



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: 2018-24131

Applicant: Gonzalez Construction Enterprise, Inc.

Job Location Site: Canyon Fields Drive, Richmond, TX 77406

Bond No. **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 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

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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

CONSTRUCTION PLANS FOR WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION LOCATED IN FORT BEND COUNTY MUD No. 132 FORT BEND COUNTY, TEXAS

INDEX OF DRAWINGS

SHEET NO. DESCRIPTION

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2. CONSTRUCTION NOTES
- LAYOUT SHEETS**
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4. PAVING, DRAINAGE, AND WATER LAYOUT
- 4.1. PAVEMENT MARKING & SIGNAGE LAYOUT
5. STORM CALCULATIONS (SHEET 1 OF 2)
- 5.1. STORM CALCULATIONS (SHEET 2 OF 2)
- PLAN AND PROFILE SHEETS**
6. MIRANDOLA LANE STA. 25+50.00 TO 35+00.00
7. MIRANDOLA LANE STA. 35+00.00 TO 45+00.00
8. IRIS HEIGHTS DRIVE, STORM LINE "A" & WATER LINE "A"
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- MISCELLANEOUS AND DETAIL SHEETS**
10. *TxDOT - PEDESTRIAN FACILITIES CURB RAMPS (PED 18)
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12. PAVING DETAILS
13. PAVING MARKING DETAILS
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15. BEDDING DETAILS AND FORT BEND COUNTY SIDEWALK AND DRIVEWAY DETAILS
16. POLLUTION PREVENTION PLAN LAYOUT
17. POLLUTION PREVENTION DETAILS
18. TRAFFIC CONTROL DETAILS
19. JUNCTION BOX PLAN & SECTIONS
20. JUNCTION BOX DETAILS

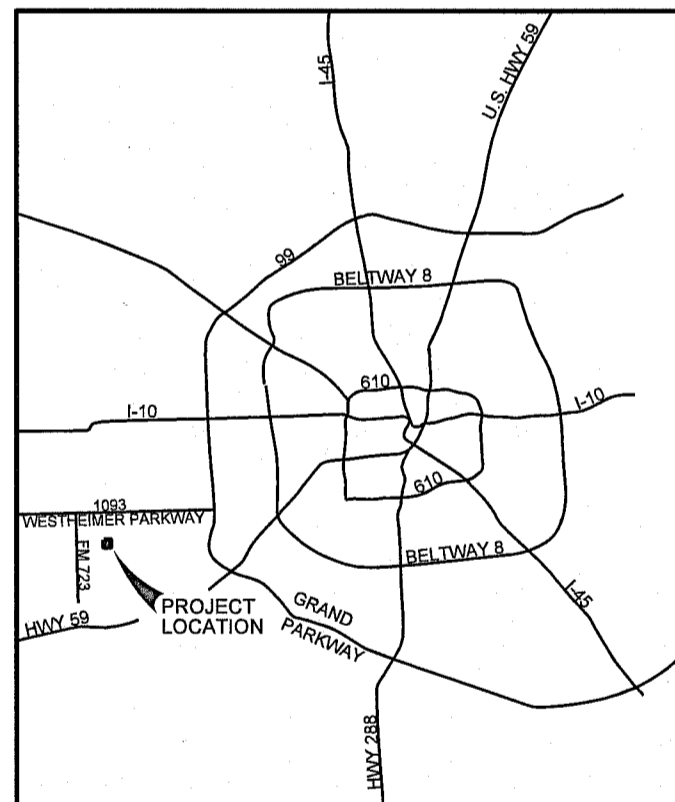
ETJ Detention Plans Information	
1. Storm Water Detention Plans	
Is Provided in:	Sendero Detention Pond Phase 2 (ILMS: 16129834)
Engineering Firm:	Costello Inc.
Date:	February 14, 2017
Signed By:	Mr. Jon R. VanderWilt
2. Storm Water Drainage Design Report	
Report Title:	Update to the 586.4 acre Phase 1 Analysis of the Drainage Analysis for the Development of the 932-acre Sendero Tract
Date:	October 27, 2015
Engineering Firm:	Costello Inc.
Acknowledgement By:	Fort Bend County Drainage District
3. City of Houston Drainage Memo	
Memo Title:	Drainage Memorandum for Sendero Sections 7, 8 and 9 and
Date:	July 27, 2018
Sent to:	Ms. Ivy Wang
Project Drainage Area	300.8 Acres
Overall Detention Basin Drainage Area	300.8 Acres
Existing Impervious Cover for Project Area	96.4 Acres
Proposed Impervious Cover for Project Area	113.2 Acres
Increased Impervious Cover for Project Area	16.8 Acres
Final Impervious Cover for Project Area	194.4 Acres
Detention Basin Storage Rate	0.63 acre-feet/acre
Overall Detention Storage Required	163.9 acre-feet
Overall Detention Storage Provided	163.9 acre-feet
Overall Detention Storage Used by Existing Development	92.4 acre-feet
Detention Storage Required for Project Area (provide calculation(s) in drainage memo and plans)	11.8 acre-feet
Detention Storage Provided for Project Area	11.8 acre-feet
Overall Detention Storage Remaining for Future Development	59.7 acre-feet

"PLEASE SEE PROJECT MEMO FROM MR. JON VANDERWILT THAT IS DATED AUGUST 1, 2018 THAT STATES THAT CONSTRUCTION WILL NOT OCCUR UNTIL THE REQUIRED EASEMENTS HAVE BEEN GRANTED AND RECORDED IN THE OFFICIAL RECORDS OF FORT BEND COUNTY."

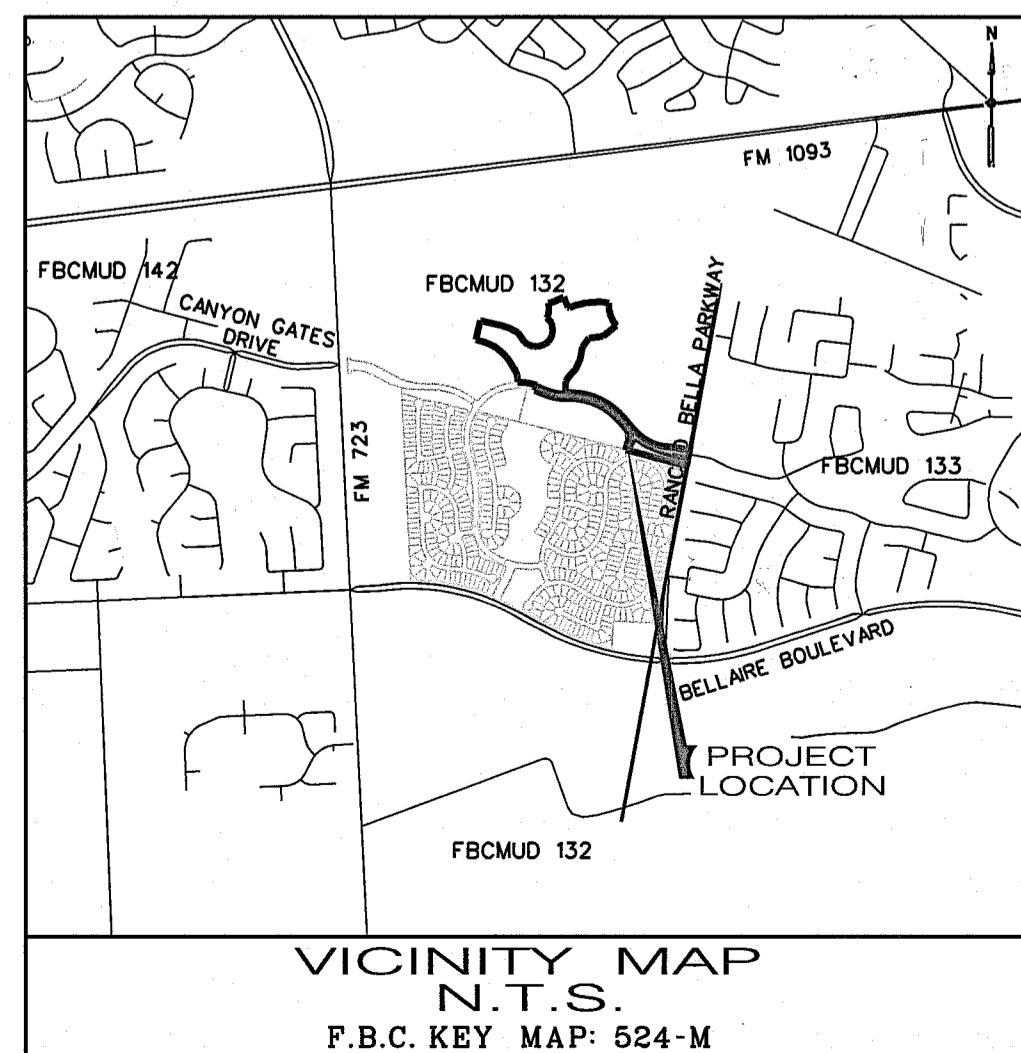
ETJ DETENTION PLANS INFORMATION
 1. STORM WATER DETENTION PLANS IS PROVIDED IN: DETENTION POND PHASE 2 IMPROVEMENTS FOR SENDERO ENGINEERING FIRM: COSTELLO, INC. DATE AND SIGNED BY: FEBRUARY 14, 2017- JON R. VANDERWILT
 2. STORM WATER DRAINAGE DESIGN REPORT REPORT TITLE: 152.2 AC SENDERO TRACT PHASE 1A-2 DRAINAGE ANALYSIS UPDATE DATE: OCTOBER 27, 2015 ENGINEERING FIRM: COSTELLO, INC. DATE OF ACKNOWLEDGEMENT BY: FORT BEND COUNTY DRAINAGE DISTRICT
 3. INCREASED IMPERVIOUS COVER = 62.86 ACRES DETENTION RATE REQUIRED = 0.59 ACRE-FEET/ACRE DETENTION RATE PROVIDED = 0.62 ACRE-FEET/ACRE

ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE GRID SYSTEM, SOUTH CENTRAL ZONE.
 CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS OFFICE OF THE CITY ENGINEER, 48 HOURS BEFORE STARTING WORK ON THIS PROJECT. PHONE No. 832-394-9098.

Location Map



LAMBERT TILE
 4353 A,B 4354 C,D
 ZIP CODE 77406



VICINITY MAP
 N.T.S.
 F.B.C. KEY MAP: 524-M

FORT BEND COUNTY
 ENGINEER: *Richard W. Stolleis*
 RICHARD W. STOLLEIS, P.E.
 DATE: 10/11/18
 THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVAL.
 APPROVED: *Maya*
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

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

Costello Engineering and Surveying 2107 CityWest Blvd. 5th Floor Houston, Texas 77042 (713) 783-7788 (713) 783-3580 Fax TEXAS PE BOARD FIRM REGISTRATION No. 280	<i>Jon R. VanderWilt</i> Jon R. VanderWilt REGISTERED PROFESSIONAL ENGINEER 50071 8/2/2018
SURVEYED BY: COSTELLO, INC. FB NO.:	
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS	
WATER <i>8/2/18</i>	TRAFFIC & TRANSPORTATION
WASTEWATER <i>8/2/18</i>	STORM WATER QUALITY
STORM <i>8-2-18</i>	FACILITIES
STREET & BRIDGE	
CITY ENGINEER	FOR CITY OF HOUSTON USE ONLY CITY DWG NO.:
DIRECTOR OF PUBLIC WORKS <i>8/1/18</i>	61214 CITY DRAWING NUMBER HOUSTON, TEXAS

FIRM FLOOD INSURANCE RATE
 PANEL 110 OF 573
 MAP # 4353/1011
 BFE ELEVATION 83.5 (Grates) 92.31 (Jones Creek)
 THIS SITE IS IN ZONE X UNSHADED



Know what's below.
 Call before you dig.

*NO PROPOSED WASTEWATER WORK IS SHOWN ON THIS PLAN SET NOR INCLUDED IN THE WORK SCOPE.

JOB NO. 2004117-CRM-DS-101
 ILMS No. 18067921
 LOG No. 18-1232
 DATE: AUGUST, 2018

SHEET No. 1 OF 20

FORT BEND COUNTY MUD 132 WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB NO. 2004117-CRAM-DS-101)

CENTERPOINT ENERGY

CAUTION: UNDERGROUND GAS FACILITIES
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 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 & 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.
PARTLY 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/OVER 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.

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF THE AT&T TEXAS/SWBT FACILITIES ARE SHOWN 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.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN 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.
4. 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.
5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.
6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER ROOSEVELT LEE JR. AT (713)567-4552 OR E-MAIL HIM AT RL7259@ATT.COM IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

FORT BEND COUNTY CONSTRUCTION - GENERAL NOTES CONT

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 PLACED 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. WHEELCHAIR 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 FLAGMAN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION - BOTH DAY AND NIGHT.
14. ALL 8-1/2" STOP SIGNS SHALL BE 30"x 30" 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 NAMES 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 HERUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, REQUIREMENTS 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 HERUNDER.
NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES.

PAVING CONSTRUCTION NOTES

1. PAVING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST FORT BEND COUNTY RULES, REGULATIONS AND REQUIREMENTS AND AMENDMENTS. MATERIALS FURNISHED SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY FORT BEND COUNTY. THE OWNER'S FINAL ACCEPTANCE OF THE COMPLETE WORK SHALL BE CONTINGENT UPON FORT BEND COUNTY'S FORMAL ACCEPTANCE OF STREETS FOR MAINTENANCE.
2. ALL PAVEMENT WIDTHS, CURB RADII, AND CURB ALIGNMENT SHOWN INDICATE BACK OF CURB. "TC" INDICATES TOP OF CURB. "TP" INDICATES TOP OF PAVEMENT.
3. GUIDELINES SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
4. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET. IF THIS NOTE CONFLICTS WITH SPECIFICATIONS OR THE CONSTRUCTION PLANS, THIS NOTE SHALL GOVERN.
5. BEFORE STABILIZING THE SUBGRADE FOR AREAS THAT ARE TO BE PAVED, PROOF ROLL WITH SUITABLE EQUIPMENT AND OBSERVE THE SUBGRADE DURING PROOF ROLLING TO DETECT ANY WET, SOFT OR PUMPING AREAS. TREAT WET, SOFT OR PUMPING AREAS WITH SUITABLE DRYING OR STABILIZING AGENTS OR REMOVE UNSUITABLE MATERIAL AND REPLACE IT WITH COMPACTED FILL MATERIAL. PAYMENT FOR REMOVING AND REPLACING MATERIAL WILL BE PAID FOR BY THE UNIT PRICE FOR EXCAVATION AND COMPACTED FILL.
6. ALL CURB RADII SHALL BE 25' UNLESS OTHERWISE NOTED. MINIMUM SLOPE AROUND CURB RETURN IS 1.0%.
7. 6-INCH PAVEMENT SHALL BE REINFORCED CONCRETE WITH NO. 4 BARS AT 20.5" LONGITUDINALLY AND 36" TRANSVERSELY. THE CONCRETE MIX DESIGN SHALL COMPLY WITH EITHER OF THE FOLLOWING OPTIONS:
¾ A MIX DESIGN CONTAINING 5 SACKS OF CEMENT PER CUBIC YARD WITH NO FLY ASH OR
¾ A MIX DESIGN CONTAINING FLY ASH AND CEMENT THAT HAS CEMENTITIOUS CONTENT OF NOT LESS THAN 6 SACKS PER CUBIC YARD. THE FLY ASH SHALL NOT EXCEED 25% BY WEIGHT.
8. A BLUE REFLECTORIZED BUTTON IS REQUIRED AT ALL FLUSH VALVE LOCATIONS. BUTTON SHALL BE PLACED 12-INCHES FROM THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE FLUSH VALVE.
9. STREET NAME SIGNS SHALL BE ON 9" HIGH SIGN FLAT BLADE W/ REFLECTIVE GREEN BACKGROUND. STREET NAMES SIGNS SHALL HAVE A HIGH INTENSITY GREEN BACKGROUND WITH UPPER AND LOWERCASE LETTERING. UPPERCASE LETTERS SHALL BE A MINIMUM OF 6" IN HEIGHT AND LOWERCASE LETTERS SHALL BE A MINIMUM OF 4.5" IN HEIGHT. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POSTS. STOP SIGNS ARE TO BE 30"x 30" DIAMOND GRADE R1-1 AS PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. POST TO BE LOCATED 15-FEET OFF APPROACHING CURB. THE EDGE OF THE WIDEST SIGN SHALL BE 2- FEET FROM THE BACK OF CURB. THE BOTTOM OF THE LOWEST SIGN SHALL BE 7- FEET FROM NATURAL GROUND OR FINISHED GRADE. SIGN SHALL BE MOUNTED ON 2-1/2-INCH ID GALVANIZED STEEL POSTS. USE VANDAL-PROOF NUTS AND BOLTS.
10. WHERE PROPOSED PAVEMENT ENDS AT A CONSTRUCTION JOINT, EXTEND BARS 15-INCHES, COAT WITH ASPHALT AND WRAP WITH BURLAP. AT EXPANSION JOINTS EXTEND DOWELS 5-INCHES, COAT AND WRAP WITH BURLAP.
11. FOR CONNECTION TO EXISTING PAVEMENT, EXPOSE AND CLEAN EXISTING REBAR AT PAVEMENT HEADER OR JOINT. IF EXISTING REINFORCING IS ABSENT OR IS IN UNSATISFACTORY CONDITION, DRILL AND EPOXY GROUT NO. 4 BARS AT 20.5-INCHES ON CENTERS A MINIMUM OF 12-INCHES INTO THE EXISTING PAVEMENT. EXTEND STEEL A MINIMUM OF 12-INCHES INTO PROPOSED PAVEMENT AND TIE REBAR TO PROPOSED PAVEMENT REBAR. REMOVE EXISTING TYPE III BARRICADE IF PRESENT.
12. CURB SHALL BE 6-INCH CURB OR 4-INCH BY 12-INCH CURB AS INDICATED ON THE CONSTRUCTION PLANS.
13. THE CROSS SLOPE OVER THE PAVEMENT IN CUL-DE-SACS SHALL NOT BE LESS THAN ¼" INCH PER FOOT FROM CURB TO CURB.
14. IRRIGATION SLEEVES ARE TO BE 2 FEET BELOW THE PAVEMENT SUBGRADE. BEDDING AND BACKFILL SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON OF SAND (DRY WEIGHT)) TO WITHIN 6-INCHES OF THE SUBGRADE. MARK SLEEVES BY TURNING UP A 90-DEGREE BEND. EXTEND 6-INCH PIPE 24-INCHES ABOVE FINISHED GRADE AND CAP THE END.

FORT BEND COUNTY CONSTRUCTION - 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 RIGHTS-OF-WAY.
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 LONGITUDINALE REINFORCING BAR SHALL BE USED IN THE CURBS.
7. ALL CONCRETE PAVEMENT SHALL BE 5 SACKS OF CEMENT PER CUBIC YARD 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.

CITY OF HOUSTON HOUSTON PUBLIC WORKS WATER CONSTRUCTION NOTES CONT

1. ALL WATER LINES TO HAVE A 4" MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEARANCE TO OTHER UTILITIES AT CROSSING UNLESS OTHERWISE NOTED ON PLANS. ALL WATER LINE INSTALLED OVER 8' DEEP SHALL UTILIZE RESTRAINED JOINT FITTINGS.
2. CONTRACTOR SHALL KEEP WATER PIPE CLEAN AND CAP (OR OTHERWISE EFFECTIVELY COVERED) OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPE LINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.
ADDITIONAL WATER MAIN CONSTRUCTION NOTES
1. PROVIDE CONCRETE THRUST BLOCKING TO PREVENT MOVEMENT OF BURIED LINES UNDER PRESSURE AT BENDS, CAPS, VALVES, ETC. BLOCKING SHALL BE PORTLAND CEMENT CONCRETE. PLACE THRUST BLOCK BETWEEN UNDISTURBED GROUND AND THE FITTING. ANCHOR FITTING TO THRUST BLOCK SO THAT PIPE AND FITTING JOINT ARE ACCESSIBLE FOR REPAIRS. CONTRACTOR IS RESPONSIBLE FOR THE ADEQUACY OF THE BLOCKING.
2. MAINTAIN A MINIMUM OF 9 FEET OF HORIZONTAL CLEARANCE BETWEEN THE OUTSIDE OF SANITARY SEWER MANHOLES AND WATER LINES.
3. ALL WATER LINES SHALL BE ENCASED WITH BANK SAND AS PER THE BEDDING DETAILS SHOWN ON THE CONSTRUCTION PLANS.
4. THE CENTERLINE OF FLUSHING VALVES TO BE LOCATED 3'-0" FROM BACK OF CURB WITH THE BASE AT THE ELEVATION INDICATED ON THE DETAIL SHEET. (DRAWING NO. 02520-01).
5. FLUSH VALVES ARE TO HAVE A MINIMUM OF 4 FEET OF BURY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADJUST WATER LINES AND APPURTENANCES TO OBTAIN THE PROPER VERTICAL LOCATION OF FLUSH VALVES IN RELATION TO THE TOP OF CURB AFTER PAVEMENT CONSTRUCTION.
6. WHENEVER POSSIBLE, ALL MAIN LINE GATE VALVES ARE TO BE LOCATED OPPOSITE PAVING CURB RETURNS OR ON LOT LINES AS INDICATED ON THE CONSTRUCTION PLANS.
7. INSTALL AT LEAST TWO JOINTS OF PIPE BETWEEN THE GATE VALVE AND THE PLUG ON DEAD-END LINES.
8. CONTRACTOR SHALL MINIMIZE DOWN TIME OF THE EXISTING WATER LINES WHEN MAKING ADJUSTMENTS AND CONNECTIONS TO THE LINES. CONTACT THE WATER SYSTEM OPERATOR, ED, LLC 832-467-1599, IN ADVANCE TO PLAN WITH THEM FOR ANY WATER SERVICE INTERRUPTION TO EXISTING CUSTOMERS.
9. THE OPENING AND CLOSING OF WATER VALVES ON THE EXISTING SYSTEM SHALL ONLY BE PERFORMED BY THE WATER SYSTEM OPERATOR, ED, LLC 832-467-1599.
10. ALL WATER MAIN BLOW-OFF VALVES ARE TO BE LOCATED AT A LOT LINE, 3- FEET FROM THE STREET RIGHT-OF-WAY.
STORM SEWER CONSTRUCTION NOTES
1. STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (C-76, CLASS III), AND SHALL BE INSTALLED, BEDDED, AND BACK FILLED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWINGS Nos. 2317-02, 02317-03, 02317-05, 02317-06 AND 02317-07 AS APPLICABLE.
2. ALL STORM SEWER CONSTRUCTED IN SIDELOTT EASEMENT SHALL BE RCP (C-76, CLASS III) AND SHALL BE EMBEDDED 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 1 FOOT BACK OF PROPOSED OR FUTURE CURB SHALL BE BACKFILLED WITH 2 SACKS PER TON OF STABILIZED SAND TO WITHIN 1 FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH NOT LOCATED UNDER OR WITHIN 1 FOOT OF PAVEMENT SHALL BE BACKFILLED WITH SUITABLE EXCAVATED MATERIAL.
4. ALL TRENCH BACKFILL SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS IN EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMACTION TEST (ASTM D-698/AASHTO T99).
5. CIRCULAR ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINT CONFORMING TO ASTM C443 AND ASTM C877 RESPECTIVELY.
6. ALL STORM SEWER PIPES AND INLET LEADS SHALL BE 24" AND LARGER RCP (C-76, CLASS III).
7. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES AND INLET LEADS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
8. MINIMUM HORIZONTAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 48-INCHES FROM EXTERIOR OF THE STORM PIPE OR BOX TO THE EXTERIOR OF THE EXISTING OR PROPOSED PUBLIC OR PRIVATE UTILITY AND OTHER APPURTENANCES. MINIMUM VERTICAL CLEARANCE BETWEEN ANY STORM PIPE AND BOX SHALL BE AT LEAST 18-INCHES FROM EXTERIOR OF THE STORM PIPE OR BOX TO THE EXTERIOR OF THE EXISTING OR PROPOSED PUBLIC OR PRIVATE UTILITY AND OTHER APPURTENANCES.
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 THIS WORK.
11. ALL DITCHES SHALL BE GRADED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE GRADEDED, SEEDED, AND FERTILIZED.
12. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

GENERAL CONSTRUCTION NOTES CONT

19. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF FORT BEND COUNTY, THE CITY OF HOUSTON, THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, FORT BEND COUNTY MUNICIPAL UTILITY DISTRICT NO. 132 AND THE ENGINEER.
20. MAINTAIN A MINIMUM OF 12" CLEARANCE BETWEEN ALL UTILITIES.
21. INCLUDE PRICE OF ALL BEDDING AND BACKFILL REQUIRED FOR WATER LINES, SANITARY SEWERS, AND STORM SEWERS IN PRICE BID PER LINEAR FOOT OF PIPE.
22. UPON PROJECT COMPLETION AND PRIOR TO RELEASE OF RETAINAGE, CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF PROJECT'S RECORD DOCUMENTS OF THE PROJECT MANUAL.
23. DELIVERY TICKETS FOR ALL MATERIALS (E.G., CONCRETE, CEMENT STABILIZED SAND, ETC.) SHALL BE MAINTAINED BY THE CONTRACTOR AND UPON REQUEST, BE MADE AVAILABLE FOR REVIEW BY THE ENGINEER.
24. THE CONTRACTOR SHALL STRIP THE VEGETATION IN ALL AREAS DESIGNATED FOR EITHER EXCAVATION OR FILL. TREES AND HEAVY BRUSH ARE TO BE REMOVED FROM THE PROJECT SITE. THE STRIPPINGS SHALL BE TEMPORARILY STOCKPILED ONSITE OR AT A LOCATION TO BE COORDINATED WITH THE OWNER. THE STRIPPINGS SHALL BE USED TO PROVIDE A MINIMUM 3-INCH LAYER OF TOPSOIL ON THE SLOPES AND HIGH BANK AREAS OF THE POND AND ON THE FILL AREAS PRIOR TO TURF ESTABLISHMENT.
25. STRIP THE ORGANIC MATERIAL FROM FILL AREAS AND PROOF ROLL WITH SUITABLE EQUIPMENT AND OBSERVE THE SUBGRADE DURING PROOF ROLLING TO DETECT ANY WET, SOFT OR PUMPING AREAS. TREAT WET, SOFT OR PUMPING AREAS WITH SUITABLE DRYING OR STABILIZING AGENTS OR REMOVE UNSUITABLE MATERIAL AND REPLACE IT WITH COMPACTED FILL MATERIAL.
26. THE FILL ELEVATIONS SHOWN ON THE PLANS ARE FINISHED GRADE ELEVATIONS AFTER PLACEMENT OF TOPSOIL.
27. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 8" LOOSE LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY WITHIN +/- 2 PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT (ASTM D698).
28. TURF SHALL BE ESTABLISHED IN ALL AREAS DISTURBED BY THE CONTRACTOR AND HIS WORK. THE PROJECT WILL NOT BE CONSIDERED COMPLETE UNTIL A PERENIAL VEGETATIVE COVER HAS BEEN ESTABLISHED IN THE FILL AREAS, UNLESS SUBSEQUENT CONSTRUCTION IS UNDERWAY OR BEGINNING IN 2 - 3 WEEKS.
29. THE CONTRACTOR SHALL PROVIDE A WATERTIGHT JOB BOARD NEAR THE SITE ENTRANCE FOR POSTING NOI INFORMATION AND THE POLLUTION PREVENTION PLAN BEFORE BEGINNING WORK. THE JOB BOARD MUST BE REMOVED WHEN THE CONTRACTOR HAS COMPLETED THE WORK.
30. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNER'S TESTING LABORATORY TO HAVE THE LAB PRESENT DURING ALL BACKFILL, PLACEMENT OF ANY FILL OR ANY OTHER REQUIRED LAB TESTING
31. THESE PLANS, PREPARED BY COSTELLO, INC., DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY HOUSE BILLS 652 AND 665 ENACTED BY THE TEXAS LEGISLATURE IN THE 70TH LEGISLATURE REGULAR SESSION AND CURRENT OSHA STANDARDS FOR TRENCH SAFETY. DESIGN OF TRENCH SAFETY SYSTEMS, SEALED BY A LICENSED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO PROCEEDING WITH THE WORK.

CITY OF HOUSTON HOUSTON PUBLIC WORKS WATER CONSTRUCTION NOTES

1. WATER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL, STANDARD SPECIFICATION, AND CONSTRUCTION DETAILS.
2. ALL 4" THROUGH 12" WATER LINES TO BE AWWA C-900 PVC DR-18 BLUE PRESSURE RATED WATER MAIN WITH 2" AND SMALLER WATER SERVICE LINE TO BE CONTINUOUS TYPE K COPPER TUBING PER COH STANDARD SPECIFICATION SECTION 02503.
3. CONCRETE THRUST BLOCKS SHALL BE PROVIDED AS NECESSARY TO PREVENT PIPE MOVEMENT. USE RESTRAINED JOINTS WHERE PREVENTING MOVEMENT OF 16" OR GREATER PIPE IS NECESSARY DUE TO THRUST.
4. ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT OF ONE(1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH CEMENT STABILIZED SAND TO WITHIN ONE(1) FOOT OF SUBGRADE.
5. ALL WATER LINE AND SEWER LINE CROSSINGS SHALL BE CONSTRUCTED PER CITY OF HOUSTON AND TCEQ REGULATIONS.
6. ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C-500 AND SHALL BE OF THE RESILIENT SEAT TYPE.
7. ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C-651 AND THE TEXAS STATE DEPARTMENT OF HEALTH AT LEAST ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EVERY 1000 LINEAR FEET OF WATER LINE AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.
8. ALL BELOW GRADE VALVES SHALL BE GASKETED, HUB END GATE VALVES WITH A CAST IRON BOX, EXCEPT WHERE FLANGES ARE CALLED OUT ON THE PLANS.
9. 4" THROUGH 12" FITTINGS SHALL BE CEMENT MORTAR LINED COMPACT DUCTILE IRON PRESSURE FITTINGS PER ANSI A21.53, OR PUSH ON FITTINGS PER ANSI A21 I0 PRESSURE RATED AT 250 PSI.
10. HYDROSTATIC TESTING ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH THE LATEST CITY OF HOUSTON STANDARD CONSTRUCTION SPECIFICATIONS. TESTS ARE TO BE PERFORMED ON THE ENTIRE FOOTAGE OF WATER PIPE LINE INCLUDED IN THE PROJECT.

GENERAL CONSTRUCTION NOTES

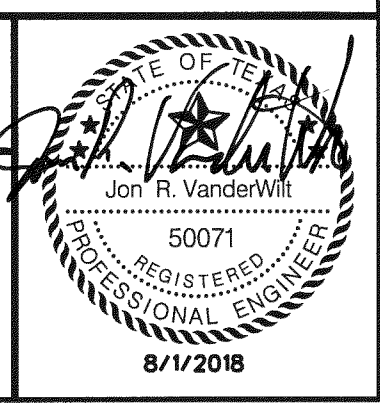
1. CONSTRUCT WASTEWATER COLLECTION SYSTEMS, WATER LINES AND STORM DRAINAGE IN ACCORDANCE WITH THE LATEST EDITION OF THE PUBLICATIONS STANDARD CONSTRUCTION SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING PUBLISHED BY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING.
2. UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713-223-4567/811 OR 800-344-8377 AND LONE STAR NOTIFICATION CENTER AT 800-669-8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION.
3. THE CONSTRUCTION PLANS DO NOT SHOW ALL OF THE UNDERGROUND TELEPHONE LINES, ELECTRICAL LINES, GAS SERVICE LINES OR CABLE TELEVISION LINES. LOCATION OF THESE LINES IS THE RESPONSIBILITY OF THE CONTRACTOR.
4. OVERHEAD LINES EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO SHOW ALL LINES ON THE PLANS SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN 6 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS AND OWNERS 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 MOVED, CALL CENTERPOINT ENERGY AT (713)207-2222.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER AND STORM DRAINAGE LINES. DAMAGES SHALL BE REPAIRED 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 AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE, AND STREET PAVING REFERENCED ABOVE, AT NO ADDITIONAL COST.
6. CONTRACTOR SHALL NOTIFY THE OFFICE OF THE CITY ENGINEER, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING IN WRITING PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEER'S OFFICE 48 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION VIA EMAIL AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV. PROVIDE THE FORT BEND COUNTY ENGINEER'S OFFICE WITH WRITTEN NOTIFICATION 48 HOURS BEFORE BEGINNING CONSTRUCTION.
7. ALL CONTRACTOR VEHICLES, INCLUDING EMPLOYEE'S VEHICLES, SHALL PARK WITHIN THE PROJECT SITE TO MINIMIZE TRAFFIC ON THE PUBLIC STREETS ADJACENT TO THE WORK SITE ENTRANCE. CONTRACTOR WILL PROVIDE SUFFICIENT PARKING AREAS TO ACCOMMODATE HIS VEHICLES. THE LOCATION OF SUCH PARKING MUST MEET THE APPROVAL OF THE OWNER. PARKING IS NOT ALLOWED UNDER THE DRIP LINE OF TREES. ANY AREAS DISTURBED OR DESTROYED BY VEHICULAR PARKING WILL BE REPAIRED TO ORIGINAL CONDITION PRIOR TO COMPLETION OF THE PROJECT.
8. THE CONTRACTOR SHALL CLEAN ALL STREETS IN THE VICINITY OF THE WORK SITE ENTRANCE, ON A DAILY BASIS, TO ENSURE THAT NO DIRT FROM THE PROJECT ACCUMULATES IN THE EXISTING STREETS.
9. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.
10. CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
11. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL PERMITS, INCLUDING PERMITS REQUIRED BY "REGULATIONS OF FORT BEND COUNTY, TEXAS FOR FLOOD PLAN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION.
12. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY FORT BEND COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY AND/OR CULVERTS WITHIN COUNTY ROAD RIGHT-OF-WAY.
13. ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING VEGETATION, ROOTS, CONCRETE, AND DEBRIS SHALL BE HAULED OFF SITE BY THE CONTRACTOR. INCLUDE COST OF THIS WORK, INCLUDING HAUL, IN OTHER ITEMS OF THE WORK.
14. CONTRACTOR SHALL CONFINE ALL WORK EFFORTS WITHIN THE DESIGNATED AREA UNLESS SPECIFICALLY AUTHORIZED BY THE OWNER. EXTREME CARE SHOULD BE EXERCISED NEAR ADJACENT PROPERTY TO PROTECT ANY EXISTING TREES, FENCES, LANDSCAPING AND OTHER EXISTING FEATURES.
15. ALL EXISTING LANDSCAPING, SIDEWALKS, FENCES, UTILITIES AND OTHER EXISTING IMPROVEMENTS DAMAGED DURING CONSTRUCTION WILL BE REPLACED OR REPAIRED TO THEIR ORIGINAL CONDITION BY THE CONTRACTOR.
16. ALL CONSTRUCTION WHICH HINDERS TRAFFIC OR REQUIRES TRAFFIC DIVERSION SHALL BE IN CONFORMANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
17. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING ABOVE AND BELOW GROUND IMPROVEMENTS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL SYSTEM AT 811 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL POINTS OF CROSSING WITH PROPOSED UNDERGROUND LINES OR EXISTING UNDERGROUND LINES THAT ARE TO BE REMOVED TO DETERMINE IF CONFLICTS EXIST BEFORE BEGINNING ANY CONSTRUCTION. NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICTS. THE CONTRACTOR SHALL NOT MAKE ANY FIELD MODIFICATIONS WITHOUT PRIOR APPROVAL OF THE ENGINEER, COSTELLO INC. 713-783-7788, FAX 713-783-3580.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PURCHASING ANY WATER NEEDED FOR CONSTRUCTION OR TESTING. THE PURCHASE OF WATER FOR CONSTRUCTION OR TESTING WILL BE CONSIDERED INCIDENTAL TO THE VARIOUS OTHER ITEMS OF THE WORK.

