Bluebonnet Groundwater Conservation District
1903 Dove Crossing Lane Suite A, P.O. Box 269
Navasota, TX 77868
Phone: 936-825-7303 Fax: 936-825-7331
Email: BGCD@bluebonnetgroundwater.org

BGCD Well ID #: _____

NON-EXEMPT WATER WELL REGISTRATION APPLICATION

Please complete all questions. Please print or type information, or place an "x" in the appropriate space.

Drill New Well: _x_____ Register an Existing Well: _____ Replace Existing Well: _____ Increase Size of Existing Well: _____

Increase Pump Size of Existing Well: _____ Abandon/Cap/Plug Existing Well: _____ Perform Dye Trace: _____

Well Owner: Phelps Water Supply Corporation - Special Utility District Phone: 936-295-4051

Address: 455 FM 2296 HUNTSVILLE, TEXAS 77340

Fax: _____ Email: PHELPSWATER @HOTMAIL.COM

Drilling Company: TDB Phone_____

Address _____

Fax: _____ Email: _____

Driller _____License#_____

Well Location: County,WALKER_____ Well Site Address or Location: 177B WATSON LAKE RD, _HUNTSVILLE, TEXAS 77340_____

Latitude: 30.6956 **Longitude** -95.4276

Proposed Water Use: Public Water Supply: x Industrial: _____ Recreational: _____ Commercial: _____

Hydraulic Fracturing: _____ Transport Outside of District: _____

Proposed depth: 1270ft. Aquifer _____ Date drilling is scheduled to begin _____

Proposed casing size: 12 in. Type Proposed casing depth: _____ft. Pump depth: _____ft. Pump size _____hp.

Pump**:** Turbine: GOULDS 7CLC Submersible: _X Windmill: _____ Other (specify): _____

Pump fuel or power source**:** Electricity: _X_ Natural Gas: _____ Wind: _____ Other (specify):_____

Pump Bowls**:** Size 7'' # of Stages: 8 Pump Column**:** Inside Diameter: 4'' in. Length: 550 ft.

Pump discharge pipe: Size 4 in. Rated pump horsepower: 100 **Pump Discharge**: 350 gpm

Water bearing formation: _____

Estimated Annual Water Production: _____ Acre-Feet or 183,960,000 Gallons

If the water produced from this well will be used in whole or in part on property other than the property where the well is located, **describe the location where the water will be used.** Transportation of water produced and moved to another location may require a District Transportation Permit. See District Rules, Section 10 or contact the District office for information.

_____

_____

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Permit form approved on: _____ By: _____ Zach Holland, General Manger

(Continued) NON-EXEMPT WATER WELL DRILLING PERMIT FORM (Continued)

The following documentation, attachments and fee payments must accompany this form when it is submitted for consideration by the District.

a. Plat or map showing location of the property and location on property of well for which form is submitted.
b. If owner and/or operator of a well is different from property owner, provide written documentation from property owner authorizing construction and operation of this well.
c. All the information and documentation required for the type and class of well for which authorization is requested by Section 8 of the District Rules and that information and documentation required by Rule 8.5.
d. Forms for non-exempt well authorizations must be accompanied by the information required by Rule 8.5A1:
   a. 8.5A1(e) – a statement of the projected effect of the proposed withdrawal on the aquifer or aquifer conditions, depletion, subsidence, or effects on existing permit holders or other groundwater users in the District;
   b. 8.5A1(f) – the applicant's water conservation plan or a declaration the applicant and subsequent user will comply with the District's management plan;
   c. 8.5A1(g)(2) – well construction diagram;
   d. 8.5A1(g)(3) – a map showing the location of the proposed well or wells, all existing well, hydrologic features, and geologic features located within half (1/2) mile radius of the proposed well or wells site;
   e. 8.5A1(h) – the applicant's well closure plan or a declaration the applicant will comply with well plugging guidelines and report closure to the applicable authorities, including the District.
e. Payment for applicable fees must accompany the form. Additional fees may apply as documented in the District's adopted Fee Schedule.

Well Development Fee	$75.00	
Operating Permit Application Fee	$375.00	
Hydrogeologic Report Fee – applicable if well completed with eight (8) inches or greater inside casing diameter		
	Phase I-a Report (less than 200MG/yr)	Phase I-b Report (> 200MG/yr)
District Prepared Report	$1,500.00	$7,500.00
Applicant Prepared/District Review	$500.00	$1,500.00

f. Forms for new non-exempt wells must be accompanied by an Operating Permit Application and, if appropriate, a Transport Permit Application.

I, the undersigned applicant, hereby agree and certify that:

a. this well will be drilled within 30 feet of the location specified and not elsewhere;
b. I will furnish the District with a copy of the completed driller's log, any electric log, the well completion report, and any water quality test report within 60 days of completion of this well and prior to production of water there from (other than such production as may be necessary to the drilling and testing of such well);
c. in using this well, I will avoid waste, achieve water conservation, protect groundwater quality and the water produced from this well will be for a beneficial use;
d. I will comply with all District and State well plugging and capping guidelines in effect at the time of well closure;
e. I agree to abide by the terms of the District Rules, the District Management Plan, and orders of the District Board of Directors currently in effect and as they may be modified, changed, and amended from time to time;
f. I hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.

Signature: _____ Date: 7/3/2024

Printed Name: MaKayla Commander Title: Project Manager

NOTES:

1. THE SURVEY HAS BEEN COMPLETED WITHOUT THE BENEFIT OF A TITLE COMMITMENT, NO ABSTRACTING WAS COMPLETED BY THE SURVEYOR WITH REGARD TO ANY RECORDED EASEMENTS, RIGHTS-OF-WAY OR SETBACKS AFFECTING THE SUBJECT PROPERTY. NO ADDITIONAL RESEARCH REGARDING THE EXISTENCE OF EASEMENTS, RESTRICTIONS, OR OTHER MATTERS OF RECORD HAS BEEN PERFORMED BY THE SURVEYOR.

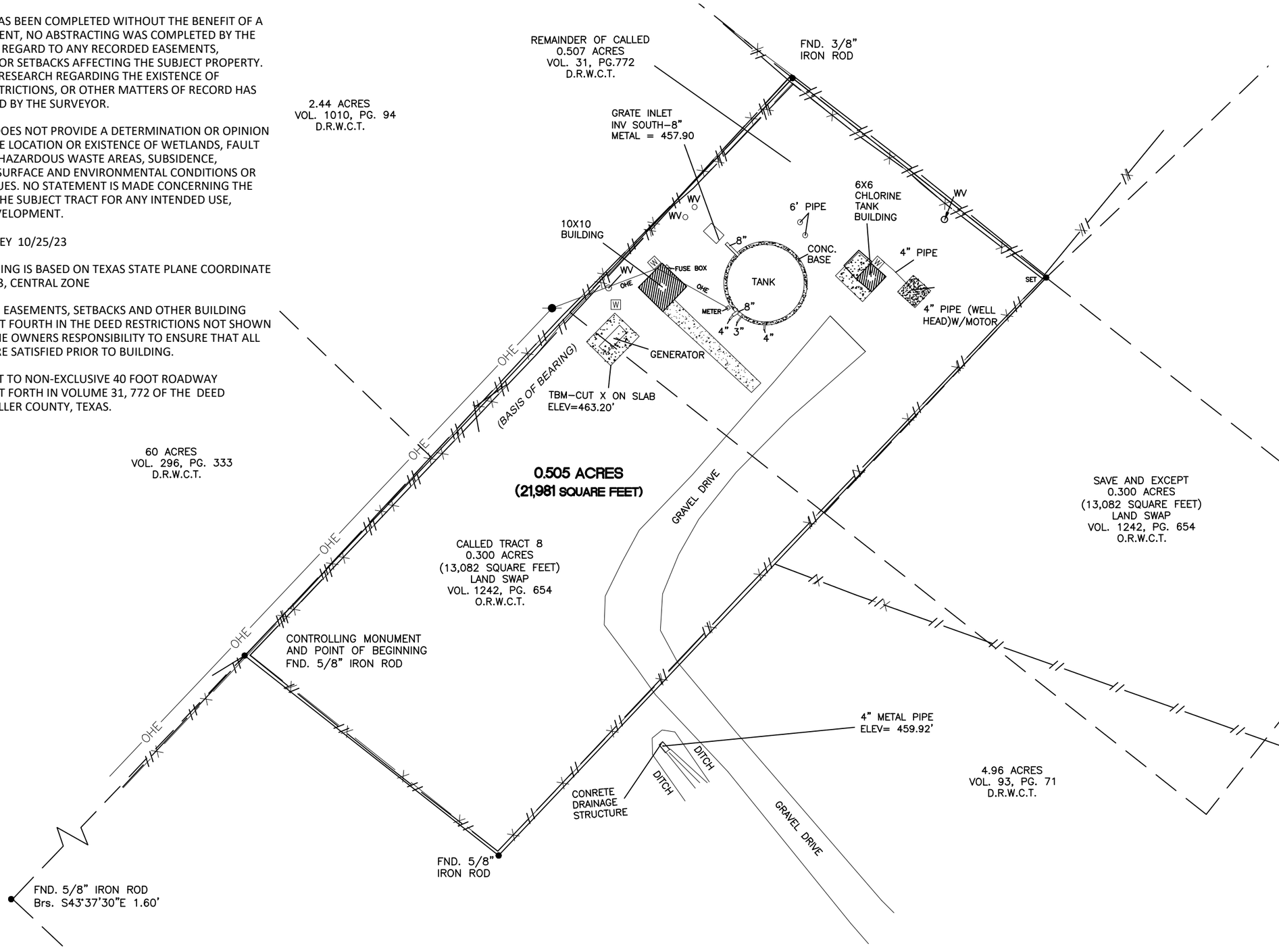
2. THIS SURVEY DOES NOT PROVIDE A DETERMINATION OR OPINION CONCERNING THE LOCATION OR EXISTENCE OF WETLANDS, FAULT LINES, TOXIC OR HAZARDOUS WASTE AREAS, SUBSIDENCE, OVERHEAD, SUBSURFACE AND ENVIRONMENTAL CONDITIONS OR GEOLOGICAL ISSUES. NO STATEMENT IS MADE CONCERNING THE SUITABILITY OF THE SUBJECT TRACT FOR ANY INTENDED USE, PURPOSE OR DEVELOPMENT.

3. DATE OF SURVEY 10/25/23

4. BASIS OF BEARING IS BASED ON TEXAS STATE PLANE COORDINATE SYSYTEM, NAD 83, CENTRAL ZONE

5. THERE MAY BE EASEMENTS, SETBACKS AND OTHER BUILDING RESTRICTIONS SET FOURTH IN THE DEED RESTRICTIONS NOT SHOWN HEREON. IT IS THE OWNERS RESPONSIBILITY TO ENSURE THAT ALL RESTRICTIONS ARE SATISFIED PRIOR TO BUILDING.

