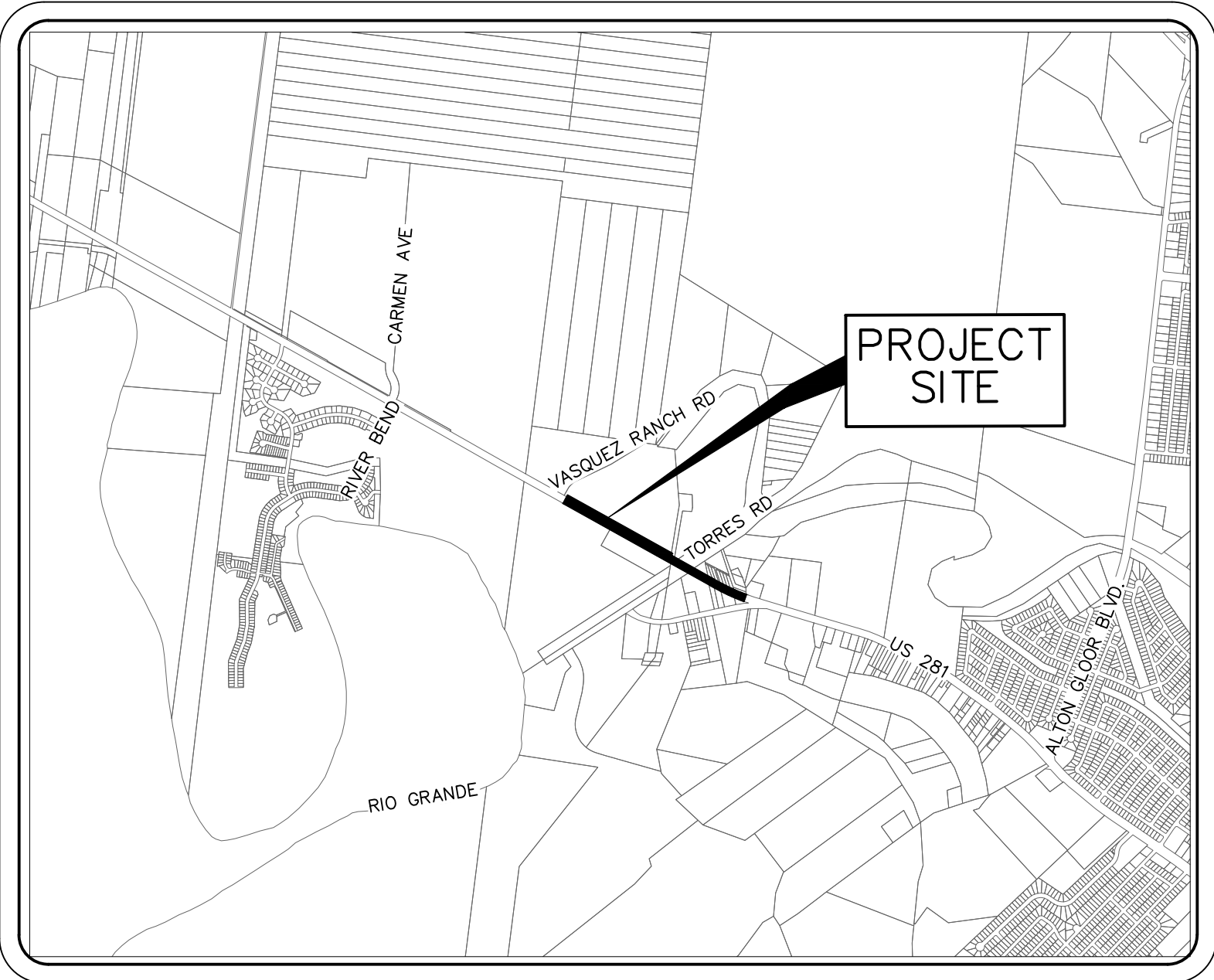


CONSTRUCTION PLANS
FOR
FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION
AND SURROUNDING AREAS

BROWNSVILLE, TEXAS

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LOCATION MAP
SCALE 1" = 2000'

PREPARED BY:



HALFF
1075 PAREDES LINE ROAD, SUITE B
BROWNSVILLE, TEXAS 78521
TEL (956) 303-7100
TBPELS ENGINEERING FIRM #312

OWNER/DEVELOPER

SPACELAND INVESTMENTS, LLC
2133 SANTA ANA AVE
RANCHO VIEJO, TX 78575
PHONE (956) 561-0864

UTILITY DISCLAIMER:

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 "ONE CALL" SYSTEM AT 811 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.

ENGINEER OF RECORD:

HALFF ASSOCIATES, INC.
1075 PAREDES LINE ROAD, SUITE B
BROWNSVILLE, TEXAS 78521
CONTACT: JOHN W. CLINT, P.E.
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TBPE FIRM# F-312

DISCLAIMER

THE SEAL(S) APPEARING ON THIS CONSTRUCTION SET WERE AUTHORIZED BY:
JOHN W. CLINT P.E., 85417
ON 02/11/2022
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 ROAD
SUITE B
BROWNSVILLE, TEXAS 78521
TBPE FIRM #F-312

BPUB ENGINEER'S STATEMENT:

THE ABOVE IDENTIFIED PLANS AND SPECIFICATIONS HAVE BEEN REVIEWED AND FOUND TO BE IN COMPLIANCE WITH THE APPLICABLE ENGINEERING PROVISIONS (WATER AND WASTEWATER IMPROVEMENTS) OF THE MUNICIPAL CODE OF THE CITY OF BROWNSVILLE AND BPUB WATER AND WASTEWATER STANDARD DETAILS. ISSUANCE OF THIS APPROVAL SHALL NOT BE CONSTRUED AS APPROVAL OF CONCEPT FOR THE CONSTRUCTION DETAILS OF THE PROPOSED IMPROVEMENTS AND SHALL NOT IN ANY WAY RELEASE THE DEVELOPER AND THE DESIGN ENGINEER FROM LIABILITY FOR THE ADEQUACY OF THE DESIGN NOR FROM LIABILITY CAUSED BY AND RESULTING FROM THE CONSTRUCTION OF IMPROVEMENTS AS PROVIDED IN THE ABOVE SPECIFIED DOCUMENTS.

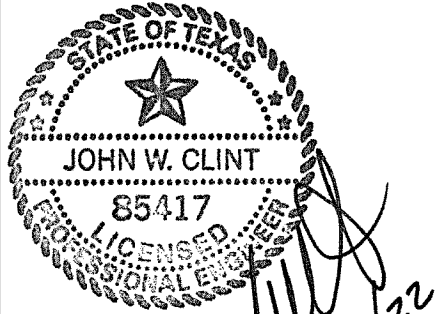
MARIE C. LEAL, P.E.
DIRECTOR OF SPECIAL PROJECTS AND WATER / WASTEWATER ENGINEERING,
PLANNING & OPERATIONS
FOR THE BROWNSVILLE PUBLIC UTILITIES BOARD

FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS
BROWNSVILLE, TEXAS



1075 PAREDES LINE ROAD, SUITE B
BROWNSVILLE, TEXAS 78521
TBPELS ENGINEERING FIRM #312

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1
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GENERAL CONSTRUCTION NOTES:

1. ALL MATERIALS, WORKMANSHIP AND IMPROVEMENTS SHALL BE IN ACCORDANCE WITH ALL LOCAL CODES, INCLUDING THE STANDARD CONSTRUCTION DETAILS AND TECHNICAL SPECIFICATIONS FROM CITY OF BROWNSVILLE, TEXAS DEPARTMENT OF TRANSPORTATION AND ALL OTHER GOVERNING AGENCIES.
2. PRIOR TO BEGINNING CONSTRUCTION, THE OWNER OR HIS AUTHORIZED REPRESENTATIVE SHALL SCHEDULE A PRECONSTRUCTION CONFERENCE BETWEEN THE CONSULTING ENGINEER, CONTRACTOR, CAMERON COUNTY, BROWNSVILLE P.U.B., CITY OF BROWNSVILLE, AND ALL AFFECTED PARTIES.
3. PRE-CONSTRUCTION PHOTOGRAPHS SHALL BE TAKEN TO SHOW EXISTING CONDITIONS OF THE SITE AND ADJOINING STRUCTURES TO REMAIN. PHOTOS SHALL INCLUDE DAMAGE TO FINISH SURFACES THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY DEMOLITION OPERATIONS. (NO SEPARATE PAY)
4. 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.
5. 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 UNDER 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 ONWER 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.
6. 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.
7. 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.
8. 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.
9. CONTRACTOR TO PLAN AND PERFORM HIS WORK IN A MANNER THAT WILL PERMIT SAFE PUBLIC TRAFFIC MOVEMENT ON ALL STREETS.
10. THE CONTRACTOR SHALL PLAN AND SEQUENCE ALL CONSTRUCTION ACTIVITY IN SUCH A MANNER THAT WILL PERMIT SAFE PEDESTRIAN AND VEHICULAR MOVEMENT.
11. TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATIONS. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN, 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.
12. 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)
13. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SAFETY OF THE WORK SITE, WORKERS, SUBCONTRACTORS, MATERIALS AND EQUIPMENT.
14. 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.
15. 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.
16. CONTRACTOR SHALL PROVIDE A SEQUENCE OF WORK AND PERFORM ASSOCIATED GRADING THAT PROVIDES POSITIVE OUTFALLS AT ALL TIMES.
17. CONSTRUCTION STAKING DESIGN PLAN SHALL BE PROVIDED BY THE CONTRACTOR AND AT CONTRACTOR'S EXPENSE. DESIGN PLANS INCLUDE HORIZONTAL AND VERTICAL CONTROL REFERENCE POINTS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. ALL DIMENSIONS ARE TO RIGHT OF WAY, BACK OF CURB, OR, WHERE NO CURB EXISTS, TO EDGE OF PAVEMENT UNLESS SHOWN OTHERWISE. ALL UTILITY DIMENSIONS AND STATIONS/COORDINATES ARE TO CENTER OF THE STRUCTURE UNLESS SHOWN OTHERWISE.
18. CONTRACTOR TO COORDINATE WITH THE OWNER ON WORK SCHEDULES, TESTING, GENERAL INSPECTION, AND OPERATION AND LOCATION OF EXISTING LINES.
19. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING ALL CONSTRUCTION MATERIALS TESTING AND GENERAL INSPECTIONS. THE CONTRACTOR SHALL COORDINATE THROUGH THE OWNER'S DESIGNATED FIELD REPRESENTATIVE AND UTILITY OWNER (BPU) 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.
20. MATERIAL TESTING SHALL BE PROVIDED BY THE OWNER. RE-TEST TO BE AT CONTRACTOR'S EXPENSE.
21. 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.
22. 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.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED. (NO SEPARATE PAY)
24. 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.
25. 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.
26. NO TREES SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER OR ENGINEER, UNLESS OTHERWISE NOTED.

