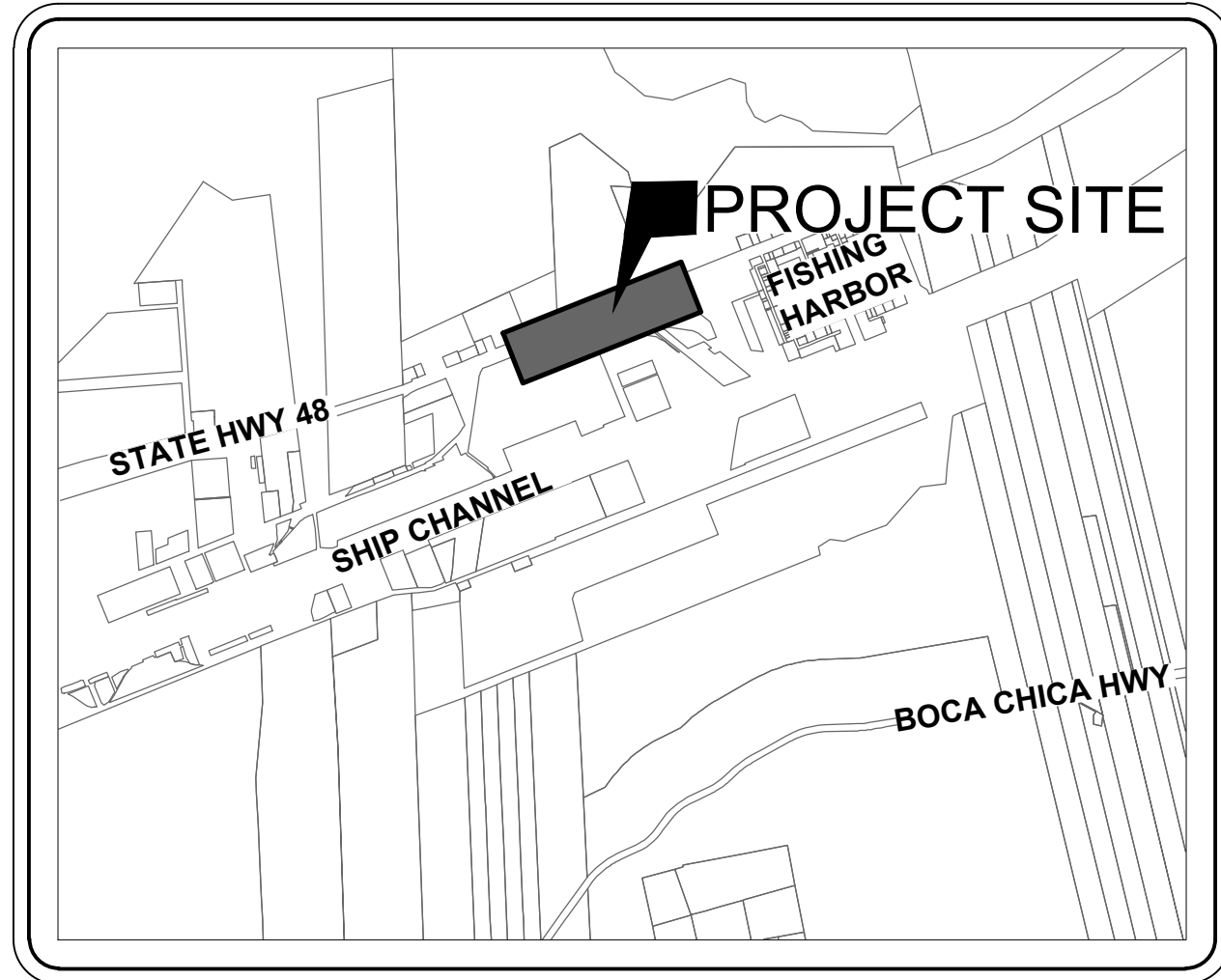


CONSTRUCTION PLANS
FOR
PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN
RELOCATION
BROWNSVILLE, TEXAS
ISSUED FOR BID

ENGINEER

HALFF ASSOCIATES INC.
1075 PAREDES LINE RD., SUITE B
BROWNSVILLE, TEXAS 78521-2696
CONTACT: MICHAEL A. SALINAS, PE
EMAIL: MICHAEL.SALINAS@HALFF.COM
TEL: (956) 697-7103
FIRM/ BUSINESS NO.: #312 STATE: TX



LOCATION MAP

1" = 4000'

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OWNER/CLIENT:



100 CAPT DONALD L FOUST RD.
BROWNSVILLE, TEXAS,
TEL. (956) 831-4592
www.portofbrownsville.com

PREPARED BY:



1075 PAREDES LINE RD., SUITE B
BROWNSVILLE, TEXAS 78521-2696
TEL. (956) 697-7103
www.halff.com



SUBMITTED FOR APPROVAL BY:

Michael A. Salinas

10/16/2026

ENGINEER OF RECORD

I, MICHAEL A. SALINAS, PE, DO HEREBY CONFIRM THAT ANY FORCE MAIN IMPROVEMENTS DESCRIBED HEREIN, HAVE BEEN DESIGNED IN COMPLIANCE WITH PORT OF BROWNSVILLE.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN ACCEPTING THESE PLANS, THE CITY OF BROWNSVILLE AND CAMERON COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK HERE IN SEALED BY THE DESIGN ENGINEER.

APPROVED BY:

NAME

DATE

NAME

DATE

DISCLAIMER:

THE SEAL(S) APPEARING ON THIS CONSTRUCTION SET WERE AUTHORIZED BY:
MICHAEL A. SALINAS (123342),
ON 10/16/2026.

ALTERATION OF SEALED DOCUMENTS WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF:

HALFF ASSOCIATES, INC
1075 PAREDES LINE RD., SUITE B
BROWNSVILLE, TEXAS 78521-2696
FIRM / BUSINESS NO.: #312 STATE: TX



Know what's below.
Call before you dig.

THE INFORMATION SHOWN ON THESE DRAWINGS INDICATING SIZE, TYPE AND LOCATION OF UNDERGROUND, SURFACE, AND AERIAL UTILITIES IS NOT GUARANTEED TO BE EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT THE "TEXAS 811" SYSTEM AT 1-800-344-8377 (DIG TESS) 48 HOURS PRIOR TO BEGINNING ANY EXCAVATION FOR EXISTING UTILITY LOCATIONS. THE CONTRACTOR SHALL ALSO BE FULLY RESPONSIBLE FOR FIELD VERIFYING LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES AFFECTED BY CONSTRUCTION FOR THIS PROJECT IN ORDER TO AVOID DAMAGING THOSE UTILITIES, AND SHALL IMMEDIATELY ARRANGE FOR REPAIR AND RESTORATION OF CONTRACTOR-DAMAGED UTILITIES TO THE UTILITY COMPANY'S APPROVAL AT THE EXPENSE OF THE CONTRACTOR.

AVO: 63708.001

DATE: OCTOBER 2026

G001

FILE NAME: A:\63000a\63708001\PW\CADD\Sheets\C-PLN-CN-63707-001.dwg DATE: October 16, 2026, TIME: 10: 16 AM, USER: ah3818

GENERAL CONSTRUCTION NOTES:

- ALL MATERIALS, WORKMANSHIP AND IMPROVEMENTS SHALL BE IN ACCORDANCE WITH ALL LOCAL CODES, INCLUDING THE STANDARD CONSTRUCTION DETAILS AND TECHNICAL SPECIFICATIONS FROM PORT OF BROWNSVILLE, BROWNSVILLE PUBLIC UTILITIES BOARD, TEXAS DEPARTMENT OF TRANSPORTATION AND ALL OTHER GOVERNING AGENCIES.
- THE CONTRACTOR SHALL HAVE A PERSON ON CALL 24 HOURS A DAY TO ADDRESS CONSTRUCTION AREA MAINTENANCE ITEMS, TRAFFIC CONTROL, OR OTHER NEEDS NECESSARY FOR PUBLIC SAFETY. THIS PERSON SHALL HAVE AUTHORITY TO ACT ON BEHALF OF THE CONTRACTOR IN EMERGENCY CONDITIONS. THE PERSON SHALL BE STATIONED WITHIN 1/2 HOUR TRAVEL TIME FROM THE PROJECT SITE. THE PERSON SHALL BE IDENTIFIED IN WRITING PRIOR TO START OF CONSTRUCTION. THE ON-SITE REPRESENTATIVE SHALL HAVE ACCESS ALL EQUIPMENT AND MATERIAL AND HAVE FULL AUTHORITY NECESSARY TO CORRECT ANY PROBLEMS, DEFICIENCIES, OR EMERGENCIES WHICH MAY ARISE DURING NON-WORKING HOURS AND DURING THE ABSENCE OF THE SUPERINTENDENT.
- STANDARD WORK HOURS: THE STANDARD WORK HOURS FOR THE OWNER IS 8:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY. SHOULD THE CONTRACTOR ELECT TO WORK ON SATURDAY, SUNDAYS OR HOLIDAYS, HE SHALL BE RESPONSIBLE FOR PAYING OVERTIME CHARGES FOR THE OWNERS PERSONNEL INVOLVED. THESE CHARGES WILL BE AT COST AND WILL BE CALCULATED EITHER AT TIME AND A HALF OR DOUBLE TIME, AS APPLICABLE TO THE PARTICULAR DAY BEING WORKED. PRE-APPROVAL SHALL BE OBTAINED FROM THE ENGINEER OR ENGINEER'S REPRESENTATIVE BY COMPLETING AND SIGNING A OWNER'S FORM ENTITLED "CONSTRUCTION INSPECTORS OVERTIME COMPENSATION AUTHORIZATION", PRIOR TO COMMENCING ANY OVERTIME WORK. ANY WORK DONE OUTSIDE THE STANDARD WORKDAY, WITHOUT PRIOR AUTHORIZATION, SHALL BE CONSIDERED UNAUTHORIZED WORK. THE CONTRACTOR IS REQUIRED TO PAY THE OVERTIME WAGES OF THE OWNER INSPECTORS THAT WORK OVERTIME MONDAYS THROUGH FRIDAYS AT TIME IN A HALF. THE CONTRACTOR IS RESPONSIBLE FOR THE OVERTIME WAGES OF THE OWNER INSPECTORS THAT WORK HOLIDAYS AT DOUBLE TIME. MINIMUM HOURS WILL BE BILLED TO CONTRACTOR FOR CALL OUTS OR FOR INSUFFICIENT NOTICE OF TWO (2) HOURS.
- THE CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL DIMENSIONS AND THE LOCATION OF EXISTING AND PROPOSED PROJECT ELEMENTS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN PLAN DIMENSIONS AND ACTUAL FIELD CONDITIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER. NO CONSTRUCTION ACTIVITY SHALL CONTINUE WITHOUT APPROVAL FROM THE OWNER.
- ALL MATERIALS AND LABOR, WHETHER SPECIFICALLY INDICATED ON PLANS OR NOT, WHICH ARE NECESSARY FOR THE PROPER INSTALLATION AND FUNCTION OF THE SYSTEM SHALL BE FURNISHED BY THIS CONTRACTOR.
- CONTRACTOR SHALL NOT PROCEED WITH ANY WORK INVOLVING A CHANGE IN PROJECT SCOPE, EQUIPMENT, MATERIALS OR COST WITHOUT FIRST HAVING OBTAINED ENGINEER'S AND/OR OWNER'S APPROVAL IN WRITING. IF APPROVAL HAS NOT BEEN OBTAINED IN WRITING PRIOR TO PROCEEDING WITH ANY CHANGE, CONTRACTOR WILL NOT BE REIMBURSED FOR SUCH CHANGE.
- CONTRACTOR TO PLAN AND PERFORM HIS WORK IN A MANNER THAT WILL PERMIT SAFE PUBLIC TRAFFIC MOVEMENT ON ALL STREETS.
- THE CONTRACTOR SHALL PLAN AND SEQUENCE ALL CONSTRUCTION ACTIVITY IN SUCH A MANNER THAT WILL PERMIT SAFE PEDESTRIAN AND VEHICULAR MOVEMENT.
- TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATIONS. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN, IN ACCORDANCE WITH SPECIFICATION 01 55 26 TRAFFIC CONTROL AND REGULATION FOR APPROVAL BY THE OWNER. PRIOR TO CONSTRUCTION, THE TRAFFIC CONTROL PLAN SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. ALL TRAFFIC CONTROL / TRAFFIC SAFETY SHALL BE IN ACCORDANCE WITH THE LATEST MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) CRITERIA.
- CONTRACTOR SHALL PROVIDE PROTECTIVE DEVICES SUCH AS SIGNS, LIGHTS, SIGNALS, AND OTHER DEVICES, AS NEEDED FOR THE SAFETY OF THE PUBLIC AND WORKERS. (NO SEPARATE PAY)
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SAFETY OF THE WORK SITE, WORKERS, SUBCONTRACTORS, MATERIALS AND EQUIPMENT.
- THE DRAWINGS AND SPECIFICATIONS REPRESENT THE COMPLETED STRUCTURES/DESIGN. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND MEANS NECESSARY TO PROTECT PERSONS AND STRUCTURES DURING CONSTRUCTION. OBSERVATION BY THE ENGINEER OR THE OWNER DOES NOT INCLUDE REVIEW OF THESE MEASURES.
- THESE PLANS, PREPARED BY HALFF ASSOCIATES, INC., DO NOT EXTEND TO OR INCLUDE DESIGN OF SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF HALFF ASSOCIATES, INC., REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY THE HOUSE BILLS 662 AND 665 ENACTED BY THE TEXAS LEGISLATURE IN THE 70TH LEGISLATURE REGULAR SESSION.
- CONTRACTOR SHALL PROVIDE A SEQUENCE OF WORK AND PERFORM ASSOCIATED GRADING THAT PROVIDES POSITIVE OUTFALLS AT ALL TIMES.
- CONSTRUCTION STAKING AND SURVEYING SHALL BE PROVIDED BY THE CONTRACTOR AND AT CONTRACTOR'S EXPENSE. ALL DIMENSIONS ARE TO BACK OF CURB OR, WHERE NO CURB EXISTS, TO EDGE OF PAVEMENT UNLESS SHOWN OTHERWISE. ALL UTILITY DIMENSIONS OR STATIONS/COORDINATES ARE TO CENTER OF THE STRUCTURE UNLESS SHOWN OTHERWISE.
- CONTRACTOR TO COORDINATE WITH THE OWNER ON WORK SCHEDULES, TESTING, GENERAL INSPECTION, AND OPERATION AND LOCATION OF EXISTING LINES.
- THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING ALL CONSTRUCTION MATERIALS TESTING AND GENERAL INSPECTIONS. THE CONTRACTOR SHALL COORDINATE THROUGH THE OWNERS DESIGNATED FIELD REPRESENTATIVE A MINIMUM OF 24-HOURS PRIOR TO TESTING OR INSPECTION. FAILURE TO BE PREPARED FOR TESTING MAY RESULT IN TRAVEL CHARGES. RE-TESTING WILL BE BORNE BY THE CONTRACTOR.
- MATERIAL TESTING SHALL BE PROVIDED BY THE OWNER. RE-TEST TO BE AT CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL INSPECT ALL MATERIALS AT DELIVERY AND NOTIFY THE OWNER OF ANY DAMAGED OR QUESTIONABLE MATERIALS. ANY DAMAGED OR QUESTIONABLE MATERIAL INSTALLED WITHOUT PRIOR INSPECTION BY THE OWNER SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL COORDINATE ANY REQUIRED TEMPORARY RELOCATION OF MAILBOXES WITH THE BROWNSVILLE POSTMASTER. FINAL LOCATION SHALL BE IN ACCORDANCE WITH THE LOCAL POST OFFICE REQUIREMENTS AT CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED. (NO SEPARATE PAY)
- THE CONTRACTOR IS ENCOURAGED TO INSPECT AND DOCUMENT THE PRE-CONSTRUCTION CONDITION OF ALL PRIVATE DRIVEWAYS, MAILBOXES, PAVEMENT AREAS, SIDEWALKS, CURB AND GUTTER, FENCES AND ALL OTHER ITEMS TO BE AFFECTED BY PROPOSED CONSTRUCTION PRIOR TO COMMENCING.
- ANY DAMAGE TO EXISTING PAVEMENT OR EXISTING STRUCTURES SHALL BE REPAIRED TO PRECONSTRUCTION CONDITION OR BETTER AT CONTRACTOR'S EXPENSE. EXISTING STRUCTURES MAY INCLUDE BUT ARE NOT LIMITED TO INLETS, MANHOLES, POWER POLES, SIDEWALKS, CURB AND GUTTER, FENCES, SPRINKLER SYSTEMS, LAWNS OR PRIVATE PROPERTY IMPROVEMENTS.
- NO TREES SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER OR ENGINEER, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL GIVE NOTICE TO ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS IN CHARGE OF PRIVATE AND PUBLIC UTILITIES AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK. NOTIFY TEXAS ONE CALL FOR UTILITY LOCATIONS PRIOR TO ANY AND ALL EXCAVATIONS.

