

CONTRACT DRAWINGS FOR  
CITY OF KERRVILLE, TEXAS  
PUBLIC WORKS DEPARTMENT

WATER TREATMENT PLANT  
EXPANSION 2004

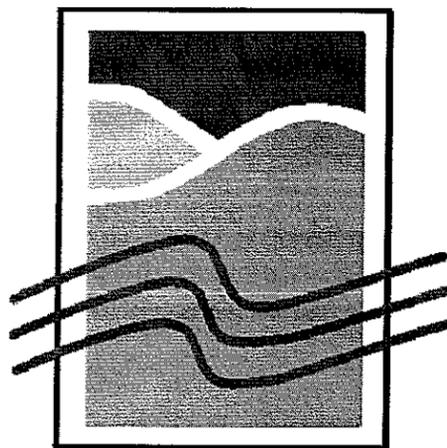
JUNE 2004

BAR LENGTH ON ORIGINAL  
DRAWING EQUALS ONE INCH.  
ADJUST SCALE ACCORDINGLY.

**HDR**

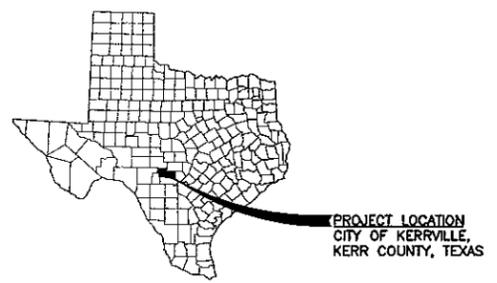
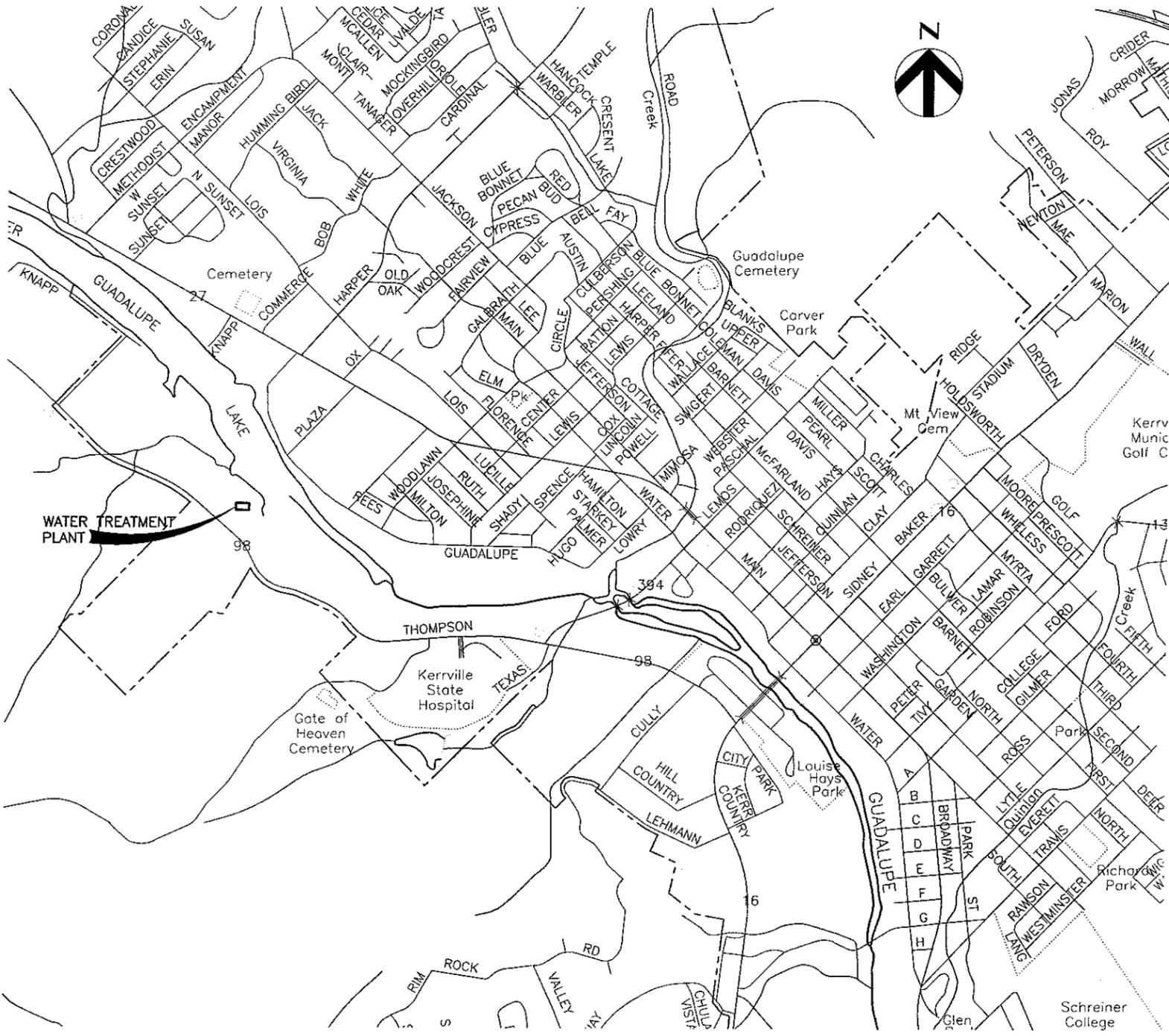
HDR Engineering, Inc.

STATE OF TEXAS  
MARK C. GRAVES  
90151  
*Mark C. Graves*  
7/14/04



THE CITY OF  
**KERRVILLE, TEXAS**

CITY OF KERRVILLE  
PUBLIC WORKS  
DEPARTMENT  
KERRVILLE, TEXAS  
WATER TREATMENT PLANT  
EXPANSION 2004



VICINITY MAP  
NO SCALE

**DRAWING INDEX**

DWG NO.	TITLE / DESCRIPTION
<b>SERIES 000 - GENERAL</b>	
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00G-02	PROJECT LOCATION MAP AND DRAWING INDEX
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00G-04	LEGEND SYMBOLS AND SITE INFORMATION
00G-05	GENERAL NOTES
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00D-02	HYDRAULIC PROFILE
00E-01	ELECTRICAL LEGEND AND ABBREVIATIONS
00E-02	INSTRUMENTATION LEGEND AND ABBREVIATIONS
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01C-02	TYPICAL FENCING AND EROSION CONTROL DETAILS
01C-03	EMBEDMENT AND JOINT BONDING DETAILS AND PAVING DETAILS
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01E-01	SITE ELECTRICAL PLAN
01E-02	PARTIAL FLOOR PLAN AND DETAILS
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04D-02	GROUND LEVEL PLAN ABOVE ELEVATION 1644.83
04D-03	GROUND LEVEL PLAN BELOW ELEVATION 1644.83
04D-04	SECTIONS
04M-01	GROUND LEVEL PLAN - HVAC
04M-02	UPPER LEVEL PLAN - HVAC
04M-03	HVAC DETAILS AND SCHEDULES
04M-04	GROUND LEVEL PLAN - PLUMBING
04M-05	UPPER LEVEL PLAN - PLUMBING
04M-06	PLUMBING DETAILS AND SCHEDULES
04E-01	GROUND LEVEL POWER PLAN
04E-02	GROUND LEVEL LIGHTING PLAN
04E-03	UPPER LEVEL POWER PLAN
04E-04	UPPER LEVEL LIGHTING PLAN

NOTE:  
SEE ZENON TENDER PACKAGE FOR  
ADDITIONAL DRAWINGS ON MEMBRANE  
SYSTEM AND ANCILLARY EQUIPMENT.

**CITY OF KERRVILLE  
LOCATION MAP**  
SCALE: 1" = 1000'

Issue No.	Description	Date	Drawn	Checked	Resp. Eng.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT  
PLANT EXPANSION  
2004**  
THE CITY OF  
KERRVILLE, TEXAS

<b>GENERAL</b>	
<b>PROJECT LOCATION MAP AND DRAWING INDEX</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	00G-02.DWG
Drawing No.	<b>00G-02</b>
Issue	<b>1</b>



SITE PLAN SYMBOLOGY	PIPING SYMBOLOGY	MATERIALS IN PLAN/SECTION	GENERAL SYMBOLOGY	IDENTIFICATION SYMBOLOGY																																																					
<p><b>EMBAKMENT SLOPE</b></p> <p><b>CONTOUR</b></p> <p>50.5</p> <p><b>VEGETATION</b></p> <p>CO CLEAN OUT</p> <p>MH MANHOLE</p> <p>MW MONITORING WELL</p> <p>PZ PIEZOMETER</p> <p>CB STORM DRAIN CATCH BASIN</p> <p>UV UTILITY VAULT</p> <p>PP POWER POLE</p> <p>TP TELEPHONE POLE</p> <p>FH FIRE HYDRANT</p> <p>YH-X YARD HYDRANT</p> <p>75.5 EXISTING SPOT ELEVATION</p> <p>75.8 FINISHED SPOT ELEVATION</p> <p>HORIZONTAL CP-X, CONTROL POINT</p> <p>BENCHMARK</p> <p>TH-X IDENTIFICATION AND APPROXIMATE LOCATION OF SOIL TEST HOLE</p> <p>DOWNGUY</p> <p><b>NOTES:</b></p> <p>1. UTILITIES THAT ARE SUSPENDED ABOVE GRADE ARE DESIGNATED BY THE PREFIX "OH".</p> <p>T TELEPHONE LINE</p> <p>E ELECTRIC LINE</p> <p>F FIBER OPTIC</p> <p>C COMMUNICATION</p> <p>HANDRAIL</p> <p>PIPELINE</p> <p>LARGE PIPELINE</p> <p>PIPELINE BENEATH CONCRETE OR STRUCTURE</p> <p>RAILROAD</p> <p>DRAINAGE FLOW</p> <p>NATURAL WATERWAY</p> <p>CHAIN LINK FENCE</p> <p>FIELD FENCE</p> <p>PROPERTY LINE</p> <p>CENTERLINE</p> <p>RB ROCK BERM</p> <p>SF SILT FENCE</p>	<p><b>NOTES:</b></p> <p>1. VALVE TYPES FOR VALVES 4" AND LARGER ARE INDICATED BY SYMBOLS SHOWN BELOW. VALVES 3-1/2" AND SMALLER MAY BE SHOWN WITH GATE VALVE SYMBOL</p> <p>REGARDLESS OF VALVE TYPE -- REFER TO SPECIFICATIONS FOR REQUIREMENTS.</p> <p>2. SYMBOLOGY SHOWN IS FOR SINGLE LINE PIPING. DOUBLE LINE PIPING SYMBOLS ARE SIMILAR.</p> <p><b>VALVES</b></p> <p>GATE VALVE</p> <p>GLOBE VALVE</p> <p>BALL VALVE</p> <p>CHECK VALVE</p> <p>DOUBLE DISK CHECK VALVE</p> <p>BALL CHECK VALVE</p> <p>BUTTERFLY VALVE</p> <p>DIAPHRAGM VALVE</p> <p>PINCH VALVE</p> <p>KNIFE GATE VALVE</p> <p>PRESSURE RELIEF VALVE</p> <p>PLUG VALVE</p> <p>NEEDLE VALVE</p> <p>PRESSURE REDUCING VALVE</p> <p>AIR RELIEF / VACUUM VALVE A = AIR RELIEF V = VACUUM</p> <p>PRESSURE REGULATING VALVE</p> <p>THREE WAY BALL VALVE</p> <p>THREE WAY PLUG VALVE</p> <p><b>MISCELLANEOUS</b></p> <p>VARIABLE AREA METER</p> <p>ROTAMETER</p> <p>UNION</p> <p>WYE-STRAINER</p> <p>LINE SIZE CHANGE (CONCENTRIC REDUCER)</p> <p>FLEXIBLE HOSE OR TUBING</p> <p>FLEXIBLE PIPING CONNECTION</p> <p>LINE SIZE CHANGE (CONCENTRIC REDUCER)</p> <p>LINE SIZE CHANGE (ECCENTRIC REDUCER)</p> <p>LINE TURNING DOWN</p> <p>LINE TURNING UP</p> <p>BLIND FLANGE</p> <p>PIPE JOINT (SEE SPECS FOR REQUIREMENTS)</p> <p>SLEEVE TYPE COUPLING</p> <p>FLANGED COUPLING ADAPTER (FCA)</p> <p>FLEXIBLE CONNECTION</p> <p>HARNESSED MECHANICAL COUPLING</p>	<p><b>MISCELLANEOUS (CONTINUED)</b></p> <p>PRESSURE GAGE (W/COCK)</p> <p>TRAP</p> <p>QUICK DISCONNECT CAM &amp; GROOVE COUPLING</p> <p>CAP or PLUG</p> <p>INTERIOR CLEANOUT</p> <p>HOSE VALVE, HOSE BIBB OR FLUSHING CONNECTION</p> <p>HOSE RACK</p> <p>FLOOR DRAIN</p> <p>X = TYPE DESIGNATED IN SPECIFICATIONS</p> <p>PIPE IN SECTION</p> <p>BELL UP (PLAN)</p> <p>BELL UP (SECTION OR SCHEMATIC)</p> <p>DRAIN (SECTION OR SCHEMATIC)</p> <p>AIR TOOL ASSEMBLY</p> <p>AUTOMATIC VALVE STATION</p> <p>PRESSURE REDUCING STATION</p> <p><b>PLUMBING PIPING:</b></p> <p>VT VENT (VT)</p> <p>POTABLE WATER, COLD (PWC)</p> <p>POTABLE WATER, HOT (PWH)</p> <p><b>PIPING SERVICES</b></p> <table border="1"> <thead> <tr> <th>SYMBOL</th> <th>SERVICE</th> </tr> </thead> <tbody> <tr><td>BP</td><td>BACKPULSE</td></tr> <tr><td>BWR</td><td>BACKWASH RECYCLE/REJECT</td></tr> <tr><td>CCW</td><td>CLEANING CHEMICAL WASTE</td></tr> <tr><td>CHV</td><td>CHEMICAL VENT</td></tr> <tr><td>CLS</td><td>CHLORINE SOLUTION</td></tr> <tr><td>CAS</td><td>CITRIC ACID SOLUTION</td></tr> <tr><td>CA</td><td>CONTROL AIR</td></tr> <tr><td>D</td><td>DRAIN LINE</td></tr> <tr><td>FES</td><td>FERRIC SULFATE SOLUTION</td></tr> <tr><td>FW</td><td>FEED WATER</td></tr> <tr><td>FN</td><td>FINISHED WATER</td></tr> <tr><td>NG</td><td>NATURAL GAS</td></tr> <tr><td>NPW</td><td>NON-POTABLE WATER</td></tr> <tr><td>PER</td><td>PERMEATE WATER</td></tr> <tr><td>PWC</td><td>POTABLE WATER COLD</td></tr> <tr><td>PWH</td><td>POTABLE WATER HOT</td></tr> <tr><td>PA</td><td>PROCESS AIR</td></tr> <tr><td>RW</td><td>RAW WATER</td></tr> <tr><td>SAM</td><td>SAMPLE</td></tr> <tr><td>SMD</td><td>SAMPLE DRAIN</td></tr> <tr><td>SVW</td><td>SERVICE WATER</td></tr> <tr><td>SBS</td><td>SODIUM BISULFITE SOLUTION</td></tr> <tr><td>SHS</td><td>SODIUM HYDROXIDE SOLUTION</td></tr> <tr><td>VT</td><td>VENT</td></tr> <tr><td>VTR</td><td>VENT THROUGH ROOF</td></tr> </tbody> </table>	SYMBOL	SERVICE	BP	BACKPULSE	BWR	BACKWASH RECYCLE/REJECT	CCW	CLEANING CHEMICAL WASTE	CHV	CHEMICAL VENT	CLS	CHLORINE SOLUTION	CAS	CITRIC ACID SOLUTION	CA	CONTROL AIR	D	DRAIN LINE	FES	FERRIC SULFATE SOLUTION	FW	FEED WATER	FN	FINISHED WATER	NG	NATURAL GAS	NPW	NON-POTABLE WATER	PER	PERMEATE WATER	PWC	POTABLE WATER COLD	PWH	POTABLE WATER HOT	PA	PROCESS AIR	RW	RAW WATER	SAM	SAMPLE	SMD	SAMPLE DRAIN	SVW	SERVICE WATER	SBS	SODIUM BISULFITE SOLUTION	SHS	SODIUM HYDROXIDE SOLUTION	VT	VENT	VTR	VENT THROUGH ROOF	<p>DEMOLITION</p> <p>CONCRETE</p> <p>MASONRY (CMU)</p> <p>BRICK (SECTION)</p> <p>ASPHALT</p> <p>GRANULAR FILL</p> <p>SAND</p> <p>EARTH</p> <p>METAL (SECTION)</p> <p>GRATING (PLAN)</p> <p>CHECKERED PLATE</p> <p>BRICK (PLAN)</p> <p>RIGID INSULATION</p> <p>BATT INSULATION</p> <p>WOOD - CONTINUOUS</p> <p>WOOD - NON CONTINUOUS</p> <p>PLYWOOD</p> <p>GYPSUM BOARD</p> <p><b>REFLECTED CEILING SYMBOLOGY</b></p> <p>SUSPENDED GYPSUM WALLBOARD CEILING</p> <p>2x4 ACOUSTICAL SUSPENDED CEILING</p> <p>RECESSED LIGHT FIXTURE</p> <p>1x4 FLUORESCENT LIGHT FIXTURE</p> <p>2x4 FLUORESCENT LIGHT FIXTURE</p> <p>4x4 FLUORESCENT LIGHT FIXTURE</p> <p>SUPPLY AIR DIFFUSER/GRILLE</p> <p>RETURN AIR GRILLE</p> <p><b>FIRE WALL RATINGS</b></p> <p>1 HOUR FIRE RATED WALL</p> <p>2 HOUR FIRE RATED WALL</p>	<p><b>PLAN</b></p> <p>1/4" = 1'-0"</p> <p>ARROW INDICATES DIRECTION OF PLAN NORTH</p> <p>SECTION LETTER</p> <p>FLAG INDICATES DIRECTION OF SECTION CUT</p> <p>DRAWING WHERE SECTION VIEW IS LOCATED</p> <p><b>SECTION CUT MARKER</b></p> <p>SECTION LETTER</p> <p>3/8" = 1'-0"</p> <p>DRAWING WHERE SECTION VIEW IS FIRST CUT</p> <p>DETAIL NUMBER</p> <p>DRAWING WHERE DETAIL IS LOCATED</p> <p><b>DETAIL MARKER</b></p> <p>DETAIL NUMBER</p> <p>3" = 1'-0"</p> <p>DRAWING WHERE DETAIL WAS TAKEN</p> <p>ELEVATION LETTER</p> <p>ARROW INDICATES POINT OF VIEW</p> <p>DRAWING WHERE ELEVATION IS LOCATED</p> <p><b>SINGLE ELEVATION OR PHOTO MARKER</b></p> <p>ELEVATION LETTER</p> <p>ARROW INDICATES POINT OF VIEW ELEVATION</p> <p>INDICATES DRAWING WHERE ELEVATION IS LOCATED</p> <p><b>MULTIPLE ELEVATION OR PHOTO MARKER</b></p> <p>ELEVATION IDENTIFICATION LETTER</p> <p>3" = 1'-0"</p> <p>DRAWING WHERE POINT OF VIEW MARKER CAN BE FOUND</p> <p>PRE-CAST MANHOLE</p> <p>DESCRIPTION</p> <p>SPECIFICATION SECTION AND DETAIL NUMBER</p> <p><b>STANDARD DETAIL MARKER</b></p> <p>KEYNOTE NUMBER</p> <p>KEYNOTE DESIGNATION</p>	<p><b>PIPING:</b></p> <p>FIGURE</p> <p>36"-PER</p> <p>EXAMPLE</p> <p>LINE SIZE</p> <p>36"</p> <p>SERVICE</p> <p>PLANT EFFLUENT</p> <p><b>EQUIPMENT TAG NUMBERS:</b></p> <p>FIGURE</p> <p>P-76-1</p> <p>EXAMPLE</p> <p>SERVICE ABBREVIATION</p> <p>INDICATES RAW WATER</p> <p>EQUIPMENT ABBREVIATION</p> <p>INDICATES PUMP</p> <p>SUFFIX FOR MULTIPLE PIECES OF EQUIPMENT</p> <p>PUMP 1</p> <p>-A, -B, -C ALTERNATING OPERATION</p> <p>-1, -2, -3 OPERATING IN PARALLEL</p> <p>-S, -T STANDBY DEVICE, NOT NORMALLY OPERATING</p> <p><b>ARCHITECTURAL:</b></p> <p>ROOM NUMBER</p> <p>DOOR NUMBER</p> <p>COLUMN GRID LINE</p> <p>WALL TYPE</p> <p>WINDOW TYPE</p> <p>LOUVER</p> <p><b>GENERAL NOTES:</b></p> <p>1. THIS IS A STANDARD DRAWING SHOWING COMMON SYMBOLOGY. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.</p> <p>2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DEEMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH DRAWING FOR USAGE.</p> <p>3. SEE PROJECT EQUIPMENT AND PIPING SYSTEMS DRAWING FOR SYMBOLS AND ABBREVIATIONS SPECIFIC TO THE PROJECT.</p>
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B	ISSUED FOR 100% REVIEW	06/15/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	--	JJC	MCG

Date	Drawn	Chk'd	Resp. Engr.	Proj. Mgr.



Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



WATER TREATMENT PLANT EXPANSION 2004

THE CITY OF KERRVILLE, TEXAS

<b>GENERAL</b>	
<b>LEGEND, SYMBOLS AND SITE INFORMATION</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	00G-04.DWG
Drawing No.	00G-04
Issue	1

**GENERAL NOTES**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ALL EXISTING PAVEMENTS, CURBS, DRIVEWAYS, SIDEWALKS, GRAVEL ROADWAYS, PIPE CULVERTS, CULVERT HEADWALLS, FENCES, BILLBOARDS, AND MISCELLANEOUS ITEMS WHERE REQUIRED TO COMPLETE THE CONSTRUCTION.
2. CONTRACTOR SHALL REPAIR TO ORIGINAL CONDITION ANY DAMAGE INCURRED DURING CONSTRUCTION AT NO EXPENSE TO OWNER.
3. CONTRACTOR SHALL FIELD VERIFY THE TYPE, LOCATION AND DEPTH OF ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION IN ORDER TO ADJUST PIPE GRADE IF NECESSARY AND AVOID DAMAGING THOSE UTILITIES. ADJUSTMENTS SHALL BE APPROVED BY ENGINEER.
4. CONTRACTOR SHALL NOTIFY PIPELINE COMPANIES, TELEPHONE COMPANIES, POWER COMPANIES, AND ALL OTHER PERTINENT UTILITIES 48 HOURS BEFORE DIGGING IN AREA OF UTILITY.
5. KNOWN UTILITIES ARE SHOWN BY LINE DRAWN PERPENDICULAR TO PIPELINE AT THE POINT OF INTERSECTION. ACTUAL ALIGNMENT OF UTILITIES SHOULD BE VERIFIED BY CONTRACTOR PRIOR TO EXCAVATING NEAR THE UTILITY.
6. CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE THAT ACCESS TO EXISTING PROPERTY IS NOT IMPAIRED.
7. ACCESS TO THE SITE SHALL BE THROUGH EXISTING ROADS AND GATES.
8. ALL GATES AND FENCES SHALL BE SECURED AND CLOSED AT ALL TIMES WHEN NOT IN USE.
9. COVER FOR ALL BURIED PIPE SHALL BE A MINIMUM OF FOUR (4) FEET UNLESS OTHERWISE SHOWN ON THE PLANS. ANY DEVIATION IN MINIMUM COVER REQUIREMENTS CAUSED BY DIMENSIONAL OR ELEVATION CALL OUTS MUST BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
10. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY UNREPORTED OBSTACLES THAT MAY IMPEDE OR PREVENT THE CONSTRUCTION.
12. PIPE JOINT DEFLECTIONS SHALL BE NO GREATER THAN 80% OF THE MANUFACTURER'S RECOMMENDED MAXIMUM DEFLECTION, UNLESS OTHERWISE NOTED ON THE PLANS. CONTRACTOR SHALL PROVIDE APPROPRIATE JOINTS OR FITTINGS WHEREVER REQUIRED FOR THE PARTICULAR TYPE OF PIPE MATERIAL PROPOSED EVEN IF THEY ARE NOT CALLED OUT ON THE PLANS.
13. CUT SHEETS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. CONTRACTOR SHALL NOTIFY ENGINEER 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION STAKING.
14. ANY PORTION OF THE PROJECT IMPROPERLY PLACED AND/OR CONFLICTING WITH ANY EXISTING STRUCTURE SHALL BE REMOVED AND CORRECTLY PLACED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL ASSOCIATED COSTS.
15. CONSTRUCTION OPERATIONS SHALL BE CONDUCTED IN SUCH A MANNER AS TO PROTECT EXISTING FACILITIES AT ALL TIMES.
16. USE OF EXPLOSIVES WILL NOT BE PERMITTED.
17. THE CONTRACTOR MUST RECORD AND SUPPLY TO THE ENGINEER THE FOLLOWING INFORMATION:
  - A. LOCATION AND ELEVATION OF ALL APPURTENANT CONNECTIONS.
  - B. "AS-BUILT" INVERTS AND PROFILE OF CONSTRUCTED PIPELINE.
  - C. THE NEW LOCATION AND DEPTH OF ALL RELOCATED AND/OR ADJUSTED UTILITIES.
18. ALL HOLES, TRENCHES, AND OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY BARRICADES, LIGHTS, OR OTHER PROTECTIVE DEVICES.
19. REMOVAL OF EXCAVATED MATERIALS AND DAILY CLEANUP OPERATIONS SHALL BE PERFORMED PER THE SPECIFICATIONS AND TO THE SATISFACTION OF THE ENGINEER.
20. ALL ROCKS, BRUSH, TIMBER AND OTHER DEBRIS THAT IS CLEARED FROM THE SITE SHALL BE REMOVED FROM THE PREMISES AND SHALL NOT BE PLACED ON ADJOINING LANDS, EXCEPT WHERE ARRANGEMENTS FOR SUCH PLACEMENT OR DISPOSAL ARE MADE WITH THE APPROPRIATE PROPERTY OWNERS.
21. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE IMPLEMENTED BEFORE CONSTRUCTION COMMENCES AND SHALL NOT BE REMOVED UNTIL REVEGETATION HAS BEEN COMPLETED.
22. CONTRACTOR IS CAUTIONED THAT WORK WILL BE ADJACENT TO EXISTING ELECTRIC UTILITIES. CONTRACTOR SHALL COMPLY WITH ELECTRIC UTILITY REQUIREMENTS FOR WORKING NEAR OVERHEAD POWER LINES.
23. SEE SECTION 01060 FOR PROJECT CONDITIONS AND PERMIT REQUIREMENTS.
24. PROVIDE RESTRAINED JOINTS AT ALL TEES, BENDS, CROSSES, PLUGS, HYDRANTS, REDUCERS AND WHERE IDENTIFIED ON THE PLANS. PROVIDE CONCRETE THRUST BLOCKS ONLY WHERE APPROVED BY THE ENGINEER.
25. A CITY INSPECTOR SHALL BE PRESENT DURING ALL TESTS. CITY INSPECTORS SHALL BE GIVEN A MINIMUM OF 24 HOURS NOTICE PRIOR TO ANY TESTING.
26. THE CONTRACTOR SHALL BE AWARE THAT DUE TO THE FACT EXISTING UTILITY LINES ARE CURRENTLY LIVE AND IN SERVICE, THERE MAY BE TIMES WHEN SHUTTING DOWN SAID LINES, CONNECTING TO SAID LINES OR TERMINATING SAID LINES WILL HAVE TO OCCUR AT OFF-PEAK HOURS. SUCH HOURS ARE USUALLY OUTSIDE NORMAL WORKING HOURS AND POSSIBLY BETWEEN 12 A.M. AND 6 A.M. ALL UTILITY TIE-INS MUST BE COORDINATED WITH, AND APPROVED BY, THE OWNER PRIOR TO BEGINNING WORK.
27. THE CONTRACTOR SHALL CONTACT THE CITY OF KERRVILLE UTILITY INSPECTOR, 48 HOURS PRIOR TO CONNECTING TO EXISTING WATER LINES.
28. LINE FLUSHING OR ANY ACTIVITY USING A LARGE QUANTITY OF WATER MUST BE SCHEDULED WITH THE WATER PLANT OPERATOR.
29. THE CONTRACTOR SHALL, AT THEIR EXPENSE, PERFORM DISINFECTION OF ALL POTABLE WATER LINES AND SHALL PROVIDE ALL EQUIPMENT (INCLUDING TEST GAUGES), SUPPLIES (INCLUDING CONCENTRATED CHLORINE DISINFECTING MATERIAL), AND NECESSARY LABOR REQUIRED FOR THE DISINFECTION PROCEDURE. THE DISINFECTION PROCEDURE SHALL BE MONITORED BY THE CITY OF KERRVILLE PERSONNEL. WATER SAMPLES WILL BE COLLECTED BY THE CITY OF KERRVILLE TO VERIFY EACH TREATED LINE HAS ATTAINED AN INITIAL CHLORINE CONCENTRATION OF 50 PPM. WHERE MEANS OF FLUSHING IS NECESSARY, THE CONTRACTOR SHALL, AT THEIR EXPENSE, PROVIDE FLUSHING DEVICES AND REMOVE SAID DEVICES PRIOR TO FINAL ACCEPTANCE BY THE CITY OF KERRVILLE. SEE SECTION 15060.
30. THE CONTRACTOR SHALL PROVIDE THE CITY OF KERRVILLE PUBLIC WORKS DEPARTMENT NO LESS THAN 48 HOURS NOTICE PRIOR TO PERFORMING DISINFECTION, QUALITY TESTING, OR PRESSURE TESTING.
31. THE CONTRACTOR SHALL NOT OPEN OR CLOSE ANY VALVES UNLESS AUTHORIZED BY THE CITY OF KERRVILLE.
32. CONTACT CITY OF KERRVILLE WATER PRODUCTION SUPERINTENDENT, GRANT TERRY, AT 830-257-4668 FOR ASSISTANCE IN OBTAINING EXISTING WATER AND WASTEWATER LOCATIONS.
33. ALL EXISTING, TEMPORARY, AND PERMANENT GATES AND FENCES SHALL BE CLOSED AND LOCKED AT ALL TIMES WHEN NOT IN USE.
34. THE CONTRACTOR SHALL DELINEATE THE OUTSIDE BOUNDARY OF THE WORK AREA USING ORANGE MESH FENCING.
35. MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, ETC. SHALL BE RAISED TO FINISHED GRADE PRIOR TO FINAL PAVING AND/OR GRADING CONSTRUCTION.
36. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
37. THE CONTRACTOR SHALL CONFINE ALL WORK TO WITHIN THE CITY OF KERRVILLE PROPERTY. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL TRASH AND DEBRIS WITHIN THE PROJECT PROPERTY. CLEAN-UP SHALL BE TO THE SATISFACTION OF THE ENGINEER.
38. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.
39. THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL CONSTRUCTION THAT DEVIATES FROM THE PLANS. THE CONTRACTOR SHALL FURNISH THE CITY OF KERRVILLE ACCURATE "AS-BUILT" DRAWINGS FOLLOWING COMPLETION OF ALL CONSTRUCTION. THESE "AS-BUILT" DRAWINGS SHALL MEET WITH THE SATISFACTION OF THE CITY DEPARTMENT PRIOR TO FINAL ACCEPTANCE.
40. DEPTH OF COVER FOR ALL CROSSINGS UNDER PAVEMENT INCLUDING GAS, ELECTRIC, AND TELEPHONE SHALL BE A MINIMUM OF 36" BELOW SUBGRADE.

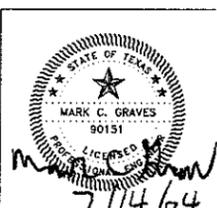
**TRENCH SAFETY NOTES**

1. IN ACCORDANCE WITH LAWS OF THE STATE OF TEXAS AND THE U. S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ALL TRENCHES OVER 5 FEET IN DEPTH IN EITHER HARD AND COMPACT OR SOFT AND UNSTABLE SOIL SHALL BE SLOPED, SHORED, SHEETED, BRACED OR OTHERWISE SUPPORTED. FURTHERMORE, ALL TRENCHES LESS THAN 5 FEET IN DEPTH SHALL ALSO BE EFFECTIVELY PROTECTED WHEN HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED.
2. IN ACCORDANCE WITH THE U. S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, WHEN EMPLOYEES ARE REQUIRED TO BE IN TRENCHES 4- FEET DEEP OR MORE, ADEQUATE MEANS OF EXIT, SUCH AS A LADDER OR STEPS, MUST BE PROVIDED AND LOCATED SO AS TO REQUIRE NO MORE THAN 25 FEET OF LATERAL TRAVEL.

**EROSION AND SEDIMENTATION CONTROL NOTES**

1. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. SEE SECTIONS 01560 AND 02270.
2. SILT FENCE, HAY BALS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE OWNER FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPTION OF THE OWNER, THEY ARE WARRANTED.
3. EROSION CONTROL STRUCTURES SHALL BE INSPECTED AFTER A RAIN EVENT AND ANY SEDIMENT SHALL BE REMOVED.
4. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE OWNER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE OWNER.

Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

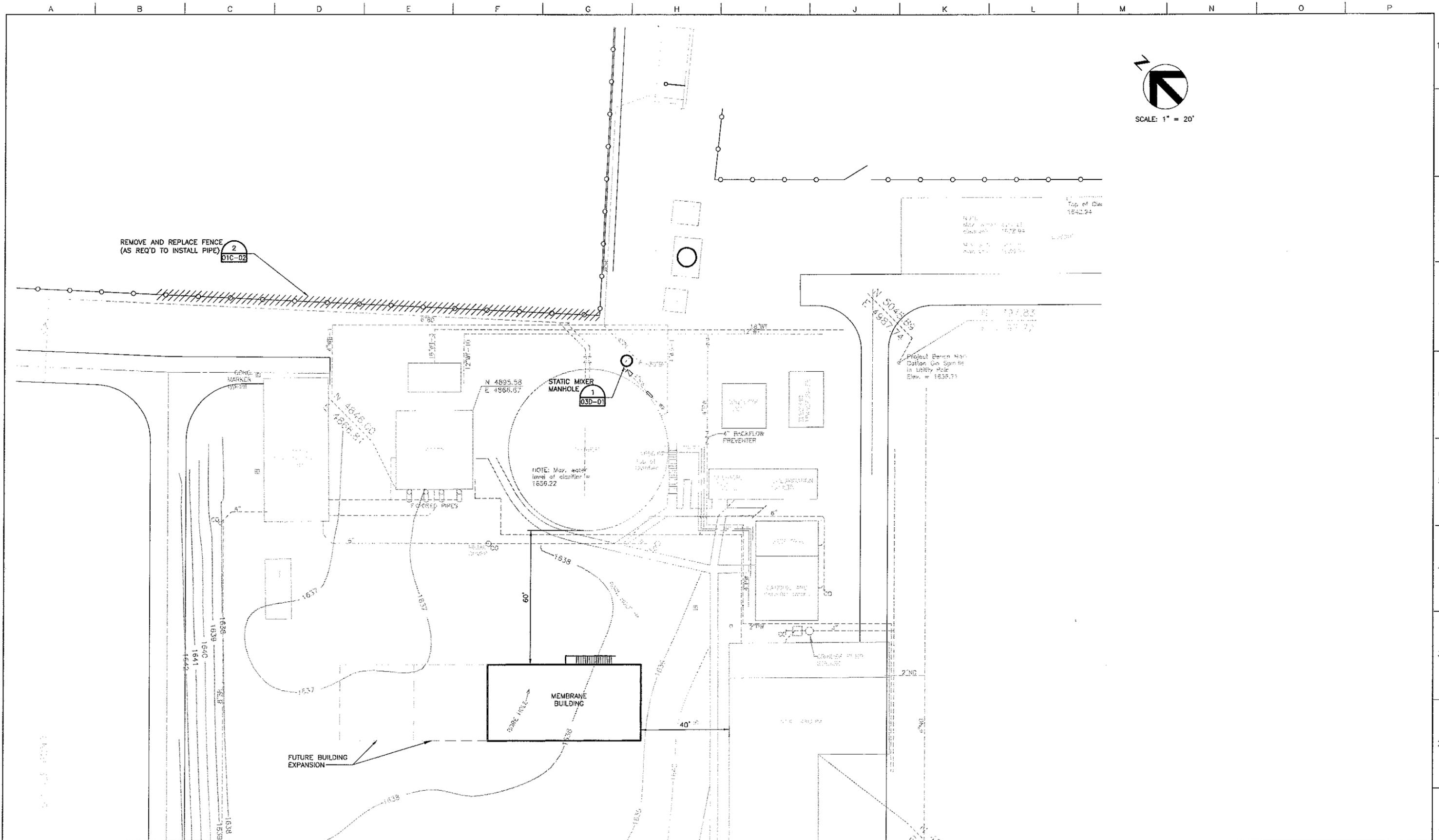


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



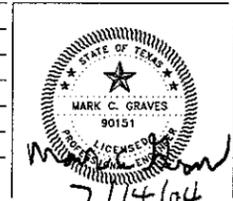
**WATER TREATMENT PLANT EXPANSION 2004**  
 THE CITY OF KERRVILLE, TEXAS

<b>GENERAL GENERAL NOTES</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	00G-05.DWG
Drawing No.	<b>00G-05</b>
Issue	<b>1</b>



Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Project Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Project Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
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B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



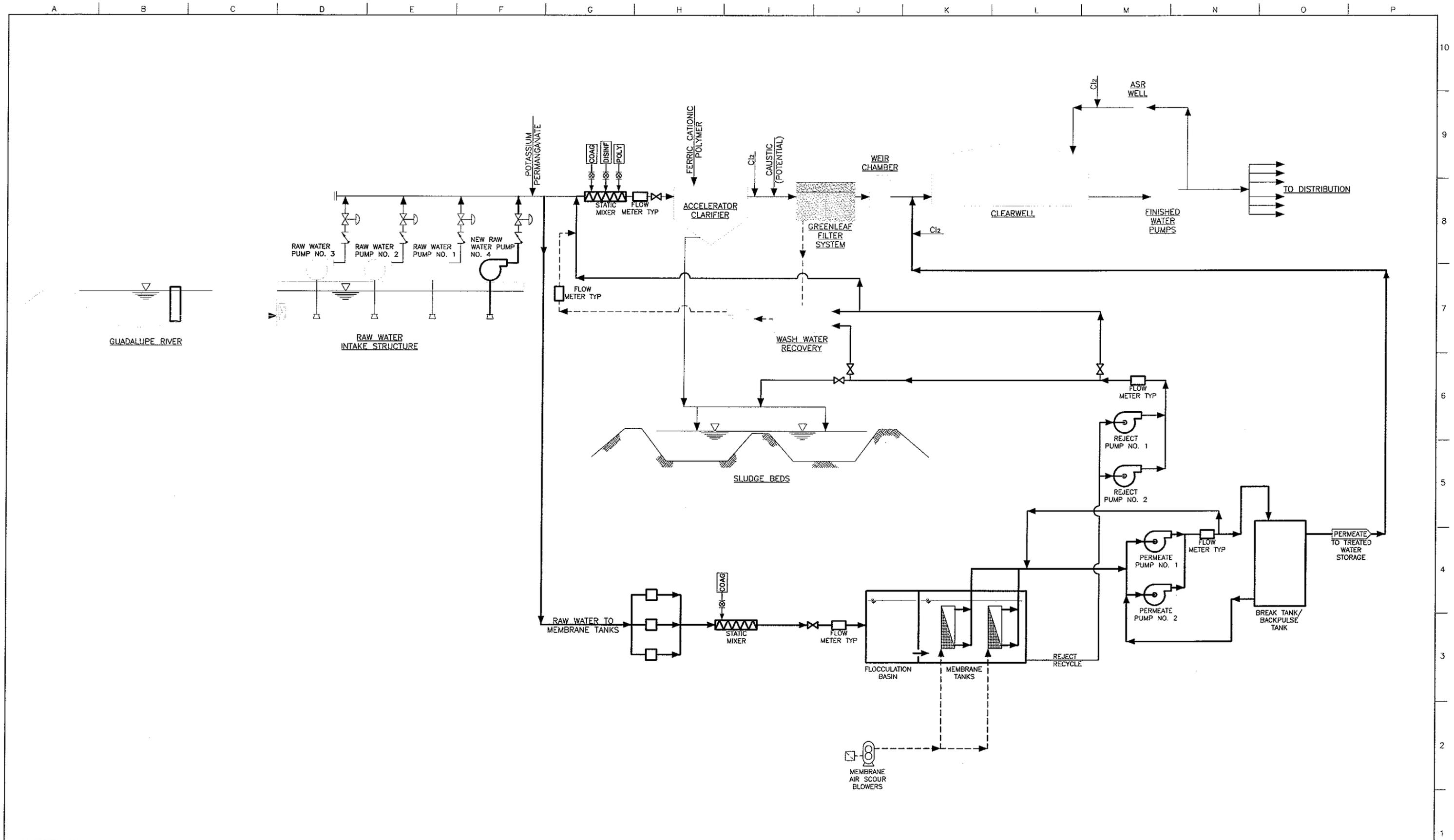
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT PLANT EXPANSION 2004**

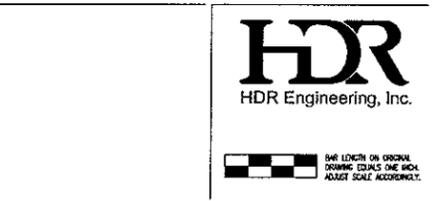
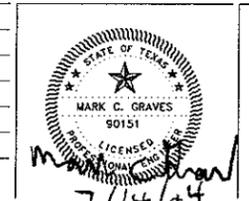
THE CITY OF  
**KERRVILLE, TEXAS**

<b>GENERAL OVERALL SITE PLAN</b>		Date	JUNE 2004	Project No.	08340-025-036	Drawing No.	00C-01	Issue	1
Scale	AS NOTED	File Name	00C-01.DWG						



Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Project Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Project Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



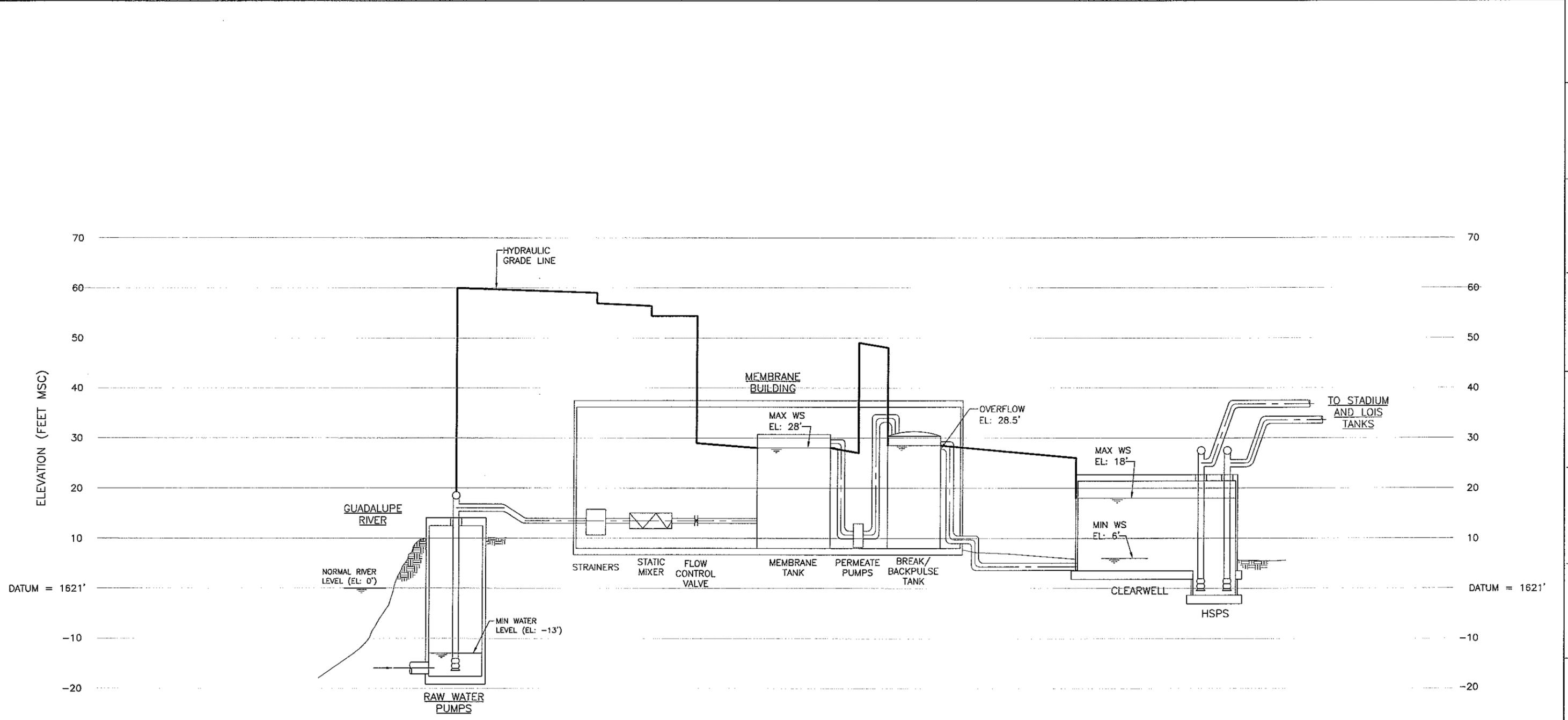
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



