Enprotec | Hibbs & Todd

March 20, 2025

EASTLAND COUNTY WATER SUPPLY DISTRICT
WATER SYSTEM IMPROVEMENTS
CONTRACT K – FACILITY SUPPORT
TEXAS WATER DEVELOPMENT BOARD (TWDB) DWSRF

Addendum No. 2

Attention is called to the following modifications to the referenced Plans, Specification and Contract Documents for the above referenced project. The Eastland County Water Supply District (ECWSD) will receive sealed Bids for the TWDB DWSRF, Water System Improvements, Contract K – Facility Support Project at the ECWSD Offices, located at 726 FM 2461 S., Ranger, Texas 76470, until 3:00 p.m., local time on **Wednesday, March 26, 2025**, at which time the sealed Bids received will be publicly opened and read. We hereby modify as follows:

PROJECT MANUAL

1. WTP Geotechnical Investigation has been **ADDED**. See the attached for pertinent information regarding site preparation, pad preparation, and building foundation and floor slab.

PROJECT DRAWINGS

1. **REPLACE** Sheet G-001 in its entirety. See the attached.
2. **REPLACE** Sheet A-803 in its entirety. See the attached.
3. **REPLACE** Sheet A-805 in its entirety. See the attached.
4. **REMOVE** Specification 12122 reference from sheet A-800.
5. **REMOVE** Detail F on sheet C-012. Use detail E for access road.
6. Sheet M-201, EF-5 to be **RELOCATED** to the break room on the Southwest corner of the building over the stove area.

CLARIFICATIONS:

1. Tree removal to be removed from the scope.
2. Contractor shall sequence and plan work to continuously provide Water, Power, and Sewer services to the existing Administration Building and the General Managers home during construction activities. Contractor to verify by field investigation the locations of all utilities (OH Power, Water, Sewer) within and adjacent to the limits of the work that may be affected by construction.
3. Contractor shall schedule and coordinate accordingly with Utility Providers and the Water Treatment Plant General Manager prior to any shutdowns or tie ins.
4. The Stove, Sink, and Refrigerator are to be located on the Southwest corner of the building as shown on sheet A-800.

This addendum consists of thirty one (31) pages and becomes a part of the Proposal Documents and shall be acknowledged by the Respondent.

By: Leroy Arce, P.E. #114163
Project Manager

3/20/2025

PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration No. 10011900

Enprotec / Hibbs & Todd

November 11, 2013

Mr. Dale Bennington
Eastland County Water Supply District
P O Box 16
Ranger, Texas 76470

Re: Geotechnical Investigation
ECWSD Water System Improvements
Eastland County, Texas

Dear Mr. Bennington:

In accordance with your instructions, we have conducted a Geotechnical Investigation for the above referenced project. The conclusions and recommendations of this investigation are to be found in the attached report.

We trust that this will provide the information you have requested. We are also available for the geotechnical and materials testing services recommended in the Report during construction. If there are any further questions, please do not hesitate to call.

Sincerely,

Enprotec/Hibbs & Todd, Inc.

11 NOV 13

G. Scott Yungblut, P.E.
Geotechnical Engineer

Enclosure
10-4948D

GEOTECHNICAL INVESTIGATION
ECWSD WATER SYSTEM IMPROVEMENTS
EASTLAND COUNTY, TEXAS
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GEOTECHNICAL INVESTIGATION
FOR THE
ECWSD WATER SYSTEM IMPROVEMENTS
EASTLAND COUNTY, TEXAS

EXECUTIVE SUMMARY

The following is a summarized outline of the report recommendations. This summary should be read in complete context with the attached report.

SITE PREPARATION:

- Initial site preparation at the membrane building will require the removal of the salvage crushed limestone base material stored in 2 to 3 foot tall rows which is present across the majority of the proposed building area.
- Site preparation in the remainder of the improvement areas will require the removal of the estimated 4 to 6 inches of moderately organic topsoil.
- Deeper organic removal may be necessary in areas of the site due to the removal of tree stumps and rootballs.
- Protect moisture sensitive subgrade from excessive moisture changes through proper drainage and runoff during construction and throughout the life of the improvements.

PAD PREPARATION (CONVENTIONAL SLAB-ON-GRADE):

- A minimum 2 feet of the expansive clayey soils should be removed at least 5 feet beyond the proposed building areas and replaced with select fill to provide a PVR of about 1 inch for a conventional slab-on-grade foundation.

BUILDING FOUNDATION AND FLOOR SLAB:

- A shallow foundation founded a minimum 24 inches in the select fill or existing material utilizing a maximum net allowable bearing pressure of 2.0 ksf.
- Floor slab underlain by a minimum 2 feet of select fill to reduce the PVR to one inch or less.
- A mat foundation may be considered for the clearwell.

INTRODUCTION

GENERAL: This investigation was authorized in April 2010 by Mr. Don Griffin, President of the Eastland County Water Supply District (ECWSD). The purpose of this investigation is to provide foundation and floor slab design information along with construction recommendations for the proposed water system improvements at the existing ECWSD water treatment plant in Eastland County, Texas.

The improvements will include new 3 structures: a 10,000 square foot membrane building; a 350,000 gallon clearwell approximately 50 feet in diameter; and a 400 square foot chlorine building. Detailed structural loading was not provided, however for this analysis it has been assumed that maximum column loads will be less than 50 kips per column and maximum wall loads will be less than 2 kips per linear foot of wall, based upon dead load plus design live load. Detailed site grading has also not been provided, therefore, it has been assumed that the structures will be constructed at or near existing grades requiring about 2 to 3 feet of cut or fill.

SCOPE: The scope of the exploration and analysis to be performed by Enprotec / Hibbs & Todd, Inc. (eHT) included a site reconnaissance, the subsurface exploration, field and laboratory testing, and an engineering analysis and evaluation to provide design recommendations for the foundations and floor slabs along with construction recommendations for the proposed improvements. Details and results of the investigation are discussed in the following sections of this report.

LIMITATIONS: The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

SITE DESCRIPTION

SITE LOCATION & TOPOGRAPHY: The proposed site is located south of Ranger, Texas along FM 2461 approximately 1½ miles south of IH-20 at the existing water treatment plant in Eastland County, Texas. At the time of the subsurface exploration the site was partially covered with short grasses. The area of the proposed membrane building was covered with what appeared to be loose rows of limestone base material spoils. Site topography was relatively flat and sloped slightly from the east down to the west.

