CONSTRUCTION DRAWINGS

QUINLAN CREEK TRUNK MAIN AND LIFT STATION

for

THE CITY OF KERRVILLE

CAPITAL IMPROVEMENT PROJECT

LIST OF DRAWINGS:

1. TITLE SHEET
2. SERVICE AREA MAP
3. GRAVITY SEWER LINE "A" STA. 8+97.16 - STA. 13+50.00
4. GRAVITY SEWER LINE "A" STA. 13+50.00 - STA. 19+00.00
5. GRAVITY SEWER LINE "A" STA. 19+00.00- STA. 23+39.87
6. GRAVITY SEWER LINE "B" STA. 10+00.00 - STA. 15+50.00
7. GRAVITY SEWER LINE "B" STA. 15+50.00 - STA. 18+42.15
   GRAVITY SEWER LINE "C" STA. 10+00.00 - STA. 11+58.00
8. LIFT STATION SITE PLAN AND DETAILS
9. LIFT STATION PLAN AND SECTION
10. SANITARY SEWER DETAILS

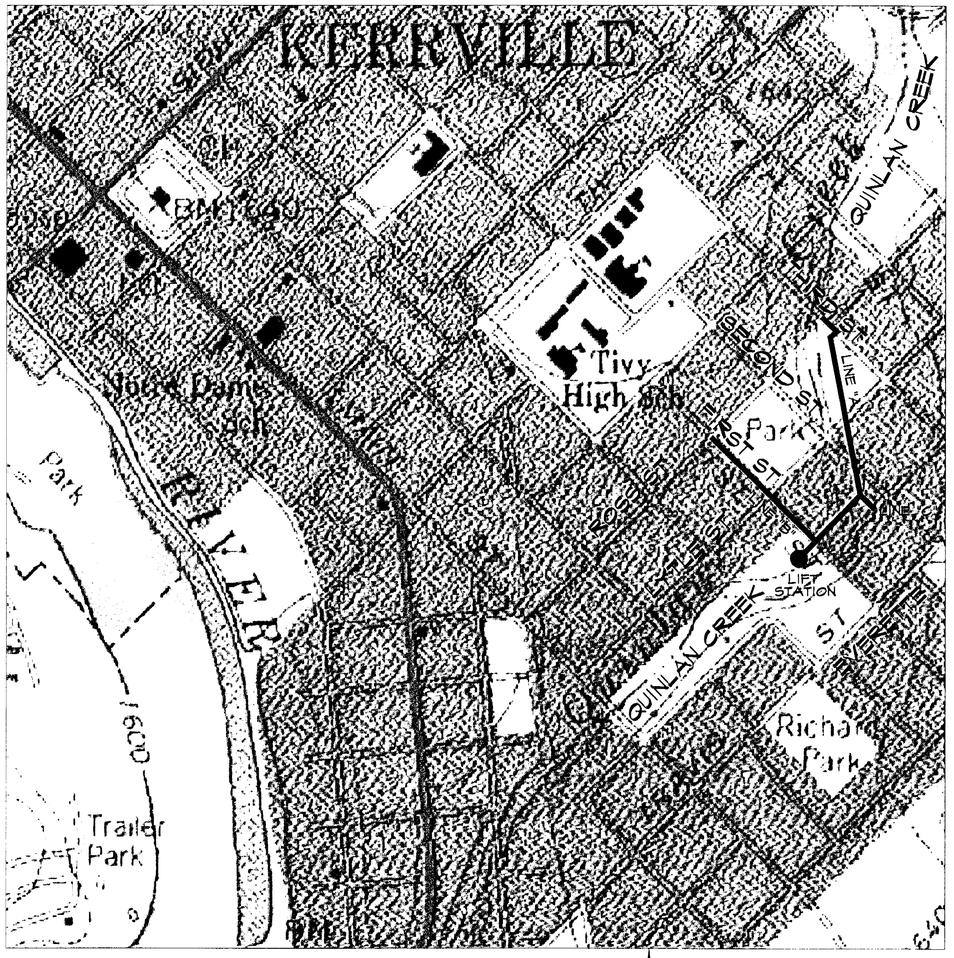
GENERAL NOTES:

EROSION CONTROL DEVICES SHALL BE INSTALLED PER THE STORM WATER POLLUTION PREVENTION CONTROL MEASURES PLAN. THESE CONTROL DEVICES SHALL BE MAINTAINED DURING THE ENTIRE COURSE OF CONSTRUCTION.

GRAVITY SANITARY SEWER LINES AND FORCE MAIN SHALL BE TESTED PER SECTION 800 OF THE KERRVILLE STANDARD SPECIFICATIONS OF SUBDIVISION CONSTRUCTION AND SUBSEQUENT REPAIRS SHALL BE MADE AS RESULT OF THE REQUIRED TESTING.

ALL UNPAVED AREAS DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED BY DRILL SEED AND SHALL BE WATERED DAILY, MONDAY THROUGH SATURDAY.

RECORD DRAWINGS (AS-BUILTS) SHALL BE SUBMITTED TO THE CITY ENGINEER BY THE CONTRACTOR.



VICINITY MAP

Scale" 1" = 400'

Note:
Prior to submitting his proposal, it is the Bidder's responsibility to obtain a copy of the latest edition of the City of Kerrville Specifications for Public Works Construction, and fully acquaint himself with the required conditions of these Standard Specifications. All materials and construction procedures within the scope of this project shall conform to all applicable City of Kerrville Standard Specifications for Public Works Construction, City of Kerrville Building Codes and Regulations, and other safety codes, regulations and inspection provisions applicable to the project.

OWNER: CITY OF KERRVILLE
800 JUNCTION HIGHWAY
KERRVILLE, TEXAS 78028
(830) 257-8000

PUBLIC WORKS DIRECTOR & CITY ENGINEER: CHARLIE HASTINGS, PE
(830) 792-8310

ENGINEER: C.L. Harvey, PE
C.L. HARVEY, P.E. 7-29-05

STATE OF TEXAS
C. L. HARVEY
56687
REGISTERED
PROFESSIONAL ENGINEER

AUG 03 2005

JULY, 2005

HARVEY ENGINEERING CIVIL ENGINEERS LAND SURVEYORS
212 CLAY STREET
KERRVILLE, TEXAS 78028-5303
Office: 830-257-2868 Fax: 830-257-3222

Sheet 1 of 10

Job No. 0213

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Scale: 1"=1000'

SERVICE AREA BOUNDARY

SERVICE AREA BOUNDARY

SERVICE AREA BOUNDARY

SERVICE AREA BOUNDARY

Interstate 10

Cypress Creek Road

QUINLAN LIFT STATION

Quinlan Sanitary Sewer Trunk Main Summary

Trunk Main Service Area = 2,300 acres

Trunk Main Service Area Breakdown (by Zoning District per Future Land Use Map)

	Zoning District	Acres	Density	Design Flow
SF-6	Single Family Standard Lot		588 units x 250 gpd/unit =	147,000 gpd
GC	General Commercial	300	1,000 gpd/acre x 300 acres =	300,000 gpd
SF-PH	Single Family Patio Home Lot		468 units x 250 gpd/unit =	117,000 gpd
MF-12	Residential Medium Density	30	6 units/acre x 30 acres x 250 gpd/unit =	45,000 gpd
MH-C	Manufactured Home Community	100	6 units/acre x 100 acres x 250 gpd/unit =	150,000 gpd
NC	Neighborhood Commercial	150	1,000 gpd/acre x 150 acres =	150,000 gpd
RC	Regional Commercial	6	1,000 gpd/acre x 6 acres =	6,000 gpd
MF-24	Residential High Density	18	18.00 units/acre x 18 acres x 250 gpd/unit =	81,000 gpd
PD	Whiskey Springs			
	Residential		316 units x 250 gpd/unit =	79,000 gpd
	Commercial	60	1,000 gpd/acre x 60 acres =	60,000 gpd
			Avg. Daily Flow =	1,135,000 gpd
				789 gpm
				1.76 cfs
			Peak Factor =	3.0 (includes I & I)
			Total Design Flow =	3,405,000 gpd
				2,365 gpm
				5.27 cfs

Note: Peak Factor is based on historical WWTP peak vs. average daily flows

STATE OF TEXAS
C. L. HARVEY
56887
REGISTERED
PROFESSIONAL ENGINEER

7-29-05

Revisions:

QUINLAN CREEK TRUNK MAIN + LIFT STATION
SERVICE AREA MAP
CITY OF KERRVILLE, TEXAS

HARVEY ENGINEERING CIVIL ENGINEERS LAND SURVEYORS
212 CLAY STREET
KERRVILLE, TEXAS 78028-5303
Office: 830-257-2868 Fax: 830-257-3222

Job No: 0213
Drawing Scale: 1"=1000'
Plot Scale: 1" = 1'
File No: Serv-Area
Print Date: AUG 03 2005
Sheet 2 of 10