6. TRACT SUBJECT TO NON-EXCLUSIVE 40 FOOT ROADWAY EASEMENT AS SET FORTH IN VOLUME 31, 772 OF THE DEED RECORDS OF WALLER COUNTY, TEXAS.



WALKER COUNTY, TEXAS

JOSEPH HOLLIS SURVEY, ABSTRACT 252

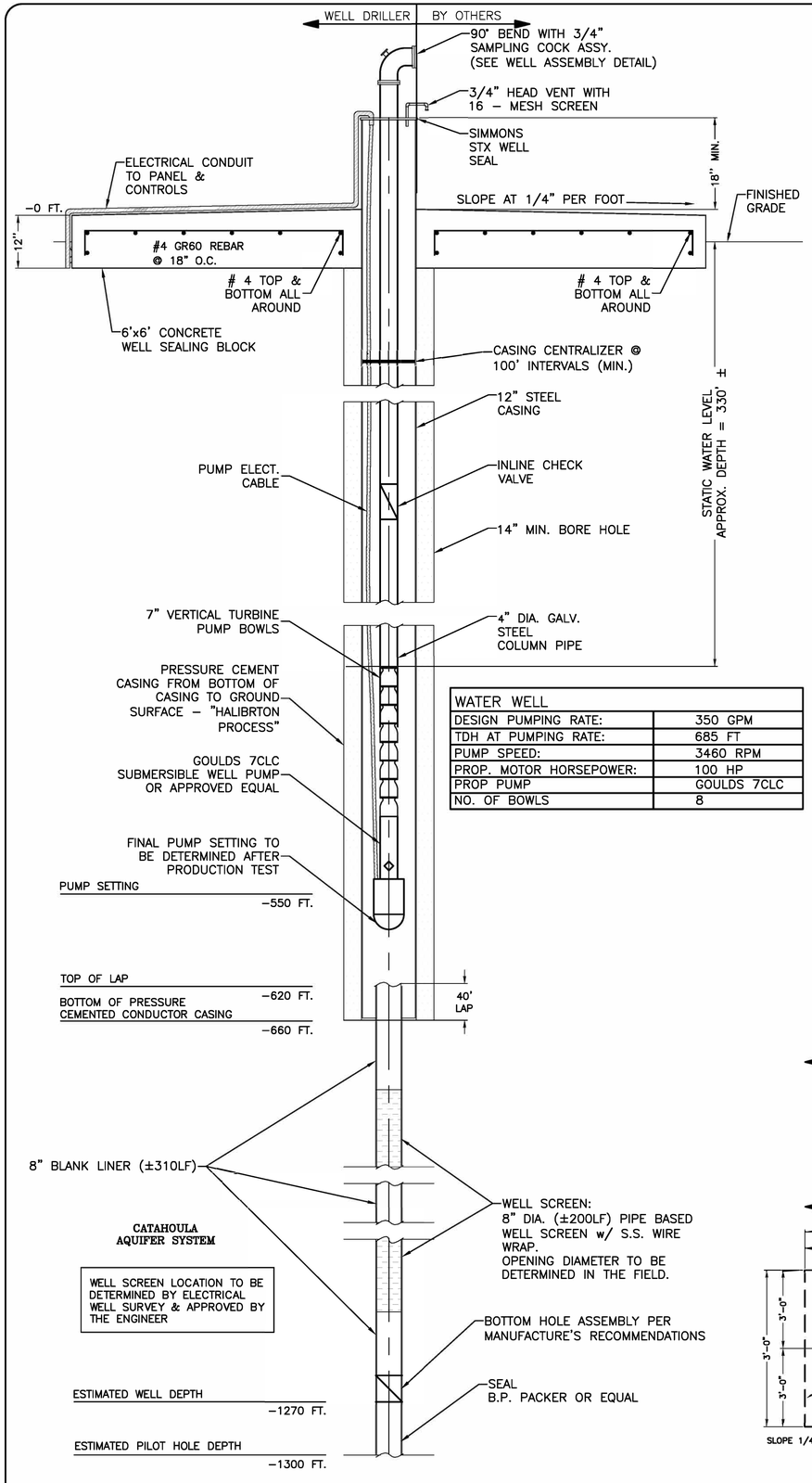
PHELPS SUD WATER PLANT

SYMBOL LEGEND	
●	PROPERTY CORNER
●—	POWER POLE
W	WATER METER
G	GAS METER
T	TELEPHONE PED

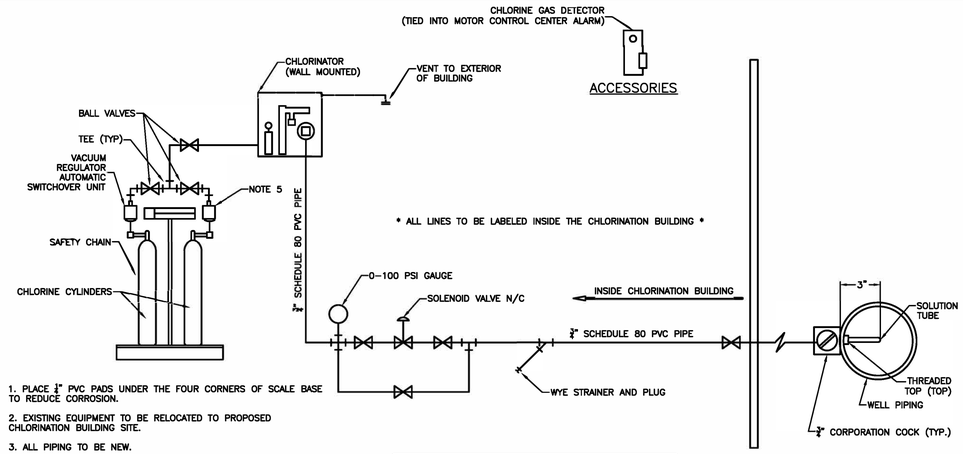
SET= 5/8 INCH IRON ROD WITH CAP STAMPED "BOURLAND SURVEYING"

BOURLAND
LAND SURVEYING, LLC
15121 HIGHWAY 150
COLDSPRING, TX 77331
(936)653-2264
TBPLS FIRM REG # 10194525

PROJECT NO. 23216



WATER WELL	
DESIGN PUMPING RATE:	350 GPM
TDH AT PUMPING RATE:	685 FT
PUMP SPEED:	3460 RPM
PROP. MOTOR HORSEPOWER:	100 HP
PROP PUMP	GOULDS 7CLC
NO. OF BOWLS	8



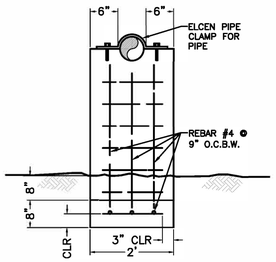
1. PLACE 3/4" PVC PADS UNDER THE FOUR CORNERS OF SCALE BASE TO REDUCE CORROSION.
2. EXISTING EQUIPMENT TO BE RELOCATED TO PROPOSED CHLORINATION BUILDING SITE.
3. ALL PIPING TO BE NEW.
4. CHLORINATOR TO BE VACUUM SYSTEM. PRESSURE SYSTEM NOT ALLOWED.
5. VACUUM REGULATOR VENTS SHALL BE PIPED OUTSIDE BUILDING AWAY FROM DOORS AND INTAKE FAN.

CHLORINE SYSTEM SCHEMATIC
SCALE: N.T.S.

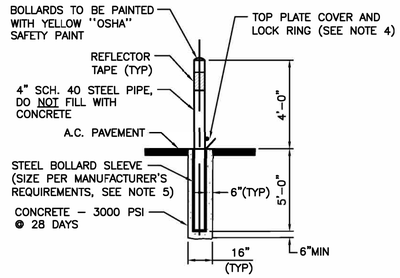
ACCESSORIES

STANDARD NOTES:

1) THE CONTRACTOR SHALL ADHERE TO ALL TCEQ SPECIFICATIONS FOR THE PROPOSED IMPROVEMENTS CONTAINED HEREIN.



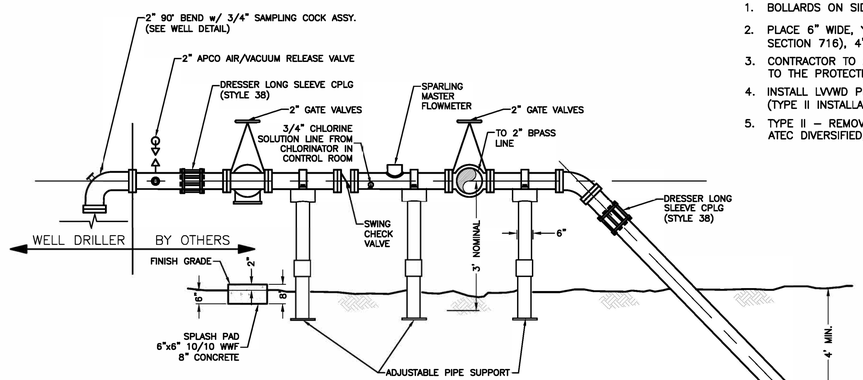
PIPE SUPPORT DETAIL
SCALE: N.T.S.

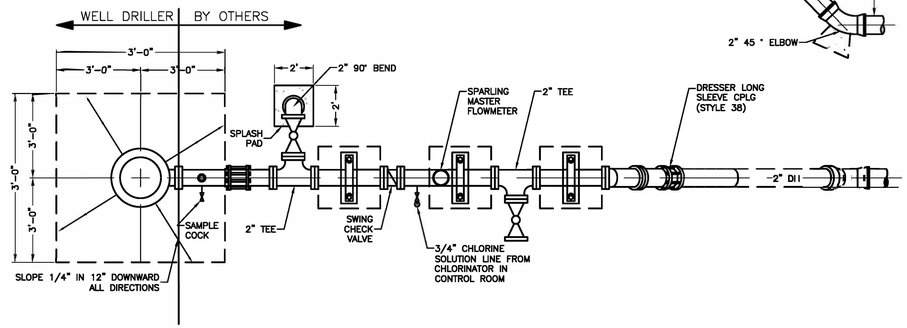


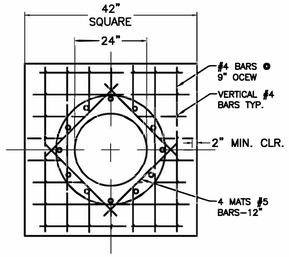
TYPE II
REMOVABLE AND LOCKABLE BOLLARDS

NOTES:

1. BOLLARDS ON SIDE NOT ACCESSIBLE TO VEHICLES MAY BE OMITTED BY ENGINEER.
2. PLACE 6" WIDE, YELLOW CLASS 4 REFLECTIVE TAPE (PER STANDARD SPECIFICATIONS, SECTION 716), 4" DOWN FROM TOP, FOR FULL DIAMETER ON ALL BOLLARDS.
3. CONTRACTOR TO ASSURE THAT BOLLARDS ARE PLACED TO ALLOW FULL ACCESS TO THE PROTECTED FACILITY.
4. INSTALL LVVWD PROVIDED LOCK AFTER INSTALLATION IS COMPLETE (TYPE II INSTALLATIONS ONLY)
5. TYPE II – REMOVABLE BOLLARDS MANUFACTURER: ATEC DIVERSIFIED, MODEL 102 OR APPROVED EQUAL







WELLHEAD CONC. BASE REBAR DETAIL
SCALE: N.T.S.