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DESCRIPTION OF WORK

FIELD INVESTIGATION: Drilling and soil sampling activities were performed at select locations of the subject site on May 29, 2013. Five test borings were drilled to depths ranging from 15 to 25 feet below the existing ground surface elevation at the locations shown on Figure 1 in Appendix A.

The test borings were drilled utilizing a truck-mounted Failing rotary drilling rig. The test borings were advanced utilizing dry sampling methods and/or rotary air drilling techniques which allow for accurate groundwater observations. Drilling and sampling activities were performed in general accordance with referenced ASTM and/or TxDOT procedures or other accepted methods.

Soil formations were sampled using a 3-inch diameter Shelby-type steel tube sampler (ASTM D 1587) and/or a 2-inch split barrel sampler (ASTM D 1586). Undisturbed soil samples were subjected to calibrated pocket penetrometer tests (Qp) to assist in evaluating the shear strength of the cohesive soils. Quantitative indications of foundation strata shear strength were obtained using the Standard Penetration Test (SPT) method. A portion of the rock formations were sampled with a 5 foot NX carbide bit core barrel. The rock core recovery and rock quality designation (RQD) were measured in the field. The reports of the field tests are reported on the Logs of Borings in Appendix C.

The borings were visually logged in the field, and all recovered samples were placed in core boxes for delivery to the laboratory. Push-tube samples and split barrel samples were placed in polyethylene plastic bags to minimize moisture changes. Samples will be retained for 30 days from the date of this report. The samples will then be discarded unless notified in writing by the client.

The borings were observed for groundwater at each test location, during and following the completion of the boring. These observations are shown on the Logs of Borings and discussed in a later section of this report. The borings were backfilled with on-site materials upon completion of the fieldwork. Logs of Borings were subsequently prepared, along with a legend titled EXPLANATION OF SYMBOLS AND TERMS USED ON BORING LOGS and GENERAL NOTES. The legend and general notes show typical soil and rock classifications, drilling symbols, weathering descriptions, and soil structure characteristics.

LABORATORY TESTING: Select materials recovered in the borings were tested in the laboratory and classified based on the laboratory test results. Laboratory testing was conducted in general accordance with ASTM procedures and standards. Atterberg Limits (ASTM D 4318) and Minus 200-Mesh Sieve Tests (ASTM D 1140) were performed on selected soil samples in order to classify and establish index properties and grain size characteristics of the soils. Appendix B summarizes the results of these classification tests. The soil classifications are based on the Unified Soil Classification System (USCS).

ENGINEERING ANALYSIS: An engineering analysis was conducted on the information obtained from the field and laboratory investigations and from information provided by Mr. Justin Kirchdoerfer, P.E., project design engineer for eHT. If revisions to the plans for the proposed structures, or if deviations from the subsurface conditions presented in this report are encountered during construction, we should be notified to determine if changes in our recommendations are required.

SUBSURFACE MATERIALS AND CONDITIONS

SITE GEOLOGY: As shown on the Abilene Sheet of the *Geologic Atlas of Texas* the site is located in an area where Pennsylvanian Age Deposits of the Winchell Limestone are present just below the Recent Age deposits of the Alluvium. The Alluvium generally consists of flood plain deposits of sands, silts, and some clay. The Winchell Limestone generally consists of fine grained limestone with interbedded calcareous shales.

SITE STRATIGRAPHY: A detailed description of the site stratigraphy is provided on the Logs of Borings. Generally the subsurface conditions at the site may be characterized as follows:

Firm relative density clayey sands were present from the surface to depths ranging from 14 feet at Test Boring Nos. 1 and 4 to at least a depth of 15 feet at the other test borings. The sands were underlain by limestone at Test Boring Nos. 1 and 4, and the limestones extended to at least a depth of 25 feet, the termination depth of the deeper test boring. Layers of very stiff to hard sandy clays were present near the surface at Test Boring Nos. 1 and 5.

GROUNDWATER: Groundwater was not encountered within the test borings during or at completion of drilling activities. An accurate depiction of the groundwater depth would require leaving the test borings open for an extended period of time due to the moderately impermeable soils. Based upon the soil moisture contents the groundwater table was considered to exist at depths greater than 25 feet below current grades at the time of the subsurface exploration, although shallower perched water may exist. The water table may fluctuate seasonally and during periods of heavy rainfall.

Groundwater is not expected to affect shallow foundation construction at this site. Filtered sump pumps placed in the bottom of excavations are expected to be suitable for water removal above the water table.

LABORATORY RESULTS: The results of the Atterberg Limits Testing indicate that the tested soils possess liquid limits (LL) ranging from 18 to 52 with corresponding Plasticity Indices (PI) of 3 to 31. Two of the samples tested were non-plastic. Soil Classification Tests indicate that the soils exhibit a low to very high expansive potential with a slight to high degree of plasticity. The soils are classified as SC, SM, and CH materials according to the Unified Soil Classification System (USCS). Refer to Appendix B for the laboratory test results of the materials tested.

FOUNDATION DESIGN RECOMMENDATIONS

GENERAL: The proposed site is underlain by moderate strength, low to highly expansive sandy clays and clayey sands further underlain by limestone. Based upon the expansive nature of the soils encountered at the site, a conventional shallow foundation is not recommended without the site work outlined in this report. The Potential Vertical Rise (PVR) has been estimated using the *State of Texas Highway Department Materials and Testing Division Test Method TEX-124-E "Methods of Determining the Potential Rise"* for the existing soils. For this site, the PVR estimation was based on a plasticity index (PI) ranging from 10 to 31. The estimation assumed average seasonal minimum moisture corresponding to the "dry line" of the test method. The PVR for this site was estimated to be 1 to 1½ inches. A differential movement of half of the PVR can be assumed. However, differential movement can be equal to or even double the PVR in extreme conditions such as soils exposed to moisture and swelling in one area and drying and shrinkage in another.

MEMBRANE BUILDING AND CHLORINE BUILDING FOUNDATIONS: Following proper site preparation, the structures may be supported by a shallow foundation system. Continuous wall footings for load bearing walls and spread footings for building columns and may be designed for maximum net allowable bearing pressures of 2.0 and 2.5 kips per square foot (ksf), respectively, based upon dead load plus design live load considerations. A subgrade modulus of 120 psi/in may be used for foundation design within the properly compacted select fill material. The bottoms of the exterior footings should bear a minimum 24 inches below adjacent surface grades along the perimeter to reduce seasonal effects on the supporting soils and should also be in accordance with local building code requirements. The grade beams should have a minimum width of 16 inches and the pads should have a minimum width of 24 inches even if the actual bearing pressure is less than the design value. Any shallow or near ground supported foundation should be designed by a structural engineer experienced in design of shallow foundations.