DESIGNED BY: <u>RLM</u>	
DESIGN CHECKED BY: <u>JRV</u>	
DRAWN BY: <u>RLM</u>	
COGO CHECKED BY:	
SURVEY CHECKED BY:	
QA/QC BY: _____ DATE: _____	
QA/QC REVISIONS BY: <u>RLM</u>	

NO.	REVISION	DATE	BY

Costello
Engineering and Surveying
2107 CityWest Blvd, 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPFS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION
CONSTRUCTION NOTES



APPROVED: [Signature]
DEVELOPMENT COORDINATOR
DATE: 10/11/18

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	TRAFFIC & WATER PROTECTION
SEWER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

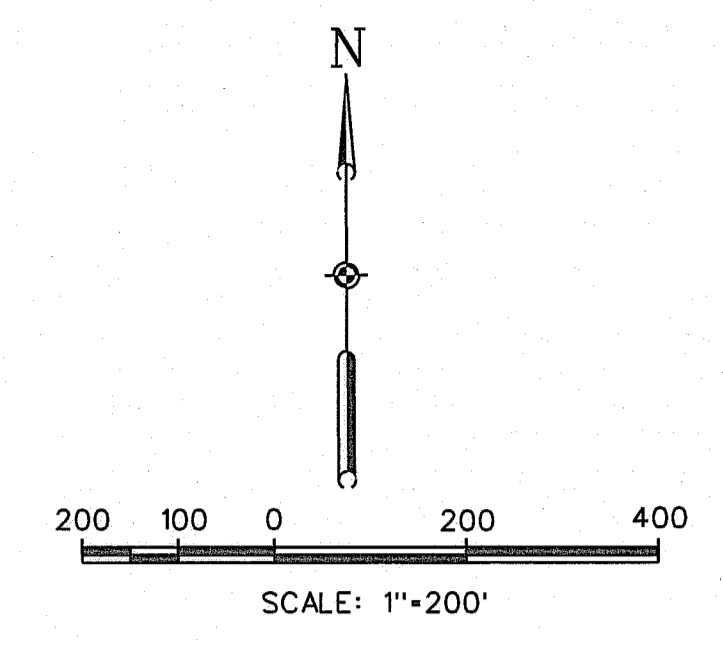
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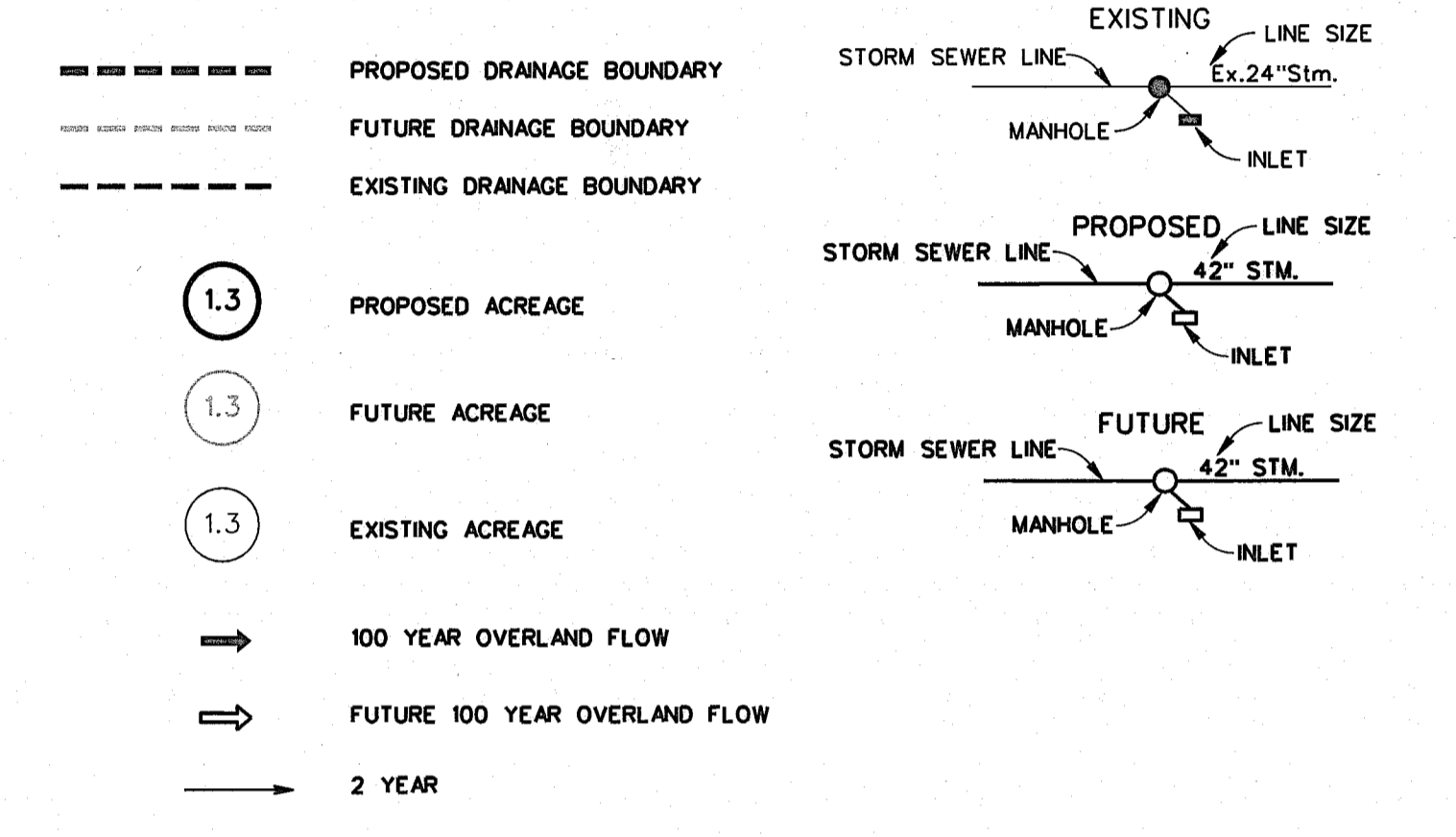
SHEET No: 2 OF 20

61214
CITY DRAWING NUMBER
HOUSTON, TEXAS
8/1/2018

BENCHMARK RM NO. 190045
 BRASS DISK LOCATED ON THE NORTHEAST CORNER OF
 CINDO RANCH BLVD CONCRETE BRIDGE OVER UPPER
 BUFFALO BAYOU (100-00-00), 0.5 MILES SOUTHWEST
 THE INTERSECTION OF CINDO RANCH BLVD. AND
 WESTHEIMER PARKWAY.
 ELEV. 115.25 NAVD 1988, 2001 ADJ.
 TEMPORARY BENCHMARK 2534-69-1
 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB,
 LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY,
 FOURTH INLET NORTH OF THE INTERSECTION OF RANCHO
 BELLA PARKWAY AND BELLAIRE BLVD DIRECTLY ACROSS
 FROM PADOVA DR. THE ENTRANCE TO EXISTING SUBDIVISION
 LAKES OF BELLA TERRA.
 ELEV. 119.54 NAVD 1988, 2001 ADJ.
 TEMPORARY BENCHMARK 2534-70-1
 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB,
 LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY,
 FIRST INLET NORTH OF THE INTERSECTION OF RANCHO
 BELLA PARKWAY AND BELLAIRE BLVD.
 ELEV. 116.72 NAVD 1988, 2001 ADJ.



LEGEND



CANYON GATES AT
 WESTHEIMER LAKES
 PLAT. NO. 200100000
 F.B.C.P.R.

CANYON GATES AT
 WESTHEIMER LAKES
 PLAT. NO. 200100000
 F.B.C.P.R.

LAKES OF
 BELLA TERRA
 SEC. 3
 PLAT. NO. 20070002
 F.B.C.P.R.

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

NOTICE:
 FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO
 CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT
 UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES
 NOT FULFILL YOUR OBLIGATION TO CALL 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date: _____
 CenterPoint Energy/Natural Gas Facilities Verification ONLY.
 (This signature verifies that you have shown CPEP Natural Gas Lines correctly
 not to be used for conflict verification.) (Gas service lines are not shown.)
 Signature Valid for six months.

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

Date: _____
 Approved for AT&T Texas/SWBT Underground Conduit Facilities only.
 Signature Valid for one year.

APPROVED: *[Signature]*
 DEVELOPMENT COORDINATOR

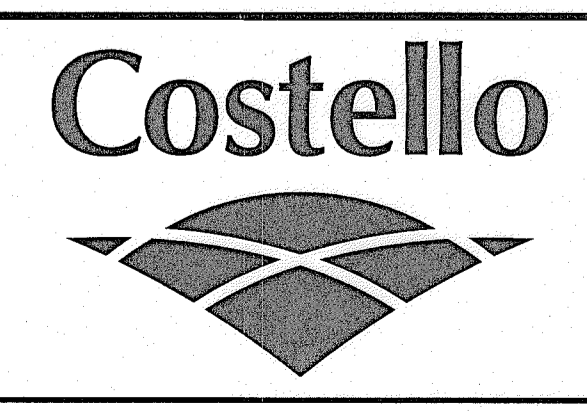
DATE: 10/11/18

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

CITY OF HOUSTON	
HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

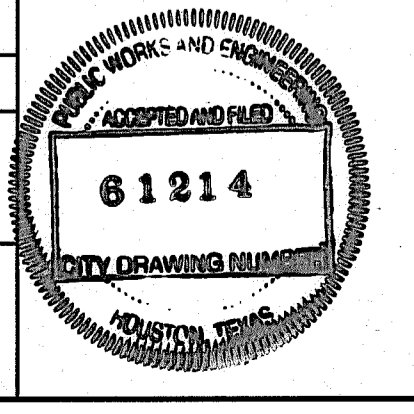
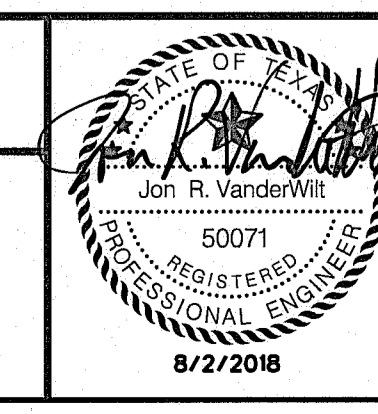
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VERT : 1" = 200'	
SHEET No: 3 OF 20	

DESIGNED BY: RLM	
DESIGN CHECKED BY: TRV	
DRAWN BY: RLM	
COGO CHECKED BY:	
SURVEY CHECKED BY:	
QA/QC BY: _____ DATE: _____	
QA/QC REVISIONS BY: RLM	



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 2107 CityWest Blvd, 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
OVERALL DRAINAGE LAYOUT



WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB No. 200417-CRM-DS-101)

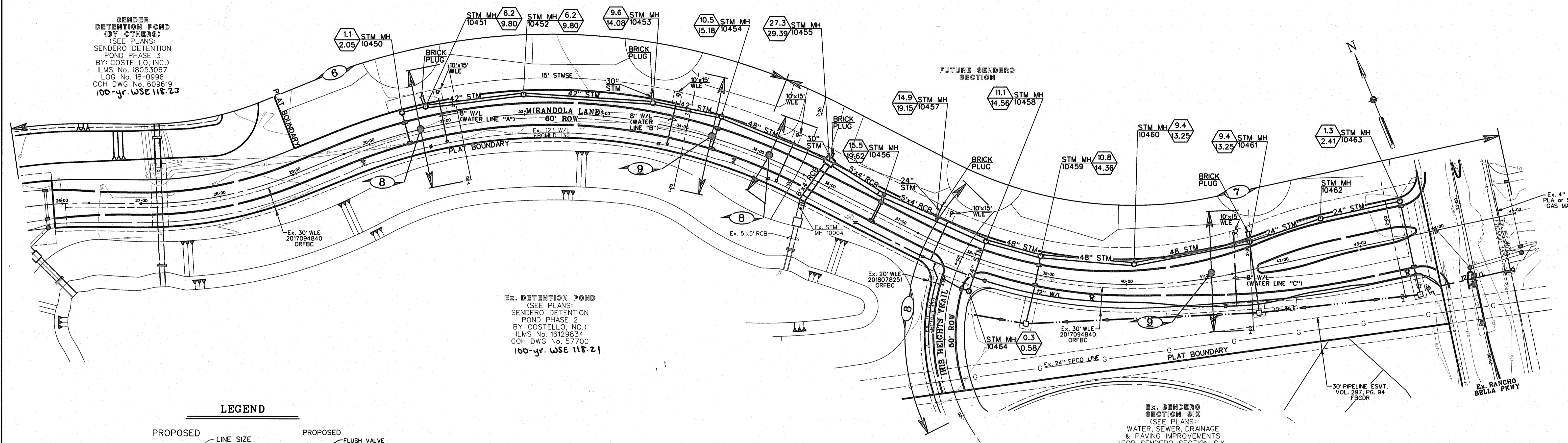
BENCHMARK RM NO. 190045
 BRASS DISK LOCATED ON THE NORTHEAST CORNER OF CINCO RANCH BLVD CONCRETE BRIDGE OVER UPPER BUFFALO BAYOU (100-00-00), 0.5 MILES SOUTHWEST OF THE INTERSECTION OF CINCO RANCH BLVD. AND WESTMEIER PARKWAY
 ELEV. 115.25 NAVD 1988, 2001 ADJ.
 TEMPORARY BENCHMARK 2534-69-1
 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB, LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY, FOURTH INLET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARINE BLVD DIRECTLY ACROSS FROM PADOVA DR. THE ENTRANCE TO EXISTING SUBDIVISION LINES OF BELLA TERRA
 ELEV. 119.54 NAVD 1988, 2001 ADJ.
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 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB, LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY, FIRST INLET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARINE BLVD.
 ELEV. 119.72 NAVD 1988, 2001 ADJ.

FORT BEND COUNTY MUD 132

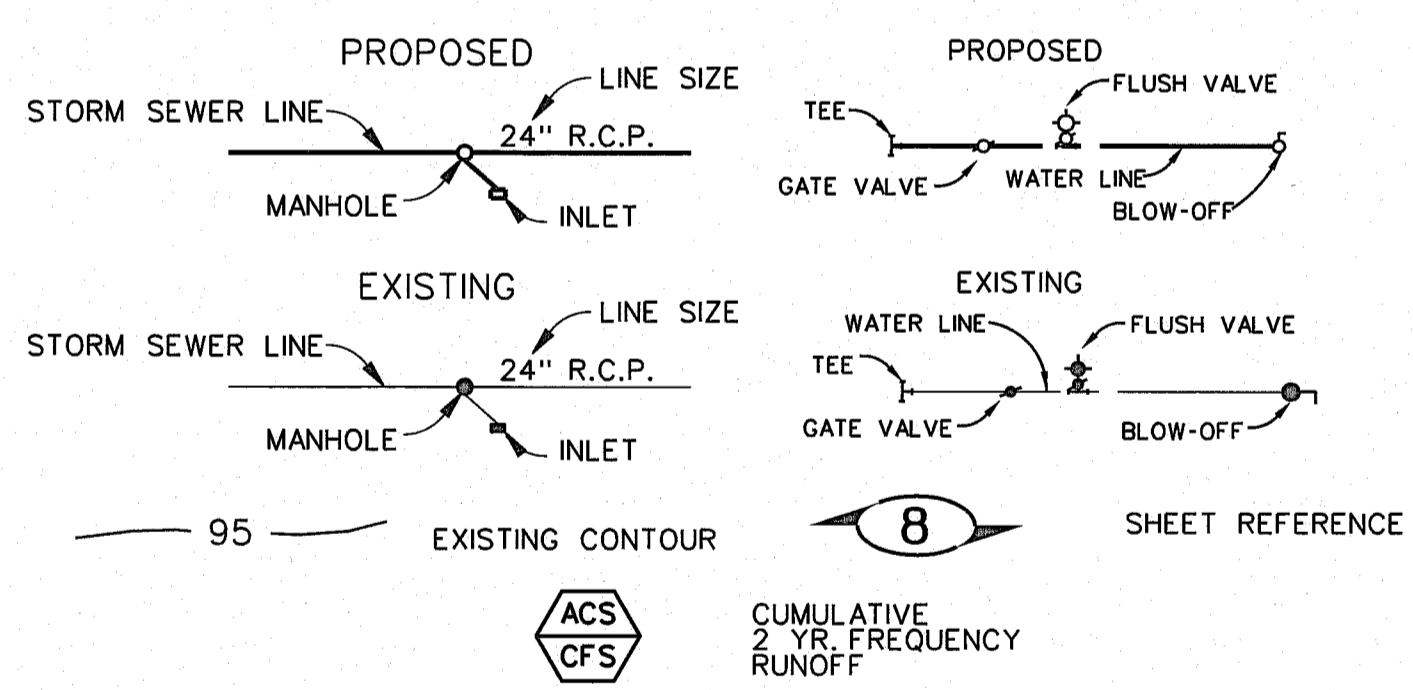
SENDER DETENTION POND (BY OTHERS)
 (SEE PLANS: POND DETENTION POND PHASE 3 BY: COSTELLO, INC.)
 ILMs No. 18053067
 LOG No. 18-0996
 COH DWG No. 609619
 100-yr. WSE 118.23

Ex. DETENTION POND (SEE PLANS: SENDERO DETENTION POND PHASE 2 BY: COSTELLO, INC.)
 ILMs No. 16129834
 COH DWG No. 57700
 100-yr. WSE 118.21

Ex. SENDERO SECTION SIX (SEE PLANS: WATER, SEWER, DRAINAGE & PAVING IMPROVEMENTS FOR SENDERO SECTION SIX BY: COSTELLO, INC.)
 ILMs No. 18015057
 LOG No. 18-0272
 COH DWG No. 60240



LEGEND



TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT AT 713-207-2222.
 NOTICE:
 FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.
VERIFICATION OF PRIVATE UTILITY LINES
 Date: _____
 CenterPoint Energy/Natural Gas Facilities Verification ONLY.
 (This signature verifies that you have shown CPEP Natural Gas lines correctly - not to be used for conflict verification.) (Gas service lines are not shown.)
 Signature Valid for six months.
 Date: _____
 CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
 (This signature verifies existing underground facilities - not to be used for conflict verification.)
 Signature Valid for six months.
 Date: _____
 Approved for AT&T Texas/SWBT Underground Conduit Facilities only.
 Signature Valid for one year.

APPROVED: *[Signature]*
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

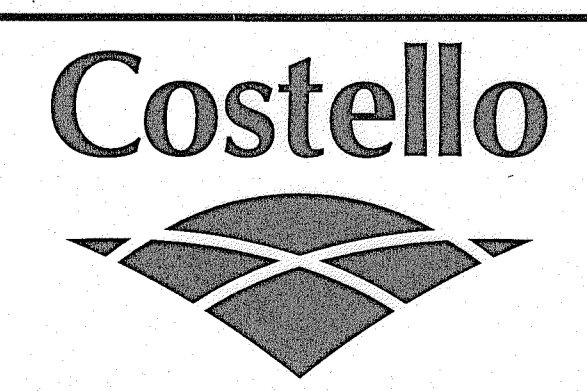
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CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 WATER: *[Signature]* TRAFFIC & TRANSPORTATION
 WASTEWATER: *[Signature]* STORM WATER QUALITY
 STORM: *[Signature]* FACILITIES
 STREET & BRIDGE: *[Signature]*

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY
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 HORZ : 1" = 60'
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 SHEET No: 4 OF 20
 61214
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 HOUSTON, TEXAS

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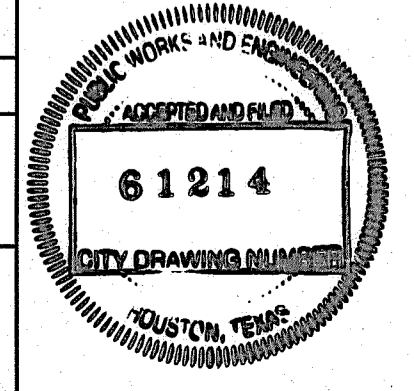
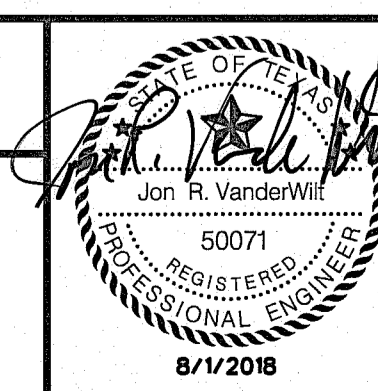
NO.	REVISION	DATE	BY

DESIGNED BY: RLM
 DESIGN CHECKED BY: *[Signature]*
 DRAWN BY: RLM
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: RLM



Engineering and Surveying
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FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
 PAVING, DRAINAGE
 AND WATER LAYOUT



SENDER DETENTION POND (BY OTHERS) (SEE PLANS: SENDERO DETENTION POND PHASE 3 BY: COSTELLO, INC.) ILMs No. 18053067 LOG No. 18-0996 COH DWG No. 609619

Ex. DETENTION POND (SEE PLANS: SENDERO DETENTION POND PHASE 2 BY: COSTELLO, INC.) ILMs No. 16129834 COH DWG No. 57700

REMOVE Ex. TYPE III BARRICADE

REMOVE Ex. TYPE III BARRICADE

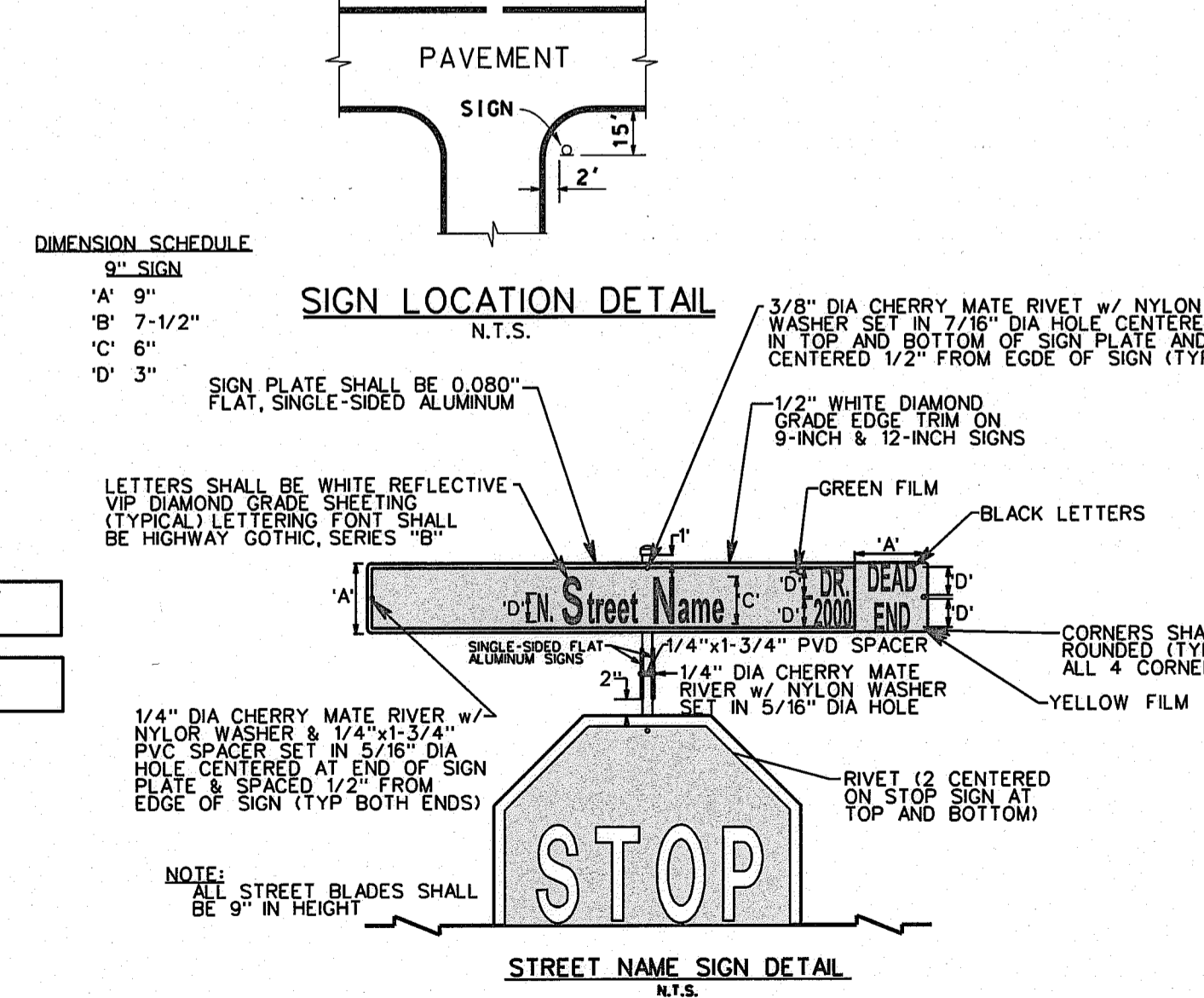
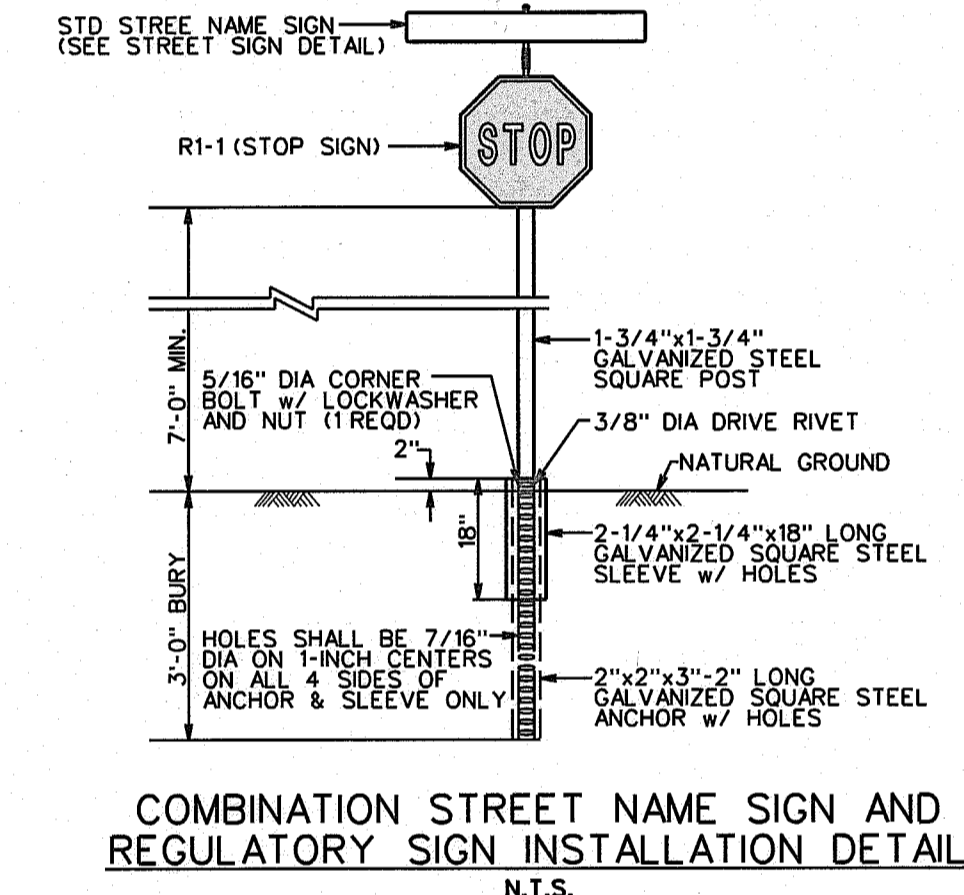
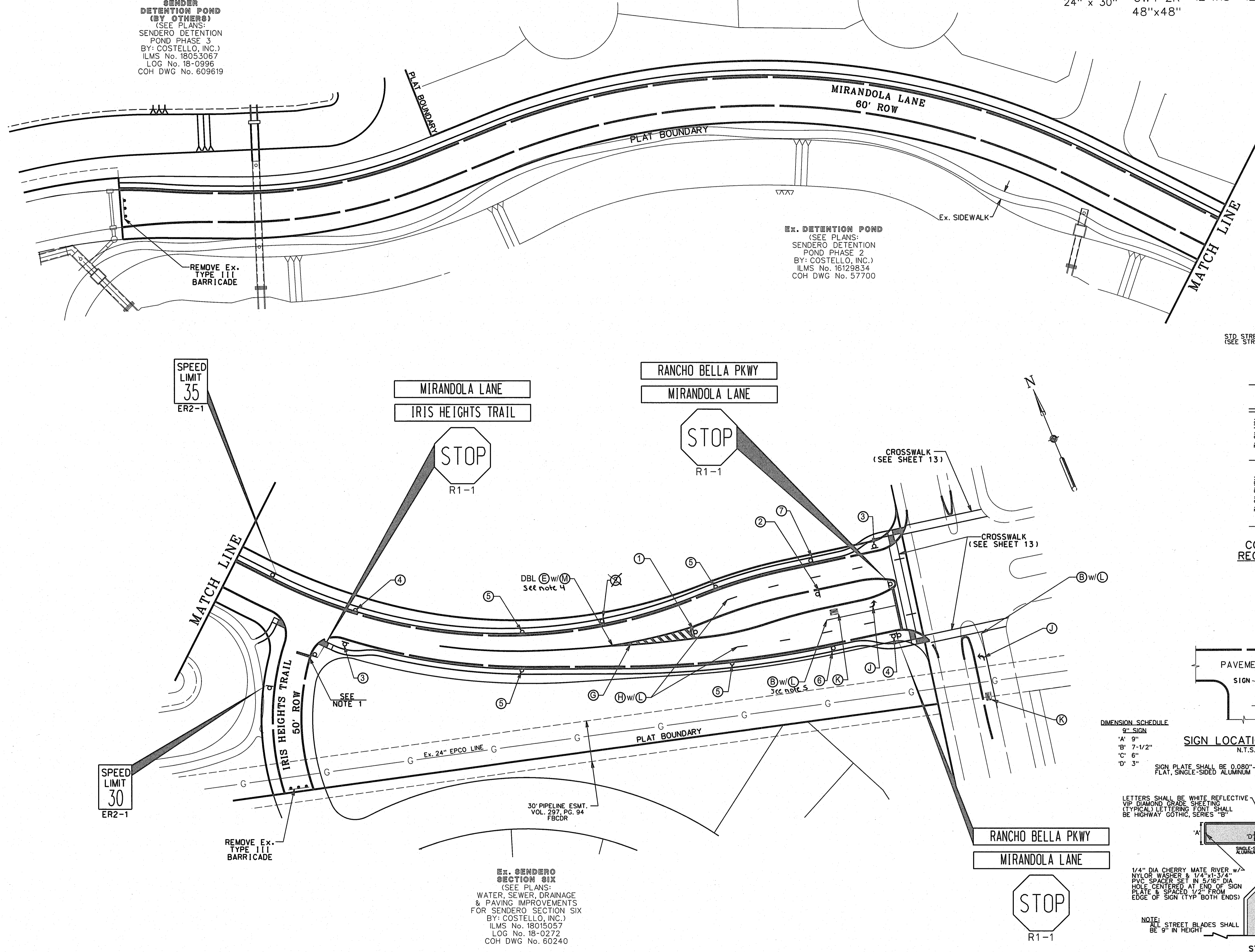
Ex. SENDERO SECTION 812 (SEE PLANS: WATER, SEWER, DRAINAGE & PAVING IMPROVEMENTS FOR SENDERO SECTION 812 BY: COSTELLO, INC.) ILMs No. 18015057 LOG No. 18-0272 COH DWG No. 60240

- 1 R4-7 24" x 30"
- 2 CW4-2R 48" x 48"
- 3 NO PARKING STOPPING STANDING SCHOOL DAYS 7:00-8:00 AM 2:25-3:10 PM 12"x18"
- 4 NO PARKING STOPPING STANDING SCHOOL DAYS 7:00-8:00 AM 2:25-3:10 PM 12"x18"
- 5 NO PARKING STOPPING STANDING SCHOOL DAYS 7:00-8:00 AM 2:25-3:10 PM 12"x18"
- 6 SCHOOL SPEED LIMIT 20 7:00-7:45 AM 2:25-3:10 PM 36" x 48"
- 7 END SCHOOL ZONE 24" x 30"
- S4-3 36" x 8"
- R2-1 36" x 48"
- S4-1a 36" x 48"
- S5-2 24" x 30"
- S5-2a 24" x 10"
- R2-1 36" x 48"
- SPEED LIMIT 35 36" x 48"

BENCHMARK RM NO. 190045
BRASS DISK LOCATED ON THE NORTHEAST CORNER OF CINCO RANCH BLVD. CONCRETE BRIDGE OVER UPPER BUFFALO BAYOU (TYP) 0.5 MILES SOUTHWEST OF THE INTERSECTION OF CINCO RANCH BLVD. AND WESTHEMER PARKWAY.
NAVD 1988 2001 ADJ.
TEMPORARY BENCHMARK 2534-69-1
CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB. LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY. FOURTH MET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARE BLVD. DIRECTLY ACROSS FROM PAVOVA DR. THE ENTRANCE TO EXISTING SUBDIVISION LINES OF BELLA TERRA.
ELEV. 119.54 NAVD 1988, 2001 ADJ.
TEMPORARY BENCHMARK 2534-70-1
CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB. LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY. FIRST MET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARE BLVD.
ELEV. 118.72 NAVD 1988, 2001 ADJ.

- LEGEND**
- (A) REFL PAV MRK (W) 4" (SLD)(100MIL)
 - (B) REFL PAV MRK (W) 8" (SLD)(100MIL)
 - (C) REFL PAV MRK (W) 12" (SLD)(100MIL)
 - (D) REFL PAV MRK (W) 24" (SLD)(100MIL)
 - (E) REFL PAV MRK (Y) 4" (SLD)(100MIL)
 - (F) REFL PAV MRK (Y) 8" (SLD)(100MIL)
 - (G) REFL PAV MRK (Y) 24" (SLD)(100MIL)
 - (SEE SHEET 13 FOR DETAILS)
 - (H) REFL PAV MRK (W) 4" (BRK) (100MIL)
 - (I) PREFAB PAV MRK (W) (ARROW)
 - (K) PREFAB PAV MRK (W) (WORD)
 - (L) REFL PAV MRKR TY2-C-R
 - (M) REFL PAV MRKR TY2-A-A
 - (P) PROPOSED SMALL ROADSIDE SIGN

- NOTES:**
- SOLID 24-INCH WIDE REFLECTORIZED WHITE STOP BAR PLACED 4-FEET IN ADVANCE OF AND PARALLEL TO CROSSWALKS OR NEAREST EDGE OF INTERSECTING ROADWAY.
 - ALL COMBINATION STREET AND REGULATORY SIGNS SHALL BE LOCATED AT CURB RETURNS UNLESS OTHERWISE NOTED.
 - SEE SHEET 13 FOR PAVING MARKING DETAILS.
 - For spacing, see cross hatching detail on sheet 13.
 - For spacing, see typical median section detail on sheet 13.



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

NOTICE:
FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date: _____
CenterPoint Energy/Natural Gas Facilities Verification ONLY.
(This signature verifies that you have shown CPE/Natural Gas Lines correctly not to be used for conflict verification.) (Gas service lines are not shown.)
Signature Valid for six months.

Date: _____
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities.)
Signature Valid for six months.

Date: _____
Approved for AT&T Texas/SWBT Underground Conduit Facilities only.
Signature Valid for one year.