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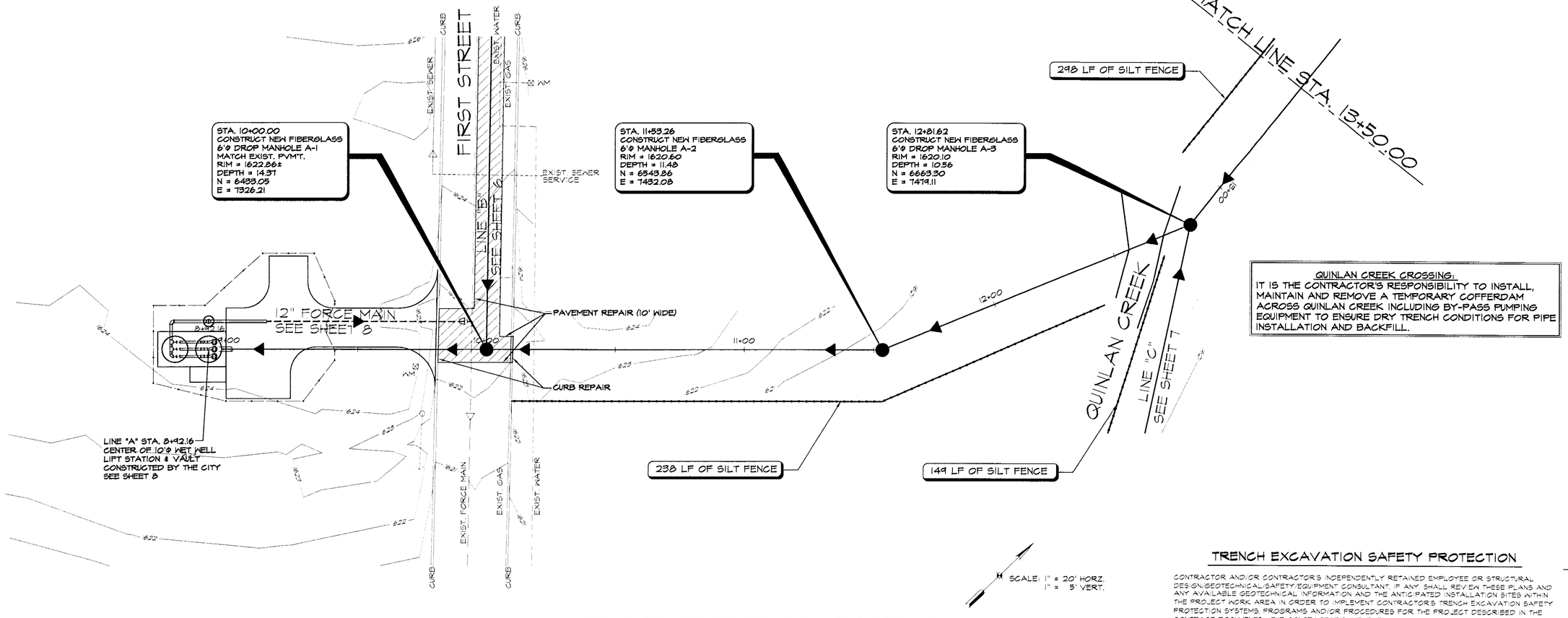
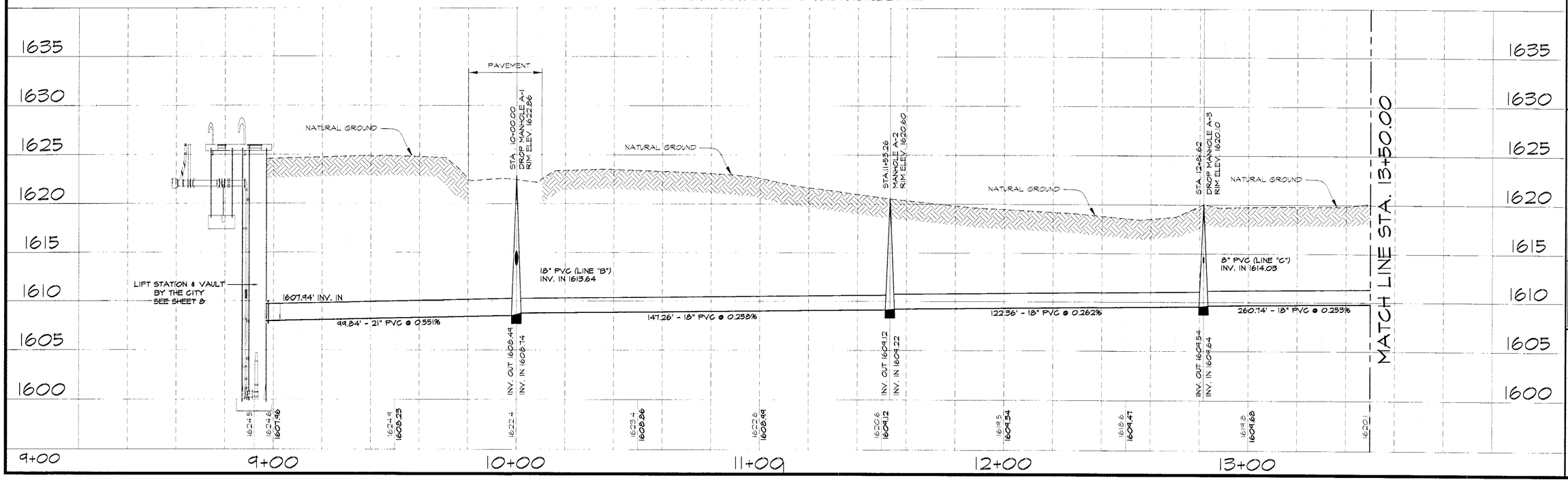


LINE "A" GRAVITY SEWER MAIN - PVC SDR-26

CONTRACTOR TO ENSURE 60" MINIMUM COVER OVER SEWER MAIN.



TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS COVERING

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GRAVITY SANITARY SEWER LINE "A" STA. 8+97.16 - STA. 13+50.00
CITY OF KERRVILLE, TEXAS

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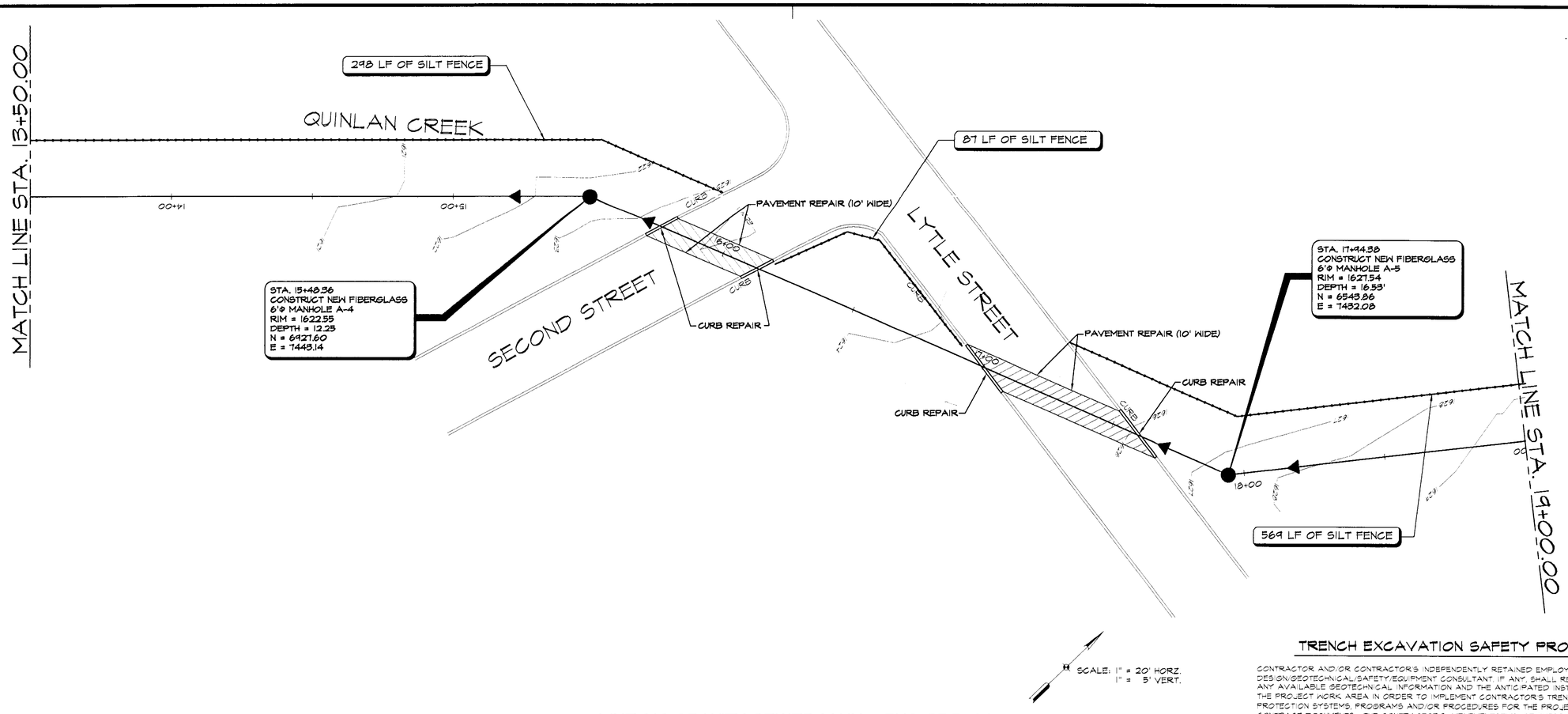