FLOOR SLAB: A soil supported floor slab may be used in conjunction with the shallow foundation. The slab-on-grade should be supported on a minimum 2 feet of select fill to provide a PVR of about 1 inch or less. Based upon the assumed floor slab live loads a minimum 5-inch thick concrete slab reinforced with at least #4 rebar 18 inches on center, each way, placed mid-height within the floor slab is recommended due to the underlying expansive soils. However, the structural engineer should provide the actual floor slab design.

A detailed settlement analysis has not been performed, although total settlement of the fill could be on the order of 1 to 2 percent of the fill thickness. Differential settlement is estimated as ½ to ⅔ of total settlement and differential settlement can be reduced by compacting fill properly and uniformly.

CLEARWELL FOUNDATION: The soils throughout the proposed clearwell foundation area and extending at least 5 feet beyond the perimeter are recommended to be removed to a minimum depth of 2 feet below the mat foundation and replaced with a crushed limestone base material (TxDOT Item 247, Type A, Grade 3 or better) imported to the site to reduce the PVR to about 1 inch. Extreme care must be exercised to prevent excessive drying of the expansive soil subgrade since a subsequent increase in moisture content can cause swell. Following proper site preparation, the clearwell may be supported by a shallow mat type foundation system. The mat foundation may be designed for maximum allowable bearing pressure of 2.0 kips per square foot (ksf), based upon dead load plus design live load considerations. The foundation should bear on a minimum 2 feet of crushed limestone base material. Total settlement of the clearwell foundation could be on the order of 2 inches, and differential settlement is estimated to be about 1 to 1¼ inches. Any shallow or near ground supported foundation should be designed by a structural engineer experienced in design of shallow foundations.

PERIMETER MOISTURE CONTROL: Proper design of foundations in expansive soils must include perimeter surface moisture control. Basically soils experience volume changes when allowed to dry or when allowed access to moisture. Thus, if the soil moisture content remains constant, soil volume changes will be minimal. In reality, it is difficult to prevent seasonal soil-moisture fluctuations, but these moisture changes can be limited.

Proper grading and drainage around the foundations to prevent ponding of water is essential from construction through the life of the structures. Outlets for gutter systems must empty either into storm drains or onto paved surfaces to allow for quick discharge of water away from the building area. Paving surfaces should extend to the building line to serve as a barrier to soil moisture evaporation and infiltration where possible. This report is being prepared assuming that conscientious watering will occur and any landscape areas near the foundation will not be continuously saturated. Trees should be kept away from the foundation edge a distance at least equal to their expected mature height. Metal or concrete edging around flower beds is not recommended near the building. Flowerbed edging will trap and pool water near the foundation and potentially cause excess swelling of the soils. If edging is installed there should be areas in the edging to allow water to quickly drain out of the flowerbed and away from the building.

TRENCH WALL DESIGN PARAMETERS: It is understood that there will be some 3 to 4 feet deep pipe trenches in the membrane building. Where a nominal amount of rotational movement of the trench walls are acceptable (i.e., basically not fixed), the use of an Equivalent Active Fluid Pressure is applicable. However, where the wall is fixed, it should be designed for "At-Rest" earth pressures. Walls that retain soils that indirectly support building foundations should also be designed for the "At-Rest" condition. Because of the movement required to activate full passive earth pressure resistance, the soil on the toe or low side of a below-grade wall should be assumed to contribute no passive resistance for stability of the wall.

The following listing presents the recommended soil related design parameters for below-grade walls. Design of the walls should incorporate an adequate factor-of-safety against both over-turning (FS=2.0) and sliding (FS=1.5). The overturning resultant should also fall within the center third (kern) of the trench wall footing for stability or the design must be reevaluated with a limited bearing area. If the walls can be tied to the floor slab, it is possible that lower braced wall design parameters could be utilized. The equivalent fluid pressures listed below are based on level backfill and do not include a surcharge. If surcharge loads are expected, an appropriate additional pressure should be utilized.

Design Parameters	Recommended Backfill	Existing Soils
Internal friction angle (estimated)	32°	28°
Coefficient of At-Rest pressure (K_o) behind wall	0.47	0.53
Unit Weight	125 lbs/ft^3	125 lbs/ft^3
Resulting "Equivalent Fluid" pressure (level backfill) (At-Rest condition)	58 lbs/ft^3	66 lbs/ft^3

BELOW-GRADE WALL BACKFILL: Backfill materials should consist of a well graded granular material placed and compacted under engineering controlled conditions in the necessary layer thickness so that an in-place density between 90 and 95 percent of its maximum laboratory dry density as determined by the Standard Proctor Test (ASTM D698) is obtained. Care should be taken to avoid over compaction of the soils behind the retaining walls, especially with the use of heavy compaction equipment. Temporary bracing of the retaining walls is recommended during backfilling and compaction activities.

The previously presented parameters for the import soils should be utilized in the design of the walls. The lateral pressure design parameters presented previously have been based upon drained conditions within the backfill material behind the below-grade walls.

BELOW-GRADE WALL DRAINAGE: A permanent subsurface drainage system may be incorporated into the below-grade wall design and will assist in reducing the potential build-up of excess hydrostatic pressures on the below-grade walls and floor slab. The drainage system should include perforated or slotted drain tile placed along the exterior and interior of the perimeter below-grade walls. The perimeter drain tiles should be sloped to drain into a sump pit from which water can be pumped, as required, or if the grades allow, drained by gravity flow to a suitable outlet. The sump pit should be designed as a sand pit to prevent blockage of the drainage system. The drain tile should be surrounded with at least 12 inches of free-draining aggregate, such as sand or sand and gravel, containing no more than 5 percent by weight passing the No. 200 sieve size. An 8 to 12 inch thick properly compacted gravel drainage layer beneath the trench floor slab is recommended and should drain any accumulated water away from the structure or towards the sump pit.

The exterior of the below-grade walls should be damp proofed. It is also recommended that a well-graded, granular free-draining soil be utilized as backfill against the below-grade walls. The granular backfill should extend a lateral distance of at least 2 feet from the outside face of the wall. The backfill material should consist of the previously described freely draining aggregate.