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 10/11/18

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER: _____
SEWER: _____
STORM: _____
STREET & BRIDGE: _____

FOR CITY OF HOUSTON USE ONLY

FILE NO: _____

DRAWING SCALE: _____

HORIZ: 1" = 50'

VERT: _____

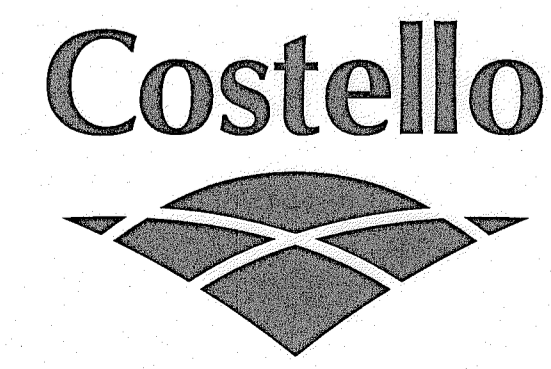
SHEET No. 4.1 of 20

61214
CITY DRAWING NUMBER
HOUSTON, TEXAS

P:\PROJECTS\17 MIRANDOLA\DWG\17 MIRANDOLA.dwg, 11/1/2018 10:11:18 AM

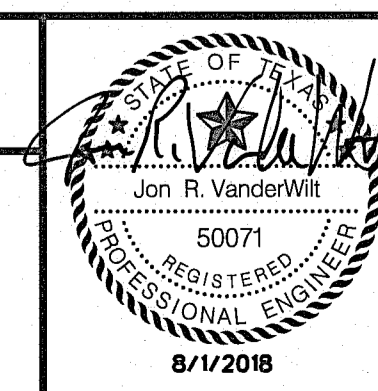
NO.	REVISION	DATE	BY

DESIGNED BY: RLM
DESIGN CHECKED BY: JRV
DRAWN BY: RLM
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: _____ DATE: _____
QA/QC REVISIONS BY: RLM



Engineering and Surveying
2107 CityWest Blvd, 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION
PAVEMENT MARKING AND
SIGNAGE LAYOUT



STORM SEWER CALCULATIONS
CITY OF HOUSTON CRITERIA
Storm Event: 2-YEAR
Project: Mirandola Lane Extension
Date: August 1, 2018
By: JAP

COH I-D-F Coefficients	
Return Freq (yr)	2
b	75.01
d	16.2
e	0.8315
Peaking Factor	1.00

RUNOFF COEFFICIENTS (C) FOR DRAINAGE		COH I-D-F Coefficients		Pipe Size, Length & Type Input		Pipe Hydraulic Data & Design Capacities		Pipe Elevation Data		2-yr Design Computations		Elevations @ Inlet Location		Elevations at D/S High Point in Street		100-Year Analysis Calculations		Check HGL of Act Gutter Depth vs. Nat Grnd @ ROW Locations		Actual Depth in Gutter to Pass Q100-Q2 @ D/S High (Method 2 Only)		100-yr Analysis Check @ D/S High Point																																									
Street Name	Subdivision	FROM M.H.#	TO M.H.#	Drainage Area Name	RESIDENTIAL				Reach (ft)	No. of BBLs	Span (ft)	Height (ft)	Pipe Type	Manning's Coefficient "n"	X-Sept Area of Pipe/Box	Hydraulic Radius (ft)	Flowline Design Slope (%)	Design Velocity (ft/s)	Design Capacity (cfs)	Fall in Pipe (ft)	M.H. Drop (ft)	Pipe Flowline Elevation @ U/S M.H. / D/S M.H.		Pipe Soffit Elevation (ft)	Actual Velocity (ft/s)	Hydraulic Gradient Slope (%)	Headloss (ft)	U/S (ft)	D/S (ft)	Top of Curb (ft)	Gutter (ft)	Natural Ground @ R.O.W. (ft)	HGL Above (+) / Below (-) Gutter @ Inlets (ft)	Top of Curb (ft)	Gutter (ft)	Natural Ground @ R.O.W. (ft)	100-Year Time of Concentration (min)	100-year Flow Computations Intensity "I" (in/hr)	Runoff Flow	Actual Velocity (ft/s)	Hydraulic Gradient Slope (%)	Headloss (ft)	U/S (ft)	D/S (ft)	HGL Above (+) / Below (-) T/C @ Inlets (ft)	100-yr Analysis Check @ Inlet Location	HGL Above (+) / Below (-) T/C @ D/S High (ft)	Actual Depth in Gutter to Pass Q100-Q2 @ D/S High (Method 2 Only)	100-yr Analysis Check @ D/S High Point														
					1/2 ac & Larger Lots	1/2 to 1/4 ac Lots	1/4 ac & Smaller Lots	Townhouse														Delta (ac)	Total (ac)																											Incremental Composite Runoff Coefficient "C"	Sum of C*A	Initial T _c = 10 min (Minimum)	Time of Concentration (T _c)	3-yr Computations Intensity "I" (in/hr)	Runoff Flow (cfs)	Delta (ac)	Total (ac)	Incremental Composite Runoff Coefficient "C"	Sum of C*A	Delta of Trib T _c	Total	Intensity "I" (in/hr)	Runoff Flow (cfs)
Existing Outfall																							149	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.10	0.00	112.42	112.32	116.42	116.32	1.05	0.009	0.013	116.33	116.32	119.09	119.09	119.81	-2.757	119.85	119.52	120.07	27.5	33.7	6.17	31.88	2.54	0.049	0.07	116.39	116.32	-3.197	Method 1 - OK	-3.457	OK	Method 1 - OK
Mirandola	CRM	MH10461	MH10460	B-3	0.00	0.00	0.55	5.17	29.7	41.8	2.56	13.25	119	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.08	0.00	112.32	112.24	116.32	116.24	1.05	0.009	0.010	116.25	116.24	119.09	118.59	119.31	-2.340	119.54	119.21	119.76	1.0	34.7	6.09	31.88	2.54	0.049	0.06	116.29	116.24	-2.791	Method 1 - OK	-3.241	OK	Method 1 - OK										
Mirandola	CRM	MH10460	MH10459	B-3	0.00	0.00	0.55	5.17	2.4	44.2	2.48	13.25	71	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.05	0.00	112.24	112.19	116.24	116.19	1.14	0.010	0.007	116.20	116.19	118.95	118.45	119.17	-2.253	119.54	119.21	119.76	0.8	35.5	6.02	35.78	2.85	0.062	0.04	116.23	116.19	-2.716	Method 1 - OK	-3.306	OK	Method 1 - OK										
Mirandola	CRM	MH10459	MH10458	B-3	1.40	10.80	0.55	5.94	1.9	46.0	2.42	14.36	69	5	X 4	RCB	0.013	19.50	1.160	0.060	3.1	60.28	0.04	0.00	112.19	112.15	116.19	116.15	0.75	0.003	0.002	116.15	116.15	119.54	119.04	119.76	-2.888	119.54	119.21	119.76	26.0	35.9	5.99	36.57	1.88	0.022	0.02	116.17	116.15	-3.375	Method 1 - OK	-3.375	OK	Method 1 - OK									
Mirandola	CRM	MH10458	MH10457	B-3	0.30	11.10	0.55	6.11	29.1	47.1	2.38	14.56	72	5	X 4	RCB	0.013	19.50	1.160	0.060	3.1	60.28	0.04	0.00	112.15	112.11	116.15	116.11	0.98	0.006	0.004	116.12	116.11	119.32	118.82	119.54	-2.704	119.32	118.89	119.44	28.0	36.5	5.84	48.71	2.50	0.039	0.03	116.14	116.11	-3.180	Method 1 - OK	-3.080	OK	Method 1 - OK									
Mirandola	CRM	MH10457	MH10456	B-3	3.80	14.90	0.55	8.20	35.2	48.6	2.34	19.15	81	5	X 4	RCB	0.013	19.50	1.160	0.060	3.1	60.28	0.05	0.00	112.11	112.06	116.11	116.06	1.01	0.006	0.005	116.07	116.06	119.22	118.30	119.02	-2.232	119.22	118.89	119.44	0.5	37.0	5.91	50.36	2.58	0.042	0.03	116.11	116.07	-2.693	Method 1 - OK	-3.113	OK	Method 1 - OK									
Mirandola	CRM	MH10456	MH10455	B-3	0.60	15.50	0.55	8.53	1.2	49.8	2.30	19.62	70	6	X 4	RCB	0.013	19.50	1.160	0.060	3.1	60.28	0.04	0.00	112.06	112.02	116.06	116.02	1.26	0.009	0.006	116.03	116.02	119.22	118.72	119.44	-2.693	119.22	118.89	119.44	40.5	40.5	5.65	84.87	3.64	0.075	0.02	116.01	116.02	-3.147	Method 1 - OK	-3.147	OK	Method 1 - OK									
Mirandola	CRM	MH10455	MH10004	B-3	11.8	27.30	0.55	15.02	64.0	64.0	1.96	29.39	22	6	X 4	RCB	0.013	23.32	1.250	0.060	3.2	75.77	0.01	0.00	112.02	112.00	116.02	116.00	1.26	0.009	0.002	116.00	116.00	119.22	118.72	119.44	-2.721	119.22	118.89	119.44	0.3	40.9	5.63	84.87	3.64	0.075	0.02	116.01	116.00	-3.206	Method 1 - OK	-3.206	OK	Method 1 - OK									
Mirandola	CRM	MH10004	Fitting	B-3	0.00	27.30	0.55	15.02	0.9	65.0	1.94	29.39	35	5	X 5	RCB	0.013	24.50	1.300	0.050	3.0	74.59	0.02	0.00	106.02	106.00	111.02	111.00	1.20	0.008	0.003	112.00	112.00	119.22	118.72	119.44	-6.717	119.22	118.89	119.44	0.1	41.0	5.62	84.87	3.64	0.065	0.02	112.02	112.00	-7.197	Method 1 - OK	-7.197	OK	Method 1 - OK									
Mirandola	CRM	MH10454	Fitting	B-3	0.00	27.30	0.55	15.02	0.3	65.0	1.93	29.39	197	24	RCP	0.013	3.14	0.500	0.180	3.1	9.60	0.35	0.00	114.25	113.89	116.25	115.89	0.77	0.011	0.022	116.36	116.33	119.35	118.85	119.57	-2.495	120.83	120.50	121.05	25.5	25.5	6.96	4.97	1.58	0.048	0.10	116.49	116.39	-2.861	Method 1 - OK	-4.341	OK	Method 1 - OK										
Mirandola	CRM	MH10463	MH10461	B-3	1.30	1.30	0.55	0.72	25.5	25.5	3.37	2.41	67	24	RCP	0.013	3.14	0.500	0.180	3.1	9.60	0.12	0.00	114.70	114.58	116.70	116.58	0.19	0.001	0.000	116.58	116.58	119.80	119.30	120.02	-2.720	119.54	119.21	119.76	23.1	23.1	7.23	1.19	0.38	0.003	0.00	116.58	116.58	-3.218	Method 1 - OK	-2.958	OK	Method 1 - OK										
Mirandola	CRM	MH10464	MH10458	B-3	0.30	0.30	0.55	0.17	23.1	23.1	3.54	0.58	125	42	RCP	0.013	9.62	0.875	0.090	3.1	30.18	0.11	0.50	113.00	112.89	116.50	116.39	1.02	0.009	0.012	116.40	116.39	119.05	118.55	119.27	-2.148	119.56	119.23	119.78	25.6	30.1	6.48	22.11	2.30	0.048	0.06	116.45	116.39	-2.600	Method 1 - OK	-3.110	OK	Method 1 - OK										
Mirandola	CRM	MH10451	MH10452	B-3	0.00	6.20	0.55	3.41	2.0	34.4	2.87	9.80	163	42	RCP	0.013	9.62	0.875	0.090	3.1	30.18	0.15	0.00	112.89	112.74	116.39	116.24	1.02	0.009	0.015	116.26	116.24	119.47	118.97	119.69	-2.715	119.56	119.23	119.78	6.40	31.0	6.40	22.11	2.30	0.048	0.08	116.34	116.26	-3.128	Method 1 - OK	-3.218	OK	Method 1 - OK										
Mirandola	CRM	MH10452	MH10453	B-3	0.00	6.20	0.55	3.41	26.0	34.4	2.87	9.80	88	42	RCP	0.013	9.62	0.875	0.090	3.1	30.18	0.08	0.00	112.74	112.66	116.24	116.16	1.46	0.020	0.017	116.18	116.16	119.11	118.61	119.33	-2.433	119.22	118.89	119.44	29.4	32.2	6.29	33.23	3.45	0.109	0.10	116.26	116.17	-2.847	Method 1 - OK	-2.957	OK	Method 1 - OK										
Mirandola	CRM	MH10453	MH10454	B-3	3.40	9.60	0.55	5.28	34.5	39.1	2.67	14.08	148	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.10	0.50	112.16	112.06	116.16	116.06	1.21	0.011	0.017	116.08	116.06	118.80	118.30	119.02	-2.221	119.22	118.89	119.44	0.4	32.6	6.26	36.14	2.88	0.063	0.09	116.17	116.07	-2.633	Method 1 - OK	-3.053	OK	Method 1 - OK										
Mirandola	CRM	MH10454	MH10455	B-3	0.90	10.50	0.55	5.78	1.0	40.1	2.63	15.18	31	24	RCP	0.013	3.14	0.500	0.180	3.1	9.60	0.06	0.00	113.85	113.79	115.85	115.79	0.65	0.008	0.003	116.40	116.40	118.95	118.45	119.17	-2.046	119.56	119.23	119.78	25.2	25.2	6.99	4.23	1.35	0.035	0.01	116.46	116.45	-2.489	Method 1 - OK	-3.099	OK	Method 1 - OK										
Mirandola	CRM	MH10450	MH10451	B-3	1.10	1.10	0.55	0.61	25.2	25.2	3.40	2.05	149	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.10	0.00	112.42	112.32	116.42	116.32	1.80	0.025	0.037	116.36	116.32	119.09	119.09	119.81	-2.733	119.85	119.52	120.07	11.0	13.8	10.42	67.37	5.36	0.220	0.33	117.42	117.09	-2.171	Method 1 - OK	-2.431	OK	Method 1 - OK										
Mirandola	CRM	MH10461	MH10460	B-3	0.00	0.00	0.55	5.17	12.4	19.9	4.38	22.63	119	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.08	0.00	112.32	112.24	116.32	116.24	1.80	0.025	0.030	116.27	116.24	119.09	118.59	119.31	-2.320	119.54	119.21	119.76	0.5	14.2	10.29	67.37	5.36	0.220	0.26	117.09	116.83	-1.998	Method 1 - OK	-2.448	OK	Method 1 - OK										
Mirandola	CRM	MH10460	MH10459	B-3	0.00	0.00	0.55	5.17	1.4	21.2	4.23	22.63	71	48	RCP	0.013	12.57	1.000	0.070	3.0	38.00	0.05	0.00	112.24	112.19	116.24	116.19	1.94	0.029	0.021	116.21	116.19	118.95	118.45	119.17	-2.239	119.54	119.21	119.76	0.4	14.6	10.19	75.69	6.02	0.278	0.20	116.83	116.63	-2.120														

Storm Sewer Collection System - 100-Year Frequency
 Design and Calculations per FBC
 Fort Bend County MUD 132

100 Year Inlet Capacity	
Existing Out DP3	CY Fill
Q (3)	= 47.9 CFS
Q (100)	= 151.2 CFS
Q EXCESS	103.3 CFS

MH 10456	
LOWEST TOP OF CURB =	118.80
THROAT OF INLET =	118.30
MAXIMUM PONDING LEVEL =	119.00
PONDING LEVEL ABOVE CURB=	0.20
MH 10454	
LOWEST TOP OF CURB =	118.78
THROAT OF INLET =	118.28
MAXIMUM PONDING LEVEL =	119.00
PONDING LEVEL ABOVE CURB=	0.22

Type "B-B"-Mod 5.43 sq. ft

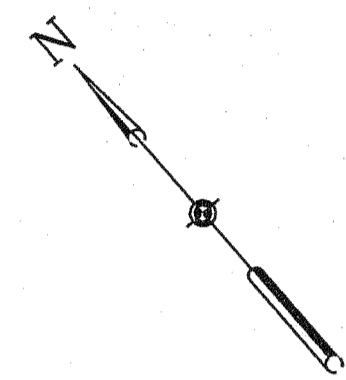
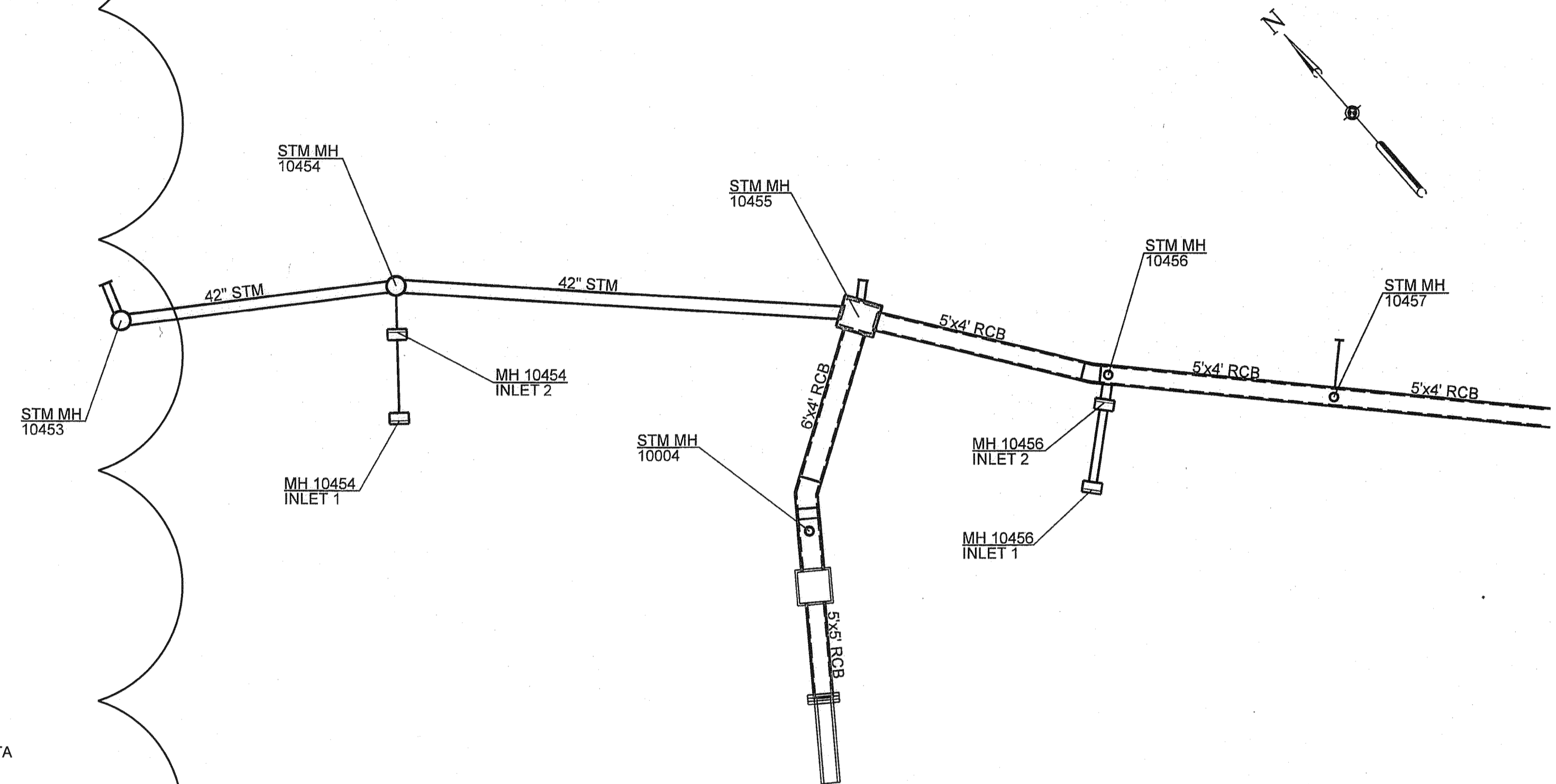
Length Over Grass (ft) =	140
Length Over Pavement (ft) =	1820
Time of Concentration =	25.00
i	8.06
C	0.85
Area with 0.85	27.30
C	0.55
Area with 0.55	15.02
CA	1.25 peak factor
Q (100)=	151.2

INLET #	INLET TYPE	Q (3)	Hydraulic Grade Line	AVAILABLE HEAD (=Max Ponding-Throat)	CALCULATED INLET CAPACITY	ASSUMED INLET CAPACITY	% per INLET
MH 10456 Inlet 1	Type "B-B"-Mod	0.38	116.35	0.70	29.2	26.0	25%
MH 10456 Inlet 2	Type "B-B"-Mod	0.38	116.24	0.70	29.2	26.0	25%
MH 10454 Inlet 1	Type "B-B"-Mod	0.95	116.35	0.72	29.6	27.0	25%
MH 10454 Inlet 2	Type "B-B"-Mod	0.95	116.24	0.72	29.6	27.0	25%

TOTAL FLOWS TAKEN IN BY INLETS: 117.5 CFS > 105.9 CFS REQUIRED
 ADEQUATE INLET CAPACITY

Existing Outfall

From	To	Q	Reach	Pipe Diameter (inches) or Span (ft) X Height (ft)	Pipe Type	X-Sect Area of Pipe/Bo	Actual v	Manning Coefficient	Hydraulic radius	Hyd. Slope	Head Loss	EI Hyd Grad US	DS	UPSTREAM Gutter Elevation	Top of Curb	DELTA Gutter-HGL
MH 10456 Inlet 1	MH 10456 Inlet 2	26.0	28	30	RCP	4.91	5.30	0.013	0.625	0.40	0.11	116.35	116.24	118.30	118.80	1.95
MH 10456 Inlet 2	MH 10456	52.0	8	36	RCP	7.07	7.36	0.013	0.750	0.61	0.05	116.24	116.19	118.30	118.80	2.06
MH 10456	MH 10455	52.8	81	5 X 4	RCB	19.50	2.71	0.015	1.160	0.06	0.05	116.24	116.19	118.30	118.80	2.06
MH 10455	MH 10004	131.6	70	6 X 4	RCB	23.32	5.64	0.015	1.250	0.24	0.17	116.19	116.02	118.72	119.22	2.53
Fitting	Existing Outfall	131.6	35	5 X 5	RCB	24.50	5.37	0.015	1.300	0.21	0.07	112.07	112.00	118.72	119.22	6.65
MH 10454 Inlet 1	MH 10454 Inlet 2	27.0	28	24	RCP	3.14	8.58	0.013	0.500	1.42	0.40	117.44	117.04	118.28	118.78	0.84
MH 10454 Inlet 2	MH 10454	53.9	15	24	RCP	3.14	17.16	0.013	0.500	5.68	0.85	117.04	116.19	118.28	118.78	1.24
MH 10454	MH 10455	78.8	148	48	RCP	12.57	6.27	0.013	1.000	0.30	0.45	116.68	116.24	118.30	118.80	1.62



APPROVED: *[Signature]*
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

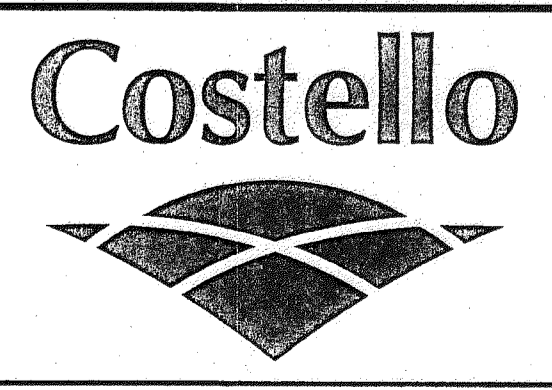
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES	
CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY
 DRAWING SCALE
 HORZ : N.T.S.
 VERT : N.T.S.
 SHEET No: 5.1 of 20
 61214
 8/2/2018

C:\Users\jmiranda\OneDrive\Documents\181117\MIRANDOLA_LANE_EXTENSION\181117_STORM_CALCULATIONS.dwg

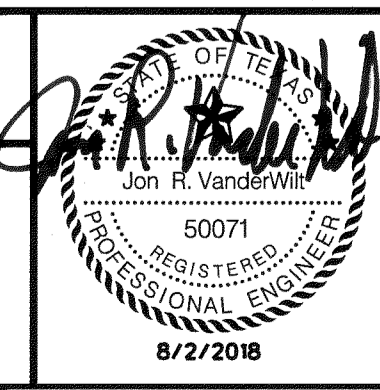
NO.	REVISION	DATE	BY
1	REVISED STORM CALCULATION	9/19/2018	JRV
2		9/20/2018	

DESIGNED BY: *RLM*
 DESIGN CHECKED BY: *JRV*
 DRAWN BY: *RLM*
 COGO CHECKED BY:
 SURVEY CHECKED BY:
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: *RLM*



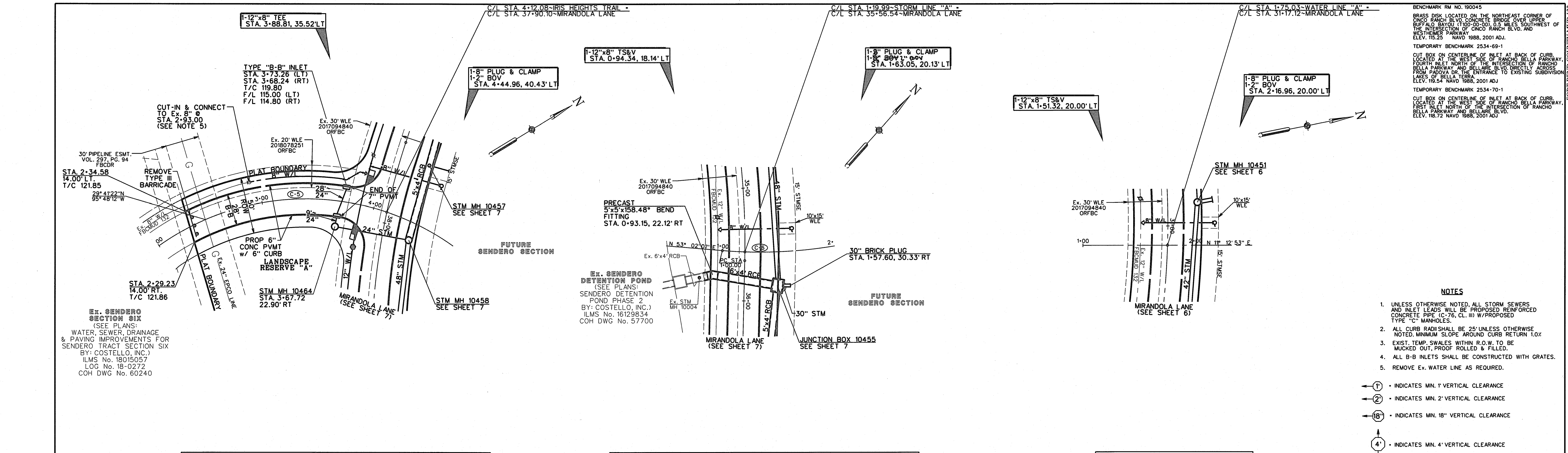
Engineering and Surveying
 2107 CityWest Blvd, 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
 STORM CALCULATIONS
 (SHEET 2 OF 2)



FORT BEND COUNTY MUD 132 WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB No. 200417-CRM-DS-01)

WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB NO. 2004117-CRM-DS-101) FORT BEND COUNTY MUD 132

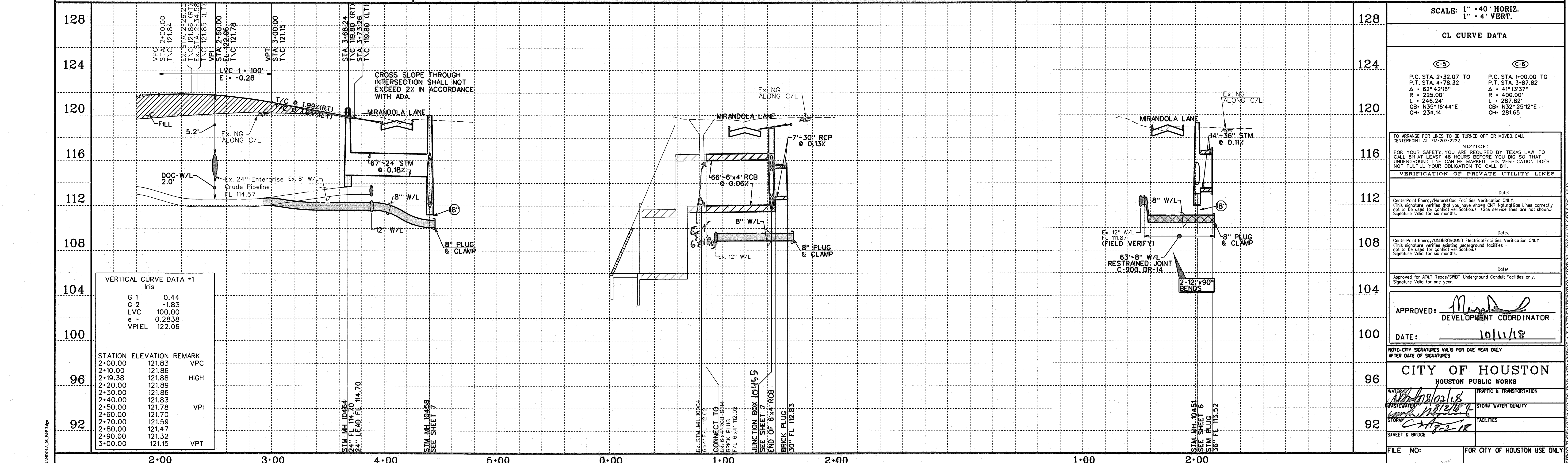


BENCHMARK RM NO. 190045
BRASS DISK LOCATED ON THE NORTHEAST CORNER OF CINCO RANCH BLVD. CONCRETE BRIDGE OVER UPPER BUFFALO BAYOU (1100-00-00) 0.5 MILES SOUTHWEST OF WESTHEWER PARKWAY.
ELEV. 115.25 NAVD 1988, 2001 ADJ.
TEMPORARY BENCHMARK 2534-69-1
CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB, LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY, FOURTH INLET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARE BLVD DIRECTLY ACROSS FROM PADDOVA DR. THE ENTRANCE TO EXISTING SUBDIVISION LINES OF BELLA TERRA.
ELEV. 119.54 NAVD 1988, 2001 ADJ.
TEMPORARY BENCHMARK 2534-70-1
CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB, LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY, FIRST INLET NORTH OF THE INTERSECTION OF RANCHO BELLA PARKWAY AND BELLARE BLVD.
ELEV. 118.72 NAVD 1988, 2001 ADJ.

- NOTES**
- UNLESS OTHERWISE NOTED, ALL STORM SEWERS AND INLET LEADS WILL BE PROPOSED REINFORCED CONCRETE PIPE (C-76, CL III) W/PROPOSED TYPE "C" MANHOLES.
 - ALL CURB RADI SHALL BE 25' UNLESS OTHERWISE NOTED. MINIMUM SLOPE AROUND CURB RETURN 1:0.
 - EXIST. TEMP. SWALES WITHIN R.O.W. TO BE MUCKED OUT, PROOF ROLLED & FILLED.
 - ALL B-B INLETS SHALL BE CONSTRUCTED WITH GRATES.
 - REMOVE EX. WATER LINE AS REQUIRED.
- ① - INDICATES MIN. 1' VERTICAL CLEARANCE
② - INDICATES MIN. 2' VERTICAL CLEARANCE
⑧ - INDICATES MIN. 18" VERTICAL CLEARANCE
④ - INDICATES MIN. 4' VERTICAL CLEARANCE

IRIS HEIGHTS TRAILS (50' ROW) STORM LINE "A" WATER LINE "A"

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



VERTICAL CURVE DATA *1
Iris

G 1	0.44
G 2	-1.83
LVC	100.00
e	0.2838
VPI EL	122.06

STATION ELEVATION REMARK

2+00.00	121.83	VPC
2+10.00	121.86	
2+19.38	121.88	HIGH
2+20.00	121.89	
2+30.00	121.86	
2+40.00	121.83	
2+50.00	121.78	VPI
2+60.00	121.70	
2+70.00	121.59	
2+80.00	121.47	
2+90.00	121.32	
3+00.00	121.15	VPT

SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

C-5	C-6
P.C. STA. 2+32.07 TO P.T. STA. 4+78.32	P.C. STA. 1+00.00 TO P.T. STA. 3+87.82
Δ = 62°42'16"	Δ = 41°13'37"
R = 225.00'	L = 400.00'
L = 246.24'	L = 287.82'
CB = N35°16'44"E	CB = N32°25'12"E
CH = 234.14	CH = 281.65

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

NOTICE:
FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND UTILITIES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date: _____
CenterPoint Energy/Natural Gas Facilities Verification ONLY.
(This signature verifies that you have shown CIP Natural Gas Lines correctly not to be used for conflict verification.) (Gas service lines are not shown.)
Signature Valid for six months.

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

Date: _____
Approved for AT&T Texas/SWB Undergound Conduit Facilities only.
Signature Valid for one year.

APPROVED: *[Signature]*
DEVELOPMENT COORDINATOR

DATE: 10/11/18

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	TRAFFIC & TRANSPORTATION
SEWER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

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

SHEET No: 8 OF 20

8/2/2018

NO.	REVISION	DATE	BY

Costello
Engineering and Surveying
2107 CityWest Blvd, 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

DESIGNED BY: RLM
DESIGN CHECKED BY: JRV
DRAWN BY: RLM
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: _____ DATE: _____
QA/QC REVISIONS BY: RLM

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION

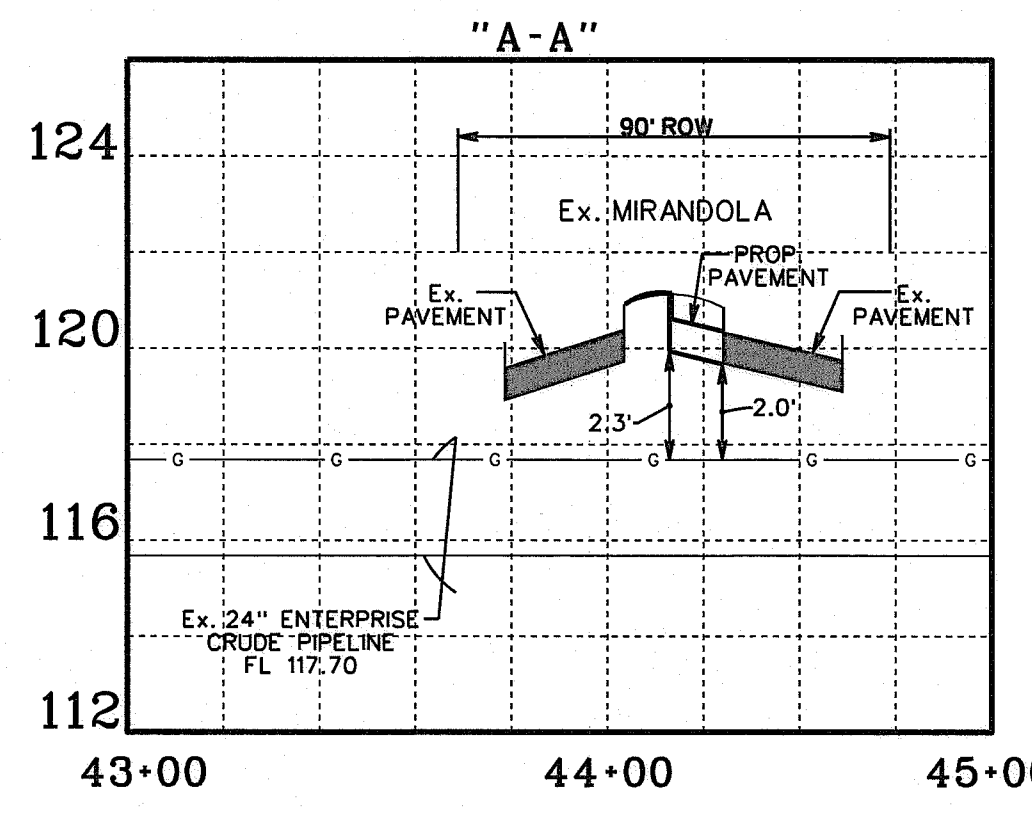
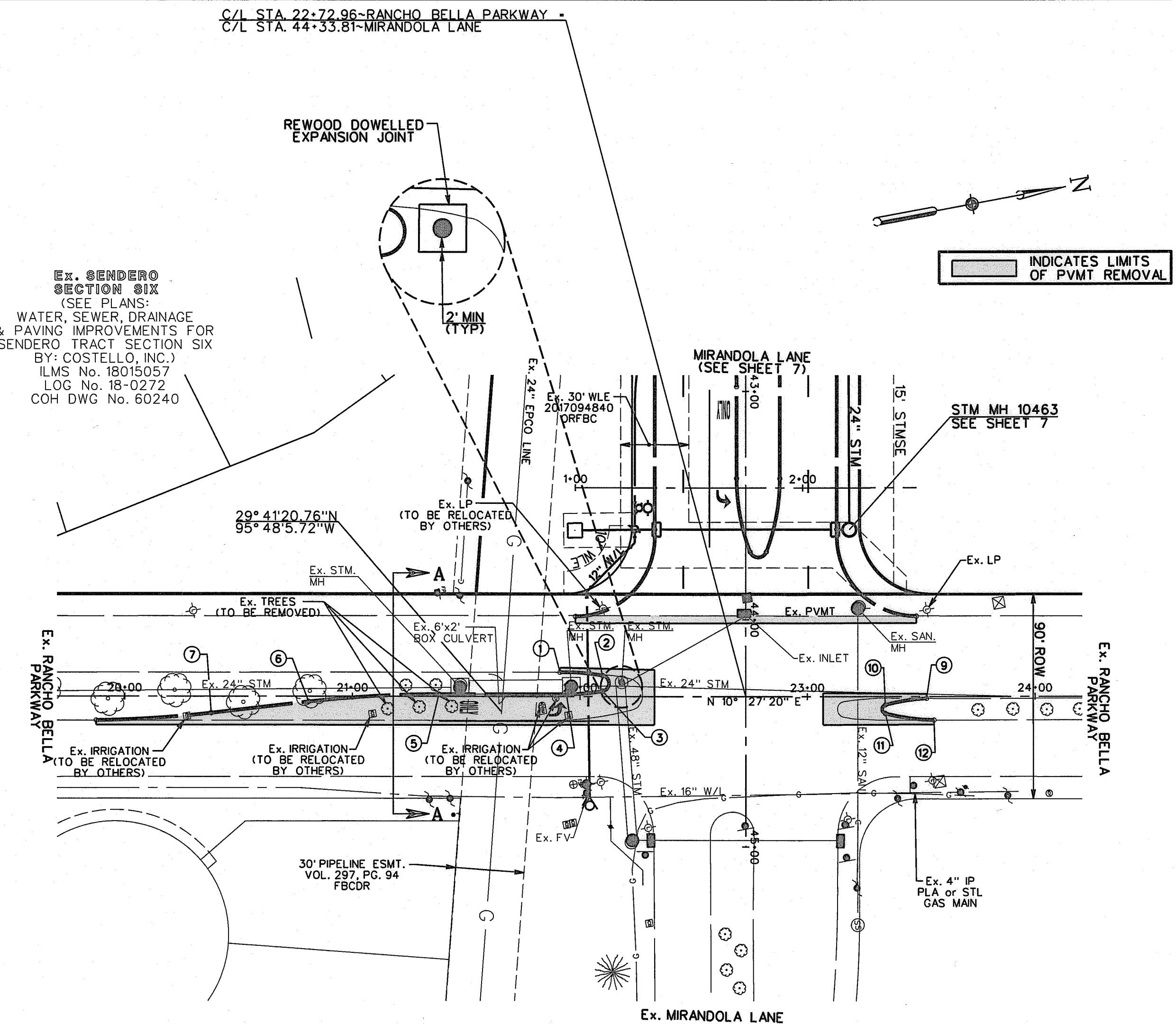
**IRIS HEIGHTS TRAILS,
STORM LINE "A"
AND WATER LINE "A"**