27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. CONTRACTOR TO ENSURE SAME DAY ACCESS TO ALL RESIDENCES AND BUSINESSES ADJACENT TO CONSTRUCTION.
33. 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.
34. 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 OWNER'S 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)
35. THE CONTRACTOR SHALL PROVIDE AN EMERGENCY PLAN, IN CASE OF A LARGE RAIN EVENT OR OTHER IMPACTFUL EVENT, FOR APPROVAL 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)
36. ALL COMPACTION SHALL BE ACHIEVED BY MECHANICAL METHODS. NO WATER JETTING ALLOWED, UNLESS APPROVED BY THE OWNER.
37. 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.
38. DEMOLITION, REMOVAL AND DISPOSAL OF ALL EXCESS CONCRETE, CURBS, RUBBLE, ETC. TO BE DONE IN A LEGAL MANNER AT CONTRACTOR'S EXPENSE.
39. 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.
40. 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.
41. CONCRETE NOTES:
- A. ALL CONCRETE WORK TO BE FORMED, UNLESS OTHERWISE APPROVED.
- B. ALL CONCRETE TO BE 3000-PSI MINIMUM AT 28 DAYS, UNLESS OTHERWISE SHOWN.
- C. ALL REINFORCING STEEL TO BE ASTM A-615, GRADE 60, UNLESS OTHERWISE SHOWN.
- D. ALL EXPOSED CONCRETE WORK TO BE CHAMFERED.
- E. 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.
- F. ALL EXPOSED CONCRETE SURFACES SHALL BE TREATED WITH CURING COMPOUND RESIN BASE ASTM C 309 TYPE 2 WITH PIGMENTED TINT OF FUGITIVE DYE.
- G. 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, 3/8" 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)
- H. CONTRACTION (DUMMY, SAWED OR GROVED) JOINTS SHALL BE 2" DEEP AND PLACED AT MAXIMUM OF 10-FOOT INTERVALS.
- I. 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.
42. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING ALL FIELD CHANGES AND FURNISHING A LEGIBLE SET OF RECORD DRAWINGS TO THE ENGINEER.
43. 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.

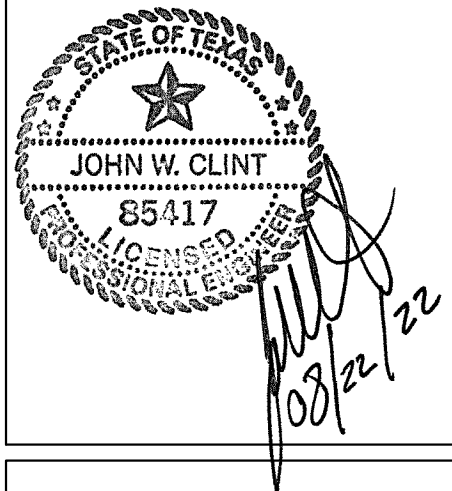
UTILITY GENERAL NOTES:

1. 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 |
| CAMERON COUNTY IRRIGATION DISTRICT NO.6 | (956) 399-7186 |
| TEXAS 811 | |
| TEXAS GAS SERVICE | (800) 959-5325 |
| SPECTRUM/TIME WARNER CABLE | (800) 222-5355 |
| AT&T TEXAS | (800) 288-2020 |
| 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 |
| MILITARY HIGHWAY WATER SUPPLY CORPORATION | (956) 565-2491 |
2. CONTRACTOR SHALL EXPOSE ANY EXISTING UTILITY THAT MAY BE IN CONFLICT PRIOR TO COMMENCING CONSTRUCTION AND EXCAVATION.
3. 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.
4. CONTRACTOR SHALL AT ALL TIMES ALLOW ACCESS TO EXISTING DRIVEWAY OR PROVIDE/MAINTAIN ALTERNATIVE ALL-WEATHER ROUTES.
5. ALL TRAFFIC CONTROL DEVICES SHALL BE IN CONFORMANCE WITH TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES LATEST EDITION.
6. ANY DAMAGES TO FENCES, WALKS, OR PRIVATE PROPERTY SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
7. ALL CONSTRUCTION MATERIALS TESTING WILL BE COORDINATED THROUGH THE OWNER.
8. 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.
9. 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.
10. 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.
11. IN THE EVENT CONDITIONS ENCOUNTERED IN THE FIELD REQUIRE TRENCH SAFETY SYSTEMS OUTSIDE OF THE EXTENTS SUGGESTED 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)
12. 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.
13. 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.
14. CONTRACTOR SHALL PROTECT AND SUSPEND ALL EXISTING UTILITIES TO REMAIN.
15. 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 PROPOSE UTILITIES. CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS.

FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS
BROWNSVILLE, TEXAS



Revision No.	Date	Description



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Drawn By:	MH
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GENERAL NOTES

2

Sheet Number

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UTILITY NOTES

1. ALL CONSTRUCTION OPERATIONS TO BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION. COPIES OF OSHA STANDARDS MAY BE PURCHASED FROM THE U.S. GOVERNMENT PRINTING OFFICE.
2. ELECTRICAL LINES ARE LOCATED IN THE PROJECT AREA. THE ATTENTION OF THE CONTRACTOR IS DIRECTED TO STATE LAW (VERNON'S ANNOTATED TEXAS STATUTES, ARTICLE 1436 (C)) CONCERNING CONSTRUCTION OPERATIONS IN THE VICINITY OF ELECTRICAL LINES AND THE NEED FOR EFFECTIVE PRECAUTIONARY MEASURES.
3. ANY CHANGES OR REVISIONS TO THE UTILITY DESIGN MUST FIRST BE SUBMITTED TO BPUB FOR REVIEW AND WRITTEN APPROVAL.
4. THE CONTRACTOR SHALL GIVE BROWNSVILLE PUB 24 HOUR ADVANCE NOTICE PRIOR TO PLACEMENT OF ANY CONCRETE, TO PERMIT THE REVIEW OF FORMS, REINFORCING STEEL PLACEMENT, AND OTHER PREPARATIONS.
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST BROWNSVILLE PUB STANDARD SPECIFICATIONS.
6. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, ALL UTILITY CONCRETE IS TO BE CLASS "K" (4000 PSI-28 DAYS), AND ALL REINFORCING STEEL TO BE ASTM A615 GRADE 60.
7. MAXIMUM LENGTH OF OPEN TRENCH TO BE 60', OR AS DIRECTED BY THE OWNER.

WASTEWATER NOTES

1. ALL PIPE BEDDING MATERIAL SHALL CONFORM TO DETAILS AND THE MANUFACTURER'S RECOMMENDATION.
2. ALL INTERNAL CONCRETE SURFACES FOR WASTEWATER MANHOLES TO BE COATED PER MATERIALS AND PROCEDURES SPECIFIED IN CONTRACT SPECIFICATIONS AND DESIGN PLANS.
3. ALL MANHOLE COVERS SHALL BE 32" DIAMETER WATERTIGHT SANITARY SEWER MANHOLE FRAME AND COVER EAST JORDAN IRON WORKS MODEL V-1430A (OR APPROVED EQUAL) AND READ "BROWNSVILLE PUB".
4. THE DISTANCE FROM TOP OF SANITARY SEWER MANHOLE CONE TO FINISHED GRADE TO BE 12" MINIMUM OR 18" MAX (AS PER DETAIL), UNLESS NOTED OTHERWISE ON PLANS.
5. EXISTING WASTEWATER LINES SHALL BE KEPT IN SERVICE UNTIL PROPOSED WASTEWATER SYSTEM IMPROVEMENTS HAVE BEEN COMPLETED AND APPROVED BY THE OWNER.
6. CONTRACTOR TO CONSTRUCT WASTEWATER GRAVITY MAIN FROM DOWNSTREAM END TO UPSTREAM END WITH BELLS FACING UPSTREAM.
7. ALL MANHOLES TO BE BENCHED IN THE DIRECTION OF FLOW TO MINIMIZE TURBULENCE.
8. ALL SEWER LINES, MANHOLES AND FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH TCEQ CHAPTER 217.57 REGULATIONS.

THE OWNER RETAINS THE RIGHTS TO TELEWISE THE LINE TO DETERMINE THE CONDITION OF THE SEWER LINE PRIOR TO FINAL ACCEPTANCE.
9. THE CONTRACTOR SHALL PERFORM QUALITY TESTING FOR THE WATER AND WASTEWATER SYSTEM INSTALLED AND AND SHALL PROVIDE ALL EQUIPMENT (INCLUDING PUMPS AND GAUGES), SUPPLIES AND LABOR NECESSARY TO PERFORM THE TESTS AT HIS EXPENSE. BPUB TO BE GIVEN 48 HRS NOTICE PRIOR TO ALL TESTING AND SHALL BE MONITORED BY BPUB PERSONNEL. TESTING IS TO BE DONE IN ACCORDANCE WITH BPUB STANDARDS.
10. ALL MANHOLES LOCATED WITHIN A ROADSIDE DITCH SHALL HAVE A MINIMUM COVER OF 18", AND HAVE WATERTIGHT COVERS. MANHOLES SHALL BE MARKED WITH MANHOLE MARKERS (USE MARKER DETAIL AS SHOWN IN "TYPICAL SERVICE CONNECTION") LOCATED AT THE RIGHT-OF-WAY. COST SUBSIDIARY TO OTHER ITEMS.
11. CONTRACTOR SHALL INSTALL ALL PROPOSED SANITARY SEWER SERVICE CONNECTIONS WITH AN ADEQUATE DEPTH TO ACCOMMODATE THE YARD LINE TO HAVE A SLOPE OF 1/4-INCH PER FOOT PLUS 2' FEET MINIMUM COVER AT THE FUTURE HOME.

