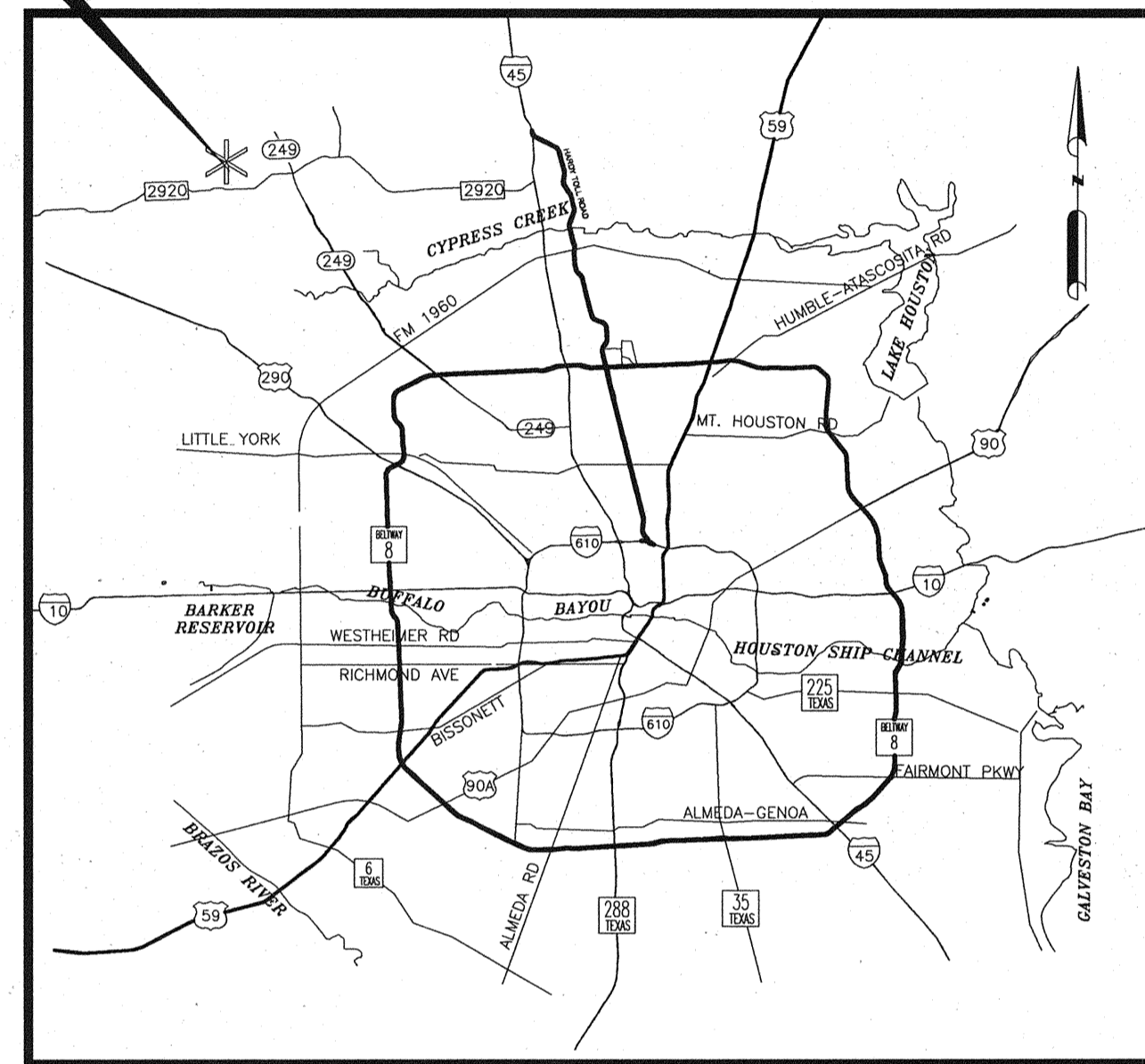


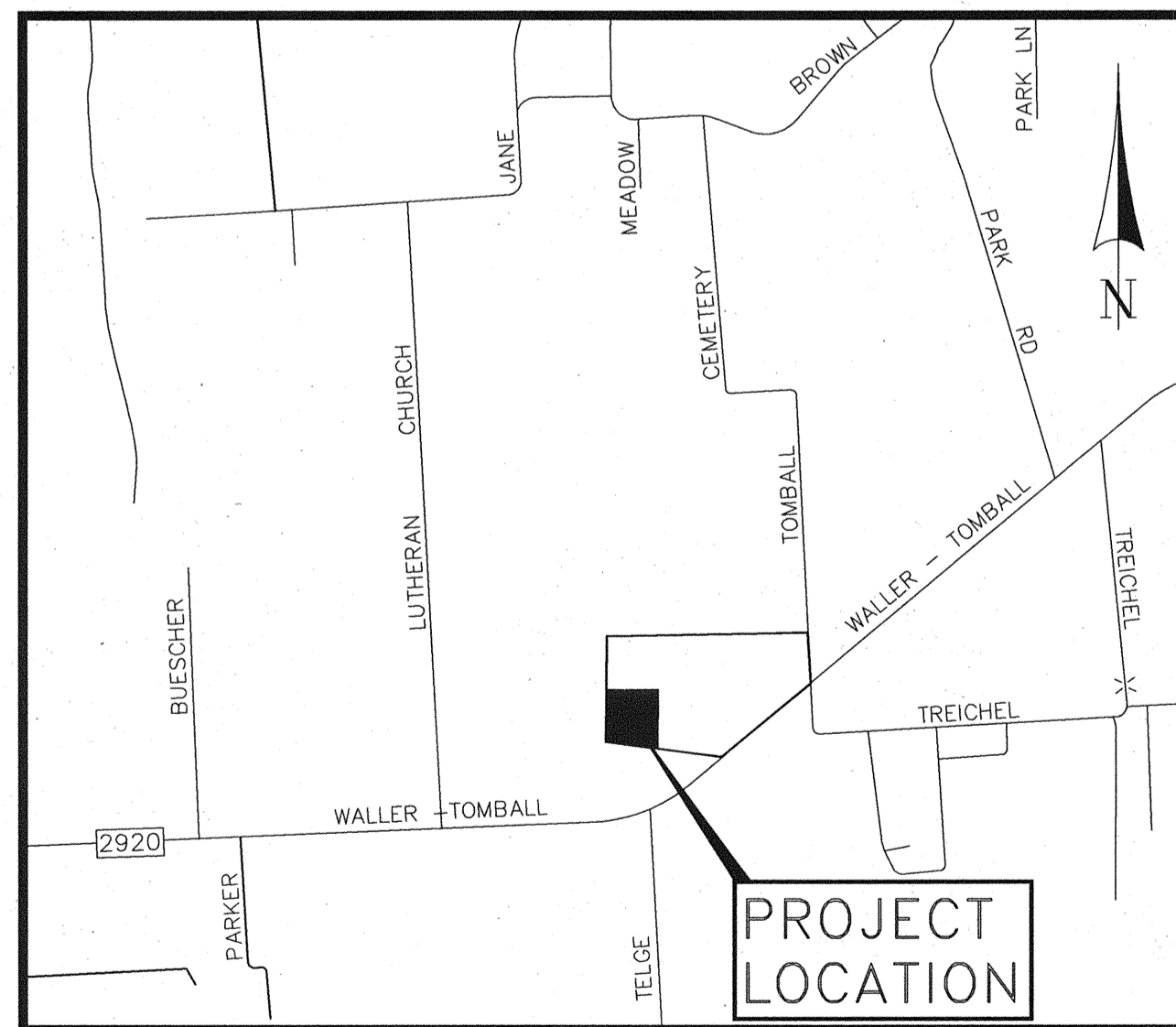
# CITY OF TOMBALL WATER SUPPLY AND STORAGE FACILITY NO. 5

MARCH 2009  
BID NO. 2009-06

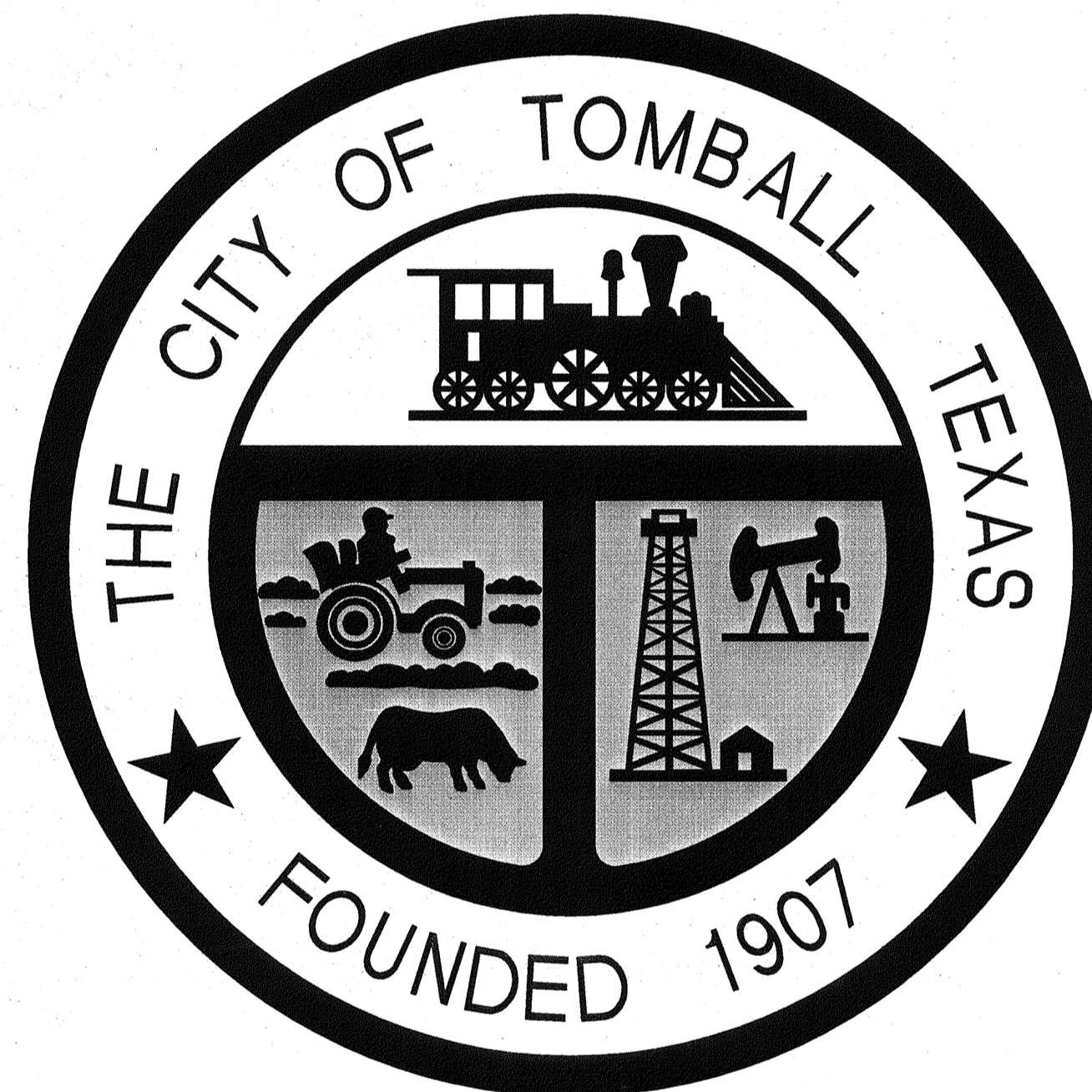
PROJECT  
LOCATION



LOCATION MAP  
KEY MAP NO. 287 M  
N.T.S.



VICINITY MAP  
N.T.S.



MAYOR  
GRETCHEN FAGAN

MAYOR PRO TEM  
MARY HARVEY  
POSITION 4

COUNCIL MEMBERS

DAVID QUINN  
POSITION 1

ROY L. LAZENBY  
POSITION 2

BILL WEBB  
POSITION 3

WARREN DRIVER  
POSITION 5

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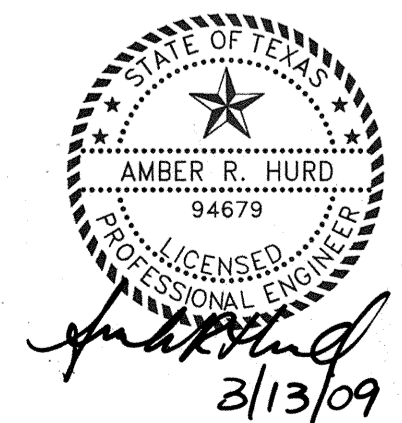
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GENERAL CONSTRUCTION NOTES

- 1. CONTRACTOR SHALL CONTACT THE CITY OF TOMBALL A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK.
2. CONTRACTOR SHALL ADEQUATELY PROTECT EXISTING STRUCTURES, UTILITIES, TREES, SHRUBS AND OTHER PERMANENT OBJECTS.
3. TREES WITHIN THE STREET RIGHT-OF-WAY SHALL NOT BE REMOVED OR DISTURBED, EXCEPT WHERE CALLED OUT TO BE REMOVED.
4. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN A MANNER SUCH THAT TRUCKS AND OTHER VEHICLES DO NOT CREATE A DIRT NUISANCE OR SAFETY HAZARD IN ANY STREETS, PUBLIC OR PRIVATE.
5. ANY AREA OF GRASS, WHICH IS DISTURBED OR DUG UP DURING THE CONSTRUCTION, SHALL BE REPLACED WITH ST. AUGUSTINE SOD OR GRASS THAT MATCHES THE GRASS REMOVED.
6. NO EXCAVATIONS SHALL BE LEFT OPEN OVERNIGHT. ALL EXCAVATIONS WHICH CANNOT BE BACKFILLED OVERNIGHT FOR THE INSTALLATION OF MANHOLES, SANITARY SEWER LINES, AND OTHER UTILITIES SHALL BE COVERED WITH STEEL SHEETING, WHEN IN PAVED AREAS, 5/4" PLYWOOD, WOOD PLANKING OR SOME OTHER MATERIAL APPROVED BY THE CITY IN OTHER AREAS.
7. ALL EXCAVATION AREAS MUST BE COMPLETELY CORDONED OFF WITH A MINIMUM OF TWO STRANDS OF YELLOW PLASTIC CONSTRUCTION TAPE, ACCEPTABLE TO THE CITY, THE TAPE SHALL BE SUPPORTED WITH ENOUGH INTERMEDIATE SUPPORTS TO AVOID EXCESSIVE SAGGING. THE TAPE MAY BE TIED TO TRAFFIC BARRICADES WITH FLASHING YELLOW LIGHTS AND WOODEN LATH FOR SUPPORT.
8. EXISTING PAVEMENTS, CURBS, SIDEWALKS, DRIVEWAYS AND LANDSCAPING DAMAGED OR REMOVED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
9. WHEN ANY STREET OR ANY SECTION OF A STREET IS CLOSED, THE CONTRACTOR SHALL FURNISH AND MAINTAIN ADEQUATE BARRICADES, WARNING AND DIRECTING SIGNS, RED FLAGS AND LIGHTS AT THE END OF EACH STREET AND AT ALL INTERSECTIONS ALONG THE STREET WITHIN THE LIMIT OF THE WORK AREA.
10. CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS.
11. OFF-DUTY UNIFORMED POLICE OFFICER(S) ARE REQUIRED TO DIRECT TRAFFIC WHERE TRAFFIC LANES ARE BLOCKED.
12. CONTRACTOR SHALL PROVIDE THE CITY OF TOMBALL ONE SET OF (RECORD) DRAWINGS AS PER SPECIFICATIONS.
13. ALL EXISTING UNDERGROUND UTILITIES ARE NOT GUARANTEED TO BE COMPLETED OR DEFINITE, BUT WERE OBTAINED FROM THE BEST INFORMATION AVAILABLE.
14. THE LOCATION OF SOUTHWESTERN BELL TELEPHONE, CITY OF TOMBALL GAS, CENTERPOINT ENERGY AND OTHER UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY.
15. CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING AS SPECIFIED.
16. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY.
17. EXISTING PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO THE ORIGINAL OR BETTER CONDITIONS.
18. CONDITION OF THE FACILITIES, UPON COMPLETION OF JOB, SHALL BE AS GOOD OR BETTER THAN THE CONDITION PRIOR TO STARTING WORK.
19. ALL DIMENSIONS SHOWN ARE APPROXIMATE AND NEED TO BE FIELD VERIFIED BY THE CONTRACTOR.
20. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AFFECTED BY THIS CONSTRUCTION BY MEANS OF ANCHORED STEEL PLATES BY BACKFILLING IMMEDIATELY AFTER CONSTRUCTION, AND/OR BY PLACING SHELL OR LIMESTONE SURFACES FOR TEMPORARY DRIVEWAY PURPOSES.
21. ALL EXCESS DIRT FROM EXCAVATION SHALL BE DISPOSED OF OFFSITE BY CONTRACTOR AT NO EXTRA PAY.
22. CONTRACTOR TO BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS INCLUDING HARRIS COUNTY, TxDOT AND CITY OF TOMBALL.
23. CONTRACTOR SHALL REMOVE ALL TRASH, EXCESS MATERIAL, DEBRIS, ETC. FROM THE SITE UPON COMPLETION OF THE PROJECT PRIOR TO INSPECTION AND APPROVAL BY THE APPROVING AGENCIES.
24. TEXAS LAW ARTICLE 1436C, PROHIBITS ALL ACTIVITIES IN WHICH PERSONS OR EQUIPMENT MAY COME WITHIN 6 FEET OF ENERGIZED OVERHEAD POWER LINES, AND FEDERAL REGULATION, TITLE 29, PART 1910.190(L) AND PART 1926.440(A)(15) REQUIRE A MINIMUM CLEARANCE OF 10 FEET FROM THESE FACILITIES.
25. CONTRACTOR SHALL NOTIFY TEXAS SOUTHEASTERN GAS COMPANY AT PHONE NUMBER 281-859-0130, UTILITY COORDINATING COMMITTEE AT PHONE NUMBERS 800-669-8344 OR 800-344-8377 AND THE CITY OF TOMBALL AT 281-351-5484 AT LEAST 48 HOURS PRIOR TO EXCAVATION.
26. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION TO DETERMINE POTENTIAL CONFLICTS AND VERIFY THAT THE BORING OPERATION AND PIPE INSTALLATION CAN BE ACCOMPLISHED WITHOUT CONFLICTING WITH EXISTING UTILITIES.
27. CONTRACTOR IS RESPONSIBLE FOR HIS OWN HORIZONTAL AND VERTICAL CONTROL. REFERENCE POINTS AND CONSTRUCTION UNDOING IS INCIDENTAL TO THE PROJECT.
28. PUBLIC EASEMENTS DENOTED ON THIS PLAN ARE HEREBY DEDICATED TO THE PUBLIC FOREVER. ANY PUBLIC UTILITY, INCLUDING THE CITY OF TOMBALL, SHALL HAVE THE RIGHTS AT ALL TIMES, OF INGRESS AND EGRESS TO AND FROM AND UPON SAID EASEMENTS FOR THE PURPOSE OF CONSTRUCTION, RECONSTRUCTION, INSPECTION, PATROLLING, MAINTAINING AND ADDING TO OR PART OF ITS RESPECTIVE SYSTEMS WITHIN THE NECESSITY OF ANY TIME OF PROCURING THE PERMISSION OF THE PROPERTY OWNER. ANY PUBLIC UTILITY, INCLUDING THE CITY OF TOMBALL, SHALL HAVE THE RIGHT TO MOVE AND KEEP MOVED ALL OR PART OF ANY BUILDING, FENCES, TREES, SHRUBS OTHER GROUNTS OR IMPROVEMENTS THAT IN ANY WAY ENDANGER OR INTERFERE WITH THE CONSTRUCTION, MAINTENANCE OR EFFICIENCY OF ITS RESPECTIVE SYSTEMS ON ANY OF THE EASEMENTS SHOWN ON THIS PLAN. NEITHER THE CITY OF TOMBALL OR ANY PUBLIC UTILITY SHALL BE RESPONSIBLE FOR THE REPLACING OR REIMBURSING PROPERTY OWNER DUE TO REMOVAL OR RELOCATION OF ANY OBSTRUCTION ON THE PUBLIC EASEMENTS.

STORM SEWER NOTES

- 1. STORM SEWER CONSTRUCTION SHALL CONFORM TO THE CITY OF TOMBALL SPECIFICATIONS FOR STORM SEWER CONSTRUCTION.
2. ALL STORM SEWER SHALL BE ASTM C-76, CLASS III REINFORCED CONCRETE PIPE WITH RUBBER GASKETED JOINTS CONFORMING TO ASTM C443. CLASS IV RCP REQUIRED UNDER PAVEMENT WITH LESS THAN 2' OF COVER.
3. ALL STORM SEWER INLETS SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND (1.5 SACS PER TON). ALL BEDDING SHALL BE CLASS 'AA'. ALL STORM SEWERS SHALL BE INSPECTED BY CITY PRIOR TO BACKFILL.
4. ALL STORM SEWER TRENCHES UNDER PROPOSED AND FUTURE PAVEMENT OR WITHIN ONE FOOT (1') FROM BACK OF CURB TO BE BACKFILLED WITH CEMENT STABILIZED SAND (1.5 SACS PER TON) TO A POINT OF ONE FOOT (1') BELOW PAVEMENT SUBGRADE. THE REMAINING BACKFILL TO BE MADE WITH COMPACTED SELECT MATERIAL. COST OF BACKFILL AND BEDDING TO BE INCLUDED IN UNIT PRICE PER LINEAR FOOT OF PIPE.
5. HIGH DENSITY POLYETHYLENE PIPE MAY BE SUBSTITUTED ON PRIVATE PROPERTY FOR REINFORCED CONCRETE PIPE SUBJECT TO THE FOLLOWING:
A. FOR PIPES 36" AND SMALLER - CEMENT STABILIZED SAND PLACED BEFORE PIPE IS LAID, TO 7" MIN. BEDDING DEPTH. FOR SEWERS 42"-60" CEMENT STABILIZED SAND PLACED BEFORE PIPE IS LAID, TO 10" MIN. BEDDING DEPTH. THE SIDES SHALL BE 12" MIN. FROM EDGE OF TRENCH TO SPRINGLINE.
B. CEMENT STABILIZED SAND SHALL BE THOROUGHLY RODDED, PLACED AND COMPACTED TO 95% STANDARD PROCTOR DENSITY 1'-0" ABOVE THE TOP OF PIPE, AFTER PIPE IS LAID.
C. PIPE AND FITTINGS: THE TYPES OF PIPE WILL BE INDICATED ON THE DRAWINGS BY THE FOLLOWING DESCRIPTION CONFORMING TO AASHTO M 252, AASHTO M 294, AND/OR AASHTO MP6-95, LATEST EDITION. PIPE DESCRIPTION: CCP (CORRUGATED POLYETHYLENE PIPE).
D. TYPE S (THIS PIPE SHALL HAVE A FULL CIRCULAR CROSS-SECTION, WITH AN OUTER CORRUGATED PIPE WALL AND A SMOOTH INNER LINE).

SANITARY SEWER CONSTRUCTION NOTES

- 1. ALIGNMENT, CENTERLINE CURVE DATA, AND STATIONING TO BE DETERMINED FROM APPROVED RECORDED SUBDIVISION PLAT OR ROAD RIGHT-OF-WAY.
2. SEWER MAINS, MANHOLES AND LIFT STATIONS ARE TO BE DESIGNED TO BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH CITY OF TOMBALL STANDARDS AND THRC TITLE 30 CHAPTER 317 OF THE TEXAS ADMINISTRATIVE CODE.
3. SEWER TRENCHES UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT TO BE BACKFILLED WITH CEMENT SAND (1.5 SACKS PER TON) BACKFILL AS SPECIFIED, TO WITHIN ONE (1) FOOT OF SUBGRADE.
4. SEWER TRENCHES UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT TO BE BACKFILLED WITH CEMENT SAND (1.5 SACKS PER TON) BACKFILL AS SPECIFIED, TO WITHIN ONE (1) FOOT OF SUBGRADE.
5. ALL PROPOSED GRAVITY SANITARY SEWER LINES WILL BE DUCTILE IRON, OR SDR 26 PVC PIPE & 8" MIN I.D. UNLESS APPROVED OTHERWISE.
6. BEDDING FOR ALL TYPES OF SANITARY SEWER PIPE SHALL BE CEMENT STABILIZED SAND (1.5 SACKS PER TON) CLASS AA AT ALL DEPTHS. ALL SEWER LINES TO BE INSPECTED BY CITY OF TOMBALL PRIOR TO BACKFILL.
7. FOR PVC PIPE, USE MANHOLE WATERSTOP GASKET AND CLAMP ASSEMBLY AT MANHOLE CONNECTIONS (NO SEPARATE PAY).
8. SANITARY SEWER, MANHOLES SHALL BE PRECAST OR Poured IN PLACE MONOLITHIC CONCRETE, AND BACKFILLED WITH CEMENT-SAND AS SPECIFIED (NO SEPARATE PAY).
9. ALL FAR-SIDE LEADS SHALL BE FOUR (4) INCHES OR SIX (6) INCHES AT 1.0% MIN. SLOPE SIX (6) INCH ABS WILL NOT BE ACCEPTABLE.
10. ALL PRECAST CONCRETE AND Poured-IN-PLACE CONCRETE MANHOLES SHALL HAVE THE TOP 18 INCHES CONSTRUCTED OF PRECAST RINGS & TO EXTEND 3"-6" ABOVE NATURAL GRADE.
11. STUBS OR LEADS SERVING TWO LOTS SHALL HAVE SERVICE WYE AND CLEANOUT WITH PLUGS (NO SEPARATE PAY). THE WYE SHALL BE LOCATED WITHIN THE STREET RIGHT-OF-WAY OR AN ADJOINING UTILITY EASEMENT.
12. STACKS SERVING NEAR-SIDE AND FAR-SIDE LOTS SHALL HAVE A SERVICE WYE AND CLEANOUTS WITH PLUGS FOR THE NEAR-SIDE LOT (NO SEPARATE PAY).
13. ALL DUCTILE IRON PIPE & FITTINGS SHALL BE 150PSI THICKNESS CLASS 50 WITH EIGHT (8) MIL BLACK VIRGIN POLYETHYLENE WRAP AS SPECIFIED.
14. MANHOLE RIMS ARE TO BE SET AT THE ELEVATIONS SHOWN ON THE PLANS INITIALLY, AFTER PAVING AND GRADING IS COMPLETED, RIMS ARE TO BE ADJUSTED TO THREE (3) TO SIX (6) INCHES ABOVE FINAL GRADE AND BLACK DRESS DIRT TO PROVIDE DRAINAGE AWAY FROM MANHOLE.
15. ALL PVC RUBBER GASKET EQUIPPED BELL AND SPIGOT JOINTS. SOLVENT WELDED JOINTS WILL NOT BE APPROVED FOR THIS PROJECT.
16. ALL GRADE CHANGES AT MANHOLES IN EXCESS OF 2 FEET SHALL BE ACCOMPLISHED WITH DROP MANHOLE CONNECTIONS, CITY OF TOMBALL DRAWING NO. 81.
17. CONTRACTOR TO FURNISH CITY WITH RECORD DRAWINGS UPON COMPLETION OF PROJECT.

SPECIAL NOTES: LOCATION OF SANITARY SEWER FACILITIES

THE UTILITY CONTRACTOR IS RESPONSIBLE FOR LOCATING AND MARKING ALL STACKS AND FAR-SIDE LEADS AFTER THE PAVING IN THIS SECTION IS COMPLETE.

A 1/4-INCH DEEP NOTCH SHALL BE CUT IN THE CURB AND PAINTED WITH RED LINE ADJACENT TO THE STACK OR LEAD.

IF STACKS ARE LEFT IN THE GROUND AT THE STACKS AND LEADS AFTER CONSTRUCTION OF UTILITIES, THEN AN EFFORT WILL BE MADE TO PRESERVE THEM DURING PAVING CONSTRUCTION. HOWEVER, IF THESE STACKS ARE KNOCKED OUT FOR ANY REASON, THE UTILITY CONTRACTOR REMAINS RESPONSIBLE FOR LOCATING AND MARKING THE FACILITIES AS DESCRIBED ABOVE.

WATER LINE CONSTRUCTION NOTES

- 1. ALIGNMENT, CENTERLINE CURVE DATA, AND STATIONING TO BE DETERMINED FROM APPROVED AND/OR RECORDED SUBDIVISION OR ROAD RIGHT-OF-WAY PLAT.
2. ALL WATERLINE CONSTRUCTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE LATEST EDITION OF THE TCEQ RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS.
3. ALL WATER LINES SHALL BE LOCATED INSIDE PUBLIC ROAD RIGHT-OF-WAYS AND PUBLIC EASEMENTS, CITY REPRESENTATIVE TO INSPECT & APPROVE PRIOR TO BACKFILL.
4. ALL WATER MAINS SHALL BE CLASS 150 (DR-18). PVC (AWWA C-900)
5. TWELVE (12) INCH OR SMALLER WATER MAINS SHALL HAVE A MINIMUM COVER OF FOUR (4) FEET. VARY FLOW LINE UNIFORMLY FROM DEPTH AND LOCATION SHOWN IN PLANS.
6. WATERLINE FITTINGS SHALL BE CAST OR DUCTILE IRON WITH POLYETHYLENE WRAP AS SPECIFIED UNLESS OTHERWISE NOTED.
7. MAINTAIN 12-INCH MINIMUM CLEARANCE AT CROSSINGS BETWEEN ALL WATERLINES AND ALL UTILITIES INCLUDING STORM SEWERS AND CULVERTS UNLESS OTHERWISE NOTED.
8. WATERLINES SHALL BE SAND-BEDDED AS SHOWN IN THE CITY OF TOMBALL DETAILS. (COT-37) ALL WATER LINES TO BE INSPECTED BY CITY OF TOMBALL PRIOR TO BACKFILL.
9. WATERLINE TRENCHES UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED PER THE CITY OF TOMBALL DETAILS (COT-37).
10. ALL 2" THRU 12" GATE VALVES FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH AWWA C509 AND BE MANUFACTURED BY MUELLER, AMERICAN-DARLING, OR APPROVED EQUAL RESILIENT SEAT GATE VALVES AND SHALL OPEN IN A COUNTER CLOCKWISE DIRECTION ONLY. VALVES ON ALL TAPPING SLEEVES ARE TO BE OF THE SAME TYPE.
11. VALVES SHALL BE LOCATED OPPOSITE PROPERTY CORNER WHERE APPROPRIATE.
12. ALL VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE AFTER PAVING IS COMPLETE.
13. ALL FIRE HYDRANTS SHALL BE MANUFACTURED BY MUELLER OR AMERICAN-DARLING, EQUIP EACH FIRE HYDRANT WITH TWO (2) TWO AND ONE-HALF (2 1/2) INCH NOMINAL INSIDE DIAMETER HOSE NOZZLES AND ONE (1) FOUR AND ONE-HALF (4 1/2) INCH NOMINAL INSIDE DIAMETER PUMPER NOZZLE WITH NATIONAL STANDARD THREADS IN EACH NOZZLE. SUPPLY STORTZ CONNECTOR & PRESSURE CAP FOR PUMPED NOZZLE.
14. CONTRACTOR SHALL PROVIDE ADEQUATE THRUST BLOCKING TO WITHSTAND TEST PRESSURES SPECIFIED BY THE TCEQ AND THE CITY OF TOMBALL.
15. ALL WATERLINE TESTING SHALL BE WITNESSED AND APPROVED BY THE CITY OF TOMBALL.
16. 14 GAUGE LOCATOR WIRE SHALL BE INSTALLED ON ALL WATER AND GAS LINES & FORCE MAINS TO BE ACCESSIBLE AT VALVE STACKS.
17. ALL T&S SHALL BE FULL BODY - CAST IRON OR DUCTILE IRON
18. 1(O)NE WATER SAMPLE PER 1000 FEET SHALL BE SUBMITTED TO A TEXAS DEPARTMENT OF HEALTH APPROVED LABORATORY AND SHALL BE FREE OF ANY CONTAMINATES, PRIOR TO BEING PUT IN SERVICE.
19. DISINFECTION OF NEW AND PREPARED WATER MAIN SHALL BE IN CONFORMANCE WITH AWWA C651. ALL NEW WATER MAINS SHALL BE DISINFECTED BEFORE THEY ARE PLACED IN SERVICE. ALL WATER MAINS TAKEN OUT OF SERVICE FOR INSPECTING, REPAIRING OR OTHER ACTIVITY, WHICH MIGHT LEAD TO CONTAMINATION OF WATER, SHALL BE DISINFECTED BEFORE THEY ARE RETURNED TO SERVICE. (NO SEP. PAY)
20. CONTRACTOR SHALL INSTALL 4" X 4" BLUE- REFLECTORIZED PAVEMENT MARKERS 6" OFF CENTER OF ROADWAY ON FIRE HYDRANT SIDE OF STREET. RAY-0-LITE OR EQUAL.
21. WATERLINE 8" OR GREATER SHALL BE CONSTRUCTED SUCH THAT ALL CROSSINGS WITH SANITARY SEWER OR SANITARY SEWER LEADS SHALL CENTER ON FULL SECTION OF WATERLINE AT THE SANITARY SEWER CROSSING. WATERLINE SHALL BE AT LEAST 2 FEET ABOVE SANITARY LINE. WHERE WATERLINE CROSSES UNDER SANITARY SEWER LINES, WATERLINE SEGMENT SHALL BE ENCASED IN PIPE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN WATERLINE AND MAINTAIN 1 FOOT VERTICAL CLEARANCE FROM SANITARY LINE.
22. WHERE WATERLINE CROSSES UNDER SANITARY SEWER LINE, BOTH SEGMENTS MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED IN AWWA C600 STANDARDS.
23. ALL VALVE BOXES SHALL BE ERECTED PLUMBED AND BE FREE OF DEBRIS.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES

- 1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D.
2. NATIONAL STANDARDS INSTITUTE/NATIONAL SANITATION FOUNDATION (ANSI/NSF) STANDARD 61 AND MUST BE CERTIFIED OR ORGANIZATION ACCREDITED BY ANSI.
3. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NATIONAL SANITATION FOUNDATION SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS.
4. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY.
5. WATER TRANSMISSION AND DISTRIBUTION LINES MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE.
6. THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY AWWA FORMULA FOR PVC PIPE: L = (N)(D)(P)/7,400. THE FORMULA FOR DUCTILE OR CAST IRON PIPE IS L = (S)(D)(P)/133,200.
7. THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION.
8. THE USE OF PIPES AND PIPE FITTINGS CONTAIN MORE THAN 8.0% LEAD OR SOLDER AND FLUX THAT CONTAINS MORE THAN 0.2% LEAD IS PROHIBITED IN THE FOLLOWING CIRCUMSTANCES FOR INSTALLATION OR REPAIR OF ANY PLUMBING IN A RESIDENTIAL OR NONRESIDENTIAL FACILITY PROVIDING WATER FOR HUMAN CONSUMPTION AND CONNECTED TO A PUBLIC DRINKING WATER SYSTEM.
9. THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES IN THE DISTRIBUTION SYSTEM AT ALL POINTS WHERE TOPOGRAPHY OR OTHER FACTORS MAY CREATE AIR LOCKS IN THE LINES. ALL VENT OPENINGS TO THE ATMOSPHERE SHALL BE COVERED WITH 16-MESH OR FINER CORROSION RESISTANT SCREENING MATERIAL OR APPROVED EQUIVALENT. THE SYSTEM SHALL BE DESIGNED TO AFFORD EFFECTIVE CIRCULATION OF WATER WITH A MINIMUM OF DEAD ENDS. ALL DEAD END MAINS SHALL BE PROVIDED WITH ACCEPTABLE FLUSH VALVES AND DISCHARGE PIPING. ALL DEAD END LINES LESS THAN TWO INCHES IN DIAMETER WILL NOT REQUIRE FLUSH VALVES IF THEY END AT A SERVICE. WHERE DEAD ENDS ARE NECESSARY AS A STAGE IN THE GROWTH OF THE SYSTEM, THEY SHALL BE LOCATED AND ARRANGED TO ULTIMATELY CONNECT THE ENDS TO PROVIDE CIRCULATION.
10. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATER LINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES AND SEPTIC TANK DRAINFIELDS. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET § 290.44 (e) OF THE CURRENT RULES.
11. THE CONTRACTOR SHALL DISINFECT THE NEW WATER MAINS IN ACCORDANCE WITH AWWA STANDARD C651 AND THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR THE MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATER LINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER.

CENTERPOINT ENERGY NOTES:

WARNING: OVERHEAD ELECTRICAL FACILITIES

WARNING: OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAWS, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713)207-2222.

CAUTION: UNDERGROUND GAS FACILITIES

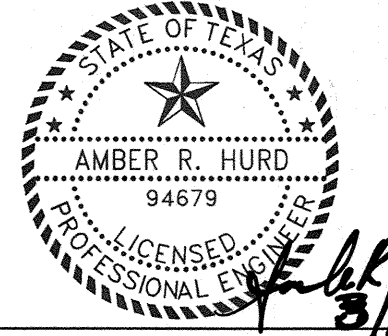
LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

- WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 967-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
• WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
• WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THE UNDERGROUND FACILITIES.

SBC FACILITIES

- 1. THE LOCATIONS OF SBC FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF SBC FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE SBC FACILITIES.
4. WHEN SBC FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.



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Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobfen.com

CITY OF TOMBALL
TOMBALL, TEXAS
WATER SUPPLY & STORAGE FACILITY NO. 5

Table with 2 columns: SUBMITTED, SCALE, DATE, SURVEY BY, F B NO. and DESIGNED BY, DRAWN BY, SHEET No., DWG. NO.

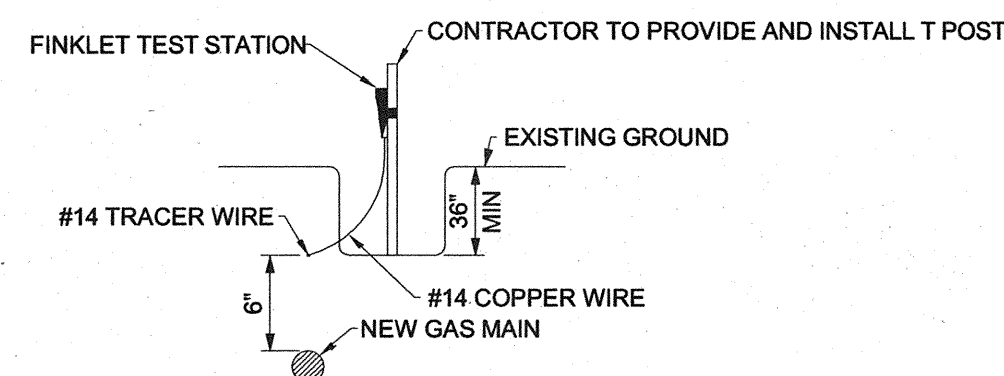
## NATURAL GAS SYSTEM REQUIREMENTS

- CONSTRUCTION OF NATURAL GAS PIPING SYSTEM MUST BE PERFORMED BY AN APPROVED CITY OF TOMBALL CONTRACTOR IN GOOD STANDING WITH THE CITY. ALL PERSONNEL CERTIFICATIONS MUST BE KEPT ON SITE WITH CONSTRUCTION CREW AT ALL TIMES.
- CONTRACTOR MUST BE IN COMPLIANCE WITH CITY OF TOMBALL ANTI-DRUG AND ALCOHOL MISUSE PLAN BY PARTICIPATING IN AN APPROVED DRUG TESTING PROGRAM. PROOF OF TESTING PROTOCOLS IS REQUIRED.
- CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL NATURAL GAS FACILITIES AS PROPOSED IN THIS PLAN SET. ANY DEVIATIONS MUST FIRST BE APPROVED BY THE ENGINEER OF RECORD AND THE CITY OF TOMBALL PUBLIC WORKS DIRECTOR OR DESIGNATED REPRESENTATIVE.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THE MEANS, METHODS, SEQUENCE, PROCEDURES, TECHNIQUES AND/OR SCHEDULING OF ALL PORTIONS OF THE GAS WORK ARE PERFORMED SAFELY AND IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS, OSHA REGULATIONS, AND ANY OTHER STANDARDS OR CODES REQUIRED BY ANY OTHER REGULATORY AGENCY.
- SHUT-INS AND/OR SYSTEM TIES ARE THE RESPONSIBILITY OF THE CITY OF TOMBALL. AT GAS REPRESENTATIVE'S DISCRETION, CONTRACTOR MAY BE ALLOWED TO TAP OR SHUT IN EXISTING MAINS, IF CONTRACTOR CAN PROVE COMPETENCY AND MAINTAINS OPERATOR QUALIFICATIONS FOR APPROPRIATE TASKS. THE CITY GAS REPRESENTATIVE MUST BE ON SITE DURING TIE-IN PROCEDURE.
- THE CITY OF TOMBALL GAS REPRESENTATIVE MUST BE CONTACTED AS FOLLOWS:
  - GAS CONSTRUCTION START.** CONTRACTOR MUST NOTIFY GAS REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO THE INITIAL START OF ANY NATURAL GAS CONSTRUCTION TO SCHEDULE AN ON SITE MEETING. DURING THIS MEETING, ALL CONTRACTOR PERSONNEL CERTIFICATIONS WILL BE REVIEWED TO CONFIRM ALL CONTRACTOR PERSONNEL MEET CITY OF TOMBALL REQUIREMENTS. DELAYS WILL NOT BE PAID FOR IN THE EVENT GAS CONSTRUCTION CANNOT START DUE TO LACKING CREDENTIALS.
  - BACKFILL.** CONTRACTOR MUST NOTIFY GAS REPRESENTATIVE TO COORDINATE A TRENCH INSPECTION PRIOR TO BACKFILLING. SEE TRENCH & BACKFILL REQUIREMENTS FOR MORE INFORMATION.
  - ENCASEMENT.** CONTRACTOR MUST ALLOW GAS REPRESENTATIVE TO OBSERVE THE INSTALLATION OF THE CARRIER PIPE AND TO INSPECT ALL CASING END POINTS. SEE MINIMUM ENCASEMENT REQUIREMENTS FOR MORE DETAIL.
  - PRESSURE TEST.** CONTRACTOR MUST COORDINATE WITH GAS REPRESENTATIVE PRIOR TO PERFORMING ANY PRESSURE TESTS. PRESSURE CHARTS CAN BE FURNISHED BY EITHER THE CONTRACTOR OR THE CITY; HOWEVER, ALL CHARTS MUST BE INITIALED BY GAS REPRESENTATIVE BEFORE THE PRESSURE TEST BEGINS.
- DRIVEWAYS WILL BE BORED, UNLESS OTHERWISE SPECIFIED IN PLANS OR AS DIRECTED BY GAS REPRESENTATIVE.
- TREES IN OR ADJACENT TO PUBLIC RIGHTS OF WAY WHICH HAVE DRIP LINES EXTENDING INTO PUBLIC RIGHTS OF WAY AND A TRUNK CALIPER OF SIX (6) INCHES OR MORE DETERMINED BY THE CITY OF TOMBALL TO HAVE ENVIRONMENTAL OR AESTHETIC VALUE MUST BE BORED FROM DRIP LINE TO DRIP LINE.
- EXISTING UTILITIES EXPOSED DURING TRENCHING OPERATIONS MUST BE SUPPORTED; CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING UTILITIES.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ALL UTILITIES SHOWN IN THE PLANS. ADDITIONALLY, CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING UTILITIES.
- CONTRACTOR MUST VISUALLY INSPECT ALL MATERIAL FOR DAMAGE BEFORE CONSTRUCTION AND PRIOR TO BACKFILLING.
- ALL POLYFUSION MUST BE PERFORMED BY A CERTIFIED OPERATOR. POLYFUSION CERTIFICATION WILL BE CHECKED AT THE CONSTRUCTION KICKOFF MEETING.
- CONTRACTOR IS REQUIRED TO RECORD ALL POLYETHYLENE MATERIAL SPECIFICATIONS ON POLYETHYLENE PIPE LINE DATA CHART (AS SHOWN BELOW).
- CONTRACTOR MUST COMPLETE THE POLYETHYLENE PIPE LINE DATA CHART FOR ALL POLYETHYLENE PIPE INSTALLED IN EACH APPLICABLE SHEET (SEE THE FOLLOWING EXAMPLE):

Point Span	Line Data	Contractor	Fused By	Date Installed
1 TO 2	2" IPS SDR 11 DRISCOPIPE 8100 GAS PE2406/PE100 CEE ASTM D2513 WT015 R NR 0356 A1-043 072706 COIL 0152	COMPANY X	JOHN DOE	04/04/2008

- CONTRACTOR IS RESPONSIBLE FOR TESTING ALL NEW FACILITIES IN ACCORDANCE WITH CITY OF TOMBALL STANDARDS. ALL TESTS MUST BE DOCUMENTED BY PRESSURE CHART AND
- MAGNETIC WARNING TAPE AND #14 TRACER WIRE MUST BE INSTALLED ABOVE PIPE INSTALLATIONS ALONG THE TRENCH IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS. TRACER WIRE SHALL BE 6" ABOVE THE PIPE, AND MAGNETIC WARNING TAPE SHALL BE 6" ABOVE THE TRACER WIRE. ALL TRACER WIRE CONNECTIONS MUST BE WATER TIGHT. IN THE EVENT MAGNETIC WARNING TAPE IS ALREADY PRESENT IN THE TRENCH, CONTRACTOR MUST STRIP BACK A PORTION OF THE EXISTING TAPE AND TIE THE NEW TAPE INTO THE EXISTING. AT VALVE LOCATIONS, TRACER WIRE MUST BE INSTALLED AROUND VALVE STACKS, NOT THROUGH THEM. FOR DETAILED PLACEMENT INFORMATION, SEE TRENCH & BACKFILL REQUIREMENTS AND/OR VALVE STACK REQUIREMENTS.
- ALL VALVES ARE TO BE INSTALLED WITH VALVE BOXES IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS. A SUPPORT MUST BE PLACED IN ACCORDANCE WITH THE VALVE MANUFACTURER SPECIFICATIONS.
- PIPELINE MARKERS ARE TO BE INSTALLED IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS. CONTRACTOR IS REQUIRED TO PLACE MARKERS AT OR NEAR TAPS, TEES, CAPS AND AT 500' INTERVALS ALONG NATURAL GAS MAINS. FINAL PLACEMENT OF PIPELINE MARKERS IS SUBJECT TO FIELD CONDITIONS; CONTRACTOR MUST USE DISCRETION TO ENSURE APPROPRIATE LINE OF SIGHT IS ESTABLISHED WITH PIPELINE MARKERS. GAS REPRESENTATIVE MAY DETERMINE THE NEED FOR ADDITIONAL PIPELINE MARKER INSTALLATIONS.
- TEST STATIONS ARE TO BE INSTALLED AT 1000' INTERVALS OR AS OTHERWISE DIRECTED BY THE PLANS OR THE GAS REPRESENTATIVE.

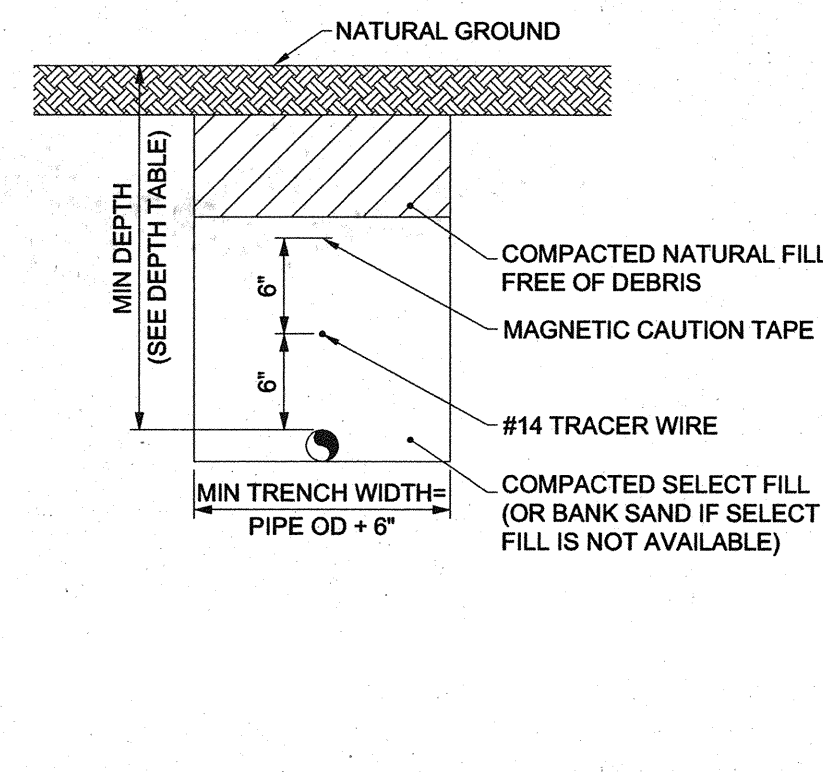
## TEST STATION REQUIREMENTS



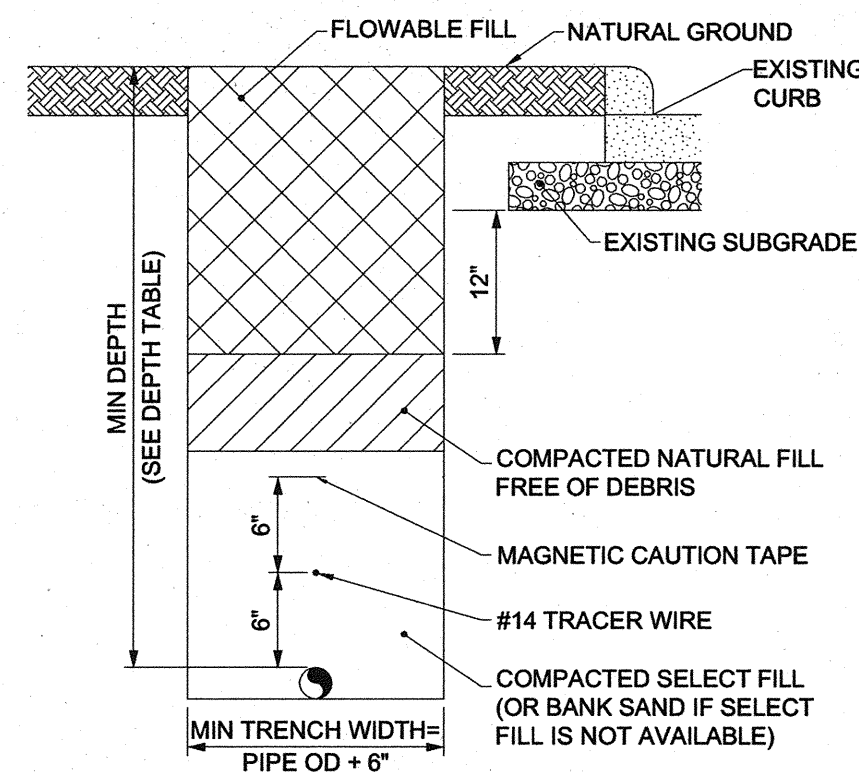
- NOTES:
- #1 ZINC ANODES ARE TO BE PLACED AT 500' INTERVALS WITH A 14 GAUGE (#14) COPPER WIRE CONNECTING THE ANODE TO THE TRACER WIRE. EVERY OTHER ANODE MUST BE CONNECTED TO A TEST STATION.

## TRENCH & BACKFILL REQUIREMENTS

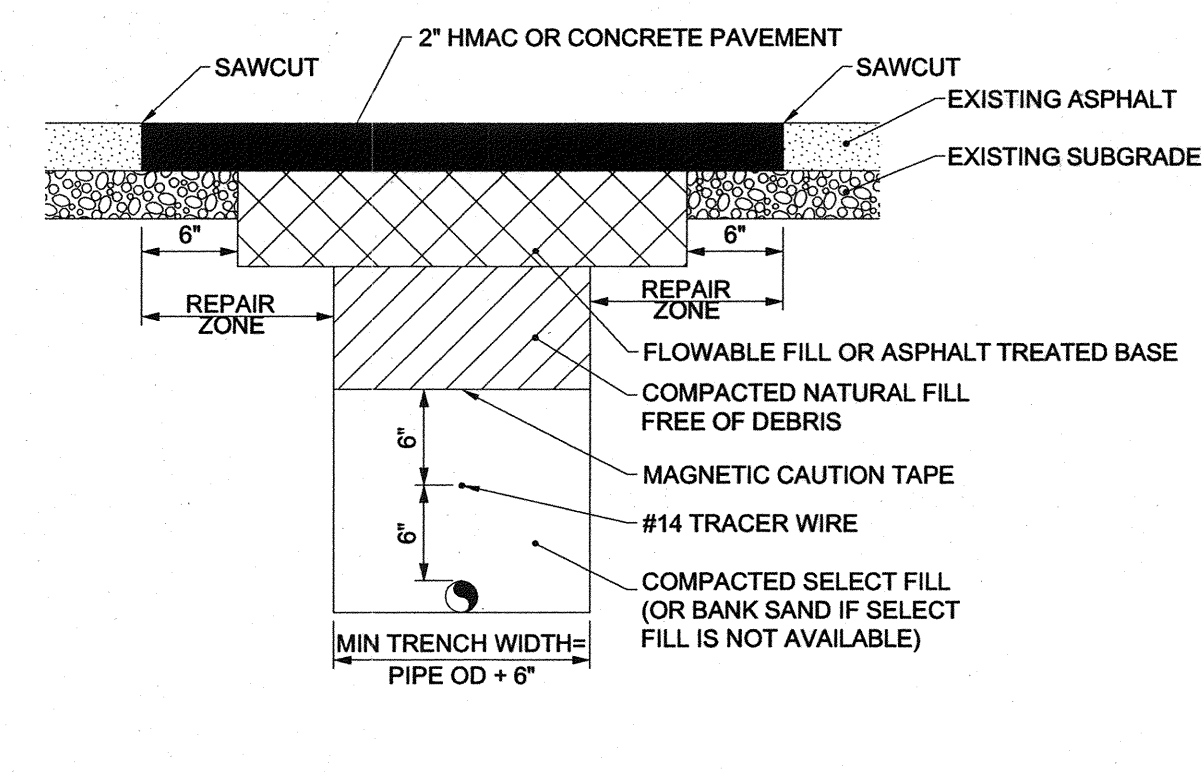
### BASIC TRENCH REQUIREMENTS



### WITHIN 10' FROM EDGE OF PAVEMENT



### UNDER PAVEMENT



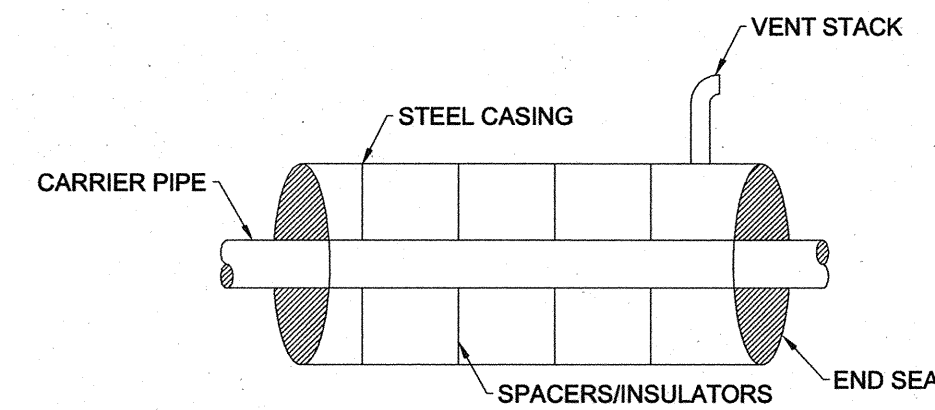
### DEPTH TABLE

LOCATION CONDITION	MINIMUM DEPTH FROM EXISTING GROUND TO TOP OF PIPE
EASEMENT	30"
BELOW DITCH	24"
IP IN TXDOT ROW	48"
HP IN TXDOT ROW	60"

### NOTES:

- CONTRACTOR MUST COMPLY WITH OSHA SPECIFICATIONS ON TRENCHING, BACKFILLING, EXCAVATION AND SHORING REQUIREMENTS.
- THE BOTTOM OF THE TRENCH MUST BE VOID OF ANY ROCKS GREATER THAN 0.5" DIAMETER AND OTHER DEBRIS CAPABLE OF DAMAGING THE SURFACE OF THE PIPE.
- A MINIMUM TWELVE INCHES (12") BANK SAND (OR OTHER APPROVED SELECT FILL) BEDDING MUST BE PLACED OVER THE NEW MAIN PRIOR TO THE COMPACTED BACKFILL.
- CONTRACTOR IS RESPONSIBLE FOR INSTALLING A CONTINUOUS LENGTH FOURTEEN GAUGE (#14) TRACER WIRE AT A MINIMUM SIX INCHES (6") ABOVE ALL NEW POLYETHYLENE MAINS. FOR CONNECTIONS TO EXISTING MAINS WHERE AN EXISTING TRACER WIRE IS ALREADY IN PLACE, CONTRACTOR IS RESPONSIBLE FOR STRIPING BACK AN APPROPRIATE LENGTH OF THE EXISTING TRACER WIRE AND MAKING A WATERPROOF CONNECTION TO WITH THE NEW TRACER WIRE. ANY JOINTS MUST BE TAPED.
- CONTRACTOR MUST INSTALL A MAGNETIC WARNING TAPE 6" ABOVE THE TRACER WIRE. CONTRACTOR MUST TIE NEW WARNING TAPE TO ANY EXISTING WARNING TAPE.
- BACKFILL PLACED OVER BEDDING MUST BE FREE OF ROCKS GREATER THAN 0.5" DIAMETER.
- ALL PIPE INSTALLED IN A TRENCH MUST UTILIZE A SNAKING METHOD.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PRESENCE OF THE GAS REPRESENTATIVE WHEN ITEMS 2-8 ABOVE ARE ADDRESSED DURING CONSTRUCTION.
- DEPTH TABLE PROVIDES MINIMUM DEPTH REQUIREMENTS FOR FINAL TOP OF PIPE DEPTH OF COVER. CONTRACTOR MUST REFER TO THIS TABLE FOR ALL INSTALLATIONS WHERE ELEVATIONS AND/OR PROFILES HAVE NOT BEEN PROVIDED.
- SERVICES ARE TO BE INSTALLED WITH A MINIMUM DEPTH OF 12" INSIDE PRIVATE PROPERTY AND 18" IN PUBLIC RIGHTS OF WAY.
- ALL DEVIATIONS TO ANY OF THE ABOVE REQUIREMENTS AND/OR ILLUSTRATIONS MUST BE APPROVED BY THE GAS REPRESENTATIVE.
- REPAIR ZONE = 12" MINIMUM OR 6" BEYOND UNDISTURBED CONDITION (WHICHEVER IS GREATER)
- FOR CONDITIONS UNDER CONCRETE PAVEMENT, CONTRACTOR MUST REPAIR TO NEAREST JOINT UNLESS OTHERWISE SPECIFIED IN PLANS OR AS DIRECTED BY GAS REPRESENTATIVE.

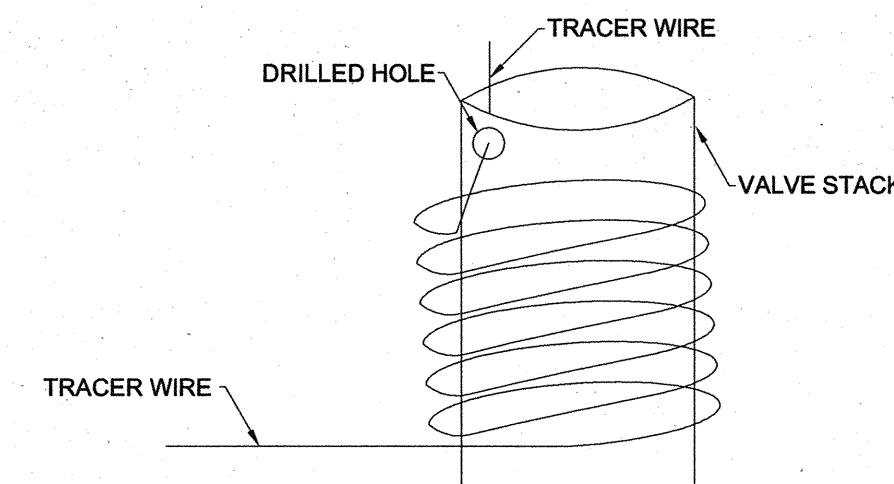
## ENCASEMENT REQUIREMENTS



### NOTES:

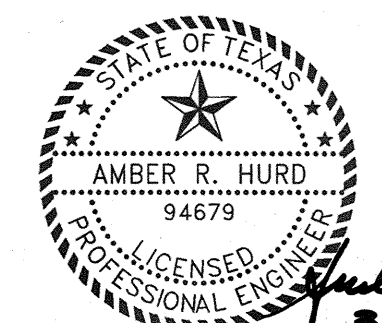
- UNLESS OTHERWISE DIRECTED IN PLANS OR BY GAS REPRESENTATIVE, MINIMUM CASING SIZE = 2" + CARRIER PIPE SIZE
- CASING PIPE MUST BE CAPPED PRIOR TO INSTALLING CARRIER PIPE TO ENSURE THE ABSENCE OF ANY DEBRIS.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE GAS REPRESENTATIVE TO INSPECT THE REMOVAL OF THE CAPS PRIOR TO INSTALLING THE CARRIER PIPE.
- CONTRACTOR MUST INSTALL CASING SPACERS/INSULATORS TO ENSURE CARRIER PIPE IS ISOLATED FROM CASING PIPE AND SECURELY ANCHOR LONG SECTIONS OF CARRIER POLYETHYLENE PIPE PRIOR TO PULLING INTO CASING PIPE TO ENSURE EACH JOINT WILL SUSTAIN LONGITUDINAL PULLOUT.
- CASING ENDS ARE TO BE SECURED WITH WATER TIGHT CASING END SEALS.
- UNLESS OTHERWISE SPECIFIED IN PLANS OR BY GAS REPRESENTATIVE, PIPE LINE MARKERS AND VENT STACKS ARE TO BE INSTALLED AT ALL CASING END POINTS IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS AND AS SPECIFIED BY THE MANUFACTURER SPECIFICATIONS.

## VALVE STACK REQUIREMENTS



### NOTES:

- ALL VALVES ARE TO BE INSTALLED WITH VALVE BOXES IN ACCORDANCE WITH CITY OF TOMBALL REQUIREMENTS.
- CONTRACTOR MUST INSTALL A SUPPORT IN ACCORDANCE WITH VALVE MANUFACTURER SPECIFICATIONS.
- TRACER WIRE MUST BE INSTALLED AROUND VALVE STACK AS SHOWN IN ABOVE ILLUSTRATION. WIRE MUST BE WRAPPED ALONG OUTSIDE OF VALVE STACK AND INSERTED THROUGH DRILLED HOLE NEAR TOP OF VALVE STACK.