8/2/2018

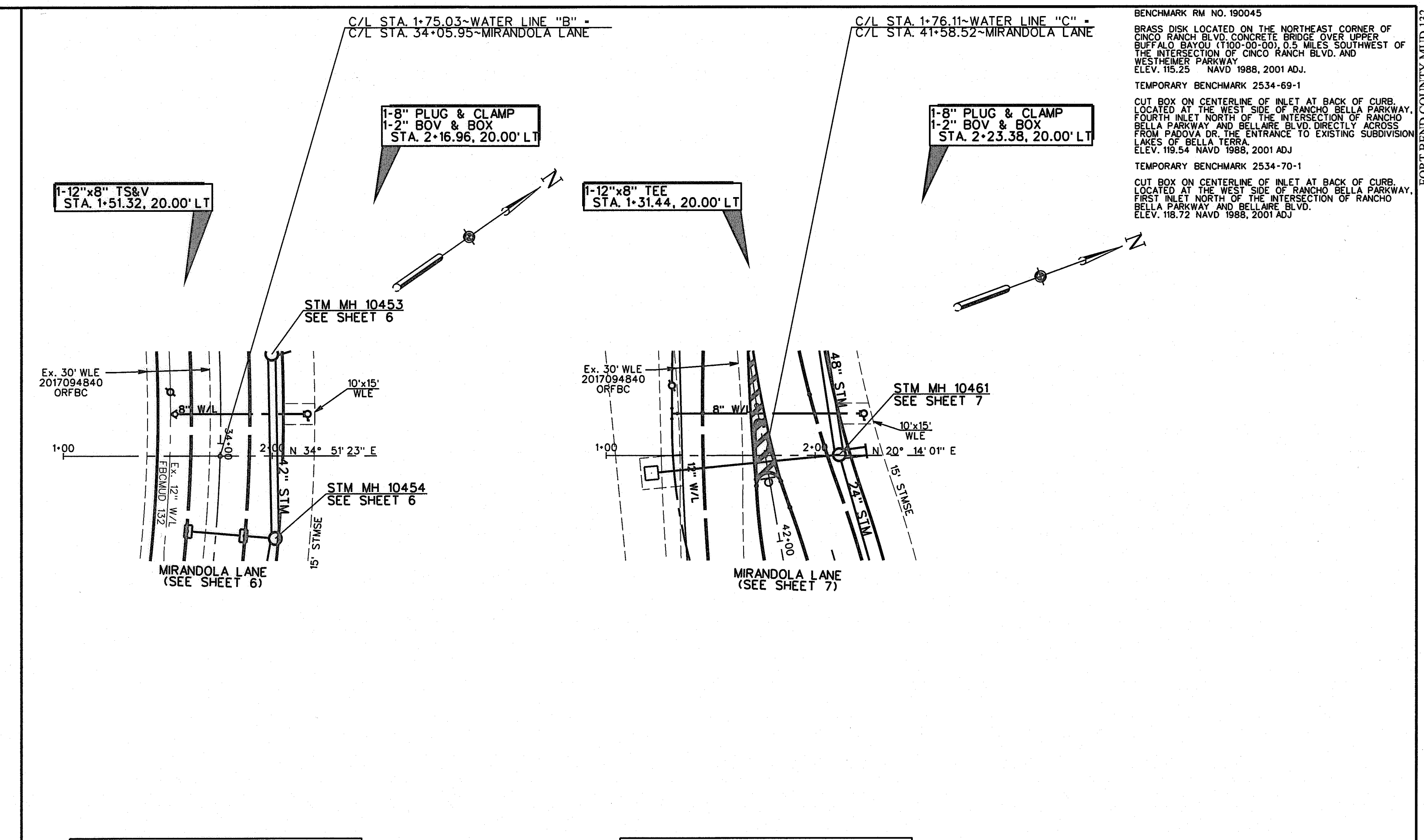
[Professional Engineer Seal]
Joni R. VanderWilt
REGISTERED PROFESSIONAL ENGINEER
50071

61214

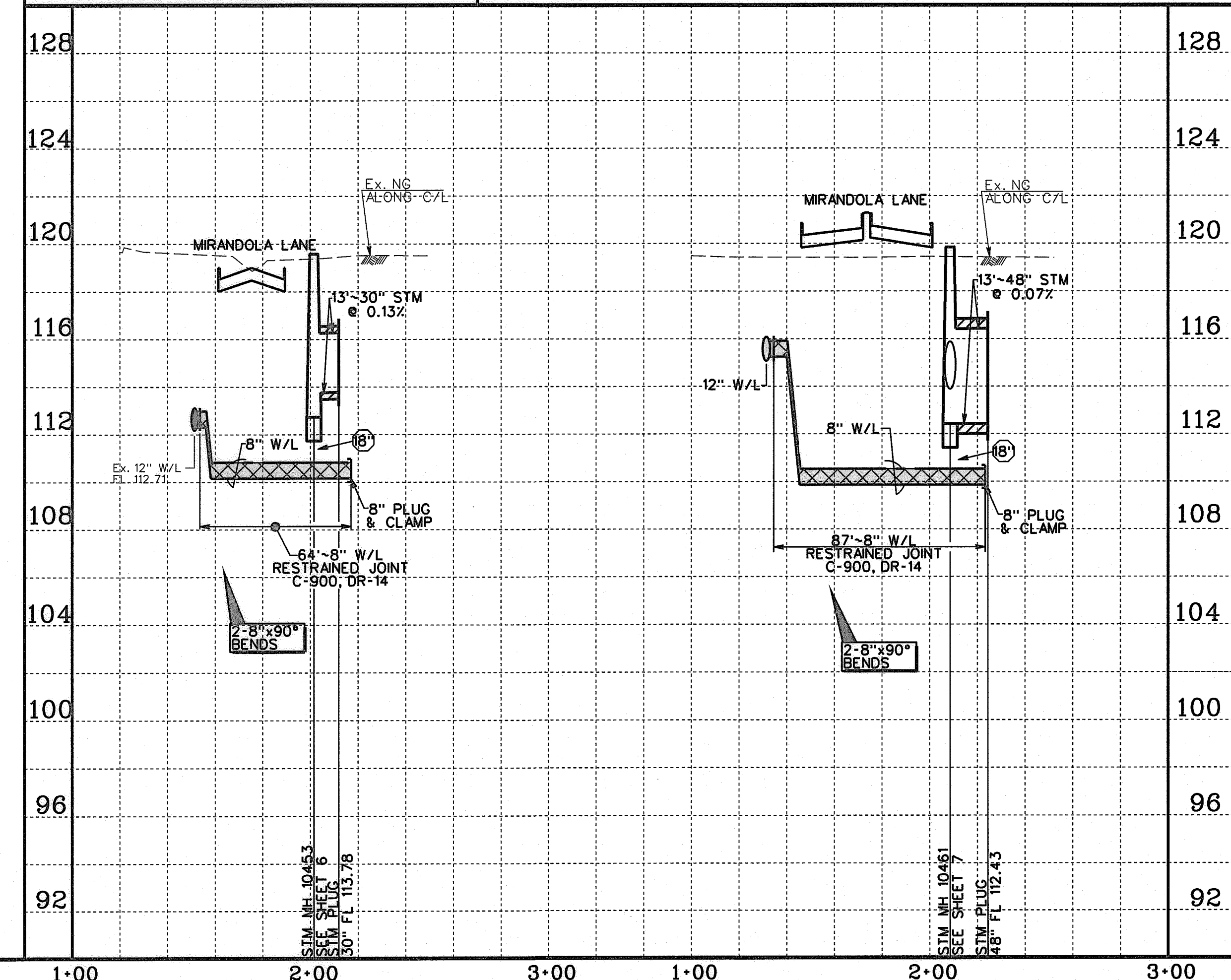
EX. SENDERO SECTION SIX (SEE PLANS: WATER, SEWER, DRAINAGE & PAVING IMPROVEMENTS FOR SENDERO TRACT SECTION SIX BY: COSTELLO, INC.) LMS No. 18015057 LOG No. 18-0272 COH DWG No. 60240



MARK	STATION	OFFSET
1	21-91.18	10.62' LT
2	22-09.91	9.26' LT
3	22-09.91	2.37' LT
4	21-94.07	0.96' LT
5	21-37.99	0.96' LT
6	20-80.78	2.32' RT
7	20-37.96	7.26' RT
8	19-87.45	10.50' RT
9	23-52.40	0.83' RT
10	23-34.32	3.70' RT
11	23-34.32	7.45' RT
12	23-55.70	10.38' RT



WATER LINE "B" **WATER LINE "C"**
 CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

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

NOTICE: FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.

VERIFICATION OF PRIVATE UTILITY LINES

Date: _____

CenterPoint Energy/Natural Gas Facilities Verification ONLY. (This signature verifies that you have shown CPE/Natural Gas lines correctly not to be used for conflict verification.) (Gas service lines are not shown.) Signature Valid for six months.

Date: _____

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

Date: _____

Approved for AT&T Texas/SWB Underground Conduit Facilities only. Signature Valid for one year.

APPROVED: *Manda*
DEVELOPMENT COORDINATOR

DATE: 10/11/18

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

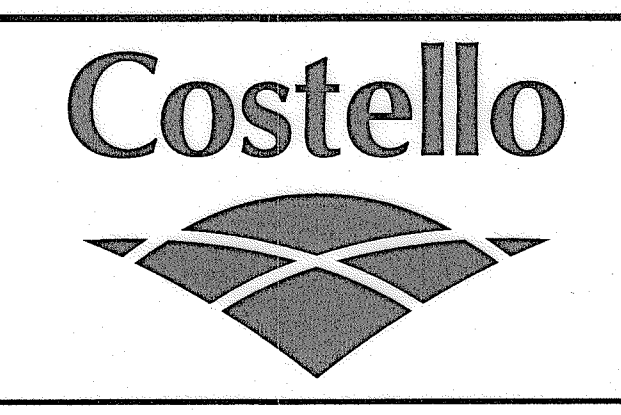
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

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

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

NO.	REVISION	DATE	BY

DESIGNED BY: *ELM*
 DESIGN CHECKED BY: *SRV*
 DRAWN BY: *ELM*
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: *ELM*



Engineering and Surveying
 2107 CityWest Blvd, 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
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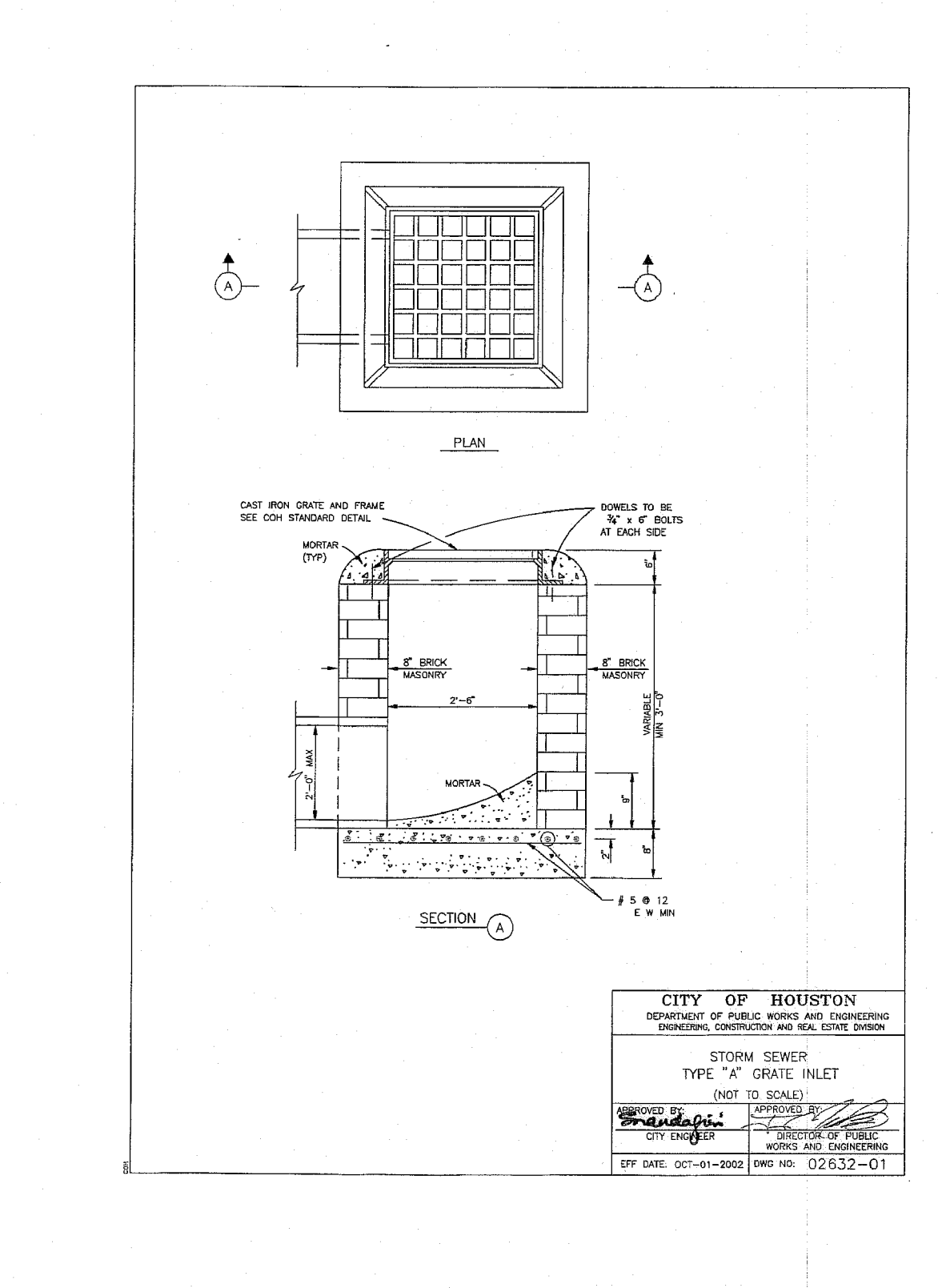
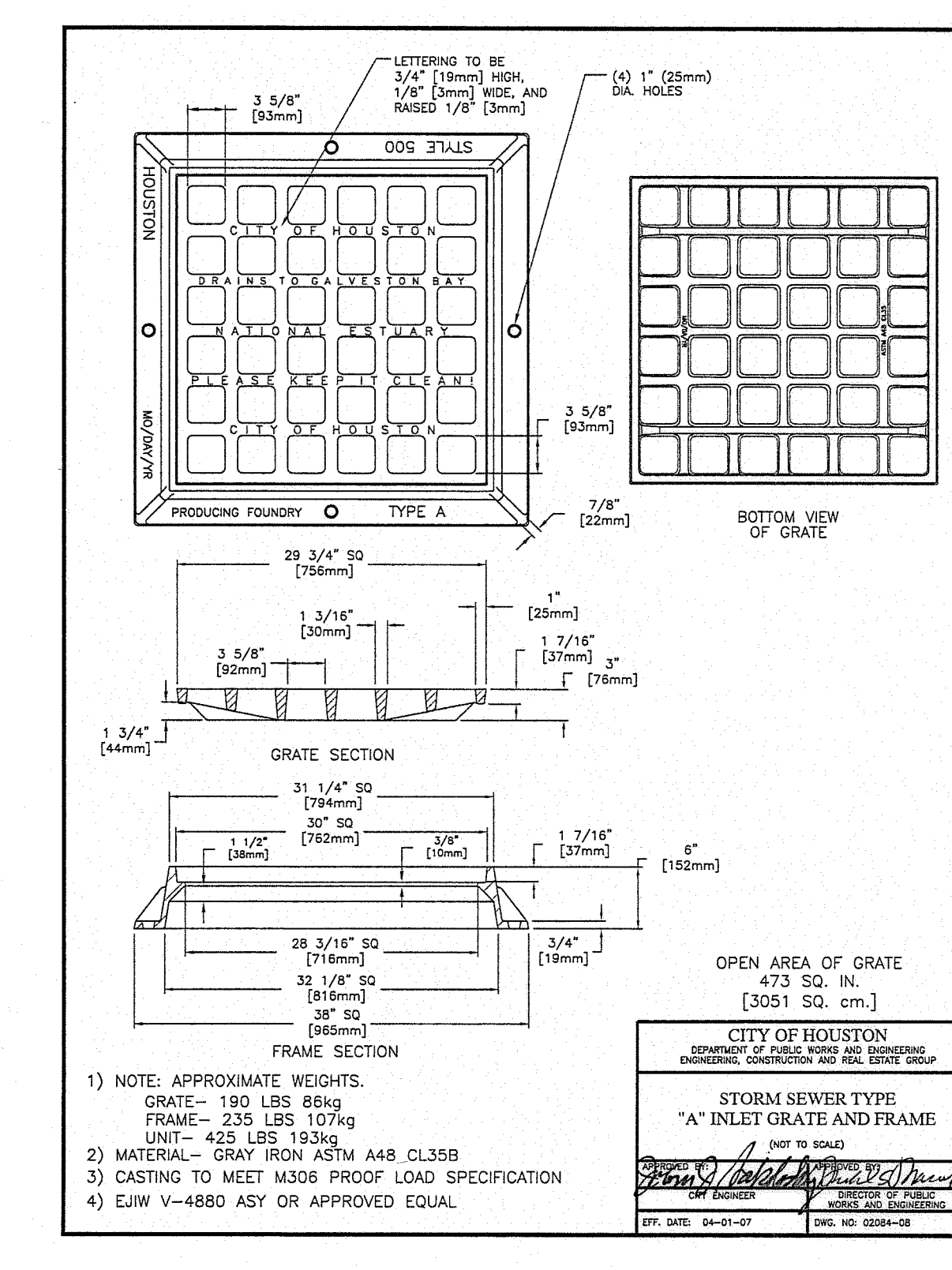
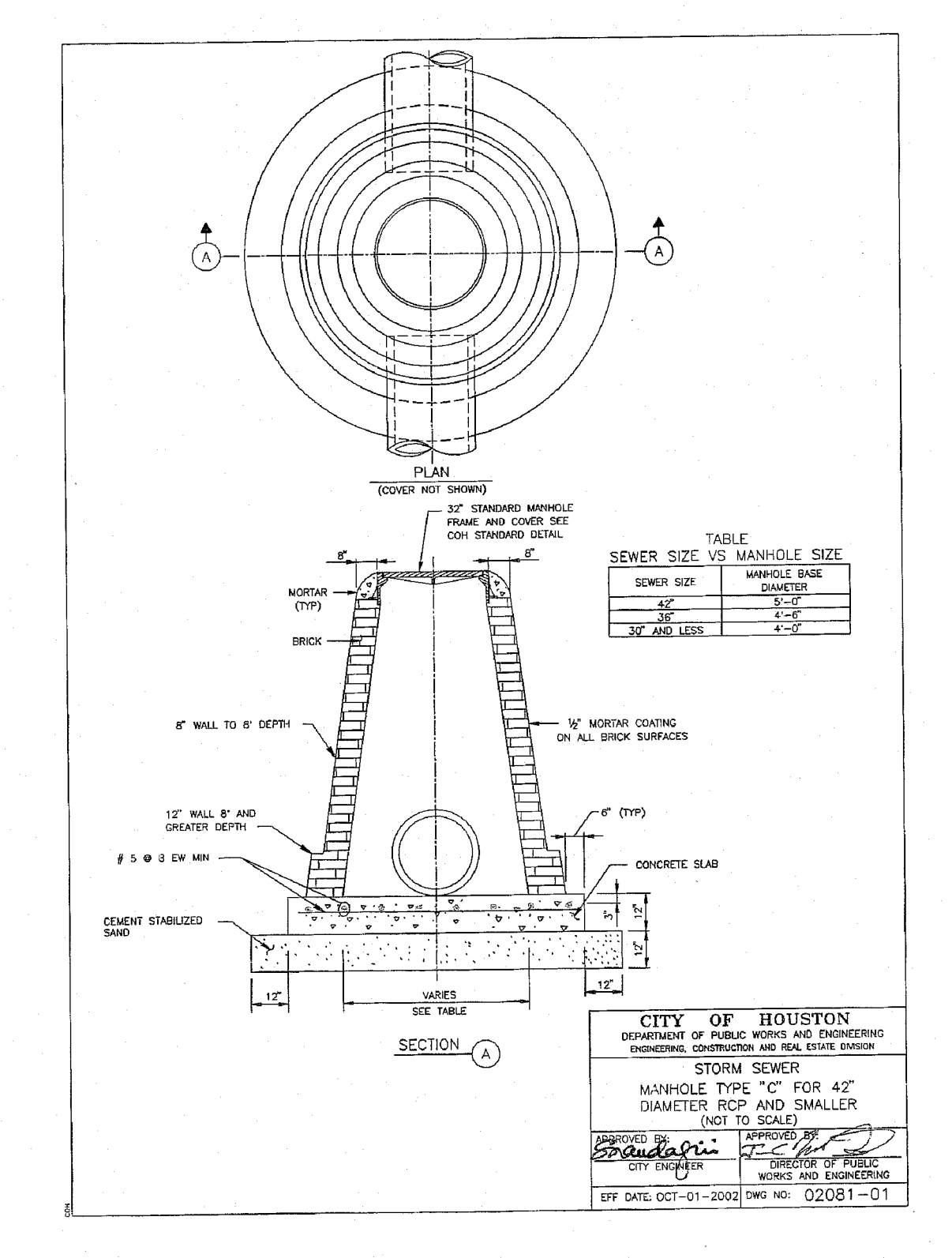
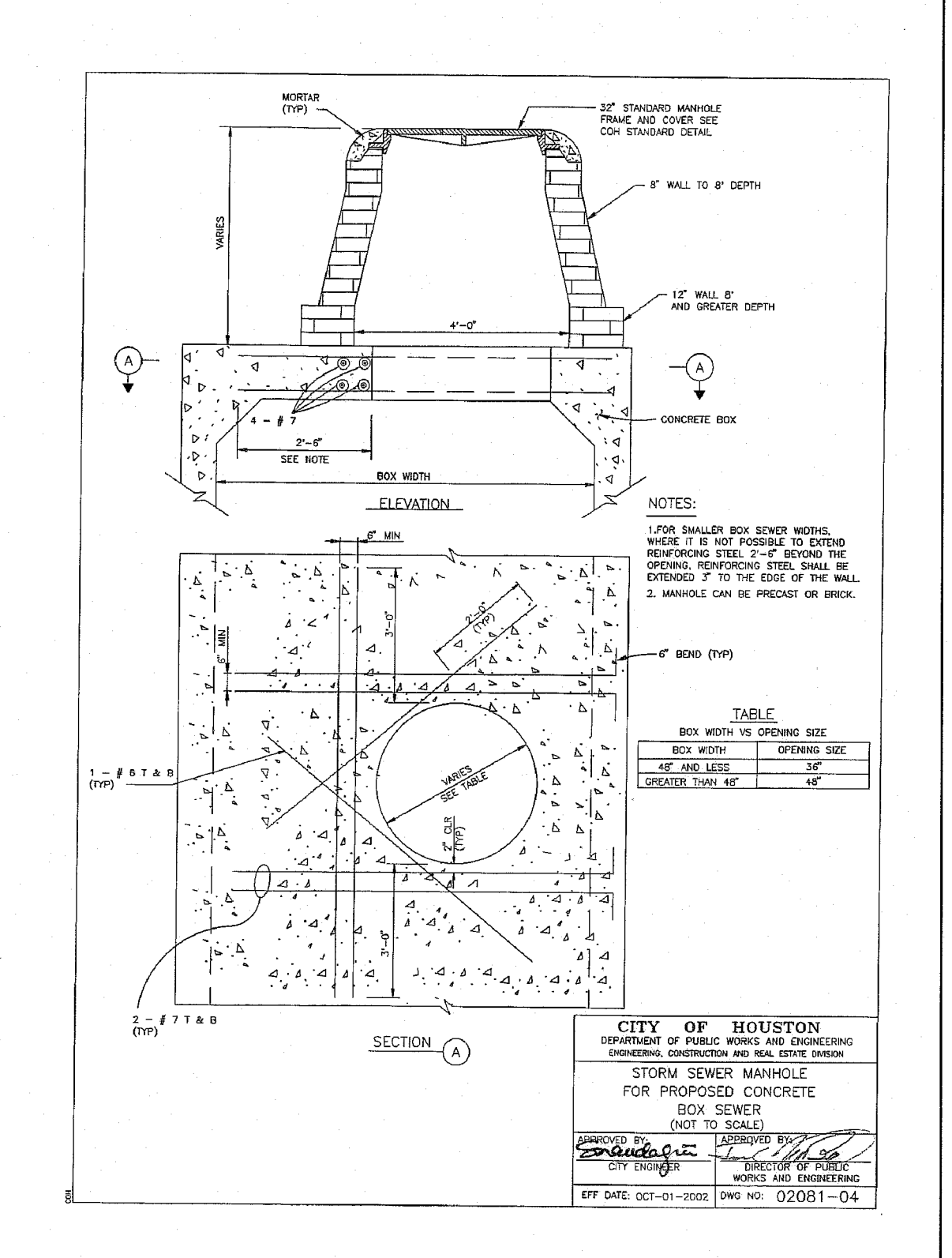
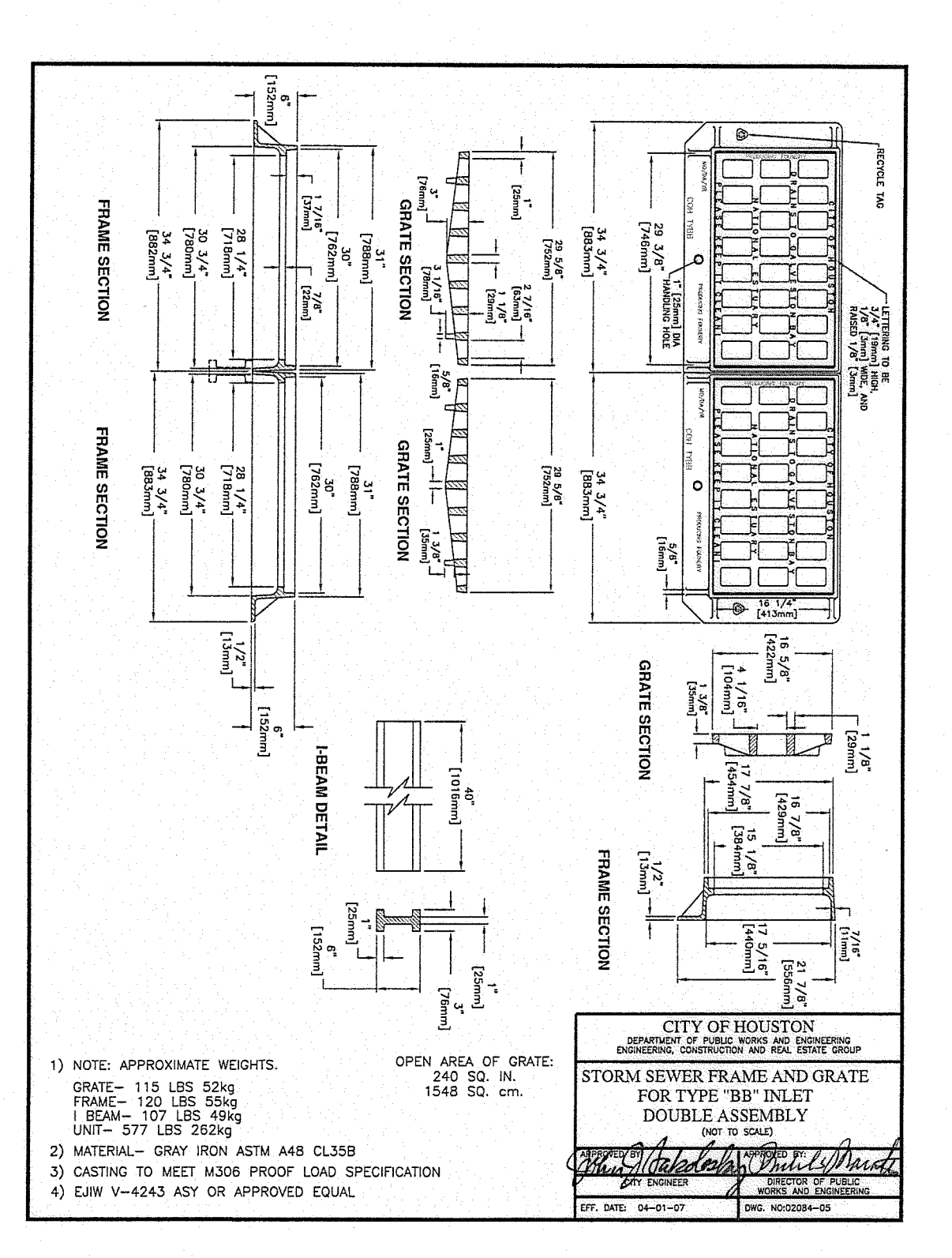
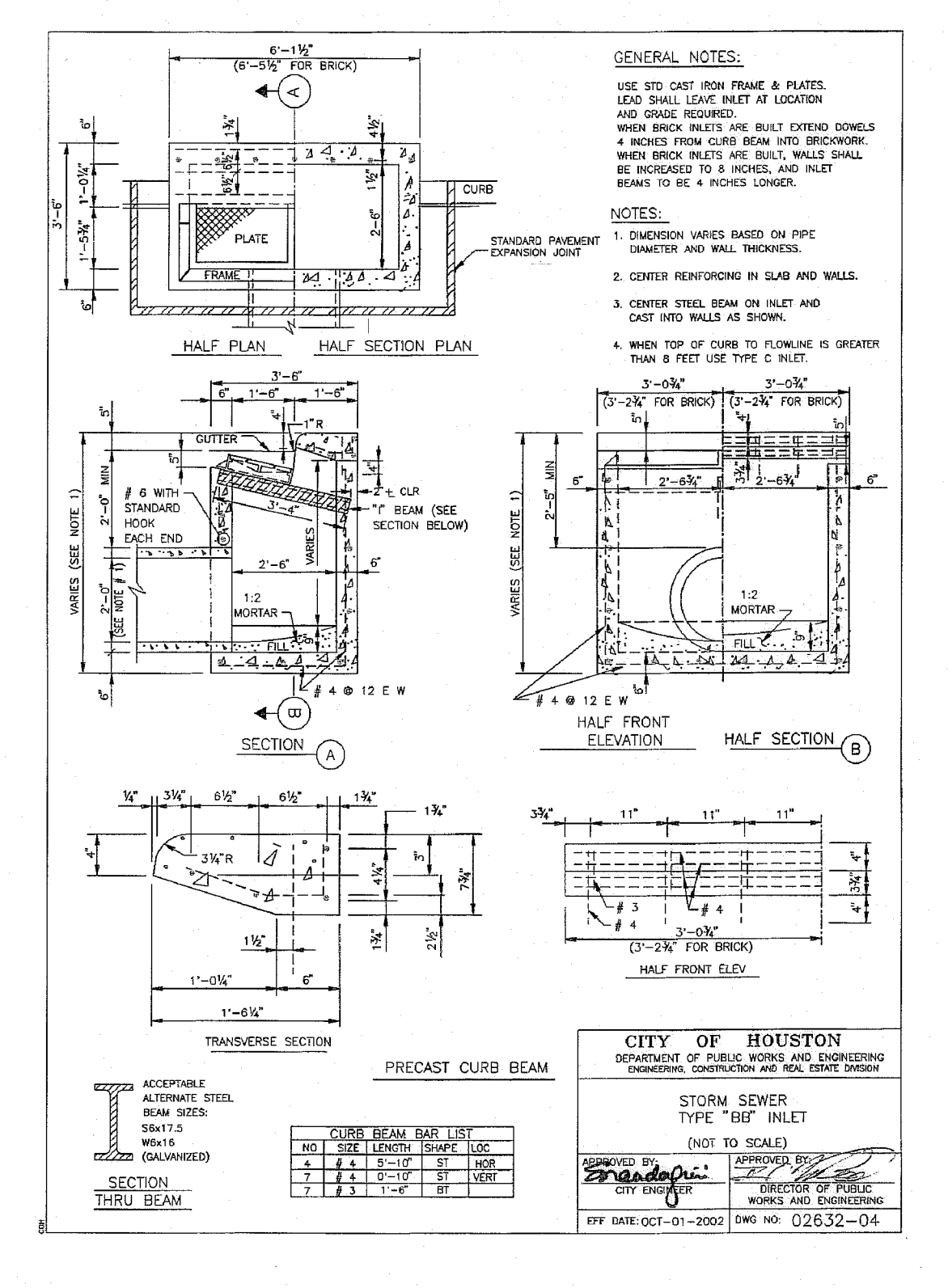
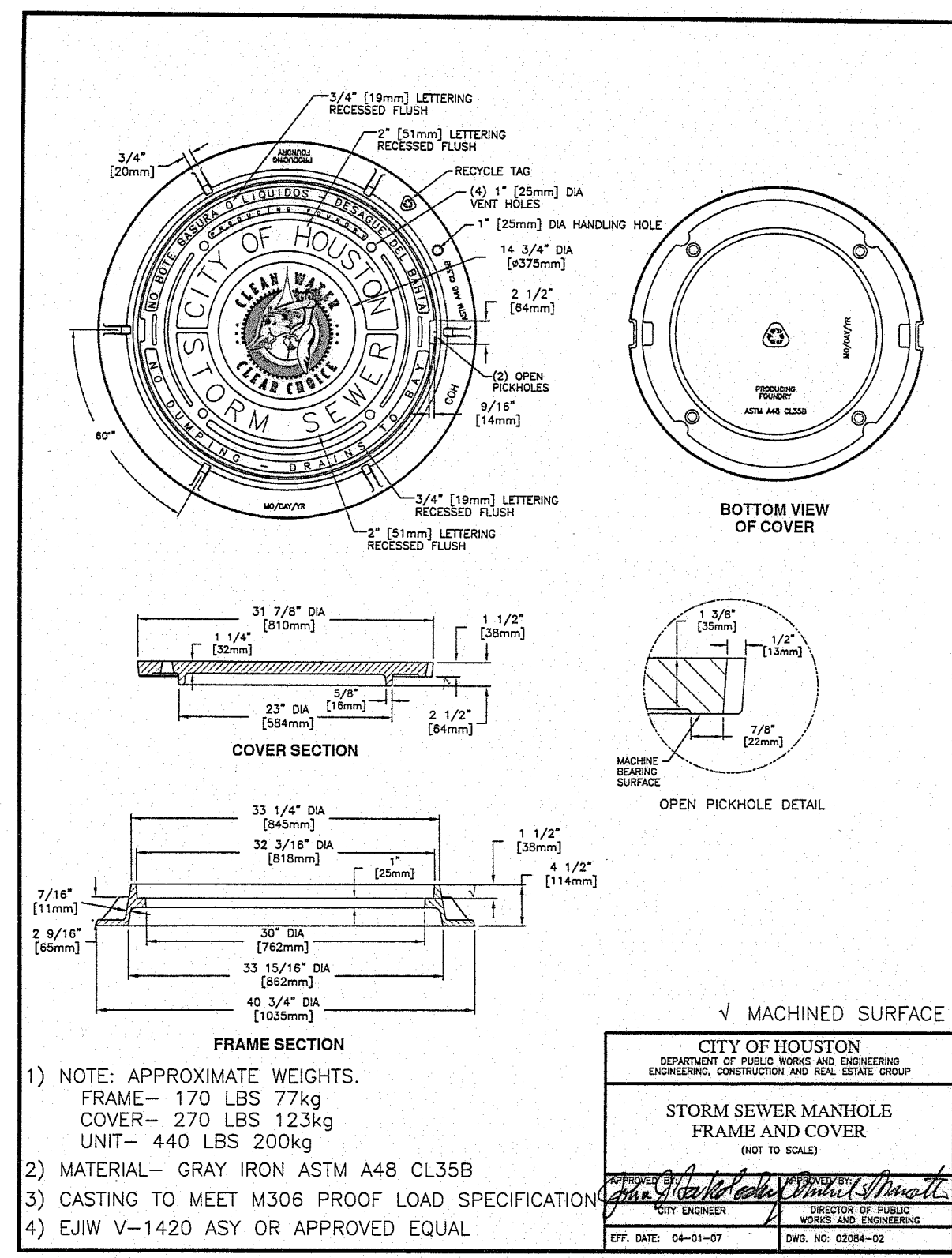
FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
**RANCHO BELLA PKWY
 LEFT TURN LANE AND
 WATER LINE "B" & WATER LINE "C"**

8/2/2018

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

SHEET No: 9 of 20

WATER DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB NO. 200417-CRM-D3-10)



NO.	REVISION	DATE	BY

DESIGNED BY: RLM
 DESIGN CHECKED BY: JRV
 DRAWN BY: RLM
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: RLM

Costello
 Engineering and Surveying
 2107 CityWest Blvd, 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
 DRAINAGE DETAILS

APPROVED: [Signature]
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

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

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

WATER: [Signature] TRAFFIC & TRANSPORTATION
 WASTEWATER: [Signature] STORM WATER QUALITY
 STORM: [Signature] FACILITIES
 STREET & BRIDGE

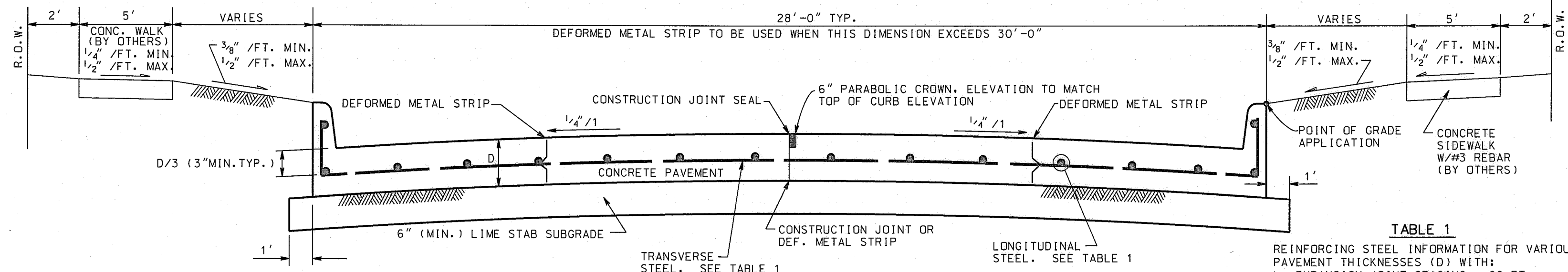
FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

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

SHEET No: 11 of 20

50071
 REGISTERED PROFESSIONAL ENGINEER
 8/2/2016

61214
 CITY DRAWING NUMBER



NOTES:
 1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM DESIGNATION A615, GRADE 60. FOR ALL 6" & 7" PAVING, USE 1/2"
 2. THE LOCATION OF CONSTRUCTION JOINTS AND DEFORMED METAL STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE CITY ENGINEER, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. THE MAXIMUM WIDTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
 3. ALL EARTHEN AREAS ARE TO BE HYDROMULCHED.
 4. CONTRACTOR MAY SAW CUT IN LIEU OF DEFORMED METAL STRIP.