FOUNDATION CONSTRUCTION RECOMMENDATIONS

SITE CLEARING/STRIPPING: Initial site preparation in the membrane building area will require the removal of the estimated 2 to 3 feet of crushed limestone spoils across the building area. Site preparation will require the removal of the estimated 4 to 6 inches of moderately organic topsoil present across the proposed clearwell and chlorine building areas. Site clearing will require the removal and proper disposal of miscellaneous pipe and older water treatment plant parts around the area. Deeper organic removal may be necessary in areas of the site due to tree stumps and rootballs. The rootballs should be completely removed and replaced with properly compacted select fill. There is a potential for the rootballs to decay and leave a void beneath the foundation if the rootballs are not properly removed. Removal depths should be verified in the field by a representative of a geotechnical engineer at the time of site grading based upon the subgrade soils and the subgrade stability.

BUILDING PAD PREPARATION: The soils throughout the proposed foundation areas and extending at least 5 feet beyond the exterior perimeters are recommended to be removed to a minimum depth of 2 feet below the proposed floor slab or mat foundation and replaced with the recommended select fill imported to the site to reduce the PVR to about 1 inch. Following site clearing and site cutting the subgrade should be scarified; moisture conditioned to above optimum moisture content; and recompacted between 95 to 100 percent dry density of Standard Proctor (ASTM D 698). Specific recommendations for the select fill are presented in the following section of this report. Extreme care must be exercised to prevent excessive drying of the expansive soil subgrade since a subsequent increase in moisture content can cause swell.

Over-compaction of the clayey subgrade should be avoided to prevent aggravating potentially swelling soil problems such as differential heave of any fill. Extreme care must be exercised to prevent excessive drying of the expansive soil subgrade since a subsequent increase in moisture content can cause swell. It is also recommended that the moisture in the pads be maintained at not less than 2 percent below optimum moisture content until concrete placement has been performed.

Crushed limestone could also serve as select fill for these buildings!

SELECT FILL: It is recommended that the fill material beneath the clearwell be crushed limestone base material meeting TxDOT Item 247, Type A, Grade 3 or better. Select fill beneath the chlorine and membrane buildings may consist of non-granular (cohesive) soils free of organics and other deleterious materials and should have a maximum liquid limit of 30, a plasticity index no greater than 15 nor less than 5, and have a maximum particle size of 2 inches. The select fill should also meet the USCS classification of SC, GC or CL. The structural fill beneath the building and extending 5 feet out from the building edge should be compacted to a minimum 95 percent Standard proctor (ASTM D 698) at not less than 2 percent below optimum moisture content. Compacted lift thicknesses should not exceed 6 inches. A portion of the site soils tested meet the select fill criteria.

FOUNDATION EXCAVATION: Excavations should be observed by the geotechnical consultant to make sure that the proper bearing material has been reached in accordance with the recommendations given herein. The excavations should be checked for size and observed to make sure that all loose material has been removed prior to concrete placement. Prompt placement of the concrete following pad preparation is strongly recommended.

UTILITIES: Evidence of above and below ground utilities were present across the site. Prior to construction all underground utilities should be located and, if present in the construction area, permanently capped and removed at the property line or rerouted around the proposed improvements to preserve their function. Special attention should be performed in evaluating the backfill of utilities that will remain which may not be suitable for support of the proposed structures. The soils should be removed and recompacted as described herein if found unsuitable. A representative of the geotechnical engineer should make this determination during construction.

Granular material or "buckshot" should not be used to backfill new utility lines entering the structure. If utilized, the granular material could provide a conduit for water to travel beneath the structure and cause the underlying soils to swell and potentially heave the slab. A utility trench "plug" should be provided for all utility trenches entering the building footprint including electrical, gas, water and sewer, etc. The plug should extend a minimum 2 feet beyond the footing, each way, and from the bottom of the trench to the surface. The plug should be constructed of low permeable higher plasticity clays or a lean concrete. Utility excavations through the select fill pad beneath the structures shall be backfilled with select fill and compacted as specified for the pads.

FOUNDATION CONSTRUCTION CONSIDERATIONS

WET WEATHER: If construction is performed during wet weather, disking or windrowing of the top 6 inches of wet unsuitable soils beneath structural areas may be necessary in order to dry out the soil. Following soils removal to a stable subgrade the excavated soils could be air-dried and reused. Mechanical stabilization through the use of a crushed limestone base material "working mat" could also be considered. The actual depths and stabilization methods should be confirmed through continuous testing under the observation of a representative of the geotechnical engineer.

EXCAVATION CAVING: Due to the presence of the low to moderately cohesive soils within the upper soils profile, bank instability problems should be anticipated. If instability problems occur, stability within the excavations should be maintained by flattening or widening slope sidewalls. All excavations should be in accordance with local and federal (OSHA) regulations and the trench safety plan. In addition, the on-site soils are susceptible to erosion and disturbance by flowing water and construction traffic. If these soils are disturbed by construction traffic and excessive moisture they may become unstable. The site should therefore be graded to prevent water from ponding near the new foundations and running into excavations.

GENERAL: Many problems can be avoided or solved in the field if proper inspection and testing services are provided. eHT should be retained to perform testing and construction observation services sufficient to verify compliance with our recommendations. It is recommended that the site preparation, foundation, and floor slab construction be monitored by the geotechnical engineer or his representative. The following are recommended minimum sampling and testing frequencies.

EARTHWORK: During the earthwork phase of the project at least one Proctor test, Atterberg limits test, and minus 200 sieve test should be performed per soil type for subgrade, backfill, and fill materials. In improvement areas, at least 1 density and moisture content test per 2,500 square feet should be performed on the subgrade soils, and at least 1 density and moisture content test per 2,500 square feet should be performed for each compacted 6-inch thickness of fill (minimum 2 tests per lift in the smaller structures). Testing of backfilled trenches should be at least 1 density and moisture content test per 100 linear feet of trench per 6 inch compacted lift thickness.

CONCRETE: At least 1 slump, air content (if required) and temperature test, and at least 1 set of 3 concrete cylinders should be molded for each type of concrete per 50 cubic yards or fraction thereof placed in a day. Each set of cylinders should be tested for compressive strength with 1 of the cylinders tested at 7 days and 2 of the cylinders tested at 28 days.