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 13430 Northwest Freeway, Suite 1100  
 Houston, Texas 77040  
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 JOB NO.0512015-00 DWG. NO.05120152\_GN02

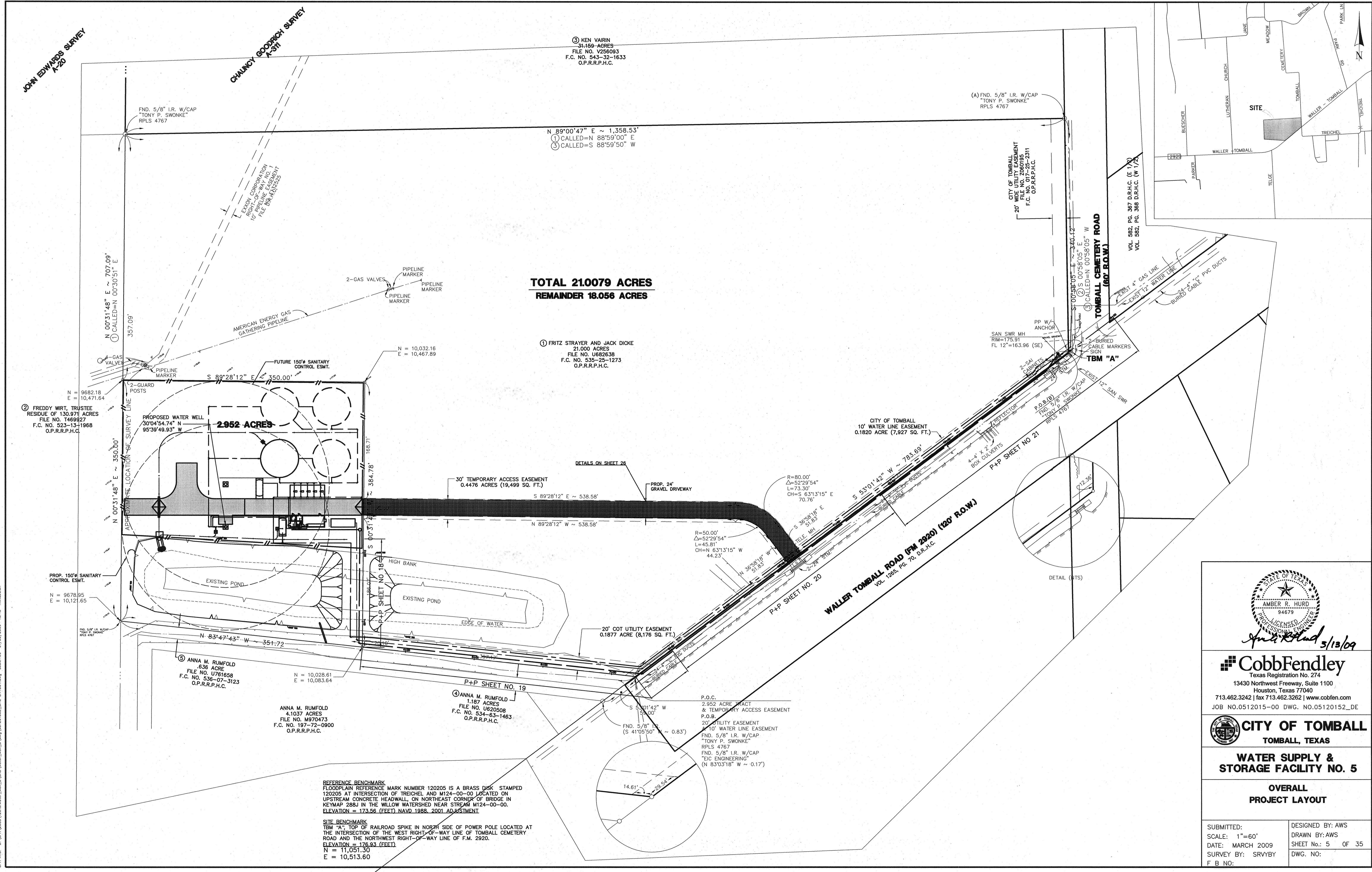
**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

### GAS NOTES

SUBMITTED:	DESIGNED BY: ARH
SCALE: N.T.S.	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 3 OF 35
SURVEY BY:	DWG. NO:
F B NO:	





**TOTAL 21.0079 ACRES**  
**REMAINDER 18.056 ACRES**

**REFERENCE BENCHMARK**  
 FLOODPLAIN REFERENCE MARK NUMBER 120205 IS A BRASS DISK STAMPED 120205 AT INTERSECTION OF TREICHEL AND M124-00-00 LOCATED ON UPSTREAM CONCRETE HEADWALL, ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 288J IN THE WILLOW WATERSHED NEAR STREAM M124-00-00. ELEVATION = 173.56 (FEET) NAVD 1988, 2001 ADJUSTMENT.

**SITE BENCHMARK**  
 TBM "A", TOP OF RAILROAD SPIKE IN NORTH SIDE OF POWER POLE LOCATED AT THE INTERSECTION OF THE WEST RIGHT-OF-WAY LINE OF TOMBALL CEMETERY ROAD AND THE NORTHWEST RIGHT-OF-WAY LINE OF F.M. 2920. ELEVATION = 176.93 (FEET).  
 N = 11,051.30  
 E = 10,513.60

*Amber R. Hurd 3/13/09*

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 Texas Registration No. 274  
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 Houston, Texas 77040  
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 JOB NO. 0512015-00 DWG. NO. 05120152\_DE

**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**OVERALL PROJECT LAYOUT**

SUBMITTED:	DESIGNED BY: AWS
SCALE: 1"=60'	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 5 OF 35
SURVEY BY: SRVYBY	DWG. NO.:
F B NO.:	

C:\FA\2005\12015\water\_well\3\CADD\water\_well\_3\CADD\water\_well\_3\_LAYOUT.dwg 01/30/2009 10:15 Revision

**REFERENCE BENCHMARK**  
 FLOODPLAIN REFERENCE MARK NUMBER 120205 IS A BRASS DISK STAMPED 120205 AT INTERSECTION OF TREICHEL AND M124-00-00 LOCATED ON UPSTREAM CONCRETE HEADWALL, ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 288J IN THE WILLOW WATERSHED NEAR STREAM M124-00-00.  
 ELEVATION = 173.56 (FEET) NAVD 1988, 2001 ADJUSTMENT

**SITE BENCHMARK**  
 TBM "A", TOP OF RAILROAD SPIKE IN NORTH SIDE OF POWER POLE LOCATED AT THE INTERSECTION OF THE WEST RIGHT-OF-WAY LINE OF TOMBALL CEMETERY ROAD AND THE NORTHWEST RIGHT-OF-WAY LINE OF F.M. 2920.  
 ELEVATION = 176.93 (FEET)  
 N = 11,051.30  
 E = 10,513.60

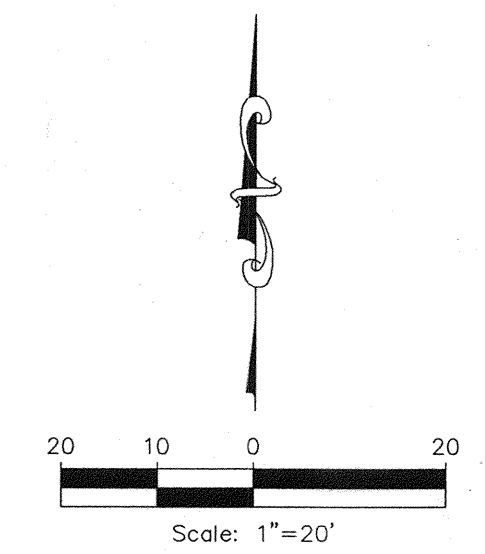
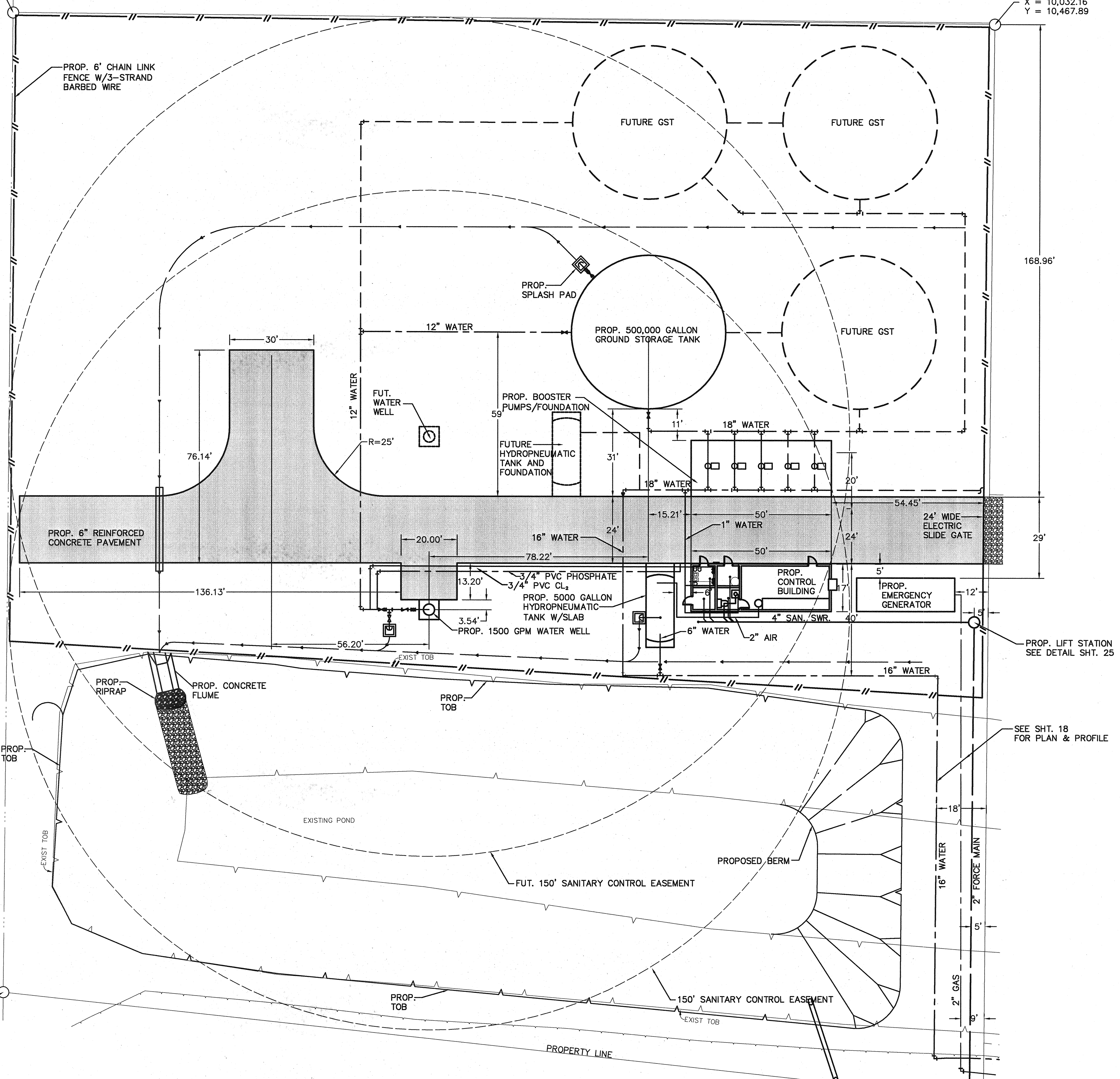
**FEMA NOTE**  
 THIS PROJECT LIES OUTSIDE THE LIMITS OF DETAILED STUDY AS PER FIRM PANEL NO. 48202C0210L DATED JUNE 18, 2007. THE 100-YEAR FLOOD PLAIN ELEVATION IS ELEV. 174.

X = 9652.18  
 Y = 10,471.64

X = 10,032.16  
 Y = 10,467.89

X = 9678.95  
 Y = 10,121.65

X = 10,028.61  
 Y = 10,083.64



**LEGEND**

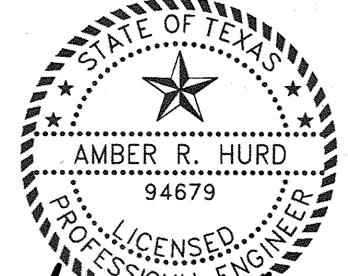
- PROP. FACILITIES
- - - FUTURE FACILITIES
- - - EXIST. CONTOURS
- PROP. PVMT.
- x 177.00 EXIST. ELEVATION
- - - PROP. WATERLINE
- - - FUTURE WATERLINE
- - - PROP. SANITARY
- - - PROP. GAS
- - - PROP. SWALE

168.96'

29'

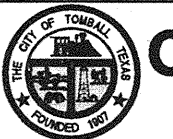
PROP. LIFT STATION  
 SEE DETAIL SHT. 25

SEE SHT. 18  
 FOR PLAN & PROFILE



*Amber R. Hurd 2/13/09*

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 JOB NO. 0512015-00 DWG. NO. 05120152\_DE



**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY &  
 STORAGE FACILITY NO. 5**

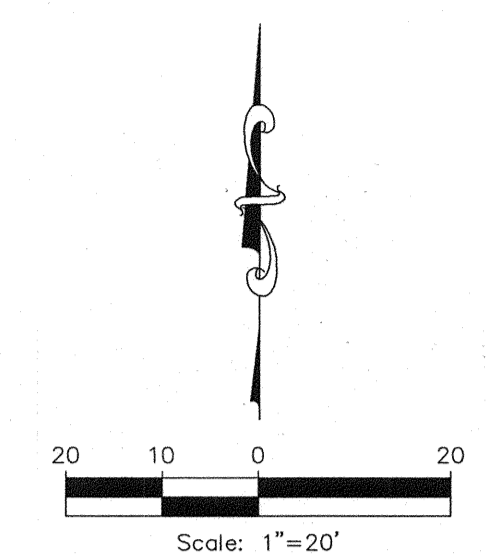
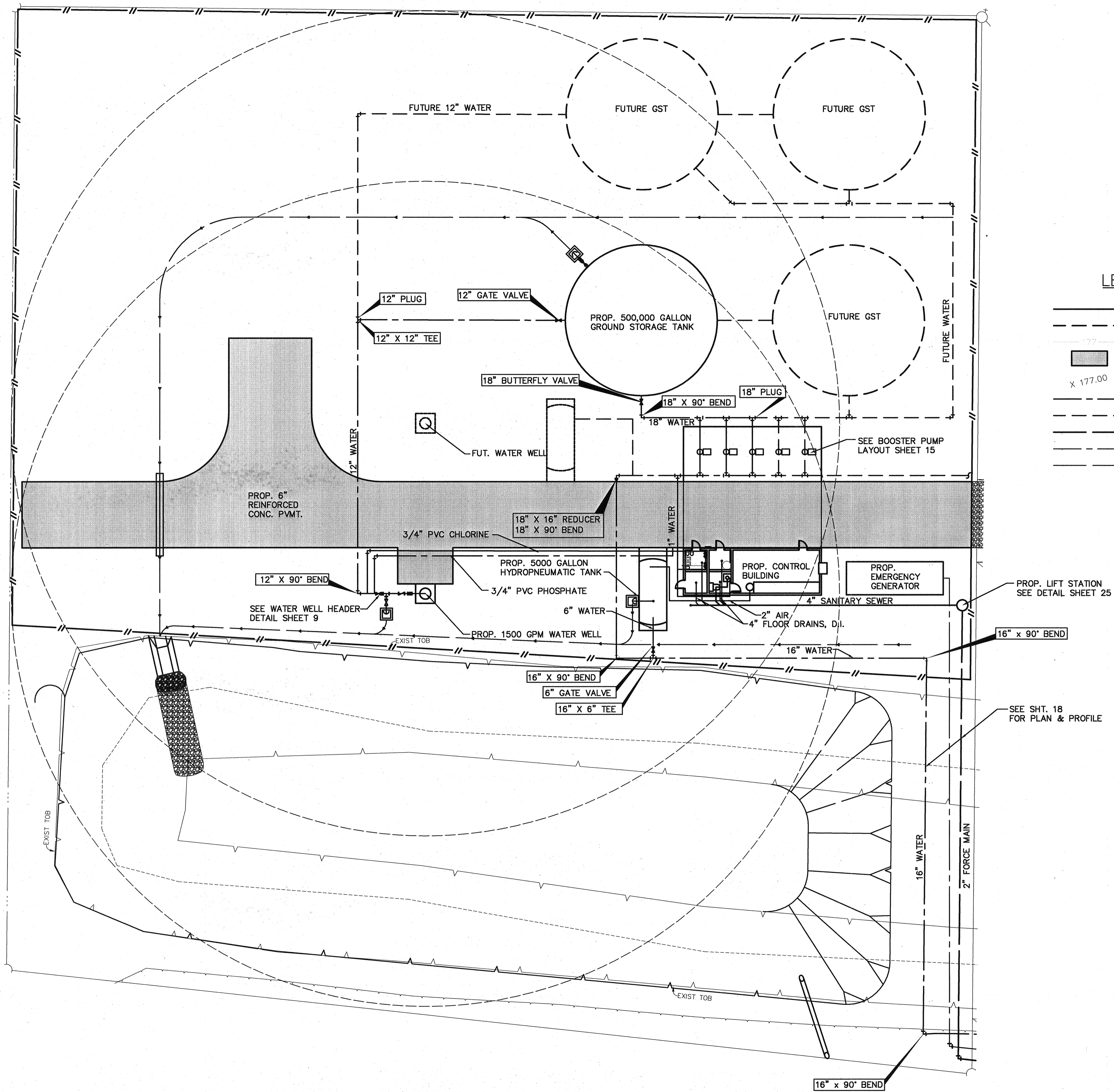
**SITE PLAN  
 GEOMETRIC LAYOUT**

SUBMITTED:	DESIGNED BY: AWS
SCALE: 1"=20'	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 6 OF 35
SURVEY BY:	DWG. NO.:
F B NO.:	

**REFERENCE BENCHMARK**  
 FLOODPLAIN REFERENCE MARK NUMBER 120205 IS A BRASS DISK STAMPED 120205 AT INTERSECTION OF TREICHEL AND M124-00-00 LOCATED ON UPSTREAM CONCRETE HEADWALL, ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 288J IN THE WILLOW WATERSHED NEAR STREAM M124-00-00. ELEVATION = 173.56 (FEET) NAVD 1988, 2001 ADJUSTMENT

**SITE BENCHMARK**  
 TBM "A", TOP OF RAILROAD SPIKE IN NORTH SIDE OF POWER POLE LOCATED AT THE INTERSECTION OF THE WEST RIGHT-OF-WAY LINE OF TOMBALL CEMETERY ROAD AND THE NORTHWEST RIGHT-OF-WAY LINE OF F.M. 2920. ELEVATION = 176.93 (FEET)

**FEMA NOTE**  
 THIS PROJECT LIES OUTSIDE THE LIMITS OF DETAILED STUDY AS PER FIRM PANEL NO. 48202C0210L DATED JUNE 18, 2007. THE 100-YEAR FLOOD PLAIN ELEVATION IS ELEV. 174.



**LEGEND**

- PROP. FACILITIES
- - - FUTURE FACILITIES
- - - EXIST. CONTOURS
- PROP. PVMT.
- x 177.00 EXIST. ELEVATION
- PROP. WATERLINE
- - - FUTURE WATERLINE
- - - PROP. SANITARY
- - - PROP. GAS
- - - PROP. SWALE

PRIVATE UTILITY LINES SHOWN  
 AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

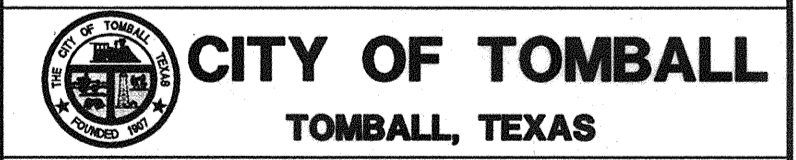
*AS Paul* Date: 3-18-09  
 CenterPoint Energy/Electric Facilities  
 (Approved only for crossing underground ductlines, unless otherwise noted.)  
 Validity: Term of agreement.

*Paul* Date: 3/16/09  
 SBC Approved for underground conduit facilities only.  
 Signature valid for one year.

Date: \_\_\_\_\_  
 City of Tomball/Gas Facilities



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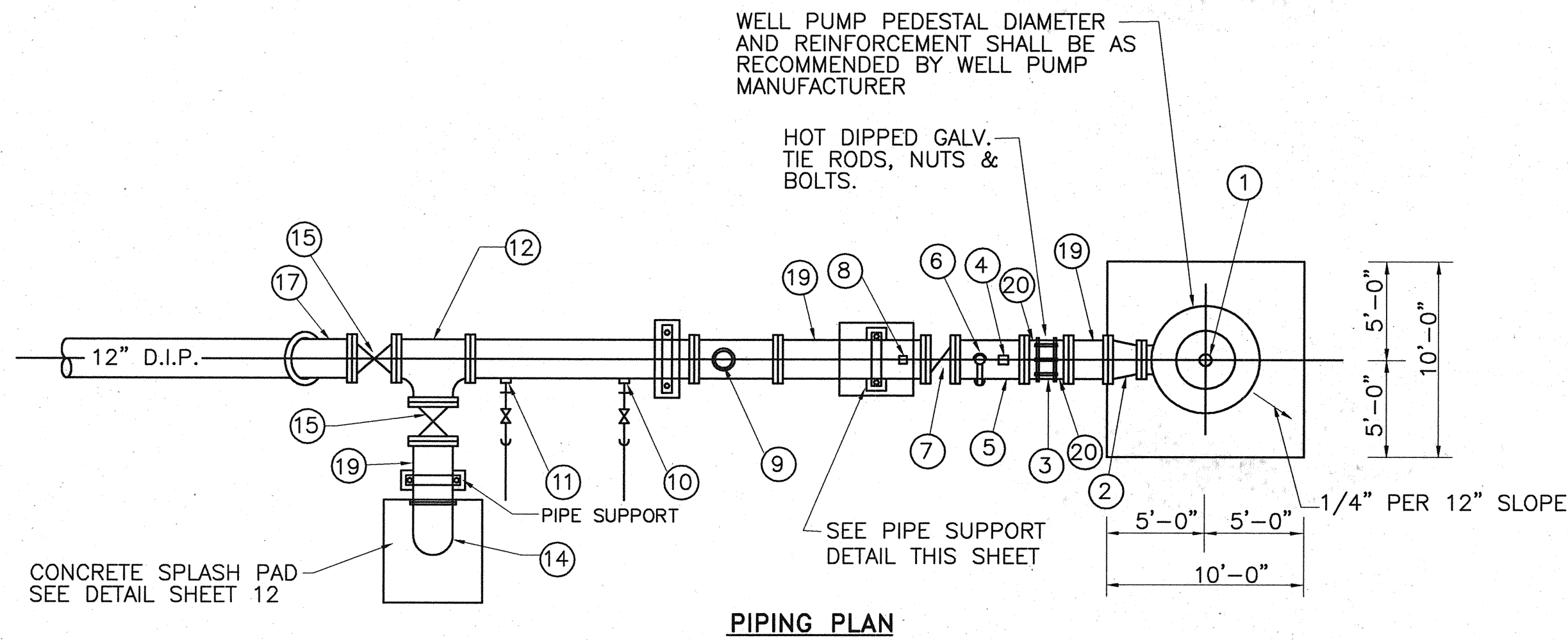
**WATER SUPPLY & STORAGE FACILITY NO. 5**

**SITE PLAN PIPING LAYOUT**

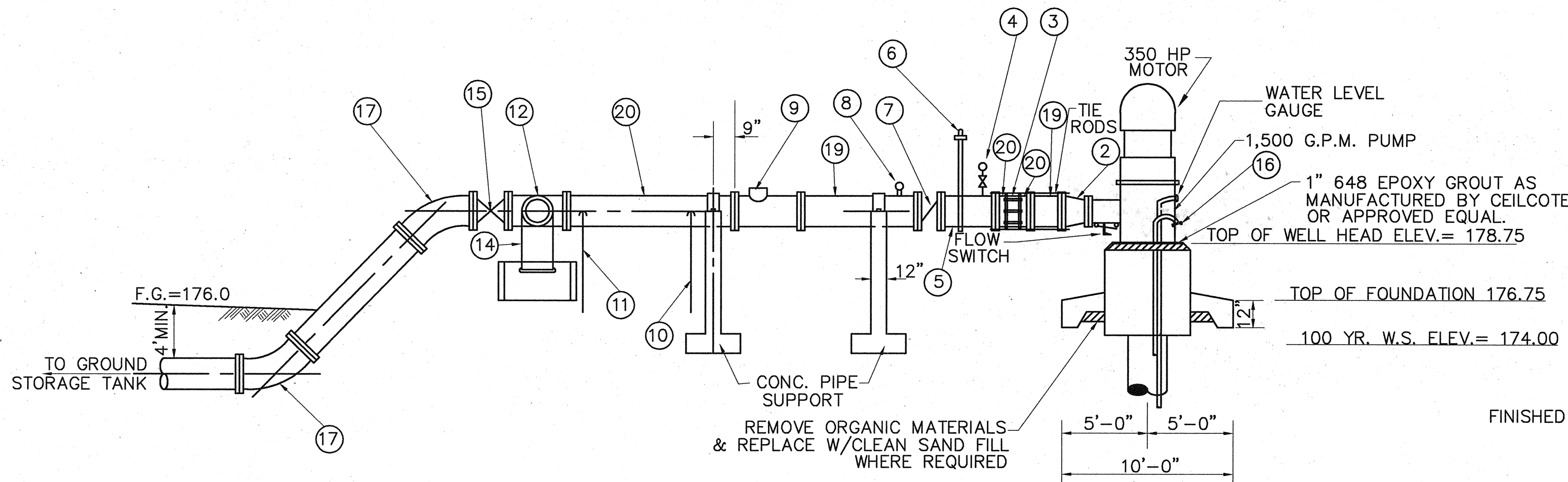
SUBMITTED:	DESIGNED BY: ARH
SCALE: 1"=20'	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 7 OF 35
SURVEY BY:	DWG. NO:
F B NO:	





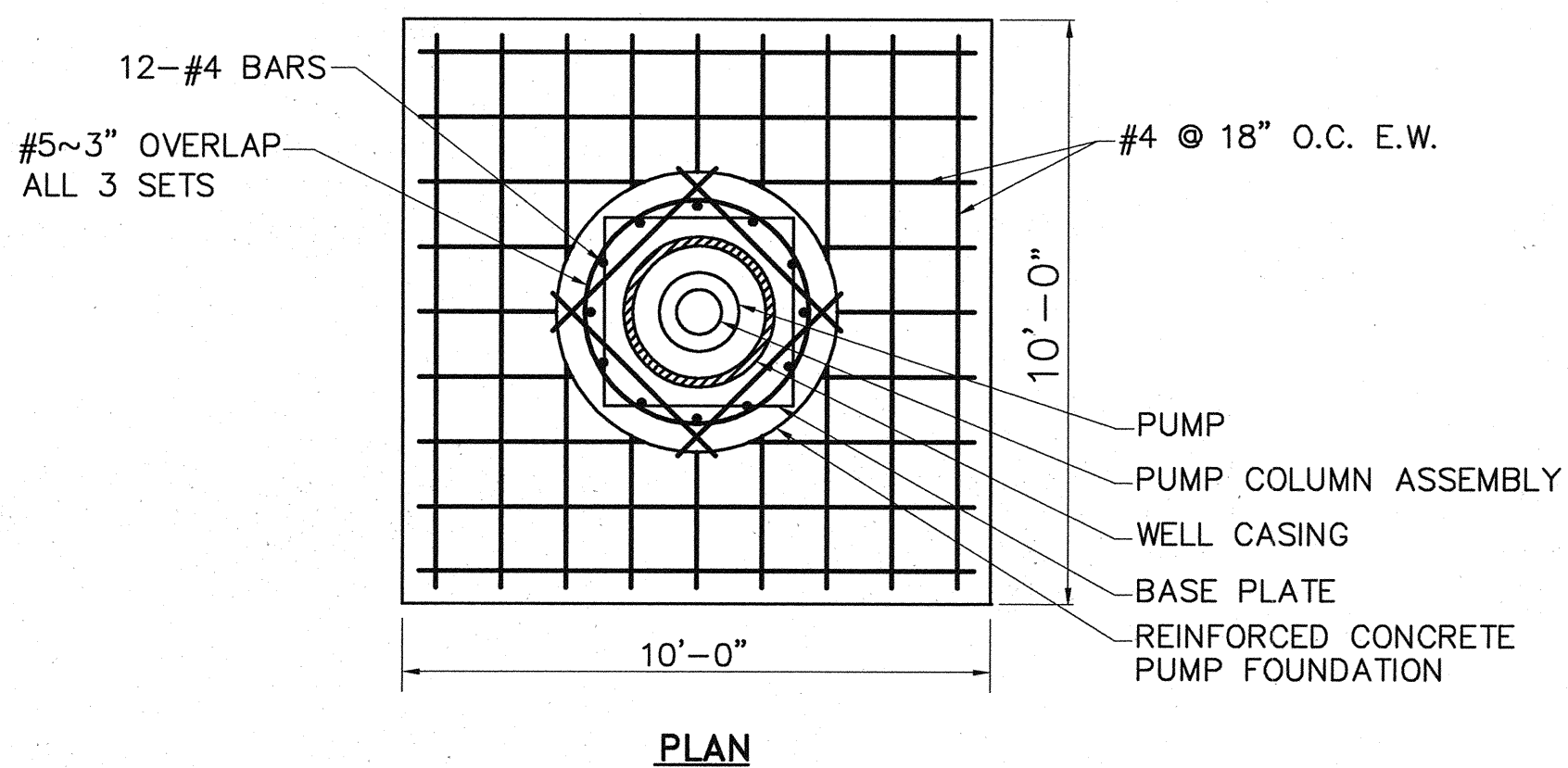


PIPING PLAN

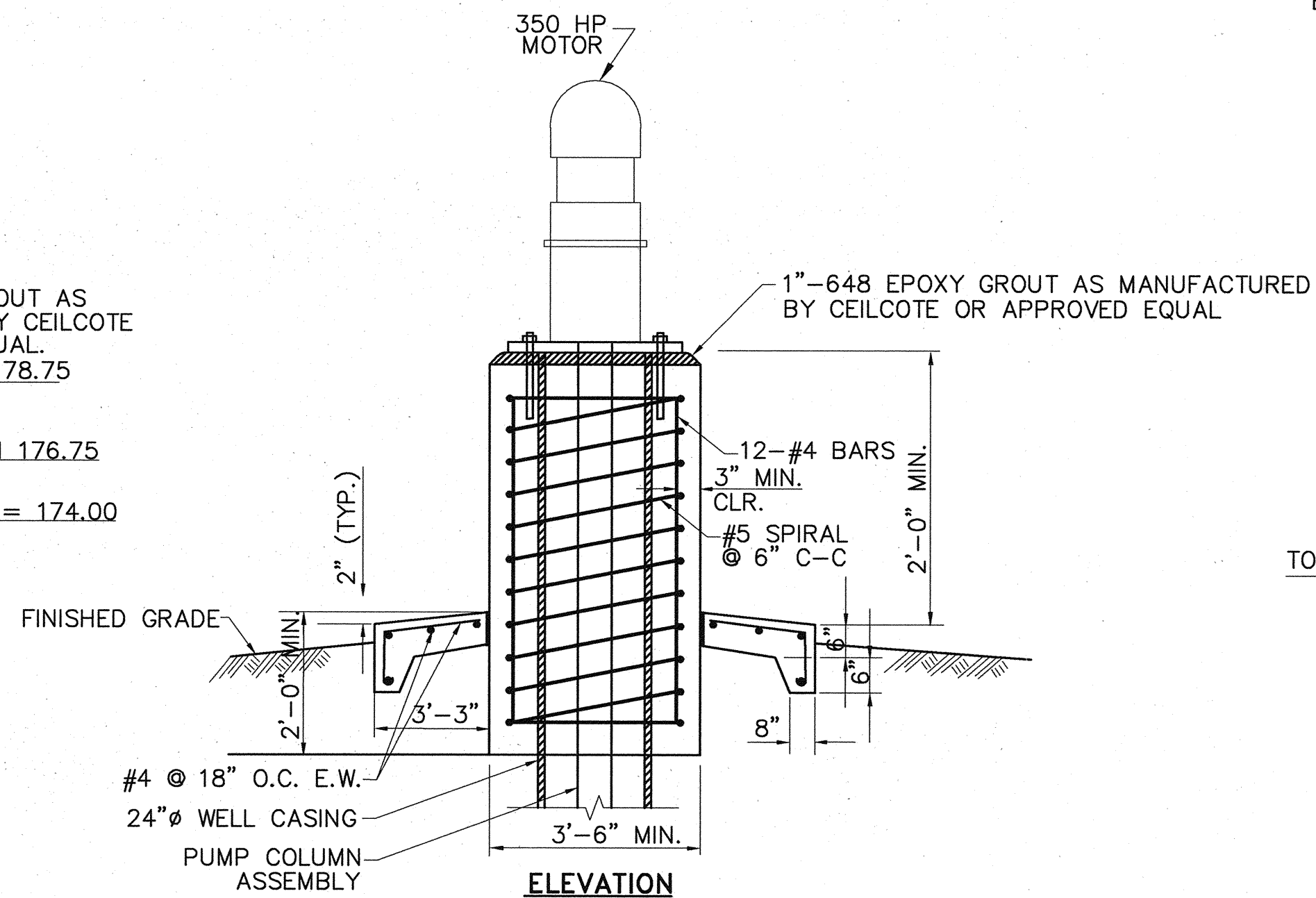


PIPING SECTION

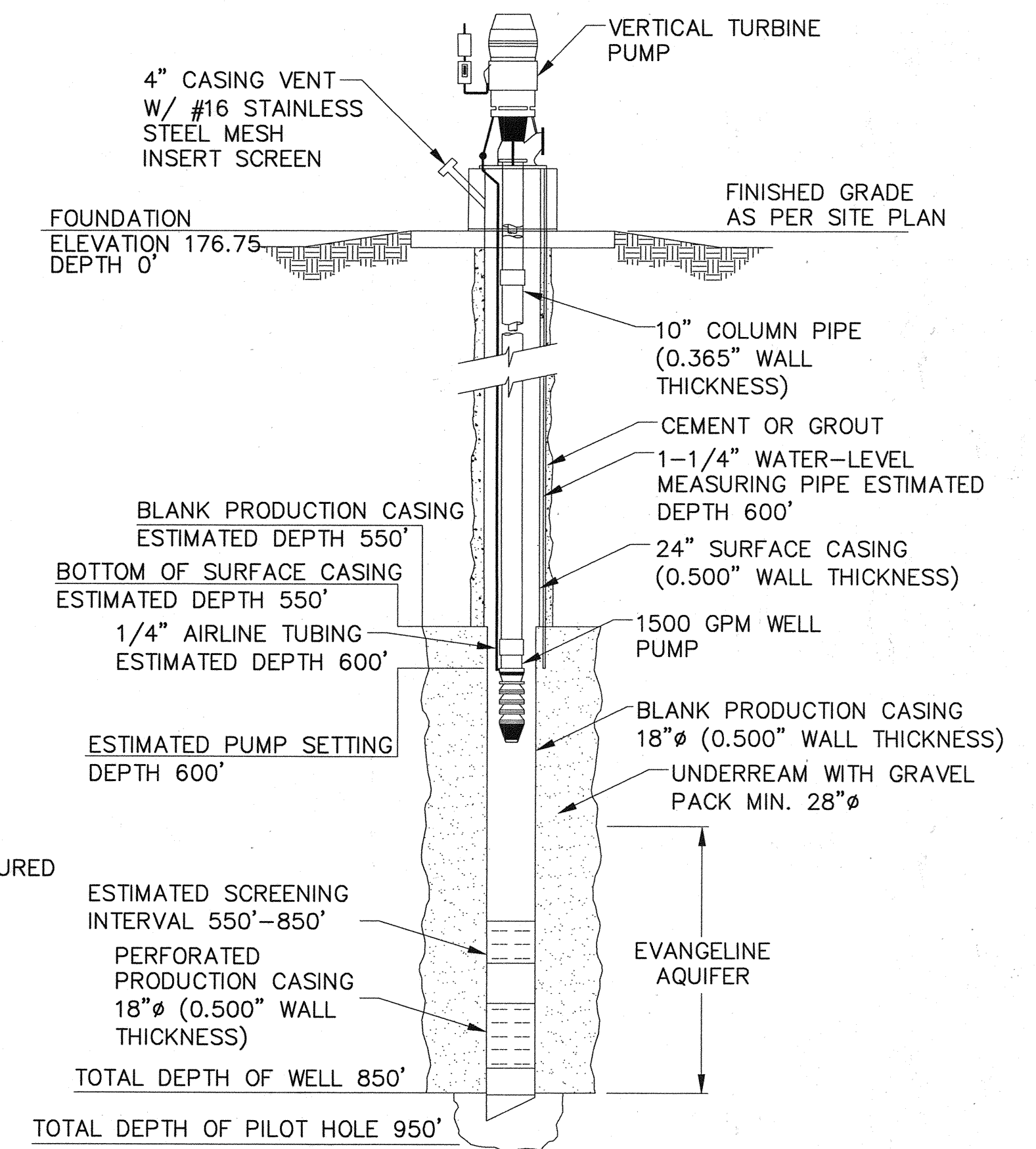
PROP 1500 G.P.M. WATER WELL HEADER  
N.T.S.



PLAN



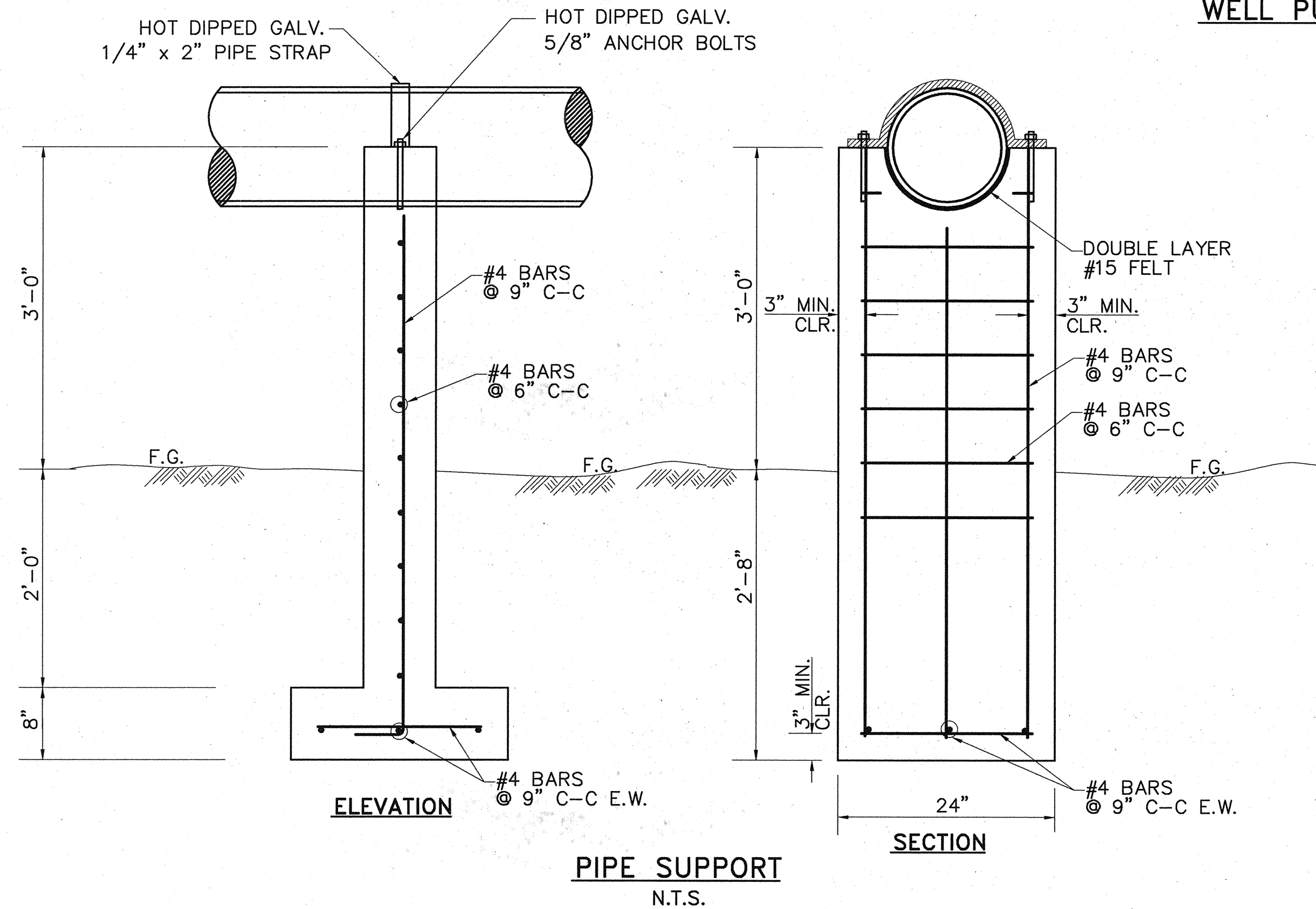
WELL PUMP FOUNDATION  
N.T.S.



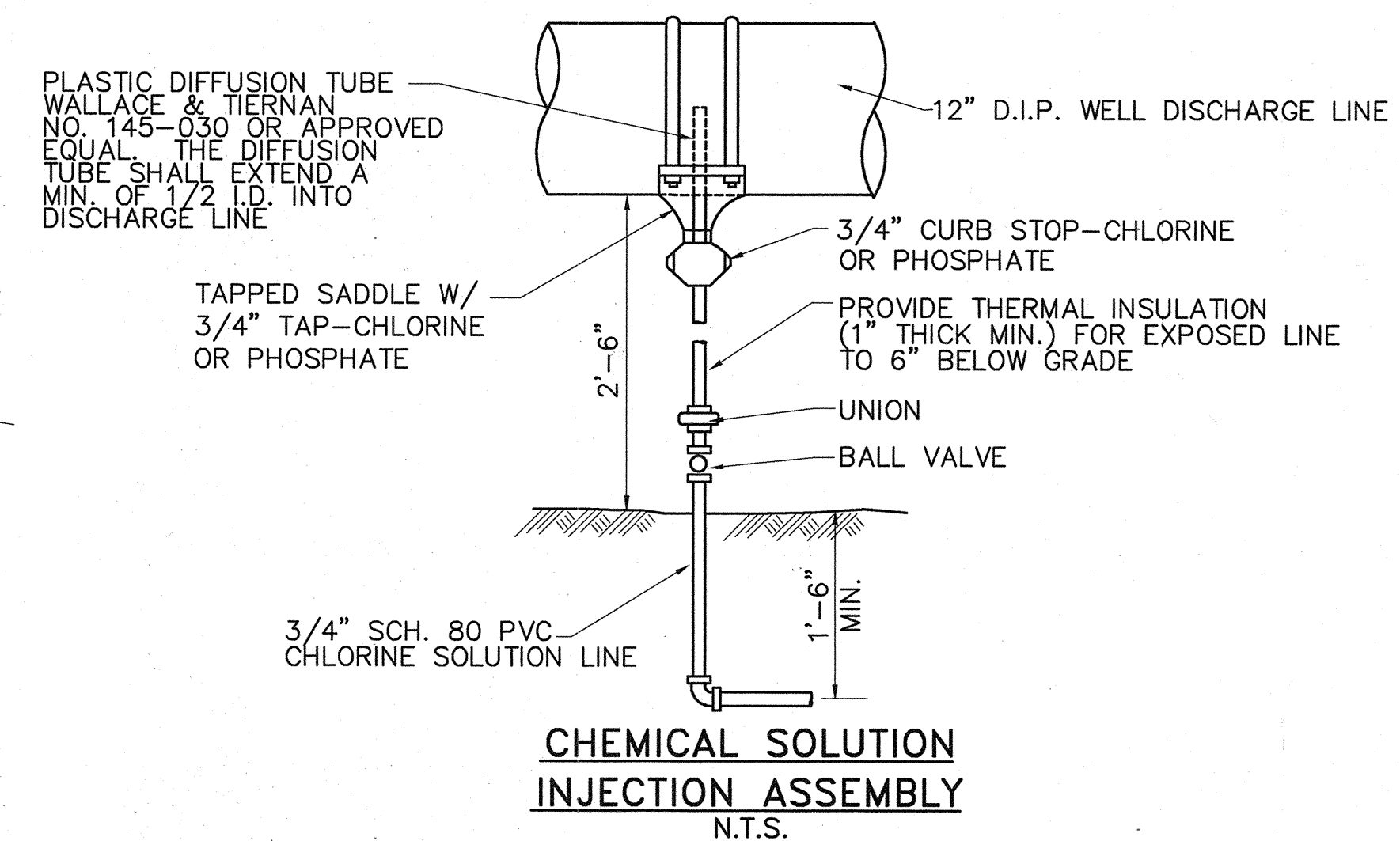
WELL SECTION  
N.T.S.

PIPE, VALVE AND FITTING SCHEDULE

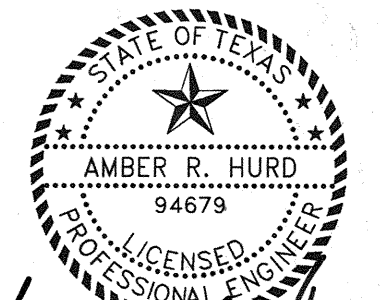
NO.	DESCRIPTION
1	WATER WELL (1,500 G.P.M.)
2	8"x 12" CONCENTRIC RED., FE/FE
3	12" DRESSER STYLE COUPLING
4	MERCOID H.P. CUT OFF SWITCH
5	12" SPOOL PIECE W/2" TAP (MIN 1' LONG), FE/FE
6	2" AIR RELEASE & VACUUM VALVE
7	12" SILENT CHECK VALVE, FE/FE
8	PRESSURE GAUGE (0-100 PSI)
9	12" FLOWMETER, FE/FE (INSTALLED MIN. 5' DOWNSTREAM OF CHECK VALVE)
10	1 3/4" CL TAP (SEE DETAIL THIS SHEET)
11	1 3/4" PHOSPHATE TAP (SEE DETAIL THIS SHEET)
12	12"x 12" TEE, FE/FE/FE
13	12" GATE VALVE, FE/FE
14	12"x 90° BEND, FE/PE
15	12" GATE VALVE, FE/FE
16	2" VENT W/#16 MESH 316 S.S.
17	12"x 45° BEND, FE/FE
18	12" SPOOL PIECE, FE/FE
19	12" SPOOL PIECE, FE/PE
20	12" SPOOL PIECE, FE/FE, MINIMUM 10' LONG



PIPE SUPPORT  
N.T.S.



CHEMICAL SOLUTION  
INJECTION ASSEMBLY  
N.T.S.



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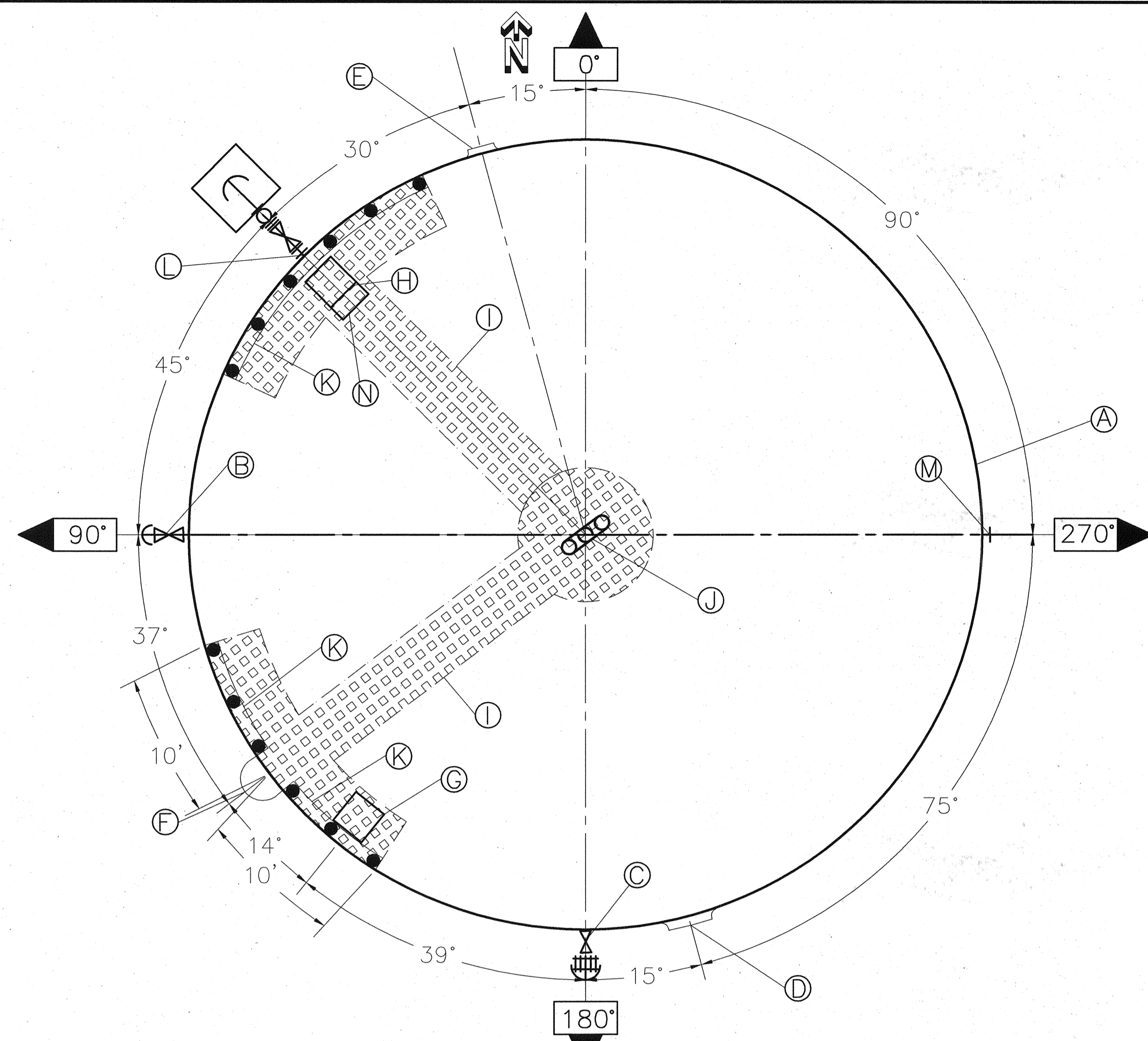
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**WATER SUPPLY & STORAGE FACILITY NO. 5**

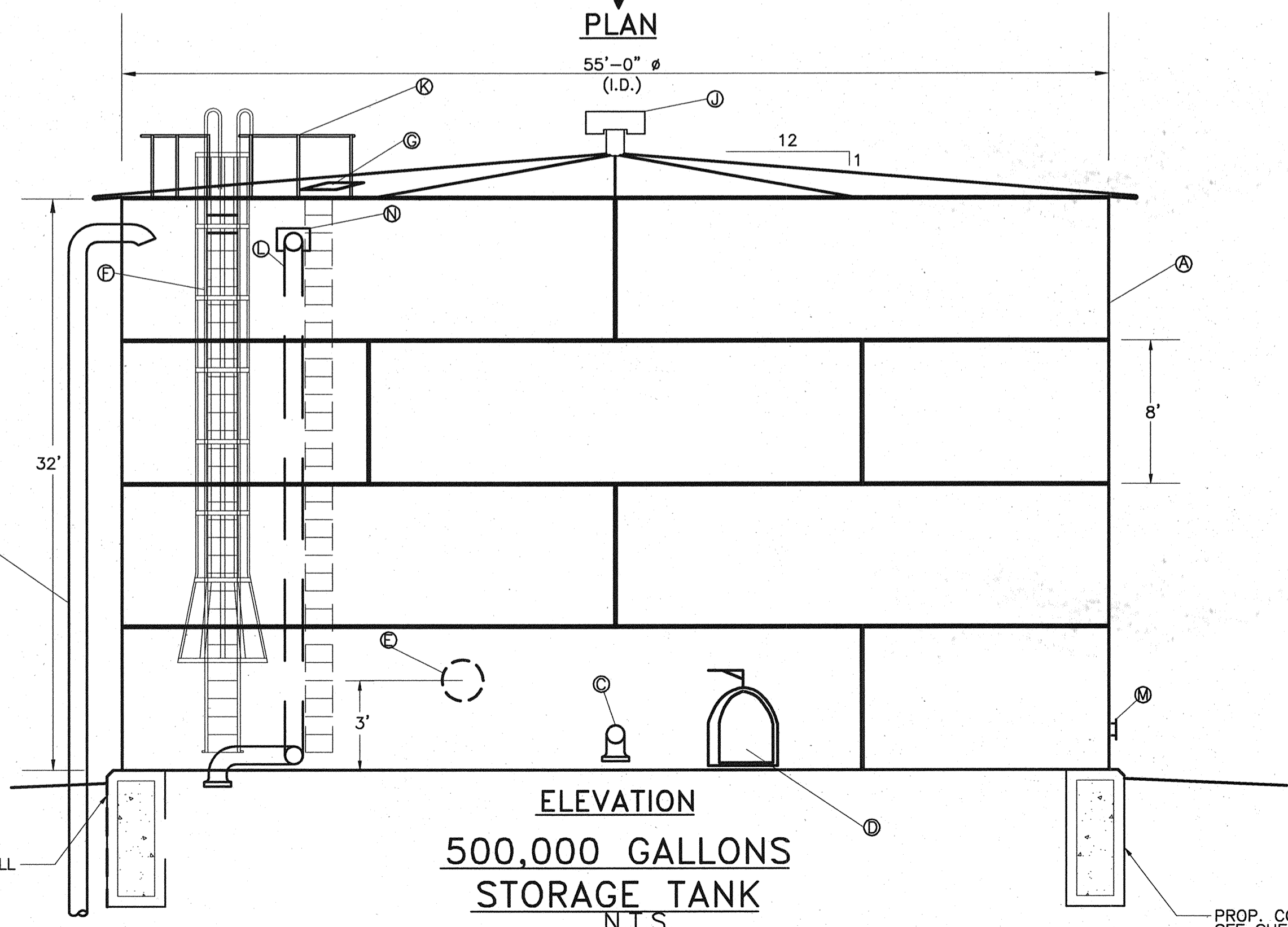
**WATER WELL DETAILS**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: AJV
DATE: MARCH 2009	SHEET No.: 9 OF 35
SURVEY BY:	DWG. NO:
F B NO:	



PLAN

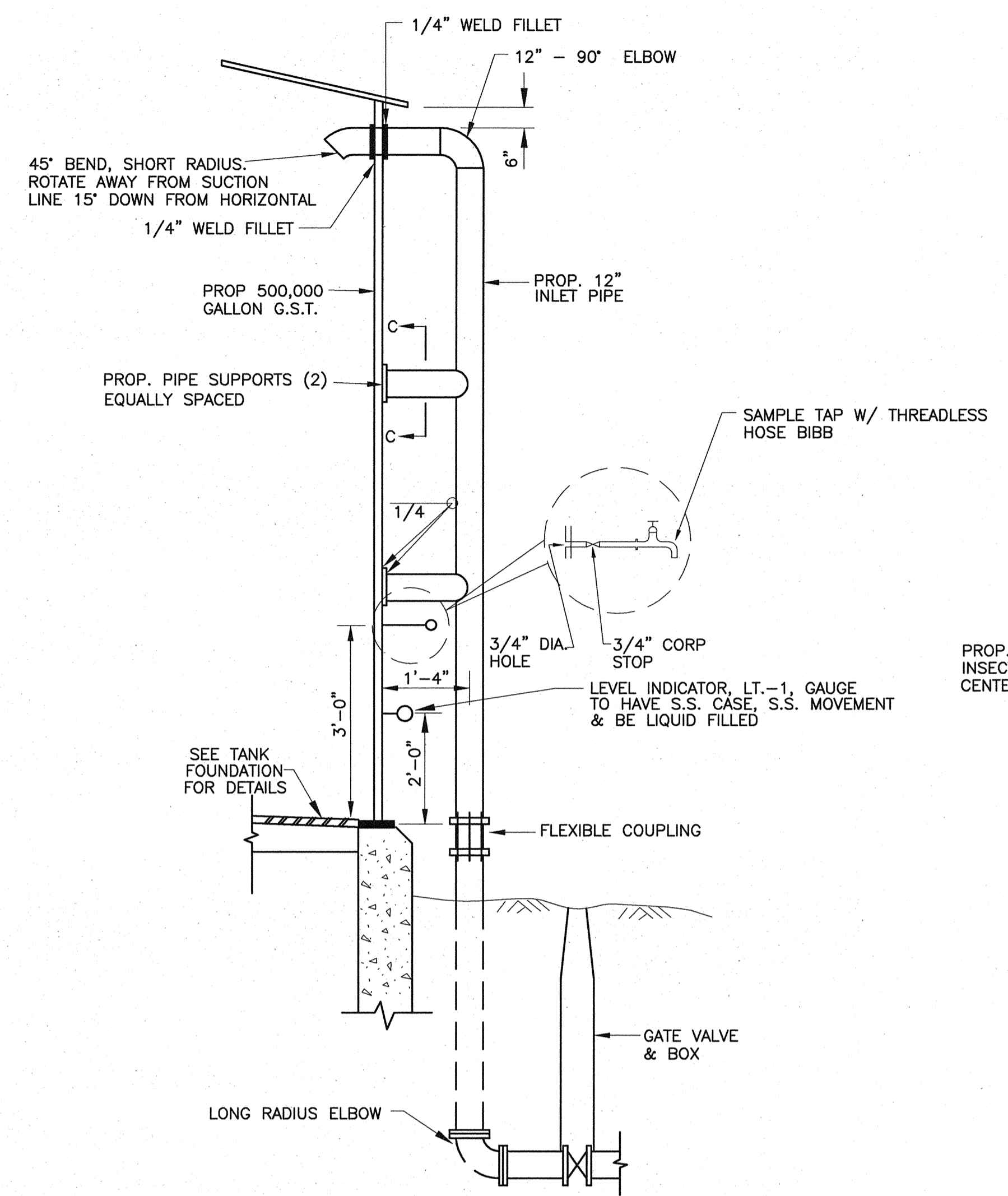
55'-0"  $\phi$   
(I.D.)



ELEVATION

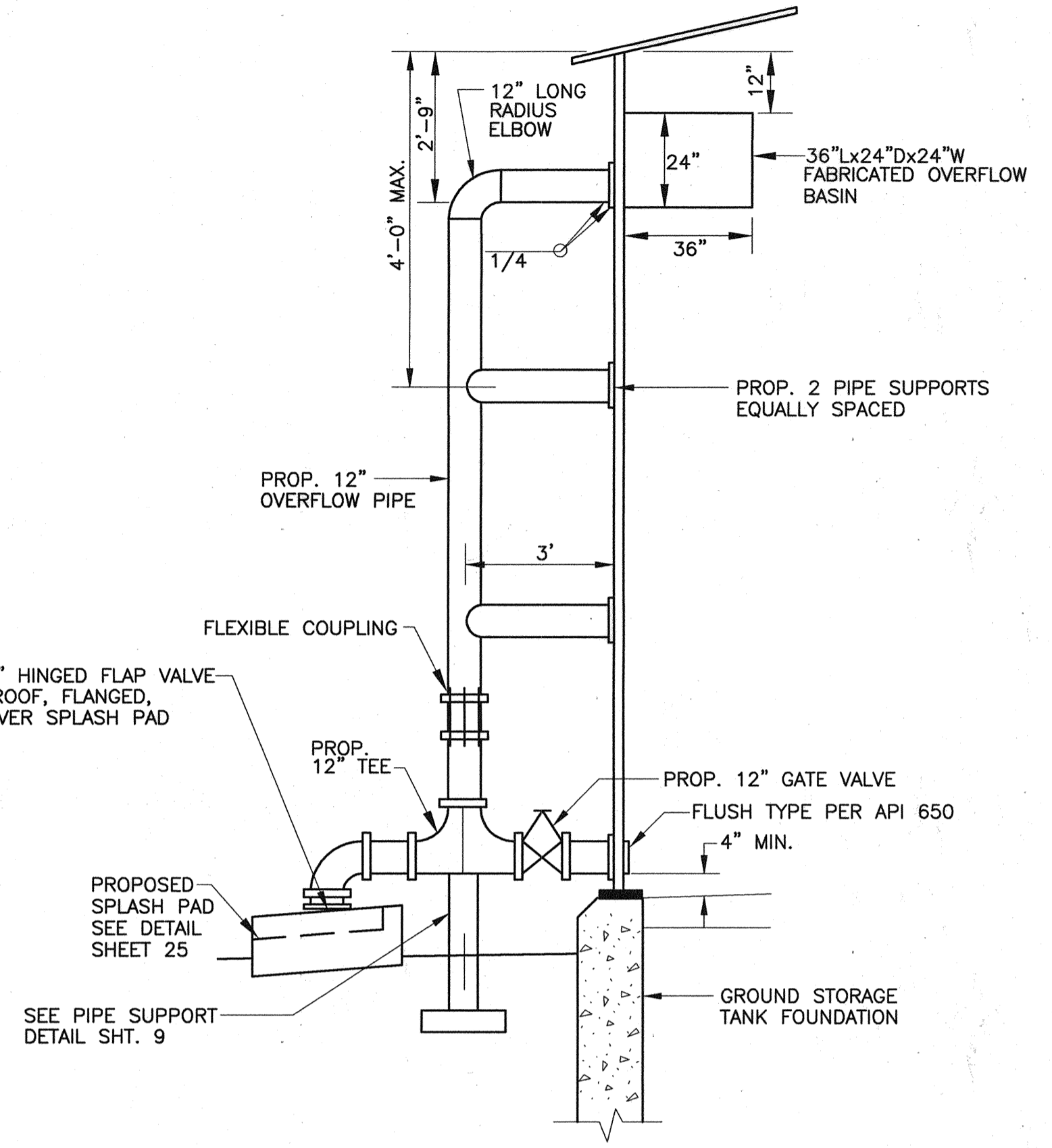
500,000 GALLONS  
STORAGE TANK

N.T.S.



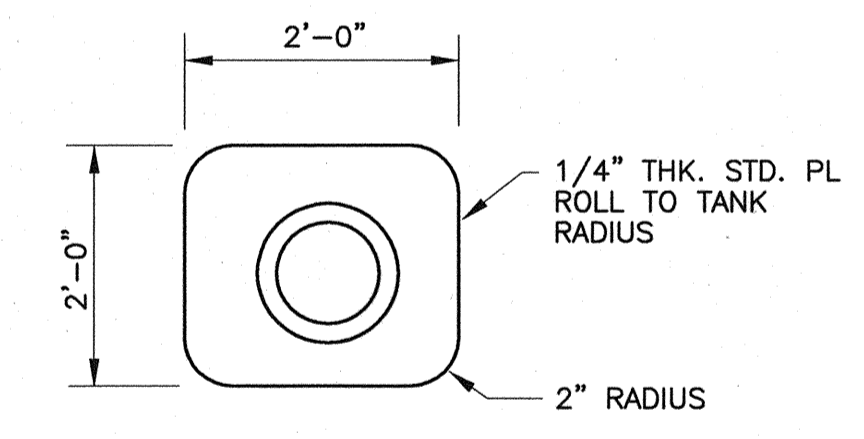
TANK SUPPLY INLET &  
SAMPLE FAUCET LOCATION  
DETAILS

N.T.S.



TANK OVERFLOW  
& DRAIN

N.T.S.



SECTION "C-C"

N.T.S.

