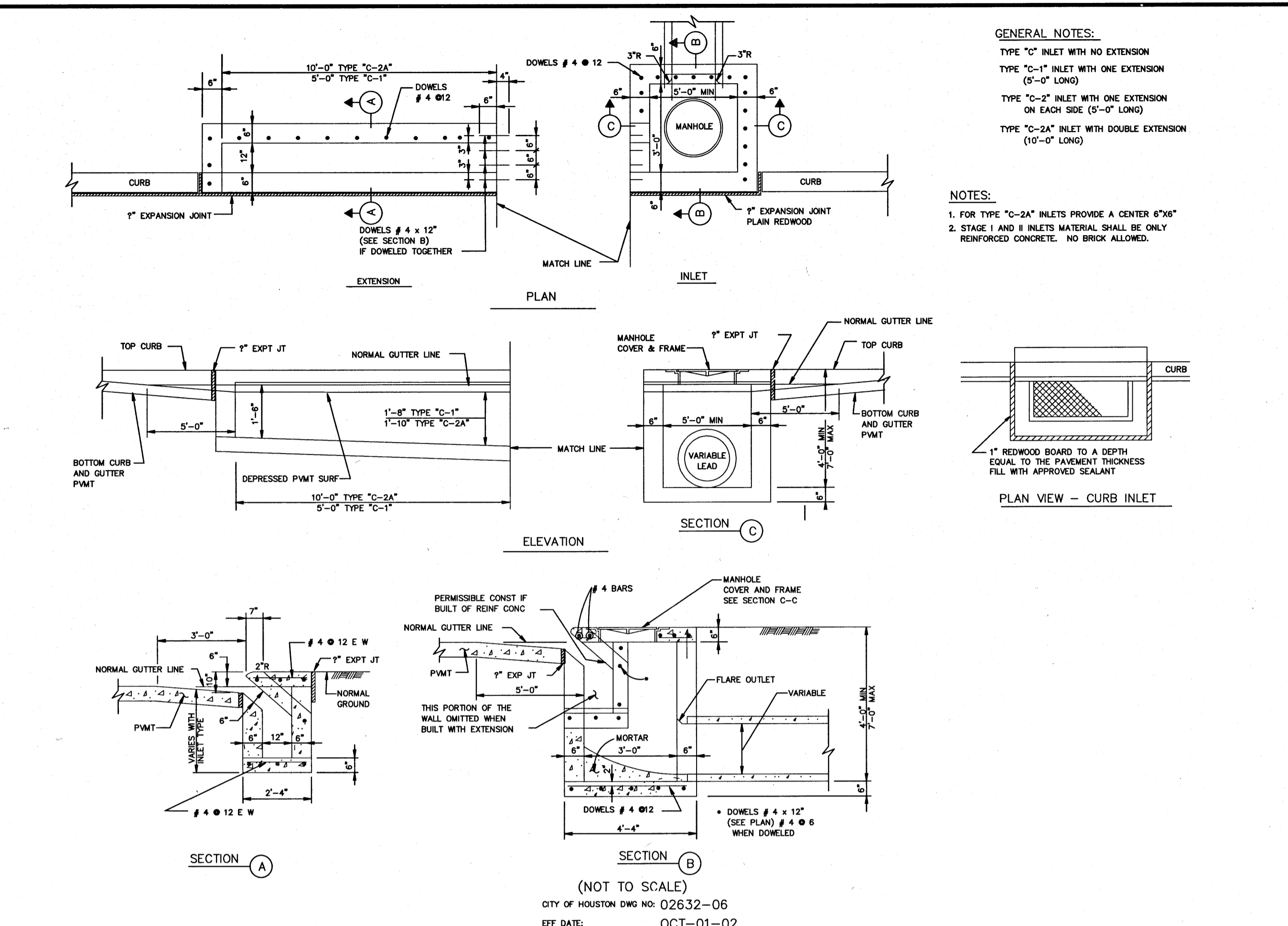
STORM SEWER
TYPE "A" GRATE INLET
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF. DATE: OCT-01-2002 DWG NO: 02632-01

STORM SEWER TYPE "A" GRATE INLET

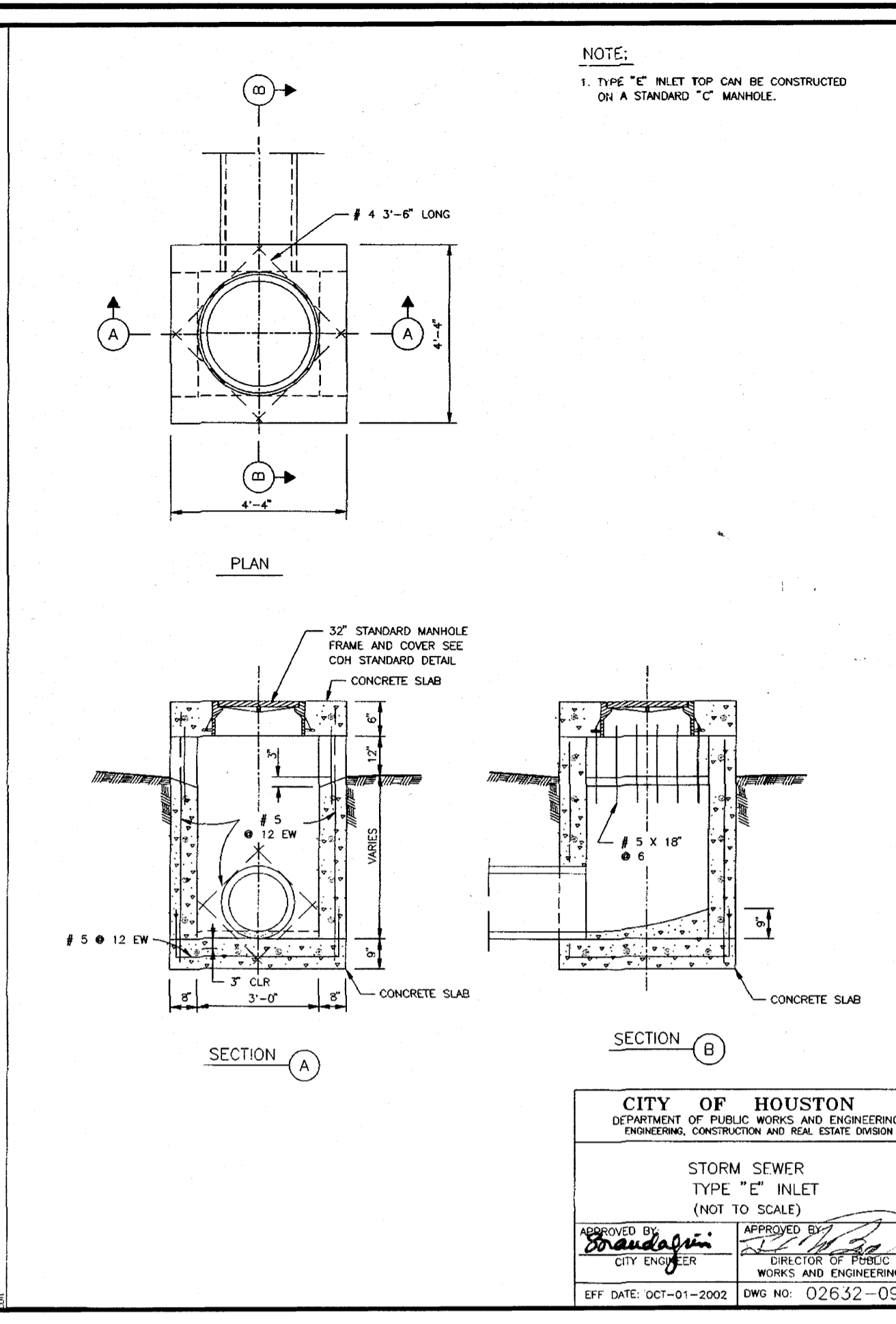


GENERAL NOTES:
TYPE "C" INLET WITH NO EXTENSION
TYPE "C-1" INLET WITH ONE EXTENSION (5'-0" LONG)
TYPE "C-2" INLET WITH ONE EXTENSION ON EACH SIDE (5'-0" LONG)
TYPE "C-2A" INLET WITH DOUBLE EXTENSION (10'-0" LONG)

NOTES:
1. FOR TYPE "C-2A" INLETS PROVIDE A CENTER 6"X6" MANHOLE COVER & FRAME.
2. STAGE I AND II INLETS MATERIAL SHALL BE ONLY REINFORCED CONCRETE. NO BRICK ALLOWED.

(NOT TO SCALE)
CITY OF HOUSTON DWG NO: 02632-06
EFF. DATE: OCT-01-02

MODIFIED STORM SEWER TYPE "C-1", "C-2" AND "C-2A" INLETS



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

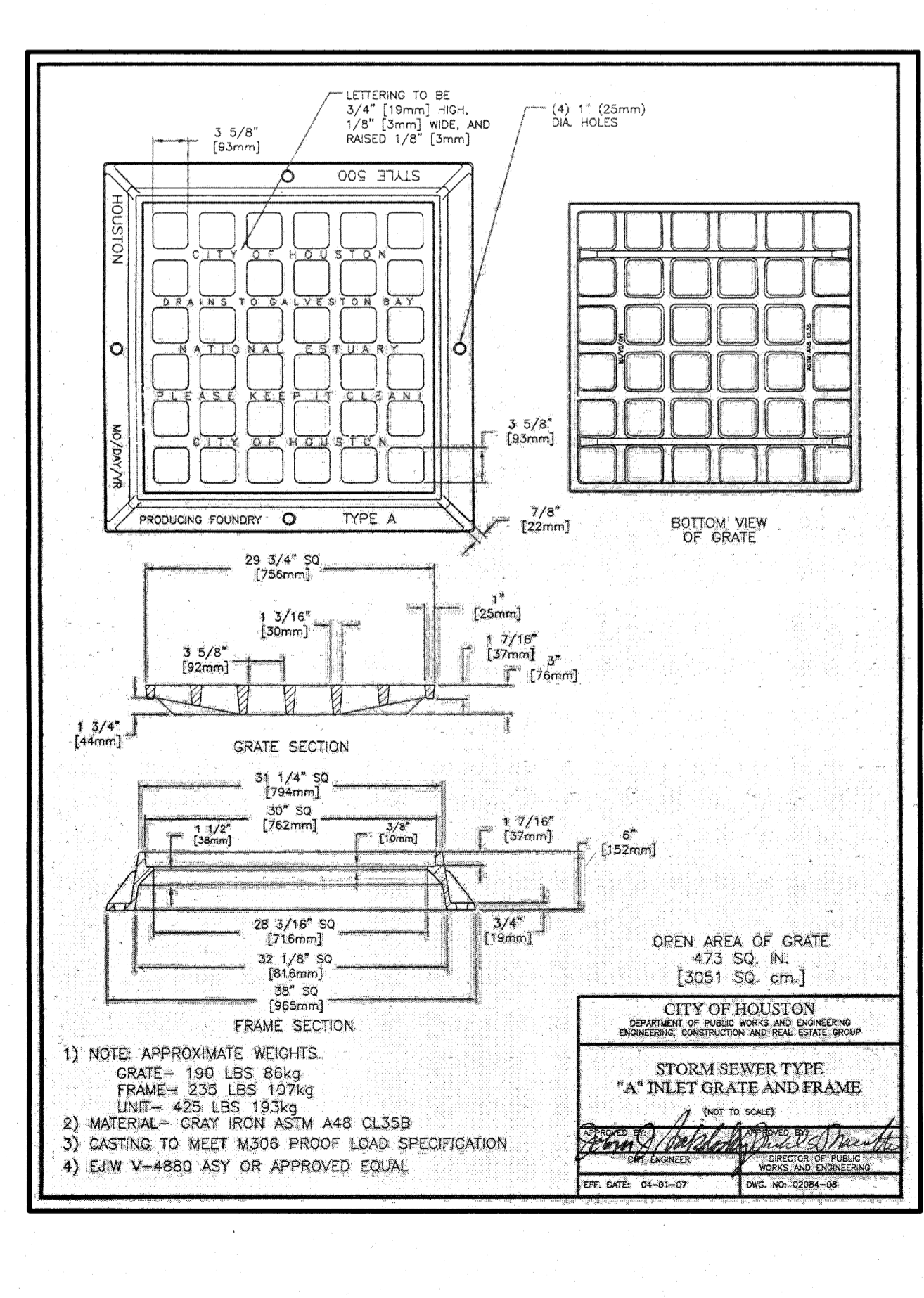
STORM SEWER
TYPE "E" INLET
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF. DATE: OCT-01-2002 DWG NO: 02632-03