REV	DATE
COMMENT	
REV	DATE
COMMENT	

STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
PROFESSIONAL ENGINEER
1/5/24

WATER WELL DETAILS

WATER WELL #4
TO SERVE
PHELPS SUD

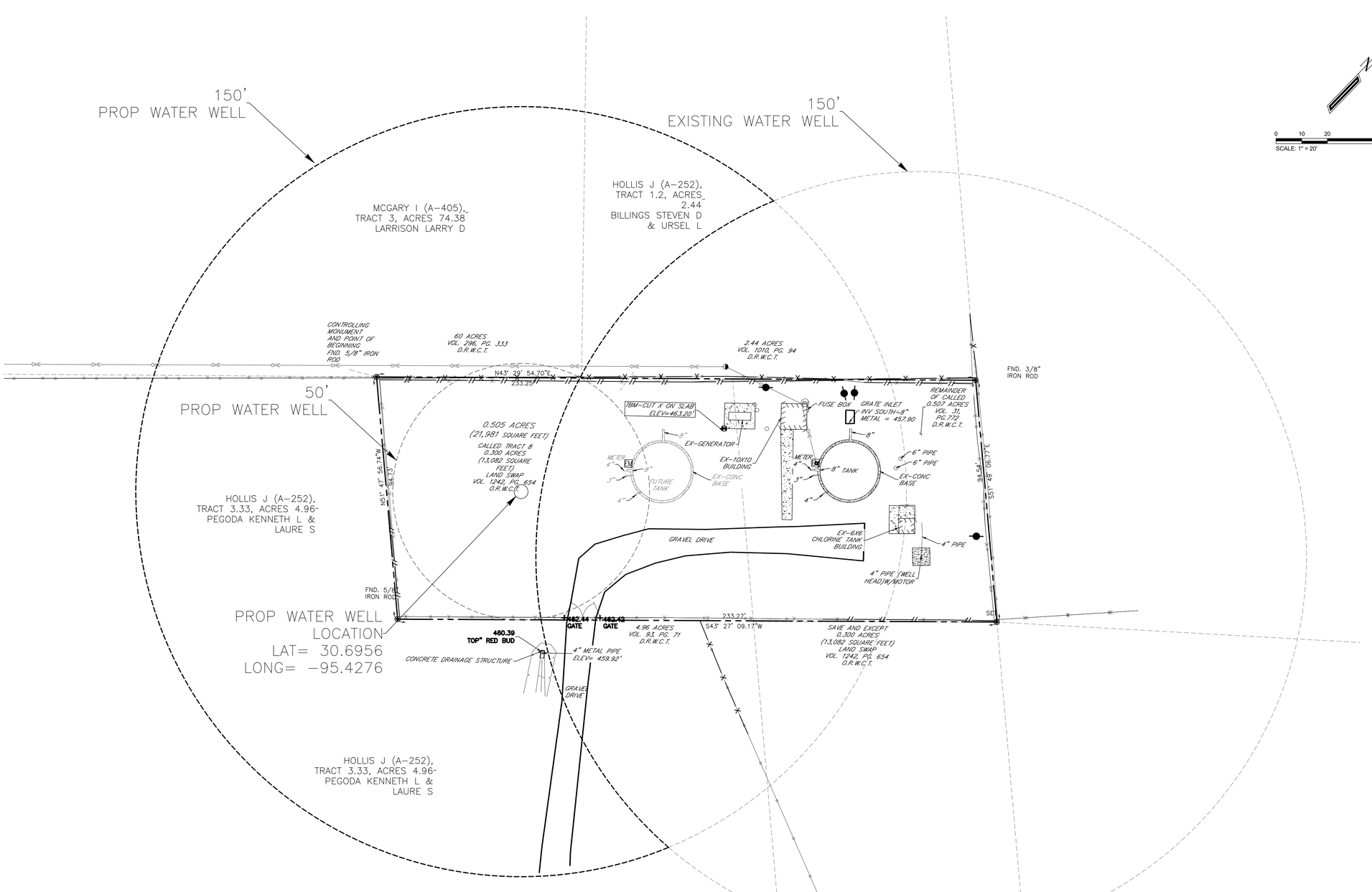
PHELPS WALKER COUNTY, TEXAS

LIGHTPOINT ENGINEERING, LLC
604 W. WORSHAM ST.
WILLIS, TEXAS 77378
TEL: (936) 256-2626
TBPE Firm No. 18938

PREPARED FOR:
PHELPS SUD
455 FM 2296
Huntsville, TX 77340
936.295.4051

JOB #
GCL717-02B

SHEET:
5 OF: 5



REV	DATE
COMMENT	

REV	DATE
COMMENT	

WATER WELL EXHIBIT

WATER WELL #4
TO SERVE
PHELPS SUD

CITY OF PHELPS/WALKER COUNTY, TEXAS

LIGHTPOINT ENGINEERING, LLC
604 W. WORSHAM ST.
WILLIS, TEXAS 77378
TEL (936) 256-2626
TBPE Firm No. 18938

PREPARED FOR:
CENTRAL STATES WATER RESOURCES
1650 DES PERES RD
ST. LOUIS, MO 63131
PHONE: (314) 736-4672

JOB #
GCL717-02B

SHEET:
OF: XX

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 5, 2024

Michael W. Mathena, P.E.
Lightpoint Engineering, LLC
604 W. Worsham Street, Suite 100
Willis, Texas 77378

Re: Phelps SUD- Public Water System ID No. 2360009
Proposed Well No. 4 - Water Plant No. 2
Engineer Contact Telephone: (936) 207-9984
Plan Review Log No. P-01052024-040
Walker County, Texas

CN601572381 RN101175255

Dear Mr. Mathena:

On January 5, 2024, the Texas Commission of Environmental Quality (TCEQ) received planning material for the proposed Well No. 4 for the above referenced public water system. Additional planning material was received on January 24, 2024 via email. Based on our review of the information submitted, the project generally meets the minimum requirements of Title 30 Texas Administrative Code (TAC) Chapter 290 – Rules and Regulations for Public Water Systems and is **conditionally approved for construction** if the project meets the following requirements:

1. Corrosive indices will be used to calculate corrosivity of the water from new source(s). Corrosive or aggressive water could result in aesthetic problems, increased levels of toxic metals, and deterioration of household plumbing and fixtures. **If the water appears to be corrosive**, the system will be required to conduct a study and submit an engineering report that addresses corrosivity issues or may choose to install corrosion control treatment **before use may be granted**. All changes in treatment require submittal of plans and specifications for approval by TCEQ.

2. Your plans showed the schematic of gas chlorine system, and the plans indicated the proposed chlorine building and disinfectant line is "By others". Please note before the approval to use the well, the system must submit sealed planning material of chlorination system in accordance with 30 TAC Section 290.42(e)(4).

3. Similarly, your plans showed well discharge piping, sample cock, flowmeter, and chlorine application point "By Others". Please note before the approval to use the well, the system must submit sealed planning material for the wellhead discharge piping for review and approval.

Please refer to the Plan Review Team's Log No. **P-01052024-040** in all correspondence for this project.

Please complete a copy of the most current Public Water System Plan Review Submittal form for any future submittals to TCEQ. Every blank on the form must be completed to minimize any delays in the review of your project. The document is available on TCEQ's website at the address shown below. You can also download the most current plan submittal checklists and forms from the same address.

https://www.tceq.texas.gov/drinkingwater/udpubs.html

For future reference, you can review part of the Plan Review Team's database to see if we have received your project. This is available on TCEQ's website at the following address:

https://www.tceq.texas.gov/drinkingwater/planrev.html/#status

You can download the latest revision of 30 TAC Chapter 290 - Rules and Regulations for Public Water Systems from this site.

If you have any questions concerning this letter or need further assistance, please contact Pritesh Tripathi at (512) 239-3794 or by email at pritesh.tripathi@tceq.texas.gov or by correspondence at the following address:

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Sincerely,

Jonathan Pi, P.E.
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

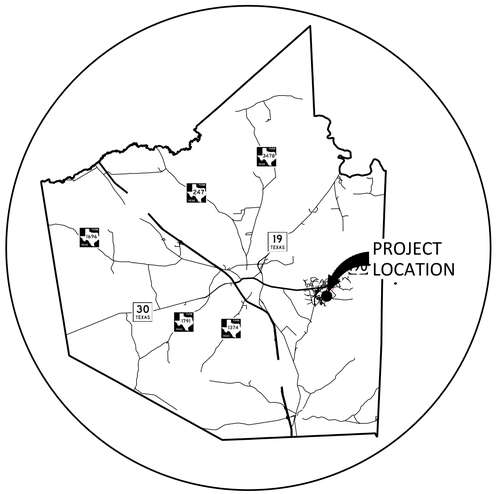
Craig A. Stowell, P.E., Team Leader
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

CAS/JP/pt/av

Enclosure: "Public Well Completion Data Checklist for Approval to Use (Step 2)"

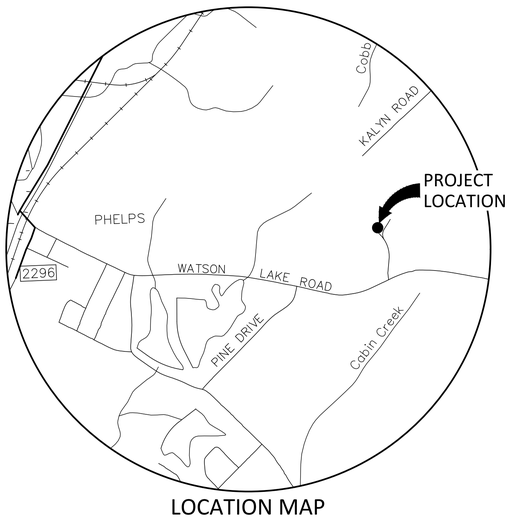
cc: Phelps SUD, Attn: Scott Rohe, Manager, 455 FM 2296 Road, Huntsville, Texas 77340-2424

CONSTRUCTION DRAWINGS FOR
PHELPS SUD
PROPOSED WATER WELL #4
WALKER COUNTY, TEXAS
JANUARY 2024



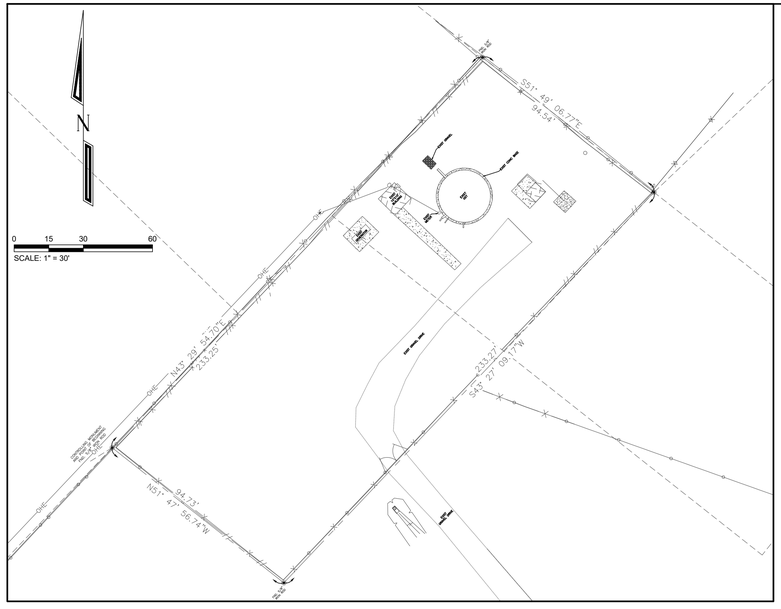
VICINITY MAP

WALKER COUNTY
SCALE : N.T.S.