- CONTRACTOR TO EXERCISE EXTREME CAUTION WHEN WORKING NEAR EXISTING FACILITIES AND/OR UTILITIES. ALL DAMAGE TO BE REPAIRED AT CONTRACTOR'S EXPENSE. ALL COSTS FOR INTERRUPTION OF GAS, ELECTRICAL, COMMUNICATIONS AND/OR WATER SERVICE DUE TO CONTRACTOR'S WORK SHALL BE BORNE BY THE CONTRACTOR.
- INFORMATION ON EXISTING UTILITIES, AS SHOWN ON THESE PLANS, IS FROM BEST AVAILABLE INFORMATION OF RECORD AND SPOT FIELD LOCATIONS. ALTHOUGH EVERY EFFORT HAS BEEN MADE TO ACCURATELY DEPICT ALL UTILITIES, NOT ALL (PUBLIC AND PRIVATE) MAY BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION AND LOCATION OF THESE UNDERGROUND UTILITIES AS REQUIRED AT NO SEPARATE PAY. CONTRACTOR TO COORDINATE WITH ALL UTILITY COMPANIES.
- ALL WORK SHALL BE PERFORMED WITHIN THE OWNER'S RIGHT-OF-WAY, EASEMENTS OR ON PUBLIC-OWNED PROPERTY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN PERMISSION TO USE PRIVATE PROPERTY, IF NECESSARY, FOR THE PURPOSES OF STAGING, STOCKPILE, STORAGE OR REFUSE AREAS. THE CONTRACTOR SHALL PROVIDE WRITTEN EVIDENCE TO THE OWNER PRIOR TO USE.
- THE CONTRACTOR SHALL NOTIFY ALL AFFECTED RESIDENTS OR BUSINESS OWNERS OF CONSTRUCTION ACTIVITY THROUGH THE USE OF BILINGUAL (ENGLISH AND SPANISH) DOOR TAGS, PAMPHLETS OR SIMILAR METHODS. ALL AFFECTED PARTIES MUST BE NOTIFIED A MINIMUM OF 48-HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A SAMPLE OF THE NOTIFICATION TO THE OWNER PRIOR TO IMPLEMENTATION.
- CONTRACTOR TO ENSURE SAME DAY ACCESS TO ALL RESIDENCES AND BUSINESSES ADJACENT TO CONSTRUCTION.
- THE CONTRACTOR SHALL DO ALL NECESSARY CLEARING, EXCAVATION, TRENCHING, SHORING, DE-WATERING, DEMOLITION, GRADING, BACKFILLING, ETC. TO COMPLETE THE PROJECT. ASSOCIATED COSTS SHALL BE SUBSIDIARY TO THE RESPECTIVE BID ITEMS AS IDENTIFIED IN THE CONTRACT UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL PROVIDE A GROUNDWATER CONTROL PLAN FOR APPROVAL BY THE OWNER PRIOR TO CONSTRUCTION. THE PLAN SHALL BE DEVELOPED, SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS AND OUTLINE THE CONTRACTOR'S MEANS AND METHODS FOR CONTROLLING GROUNDWATER INCLUDING THE LOCATION OF ALL PROPOSED GROUNDWATER MONITORING WELLS FOR VERIFICATION PRIOR TO BEGINNING EXCAVATION FOR THE CONTRACTOR'S PROPOSED EXCAVATION SAFETY SYSTEM. ADEQUACY AND IMPLEMENTATION OF THE PLAN IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER RESERVES THE RIGHT TO REJECT PLANS. THE GROUNDWATER CONTROL PLAN WILL BE MAINTAINED IN THE OWNERS REPRESENTATIVE FILES FOR REFERENCE PURPOSES ONLY. NO REVIEW WILL BE MADE NOR IS ANY RESPONSIBILITY FOR THE PLAN ASSUMED BY THE OWNER OR THE OWNER'S REPRESENTATIVES. (NO SEPARATE PAY)
- THE CONTRACTOR SHALL PROVIDE AN EMERGENCY PLAN, IN CASE OF A LARGE RAIN EVENT OR OTHER IMPACTFUL EVENT, FOR APPROVAL BY THE OWNER PRIOR TO CONSTRUCTION. THE PLAN SHALL BE DEVELOPED, SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS. ADEQUACY AND IMPLEMENTATION OF THE PLAN IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER RESERVES THE RIGHT TO REJECT THE PLANS. (NO SEPARATE PAY)
- ALL COMPACTION SHALL BE ACHIEVED BY MECHANICAL METHODS. NO WATER JETTING ALLOWED, UNLESS APPROVED BY THE OWNER.
- UNLESS OTHERWISE NOTED ON THE PLANS, ALL SPOIL MATERIAL AND DEBRIS SHALL BE DISPOSED OFFSITE BY THE CONTRACTOR IN A LEGAL MANNER. FURNISHING AND TRANSPORTATION OF ALL OFFSITE MATERIAL TO BE AT CONTRACTOR'S EXPENSE.
- DEMOLITION, REMOVAL AND DISPOSAL OF ALL EXCESS CONCRETE, CURBS, UTILITY DEBRIS, RUBBLE, ETC. TO BE DONE IN A LEGAL MANNER AT CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA AS CLEAN AS POSSIBLE. ALL ASSOCIATED DEBRIS SHALL BE COLLECTED AND PROPERLY DISPOSED OF AT THE END OF EACH WORKDAY.
- UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL RETURN THE SITE TO ORIGINAL CONTOURS UNLESS DIFFERENT FINISHED ELEVATIONS ARE SHOWN ON PLANS. CONTRACTOR TO ENSURE NO AREAS OF PONDING ARE PRESENT.
- CONCRETE NOTES:
 - ALL CONCRETE WORK TO BE FORMED, UNLESS OTHERWISE APPROVED.
 - ALL CONCRETE TO BE 3000-PSI MINIMUM AT 28 DAYS, UNLESS OTHERWISE SHOWN. STRENGTH TO BE DETERMINED BY CYLINDER BREAK TEST.
 - ALL REINFORCING STEEL TO BE ASTM A-615, GRADE 60, UNLESS OTHERWISE SHOWN.
 - ALL EXPOSED CONCRETE WORK TO BE CHAMFERED.
 - ALL CONCRETE USED FOR CURB AND GUTTER, CONCRETE PAVEMENT, DRIVEWAYS, SIDEWALKS AND OTHER FLAT WORK SHALL CONTAIN A MINIMUM OF 1.5 POUNDS OF FIBER MESH PER CUBIC YARD.
 - ALL EXPOSED CONCRETE SURFACES SHALL BE TREATED WITH CURING COMPOUND RESIN BASE ASTM C 309 TYPE 2 WITH PIGMENTED TINT OF FUGITIVE DYE.
 - EXPANSION JOINTS WILL BE PLACED AT CURB RETURNS, INLETS AND AT THE END OF EACH POUR WITH INTERVALS NOT TO EXCEED 40 FT. JOINTS SHALL CONSIST OF 1/2" PRE-MOLDED EXPANSION JOINT MATERIAL WITH 3, 36" X 1/2" DOWELS, ONE END GREASED AND WRAPPED. CARE MUST BE TAKEN THAT DOWELS ARE STRAIGHT AND LAID PARALLEL WITH CURB AND NO CONCRETE PLUGS OR OTHER MATERIAL BE ALLOWED THROUGH THE DOWEL HOLES OR EXPANSION MATERIAL WHICH WOULD PREVENT THE JOINT FROM OPERATION AS AN EXPANSION JOINT. EXPANSION JOINT MATERIALS SHALL BE PRE-MOLDED ASPHALT IMPREGNATED EXPANSION JOINT MATERIAL CONFORMING WITH ASTM D 994 (NOT WOOD FIBER TYPE)
 - CONTRACTION (DUMMY, SAWED OR GROVED) JOINTS SHALL BE 2" DEEP AND PLACED AT MAXIMUM OF 10-FOOT INTERVALS.
 - WHEN CONNECTING TO EXISTING CURB AND GUTTER, THE CONTRACTOR SHALL DRILL AND DOWEL TWO #6 X 16" TIE BARS A MINIMUM OF 6-INCHES DEEP INTO THE EXISTING CURB AND GUTTER SECTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING INSTALLED IMPROVEMENTS, FIELD CHANGES, AND UNFORESEEN ENCOUNTERED UTILITIES. CONTRACTOR SHALL FURNISH A LEGIBLE SET OF "AS-BUILT" DRAWINGS TO THE OWNER.
- WHEN INSTALLING ANY MANUFACTURED PRODUCT, THE CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDED INSTALLATION DIRECTIONS. IF ANY CONFLICTS OR DISCREPANCIES BETWEEN MANUFACTURER'S DIRECTIONS AND THE CONTRACT DOCUMENTS ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AND SHALL NOT PERFORM ANY WORK ON ANY ITEM UNTIL SUCH CONFLICT HAS BEEN RESOLVED IN WRITING.

UTILITY GENERAL NOTES:

- THE TYPE, SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES DEPICTED ON THE CONSTRUCTION PLANS WERE RESEARCHED WITH RESPECT TO THE BEST AVAILABLE DATA AND THEREFORE SHOWN APPROXIMATE. ALTHOUGH EVERY EFFORT HAS BEEN MADE TO ACCURATELY DEPICT ALL UTILITIES, NOT ALL (PUBLIC AND PRIVATE) MAY BE SHOWN. NEITHER THE ENGINEER NOR THE OWNER IS RESPONSIBLE FOR THE ACCURACY OF THE LOCATION OF THE UTILITIES SHOWN ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL UTILITY COMPANIES WITH JURISDICTION WITHIN THE LIMITS OF CONSTRUCTION FOR FIELD VERIFICATION AT NO ADDITIONAL EXPENSE TO THE OWNER. UTILITY COMPANIES TO INCLUDE BUT NOT LIMITED TO THE FOLLOWING:

BROWNSVILLE PUB (956) 983-6100
BROWNSVILLE ENGINEERING DEPT. (956) 541-1012
TXDOT - BROWNSVILLE OFFICE (956) 542-2260
TEXAS 811
TEXAS GAS SERVICE (800) 959-5325
SPECTRUM/TIME WARNER CABLE (800) 222-5355
AT&T TEXAS (956) 630-8261
AMERICAN ELECTRIC AND POWER (AEP) TEXAS (800) 277-2177
MAGIC VALLEY ELECTRICAL COOPERATIVE (MVEC) (866) 225-5683
FRONTIER COMMUNICATIONS (800) 921-8101
CHARTER COMMUNICATIONS (866) 874-2389
VERIZON (800) 922-0204
OMNI FIBER (956) 953-8384
- CONTRACTOR SHALL EXPOSE ANY EXISTING UTILITY (VIA SUE LEVEL A) AT EACH CROSSING THAT MAY BE IN CONFLICT PRIOR TO COMMENCING CONSTRUCTION AND EXCAVATION AT NO ADDITIONAL EXPENSE.
- THE CONTRACTOR SHALL NOTIFY ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS RESPONSIBLE FOR PUBLIC AND PRIVATE UTILITIES AFFECTED BY HIS/HER OPERATIONS PRIOR TO COMMENCING CONSTRUCTION.
- CONTRACTOR SHALL AT ALL TIMES ALLOW ACCESS TO EXISTING DRIVEWAY OR PROVIDE/MAINTAIN ALTERNATIVE ALL-WEATHER ROUTES.
- ALL TRAFFIC CONTROL DEVICES SHALL BE IN CONFORMANCE WITH TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES LATEST EDITION.
- ANY DAMAGES TO FENCES, WALKS, OR PRIVATE PROPERTY SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- ALL CONSTRUCTION MATERIALS TESTING WILL BE COORDINATED THROUGH THE OWNER.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL EXCAVATED MATERIAL, EXCESS CONCRETE, AND DEBRIS FROM THE CONSTRUCTION SITE AT NO ADDITIONAL EXPENSE TO THE OWNER.
- IN ACCORDANCE WITH HOUSE BILLS 662 AND 665 ENACTED BY THE TEXAS LEGISLATURE (70th REGULAR LEGISLATIVE SESSION), THE CONTRACTOR SHALL MEET THE REQUIREMENTS FOR TRENCH SAFETY AS OUTLINED IN THE CURRENT VERSION OF THE UNITED STATES DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS, 29 CFR, PART 1926, SUBPART P-EXCAVATIONS.
- PRIOR TO COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL PROVIDE A TRENCH SAFETY PLAN. ALL PLANS SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. THE PLAN SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL.
- IN THE EVENT CONDITIONS ENCOUNTERED IN THE FIELD REQUIRE TRENCH SAFETY SYSTEMS OUTSIDE OF THE EXTENTS SUGGESTED IN THE TRENCH PROTECTION SHOWN ON THE CONSTRUCTION PLANS, ALL EXCAVATION SHALL CEASE AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A REVISED TRENCH SAFETY PLAN. NO EXCAVATION SHALL RESUME UNTIL THE REVISED TRENCH SAFETY PLAN HAS BEEN APPROVED. (NO SEPARATE PAY)
- THE CONTRACTOR SHALL ENSURE APPROVED TRENCH SAFETY PLANS ARE IMPLEMENTED. FAILURE TO ADHERE TO THE TRENCH SAFETY PLAN WILL RESULT IN A STOP WORK ORDER. NON-COMPLIANCE INCIDENTS MAY BE REPORTED TO OSHA.
- TRENCHES OR EXCAVATIONS MAY NOT BE LEFT OPEN OVERNIGHT UNLESS AUTHORIZED IN WRITING BY THE OWNER. IN CASES WHERE TRENCHES ARE LEFT OPEN, THE CONTRACTOR MUST PROVIDE TRAFFIC-RATED, ANCHORED STEEL PLATE COVERS APPROVED BY THE OWNER.
- CONTRACTOR SHALL PROTECT AND SUSPEND ALL EXISTING UTILITIES TO REMAIN AT NO ADDITIONAL EXPENSE.
- ALL UTILITIES SHALL REMAIN IN SERVICE AT ALL TIMES. THE PROTECTION, TEMPORARY BYPASS PUMPING, ETC. OF ALL UTILITY LINES SHALL BE INCIDENTAL TO THE INSTALLATION OF THE PROPOSED UTILITIES. CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS.

EXCAVATION FOR STRUCTURES AND SHORING PROTECTION GENERAL NOTES:

- THE CONTRACTOR WILL BE REQUIRED TO TAKE SPECIAL PRECAUTION AND CARE IN CONNECTION WITH EXCAVATING AND SHORING PITS, AND IN DRIVING PILES OR SHEETING FOR FOOTINGS ADJACENT TO TRACKS TO PROVIDE ADEQUATE LATERAL SUPPORT FOR THE TRACKS AND THE LOADS WHICH THEY CARRY, WITHOUT DISTURBANCE OF TRACK ALIGNMENT AND SURFACE, AND TO AVOID OBSTRUCTING TRACK CLEARANCES WITH WORKING EQUIPMENT, TOOLS OR OTHER MATERIAL.
- ALL PLANS AND CALCULATIONS FOR SHORING SHALL BE PREPARED, SIGNED, AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF THE PROPOSED PROJECT. IN ACCORDANCE AREMA STANDARDS, THE REGISTERED PROFESSIONAL ENGINEER WILL BE RESPONSIBLE FOR THE ACCURACY FOR ALL CONTROLLING DIMENSIONS AS WELL AS THE SELECTION OF SOIL DESIGN VALUES WHICH WILL ACCURATELY REFLECT THE ACTUAL FIELD CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE A DETAILED INSTALLATION AND REMOVAL PLAN OF THE SHORING COMPONENTS. ANY COMPONENT THAT WILL BE INSTALLED VIA THE USE OF A CRANE OR ANY OTHER LIFTING DEVICE SHALL BE SUBJECT TO THE GUIDELINES OUTLINED IN SECTION 5.G OF THESE PROVISIONS.
- THE CONTRACTOR SHALL BE REQUIRED TO SURVEY THE TRACK(S) AND RAILROAD EMBANKMENT AND PROVIDE A CROSS SECTION OF THE PROPOSED EXCAVATION IN RELATION TO THE TRACKS.
- CALCULATIONS FOR THE PROPOSED SHORING SHOULD INCLUDE DEFLECTION CALCULATIONS. THE MAXIMUM DEFLECTION FOR EXCAVATIONS WITHIN 18'-0" OF THE CENTERLINE OF THE NEAREST TRACK SHALL BE 3/8". FOR ALL OTHER CASES, THE MAX DEFLECTION SHALL NOT EXCEED 1/4".
- ADDITIONALLY, THE RAILROAD WILL REQUIRE THE INSTALLATION OF AN OSHA APPROVED HANDRAIL AND ORANGE CONSTRUCTION SAFETY FENCING FOR ALL EXCAVATIONS OF THE RAILROAD RIGHT-OF-WAY.
- THE FRONT FACE OF SHORING LOCATED TO THE CLOSEST RAILROAD TRACK FOR ALL SHORING SETUPS LOCATED IN ZONE 2 AS SHOWN ON TYPICAL DRAWING NO. 4 - SHORING REQUIREMENTS (APPENDIX I) SHALL REMAIN IN PLACE AND BE CUT OFF 2'-0" BELOW THE FINAL GROUND ELEVATION. THE REMAINING SHORING IN ZONE 2 AND ALL SHORING IN ZONE 1 MAY BE REMOVED AND ALL VOIDS MUST BE BACKFILLED WITH FLOWABLE FILL.

PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN RELOCATION
BROWNSVILLE, TX



REVISION		DESCRIPTION							
NO.	DATE								

10/16/2026



THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:

MICHAEL SALINAS, P.E. 123342
NAME PE LICENSE NO.
10/16/2026
DATE

THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF:
HALFF ASSOCIATES, INC.

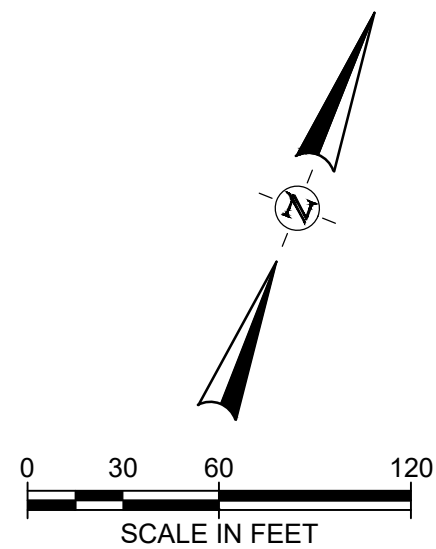
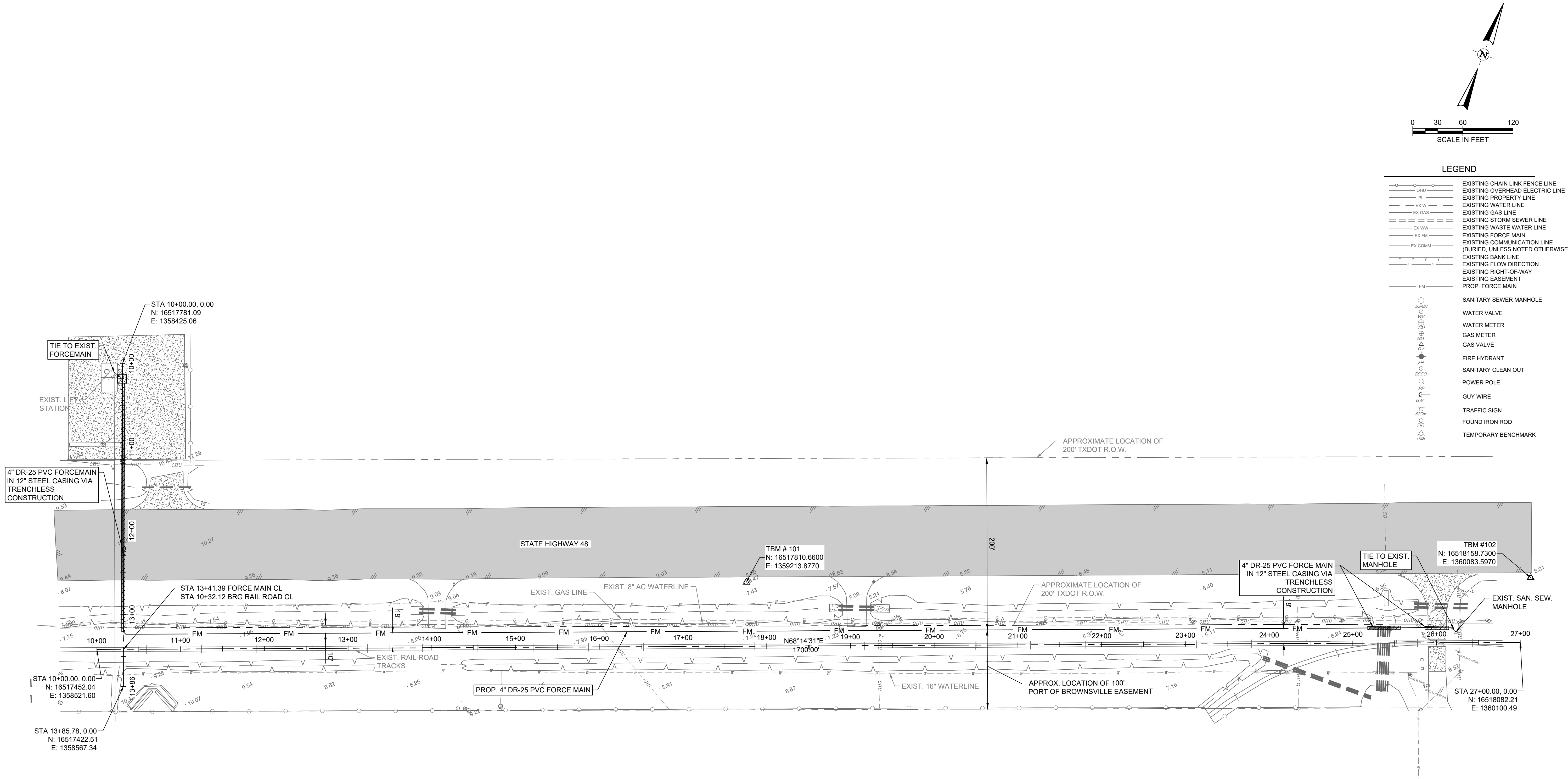
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FIRM / BUSINESS NO. STATE

PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 20'
SHEET TITLE:

GENERAL
NOTES

G002

FILE NAME: A:\630006\63708001\PM\CADD\Sheets\C-PLN\OVERVIEW\463707-001.dwg DATE: October 16, 2026, TIME: 10:16 AM, USER: ah3818



LEGEND	
	EXISTING CHAIN LINK FENCE LINE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING PROPERTY LINE
	EXISTING WATER LINE
	EXISTING GAS LINE
	EXISTING STORM SEWER LINE
	EXISTING WASTE WATER LINE
	EXISTING FORCE MAIN
	EXISTING COMMUNICATION LINE (BURIED, UNLESS NOTED OTHERWISE)
	EXISTING BANK LINE
	EXISTING FLOW DIRECTION
	EXISTING RIGHT-OF-WAY
	EXISTING EASEMENT
	PROP. FORCE MAIN
	SANITARY SEWER MANHOLE
	WATER VALVE
	WATER METER
	GAS METER
	GAS VALVE
	FIRE HYDRANT
	SANITARY CLEAN OUT
	POWER POLE
	GUY WIRE
	TRAFFIC SIGN
	FOUND IRON ROD
	TEMPORARY BENCHMARK

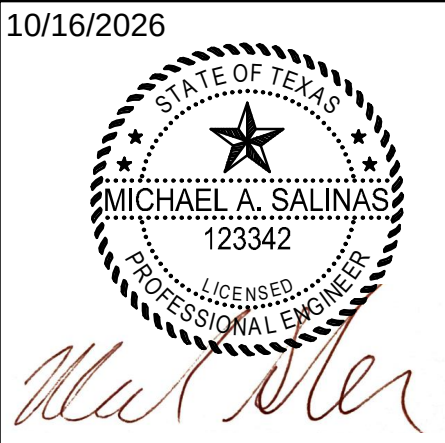
TEMPORARY BENCHMARKS				
POINT NO.	DESCRIPTION	ELEVATION	NORTHING	EASTING
101	5/8" SIRTIP W/HALFF CNTL CAP	8.32	16517810.66	1359213.88
102	5/8" SIRTIP W/HALFF CNTL CAP	7.19	16518158.73	1360083.60

- NOTE:
- THE HORIZONTAL DATUM IS THE TEXAS STATE-PLANE COORDINATE SYSTEM (TEXAS SOUTH ZONE 4205), NORTH AMERICAN DATUM OF 1983 (NAD 83) 2011 ADJUSTMENT, EPOCH 2010.00, GEOID 18.
 - THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND IN U.S. SURVEY FEET.
 - NO GEOTECHNICAL INVESTIGATION WAS COMPLETED. CONTRACTOR SHALL PERFORM GEOTECHNICAL INVESTIGATION AS NEEDED PRIOR TO STARTING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
 - SURVEY PROVIDED IS FROM MAY 2026. CONTRACTOR SHALL VERIFY UTILITY ALIGNMENTS WITH ONE-CALL AND FIELD VERIFY ALL CROSSINGS AT NO ADDITIONAL COST TO OWNER.

PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN RELOCATION
BROWNSVILLE, TX



REVISION NO.	DATE	DESCRIPTION							

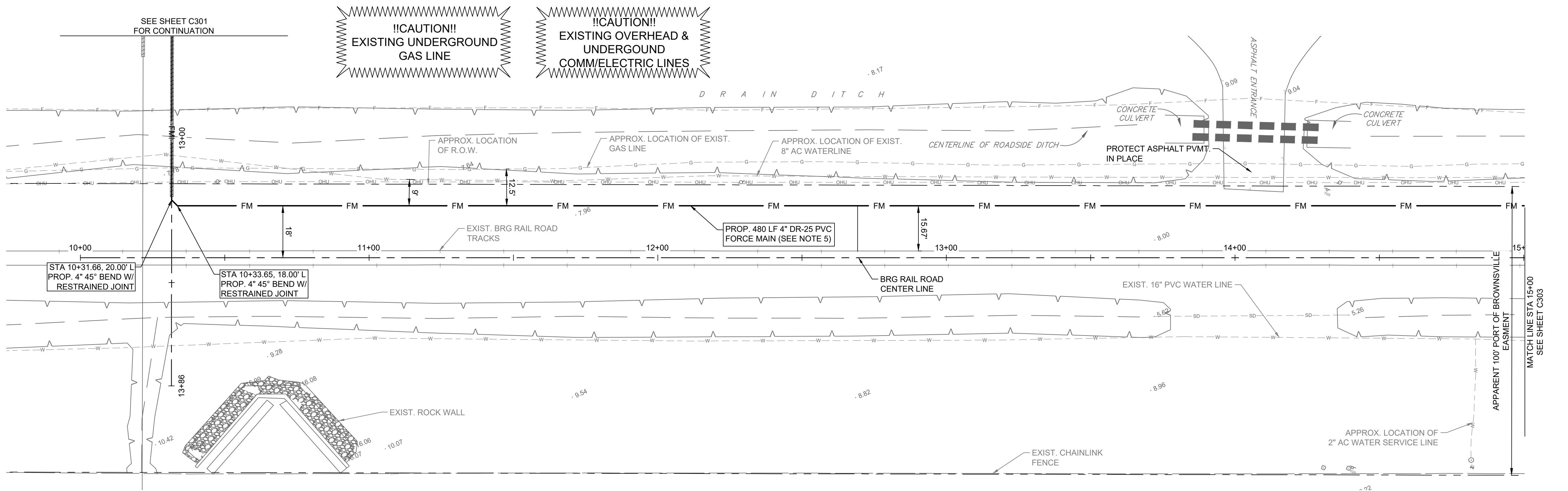


THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
MICHAEL A. SALINAS, P.E. 123342
NAME PE LICENSE NO.
10/16/2026
DATE
THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF:
HALFF ASSOCIATES, INC.
#512 FIRM / BUSINESS NO. TX STATE
PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 60'
SHEET TITLE:

PROJECT
OVERVIEW

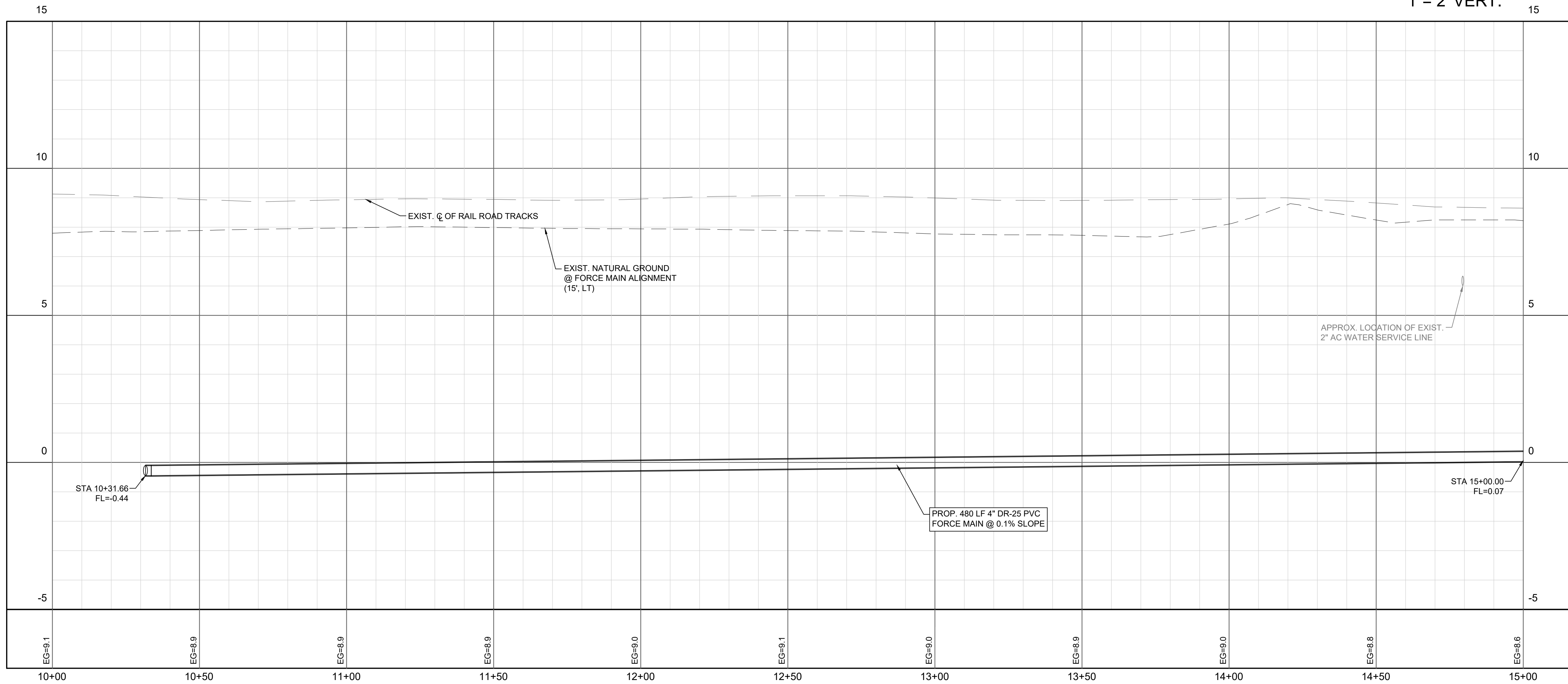
C101

FILE NAME: A:\63000\63708\001\1PW\CADD\Sheets\C-PLN\PLPR-63708-001.dwg DATE: October 16, 2026, TIME: 10:17 AM, USER: al3818



LEGEND	
	EXISTING CHAIN LINK FENCE LINE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING PROPERTY LINE
	EXISTING WATER LINE
	EXISTING GAS LINE
	EXISTING STORM SEWER LINE
	EXISTING WASTE WATER LINE
	EXISTING FORCE MAIN
	EXISTING COMMUNICATION LINE (BURIED) (UNLESS NOTED OTHERWISE)
	EXISTING BANK LINE
	EXISTING FLOW DIRECTION
	EXISTING RIGHT-OF-WAY
	EXISTING EASEMENT
	PROP. FORCE MAIN
	SANITARY SEWER MANHOLE
	WATER VALVE
	WATER METER
	GAS METER
	GAS VALVE
	FIRE HYDRANT
	SANITARY CLEAN OUT
	POWER POLE
	GUY WIRE
	TRAFFIC SIGN
	FOUND IRON ROD
	TEMPORARY BENCHMARK

- NOTES:
- CONTRACTOR TO FIELD VERIFY LOCATION OF EXIST. UTILITIES VIA LEVEL "A" SUE.
 - THRUST BLOCKS SHALL BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS. REFER TO C601 FOR DETAILS.
 - COORDINATE WITH BRG RAILROAD PRIOR TO BEGINNING CONSTRUCTION.
 - EXISTING SURFACE IS AGGREGATE AND SHALL BE RESTORED TO MATCH EXISTING CONDITIONS.
 - CONTRACTOR SHALL PROVIDE SHORING PLANS AND CALCULATIONS PREPARED, SIGNED, AND SEALED BY A TEXAS REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH AREMA STANDARDS. A RAILROAD FLAGMAN SHALL BE REQUIRED FOR WORK WITHIN 25 FT OF THE TRACK IF DIRECTED BY BRG.



PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN RELOCATION
BROWNSVILLE, TX



REVISION NO.	DATE	DESCRIPTION							

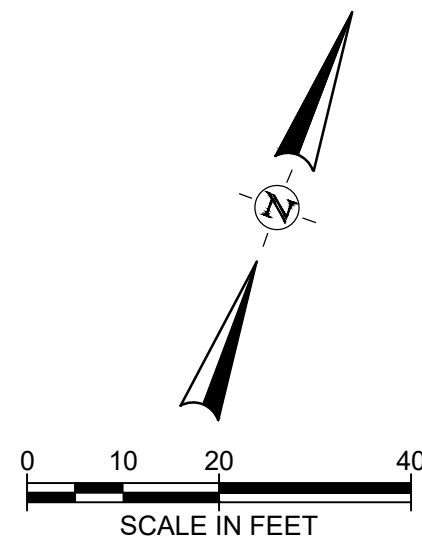
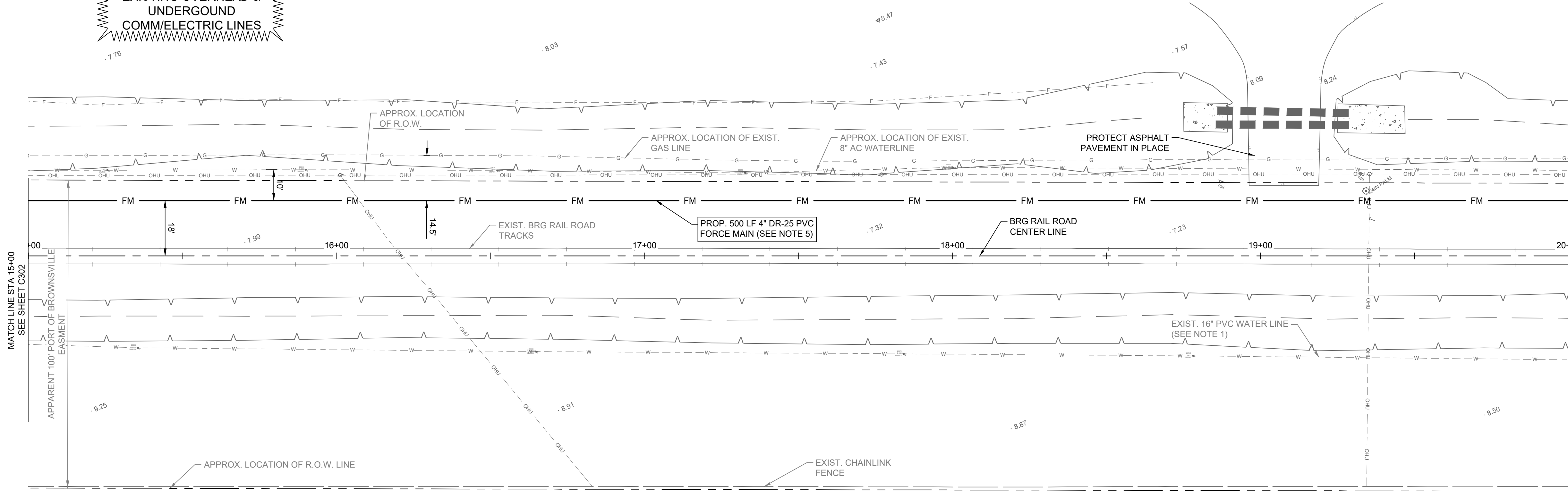


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NAME PE LICENSE NO.
DATE 10/16/2026
THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF:
HALFF ASSOCIATES, INC.
#512 FIRM / BUSINESS NO. TX STATE

PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 20'
SHEET TITLE:
FORCE MAIN STA 10+00 TO 15+00 (EAST- WEST)

FILE NAME: A:\63000\63708\001\PM\CADD\Sheets\C-PLN\PLPR-63708-001.dwg DATE: October 16, 2026, TIME: 10:17 AM, USER: ah3818