STORM SEWER TYPE "E" INLET



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

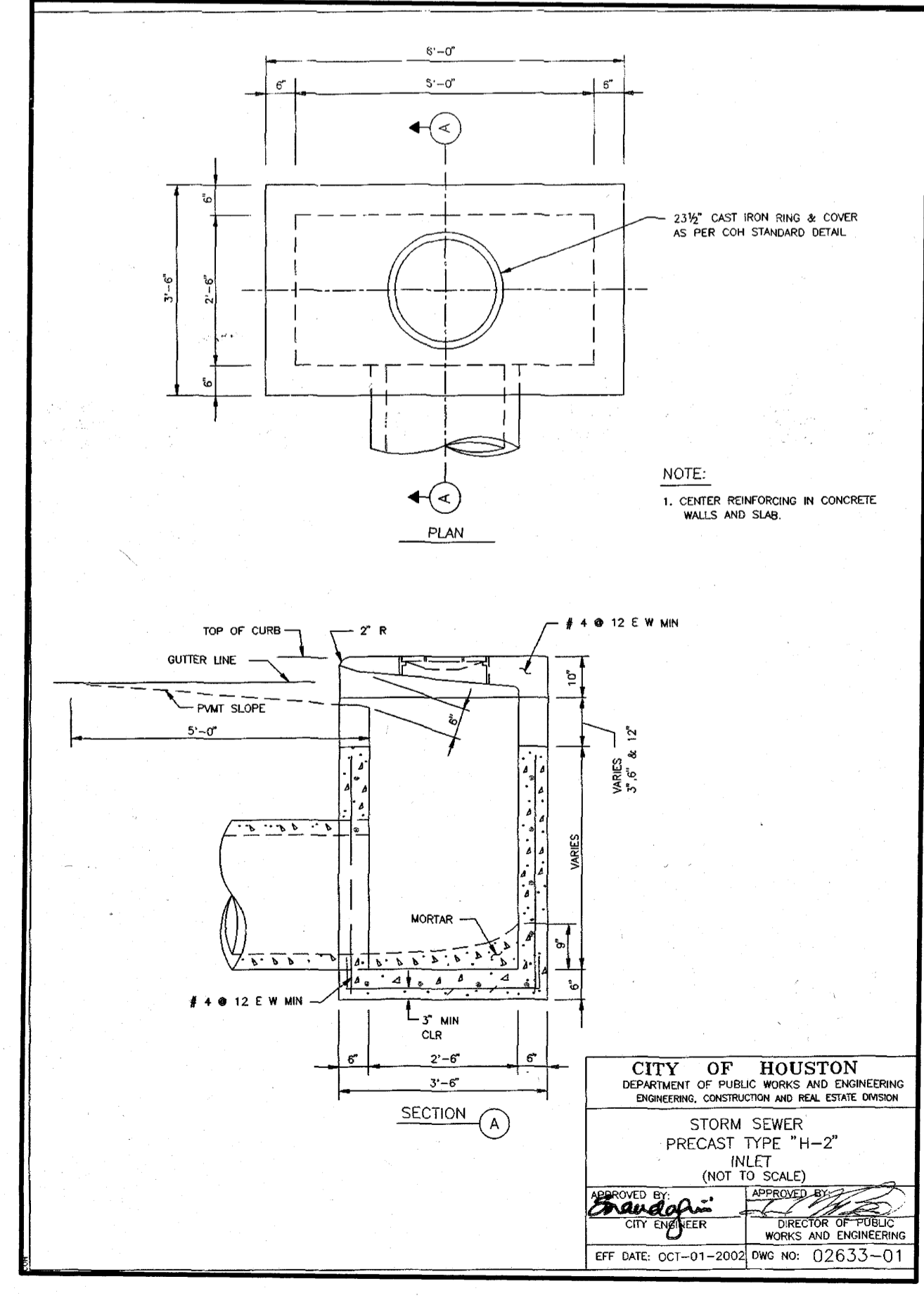
STORM SEWER TYPE "A" INLET GRATE AND FRAME
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF. DATE: OCT-01-2002 DWG NO: 02633-01

STORM SEWER TYPE "A" INLET GRATE AND FRAME



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

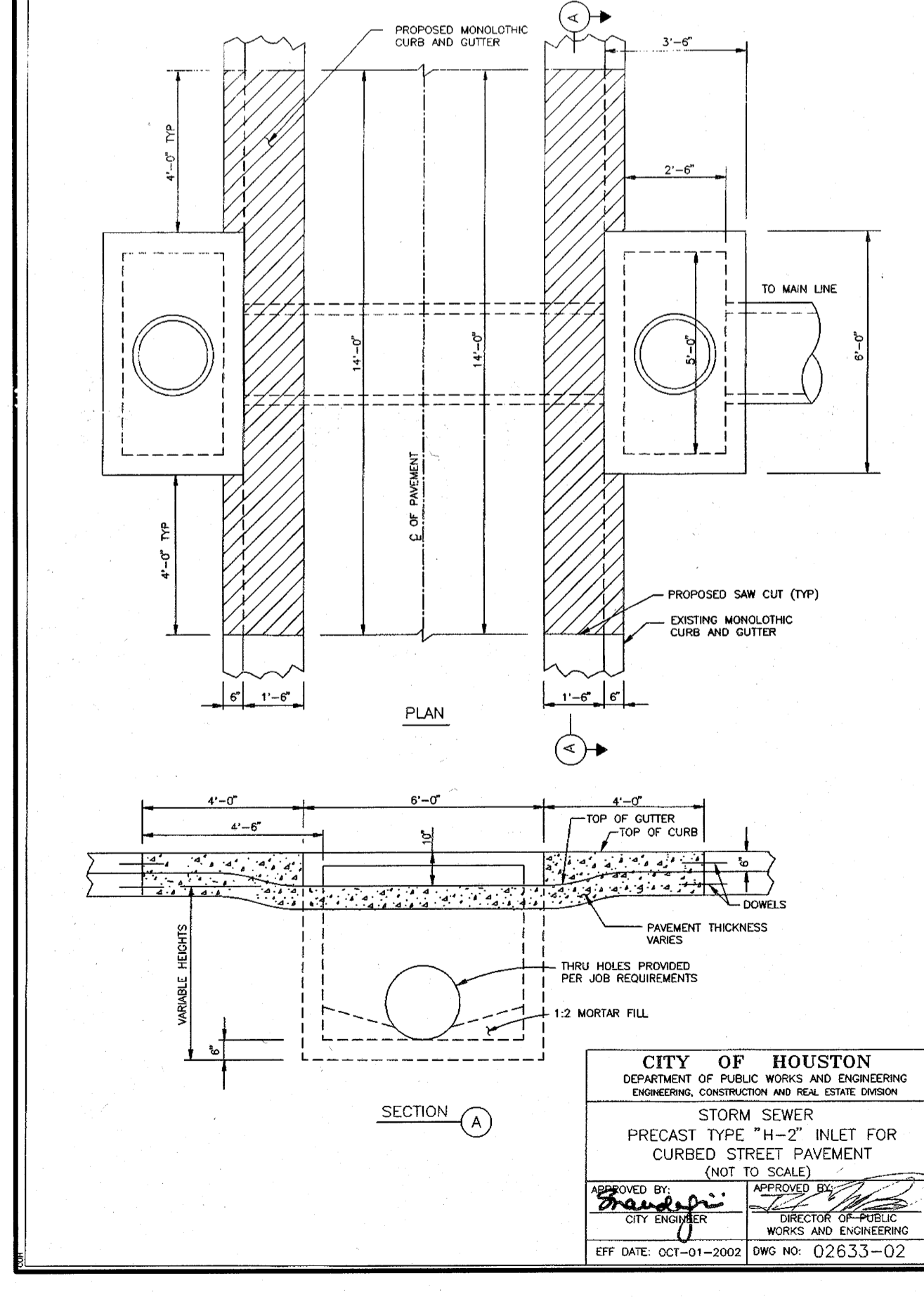
STORM SEWER
PRECAST TYPE "H-2" INLET
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF. DATE: OCT-01-2002 DWG NO: 02633-01

STORM SEWER PRECAST TYPE "H-2" INLET



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

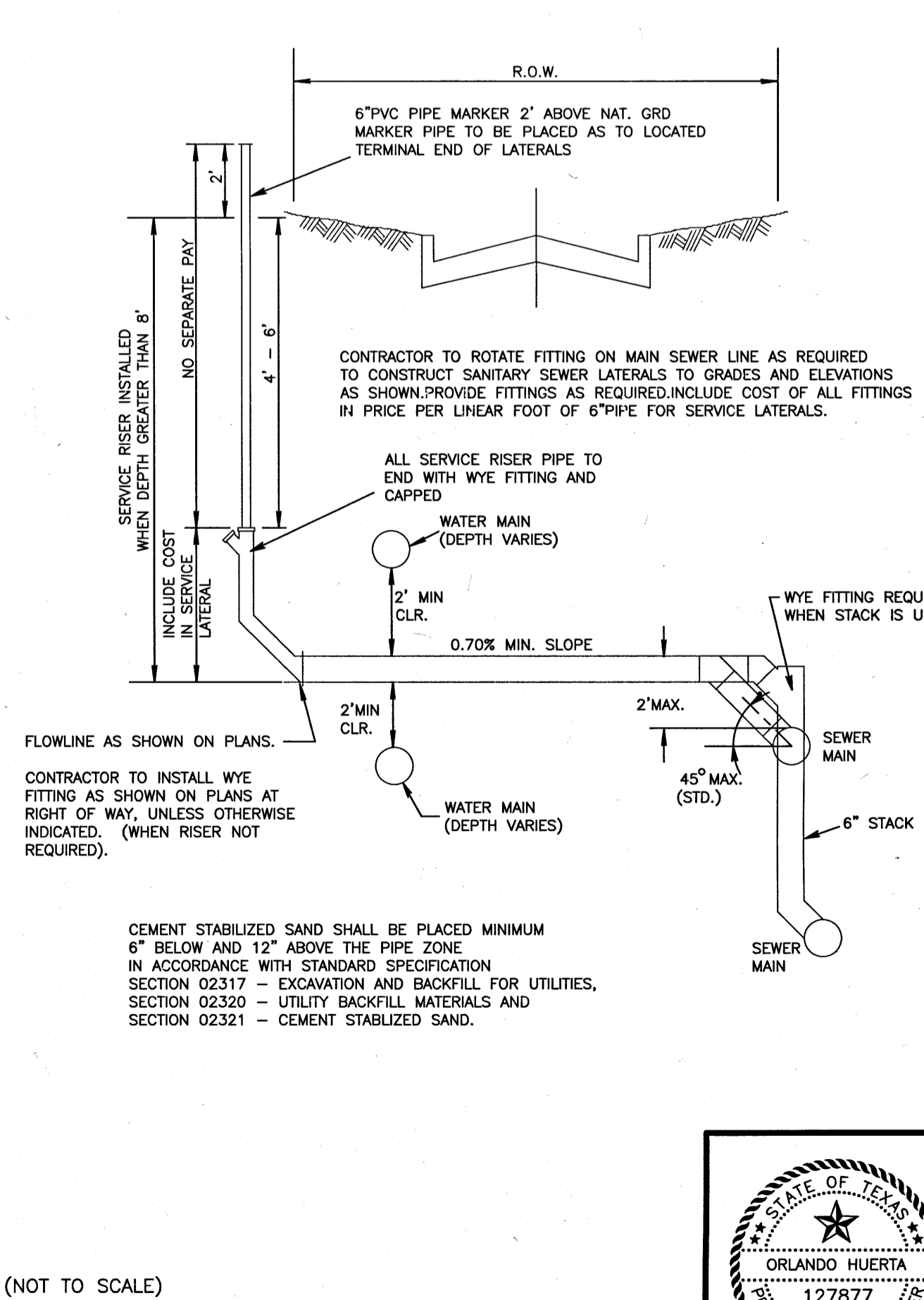
STORM SEWER
PRECAST TYPE "H-2" INLET FOR CURBED STREET PAVEMENT
(NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF. DATE: OCT-01-2002 DWG NO: 02633-02