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LINE "A" GRAVITY SEWER MAIN - PVC SDR-26

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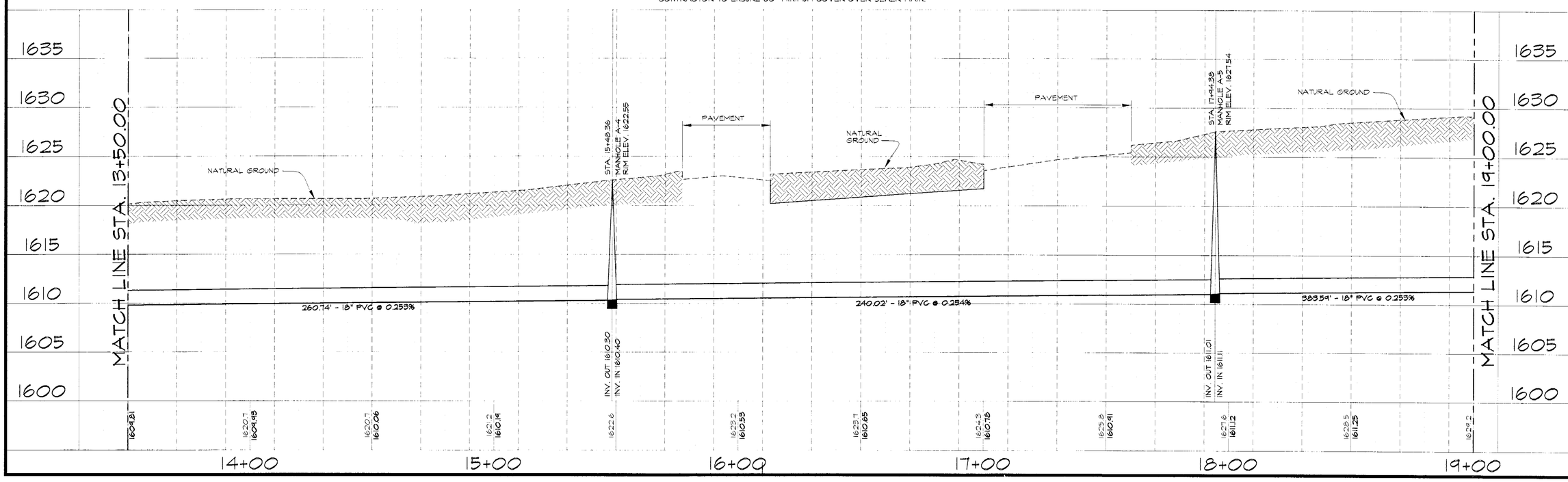

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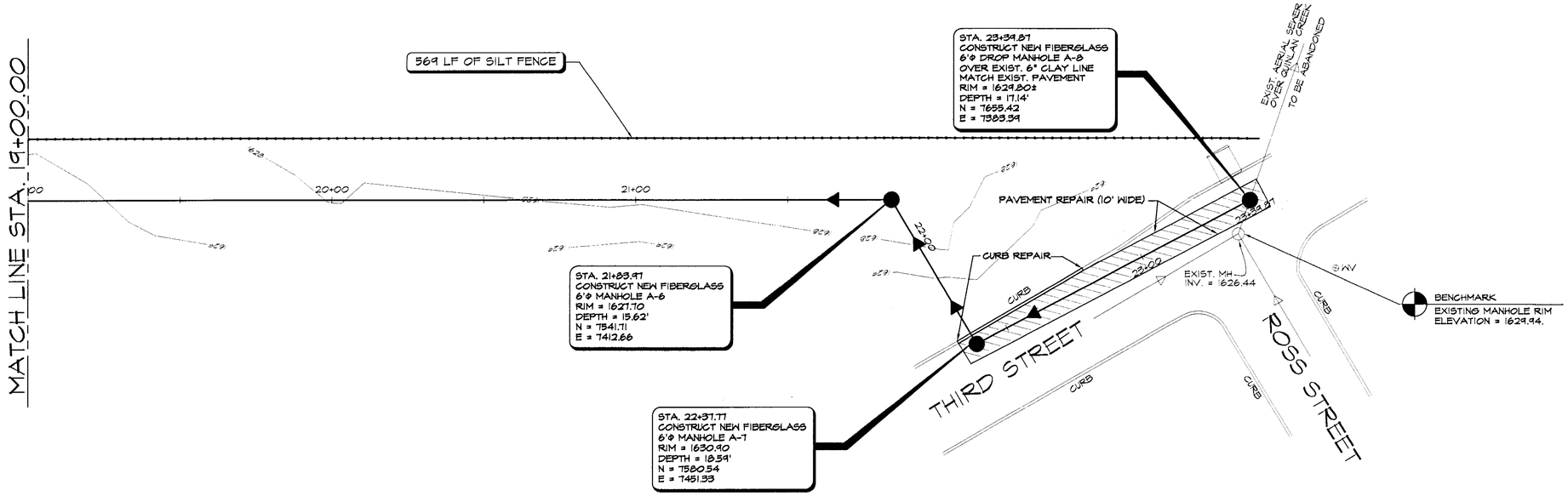

SCALE: 1" = 20' HORZ.
1" = 5' VERT.

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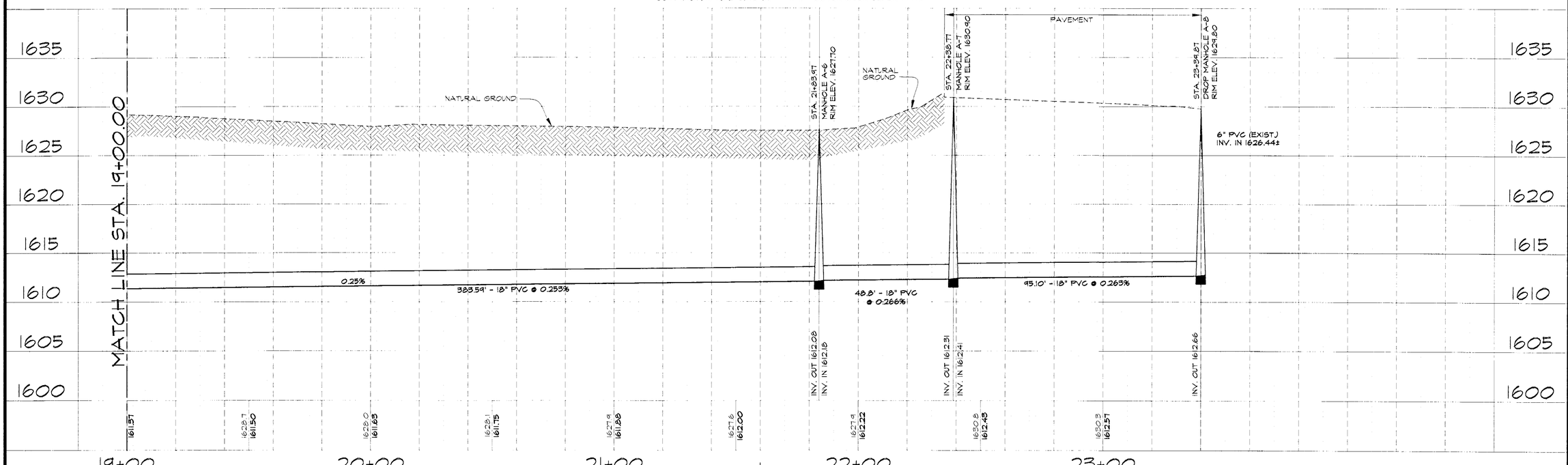
LINE "A" GRAVITY SEWER MAIN - PVC SDR-26

CONTRACTOR TO ENSURE 60" MINIMUM COVER OVER SEWER MAIN.