APPENDIX A

NOT TO SCALE

EHT

BORING LOCATION PLAN

FIGURE 1
ECWSD WATER SYSTEM IMPROVEMENTS
EASTLAND COUNTY, TEXAS

Project No.: 10-4948D

Date: May 2013

APPENDIX B

ECWSD WATER SYSTEM IMPROVEMENTS

EASTLAND COUNTY, TEXAS

SUMMARY OF CLASSIFICATION TESTS

Boring No.	Depth (ft)	Liquid Limit %	Plasticity Index	% Passing #200 Mesh Sieve	Water Content %	USCS
B-1	8½-10'	22	10	41	9.3	SC
B-2	0-1'	---	---	31	3.8	SM
B-2	6-7'	18	3	40	5.1	SC
B-2	13½-15'	21	8	34	7.8	SC
B-3	3½-5'	33	18	47	10.8	SC
B-3	7-8½'	21	5	6	8.4	SC
B-4	0-1'	30	16	44	11.2	SC
B-5	3½-5'	52	31	59	13.2	CH
B-5	5-8½'	23	11	41	5.8	SC
B-5	8½-10'	---	Non-plastic	19	3.5	SM

APPENDIX C

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **ECWSD - DWSRF IMPROVEMENTS** Date: MAY 29, 2013

Location: **EASTLAND COUNTY, TEXAS** Type: AIR ROTARY Boring No.: **B-1**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	CORE RECOVERY (%)	RQD (%)	Qp (tsf)	DEPTH SCALE
		ST	BROWN SANDY CLAY WITH LIMESTONE GRAVEL (FILL)				4.5+	
		SS	BROWN AND TAN SANDY CLAY	10				
5			TAN SANDY CLAY WITH CALCAREOUS NODULES					
		SS	TAN AND BROWN CLAYEY SAND	12				
10								
		SS		50 / 1"				
15		DB	GRAY LIMESTONE		87	15		
20		DB			90	7		
25			TOTAL DEPTH OF BORING 25 FEET					

NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

10-4948D

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **ECWSD - DWSRF IMPROVEMENTS** Date: MAY 29, 2013

Location: **EASTLAND COUNTY, TEXAS** Type: AIR ROTARY Boring No.: **B-2**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	BROWN CLAYEY SAND WITH LIMESTONE GRAVEL (FILL)				4.5+	
		SS	RED-BROWN CLAYEY SAND	12				
5		ST					4.5+	
		SS		10				
10			TAN CLAYEY SILTY SAND WITH FINE GRAVEL					
		SS		21				
15								

TOTAL DEPTH OF BORING 15 FEET
DUE TO CAVING SANDS AND FINE GRAVEL

NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

10-4948D

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **ECWSD - DWSRF IMPROVEMENTS** Date: MAY 29, 2013

Location: **EASTLAND COUNTY, TEXAS** Type: AIR ROTARY Boring No.: **B-3**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	BROWN CLAYEY SAND WITH LIMESTONE GRAVEL (FILL)				4.5+	
			RED-BROWN CLAYEY SAND					
		SS		13				
5		ST					4.5+	
		ST					4.5+	
		SS		17				
10			TAN CLAYEY SILTY SAND WITH FINE GRAVEL					
		SS		13				
15			TOTAL DEPTH OF BORING 15 FEET DUE TO CAVING SANDS AND FINE GRAVEL					

NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

10-4948D

ENPROTEC/HIBBS & TODD, INC.
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402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **ECWSD - DWSRF IMPROVEMENTS** Date: MAY 29, 2013

Location: **EASTLAND COUNTY, TEXAS** Type: AIR ROTARY Boring No.: **B-4**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	BROWN SANDY CLAY WITH LIMESTONE GRAVEL (FILL)				4.0	
		SS	RED-BROWN CLAYEY SAND	11				
5								
		SS	TAN CLAYEY SILTY SAND WITH FINE GRAVEL	19				
10								
		SS	TAN LIMESTONE	50 / 4"				
15			TOTAL DEPTH OF BORING 15 FEET					

NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

10-4948D

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **ECWSD - DWSRF IMPROVEMENTS** Date: MAY 29, 2013

Location: **EASTLAND COUNTY, TEXAS** Type: AIR ROTARY Boring No.: **B-5**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	BROWN SANDY CLAY WITH LIMESTONE GRAVEL (FILL)				4.0	
		SS	BROWN SANDY CLAY	10				
5								
		SS	TAN CLAYEY SILTY SAND WITH FINE GRAVEL	21				
10								
15								

TOTAL DEPTH OF BORING 15 FEET
BORING CAVED TO 9' IMMEDIATELY AFTER DRILLING

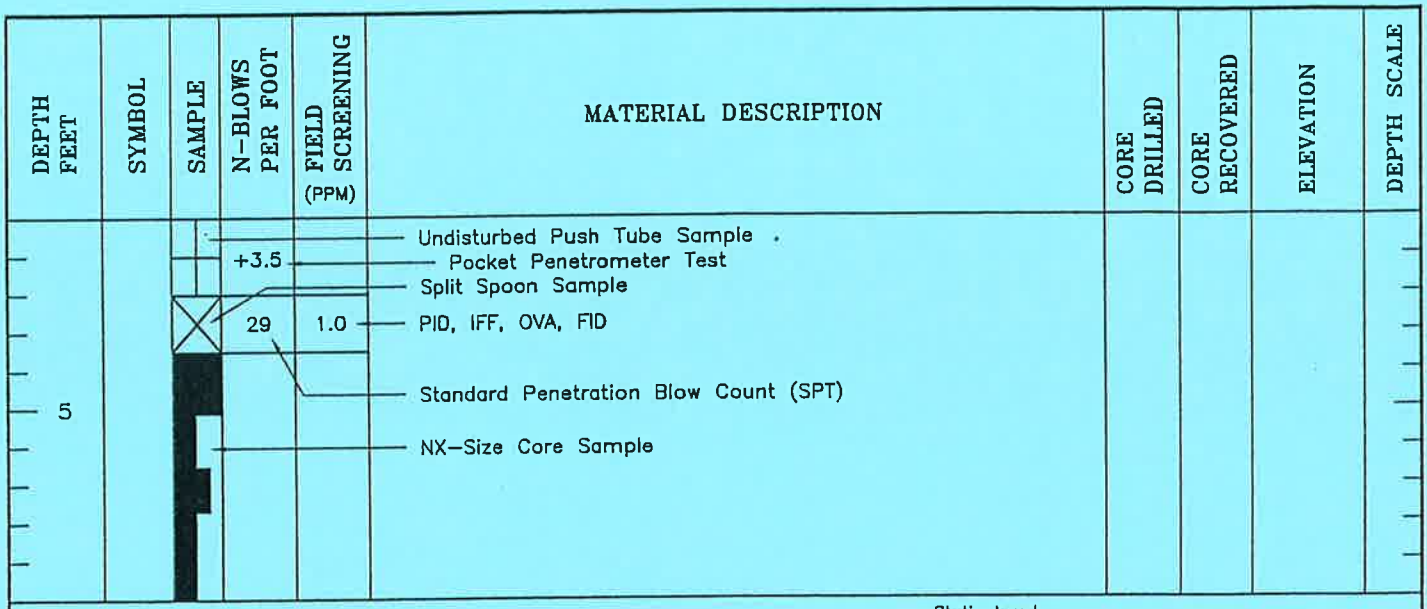
NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

10-4948D

ENPROTEC, INC.