STORM SEWER PRECAST TYPE "H-2" INLET FOR CURBED STREET PAVEMENT



(NOT TO SCALE)

FAR SIDE SANITARY SEWER CONNECTION

BENCHMARK:
A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.
ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
TBM:
3/4\"/>

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS.
BY: _____ DATE: _____
TITLE: _____
FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: *[Signature]*
DEVELOPMENT COORDINATOR
DATE: 9/25/18

DATE	REVISION	BY

C.O.H. LOG NO. 18-1051
F.B.C.M.U.D. NO. 134B
ALIANA COMMERCIAL TRACTS
C20, C21, C28, C29, C30

SANITARY AND STORM SEWER DETAILS
(SHEET 2 OF 3)

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-1064
DESIGNED BY: JLC
DRAWN BY: JLC
DATE: JULY 2018

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STREET & BRIDGE
TRAFFIC
STORM WATER QUALITY
FACILITIES

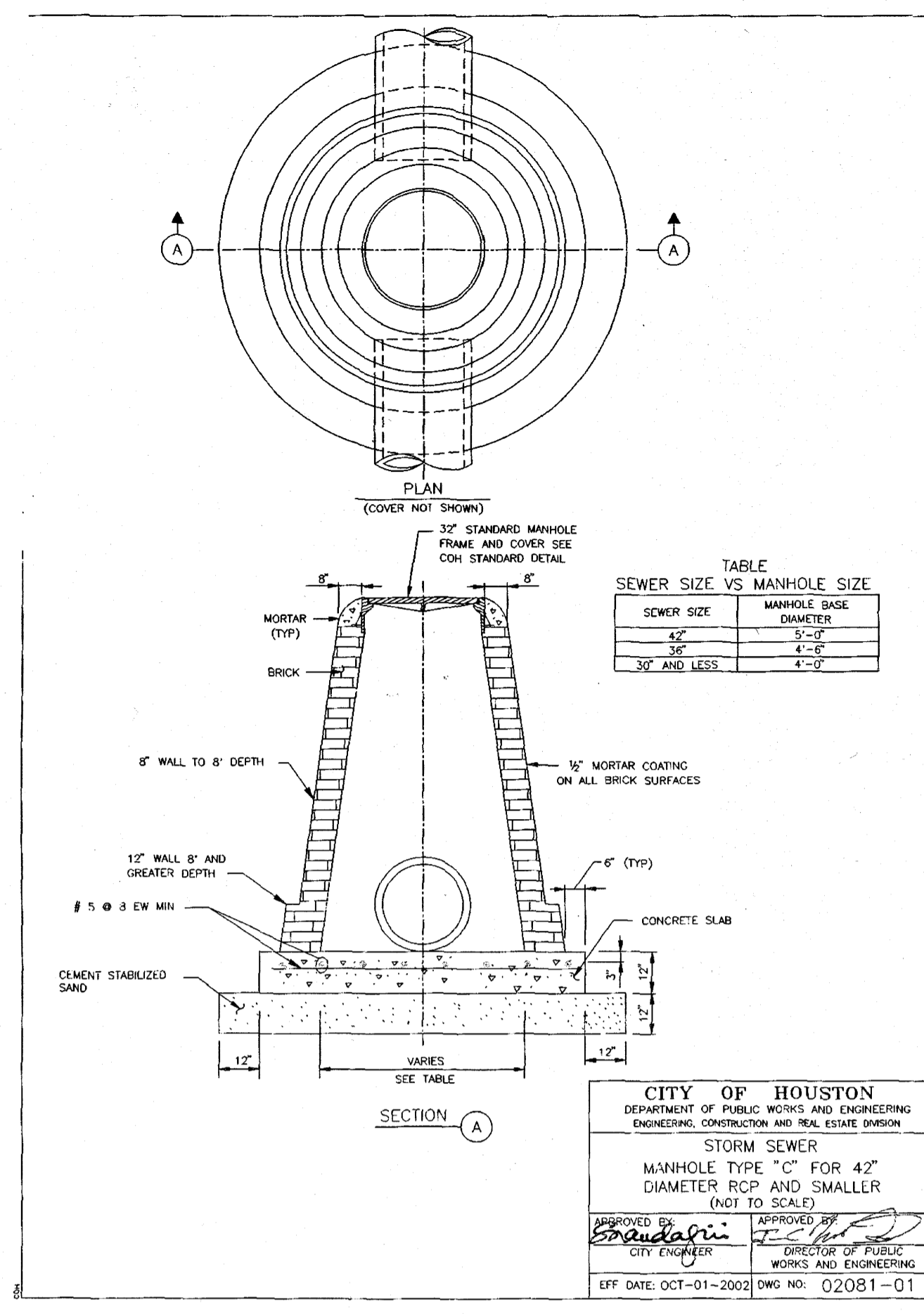
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FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE: NONE
SCALE: NONE
SHEET NO. 13 OF 15

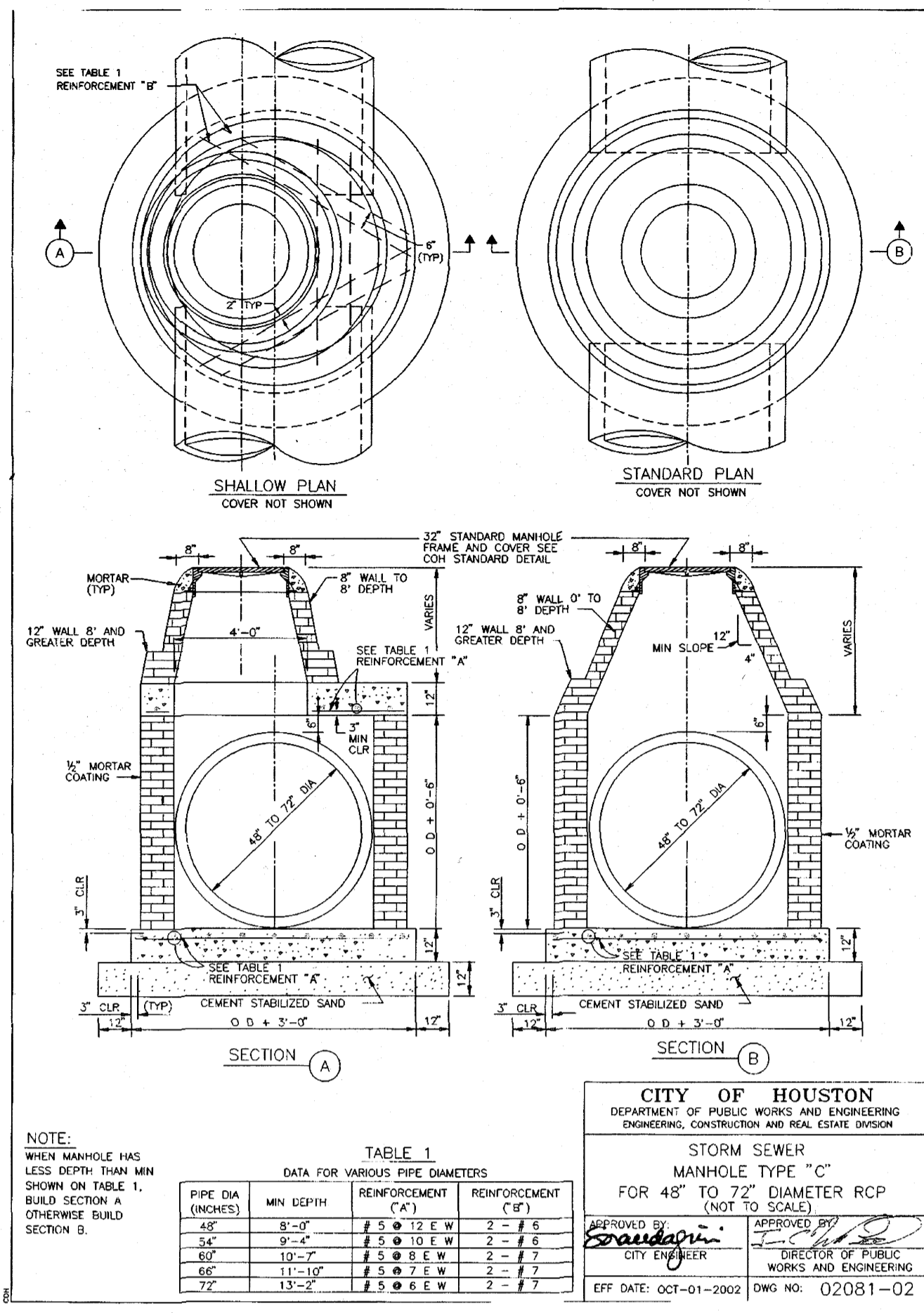
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CITY DRAWING NUMBER