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7-29-05

Revisions

QUINLAN CREEK TRUNK MAIN + LIFT STATION
GRAVITY SANITARY SEWER LINE "A" STA.19+00.00 - STA. 23+39.87
CITY OF KERRVILLE, TEXAS

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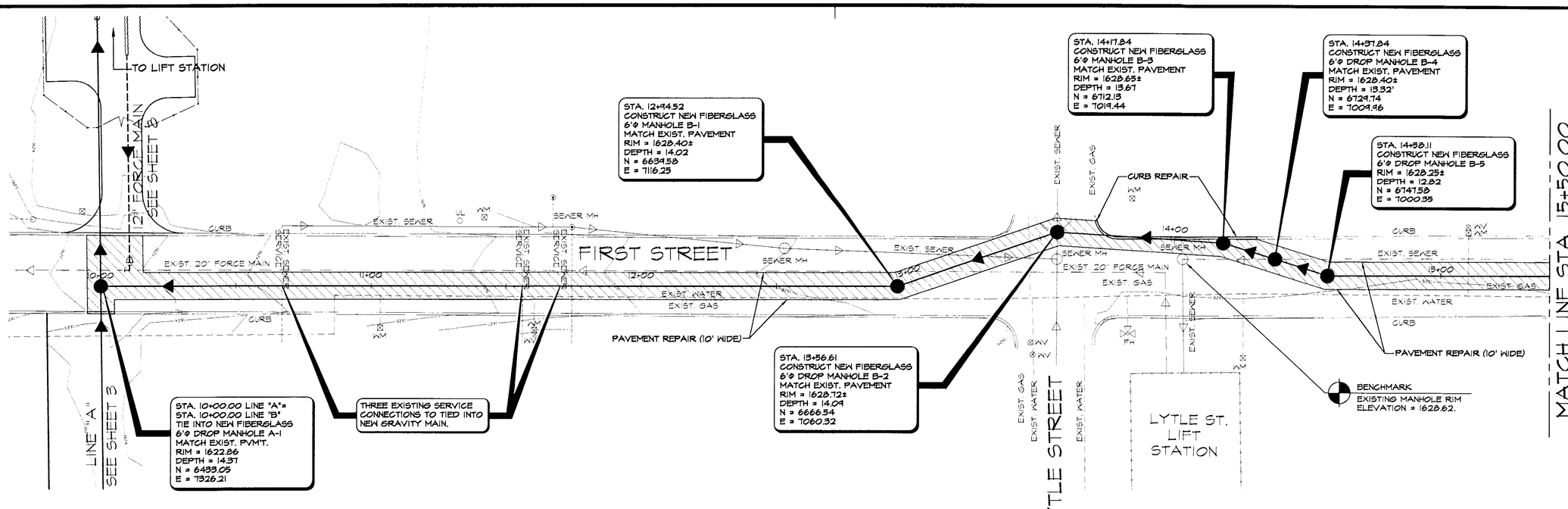
Sheet 5 of 10



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LINE "B" GRAVITY SEWER MAIN - PVC SDR-26

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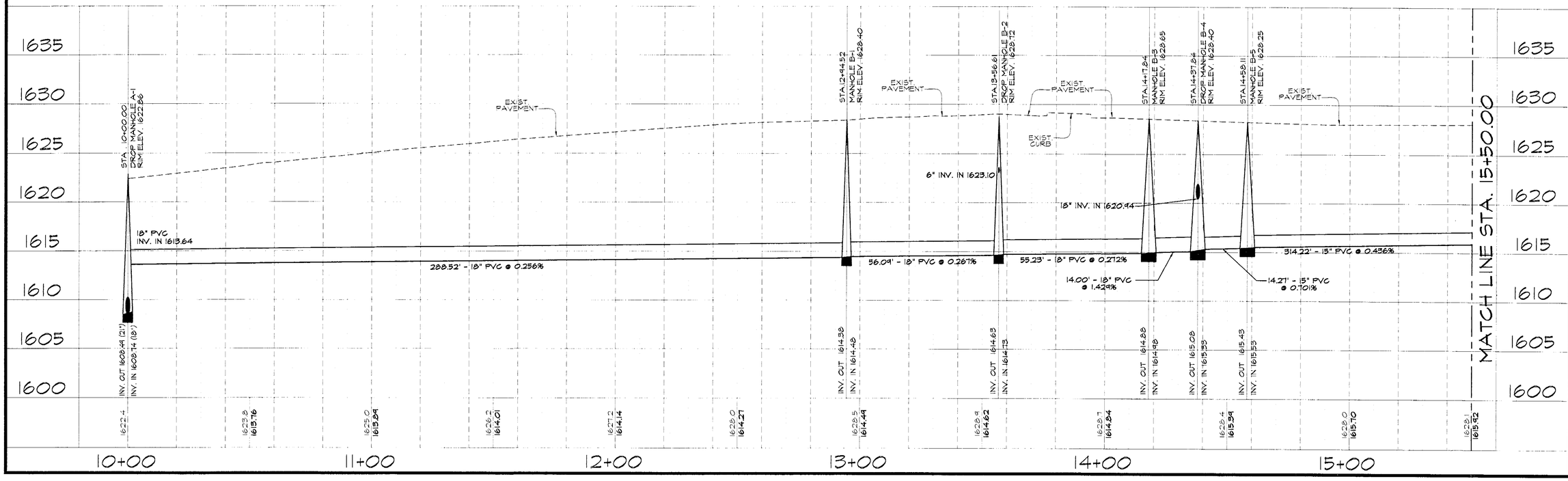

C. L. HARVEY 68887 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
C. L. Harvey, P.E.
7-29-05

Revisions:

QUINLAN CREEK TRUNK MAIN + LIFT STATION
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Sheet 6 of 10

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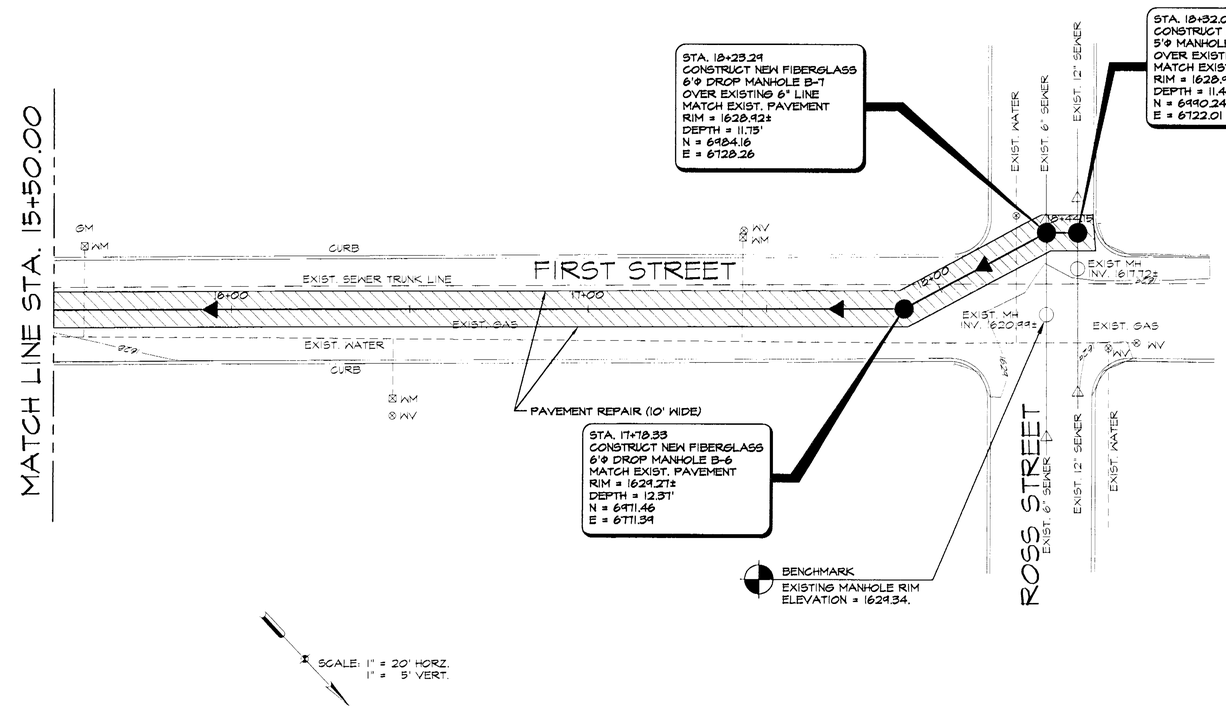
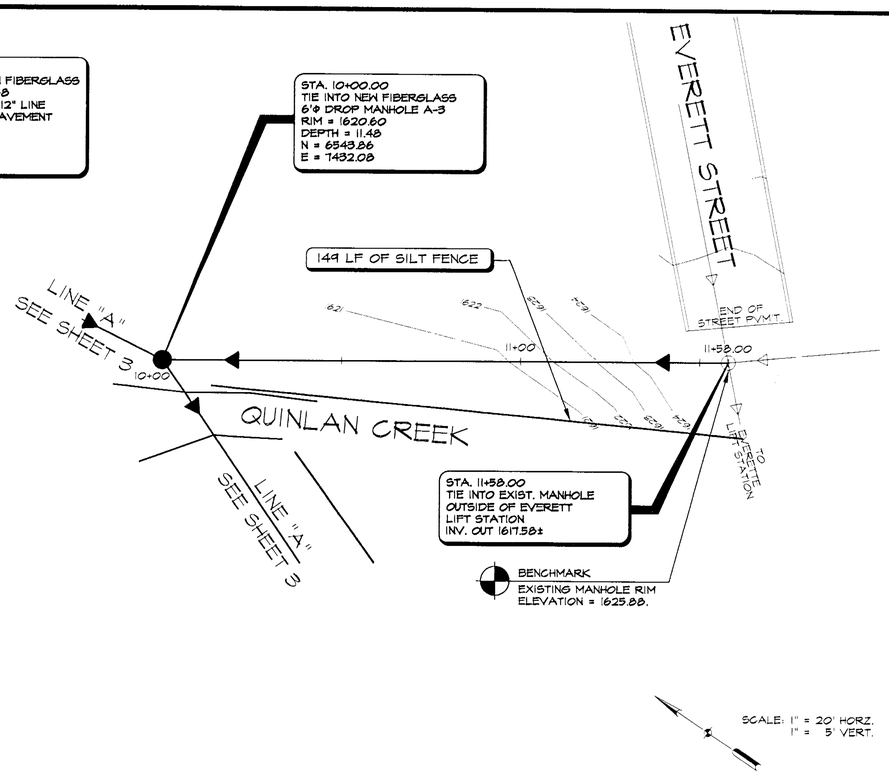