EXPLANATION OF SYMBOLS AND TERMS USED ON BORING LOGS



Water Encountered — Water Level Encountered During Drilling

Static Level (date) — Stabilized Water Level

UNIFIED SOIL CLASSIFICATION DESCRIPTION OF SYMBOLS AND DIVISIONS

- Well-Graded Gravels, Gravel Sand Mixtures (GW)
- Poorly-Graded Gravels, Gravel Sand Mixtures (GP)
- Silty Gravel, Gravel Sand-Silt Mixtures (GM)
- Clayey Gravels, Gravel-Sand-Clay Mixtures (GC)
- Well-Graded Sands, Gravelly Sands (SW)
- Poorly-Graded Sands, Gravelly Sands (SP)
- Silty Sands, Poorly-Graded, Sand-Silt Mixtures (SM)
- Clayey Sands, Poorly-Graded, Sand-Clay Mixtures (SC)
- Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands (ML)
- Inorganic Clays of Low to Medium Plasticity Gravelly, Sandy or Silty Clays, Lean Clays (CL)
- Organic Silts and Organic Silty Clays of Low Plasticity (OL)
- Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils (MH)
- Inorganic Clays of High Plasticity, Fat Clays (CH)
- Organic Clays of Medium to High Plasticity, Organic Silts (OH)
- Caliche and Other Impervious Layer (HP)

BEDROCK SYMBOLS

- Conglomerate (CGL)
- Sandstone (SS)
- Limestone (LS)
- Shale (Sh)
- Weathered Shale (WS)
- Sandy Shale (SSh)
- Shaley Limestone (Sh LS)
- Dolomite (DOL)

MISCELLANEOUS SYMBOLS

- Asphaltic Concrete (HMAC)
- Cement Grout (CMT)
- Bentonite (BENT)

The LOG of BORING is a representation of the subsurface material at specific boring location and within the depth explored. The transition between strata may be gradual and variations in material types and depths between borings can be expected. Water level observations represent those conditions at the time of exploration and may vary with time and location of site.

SOIL COLOR CLASSIFICATION
Determined by
MUNSELL SOIL COLOR CHARTS
1990 EDITION REVISED

GENERAL NOTES

SAMPLE IDENTIFICATION

Soil Samples are visually classified in general accordance with the Unified Soil Classification System (ASTM D2487 or D 2488)

DRILLING AND SAMPLING SYMBOLS

ST:	Shelby Tube - 3" O.D., except where noted
SS:	Split-Spoon
THD:	THD Cone Penetrometer
AU:	Auger Sample
DB:	Diamond Bit
CB:	Carbide Bit
WS:	Wash Sample

SOIL PROPERTY SYMBOLS

N:	Standard "N" penetration: Blows per foot, or fraction thereof, of a 140 pound hammer 30 inches on a split-spoon
Qp:	Calibrated Penetrometer Resistence, TSF
Qu:	Unconfined Compression Strength, TSF
LL:	Liquid Limit, %
PI:	Plasticity Index

SOIL STRENGTH CHARACTERISTICS

NON-COHESIVE (GRANULAR) SOILS

RELATIVE DENSITY	BLOWS PER FOOT(N)
Very Loose	0-4
Loose	5-10
Firm	11-30
Dense	31-50
Very Dense	51 +

COHESIVE (CLAYEY) SOILS

COMPARATIVE CONSISTENCY	BLOWS PER FOOT(N)	UNCONFINED COMPRESSIVE STRENGTH (Qu)
Very Soft	0-2	0 - 0.25
Soft	3-4	0.25 - 0.50
Medium Stiff	5-8	0.50 - 1.00
Stiff	9-15	1.00 - 2.00
Very Stiff	16-30	2.00 - 4.00
Hard	31 +	4.00 +

SOIL CHARACTERISTICS

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6 mm	Silt	0.074mm-.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074 mm		

DEGREE OF EXPANSIVE POTENTIAL	PI
Low	0-15
Moderate	15-25
High	25 +

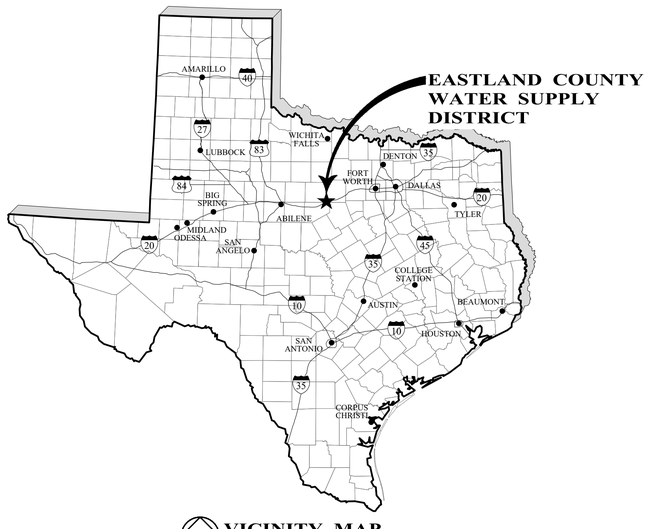
DEGREE OF PLASTICITY	PI
None to Slight	0-4
Slight	5-10
Moderate	11-30
High	31 +

ENPROTEC / HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING

ENPROTEC / HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING

EASTLAND COUNTY WATER SUPPLY DISTRICT
CONTRACT K
WTP SUPPORT IMPROVEMENTS
EASTLAND COUNTY, TEXAS
SEPTEMBER 2024

FUNDING PROVIDED BY:
TEXAS WATER DEVELOPMENT BOARD



VICINITY MAP
NO SCALE

PRESIDENT
STEVE GERDES

DIRECTORS
BOBBY ADAMS
CHARLES CALVERT
TERRY SLAVENS
DON GRIFFIN
MARK PIPKIN
CHUCK LEMASTER

GENERAL MANAGER
CHAD ROBERTS

DISTRICT SECRETARY
CARRIE GOODMAN

03/19/2025
LEROY ARCE
114163
LICENSED
PROFESSIONAL
ENGINEER

LEROY ARCE, P.E.