Date/Time: Thu, 26 Jul 2018 10:46am
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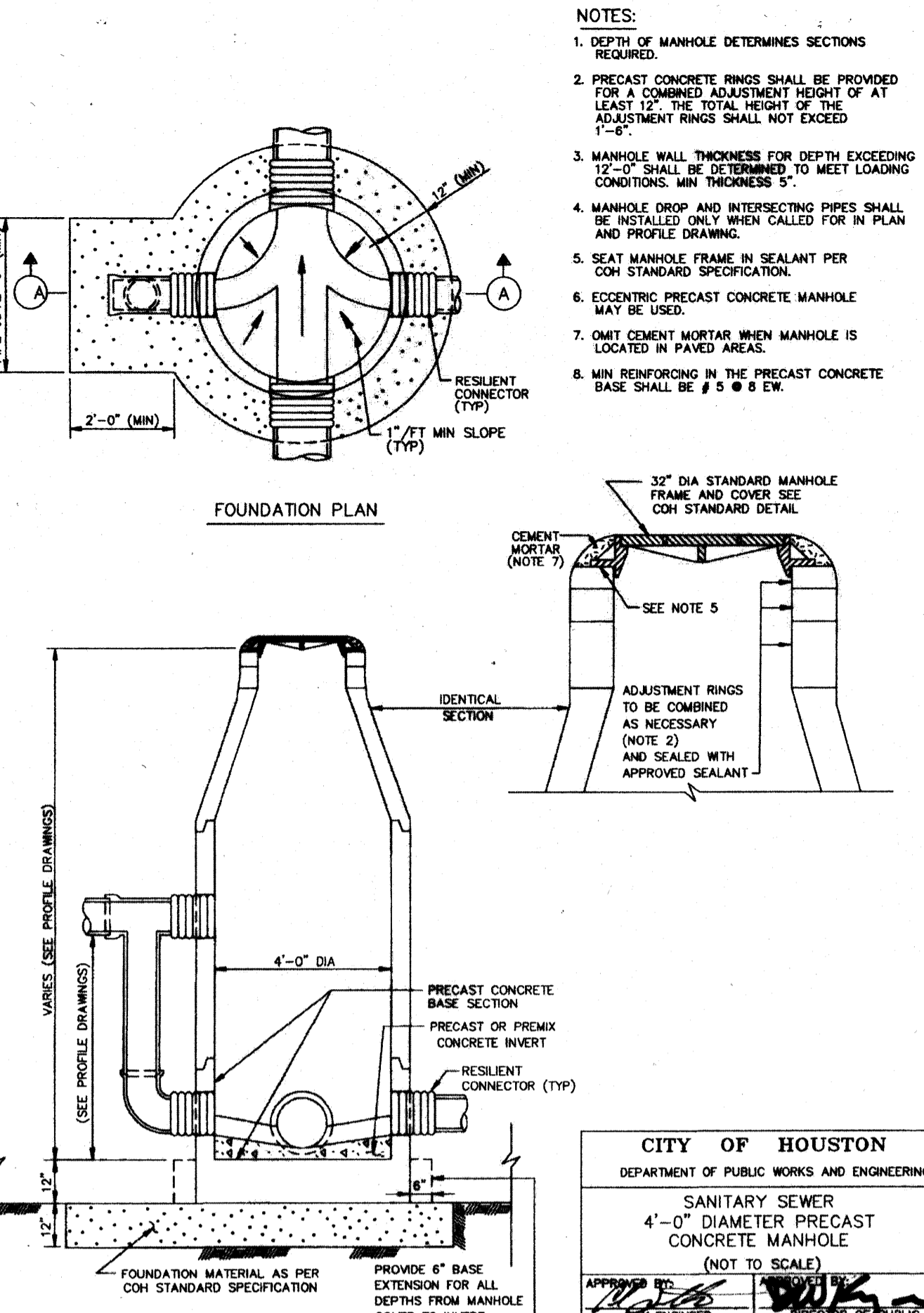
ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064



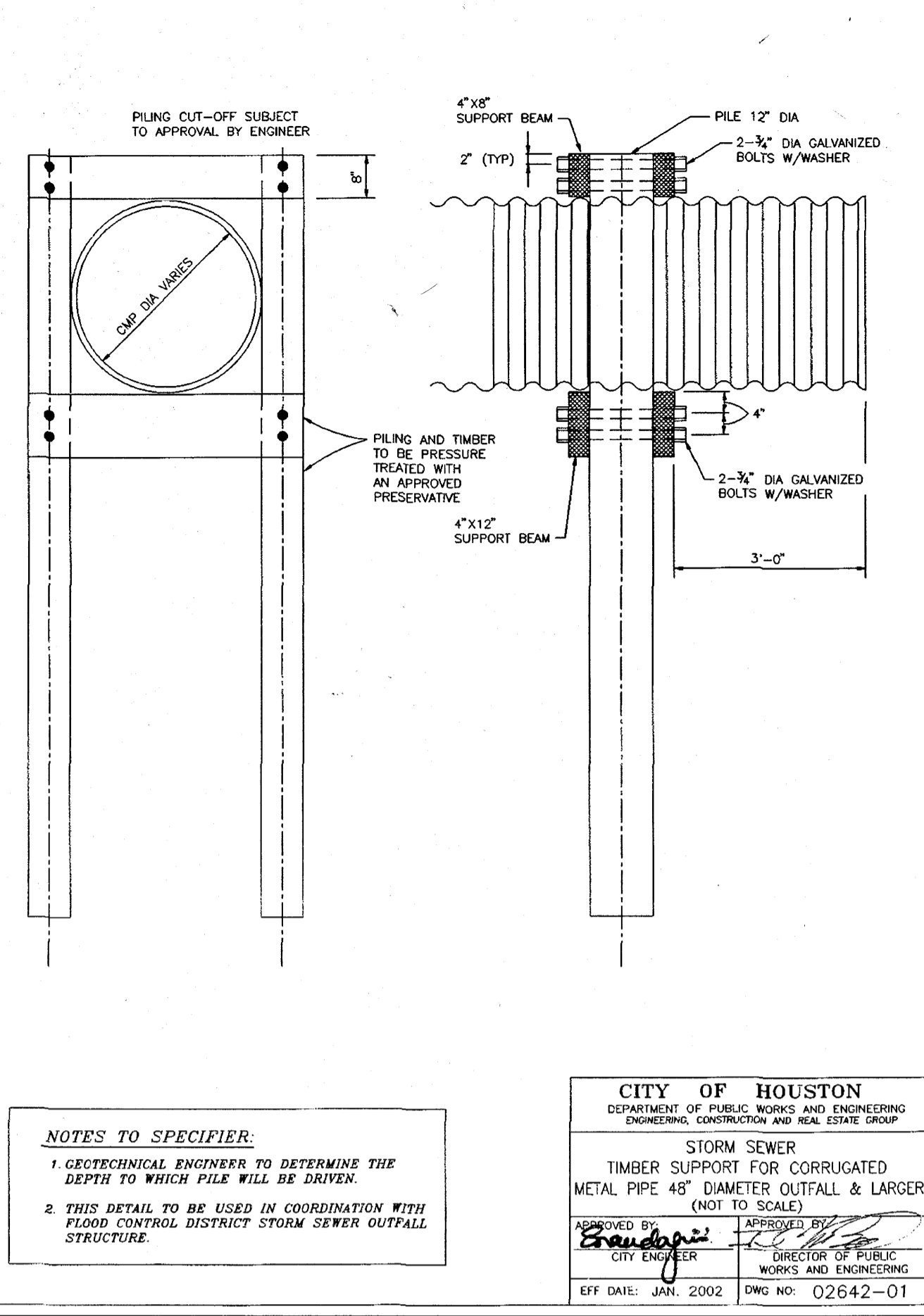
STORM SEWER MANHOLE TYPE "C" FOR 42" DIAMETER RCP AND SMALLER



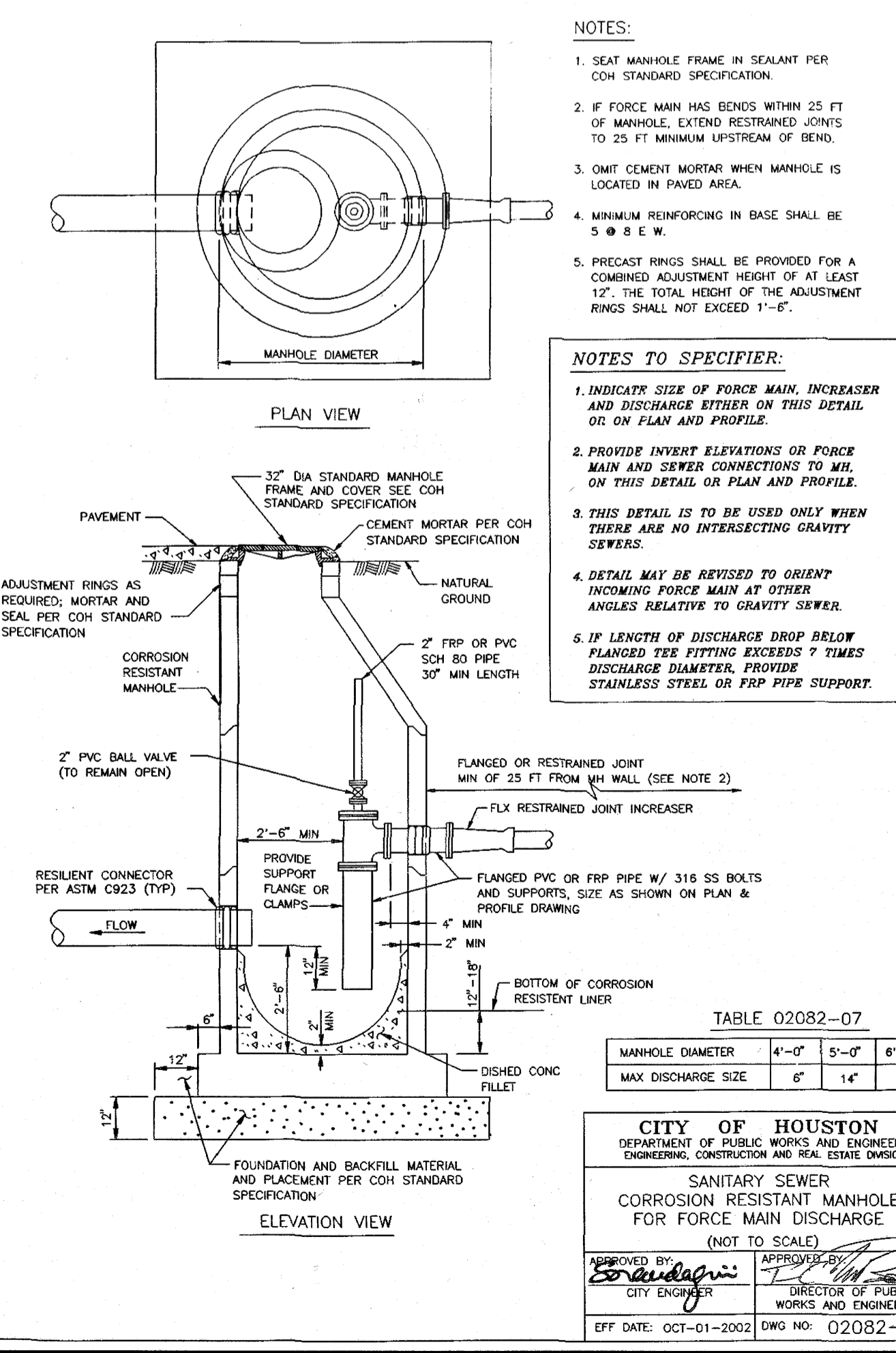
STORM SEWER MANHOLE TYPE "C" FOR 48" TO 72" DIAMETER RCP