LOCATION MAP

WALKER COUNTY
SCALE : N.T.S



PROJECT SITE

Sheet List Table	
Sheet Number	Sheet Title
1	COVER
2	CONSTRUCTION NOTES
3	EXISTING SITE PLAN SANITARY SEWER CONTROL EASEMENT LAYOUT
4	EXISTING AND PROPOSED SITE PLAN
5	WATER WELL DETAILS

CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS, AND CONFIRM POINTS OF CONNECTIONS TO EXISTING IMPROVEMENTS, INCLUDING CONFIRMATION OF ELEVATIONS AND GRADES OF EXISTING FACILITIES AND UTILITIES PRIOR TO STARTING ANY GRADING, PAVING OR UTILITY INSTALLATION. VERIFICATION OF LOCATIONS AND FUNCTIONS OF EACH EXISTING STRUCTURE OR SYSTEM AND ALL EXISTING UTILITY GRADES AND INVERT ELEVATIONS IS THE CONTRACTOR'S RESPONSIBILITY. NOTIFY THE ENGINEER OF ANY DISCREPANCIES IMMEDIATELY. ANY CONFLICTS OR ERRORS BETWEEN EXISTING FIELD CONDITIONS AND ENGINEERING PLANS MUST BE RESOLVED PRIOR TO STARTING EXCAVATION OR SETTING ANY GRAVITY SEWER (STORM OR SANITARY) AND APPURTENANCES.

REV	DATE
COMMENT	
REV	DATE
COMMENT	

STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
PROFESSIONAL ENGINEER

1/5/24

COVER

WATER WELL #4
TO SERVE
PHELPS SUD

PHELPS WALKER COUNTY, TEXAS

LIGHTPOINT ENGINEERING, LLC
604 W. WORSHAM ST.
WILLIS, TEXAS 77378
TEL: (936) 256-2626
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PREPARED FOR:
PHELPS SUD
455 FM 2296
Huntsville, TX 77340
936.295.4051

JOB #
GCL717-02B

SHEET:
1 OF: 5

TCEQ WATER WELL GENERAL CONSTRUCTION NOTES

1. These water well facilities must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. At a minimum, construction for public water systems must always meet TCEQ's "Rules and Regulations for Public Water Systems.
2. The premises, materials, tools, and drilling equipment shall be maintained so as to minimize contamination of the groundwater during drilling operation.
3. Water used in any drilling operation shall be of safe sanitary quality. Water used in the mixing of drilling fluids or mud shall contain a chlorine residual of at least 0.5 milligrams per liter (mg/l).
4. The slush pit shall be constructed and maintained so as to minimize contamination of the drilling mud.
5. No temporary toilet facilities shall be maintained within 150 feet of the well being constructed unless they are of a sealed, leakproof type.
6. The construction, disinfection, protection, and testing of a well to be used as a public water supply source must meet the following conditions.
   a. The casing material used in the construction of wells for public use shall be new carbon steel, high strength low alloy steel, stainless steel or plastic. The material shall conform to the most recent American Water Works Association (AWWA) standards. The casing shall extend a minimum of 18 inches above the elevation of the finished floor of the pump room or natural ground surface and a minimum of one inch above the sealing block or pump motor foundation block when provided. The casing shall extend at least to the depth of the shallowest water formation to be developed and deeper, if necessary, in order to eliminate all undesirable water bearing strata. Well construction materials containing more than 0.25 percent lead are prohibited.
   b. The space between the casing and drill hole shall be sealed by using enough cement under pressure to completely fill and seal the annular space between the casing and the drill hole. The well casing shall be cemented in this manner from the top of the shallowest formation to be developed to the earth's surface. The driller shall utilize a pressure cementation method in accordance with the AWWA standard for water wells (A100-15) or most recent, Appendix C: Section C.2 (Positive Displacement Exterior Method); Section C.3 (Interior Method Without Plug); Section C.4 (Positive Placement, Interior Method, Drillable Plug); and Section C.5 (Placement Through Float Shoe Attached To Bottom Of Casing).
   c. The grouting mixture used to pressure cement the annular space shall be neat cement as specified in the most recent AWWA Standard for Water Wells and to which a maximum of 6%, by dry weight, bentonite and 2%, by dry weight, calcium chloride may be added. The minimum annular space between the outside diameter of the casing pipe and the borehole shall be no less than 1 1/2 inches in radial thickness or three inches in net diametrical difference and the pressure grouting shall be from the bottom upward utilizing one of the methods listed in this subparagraph for all public water system groundwater well construction.
   d. All gravel shall be of selected and graded quality and shall be thoroughly disinfected with a 50 mg/l chlorine solution as it is added to the well cavity.
   e. Safeguards shall be taken to prevent possible contamination of the water or damage by trespassers following the completion of the well and prior to installation of permanent pumping equipment.
   f. Upon well completion, or after an existing well has been reworked, the well shall be disinfected in accordance with recent AWWA Standard C654-13 or most recent for well disinfection except that the disinfectant shall remain in the well for at least 12 hours.
7. Dechlorination of disinfecting water shall be in strict accordance with current AWWA Standard C655-09 or most recent.
8. The well site shall be fine graded so that the site is free from depressions, reverse grades, or areas too rough for proper ground maintenance so as to ensure that surface water will drain away from the well. In all cases, arrangements shall be made to convey well pump drainage, packing gland leakage, and floor drainage away from the wellhead. Suitable drain pipes located at the outer edge of the concrete floor shall be provided to collect this water and prevent its ponding or collecting around the wellhead. This wastewater shall be disposed of in a manner that will not cause any nuisance from mosquito breeding or stagnation. Drains shall not be directly connected to storm or sanitary sewers.
9. A concrete sealing block extending at least three feet from the well casing in all directions, with a minimum thickness of six inches and sloped to drain away at not less than 0.25 inches per foot shall be provided around the wellhead.
10. Wellheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well water. A well casing vent shall be provided with an opening that is covered with 16-mesh or finer corrosion resistant screen, facing downward, elevated and located so as to minimize the drawing of contaminants into the well. Wellheads and well vents shall be at least two feet above the highest known watermark or 100 year flood elevation, if available or adequately protected from possible flood damage by levees.
11. If a well blow off line is provided, its discharge shall terminate in a downward direction and at a point which will not be submerged by flood waters.
12. A suitable sampling cock shall be provided on the discharge pipe of each well pump prior to any treatment.
13. Flow measuring devices shall be provided for each well to measure production yields and provide for the accumulation of water production data. These devices shall be located to facilitate daily reading.
14. All completed well units shall be protected by intruder resistant fences, the gates of which are provided with locks or shall be enclosed in locked, ventilated well houses to exclude possible contamination or damage to the facilities by trespassers. The gates or well houses shall be locked during periods of darkness and when the plant is unattended.
15. An all-weather access shall be provided to each well site.
16. 16. An air release device shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion resistant screening material or an acceptable equivalent.