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
Abilene, Texas 79601
325-698-5560
PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration No. 10011900

PROJECT NO.: **10-4948**
SEQUENCE No.
SHEET No. **G-001**

ROOM FINISH SCHEDULE

ROOM NAME	FLR.	BASE	WALL				CLG.	REMARKS
			N	E	S	W		
ADMINISTRATION/CONTROL BUILDING								
WOMEN'S RESTROOM	4	12	23	23	23	23	31	
MEN'S RESTROOM	4	12	23	23	23	23	31	
OPERATOR RESTROOM	4	12	23	23	23	23	31	
LOCKER ROOM	1	11	23	23	23	23	31	
MEETING/TRAINING ROOM	1	11	23	23	23	23	31	
KITCHEN/BREAK ROOM	1	11	23	23	23	23	31	
ADMINISTRATION OFFICE AREA	1	11	23	23	23	23	31	
LABORATORY AREA / CONTROL AREA	1	11	23	23	23	23	31	

FIXTURE SCHEDULE

◇	DESCRIPTION	MFGR. MODEL	QTY.	REMARKS
A	FRAME MIRROR	TO BE CUSTOM CUT LOCALLY BY GLASS CO.	2	18" x 36"
B	WALL MOUNTED TOILET TISSUE DISPENSER	FORT JAMES	2	
C	GRAB BAR	FRANKLIN BRASS	6	FINISH PER OWNER, 1 1/2"Ø
D	SOAP DISPENSER	FORT JAMES	3	
E	SINK FAUCET	BRIGGS	3	DRAIN ACCESSORIES AS APPROVED BY ENGINEER
F	DROP-IN LAVATORY	BRIGGS	1	WITH COUNTER
G	VITREOUS CHINA TOILET	BRIGGS ALTIMA 4234 ELONGATED	3	1 1/2" SPUD, 1.6 gpf, ADA COMPLIANT
H	FLUSH VALVE		3	
I	PAPER TOWEL DISPENSER	FORT JAMES	3	
J	DEEP STAINLESS STEEL SINK	GILMORE-KRAMER WITH FAUCET	1	
K	WATER HEATER		1	
L	SHOWER		1	
M	VITREOUS CHINA LAVETORY	KOHLER KINGTON 16" WITH OVERFLOW	3	WALL MOUNTED

WINDOW SCHEDULE

○	SIZE	REMARKS	
A	3'-0" x 4'-8"		
B	3'-0" x 3'-0"		
C	6'-0" x 3'-0"	INTERIOR	
D	3'-0" x 3'-0"	INTERIOR	

DOOR SCHEDULE

⬡	SIZE	MATERIAL	REMARKS
1	3'-0" x 7'-0"	EXTERIOR/INTERIOR HOLLOW METAL FRAME	
2	3'-0" x 7'-0"	INTERIOR WOODEN DOOR	SOLID CORE; 1 3/4 STANDARD THICKNESS
3	2'-0" x 7'-0"	INTERIOR WOODEN DOOR	SOLID CORE; 1 3/4 STANDARD THICKNESS
4	6'-0" x 7'-0"	EXTERIOR/INTERIOR HOLLOW DOUBLE DOOR METAL FRAME	

COUNTER HEIGHT SWINGING DOOR.

FINISH SCHEDULE KEY

No.	FLOOR	No.	BASE	No.	WALLS	No.	CEILING
1	12" x 12" VINYL TILE *	11	VINYL	21	METAL	31	2' x 2' ACOUSTICAL TILE, WHITE GRID (9 FT. CEILING)
2	CONCRETE	12	CERAMIC	22	CONCRETE	32	CONCRETE
3	CARPET	13		23	1/2" SHEET ROCK, TEXTURED AND PAINTED, ATTACHED TO 3 1/2" METAL STUD WALL	33	OPEN
4	CERAMIC TILE	14		24	PAINTED OR SEALED CMU	34	1/2" GYP. BOARD, PAINTED
5		15		25		35	CEMENT BOARD
6		16		26		36	HOLLOW CORE PLANK
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

* COLOR AND PATTERN TO BE SELECTED BY OWNER FROM SAMPLES PRESENTED BY THE CONTRACTOR.

NO.	REVISION	DATE
1	ISSUED FOR TWBD	04/18/2024
△	ADDENDUM #2	03/19/2025

03/19/2025

LEROY ARCE 114163 LICENSED PROFESSIONAL ENGINEER

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
Abilene, Texas 79601
325-698-5560
PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration No. 10011900

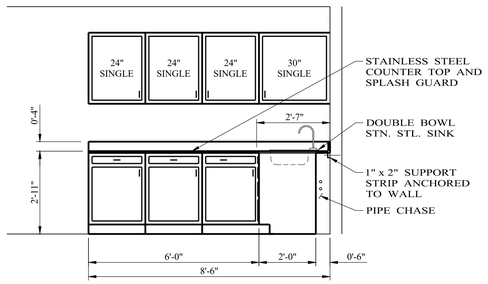
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY L.A.
DRAWN BY JR. SALINAS
CHECKED BY C.S.R.
SCALE NO SCALE
DATE 09/19/2024

EASTLAND COUNTY WATER SUPPLY DISTRICT
CONTRACT K
WTP SUPPORT IMPROVEMENTS
EASTLAND COUNTY, TEXAS

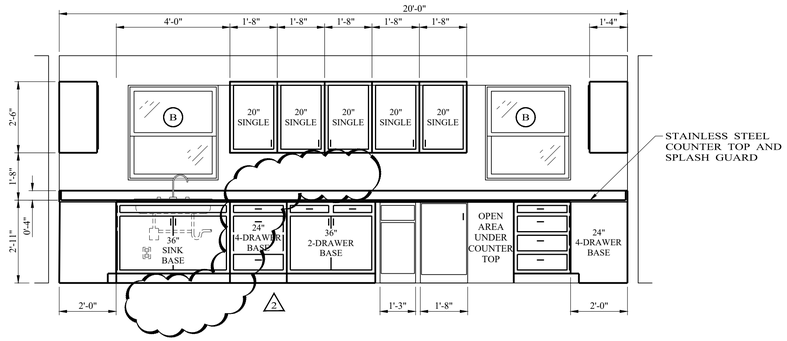
ADMIN-CONTROL BUILDING SCHEDULES

PROJECT NO.: **10-4948**
SEQUENCE No.
SHEET No. **A-803**



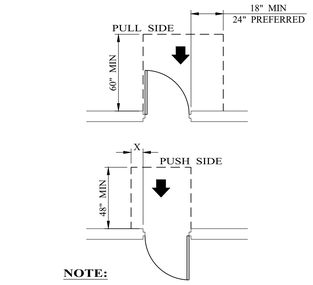
LABORATORY CABINET WEST ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