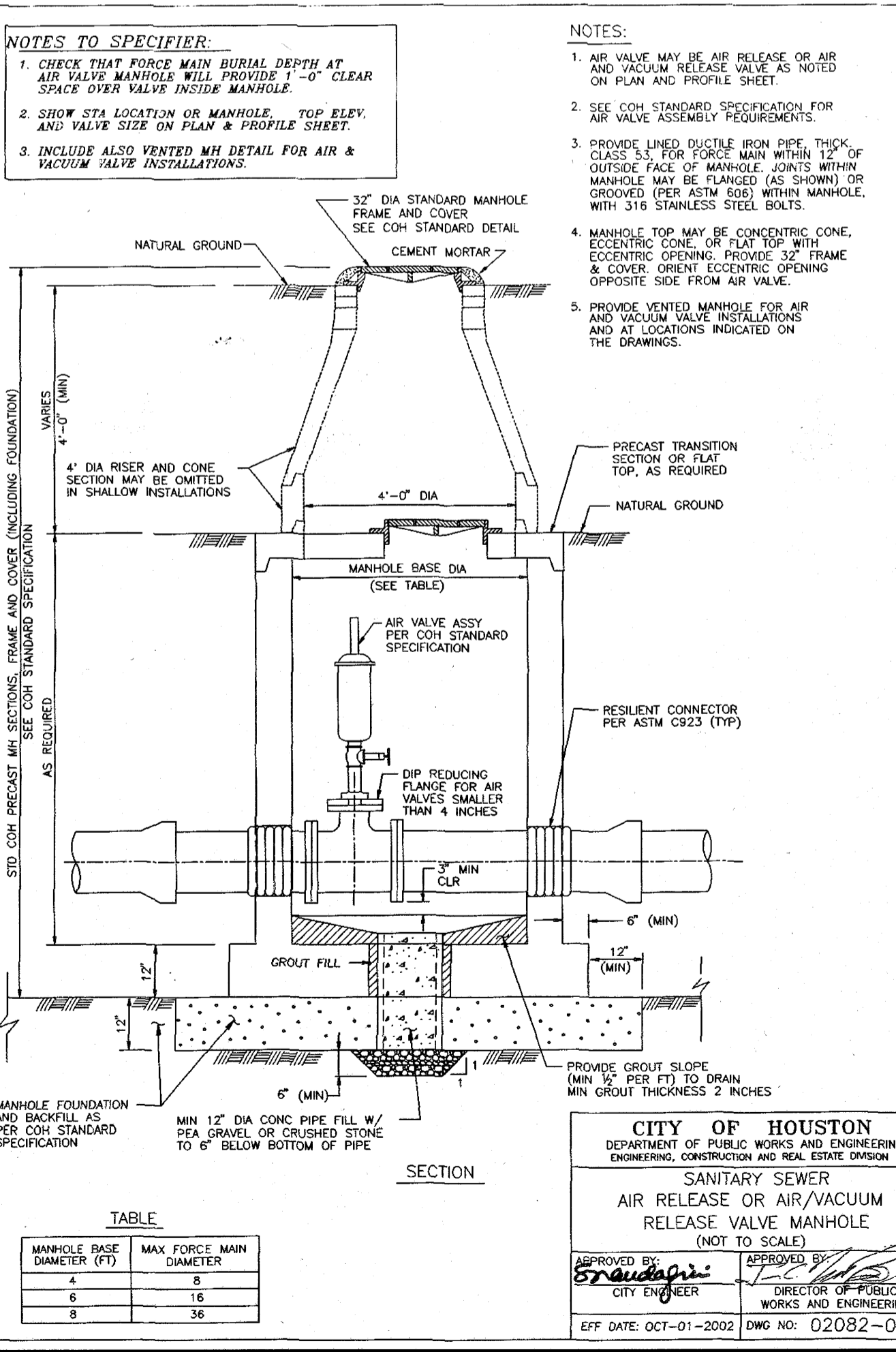
SANITARY SEWER 4'-0" DIAMETER PRECAST CONCRETE MANHOLE



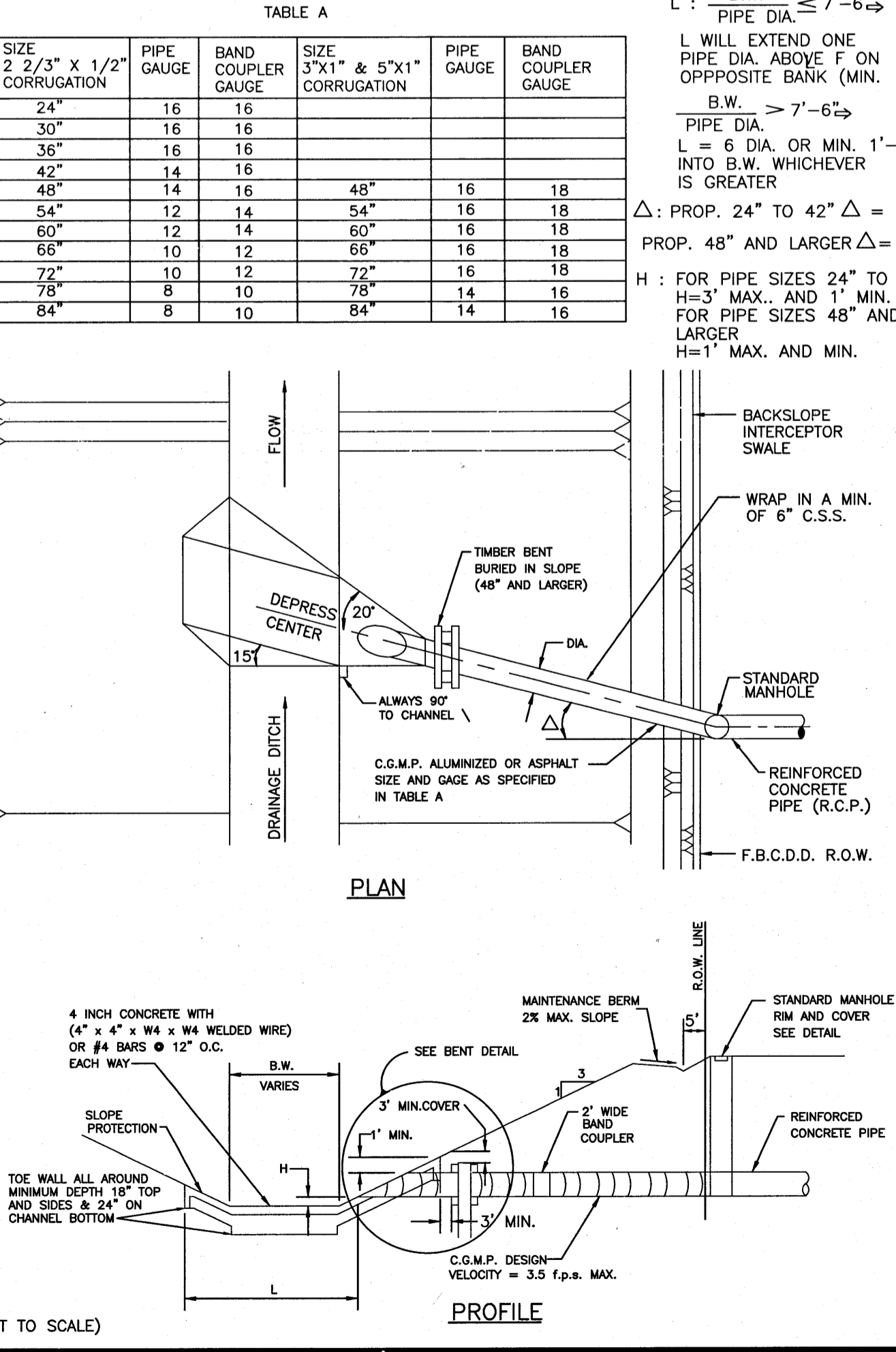
STORM SEWER TIMBER SUPPORT FOR CORRUGATED METAL PIPE 48" DIAMETER OUTFALL AND LARGER



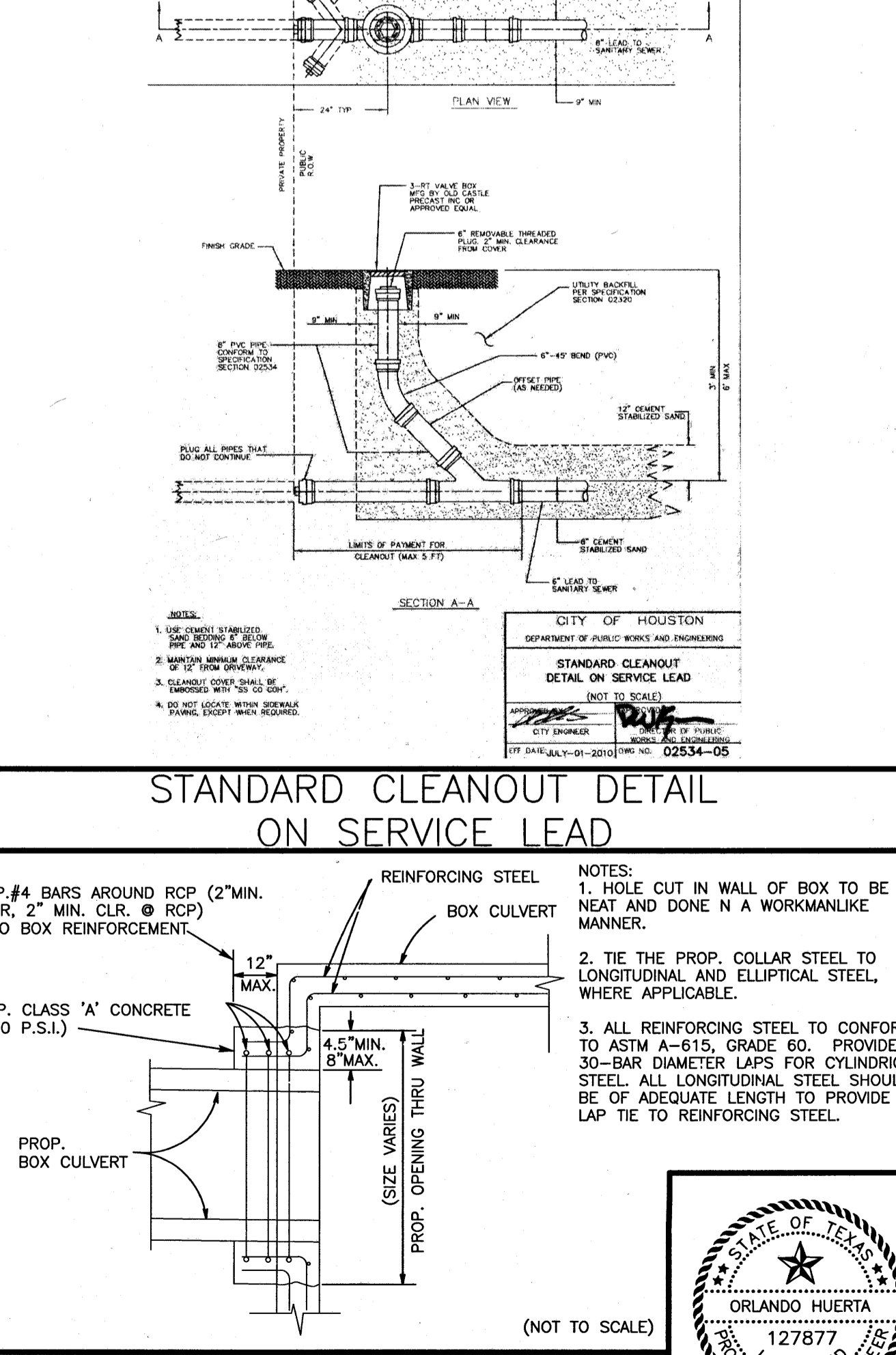
SANITARY SEWER CORROSION RESISTANT MANHOLE FOR FORCE MAIN DISCHARGE



SANITARY SEWER AIR RELEASE VALVE MANHOLE



STORM SEWER OUTFALL



STORM SEWER / BOX CULVERT CONCRETE COLLAR

BENCHMARK:
A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A, APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/8 FOOT LOWER THAN THE ROAD.
ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.
TBM:
3/4" IRON ROD W/ LJA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.
ELEV. = 93.19 FEET 1973 ADJ.