- (A) 500,000 GALLON STORAGE TANK
- (B) 12" INLET PIPE
- (C) 18" SUCTION PIPE, BUTTERFLY VALVE, & FLEXIBLE COUPLING
- (D) 4'x4' FLUSH MANWAY
- (E) 30"  $\phi$  MANWAY
- (F) EXTERIOR LADDER WITH CAGE
- (G) ROOF HATCH WITH INTERIOR LADDER
- (H) ROOF HATCH WITHOUT INTERIOR LADDER
- (I) 4' WIDE NON-SKID WALKWAY
- (J) 20" GOOSE NECK ROOF VENT
- (K) HANDRAIL (MIN. 10' LONG)
- (L) 12" OVERFLOW PIPE
- (M) 16" INTERCONNECT PIPE W/ BLIND FLANGE
- (N) OVERFLOW WEIR

*Amber R. Hurd 3/13/09*

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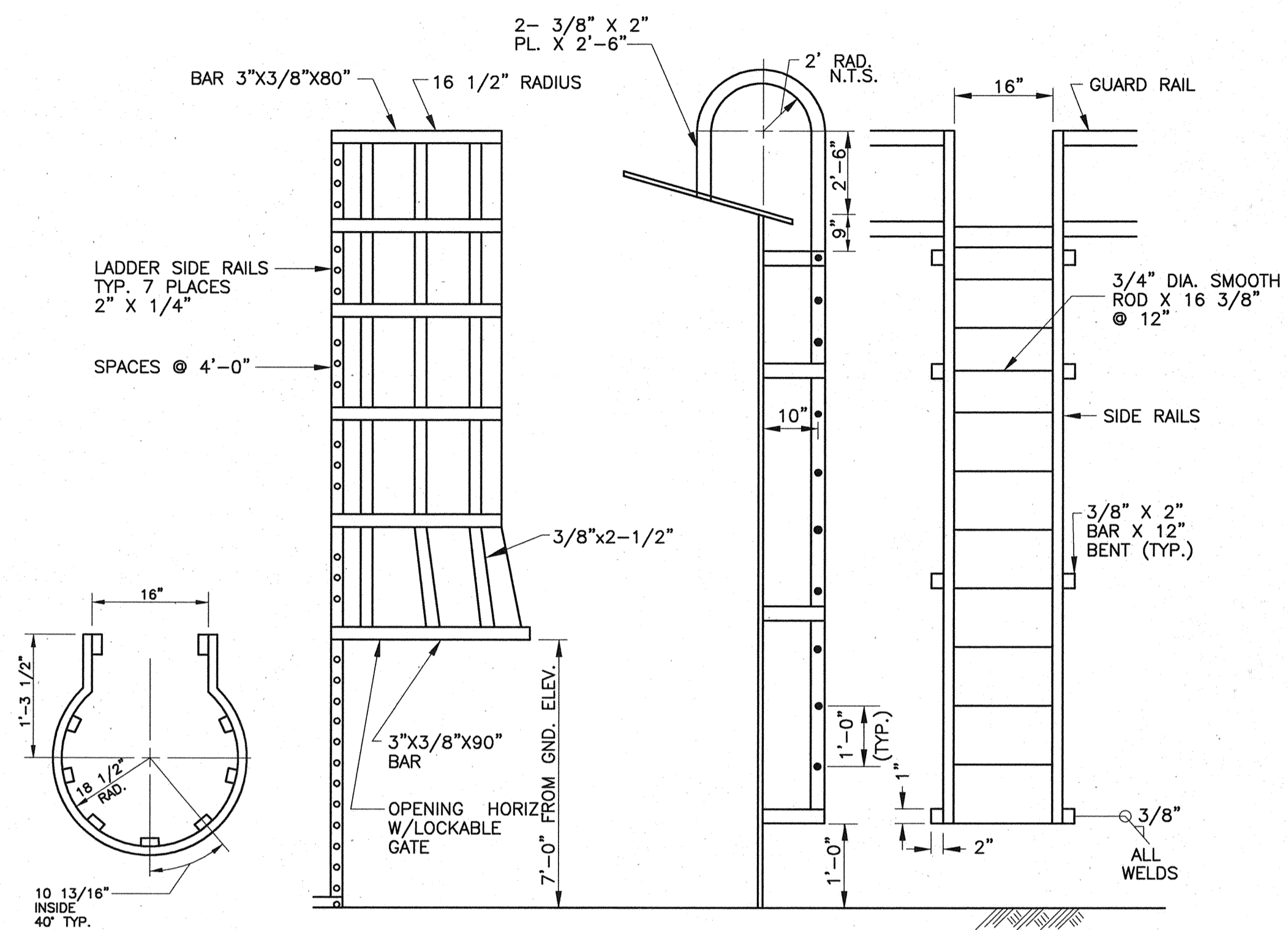
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY &  
STORAGE FACILITY NO. 5**

**GROUND STORAGE TANK DETAILS  
(SHEET 1 OF 3)**

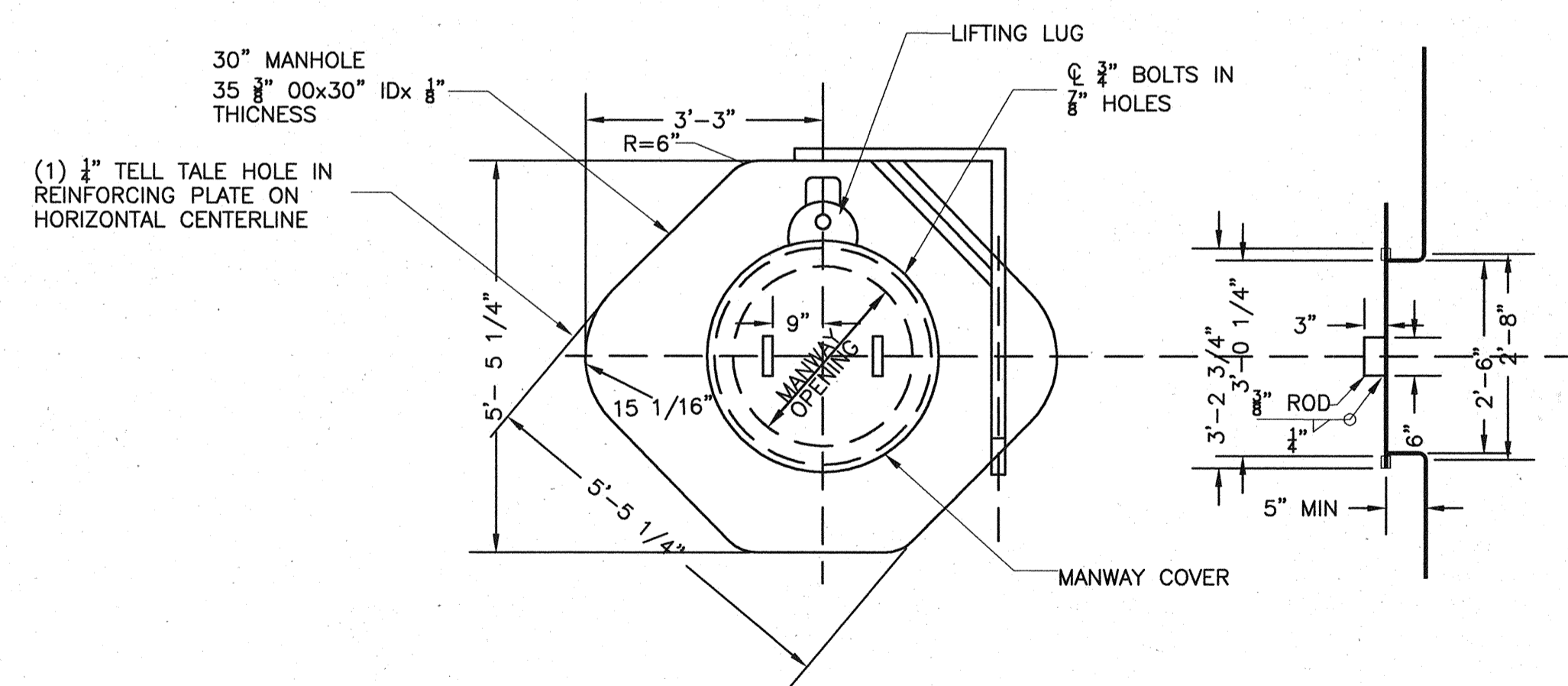
SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 10 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

C:\A\2005\2015\water\_well\_5\CAD\water\_well\_5\CAD\water\_well\_5\CAD\DETAILS\_1.dwg, made=1 01/28/2009 12:30:48



**EXTERIOR LADDER & CAGE**

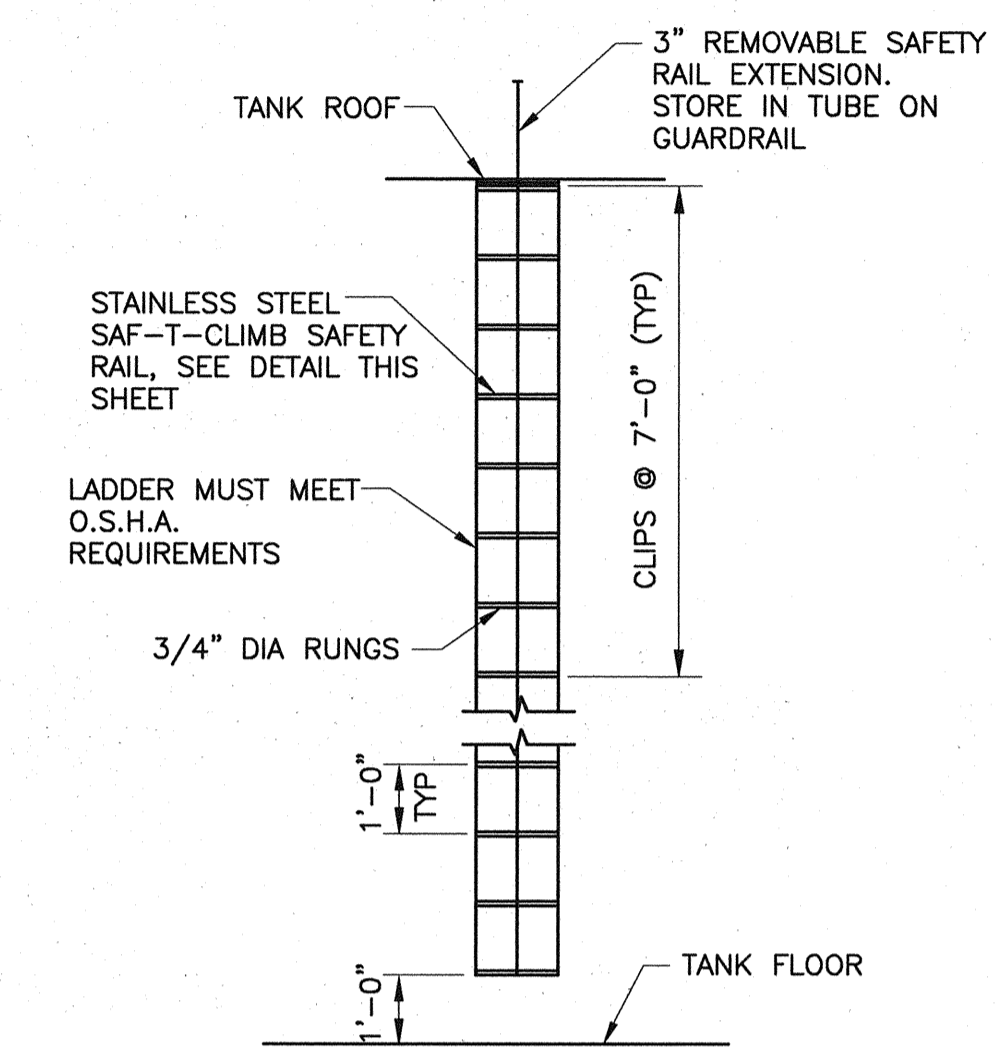
N.T.S.



NOTE:  
 1. MANHOLE FLANGE SHALL BE SHAPED TO MATCH TANK CURVATURE  
 2. 1/2" THICK NEOPRENE GASKET (API 650 REUSABLE). PROVIDE PER DAVIT

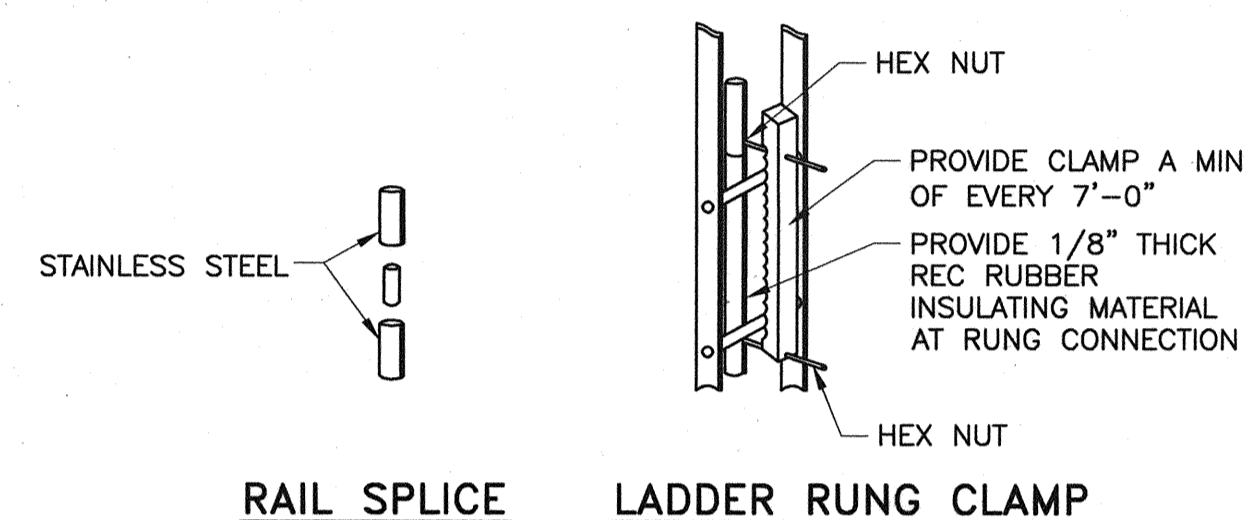
**30"Ø MANWAY DETAIL**

N.T.S.



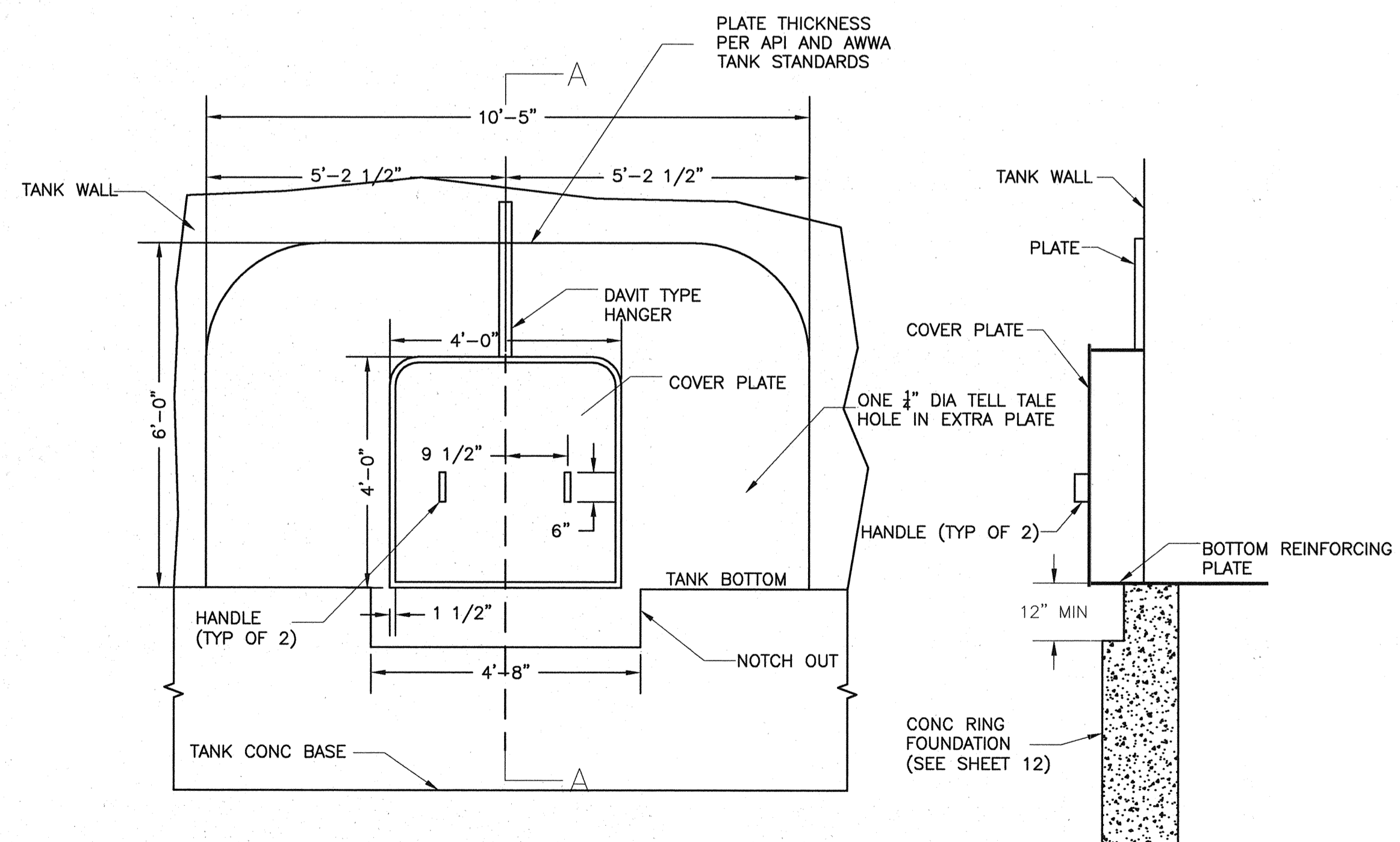
**INTERIOR LADDER DETAIL**

N.T.S.



**SAFETY RAIL DETAIL**

N.T.S.



**48" X 48" FLUSH MANWAY DETAIL**

N.T.S.

*Amber R. Hurd 3/13/09*

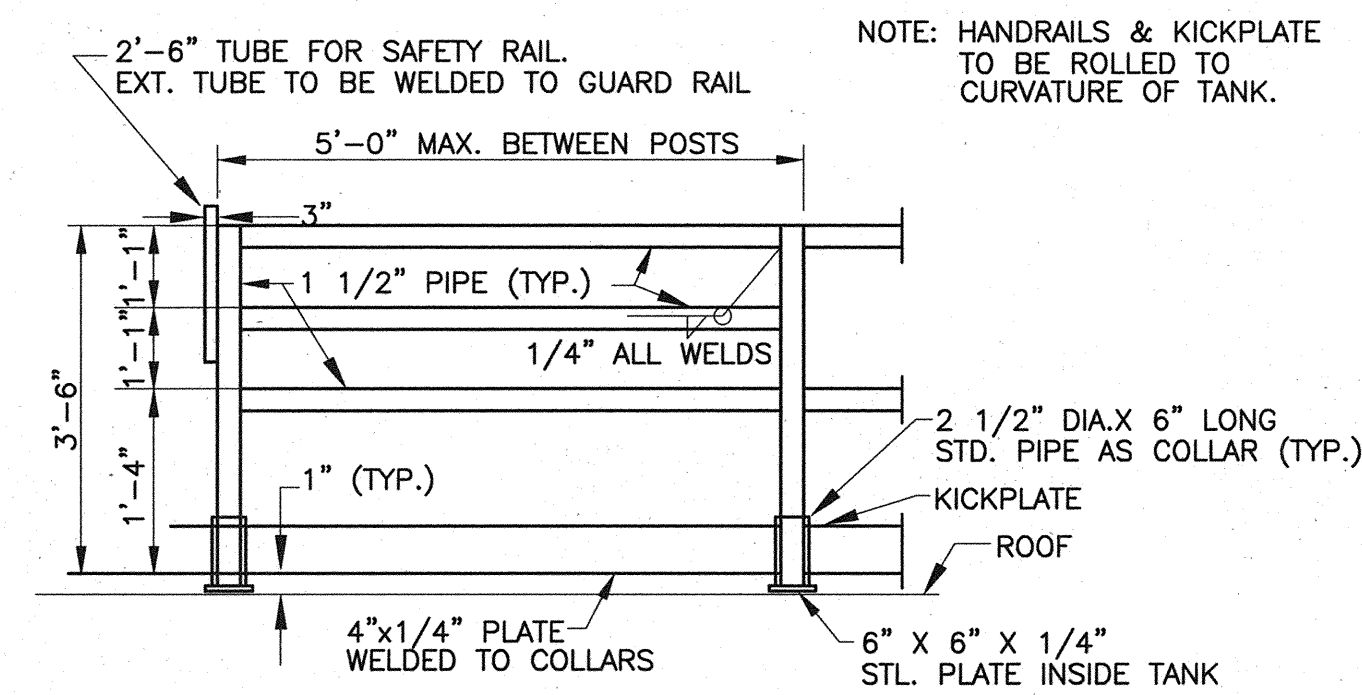
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**CITY OF TOMBALL**  
 TOMBALL, TEXAS  
**WATER SUPPLY & STORAGE FACILITY NO. 5**

**GROUND STORAGE TANK DETAILS**  
 (SHEET 2 OF 3)

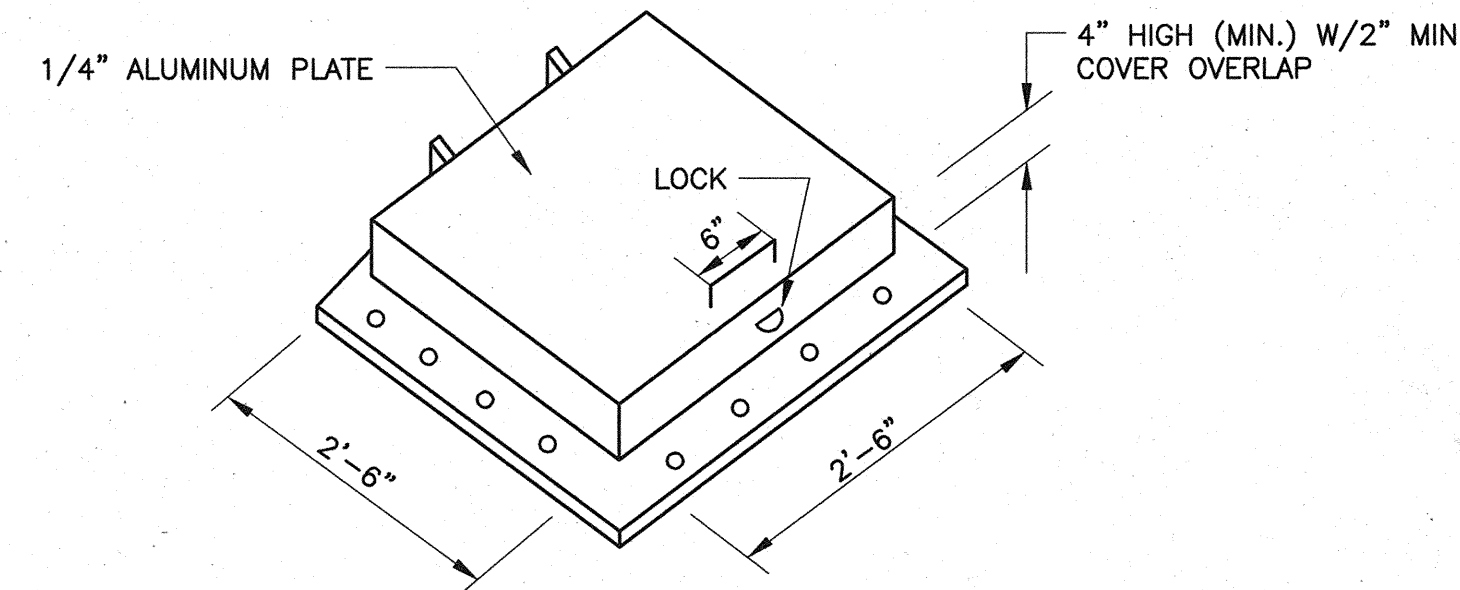
SUBMITTED: SCALE: AS NOTED DATE: MARCH 2009 SURVEY BY: F. B. NO.:	DESIGNED BY: ARH DRAWN BY: AWS SHEET No.: 11 OF 35 DWG. NO.:
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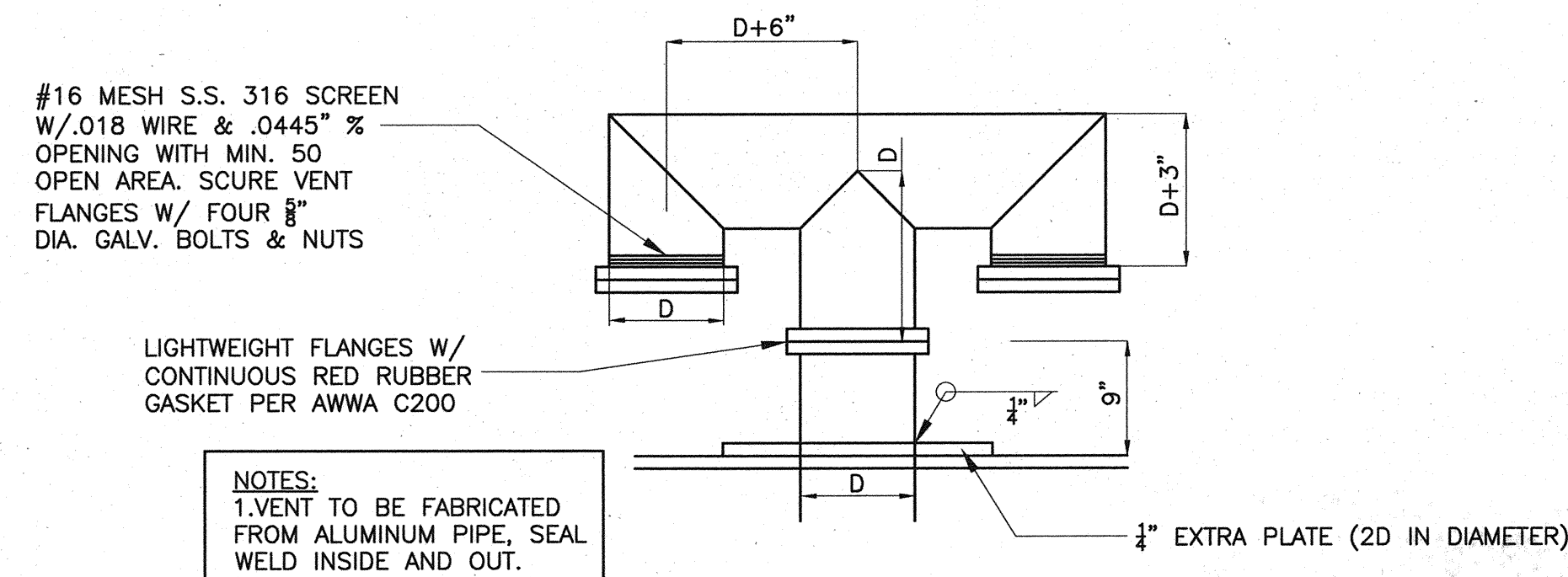
DETAIL OF GUARD RAIL

N.T.S.



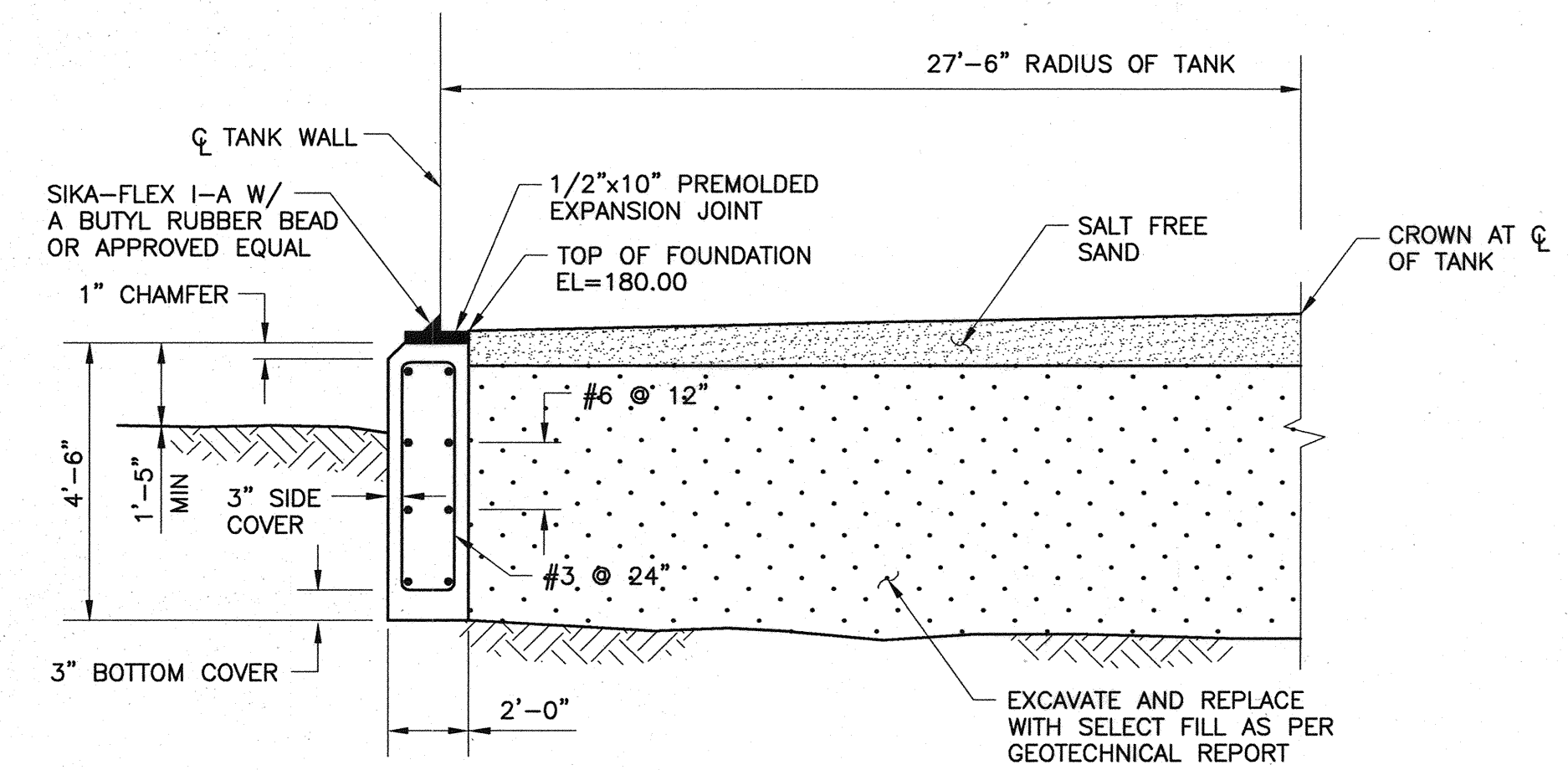
ROOF HATCH

N.T.S.



CENTER ROOF VENT DETAIL

N.T.S.



GROUND STORAGE TANK FOUNDATION

N.T.S.

NOTES:

- EXCAVATE AND REMOVE A MINIMUM OF SIX FEET OF EXISTING SUBGRADE SOILS BENEATH THE TANK UNTIL COMPETENT SOIL IS LOCATED. LIMITS OF EXCAVATION SHALL EXTEND HORIZONTALLY FIVE FEET BEYOND THE EDGE OF THE PROPOSED TANK FOUNDATION. SELECT FILL SHALL BE NON-ACTIVE INORGANIC UNIFORM SANDY LEAN CLAY WITH A MAXIMUM LIQUID LIMIT OF 35, PLASTICITY INDEX BETWEEN 7 AND 20, AND NOT MORE THAN 50 PERCENT RETAINED ON THE NO. 200 SIEVE. THE SELECT FILL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8 INCHES AND SHOULD BE UNIFORMLY COMPACTED TO 95% MAXIMUM DRY DENSITY WITH +/- 2 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT.
- FOLLOWING EXCAVATION AND PLACEMENT OF SELECT FILL, THE EXPOSED SUBGRADES ARE TO BE PROOF-ROLLED WITH A 15 TON PNEUMATIC ROLLER TO DETECT ANY SOFT OR POORLY COMPACTED AREAS. ALL WEAK AREAS IN THE SUBGRADE ARE TO BE REMOVED AND REPLACED WITH SELECT FILL. SHAPE SURFACE TO RECEIVE SAND FILL AS SHOWN ON PLANS AND DESCRIBED BELOW.
- FILL FOR GRADE ADJUSTMENTS (BELOW CLEAN SAND) IS TO BE SELECT FILL, FREE OF ORGANIC AND DELETERIOUS MATERIAL AND HAVE A PLASTICITY INDEX BETWEEN 7 AND 20.
- PLACE CLEAN SAND OR CLEAN BANK SAND BASE UNDER FLOOR PLATE IN 4-INCH MAXIMUM LIFTS, MEASURED LOOSE, AND COMPACT WITH PNEUMATIC, VIBRATORY OR MECHANICAL TAMPS. COMPACT TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY WITH +/- 2 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE ASTM D698. AFTER COMPACTION, SLOPE SURFACE AREA OF SAND SUBGRADE 1 INCH PER 10 FEET FROM THE CENTER TO THE EDGE OF THE TANK.
- CLEAN SAND OR CLEAN BANK SAND THAT IS FREE FROM CLAY LUMPS, SHALE, LOAM, ORGANIC MATTER, SALT OR CHLORIDES, AND OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ASTM C33 SHALL BE USED BENEATH THE TANK FLOOR. WATER SOLUBLE IONIC (SALT) CONTAMINATION OF THE SAND SHALL BE DETERMINED AND LIMITED IN ACCORDANCE WITH AWWA D100-96, SECTION 12.6. MAXIMUM SULFATE LEVEL NOT TO EXCEED 200 PPM. SAND TO HAVE MAXIMUM PLASTICITY INDEX OF 7 IN ACCORDANCE WITH ASTM D-4318 AND NOT MORE THAN 15% PASSING A NO. 200 SIEVE, IN ACCORDANCE WITH ASTM C117. WATER, IF USED TO OBTAIN MOISTURE CONTENT, TO BE CLEAN AND FRESH.
- THE OWNER SHALL PROVIDE FOR DENSITY TESTING AND WILL BE PERFORMED ON EACH LIFT OR FILL FOR GRADE ADJUSTMENTS AND FILL UNDER TANK FLOOR AS DIRECTED BY THE ENGINEER.
- CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO PROOF ROLLING AND DENSITY TESTING.



*Amber R. Hurd 2/13/09*

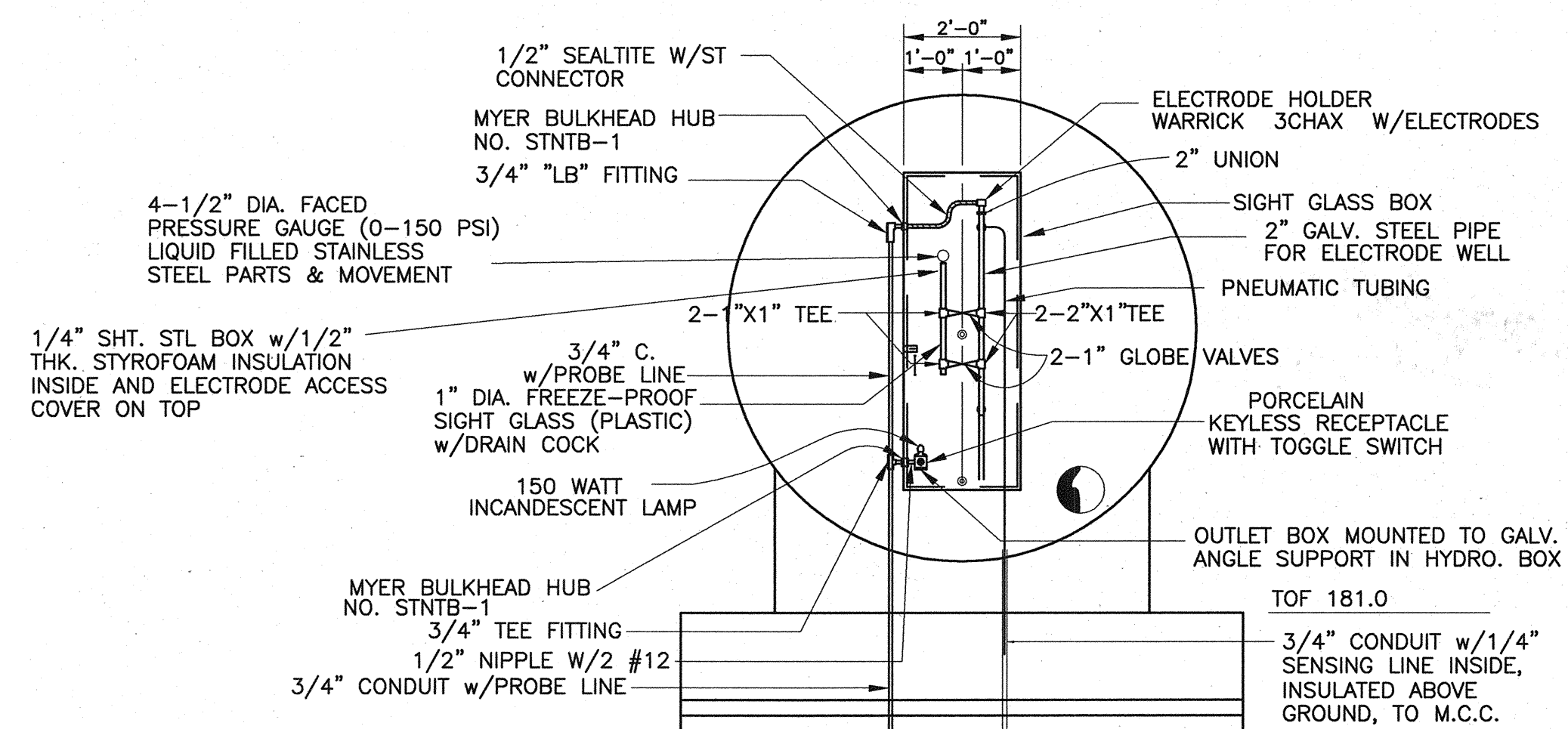
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**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**GROUND STORAGE TANK DETAILS**  
(SHEET 3 OF 3)

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 12 OF 35
SURVEY BY:	DWG. NO:
F B NO:	



HYDRO TANK ELECTRODE HOLDER & HEATER

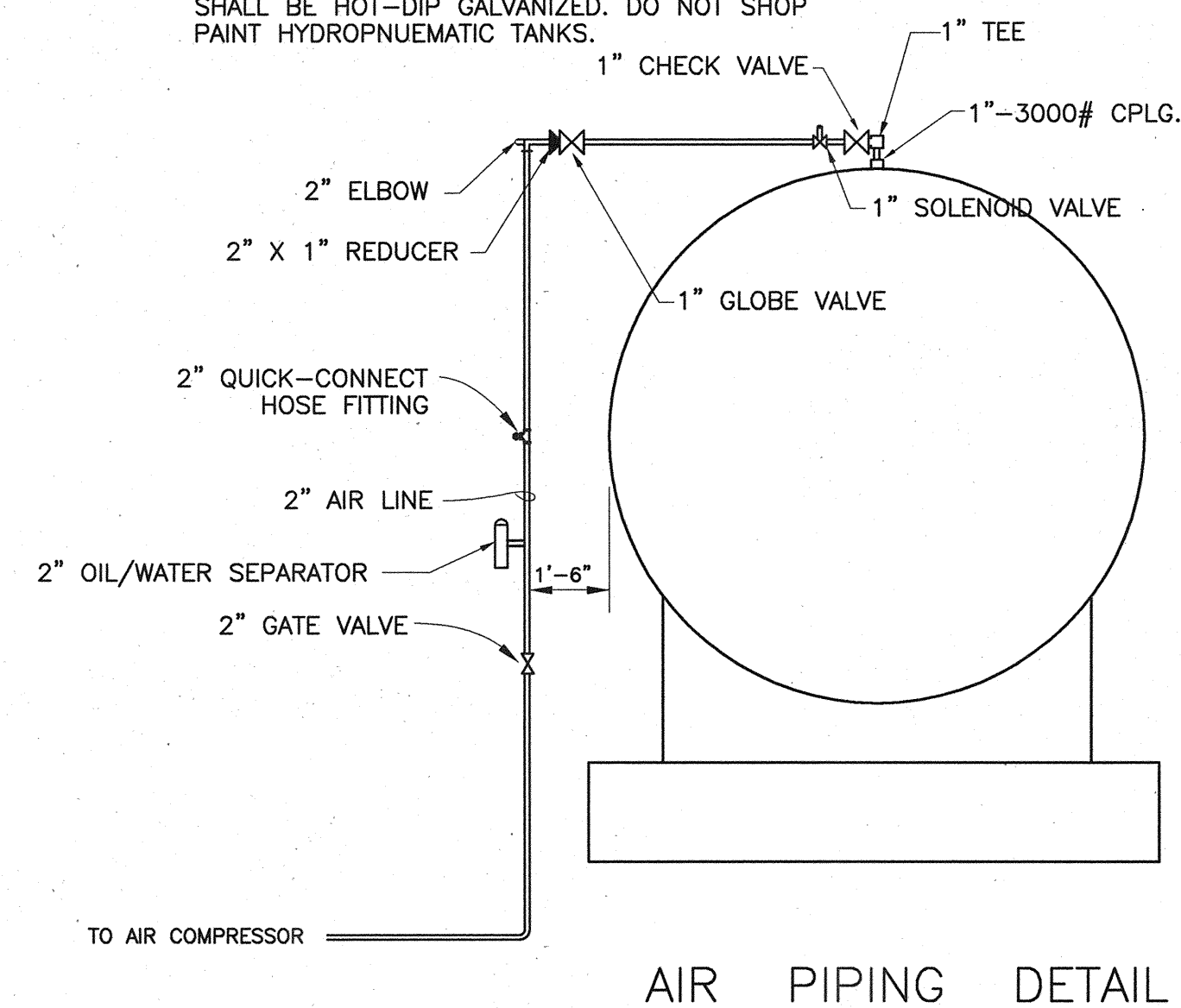
SCHEDULE ◊

SYM.	SIZE	TYPE	SERVICE
A	6"	150# FLG.	INLET
B	4"	150# FLG.	DRAIN
C	14" X 18"	BOLTED	MAN-WAY
D	1"	3000# CPLG.	SIGHTGLASS
E	3/4"	3000# CPLG.	AIR INLET
F	3/4"	150# FLG.	RELIEF VALVE

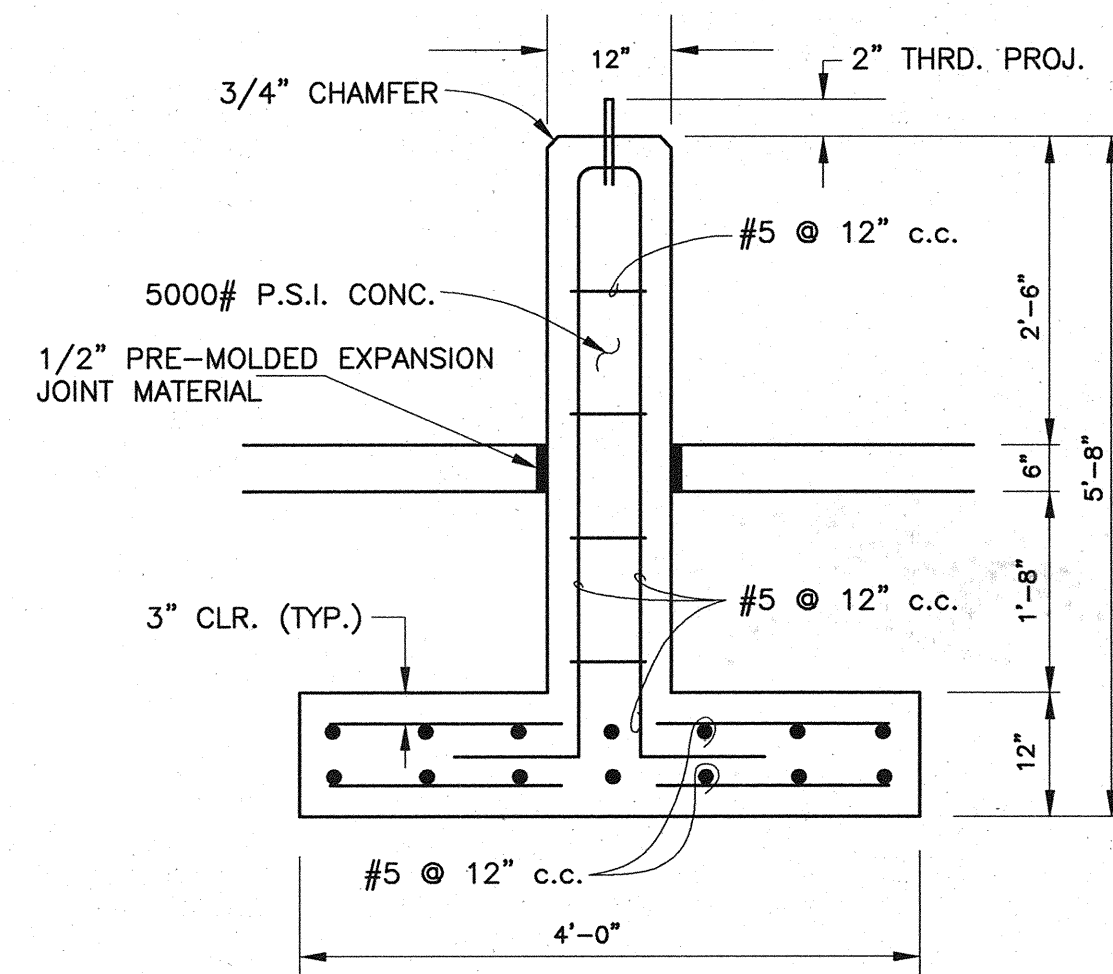
CAPACITY: 5,000 GAL.  
SIZE: 6'-0" DIA., 24'-0" LONG  
WORKING PRESSURE: 80 P.S.I.G.  
TEST PRESSURE: 150 P.S.I.G.  
CODE: A.S.M.E. SECTION VIII, DIV. 1  
CODE STAMP: YES  
FILL OUT FORM U.I.A.

NOTES

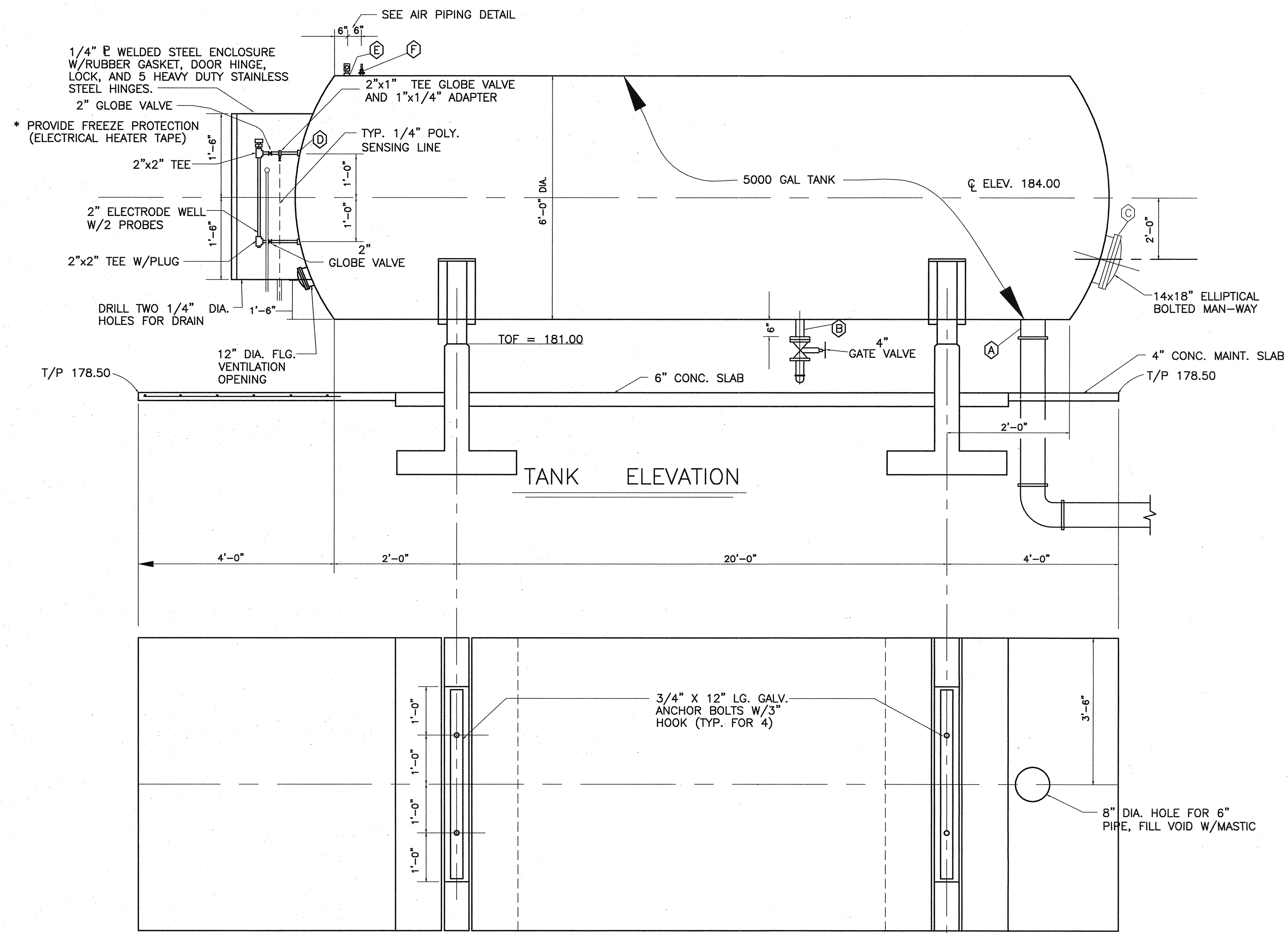
- ALL PIPING IS TO BE D.I.P. EXCEPT WHERE NOTED.
- FITTING SIZES SHALL BE COMPATIBLE WITH PIPING.
- ALL WELDING SHALL BE IN ACCORDANCE WITH A.S.M.E. & A.W.S.
- VERIFY ASSEMBLED PIPING DIMENSIONS PRIOR TO FABRICATION OF SIGHT GLASS CABINET.
- COAT SIGHT GLASS CABINET AFTER FABRICATION PER PAINTING SPECIFICATIONS.
- ALL HANGERS, SUPPORTS, STRAPS, NUTS AND BOLTS SHALL BE HOT-DIP GALVANIZED. DO NOT SHOP PAINT HYDROPNEUMATIC TANKS.



AIR PIPING DETAIL

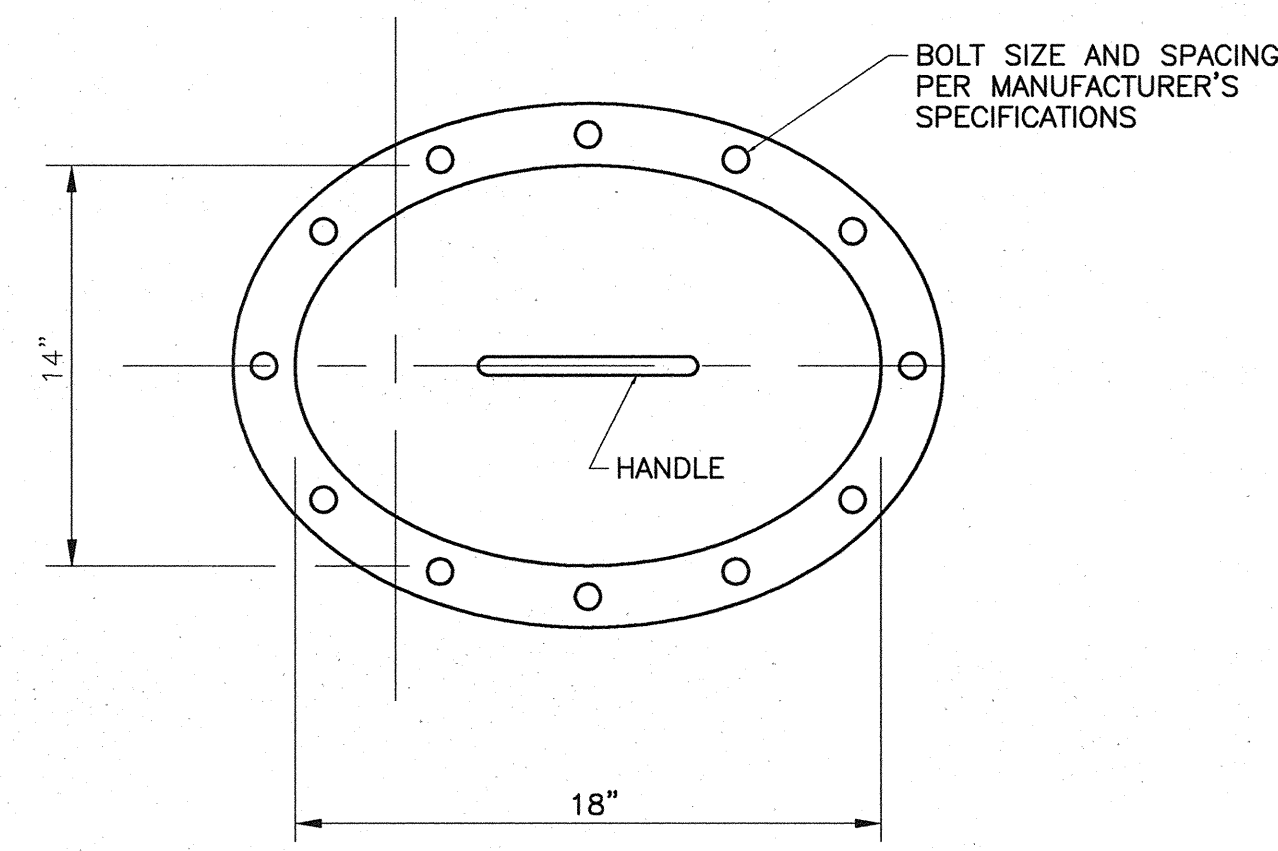


FOUNDATION DETAIL



TANK ELEVATION

FOUNDATION PLAN



14"x18" ELLIPTICAL MAN-WAY FRONT VIEW

N.T.S.

STATE OF TEXAS  
AMBER R. HURD  
94679  
LICENSED PROFESSIONAL ENGINEER  
Amber R. Hurd 5/13/09

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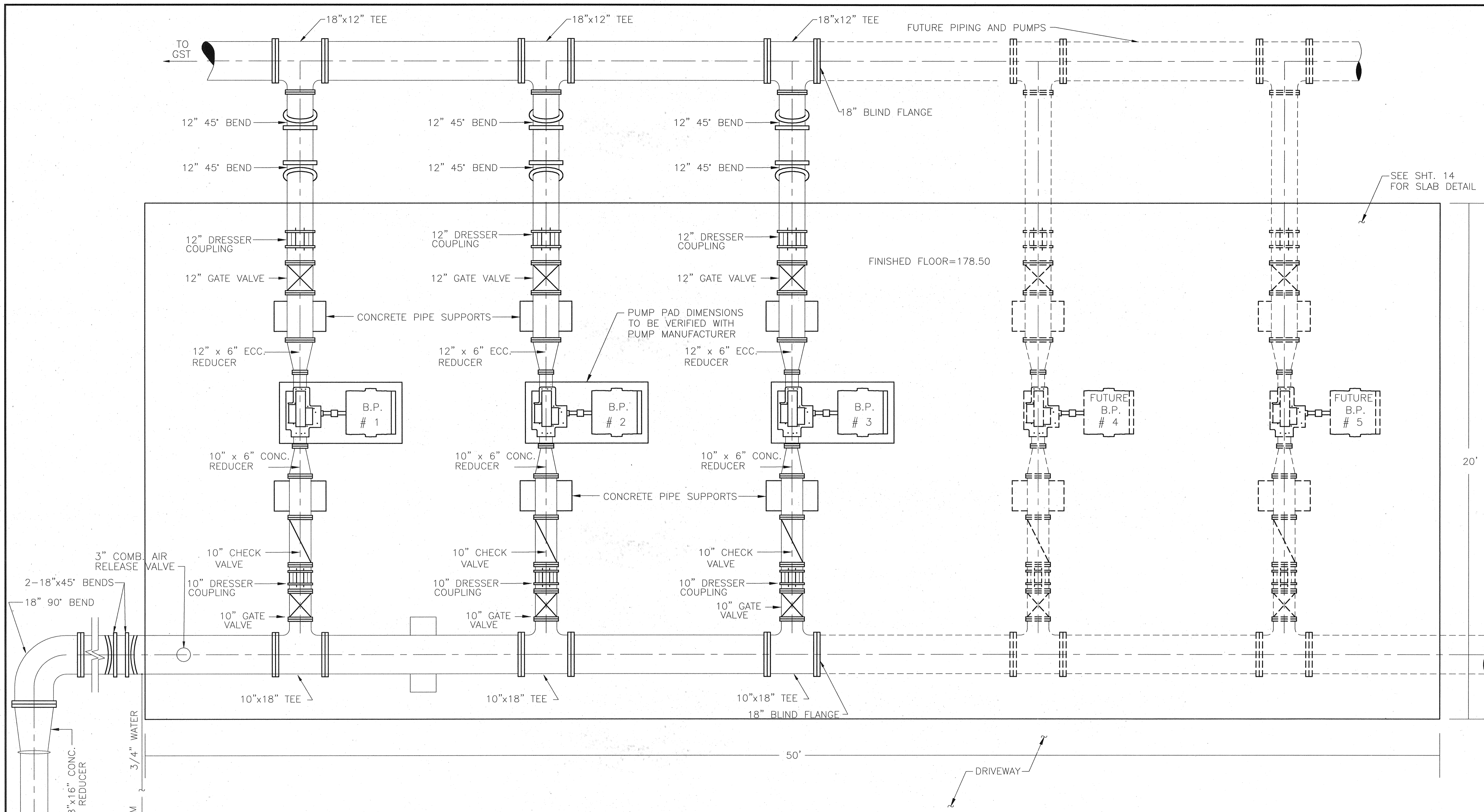
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**HYDROPNEUMATIC TANK DETAILS**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY:
DATE: MARCH 2009	SHEET No.: 13 OF 35
SURVEY BY:	DWG. NO:
F B NO:	





PLAN  
SCALE: 1" = 2'-0"

PUMP PERFORMANCE REQUIREMENTS	
CAPACITY, GPM	1000
TDH, FT	150
EFFICIENCY, MIN	80%
MOTOR, HP	60

*Amber R. Hurd* 3/13/09

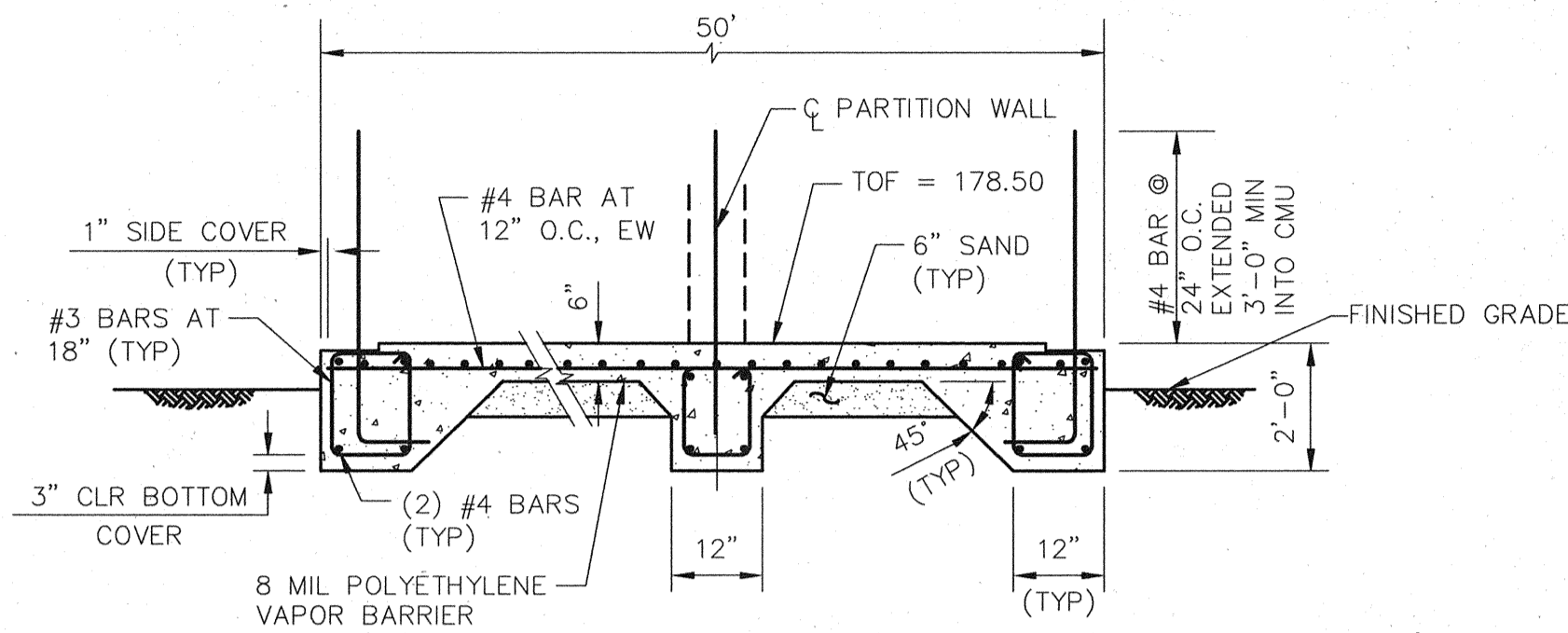
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**CITY OF TOMBALL**  
TOMBALL, TEXAS

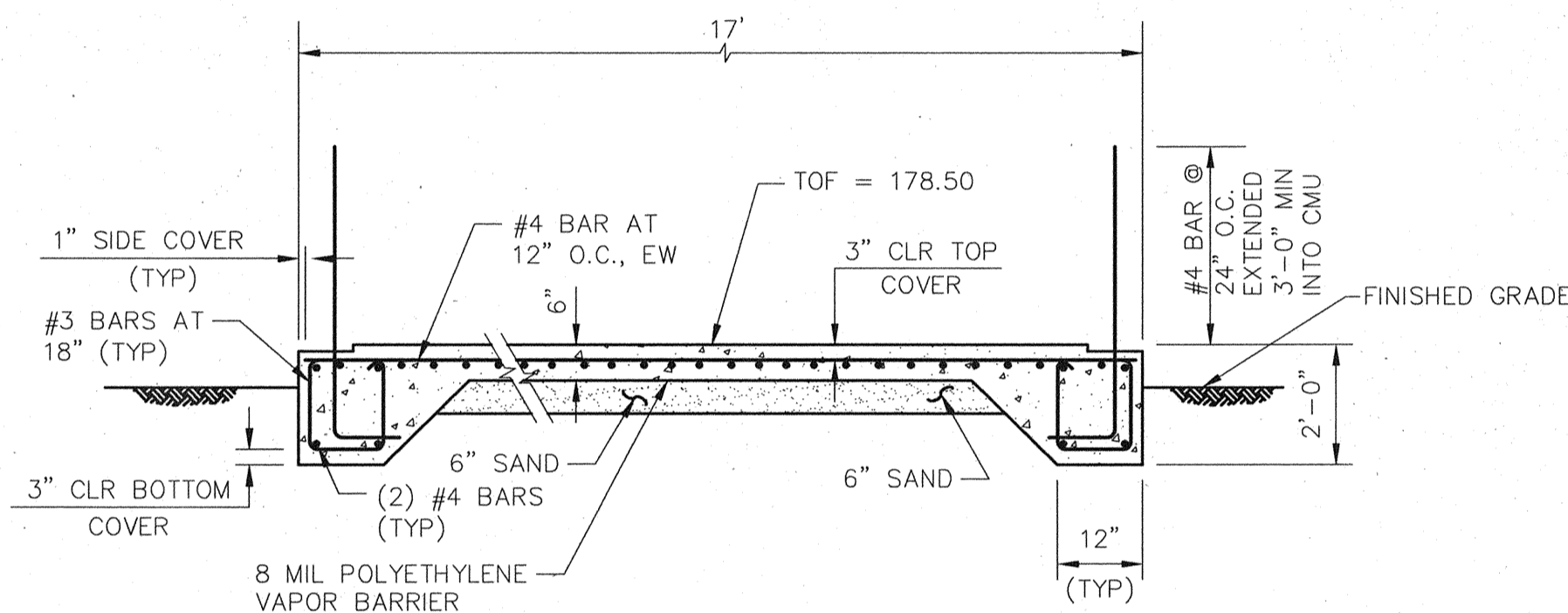
**WATER SUPPLY & STORAGE FACILITY NO. 5**

**BOOSTER PUMP PIPING LAYOUT**

SUBMITTED:	DESIGNED BY:
SCALE: 1" = 2'-0"	DRAWN BY: CFA
DATE: NOVEMBER 2008	SHEET No.: 15 OF 35
SURVEY BY:	DWG. NO.:
F B NO.:	

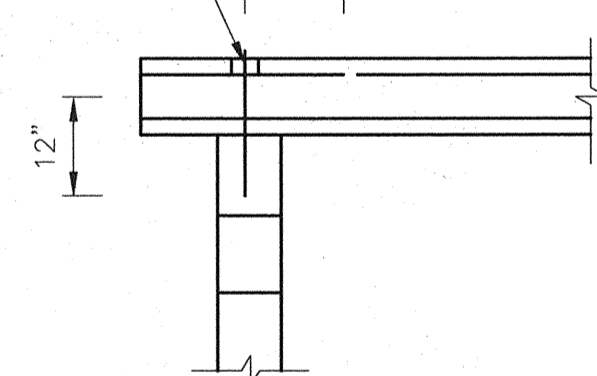


**LONGITUDINAL SECTION OF SLAB**  
N.T.S.

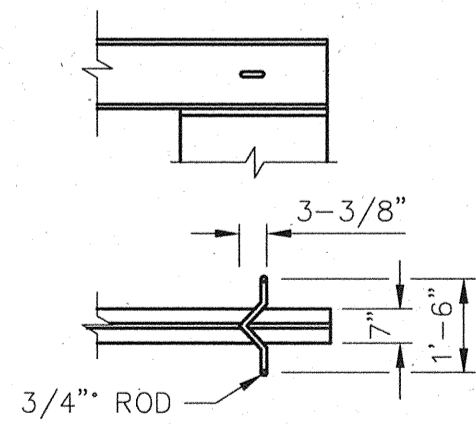


**TRANSVERSE SECTION OF SLAB**  
N.T.S.

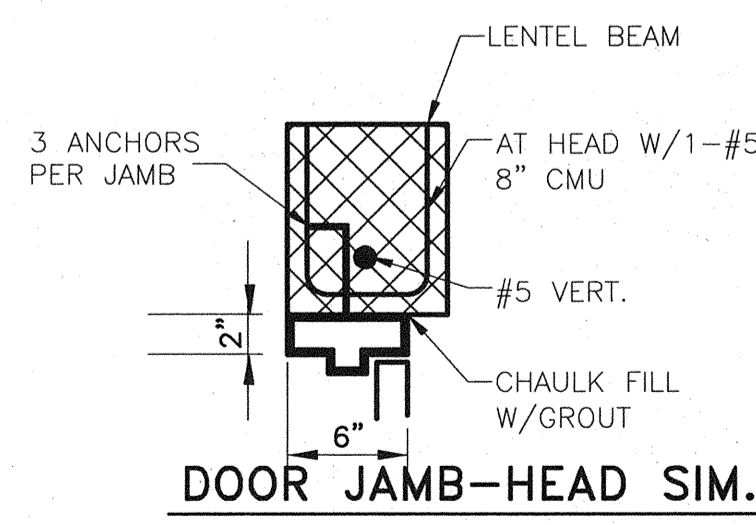
PUNCH #4 DOWELS THROUGH THE SLAB AT 3'-4" INTO THE BEAM AND GROUT JOINT. CURE BEFORE CONSTRUCTING BUILT-UP.