GENERAL NOTES

1. REVISIONS TO THESE ENGINEERING PLANS MUST BE AUTHORIZED BY LIGHTPOINT ENGINEERING PRIOR TO CONSTRUCTION. (936) 256-2626
2. CONTRACTOR SHALL NOTIFY LIGHTPOINT ENGINEERING, MR. DAN POWERS (936-230-0120), AND SCOTT ROWE, 48 HOURS PRIOR TO START OF CONSTRUCTION.
3. THE CONTRACTOR SHALL:
   a. NOTIFY ALL APPROPRIATE UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION.
   b. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT PRIOR ENGINEER APPROVAL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY AND SAFETY PROVISIONS FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR THE STORAGE OF MATERIALS IN SAFE AND WORKMANLIKE MANNER TO PREVENT INJURIES DURING ALL HOURS UNTIL PROJECT COMPLETION.
5. CONTRACTOR IS RESPONSIBLE FOR KEEPING ACCURATE RECORDS SHOWING THE INSTALLED LOCATIONS OF ALL IMPROVEMENTS, AND SHALL PROVIDE TO THE ENGINEER UPON PROJECT COMPLETION.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING THE MUD AND/OR DIRT DEPOSITED ON EXISTING PAVEMENT DUE TO HIS CONSTRUCTION ACTIVITY DAILY. ALL EQUIPMENT AND DEBRIS FROM CONSTRUCTION TO BE REMOVED FROM THE SITE AT END OF PROJECT.
7. AFTER DISTURBED AREAS HAVE BEEN COMPLETED TO THE LINES, GRADES, AND CROSS-SECTIONS SHOWN ON THE PLANS, CONTRACTOR IS RESPONSIBLE FOR ACHIEVING 70% VEGETATION COVERAGE.
8. SIGNING, BARRICADING AND LIGHTING FOR CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND OTHER APPLICABLE STATE OR LOCAL STANDARDS. SIGNS, BARRICADES AND LIGHTS SHALL BE KEPT CLEAN, OPERATIONAL AND PROPERLY POSITIONED TO ASSURE PROPER SAFETY PRECAUTIONS.
9. ALL TESTING PROCEDURES USED ON THIS PROJECT SHALL CONFORM TO THE TCEQ, AWWA, NSF OR OTHER APPLICABLE STANDARDS. THE TESTING EXPENSE SHALL BE BORNE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
10. 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 910.130 (1) AND PART 1926.440 (A) (15) REQUIRE A MINIMUM CLEARANCE OF 10 FEET FROM THESE FACILITIES. THE ABOVE LAWS CARRY BOTH CRIMINAL AND CIVIL LIABILITIES, WITH CONTRACTORS AND OWNERS BEING LEGALLY RESPONSIBLE FOR THE SAFETY OF WORKERS UNDER THESE LAWS. IF YOU OR YOUR COMPANY MUST WORK NEAR OVERHEAD POWER LINES, CALL THE POWER COMPANY FOR THE LINES TO BE DE-ENERGIZED AND/OR MOVED AT YOUR EXPENSE.
11. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES WITH FACILITIES IN THE PROJECT LOCATION A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES IN THE RESPECTIVE WORK AREAS. ADEQUATE PROVISIONS FOR PROTECTING EXISTING FACILITIES SHOULD BE EMPLOYED.
12. ALL UNDERGROUND UTILITY LINES, SHOWN ON THE PLANS ARE TO MAKE THE CONTRACTOR AWARE THAT THE EXIST. NEITHER THE OWNER, NOR THE ENGINEER GUARANTEES THEIR ACCURACY. THERE IS NO GUARANTEE THAT ALL EXISTING UTILITIES ARE SHOWN.
13. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL CROSSINGS TO DETERMINE IF CONFLICTS EXIST BEFORE COMMENCING ANY CONSTRUCTION. NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICTS.
14. THE LATEST TCEQ REGULATIONS MUST BE FOLLOWED FOR CROSSINGS OF SANITARY SEWER MAINS AND WATER MAINS. IT IS THE INTENT THAT THE MOST ECONOMICALLY ACCEPTABLE ALTERNATIVE BE USED. ACCORDINGLY, FIELD VERIFICATION OF EXISTING UTILITY GRADES IS IMPERATIVE.
15. FINAL COVER OF INSTALLED LINES SHALL NOT BEGIN PRIOR TO OBSERVATION AND ACCEPTANCE BY THE OWNER OR ENGINEER.
16. CONNECTIONS TO EXISTING LINES SHALL INCLUDE ALL REQUIRED FITTINGS AND MATERIALS REQUIRED TO MAKE A TIE IN MEETING ALL APPLICABLE REQUIREMENTS.
17. THE LOADING AND UNLOADING OF ALL MATERIALS AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PRACTICES AND SHALL TAKE PLACE ON THE SITE. THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE AREAS FOR MATERIALS AND EQUIPMENT.
18. ALL MATERIALS AND EQUIPMENT SHALL BE BOTH FURNISHED AND INSTALLED UNLESS OTHERWISE NOTED.
19. CONSTRUCTION SHALL COMPLY WITH THE LATEST REVISIONS OF OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING TRENCHING AND SHORING. CONTRACTOR SHALL PROVIDE A TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATION, PART 1926, SUB-PART P AS PUBLISHED IN THE FEDERAL REGISTER, VOLUME 54, NO. 209, DATED OCTOBER 31, 1989, AND LATEST REVISIONS.
20. DETAILS PREPARED DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY CHAPTER 756, SUBCHAPTER "C" OF THE TEXAS HEALTH AND SAFETY CODE.
21. CONTRACTOR IS RESPONSIBLE FOR COVERING OPEN EXCAVATIONS DURING NON-WORKING HOURS.
22. ALL TRENCHES, INCLUDING TRENCHES FOR LEADS AND STUBS UNDER PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PAVEMENT SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND AS PER SPECIFICATION TO A POINT IMMEDIATELY BELOW THE SUBGRADE. TRENCHES OTHER THAN UNDER PAVEMENT SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL IN 6 INCH LAYERS AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D-698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CEMENT STABILIZED SAND SPECIFICATIONS. SEE DETAIL SHEETS FOR BEDDING AND OTHER DESIGN REQUIREMENTS.
23. CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS, AND CONFIRM POINTS OF CONNECTIONS TO EXISTING IMPROVEMENTS, INCLUDING CONFIRMATION OF ELEVATIONS AND GRADES OF EXISTING FACILITIES AND UTILITIES PRIOR TO STARTING ANY GRADING, PAVING OR UTILITY INSTALLATION. VERIFICATION OF LOCATIONS AND FUNCTIONS OF EACH EXISTING STRUCTURE OR SYSTEM AND ALL EXISTING UTILITY GRADES AND INVERT ELEVATIONS IS THE CONTRACTOR'S RESPONSIBILITY. NOTIFY THE ENGINEER OF ANY DISCREPANCIES IMMEDIATELY. ANY CONFLICTS OR ERRORS BETWEEN EXISTING FIELD CONDITIONS AND ENGINEERING PLANS MUST BE RESOLVED PRIOR TO STARTING EXCAVATION OR SETTING ANY GRAVITY SEWER (STORM OR SANITARY) AND APPURTENANCES. CONTRACTOR IS RESPONSIBLE FOR COMPLETING CERTIFICATION FORM 006293 IN THE BID PACKAGE PRIOR TO START OF CONSTRUCTION.
24. ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING VEGETATION, ROOTS, CONCRETE AND DEBRIS SHALL BE HAULED OFF-SITE BY THE CONTRACTOR. INCLUDE COST OF THIS WORK, INCLUDING HAUL, IN OTHER ITEMS OF THIS PROJECT.
25. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED FACILITIES.
26. CONTRACTOR SHALL CONFINE ALL WORK EFFORTS WITHIN THE DESIGNATED WORK AREA UNLESS SPECIFICALLY AUTHORIZED BY THE OWNER. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO NEIGHBORING PROPERTIES.
27. THIS DESIGN WAS BASED ON A SURVEY PROVIDED BY OTHERS.
28. CONTRACTOR IS RESPONSIBLE OF SITE SECURITY AT EACH WATER PLANT SITE DURING CONSTRUCTION.

WATER GENERAL NOTES

1. ALL PVC WATER MAINS USED IN THIS PROJECT RANGING IN SIZE FROM 6" THROUGH 16" SHALL BE C-900-81 OR LATEST REVISION.
2. ALL WATER MAINS UNDER STREET PAVEMENT - 4" THROUGH 12" IN DIAMETER, IF NOT SPECOFOED OTHERWISE, SHALL BE AWWA C-900 PVC PIPE.
3. ALL WATER LINES, AFTER INSTALLATION, SHALL BE THOROUGHLY DISINFECTED ACCORDING TO AWWA SPECIFICATIONS C-601 AND THEN FLUSHED BEFORE BEING PLACED INTO SERVICE. WATER SAMPLES SHALL BE COLLECTED FOR BACTERIOLOGIC ANALYSIS AND LINES SHALL NOT BE ACCEPTED FOR SERVICE UNTIL WATER SAMPLES MEET THE REQUIREMENTS OF THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION.
4. CONTRACTOR TO ALLOW MINIMUM 6" CLEARANCE BETWEEN PROPOSED WATER LINE AND OTHER EXISTING OR PROPOSED UTILITIES.
5. MINIMUM OF ONE JOINT OF PIPE SHALL BE INSTALLED GATE VALVE AND PLUG ON DEAD END LINES.

CAUTION UNDERGROUND GAS FACILITIES

LOCATION OF ENTEX MAIN LINES (TO INCLUDE UNIT GAS TRANSMISSION, AND/OR INDUSTRIAL GAS SUPPLY CORPORATION, WHERE APPLICABLE) AS SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (7130223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED. 1.) WHEN ENTEX PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713)967-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS. 2.) WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF ENTEX FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. 3.) WHEN ENTEX FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

STANDARD CONSTRUCTION NOTES - WATER PLANTS

1. ALL INTERNAL PLANT PIPING SHALL BE DUCTILE IRON PIPE OR WELDED STEEL PIPE RATED FOR AN INTERNAL WORKING PRESSURE OF 150 PSI. PIPE USED WITH THREADED OR FLANGED CONNECTIONS SHALL BE THICKNESS CLASS 53 (MINIMUM). ALL PIPING SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH ANSI/AWWA C151-96.
2. DUCTILE IRON AND WELDED STEEL PIPE WILL BE CEMENT MORTAR LINED IN ACCORDANCE WITH ANSI/AWWA C104-A21.4-95 (AND NSF STANDARD 51). ALL OTHER PIPE SHALL HAVE INTERNAL COATING WHICH MEETS NSF STANDARD 61.
3. FLANGED FITTINGS AND/OR COMPRESSION-TYPE PUSH ON FITTINGS SHALL BE RATED FOR AN INTERNAL WORKING PRESSURE OF 150 PSI. ALL FITTINGS SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH ANSI/AWWA C110/A21.10-93.
4. ALL THREADED FLANGES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH ANSI/AWWA C115/A21.15-94.
5. CONCRETE THRUST BLOCKS SHALL BE PROVIDED AT ALL UNDERGROUND TEES, BENDS AND LATERALS. THEY SHALL BE BUILT IN ACCORDANCE WITH DETAILS PROVIDED.
6. ALL ABOVE GROUND DUCTILE IRON PIPE CONNECTIONS SHALL BE FLANGED. UNDERGROUND DUCTILE IRON PIPING CONNECTIONS AT TO BE BOLTLESS AND PUSH-ON AFTER THE FIRST JOINT BELOW GRADE.
7. ALL FLANGES BELOW GRADE SHALL HAVE STAINLESS STEEL BOLTS AND NUTS.
8. ALL INTERNAL WATER PLANT VALVES SHALL OPEN COUNTERCLOCKWISE. VALVES WITHIN PUBLIC STREET RIGHTS-OF-WAY SHALL OPEN CLOCKWISE. ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH ANSI/AWWA C509-94 (GATE VALVES) AND ANSI/AWWA C504-94 (BUTTERFLY VALVES).
9. ALL ABOVE-GRADE VALVES 12 INCHES AND SMALLER SHALL BE FLANGED AND OS&Y GATE VALVES WITH RESILIENT SEATS.
10. ALL BELOW-GRADE VALVES 12 INCHES AND SMALLER SHALL BE N.R.S GATE VALVES WITH RESILIENT SEATS, GASKETED AND HUB-ENDS, EXCEPT WHERE FLANGED ENDS ARE CALLED OUT ON THE DRAWINGS.
11. ALL VALVES LARGER THAN 12-INCH SHALL BE GASKETED, FLANGED RUBBER SEATED BUTTERFLY VALVES. ABOVE-GROUND BUTTERFLY VALVES SHALL HAVE POST INDICATOR AND HANDWHEEL.
12. ALL BURIED VALVES SHALL BE EQUIPPED WITH VALVE BOXES.
13. SIX-INCH TO 12-INCH WATER LINES SHALL HAVE A MINIMUM COVER OF FOUR FEET. 16-INCH AND LARGER WATER LINES SHALL HAVE A MINIMUM COVER OF FIVE FEET.
14. ALL EXCAVATIONS OVER FIVE FEET DEEP SHALL HAVE TRENCH SAFETY SYSTEM.
15. ALL WATERLINE CONSTRUCTION IS TO BE ACCOMPLISHED IN ACCORDANCE WITH THE LATEST EDITION OF CITY OF HOUSTON STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.
16. ALL PIPE SHALL BE SUPPLIED IN ACCORDANCE WITH SECTION 02610. ALL BURIED DUCTILE IRON PIPE SHALL BE COVERED WITH 8 MILS MINIMUM OF COAL TAR EPOXY AND WRAPPED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH ANSI/AWWA C105/A21.5-93.
17. ALL PRESSURE OR ALTITUDE GAUGES SHALL HAVE A 4-1/2" FACE DIAMETER, LIQUID FILLED STAINLESS STEEL CASE WITH 1/2" BOTTOM CONNECTION.
18. PROVIDE PROTECTIVE COATING FOR TANKS, PIPING, VALVES, CONTROL BUILDING AND OTHER APPURTENANCES IN ACCORDANCE WITH SECTION 09916.
19. CONTRACTOR SHALL FOLLOW CONSTRUCTION DETAILS IF DRAWINGS DIFFER FROM REFERENCE STANDARDS.
20. SITE FENCING SHALL CONSIST OF A SIX FOOT HIGH CHAIN LINK FENCE WITH THREE STRANDS OF BARBED WIRE.
21. ALL KNOWN EXISTING OR FUTURE SANITARY SEWER LINES WITHIN 200 FEET OF THE WATER PLANT ARE SHOWN.
22. HYDRO-MULCH SEED THE DISTURBED AREAS OF THE PLANT IN ACCORDANCE WITH SPECIFICATIONS.
23. CONTRACTOR SHALL OBTAIN ALL CITY, COUNTY, STATE AND FEDERAL PERMITS. ENGINEER WILL ASSIST WHERE NECESSARY. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY MONTGOMERY COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.
24. CONTRACTOR TO CONTACT THE UTILITY COORDINATING COMMITTEE FOR LOCATION OF EXISTING FACILITIES AT LEAST 48 HOURS BEFORE STARTING CONSTRUCTION.
25. CONTRACTOR SHALL PROTECT, MAINTAIN, AND RESTORE TO ORIGINAL CONDITION OR BETTER ANY ON-SITE OR OFF-SITE AREAS THAT ARE AFFECTED BY CONSTRUCTION.
26. REINFORCED WELDED WIRE FABRIC WILL BE PROVIDED IN SHEETS. ROLLED WELDED WIRE FABRIC IS NOT ALLOWED.
27. NEAT FORMS ARE ALLOWED ON ALL FOUNDATIONS EXCEPT GROUND STORAGE TANK RINGS. GROUND STORAGE TANK RINGS MUST BE INSPECTED FOR HONEYCOMBING INSIDE AND OUT PRIOR TO BACKFILL.