TYPICAL SINGLE ROADWAY SECTION

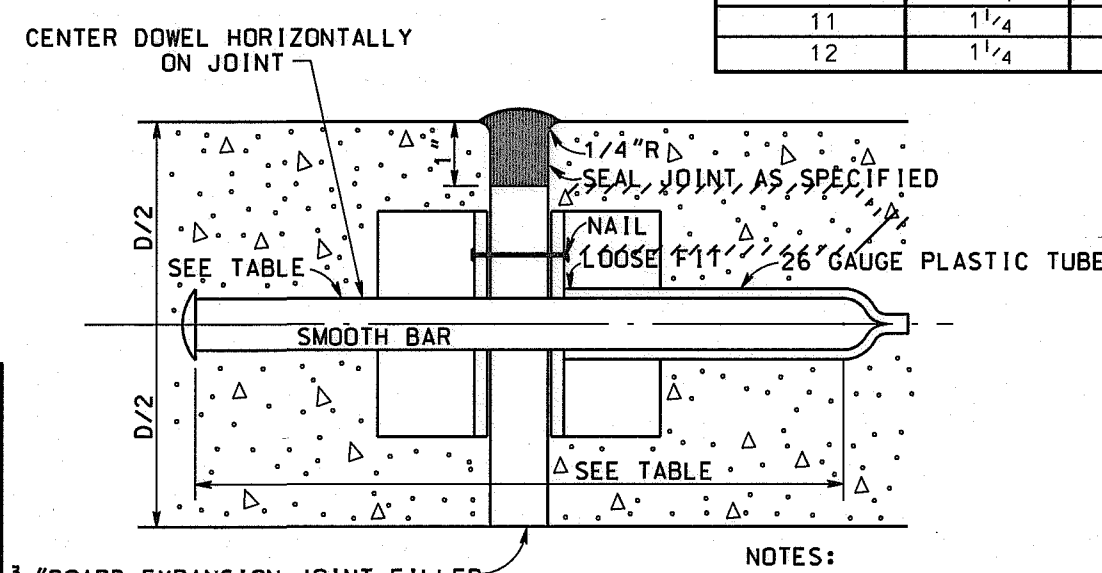
TABLE 1
 REINFORCING STEEL INFORMATION FOR VARIOUS PAVEMENT THICKNESSES (D) WITH: L = EXPANSION JOINT SPACING = 60 FT
 $f_c = 3,500$ PSI AND $f_y = 60,000$ PSI

PAVEMENT THICKNESS (D) (IN)	PAVEMENT WIDTH (FT)	LONGITUDINAL STEEL		TRANSVERSE STEEL	
		NUMBER OF BARS	SPACING (IN)	NUMBER OF BARS	SPACING (IN)
6	28	17	20.50	4	36
7	25	17	18.25	4	36
7	35	25	18.00	3	36
7	36	25	17.75	3	36
7	37	25	18.25	3	36
7	41	28	18.00	3	36
7	45	31	17.75	3	36

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

DOWEL SIZES AND SPACINGS

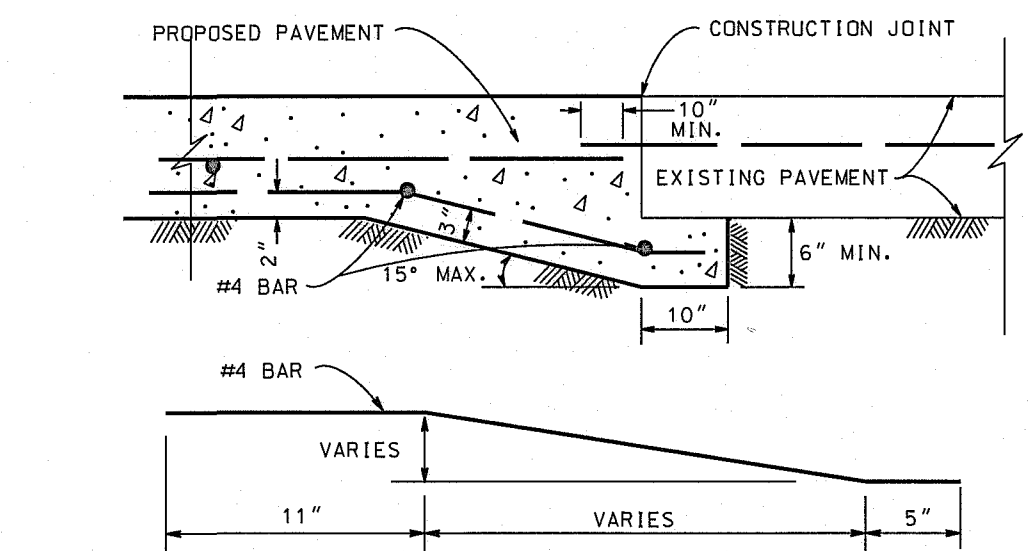
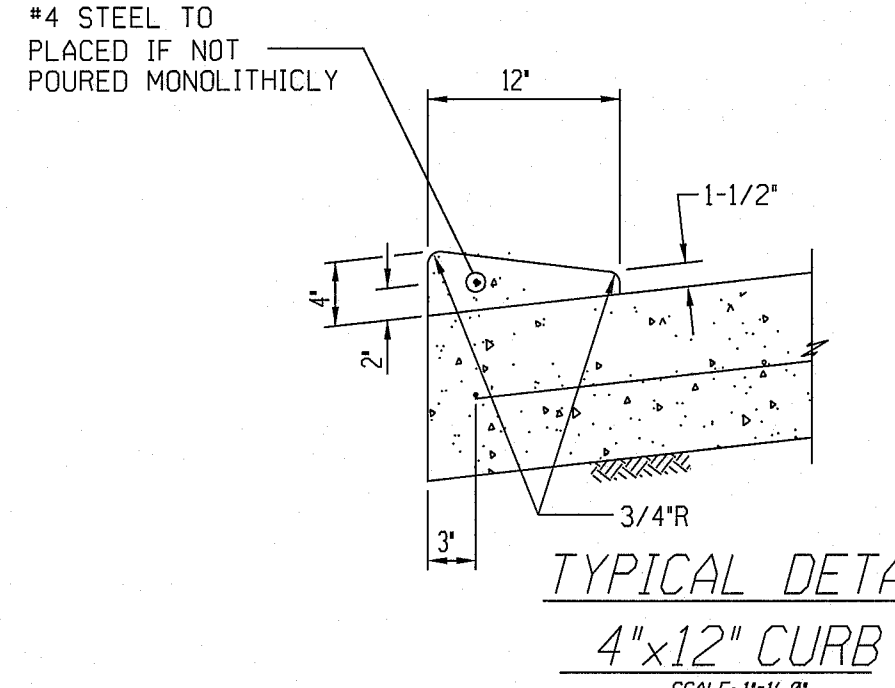
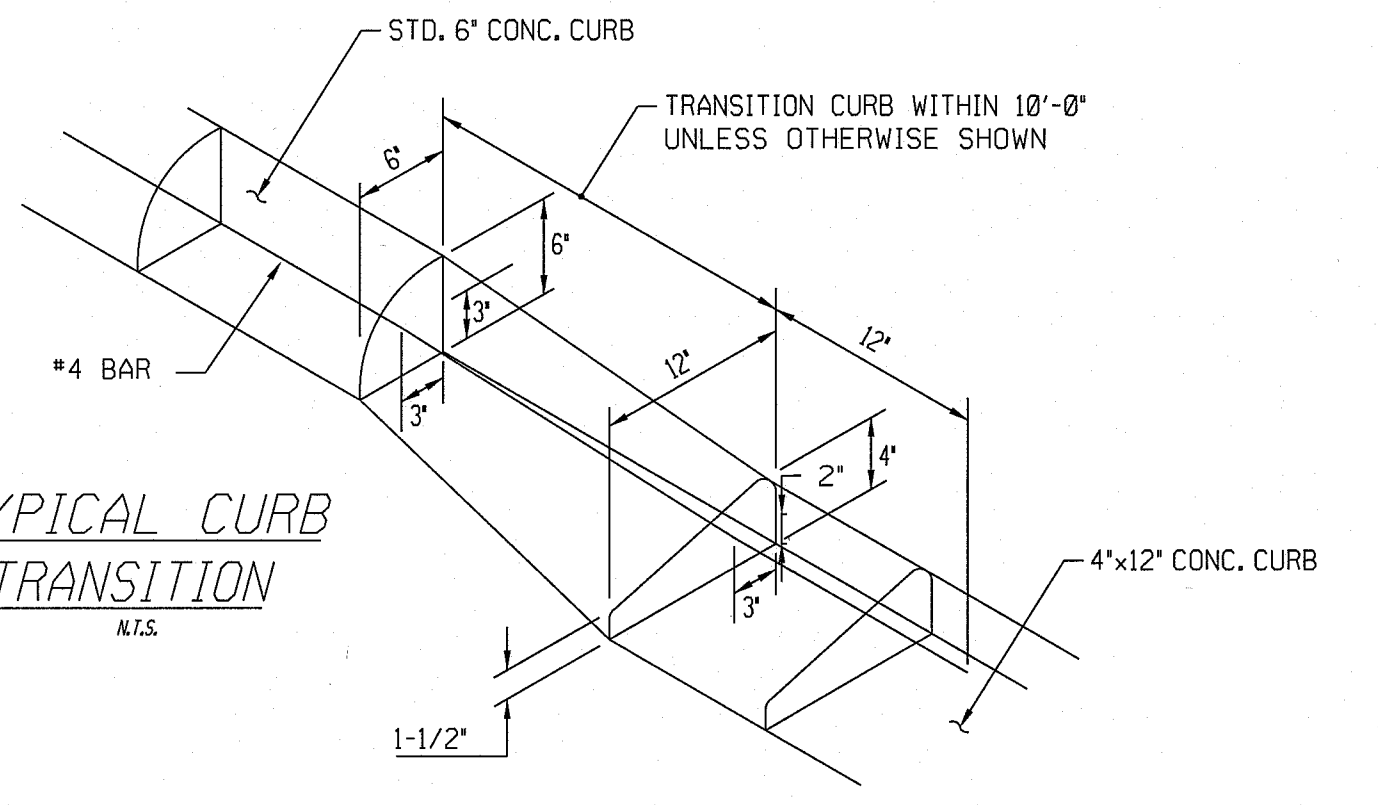
PAVEMENT THICKNESS (D) (IN)	DIAMETER (IN.)	LENGTH (IN.)	SPACING (IN.)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12



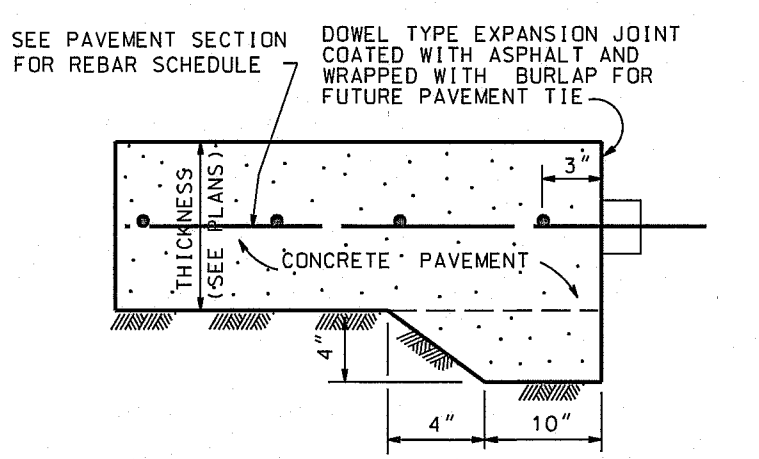
DOWEL TYPE EXPANSION JOINT

(CANTILEVER TYPE, CAST MALLEABLE IRON LOAD TRANSMISSION UNIT STAR LUG MODEL D-27 OR EQUAL ON 22" C-C ACCEPTABLE AS ALTERNATE)

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:
 1. 6-inch concrete curb to be constructed on all esplanades, islands and nonresidential 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. Transitions from 6-inch concrete curb to 4-inch x 12-inch concrete curb to be accomplished within 10 feet, unless otherwise shown. If the 10-foot transition curb is not poured monolithically with the pavement, then reinforcing steel as shown above in typical detail 4-inch x 12-inch transition curb is to be installed.

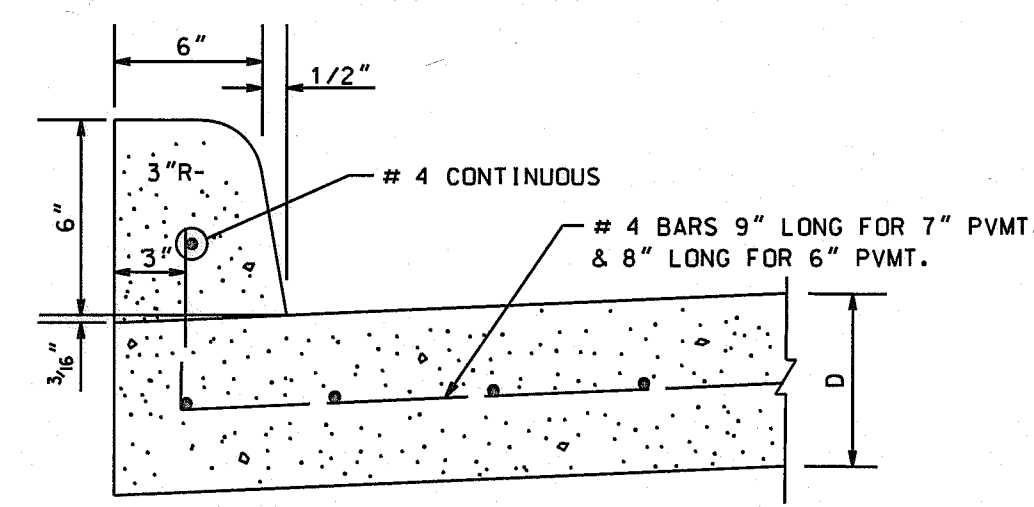


UNDERCUT BAR LAYOUT

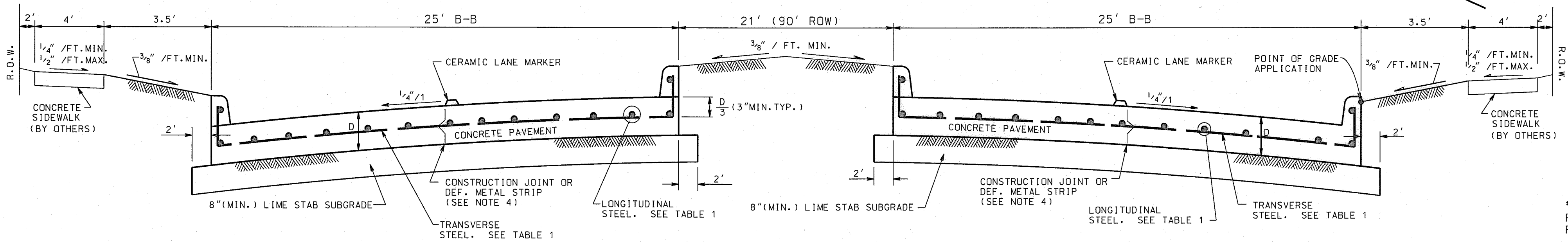


PAVEMENT HEADER

PAVEMENT UNDERCUT

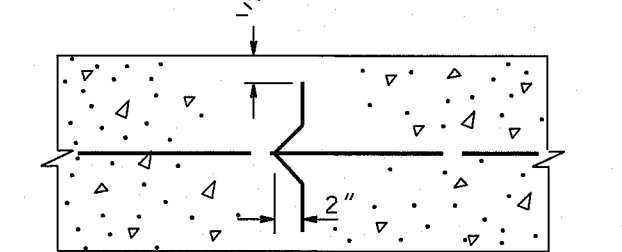


CONCRETE CURB



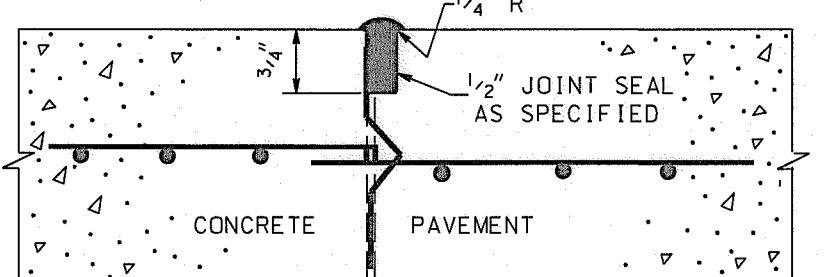
TYPICAL DOUBLE ROADWAY SECTION

** THIS SLOPE MAY BE INCREASED AT THE DISCRETION OF THE ENGINEER, TO MEET CERTAIN EXISTING FIELD CONDITIONS



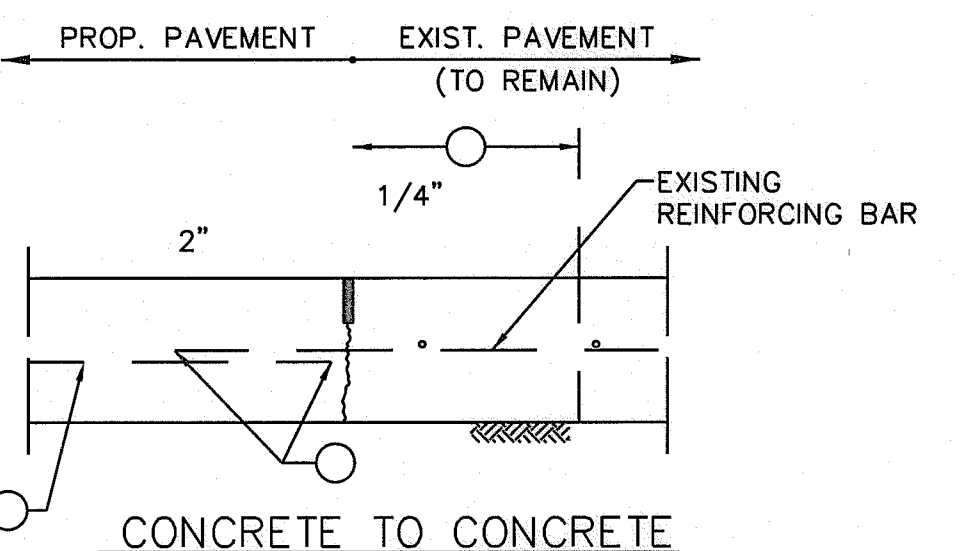
DEFORMED METAL STRIP

THE LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE ENGINEER, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR



CONSTRUCTION JOINT SEAL

N.T.S.

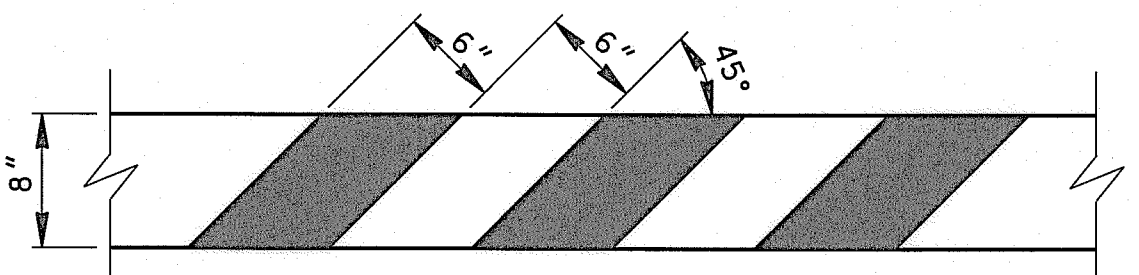


CONCRETE TO CONCRETE STANDARD PAVEMENT TIE-IN

(SEE NOTES)

- NOTES FOR TIE-IN:**
1. REINFORCING CENTERED IN PROPOSED PAVEMENT, 3" CLEAR AT EDGES.
 2. SAW-CUT 2" DEEP AND REMOVE 2' EXISTING PAVEMENT OR PAVEMENT WITH CURB. EXPOSE AND CLEAN EXISTING REINFORCING.
 3. 24xBAR DIAMETER LAP OR WELD, IF DIRECTED.
 4. IF NO EXPOSED REINFORCING STEEL EXISTS, HORIZONTAL DOWELS SHALL BE #5 BARS, GRADE 60, 30" LONG DRILLED AND EMBEDDED 15" INTO THE CENTER OF THE EXIST CONCRETE SLAB WITH EPOXY OR APPROVED EQUAL. DOWELS SHALL BE PLACED 24" CENTER TO CENTER.

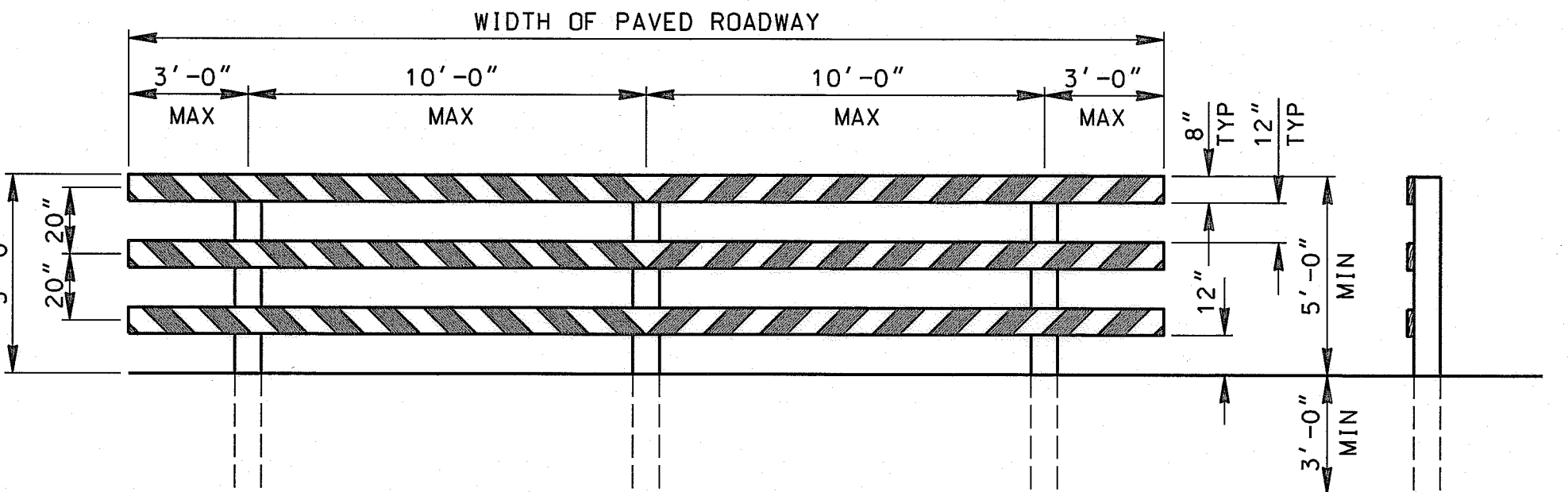
STRIPING SHOULD COVER THE FULL WIDTH OF THE RAIL. STRIPING OF RAILS, PANELS, ETC. SHOULD SLOPE DOWNWARD AT AN ANGLE OF 45 DEGREES IN DIRECTIONS TRAFFIC IS TO PASS.



STRIPING FOR BARRICADE

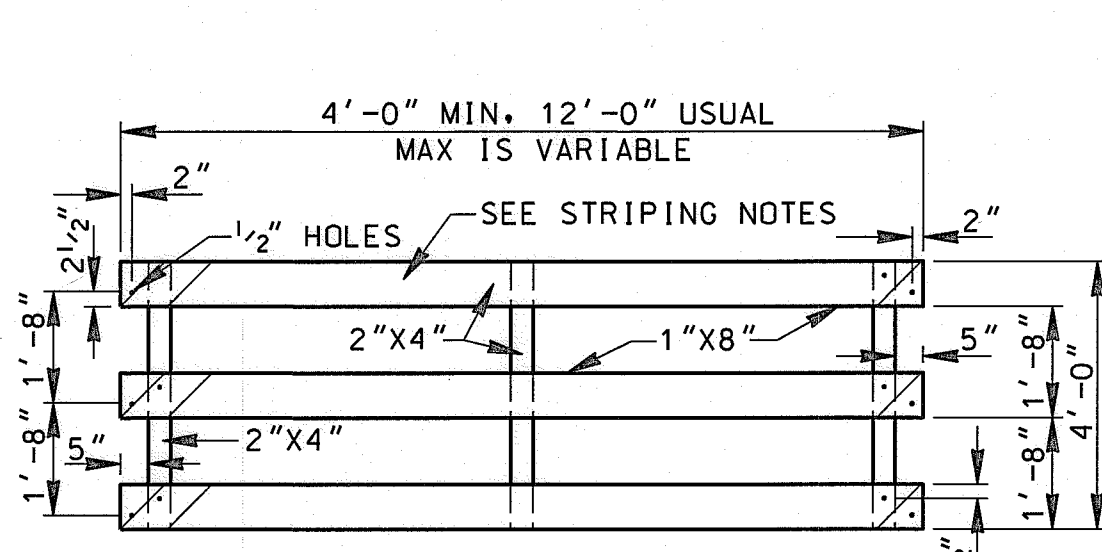
WHERE A BARRICADE EXTENDS ENTIRELY ACROSS A ROADWAY, IT IS DESIRABLE THAT THE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED FOR, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.

FOR ALL TYPES OF BARRICADES WITH RAILS LESS THAN 3'-0" LONG, STRIPES 4" WIDE SHALL BE USED. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON BACK SIDE OF BARRICADE RAILS.



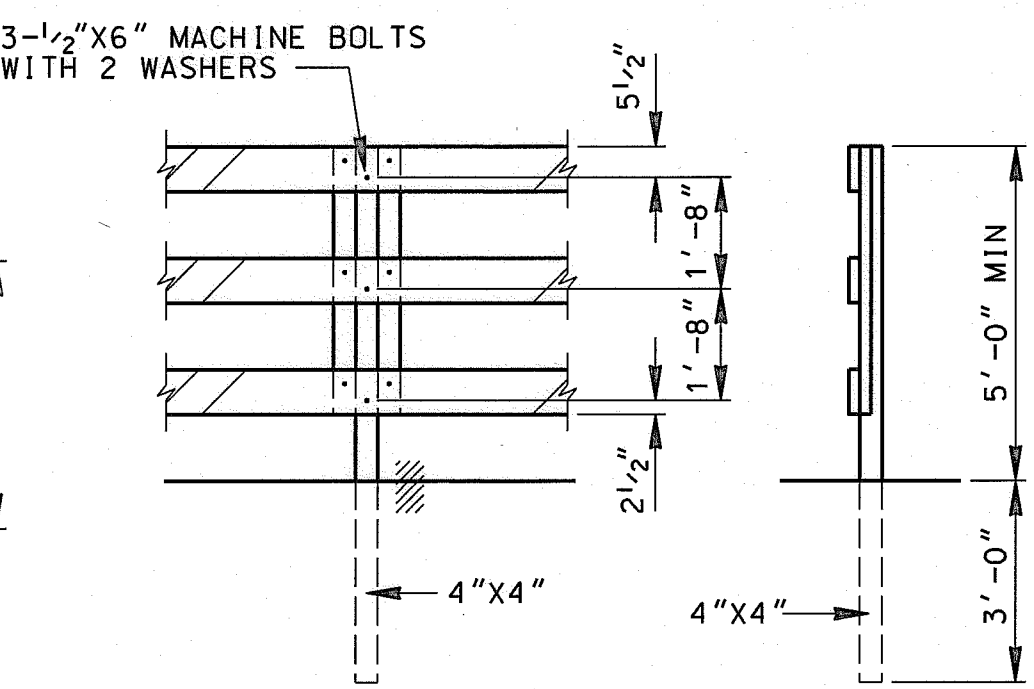
TYPE III BARRICADE FOR END OF ROAD

FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND RELFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC (HIGH INTENSITY SHEETING ON BARRICADE OR NICKOLITE)



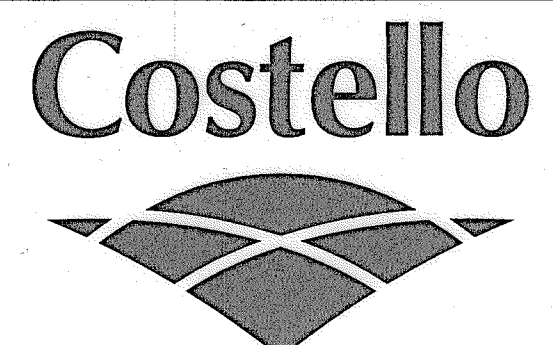
PANEL FOR TYPE III BARRICADE

USE 1/2" x 3 3/4" MACHINE BOLTS, WITH TWO WASHERS EACH



POST FOR TYPE III BARRICADE

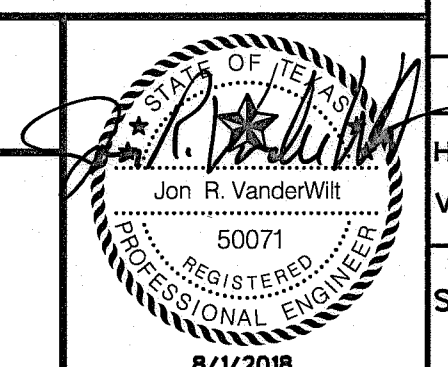
DESIGNED BY: <i>ELM</i>	DATE: _____
DESIGN CHECKED BY: <i>TRV</i>	DATE: _____
DRAWN BY: <i>ELM</i>	DATE: _____
COGO CHECKED BY: _____	DATE: _____
SURVEY CHECKED BY: _____	DATE: _____
QA/QC BY: _____	DATE: _____
QA/QC REVISIONS BY: <i>ELM</i>	DATE: _____



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 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION

PAVING DETAILS

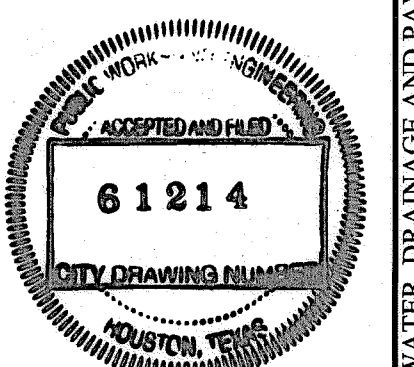


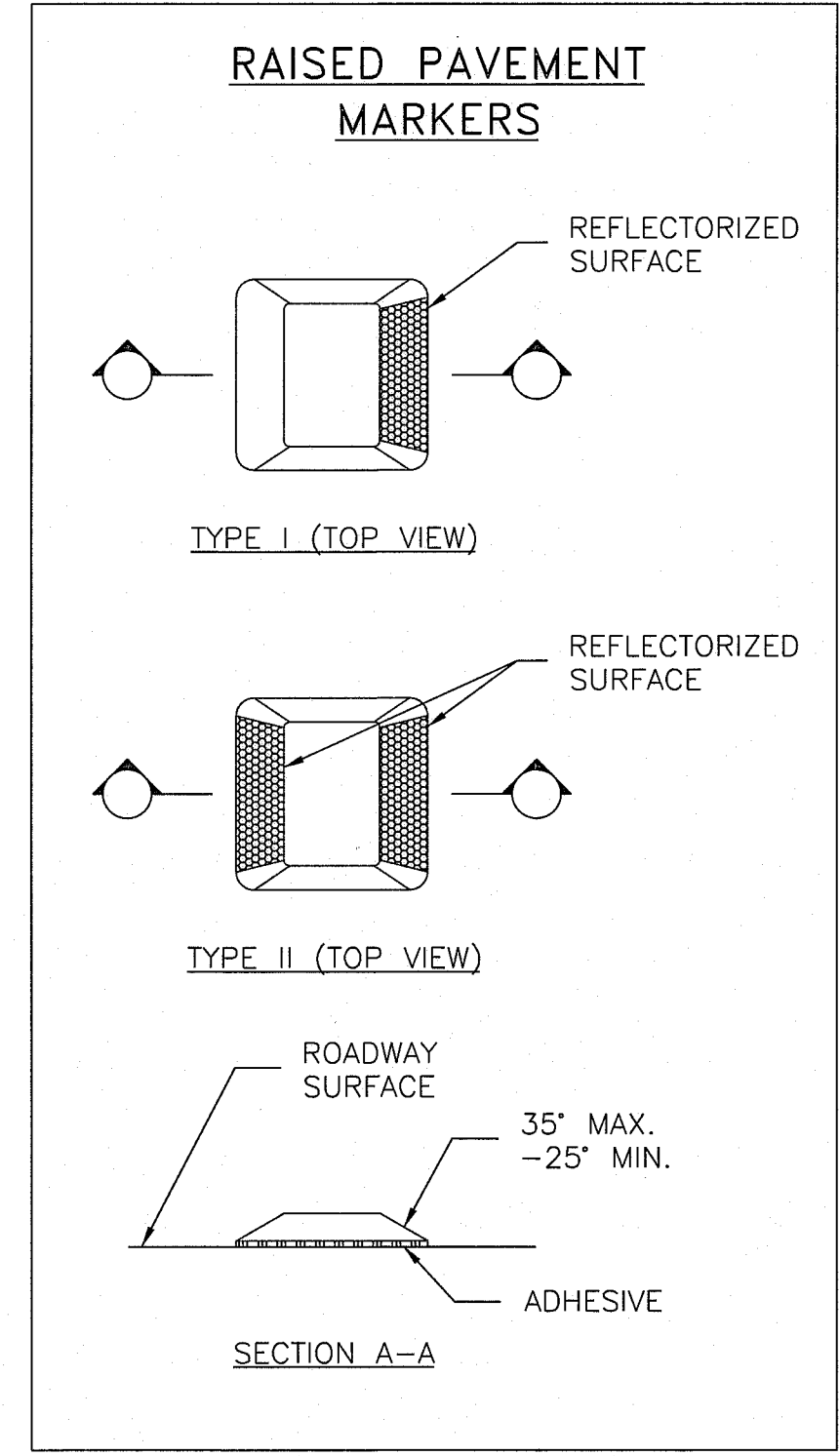
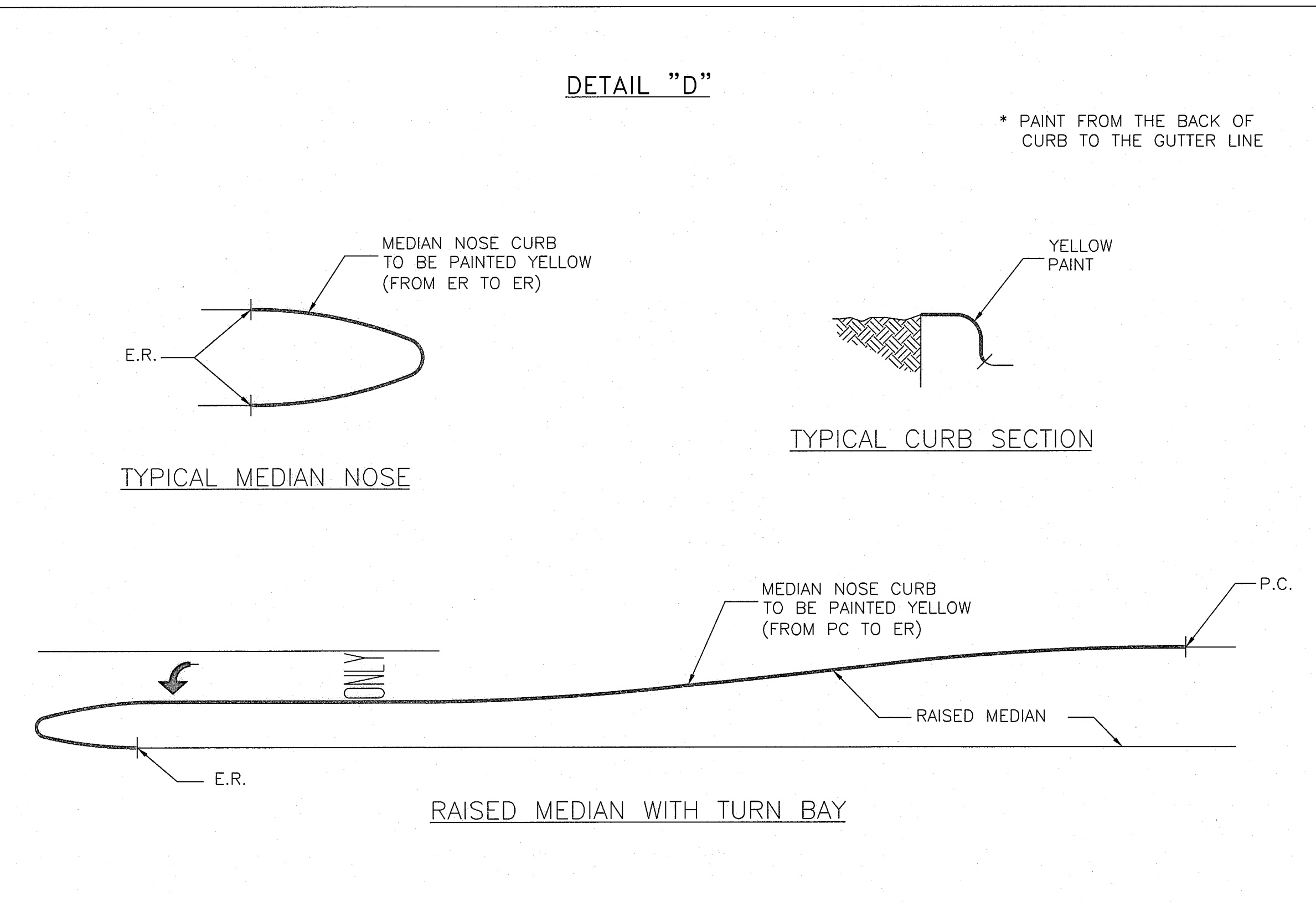
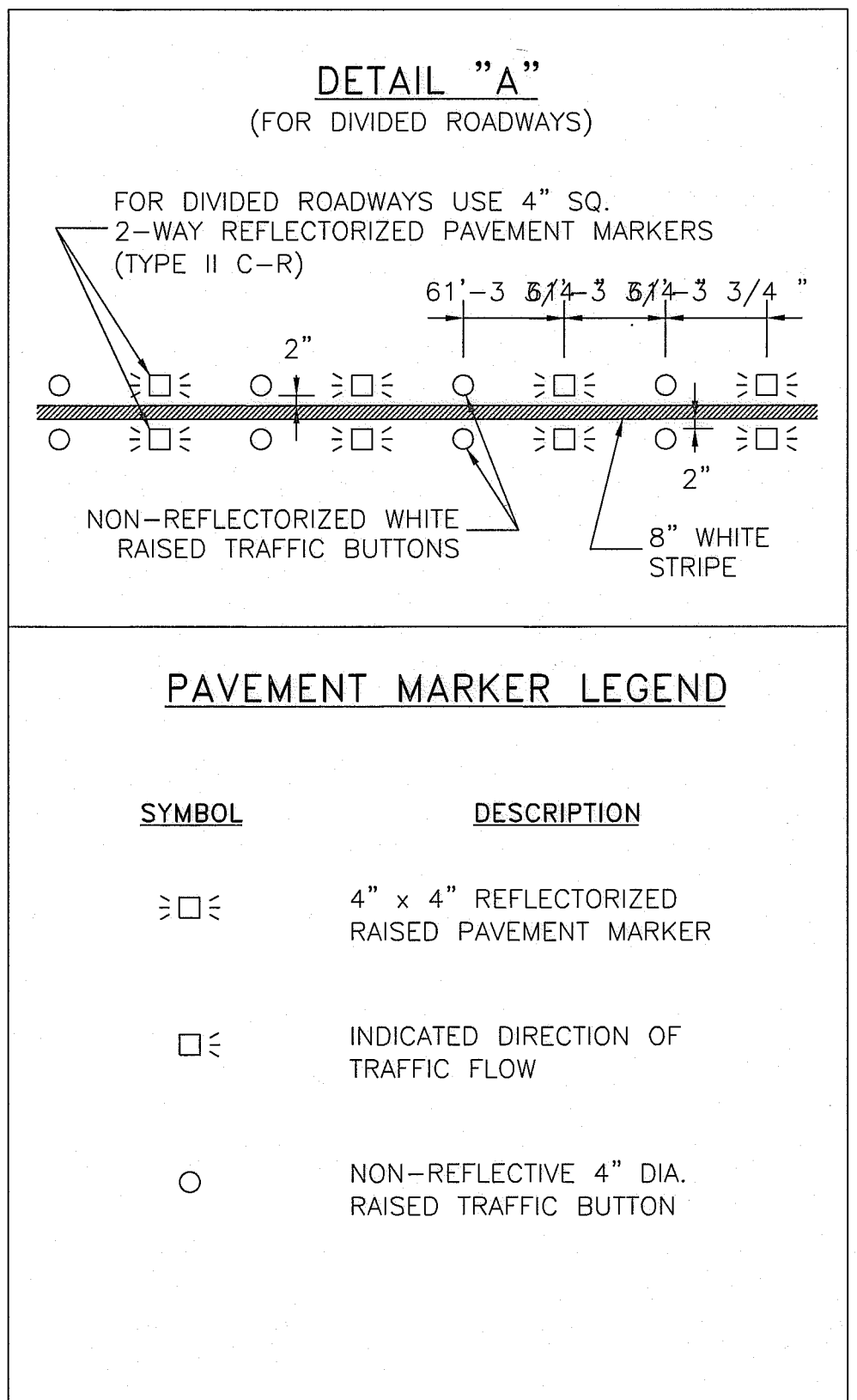
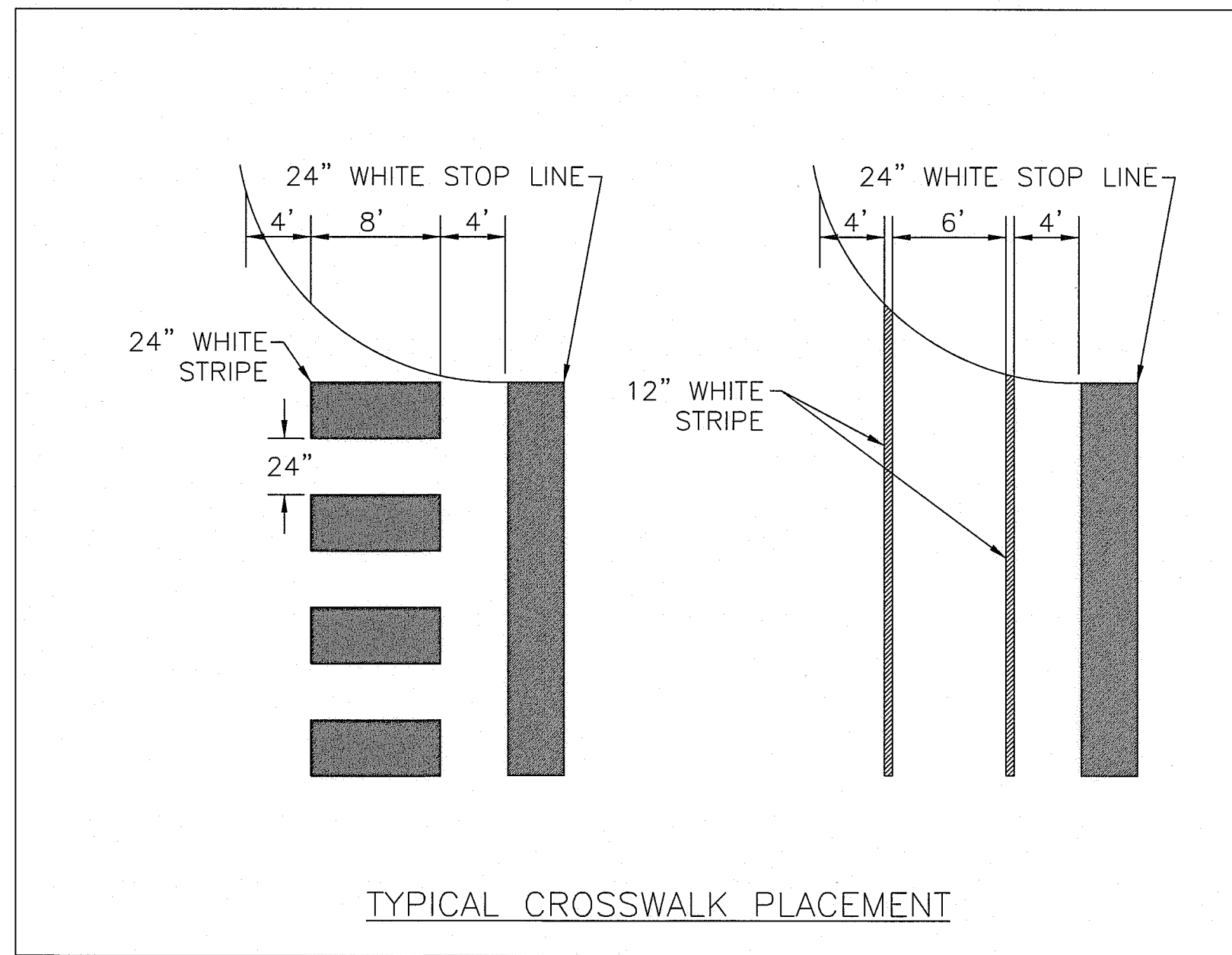
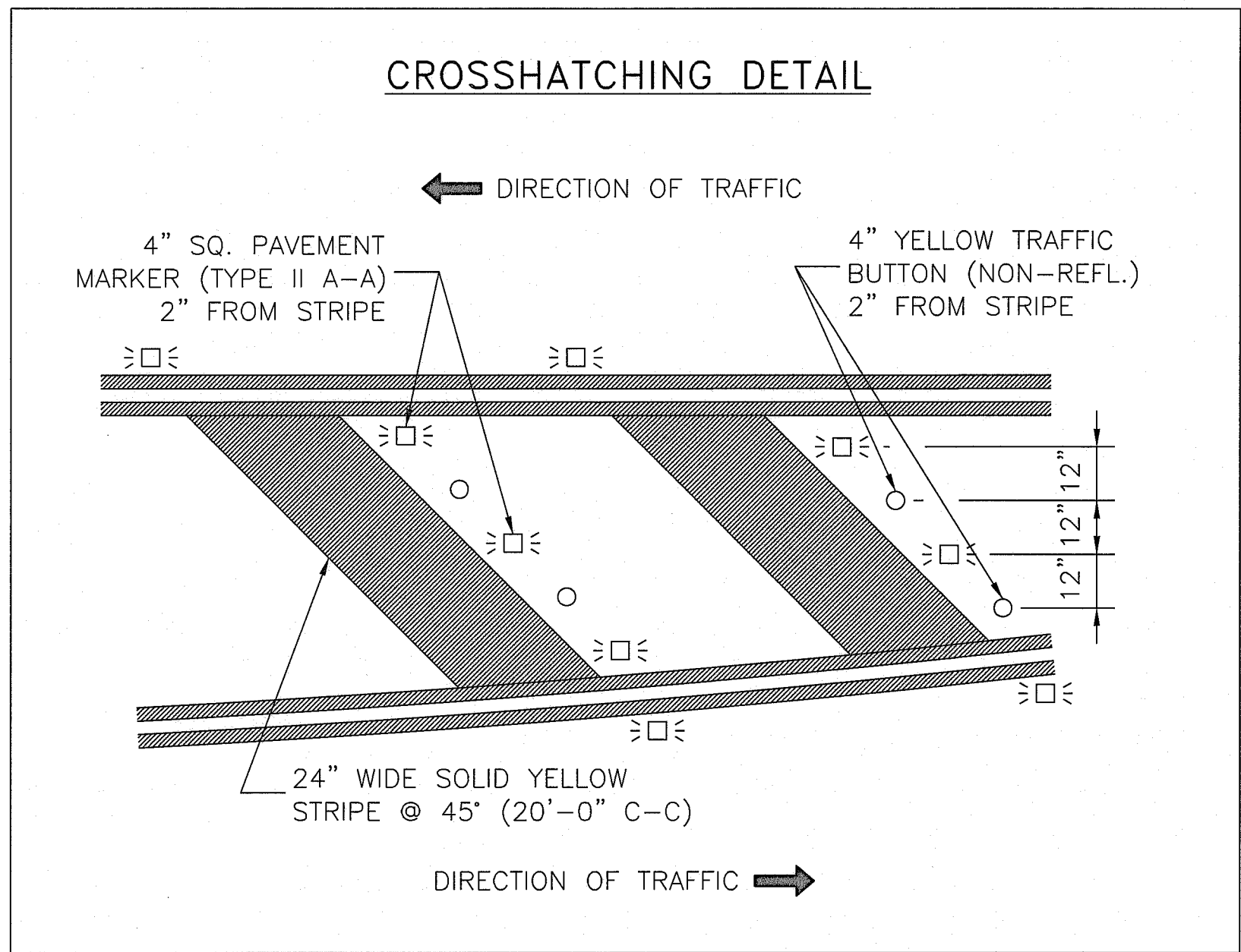
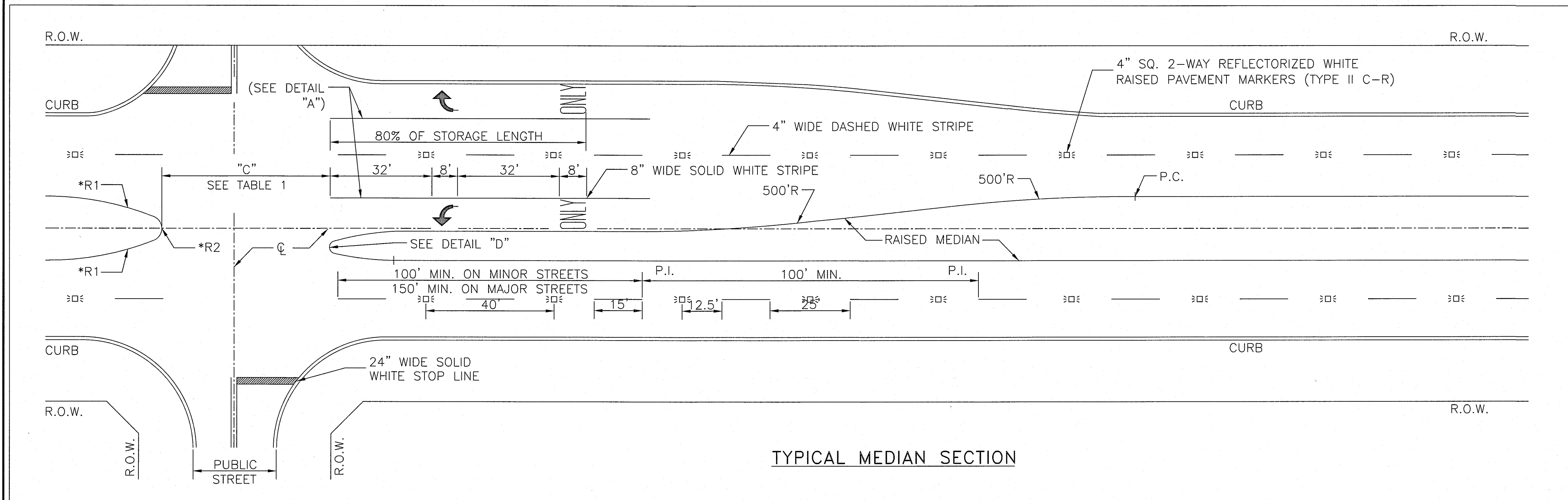
APPROVED: *Mand*
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

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

CITY OF HOUSTON	
HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
SEWER/WASTEWATER	STORM WATER QUALITY
STREET & BRIDGE	FACILITIES

FILE NO: _____	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ: N.T.S.	
VERT: N.T.S.	
SHEET No: 12 OF 20	





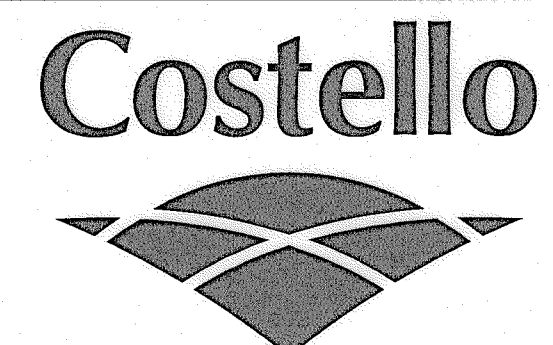
PAVEMENT MARKER LEGEND

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

- NOTES:**
- ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
 - ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES (APPROXIMATELY 2").
 - LEFT TURN STORAGE BAYS SHALL BE A MIN. OF 100' ON MINOR STREETS AND A MIN. 150' ON MAJOR STREETS.
 - REPEAT ARROWS AT APPROXIMATELY 1000' INTERVALS WITHIN TWO-WAY LEFT TURN SECTION.
 - OMIT
 - 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.
 - WHEN CROSSWALK MARKINGS ARE USED WITHIN AN ESTABLISHED SCHOOL ZONE AREA, CONTINENTAL TYPE MARKINGS SHALL BE USED.
 - ADDITIONAL SET OF "WORD" AND "ARROW" PAVEMENT MARKINGS SHALL BE USED WHEN TURN LANE STORAGE LENGTH IS 160 FEET OR GREATER.

NO.	REVISION	DATE	BY

DESIGNED BY: RLM
 DESIGN CHECKED BY: JRV
 DRAWN BY: RLM
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: RLM



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FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION

PAVING MARKING DETAILS

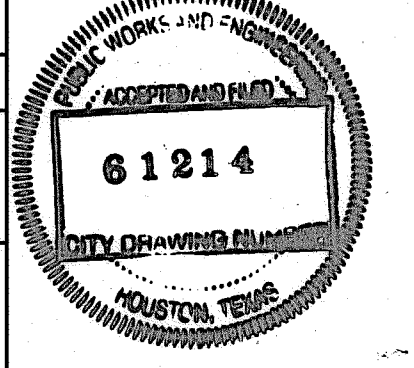


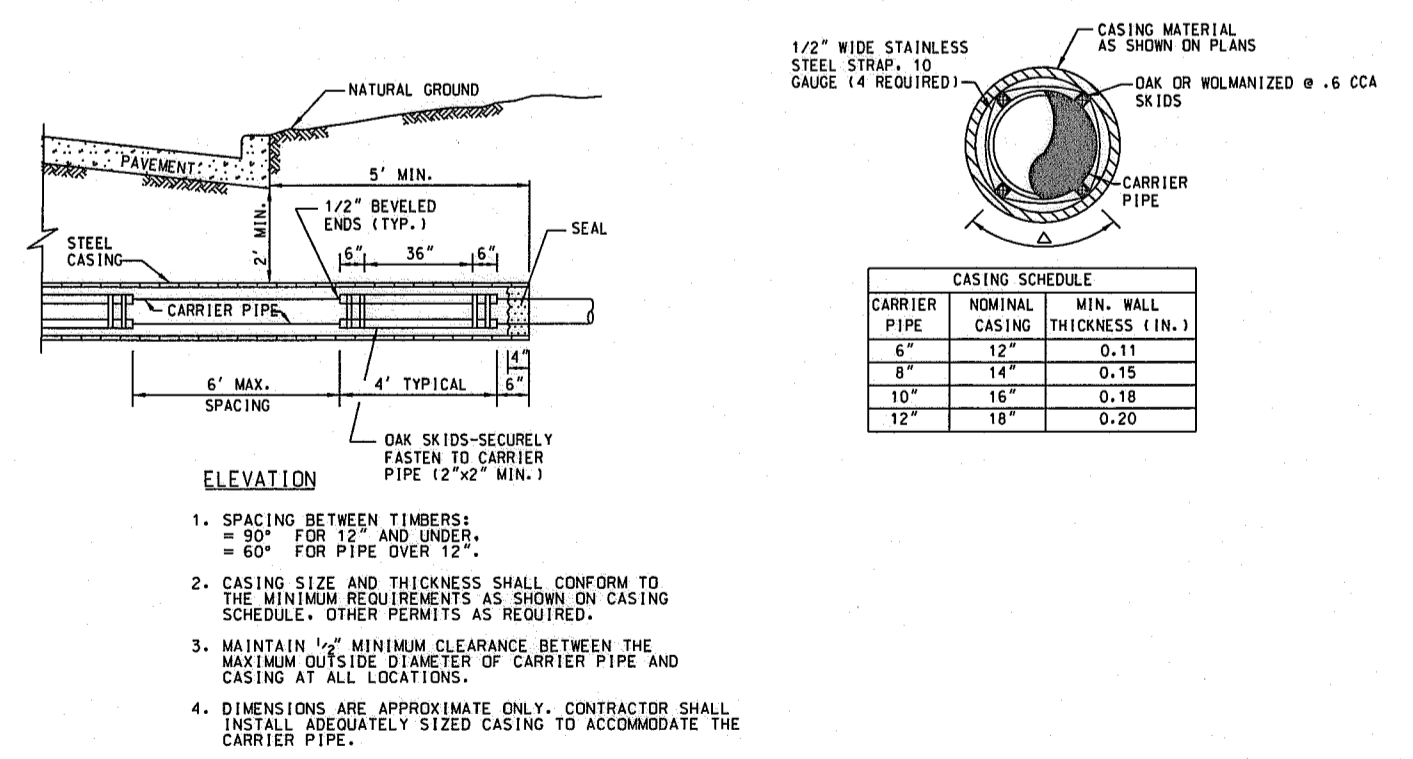
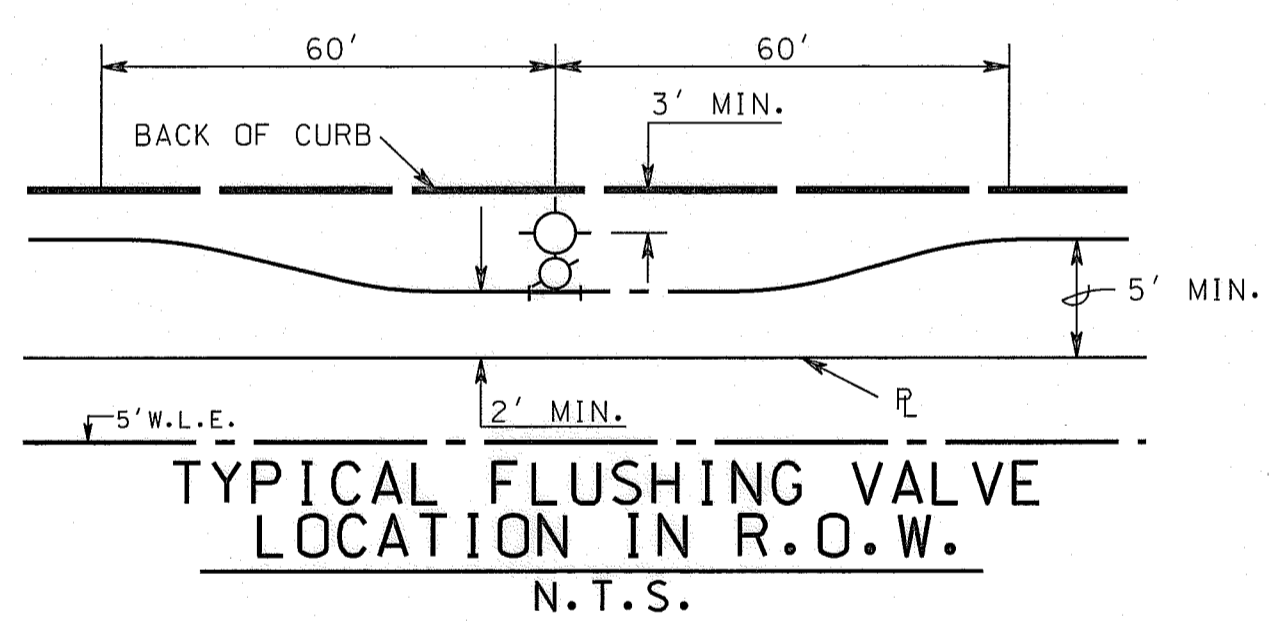
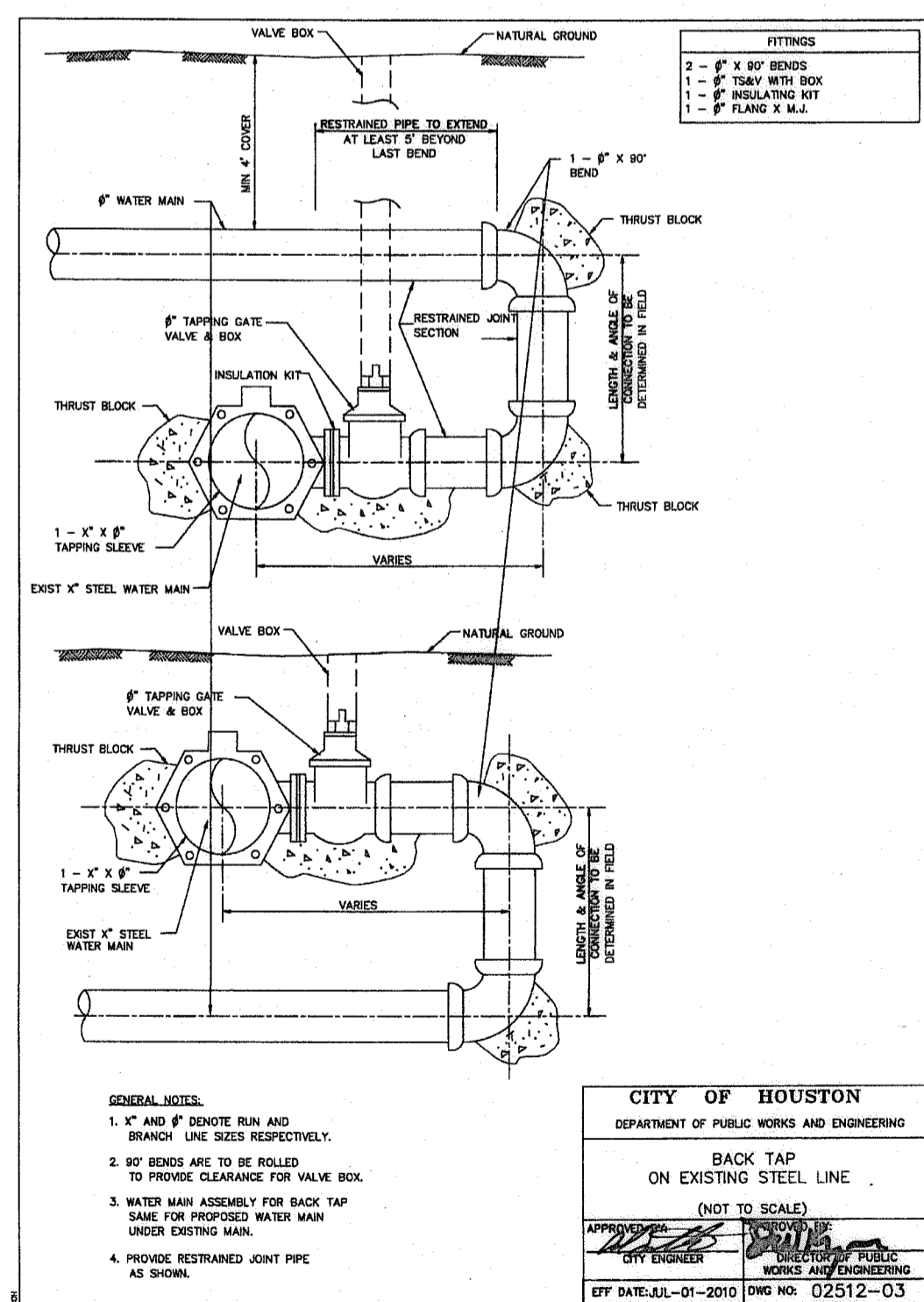
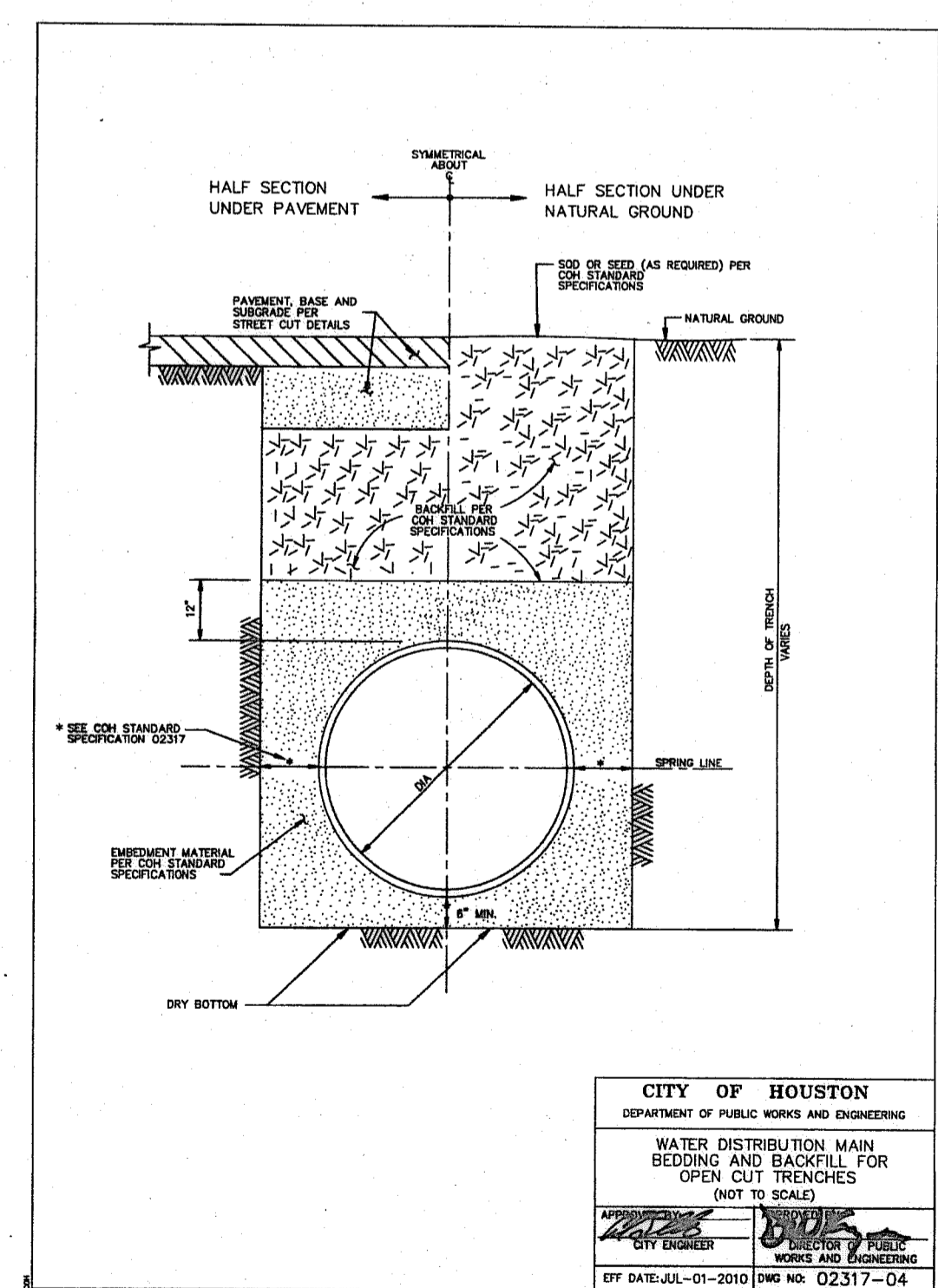
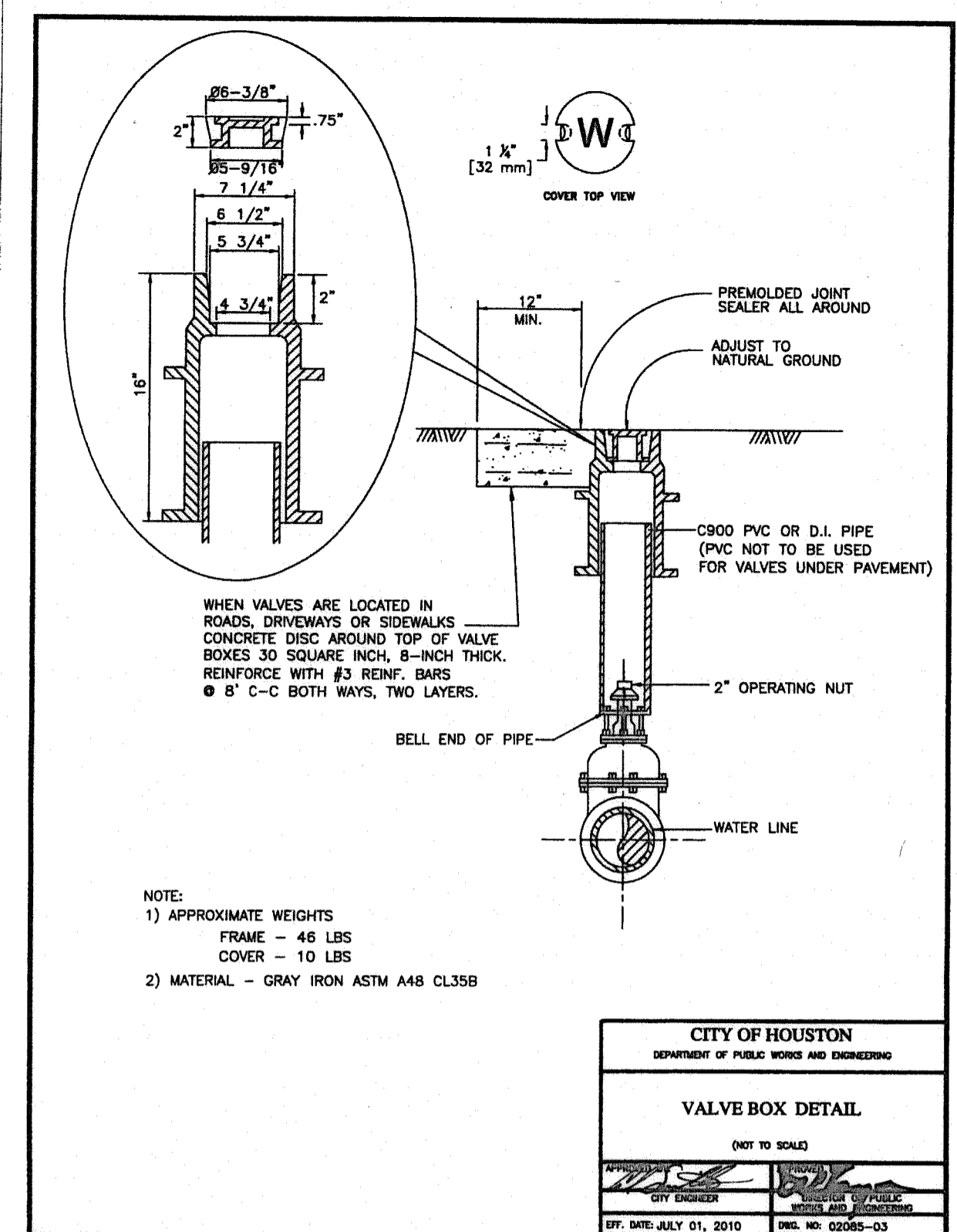
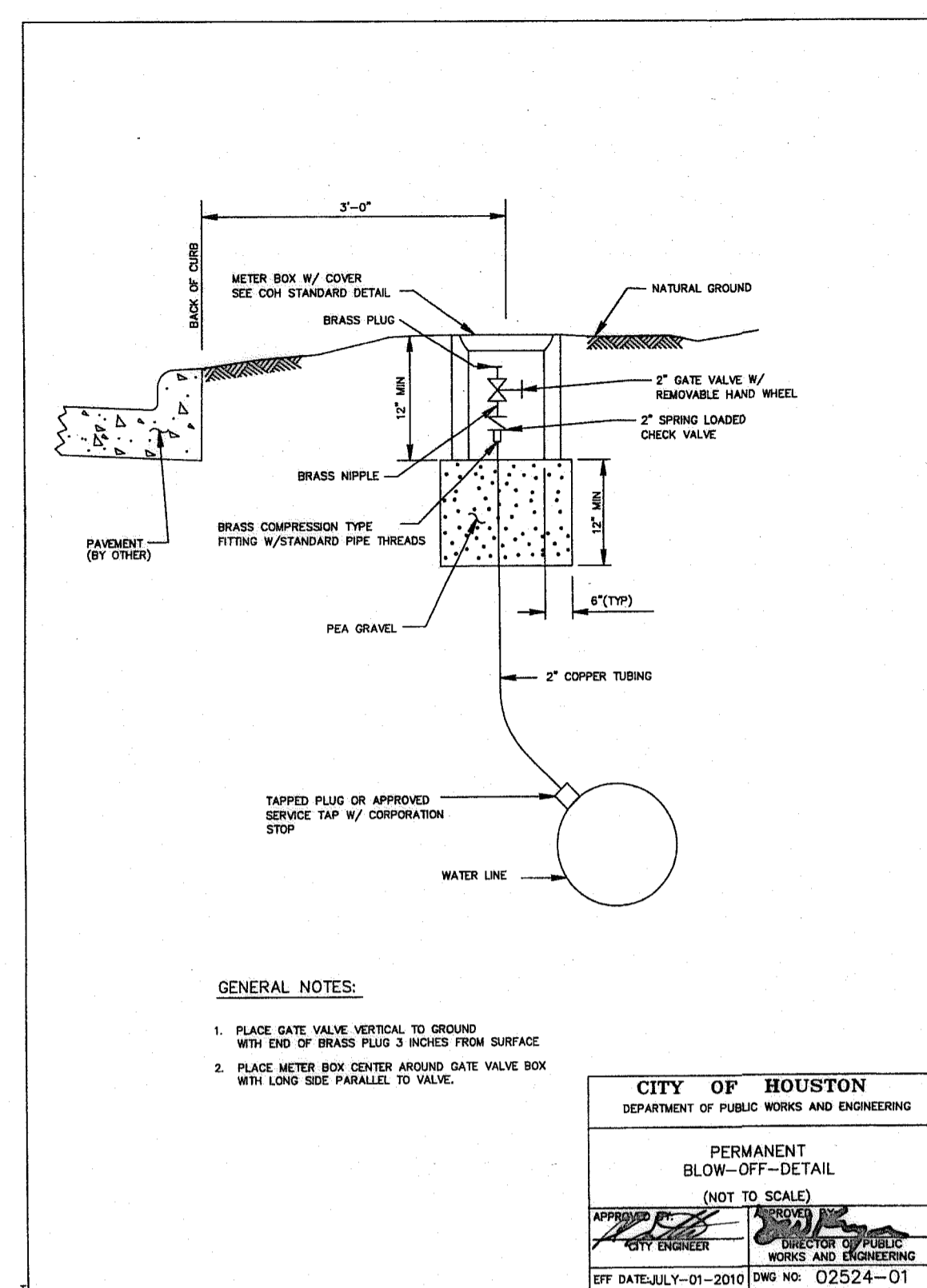
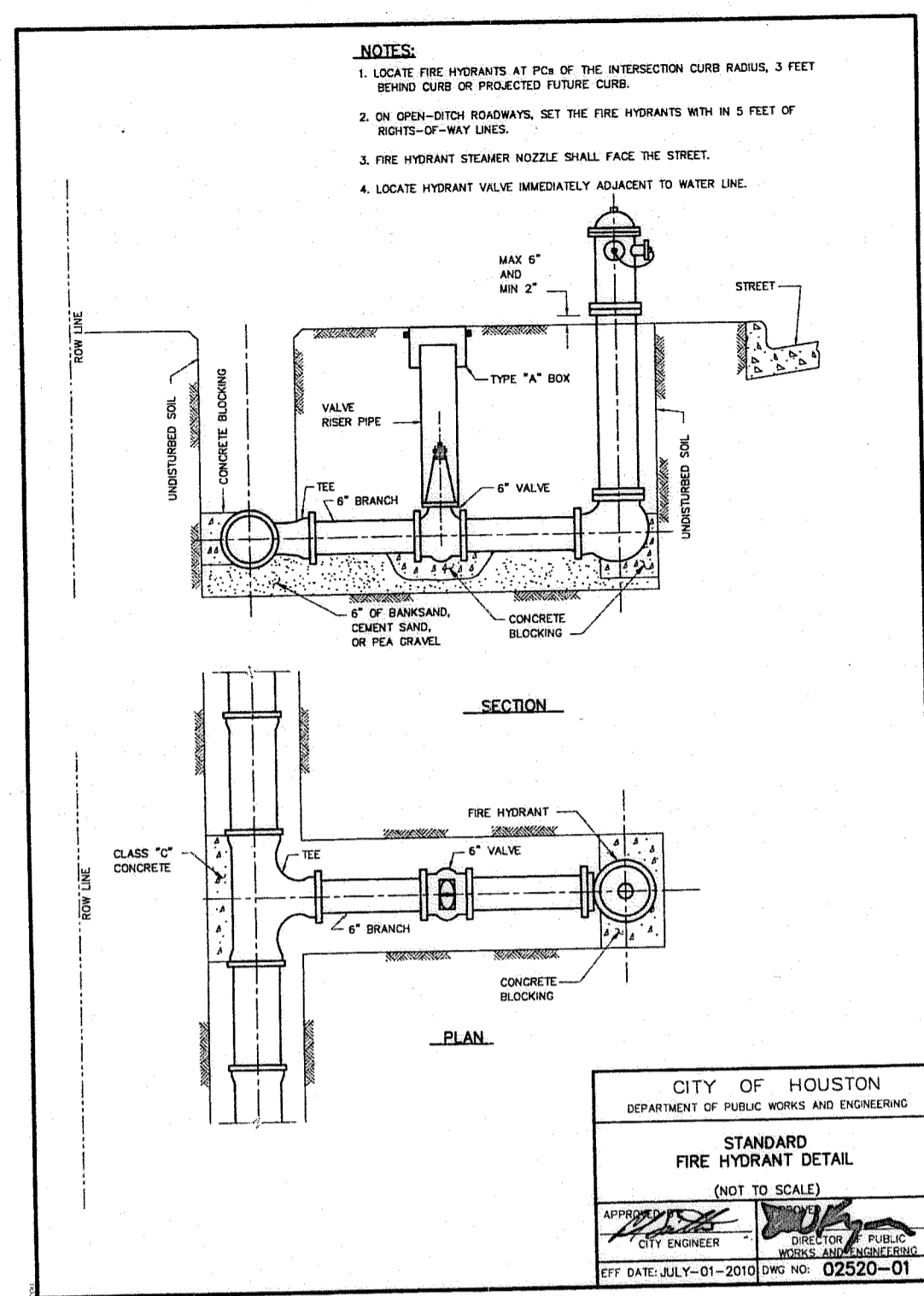
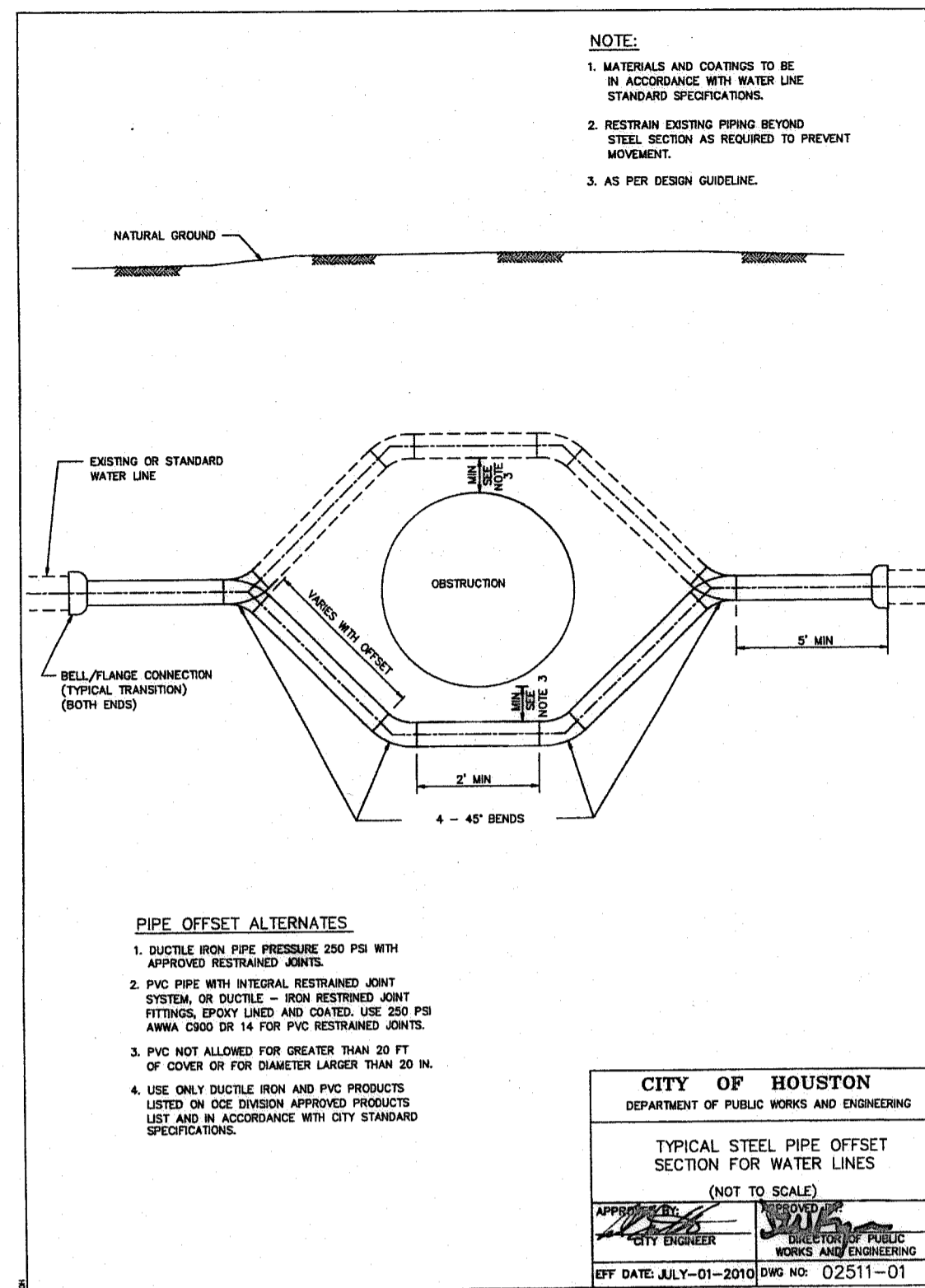
APPROVED: [Signature]
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY
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 HORZ: N.T.S.
 VERT: _____
 SHEET No: **13** OF 20