LINE "B" GRAVITY SEWER MAIN - PVC SDR-26



LINE "C" GRAVITY SEWER MAIN - PVC SDR-26

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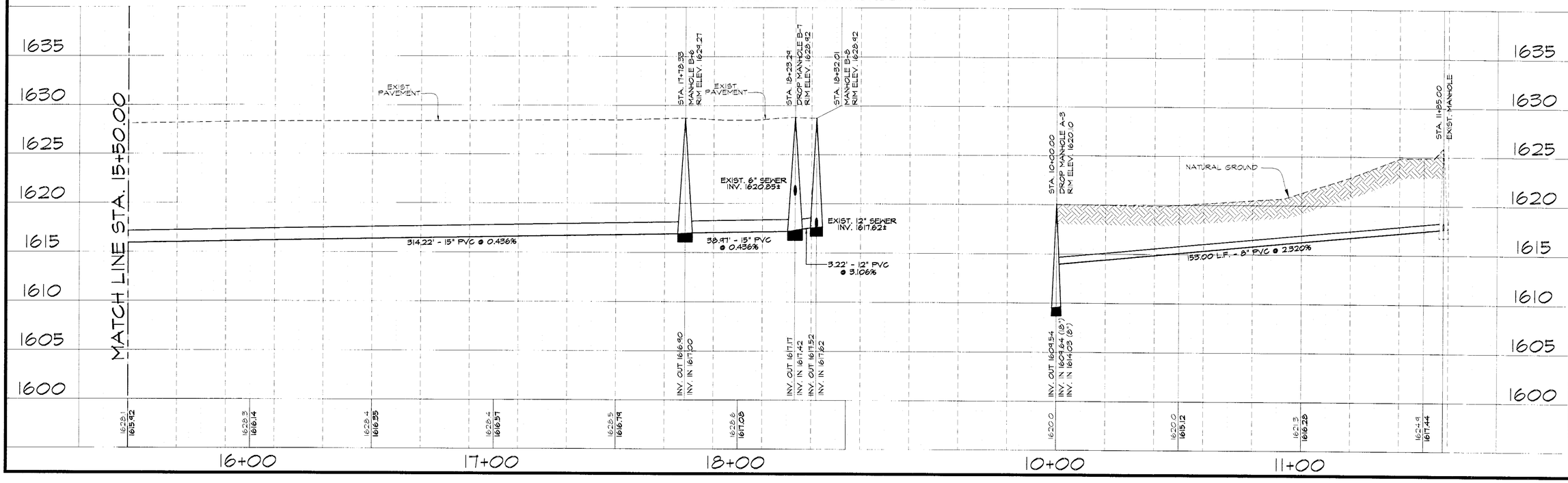
CONTRACTOR TO ENSURE 60" MINIMUM COVER OVER SEWER MAIN.



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C. L. HARVEY 56887 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
C. L. Harvey, P.E.
7-29-05
Revisions:

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GRAVITY SANITARY SEWER LINE "B" STA. 15+15.50 - STA. 18+42.15
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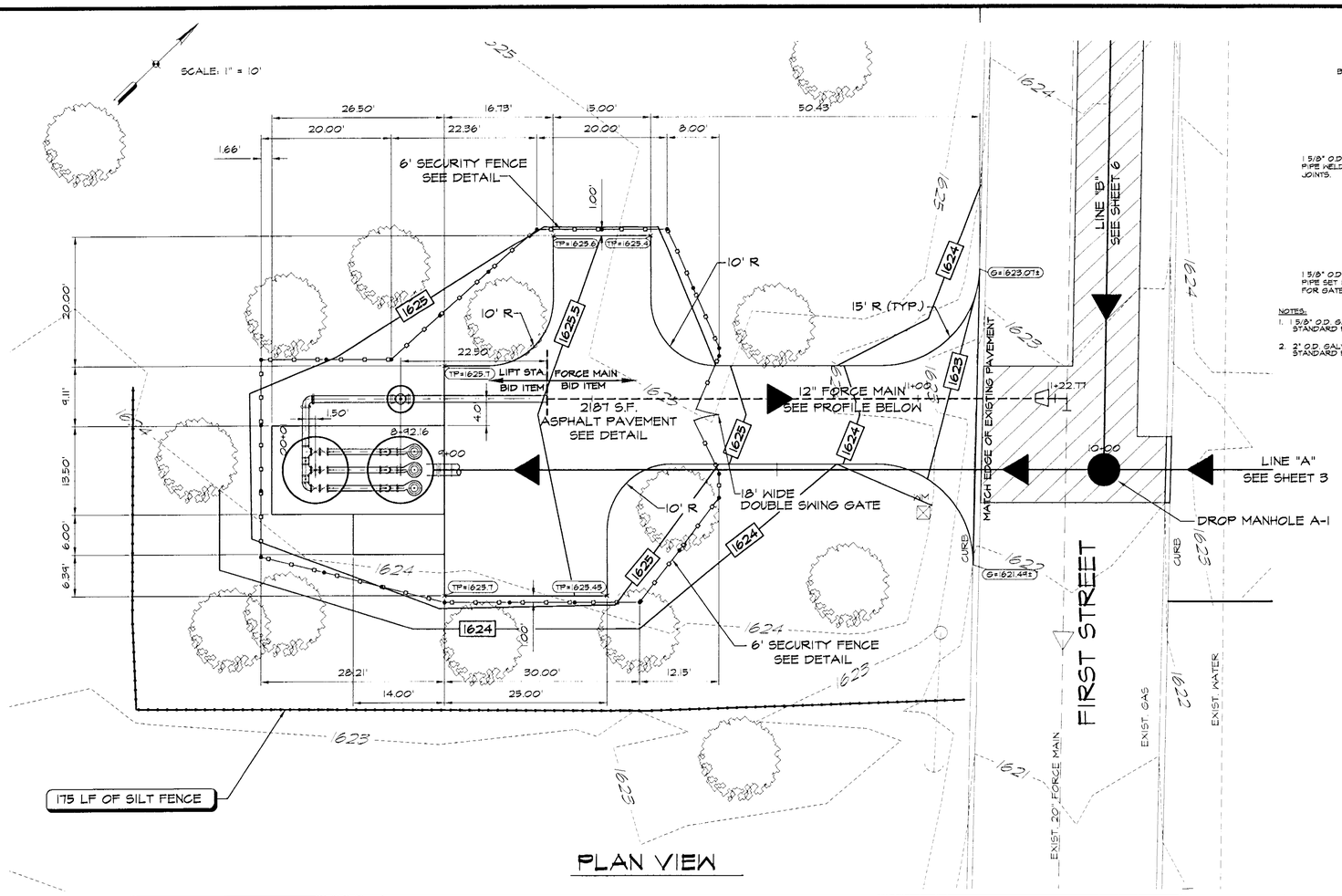
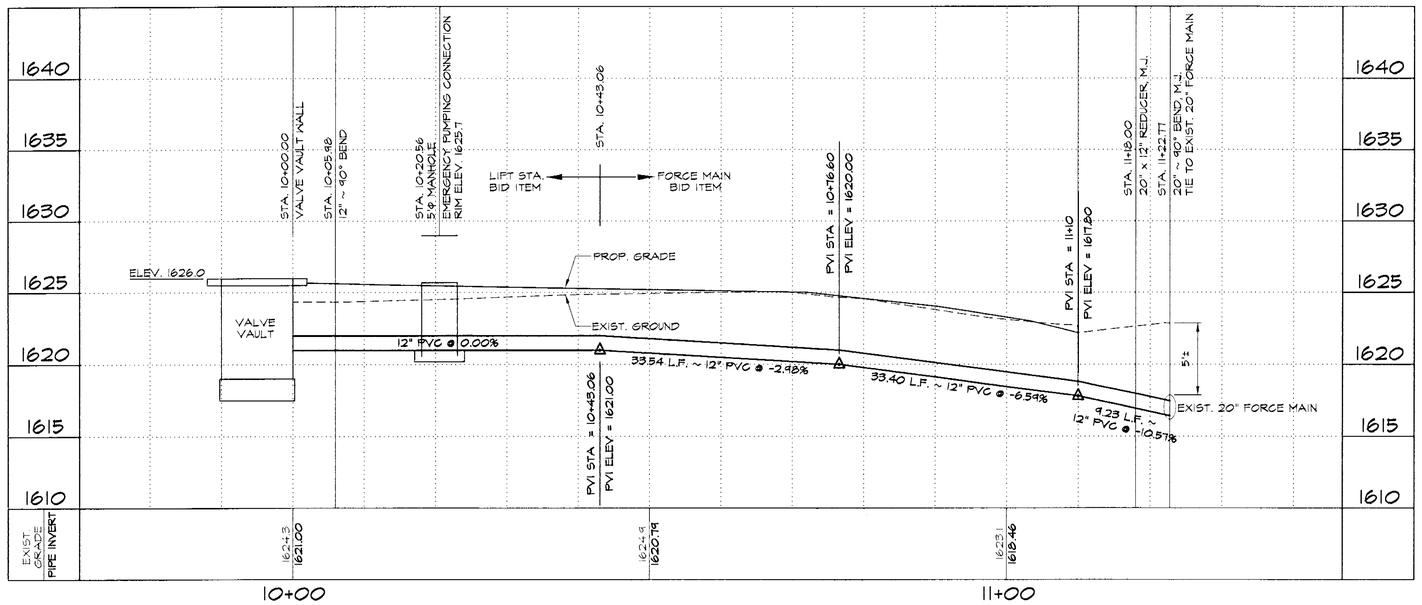
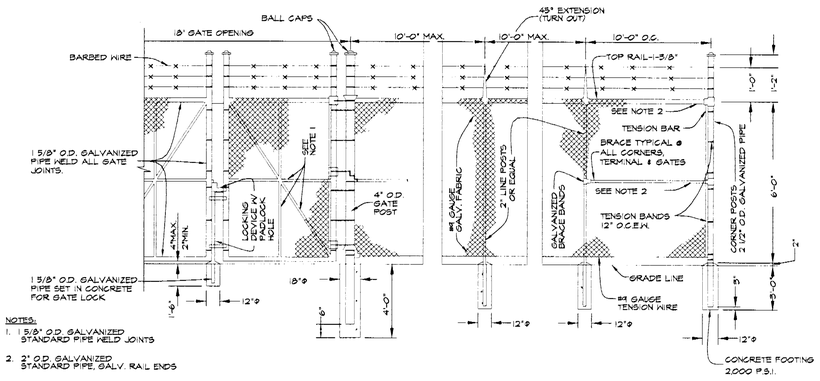