UTILITY TESTING NOTES

1. BROWNSVILLE PUBLIC UTILITIES BOARD TO BE GIVEN 48 HOURS NOTICE PRIOR TO ALL TESTING OF WATER LINES AND WASTEWATER LINES, AND DENSITY TESTING. REFER TO SPECIFICATIONS AND TCEQ NOTES FOR TESTING REQUIREMENTS. ALL TESTING TO BE CONDUCTED IN PRESENCE OF B.P.U.B. INSPECTOR.
2. ALL SANITARY SEWERS, EXCLUDING SERVICE LINES, SHALL BE MANDREL TESTED PER TEXAS COMMISSION ON ENVIRONMENTAL QUALITY CRITERIA. MANDREL TEST SHALL NOT BE PERFORMED UNTIL BACKFILL HAS BEEN IN PLACE FOR A MINIMUM OF 30 DAYS.
3. SOIL DENSITY TESTS AND RELATED SOIL ANALYSIS TESTS TO BE ACCOMPLISHED BY AN INDEPENDENT LABORATORY UNDER CONTRACT WITH THE OWNER. TESTS WHICH SHOW UNSATISFACTORY RESULTS ARE TO BE REPEATED AT THE EXPENSE OF THE CONTRACTOR SUBSEQUENT TO CONTRACTOR'S REMEDIAL ACTIVITIES.
4. DENSITY TESTING OF COMPACTED SUBGRADE MATERIAL FOR FIRST COURSE, AND SECOND COURSE OF COMPACTED BASE SHALL BE MADE AT ALL DRIVEWAYS AND INTERSECTING STREETS. IN ADDITION, ONE (1) DENSITY TEST PER LIFT PER FIVE HUNDRED (500) FEET OF INSTALLED PIPELINE SHALL BE CONDUCTED.

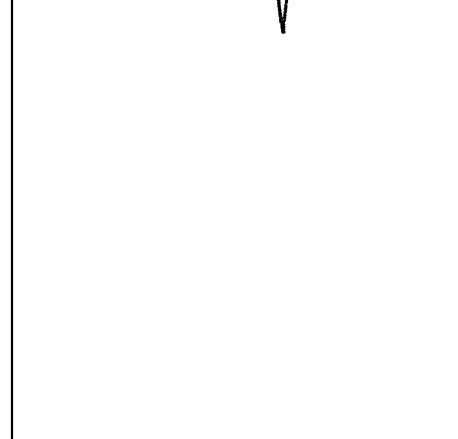
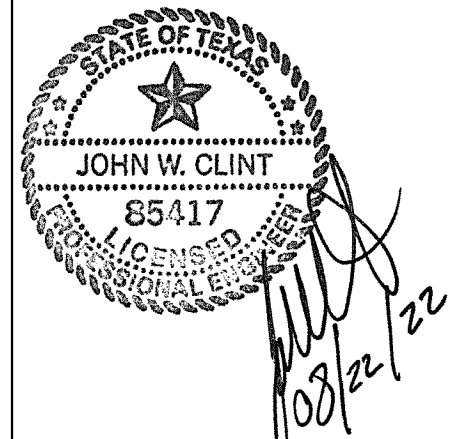
EROSION CONTROL NOTES:

1. CONTRACTOR SHALL OBTAIN A SWPPP PERMIT AND POST IT AT THE CONSTRUCTION SITE, IN ACCORDANCE WITH TDPS REQUIREMENTS, PRIOR TO CONSTRUCTION.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING ANY EARTH DISTURBING ACTIVITY.
3. ALL EFFORTS SHALL BE MADE TO CONTAIN DISTURBED SOILS WITHIN THE EXTENTS OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES.
4. THE CONTRACTOR SHALL SEQUENCE ALL CONSTRUCTION IN SUCH A MANNER AS TO MINIMIZE THE AMOUNT AND EXTENTS OF DISTURBED EARTH.
5. A STABILIZED CONSTRUCTION EXIT IS REQUIRED AT ALL POINTS OF DESIGNATED EGRESS FROM THE LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION(S) UNLESS OTHERWISE NOTED ON THE PLANS. THE LOCATION(S) OF THE STABILIZED CONSTRUCTION EXIT(S) MAY BE MODIFIED WITH RESPECT TO THE SEQUENCE OF CONSTRUCTION.
6. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY MAINTAINED DURING THE COURSE OF THEIR INTENDED USE.
7. ALL STAGING, MATERIAL STORAGE, STOCKPILE AND REFUSE AREAS SHALL REQUIRE APPLICABLE EROSION AND SEDIMENT CONTROL MEASURES.
8. ALL CONSTRUCTION DEBRIS SHALL BE CONTAINED WITHIN APPROPRIATE RECEPTACLES (ROLL-OFF CONTAINERS, DUMPSTERS, TRASH CANS, WIRE-MESH CAGES, ETC.) AND CONFINED WITHIN PERIMETER EROSION AND SEDIMENT CONTROLS.
9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE DURING THE COURSE OF EARTH DISTURBING ACTIVITY AND UNTIL FINAL STABILIZATION IS ACHIEVED. STRUCTURAL MEASURES MAY BE REMOVED ONLY UPON FINAL PROJECT ACCEPTANCE BY THE OWNER OR AS DIRECTED BY THE OWNER.
10. PERMANENT STABILIZATION SHALL BEGIN AS SOON AS PRACTICABLE OR AS DIRECTED BY THE OWNER.
11. DUST CONTROL SHALL BE IMPLEMENTED AS NECESSARY OR AS DIRECTED BY THE OWNER. DUST CONTROL MAY CONSIST OF WATERING OR OTHER METHODS APPROVED BY THE OWNER. DUST CONTROL AND ASSOCIATED WATERING OR OTHER METHOD SHALL BE SUBSIDIARY TO THE EROSION CONTROL BID ITEM IN THE UNIT PRICE SCHEDULE.
12. TRACKED DEBRIS SHALL BE SWEEPED AT THE END OF EACH WORKDAY OR AS DIRECTED BY THE OWNER.
13. ALL DISCHARGES ASSOCIATED WITH DEWATERING OPERATIONS SHALL IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES. MEASURES MAY INCLUDE BUT ARE NOT LIMITED TO SEDIMENTATION BASINS OR FILTER SOCKS.
14. CONCRETE WASH-WATER SHALL NOT BE DISCHARGED DIRECTLY INTO A STORM SEWER SYSTEM OR RECEIVING STREAM. ALL WASH ACTIVITIES MUST BE PERFORMED WITHIN THE EXTENTS OF ESTABLISHED EROSION AND SEDIMENT CONTROL MEASURES OR DESIGNATED AREAS APPROVED BY THE OWNER.
15. SEDIMENT SHALL BE CLEARED FROM ALL STORM SEWER PIPES, CULVERTS AND APPURTENANCES WITHIN THE LIMITS OF CONSTRUCTION PRIOR TO FINAL PROJECT ACCEPTANCE. SEDIMENT SHALL BE PROPERLY DISPOSED.
16. STAGING, STOCKPILE AND EQUIPMENT STORAGE AREAS SHALL NOT BE LOCATED WITHIN THE EXTENTS OF ANY TREE DRIPLINES.

FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS
BROWNSVILLE, TEXAS



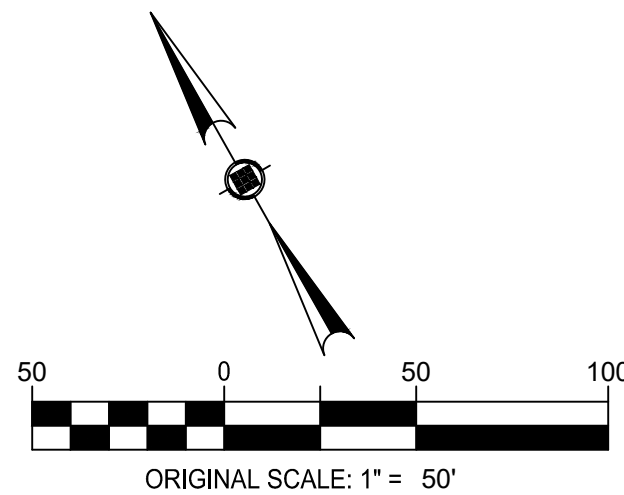
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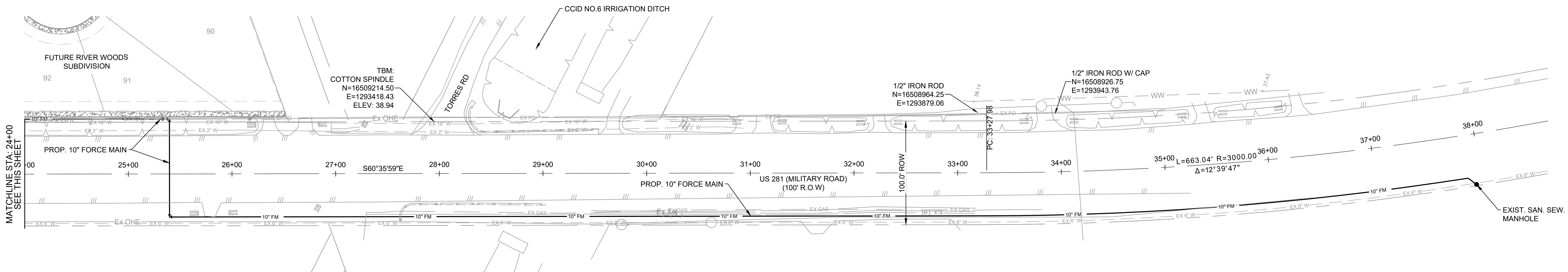
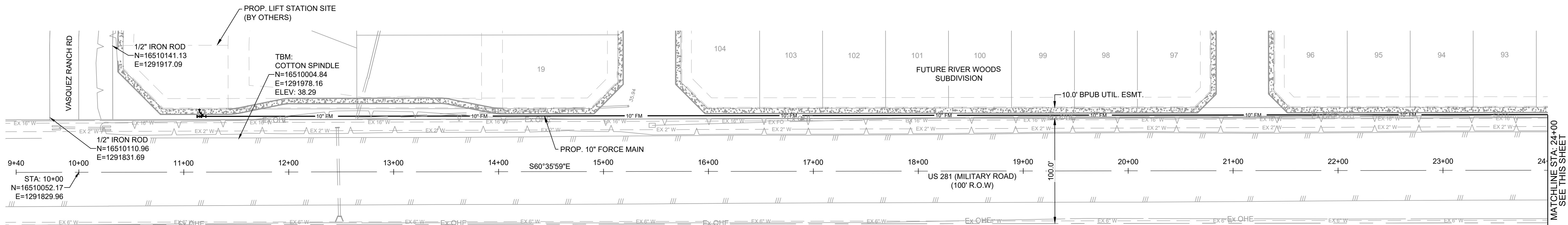
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- LEGEND
- EXIST. FENCE
 - - - EX W - - - EX W - - - EXIST. WATER LINE
 - - - EX WW - - - EX WW - - - EXIST. WASTEWATER LINE
 - - - EX ST - - - EX ST - - - EXIST. STORM LINE
 - - - EX OHE - - - EX OHE - - - EXIST. POWER LINE
 - - - EX FM - - - EX FM - - - EXIST. FORCE MAIN
 - - - EX R/W - - - EX R/W - - - RIGHT OF WAY
 - - - EX C/L - - - EX C/L - - - ROAD CENTERLINE
 - - - EX T/B - - - EX T/B - - - TOP OF BERM
 - - - EX W/L - - - EX W/L - - - PROP. WATER LINE
 - - - EX W/W - - - EX W/W - - - PROP. WASTEWATER LINE