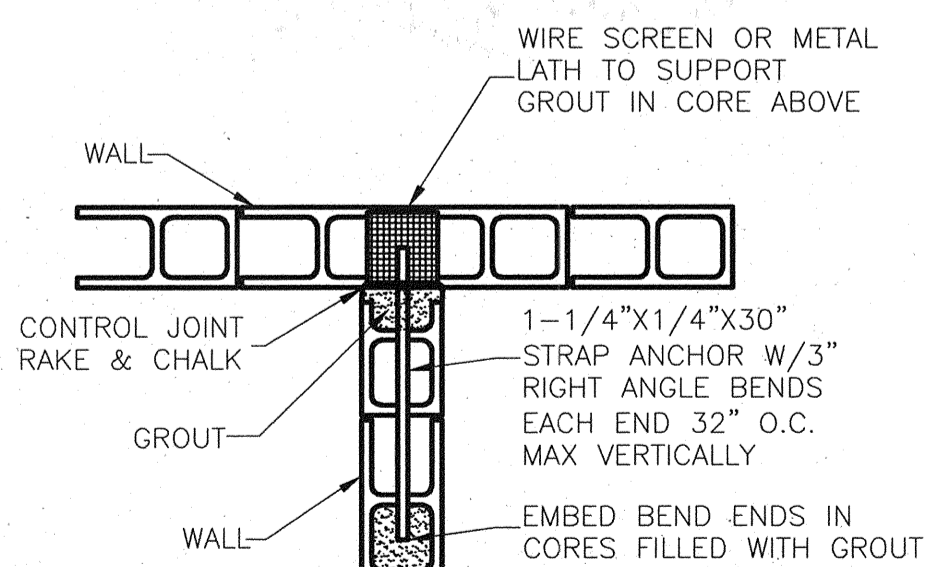
**ROOF ANCHOR DETAIL**  
N.T.S.



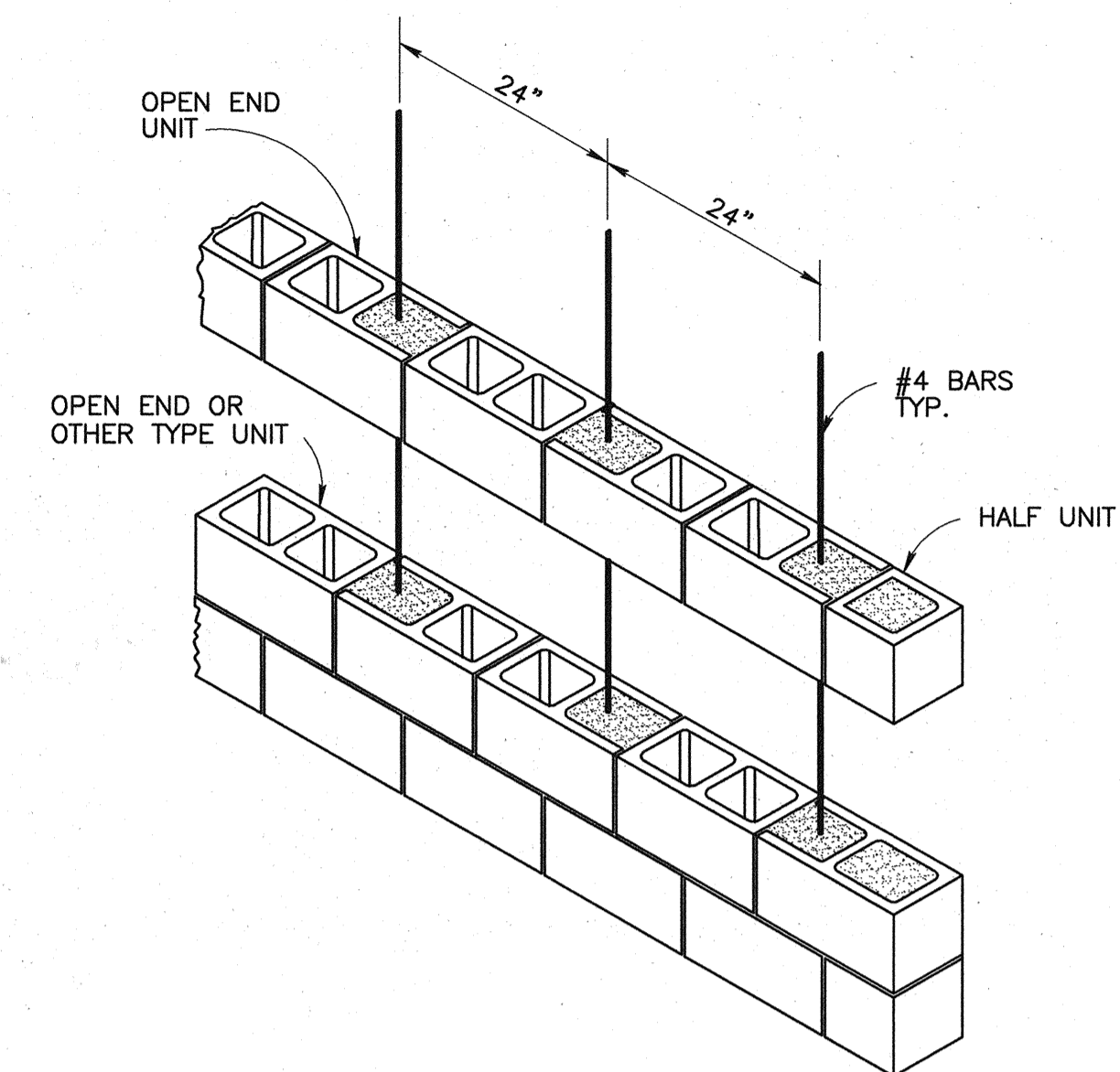
**GOVERNMENT ANCHOR DETAIL**  
N.T.S.



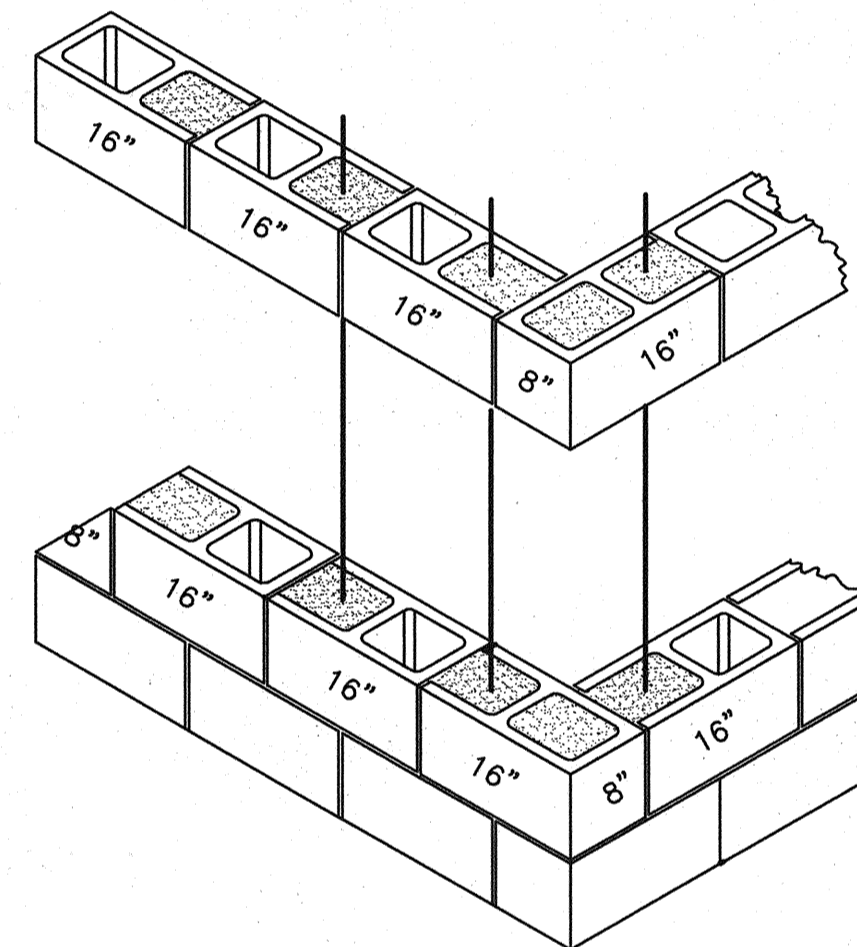
**DOOR JAMB-HEAD SIM.**  
N.T.S.



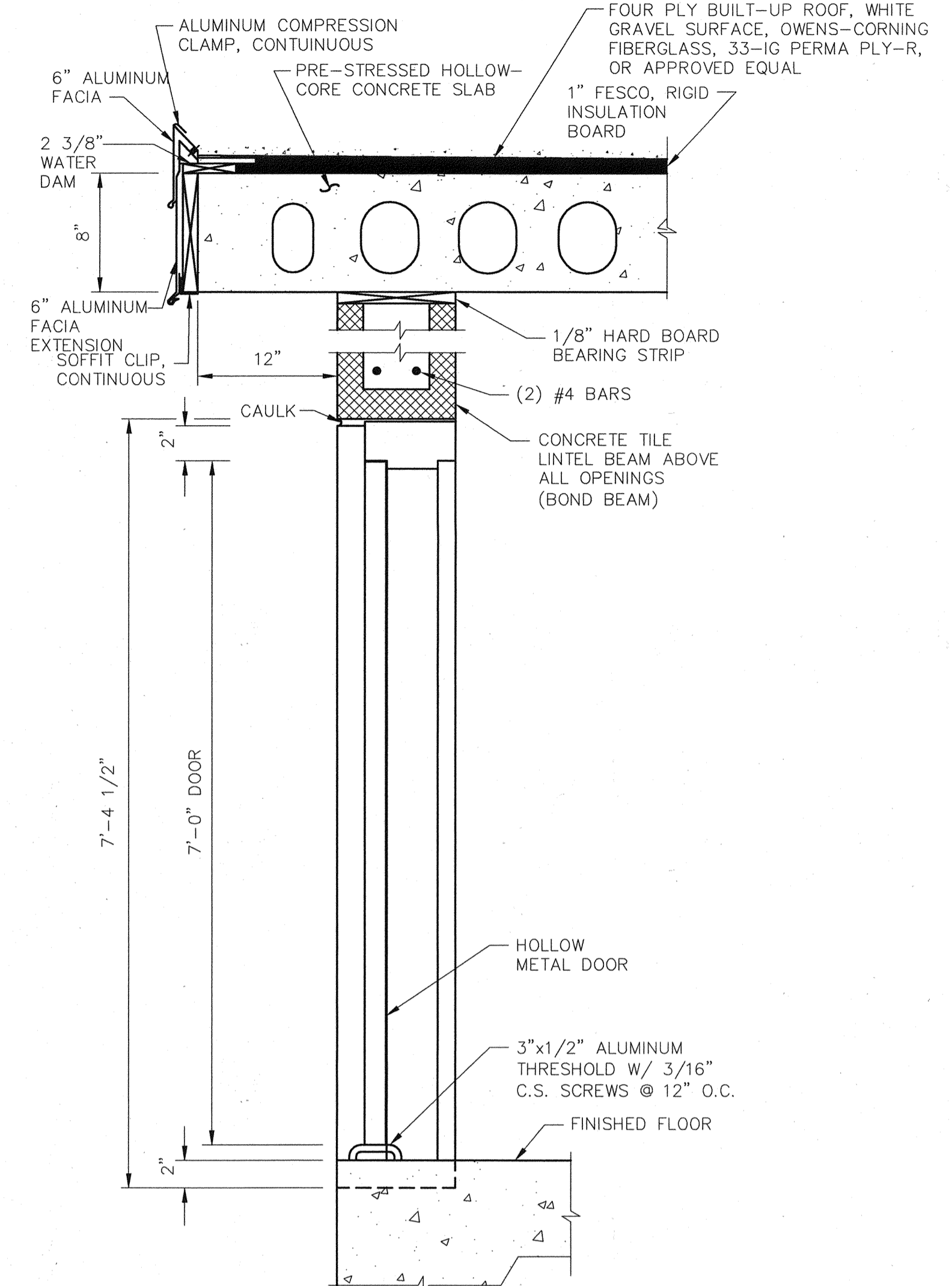
**CMU WALL CONNECTION**  
N.T.S.



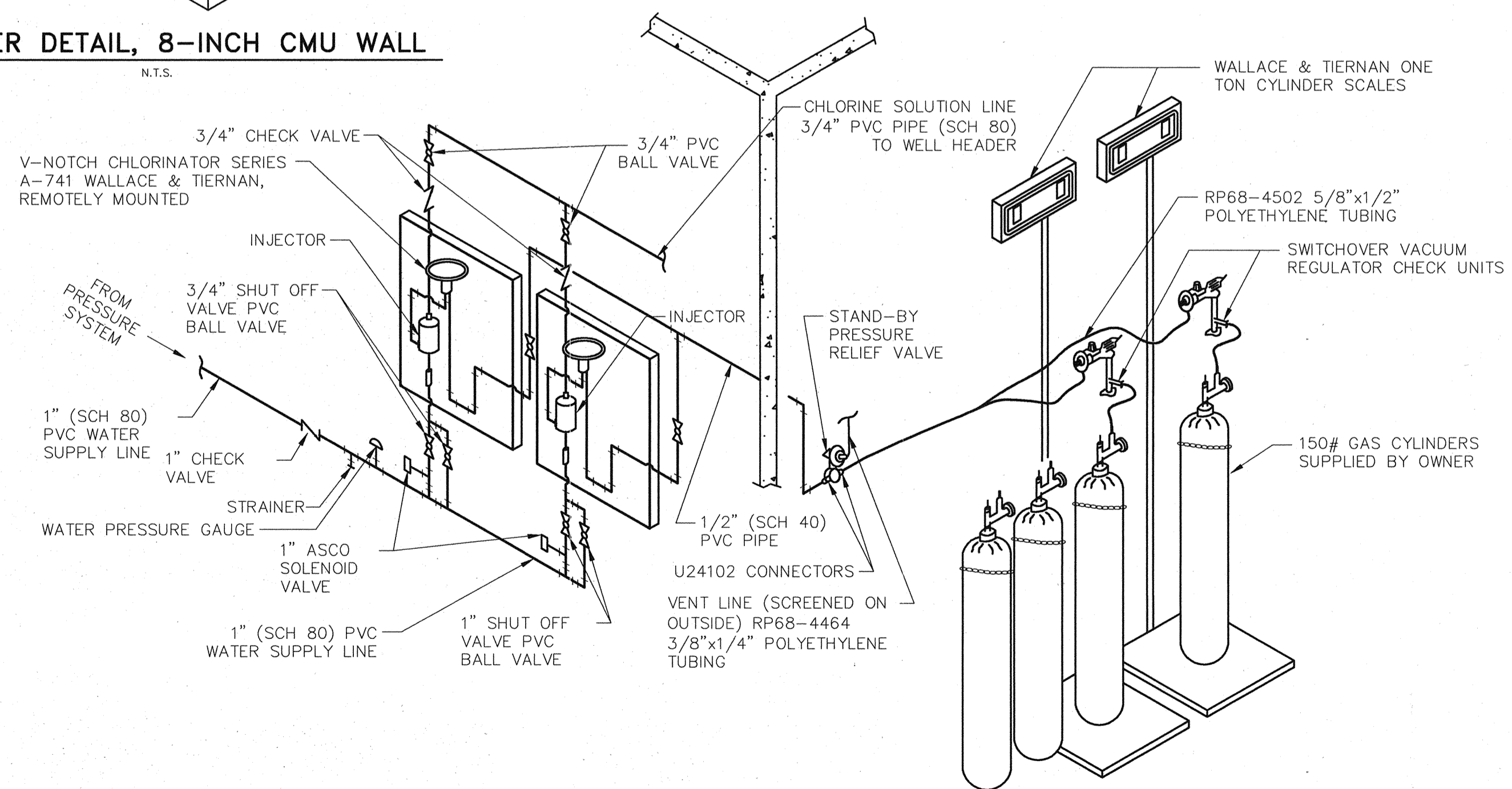
**8-INCH CMU WALL REINFORCING DETAIL**  
N.T.S.



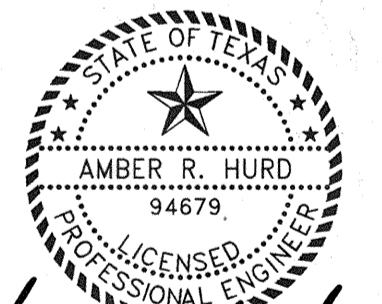
**CORNER DETAIL, 8-INCH CMU WALL**  
N.T.S.



**EXTERIOR DOOR DETAIL**  
N.T.S.



**CHLORINE PIPE SCHEMATIC**  
N.T.S.



*Amber R. Hurd 3/13/09*

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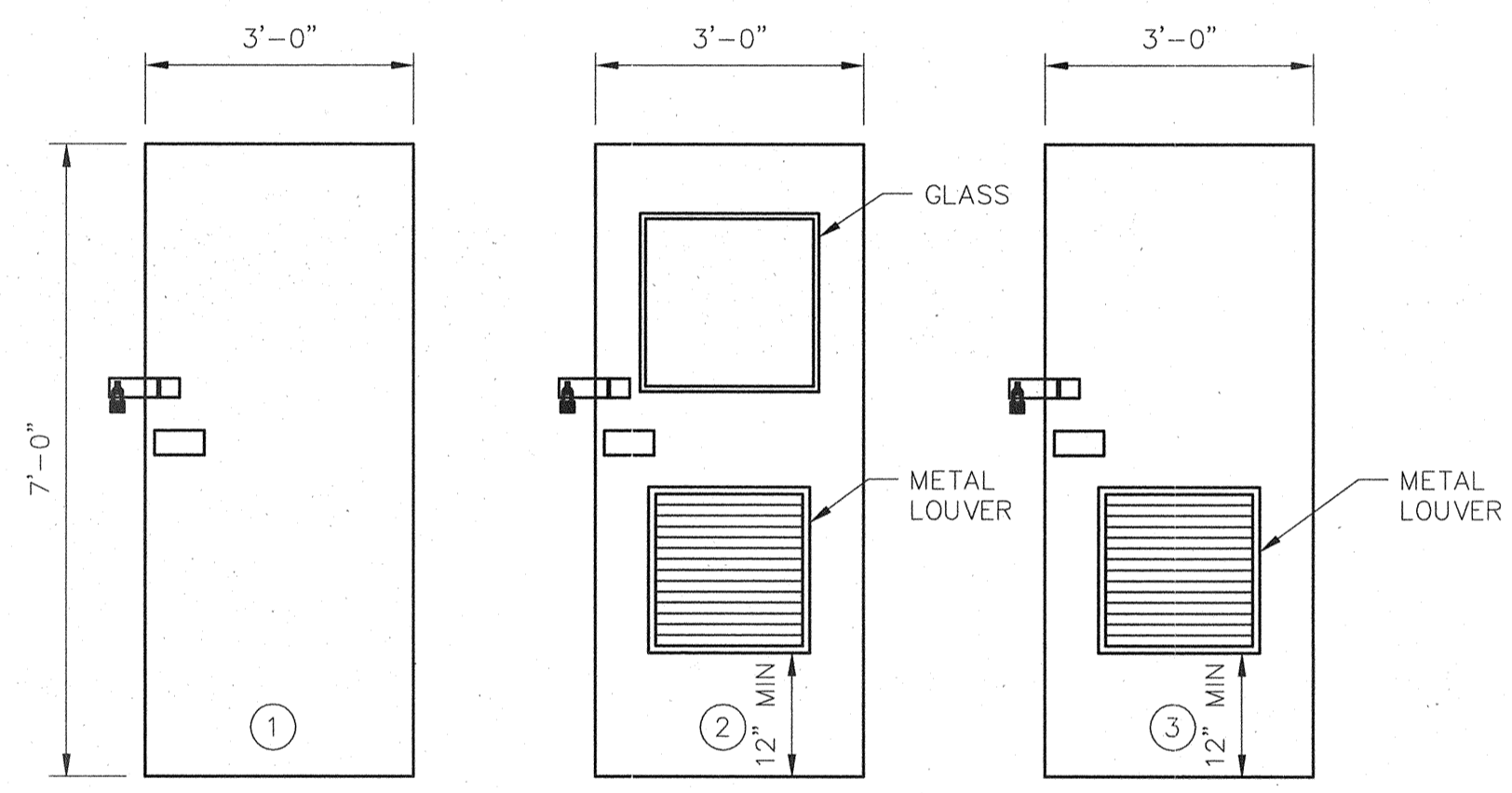
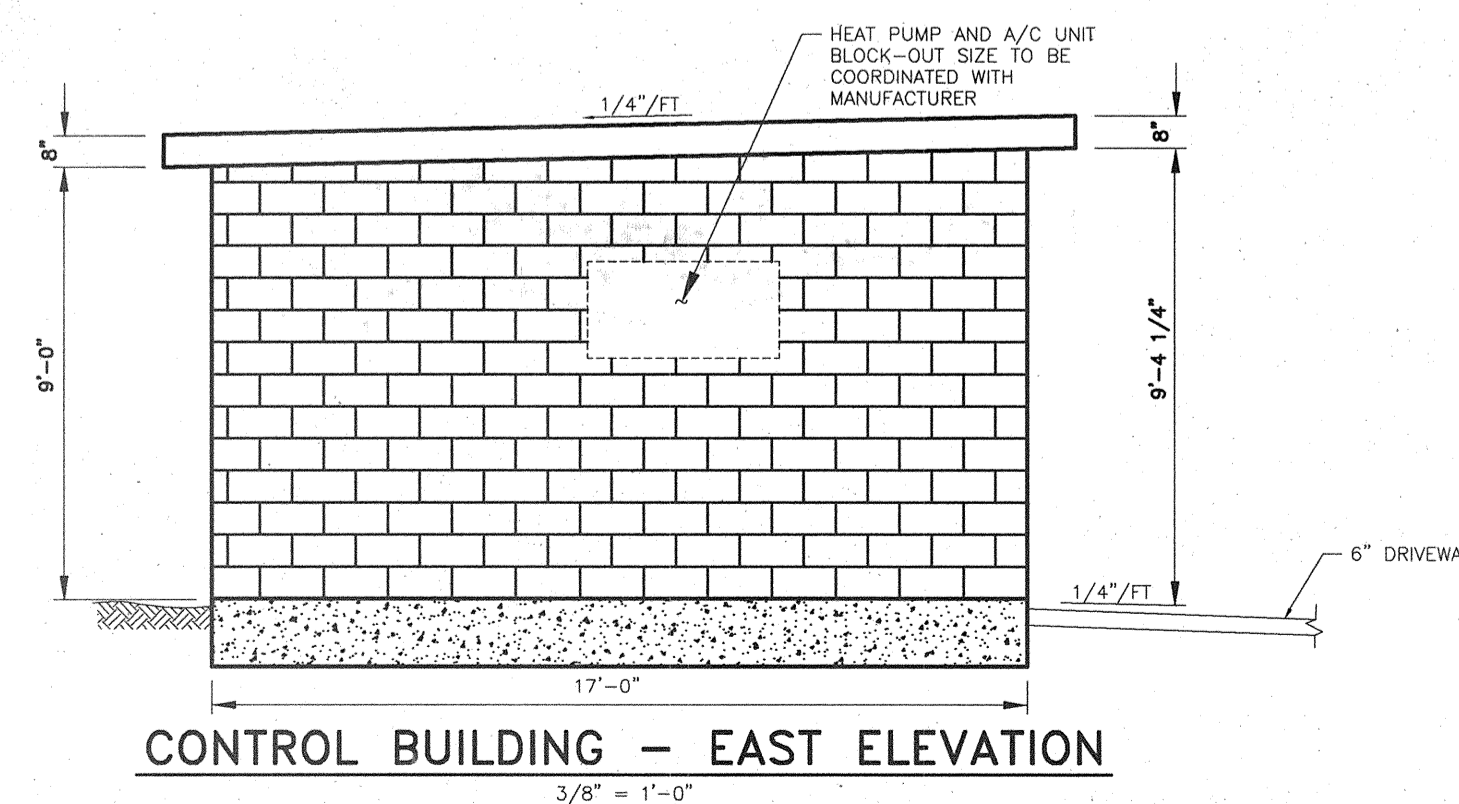
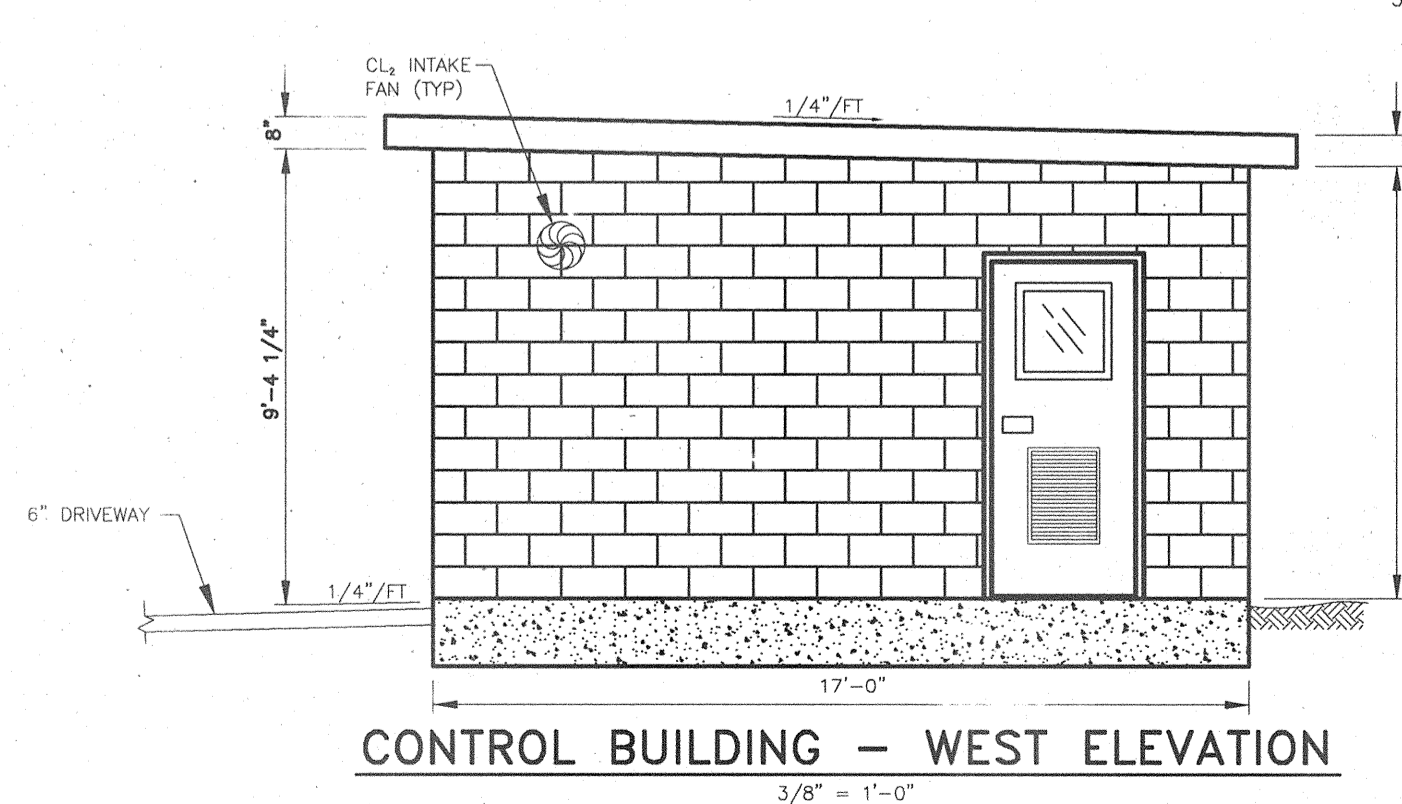
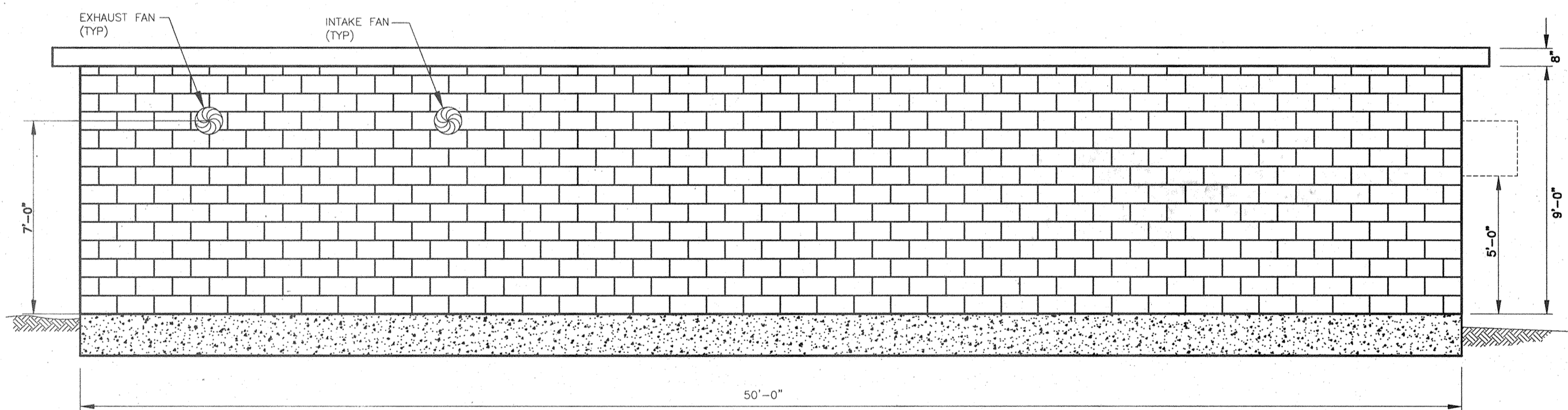
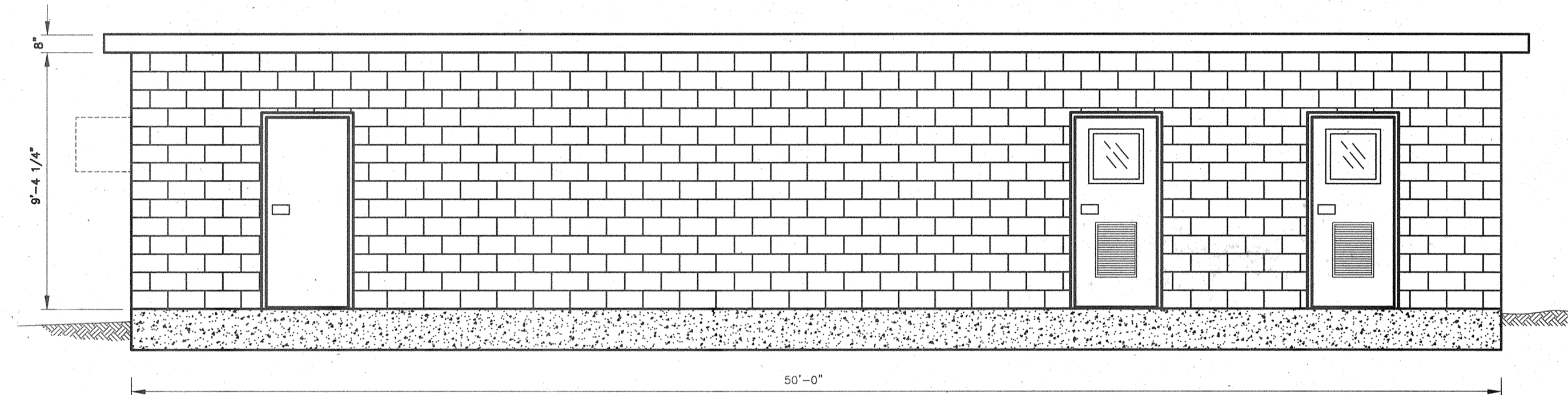
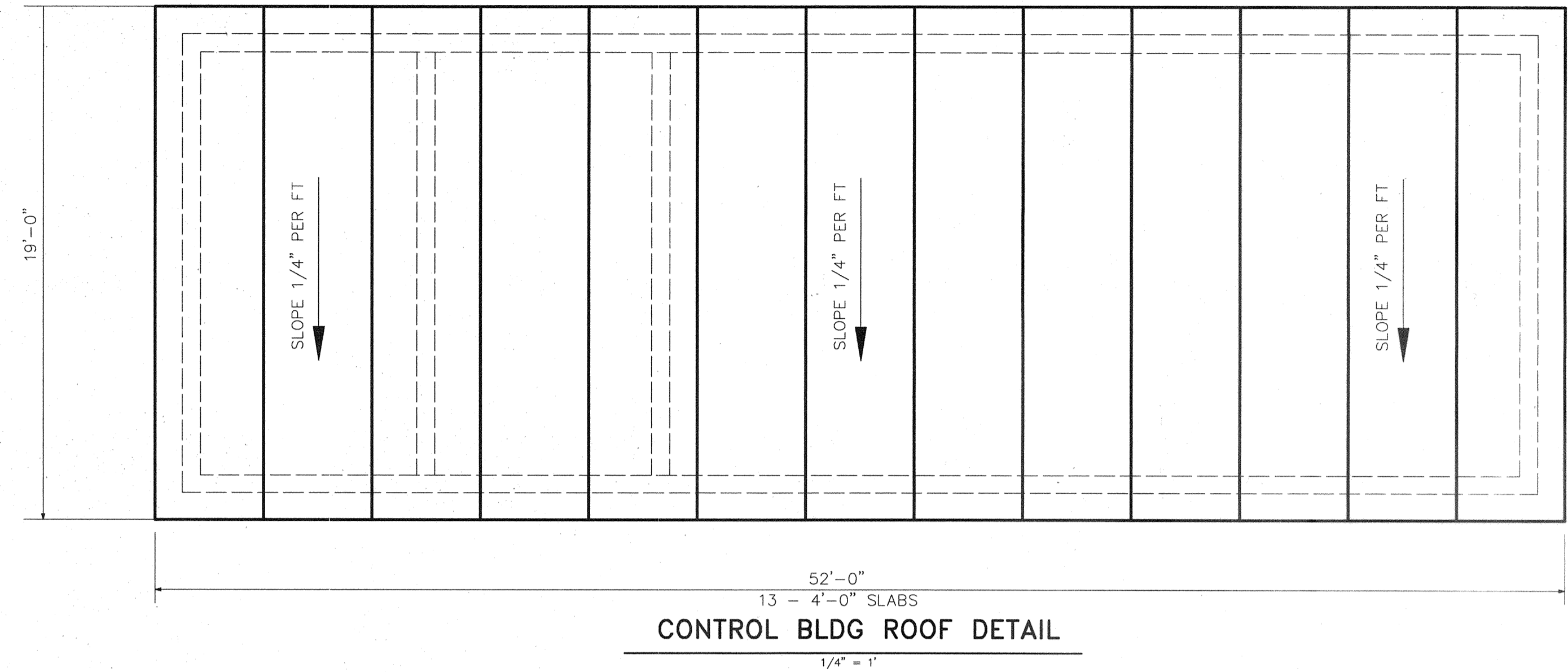
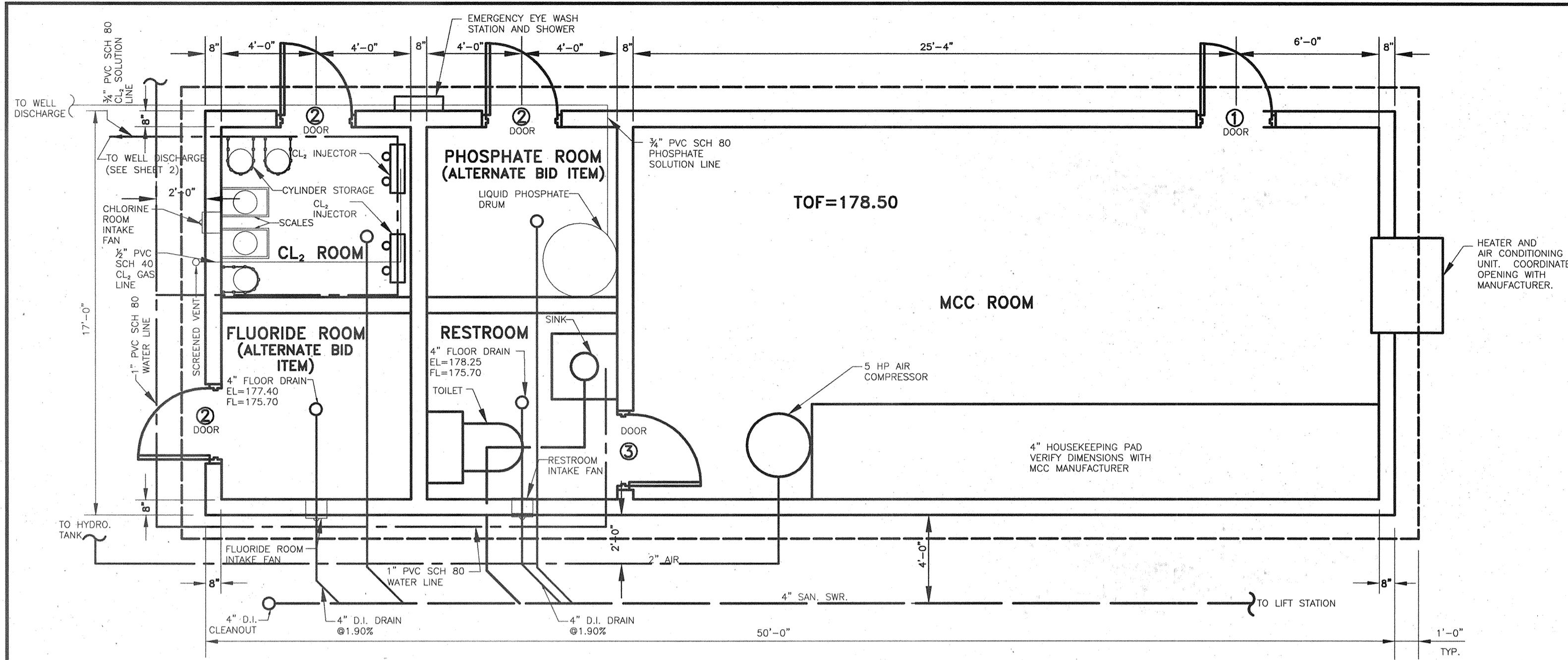
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**CONTROL BUILDING AND CHLORINE SCHEMATIC DETAILS**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY:
DATE: MARCH 2009	SHEET No.: 16 OF 35
SURVEY BY:	DWG. NO:
F B NO:	





- ① 1 3/4" HOLLOW METAL DOORS AND FRAMES, TRUSCON SERIES S7 COMPLETE WITH STAINLESS STEEL PANIC HARDWARE AND PAD LOCK W/ HASP ON EXTERIOR.
- ② 1 3/4" HOLLOW METAL DOORS FLUSH HOLLOW METAL FRAMES W/ WIRE GLASS. DOORS SHALL BE PAINTED WITH THE SYSTEM USED ON THE EXTERIOR STEEL SURFACES. PROVIDE PANIC HARDWARE ON DOOR INTERIOR AND PAD LOCK WITH HASP ON EXTERIOR.
- ③ 1 3/4" HOLLOW METAL DOORS, FLUSH HOLLOW METAL FRAMES W/ LOUVER. STAINLESS STEEL HARDWARE AND HASP ON EXTERIOR.

*Amber R. Hurd* 3/13/09

**CobbFendley**  
 Texas Registration No. 274  
 13430 Northwest Freeway, Suite 1100  
 Houston, Texas 77040  
 713.462.3242 | fax 713.462.3262 | www.cobfen.com  
 JOB NO. 0512015-00 DWG. NO. 05120152\_DE

**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**CONTROL BUILDING LAYOUT**

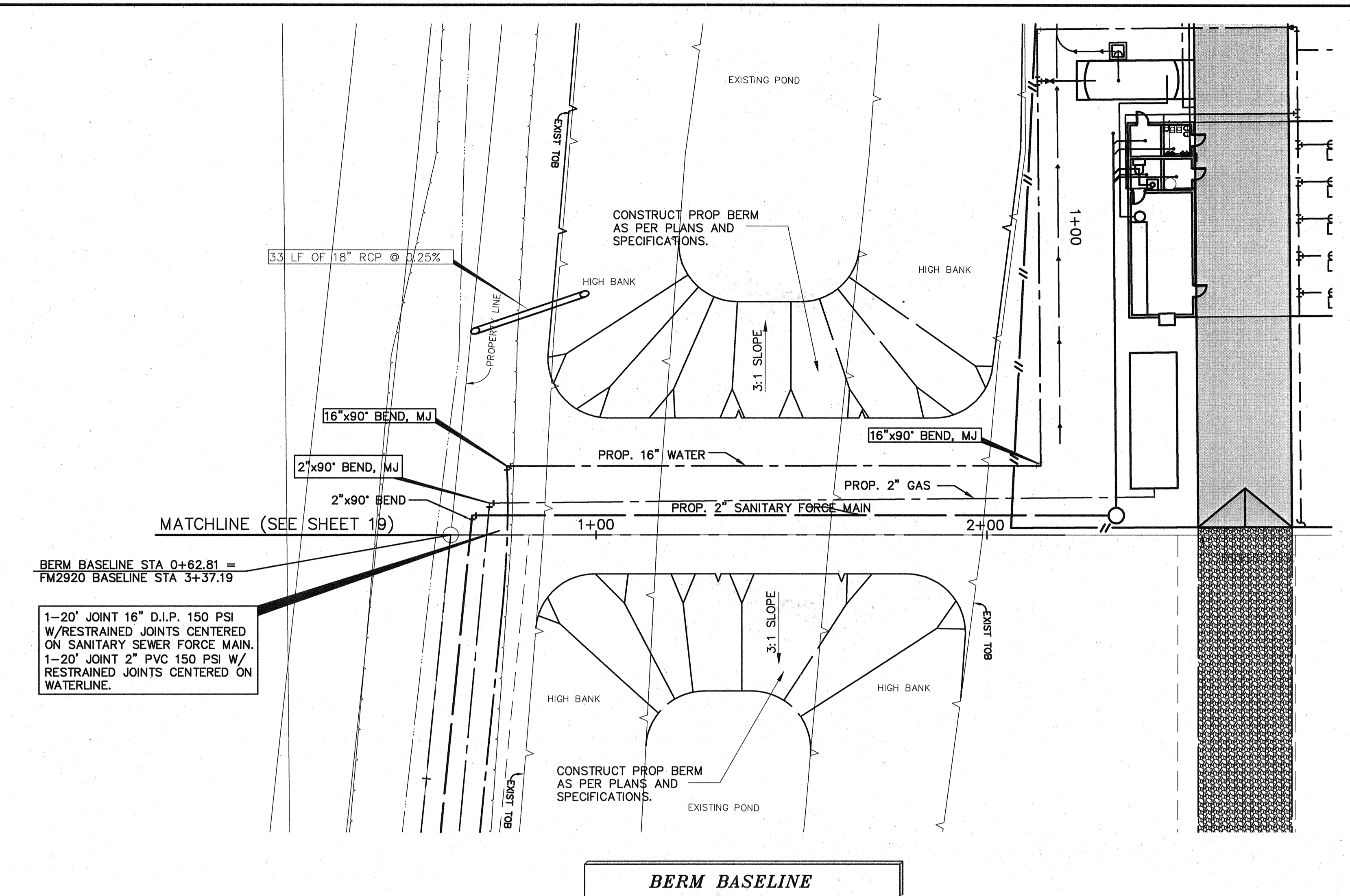
SUBMITTED: AS NOTED SCALE: AS NOTED DATE: DATE SURVEY BY: F B NO:	DESIGNED BY: ARH DRAWN BY: SHEET No.: 17 OF 35 DWG. NO:
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**BENCH MARK**

FLOODPLAIN REFERENCE MARK  
 No. 12020515 A BRASS DISK STAMPED  
 120205 AT INTERSECTION OF TREICHEL AND  
 M124-00-00 LOCATED ON UPSTREAM  
 CONCRETE HEADWALL ON NORTHEAST CORNER  
 OF BRIDGE IN KEYMAP 288J IN THE WILLOW  
 WATERSHED NEAR STREAM M124-00-00.  
 ELEV.=173.56 (FEET) NAVD 1988, 2001  
 ADJUSTMENT.

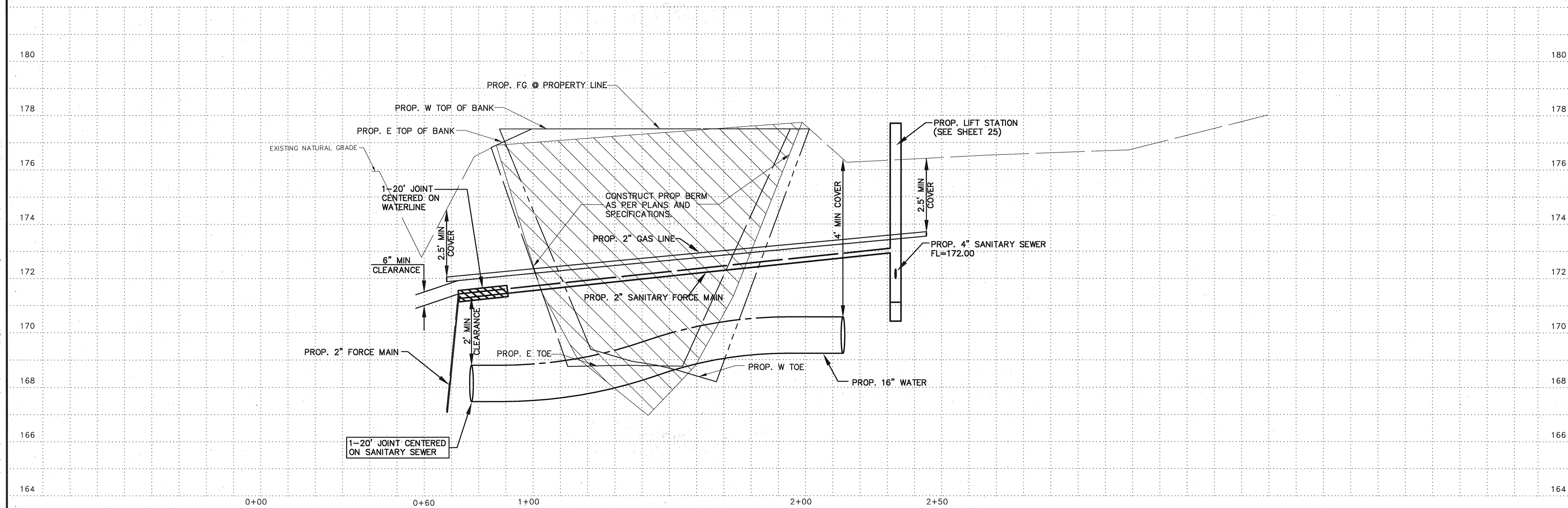
TEMPORARY BENCHMARK:  
 TBM "A" TOP OF RAILROAD SPIKE IN NORTH  
 SIDE OF POWER POLE LOCATED AT THE  
 INTERSECTION OF THE WEST RIGHT-OF-WAY  
 LINE OF TOMBALL CEMETERY ROAD AND THE  
 NORTHWEST RIGHT-OF-WAY LINE OF FM  
 2920.  
 ELE.=176.93 (FEET)



BERM BASELINE STA 0+62.81 =  
 FM2920 BASELINE STA 3+37.19

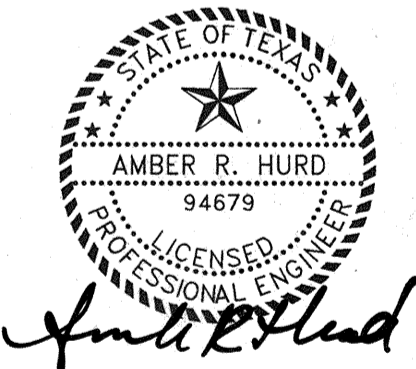
1-20' JOINT 16" D.I.P. 150 PSI  
 W/RESTRAINED JOINTS CENTERED  
 ON SANITARY SEWER FORCE MAIN.  
 1-20' JOINT 2" PVC 150 PSI W/  
 RESTRAINED JOINTS CENTERED ON  
 WATERLINE.

**BERM BASELINE**



PRIVATE UTILITY LINES SHOWN  
 AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR  
 EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

*J.P. Paul* Date: 3-16-09  
 CenterPoint Energy/Electric Facilities  
 (Approved for crossing underground ductlines, unless otherwise noted.)  
 Void after review of  
*Paul* Date: 3/16/09  
 SBC Approved for underground conduit facilities only.  
 Signature valid for one year.  
 Date:  
 City of Tomball/Gas Facilities



*Amber R. Hurd* 3/13/09

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 JOB NO.0512015-00 DWG. NO.0512015\_PP02



**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY &  
 STORAGE FACILITY NO. 5**

**PLAN & PROFILE**

**STA. 0+62 TO STA. 2+20**

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 SCALE: 1"=20H 1"=2V  
 DATE: MARCH 2009  
 SURVEY BY:  
 F B NO: FBN0

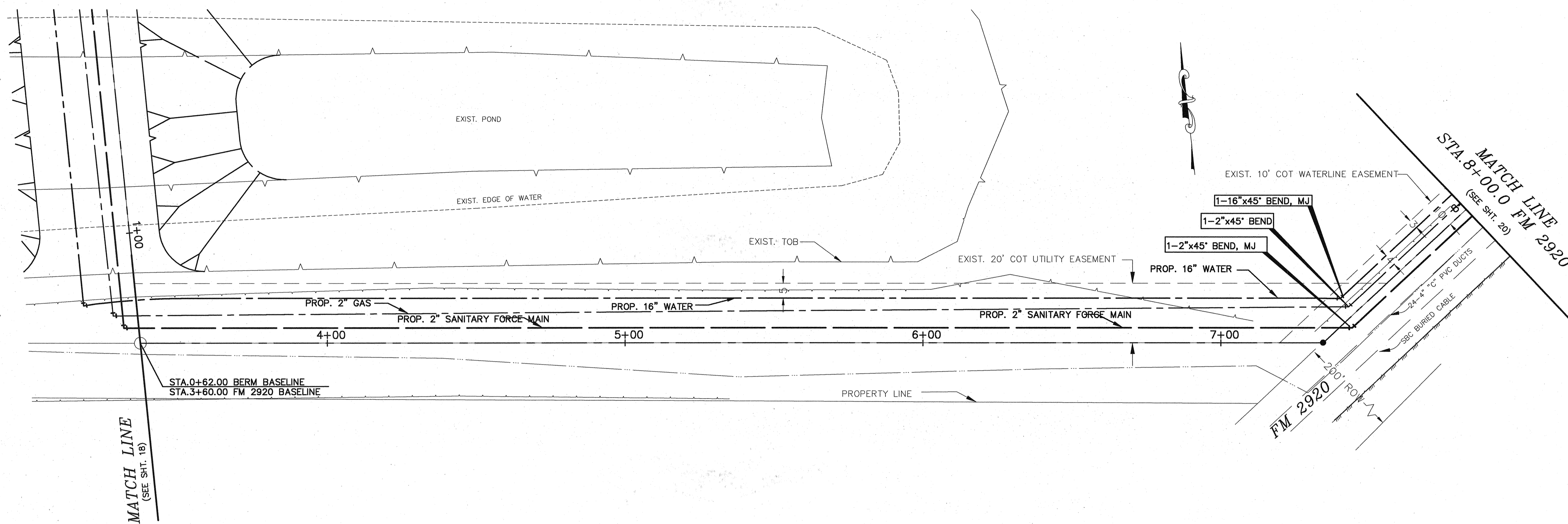
DESIGNED BY: AJV  
 DRAWN BY: AJV  
 SHEET No.: 18 OF 35  
 DWG. NO:

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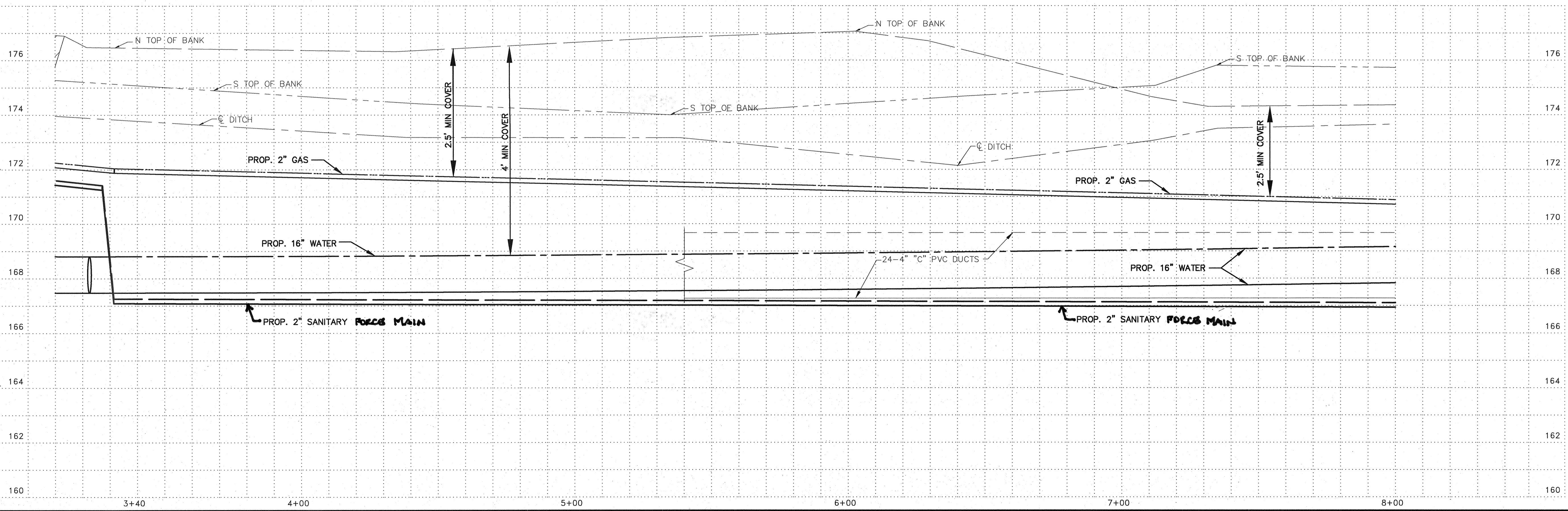
**BENCH MARK**

FLOODPLAIN REFERENCE MARK  
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 M124-00-00 LOCATED ON UPSTREAM  
 CONCRETE HEADWALL ON NORTHEAST CORNER  
 OF BRIDGE IN KEYMAP 285J IN THE WILLOW  
 WATERSHED NEAR STREAM M124-00-00.  
 ELEV.=173.56 (FEET) NAVD 1988, 2001  
 ADJUSTMENT.

TEMPORARY BENCHMARK:  
 TBM "A" TOP OF RAILROAD SPIKE IN NORTH  
 SIDE OF POWER POLE LOCATED AT THE  
 INTERSECTION OF THE WEST RIGHT-OF-WAY  
 LINE OF TOMBALL CEMETERY ROAD AND THE  
 NORTHWEST RIGHT-OF-WAY LINE OF FM  
 2920.  
 ELE.=176.93 (FEET)



**FM 2920 BASELINE**

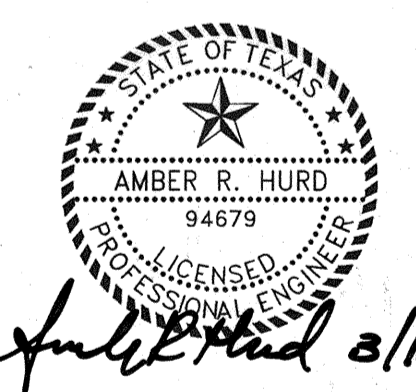


PRIVATE UTILITY LINES SHOWN  
 AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR  
 EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

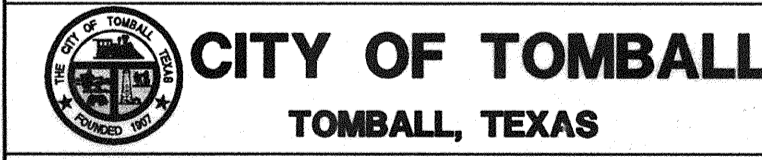
*[Signature]* Date: 3-16-09  
 CenterPoint Energy/Electric Facilities  
 Approved only for crossing underground ductlines, unless otherwise noted.  
 Valid only after review

*[Signature]* Date: 3/14/09  
 SBC Approved for underground conduit facilities only.  
 Signature valid for one year.

Date: \_\_\_\_\_  
 City of Tomball/Gas Facilities



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 JOB NO. 0512015-00 DWG. NO. 05120152\_DE



**WATER SUPPLY & STORAGE FACILITY NO. 5**

**PLAN & PROFILE  
 STA. 3+38 TO STA. 8+00**

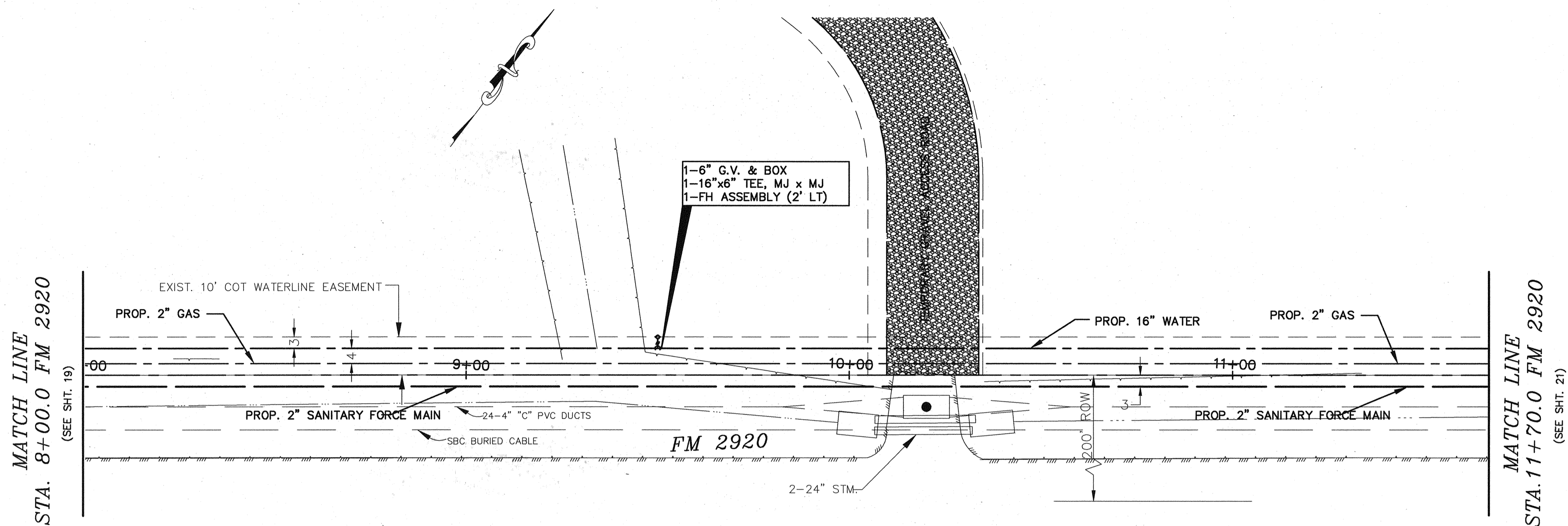
SUBMITTED:	DESIGNED BY: ARH
SCALE: 1"=20'H 1"=2'V	DRAWN BY:
DATE: MARCH 2009	SHEET No.: 19 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

C:\Users\jv2018\OneDrive\Documents\02\_02\_2009\_13\_00\_A\AMANDLER...  
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 02/02/2009 13:00 AMANDLER...

