TERRABELLA
Environmental
Services

TERRABELLA ENVIRONMENTAL SERVICES INC.
PLEASANTON FACILITY
PLEASANTON, ATASCOSA COUNTY, TEXAS

TYPE V MUNICIPAL SOLID WASTE
REGISTRATION APPLICATION
PART III

REGISTRATION NO. 43036

Prepared for:
Terrabella Environmental Solutions Inc.
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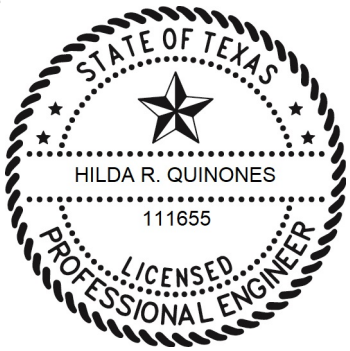
Prepared on June 24, 2020
Revision 1 – September 7, 2020
Revision 2 – September 25, 2020



September 27, 2020

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Q&A
Diversified LLC

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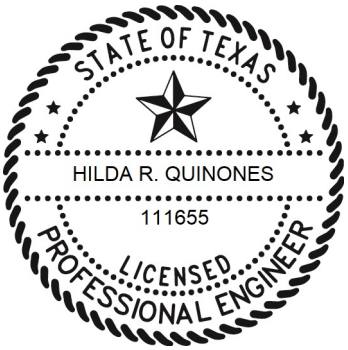

September 27, 2020

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1	WASTE PROCESSING SCHEMATIC AND PROCESS FLOW DIAGRAM
2	EQUIPMENT LIST
3	CONSTRUCTION DETAILS
4	CONTAINMENT CALCULATIONS
5	ENDANGERED SPECIES LIST
6	25 YEAR 24 HR RAIN EVENT
7	CLOSURE PLAN
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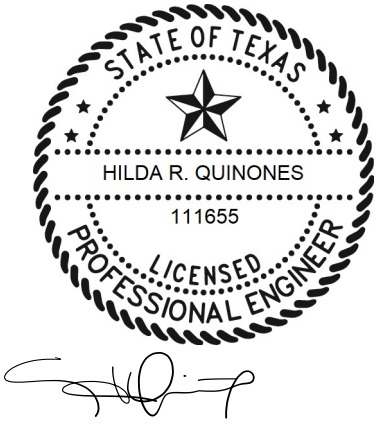


September 27, 2020

3. CONTENTS OF PART III OF THE APPLICATION 330.63

3.1 SITE DEVELOPMENT PLAN 330.63(a)

This Site Development Plan (SDP) includes details specific to the facility for which this registration application is being prepared. This SDP addresses criteria providing for the safeguarding of the health, welfare, and physical property of the people and environment through consideration of geology, soil conditions, drainage, land use, zoning, adequacy of access roads, and other considerations as the site dictates were used in the selection of the site and design of the facility.

3.2 GENERAL FACILITY DESIGN 330.63(b)

3.2.1 Facility Access 330.63(b)(1)

The facility will provide access control by fences and lockable gates. These measures are suitable access control to prevent the entry of livestock, to protect the public from exposure to potential health and safety hazards and to discourage unauthorized entry or uncontrolled disposal of solid waste or hazardous waste.

3.2.2 Waste Movement 330.63(b)(2)

The facility will receive for processing and storage formalin and water; unused and/or expired IV bags, nonhazardous non-industrial liquids, and other products or waste acknowledged for receipt by the TCEQ Industrial and Hazardous Waste Section regarding notifications in accordance with 30 TAC 335.6. The facility will not accept waste defined in 30 TAC 330.15, relating to General Prohibitions unless otherwise identified in this application and the issued Registration.

Unused and/or expired IV bags are transported into the facility in the form of drums. The IV bags are transferred entirely into totes for their final disposition at a TCEQ Permitted Facility.

Formalin and water is transported to the facility in the form of drums or totes primarily. Before discharging the material into the off-load tanks, the waste load is checked by the waste receiving operation to determine the volume, content, identity and character of the waste. The transporter waste manifest form is verified and collected. If the material is

found to be an unauthorized or prohibited waste, it will not be accepted.

The drums and/or totes are then unloaded to the processing building where the operations occur. It is here where the compatible liquid waste will be combined into compatible storage tanks that will be located on the exterior of the building on a reinforced concrete slab.

The maximum amount of waste to be received at the facility is 8,440 gallons per day (GPD)/35.21 tons per day. The tanks are never filled to capacity because of material expansion and venting requirements needed to pump material in and out of tanks. The maximum amount of waste to be received at the facility daily and yearly for the next 5 years is 8,440 gallons/35.21 tons and 2,194,400 gallons/9,155 tons, respectively.

Once the liquid waste storage tank has reached a fill level, it is then sent via tanker truck to a TCEQ permitted facility. Wastewater produced at the facility is never combined with the above mentioned liquid waste for disposal. Additional information regarding waste movement is shown on Attachment 1 – Waste Processing Schematic and Process Flow Diagram.