APPROVED: [Signature]
 DEVELOPMENT COORDINATOR
 DATE: 10/1/18

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE: _____

HORIZ: N.T.S.

VERT: _____

SHEET No: 14 of 20

8/2/2018

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WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB NO. 200417-CRM-JS-10)

FORT BEND COUNTY MUD 132

DESIGNED BY: RLM
 DESIGN CHECKED BY: JRV
 DRAWN BY: RLM
 COGO CHECKED BY:
 SURVEY CHECKED BY:
 QA/QC BY: _____ DATE:
 QA/QC REVISIONS BY: RLM

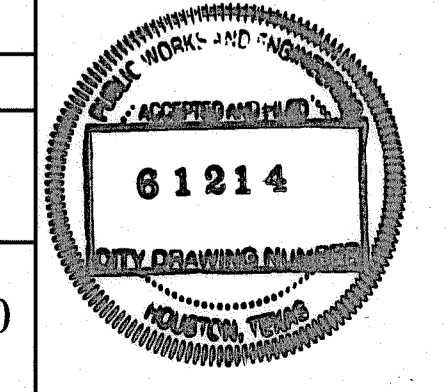
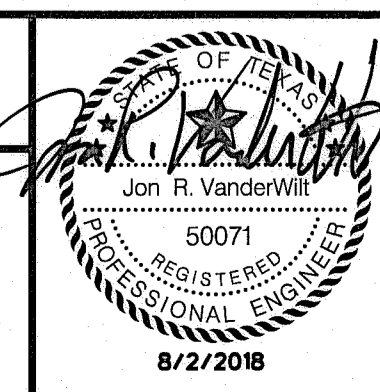
Costello

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 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. NO. 280
 TBPLS FIRM REG. NO. 100486

FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION

WATER MAIN DETAILS



NOTES:

- THIS DETAIL MAY BE USED ONLY FOR 30" STORM TRENCH CONDITIONS. FOR REQUIREMENTS FOR REINFORCEMENTS IN OTHER CONDITIONS.
- MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "X" FOR THE NOMINAL PIPE SIZE:
NOMINAL PIPE SIZE "X"
1/2" TO 30" 3/4"
OVER 30" 1"
- MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MAX TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
- ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR FORCE MAINS MAY BE ALIGNED TO THE 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: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: OCT-01-2002 DWG NO. 02317-03

NOTES:

- MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "X" FOR THE NOMINAL PIPE SIZE:
NOMINAL PIPE SIZE "X"
1/2" TO 30" 3/4"
OVER 30" 1"
- MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MAX TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
- ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR FORCE MAINS MAY BE ALIGNED TO THE STANDARD SPECIFICATIONS.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
SANITARY SEWER EMBEDMENT AND TRENCH ZONE BACKFILL FOR DRY OR WET STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: JUL-01-2010 DWG NO. 02317-01

NOTES:

- ACTUAL SHAPE OF CONCRETE TRENCH DAM CROSS SECTION MAY BE DETERMINED BY CONSTRUCTION IN FIELD. MEETING MINIMUM REQUIREMENTS AND PER DOT REQUIREMENTS.
- THIS DETAIL SHALL BE USED WITH CONCRETE STABILIZED SAND EMBEDMENT OF OTHER CLASS II EMBEDMENT, IN WET STABLE TRENCH CONDITIONS.
- PLACE TRENCH DAMS IN CLASS II EMBEDMENTS AT THE INTERSECT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES.

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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR WET STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: OCT-01-2002 DWG NO. 02317-06

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH
(NOT TO SCALE)
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: OCT-01-2002 DWG NO. 02317-05

WHEN A RESIDENTIAL SIDEWALK, DRIVEWAY OR 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.

A. USE FOR ALL PROPOSED EXISTING CURB REMOVAL FOR DRIVEWAYS:

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

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SIDEWALKS & DRIVEWAYS WITH CURB TYPE STREETS RESIDENTIAL AREA
DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94
REVISED BY: L. BRDECKA DATE REVISED: 3-10-05
APPROVED BY: L. HOOD DATE: 2-1-94
DRAWING NO. FBC-010A
FORT BEND COUNTY ENGINEERING DEPARTMENT

WHEN A RESIDENTIAL SIDEWALK, DRIVEWAY OR 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:

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SIDEWALKS & DRIVEWAYS WITH CURB TYPE STREETS RESIDENTIAL AREA
DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94
REVISED BY: L. BRDECKA DATE REVISED: 3-10-05
APPROVED BY: L. HOOD DATE: 2-1-94
DRAWING NO. FBC-010B
FORT BEND COUNTY ENGINEERING DEPARTMENT

GENERAL NOTES FOR SIDEWALKS AND DRIVEWAYS

- PROPOSED DRIVEWAY, SIDEWALK, CURB, GUTTER LINE AND GRADE SHALL MATCH EXISTING STREET.
- PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT, CLASS A STRUCTURAL (REFER TO SPECIFICATION 03301), 4 INCHES THICK AND 4 FEET MINIMUM WIDTH.
- PROPOSED DRIVEWAY AND CURB SHALL BE BUILT WITH PORTLAND 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.
- PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE TIED TO EXISTING ROADWAY REINFORCING STEEL WITH A MINIMUM 12 INCHES C.C., EACH WAY, WITH 10 INCHES MINIMUM LAP.
- PROPOSED GUTTER LINE IS TO BE MAINTAINED AT FACE OF EXISTING CURB.
- SAW CUT EXISTING CURB AT EACH END OF PROPOSED DRIVEWAY AND KNOCK OUT EXISTING CURB.
- SAW CUT EXISTING PAVEMENT MINIMUM 2 INCHES AND BREAK OUT TO EXPOSED EXISTING REINFORCING STEEL WITH A MINIMUM 12 INCHES LAP. FULL DEPTH CUT IS ACCEPTABLE PROVIDING 18" LONG DRILL IN DOWELS ARE INSTALLED AT A SPACING TO MATCH EXISTING WITH A MIN. 6" EMBEDMENT.
- COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO RIGHT-OF-WAY LINE, COMPACT TO 95% OF STANDARD PROCTOR DENSITY (+/- 2% OPT. MOISTURE). THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TEST IF HE DEEMS THEM NECESSARY.
- PLACE AND COMPACT 4 INCH CLEAN BANK SAND.
- 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).
- IF MORE THAN ONE PROPOSED DRIVEWAY IS BUILT ON THE SAME PROPERTY, SAID DRIVEWAYS SHALL BE SEPARATED BY A MINIMUM DISTANCE OF AT LEAST 20 FEET (ROADWAYS WITH CURBS AND SIDEWALKS).
- SIDEWALKS SHALL HAVE 1/4 INCH REDWOOD BOARD EXPANSION JOINTS EVERY 20 FEET ON CENTER.
- PLACE ONE-INCH BOARD EXPANSION JOINT AT RIGHT-OF-WAY LINE.
- 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.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
SIDEWALKS & DRIVEWAYS WITH CURB TYPE STREETS RESIDENTIAL AREA
APPROVED BY: LOUIS HOOD DATE DRAWN: 2-1-94
DRAWN BY: L. BRDECKA DATE: 2-1-94
REVISED: FBC-101C
FORT BEND COUNTY ENGINEERING DEPARTMENT

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL WITH SEAL SLAB
(NOT TO SCALE)
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: OCT-01-2002 DWG NO. 02317-07

NOTES:

- WHEN MULTIPLE BOX SEWERS ARE USED IN THE SAME TRENCH, MIN OUTSIDE TO OUTSIDE BOX SEWER SEPARATION SHALL BE 6" IN DRY TRENCH ONLY.
- REINFORCED CONCRETE SLAB, PIPE AND BEDDING TO BE PLACED IN DRY TRENCH ONLY.
- CONCRETE IN SLAB TO REACH MIN COMPRESSIVE STRENGTH OF 1000 PSI BASED ON MAX SEASON BEFORE PIPE IS Laid.
- PRECAST SEAL SLAB WAVE USED AS APPROVED BY CITY ENGINEER.

APPROVED: [Signature] DEVELOPMENT COORDINATOR
DATE: 10/11/18

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL WITH SEAL SLAB
(NOT TO SCALE)
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING
CITY ENGINEER
EFF DATE: OCT-01-2002 DWG NO. 02317-07

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	TRAFFIC & TRANSPORTATION
SEWER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

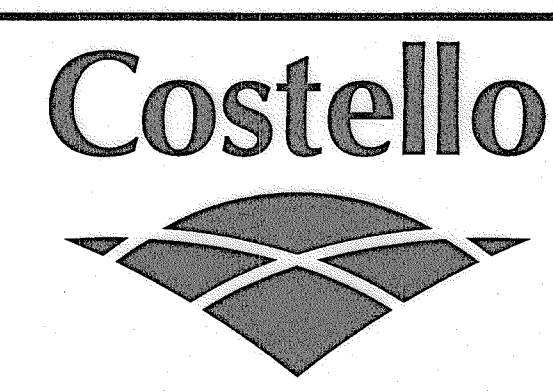
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DRAWING SCALE: _____
HORIZ: N.T.S.
VERT: _____

SHEET No: 15 OF 20

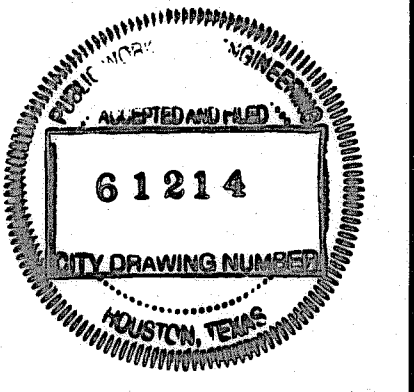
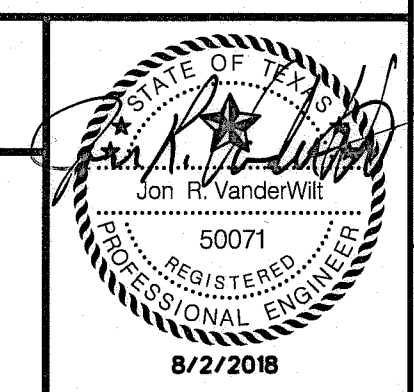
8/2/2018

DESIGNED BY: BLM
DESIGN CHECKED BY: JRV
DRAWN BY: BLM
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: _____ DATE: _____
QA/QC REVISIONS BY: BLM



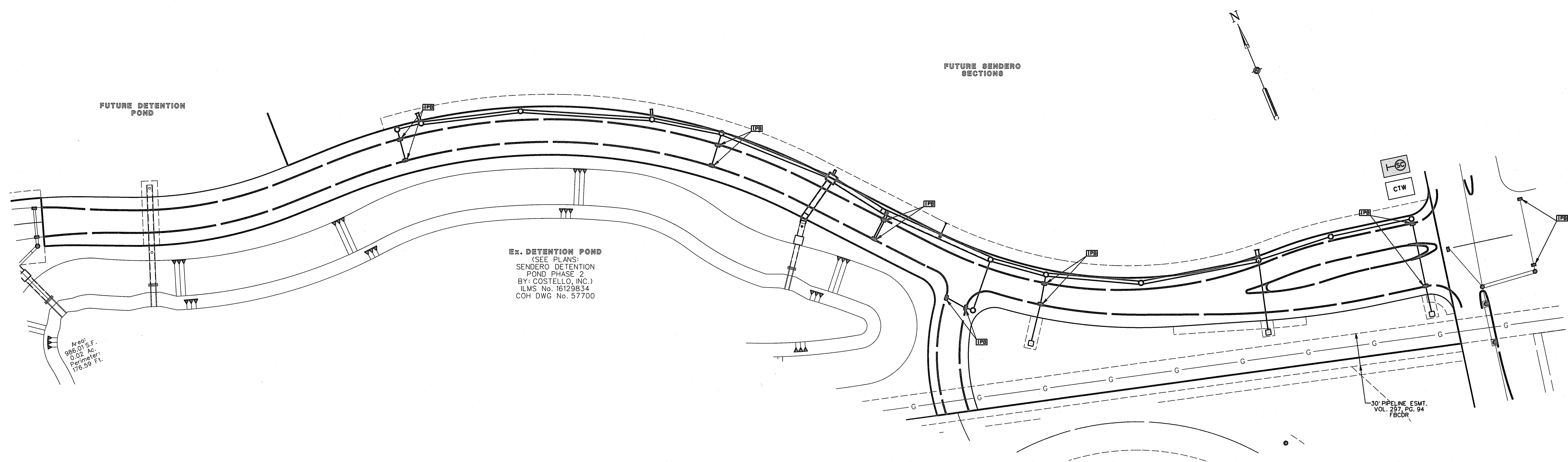
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Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
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TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION
**BEDDING DETAILS
AND FORT BEND COUNTY
SIDEWALK AND DRIVEWAY DETAILS**



BENCHMARK RM NO. 190045
 BRASS DISK LOCATED ON THE NORTHEAST CORNER OF
 CINCO RANCH BLVD. CONCRETE BRIDGE OVER UPPER
 BUFFALO BAYOU (150-00-001) 0.5 MILES SOUTHWEST
 OF THE INTERSECTION OF CINCO RANCH BLVD. AND
 WESTHEMER PARKWAY.
 ELEV. 115.25 NAVD 1988, 2001 ADJ.
 TEMPORARY BENCHMARK 2534-69-1
 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB.
 LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY,
 FOURTH INLET NORTH OF THE INTERSECTION OF RANCHO
 BELLA PARKWAY AND BELLARE BLVD DIRECTLY ACROSS
 FROM PADOVA DR. THE ENTRANCE TO EXISTING SUBDIVISION
 LINES OF BELLA TERRA.
 ELEV. 119.54 NAVD 1988, 2001 ADJ.
 TEMPORARY BENCHMARK 2534-70-1
 CUT BOX ON CENTERLINE OF INLET AT BACK OF CURB.
 LOCATED AT THE WEST SIDE OF RANCHO BELLA PARKWAY,
 FIRST INLET NORTH OF THE INTERSECTION OF RANCHO
 BELLA PARKWAY AND BELLARE BLVD.
 ELEV. 116.72 NAVD 1988, 2001 ADJ.

FORT BEND COUNTY MUD 132



**POLLUTION PREVENTION PLAN
 LEGEND**

- INLET PROTECTION BARRIER
- REINFORCED FILTER FABRIC BARRIER
A MINIMUM OF 2' BEHIND BACK OF CURB
- STABILIZED CONSTRUCTION ACCESS
- CONCRETE TRUCK WASH

- NOTES:**
1. PLACE FILTER FABRIC SILT FENCE +/- 5 FEET AROUND ALL INLETS.
 2. ALL SOIL STOCKPILES OF SIGNIFICANT SIZE SHALL BE ENCOMPASSED BY A SILT FENCE.
 3. ALL PROPOSED SWALES TO BE CONSTRUCTED BY THE CONTRACTOR FOR MAINTAINING SITE DRAINAGE SHALL HAVE SILT FENCES PLACED ACROSS THE ENTIRE SWALE JUST UPSTREAM OF THE OUTFALL LOCATION.
 4. A VEHICLE WASH-DOWN AREA FOR THE PROJECT MAY BE LOCATED BY THE CONTRACTOR. WHEN IN USE BY THE CONTRACTOR, THE INLET WHERE THE WASH-DOWN WATER IS DIRECTED SHALL BE PROTECTED. THE LOCATION OF THE WASH-DOWN IS AT THE CONTRACTOR'S OPTION.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL SWPP FEATURES INDICATED ON THIS PLAN.
 6. ESTABLISH TURF ON ALL AREA'S DISTURBED DURING CONSTRUCTION UNLESS CONSTRUCTION IS SCHEDULED TO CONTINUE WITHIN 14 DAYS.
 7. UPON PROJECT COMPLETION AND FINAL STABILIZATION, ALL SILT FENCE SHALL BE REMOVED AND DISPOSED OF.

APPROVED:
 DEVELOPMENT COORDINATOR
 DATE: 10/11/18

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

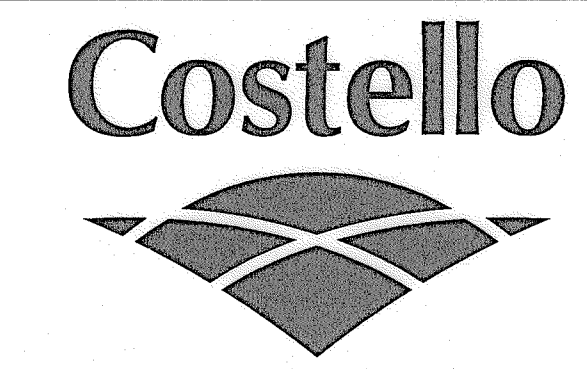
CITY OF HOUSTON	
HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO:	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	 61214
HORZ : 1" = 60'	
VERT : 1" = 60'	
SHEET No: 16 of 20	

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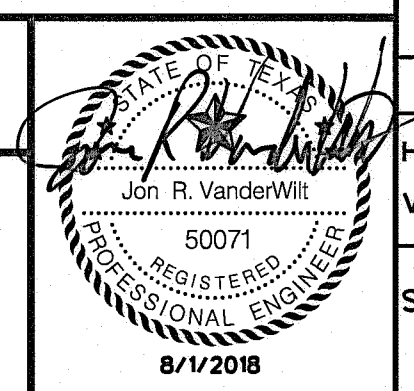
NO.	REVISION	DATE	BY

DESIGNED BY: RLM
 DESIGN CHECKED BY: TRV
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 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
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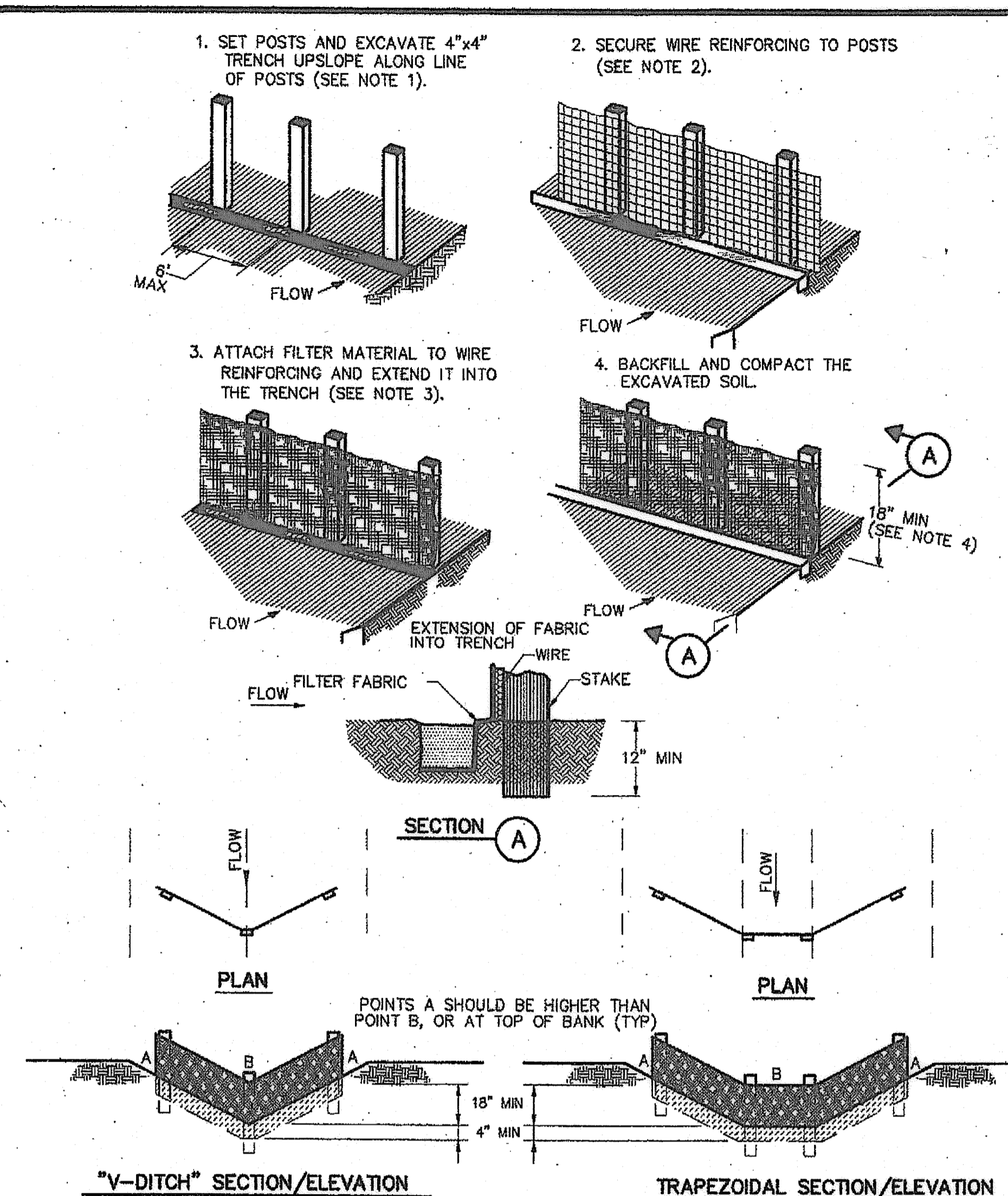


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FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
**POLLUTION PREVENTION
 PLAN LAYOUT**



WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB No. 200417-CRM-DS-10)

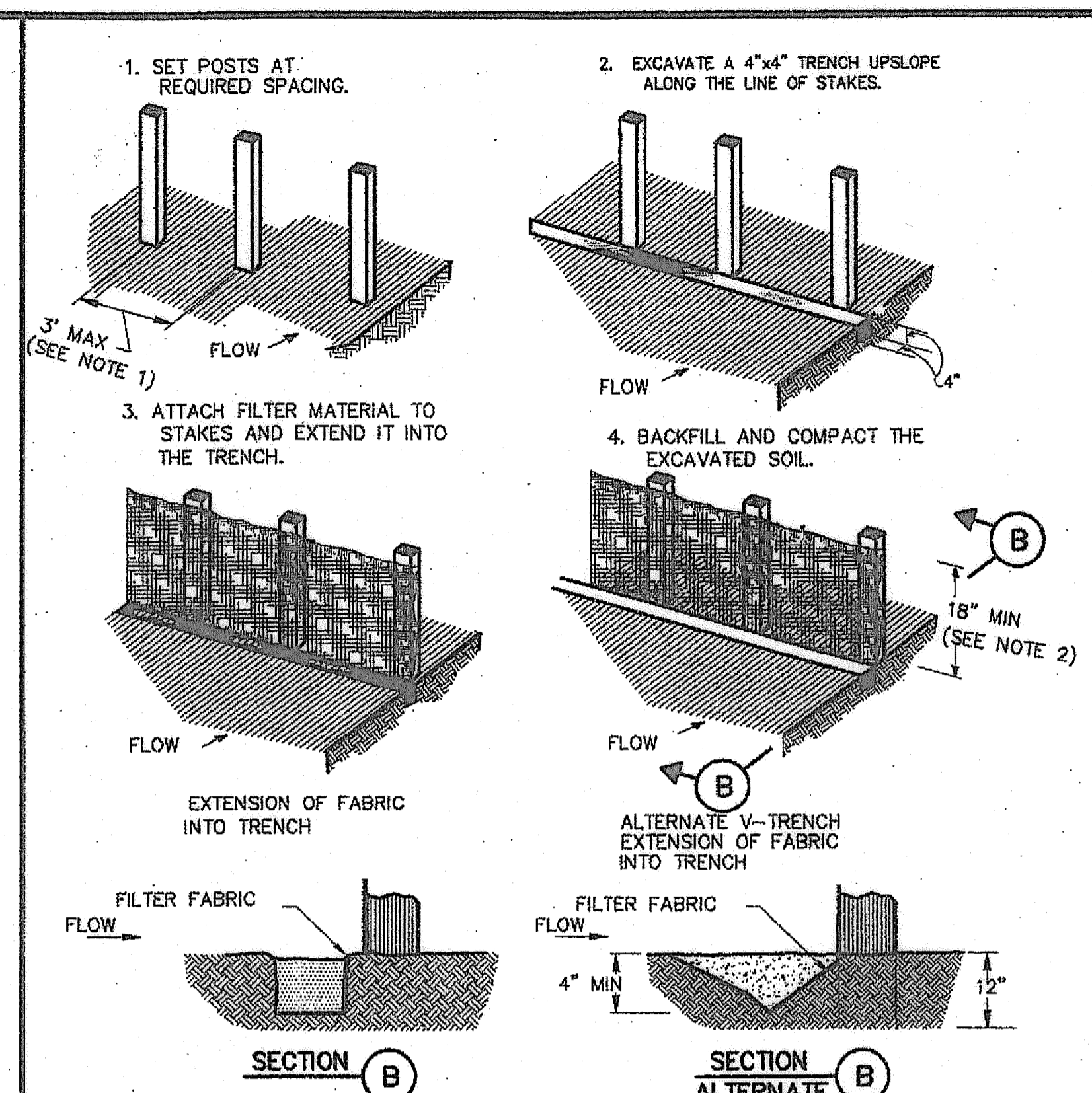
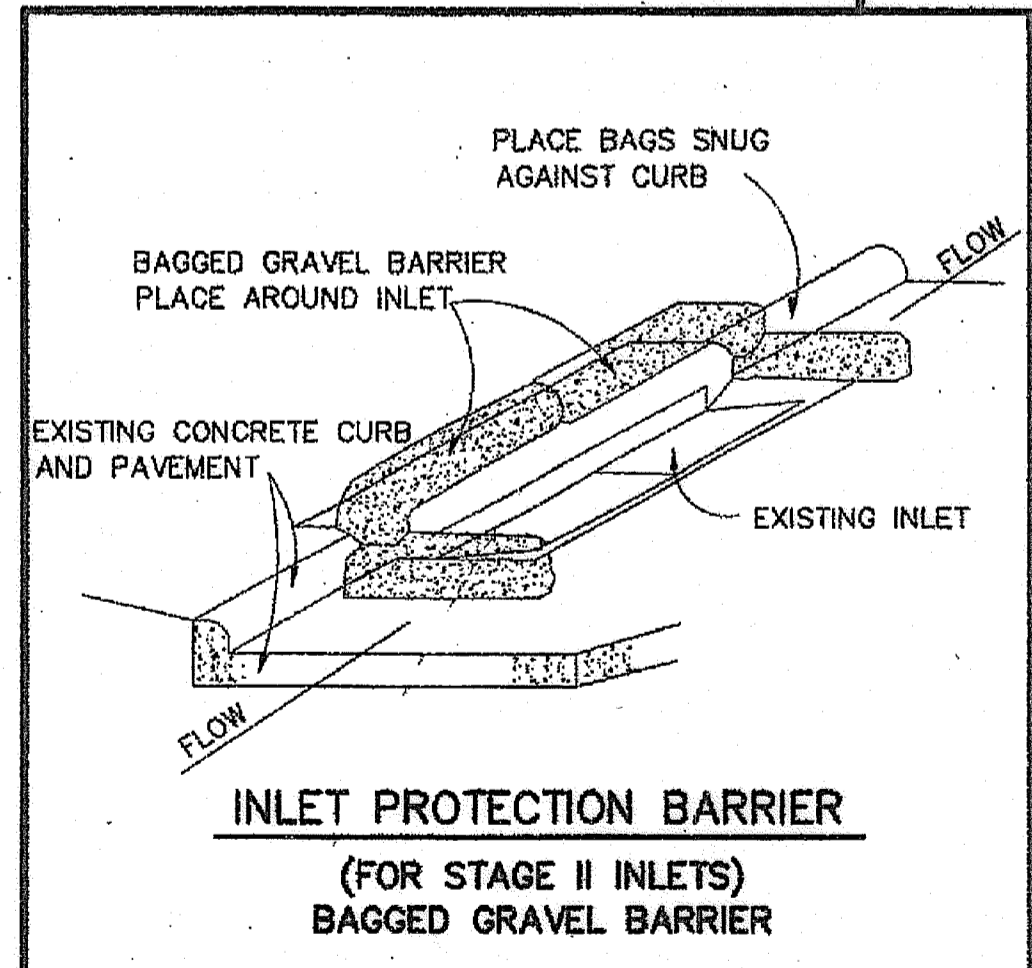


CONSTRUCTION NOTES:

- SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
- WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
- FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
- MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
- SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