NOTES:
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

FORT BEND COUNTY ENGINEERING DEPARTMENT
APPROVED: *[Signature]*
DEVELOPMENT COORDINATOR
DATE: 9/25/18
REVISION BY

C.O.H. LOG NO. 18-1051
F.B.C.M.U.D. NO. 134B

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064

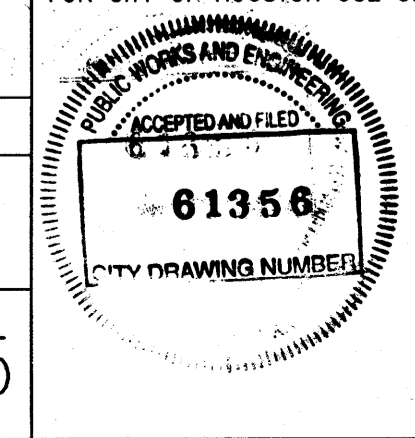
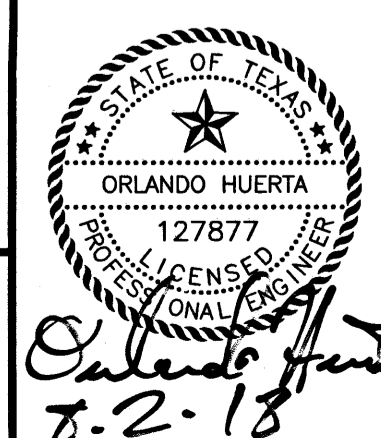
SANITARY AND STORM SEWER DETAILS (SHEET 3 OF 3)

LJA Engineering, Inc.
2929 Briarpark Drive Suite 600 Houston, Texas 77042
Phone 713.953.5200 Fax 713.953.5025 FRN-F-1386