LABORATORY CABINET NORTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"

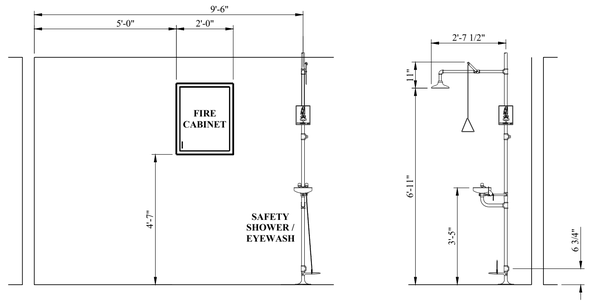


NOTE:

"X" = 12" IF DOOR HAS BOTH A CLOSER AND LATCH

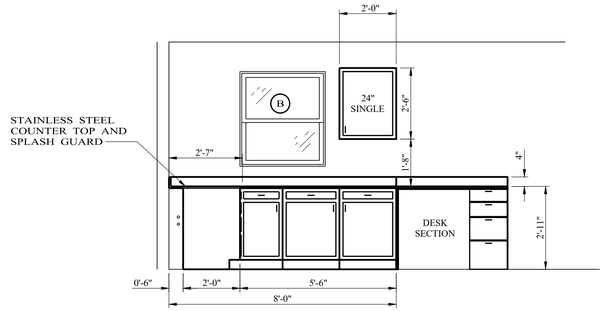
DOOR SWING CLEARANCES

NO SCALE



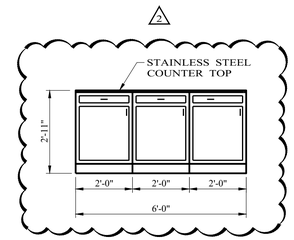
LABORATORY CABINET SOUTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



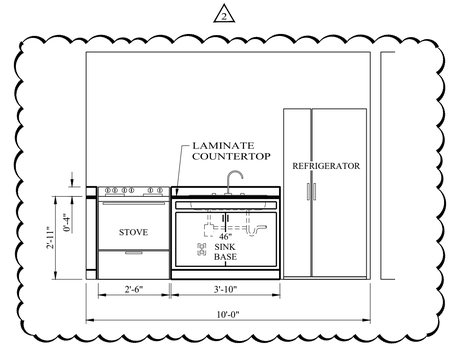
LABORATORY CABINET EAST ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



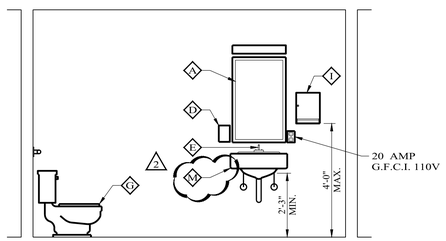
LABORATORY ISLAND SOUTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



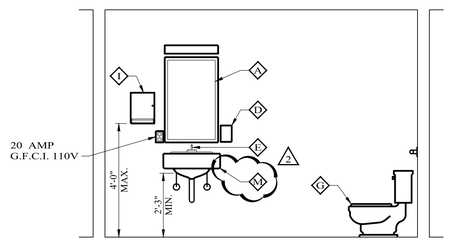
KITCHEN WEST ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



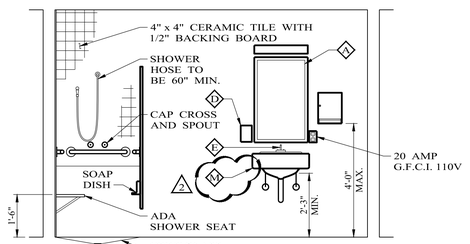
MEN'S RESTROOM SOUTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



WOMAN'S RESTROOM NORTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"

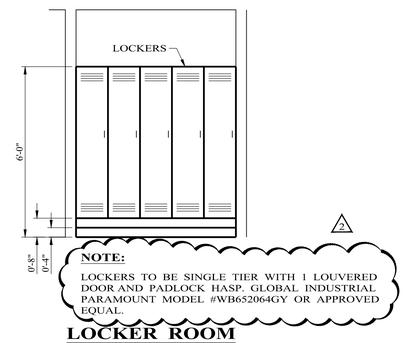


NOTE:

SHOWER NOZZLE CONTROL AREA SHALL BE 48" TO CL ABOVE SHOWER FLOOR

OPERATOR RESTROOM EAST ELEVATION DETAILS

SCALE: 3/8" = 1'-0"



NOTE:

LOCKERS TO BE SINGLE TIER WITH 1 LOUVERED DOOR AND PADLOCK HASP, GLOBAL INDUSTRIAL PARAMOUNT MODEL #WB652064GY OR APPROVED EQUAL.

LOCKER ROOM SOUTH ELEVATION DETAILS

SCALE: 3/8" = 1'-0"

NO.	REVISION	DATE
1	ISSUED FOR TWBD	04/18/2024
2	ADDENDUM #2	03/19/2025

03/19/2025

LEROY ARCE 114163 LICENSED PROFESSIONAL ENGINEER

ENPROTEC/HIBBS & TODD, INC.

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325-698-5560

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BAR IS ONE INCH ON ORIGINAL DRAWING

0 1

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY	L.A.
DRAWN BY	JR. SALINAS
CHECKED BY	C.S.R.
SCALE	AS NOTED
DATE	09/19/2024

EASTLAND COUNTY WATER SUPPLY DISTRICT
CONTRACT K
WTP SUPPORT IMPROVEMENTS
EASTLAND COUNTY, TEXAS

ADMIN-CONTROL BUILDING CABINET ELEVATIONS AND DETAILS

PROJECT NO.: 10-4948

SEQUENCE No.

SHEET No. A-805