WATER TREATMENT  
PLANT EXPANSION  
2004

THE CITY OF  
KERRVILLE, TEXAS

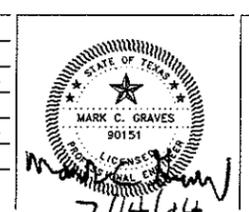
<b>GENERAL PROCESS PLANT FLOW SCHEMATIC</b>	
Date	JUNE 2004
Scale	AS NOTED
Project No.	08340-025-036
File Name	00D-01.DWG
Drawing No.	00D-01
Issue	1



DESIGN RAW WATER FLOW = 1.79 MGD  
 DESIGN PERMEATE FLOW = 1.65 MGD

**MAIN PROCESS HYDRAULIC PROFILE**  
 NTS

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	08/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	--	JJC	MCG

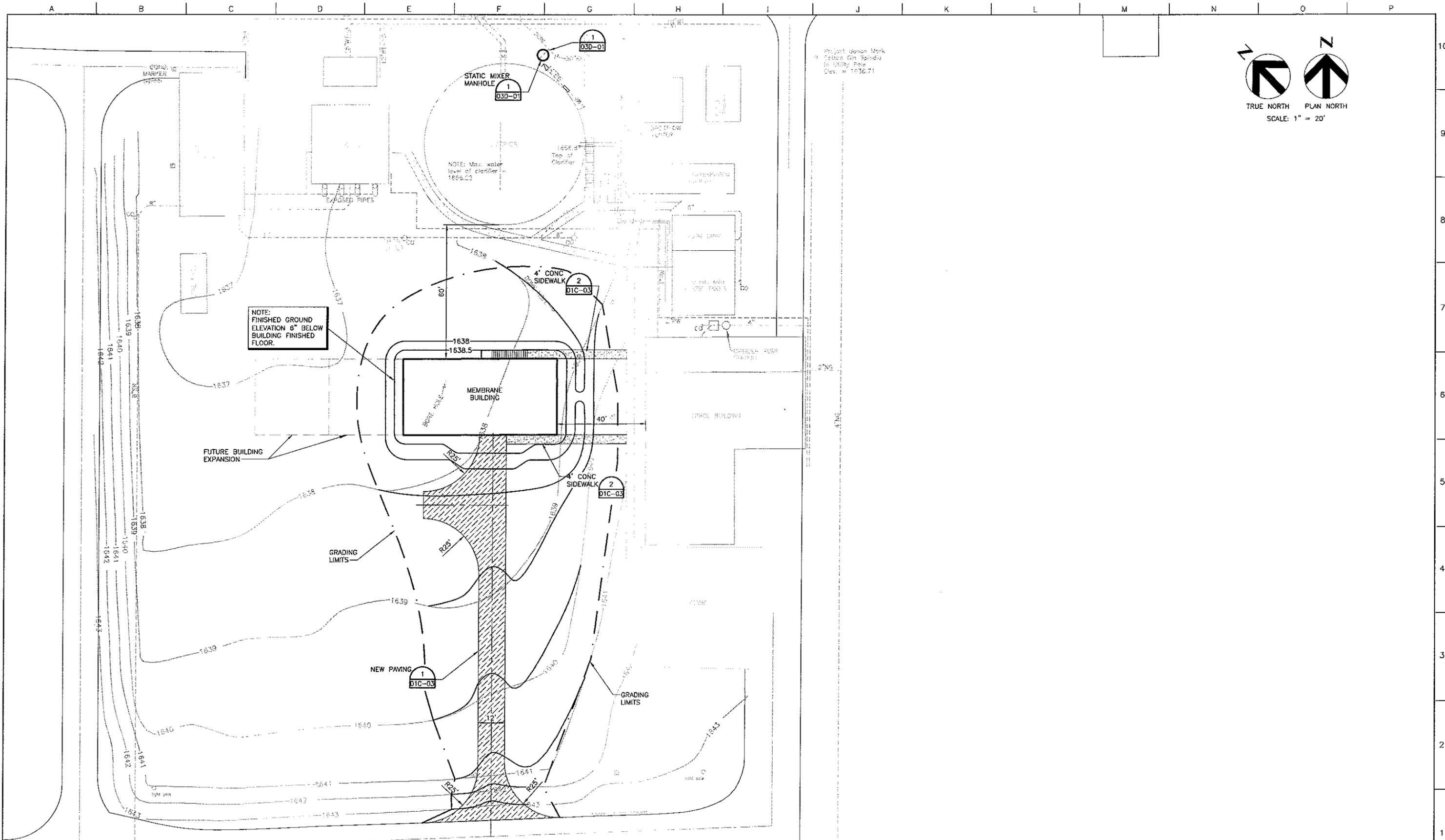


Project Manager  
 M. C. GRAVES  
 Designed  
 J. J. CHRISTENSEN  
 Checked  
 B. BENJES  
 Drawn  
 S. R. FRANKLIN

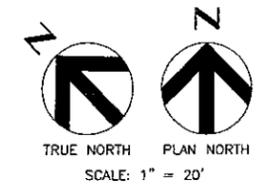


**WATER TREATMENT PLANT EXPANSION 2004**  
 THE CITY OF KERRVILLE, TEXAS

GENERAL PROCESS HYDRAULIC PROFILE		Date	Project No.	Drawing No.	Issue
		JUNE 2004	08.340-025-036	00D-02	1
		AS NOTED	00D-02.DWG		

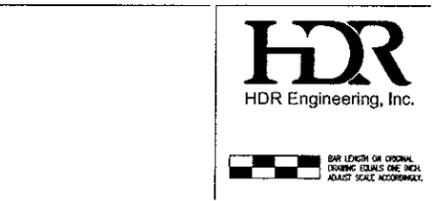
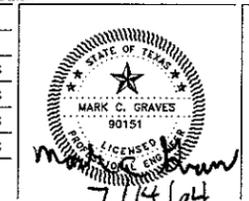


Project: Benson Mark  
 Station: Gm 3/2004  
 In: 10/15/04 File  
 Elev. w: 1636.71



Issue No.	Description	Date	Drawn	Checked	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
D	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

Issue No.	Description	Date	Drawn	Checked	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
D	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



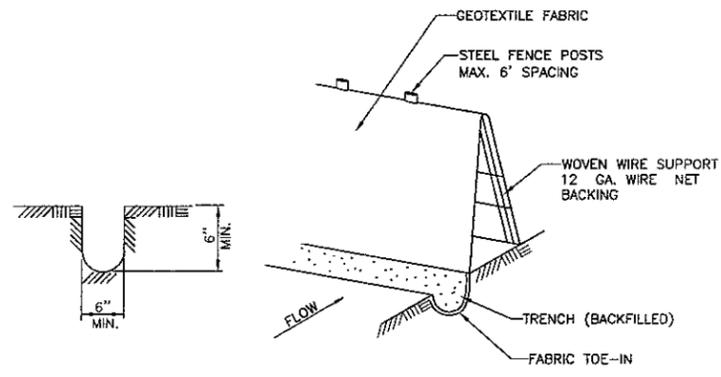
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT PLANT EXPANSION 2004**

THE CITY OF  
**KERRVILLE, TEXAS**

<b>SITE WORK CIVIL</b>	
<b>SITE GRADING AND PAVING PLAN</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	01C-01.DWG
Drawing No.	<b>01C-01</b>
Issue	<b>1</b>



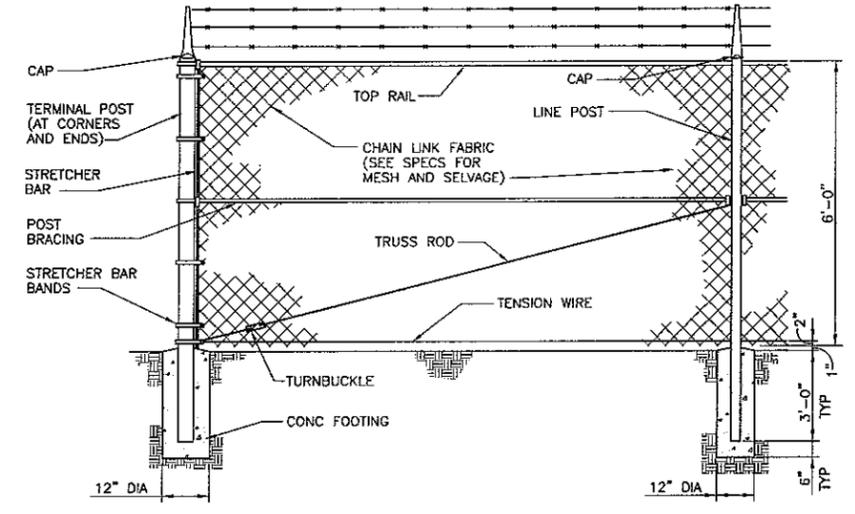
TRENCH CROSS SECTION      SILT FENCE DIAGRAM

**SILT FENCE DETAIL**  
NO SCALE

1  
01C-02

**SILT FENCE NOTES:**

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CAN NOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.



TYPICAL ELEVATION

**CHAIN LINK FENCING DETAIL**  
NO SCALE

2  
01C-02

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

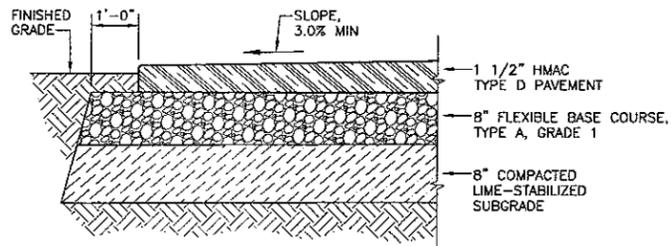
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



WATER TREATMENT PLANT EXPANSION 2004  
THE CITY OF KERRVILLE, TEXAS

**SITE WORK CIVIL  
TYPICAL FENCING AND  
EROSION CONTROL DETAILS**

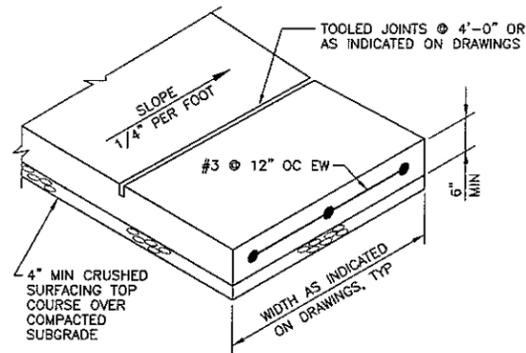
Date	JUNE 2004	Project No.	08340-025-036	Drawing No.	01C-02	Issue	1
Scale	AS NOTED	File Name	01C-02.DWG				



**ASPHALT PAVEMENT DETAIL**  
NO SCALE

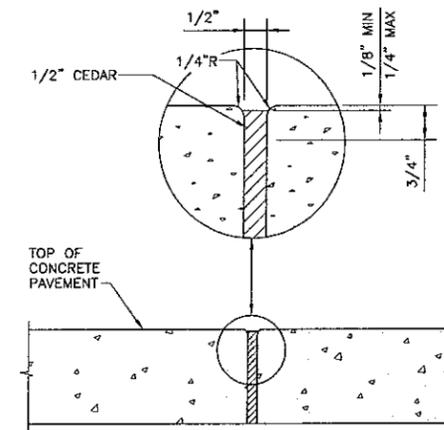
**PAVING AND SURFACING NOTES:**

- ASPHALT PAVEMENT:** HOT MIX ASPHALTIC CONCRETE (HMAC) MATERIALS, PLACEMENT, AND TESTING SHALL CONFORM TO SPECIFICATION 02513.
- PAVEMENT CROWN:** CROWN IN PAVED ROADWAYS SHALL BE PARABOLIC.
- FLEXIBLE BASE COURSE:** CRUSHED LIMESTONE BASE MATERIALS, PLACEMENT, AND TESTING SHALL CONFORM TO SPECIFICATIONS.
- COMPACTED SUBGRADE:** SCARIFY AND COMPACT THE SUBGRADE BELOW CONCRETE PAVEMENT, H.M.A.C. PAVEMENT, BASE SURFACING, AND SIDEWALK AREAS. LIME STABILIZE THE COMPACTED SUBGRADE.
- MISCELLANEOUS:** GRADE ALL AREAS TO DRAIN AWAY FROM STRUCTURE.

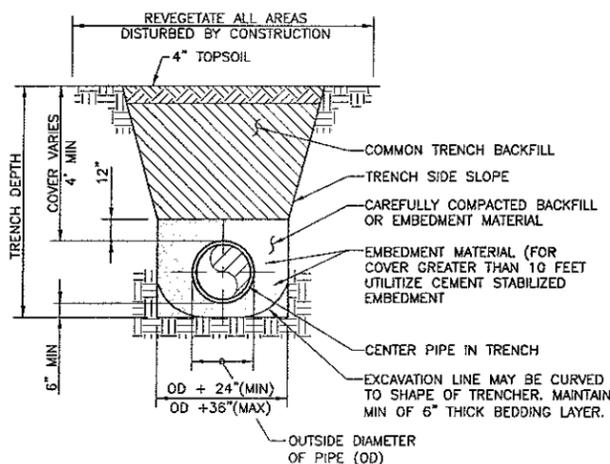


- NOTES:**
- PROVIDE 1/2" PREMOLDED JOINT FILLER (FULL DEPTH) ALL AROUND ALL UTILITY POLES, METER BOXES, BUILDING FOUNDATIONS, ETC.
  - PROVIDE EXPANSION JOINTS AT 30' MAX SPACING, TYPICAL.

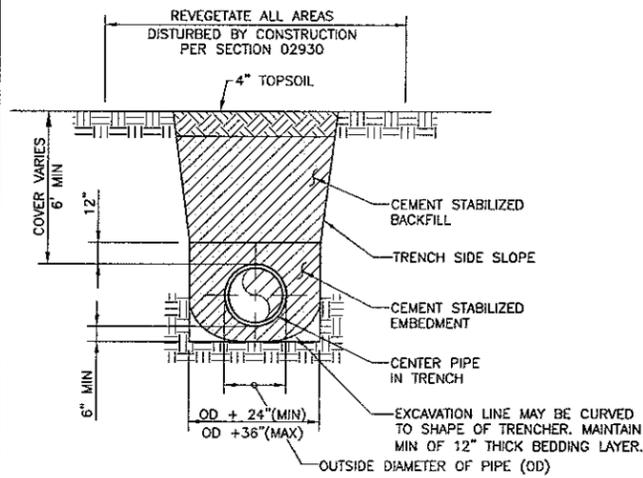
**CONCRETE SIDEWALK DETAIL**  
NO SCALE



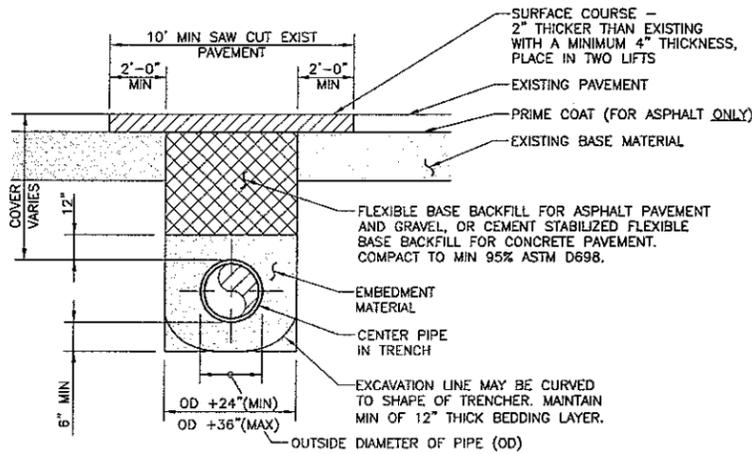
**CONCRETE SIDEWALK EXPANSION JOINT DETAIL**  
NO SCALE



**TYPICAL PIPE EMBEDMENT DETAIL**  
NO SCALE



**CEMENT STABILIZED BACKFILL DETAIL**  
NO SCALE

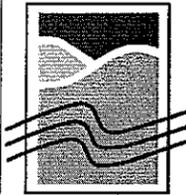


**GRAVEL/ASPHALT/CONCRETE ROAD TRENCH AND REPAIR DETAIL**  
NO SCALE

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

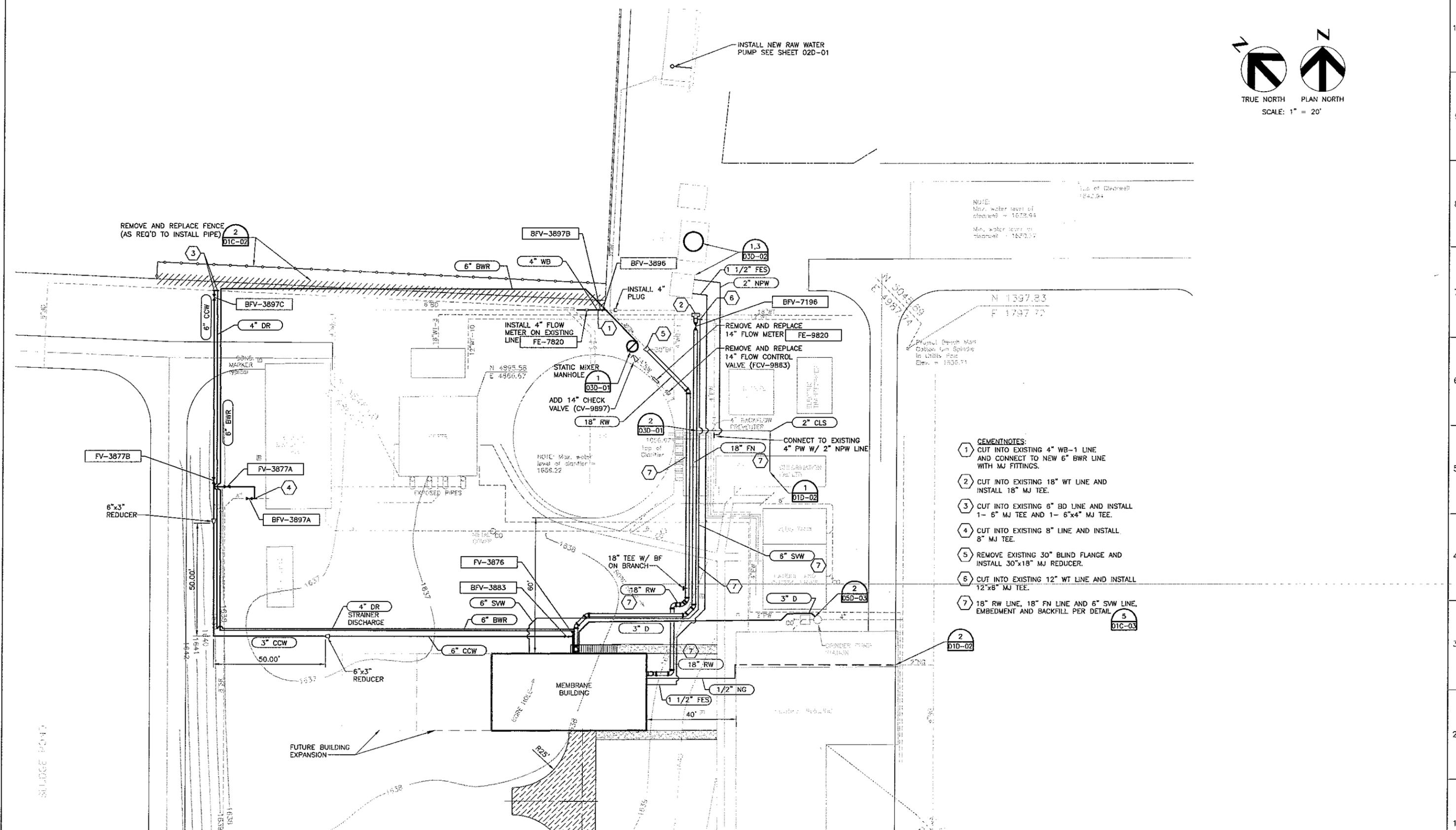
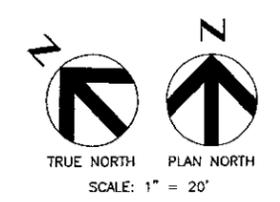


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT PLANT EXPANSION 2004**  
THE CITY OF KERRVILLE, TEXAS

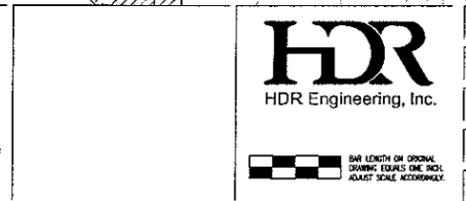
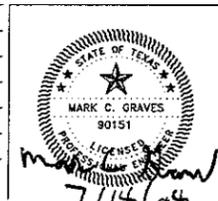
SITE WORK CIVIL EMBEDMENT AND JOINT BONDING DETAILS AND PAVING DETAILS	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
Drawing No.	01C-03
Issue	1



- CEMENT NOTES:**
- 1 CUT INTO EXISTING 4" WB-1 LINE AND CONNECT TO NEW 6" BWR LINE WITH MJ FITTINGS.
  - 2 CUT INTO EXISTING 18" WT LINE AND INSTALL 18" MJ TEE.
  - 3 CUT INTO EXISTING 6" BD LINE AND INSTALL 1- 6" MJ TEE AND 1- 6"x4" MJ TEE.
  - 4 CUT INTO EXISTING 8" LINE AND INSTALL 8" MJ TEE.
  - 5 REMOVE EXISTING 30" BLIND FLANGE AND INSTALL 30"x18" MJ REDUCER.
  - 6 CUT INTO EXISTING 12" WT LINE AND INSTALL 12"x6" MJ TEE.
  - 7 18" RW LINE, 18" FN LINE AND 6" SVW LINE, EMBEDMENT AND BACKFILL PER DETAIL.