PLAN VIEW



12" FORCE MAIN PROFILE

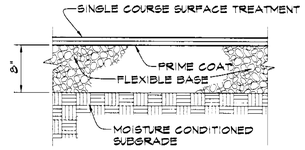
SCALE : 1" = 10' HORZ.
1" = 5' VERT.



NOTES:
1. 1 5/8" O.D. GALVANIZED STANDARD PIPE WELD JOINTS
2. 2" O.D. GALVANIZED STANDARD PIPE, GALV. RAIL ENDS

SECURITY FENCE w/DOUBLE DRIVE GATE

SCALE : NONE



ASPHALT PAVEMENT

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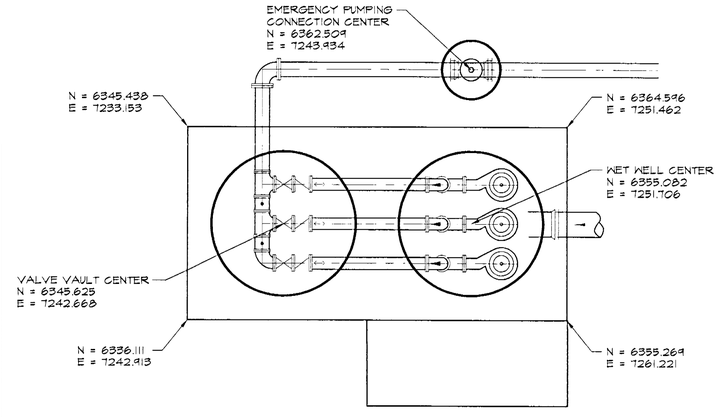

LIFT STATION COORDINATES

SCALE : 1" = 5'

STATE OF TEXAS
C. L. HARVEY
56887
REGISTERED
PROFESSIONAL ENGINEER

C.L. Harvey PE
7-29-05

Revisions:

QUINLAN CREEK TRUNK MAIN + LIFT STATION
LIFT STATION PLAN

CITY OF KERRVILLE, TEXAS

HARVEY ENGINEERING
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212 CLAY STREET
KERRVILLE, TEXAS 78028-5303
Office: 830-257-2868 Fax: 830-257-3222

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Sheet 8 of 10

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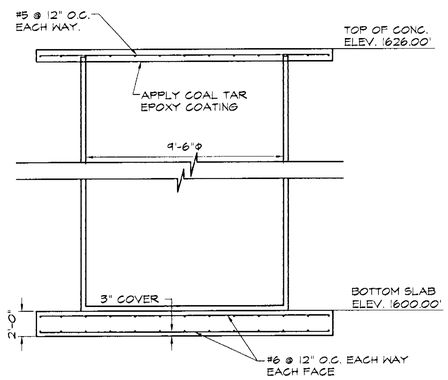
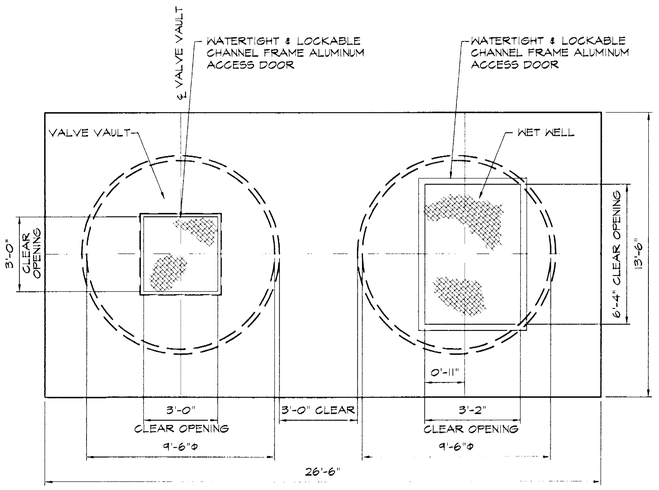
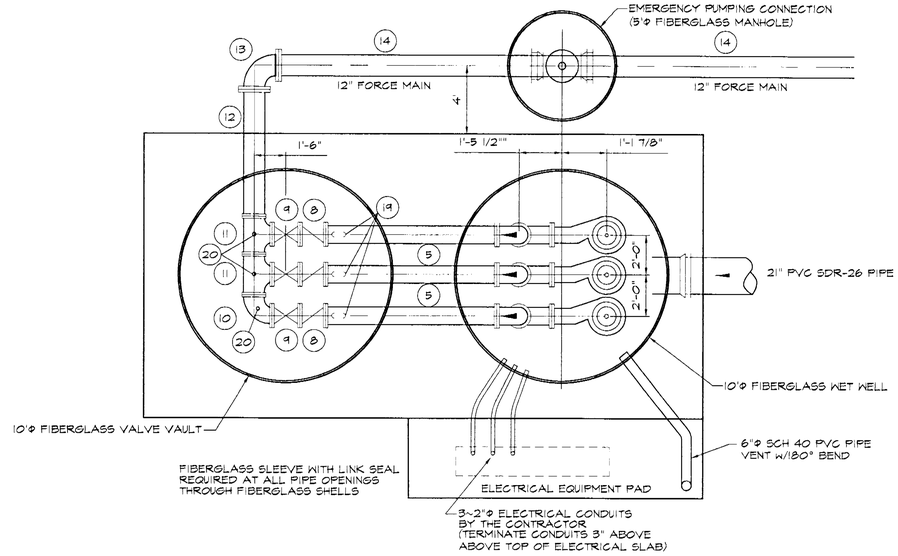


CONCRETE SHALL TEST 3,000 PSI AT 28 DAYS.

WET WELL STRUCTURAL SECTION

NOT TO SCALE





ILLUSTRATIVE PLAN

NOT TO SCALE

NOTE: THE CITY OF KERRVILLE WASTEWATER DEPARTMENT TO PURCHASE AND INSTALL ALL LIFT STATION ELECTRICAL AND CONTROL SYSTEMS.