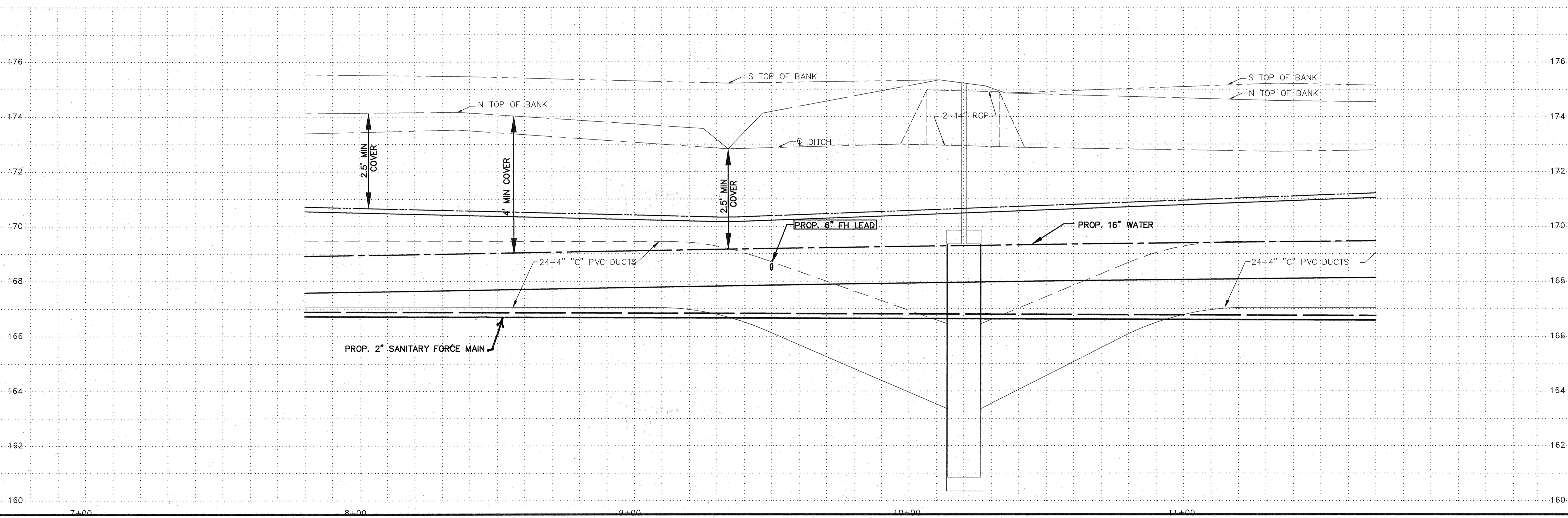
**BENCH MARK**

FLOODPLAIN REFERENCE MARK  
 No. 12020515 A BRASS DISK STAMPED  
 120205 AT INTERSECTION OF TREICHEL AND  
 M124-00-00 LOCATED ON UPSTREAM  
 CONCRETE HEADWALL ON NORTHEAST CORNER  
 OF BRIDGE IN KEYMAP 288J IN THE WILLOW  
 WATERSHED NEAR STREAM M124-00-00.  
 ELEV.=173.56 (FEET) NAVD 1988, 2001  
 ADJUSTMENT.

TEMPORARY BENCHMARK:  
 TBM "A" TOP OF RAILROAD SPIKE IN NORTH  
 SIDE OF POWER POLE LOCATED AT THE  
 INTERSECTION OF THE WEST RIGHT-OF-WAY  
 LINE OF TOMBALL CEMETERY ROAD AND THE  
 NORTHWEST RIGHT-OF-WAY LINE OF FM  
 2920.  
 ELE.=176.93 (FEET)



**FM 2920 BASELINE**

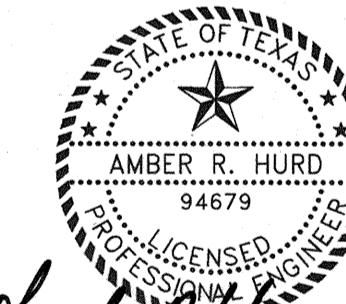


PRIVATE UTILITY LINES SHOWN  
 AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR  
 EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

*Paul* Date: 3-16-09  
 CenterPoint Energy/Electric Facilities  
 Approved only for crossing underground ductlines, unless otherwise noted.  
 Valid only for review of underground ductlines, unless otherwise noted.

*Paul* Date: 3/14/09  
 SBC Approved for underground conduit facilities only.  
 Signature valid for one year.

Date:  
 City of Tomball/Gas Facilities



*Amber R. Hurd* 3/13/09

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 13430 Northwest Freeway, Suite 1100  
 Houston, Texas 77040  
 713.462.3242 | fax 713.462.3262 | www.cobfend.com  
 JOB NO.0512015-00 DWG. NO.05120152\_DE

**CITY OF TOMBALL**  
 TOMBALL, TEXAS

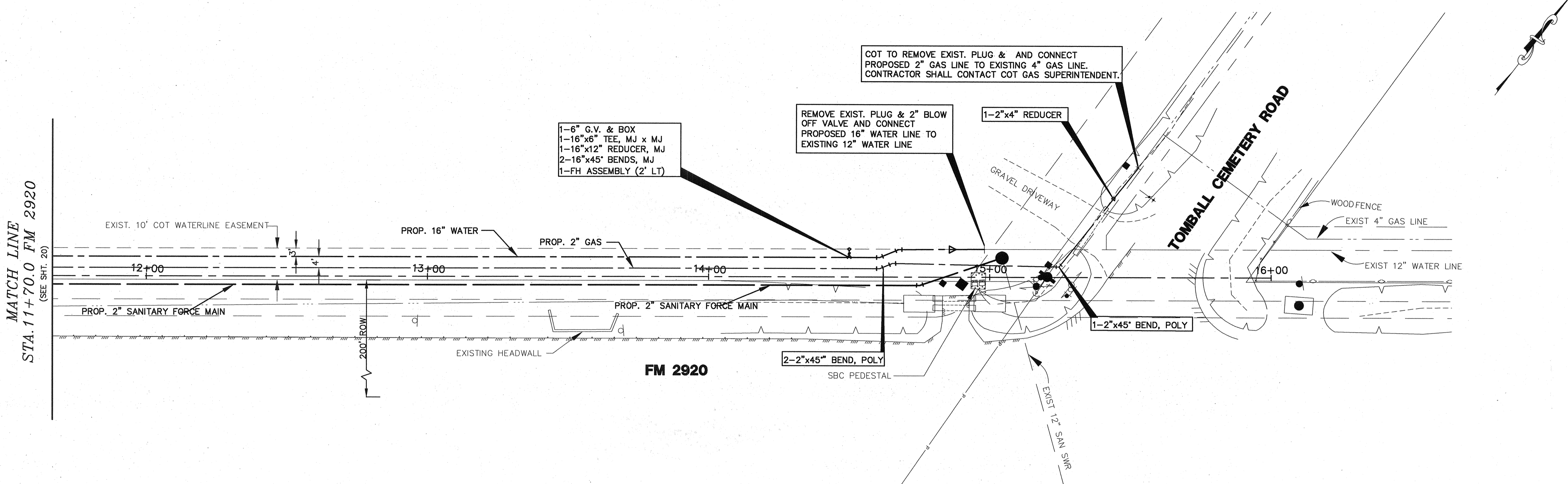
**WATER SUPPLY &  
 STORAGE FACILITY NO. 5**

**PLAN & PROFILE  
 STA. 8+00 TO STA. 1170**

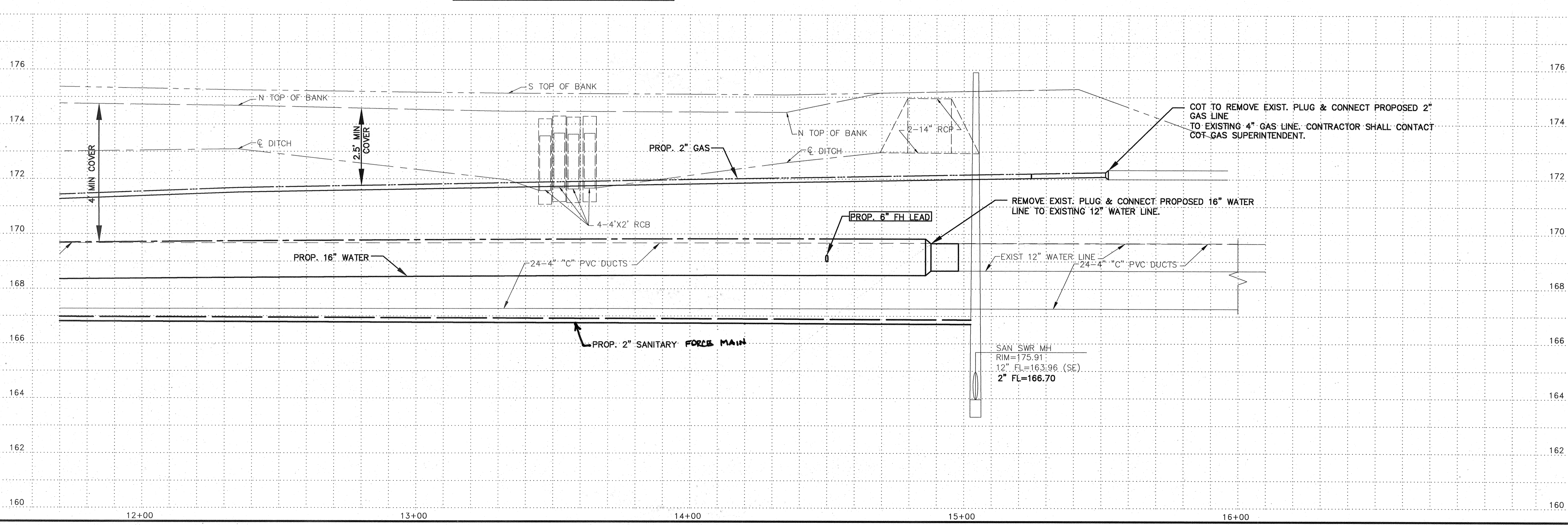
SUBMITTED:	DESIGNED BY: AWS
SCALE: 1"=20'H 1"=2'V	DRAWN BY: AWS
DATE: NOVEMBER 2008	SHEET No.: 20 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

MATCH LINE  
STA. 11+70.0 FM 2920  
(SEE SHT. 20)

**BENCH MARK**  
FLOODPLAIN REFERENCE MARK  
No. 120205 IS A BRASS DISK STAMPED  
120205 AT INTERSECTION OF TREICHEL AND  
M124-00-00 LOCATED ON UPSTREAM  
CONCRETE HEADWALL ON NORTHEAST CORNER  
OF BRIDGE IN KEYMAP 288J IN THE WILLOW  
WATERSHED NEAR STREAM M124-00-00.  
ELEV.=173.56 (FEET) NAVD 1988, 2001  
ADJUSTMENT.  
**TEMPORARY BENCHMARK:**  
TEM "A" TOP OF RAILROAD SPIKE IN NORTH  
SIDE OF POWER POLE LOCATED AT THE  
INTERSECTION OF THE WEST RIGHT-OF-WAY  
LINE OF TOMBALL CEMETERY ROAD AND THE  
NORTHWEST RIGHT-OF-WAY LINE OF FM  
2920.  
ELEV.=176.93 (FEET)



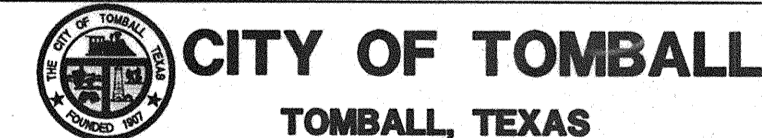
**FM 2920 BASELINE**



**PRIVATE UTILITY LINES SHOWN**  
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR  
EASEMENTS CALL THE "ONE STAR" NOTIFICATION 713-223-4567.  
*[Signature]* Date: 3-16-09  
Water/Energy/Electric Facilities  
(Approved only for crossing underground ductlines, unless otherwise noted.)  
Valid for 1 year.  
*[Signature]* Date: 3/14/09  
SBC Approved for underground conduit facilities only.  
Signature valid for one year.  
Date: \_\_\_\_\_  
City of Tomball/Gas Facilities



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JOB NO.0512015-00 DWG. NO.05120152\_DE



**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY &  
STORAGE FACILITY NO. 5**

**PLAN & PROFILE  
STA. 11+70 TO END**

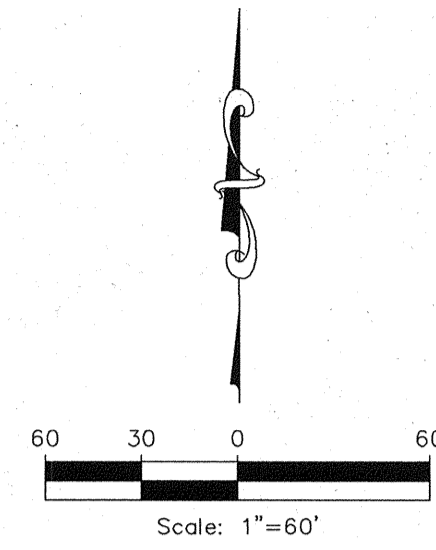
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SCALE: 1"=20'H 1"=2'V	DRAWN BY: AJV
DATE: MARCH 2009	SHEET No.: 21 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

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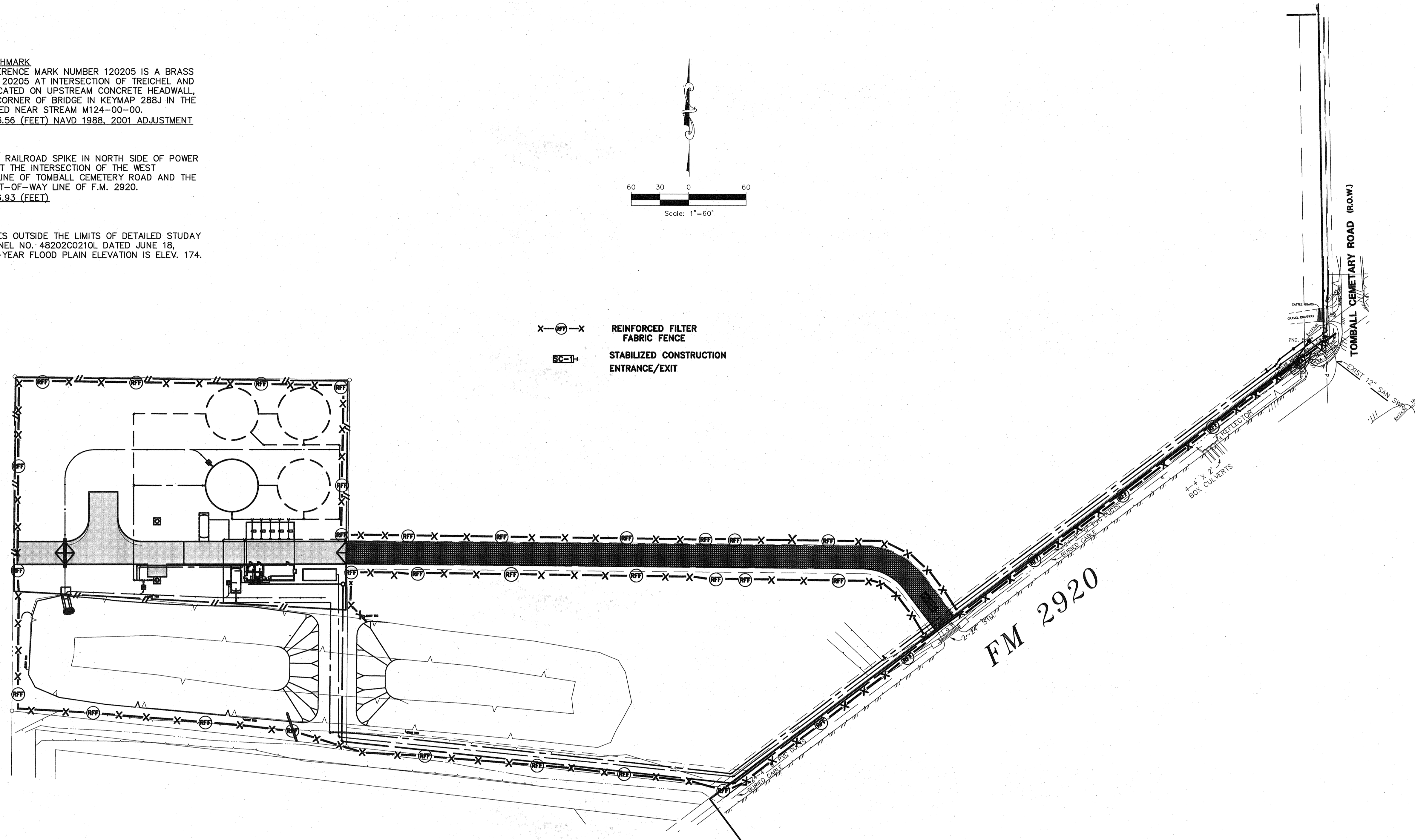
**REFERENCE BENCHMARK**  
 FLOODPLAIN REFERENCE MARK NUMBER 120205 IS A BRASS DISK STAMPED 120205 AT INTERSECTION OF TREICHEL AND M124-00-00 LOCATED ON UPSTREAM CONCRETE HEADWALL, ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 288J IN THE WILLOW WATERSHED NEAR STREAM M124-00-00.  
 ELEVATION = 173.56 (FEET) NAVD 1988, 2001 ADJUSTMENT

**SITE BENCHMARK**  
 TBM "A", TOP OF RAILROAD SPIKE IN NORTH SIDE OF POWER POLE LOCATED AT THE INTERSECTION OF THE WEST RIGHT-OF-WAY LINE OF TOMBALL CEMETERY ROAD AND THE NORTHWEST RIGHT-OF-WAY LINE OF F.M. 2920.  
 ELEVATION = 176.93 (FEET)

**FEMA NOTE**  
 THIS PROJECT LIES OUTSIDE THE LIMITS OF DETAILED STUDY AS PER FIRM PANEL NO. 48202C0210L DATED JUNE 18, 2007. THE 100-YEAR FLOOD PLAIN ELEVATION IS ELEV. 174.



X-⊖-X REINFORCED FILTER FABRIC FENCE  
 ⊖-H-⊖ STABILIZED CONSTRUCTION ENTRANCE/EXIT



*Amber R. Hurd 3/13/09*

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 JOB NO.0512015-00 DWG. NO.05120152\_DE

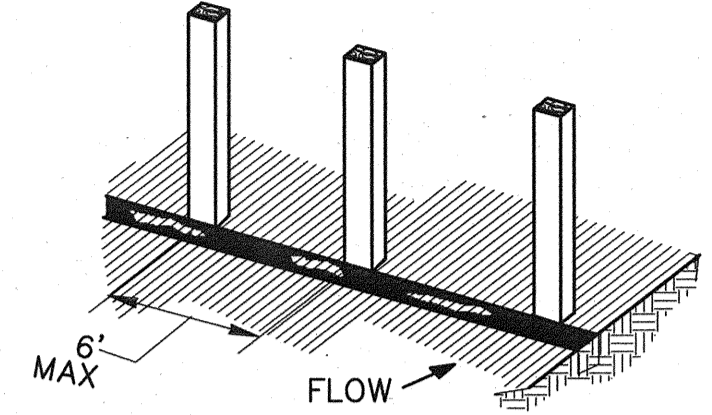
**CITY OF TOMBALL**  
 TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

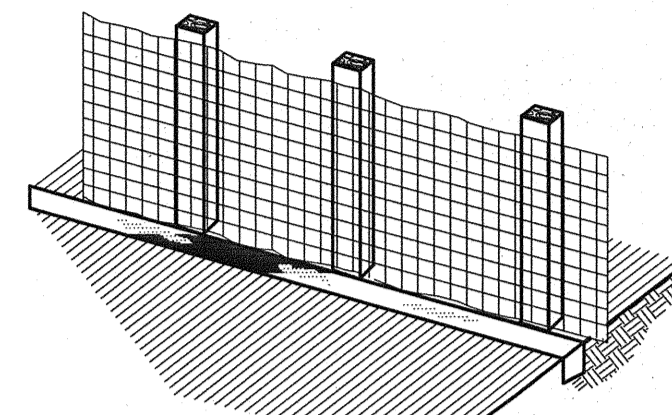
**SWPPP LAYOUT**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY:
DATE: MARCH 2009	SHEET No.: 22 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

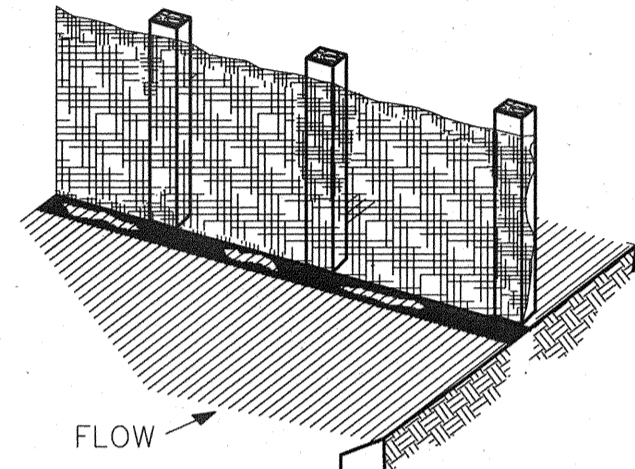
1. SET POSTS AND EXCAVATE 4"x4" TRENCH UPSLOPE ALONG LINE OF POSTS (SEE NOTE 1).



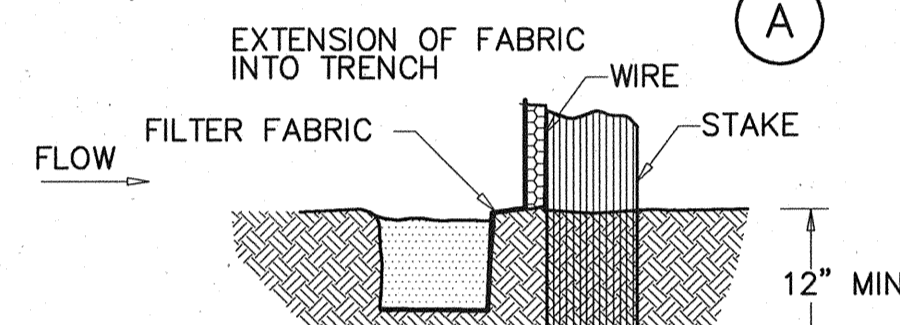
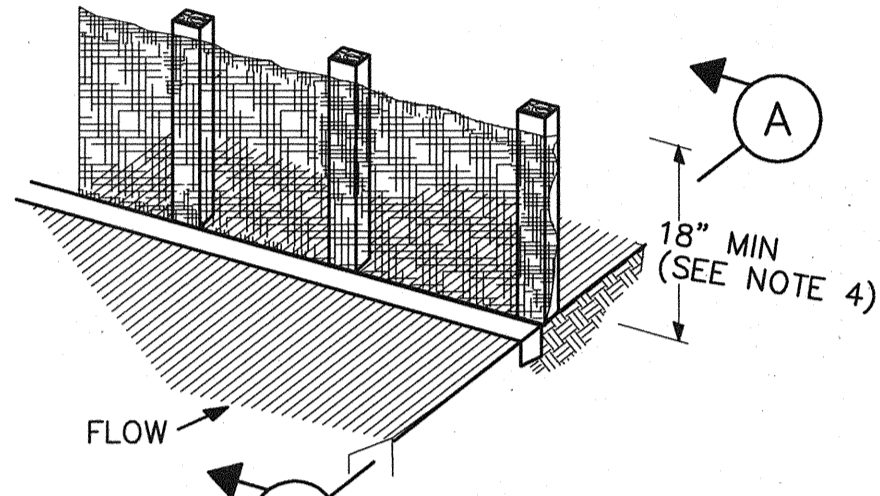
2. SECURE WIRE FENCING TO POSTS (SEE NOTE 2).



3. ATTACH FILTER MATERIAL TO WIRE FENCE AND EXTEND IT INTO THE TRENCH (SEE NOTE 3).

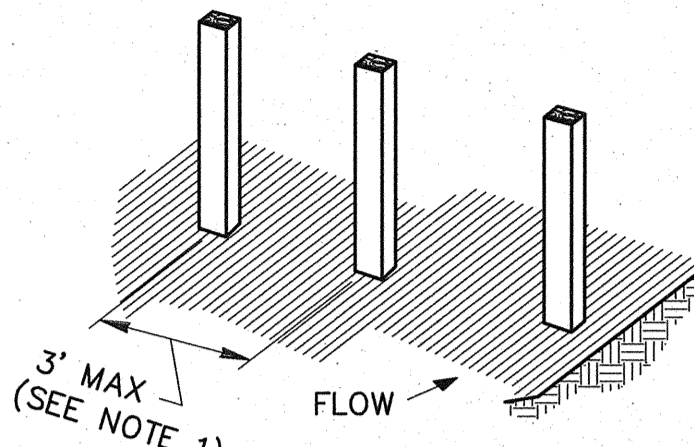


4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

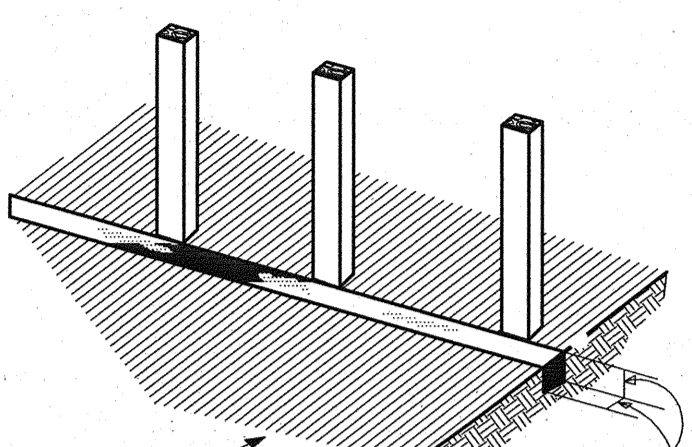


SECTION A

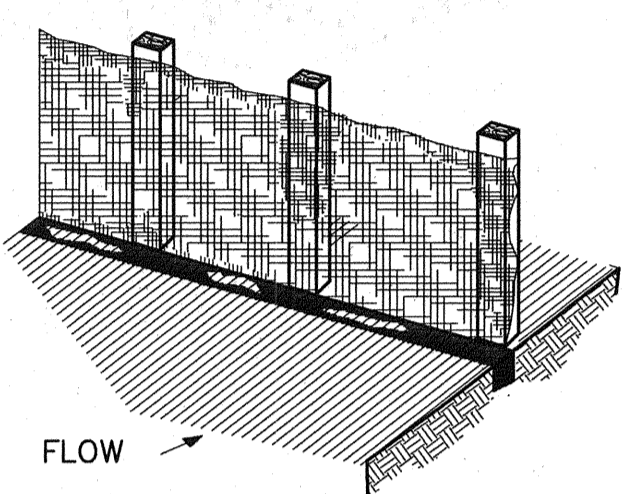
1. SET POSTS AT REQUIRED SPACING.



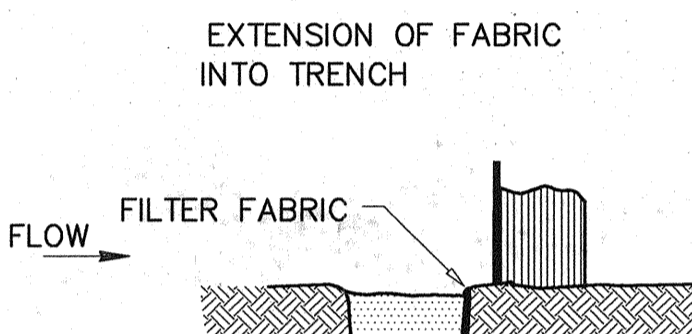
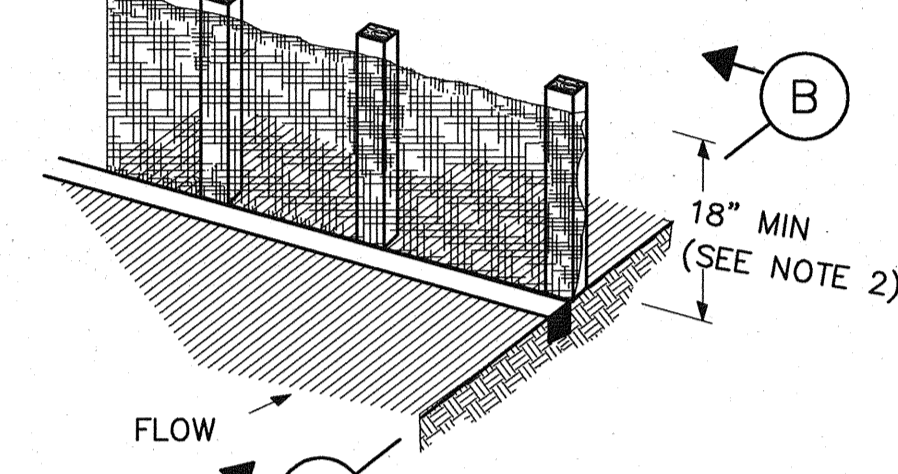
2. EXCAVATE A 4"x4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



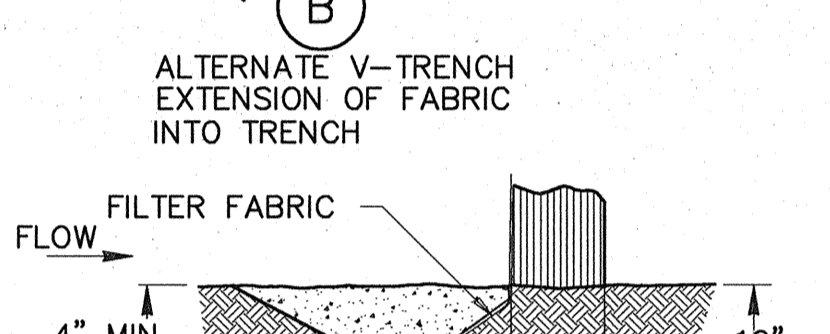
3. ATTACH FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



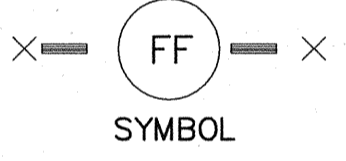
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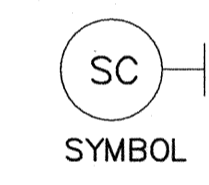
SECTION B ALTERNATE

CONSTRUCTION NOTES:

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



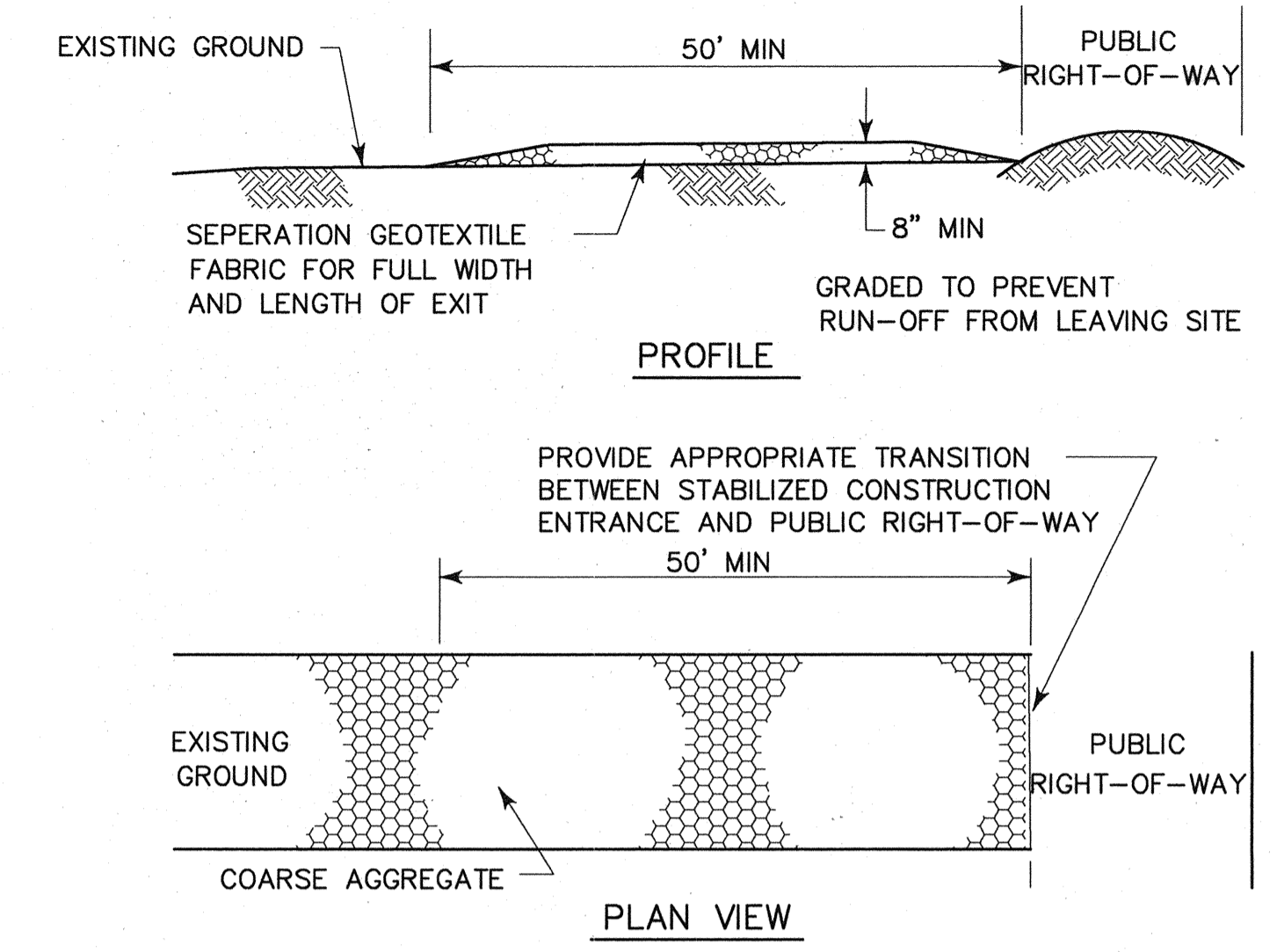
SYMBOL



SYMBOL

CONSTRUCTION NOTES:

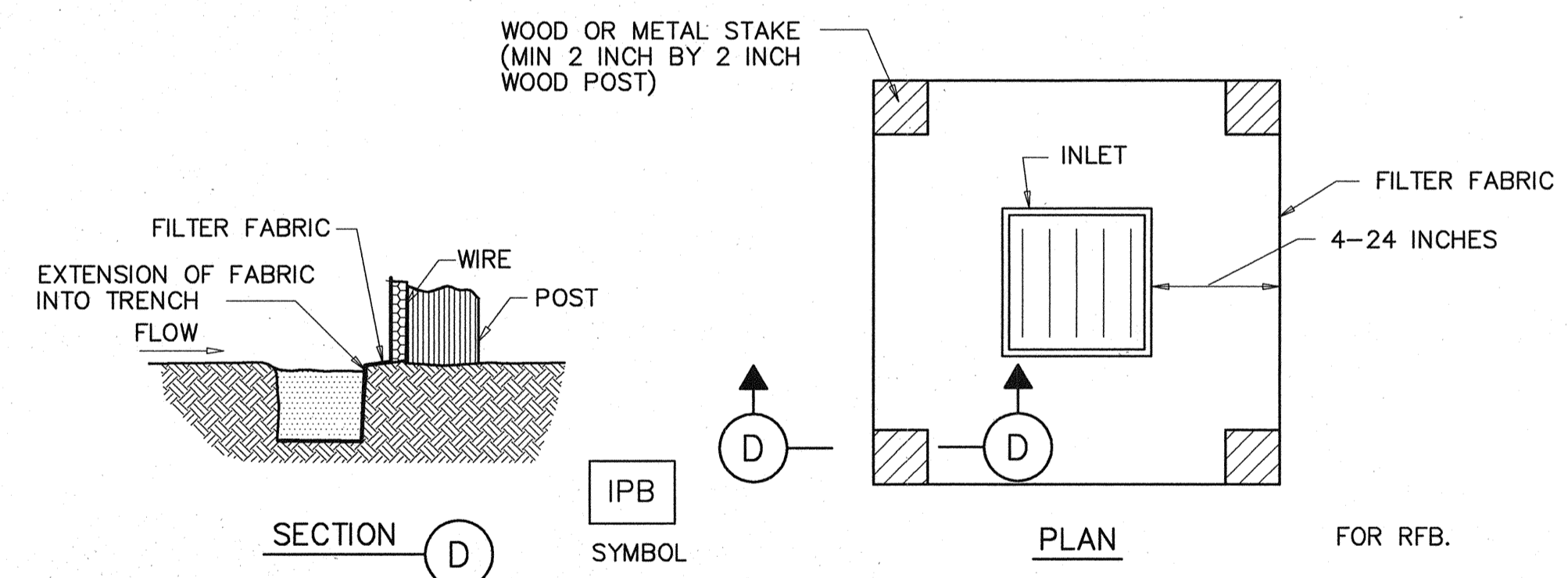
- LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
- THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
- WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
- STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS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



PROFILE

PLAN VIEW

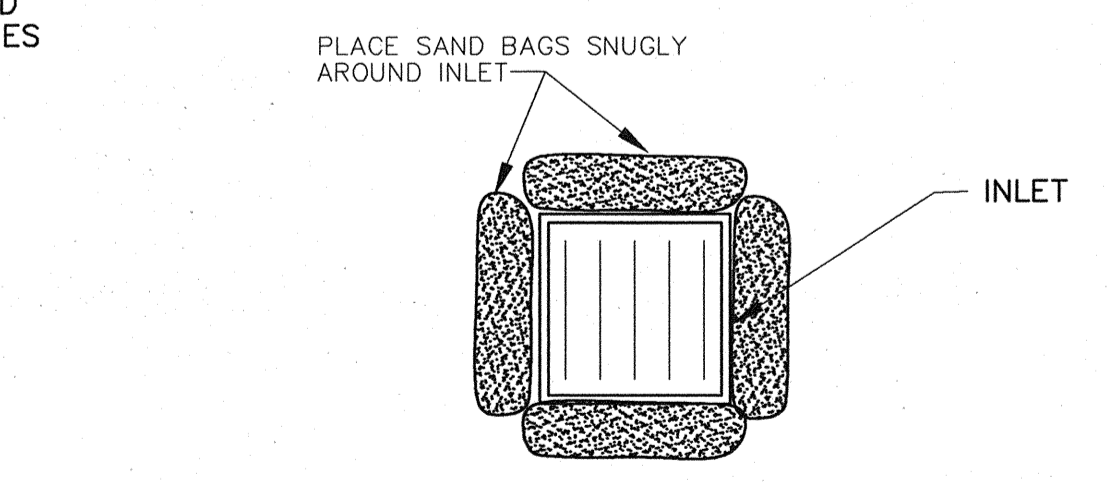
STABILIZED CONSTRUCTION EXIT



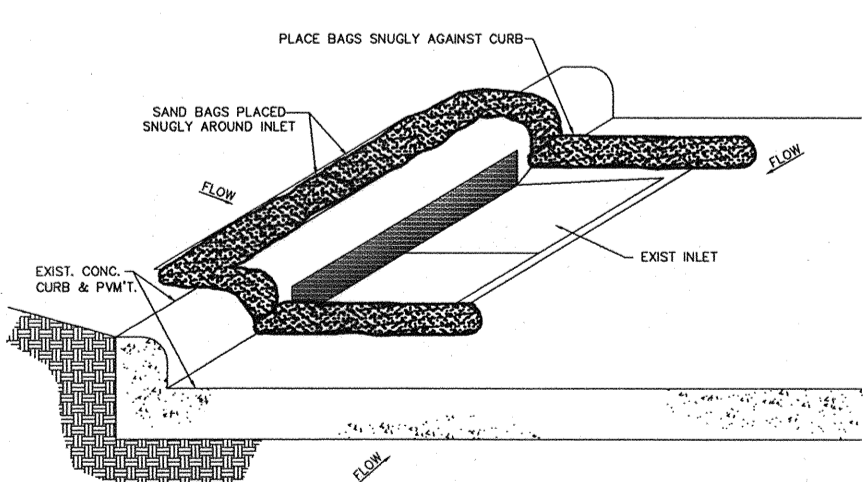
SECTION D

PLAN

SILT FENCE INLET PROTECTION BARRIER (PHASE I)



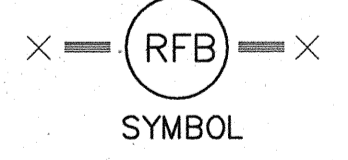
SAND BAG INLET PROTECTION BARRIER (PHASE II)



PHASE II INLET PROTECTION BARRIER FOR CURB INLETS

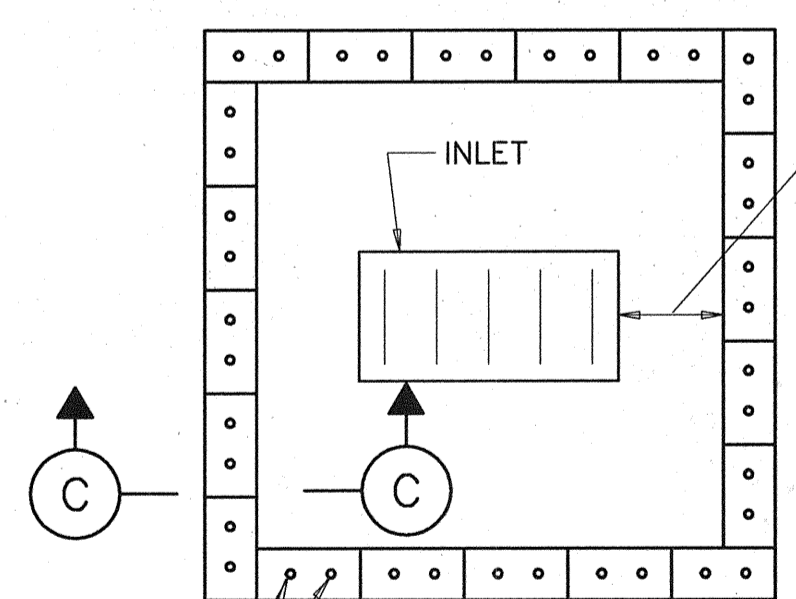
CONSTRUCTION NOTES:

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



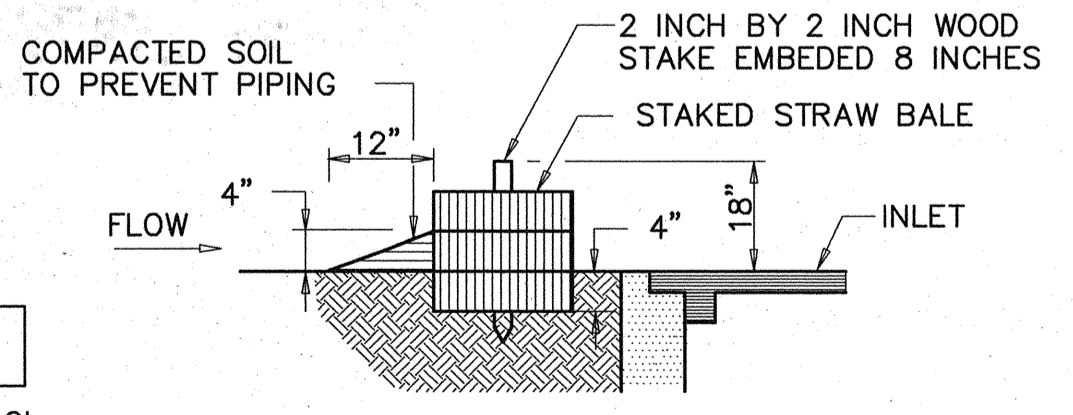
SYMBOL

REINFORCED FILTER FABRIC BARRIER



SECTION C

PLAN



SECTION C

STRAW BALE DROP INLET PROTECTION BARRIER



Amber R. Hurd 3/13/09

**CobbFendley**

Texas Registration No. 274  
13430 Northwest Freeway, Suite 1100  
Houston, Texas 77040  
713.462.3242 | fax 713.462.3262 | www.cobfen.com  
JOB NO. 0512015-00 DWG. NO. 05120152\_DE

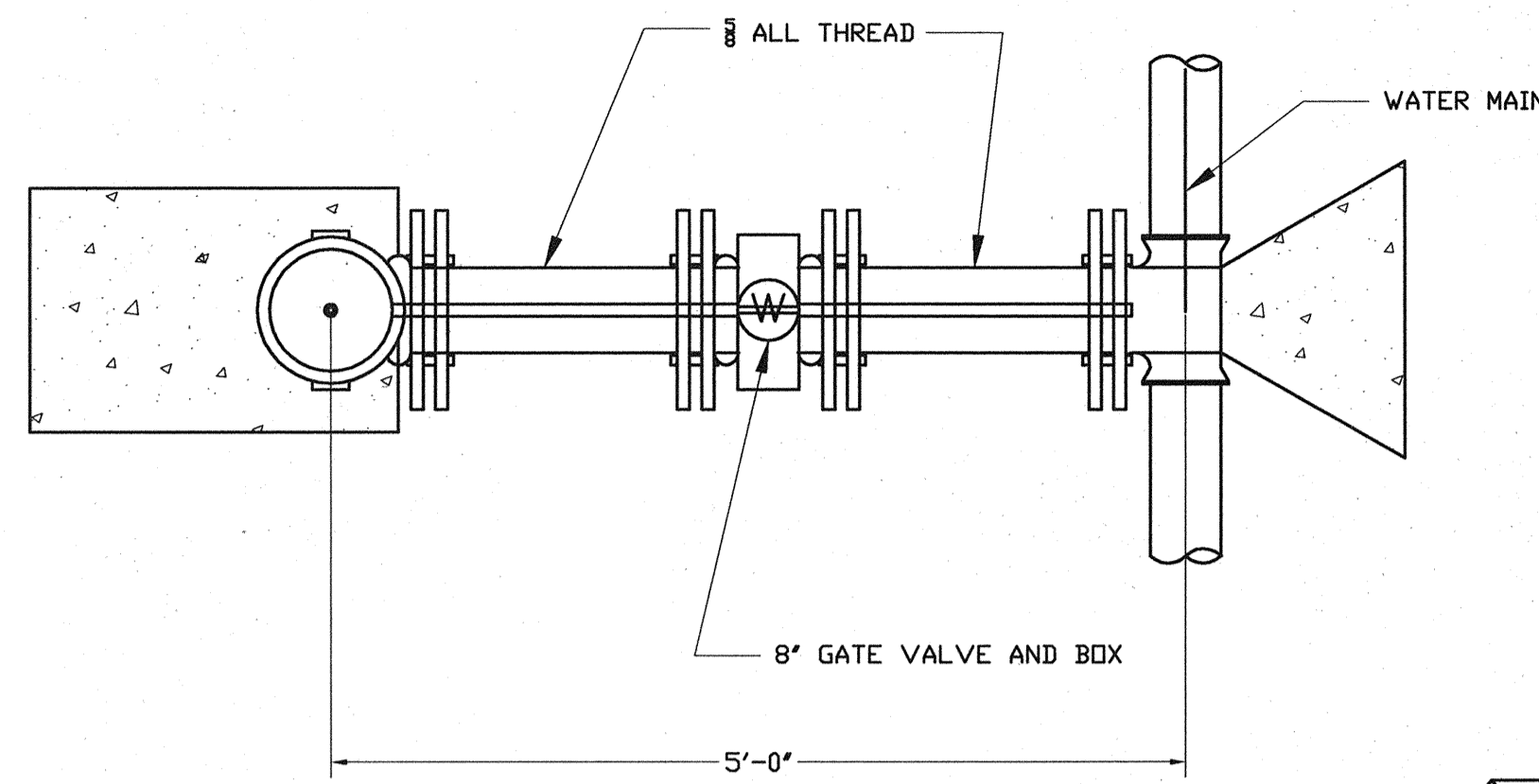
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**DETAILS**  
**SWPPP**

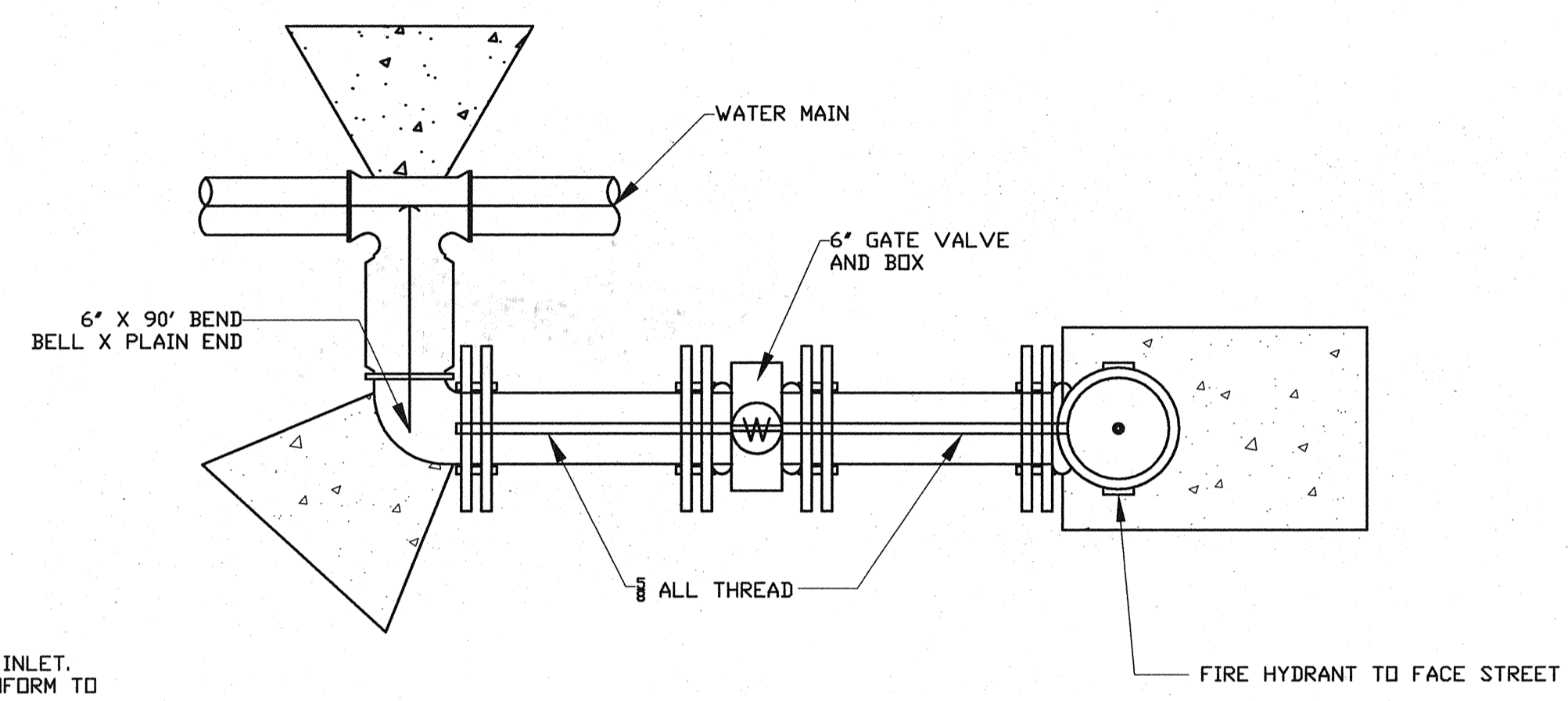
SUBMITTED:	DESIGNED BY: AWS
SCALE: AS NOTED	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 23 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

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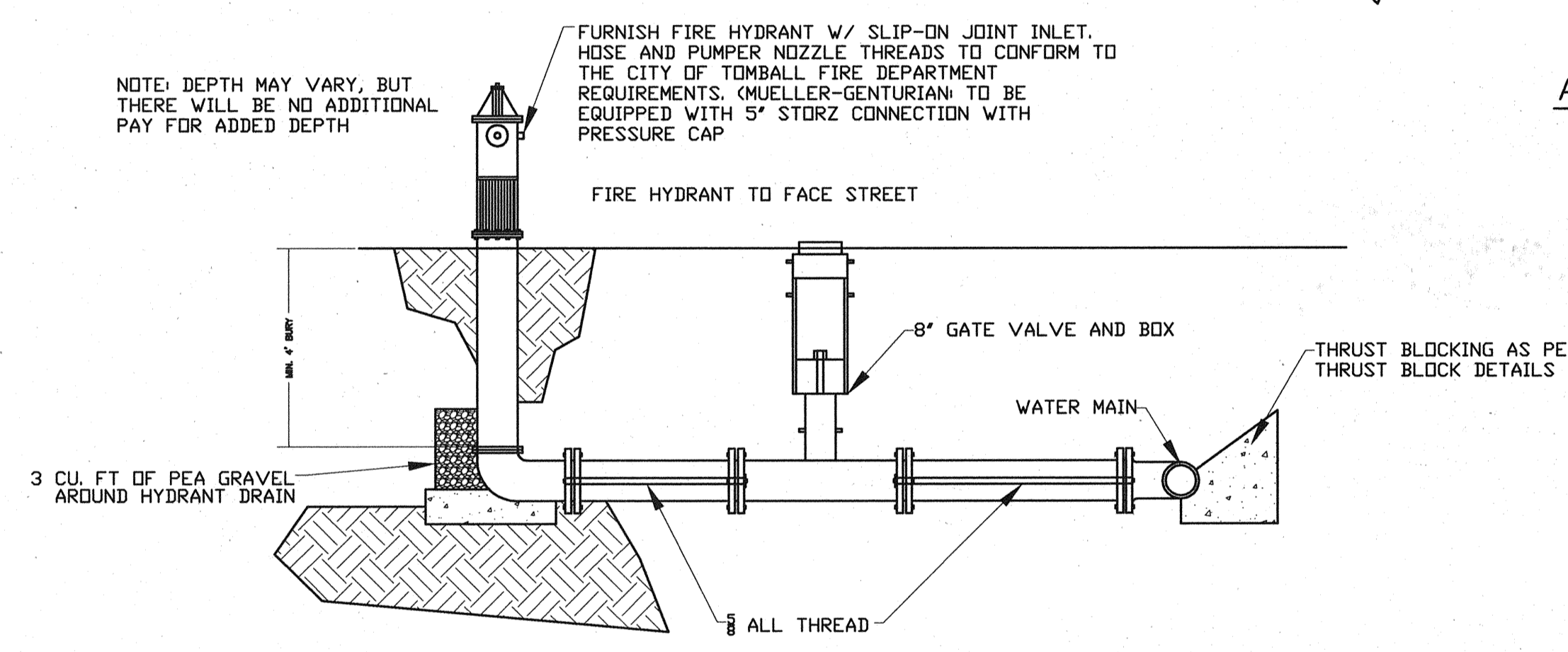


PLAN

NOTES:  
 ALL THREAD BETWEEN TEE VALVE & VALVE AND VALVE & FIRE HYDRANT



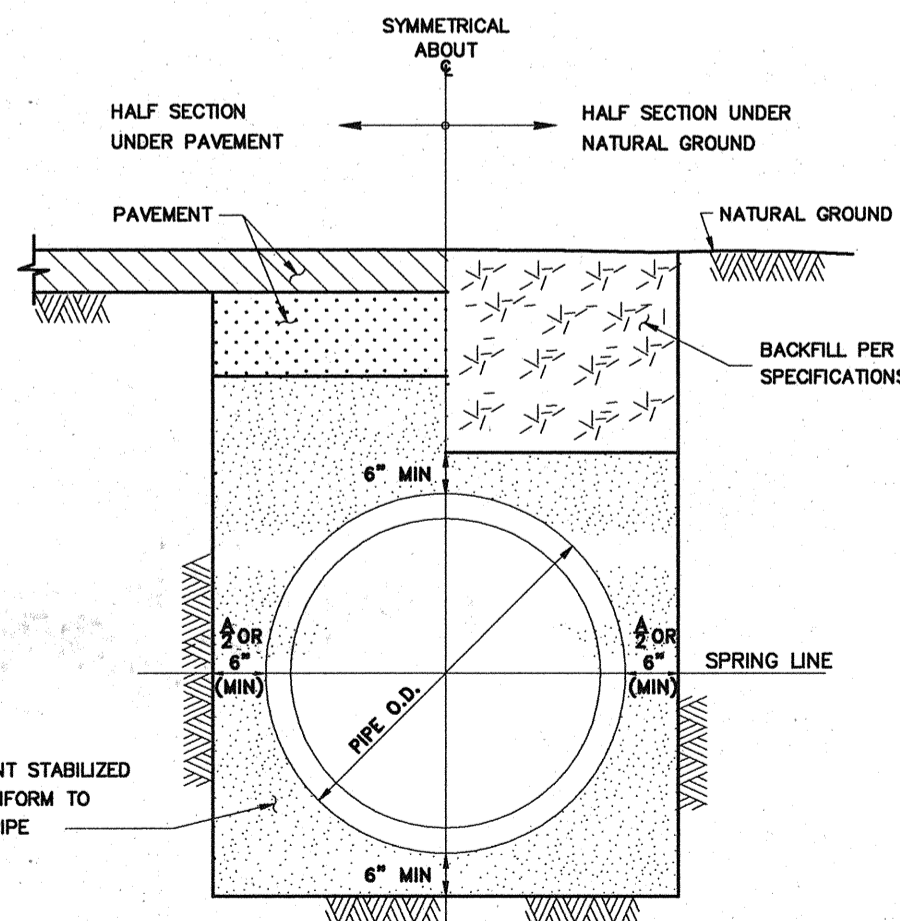
ALTERNATE PLAN



SECTION

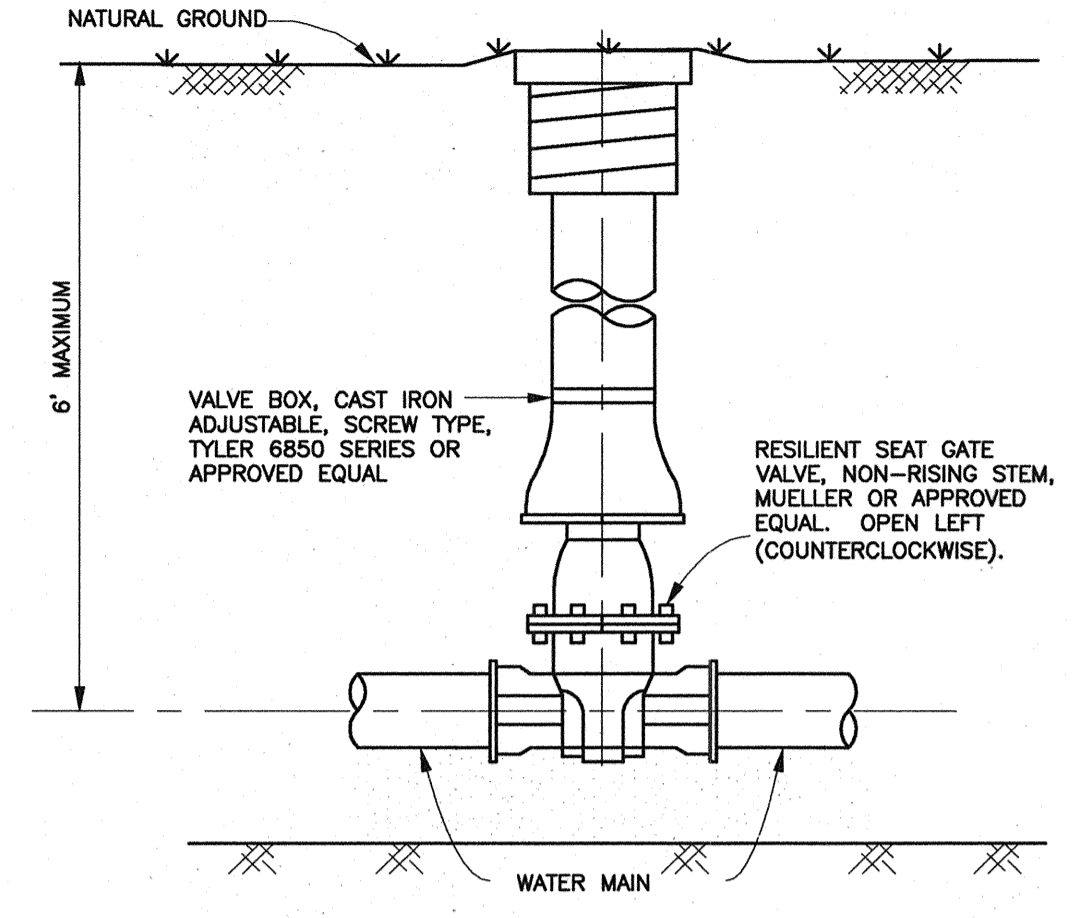
FIRE HYDRANT DETAIL

N.T.S.



WATER MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES

N.T.S.

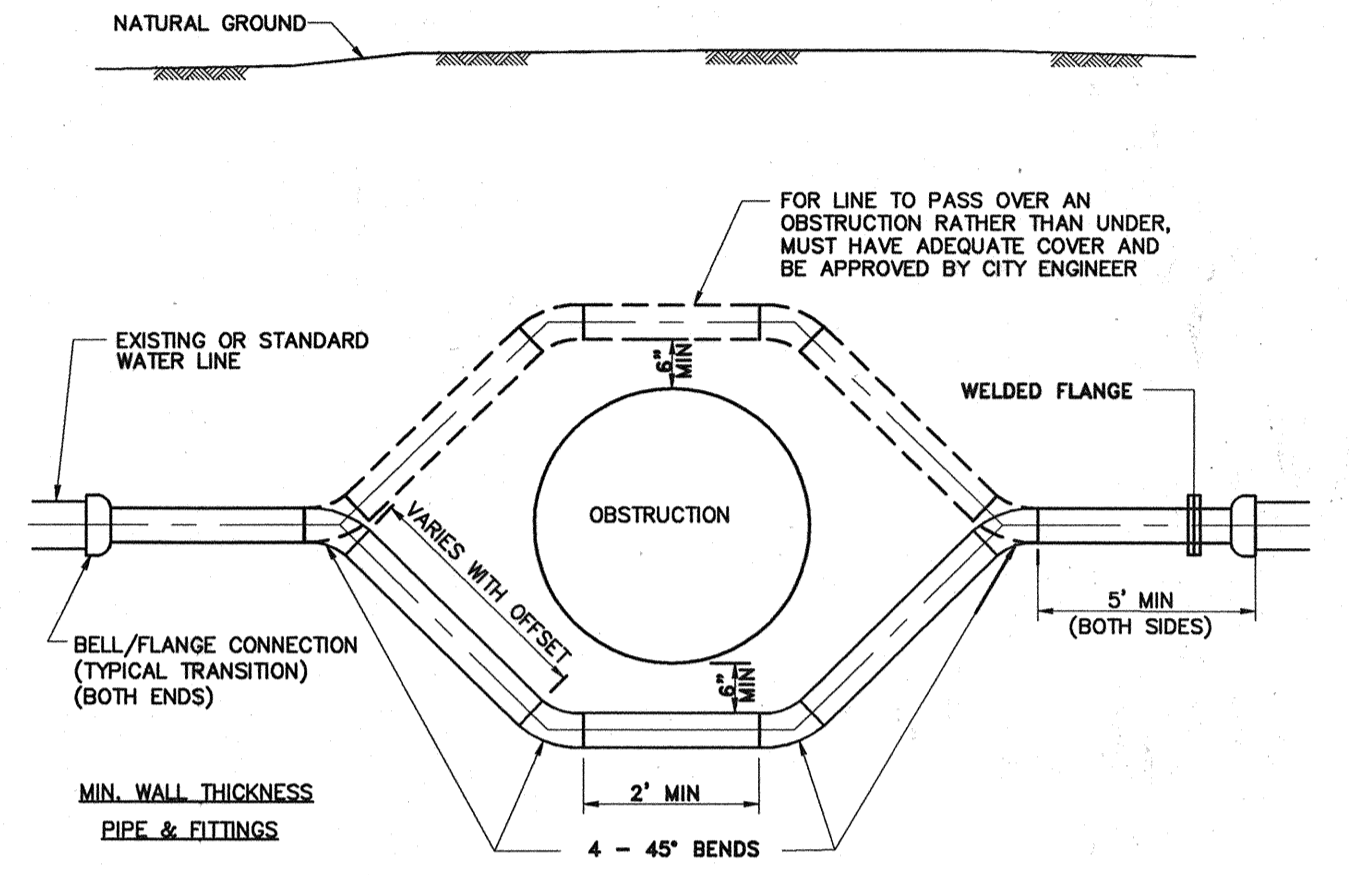


ELEVATION VIEW

GATE VALVE AND BOX DETAIL

N.T.S.