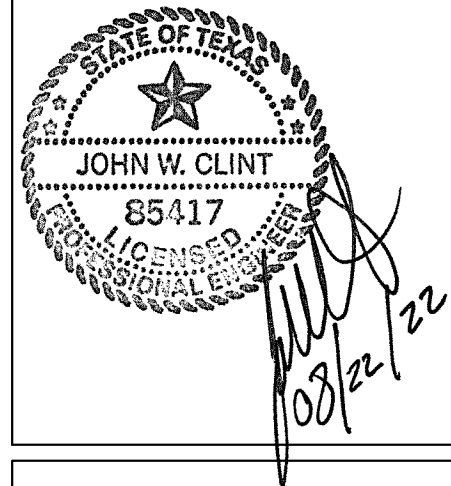


FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS

BROWNSVILLE, TEXAS



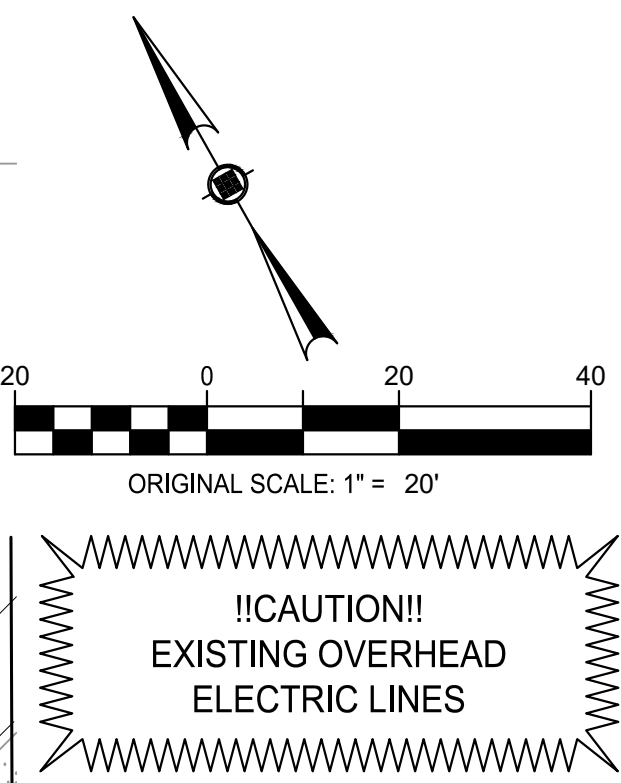
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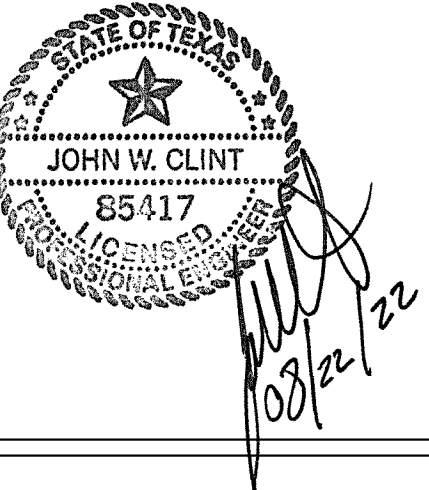
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SURVEY CONTROL PLAN



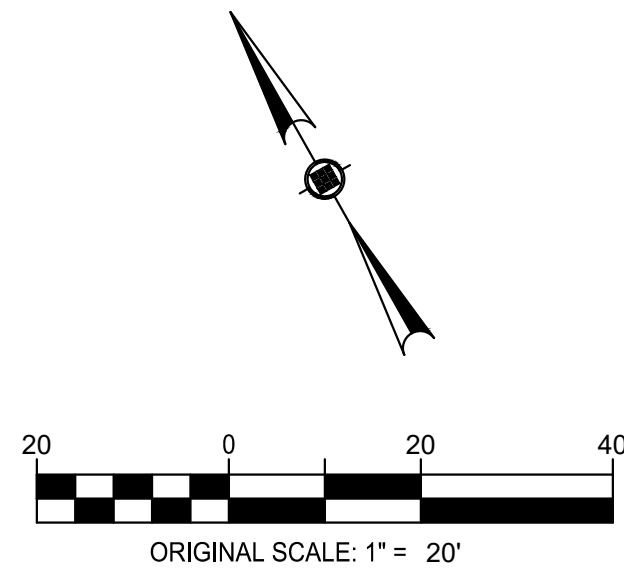
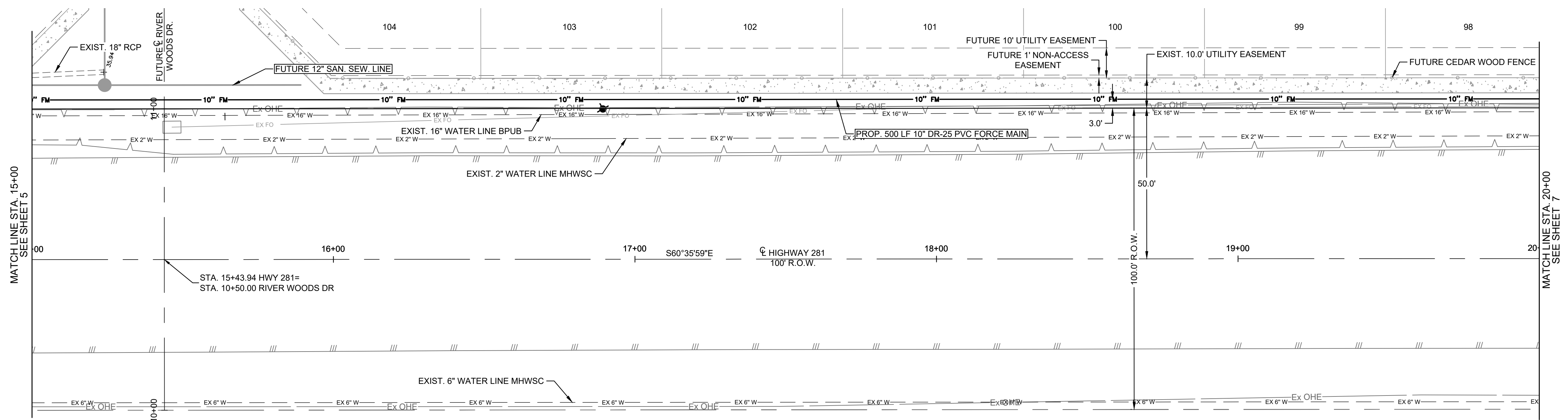
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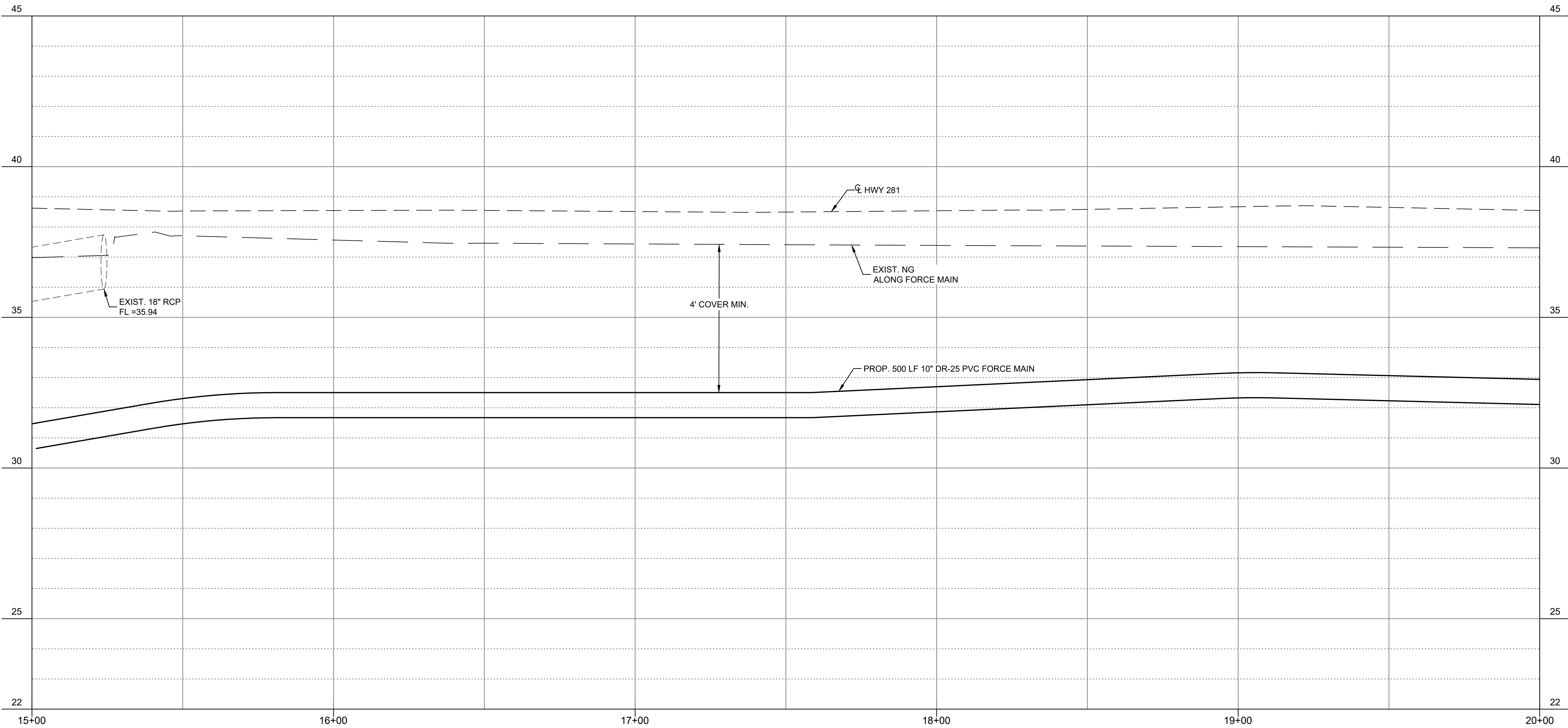
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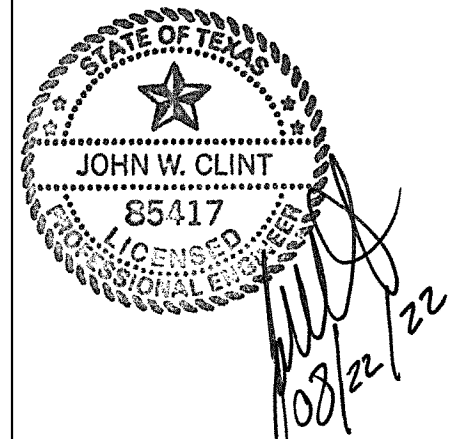


FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS

BROWNSVILLE, TEXAS



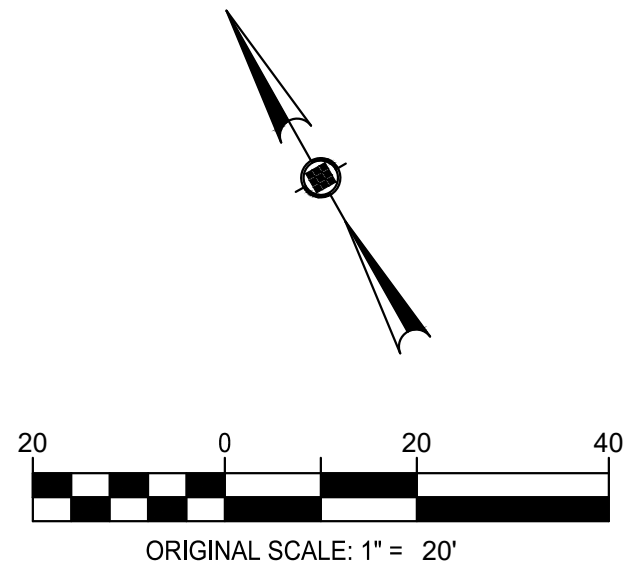
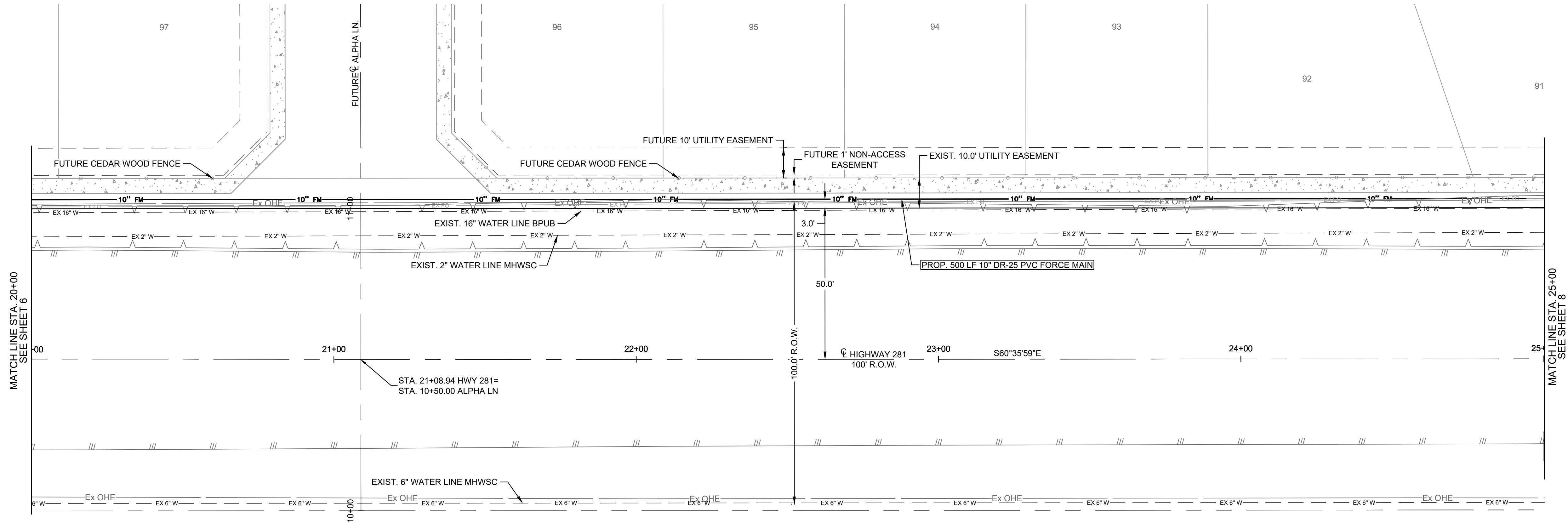
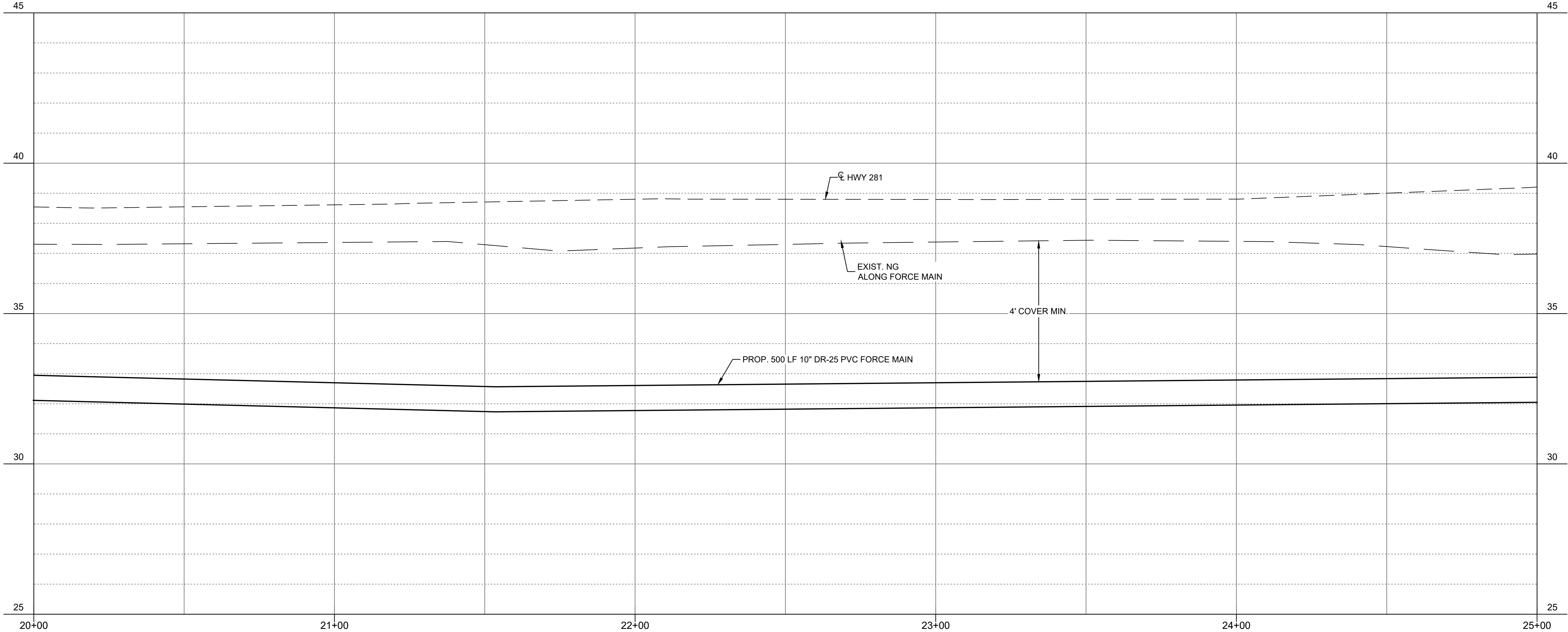
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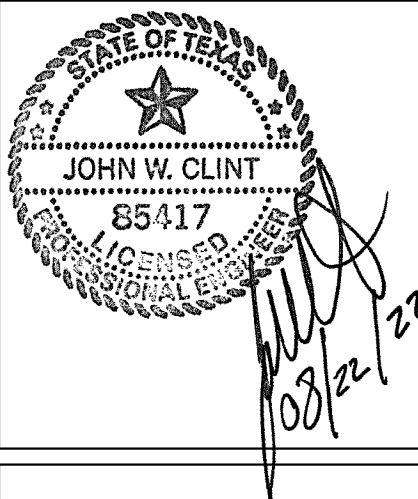