GENERAL NOTES:

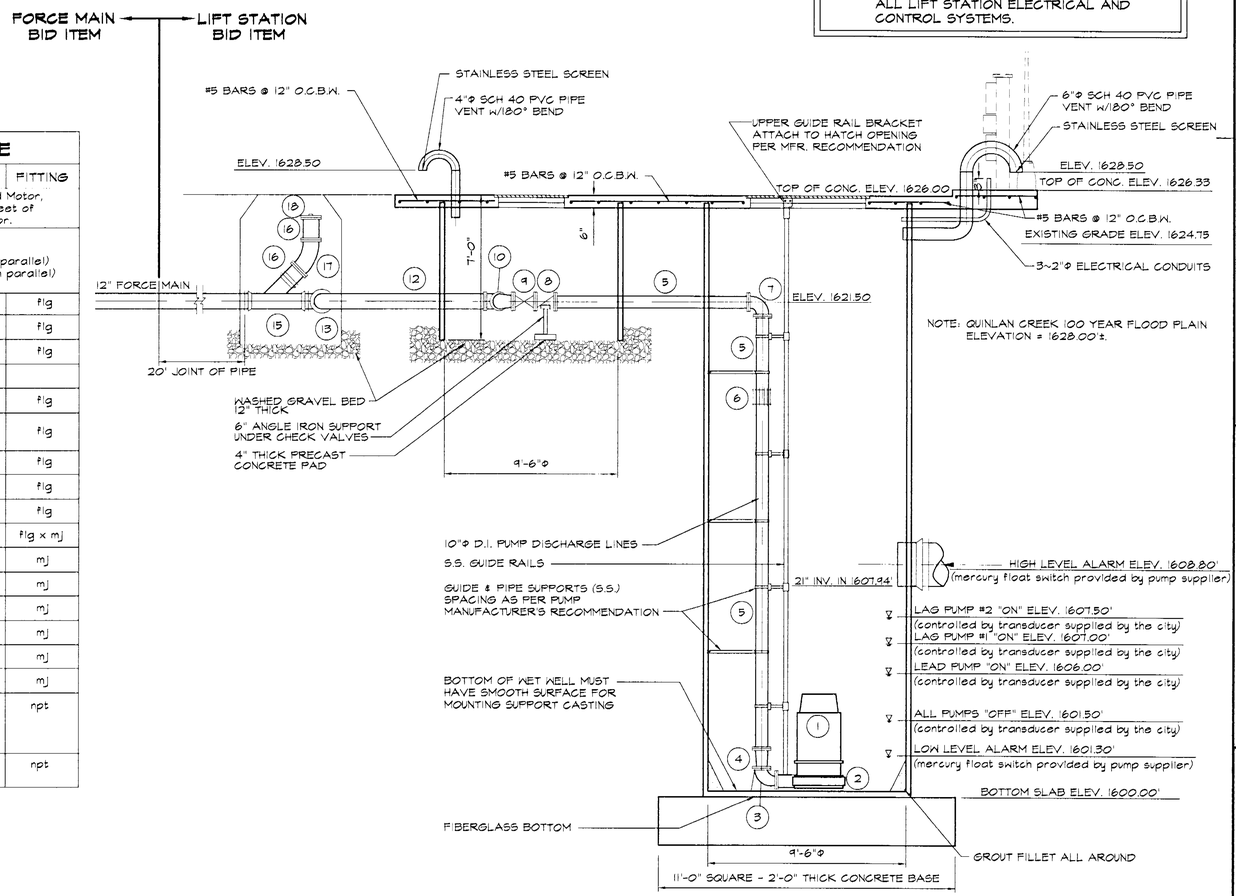
1. LOCATION OF ANCHOR BOLTS, RELATIVE POSITION OF PUMPS AND ACCESS COVERS MUST BE MAINTAINED ACCORDING TO THE PUMP MANUFACTURE'S RECOMMENDATIONS.
2. ALL HARDWARE, CABLE RACK, GUIDE POLE, BRACKETS AND CHAINS LOCATED IN WET WELL SHALL BE 316 STAINLESS STEEL UNLESS OTHERWISE NOTED.
3. SEAL BOTH ENDS OF CONDUIT WITH DUXSEAL AFTER CABLE INSTALLATION TO PROVIDE A GAS TIGHT SEAL.
4. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COORDINATE WITH THE CITY WORK SCHEDULES FOR THE INSTALLATION OF THE PROPOSED 21" GRAVITY SANITARY SEWER, AND THE PROPOSED 12" FORCE MAIN.

Fiberglass Reinforced Polyester Wetwells & Valve Vaults for Lift Stations

1. Fiberglass reinforced polyester wetwells and valve vaults, with bottoms, shall be a one-piece unit manufactured from isothallic, bisphenol or other suitable polyester or vinyl ester resins, with fiberglass reinforcements and sand.
2. The resins used shall be a commercial grade unsaturated polyester resin.
3. The reinforcing materials shall be commercial Grade "E" type glass in the form of mat, continuous roving, chopped roving, roving fabric, or both, having a coupling agent that will provide a suitable bond between the glass and resin.
4. If reinforcing material is used on the interior surface, it shall be a commercial grade chemical-resistant glass or organic surfacing mat having a coupling agent that will provide a suitable bond with the resin.
5. Fillers shall be inert to the environment and wetwell/valve vault construction. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used. The resulting reinforced plastic material must meet the requirement of these specifications.
6. The exterior surface shall be relatively smooth with no sharp projections. Handwork finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 1/2 inch in diameter, delamination and fiber show.
7. The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters larger than 1/2 inch in diameter, and wrinkles of 1/8 inch or greater in depth. Surface pits shall be permitted up to 6 square feet if they are less than 3/4 inch in diameter and less than 1/16 inch deep.
8. The following defects are not permitted: Glass fibers not wet out with resin. Runs of resin and sand on the surface. Areas with glass not wet out with resin. Separation in the laminate. Blisters (light-colored areas) larger than 1/2 inch in diameter. Crazing and cracks caused by sharp objects. Pits or voids caused by air pockets. Wrinkles in the surface over 1/8 inch. Fiber or resin projections necessitating gloves for handling.
9. The complete wetwell and valve vault shall have a minimum dynamic head rating of 16,000 pounds when tested in accordance with ASTM D3753. To establish this rating, the complete wetwell and valve vault shall not leak, crack or suffer other damage when load tested to 40,000 pounds and shall not deflect vertically downward more than 1/4 inch at the point of load application when loaded to 24,000 pounds.
10. The wetwell and valve vault shall meet all requirements for pipe stiffness as required in ASTM D3753.
11. The wetwell and valve vault shall have the following minimum Physical Properties:
    Flexural Strength (pipe): Hoop: 22.5 x 103 psi; Axial: 14.3 x 103 psi
    Compressive Strength: 8.90 x 103 psi
12. Test methods shall be performed as specified in the latest edition of ASTM D3753, Section 8.
13. Cutouts shall be equal to the outside diameter of the pipes to pass through the wetwell or valve vault wall, plus 1/2 inch. Cuts are to be made using an electric or gasoline powered circular saw, with masonry type blades. Use of impact-type tools will not be allowed.
14. Do not drop or impact the wetwell or valve vault. The wetwell and valve vault shall be chocked if stored horizontally. If the wetwell or valve vault must be moved by rolling, the ground traversed shall be smooth and free of rocks, debris, etc. When lifting the wetwell or valve vault in horizontal position, use two slings with a spreader bar. For lifting into vertical position, lift lugs shall be provided as recommended by the manufacturer at the top of the wetwell and valve vault. Only a pliable strap or rope should contly a plia?act the fiberglass. The use chains or steel cables will not be allowed.
15. If necessary, position bricks in the excavation to adjust the wetwell and valve vault to the correct elevations.
16. Pour concrete in the excavation to the depth specified on the drawings. Concrete shall extend at least 4 inches above all bricks used for height adjustments.
17. Lower the wetwell and valve vault into wet concrete until it rests at the proper elevation, and 5 inches into concrete, then move wetwell and valve vault to plumb.
18. Backfill for the wetwell and valve vault shall be in strict compliance with the manufacture's recommendation.
19. The Contractor shall submit a written certification before acceptance. This certification shall consist of a copy of the manufacturer's test report or a statement by the supplier, accompanied by a copy of the test results, that the wetwell and valve vault have been sampled, tested and inspected in accordance with the provisions of this specification and meets all requirements. An authorized agent of the supplier or manufacturer shall sign each certification so furnished.
20. The Contractor shall provide water, labor and materials for leakage testing of the wetwell and valve vault. The wetwell and valve vault shall be filled with water, and checked after 24 hours have elapsed for visible signs of water loss. If water loss is experienced, the Contractor shall correct the problem, and retest.
21. The wetwell and valve vault shall be marked with the Manufacturer's name, Manufacturing serial number, ASTM designation, and total length and nominal diameter.