NOTES:  
 1. ALL MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH SPECIFICATIONS.  
 2. INSULATED JOINT TO BE MADE UP USING INSULATING GASKETS, PLASTIC BOLT SLEEVES AND WASHERS OF INSULATING GASKET MATERIAL BACKED WITH ZINC-PLATED WASHERS, OR OTHER METHODS APPROVED BY THE ENGINEER.

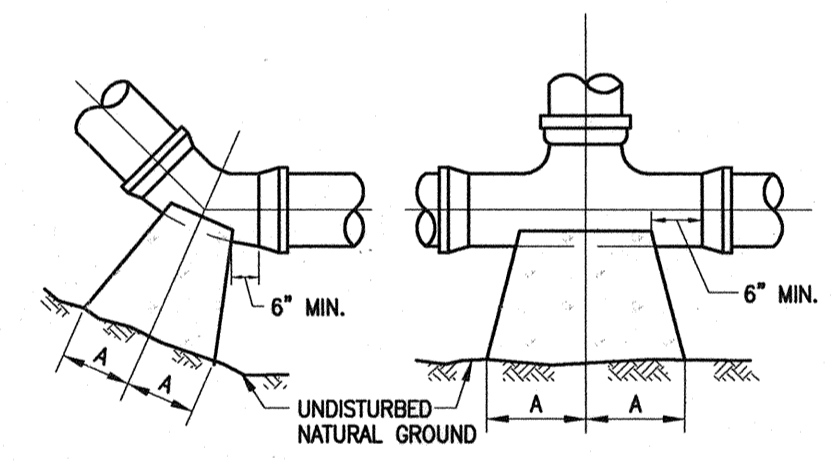


MIN. WALL THICKNESS  
PIPE & FITTINGS

4"	0.250"
6"	0.280"
8"	0.322"
12"	0.375"
AND LARGER	

WATER PIPE OFFSET ASSEMBLY

N.T.S.

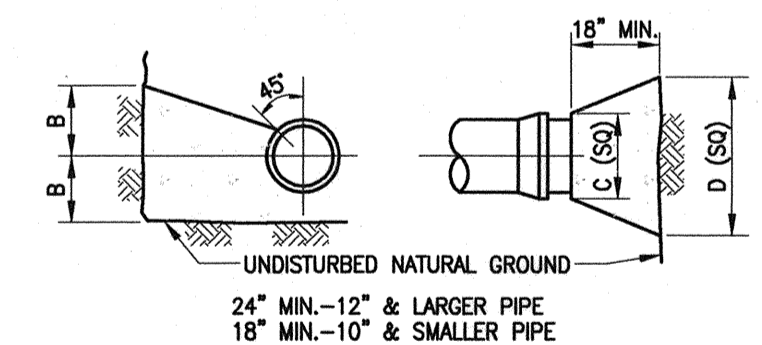


BEND

N.T.S.

TEE

N.T.S.



BEND & TEE

N.T.S.

PLUG

N.T.S.

SIZE	90° BEND		45° BEND		22 1/2° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	A	B
2 1/2"	12"	7"	6"	7"	6"	6"	7"	8"	8"	14"
6"	16"	10"	9"	10"	8"	12"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	28"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

NOTE: THRUST BLOCKS AT TRENCH FACE MUST HAVE A MINIMUM BEARING SURFACE OF 1.0 SQ. FOOT AND THE LEAST DIMENSION SHALL BE NO SMALLER THAN 1.5 TIMES PIPE DIAMETER, BUT NOT LESS THAN 1.0 FT.

N.T.S.

NOTES:  
 1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, COMPACTED TO 90% STANDARD PROCTOR DENSITY EXCEPT AS REQUIRED BELOW.  
 2. BACKFILL UNDER DRIVEWAY AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (1.1 SACKS OF CEMENT PER CUBIC YARD OF SAND), COMPACTED TO 95% STANDARD PROCTOR DENSITY.  
 3. TRENCH SHORING IN ACCORDANCE WITH OSHA, SHALL BE INSTALLED WHERE REQUIRED.

*Amber R. Hurd 8/13/09*

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**CITY OF TOMBALL**  
 TOMBALL, TEXAS

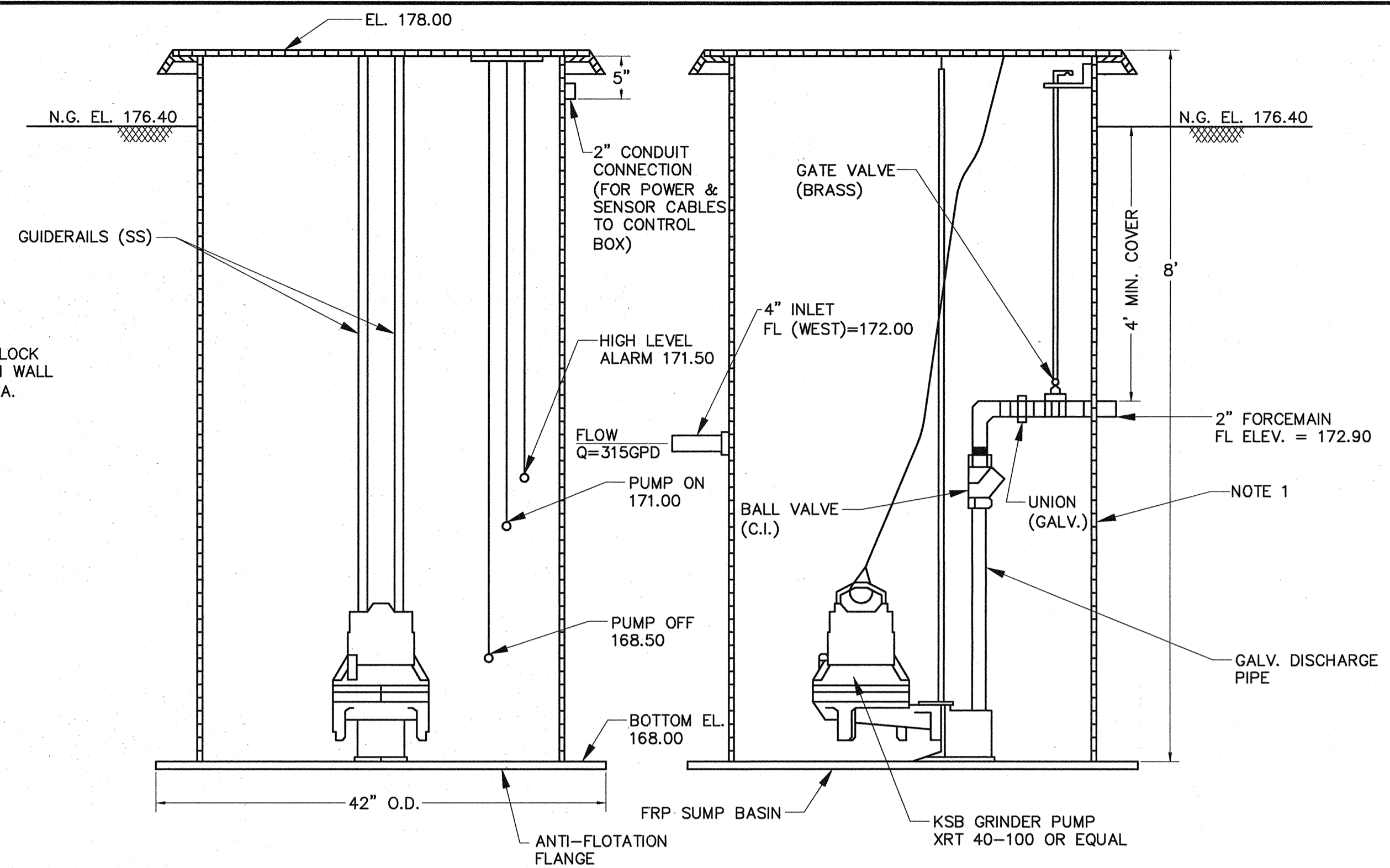
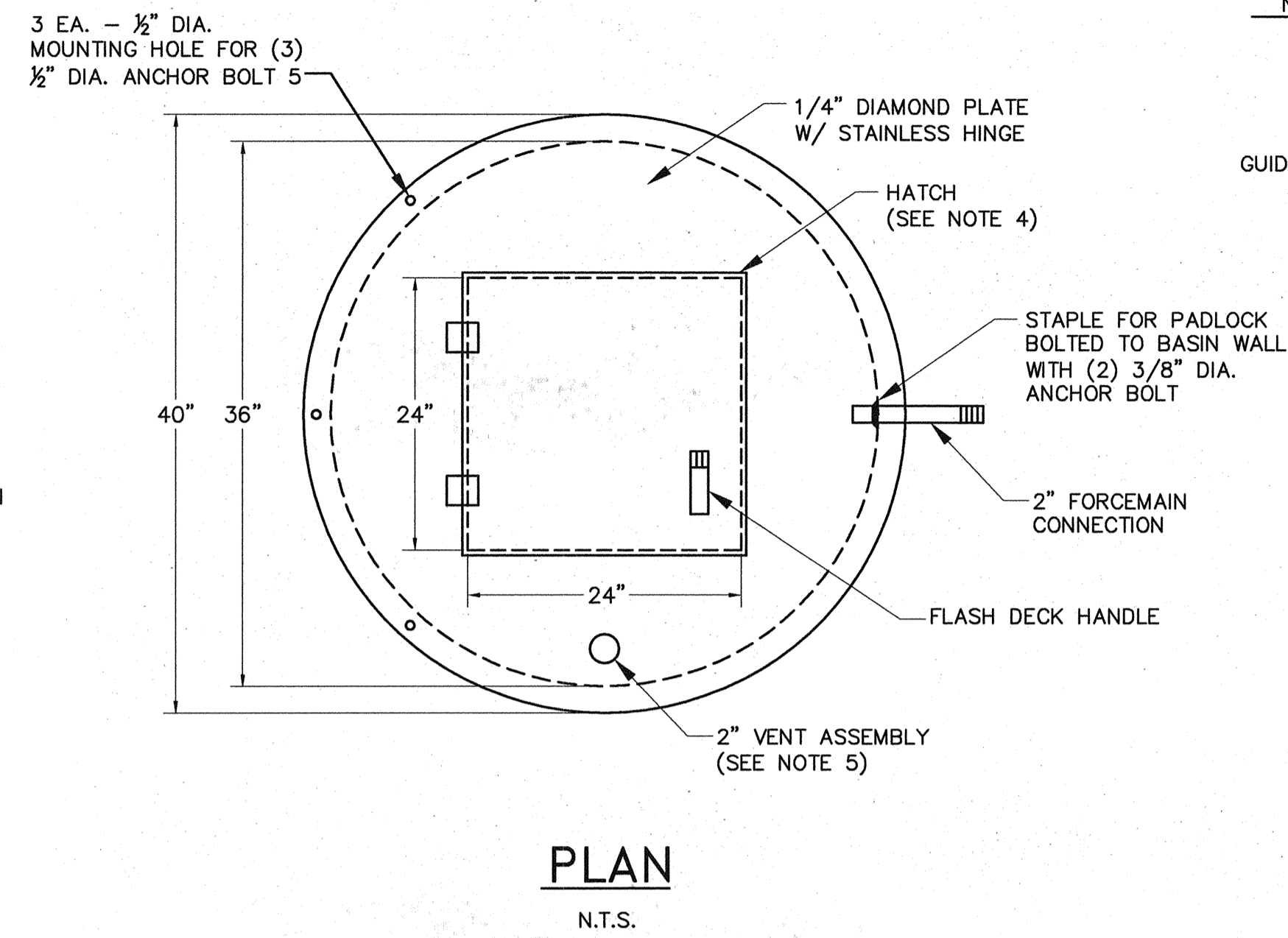
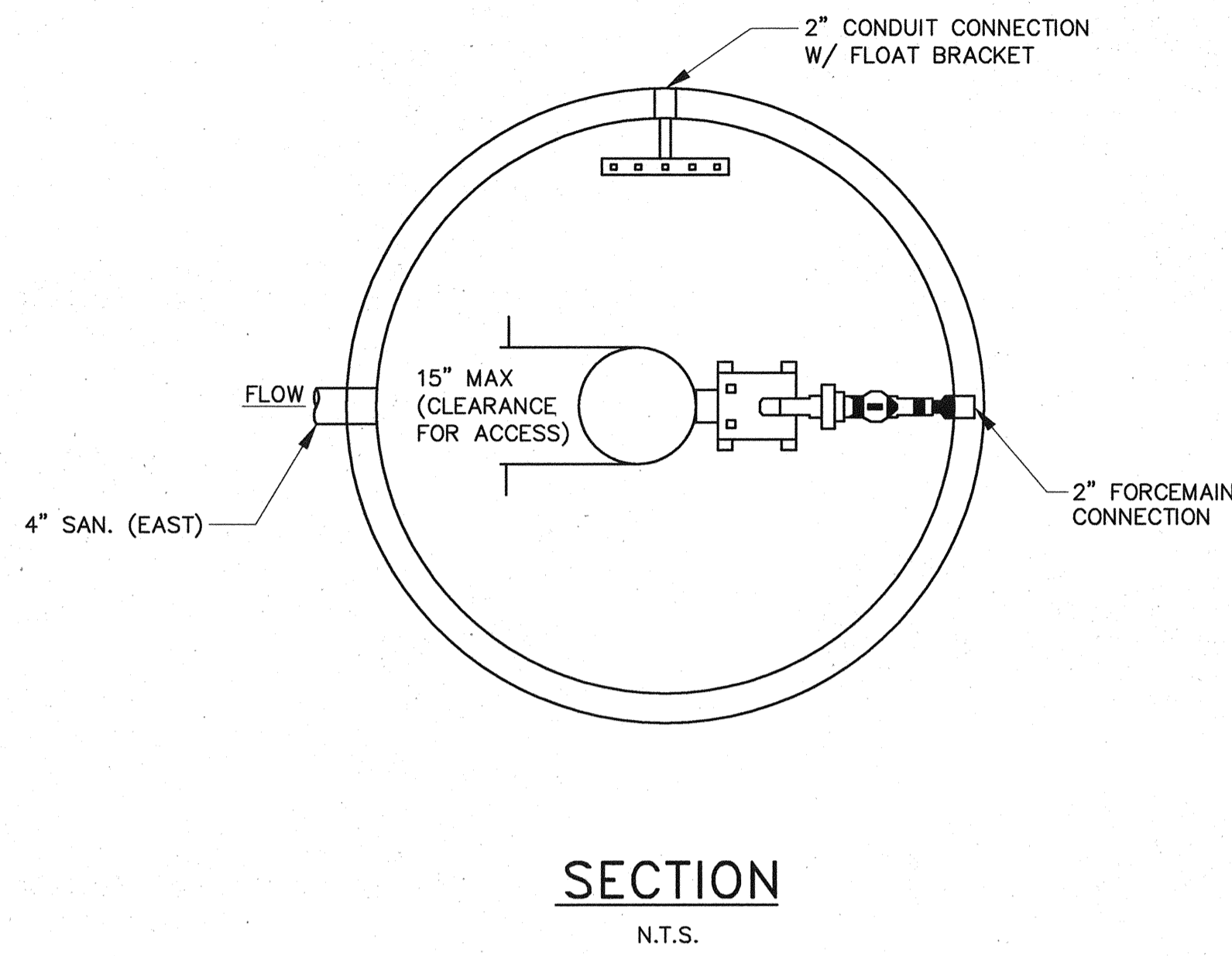
**WATER SUPPLY & STORAGE FACILITY NO. 5**

**WATER DETAILS**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: TDB
DATE: MARCH 2009	SHEET No.: 24 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

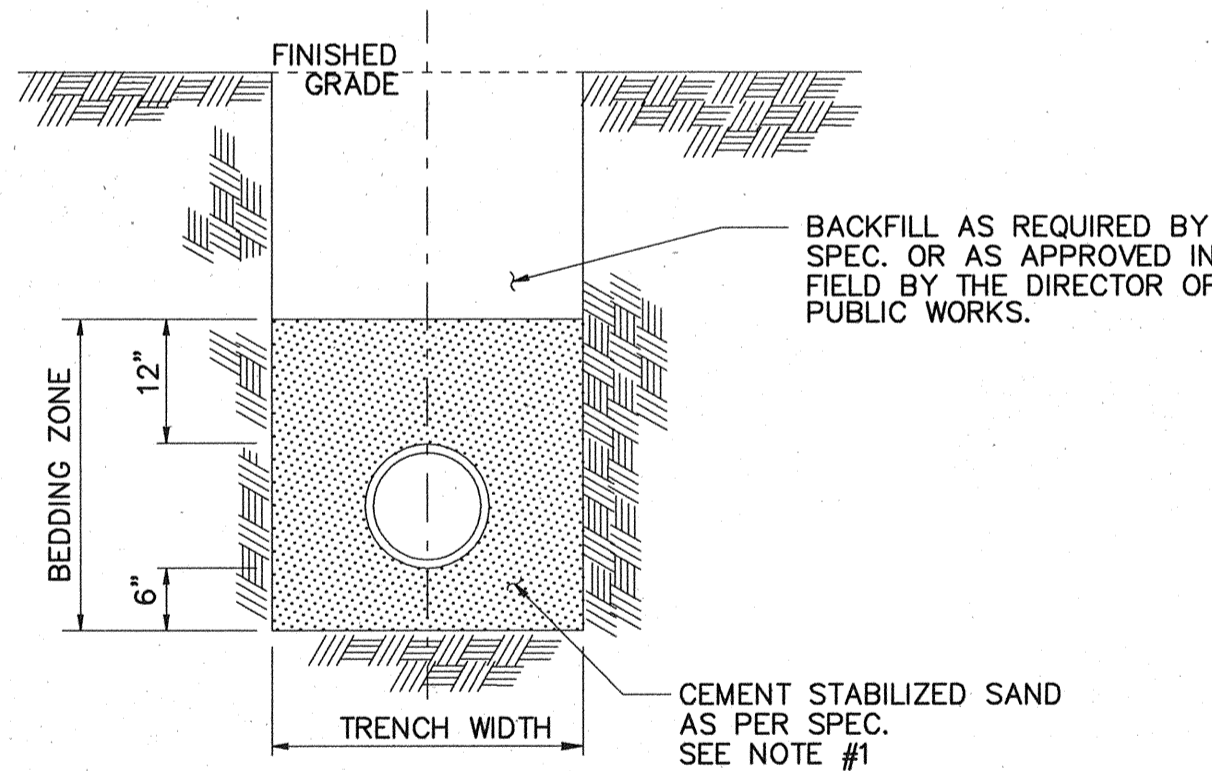


NOTE:  
THERE SHALL BE A MINIMUM OF 6" CLEARANCE  
FROM THE INSIDE WET WELL WALL TO ALL FLANGES.

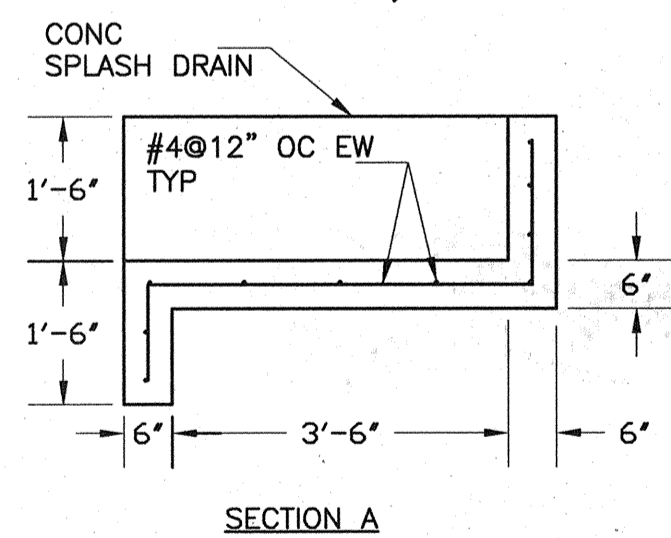
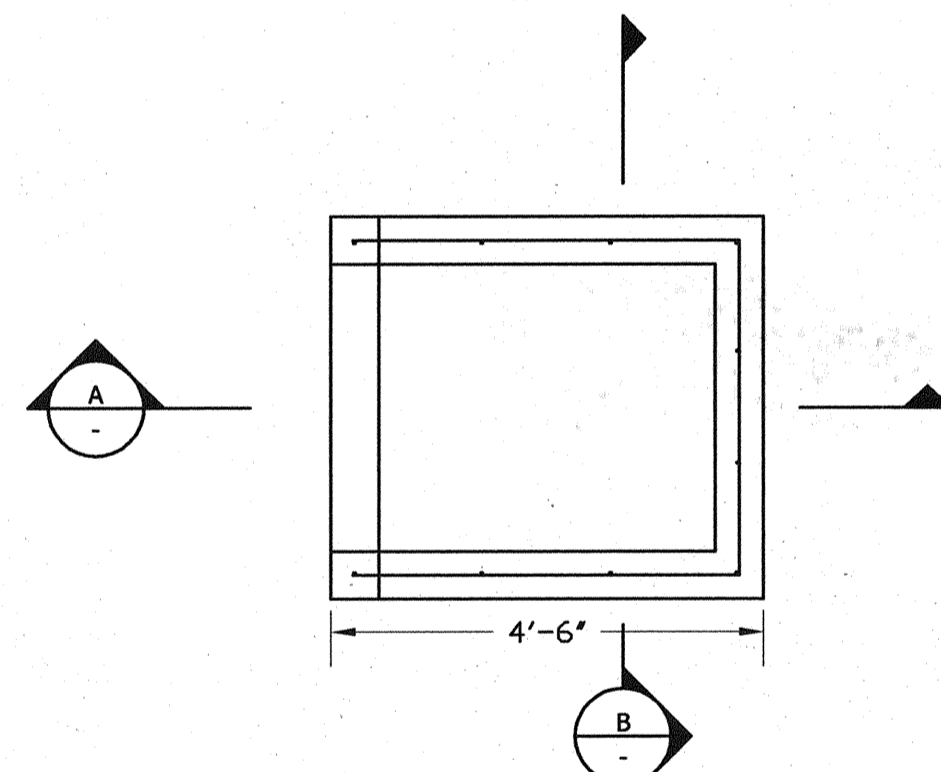


- NOTES:
1. WET WELL CAN BE INVERTED RCP OR FIBERGLASS MANHOLE. WET WELL MUST BE WATER TIGHT AND BE PROVIDED WITH ANTI-FLOTATION DEVICE. SHOP DRAWING INCLUDING ARRANGEMENTS OF ALL COMPONENTS MUST BE SUBMITTED TO ENGINEER FOR APPROVAL.
  2. CONDUIT OUTSIDE BASIN MUST BE FULLY SEALED. MEET N.E.C. AND LOCAL CODE REQUIREMENTS.
  3. ALL PIPING AND FITTINGS WITHIN WET WELL SHALL BE STAINLESS STEEL.
  4. HATCHES SHALL BE CONSTRUCTED ENTIRELY OF ALUMINUM OR STAINLESS STEEL AND DESIGNED FOR A MINIMUM OF 150 POUND PER SQUARE FOOT LOAD. THE UNDERSIDE OF THE HATCH SHALL HAVE THE FOLLOWING STENCILED IN RED PAINT: "WARNING! CONFINED SPACE ENTRY."
  5. VENT ASSEMBLY SHALL CONSIST OF SCHEDULE 40 PVC PIPE AND FITTINGS AND STEEL VENT WITH BRONZE SCREEN AND POWDER COAT FINISH. VENT ASSEMBLY SHALL BE DESIGNED FOR INSTALLATION THROUGH SUMP COVER.

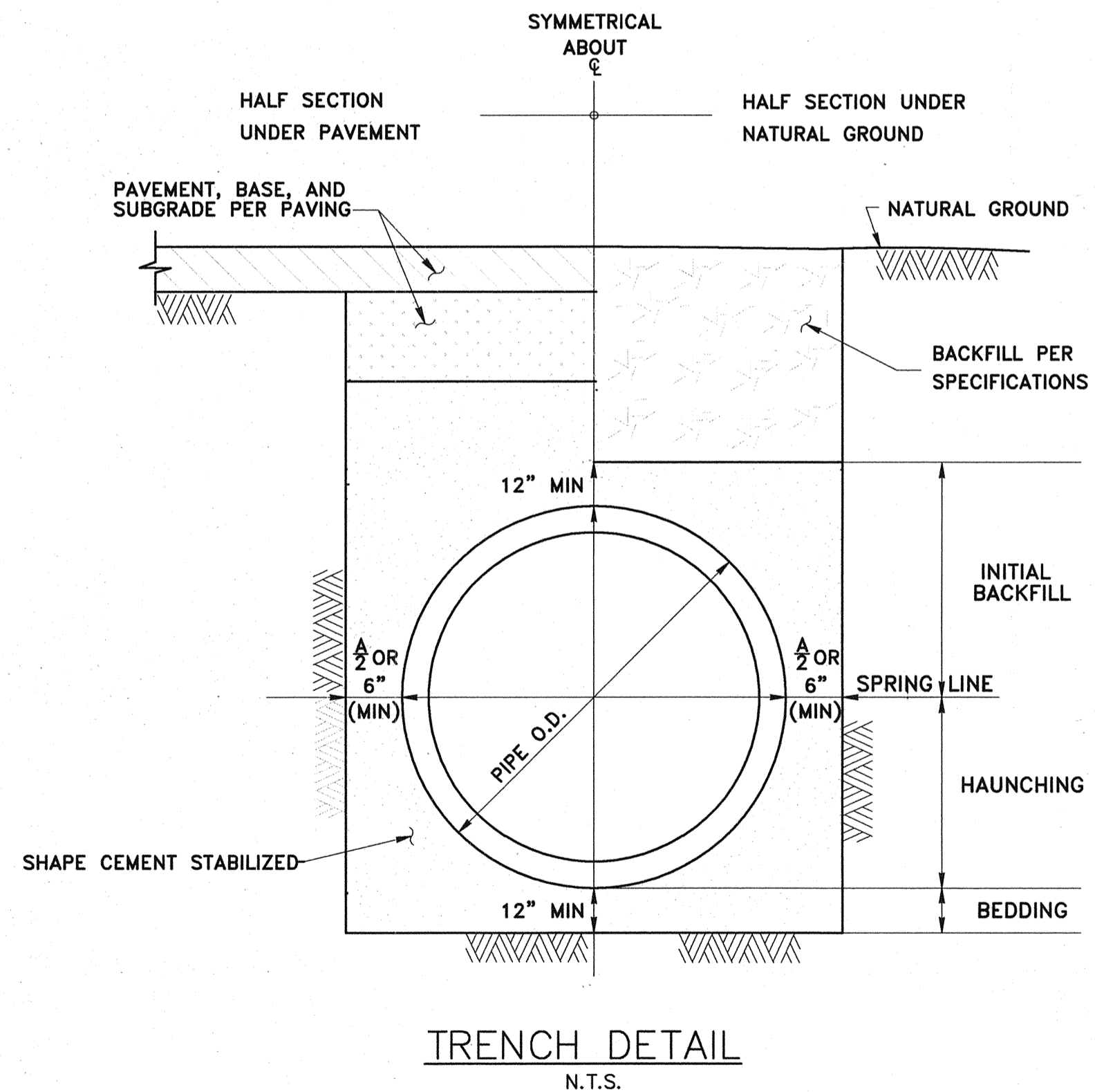
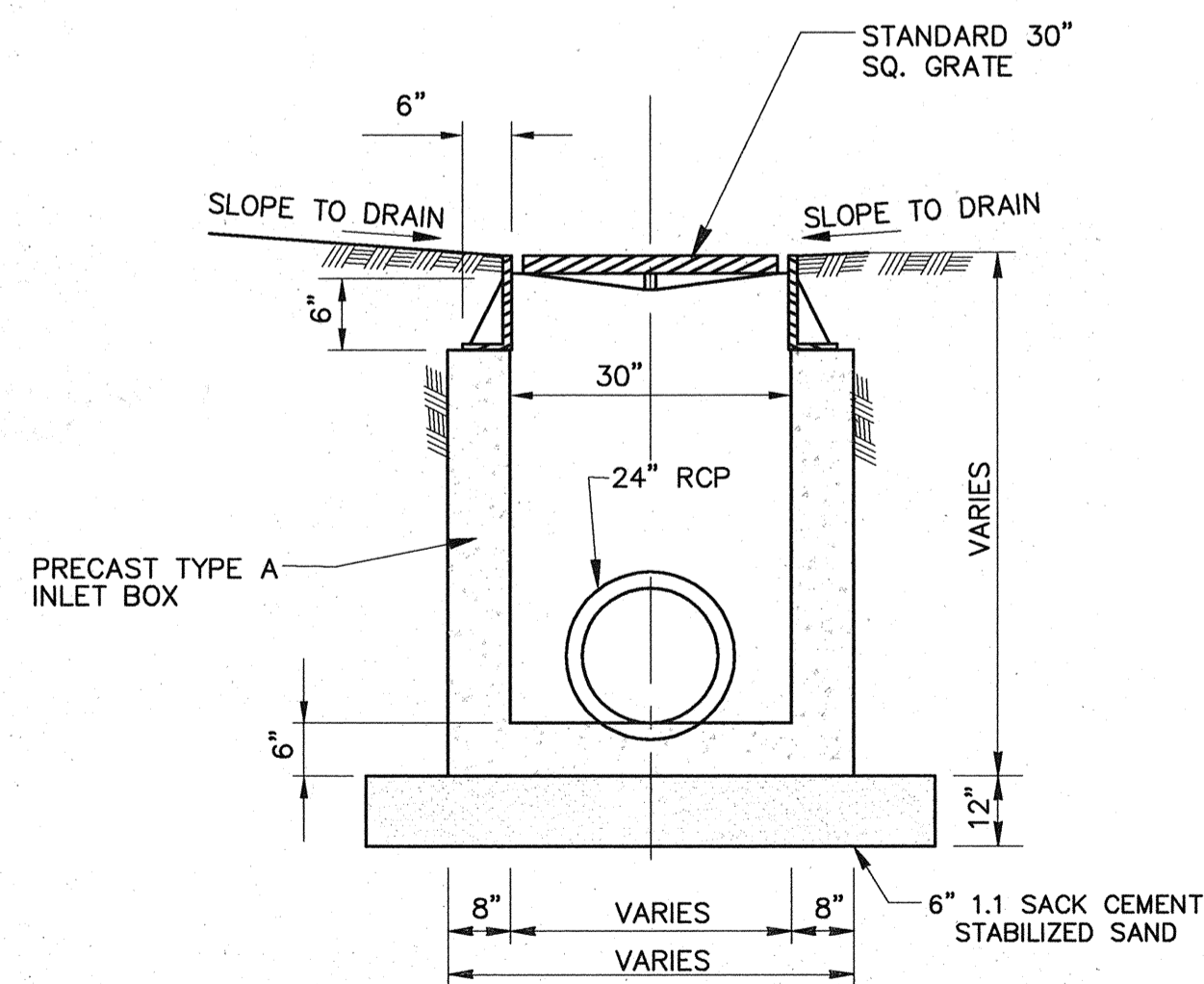
- NOTES:
1. EXCESS EXCAVATION SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND AT NO EXTRA COST TO THE CITY.
  2. TRENCH SAFETY SHALL BE INSTALLED IN ACCORDANCE WITH TRENCH SAFETY SPECIFICATION SECTION 01526.



SEWER SIZE	TRENCH WIDTH:
LESS THAN 30"	MINIMUM = PIPE O.D. + 12" MAXIMUM = PIPE O.D. + 18"
GREATER THAN 30"	MINIMUM = PIPE O.D. + 16" MAXIMUM = PIPE O.D. + 24"



SPLASH PAD DETAIL  
N.T.S.



- NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE CONDITIONS PER SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN OTHER CONDITIONS.
  2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS AN ALLOWANCE "A" FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
< 18"	18"
18" TO 30"	24"
OVER 30"	36"

3. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.

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TOMBALL, TEXAS

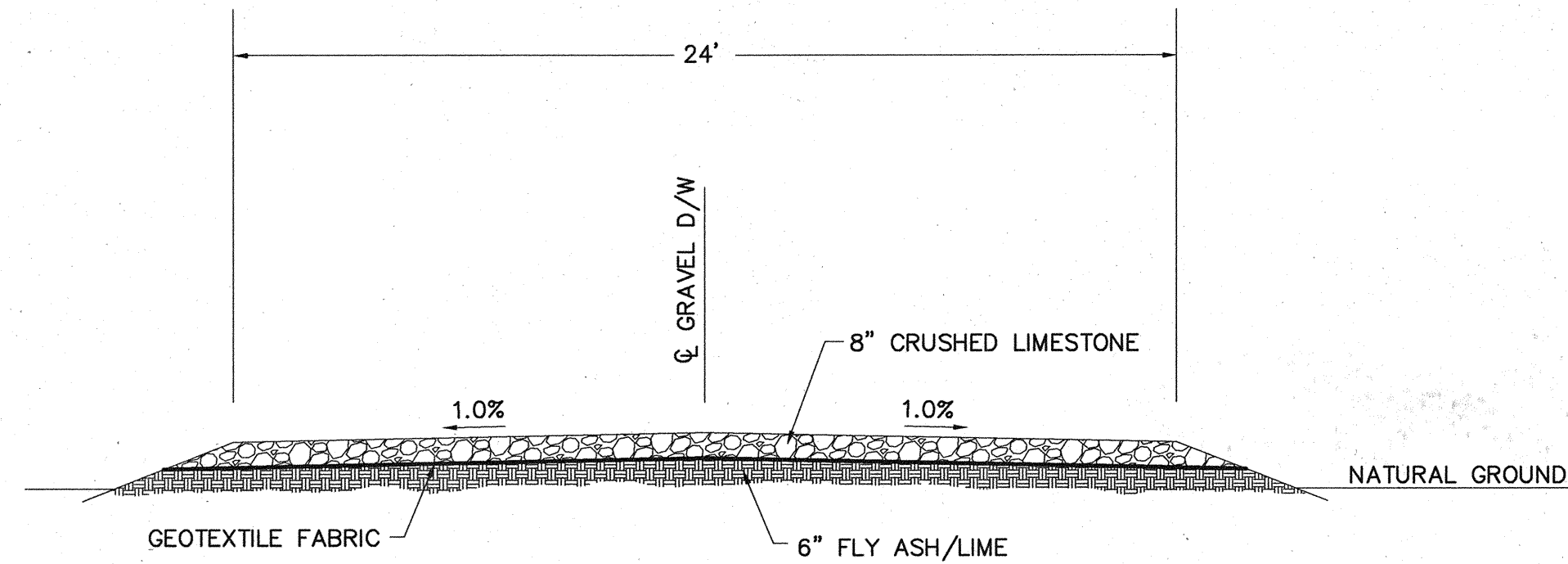
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**WATER SUPPLY & STORAGE FACILITY NO. 5**

**STORM SEWER & SANITARY SEWER DETAILS**

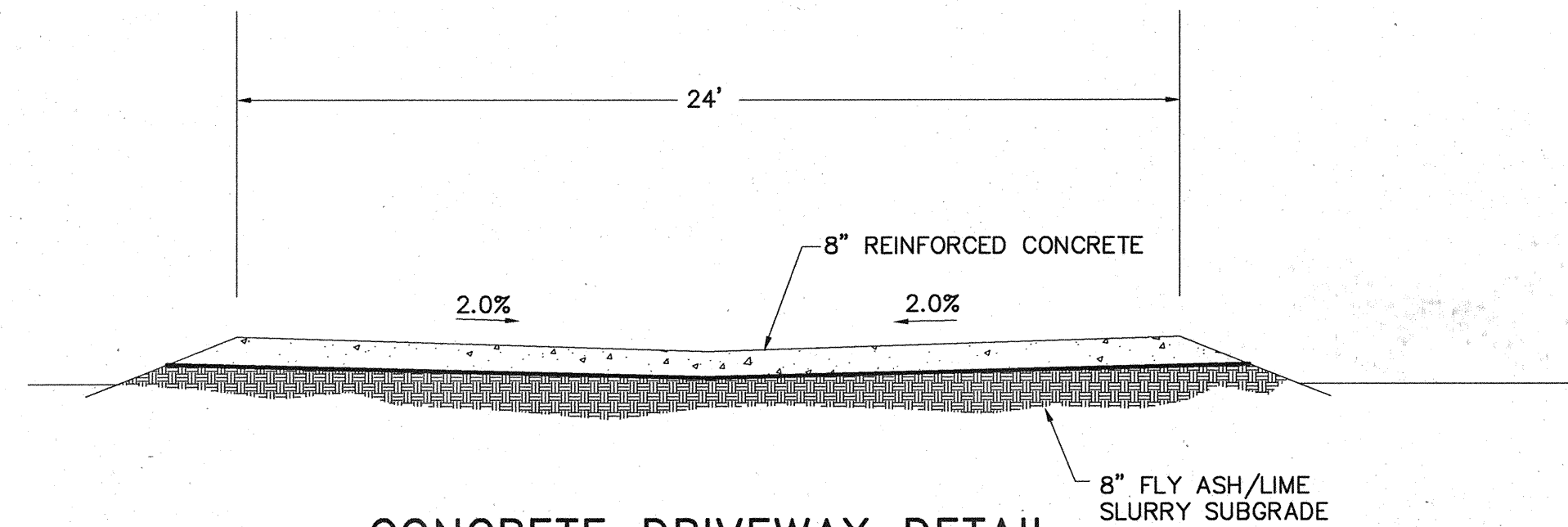
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SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: AWS
DATE: MARCH 2009	SHEET No.: 25 OF 35
SURVEY BY:	DWG. NO:
F B NO:	



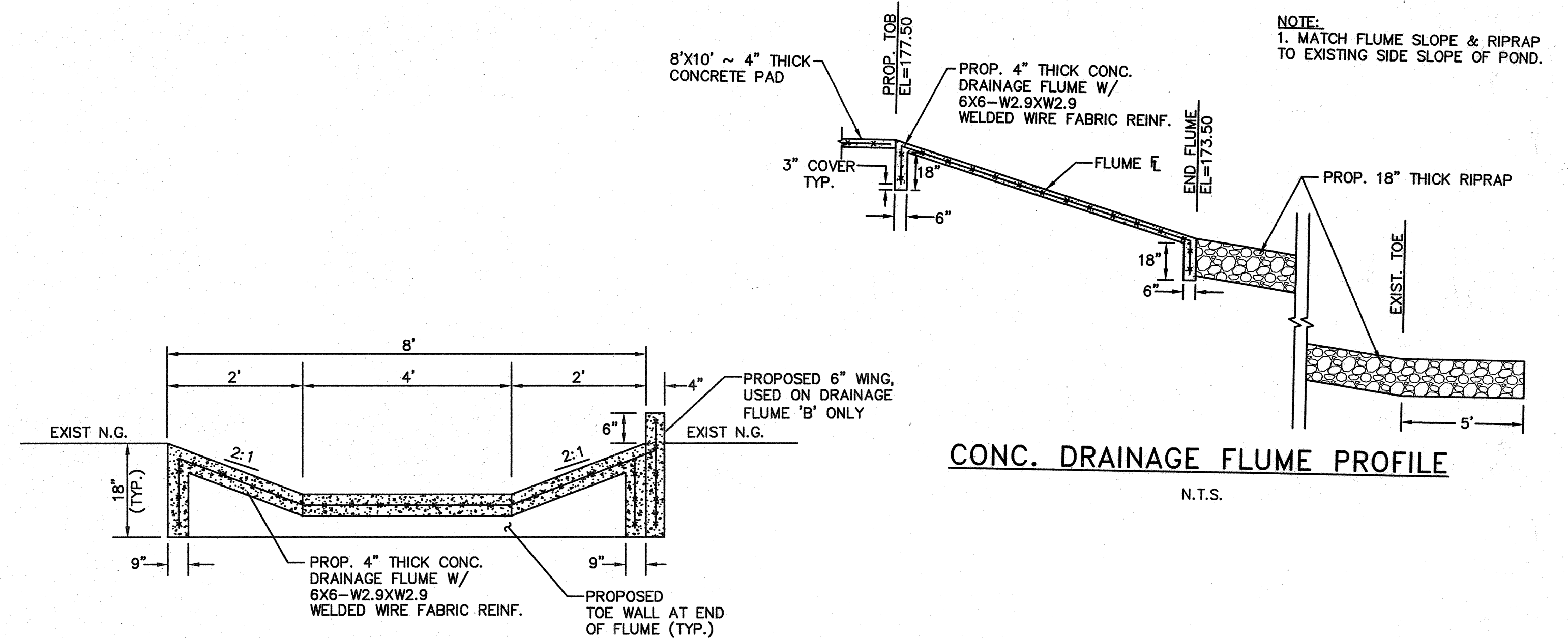
**GRAVEL ACCESS ROAD**

N.T.S.



**CONCRETE DRIVEWAY DETAIL**

N.T.S.

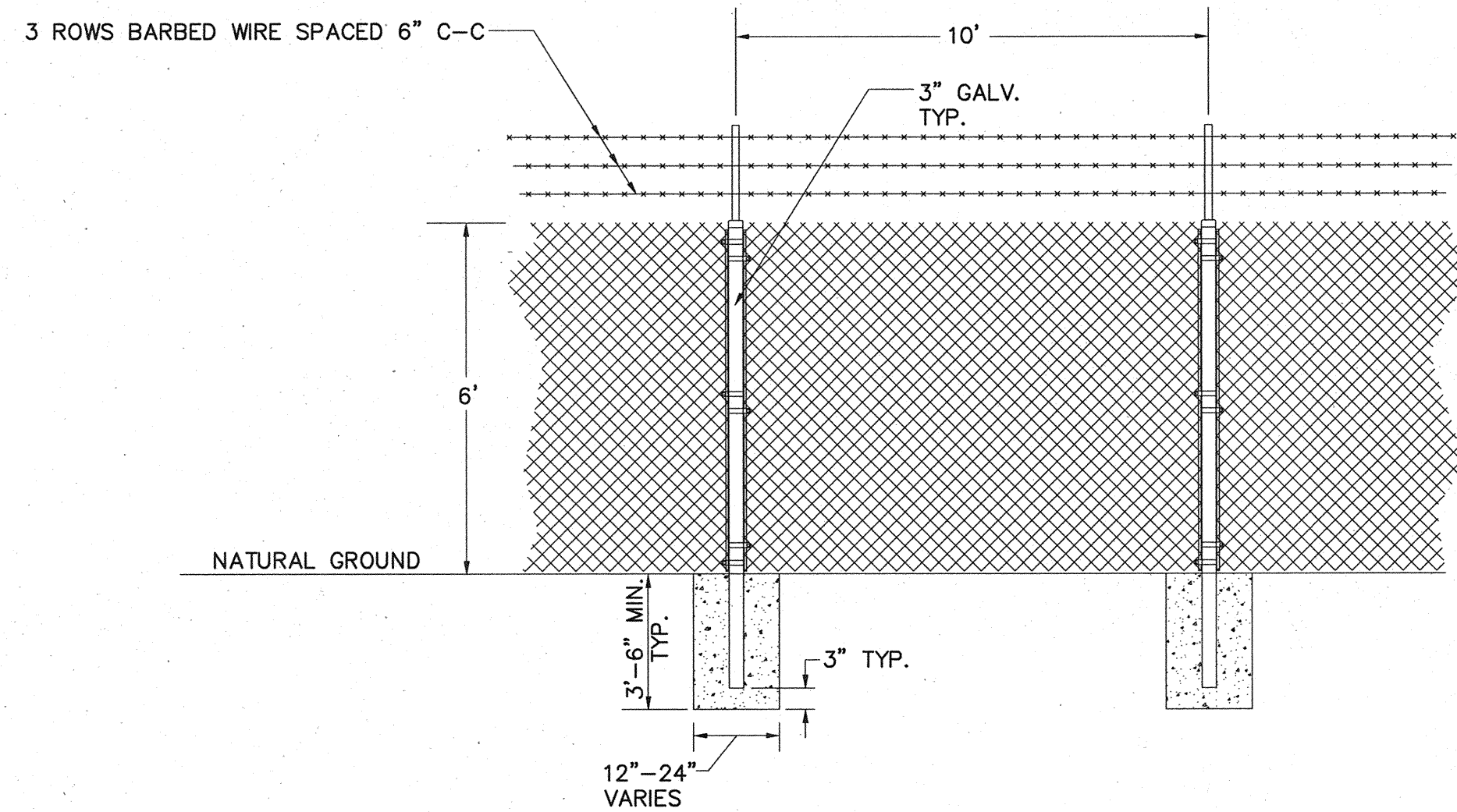


**CONC. DRAINAGE FLUME CROSS SECTION**

N.T.S.

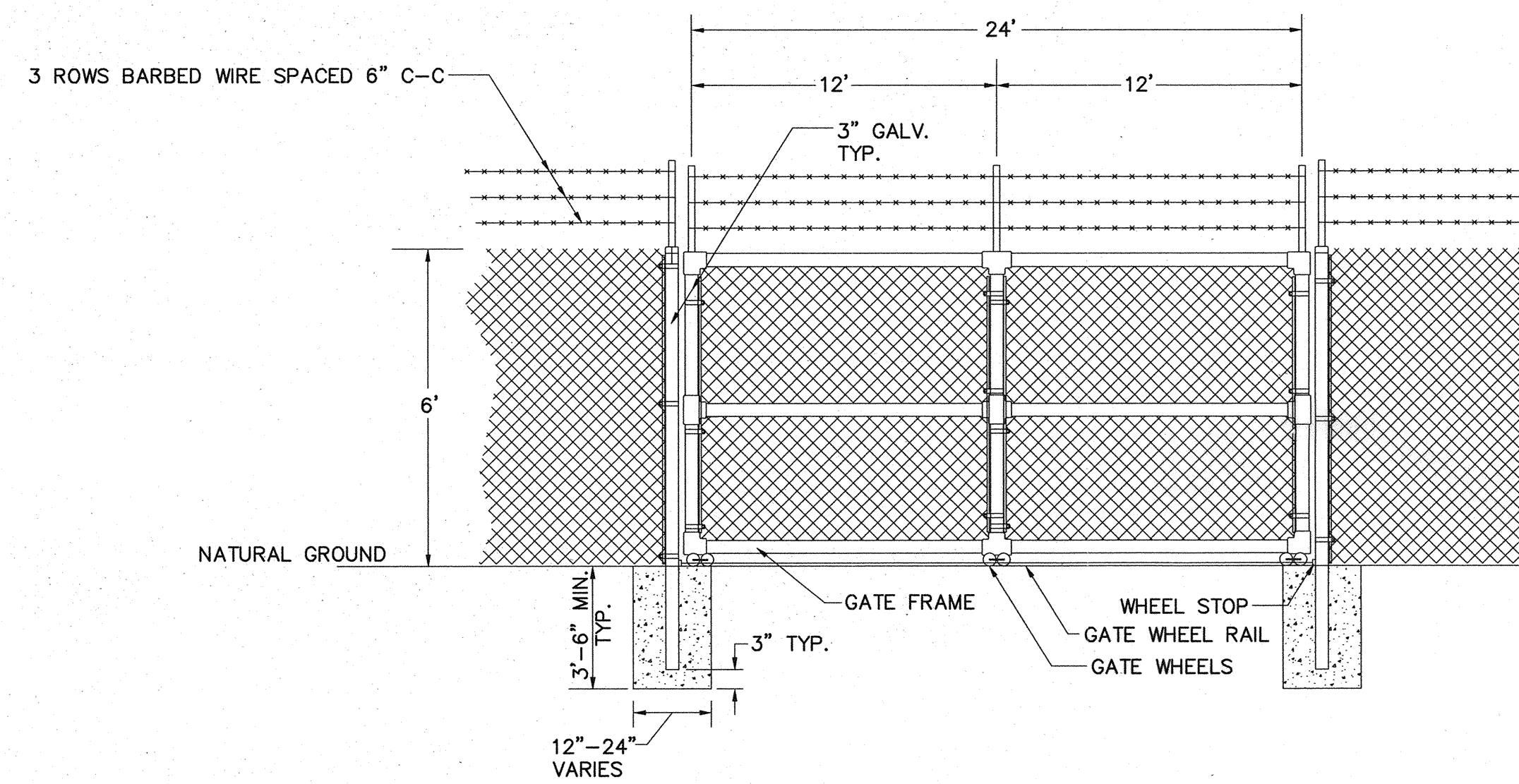
**CONC. DRAINAGE FLUME PROFILE**

N.T.S.



**CHAIN LINK FENCE DETAIL**

N.T.S.



**SLIDING FENCE DETAIL**

N.T.S.

*Amber R. Hurd* 3/13/09

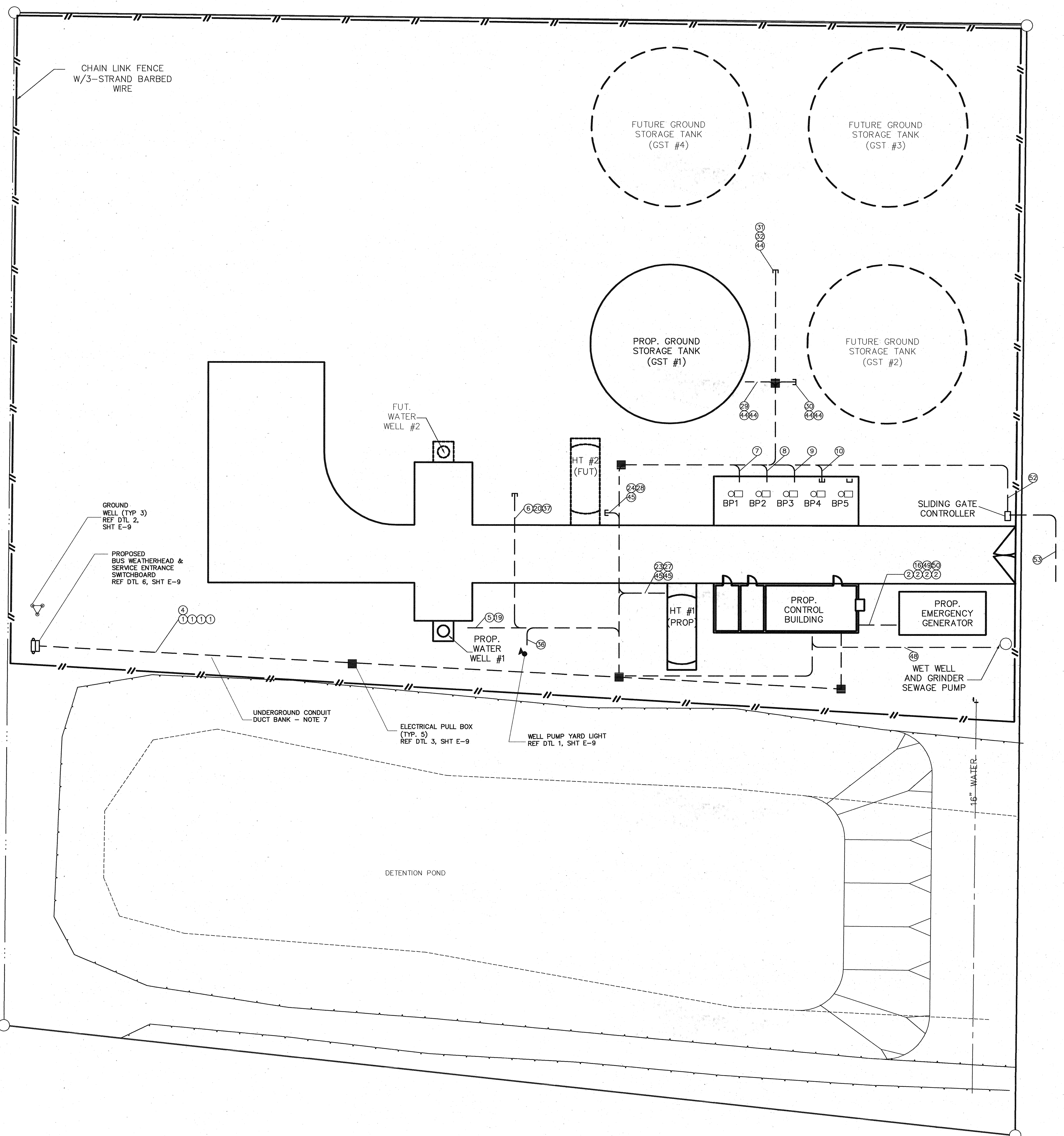
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**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 5**

**MISCELLANEOUS DETAIL**

SUBMITTED:	DESIGNED BY: ARH
SCALE: AS NOTED	DRAWN BY: TDB
DATE: MARCH 2009	SHEET No.: 26 OF 35
SURVEY BY:	DWG. NO:
F B NO:	

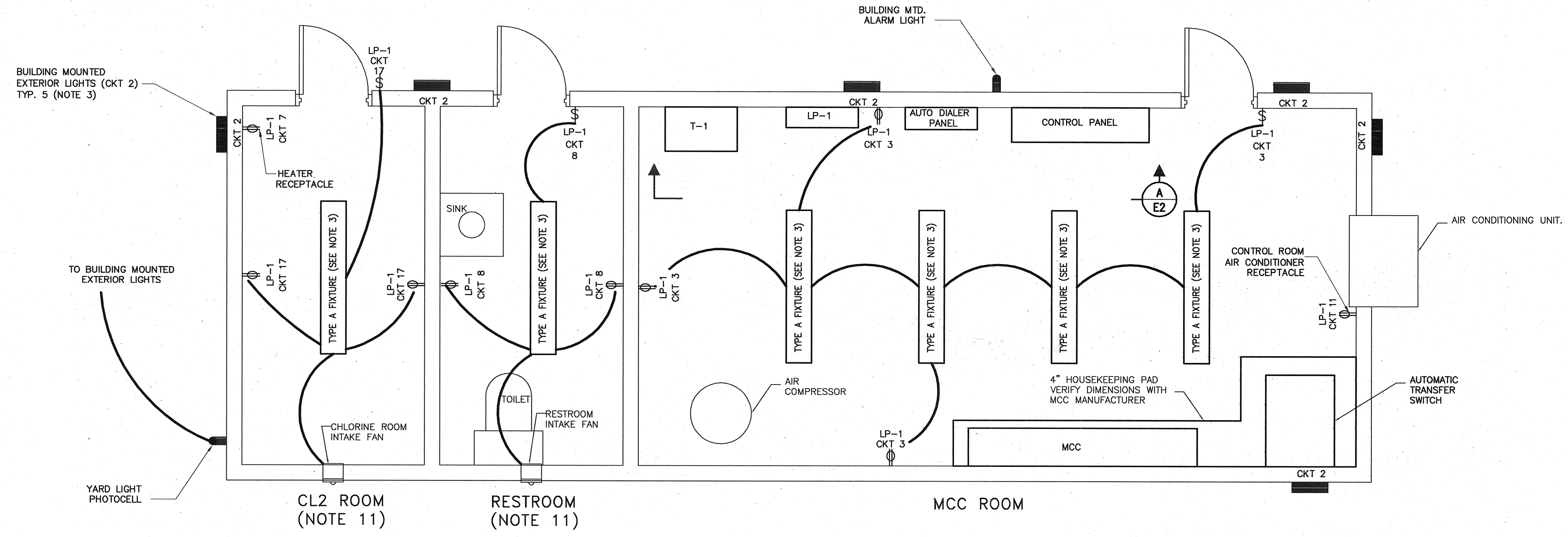


- NOTES**
- 1) IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE APPLICATIONS FOR ELECTRICAL AND TELEPHONE SERVICE, WITH THE OWNER.
  - 2) REFERENCE SHEET E-2 FOR THE BUILDING LIGHTING PLAN, BUILDING CONDUIT ROUTING PLAN, AND CONDUIT SCHEDULE.
  - 3) REFERENCE SHEET E-8 FOR YARD LIGHT FIXTURE SCHEDULE.
  - 4) ALL CHLORINE ROOM & UNDERGROUND CONDUIT TO BE SCHEDULE 80 PVC, AND ALL ABOVE GROUND CONDUIT TO BE RIGID GALVANIZED STEEL, PVC COATED IN CORROSIVE ENVIRONMENTS.
  - 5) NO PENETRATIONS SHALL BE PERMITTED THROUGH THE COMMON WALL BETWEEN THE CONTROL ROOM AND CHLORINE ROOMS.
  - 6) GST & HYDRO PRESSURE SENSING POLY TUBING CONDUIT SHALL BE HEAT TRACED AND INSULATED, EVERYWHERE IT EXTENDS ABOVE GROUND. PROVIDE OUTDOOR GFCI RECEPTACLE AT EACH LOCATION.
  - 7) REFERENCE SHEET E-9, DETAILS 4 & 5, FOR UNDERGROUND DUCTBANK DETAILS.
  - 8) REFERENCE CIVIL & MECHANICAL SHEETS FOR ALL DIMENSIONS, PIPING CONFIGURATION, AND SITE DETAILS.
  - 9) CONDUIT FOR FUTURE USE SHALL BE STUBBED-OUT AND MARKED WITH PERMANENT CONDUIT MARKERS. FUTURE PROJECTS SHALL EXTEND CONDUIT RUNS FROM THE PROPOSED TERMINATION POINTS TO THE FUTURE POINTS.
  - 10) PULL BOXES, WHEN LOCATED IN A DRIVEWAY, MUST BE CAPABLE OF WITHSTANDING VEHICULAR TRAFFIC, WITHOUT DAMAGE.
  - 11) REFERENCE CIVIL SHEETS AND BID SHEET FOR ALTERNATE BID ITEM DESCRIPTION OF THE CHLORINE ROOM, RESTROOM, & POSSIBLE FLUORIDE & POLYPHOSPHATE ROOMS.