REINFORCED FILTER FABRIC BARRIER

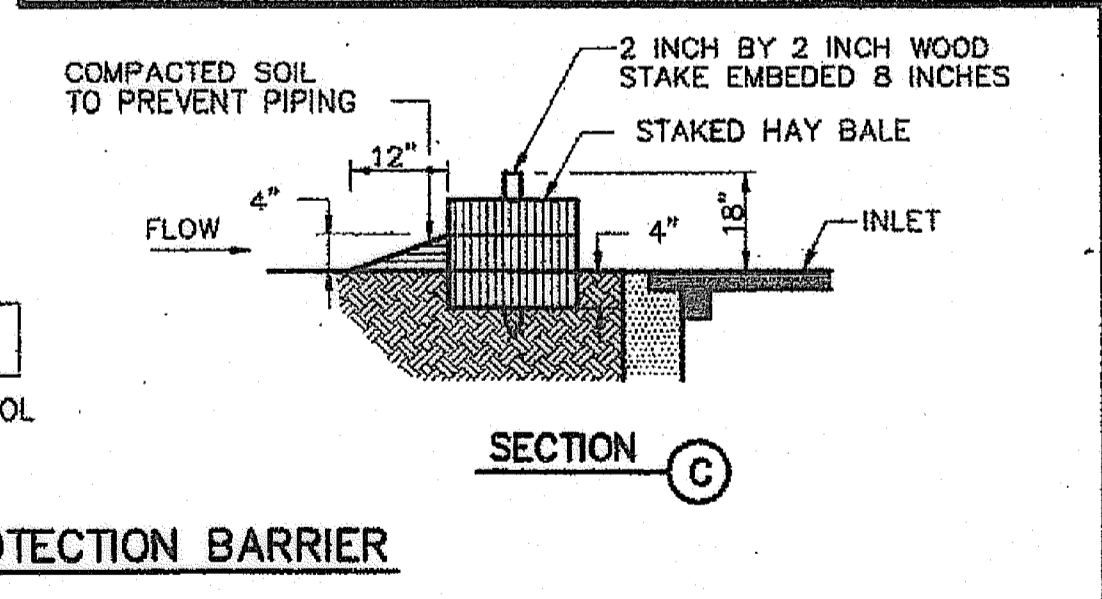
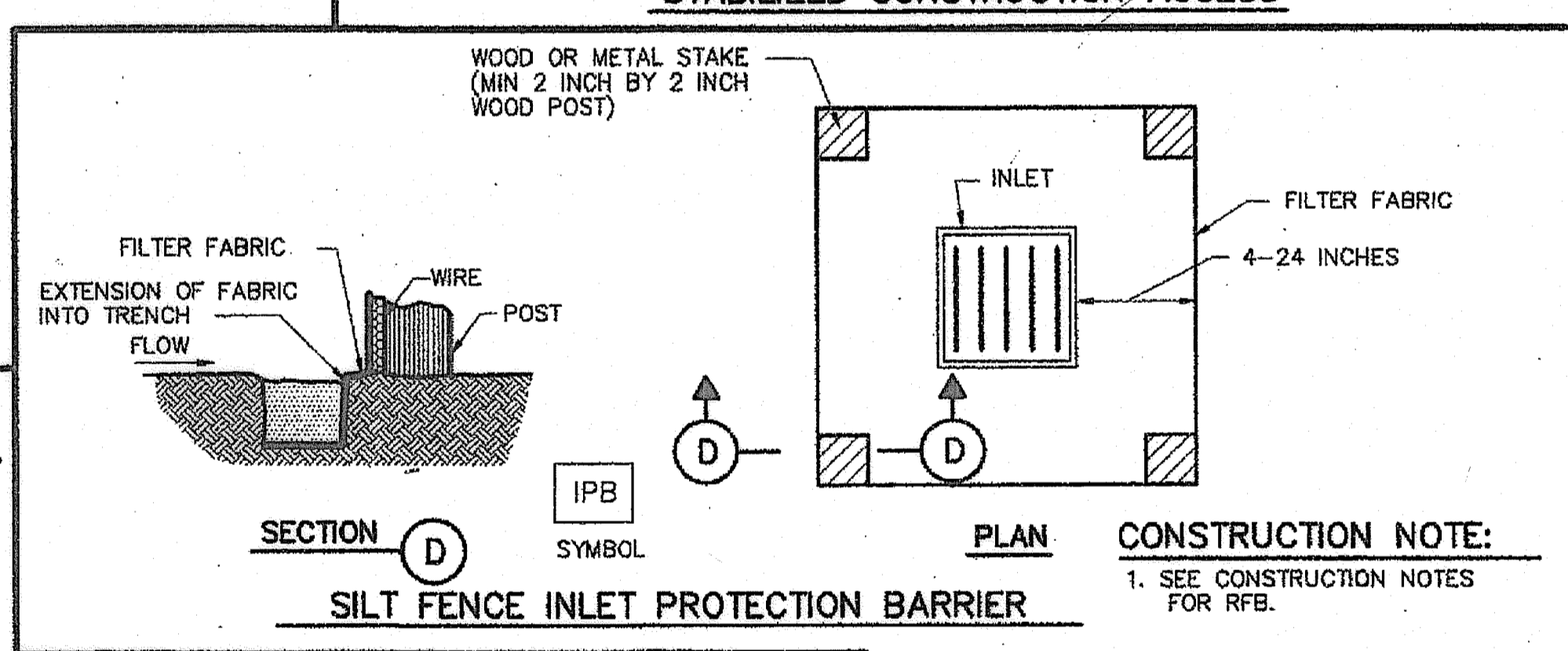
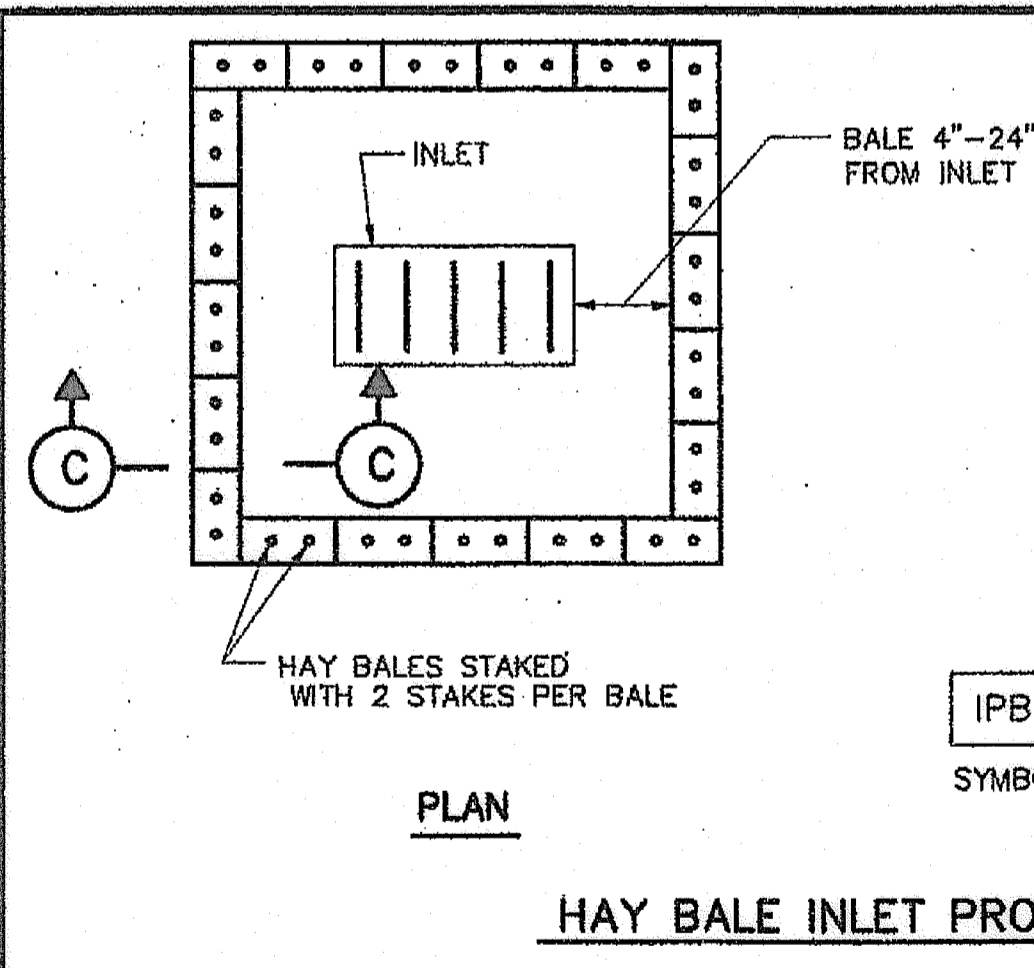
SYMBOL:



CONSTRUCTION NOTES:

- 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED BARRIER WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
- ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC BARRIER SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
- SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

FILTER FABRIC BARRIER



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS
(NOT TO SCALE)

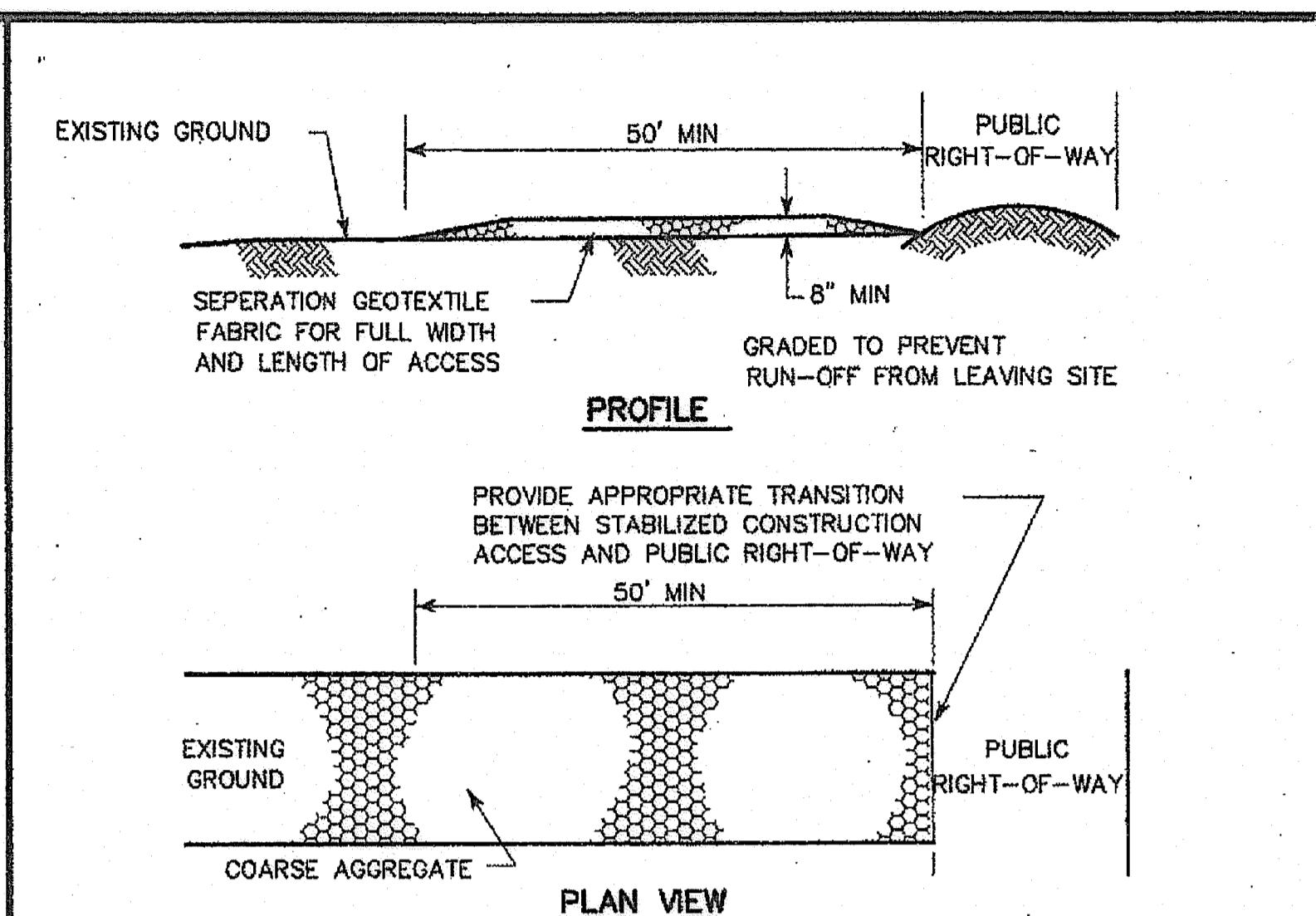
APPROVED:

CITY ENGINEER

APPROVED:

DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 01571-01



CONSTRUCTION NOTES:

- LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
- THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
- WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
- STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
- STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
- COH STANDARD SPECIFICATION FOR STABILIZED CONSTRUCTION ACCESS.
- STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

STABILIZED CONSTRUCTION ACCESS

SYMBOL:

APPROVED:

DEVELOPMENT COORDINATOR

DATE: 10/11/18

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	
FILE NO:	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ: N.T.S.	
VERT:	
SHEET No: 17 of 20	

61214

8/2/2018

DESIGNED BY: <i>ELM</i>	
DESIGN CHECKED BY: <i>IRV</i>	
DRAWN BY: <i>ELM</i>	
COGO CHECKED BY:	
SURVEY CHECKED BY:	
QA/QC BY: _____ DATE: _____	
QA/QC REVISIONS BY: <i>ELM</i>	

NO.	REVISION	DATE	BY

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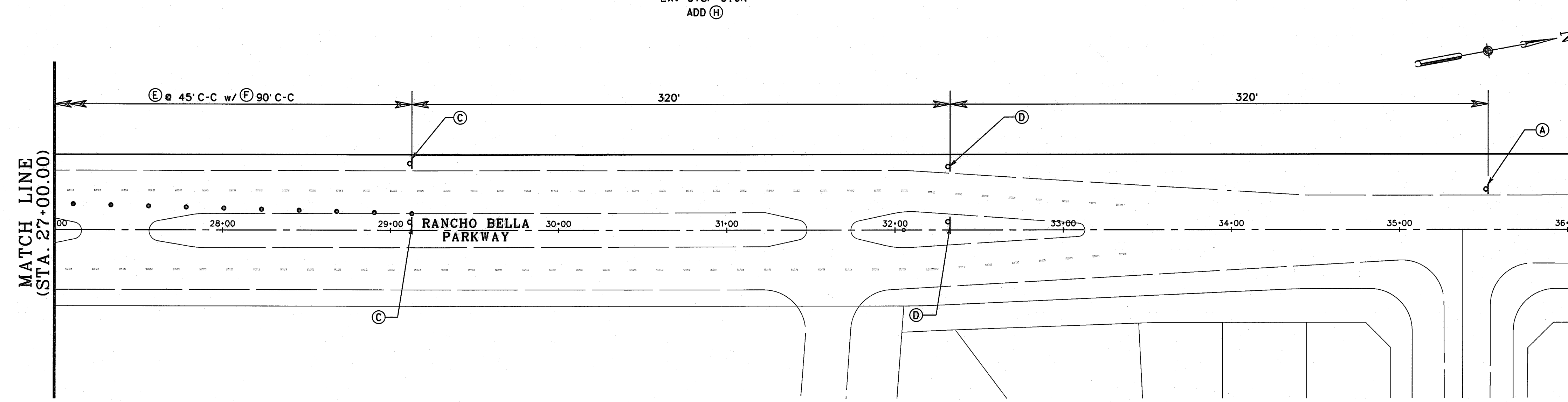
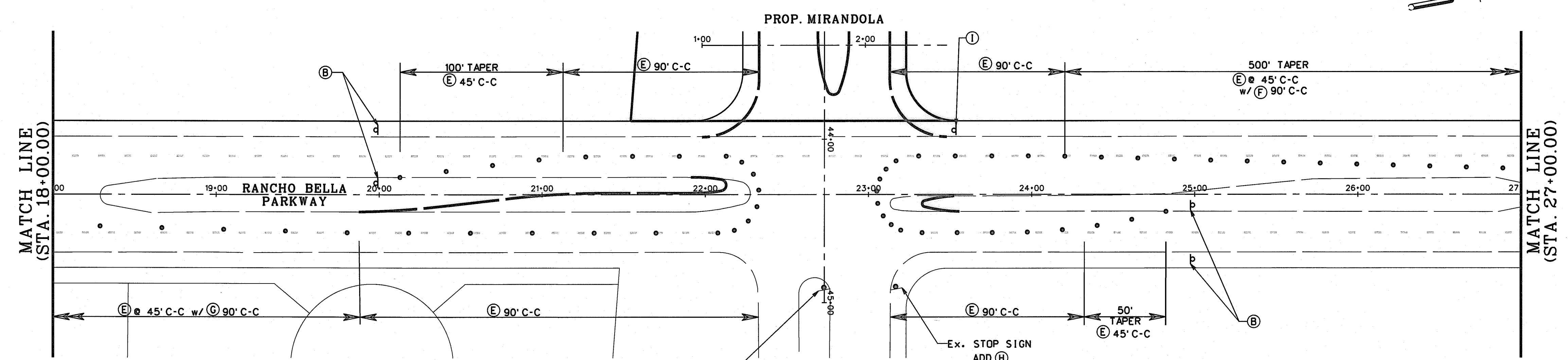
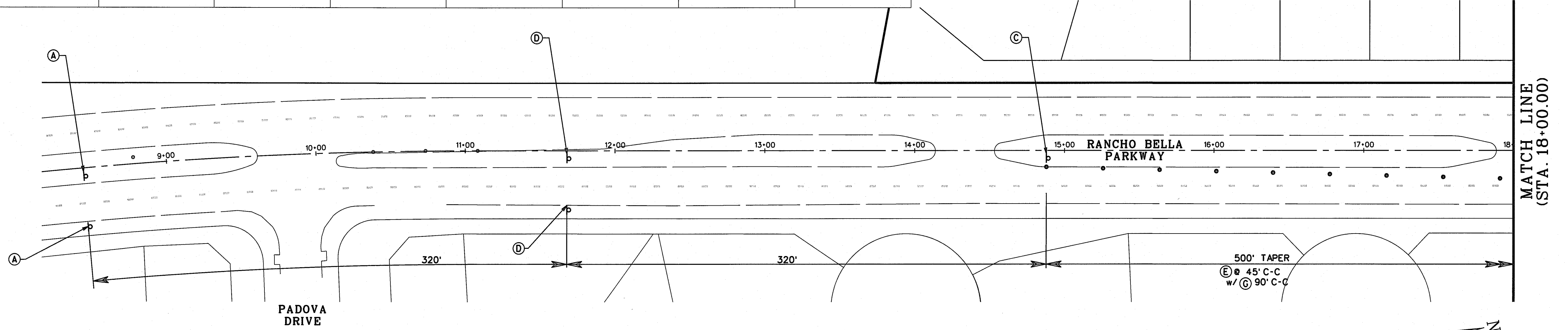
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION

POLLUTION PREVENTION DETAILS



ROAD WORK AHEAD CW20-1D A	END ROAD WORK G20-2a B	LANE ENDS MERGE RIGHT CW9-2R C	LEFT LANE ENDS CW9-1L D	DRUMS E	CHEVRON CW1-BL F	CHEVRON CW1-BR G	CROSS TRAFFIC DOES NOT STOP W4-4P H	R3-6L I
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APPROVED: *[Signature]*
DEVELOPMENT COORDINATOR
DATE: 10/11/18

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	TRAFFIC & TRANSPORTATION
WASTEWATER	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	

FILE NO: _____ FOR CITY OF HOUSTON USE ONLY

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

SHEET No: 18 of 20

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NO.	REVISION	DATE	BY

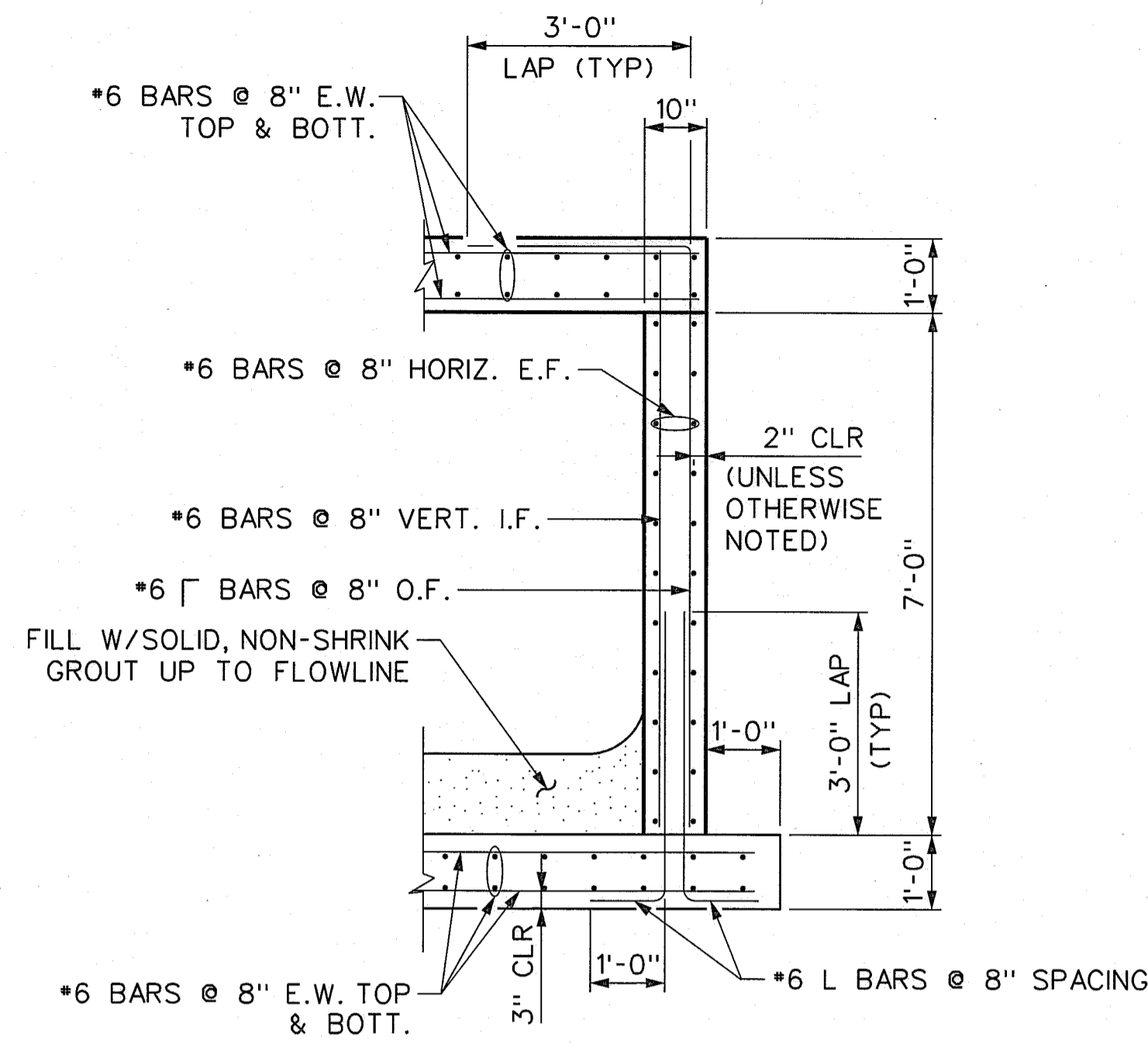
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 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: *RLM*

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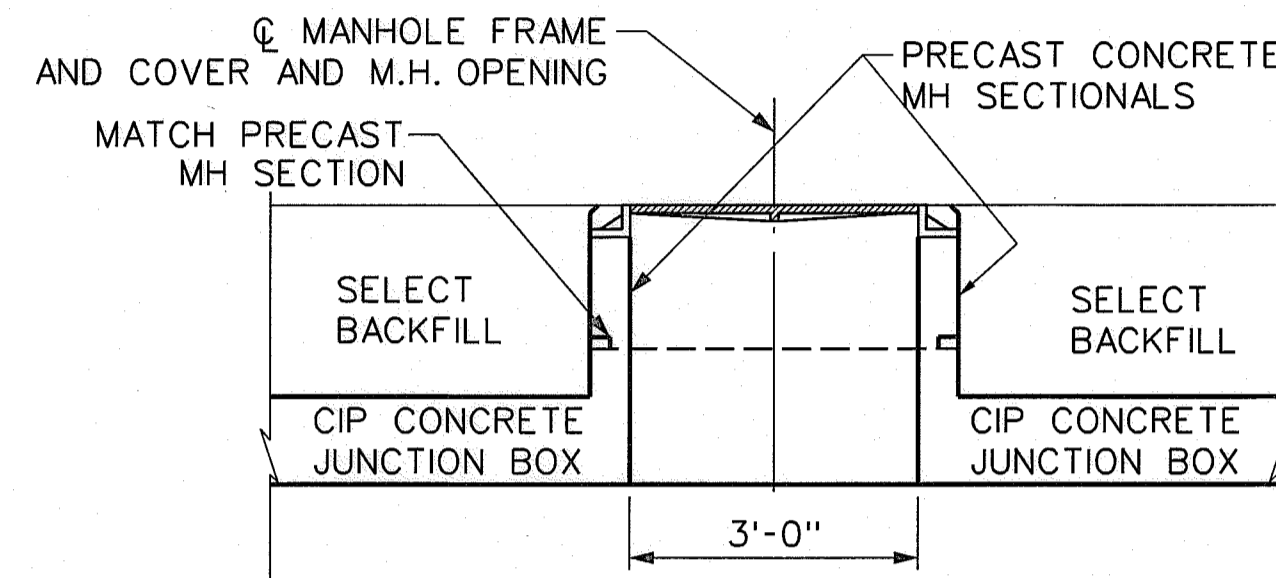
FORT BEND COUNTY MUD 132
 MIRANDOLA LANE EXTENSION
 TRAFFIC CONTROL DETAILS

STRUCTURAL NOTES:

- CONTRACTOR SHALL CONSTRUCT THE JUNCTION BOX AS PRESENTED ON THE STRUCTURAL DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS.
- THE STRUCTURAL DRAWINGS OF THE SUBJECT JUNCTION BOX SHOW THE WALL, BASE, AND TOP SLAB THICKNESSES AND CORRESPONDING REINFORCING STEEL. A PRECAST CONCRETE FABRICATOR MAY PROVIDE AN ALTERNATE DESIGN THROUGH THE SHOP DRAWING SUBMITTAL PROCESS. THESE SHOP DRAWING AND SUPPORTING DOCUMENTS SHALL BE SEALED BY A TEXAS PROFESSIONAL ENGINEER.
- JUNCTION BOX BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATION SECTION TITLED "EXCAVATION AND BACKFILL FOR UTILITIES".
- THE LAST REVISIONS OF THE FOLLOWING AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARDS SHALL BE USED FOR REINFORCED CONCRETE MATERIALS:
 - "SPECIFICATION FOR CONCRETE AGGREGATES" (ASTM C33)
 - "SPECIFICATION FOR PORTLAND CEMENT" (ASTM C150)
 - "SPECIFICATION FOR READY-MIX CONCRETE" (ASTM C94)
 - "SPECIFICATION FOR DEFORMED AND PLAIN CARBON STEEL BARS FOR CONCRETE REINFORCEMENT" (ASTM A615, GRADE 60)
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.
- ALL REINFORCING STEEL SHALL BE GRADE 60.
- EXPOSED CORNERS SHALL BE CHAMFERED 3/4 INCH.
- CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING.

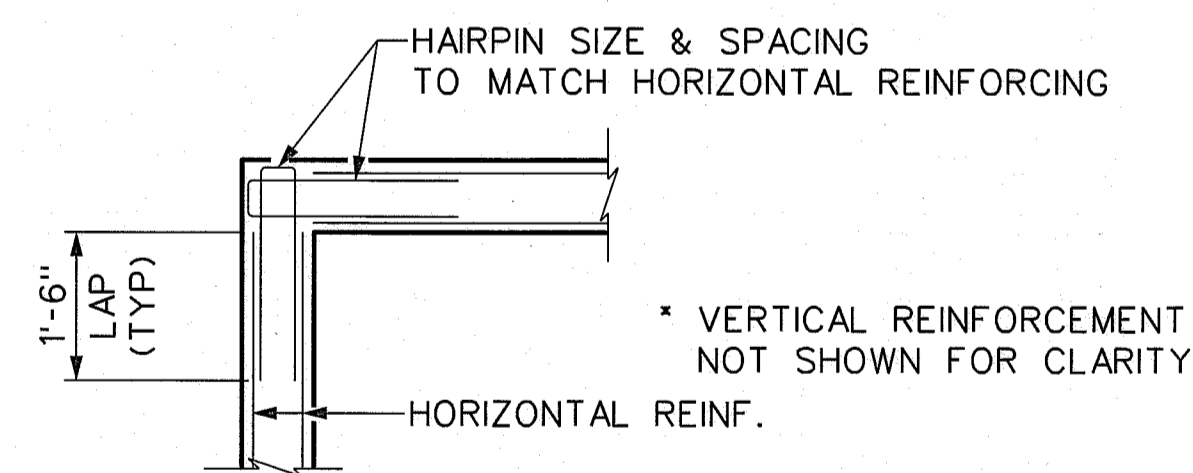


① TYPICAL WALL SECTION FOR JUNCTION BOX
SCALE: 1/2"=1'-0"



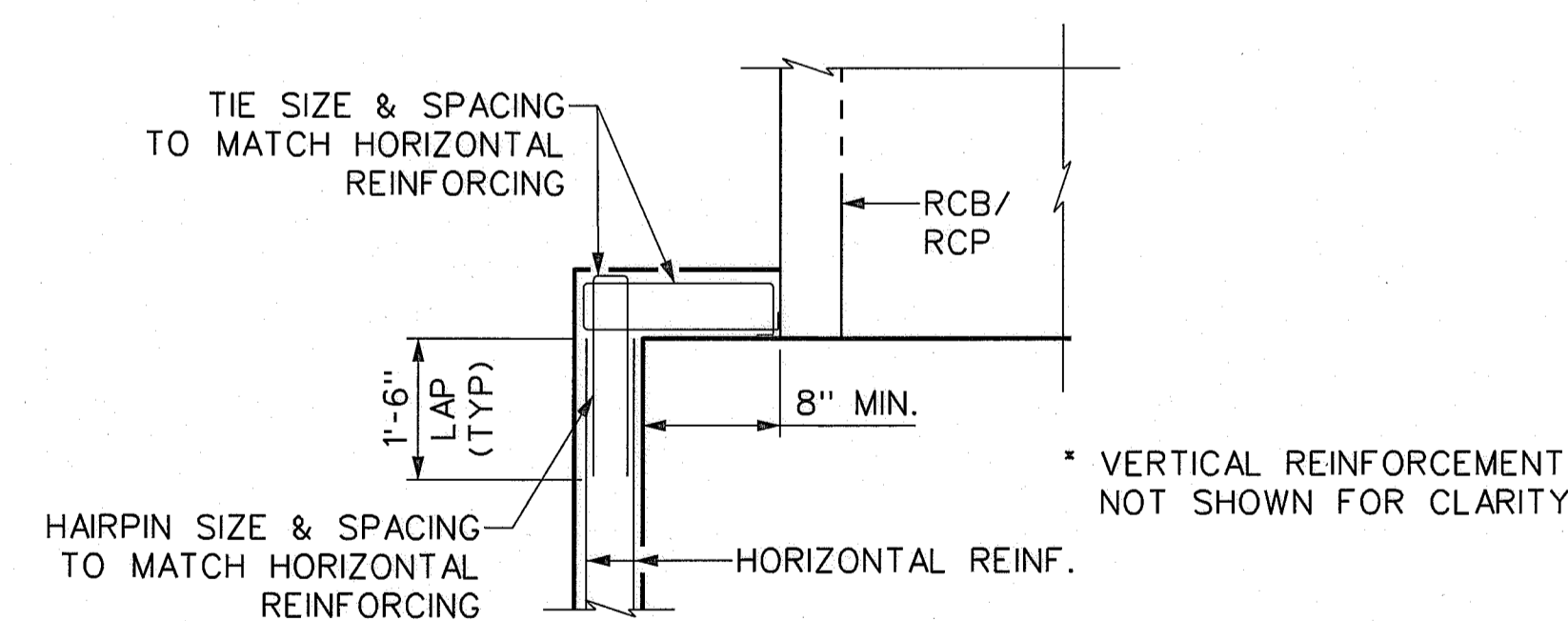
② MANHOLE OPENING AT JUNC. BOX
SCALE: 1/2"=1'-0"

"A"	NOMINAL KEY SIZE
UP TO 8"	1 - 2"x3" KEY
9" TO 12"	1 - 2"x4" KEY
13" TO 18"	1 - 2"x6" KEY
19" TO 24"	2 - 2"x4" KEY
25" & OVER	2 - 2"x6" KEY

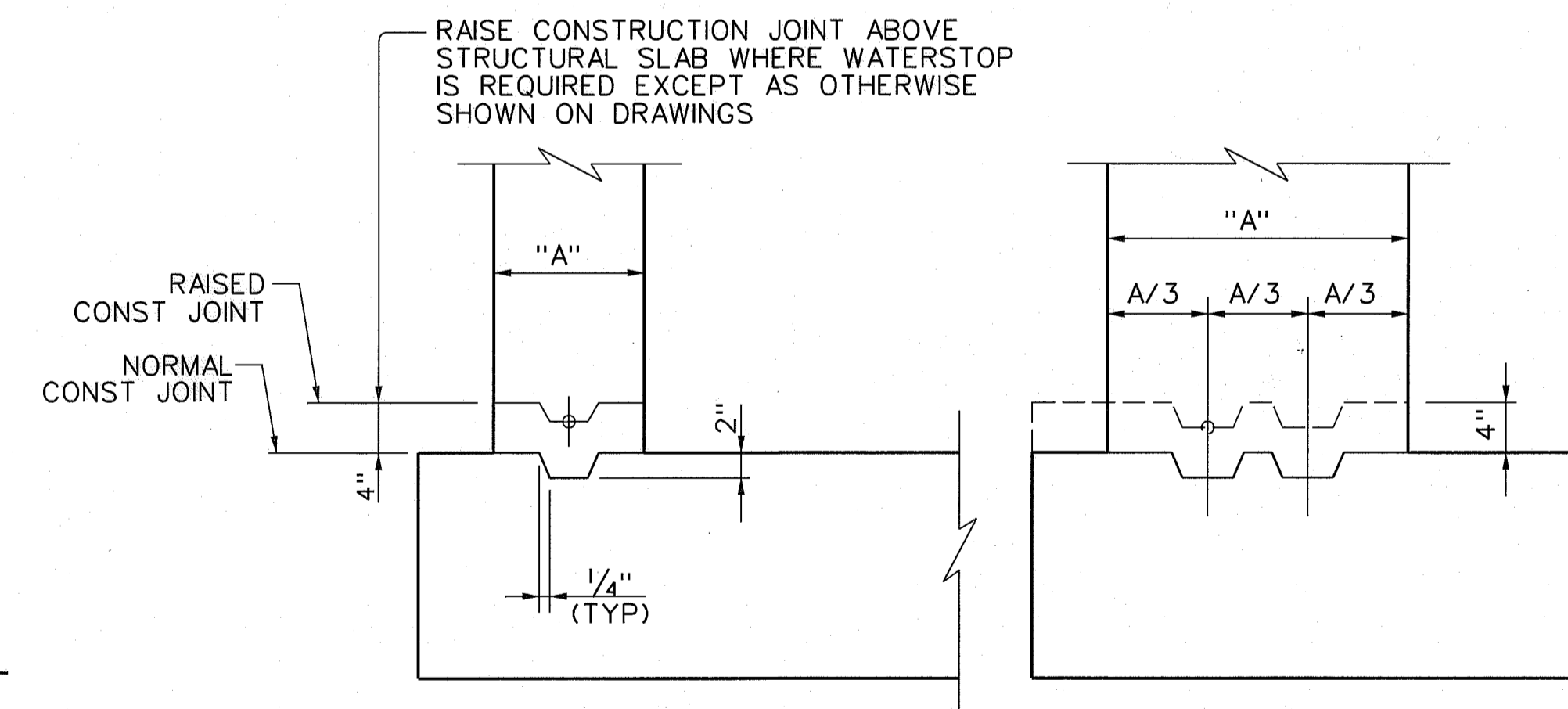


NOTE: USE TIES WHEN HORIZONTAL REINF. LAP LENGTH IS LESS THAN 1'-6".

③ TYPICAL WALL CORNER DETAIL
SCALE: 1/2"=1'-0"



④ TYP. WALL CORNER DETAIL @ R.C. BOX/PIPE
SCALE: 1/2"=1'-0"



⑤ CONSTRUCTION JOINT KEY DETAILS
N.T.S.

APPROVED: *[Signature]*
DEVELOPMENT COORDINATOR
DATE: 10/11/18

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SHEET No: 20 OF 20
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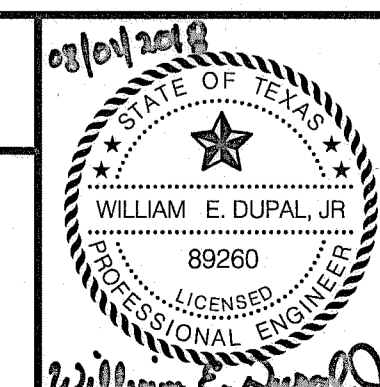
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COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: MAW DATE: 7/19/18
QA/QC REVISIONS BY: TN



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FORT BEND COUNTY MUD 132
MIRANDOLA LANE EXTENSION

JUNCTION BOX DETAILS



FORT BEND COUNTY MUD132
WATER, DRAINAGE AND PAVING IMPROVEMENTS FOR MIRANDOLA LANE EXTENSION (JOB No. 2004117-CRM-DS-101)