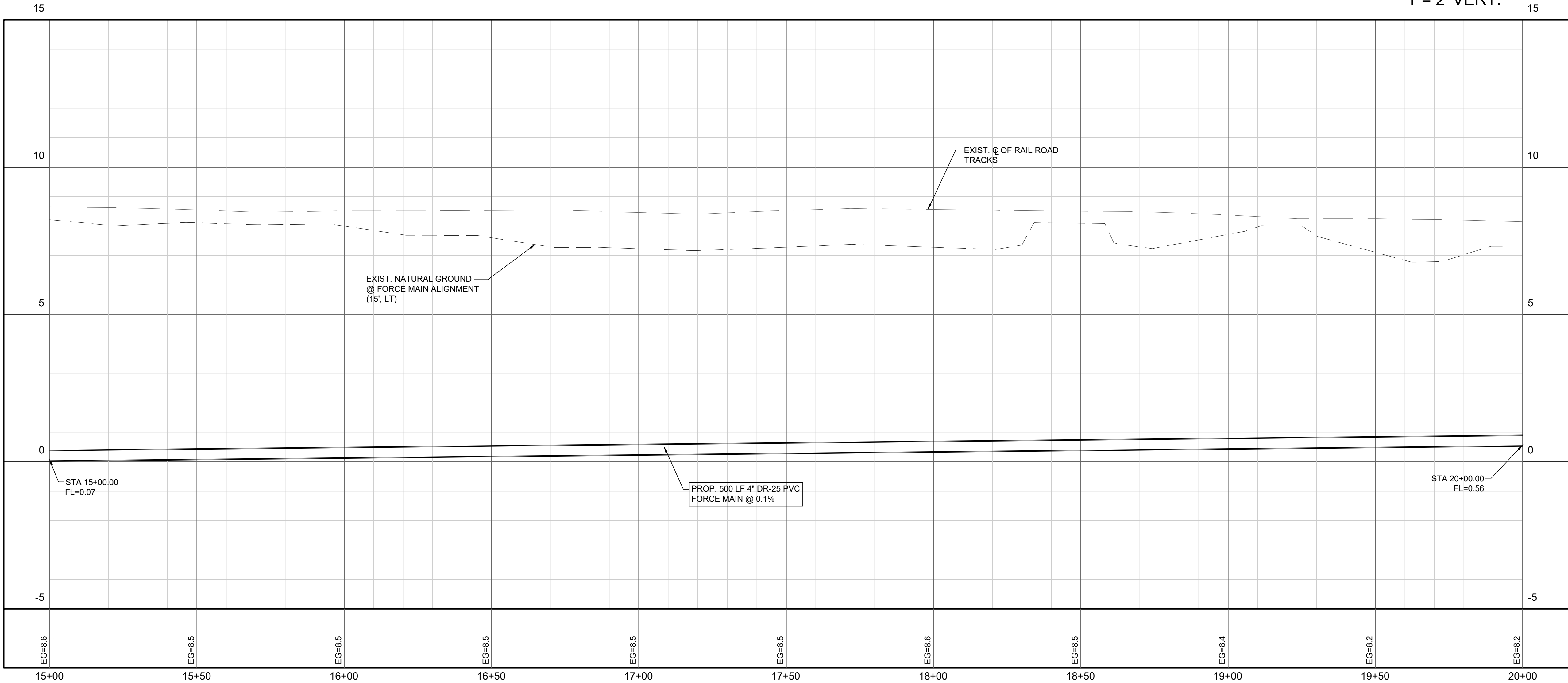
!!CAUTION!!
EXISTING OVERHEAD &
UNDERGROUND
COMM/ELECTRIC LINES



LEGEND	
	EXISTING CHAIN LINK FENCE LINE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING PROPERTY LINE
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	GAS VALVE
	FIRE HYDRANT
	SANITARY CLEAN OUT
	POWER POLE
	GUY WIRE
	TRAFFIC SIGN
	FOUND IRON ROD
	TEMPORARY BENCHMARK

FORCE MAIN EAST TO WEST
STA. 15+00.00 - 20+00.00
1" = 20' HORZ.
1" = 2' VERT.

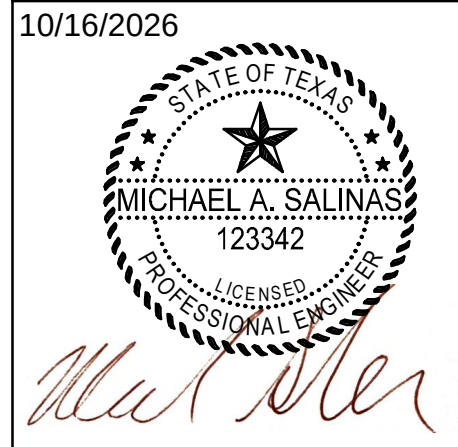
- NOTES:
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 - THRUST BLOCKS SHALL BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS. REFER TO C601 FOR DETAILS.
 - COORDINATE WITH BRG RAILROAD PRIOR TO BEGINNING CONSTRUCTION.
 - EXISTING SURFACE IS AGGREGATE AND SHALL BE RESTORED TO MATCH EXISTING CONDITIONS.
 - CONTRACTOR SHALL PROVIDE SHORING PLANS AND CALCULATIONS PREPARED, SIGNED, AND SEALED BY A TEXAS REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH AREMA STANDARDS. A RAILROAD FLAGMAN SHALL BE REQUIRED FOR WORK WITHIN 25 FT OF THE TRACK IF DIRECTED BY BRG.



PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN RELOCATION
BROWNSVILLE, TX



REVISION NO.	DATE	DESCRIPTION



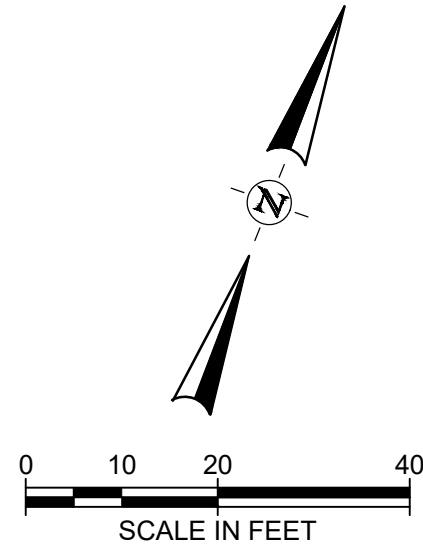
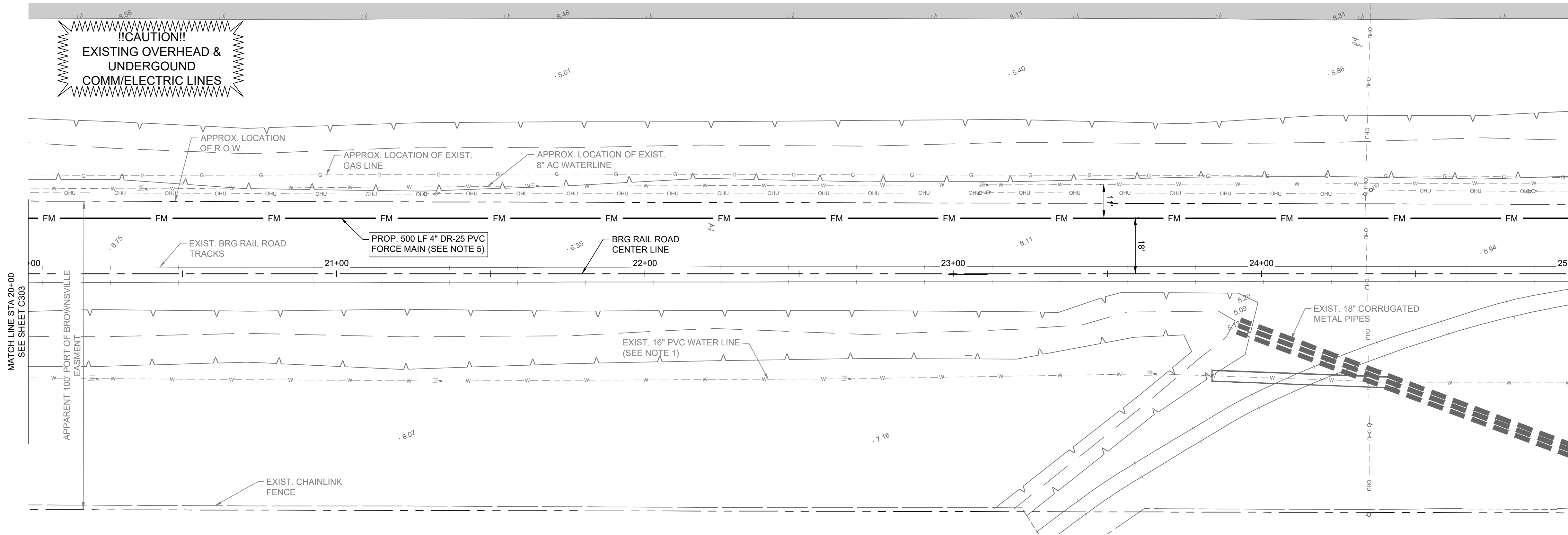
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NAME PE LICENSE NO.
10/16/2026 DATE
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HALFF ASSOCIATES, INC.

#512 FIRM / BUSINESS NO. TX STATE
PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 20'
SHEET TITLE:

FORCE MAIN STA
15+00 TO 20+00
(EAST- WEST)

C303

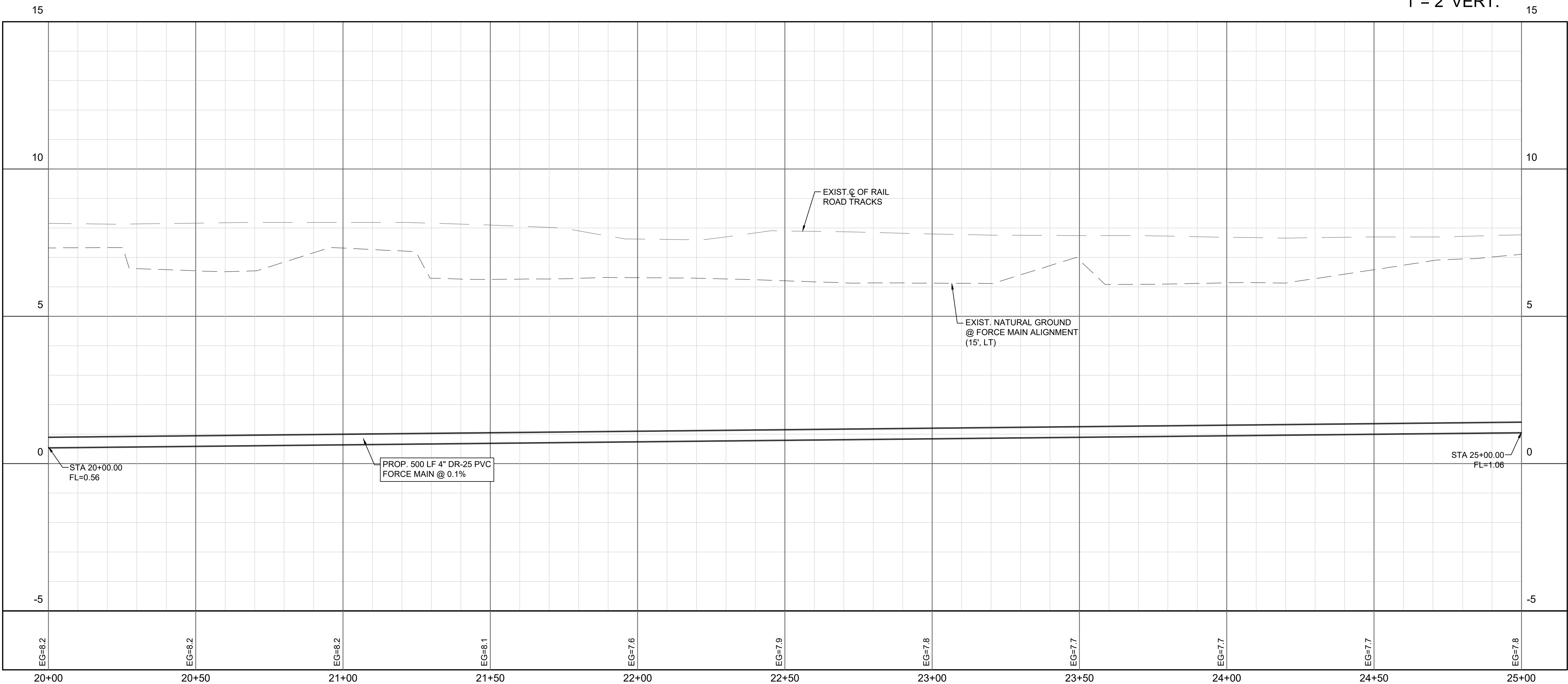
FILE NAME: A:\63000\63708\001\1\DWG\CADD\Sheets\C-PLN\PLR-63708-001.dwg DATE: October 16, 2026, TIME: 10:17 AM, USER: al3818



LEGEND	
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	WATER METER
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	GAS VALVE
	FIRE HYDRANT
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	POWER POLE
	GUY WIRE
	TRAFFIC SIGN
	FOUND IRON ROD
	TEMPORARY BENCHMARK

FORCE MAIN EAST TO WEST
STA. 20+00.00 - 25+00.00
1" = 20' HORZ.
1"= 2' VERT.

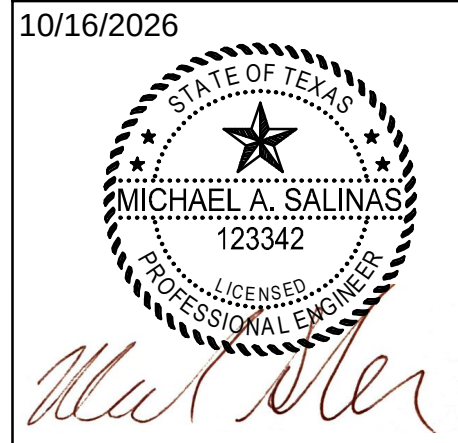
- NOTES:
1. CONTRACTOR TO FIELD VERIFY LOCATION OF EXIST. UTILITIES VIA LEVEL "A" SUE.
 2. THRUST BLOCKS SHALL BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS. REFER TO C801 FOR DETAILS.
 3. COORDINATE WITH BRG RAILROAD PRIOR TO BEGINNING CONSTRUCTION.
 4. EXISTING SURFACE IS AGGREGATE AND SHALL BE RESTORED TO MATCH EXISTING CONDITIONS.
 5. CONTRACTOR SHALL PROVIDE SHORING PLANS AND CALCULATIONS PREPARED, SIGNED, AND SEALED BY A TEXAS REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH AREMA STANDARDS. A RAILROAD FLAGMAN SHALL BE REQUIRED FOR WORK WITHIN 25 FT OF THE TRACK IF DIRECTED BY BRG.