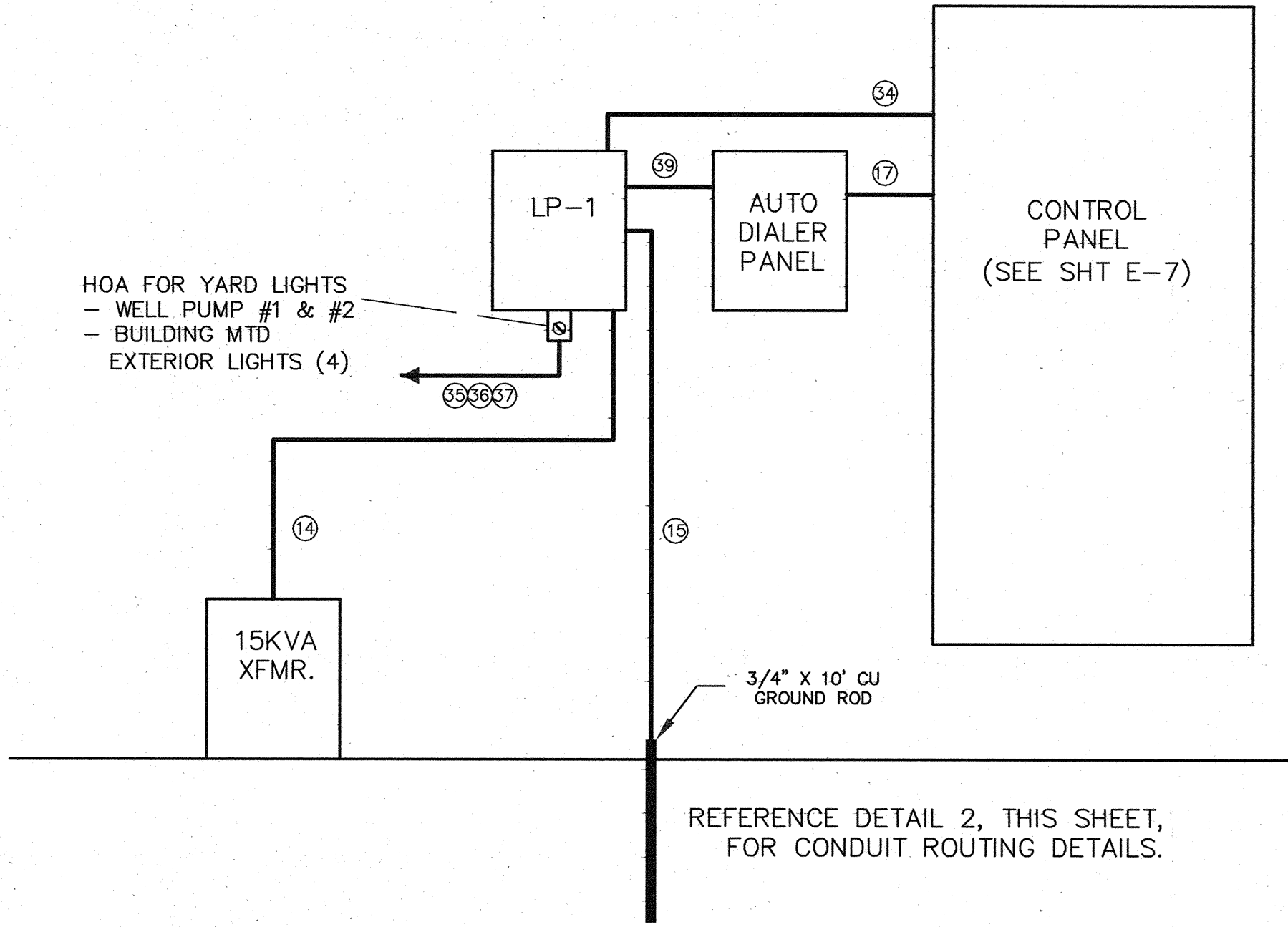
**CONDUIT SCHEDULE**

- 1 4"C - UTILITY SERVICE CONDUIT TO A.T.S. (4 REQUIRED)
- 2 4"C - GEN SET SERVICE CONDUIT TO A.T.S. (4 REQUIRED)
- 3 4"C - SERVICE CONDUIT FROM A.T.S. TO MCC (4 REQUIRED)
- 4 1"C - TELEPHONE SERVICE TO AUTO DIALER PANEL
- 5 4"C - WELL PUMP #1 POWER
- 6 2"EC - FUTURE WELL PUMP #2 POWER
- 7 2"C - BOOSTER PUMP #1 POWER & STRIP HEATER
- 8 2"C - BOOSTER PUMP #2 POWER & STRIP HEATER
- 9 2"C - BOOSTER PUMP #3 POWER & STRIP HEATER
- 10 2"EC - FUTURE BOOSTER PUMP #4 POWER & STRIP HEATER
- 11 2"EC - FUTURE BOOSTER PUMP #5 POWER & STRIP HEATER
- 12 3/4"C - AIR COMPRESSOR POWER
- 13 1"C - 15KVA SINGLE PHASE TRANSFORMER FEEDER (LOCATED IN CONTROL ROOM)
- 14 1-1/4"C - 15KVA TRANSFORMER TO PANELBOARD
- 15 1/2"C - PANELBOARD GND BAR TO GROUNDING SYSTEM
- 16 1"C - 15KVA SINGLE PHASE TRANSFORMER FEEDER (GEN SET ENCLOSURE ELECTRICAL PKG FEEDER)
- 17 1-1/2"C - INTERCONNECT WIRING - CONTROL PNL TO AUTO DIALER PANEL
- 18 2" C - INTERCONNECT WIRING - CONTROL PNL TO 480V MCC (MS's & AUX's)
- 19 3/4"C - FIELD WIRING - CONTROL PNL TO WELL PUMP #1 INSTRUMENTATION
- 20 3/4"EC - FIELD WIRING - CONTROL PNL TO FUTURE WELL PUMP #2 INSTRUMENTATION
- 21 3/4"C - FIELD WIRING - CONTROL PNL TO CHLORINE GAS DETECTOR ALARM CONTACT
- 22 3/4"C - FIELD WIRING - CONTROL PNL TO CHLORINE FEED SOLENOIDS - WP #1 & #2
- 23 3/4"C - FIELD WIRING - CONTROL PNL TO HYDRO No. 1 LEVEL PROBE & ADD AIR SOV
- 24 3/4"C - FIELD WIRING - CONTROL PNL TO HYDRO No. 2 LEVEL PROBE & ADD AIR SOV
- 25 1/2"C - FIELD WIRING - CONTROL PNL TO EXTERIOR ALARM BEACON
- 26 3/4"C - CONTROL PNL TO AIR COMPRESSOR TANK MTD. PRESSURE SWITCH
- 27 1"C - POLY TUBING TO HYDRO #1 PRESSURE TAP
- 28 1"C - POLY TUBING TO HYDRO #2 PRESSURE TAP
- 29 1"C - POLY TUBING TO GST NO. 1 PRESSURE TAP
- 30 1"EC - POLY TUBING TO FUTURE GST NO. 2 PRESSURE TAP
- 31 1"EC - POLY TUBING TO FUTURE GST NO. 3 PRESSURE TAP
- 32 1"EC - POLY TUBING TO FUTURE GST NO. 4 PRESSURE TAP
- 33 1/2"C - PHASE FAILURE SENSING LEADS (CONTROL PANEL TO 480V MCC MAIN LUGS - 480V-3PH)
- 34 1/2"C - AC POWER TO CONTROL PNL (CKT 1)
- 35 3/4"C - AC PWR TO BUILDING MTD EXTERIOR LIGHTS (CKT2, FROM PANELBOARD MTD HOA)
- 36 3/4"C - AC POWER TO WELL PUMP #1 YARD LIGHT (CKT 2, FROM PANELBOARD MTD HOA)
- 37 3/4"EC - AC POWER TO FUTURE WELL PUMP #2 YARD LIGHT (CKT 2, FROM PANELBOARD MTD HOA)
- 38 1/2"C - AC POWER TO CONTROL RM INTERIOR LIGHTS & RECEPTACLES (CKT 3)
- 39 1/2"C - AC POWER TO AUTO DIALER PNL (CKT 4)
- 40 1/2"C - AC POWER TO CHLORINE DETECTOR (CKT 5)
- 41 1/2"C - AC POWER TO STRIP HEATERS - 480V MCC & B-PUMPS (CKT 6)
- 42 1/2"C - AC PWR TO CHLORINATION ROOM HEATER RECEPTACLE (CKT 7)
- 43 1/2"C - AC POWER TO RESTROOM INTERIOR LIGHTS & RECEPTACLES (CKT 8)
- 44 3/4"C - AC POWER TO GST HEAT TRACE RECEPTACLES (CKT 10)
- 45 3/4"C - AC POWER TO HYDRO HEAT TRACE RECEPTACLES (CKT 10)
- 46 3/4"C - AC POWER TO CONTROL ROOM AC UNIT (CKT 11)
- 47 1/2"C - AC POWER TO CHLORINATION ROOM LIGHTS, RECEPTACLES, & VENT FANS (CKT 17)
- 48 T.B.D. - RESTROOM LIFT STATION FEEDER (CKT 22/24) - SEE NOTE 12, SHT E-3
- 49 3/4"C - GEN SET AUTO START SIGNAL - A.T.S. TO GEN SET CONTROL PANEL
- 50 3/4"C - GEN SET RUNNING/ALARM/SHUTDOWN CONTACTS - GEN SET CONTROL PANEL TO A.T.S.
- 51 1"C - GEN SET & A.T.S. AUTO DIALER INPUTS - FROM A.T.S. TO AUTO DIALER PANEL ("A.T.S. IN EMERGENCY POS.", "GEN SET RUNNING", & "GEN SET ALARM/SHUTDOWN")
- 52 1"C - AC POWER TO SLIDING GATE OPERATOR (CKT 14)
- 53 1"C - SLIDING GATE OPERATOR TO KEYPAD/CARD READER

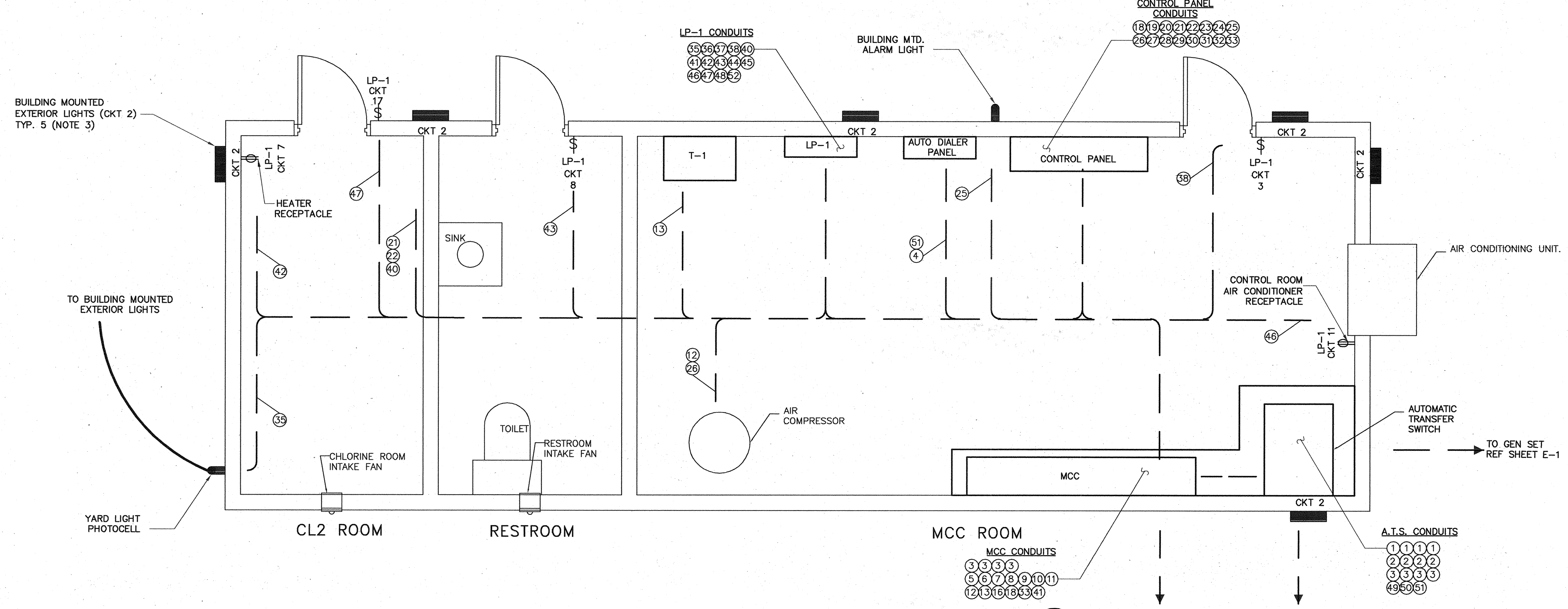
Alteration of a sealed document without proper notification to the responsible Engineer is an offense under the Texas Engineering Practice Act.		DWG NO. E-1
<b>Coastal Bend Consultants, Inc.</b> Electrical Engineering Control Engineering Project Management 11811 110 East, Suite 535 Houston, Tx. 77029 Phone: 713-455-5792, Fax: 713-455-5793 TBPE Firm Reg. No. F-1069		
13430 NORTHWEST FWY. SUITE 1100 HOUSTON, TEXAS 77040 (713) 462-3242 JOB NO. 0512015-00		
<b>CITY OF TOMBALL</b> TOMBALL, TEXAS		
<b>WATER SUPPLY &amp; STORAGE FACILITY NO. 3</b>		
<b>ELECTRICAL SITE PLAN</b>		
SUBMITTED:	DESIGNED BY: GWW	
SCALE: N.T.S.	DRAWN BY: GWW	
DATE: OCTOBER 2008	SHEET No.: 17 OF 36	
SURVEY BY:	DWG. NO:	
F B NO:		



**CONTROL AND CHLORINE BUILDING EQUIPMENT LAYOUT & LIGHTING PLAN** 1  
N.T.S.



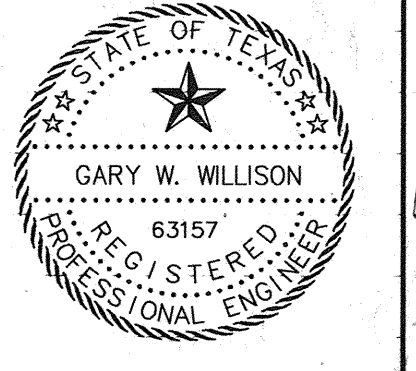
**PANEL INTERCONNECT CONDUIT ELEVATION** A  
N.T.S.



**CONTROL AND CHLORINE BUILDING CONDUIT ROUTING PLAN** 2  
N.T.S.

**NOTES**  
REFERENCE SHEET E-1 FOR ELECTRICAL SITE PLAN AND NOTES.

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*Gary W. Willison*  
03/09/09

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TBPE Firm Reg. No. F-1069

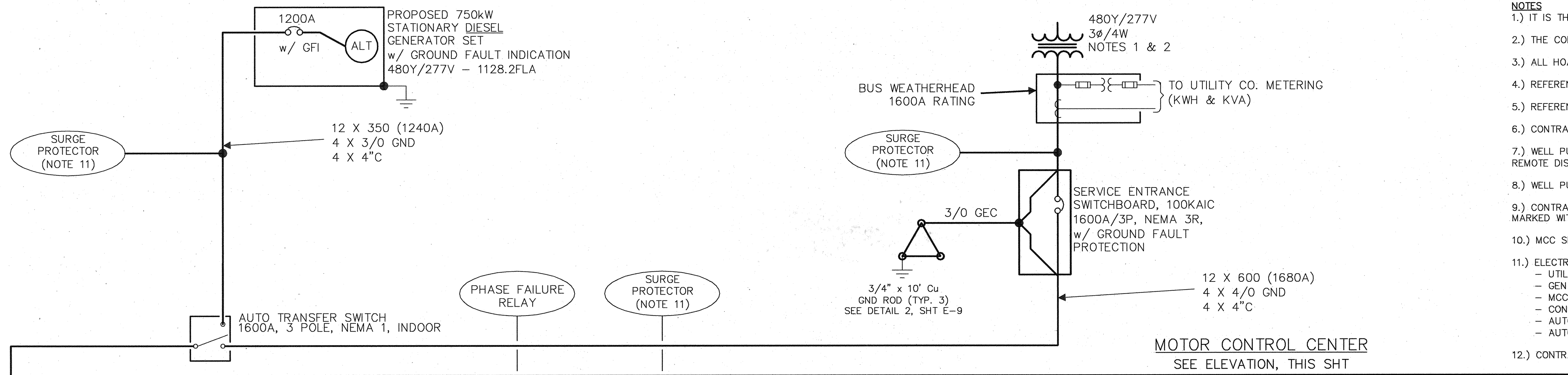
**Cobb Pendley Associates**  
13430 NORTHWEST FWY.  
SUITE 1100  
HOUSTON, TEXAS 77040  
(713) 462-3242

JOB NO. 0512015-00  
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 3**

**ELECTRICAL CONTROL BUILDING LIGHTING & CONDUIT ROUTING PLAN**

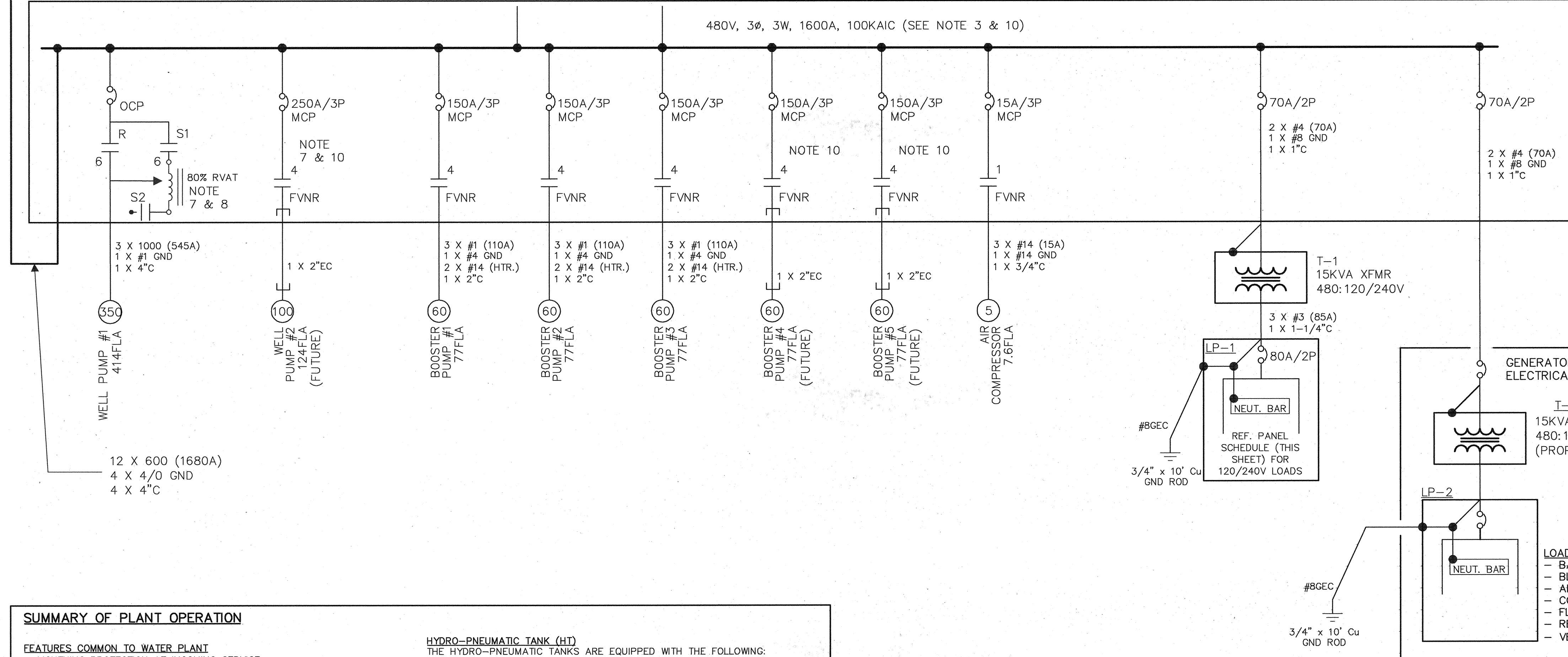
SUBMITTED:	DESIGNED BY: GWW
SCALE: N.T.S.	DRAWN BY: GWW
DATE: OCTOBER 2008	SHEET No.: 18 OF 35
SURVEY BY:	DWG. NO:
F B NO:	



- NOTES**
- 1.) IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE APPLICATIONS FOR ELECTRICAL SERVICE AND TELEPHONE SERVICE, WITH THE OWNER.
  - 2.) THE CONTRACTOR MUST CONFIRM AVAILABLE FAULT CURRENT WITH THE UTILITY COMPANY, AND ADJUST EQUIPMENT RATINGS ACCORDINGLY.
  - 3.) ALL HOA'S, ELAPSED TIME METERS, AND PILOT LIGHTS ARE LOCATED ON THE CONTROL PANEL. REFERENCE SHEET E-7 FOR CONTROL PANEL LAYOUT.
  - 4.) REFERENCE SHEETS E-4, E-5, & E-6 FOR CONTROL SCHEMATICS.
  - 5.) REFERENCE SHEET E-8 FOR 120/240V SCHEMATICS.
  - 6.) CONTRACTOR TO CONFIRM BRANCH CIRCUIT REQUIRED FOR WALL MOUNTED AIR CONDITIONING UNIT.
  - 7.) WELL PUMP No. 1 & WELL PUMP No. 2 (FUTURE) ARE TO BE EQUIPPED WITH MOTOR MANAGEMENT RELAYS (DIVERSIFIED ELECTRONICS MPA-1000 w/ MGR-1000 REMOTE DISPLAY).
  - 8.) WELL PUMP No. 1 IS TO BE EQUIPPED WITH A REDUCED VOLTAGE, 80% TAP AUTOTRANSFORMER TYPE, MOTOR STARTER.
  - 9.) CONTRACTOR SHALL INSTALL CONDUIT FOR ALL PROPOSED AND FUTURE LOADS. FUTURE CONDUITS SHALL BE STUBBED-OUT AS SHOWN ON THE SITE PLAN AND MARKED WITH PERMANENT CONDUIT MARKERS. FUTURE PROJECT PHASES WILL EXTEND THE CONDUITS AND INSTALL THE MOTOR CONDUCTORS.
  - 10.) MCC SPACE IS TO BE PROVIDED FOR ALL FUTURE LOADS. FUTURE PROJECTS WILL ADD THE REQUIRED MOTOR CONTROL COMPONENTS.
  - 11.) ELECTRICAL CONTRACTOR SHALL INSTALL THE FOLLOWING SURGE PROTECTION DEVICES AT THE SPECIFIED LOCATIONS.
    - UTILITY SERVICE ENTRANCE (480Y/277V-3Ø-4W), PHOENIX CONTACT COMBOTRAB w/ NEMA 4X-SS ENCLOSURE & INDICATING LIGHTS.
    - GEN SET SERVICE ENTRANCE (480Y/277V-3Ø-4W), PHOENIX CONTACT COMBOTRAB w/ NEMA 4X-SS ENCLOSURE & INDICATING LIGHTS.
    - MCC MAIN LUGS (480V-3Ø-3W), PHOENIX CONTACT VALVETRAB
    - CONTROL PANEL AC PWR INPUT (120V-1Ø), PHOENIX CONTACT PLUGTRAB
    - AUTO DIALER AC PWR INPUT (120V-1Ø), PHOENIX CONTACT PLUGTRAB
    - AUTO DIALER TELEPHONE LINE (ANALOG), PHOENIX CONTACT TELETRAB
  - 12.) CONTRACTOR SHALL COORDINATE SIZE OF RESTROOM LIFT STATION FEEDER WITH LIFT STATION SUPPLIER.

**ELECTRICAL LOAD ANALYSIS - ULTIMATE**

DESCRIPTION	HP	AMPS	VOLTAGE	PHASE	VA	
					PHASE	NEUTRAL
WELL PUMP #1	350	414	480	3	344,193.1	0.0
WELL PUMP #2 (FUTURE)	100	124	480	3	103,091.7	0.0
BOOSTER PUMP #1	60	77	480	3	64,016.6	0.0
BOOSTER PUMP #2	60	77	480	3	64,016.6	0.0
BOOSTER PUMP #3	60	77	480	3	64,016.6	0.0
BOOSTER PUMP #4 (FUTURE)	60	77	480	3	64,016.6	0.0
BOOSTER PUMP #5 (FUTURE)	60	77	480	3	64,016.6	0.0
AIR COMPRESSOR	5	7.6	480	3	6,318.5	0.0
1Ø XFMR, 15KVA, IN ELECTRICAL ROOM		31.3	480	1	32,527.9	0.0
1Ø XFMR, 15KVA, GEN SET		31.3	480	1	32,527.9	0.0
25% LARGEST MOTOR		103.5	480	3	86,048.3	0.0
<b>TOTAL VA:</b>					<b>924,790.4</b>	<b>0.0</b>
<b>TOTAL kVA:</b>					<b>924.8</b>	<b>0.0</b>
<b>TOTAL AMPS @ 480Y/277V-3Ø-4W:</b>					<b>1,112.4</b>	<b>0.0</b>
<b>PROPOSED SERVICE RATING:</b>					<b>1600 AMPS</b>	



**SUMMARY OF PLANT OPERATION**

**FEATURES COMMON TO WATER PLANT**

- LIGHTNING PROTECTION AT INCOMING SERVICE
- PHASE FAILURE ALARM
- ALARM TEST
- ALARM SILENCE
- ALARM RESET
- PANEL MOUNTED ALARM HORN
- BUILDING MOUNTED ALARM BEACON
- POWER FAILURE TIMERS ON ALL MOTORS
- CHLORINE DETECTION ALARM

**GROUND STORAGE TANK (GST)**

THE GROUND STORAGE TANK IS EQUIPPED WITH THE FOLLOWING:

- HIGH LEVEL ALARM (LOCKS OUT WELL PUMP)
- LOW LEVEL ALARM
- LOW LEVEL CUTOFF ALARM (LOCKS OUT BOOSTER PUMPS)
- WELL PUMP CALL PILOT LIGHTS

THE WELL PUMPS ARE EQUIPPED WITH THE FOLLOWING:

- H/O/A
- ELAPSED TIME METER IN HOURS
- RUN COMMAND PILOT LIGHT
- RUNNING PILOT LIGHT
- NO FLOW ALARM (FSL-GST) - MANUAL RESET
- HIGH DISCHARGE PRESSURE ALARM (PSH-GST) - MANUAL RESET
- MOTOR MANAGEMENT RELAY (SEE NOTE 7)

ON GST RISING LEVEL:

- LOW LEVEL CUTOFF PRESSURE SWITCH MAKES (PSL-GST)
- LOW LEVEL ALARM PRESSURE SWITCH MAKES (PSL-GST)
- LAG WELL PUMP CALL PRESSURE SWITCH BREAKS (PS-LAG)
- LEAD WELL PUMP CALL PRESSURE SWITCH BREAKS (PS-LEAD)
- HIGH LEVEL ALARM PRESSURE SWITCH BREAKS (PSH-GST)

ON GST FALLING LEVEL:

- HIGH LEVEL ALARM PRESSURE SWITCH MAKES (PSH-GST)
- LEAD WELL PUMP CALL PRESSURE SWITCH MAKES (PS-LEAD)
- LAG WELL PUMP CALL PRESSURE SWITCH MAKES (PS-LAG)
- LOW LEVEL ALARM PRESSURE SWITCH BREAKS (PSL-GST)
- LOW LEVEL CUTOFF PRESSURE SWITCH BREAKS (PSL-GST)

**HYDRO-PNEUMATIC TANK (HT)**

THE HYDRO-PNEUMATIC TANKS ARE EQUIPPED WITH THE FOLLOWING:

- LEAD BOOSTER PUMPS (BP #1 & BP#2), WITH ALTERNATION
- LAG BOOSTER PUMPS (BP#3 THRU BP#5), WITH ALTERNATION
- HIGH PRESSURE ALARM (LOCKS OUT BOOSTER PUMPS & ADD AIR SOV's)
- LOW PRESSURE ALARM
- LEVEL CONTROL SELECTOR SWITCH: HYDRO #1/HYDRO #2/HYDRO #1 & #2 (EACH HYDRO IS EQUIPPED WITH A LEVEL PROBE RELAY & ADD AIR SOV)
- LEAD B-PUMP #1 CALL PILOT LIGHT
- LEAD B-PUMP #2 CALL PILOT LIGHT
- LAG B-PUMP #1 CALL PILOT LIGHT
- LAG B-PUMP #2 CALL PILOT LIGHT
- LAG B-PUMP #3 CALL PILOT LIGHT

THE AIR COMPRESSOR AND ALL B-PUMPS ARE EQUIPPED WITH THE FOLLOWING:

- H/O/A
- ELAPSED TIME METER IN HOURS
- RUN COMMAND PILOT LIGHT
- RUNNING PILOT LIGHT

THE ADD AIR SOV's ARE EQUIPPED WITH THE FOLLOWING:

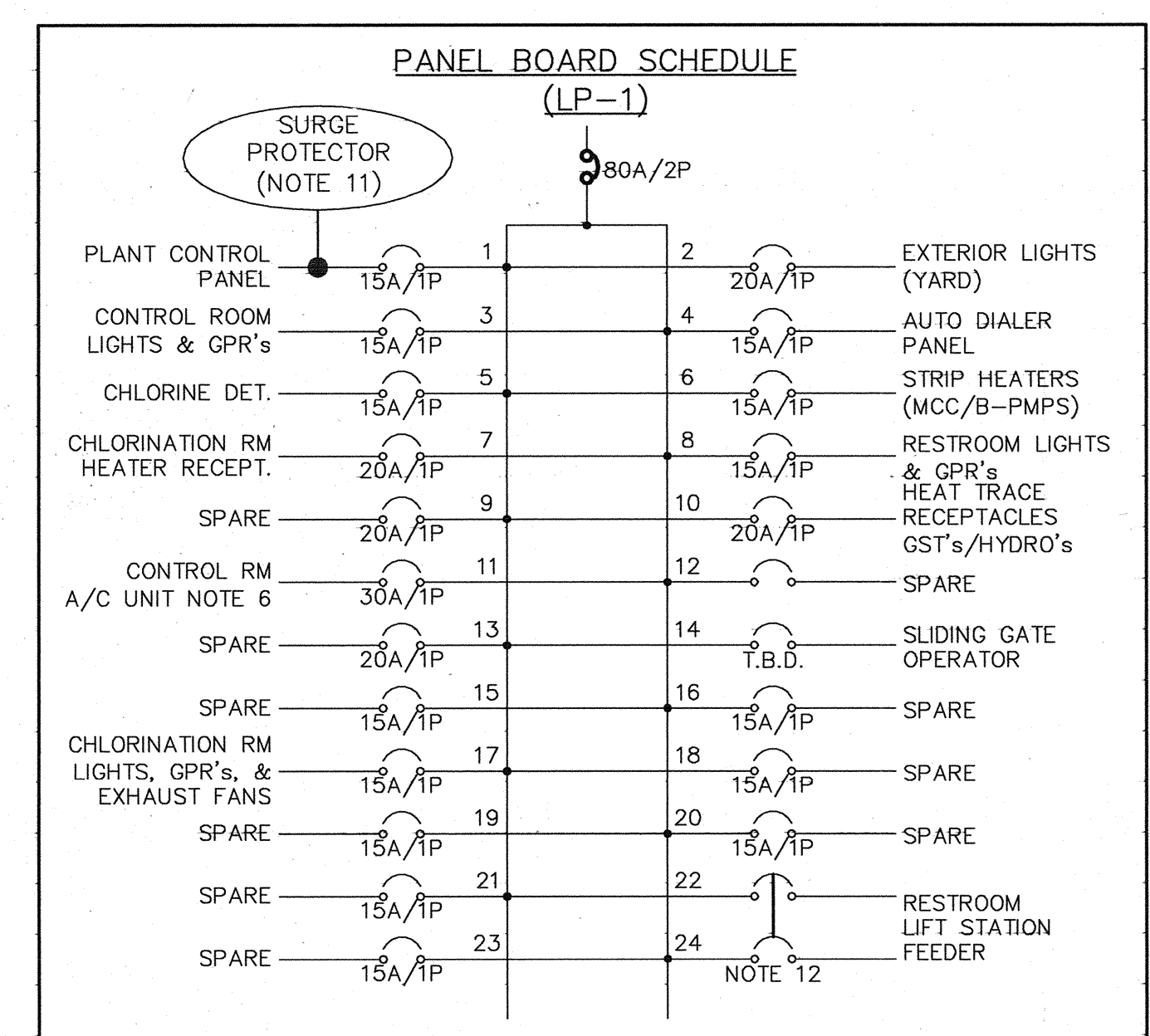
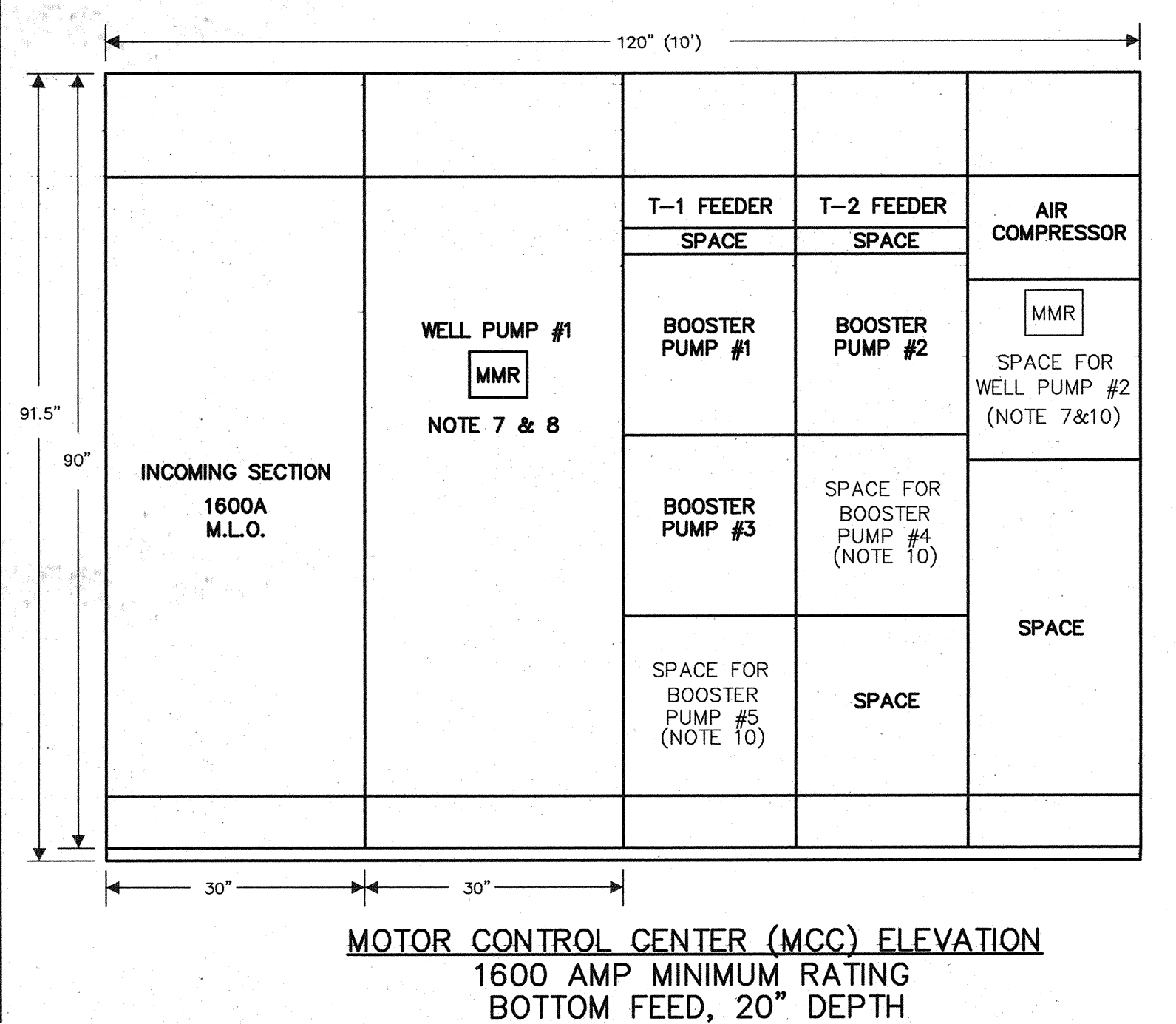
- CALL TO OPEN PILOT LIGHT
- OPEN COMMAND PILOT LIGHT

ON HYDRO-PNEUMATIC TANK RISING PRESSURE:

- LAG PUMP #3 CALL PRESSURE SWITCH BREAKS (PS-5)
- LOW PRESSURE ALARM PRESSURE SWITCH MAKES (PSL-HT)
- LAG PUMP #2 CALL PRESSURE SWITCH BREAKS (PS-4)
- LAG PUMP #1 CALL PRESSURE SWITCH BREAKS (PS-3)
- LEAD PUMP #2 CALL PRESSURE SWITCH BREAKS (PS-2)
- LEAD PUMP #1 CALL PRESSURE SWITCH BREAKS (PS-1)
- ADD AIR PRESSURE SWITCH BREAKS (PS-ADD AIR)
- HIGH PRESSURE ALARM PRESSURE SWITCH BREAKS (PSH-HT)

ON HYDRO-PNEUMATIC TANK FALLING PRESSURE:

- HIGH PRESSURE ALARM PRESSURE SWITCH MAKES (PSH-HT)
- ADD AIR PRESSURE SWITCH MAKES (PS-ADD AIR)
- & ADD AIR SOV OPENS IF LEVEL PROBE IS COVERED.
- LEAD PUMP #1 CALL PRESSURE SWITCH MAKES (PS-1)
- LEAD PUMP #2 CALL PRESSURE SWITCH MAKES (PS-2)
- LAG PUMP #1 CALL PRESSURE SWITCH MAKES (PS-3)
- LAG PUMP #2 CALL PRESSURE SWITCH MAKES (PS-4)
- LOW PRESSURE ALARM PRESSURE SWITCH BREAKS (PSL-HT)
- LAG PUMP #3 CALL PRESSURE SWITCH MAKES (PS-5)



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DWG NO. E-3

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JOB NO.0512015-00

CITY OF TOMBALL  
TOMBALL, TEXAS

WATER SUPPLY & STORAGE FACILITY NO. 3

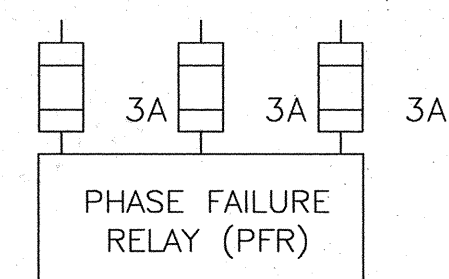
ELECTRICAL ONE-LINE DIAGRAM

SUBMITTED: SCALE: N.T.S. DATE: OCTOBER 2008 SURVEY BY: F B NO:

DESIGNED BY: GWW DRAWN BY: GWW SHEET No.: 29 OF 35 DWG. NO:

FILE NAME: 08009\_E3 DATE: 03/13/08

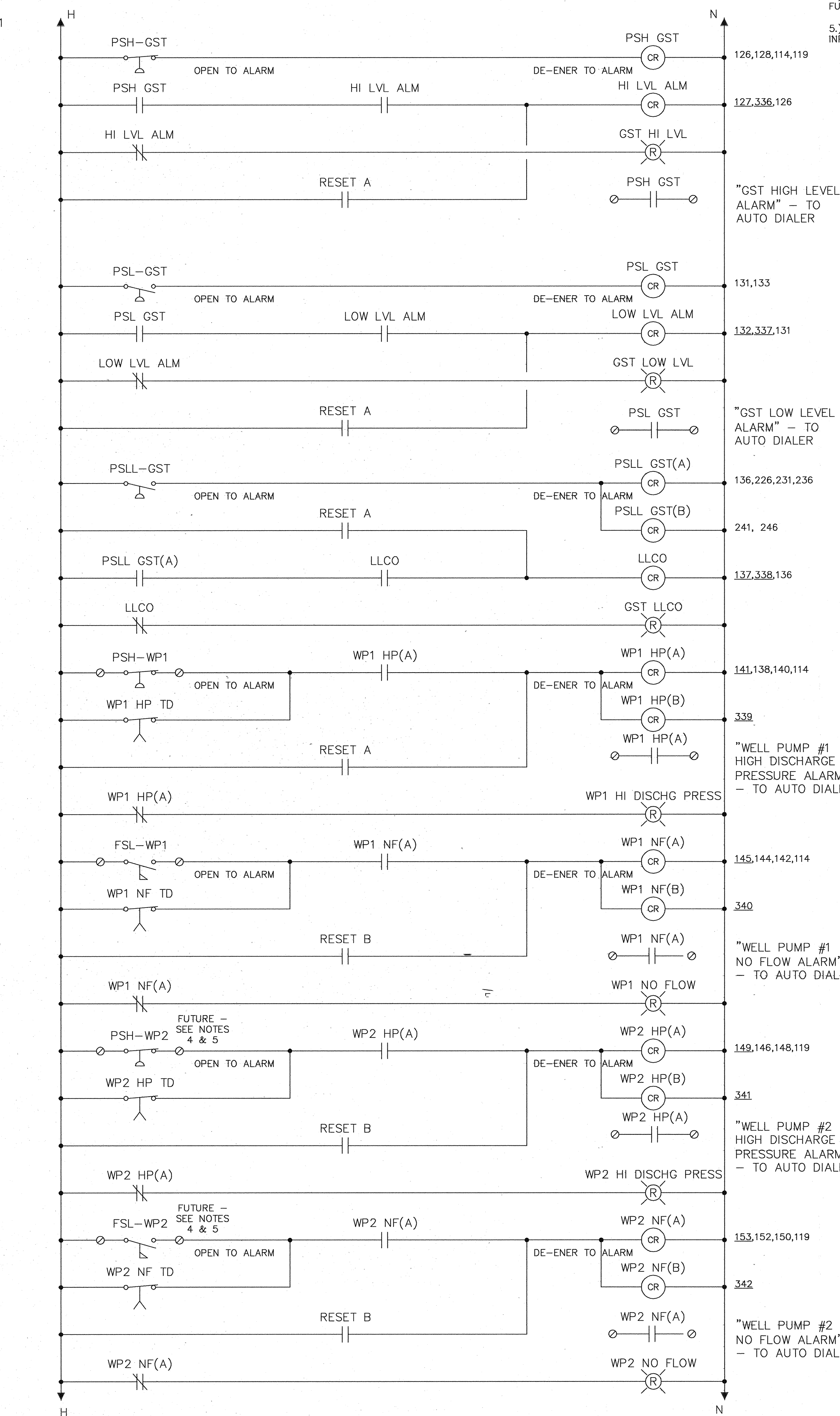
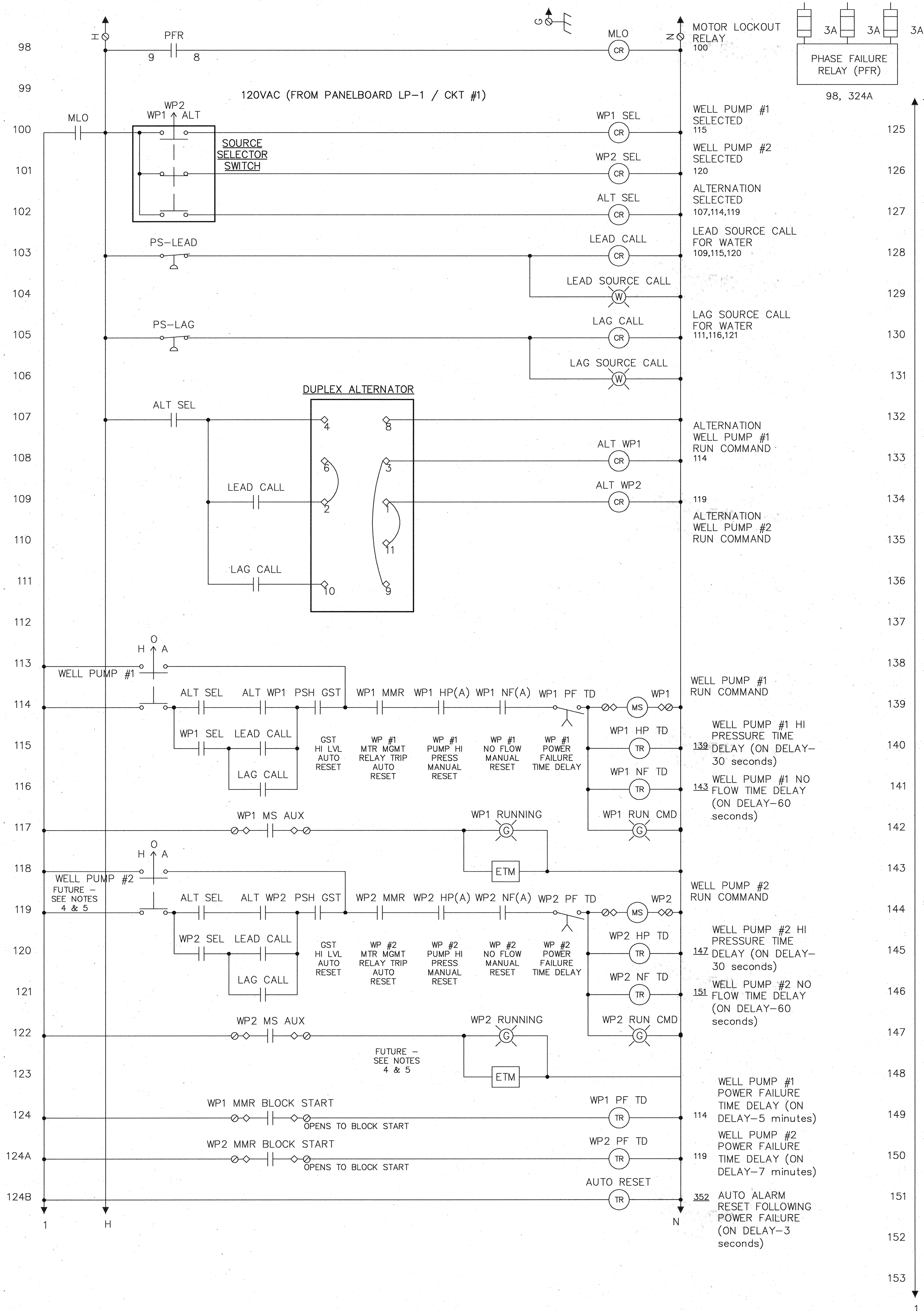
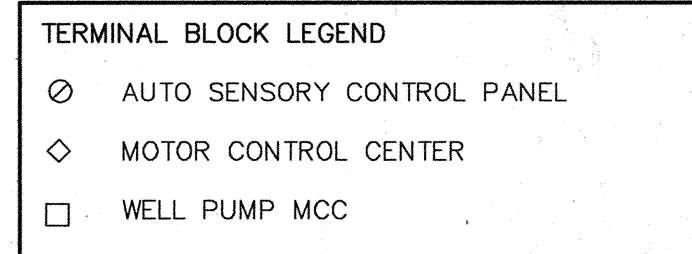
TO MCC MAIN LUGS



98, 324A

NOTES

- 1.) ALL LAMPS TO BE PRESS-TO-TEST STYLE.
- 2.) REFERENCE SHEET E-8 FOR AUTO DIALER CONNECTION DIAGRAM.
- 3.) REFERENCE SHEET E-7 FOR CONTROL PANEL LAYOUT.
- 4.) ALL CONTROL PANEL MOUNTED COMPONENTS FOR THE FUTURE PUMPS SHALL BE PROVIDED.
- 5.) INSTALL JUMPERS AT TERMINAL BLOCK TO DISABLE PHASE II INPUTS, AS REQUIRED.



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DWG NO. E-4

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03/09/09

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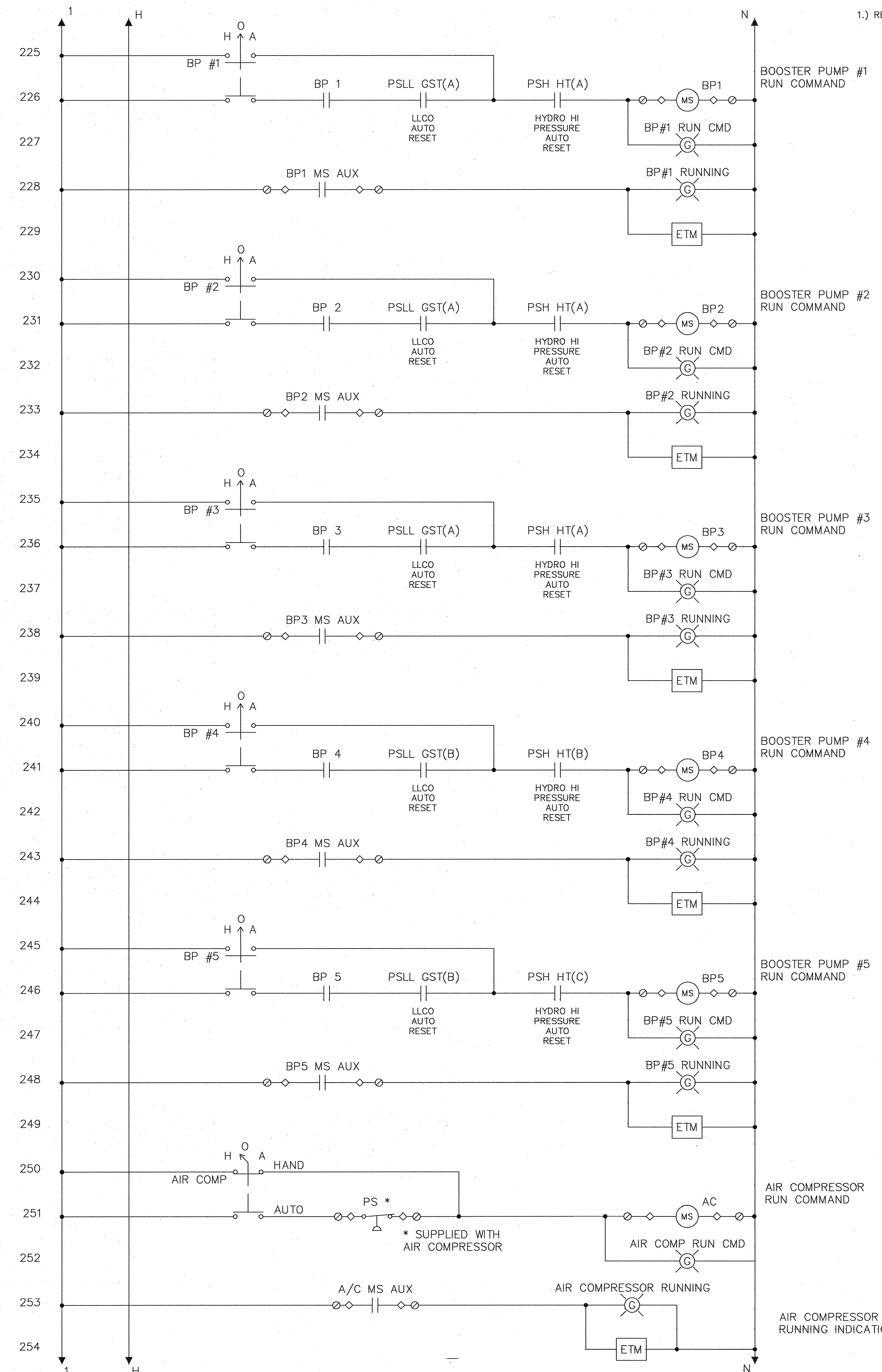
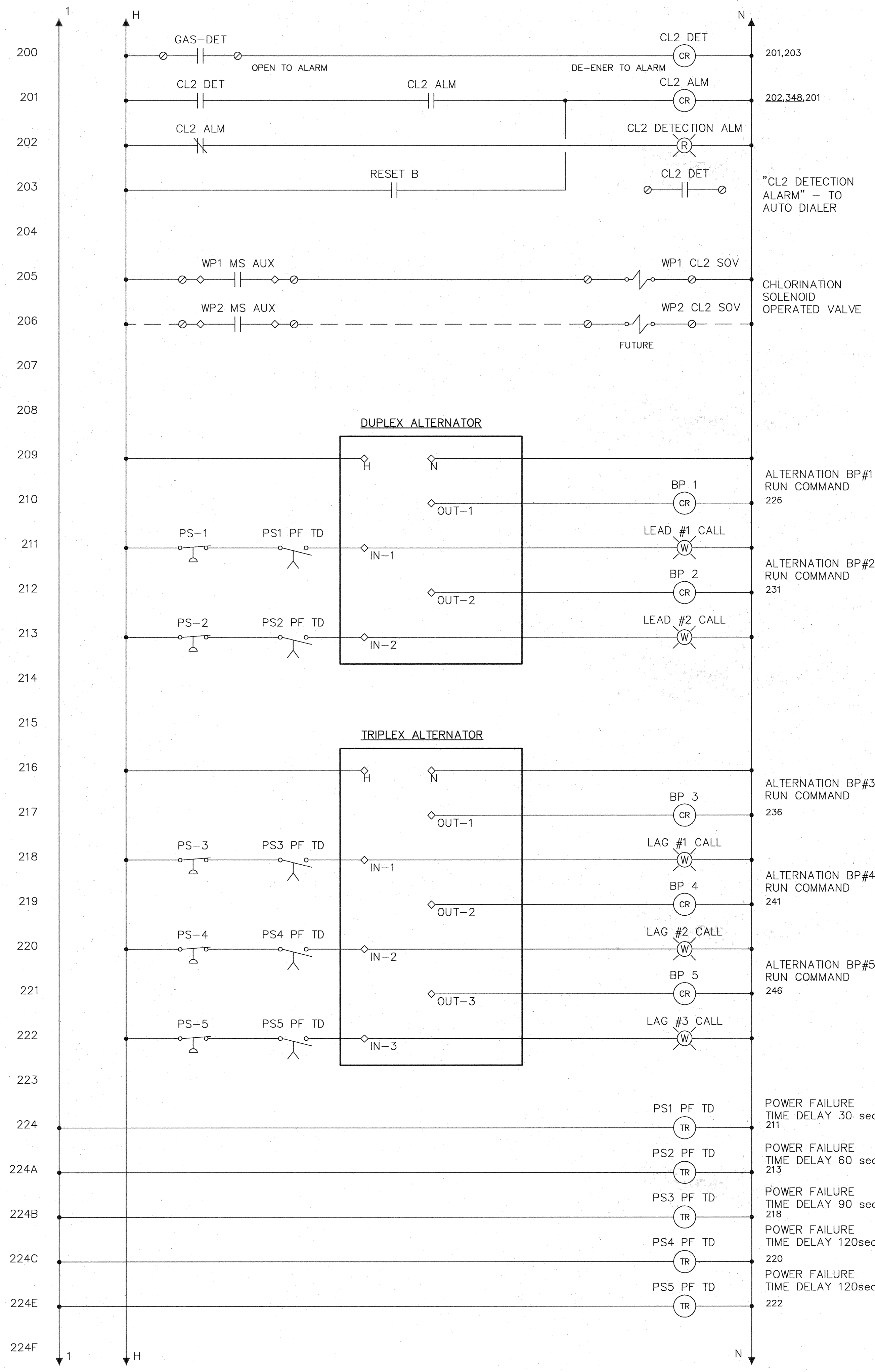
**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 3**

**ELECTRICAL CONTROL SCHEMATIC (SHT 1 of 3)**

SUBMITTED:	DESIGNED BY: GWW
SCALE: N.T.S.	DRAWN BY: GWW
DATE: OCTOBER 2008	SHEET No.: <b>30</b> OF <b>35</b>
SURVEY BY:	DWG. NO.:
F B NO.:	

NOTES  
1.) REFERENCE SHEET E-4 FOR NOTES.



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DWG NO. E-5

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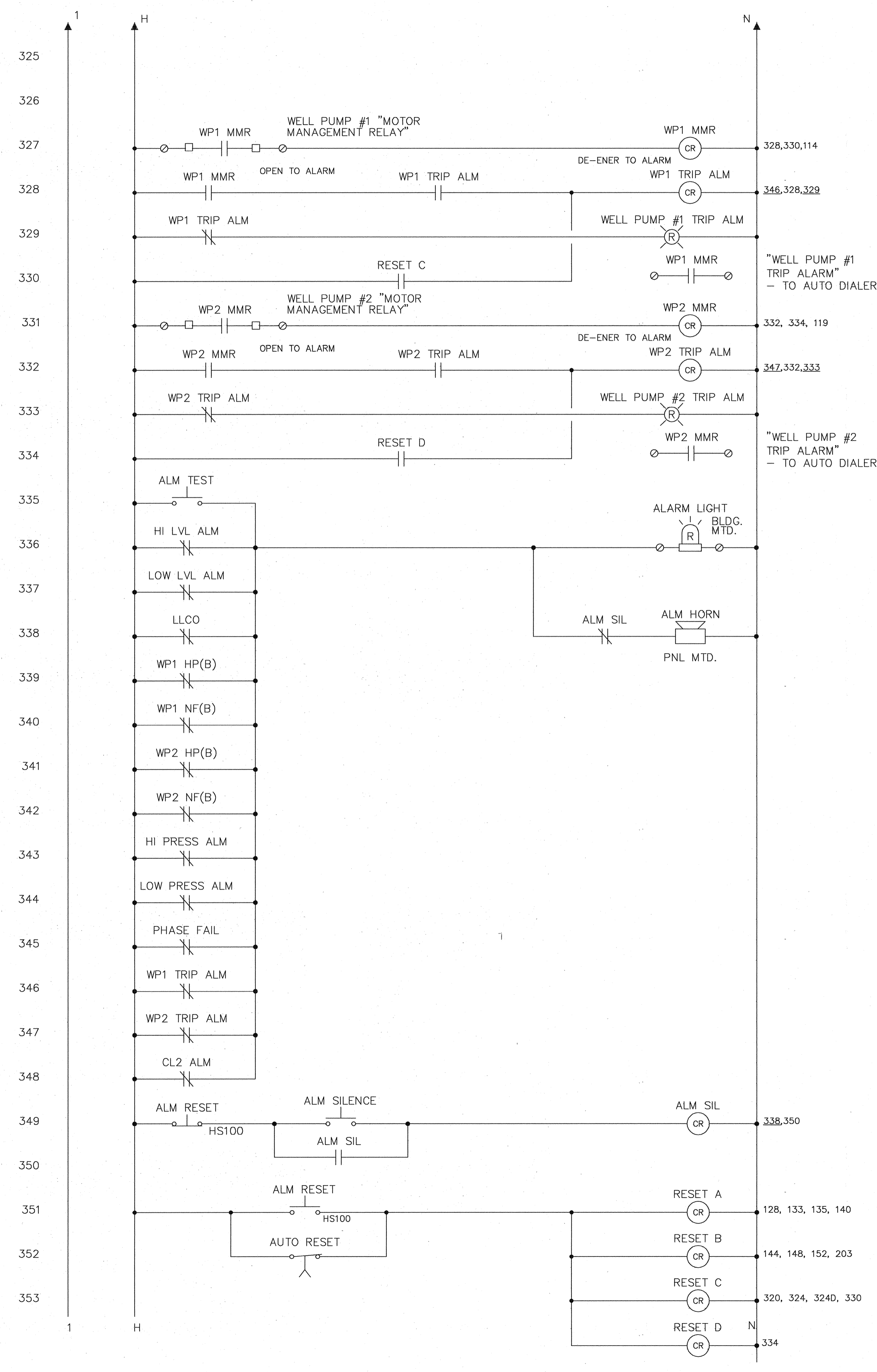
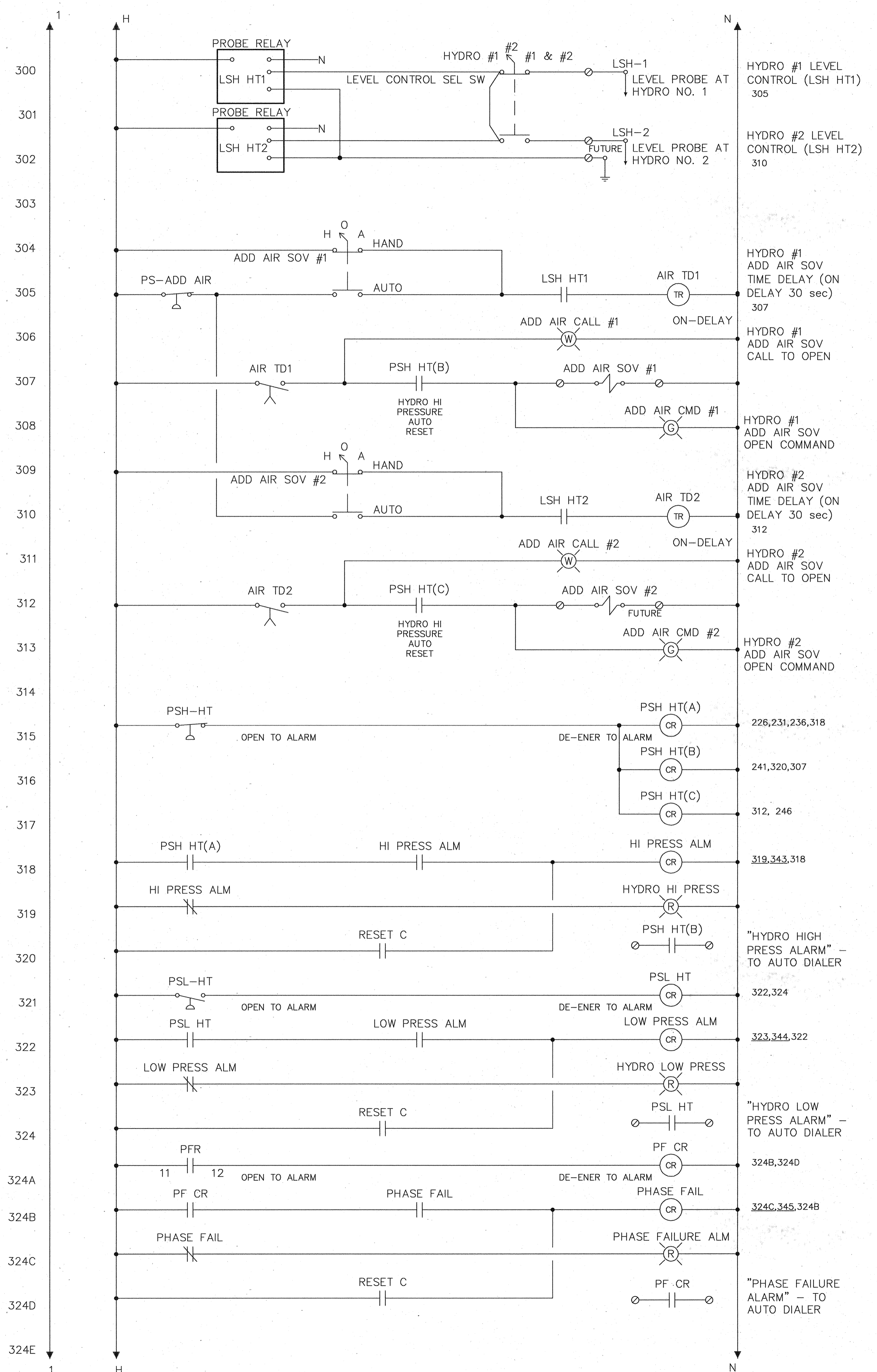
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TOMBALL, TEXAS

WATER SUPPLY & STORAGE FACILITY NO. 3

ELECTRICAL CONTROL SCHEMATIC (SHT 2 of 3)

SUBMITTED: SCALE: N.T.S. DATE: OCTOBER 2008 SURVEY BY: F B NO:  
DESIGNED BY: GWW DRAWN BY: GWW SHEET No.: 31 OF 35 DWG. NO:

NOTES  
1.) REFERENCE SHEET E-4 FOR NOTES.