REV	DATE
COMMENT	

REV	DATE
COMMENT	

STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
PROFESSIONAL ENGINEER

1/5/24

CONSTRUCTION NOTES

WATER WELL #4
TO SERVE
PHELPS SUD

PHELPS WALKER COUNTY, TEXAS

LIGHTPOINT ENGINEERING, LLC
604 W. WORSHAM ST.
WILLIS, TEXAS 77378
TEL (936) 256-2626
TBPE Firm No. 18938

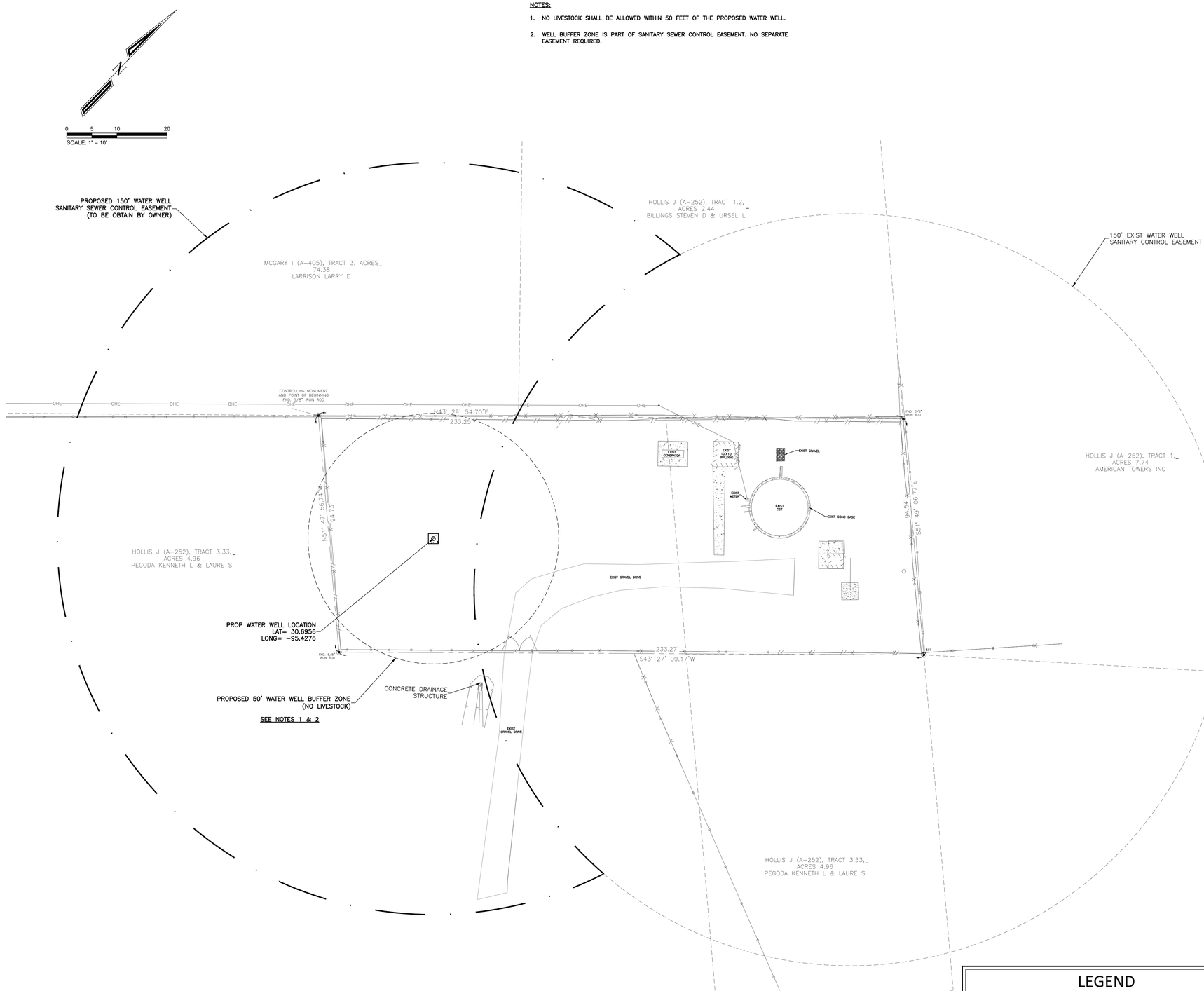
PREPARED FOR:
PHELPS SUD
455 FM 2296
Huntsville, TX 77340
936.295.4051

JOB #
GCL717-02B

SHEET:
2 OF: 5

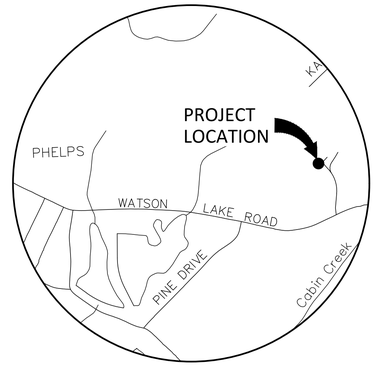
NOTES:

1. NO LIVESTOCK SHALL BE ALLOWED WITHIN 50 FEET OF THE PROPOSED WATER WELL.
2. WELL BUFFER ZONE IS PART OF SANITARY SEWER CONTROL EASEMENT. NO SEPARATE EASEMENT REQUIRED.



LEGEND

- PROPOSED 50' SANITARY SEWER BUFFER ZONE
- PROPOSED 150' SANITARY SEWER CONTROL EASEMENT
- EXISTING 150' SANITARY SEWER CONTROL EASEMENT



LOCATION MAP

WALKER COUNTY
SCALE : N.T.S.

CAUTION!!

BEFORE YOU DIG – CALL

DIG TESS	(800) 344-8377
SAM HOUSTON ELEC. CO-OP	(800) 458-0381
CONSOLIDATED COMMUNICATIONS 800-1611 SERVICE	811 FOR BURIED OR 1-(888)
LONE STAR NOTIFICATION CENTER RELIANT ENERGY ENTEX	(800) 669-8344

LOCATION OF EXISTING UNDERGROUND UTILITY LINES INDICATED ON THIS PLAN ARE APPROXIMATE, AND THE CONTRACTOR SHALL VERIFY THEIR LOCATION PRIOR TO COMMENCEMENT OF ANY TRENCHING OR EXCAVATION OPERATIONS. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES.

ALL CONSTRUCTION SHALL BE DONE PER TCEQ STANDARD SPECIFICATIONS; LATEST REVISIONS.

REV	DATE
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REV	DATE
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STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
PROFESSIONAL ENGINEER

1/5/24

EXISTING SITE PLAN SANITARY SEWER CONTROL EASEMENT LAYOUT

WATER WELL #4
TO SERVE
PHELPS SUD

PHELPS WALKER COUNTY, TEXAS

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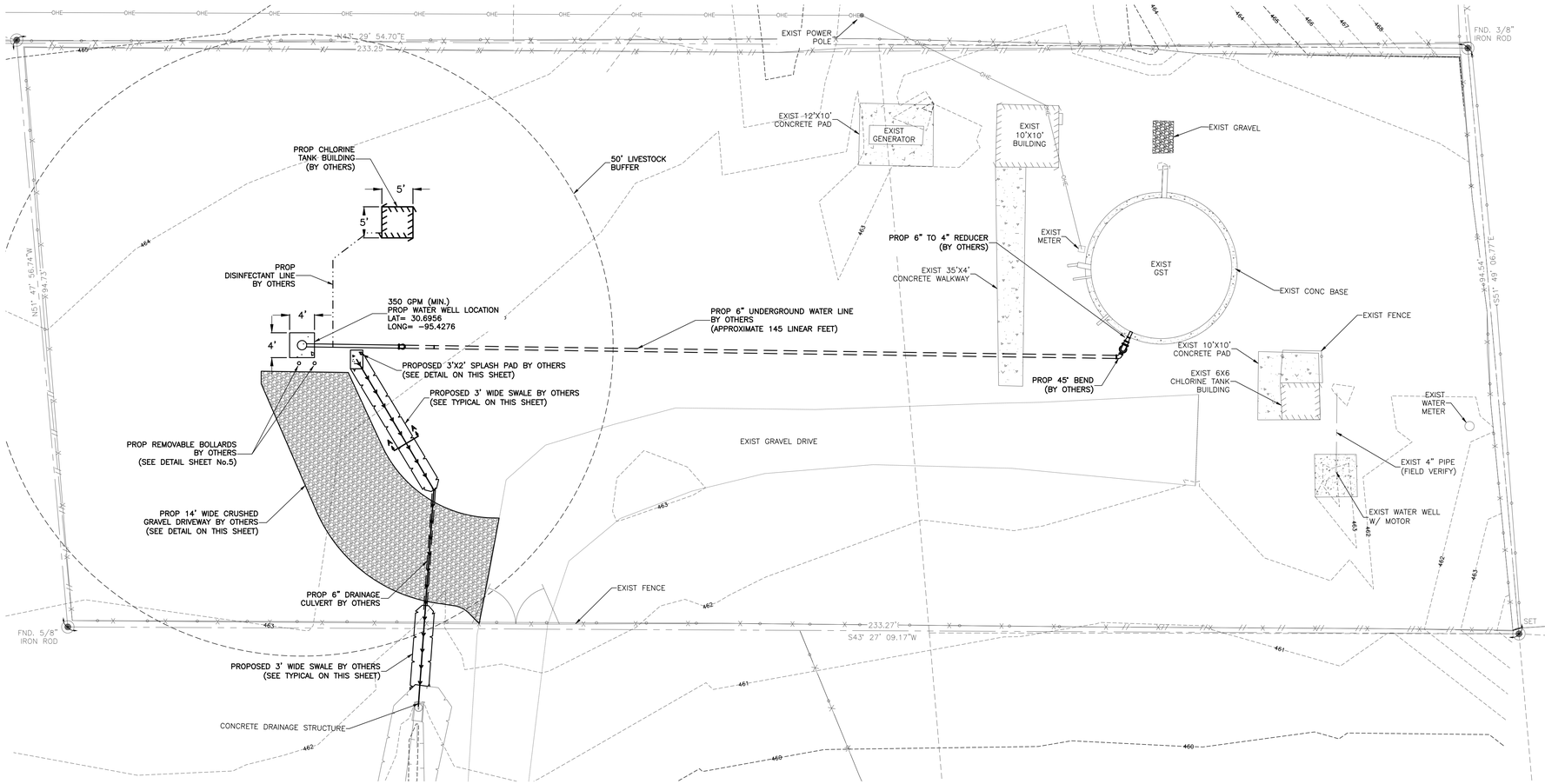
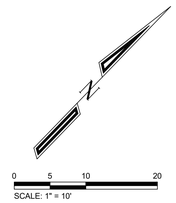
SHEET:
3 OF: 5