PORT OF BROWNSVILLE
STATE HIGHWAY 48 FORCE MAIN RELOCATION
BROWNSVILLE, TX



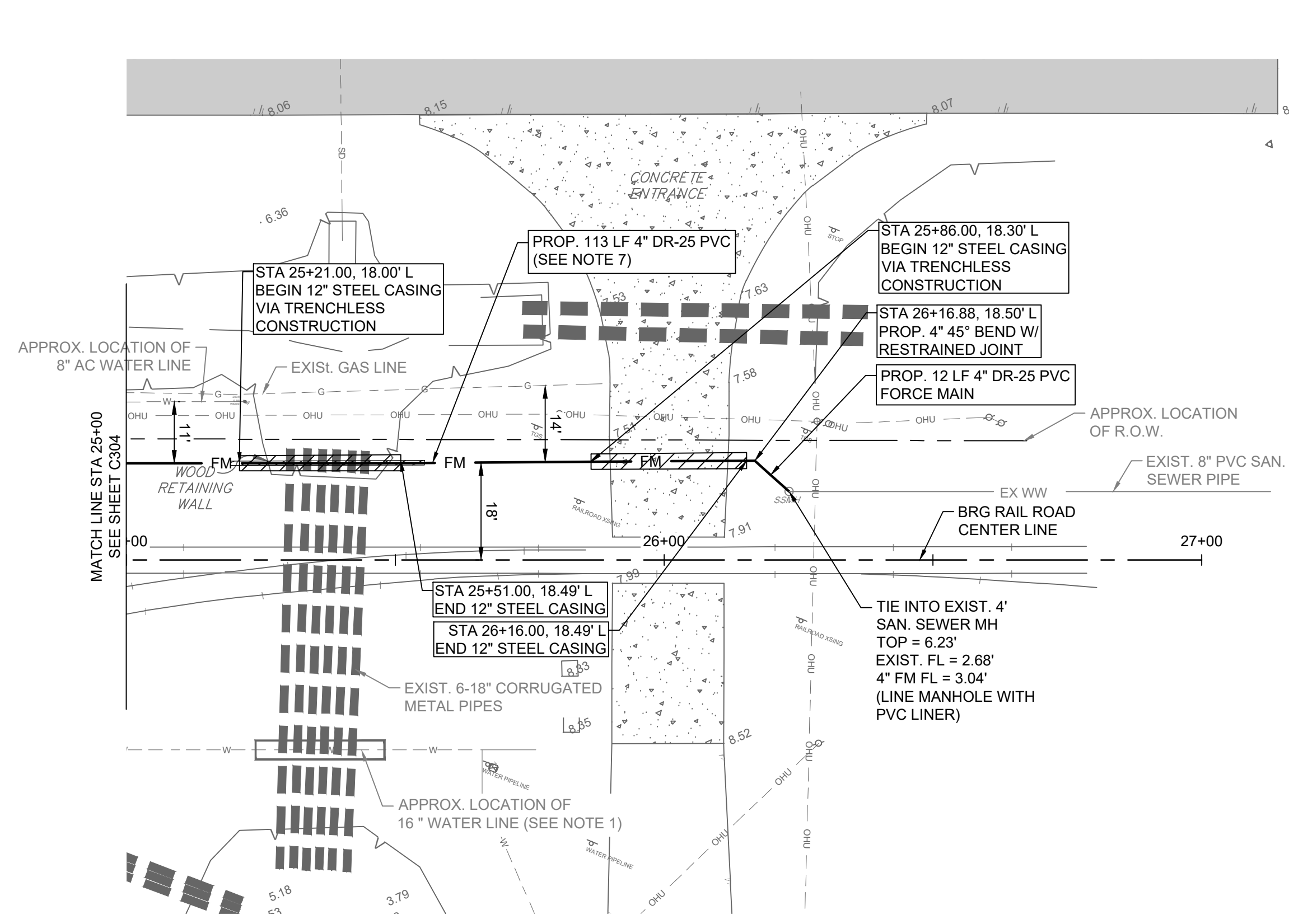
REVISION NO.	DATE	DESCRIPTION							



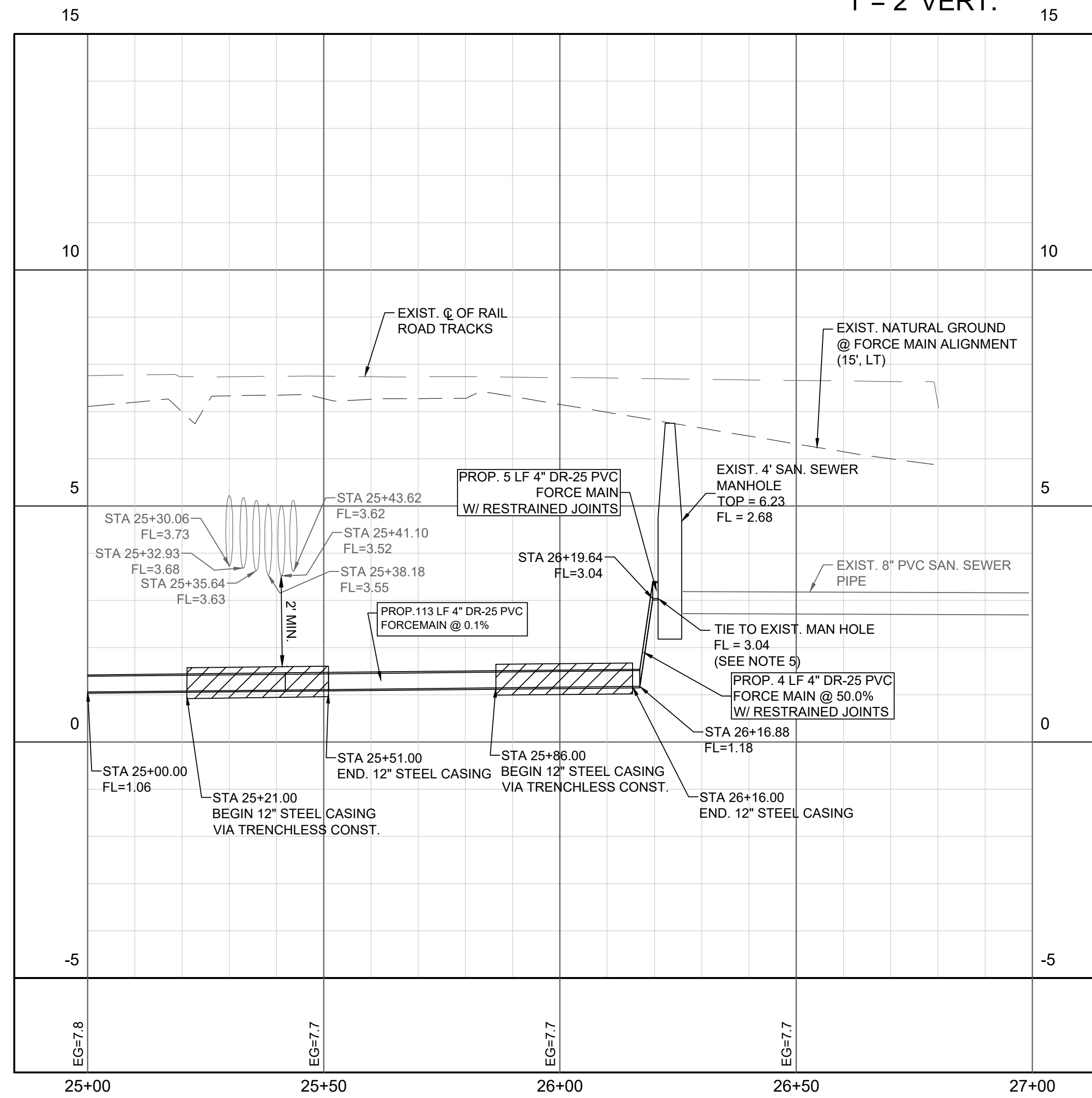
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NAME PE LICENSE NO.
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HALFF ASSOCIATES, INC.
#512 FIRM / BUSINESS NO. TX STATE

PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 20'
SHEET TITLE:
FORCE MAIN STA
20+00 TO 25+00
(EAST- WEST)

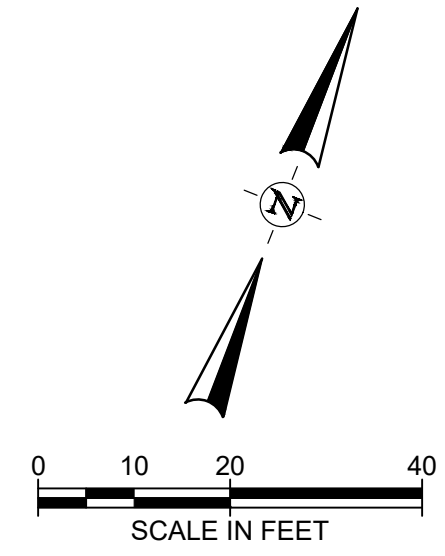
C304



FORCE MAIN EAST TO WEST
STA. 25+00.00 - 27+00.00
 1" = 20' HORZ.
 1" = 2' VERT.



!!CAUTION!!
**EXISTING OVERHEAD &
UNDERGROUND
COMM/ELECTRIC LINES**



LEGEND

	EXISTING CHAIN LINK FENCE LINE
	EXISTING OVERHEAD ELECTRIC LINE
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	WATER VALVE
	WATER METER
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	SANITARY CLEAN OUT
	POWER POLE
	GUY WIRE
	TRAFFIC SIGN
	FOUND IRON ROD
	TEMPORARY BENCHMARK

NOTES

1. CONTRACTOR TO FIELD VERIFY LOCATION OF EXIST. UTILITIES VIA LEVEL "A" SUE.
2. THRUST BLOCKS SHALL BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS. REFER TO C601 FOR DETAILS.
3. COORDINATE WITH BRG RAILROAD PRIOR TO BEGINNING CONSTRUCTION.
4. EXISTING SURFACE IS AGGREGATE AND SHALL BE RESTORED TO MATCH EXISTING CONDITIONS.
5. DRIVEWAY SHALL REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION. COORDINATE WITH BRG PRIOR TO INSTALLING BORING PITS.
6. EXISTING MANHOLE IS CONCRETE. SEE C601 FOR CONNECTION DETAIL.
7. CONTRACTOR SHALL PROVIDE SHORING PLANS AND CALCULATIONS PREPARED, SIGNED, AND SEALED BY A TEXAS REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH AREMA STANDARDS. A RAILROAD FLAGMAN SHALL BE REQUIRED FOR WORK WITHIN 25 FT OF THE TRACK IF DIRECTED BY BRG.

[illegible]

10/16/2026



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MICHAEL SALINAS, P.E.	123342
NAME	PE LICENSE NO.
10/16/2026	
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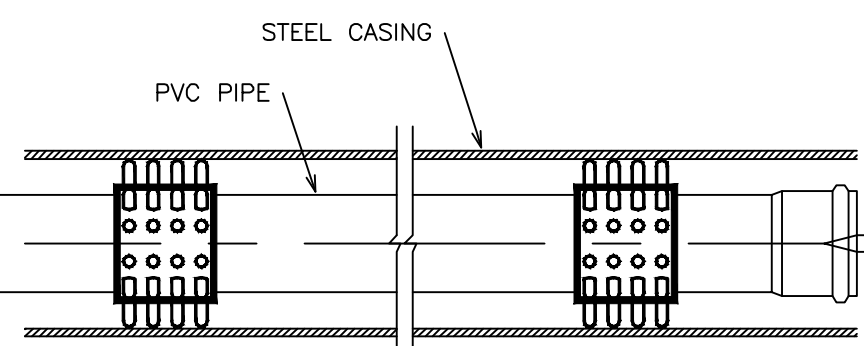
HALFF ASSOCIATES, INC.

#312	TX
FIRM / BUSINESS NO.	STATE

PROJECT NO.:	63708.001
ISSUED:	4/10/2026
DRAWN BY:	JG
CHECKED BY:	MS
SCALE:	1" = 20'
SHEET TITLE:	FORCE MAIN STA 25+00 TO 27+54 (EAST- WEST)

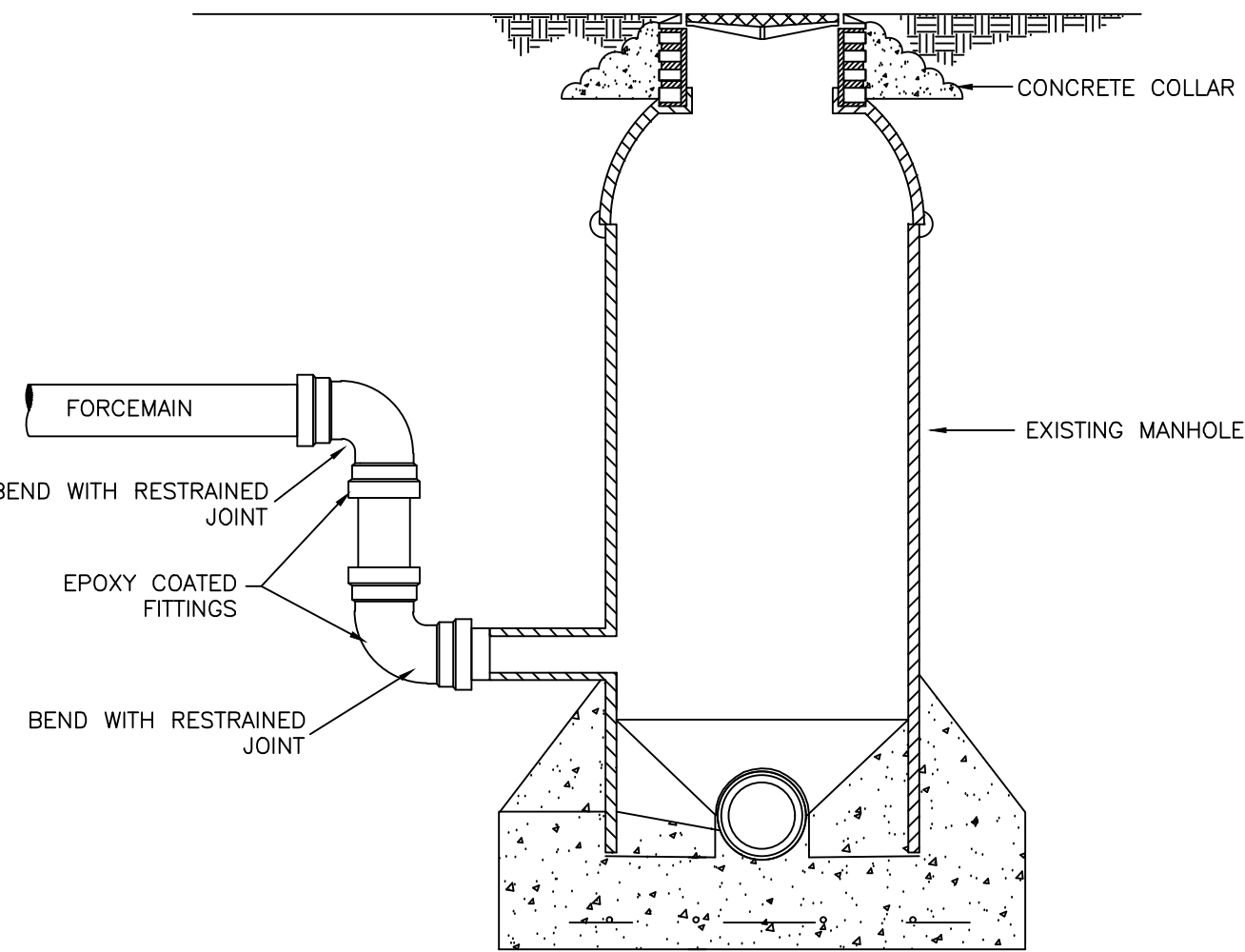
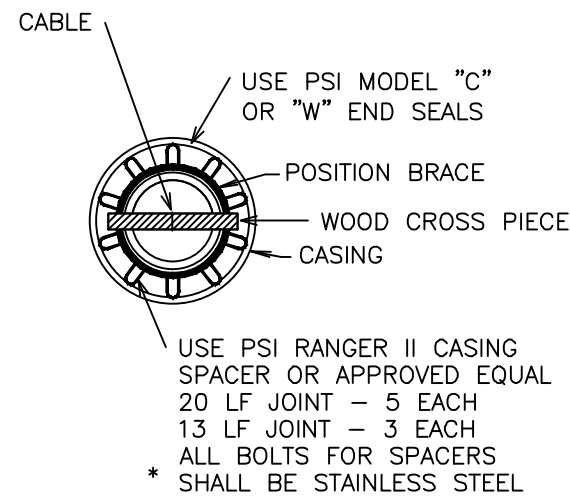
C305