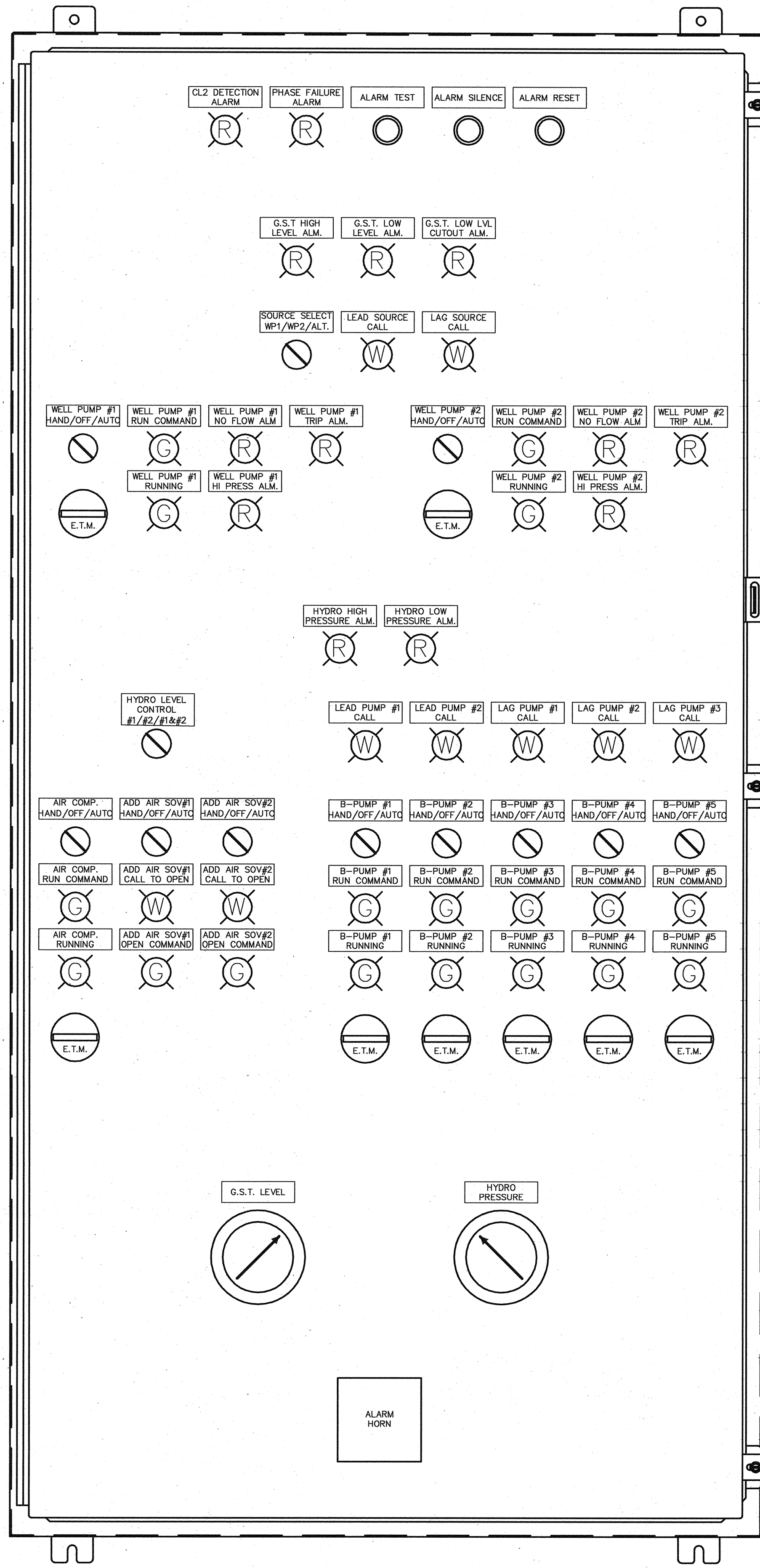


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<b>CITY OF TOMBALL</b> TOMBALL, TEXAS		
<b>WATER SUPPLY &amp; STORAGE FACILITY NO. 3</b>		
<b>ELECTRICAL CONTROL SCHEMATIC (SHT 3 OF 3)</b>		
SUBMITTED: SCALE: N.T.S. DATE: OCTOBER 2008 SURVEY BY:	DESIGNED BY: GWW DRAWN BY: GWW SHEET No.: <b>32 OF 35</b> DWG. NO:	FILE NAME: 08009_E6 DATE: 03/13/08

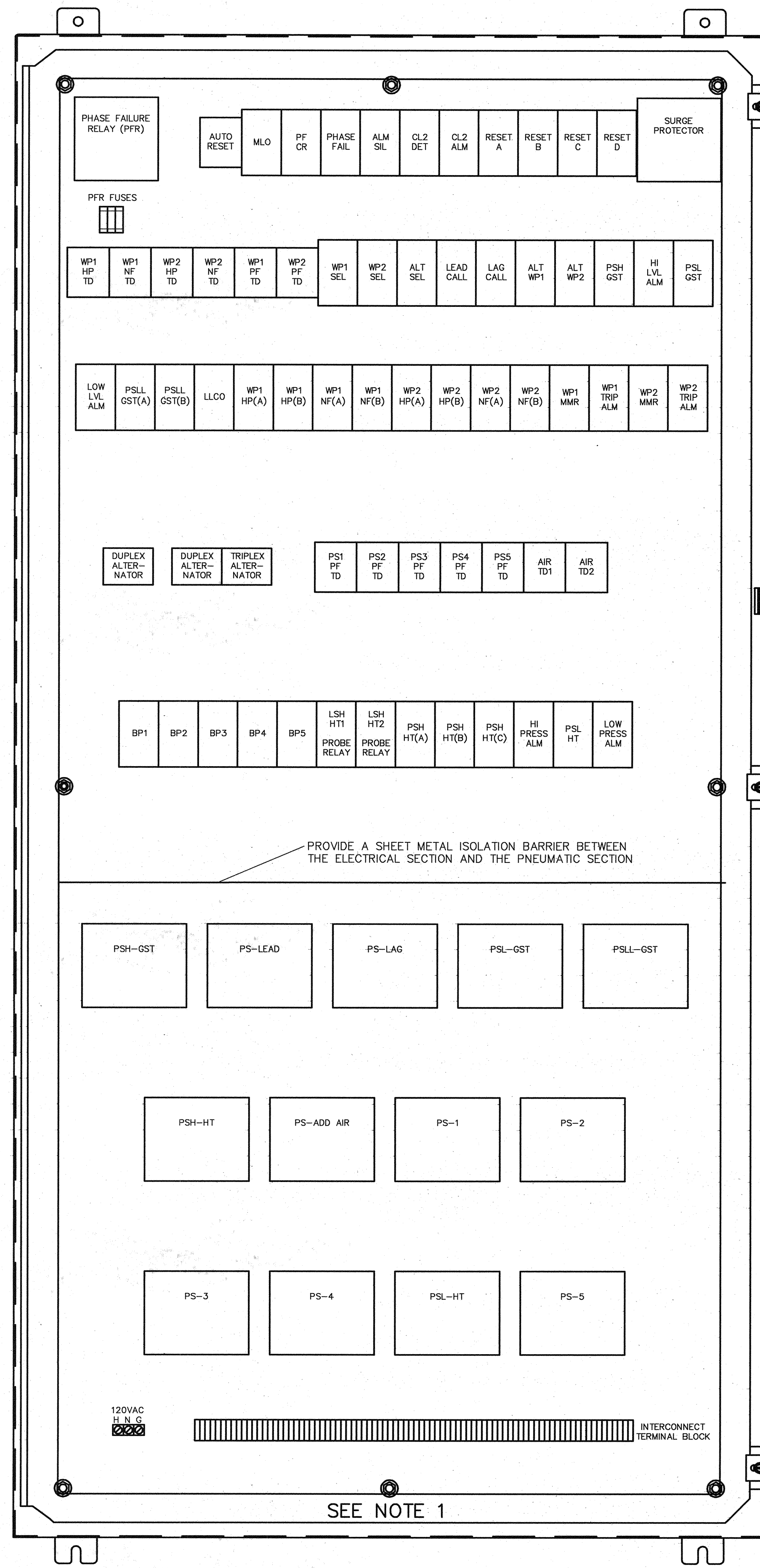


**NOTES**

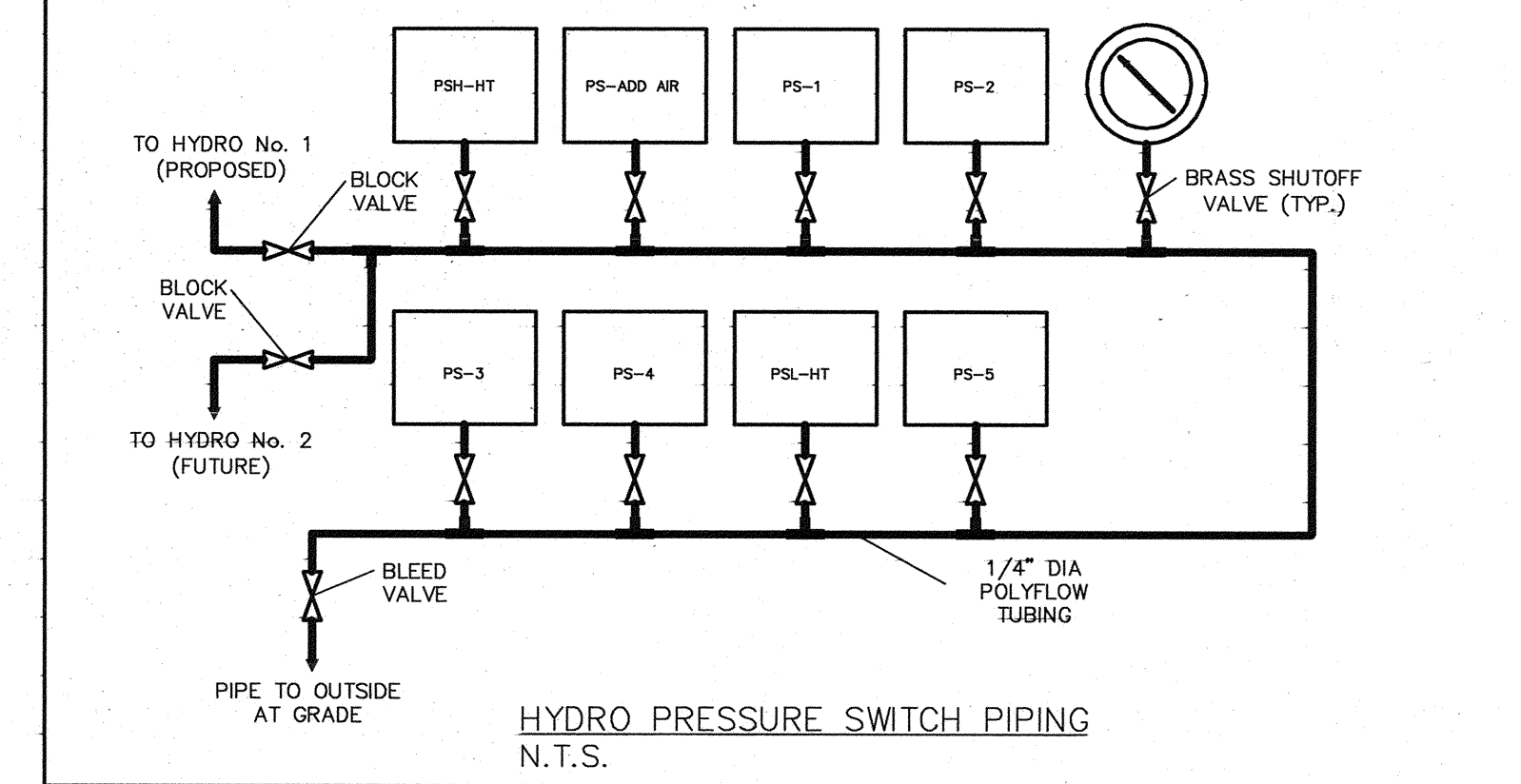
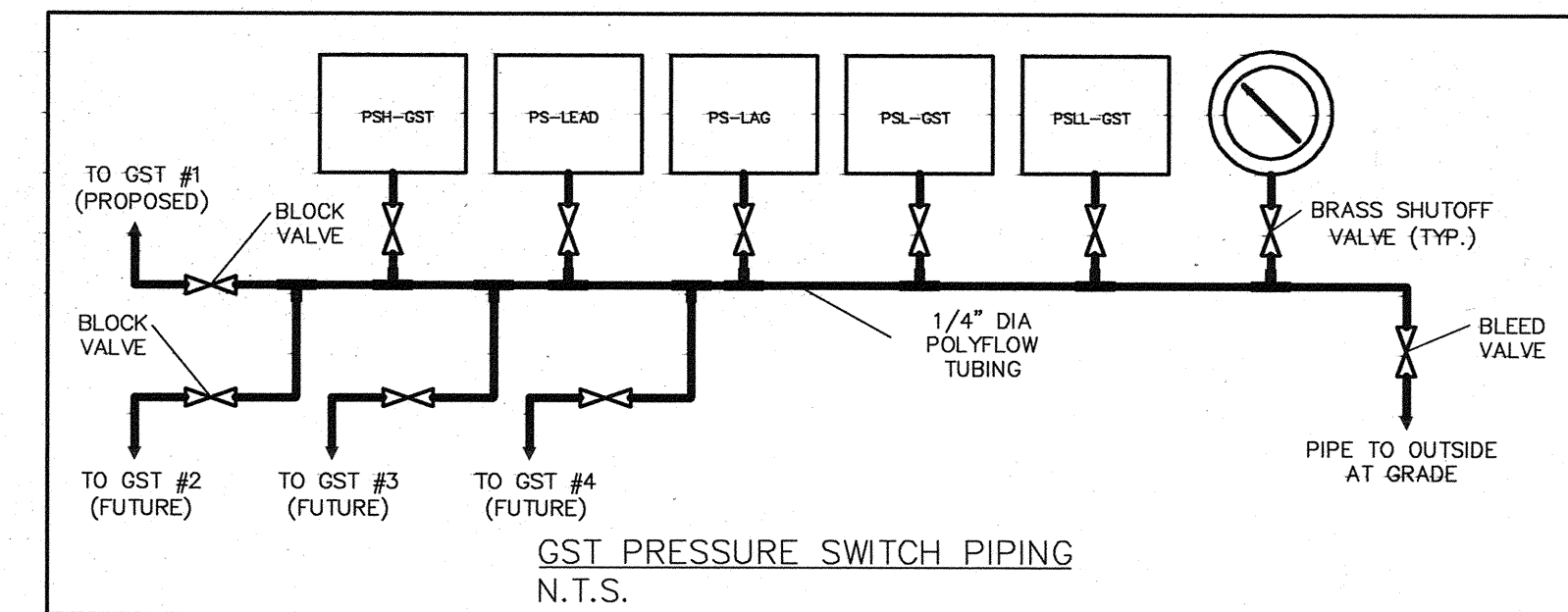
- 1.) PANEL LAYOUT SHOWN IS BASED ON A 72"x36"x12" NEMA 1 ENCLOSURE. PANEL MFG'R TO ADJUST DIMENSIONS AS REQUIRED. ALSO, PROVIDE A SHEET METAL ISOLATION BARRIER BETWEEN THE ELECTRICAL SECTION AND THE PNEUMATIC SECTION, AS SHOWN ON THE SUB-PANEL LAYOUT VIEW.
- 2.) ALL PILOT LIGHTS TO BE PRESS-TO-TEST.
- 3.) REFERENCE SHEETS E-4, E-5, & E-6 FOR CONTROL SCHEMATICS.



FRONT PANEL LAYOUT



SUB-PANEL LAYOUT



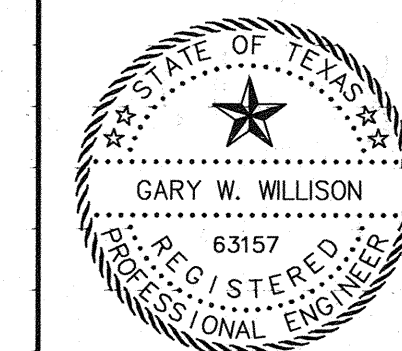
**BILL OF MATERIALS - CONTROL PANEL**

1	ENCLOSURE, SINGLE DOOR, NEMA 1 - PAINTED (SEE NOTE 1)
2	PUSHBUTTON, MOMENTARY, (1) N/O, 120VAC, HEAVY DUTY, OIL-TIGHT, "ALARM TEST" & "ALARM SILENCE"
1	PUSHBUTTON, MOMENTARY, (1) N/C & (1) N/O, 120VAC, HEAVY DUTY, OIL-TIGHT, "ALARM RESET"
11	SELECTOR SWITCH, 3-POSITION, MAINTAINED, 120VAC
1	SELECTOR SWITCH, 3-POSITION, MAINTAINED, 120VAC, HYDRO LEVEL CONTROL: #1/#2/#3 & #2 (SPECIAL CONTACT CONFIGURATION)
8	ELAPSED TIME METER, HOURS, NON-RESET, 120VAC, ATC 800-3-0201, OR EQUAL
13	PILOT LIGHTS, RED LENS, 120VAC, PRESS-TO-TEST
18	PILOT LIGHTS, GREEN LENS, 120VAC, PRESS-TO-TEST
9	PILOT LIGHTS, WHITE LENS, 120VAC, PRESS-TO-TEST
1	GAUGE, 4-1/2" DIA., "G.S.T. LEVEL", COORDINATE RANGE WITH G.S.T. PNEUMATIC SIGNAL
1	GAUGE, 4-1/2" DIA., "HYDRO PRESSURE", COORDINATE RANGE WITH HYDRO OPERATING PRESSURE
1	ALARM HORN, PANEL MOUNTED, 120VAC
1	PHASE FAILURE RELAY (PFR), 480VAC, DIVERSIFIED ELECTRONICS SLD-440-ALE, OR EQUAL.
1	SURGE PROTECTOR, SEE NOTE 11 ON SHT E-3
1	FUSE BLOCK, w/3 FUSES, FOR PFR SENSING LEADS
1	DUPLX ALTERNATOR, 120VAC, DPDT, WELL PUMP ALTERNATION
1	DUPLX ALTERNATOR, 120VAC, DPDT, LEAD B-PUMP ALTERNATION
1	TRIPLEX ALTERNATOR, 120VAC, DPDT, LAG B-PUMP ALTERNATION
14	TIME DELAY RELAY, ON-DELAY, 0-30 min., (2) DPDT, 120VAC, 5 AMPS, ATC 319D-016, OR EQUAL
47	CONTROL RELAY, (4) DPDT, 120VAC, CUTLER HAMMER D5PR3A, OR EQUAL
2	HYDRO TANK LEVEL PROBE RELAY, WARRICK OR EQUAL (LSH-HT1 & LSH-HT2)
5	PRESSURE SWITCH, G.S.T. LEVEL CONTROL, HONEYWELL L404 OR EQUAL
8	PRESSURE SWITCH, HYDRO PRESSURE CONTROL, HONEYWELL L404 OR EQUAL
1	TERMINAL BLOCK, 3 POINT (HOT/NEUT/GND), 20 AMP
1	TERMINAL BLOCK, INTERCONNECT, NO. OF PTS AS REQ'D, INCLUDING ~10% SPARES

**BILL OF MATERIALS - FIELD DEVICES**

1	ALARM LIGHT, RED BEACON, OUTDOOR, 120VAC, BUILDING MOUNTED
1	PRESSURE SWITCH, WELL PUMP HIGH DISCHARGE PRESSURE (PSH-WP1) (NOTE: PSH-WP2 IS FUTURE). COORDINATE SET POINT WITH PUMP & PIPING DESIGN.
1	FLOW SWITCH, NO FLOW INDICATION (FSL-WP1) (NOTE: FSL-WP2 IS FUTURE). PADDLE TYPE, STAINLESS STEEL, CONSOLIDATED ELECTRIC FS7-4S, OR EQUAL
1	HYDRO TANK LEVEL PROBE, (LSH-1) (NOTE: LSH-2 IS FUTURE)
1	SOLENOID VALVE, CHLORINE FEED, N/C, 120VAC (WP1 CL2 SOV) (NOTE: WP2 CL2 SOV IS FUTURE)
1	SOLENOID VALVE, ADD AIR, N/C, 120VAC (ADD AIR SOV #1) (NOTE: ADD AIR SOV #2 IS FUTURE) NOTE: ADD AIR SOV'S ARE LOCATED AT EACH RESPECTIVE HYDRO TANK.

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*Gary W. Willison*  
02/19/09

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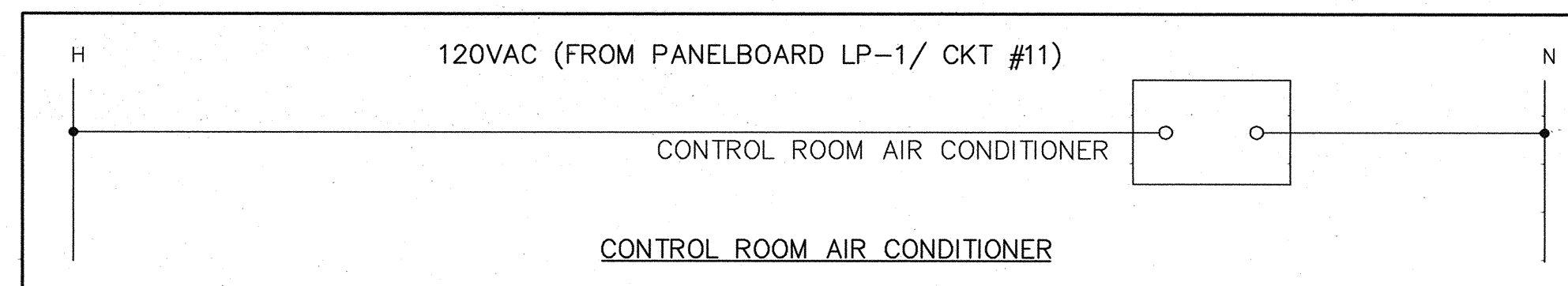
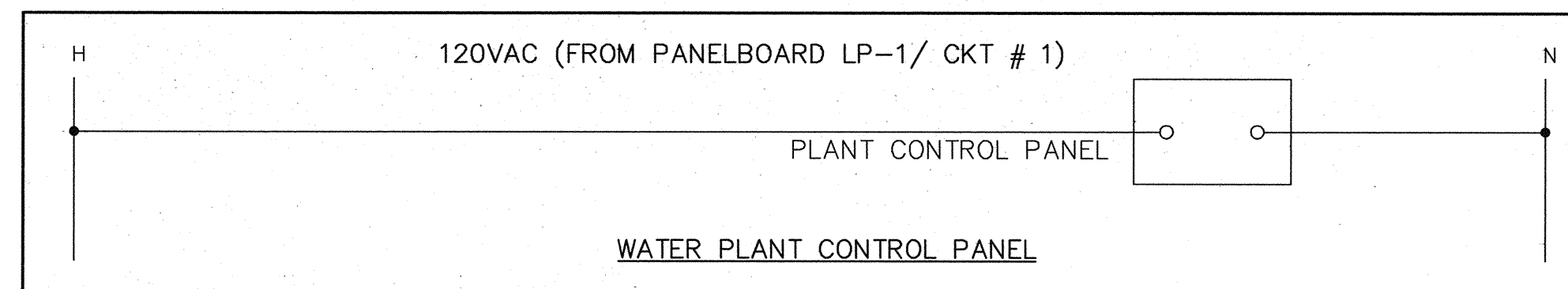
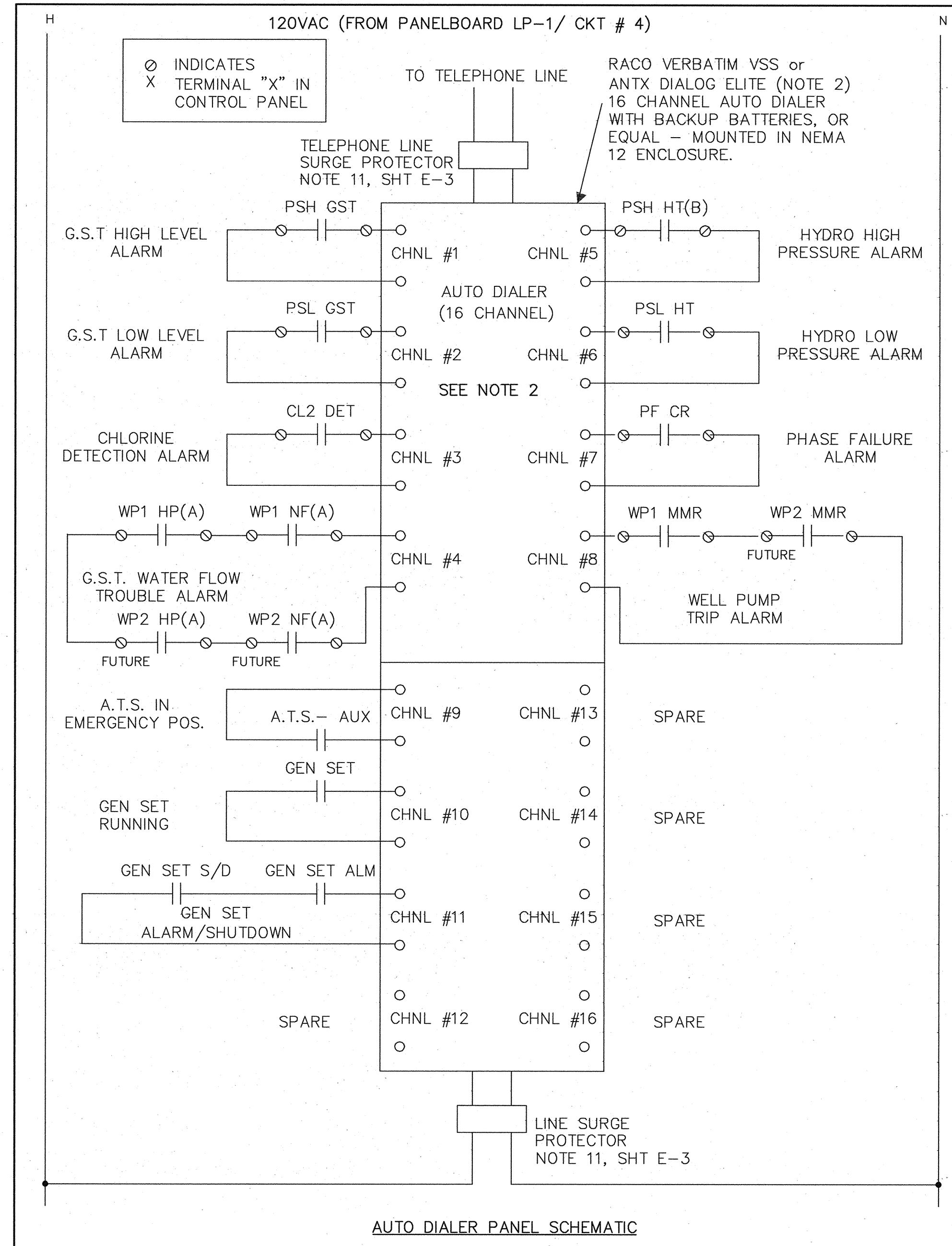
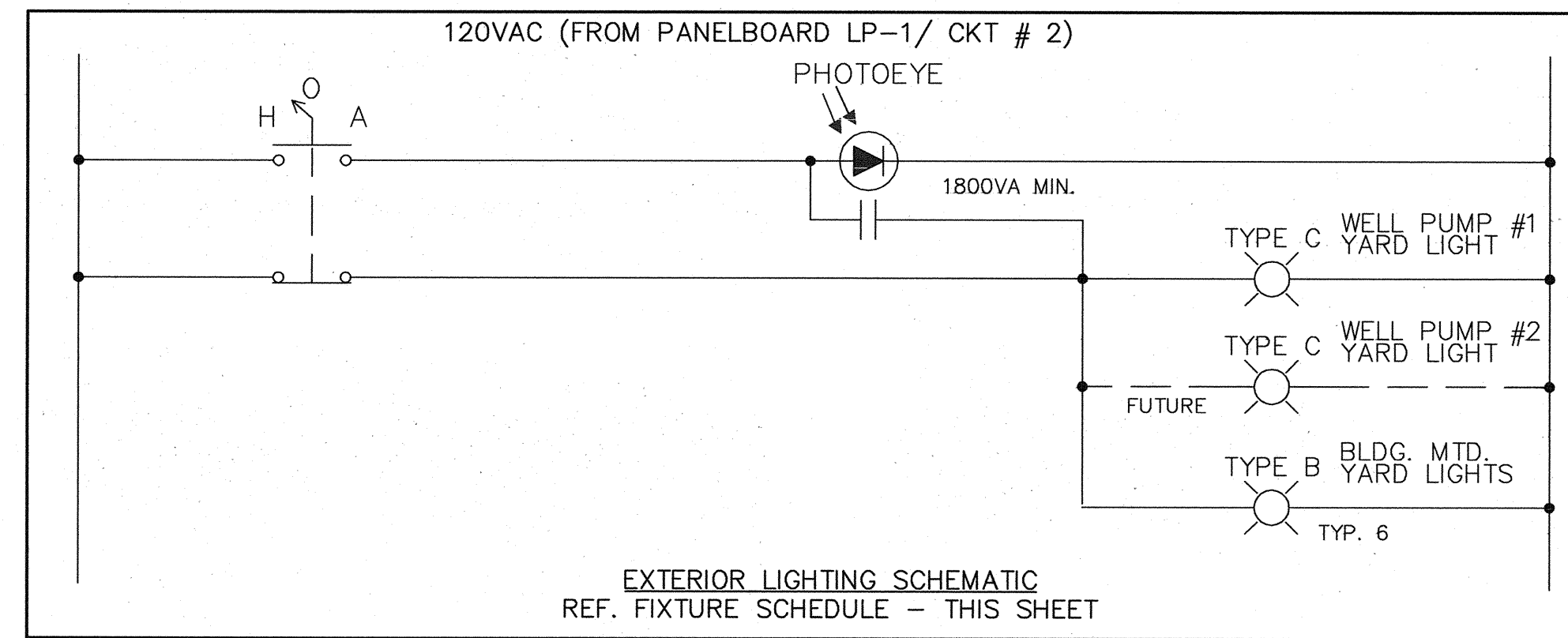
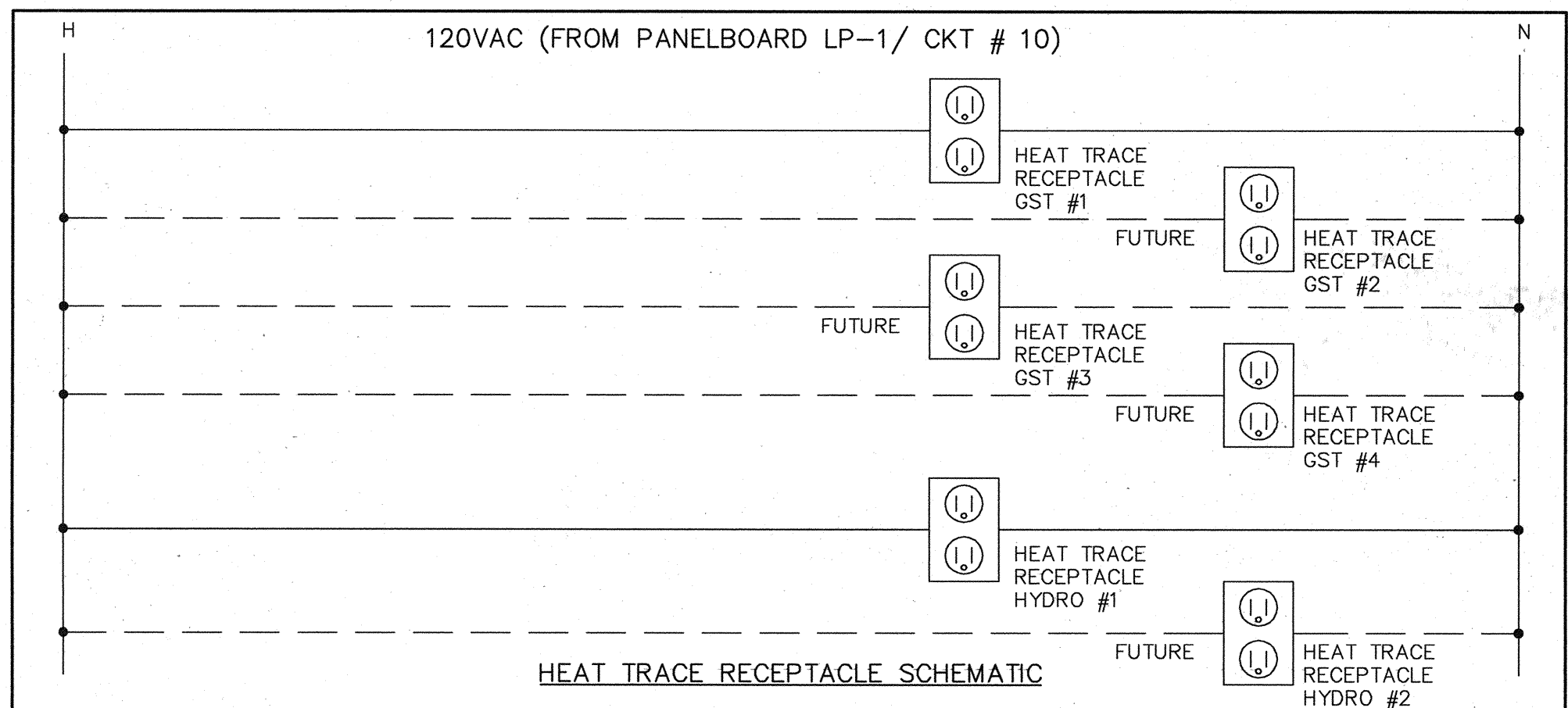
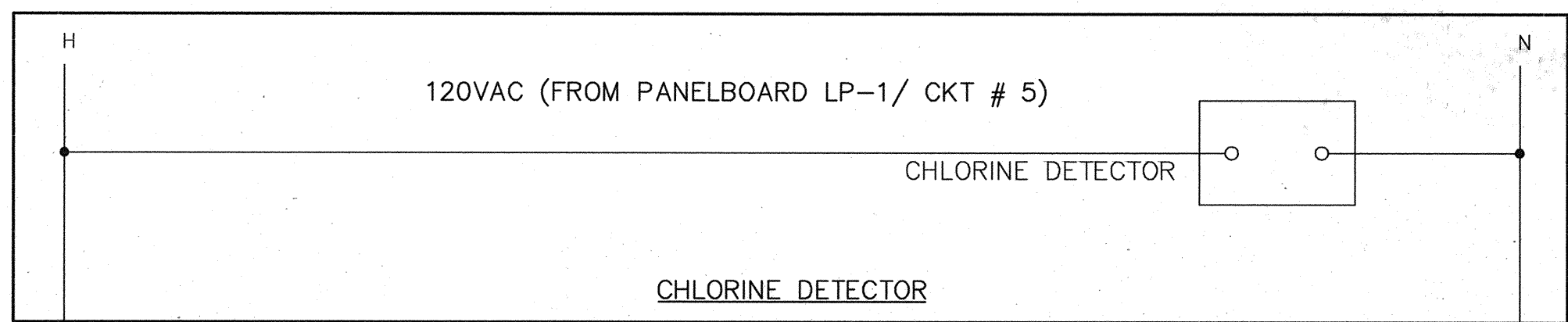
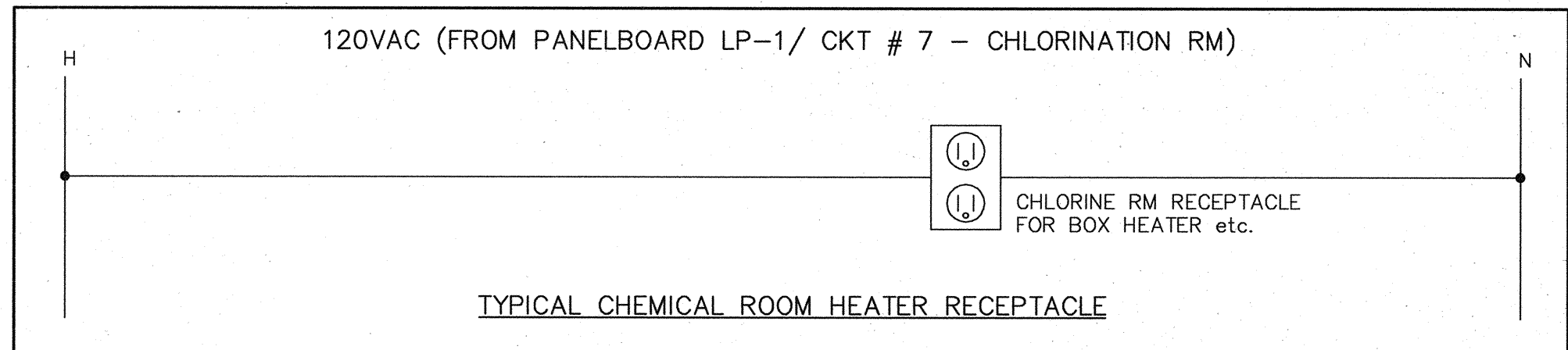
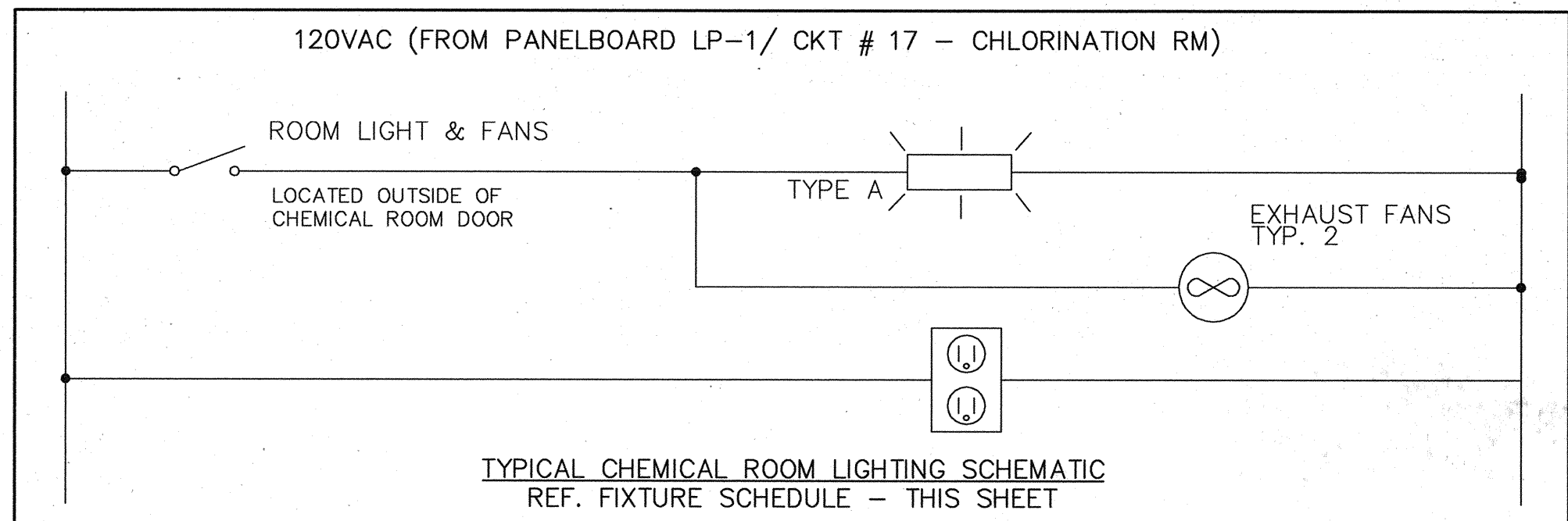
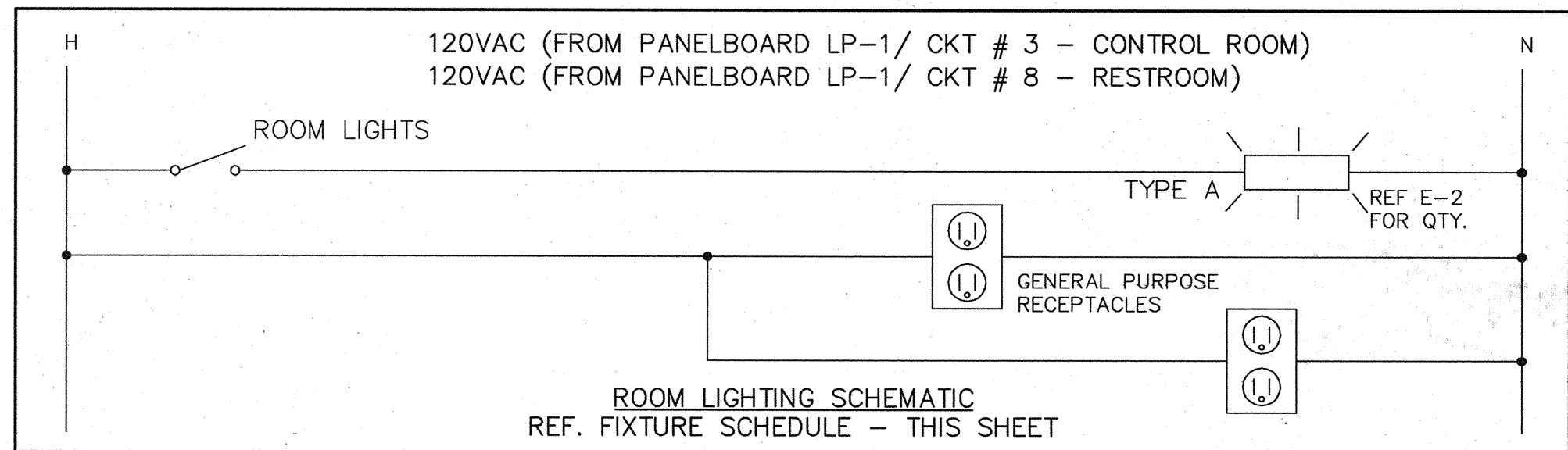
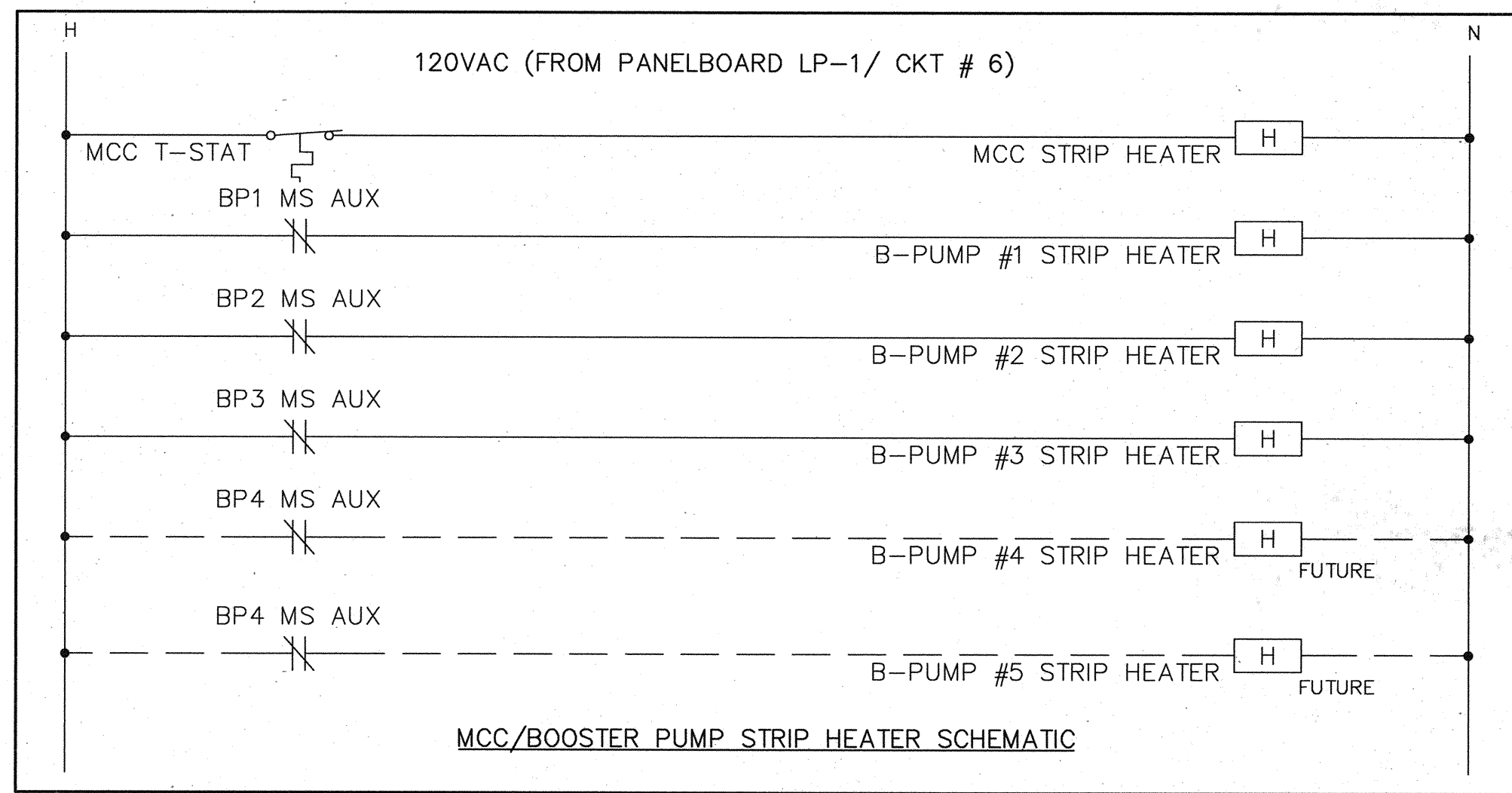
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JOB NO. 0512015-00

**CITY OF TOMBALL**  
TOMBALL, TEXAS

**WATER SUPPLY & STORAGE FACILITY NO. 3**

**ELECTRICAL CONTROL PANEL LAYOUT**

SUBMITTED: DATE: OCTOBER 2008  
SHEET No.: 33 OF 35  
DESIGNED BY: GWW  
DRAWN BY: GWW  
DWG. NO:



**NOTES**

1.) REFERENCE SHEETS E-4, E-5, & E-6 FOR PLANT CONTROL SCHEMATICS.

2.) PROVIDE ADDITIONAL LOGIC, AS REQUIRED, TO PREVENT ERRONEOUS AUTO DIALER ALARMS DURING A POWER FAILURE. (i.e. DISABLE ALL CHANNELS EXCEPT THE PHASE FAILURE & GEN SET/ATS INPUTS).

FIXTURE SCHEDULE

TYPE	DESCRIPTION
A	FLUORESCENT, 120V, 4 FOOT, 2 LAMP, WITH PROTECTIVE WRAP-AROUND POLYCARBONATE LENS
B	HIGH PRESSURE SODIUM, 120VAC, 150W, APPLETON G-AM471L-MT OR EQUAL, WALL MOUNTED, w/SINGLE PHOTO-EYE CONTROL
C	HIGH PRESSURE SODIUM, 120VAC, 150W, APPLETON G-AM471L-MT OR EQUAL, POLE MOUNTED, w/SINGLE PHOTO-EYE CONTROL

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DWG NO. **E-8**

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03/15/08

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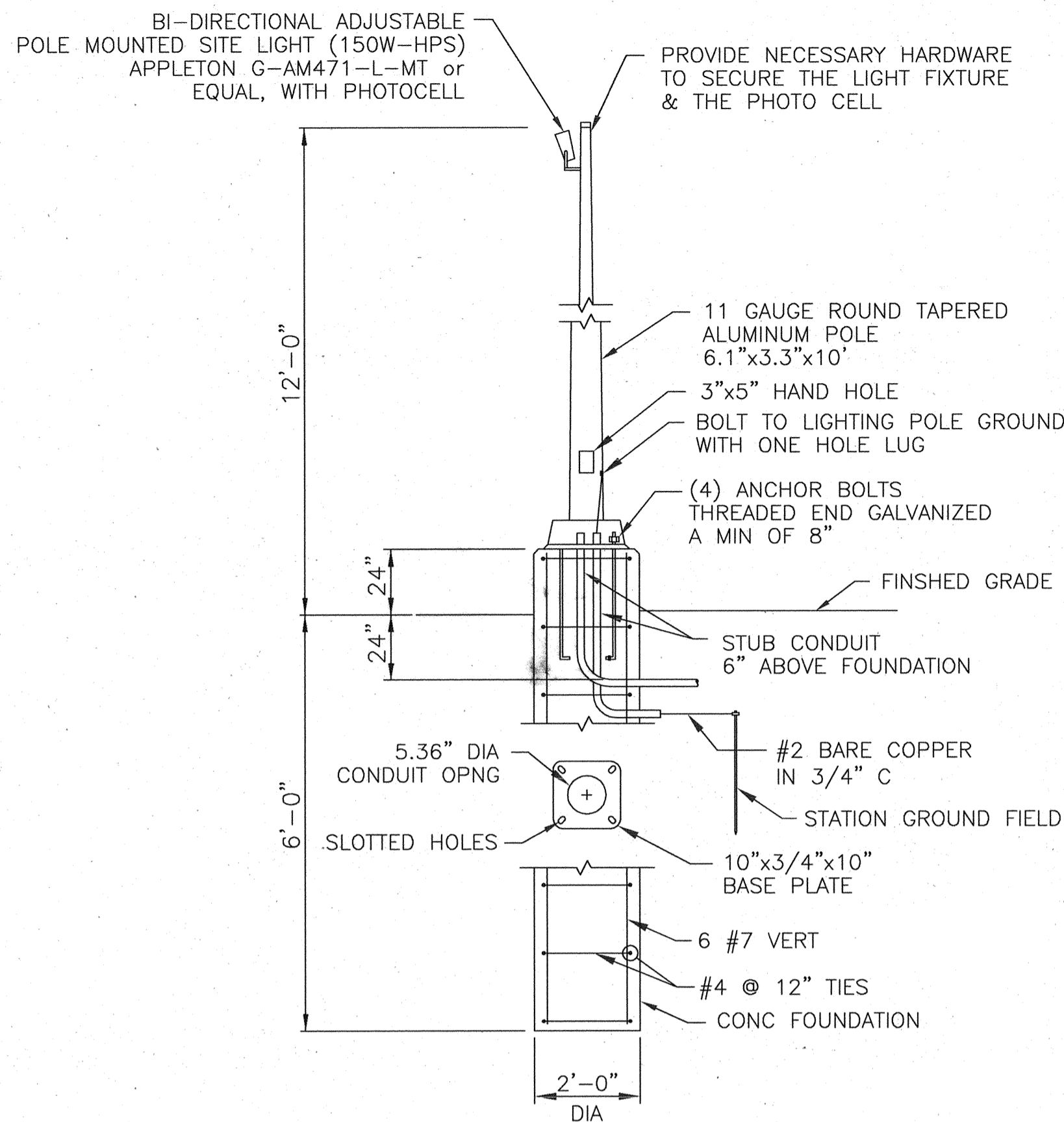
**WATER SUPPLY & STORAGE FACILITY NO. 3**

**ELECTRICAL**  
120/240V SCHEMATICS & AUTO DIALER DIAGRAM

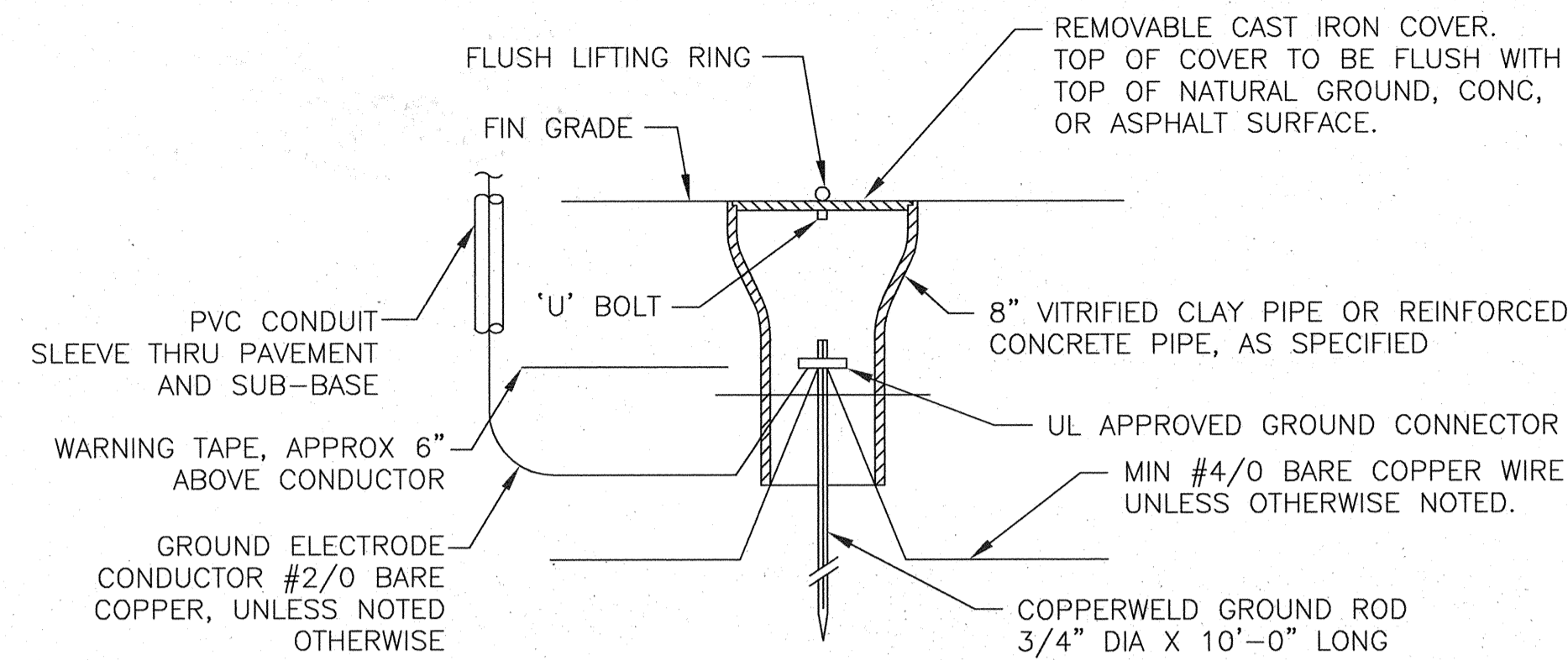
SUBMITTED: N.T.S.  
SCALE: N.T.S.  
DATE: OCTOBER 2008  
SURVEY BY: GFW

DESIGNED BY: GWW  
DRAWN BY: GWW  
SHEET No.: **34** OF **35**  
DWG. NO:

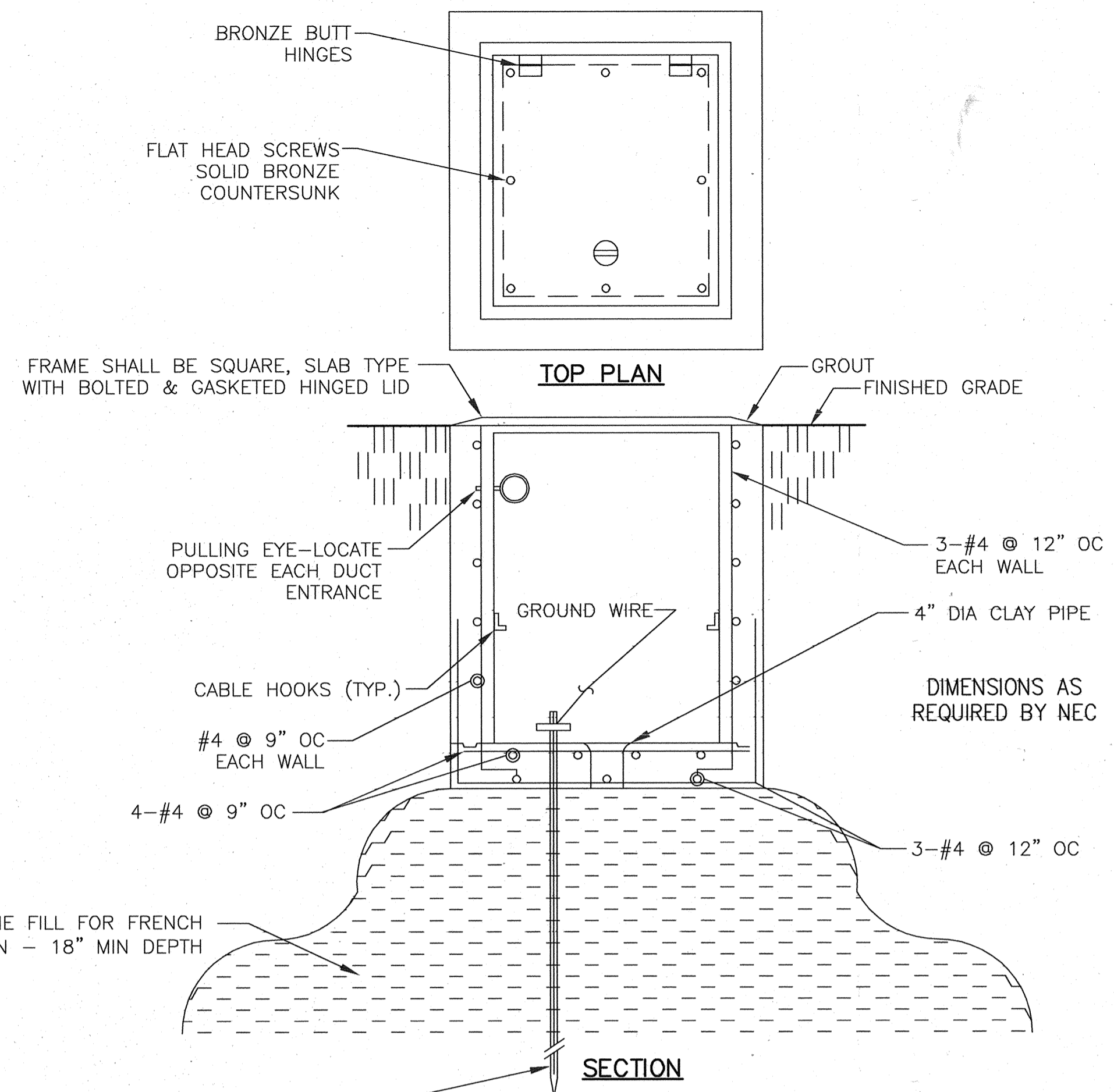
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DATE: 03/13/08  
F B NO:



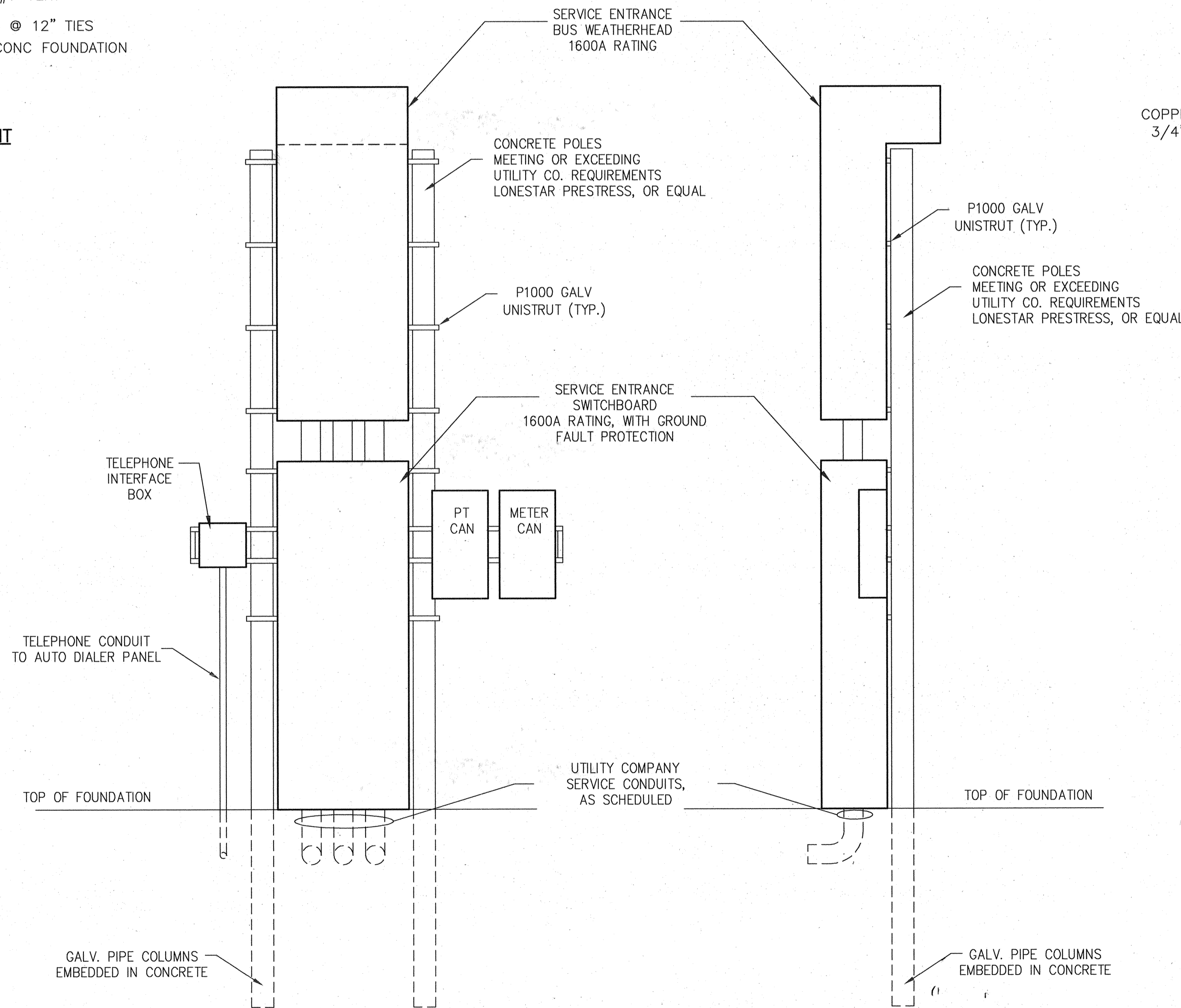
TYPICAL YARD LIGHT  
DETAIL 1



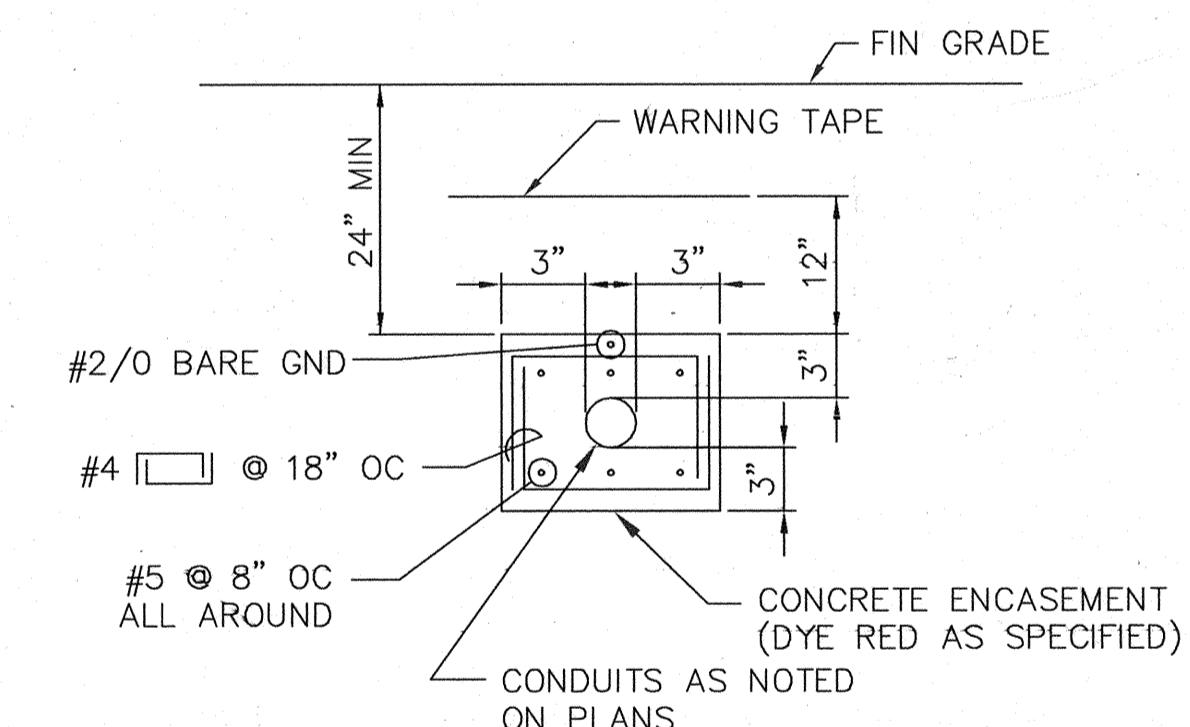
TYPICAL GROUND WELL INSTALLATION  
DETAIL 2



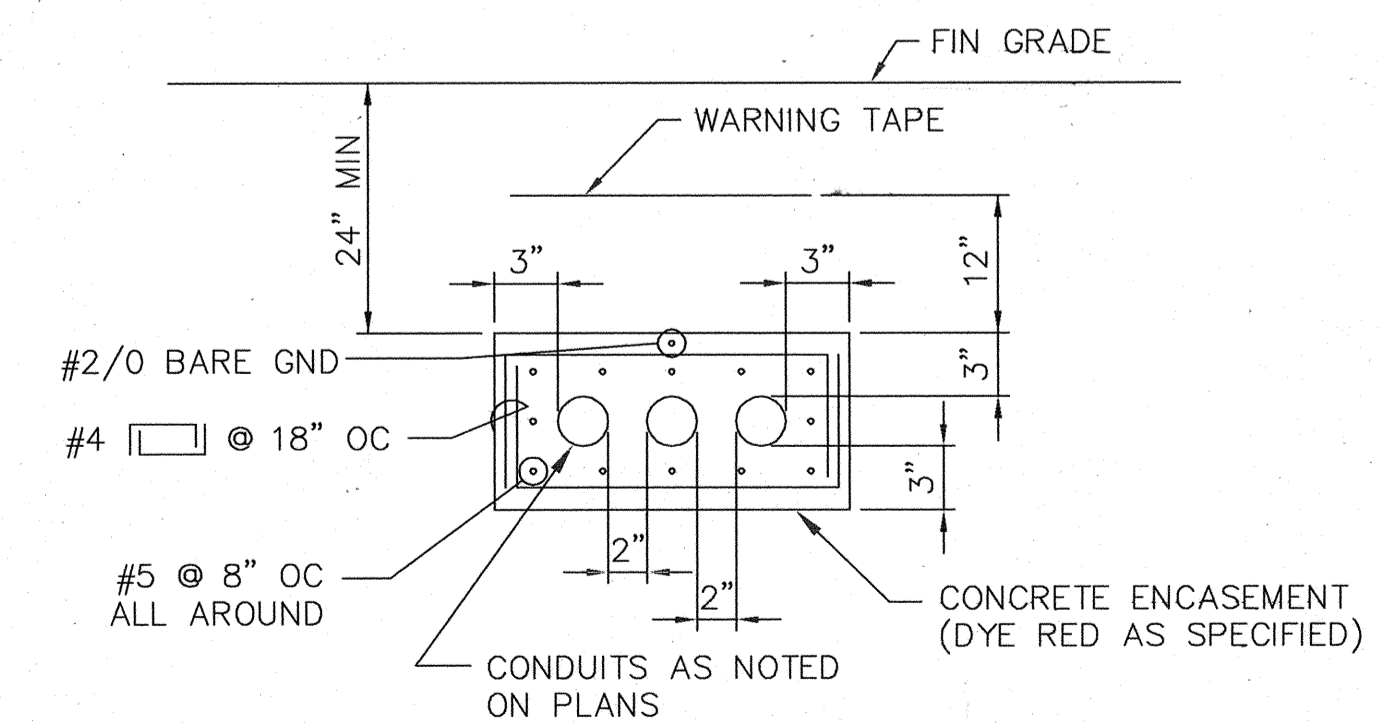
TYPICAL ELECTRICAL HANDHOLE CONSTRUCTION  
DETAIL 3



ELECTRIC & TELEPHONE SERVICE OVERHEAD INSTALLATION DETAIL  
DETAIL 6  
N.T.S.



TYP SINGLE DUCTBANK SECTION  
DETAIL 4



TYP DUCTBANK SECTION  
DETAIL 5

Alteration of a sealed document without proper notification to the responsible Engineer is an offense under the Texas Engineering Practice Act.

DWG NO. E-9

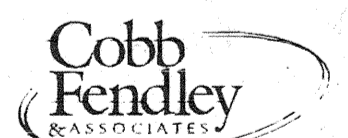


*G. Willison*  
03/09/09

Coastal Bend Consultants, Inc.

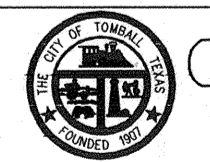


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JOB NO.0512015-00



CITY OF TOMBALL  
TOMBALL, TEXAS

WATER SUPPLY &  
STORAGE FACILITY NO. 3

ELECTRICAL  
MISCELLANEOUS DETAILS

SUBMITTED:  
SCALE: N.T.S.  
DATE: OCTOBER 2008  
SURVEY BY:

DESIGNED BY: GWW  
DRAWN BY: GWW  
SHEET No.: 35 OF 35  
DWG. NO.:

FILE NAME: 08009\_E3  
DATE: 03/13/08