A list of waste processing equipment is identified in Attachment 2 – Equipment List. The equipment identified in Attachment 2 includes a listing of storage units and ancillary equipment routinely used at the facility. Tanker trucks/hauling trucks are used to move materials in and out of the site. Although these trucks may be staged on site for these purposes, they are not part of the active process and they are not used to add storage volume to the facility. The general type, minimum number, typical size, and functions of the equipment are also included. TES may supplement this basic equipment with other similar equipment as needed to operate the facility in the event of a failure or breakdown of existing equipment, to improve operational efficiency, or to meet special needs. The TCEQ will be consulted if new equipment may require an amendment to the facility registration.

3.2.2.2 Flow Diagram 330.63(b)(2)(A)

A flow diagram indicating the storage, processing and disposal sequences for the waste types received at the facility is found in Attachment 1.

3.2.2.3 Schematic View 330.63(b)(2)(B)

A schematic view drawing showing the various phases of collection, separation, processing and disposal for the waste streams received at the facility is found in Attachment 1.

3.2.2.4 Ventilation and Odor Control 330.63(b)(2)(C)

Portions of waste management activity will take place within an open metal building with a concrete slab. Off-loading tanks will be located outside the processing building. Odor will be controlled by minimizing contact between unprocessed waste and air, and by following good housekeeping practices. Liquid wastes will be transferred in hoses and pipes and stored in enclosed tanks. Under these conditions, airflow is limited over the surfaces of liquid as the waste is transferred and processed. Odors will not be mixed with large volumes of air and widely distributed in the building or throughout the site. If odor is detected past the registration boundary, other odor control measures will be implemented as necessary. These may include the restricting of off-loading of waste, or the use of odor masking sprays until odors are not detected past the registration boundary.

Because of the nature of the waste material handled at the facility, the facility is permitted by rule and does not require a site-specific air permit (30 TAC 106.532). The owner will obtain all required authorizations under Chapter 116 or Subchapter U from Air Permits Division. Further discussion of ventilation and odor control is contained in Part IV, Site Operating Plan.

3.2.2.5 Generalized Construction Details-Storage and Processing Units 330.63(b)(2)(D)

The facility will be comprised of a pre-fabricated open metal building and reinforced concrete slab. The building and roof are made of galvanized metal. The roof is sloped away from the storage tank area and has a 2-foot overhang. Generalized details are provided in Attachment 3 – Construction Details. Performance data for all storage and

processing units and equipment is provided in Attachment 4.

3.2.2.6 Generalized Construction Details-Slab and Subsurface Supports 330.63(b)(2)(E)

The facility building is supported on a reinforced concrete slab-on-grade foundation of sufficient thickness capable of supporting the building and waste processing activities.

Processing units and containerized waste will rest directly on the slab-on-grade building foundation. Specially designed slabs or subsurface supports are not required. Building slab details are provided in Attachment 3. Concrete slabs, berms, a sloped floor and curbs will provide the required spill storage capacity. Minimum curb dimensions and spill containment calculations are presented in Attachments 3 and 4.

3.2.2.7 Location and Engineering Design Details 330.63(b)(2)(F)

A summary and layout for the individual containment areas and calculations for secondary containment are included in Attachments 3 and 4.

3.2.2.8 Storage of Grease, Oil and Sludge Plans 330.63(b)(2)(G)

This facility will not store grease, oil and sludge therefore this section is not applicable.

3.2.2.9 Disposition of Effluent 330.63(b)(2)(H)

No waste water is produced during the transfer and storage of material.

3.2.2.10 Noise Pollution Control 330.63(b)(2)(I)

While there will be storage tanks located outside the building, waste processing operations and activity will take place within the processing building.

3.2.3 Sanitation 330.63(b)(3)

The processing facility and equipment will be inspected regularly and cleaned as required in Part IV of this application. Wash waters will not be allowed to accumulate on-site to prevent the creation of odors or an attraction to vectors. Wash water from sumps will be pumped back to the processing tanks.

Wash down equipment and water connections will be provided for the process and unloading areas. Floors and walls adjacent to unloading areas, operating areas and

equipment which require frequent wash down will be constructed of reinforced concrete, steel or other non-porous hard-surfaced material. See Attachment 3 – Construction Details.

3.2.4 Water Pollution Control 330.63(b)(4)

All waste unloading areas, waste storage tanks and waste processing areas will have secondary containment. There will be no surface water discharges from the waste storage and processing areas. The building slab will be designed to allow for collection of any minor spills and facility washdown water which will be routed through the processing equipment prior to discharge to a permitted facility. Disposal of process liquids will be in a manner that will not cause surface or groundwater pollution.

3.2.5 Endangered Species Protection 330.63(b)(5)

The facility and the operation of the facility will not result in the destruction or adverse modification of the critical habitat of endangered or threatened species, or cause or contribute to the taking of any endangered or threatened species. The site was evaluated using the U.S. Fish and Wildlife Critical Habitat Portal for the occurrence of threatened, endangered, and candidate listed species for Atascosa County. An annotated list of threatened, endangered and candidate listed species for Atascosa County is provided in Attachment 5. There were no critical habitats identified using the Critical Habitat Portal for the property.