!!CAUTION!!
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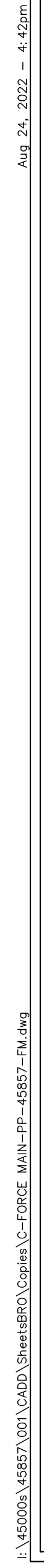
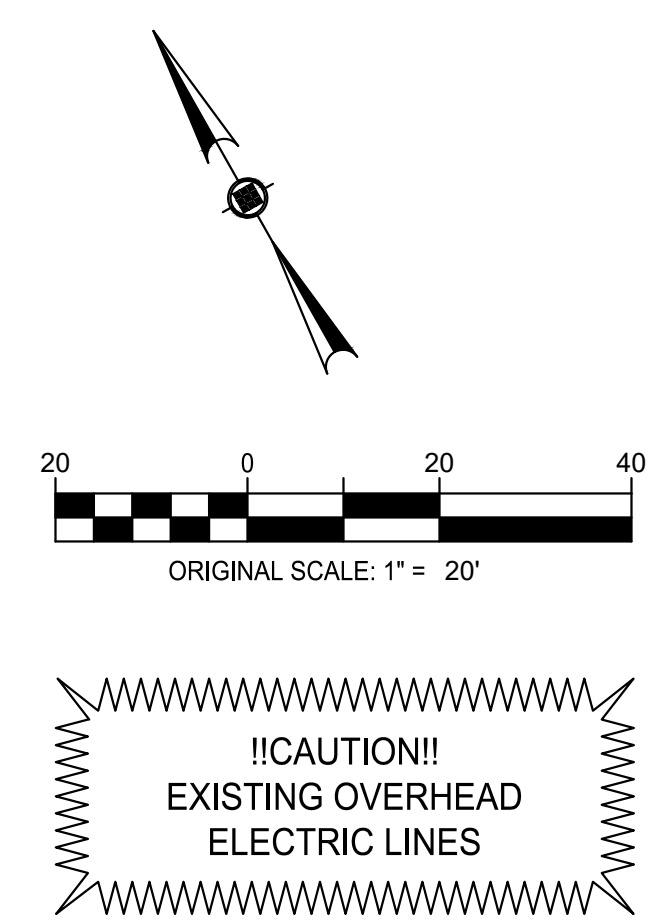
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SURROUNDING AREAS
BROWNSVILLE, TEXAS



Revision No.	Date	Description



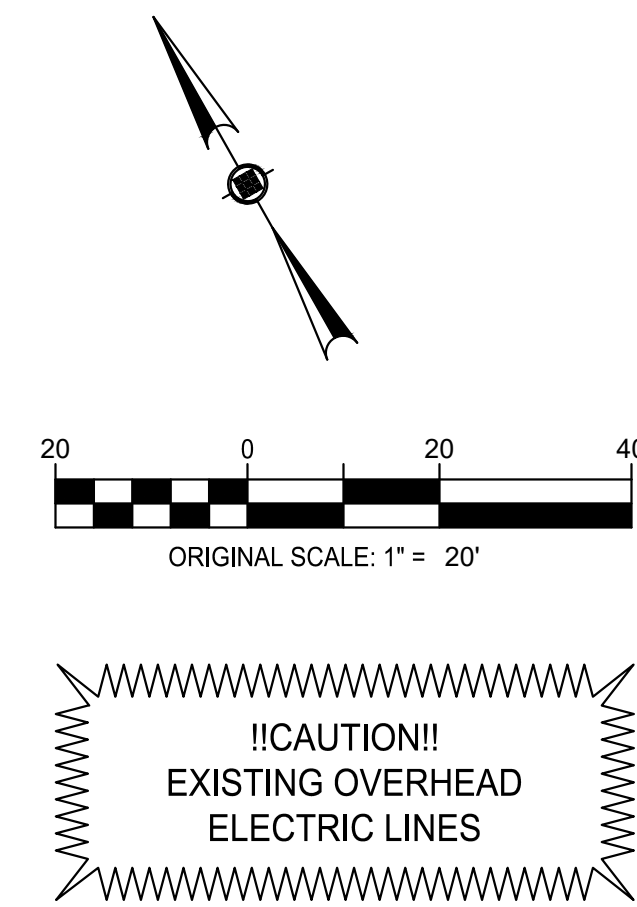
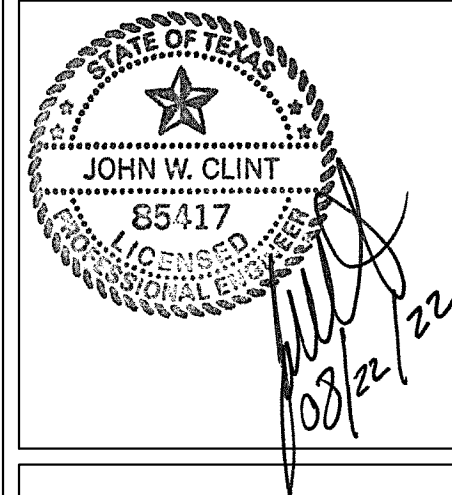
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FORCE MAIN
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BROWNSVILLE, TEXAS 77826
TEL (956) 303-7100
TBPEL'S ENGINEERING FIRM #312

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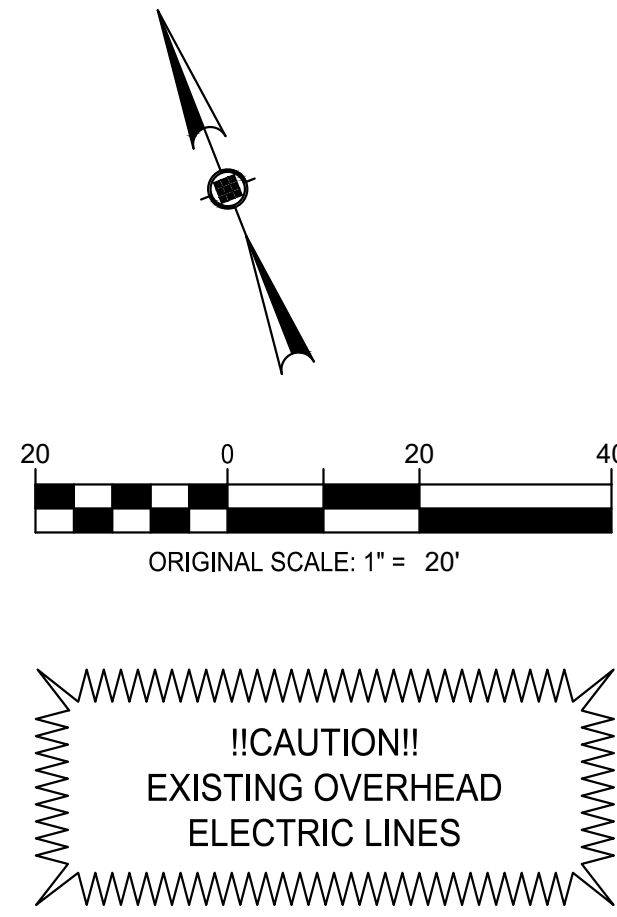
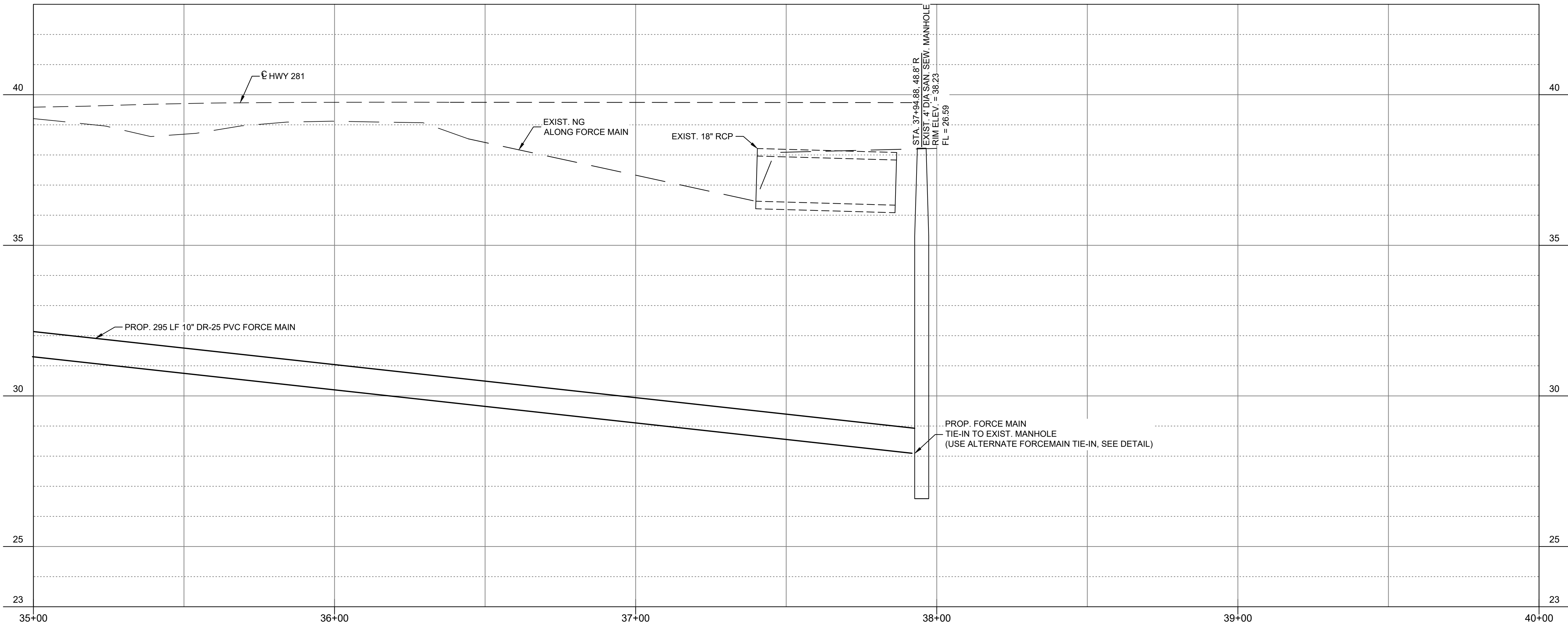
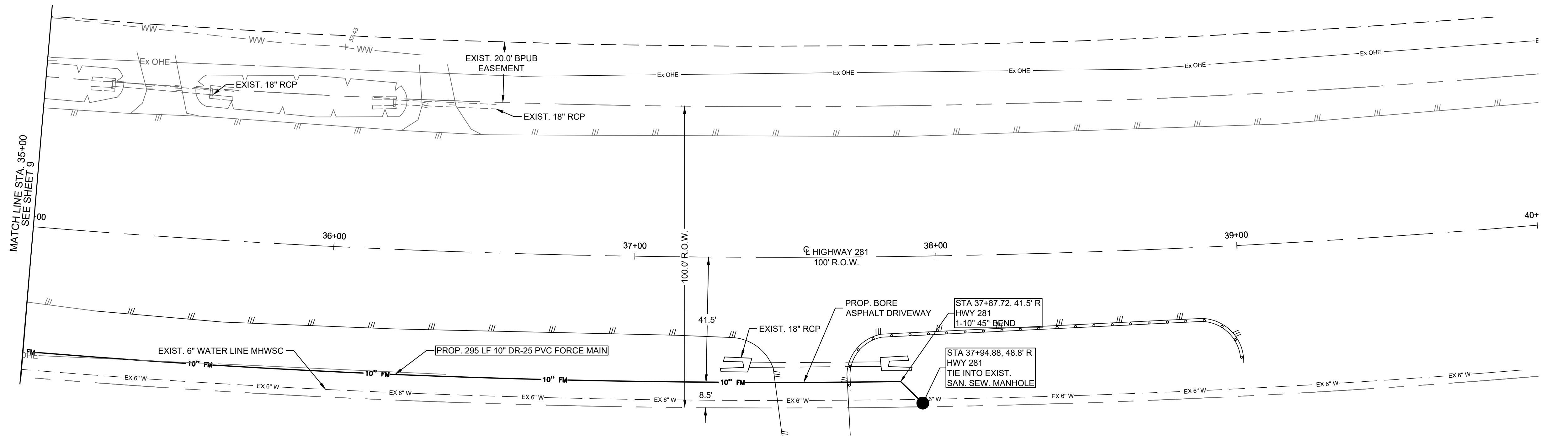
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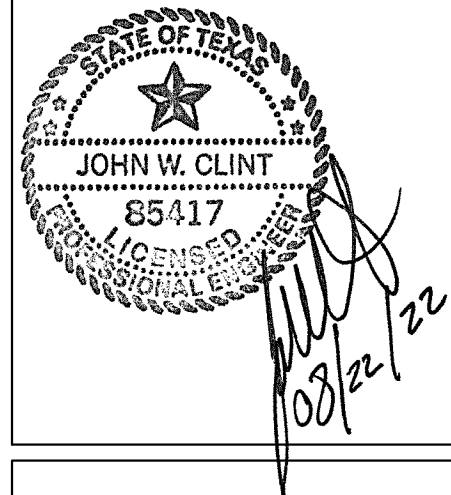