1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

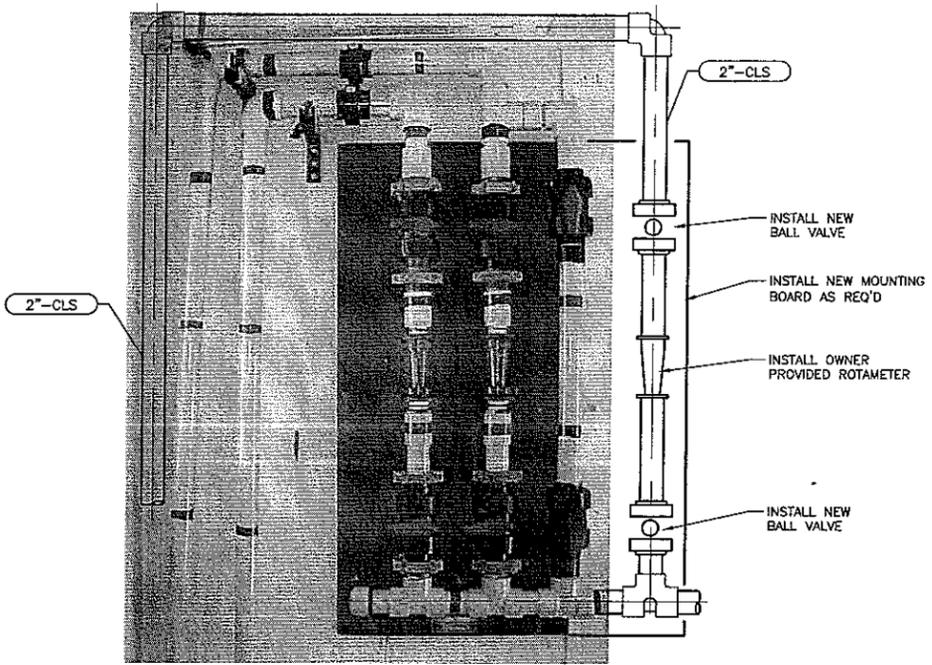


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



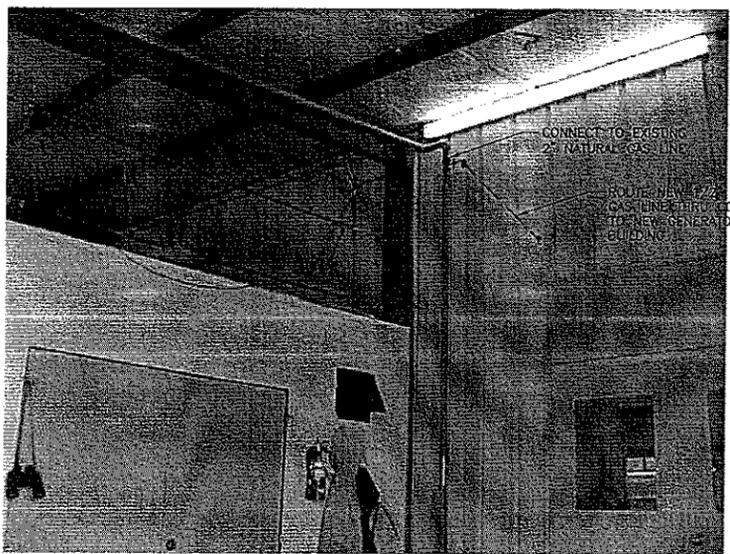
**WATER TREATMENT PLANT EXPANSION 2004**  
THE CITY OF KERRVILLE, TEXAS

<b>SITE WORK PROCESS</b>	
<b>YARD PIPING PLAN</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	01D-01.DWG
Drawing No.	<b>01D-01</b>
Issue	<b>1</b>



**ROTAMETER INSTALLATION DETAIL**  
NO SCALE

1  
01D-02



**NATURAL GAS CONNECTION DETAIL**  
NO SCALE

2  
01D-02

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
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A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

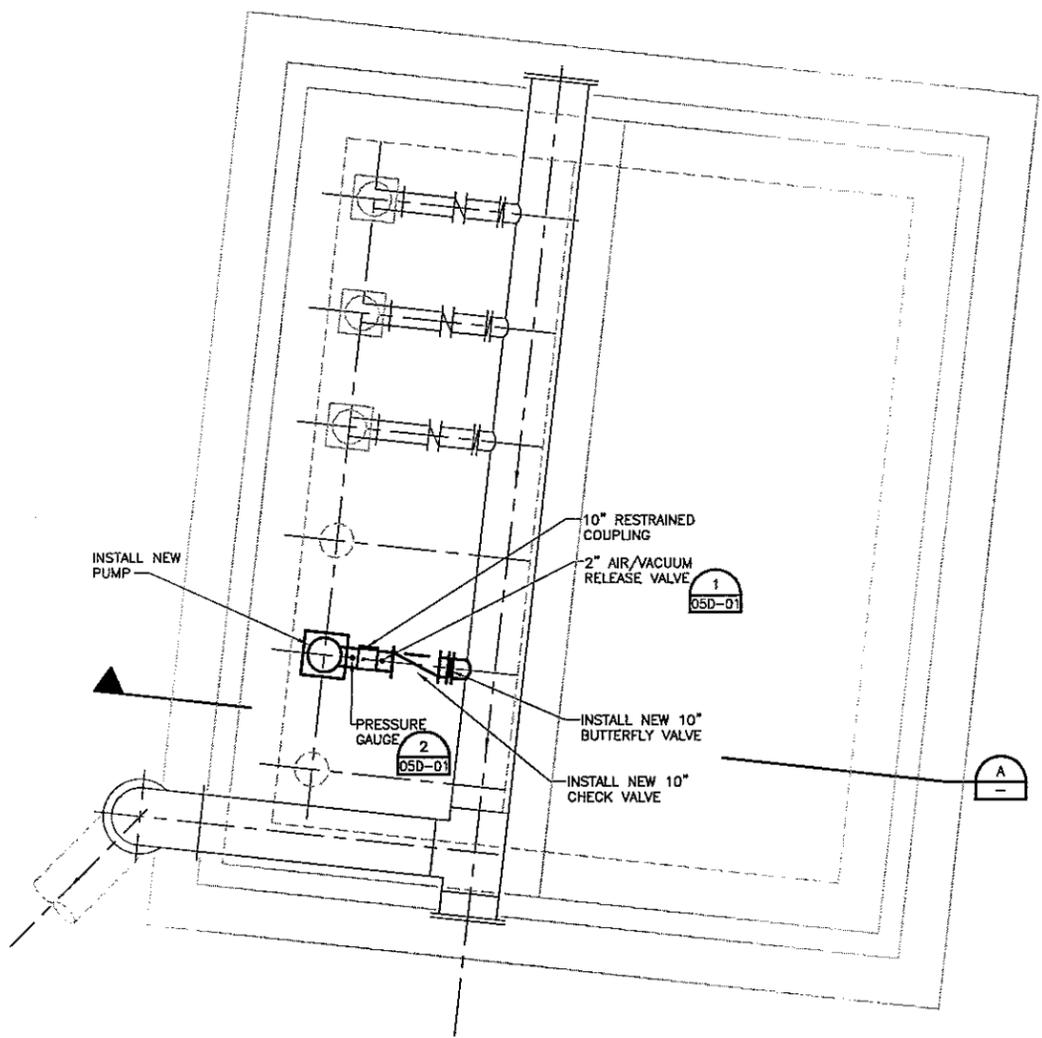


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN

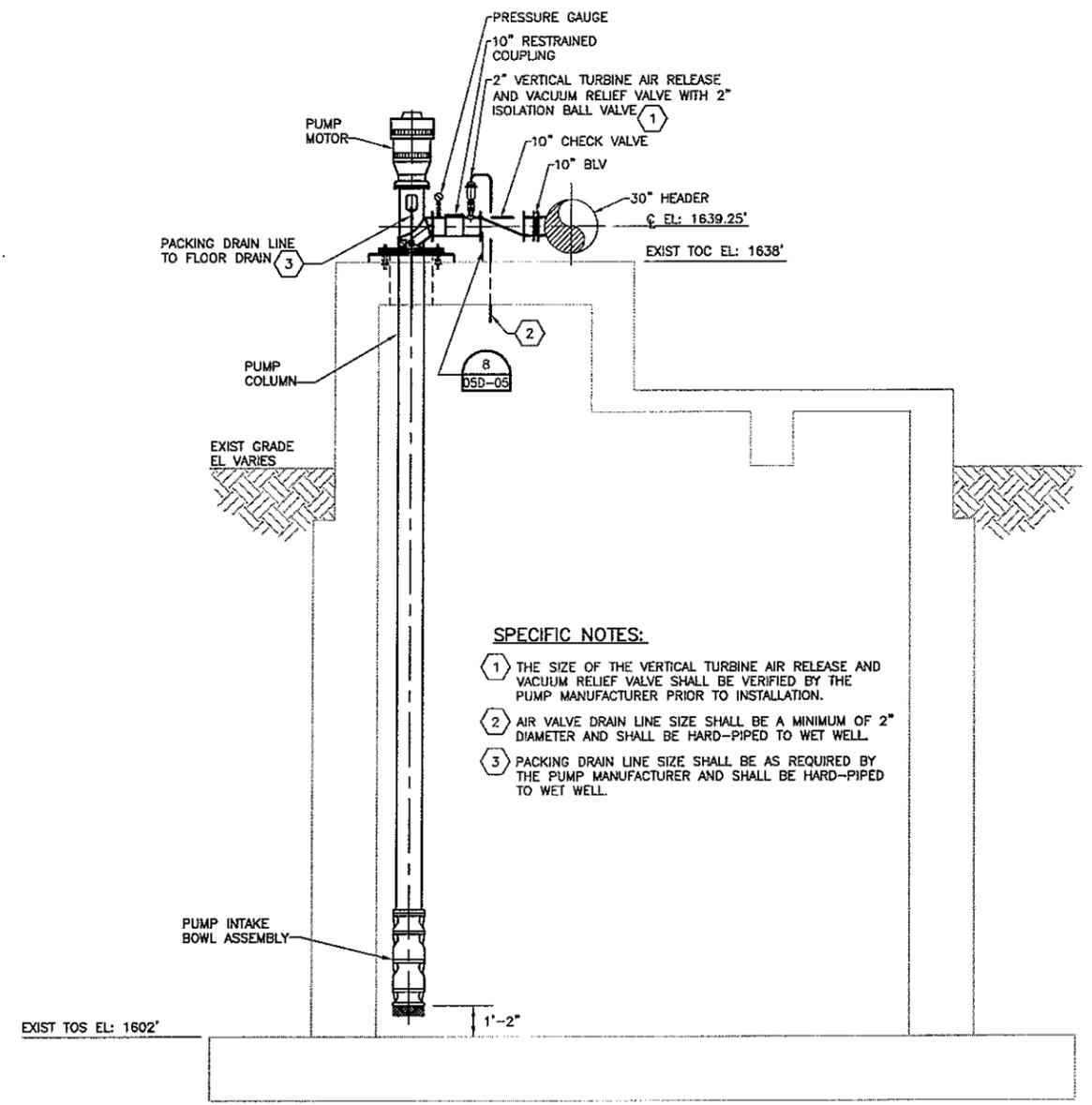


**WATER TREATMENT PLANT EXPANSION 2004**  
THE CITY OF  
**KERRVILLE, TEXAS**

<b>SITE WORK PROCESS DETAILS</b>		Date	JUNE 2004	Project No.	08340-025-036	Drawing No.	01D-02	Issue	1
		Scale	AS NOTED	File Name	01D-02.DWG				



**RAW WATER PUMPING STATION PLAN**  
1/4" = 1'-0"

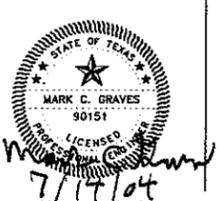


- SPECIFIC NOTES:**
- 1 THE SIZE OF THE VERTICAL TURBINE AIR RELEASE AND VACUUM RELIEF VALVE SHALL BE VERIFIED BY THE PUMP MANUFACTURER PRIOR TO INSTALLATION.
  - 2 AIR VALVE DRAIN LINE SIZE SHALL BE A MINIMUM OF 2" DIAMETER AND SHALL BE HARD-PIPED TO WET WELL.
  - 3 PACKING DRAIN LINE SIZE SHALL BE AS REQUIRED BY THE PUMP MANUFACTURER AND SHALL BE HARD-PIPED TO WET WELL.

**SECTION**  
1/4" = 1'-0"

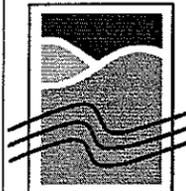
C:\WINDM\08340-025-036 WTP\PROJECT-DWG\02D-01.DWG, Plot: 07/14/2004 02:15:10 PM, sfrankli

Issue No.	Description	Date	Drawn	Checked	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/13/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



ONE LENGTH OR ORIGINAL  
OVERSIZING TEAMS ONE INCH  
ADJUST SCALE ACCORDINGLY

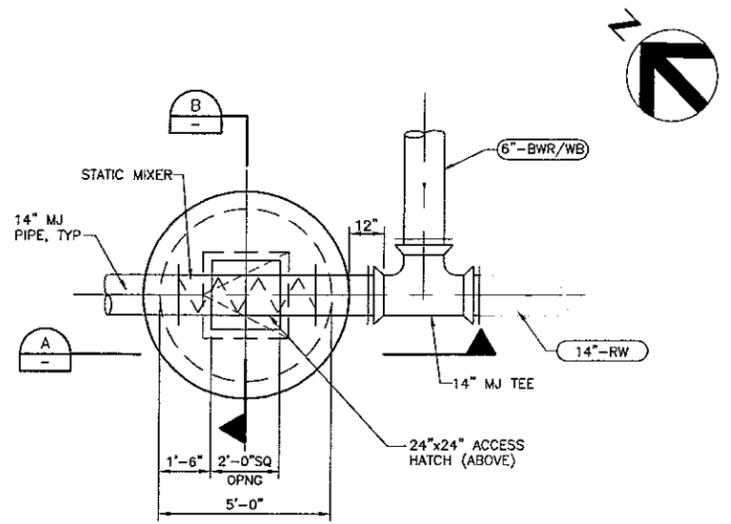
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



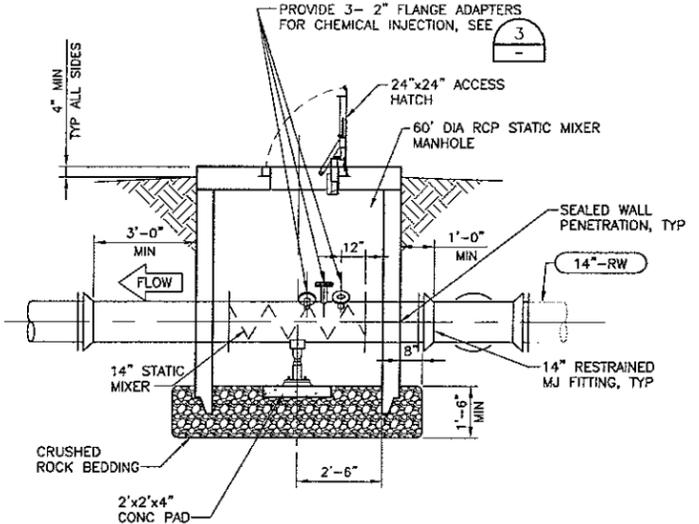
**WATER TREATMENT  
PLANT EXPANSION  
2004**

THE CITY OF  
**KERRVILLE, TEXAS**

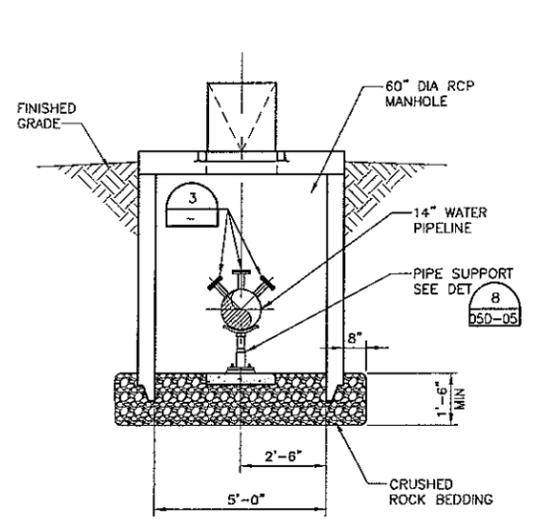
<b>RAW WATER PUMPING STATION PROCESS</b>		<b>PLAN AND SECTION</b>	
Date	JUNE 2004	Project No.	08340-025-036
Scale	AS NOTED	File Name	02D-01.DWG
Issue No.	02D-01	Issue	1



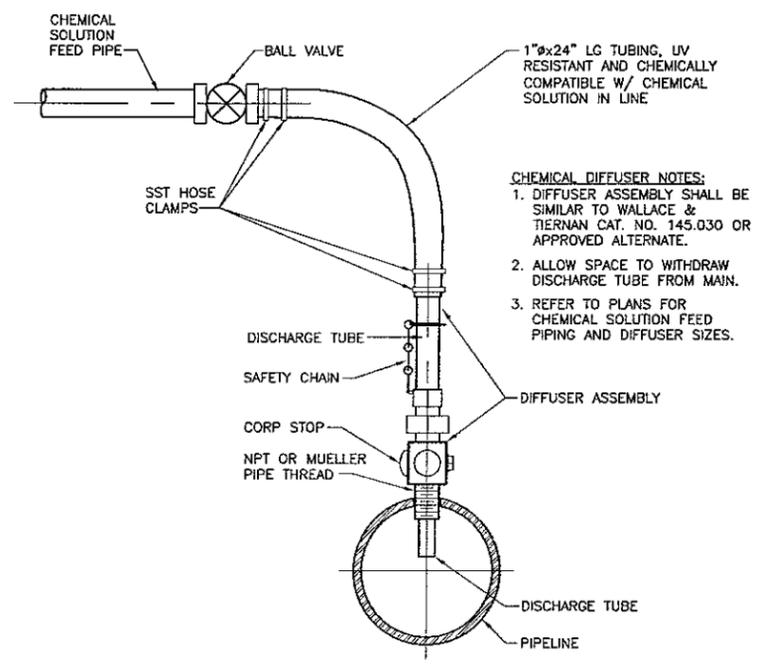
**STATIC MIXER MANHOLE DETAIL**  
3/8" = 1'-0"  
03D-01



**SECTION**  
3/8" = 1'-0"  
A

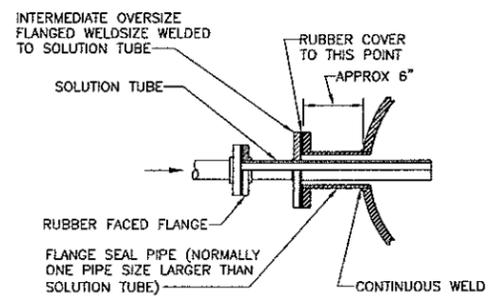


**SECTION**  
3/8" = 1'-0"  
B



**CHEMICAL SOLUTION INJECTION DIFFUSER DETAIL**  
NO SCALE  
03D-01

- CHEMICAL DIFFUSER NOTES:**
1. DIFFUSER ASSEMBLY SHALL BE SIMILAR TO WALLACE & TIERNAN CAT. NO. 145.030 OR APPROVED ALTERNATE.
  2. ALLOW SPACE TO WITHDRAW DISCHARGE TUBE FROM MAIN.
  3. REFER TO PLANS FOR CHEMICAL SOLUTION FEED PIPING AND DIFFUSER SIZES.



**FLANGE ADAPTOR DETAIL**  
3/8" = 1'-0"  
03D-01

1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG
Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.



Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT PLANT EXPANSION 2004**  
THE CITY OF KERRVILLE, TEXAS

<b>COAGULANT FEED SYSTEM PROCESS</b>	
<b>STATIC MIXER MANHOLE DETAIL AND MISCELLANEOUS DETAILS</b>	
Date	JUNE 2004
Scale	AS NOTED
Project No.	08340-025-036
File Name	03D-01.DWG
Drawing No.	<b>03D-01</b>
Issue	<b>1</b>

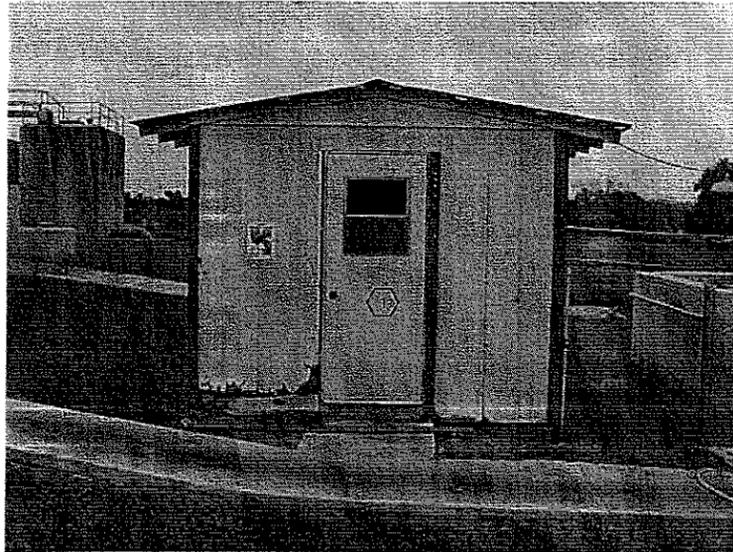


PHOTO  
NO SCALE

1  
03D-02

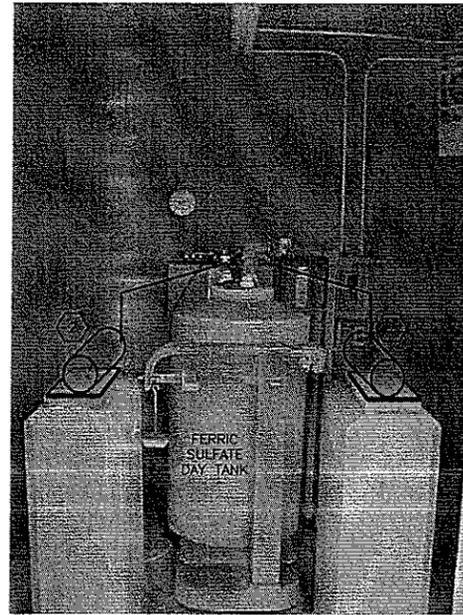
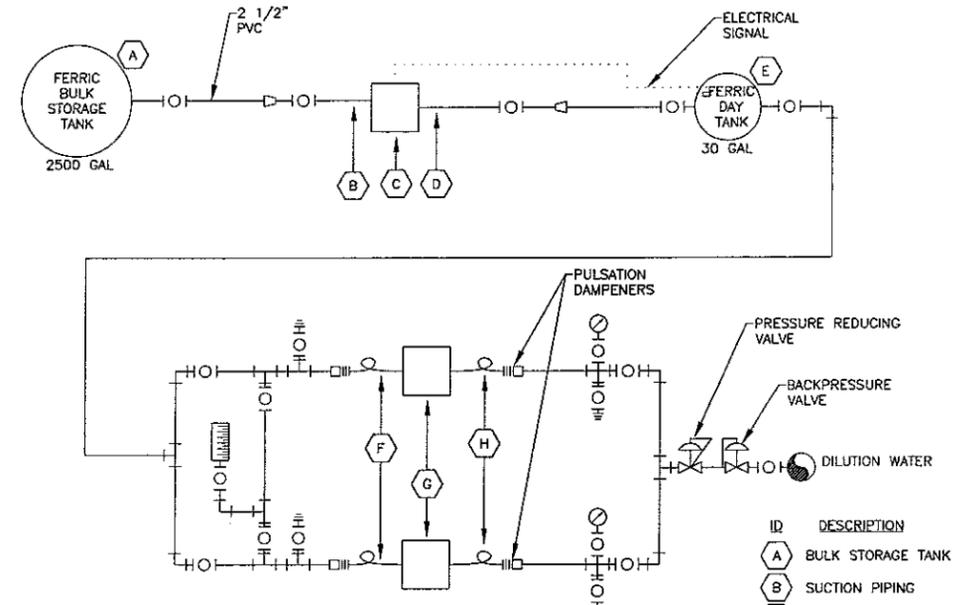


PHOTO  
NO SCALE

2  
03D-02

- 1 NEW FERRIC SULFATE FEED PUMPS TO BE HOUSED IN EXISTING BUILDING.
- 2 INSTALL NEW FERRIC SULFATE FEED PUMPS.
- 3 EXISTING BULK STORAGE TANK TO BE REMOVED BY OTHERS PRIOR TO CONSTRUCTION AND CONTRACTOR SHALL REPLACE WITH NEW FERRIC SULFATE BULK STORAGE TANK AND ANCILLARY PIPING AND EQUIPMENT AS SPECIFIED.
- 4 REMOVE EXISTING COATING ON ALL CONCRETE SURFACES. COAT ALL INTERIOR CONCRETE SURFACES WITH FERRIC SULFATE COMPATIBLE COATING AS SPECIFIED.



FERRIC SULFATE FEED SYSTEM SCHEMATIC  
NO SCALE

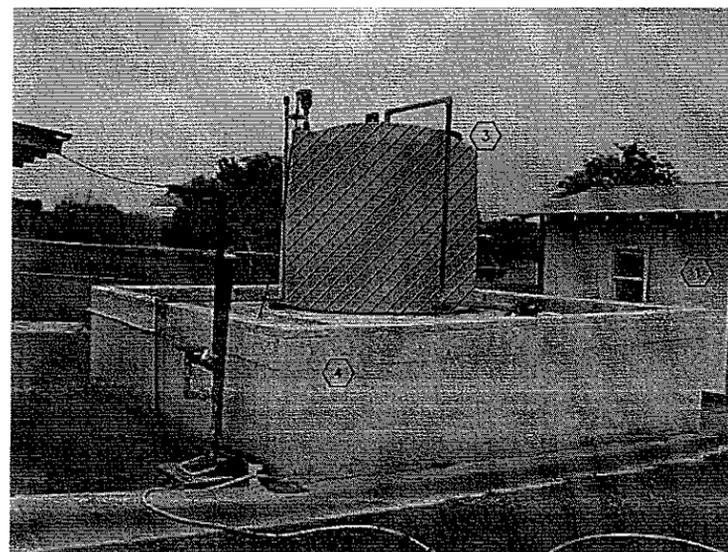
ID	DESCRIPTION	ES
A	BULK STORAGE TANK	FSBST
B	SUCTION PIPING	1.5"
C	TRANSFER PUMP	FSTP
D	DISCHARGE PIPING	1.5"
E	DAY TANK	FSDT
G	METERING PUMPS	FSMP
H	DISCHARGE PIPING TO APPLICATION POINT	3/4"



BULK STORAGE TANK AND CONTAINMENT WALL EAST ELEVATION

PHOTO  
NO SCALE

3  
03D-02



BULK STORAGE TANK AND CONTAINMENT WALL WEST ELEVATION

PHOTO  
NO SCALE

4  
03D-02

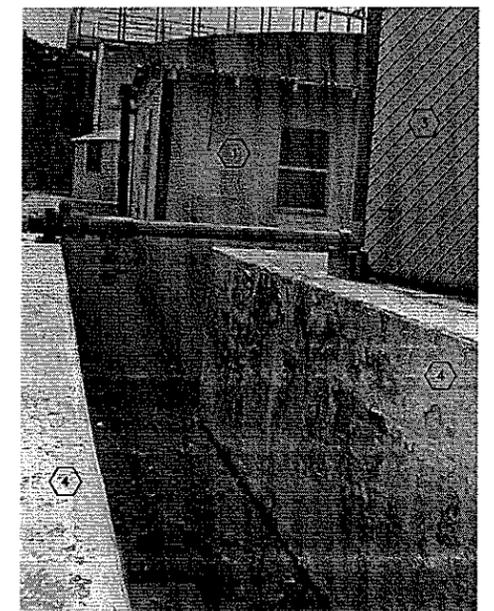


PHOTO  
1/4" = 1'-0"

5  
03D-02

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADAPT SCALE ACCORDINGLY.

Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN

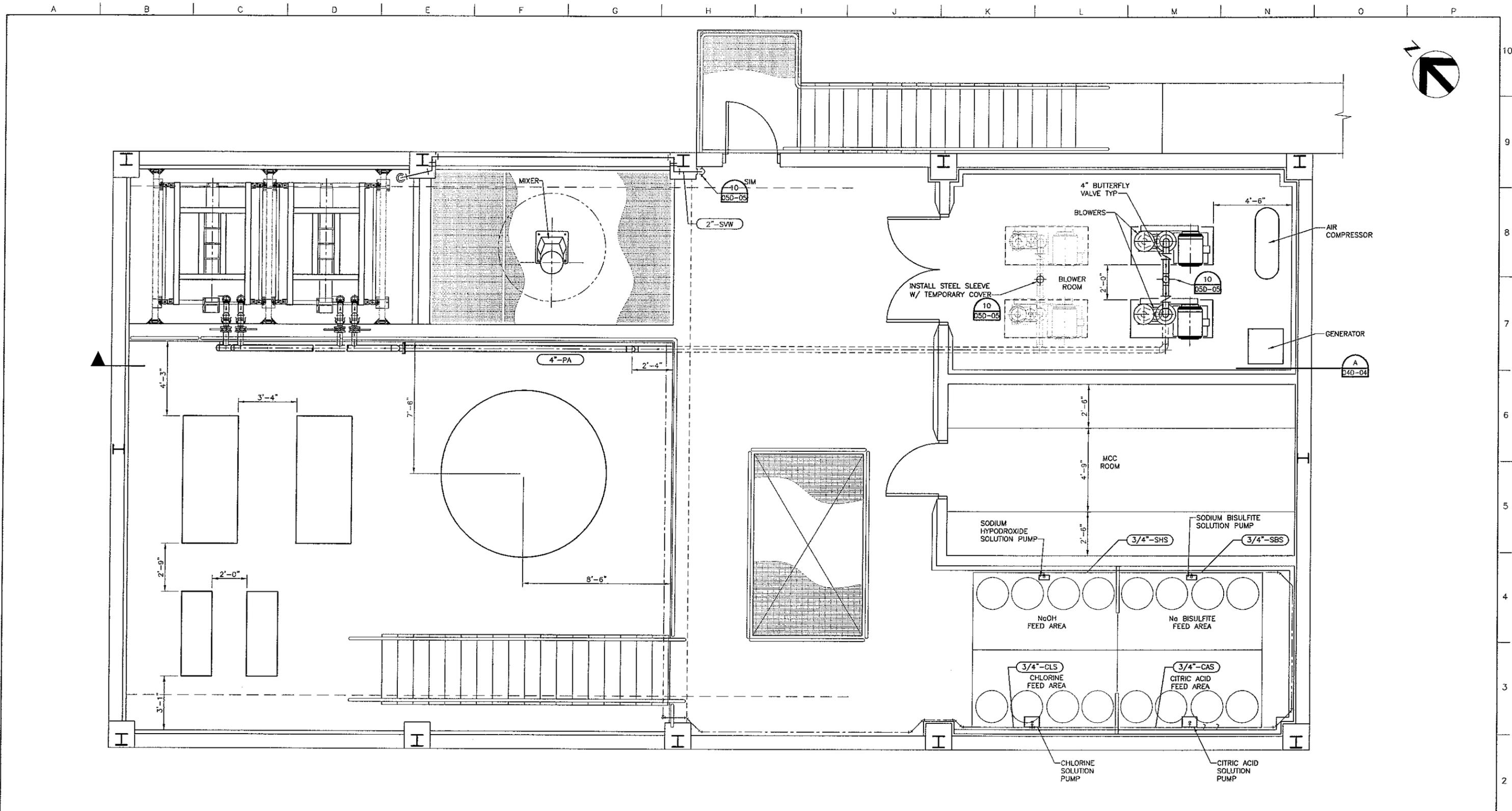


WATER TREATMENT  
PLANT EXPANSION  
2004

THE CITY OF  
KERRVILLE, TEXAS

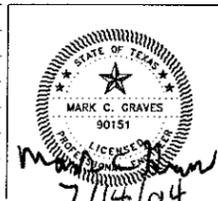
COAGULANT FEED SYSTEM  
PROCESS  
EXISTING CHEMICAL FEED FACILITIES  
RENOVATION

Date	JUNE 2004	Project No.	08340-025-036	Drawing No.	03D-02	Issue	1
Scale	AS NOTED	File Name	03D-02.DWG				



UPPER LEVEL FLOOR PLAN  
3/8" = 1'-0"

1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	--	JJC	MCG
Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

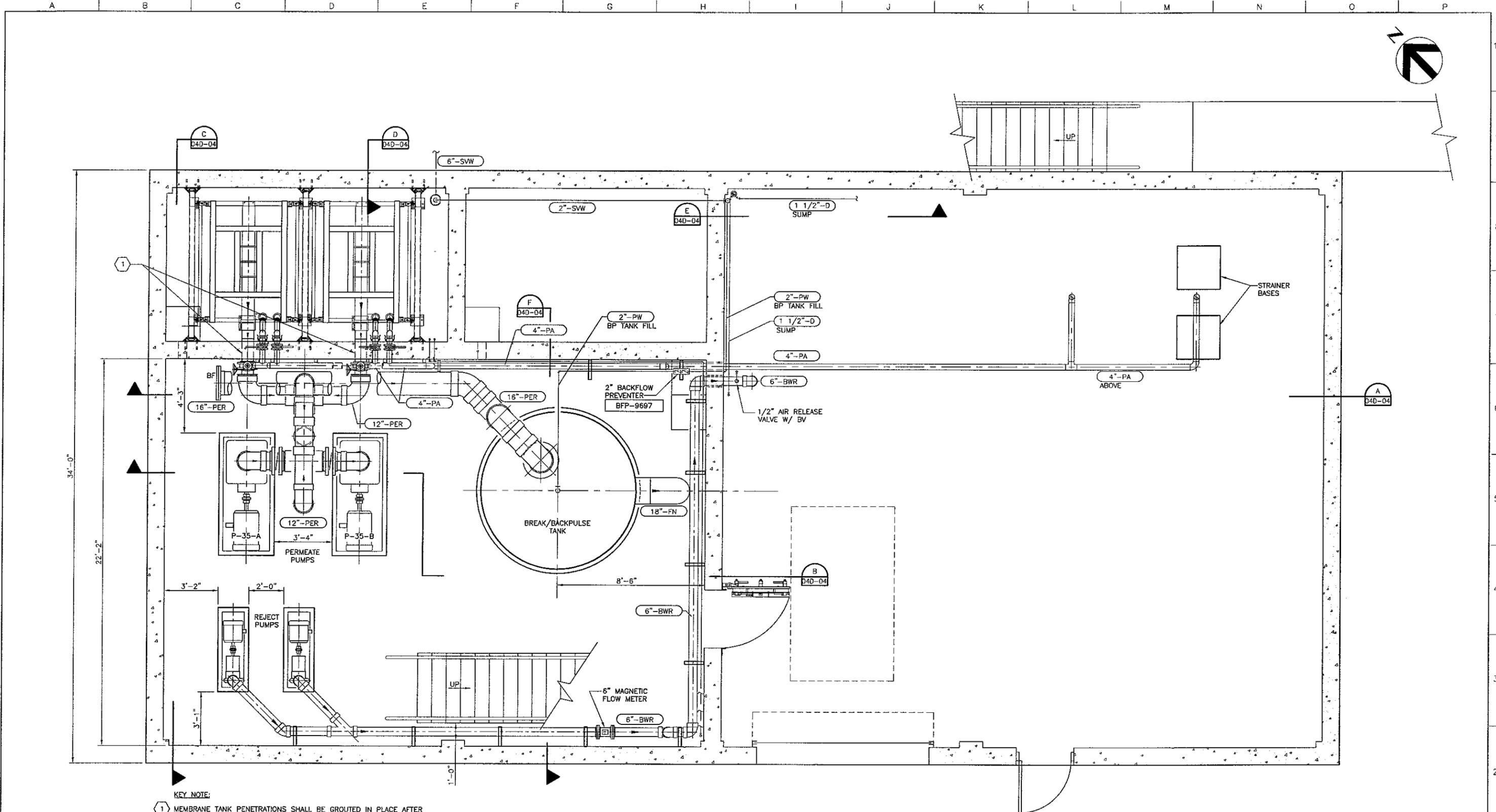


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



WATER TREATMENT  
PLANT EXPANSION  
2004  
THE CITY OF  
KERRVILLE, TEXAS

MEMBRANE SYSTEM PROCESS		UPPER LEVEL FLOOR PLAN	
Date	JUNE 2004	Project No.	08340-025-035
Scale	AS NOTED	File Name	04D-01.DWG
Drawing No.	04D-01	Issue	1



**KEY NOTE:**  
 1 MEMBRANE TANK PENETRATIONS SHALL BE GROUTED IN PLACE AFTER INSTALLATION OF MEMBRANE EQUIPMENT. COAT GROUT ON INTERIOR OF TANK AS SPECIFIED BY SYSTEM #6 SPECIFICATION SECTION 09905.

**GROUND LEVEL PLAN ABOVE EL:1644.83**  
 3/8" = 1'-0"

1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG
Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.



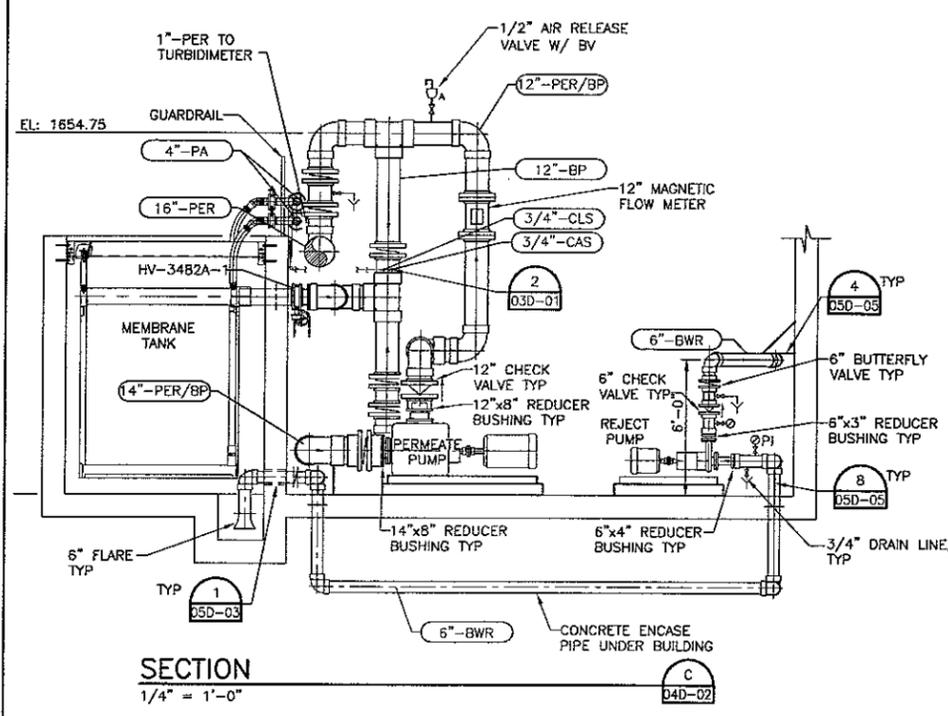
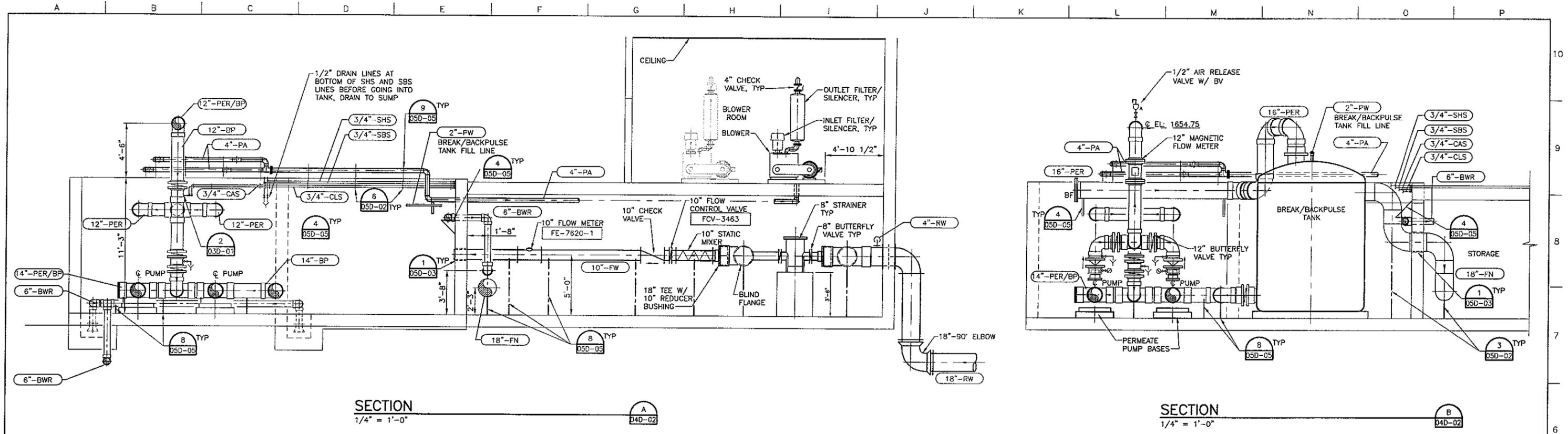
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Design	
Checked	B. BENJES
Drawn	S. R. FRANKLIN



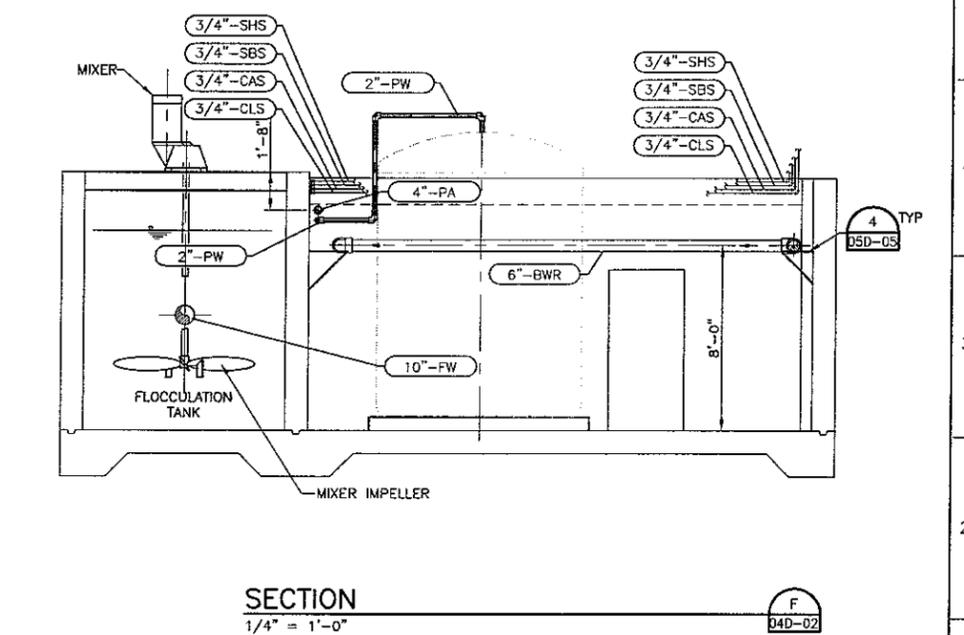
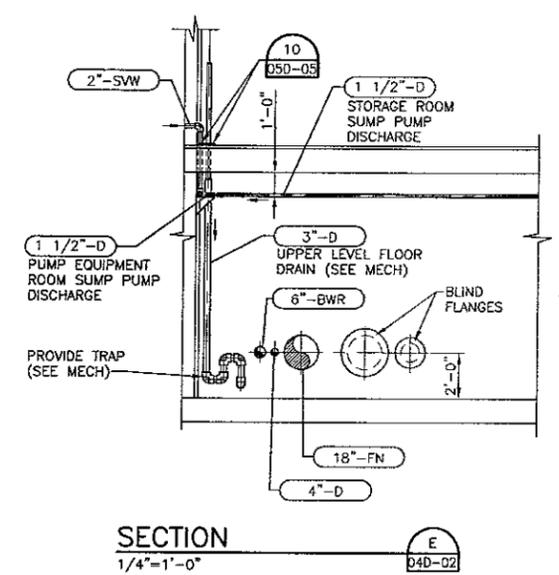
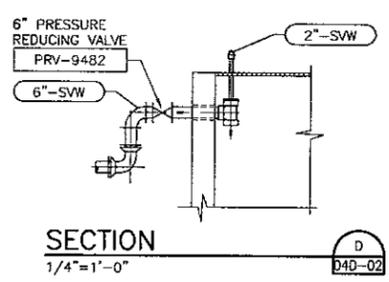
**WATER TREATMENT  
 PLANT EXPANSION  
 2004**  
 THE CITY OF  
**KERRVILLE, TEXAS**

<b>MEMBRANE SYSTEM    PROCESS</b>		Date	JUNE 2004	Project No.	08340-025-036
		Scale	AS NOTED	File Name	04D-02.DWG
<b>GROUND LEVEL PLAN    ABOVE ELEVATION 1644.83</b>		Drawing No.	04D-02		Issue
				1	





NOTE:  
ALL VALVES OVER 5'-0" AFF  
SHALL HAVE CHAIN WHEEL  
OPERATORS UNLESS  
SPECIFIED OTHERWISE.



Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

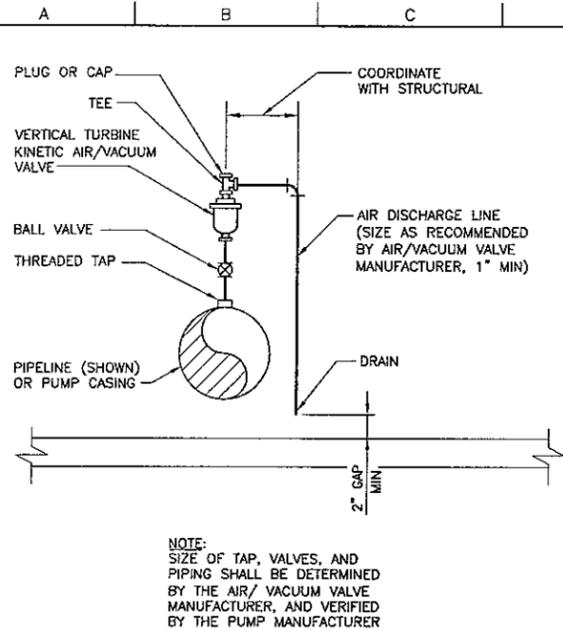


Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



WATER TREATMENT  
PLANT EXPANSION  
2004  
THE CITY OF  
KERRVILLE, TEXAS

MEMBRANE SYSTEM PROCESS SECTIONS		Date	Project No.	Drawing No.	Issue
		JUNE 2004	08340-025-036	04D-04	1
		AS NOTED	04D-04.DWG		



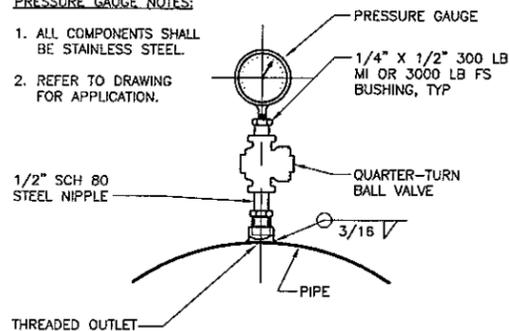
**AIR/VACUUM VALVE DETAIL**

NO SCALE

1  
05D-01

**PRESSURE GAUGE NOTES:**

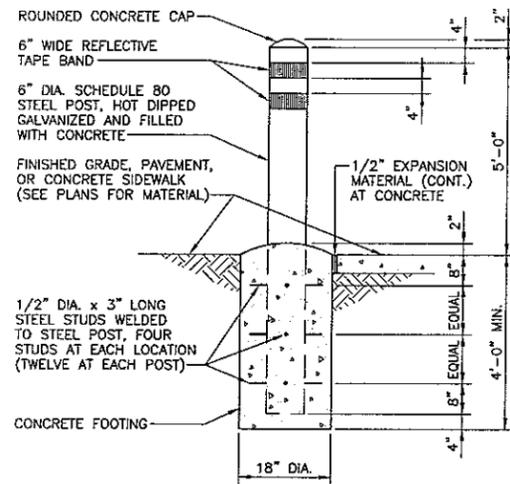
1. ALL COMPONENTS SHALL BE STAINLESS STEEL.
2. REFER TO DRAWING FOR APPLICATION.



**PRESSURE GAUGE DETAIL**

NO SCALE

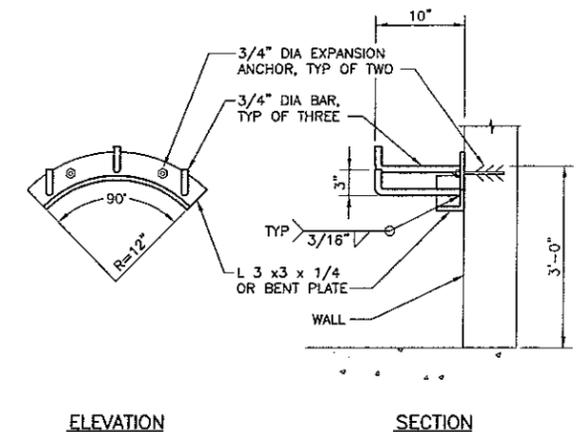
2  
05D-01



**GUARD POST DETAIL**

NO SCALE

3  
05D-01



**ELEVATION**

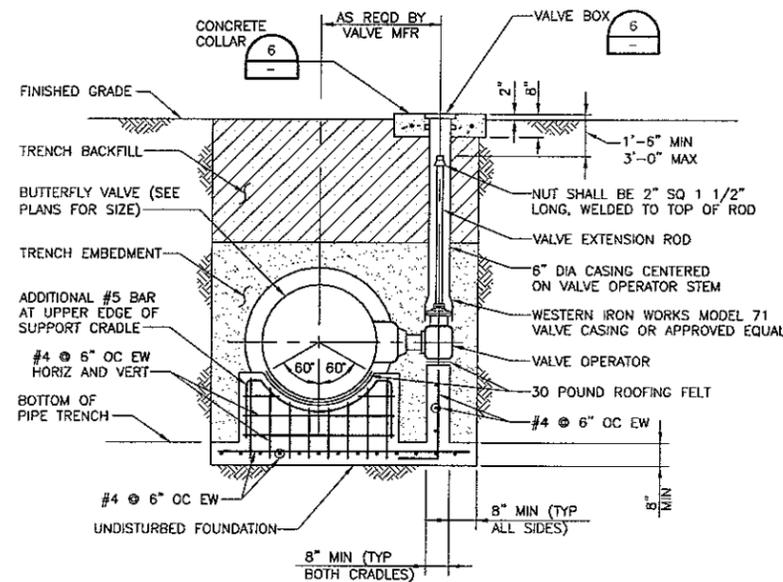
**SECTION**

**WALL MOUNTED HOSE RACK DETAIL**

NO SCALE

4  
05D-01

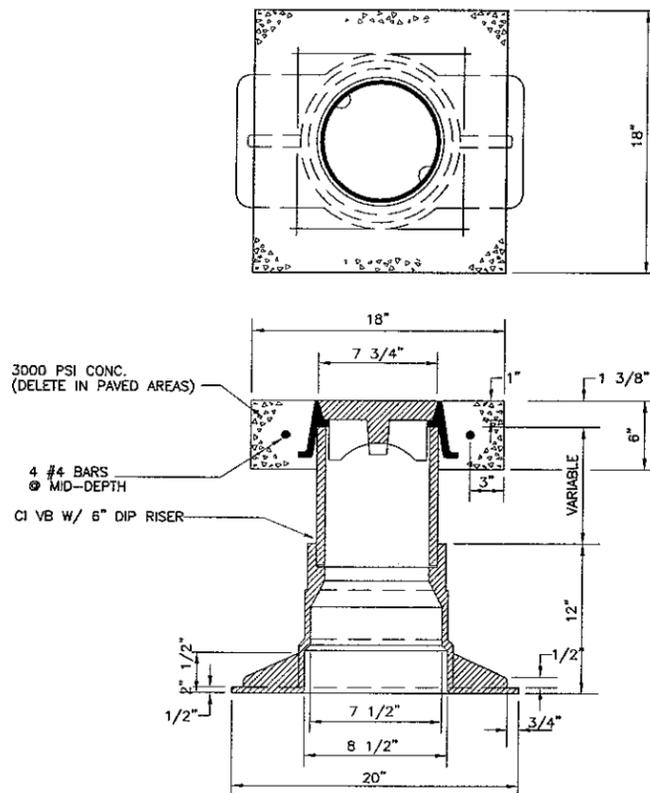
- NOTES:**
1. RESTRAIN ALL PIPE JOINTS ON BURIED BUTTERFLY VALVES.
  2. CONCRETE SUPPORT CRADLE AND SUPPORT PAD SHALL BE 3000 P.S.I. READY-MIX CONCRETE WITH A MINIMUM OF 517 POUNDS PER CUBIC YARD TYPE 1 CEMENT AND A MAXIMUM SLUMP OF 4 INCHES.



**BURIED BUTTERFLY VALVE DETAIL**

NO SCALE

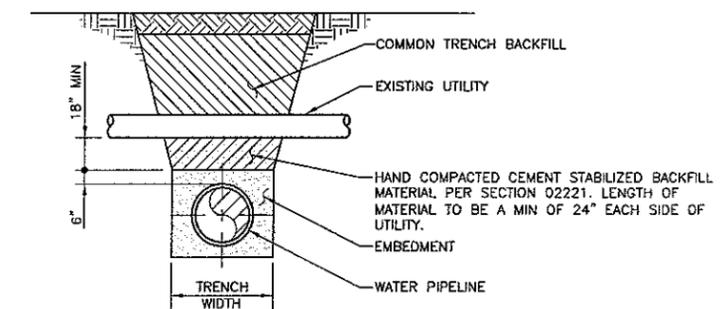
5  
05D-01



**VALVE BOX DETAIL**

NO SCALE

6  
05D-01



**EXISTING UTILITY CROSSING DETAIL**

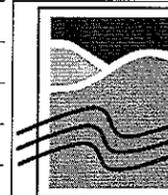
NO SCALE

7  
05D-01

Issue No.	Description	Date	Drawn	Checked	Responsible Engr.	Project Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	06/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	--	JJC	MCG



Project Manager  
M. C. GRAVES  
Designed  
J. J. CHRISTENSEN  
Checked  
B. BENJES  
Drawn  
S. R. FRANKLIN



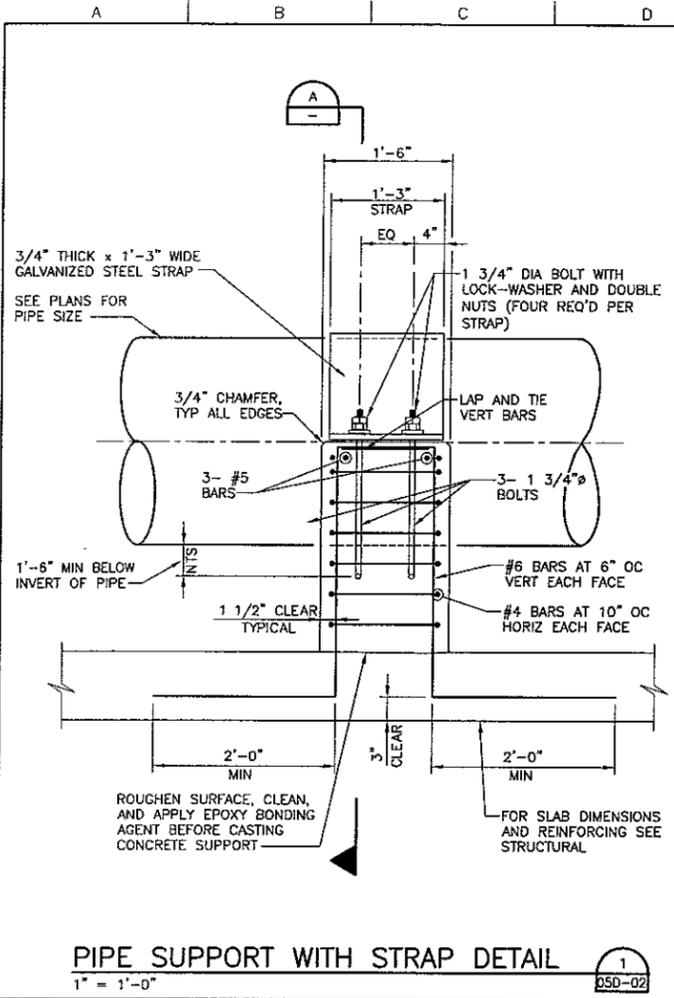
WATER TREATMENT  
PLANT EXPANSION  
2004

THE CITY OF  
KERRVILLE, TEXAS

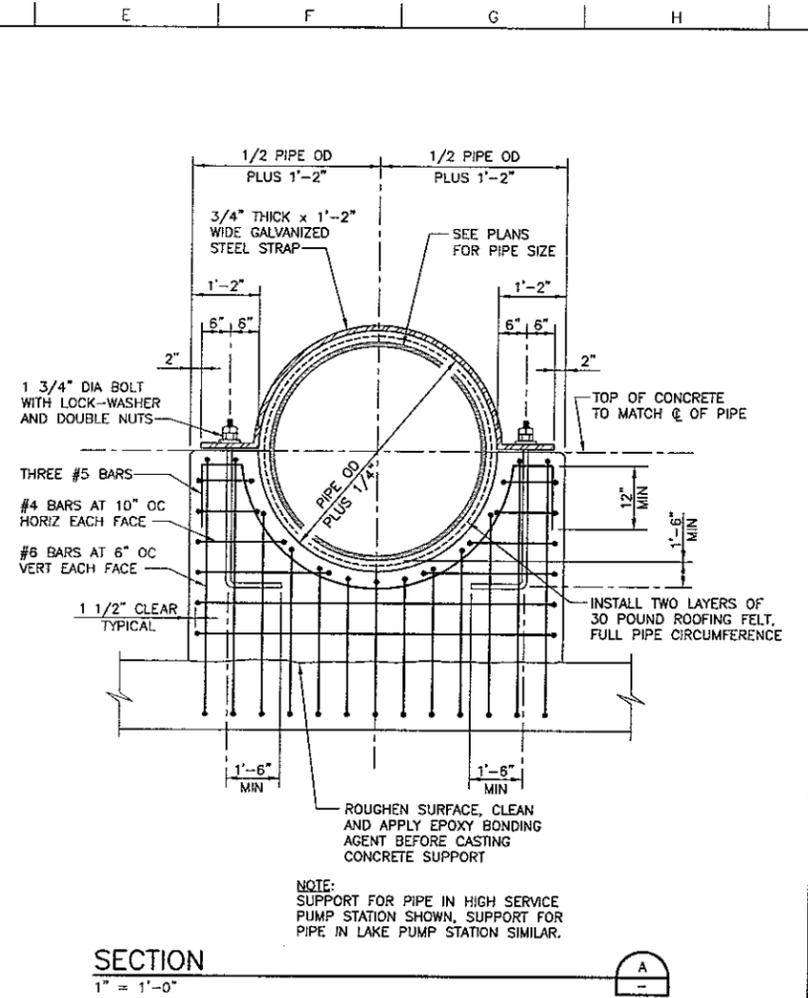
MISCELLANEOUS IMPROVEMENTS  
AND GENERAL DETAILS  
PROCESS

MISCELLANEOUS DETAILS

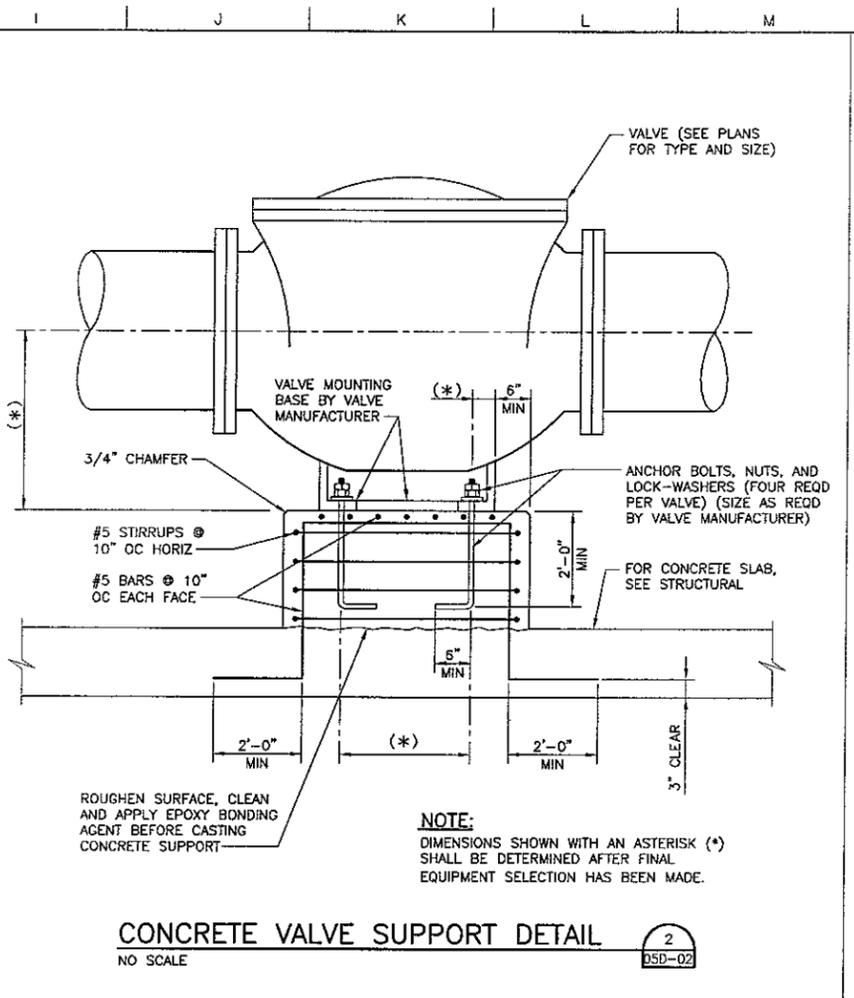
Date	JUNE 2004	Project No.	08340-025-036	Drawing No.	05D-01	Issue	1
Scale	AS NOTED	File Name	05D-01.DWG				



**PIPE SUPPORT WITH STRAP DETAIL**  
1  
1" = 1'-0"  
05D-02



**SECTION**  
1" = 1'-0"  
05D-02



**CONCRETE VALVE SUPPORT DETAIL**  
2  
NO SCALE  
05D-02

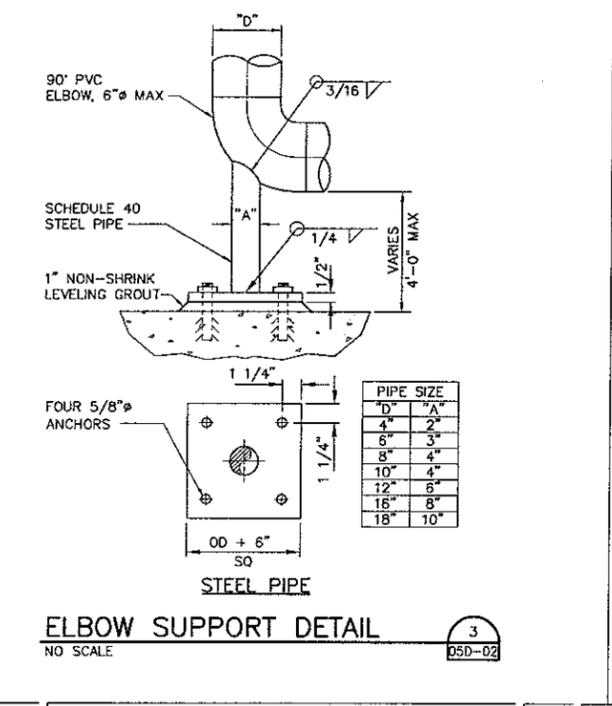
**PIPE/CONDUIT SUPPORT NOTES:**

PROVIDE PIPE SUPPORTS FOR ALL PIPE AND CONDUITS IN ACCORDANCE WITH THESE DETAILS AND SECTION 15090. THE TERM "PIPE" OR "PIPING" REFERS TO BOTH PIPE AND ELECTRICAL CONDUIT UNLESS THE LANGUAGE REFERS TO EACH SPECIFICALLY.

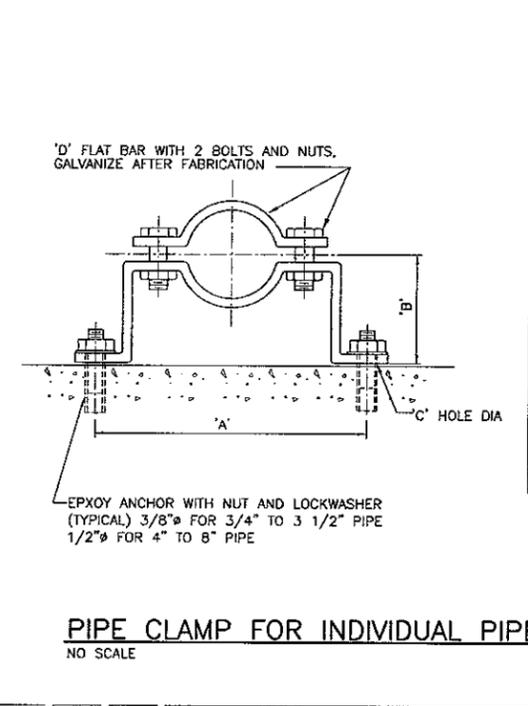
SUPPORTS FOR PIPING 4" AND LARGER ARE IDENTIFIED ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR SELECTION OF SUPPORTS FOR PIPING SMALLER THAN 6" USING DETAILS SHOWN ON THIS SHEET. CONTRACTOR MAY USE ALTERNATE DETAILS WITH THE ENGINEER'S REVIEW AND APPROVAL IF THE DETAILS SHOWN ARE UNSUITABLE FOR CONDITIONS ENCOUNTERED.