PIPING & EQUIPMENT SCHEDULE

NO.	DESCRIPTION	FITTING
1	60 Hp, 3 Phase, 480 Volt, 320 Frame Water Jacketed Motor, Non-Overloading at any point on the pump curve. 35 feet of power and control cable to be supplied with each motor.	
2	60 Hp Non-Clog Submersible Pump, 1600 GPM @ 90.8 feet TDH (single pump operation) 2400 GPM @ 108.4 feet TDH (two pumps operating in parallel) 2800 GPM @ 116.3 feet TDH (three pumps operating in parallel) Single pump operation efficiency = 79% minimum	
3	One piece 6" x 5" base elbow per pump manufacturer	flg
4	10" x 6" ductile iron eccentric reducer	flg
5	10" ductile iron pipe	flg
6	10" Style 153 Dresser coupling or approved equal	
7	10" ductile iron 90 degree Bend	flg
8	10" air cushioned swing check valve (bronze) APCO Series 6000 or approved equal	flg
9	10" gate valve	flg
10	12" x 10" reducing 90 degree bend	flg
11	12" X 10" ductile iron tee	flg
12	12" ductile iron pipe	flg x mj
13	12" ductile iron 90 degree bend	mj
14	12" PVC pipe	mj
15	12" x 6" ductile iron wye	mj
16	6" ductile iron pipe	mj
17	6" ductile iron 45 degree bend	mj
18	6" ductile iron blind flange with 2" ductile iron plug	mj
19	1/4" tap with ball valve - brass or bronze w/ stainless steel nipples 1 1/4" gate galve and tap - brass or bronze with stainless steel nipples	npt
20	1/4" tap with ball valve - brass or bronze w/ stainless steel nipples	npt



ILLUSTRATIVE SECTION

NOT TO SCALE

HARVEY ENGINEERING
CIVIL ENGINEERS LAND SURVEYORS
212 CLAY STREET
KERRVILLE, TEXAS 78028-5303
Office: 830-257-2868 Fax: 830-257-3222

STATE OF TEXAS C. L. HARVEY 56887 REGISTERED PROFESSIONAL ENGINEER

C. L. Harvey, P.E. 7-29-05

Revisions:

QUINLAN CREEK TRUNK MAIN + LIFT STATION
LIFT STATION PLAN AND SECTION
CITY OF KERRVILLE, TEXAS

Job No: 0213
Drawing Scale: NONE
Plot Scale: 1" = 1"
File No: Lift-sta
Print Date: AUG 03 2005
Sheet 9 of 10

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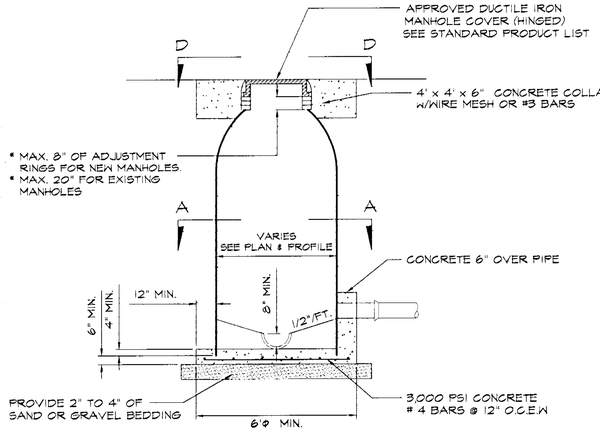
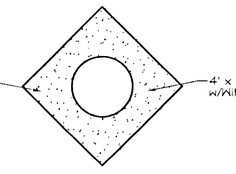
COMPLETED MANHOLES SHALL BE TESTED FOR LEAKAGE SEPARATELY AND INDEPENDENTLY OF THE SANITARY SEWER LINES BY VACUUM TESTING IN ACCORDANCE WITH ASTM C1244-93.



EXISTING CONDITIONS MAY DICTATE FOOTING SIZE AND ENGAGEMENT OF DROP ASSEMBLY.

FIBERGLASS MANHOLE
SCALE : NONE



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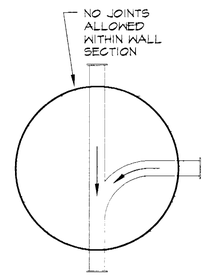

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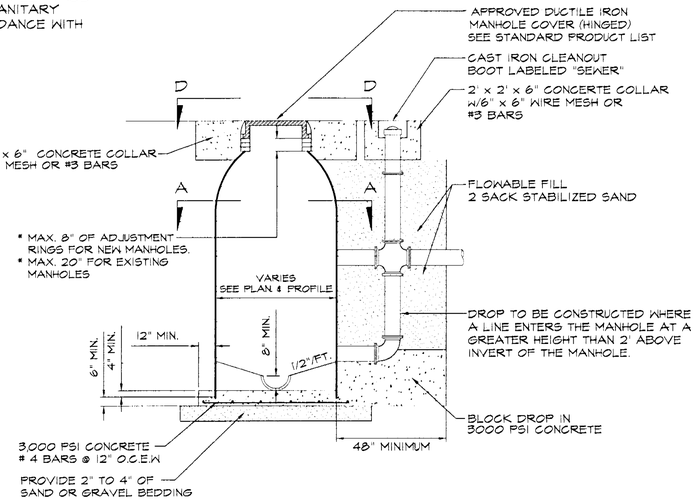
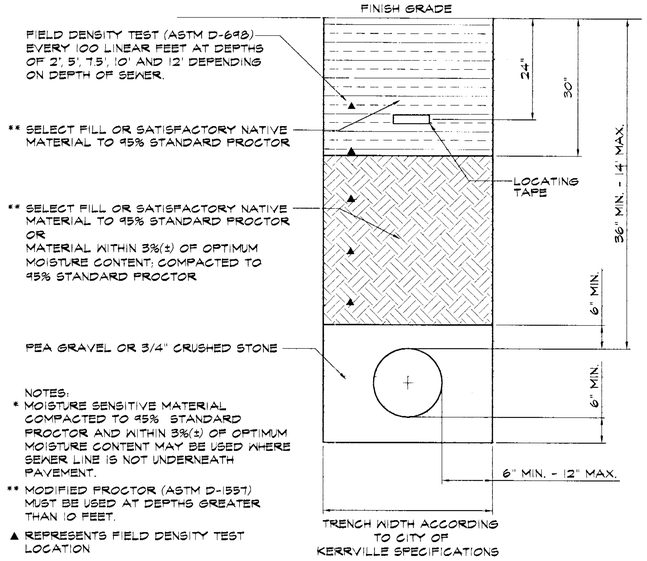


EXISTING CONDITIONS MAY DICTATE FOOTING SIZE AND ENGAGEMENT OF DROP ASSEMBLY.

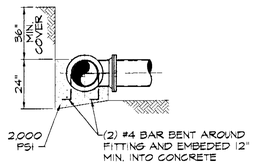
FIBERGLASS DROP MANHOLE
SCALE : NONE



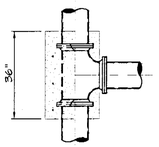
NOTES:
* MOISTURE SENSITIVE MATERIAL COMPACTED TO 95% STANDARD PROCTOR AND WITHIN 3%(±) OF OPTIMUM MOISTURE CONTENT MAY BE USED WHERE SEWER LINE IS NOT UNDERNEATH PAVEMENT.
** MODIFIED PROCTOR (ASTM D-1557) MUST BE USED AT DEPTHS GREATER THAN 10 FEET.
▲ REPRESENTS FIELD DENSITY TEST LOCATION

INSTALLATION OF PIPE TO FOLLOW CITY OF KERRVILLE SUBDIVISION SPECIFICATIONS.

SEWER LINE PIPE EMBEDMENT & FIELD DENSITY TESTING DETAIL
SCALE : NONE



ALL FITTINGS



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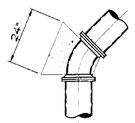
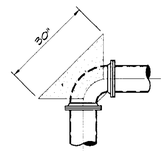


ALL OTHER BENDS



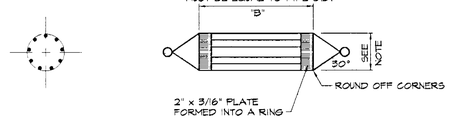
90° BENDS

THRUST BLOCKING NOTES

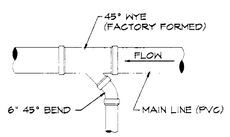
1. CONCRETE THRUST BLOCKING WILL BE PROVIDED FOR ALL FITTINGS.
2. CONCRETE THRUST BLOCKING SHALL PROVIDE ENOUGH BEARING AREA IN ORDER THAT THE LINE AND FITTING WILL NOT MOVE WHEN SUBJECTED TO TEST PRESSURE, BUT IN ANY CASE NOT LESS THAN THE DIMENSIONS SHOWN ON THIS SHEET.
3. THRUST BLOCK SHALL BE POURED AGAINST UNDISTURED SOIL.

FORCE MAIN THRUST BLOCK DETAILS
SCALE : NONE

NOTE:
* MANDREL MUST HAVE MANUFACTURE ID PLATE INTACT.
* MANDREL MUST HAVE ODD NUMBER OF RUNNERS, 9 MIN.
* AFTER CONSTRUCTION IS COMPLETED, TRUE O.D. DIMENSION FOR THE FULL LENGTH OF "B" TO 0.010 INCH BY TOOL AND LATH GRINDING.
* CONTRACTOR MUST PROVIDE PROVING RING.



MANDREL CONSTRUCTION DETAIL FOR 5.0 % DEFLECTION
SCALE : NONE



PLAN - SINGLE SERVICE
SCALE : NONE

STATE OF TEXAS
C. L. HARVEY
56887
REGISTERED
PROFESSIONAL ENGINEER

C. L. Harvey, PE
7-29-05

Revisions

QUINLAN CREEK TRUNK MAIN + LIFT STATION
SANITARY SEWER DETAILS
CITY OF KERRVILLE, TEXAS

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Sheet 10 of 10

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