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RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS

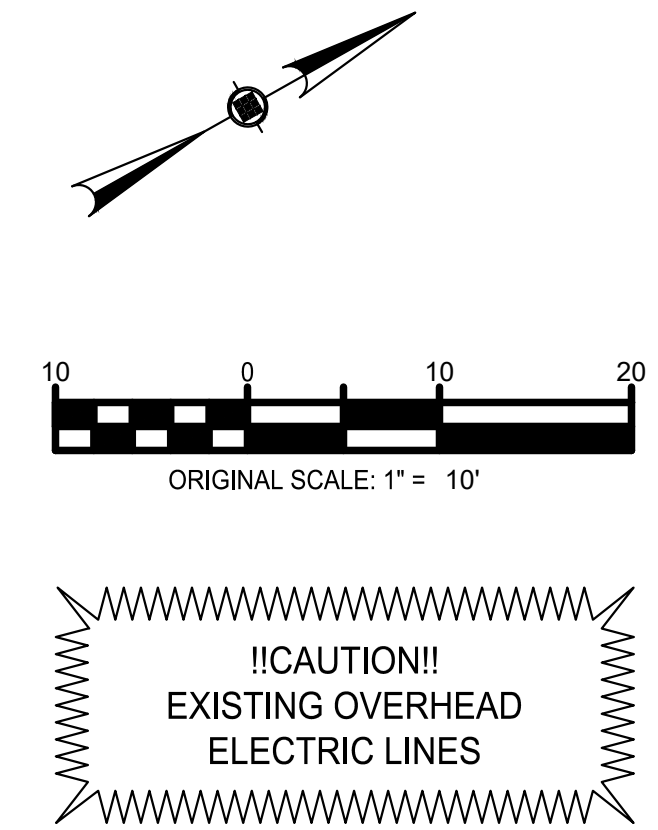
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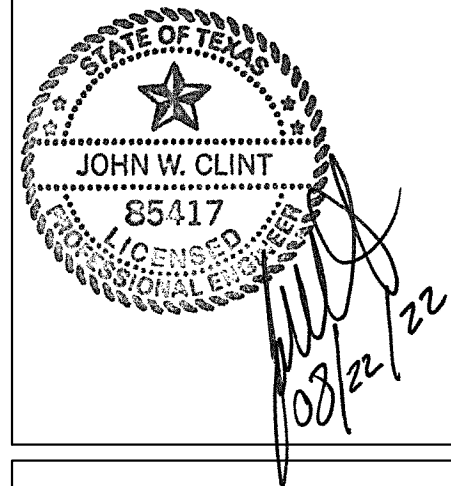
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Sheet Number



- 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.



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



ALL MJ FITTINGS WILL REQUIRE RESTRAINERS (MEGA LUGS) WITH THRUST BLOCKS

NOTES ON THRUST BLOCKING:

1. 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.
2. THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE. $THRUST = 2 AP \sin 1/2 \phi$ WHERE A = AREA OF PIPE, P = WATER PRESSURE, ϕ = DEFLECTION ANGLE.
3. 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.
4. 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.
5. 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.
6. ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF 1 FT.
7. ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.

FORCE MAIN IMPROVEMENTS FOR
RIVER WOODS SUBDIVISION AND
SURROUNDING AREAS

BROWNSVILLE, TEXAS

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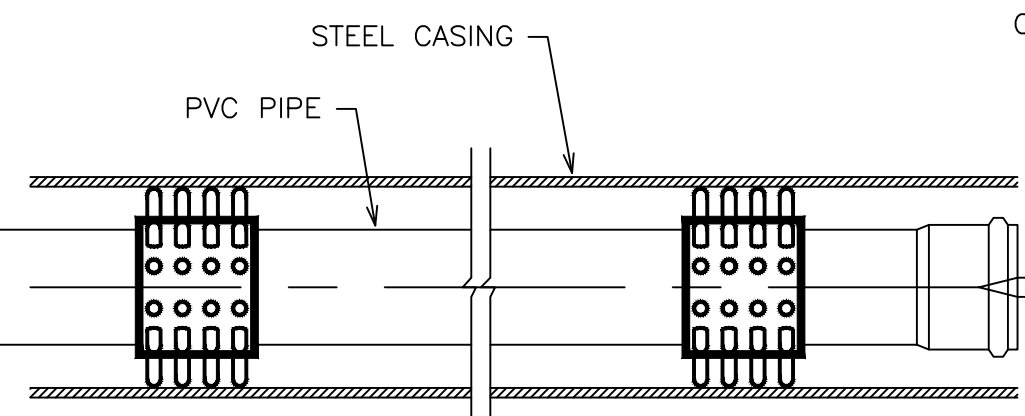
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SANITARY SEWER DETAILS

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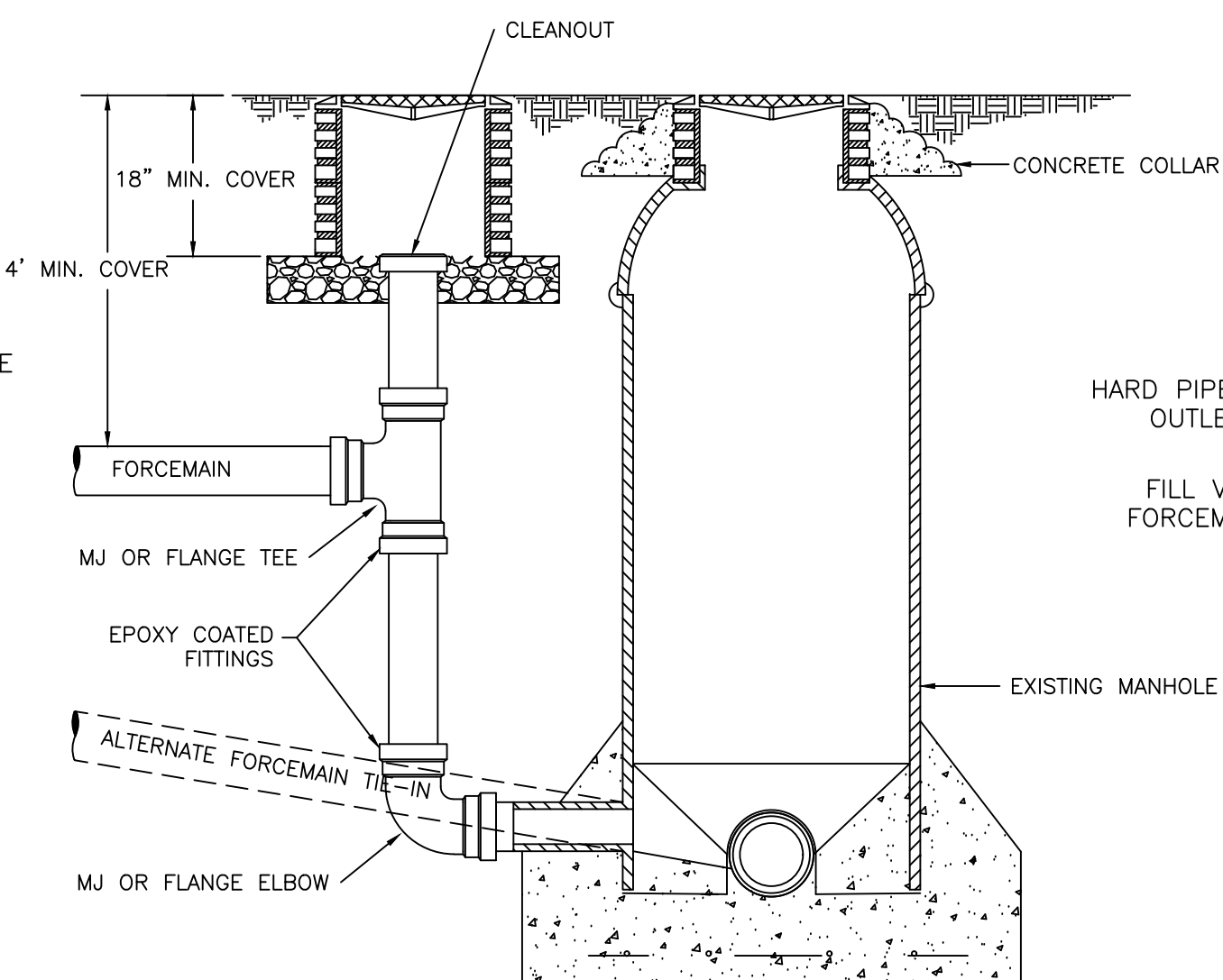
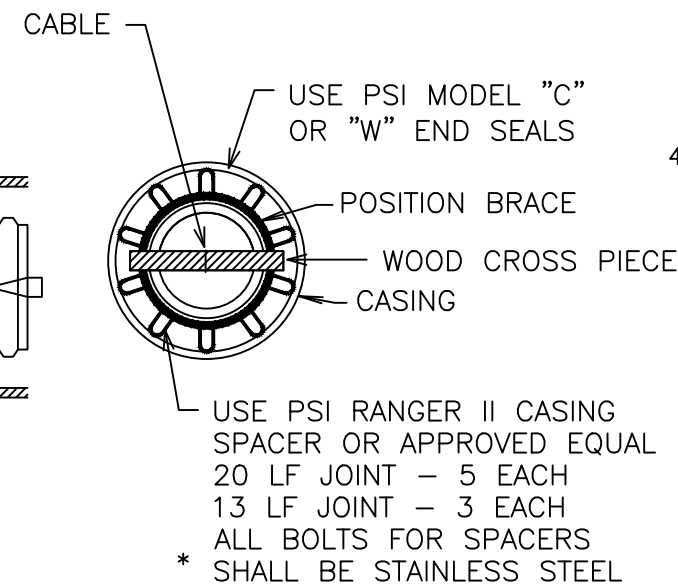
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STEEL CASING WALL THICKNESS CHART	
MINIMUM THICKNESS	DIAMETER OF CASING PIPE
1/4"	12" OR LESS
5/16"	OVER 12"—18"
3/8"	OVER 18"—22"
7/16"	OVER 22"—28"
1/2"	OVER 28"—34"
9/16"	OVER 34"—42"
5/8"	OVER 42"—48"
OVER 48" MUST BE APPROVED BY B.P.U.B.	
NOTE: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