STEEL CASING WALL THICKNESS CHART	
MINIMUM THICKNESS	DIAMETER OF CASING PIPE
1/4"	12" OR LESS
5/16"	OVER 12"-18"
3/8"	OVER 18"-22"
7/16"	OVER 22"-28"
1/2"	OVER 28"-34"
9/16"	OVER 34"-42"
5/8"	OVER 42"-48"
OVER 48" MUST BE APPROVED BY B.P.U.B.	
NOTE: THIS CHART IS ONLY FOR SMOOTH STEEL CASING PIPES WITH MINIMUM YIELD STRENGTH OF 35,000 PSI	



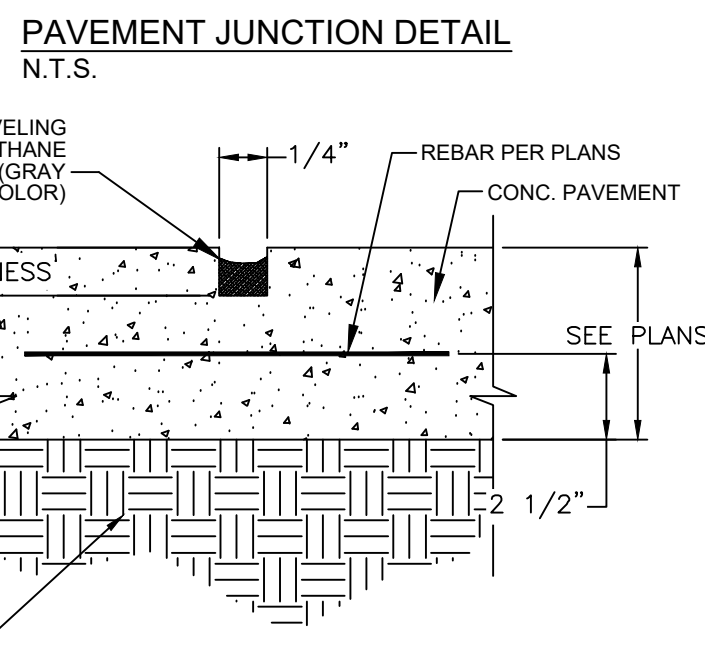
PVC PIPE CASING & SKIDS
NOT TO SCALE

NOMINAL PIPE SIZE	CASING SIZE	NO. OF SKIDS
4"	12"	4
6"	12"	4
8"	16"	4
12"	20"	4



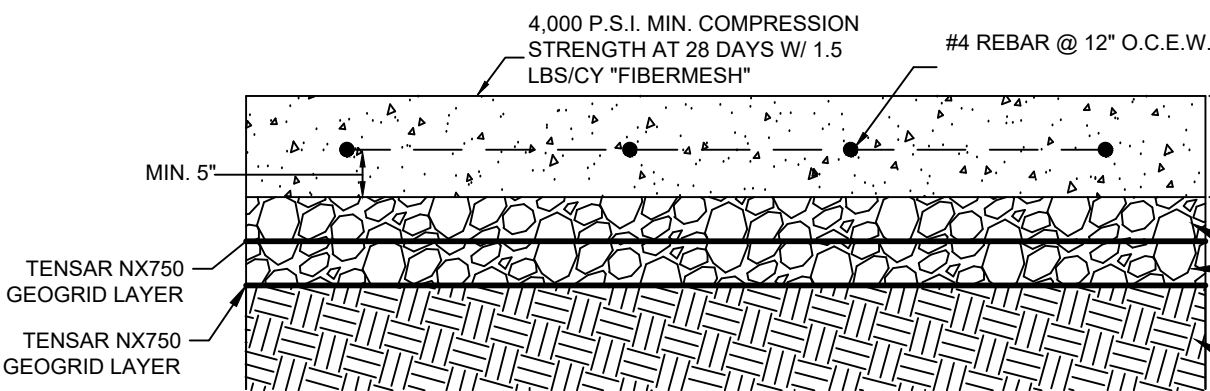
FORCEMAIN TIE-IN TO EXISTING MANHOLE
NOT TO SCALE

- FIELD CUTTING INTO FIBERGLASS MANHOLE SHALL BE COMPLETED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. SUBMIT CONNECTION PLAN TO ENGINEER FOR APPROVAL.
- CONNECTION SHALL BE WATERTIGHT AND FIELD TESTED.
- FOR CONCRETE MANHOLES, CORE INTO MANHOLE AND INSTALL LINK SEAL TO CONNECT FORCE MAIN TO THE MANHOLE. SUBMIT CONNECTION PLAN TO ENGINEER FOR APPROVAL.



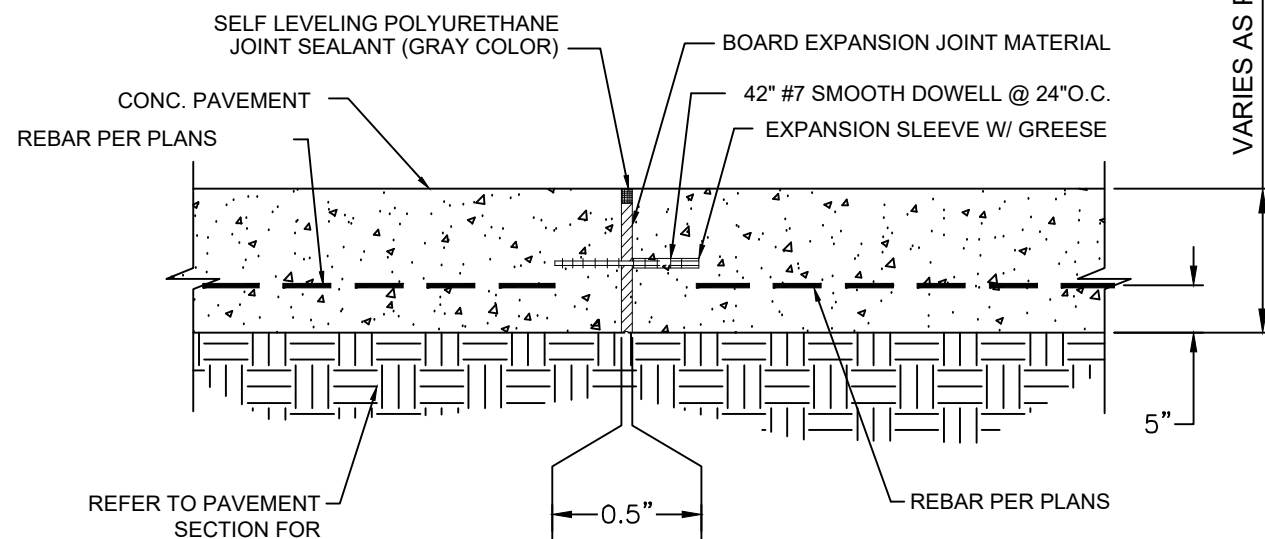
PAVEMENT JUNCTION DETAIL
N.T.S.

- NOTES:
- CONTRACTION JOINS SHALL BE PLACED AT 15-FOOT SPACING (MAX.).
 - PLACE JOINT SEALANT FLUSH OR SLIGHTLY BELOW TOP OF PAVEMENT. DO NOT MOUND MATERIAL ABOVE PAVEMENT.



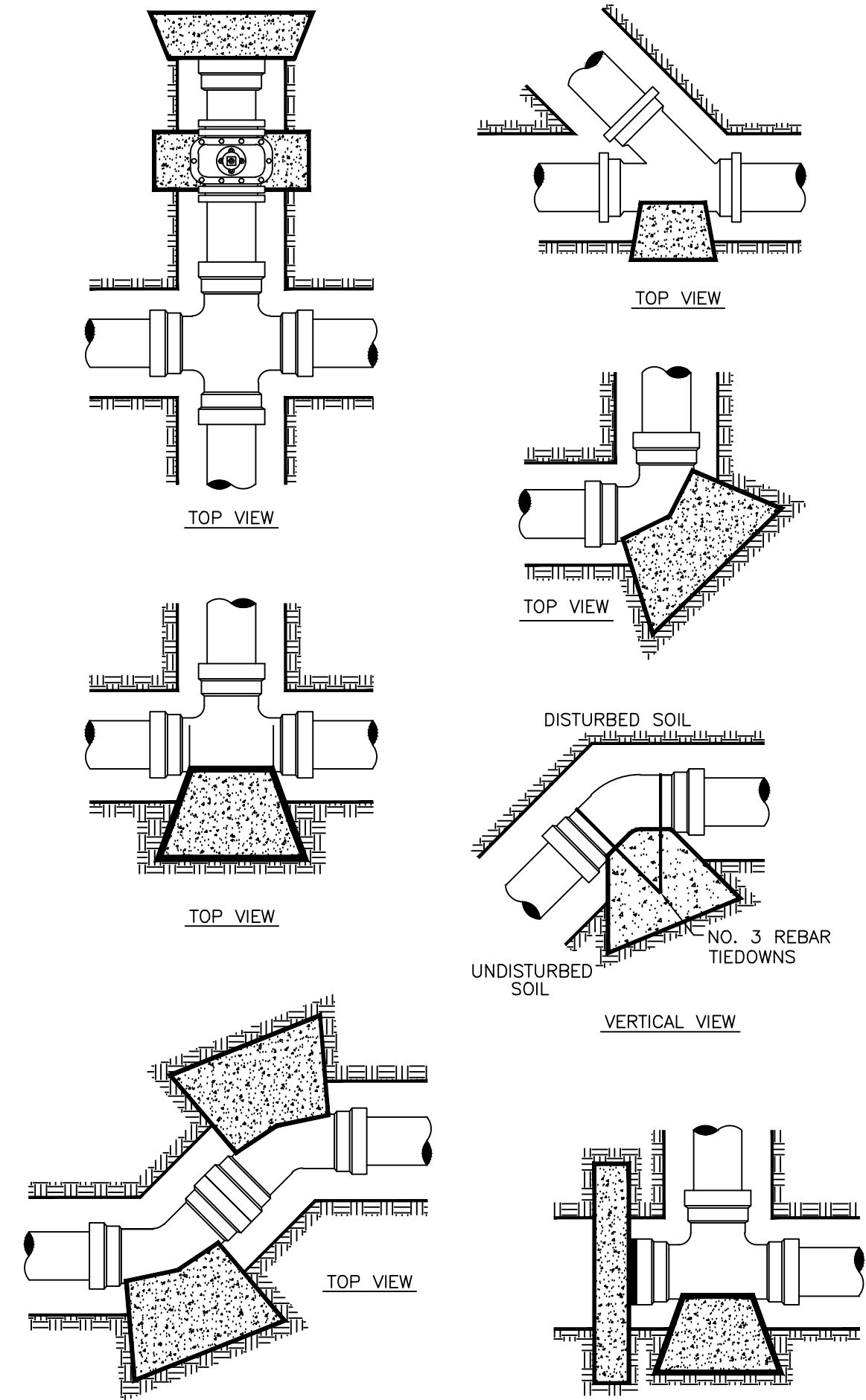
CONCRETE PAVEMENT DETAIL
N.T.S.

- NOTES:
- CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 15' EACH DIRECTION WITH EXPANSION (CONTRACTION) JOINTS EVERY 75', EXCEPT WHERE NOTED ON ENTRANCE DETAILS.
 - DETAILS FOR PAVEMENT WIDTH AND CROSS SLOPE SHALL BE AS SHOWN ELSEWHERE IN PLANS
 - THE SUBGRADE SHALL BE SCARIFIED TO A DEPTH OF TWELVE (12) INCHES AND MOISTURE CONDITIONED TO WITHIN THE RANGE OF PLUS TWO (+2) PERCENTAGE POINTS ABOVE OPTIMUM TO PLUS FOUR (+4) PERCENTAGE POINTS ABOVE THE OPTIMUM MOISTURE CONTENT. THE SUBGRADE SHALL BE COMPACTED TO A MINIMUM 98 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D 698.



- NOTES:
- PLACE JOINT SEALANT FLUSH OR SLIGHTLY BELOW TOP OF PAVEMENT. DO NOT MOUND MATERIAL ABOVE PAVEMENT.
 - JOINTS WILL CONSIST OF BOARD EXPANSION JOINT MATERIAL AND SELF LEVELING POLYURETHANE SEALANT (GRAY COLOR) WITH 3-367#5 SMOOTH DOWELS, ONE END GREASED AND WRAPPED.
 - CARE MUST BE TAKEN THAT THE DOWELS ARE STRAIGHT AND LAID PARALLEL WITH CURB AND NO CONCRETE "PLUGS" OR OTHER MATERIAL BE ALLOWED THROUGH THE DOWEL HOLES OR EXPANSION MATERIAL THAT WOULD PREVENT JOINT FROM OPERATING AS AN EXPANSION JOINT
 - EXPANSION JOINTS SHALL BE PLACED AT 75-FOOT SPACING (MAX.).