CORROSIVE ENVIRONMENTS ARE DEFINED AS FOLLOWS: AREAS WITHIN OR ABOVE WATER BEARING STRUCTURES, CHEMICAL STORAGE ROOMS AND AREAS BELOW THE RIM OF SECONDARY CONTAINMENT STRUCTURES, UNVENTILATED ROOMS AND OTHER ENCLOSED AREAS WHERE MOISTURE ACCUMULATIONS MAY OCCUR (INCLUDING VAULTS), OTHER LOCATIONS SUBJECT TO SPLASH OR SPILLAGE, AND WHERE SHOWN ON THE PLANS.

- GENERAL NOTES:**
- ANCHORS & ALL-THREADS: USE FRP ALL-THREADS, WASHERS, AND NUTS IN CORROSIVE AREAS, CADMIUM PLATED STEEL ELSEWHERE. INSTALL USING "EPCON SYSTEM" ADHESIVE ANCHOR BY ITW RAMSET/REDHEAD OR APPROVED EQUAL. INSTALL PER MFR.'S WRITTEN INSTRUCTIONS. EMBEDMENT DEPTH AND TYPE SHALL BE AS RECOMMENDED BY THE MFR. OR 12 X DIA., WHICHEVER IS GREATER. BEAM CLAMPS MAY BE USED IN LIEU OF EPOXY ANCHORAGE WHERE SUITABLE CONDITIONS EXIST. BEAM CLAMPS TO BE FRP OR CADMIUM PLATED STEEL TO MATCH HANGER RODS.
  - STRUCTURAL FRAMING CHANNEL (SFC): USE FRP W/ STAINLESS STEEL HARDWARE IN CORROSIVE AREAS, GALVANIZED W/ CADMIUM PLATED STEEL HARDWARE ELSEWHERE. SFC TO BE UNISTRUT, ACKENSTRUT, OR APPROVED EQUAL.
  - PIPE CLAMPS FOR SFC: USE FRP CLAMPS W/ NYLON FASTENERS IN CORROSIVE AREAS, CADMIUM PLATED STEEL CLAMPS AND HARDWARE ELSEWHERE. INSTALL PER MFRS RECOMMENDATIONS.
  - SWAY BRACING: PROVIDE BRACING ADJACENT TO 90° BENDS FOR SUSPENDED PIPE. USE GRINNEL FIG. 211 SIZE A FOR PIPE 6" AND SMALLER, SIZE B FOR PIPE 8" AND LARGER. ALTERNATE TYPE OF BRACING IS ACCEPTABLE.
  - SPACING: PROVIDE SUPPORTS AT THE SPACINGS SHOWN IN SECTION 15090 IF SPACING OR SUPPORT LOCATIONS ARE NOT SHOWN ON THE DRAWINGS.
  - CUTTING FRP: CUT AND COAT CUT ENDS OF ALL FRP COMPONENTS W/ RESIN AS RECOMMENDED BY COMPONENT MFR.



**ELBOW SUPPORT DETAIL**  
3  
NO SCALE  
05D-02



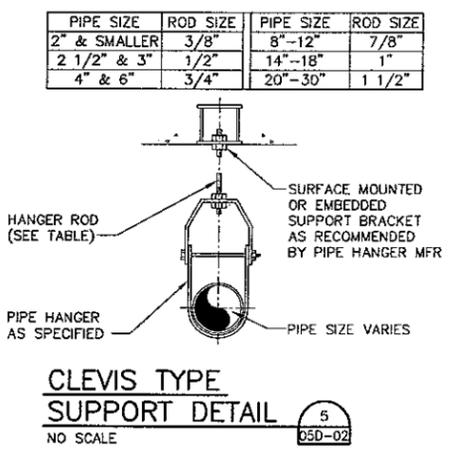
**PIPE CLAMP FOR INDIVIDUAL PIPES**  
4  
NO SCALE  
05D-02

PIPE DIA.	'A'	'B' SEE NOTE 3 BELOW	'C' HOLE DIA	'D' FLAT BAR SIZE	LOAD RATING LBS.
3/4	5-15/16	2-1/2	7/16	3/16 x 1-1/4	300
1	6-1/4	2-5/8	7/16	3/16 x 1-1/4	300
1-1/4	6-11/16	2-3/4	7/16	3/16 x 1-1/4	300
1-1/2	6-15/16	3	7/16	3/16 x 1-1/4	300
2	8-5/16	3-3/16	7/16	1/4 x 1-1/4	500
2-1/2	8-7/8	3-7/16	7/16	1/4 x 1-1/4	500
3	9-1/8	3-3/4	7/16	1/4 x 1-1/4	500
3-1/2	10-1/16	4	7/16	1/4 x 1-1/4	500
4	10-9/16	4-1/4	9/16	1/4 x 1-1/2	600
5	11-3/4	4-3/4	9/16	1/4 x 1-1/2	600
6	14-3/8	5-5/16	9/16	3/8 x 1-1/2	850
8	16-5/8	6-5/16	9/16	3/8 x 1-1/2	850

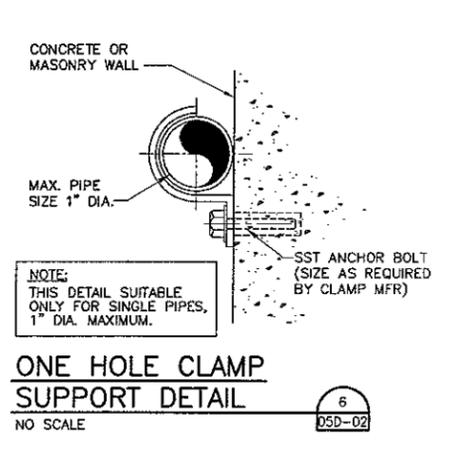
\* SAFETY FACTOR OF 5

**NOTES:**

- WHERE SUBMERGED, PIPE CLAMP, ANCHOR, SHIELD, NUTS AND LOCKWASHER TO BE TYPE 316 STAINLESS STEEL.
- FOR FLANGED PIPING, INCREASE 'B' DIMENSION AS REQUIRED.



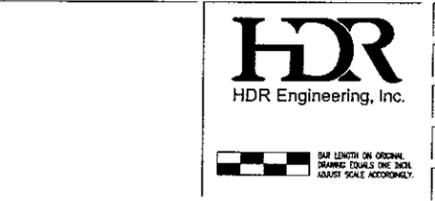
**CLEVIS TYPE SUPPORT DETAIL**  
5  
NO SCALE  
05D-02



**ONE HOLE CLAMP SUPPORT DETAIL**  
6  
NO SCALE  
05D-02

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
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Project Manager  
M. C. GRAVES  
Designed  
J. J. CHRISTENSEN  
Checked  
B. BENJES  
Drawn  
S. R. FRANKLIN



WATER TREATMENT  
PLANT EXPANSION  
2004  
THE CITY OF  
KERRVILLE, TEXAS

Date	Project No.	Drawing No.	Issue
JUNE 2004	08340-025-036	05D-02	1
AS NOTED	05D-02.DWG		

**OPENING/PENETRATION TYPES**

- TYPE A BLOCK-OUT 1" LARGER THAN OUTSIDE DIMENSIONS OF PIPING.
- TYPE B SAW-CUT OPENING. PLACE NEW CONC WITH INTEGRALLY CAST SHEET METAL OR PIPE SLEEVE.
- TYPE C FABRICATED SHEET METAL OR PIPE SLEEVE, CAST IN PLACE.
- TYPE D COMMERCIAL-TYPE CASTING.
- TYPE E SAW-CUT OPENING. PLACE NEW CONC WITH INTEGRALLY CAST PIPING.
- TYPE F INTEGRALLY CAST PIPING.
- TYPE G SAW-CUT AND REMOVE AREA 1" LARGER THAN OUTSIDE DIMENSIONS OF PIPING.
- TYPE H CORE DRILL.
- TYPE I BLOCK OUT AREA. AT LATER DATE, PLACE NEW CONC WITH INTEGRALLY CAST SHEET METAL OR PIPE SLEEVE.

**SEAL CATEGORIES**

- CATEGORY 1 ELASTOMERIC LINK SEALANT. PROVIDE TWO ROWS FOR PIPING 16" DIA. AND LARGER.
- CATEGORY 2 ROOF CURB AND FLASHING PER SMACNA SPECS.
- CATEGORY 3 12 GAUGE SHEET METAL DRIP SLEEVE SET IN BED OF SILICONE SEALANT WITH BACKER ROD AND SEALANT USED IN SLEEVE ANNULUS.
- CATEGORY 4 BACKER ROD AND SEALANT.
- CATEGORY 5 FULL-DEPTH COMPRESSIBLE SEALANT WITH ESCUTCHEONS ON BOTH SIDES OF OPENING.
- CATEGORY 6 FULL-DEPTH COMPRESSIBLE SEALANT & FLANGES ON BOTH OPENING. FLANGES CONSTRUCTED AS SAME MATL AS DUCT, FASTENED TO DUCT, AND 1/2" (MIN) LARGER THAN OPENING.
- CATEGORY 7 FULL-DEPTH COMPRESSIBLE SEALANT WITH FINISH SEALANT, OR FULL-DEPTH EXPANDING FOAM SEALANT.

NOTE: "PIPING" AS USED ABOVE REFERS TO DUCTS, PIPES, AND CONDUITS.

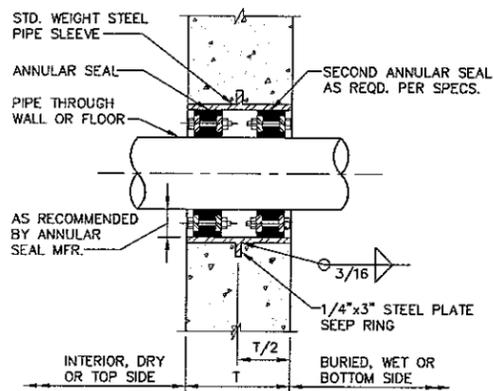
**OPENING/PENETRATION SCHEDULE FOR NEW CONSTRUCTION**

APPLICATIONS	DUCTS		PIPING		CONDUIT	
	OPNG TYPE	SEAL CATEGORY	OPNG TYPE	SEAL CATEGORY	OPNG TYPE	SEAL CATEGORY
THROUGH FLOORS W/ BOTTOM SIDE A HAZARDOUS LOCATION	C F I	7 NOT REQD 7	D F I (1)	NOT REQD NOT REQD 7	C F	7 NOT REQD
THROUGH FLOORS ON-GRADE ABOVE WATER TABLE	C F I	4 NOT REQD 4	C F I (1)	7 NOT REQD 7	C F I (1)	4 NOT REQD 7
THROUGH SLAB ON-GRADE BELOW WATER TABLE	F	NOT REQD	F	NOT REQD	F	NOT REQD
THROUGH FLOORS ABOVE GRADE	C I	4 4	C H (2) I (1)	4 3 4	F H (2) I (1)	NOT REQD 3 7
THROUGH WALLS WHERE ONE SIDE IS A HAZARDOUS AREA	C F I	7 NOT REQD 7	D F I (1)	NOT REQD NOT REQD 7	C F	7 NOT REQD
THROUGH EXTERIOR WALL BELOW GRADE ABOVE WATER TABLE	C F I	7 NOT REQD 7	C D F I (1)	1 NOT REQD NOT REQD 7	F I (1)	NOT REQD 7
THROUGH WALL ABOVE HIGH WATER LEVEL FROM TANKAGE OR WET-WELL TO DRY-WELL OR DRY AREA.	C F I	7 NOT REQD 7	C D H (2)	1 NOT REQD NOT REQD 1	C F H (2) I (1)	7 NOT REQD 7 7
THROUGH WALL BELOW HIGH WATER LEVEL FROM TANKAGE OR WET-WELL TO DRY-WELL OR DRY AREA.	F	NOT REQD	F	NOT REQD	F	NOT REQD
THROUGH EXTERIOR WALL ABOVE GRADE	A B C	6 6 6	A B D H (2)	5 5 NOT REQD 5	C H (2)	5 4
ROOF PENETRATIONS	A	2	A	2	A	2
THROUGH INTERIOR WALLS AND SLABS NOT COVERED BY THE ABOVE APPLICATIONS	A C	4 4	A C	4 4	A C F	4 4 NOT REQD

- NOTES:  
 (1) MULTIPLE PIPING 3" AND SMALLER, OR MULTIPLE CONDUITS.  
 (2) SINGLE PIPING 3" AND SMALLER, OR SINGLE CONDUIT.

**GENERAL NOTES:**

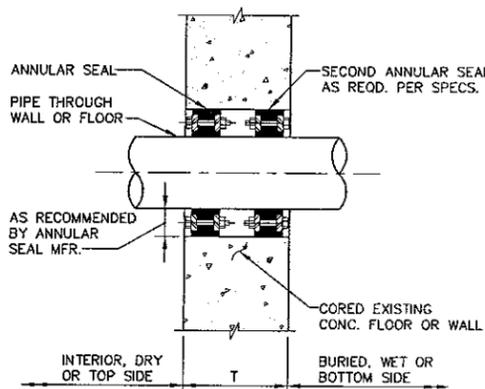
- A. REFER TO SPEC SECTION 01800, OPENINGS & PENETRATIONS IN CONSTRUCTION, FOR ADDITIONAL INFORMATION. THIS DRAWING DOES NOT INCLUDE ALL SPECIFICATION REQUIREMENTS.
- B. INSTALL OPENINGS & PENETRATIONS AS SCHEDULED ABOVE UNLESS SHOWN OTHERWISE ON THE PLANS.
- C. CONTACT ENGINEER FOR CLARIFICATION IF CONDITIONS ENCOUNTERED DIFFER FROM THOSE SCHEDULED ABOVE.



**PIPE SLEEVE WITH ANNULAR SEAL**

NO SCALE

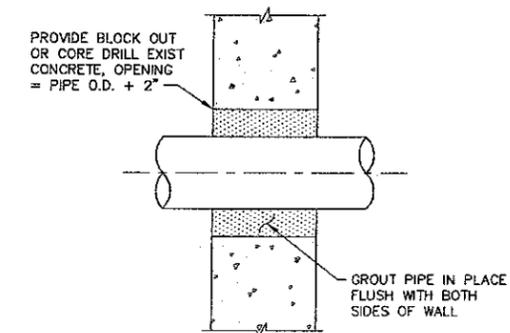
1  
05D-03



**PIPE PENETRATION WITH ANNULAR SEAL**

NO SCALE

2  
05D-03

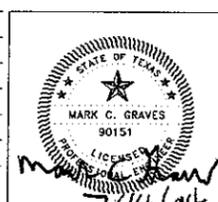


**PIPE PENETRATION GROUT IN PLACE**

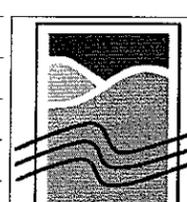
NO SCALE

3  
05D-03

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG

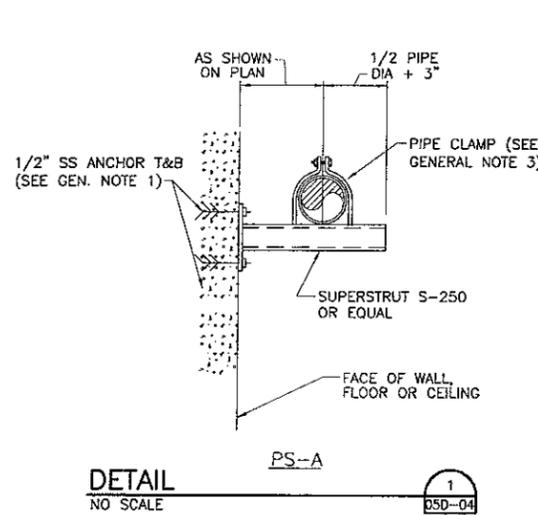


Project Manager  
M. C. GRAVES  
 Designed  
J. J. CHRISTENSEN  
 Checked  
B. BENJES  
 Drawn  
S. R. FRANKLIN

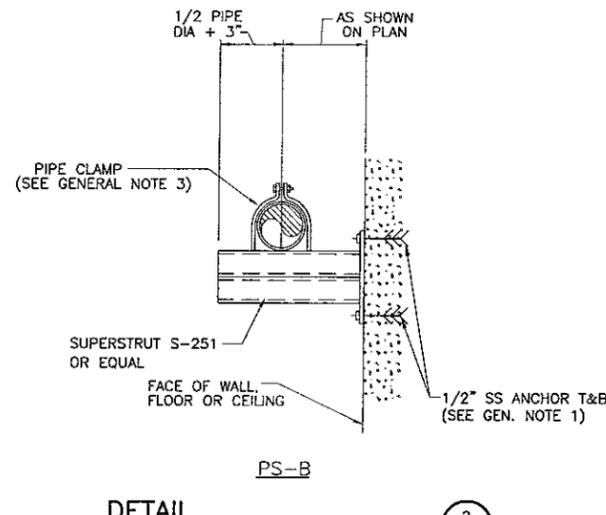


**WATER TREATMENT PLANT EXPANSION 2004**  
 THE CITY OF KERRVILLE, TEXAS

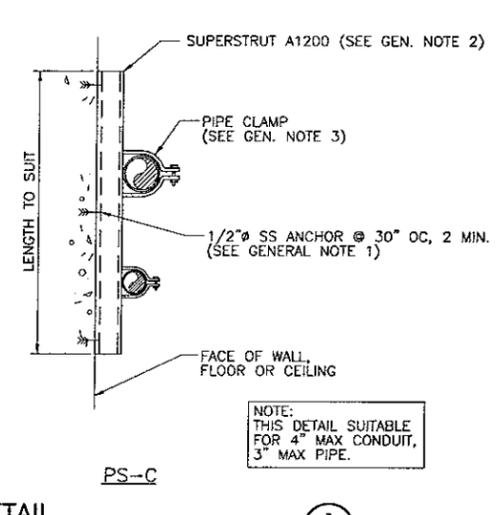
MISCELLANEOUS IMPROVEMENTS AND GENERAL DETAILS PROCESS WALL AND FLOOR PENETRATION DETAILS AND SCHEDULE	
Date JUNE 2004	Project No. 08340-025-036
Scale AS NOTED	File Name 05D-03.DWG
Drawing No. <b>05D-03</b>	Issue <b>1</b>



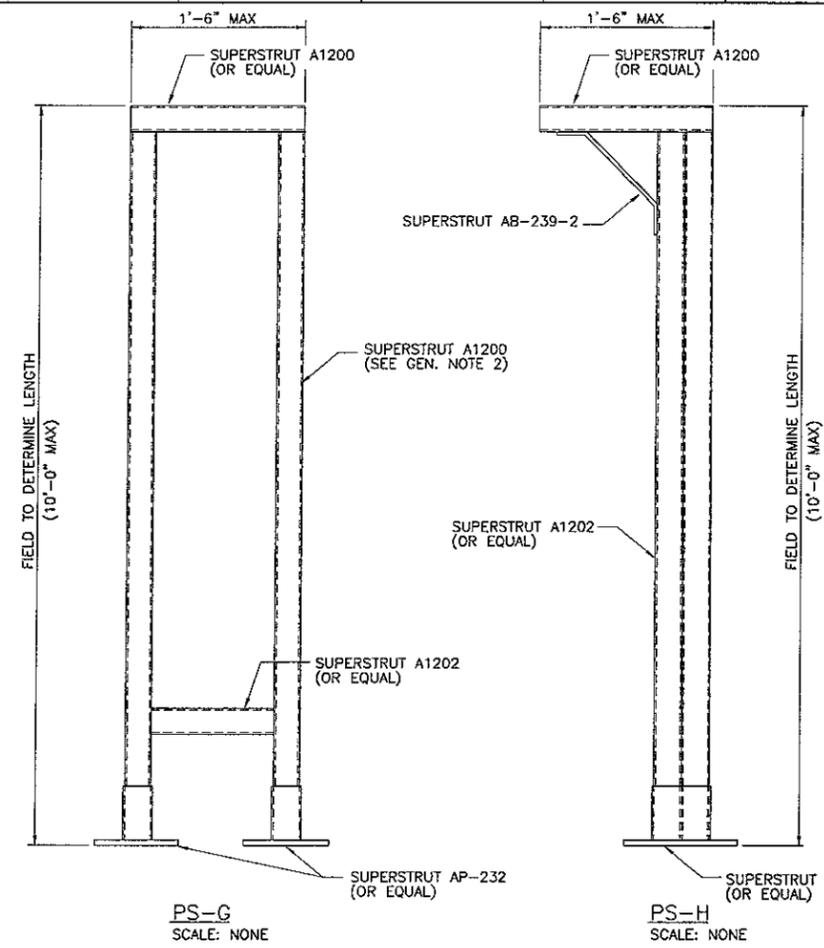
**DETAIL**  
NO SCALE  
PS-A  
1  
05D-04