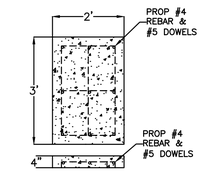
PROPOSED WATER PLANT REPAIRS & IMPROVEMENTS



LEGEND

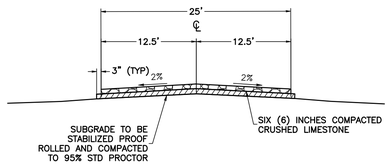
- PROPOSED ABOVE GROUND PIPING
- PROPOSED UNDERGROUND PIPING
- PROPOSED UNDERGROUND DISINFECTANT LINE
- PROPOSED 50' SANITARY SEWER CONTROL EASEMENT





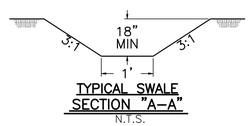
CONCRETE SPLASH PAD DETAIL

SCALE: N.T.S.



TYPICAL DRIVE SECTION GRAVEL PAVING DETAIL

SCALE: N.T.S.



TYPICAL SWALE SECTION "A-A"

N.T.S.

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LONE STAR NOTIFICATION CENTER RELIANT ENERGY ENTEX	(800) 669-8344

LOCATION OF EXISTING UNDERGROUND UTILITY LINES INDICATED ON THIS PLAN ARE APPROXIMATE, AND THE CONTRACTOR SHALL VERIFY THEIR LOCATION PRIOR TO COMMENCEMENT OF ANY TRENCHING OR EXCAVATION OPERATIONS. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES.

ALL CONSTRUCTION SHALL BE DONE PER TCEQ STANDARD SPECIFICATIONS; LATEST REVISIONS.

REV	DATE
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REV	DATE
COMMENT	

STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
PROFESSIONAL ENGINEER

1/5/24

EXISTING AND PROPOSED SITE PLAN

WATER WELL #4
TO SERVE
PHELPS SUD

PHELPS WALKER COUNTY, TEXAS

LIGHTPOINT ENGINEERING, LLC
604 W. WORSHAM ST.
WILLIS, TEXAS 77378
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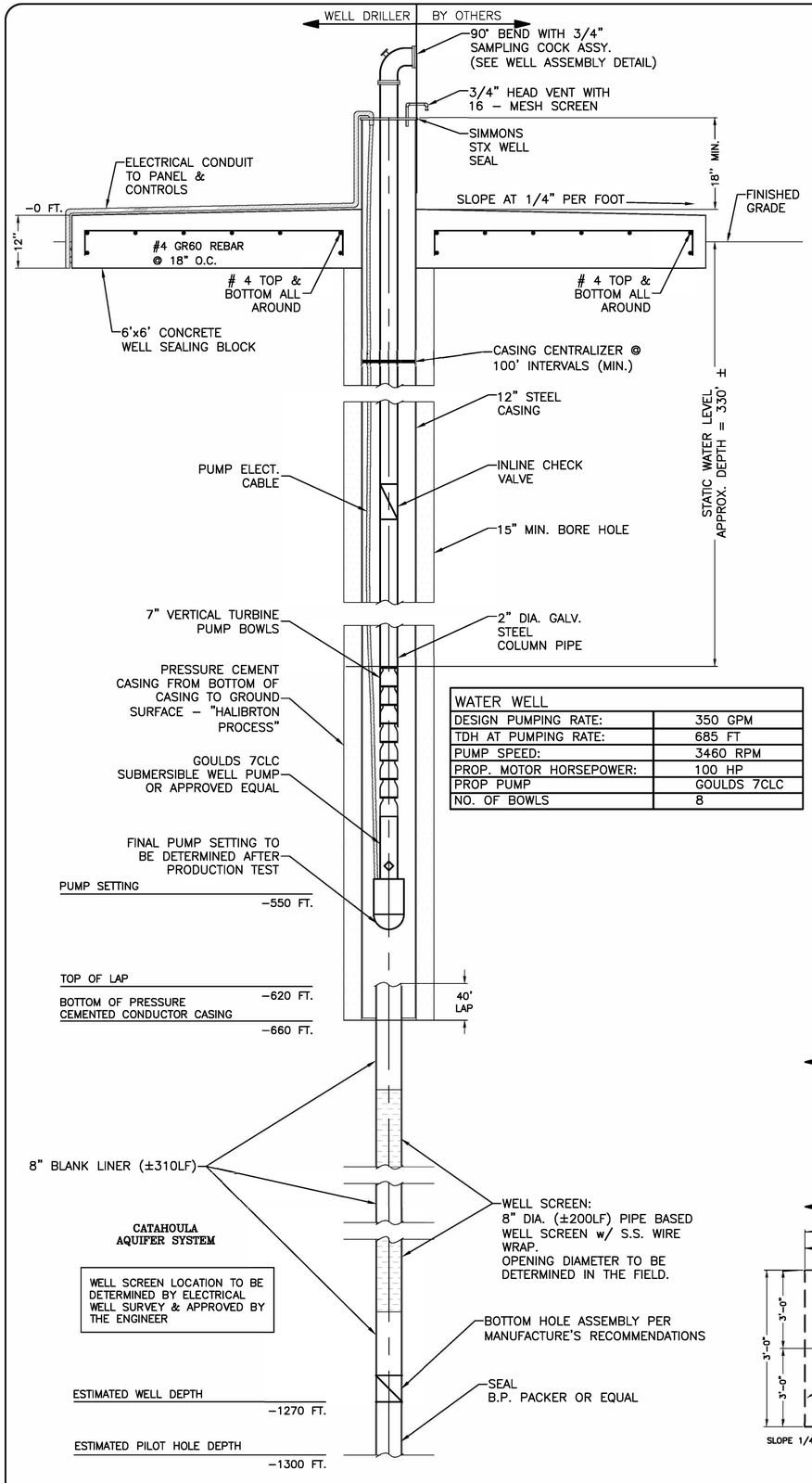
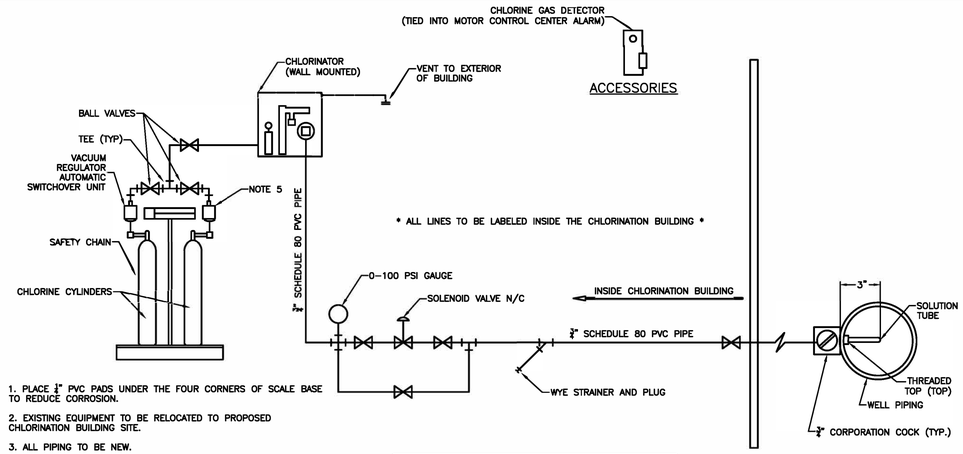
4 OF: 5



WATER WELL	
DESIGN PUMPING RATE:	350 GPM
TDH AT PUMPING RATE:	685 FT
PUMP SPEED:	3460 RPM
PROP. MOTOR HORSEPOWER:	100 HP
PROP PUMP	GOULDS 7CLC
NO. OF BOWLS	8



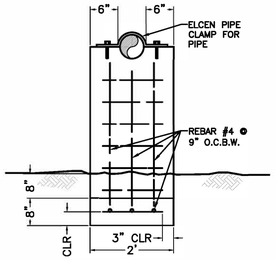
1. PLACE 3/4" PVC PADS UNDER THE FOUR CORNERS OF SCALE BASE TO REDUCE CORROSION.
2. EXISTING EQUIPMENT TO BE RELOCATED TO PROPOSED CHLORINATION BUILDING SITE.
3. ALL PIPING TO BE NEW.
4. CHLORINATOR TO BE VACUUM SYSTEM. PRESSURE SYSTEM NOT ALLOWED.
5. VACUUM REGULATOR VENTS SHALL BE PIPED OUTSIDE BUILDING AWAY FROM DOORS AND INTAKE FAN.

CHLORINE SYSTEM SCHEMATIC
SCALE: N.T.S.

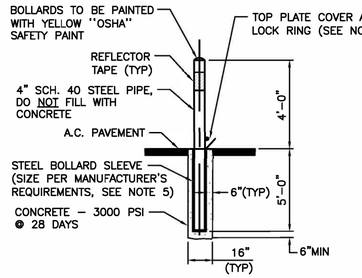
ACCESSORIES

STANDARD NOTES:

1) THE CONTRACTOR SHALL ADHERE TO ALL TCEQ SPECIFICATIONS FOR THE PROPOSED IMPROVEMENTS CONTAINED HEREIN.