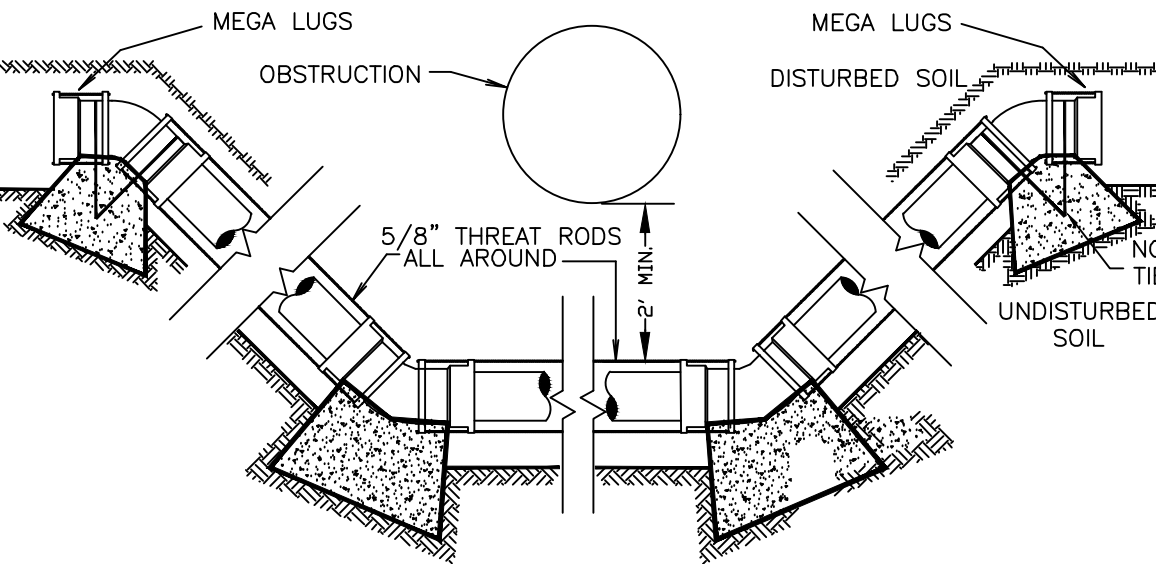
EXPANSION CONSTRUCTION JOINT
N.T.S.



THRUST BLOCK DETAILS
NOT TO SCALE

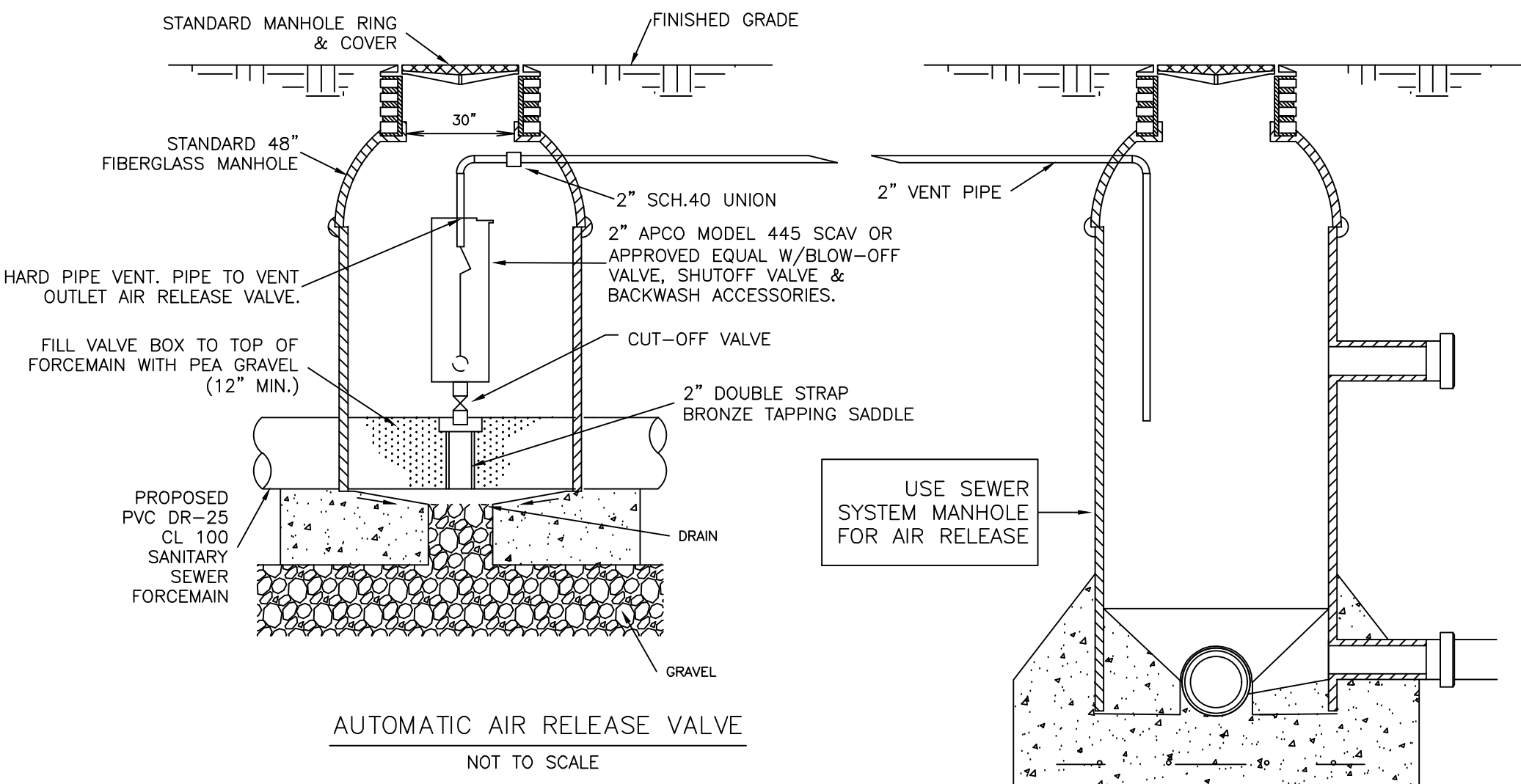
- ALL MJ FITTINGS WILL REQUIRE RESTRAINERS (MEGA LUGS) WITH THRUST BLOCKS
- NOTES ON THRUST BLOCKING:
- ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY STRENGTH OF 2000 LBS. PER SQUARE INCH.
 - THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE. $THRUST = 2 AP \sin 1/2 \theta$ WHERE A = AREA OF PIPE, P = WATER PRESSURE, θ = DEFLECTION ANGLE.
 - VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS. PER CU. FT. FOR CONCRETE AND SOIL AT 120 LBS. PER FT. OVER THE AREA OF BLOCK.
 - VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 2000 LBS. PER SQ. FT. ALLOWABLE SOIL BEARING PRESSURE. DIMENSION MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.
 - THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 24000 LBS. PER SQ. FT. OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL. BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.
 - ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF 1 FT.
 - ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.

GENERAL DATA FOR BLOCKING STANDARD FITTING							
PIPE SIZE	THRUST IN TONS EXERTED AT PLUGS, TEES AND BENDS FOR EACH 100 LBS. PER SQ. IN. OF TEST PRESSURE						
	PLUG	TEE	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND	
4"	0.63	0.63	0.89	0.48	0.25	0.12	
6"	1.40	1.40	2.00	1.08	0.55	0.28	
8"	2.50	2.50	3.55	1.92	0.98	0.49	
10"	3.93	3.93	5.55	3.00	1.53	0.77	
12"	5.65	5.65	8.00	4.33	2.21	1.11	
14"	7.70	7.70	10.88	5.89	3.00	1.51	
16"	10.05	10.05	14.21	7.69	3.85	1.97	
18"	12.70	12.70	17.99	9.74	4.96	2.49	
20"	15.71	15.71	22.22	12.02	6.13	3.08	
24"	22.67	22.67	32.00	17.31	8.83	4.43	
27"	28.63	28.63	40.48	21.91	11.17	5.61	
30"	35.35	35.35	50.00	27.08	13.79	6.93	
36"	50.90	50.90	72.98	38.95	19.89	9.98	
42"	69.27	69.27	97.97	53.02	27.03	13.58	
48"	90.48	90.48	127.96	69.25	35.30	17.74	
54"	114.51	114.51	161.94	87.64	44.68	22.45	



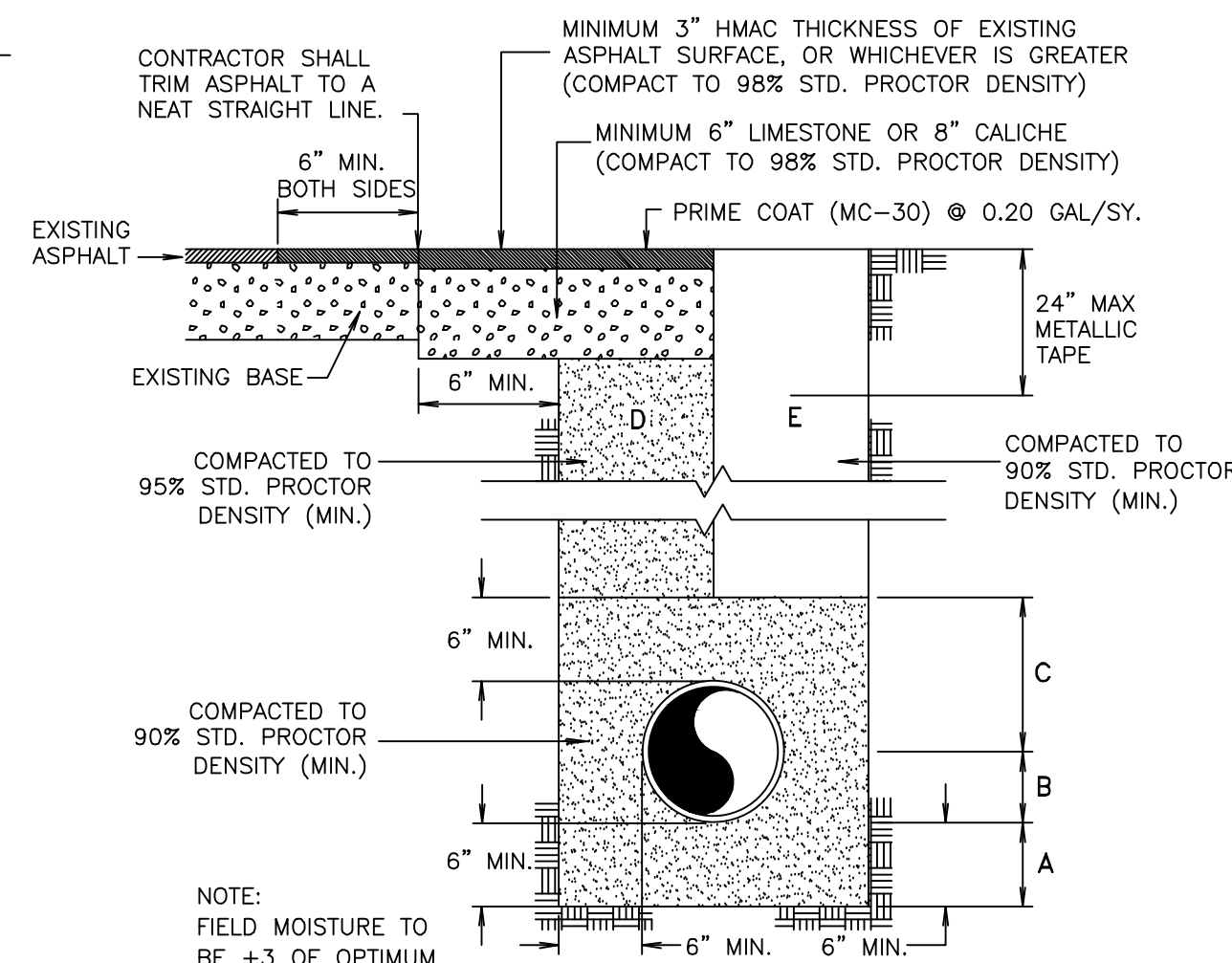
ADJUSTMENTS
NOT TO SCALE

SPECIAL CONDITION LINE ADJUSTMENTS 5/8" GALV. ALL THREAT RODS WITH EYELET BOLTS FOR ASSEMBLY WITH THRUST BLOCKS.



AUTOMATIC AIR RELEASE VALVE
NOT TO SCALE

MANHOLE
NOT TO SCALE



TYPICAL PIPE BEDDING AND TRENCH BACKFILL DETAIL
NOT TO SCALE

- A BANK RUN SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE (MIN. THICKNESS = 6").
- B BANK RUN SAND BACKFILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE (4" LIFTS, HAND TAMPED).
- C BANK RUN SAND BACKFILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE (6" LIFTS, HAND TAMPED).
- D BANK RUN SAND BACKFILL, CLASS "A" (6" LIFTS, MECHANICAL COMPACTION).
- E EARTH BACKFILL, CLASS "B" (12" LIFTS, MECHANICAL COMPACTION).
- FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS STABLE.
- BACKFILL AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6".
- STRUCTURE BACKFILL MATERIAL SHALL BE BANK RUN SAND, APPROVED SITE SOIL, OR OTHER APPROVED.

REVISION NO.	DATE	DESCRIPTION				

10/16/2026



THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
MICHAEL SALINAS, P.E. 123342
NAME PE LICENSE NO.
10/16/2026
DATE
THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF:
HALFF ASSOCIATES, INC.

#12 FIRM / BUSINESS NO. TX STATE

PROJECT NO.: 63708.001
ISSUED: 4/10/2026
DRAWN BY: JG
CHECKED BY: MS
SCALE: 1" = 20'
SHEET TITLE:

DETAILS

C601