**DETAIL**  
NO SCALE  
PS-B  
2  
05D-04

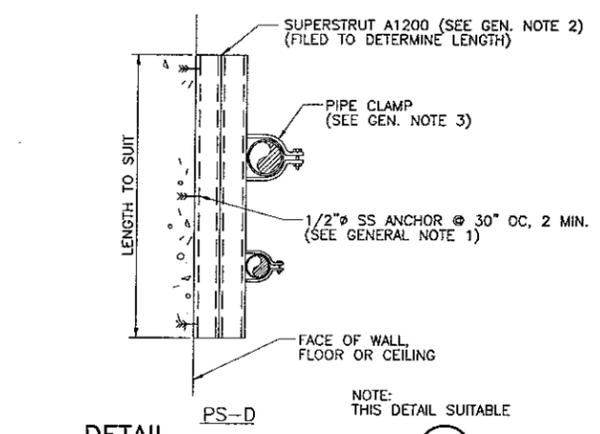


**DETAIL**  
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PS-C  
3  
05D-04

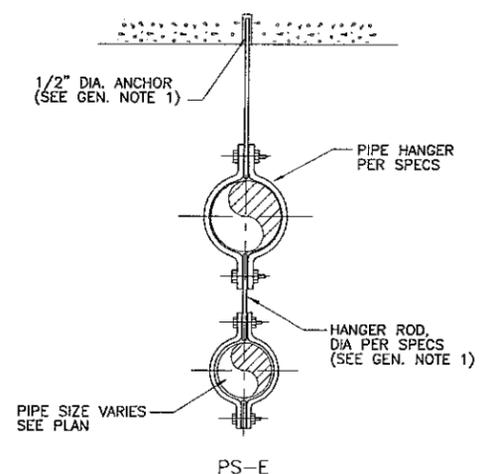


PS-G  
SCALE: NONE

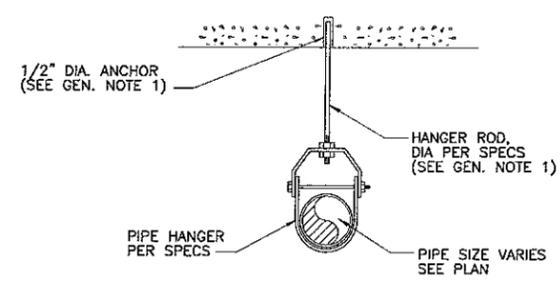
PS-H  
SCALE: NONE



**DETAIL**  
NO SCALE  
PS-D  
4  
05D-04

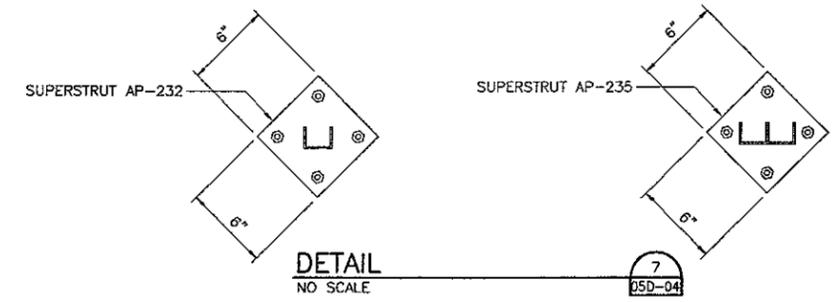


**DETAIL**  
NO SCALE  
PS-E  
5  
05D-04

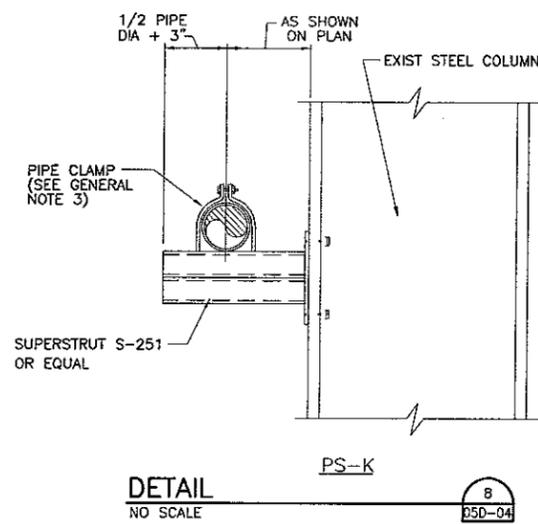


**DETAIL**  
NO SCALE  
PS-F  
6  
05D-04

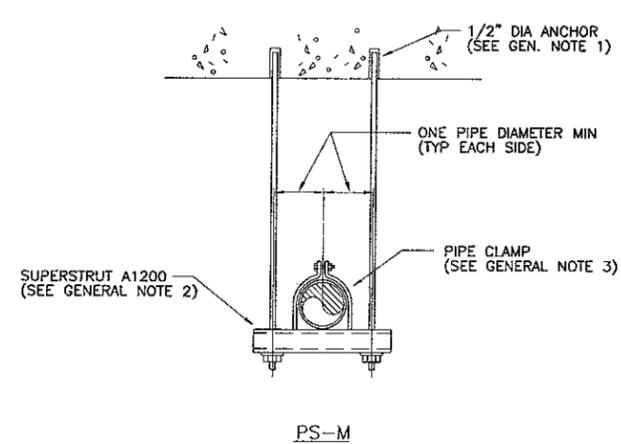
NOTE: THIS DETAIL IS NOT TO BE USED WHERE PIPE MAY BE SUBJECT TO LATERAL FORCES W/O SUPPLEMENTAL SWAY BRACING.



**DETAIL**  
NO SCALE  
PS-G  
7  
05D-04



**DETAIL**  
NO SCALE  
PS-K  
8  
05D-04

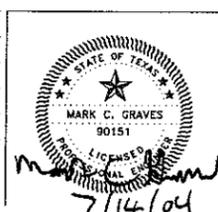


**DETAIL**  
NO SCALE  
PS-M  
9  
05D-04

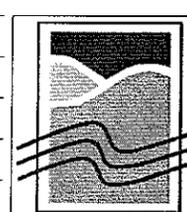
**GENERAL NOTES:**

- ANCHORS & HANGER RODS: USE SS HANGER RODS, WASHERS, AND NUTS IN CORROSIVE AREAS, CADMIUM PLATED STEEL ELSEWHERE. INSTALL USING ADHESIVE ANCHOR. INSTALL PER MFRS WRITTEN INSTRUCTIONS. EMBEDMENT DEPTH AND TYPE SHALL BE AS RECOMMENDED BY THE MFR, OR 12 X DIA. WHICHEVER IS GREATER. BEAM CLAMPS MAY BE USED IN LIEU OF EPOXY ANCHORAGE WHERE SUITABLE CONDITIONS EXIST. BEAM CLAMPS TO BE SS OR CADMIUM PLATED STL TO MATCH HANGER RODS.
- CADMIUM PLATED STEEL: USE SUPERSTRUT FRAMING CHANNEL (SFC) WITH STAINLESS STEEL HARDWARE IN CORROSIVE AREAS. GALVANIZED W/ CADMIUM PLATED STEEL HARDWARE ELSEWHERE.
- PIPE CLAMPS FOR SFC: USE SS CLAMPS W/ SS FASTENERS IN CORROSIVE AREAS, CADMIUM PLATED STEEL CLAMPS AND HARDWARE ELSEWHERE. INSTALL PER MFRS RECOMMENDATIONS.
- SPACING: PROVIDE SUPPORTS AT THE SPACINGS SHOWN IN SECTION 15090 IF SPACING OR SUPPORT LOCATIONS ARE NOT SHOWN ON THE DRAWINGS.
- PROVIDE PIPE SUPPORTS FOR ALL PIPE AND CONDUITS IN ACCORDANCE WITH THESE DETAILS AND SECTION 15090. THE TERM "PIPE" OR "PIPING" REFERS TO BOTH PIPE AND ELECTRICAL CONDUIT UNLESS THE LANGUAGE REFERS TO EACH SPECIFICALLY.
- SUPPORTS FOR PIPING 6" AND LARGER ARE IDENTIFIED ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR SELECTION OF SUPPORTS FOR PIPING SMALLER THAN 6" USING DETAILS SHOWN ON THIS SHEET. CONTRACTOR MAY USE ALTERNATE DETAILS W/ THE ENGINEER'S REVIEW & APPROVAL IF THE DETAILS SHOWN ARE UNSUITABLE FOR CONDITIONS ENCOUNTERED.
- CORROSIVE ENVIRONMENTS ARE DEFINED AS FOLLOWS: AREAS WITHIN OR ABOVE WATER BEARING STRUCTURES, MEMBRANE BUILDING PROCESS AND CHEMICAL AREAS. UNVENTILATED ROOMS AND OTHER ENCLOSED AREAS WHERE MOISTURE ACCUMULATIONS MAY OCCUR (INCLUDING VAULTS), AND OTHER LOCATIONS WHERE NOTED ON THE PLANS.

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
0	ISSUED FOR BID	06/02/04	SRF	BB	JJC	MCG
B	ISSUED FOR 100% REVIEW	05/19/04	SRF	BB	JJC	MCG
A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



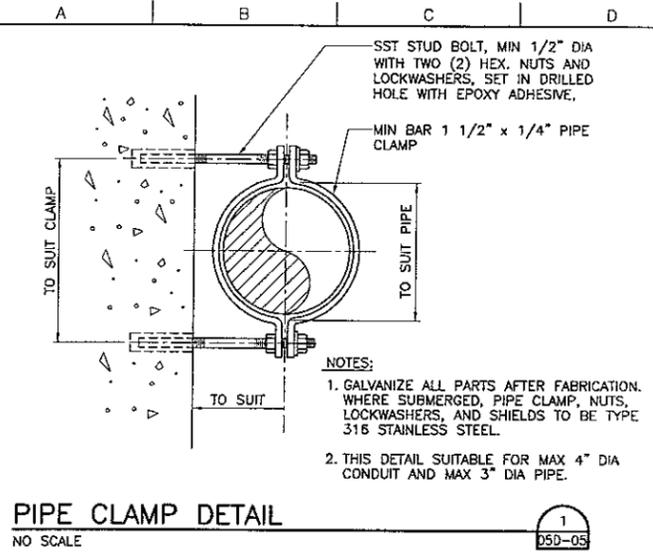
Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT  
PLANT EXPANSION  
2004**

THE CITY OF  
**KERRVILLE, TEXAS**

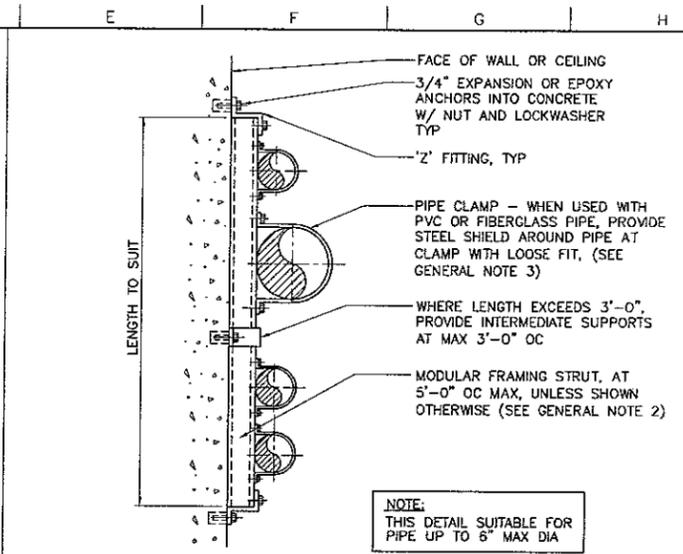
<b>MISCELLANEOUS IMPROVEMENTS AND GENERAL DETAILS PROCESS PIPE SUPPORT DETAILS</b>	
Date	JUNE 2004
Project No.	08340-025-035
Scale	AS NOTED
File Name	05D-04.DWG
Drawing No.	<b>05D-04</b>
Issue	<b>1</b>



**PIPE CLAMP DETAIL**

NO SCALE

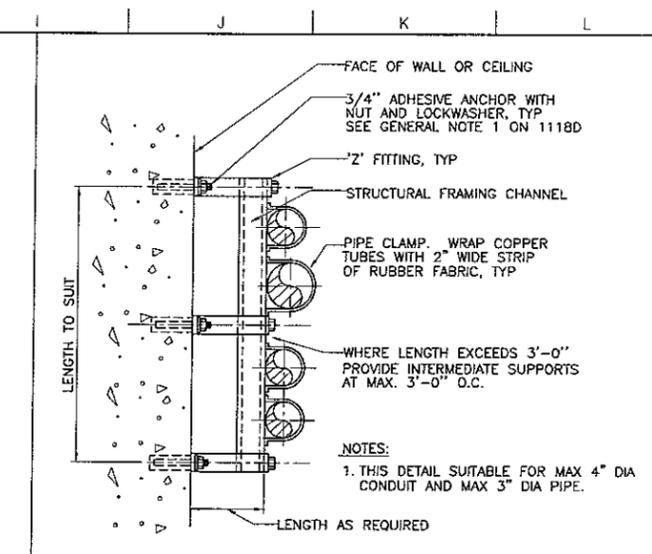
1  
05D-05



**FLUSH MOUNTED SUPPORT DETAIL**

NO SCALE

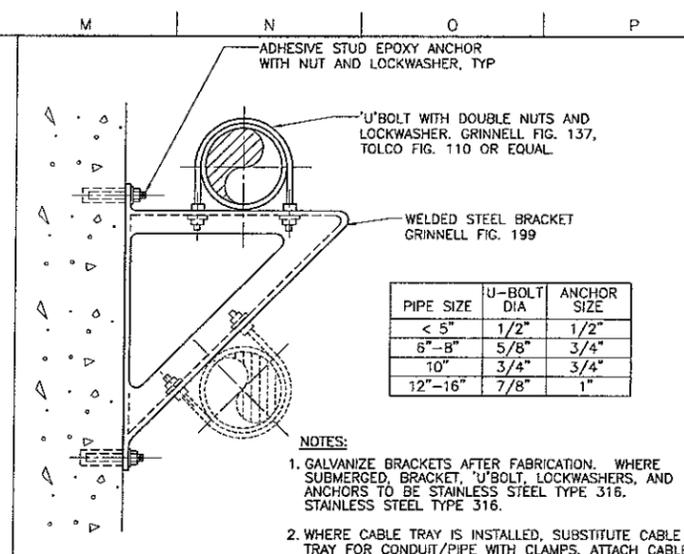
2  
05D-05



**EXTENDED SUPPORT DETAIL**

NO SCALE

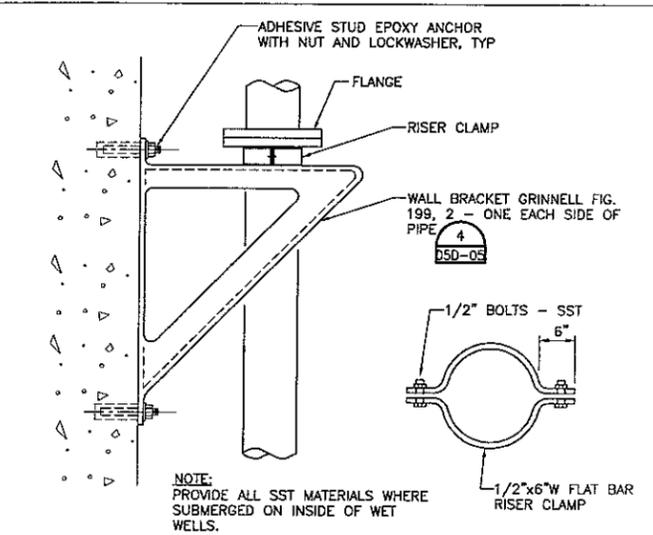
3  
05D-05



**WALL BRACKET DETAIL**

NO SCALE

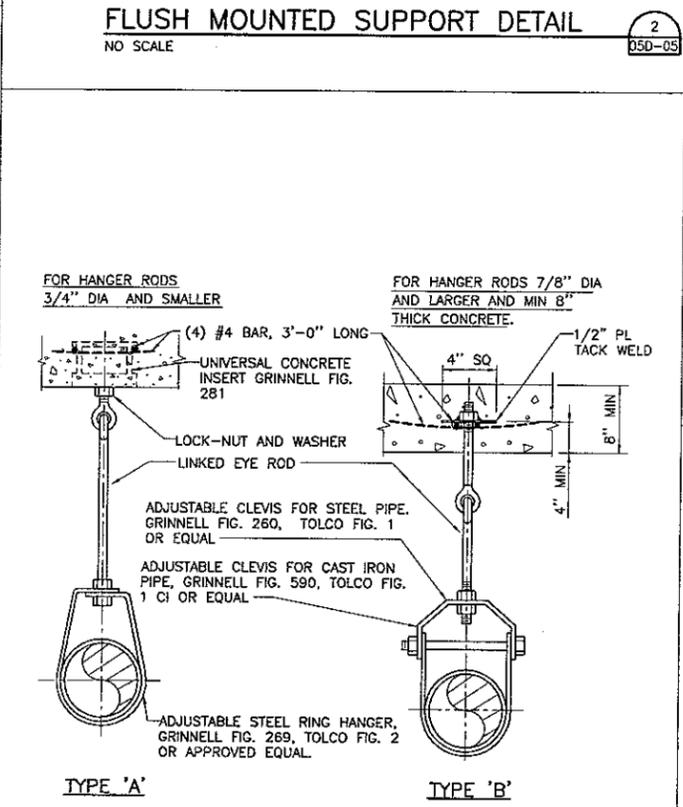
4  
05D-05



**VERTICAL SUPPORT DETAIL**

NO SCALE

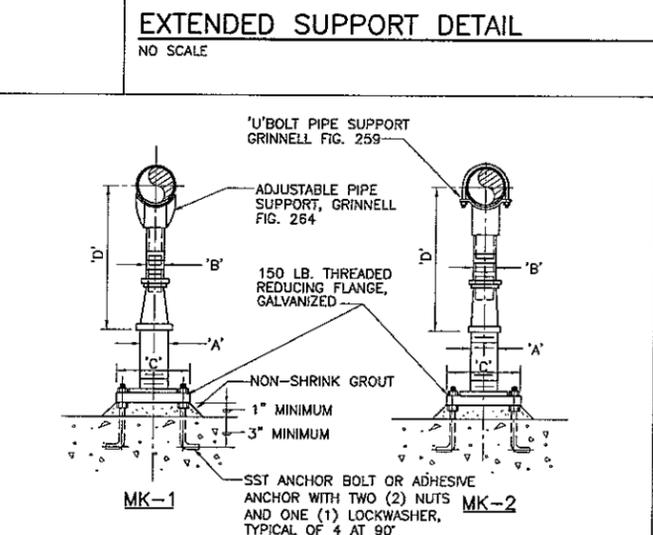
5  
05D-05



**CLEVIS SUPPORT DETAIL**

NO SCALE

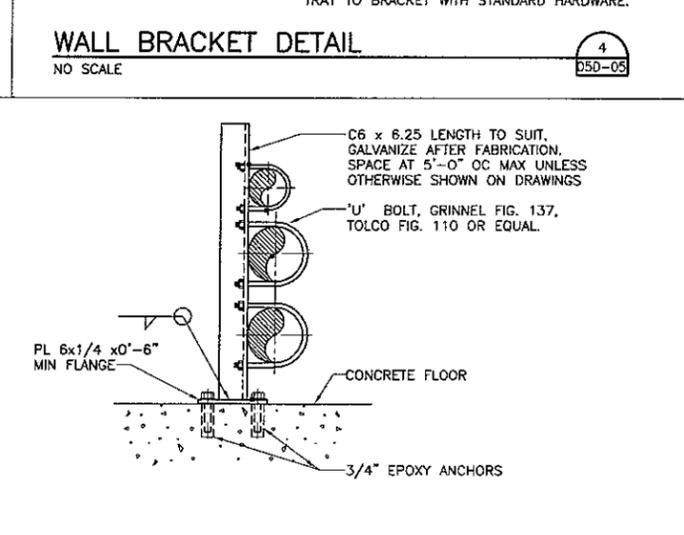
7  
05D-05



**ADJUSTABLE STANCHION DETAILS**

NO SCALE

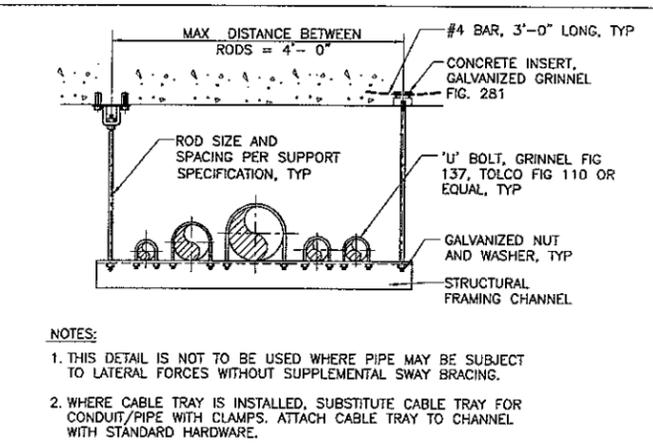
8  
05D-05



**PIPE SUPPORT**

NO SCALE

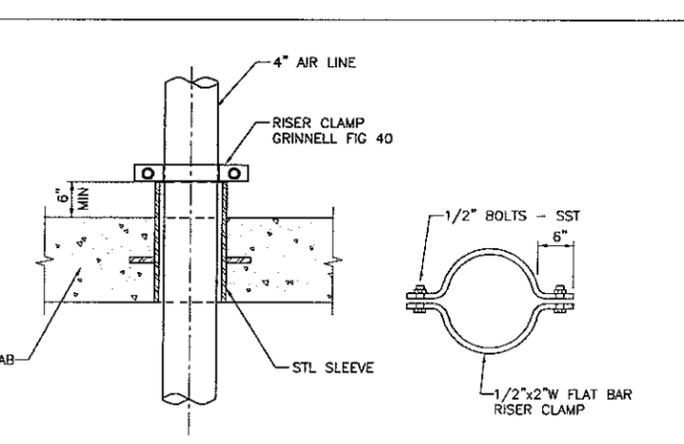
9  
05D-05



**TRAPEZE HANGER DETAIL**

NO SCALE

6  
05D-05

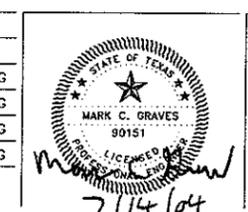


**RISER CLAMP DETAIL**

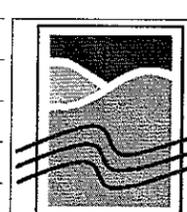
NO SCALE

10  
05D-05

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Mgr.
1	REVISED PRIOR TO FINAL BID ISSUE	07/14/04	JF	BB	JJC	MCG
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A	ISSUED FOR REVIEW	04/30/04	SRF	---	JJC	MCG



Project Manager	M. C. GRAVES
Designed	J. J. CHRISTENSEN
Checked	B. BENJES
Drawn	S. R. FRANKLIN



**WATER TREATMENT PLANT EXPANSION 2004**  
THE CITY OF KERRVILLE, TEXAS

<b>MISCELLANEOUS IMPROVEMENTS AND GENERAL DETAILS PIPE SUPPORT DETAILS</b>	
Date	JUNE 2004
Project No.	08340-025-036
Scale	AS NOTED
File Name	05D-05.DWG
Drawing No.	<b>05D-05</b>
Issue	<b>1</b>