LJA PROJECT NO.: 1968-1064
DESIGNED BY: J.L.C. DRAWN BY: J.L.C. DATE: JULY 2018

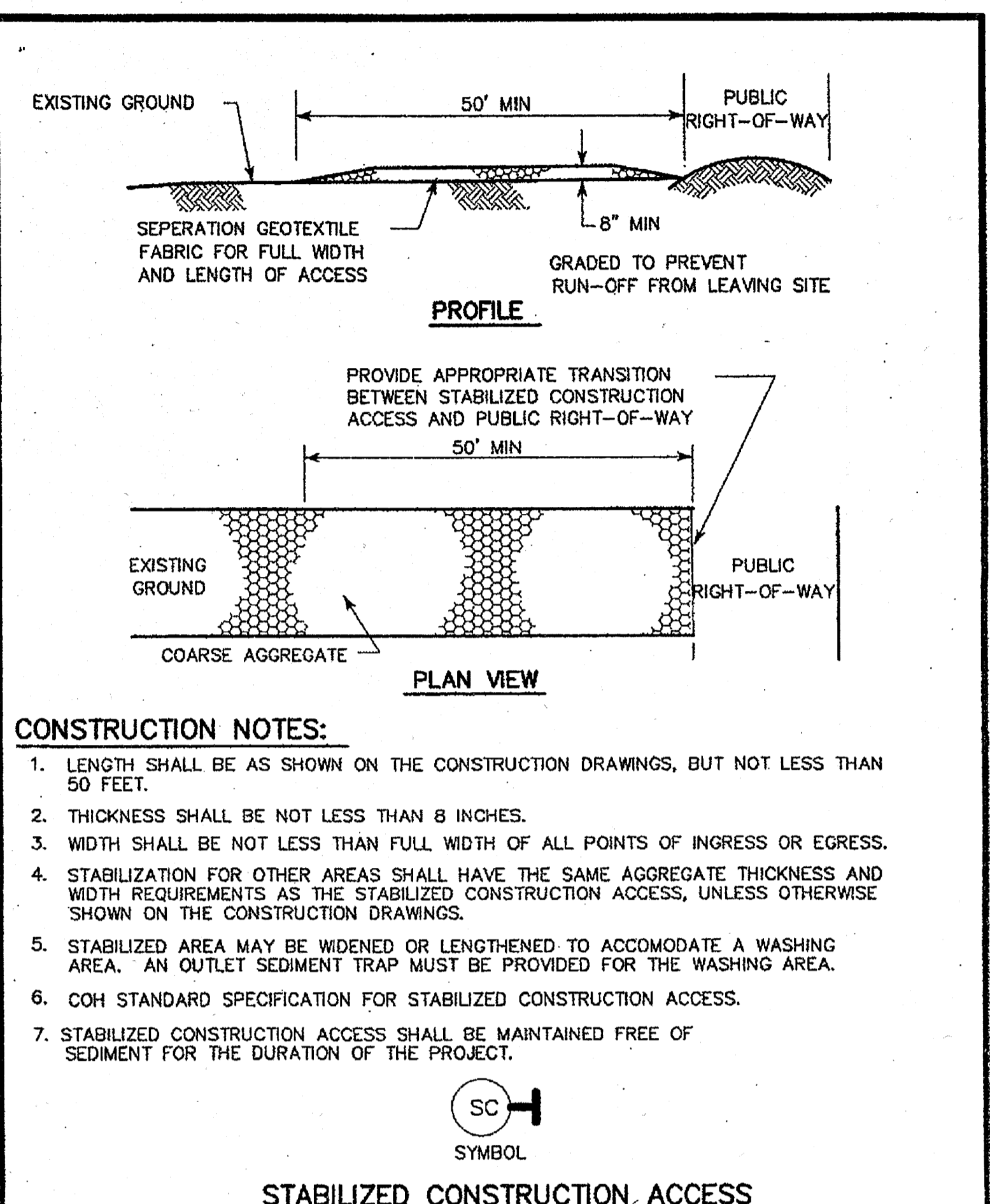
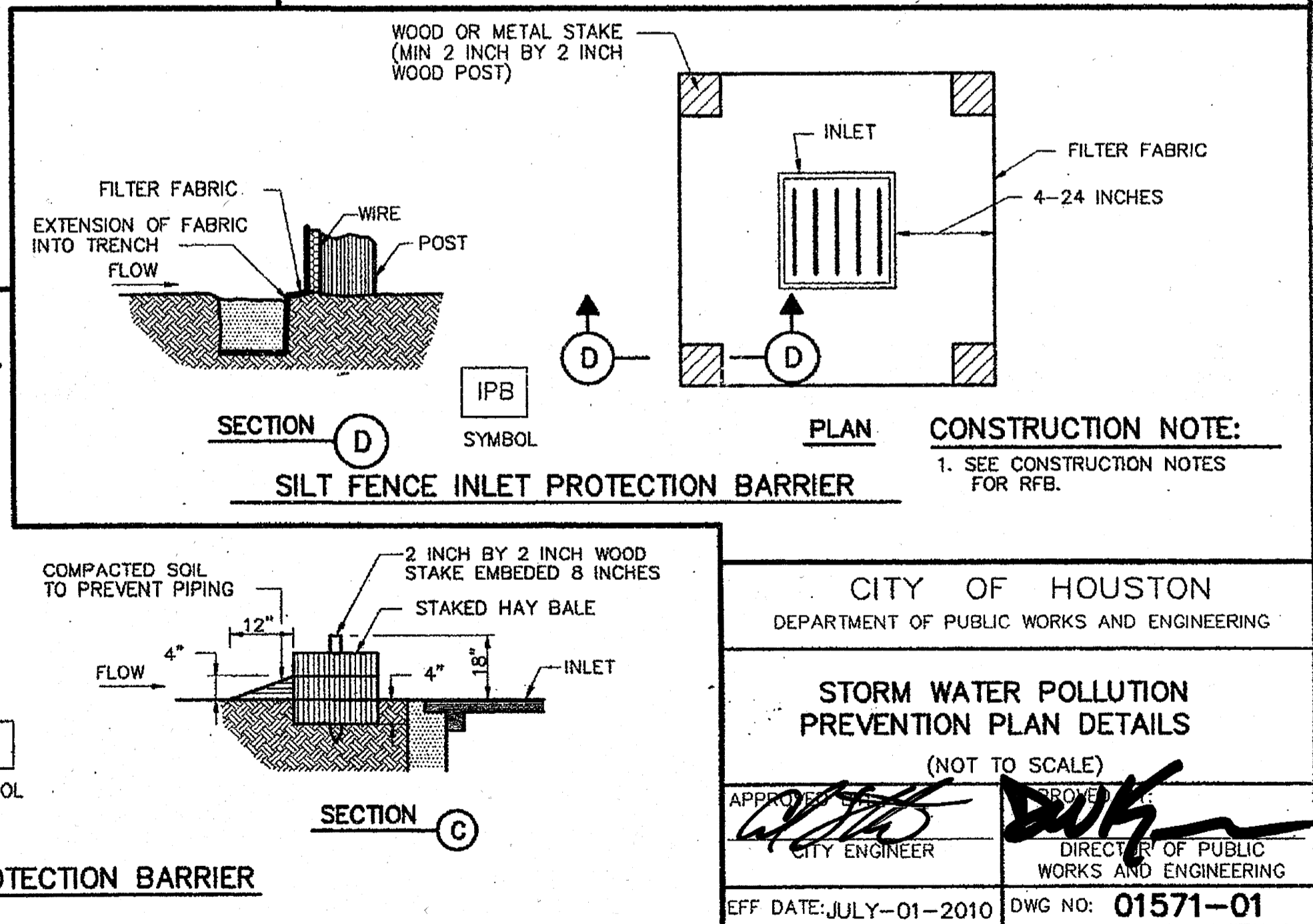
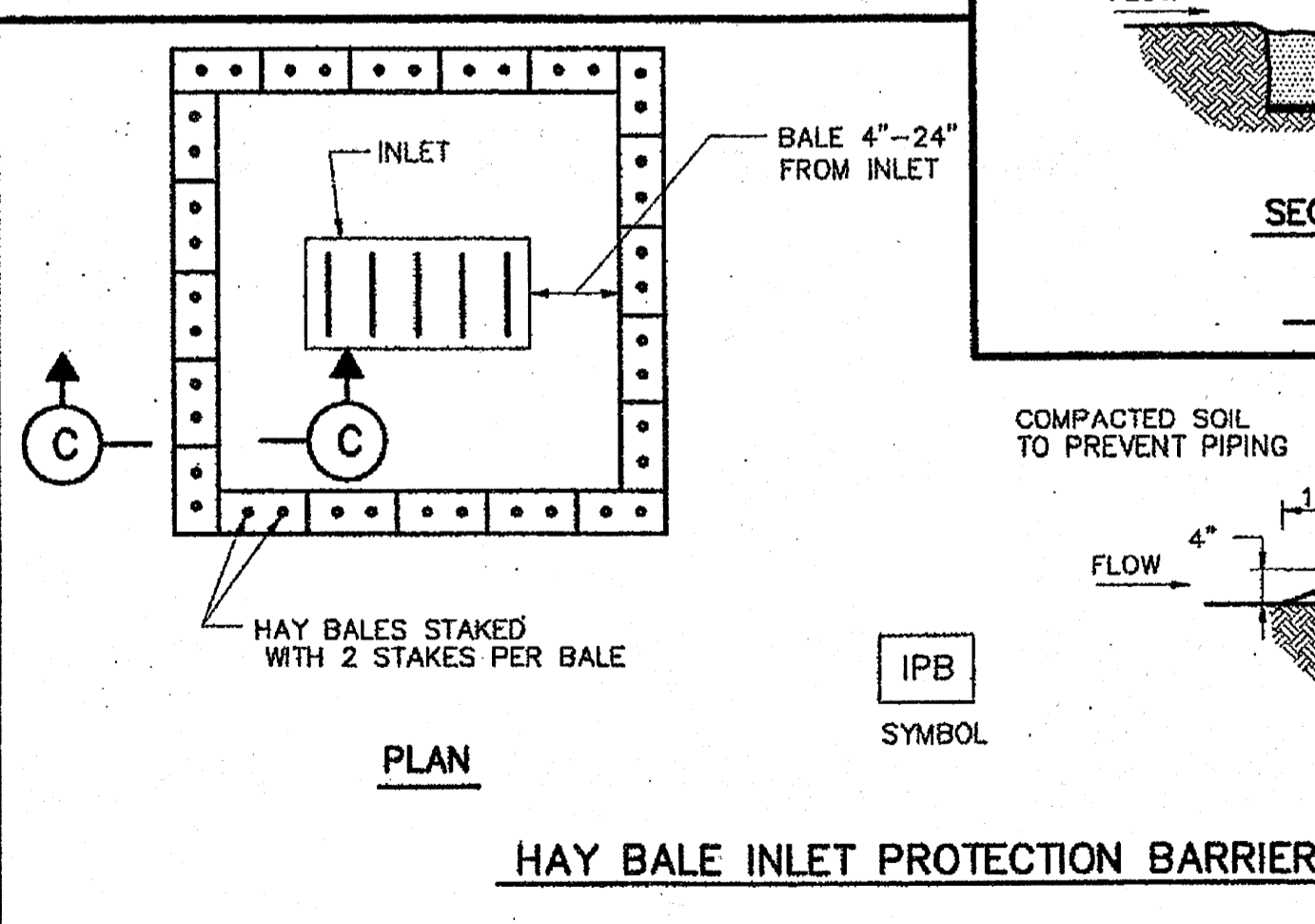
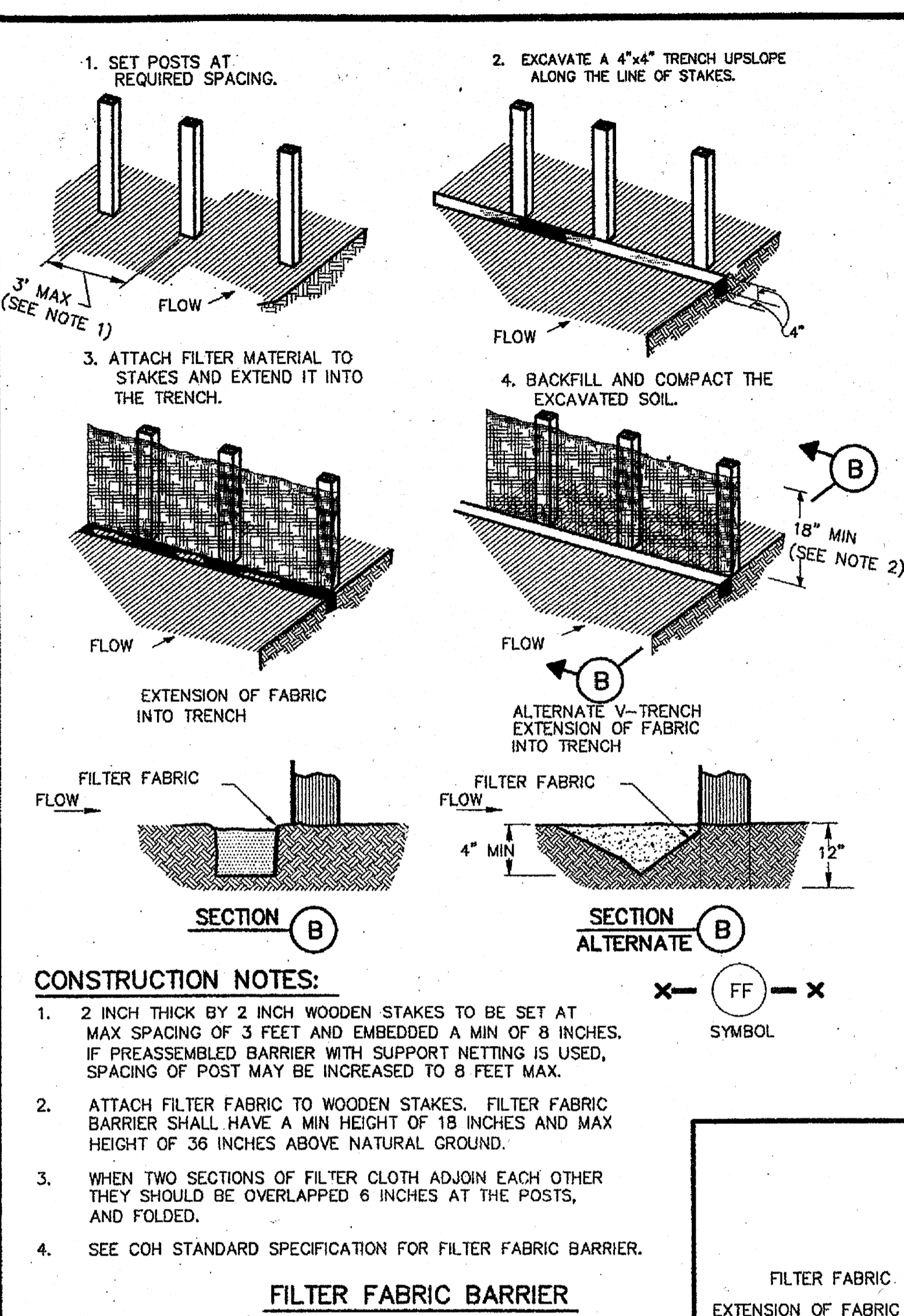
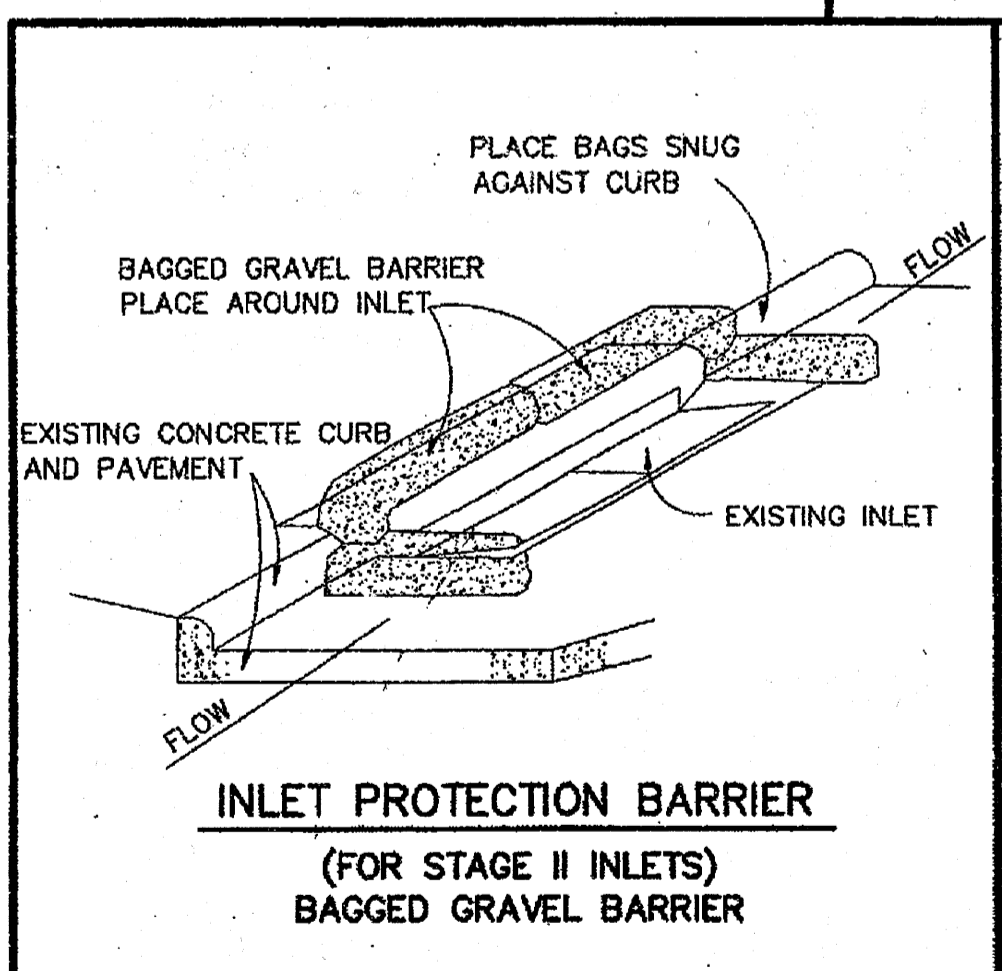
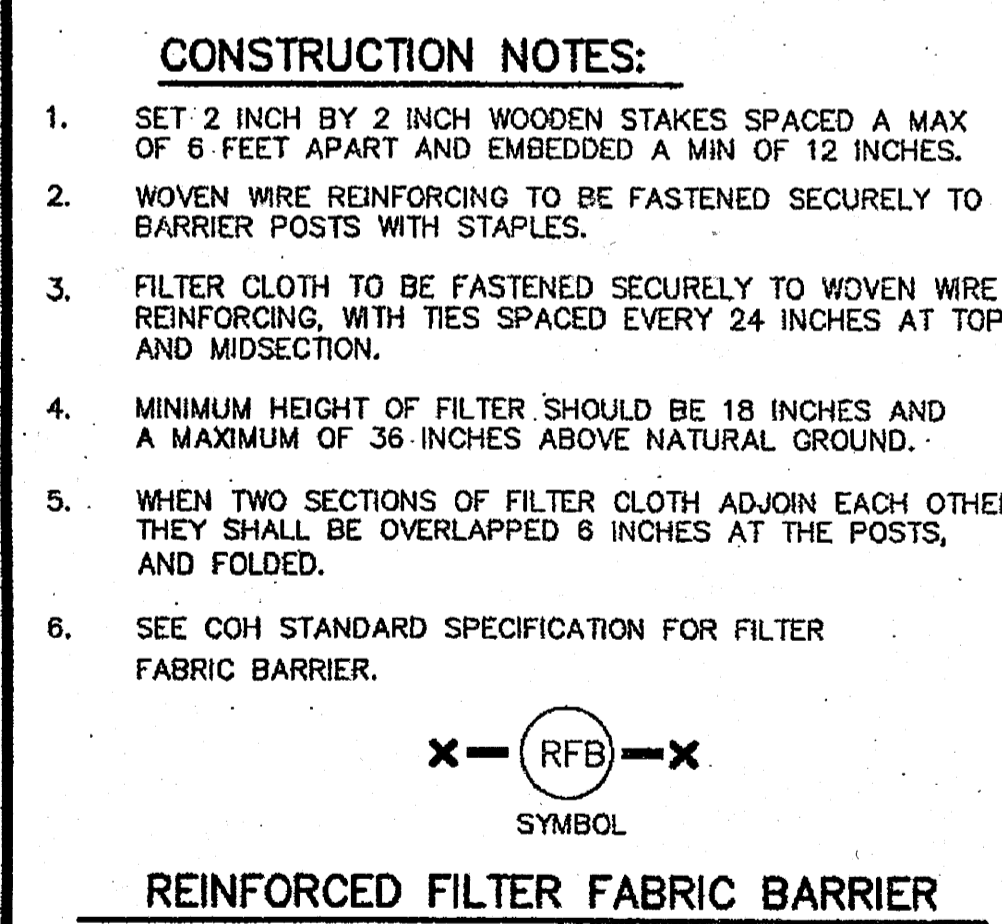
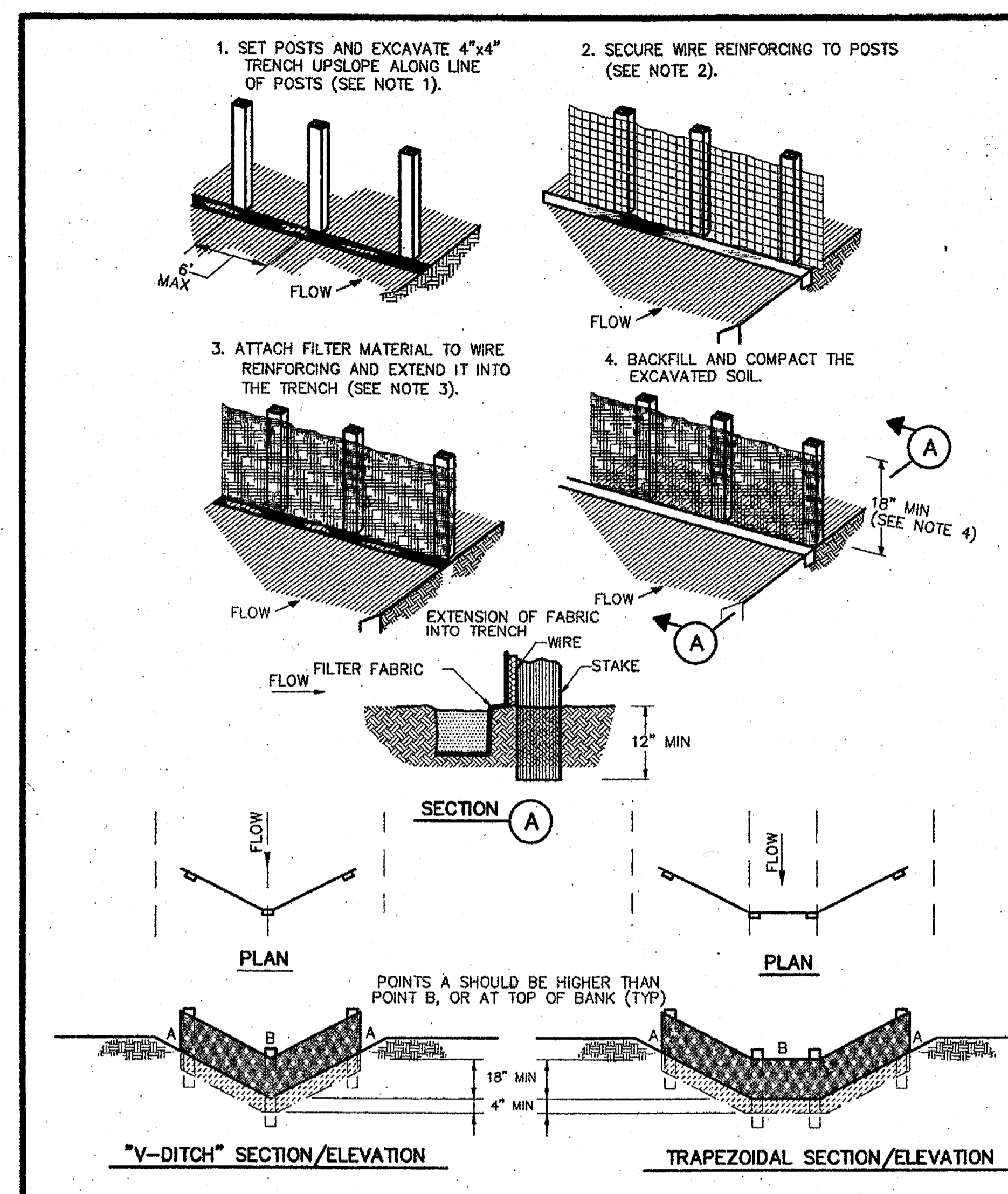
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
STREET & BRIDGE
TRAFFIC
STORM WATER QUALITY
FACILITIES