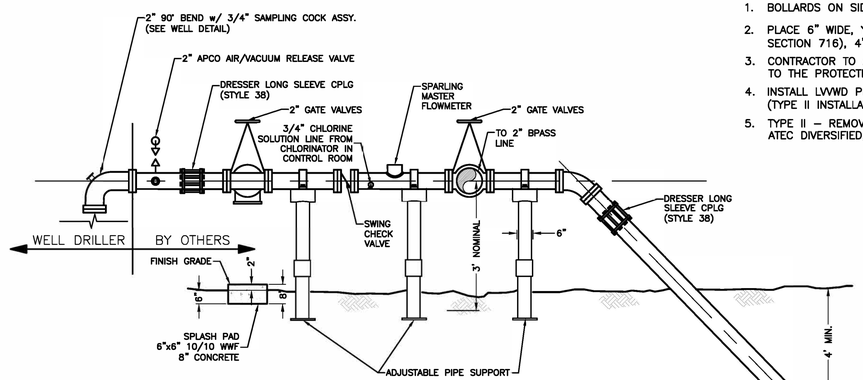
PIPE SUPPORT DETAIL
SCALE: N.T.S.

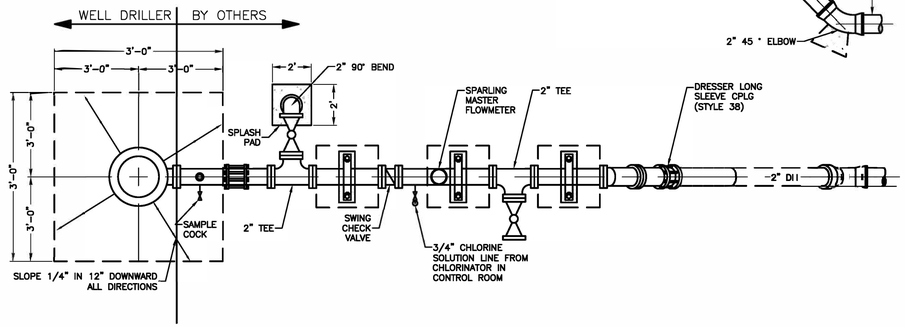


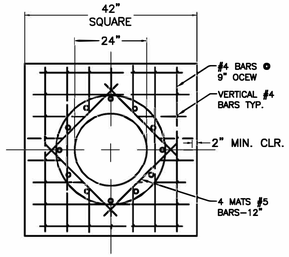
TYPE II
REMOVABLE AND LOCKABLE BOLLARDS

NOTES:

1. BOLLARDS ON SIDE NOT ACCESSIBLE TO VEHICLES MAY BE OMITTED BY ENGINEER.
2. PLACE 6" WIDE, YELLOW CLASS 4 REFLECTIVE TAPE (PER STANDARD SPECIFICATIONS, SECTION 716), 4" DOWN FROM TOP, FOR FULL DIAMETER ON ALL BOLLARDS.
3. CONTRACTOR TO ASSURE THAT BOLLARDS ARE PLACED TO ALLOW FULL ACCESS TO THE PROTECTED FACILITY.
4. INSTALL LVVWD PROVIDED LOCK AFTER INSTALLATION IS COMPLETE (TYPE II INSTALLATIONS ONLY)
5. TYPE II – REMOVABLE BOLLARDS MANUFACTURER: ATEC DIVERSIFIED, MODEL 102 OR APPROVED EQUAL







WELLHEAD CONC. BASE REBAR DETAIL
SCALE: N.T.S.

REV	DATE
COMMENT	
REV	DATE
COMMENT	

STATE OF TEXAS
MICHAEL W. MATHENA
91895
LICENSED
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1/5/24

WATER WELL DETAILS

WATER WELL #4
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SHEET:
5 OF: 5

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July 18, 2024

Mr. Zach Holland
General Manager
Bluebonnet Groundwater Conservation District
PO Box 269
Navasota, TX 77868-0269

RE: Phase I-a Report: Phelps SUD Well 5

Dear Mr. Holland,

This letter represents the Phase I-a report for the Bellville Well permit application that I received from you via email on July 17, 2024.

"Estimated Annual Water Production" is 183.96 million gallons per year, which is below the 200 million gallon per year threshold for Phase I of the permit application process . Therefore, the application requires the preparation of a Phase I-a analysis of potential drawdown.

The pump discharge listed in the application is 350 gpm. This does not appear to be the pump capacity, but an average flow rate for the full annual production. As discussed in this letter, calculations for drawdown at various times and at various distances assumed that the pumping capacity is 1,050 gpm (three times the average annual rate), which is consistent with information in the permit application (i.e. discharge pipe of 4 inches and a pump horsepower of 100).

Well Locations on HAGM Grid

The latitude and longitude data on the application were used to convert the location data to x- and y-coordinates in the GAM coordinate system using Surfer, a commercial gridding program. The FORTRAN program *PointRC.exe* was used to find the HAGM cell for those x- and y-coordinates. The results of this effort yielded that the well is in HAGM row 19, column 135.

The applications noted a well depth of 1,270 feet, which would place the bottom of the well below the bottom of the Jasper Aquifer (HAGM layer 4). As noted below, the Jasper Aquifer at this location occurs from the surface to a depth of 786 feet (based on the HAGM). Although it is reasonable to conclude that the HAGM geologic picks are not precise, it seems likely that the depth of the proposed well would be significantly less than listed in the permit application to fully penetrate the Jasper Aquifer. Test drilling and geophysical logging will be able to confirm an appropriate well depth as part of Phase II.

Grid Parameters, HAGM Parameters, HAGM Results, Theis Parameters

The Excel spreadsheet named *BGCD Parameters.xlsx* contains the data needed for the review and Phase I-a calculations for cells designated in the four counties of the Bluebonnet Groundwater Conservation District. The data for row 19, column 135 were copied and transposed into the spreadsheet *Phelps SUD 5 Phase I-a Tables.xlsx*. Results for layer 4 (Jasper Aquifer) are summarized into four tables as follows:

- Table 1: Grid Parameters
- Table 2: HAGM Parameters
- Table 3: HAGM Results
- Table 4: Theis Parameters (modified from standard Phase I-a Tables as discussed below)

Table 1. Grid Parameters for Phelps SUD Well 5

County Name	Walker
County Code	236
Outcrop Layer	4
Layer	4
Row	19
Column	135
x-coordinate (GAM-ft)	6355797.5
y-coordinate (GAM-ft)	19511024
Surface Elevation (ft MSL)	412
Cell Top Elevation (ft MSL)	412
Cell Bottom Elevation (ft MSL)	-374
Cell Thickness (ft)	786
Clay Thickness (ft)	490
Clay Thickness (% of Cell Thickness)	62.34

Table 2. HAGM Parameters for Phelps SUD Well 5

County Name	Walker
County Code	236
Outcrop Layer	4
Layer	4
Row	19
Column	135
Hydraulic Conductivity (ft/day)	2.21
Transmissivity (gpd/ft)	12,981
Leakage (1/day)	0.00E+00
Storativity (dimensionless)	1.80E-01
Elastic Storativity (dimensionless)	5.16E-06
Inelastic Storativity (dimensionless)	5.16E-04

Please note that the storativity at this location from the HAGM is 0.18. This value is indicative of clean sand in an unconfined aquifer. Although the Jasper Aquifer is the surficial layer in this area, the fact that it is over 700 feet thick at this location and has about 62 percent clay content means that the aquifer would likely respond as a confined or semi-confined aquifer. As developed below in the discussion and presentation of drawdown calculations, a more appropriate storativity value is assumed.

Table 3. HAGM Results for Phelps SUD Well 5

County Name	Walker
County Code	236
Outcrop Layer	4
Layer	4
Row	19
Column	135
Groundwater Elevation in 2009 (ft MSL)	274
Groundwater Elevation in 2080 (ft MSL)	192
DFC Drawdown (ft)	82
Artesian Head (ft)	-138
Subsidence in 2009 (ft)	0
Subsidence in 2080 (ft)	0.04
Subsidence from 2009 to 2080 (ft)	0.04
Cell Pumping in 2009 (AF/yr)	13.36
Cell Pumping in 2080 (AF/yr)	68.81

Table 4. Theis Parameters for Phelps SUD Well 5

County Name	Austin
County Code	8
Outcrop Layer	2
Layer	4
Row	31
Column	65
Assumed Storativity for these Calculations	5.00E-03
Drawdown in Production Well at 100 gpm for 36 hours	13.56
Drawdown 1/2 mile from Production Well at 100 gpm for 36 hours	0.05
Drawdown 1/2 miles from Production Well at 100 gpm for 1 year	3.29
Drawdown-Pumping Ratio for Production Well for 36 hours	0.13559
Drawdown-Pumping Ratio for 1/2 mile from Production Well for 36 hours	0.00053
Drawdown-Pumping Ratio for 1/2 mile from Production Well for 1 yr	0.03287

At this location, the Theis parameters do not appear in *BGCD Parameters.xlsx* due to the high storativity values (0.18). For purposes of these calculations, the assumed storativity is 5.00E-03, which is more consistent with a thick aquifer with clay interbeds.

Theis Equation Calculations

Groundwater production data from the permit applications were used along with the drawdown-pumping ratios contained in Table 4 to develop three estimates of drawdown for each well:

- Scenario 1: drawdown in the production well after 36-hours of pumping at three times the average annual pumping rate
- Scenario 2: drawdown in a well ½ mile from the production well after 36 hours of pumping at three times the annual pumping rate
- Scenario 3: drawdown in a well ½ mile from the production well after one year at the average pumping rate.

Results of these calculations for are presented in Table 5.

Table 5. Theis Results for Phelps SUD Well 5

Production Summary	Value
Annual Permit Production Limit (gallons)	183,960,000
Annual Permit Production Limit (acre-feet)	565
Average Pumping Rate (gpm)	350
3X Average Pumping Rate (gpm)	1050
Permit Capacity (gpm)	350

	Evangeline	
Drawdown Calculations	Drawdown-Pumping Ratios	Calculated Drawdown (ft)
Production Well - 36 hours (3X avg pumping)	0.13559	142.37
1/2 mile from Production Well - 36 hours (3X avg pumping)	0.00053	0.55
1/2 mile from Production Well - one year (avg pumping)	0.03287	11.50

These data represent the best integrated data of the area from a regional perspective. The local-scale data will be developed as part of the Phase II investigation. This will include more site-specific information and data on aquifer depth, clay content, and aquifer parameters calculated from the 36-hour pumping test.

Recommendation

Based on the results of the Phase I-a report, the application should be approved, and the Phase II investigation should proceed to verify the Phase I-a estimates related to the aquifer (e.g. depth to bottom of Jasper Aquifer and clay content) and related to aquifer performance (e.g. drawdown at the end of the 36-hour pumping test and aquifer transmissivity).

I appreciate the opportunity to work with you on this effort. Please call me at 512-745-0599 or email me at billhutch@texasgw.com if you have any questions.

Sincerely,

William R Hutchison

William R. Hutchison, Ph.D., P.E., P.G.