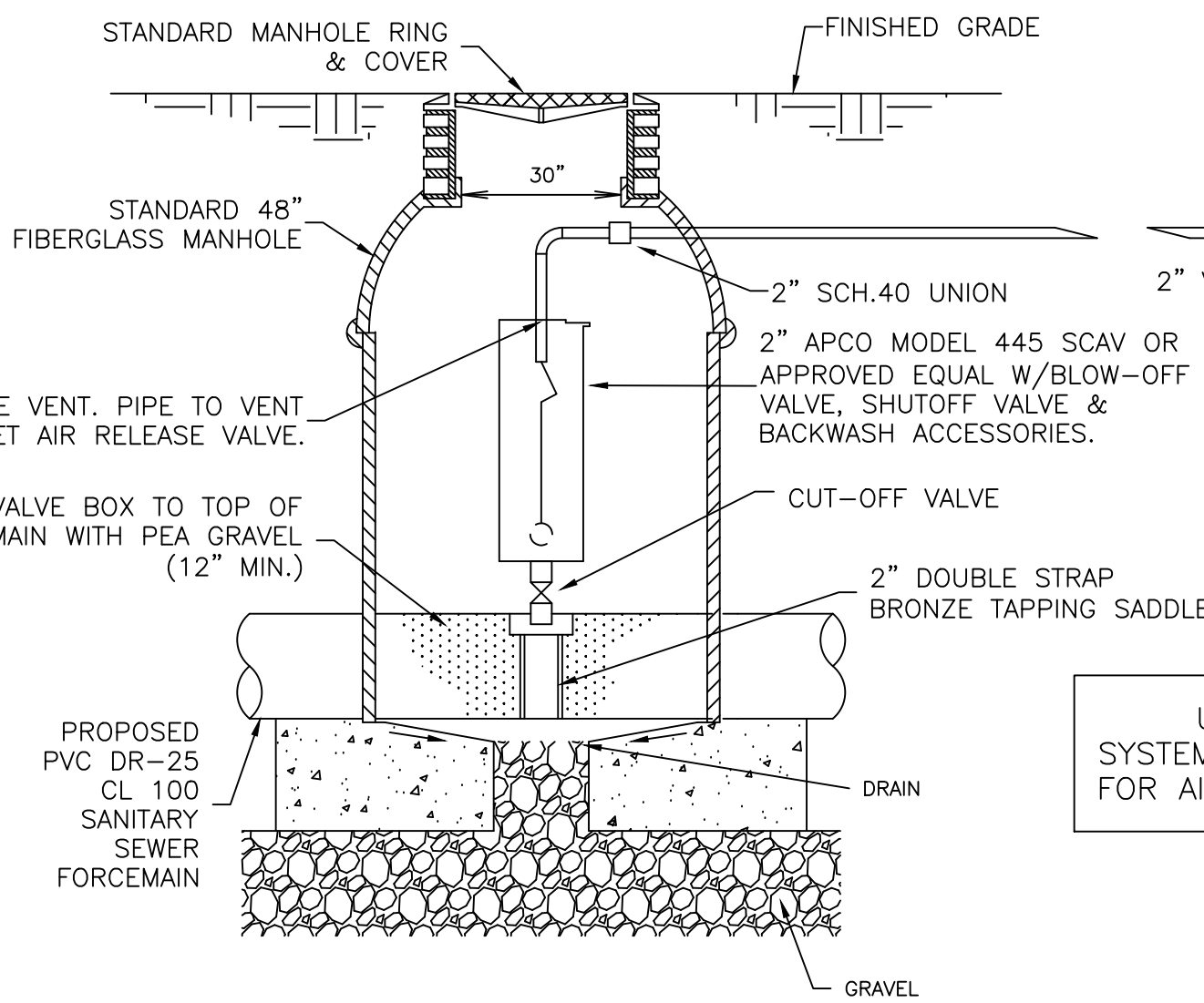


PVC PIPE CASING & SKIDS
NOT TO SCALE

NOMINAL PIPE SIZE	CASING SIZE	NO. OF SKIDS
6"	12"	4
8"	16"	4
12"	20"	4
16"	24"	5

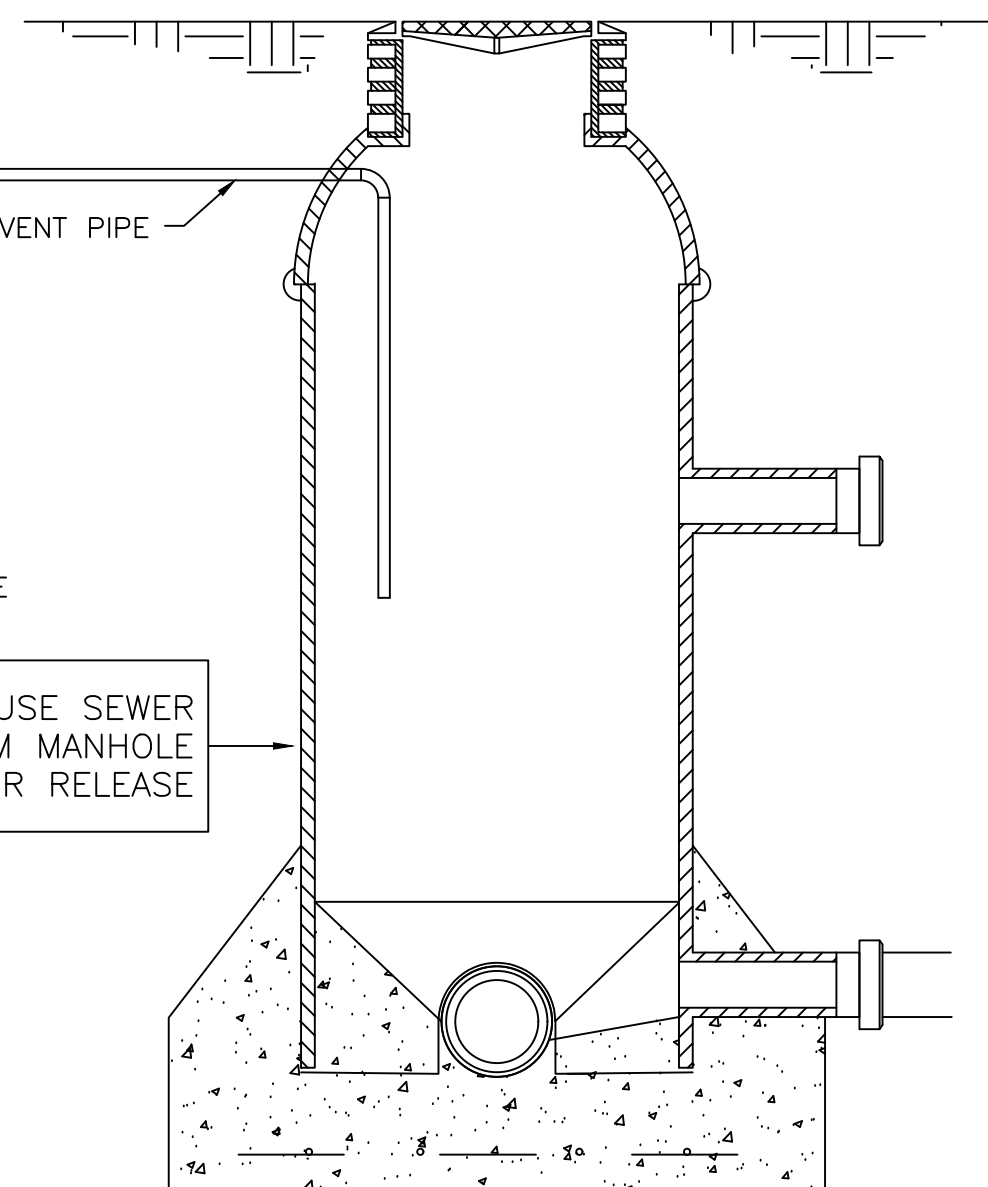


FORCEMAIN TIE-IN TO EXISTING MANHOLE
NOT TO SCALE



AUTOMATIC AIR RELEASE VALVE

NOT TO SCALE



MANHOLE
NOT TO SCALE