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE _____
SCALE: NONE
SHEET NO. 14 OF 15



User Name: jcarline Date/Time: Thu, 26 Jul 2018 10:46am Path: \\p010119081\19081\0001\0001\14-Aliana Comm. Tracts-SANSTMDTL3.dwg

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064



BENCHMARK:

A-1212 - BRASS DISK, STAMPED A-1212 1973, SET IN THE TOP OF A CONCRETE HEADWALL ON THE WEST BOUND LANES OF HWY 90A APPROX. 4.1 MILES WEST ALONG HWY 90A FROM THE JUNCTION OF HWY 6, IN SUGARLAND, TEXAS. THE DISK IS SET 2.0 FEET EAST OF THE WEST END, OF THE NORTH CONCRETE HEADWALL, AND 27.0 FEET NORTH OF THE CENTERLINE OF THE WESTBOUND LANES, AND 1/2 FOOT LOWER THAN THE ROAD.

ELEV. = 78.65 FEET (NGVD-29) 1973 ADJ.

TRM:

1/4" IRON ROD W/ LJA CAP LOCATED APPROX. 50.6 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE ALIANA PROPERTY AT THE INTERSECTION OF MADDEN ROAD AND FM 1464.

ELEV. = 93.19 FEET 1973 ADJ.

NOTES:

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY: _____ DATE: _____

TITLE: _____

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: [Signature] DEVELOPMENT COORDINATOR

DATE: 9/25/18

DATE	REVISION	BY

C.O.H. LOG NO. 18-1051

F.B.C.M.U.D. NO. 134B

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30

STORM WATER POLLUTION PREVENTION PLAN DETAILS

LJA Engineering, Inc.

2929 Briarpark Drive Phone 713.953.5200
Suite 600 Fax 713.953.5026
Houston, Texas 77042 FRN - F-1386

LJA PROJECT NO.: 1968-1064

DESIGNED BY: JLC DRAWN BY: JLC DATE: JULY 2018

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

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER: [Signature] STREET & BRIDGE

ESTIMATE: [Signature] TRAFFIC

SCHEM: [Signature] STORM WATER QUALITY

FACILITIES: [Signature]

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE _____

SCALE: NONE

SHEET NO. 15 OF 15

61356

ACCEPTED AND FILED

ORLANDO HUERTA

127877

12/27/17

7-2-18

User Name: jcaprine Path Name: \\proj\proj\18685\1064\VCAD_Sheet_Files\15-Aliana_Comm_Tracts-PPFD.dwg

ALIANA COMMERCIAL TRACTS C20, C21, C28, C29, C30 - JOB NO. 1968-1064

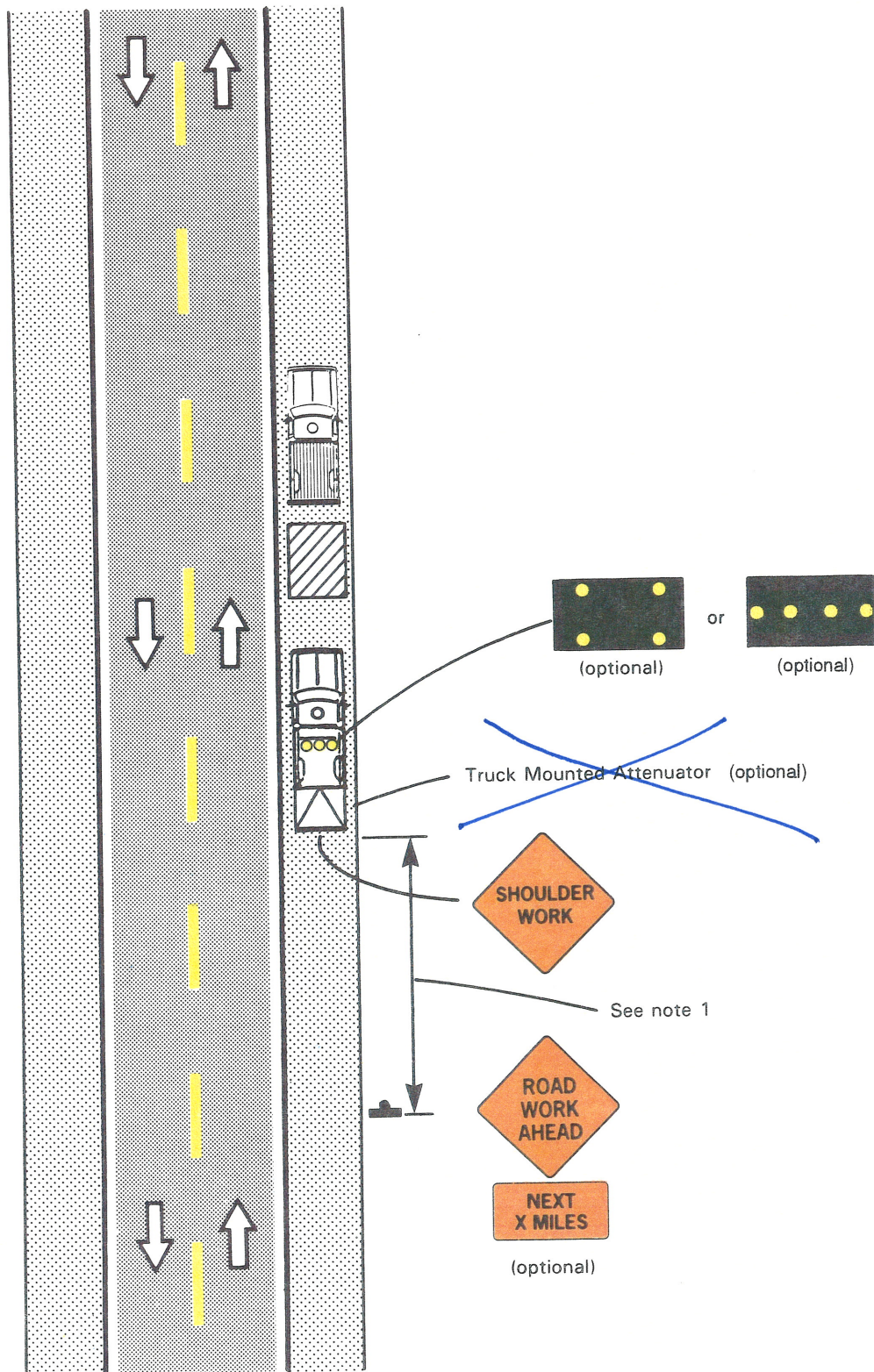


Figure TA-4. Mobile operation on shoulder.