In the unlikely event critical habitat of an endangered or threatened species or the identification of a threatened or endangered species is encountered during construction, TES will stop work immediately and coordinate with local and federal agencies regarding an action plan.

3.3 FACILITY SURFACE WATER DRAINAGE REPORT 330.63(c) and 330.303

The facility design complies with the requirements of 30 TAC 330.303 (related to Surface Water Drainage for Municipal Solid Waste Facilities). The requirements found in 30 TAC 330.63(c)(1) and 30 TAC 330.63(c)(2) are not applicable to this MSW Type V Facility.

3.4 SURFACE WATER DRAINAGE FOR MUNICIPAL SOLID WASTE FACILITIES 330.303

3.4.1 Facility Management of Run-On and Run-Off 330.303(a)

The facility will be constructed, maintained and operated to manage run-on and run-off during the peak discharge of a 25-year rainfall event and prevent off-site discharge of waste, including in-process and processed materials. Waste storage will occur in the building processing area in non-bulk containers and/or holding tanks located outside the processing building. Secondary containment has been designed to manage run-on and run-off during peak discharge of a 25-year rainfall event away. See Attachment 6.

The site operator will monitor the activities at the facility to ensure that no pollutants, solid waste, or non-point source pollution of the waters of the United States or Waters of the State, or adjacent to, occurs at any time.

3.4.2 Surface Water Drainage 330.303(b)

Waste will be stored under cover in 55 gallon drums or totes prior to processing within the MSW processing unit, transport trucks while in transit, and in holding tanks located outside the processing building. Transport trucks are elevated which prevents surface water from running onto or into them. The facility is designed so that surface water drainage, in and around the facility, will not run onto, into, or off the storage area from outside the building.

3.5 WASTE MANAGEMENT UNIT DESIGN 330.63(d)

3.5.1 Storage and Transfer Units 330.63(d) (1)

The number and size of tanks used for processing and storage have been selected to provide the facility with the capacity to process all the waste received each day with equipment that can process the daily maximum receipt of 8,440 gallons/35.21 tons, minimizing the holding time of liquid waste. The liquid waste, which may be capable of creating public health hazards or nuisances, will be stored in enclosed tanks and transferred promptly. The management of waste will not be allowed to result in nuisances or public health hazards.

Storage tanks are enclosed high-density polyethylene (HDPE) tanks with a working capacity of up to 3,000 gallons each. Tanks may be phased in according to processing needs.

The facility is designed to control and contain spills. The spill prevention and control measures layout for the individual containment areas and calculations for secondary containment are included in Attachments 3 and 4.

Anticipated processing rates and storage times for unprocessed and processed materials are as follows:

TABLE 1
RECEIPT, STORAGE AND PROCESSING DATA

Waste Type	Daily Volume Received (Gallons)	Maximum Waste Storage (Gallons)	Storage of Unprocessed Waste (Hours)		Time On Site of processed waste (Days)		Processing Time (Days)	
			Max	Ave	Max	Ave	Max	Ave
Formalin and Water	8,000	18,000	240	72	365	180	3	1
Unused and/or Expired IV Bags	440	1000	240	72	365	180	3	1
Total Waste Volume (Gal)	**8,440**	**19,000**	240	72	365	180	3	1
Equivalent Total Waste Volume (Tons)	**35.21**	**71.92**						

3.6 NON-APPLICABLE REGULATORY SECTIONS

The following rules are not applicable to this MSW Type V Facility.

330.59(d)(2)(B), since no waste will remain after closure;

330.59(f)(5), applicable only for landfill applications;

330.59(f)(6), applicable only for mobile liquid waste processing units; and

330.59(h)(2), applicable only for a registration over a closed MSW landfill.

330.63(d)(2) - 330.63(d)(9), applicable only for incineration units, surface impoundments, landfill units, mobile liquid waste units, Type IX and IV facilities and compost units.

330.63(e), applicable only for landfill units and compost units.

330.63(f), applicable only for landfill units and compost units.

330.63(g), applicable only for landfill units and compost units.

3.7 CLOSURE PLAN 330.63(h)

The closure plan, provided in Attachment 7, has been prepared in accordance with 30 TAC 330, Subchapter K relating to Closure and Post Closure of a processing facility.

3.8 POST-CLOSURE PLAN 330.63(i)

All waste and waste residue will be removed from the site during closure, and there are no applicable required monitoring programs. Therefore, a facility post-closure care plan is not required for this MSW Type V Facility.

3.9 COST ESTIMATE FOR CLOSURE AND POST-CLOSURE CARE 330.63(j)

A cost estimate for closure prepared in accordance with 30 TAC 330.505 (Closure Cost Estimate for Storage and Processing Units) is provided in Attachment 8. A post-closure care cost estimate is not required for this MSW Type V Facility.

Demonstration of financial assurance as specified in Chapter 37, Subchapter R (related to Financial Assurance for Solid Waste Facilities) will be provided within 60 days prior to the initial receipt of waste. In accordance with 30 TAC 330.505(b)(2), continuous financial assurance coverage for closure will be provided until all requirements of the closure plan have been completed and the site is determined to be closed in writing by the Executive Director.

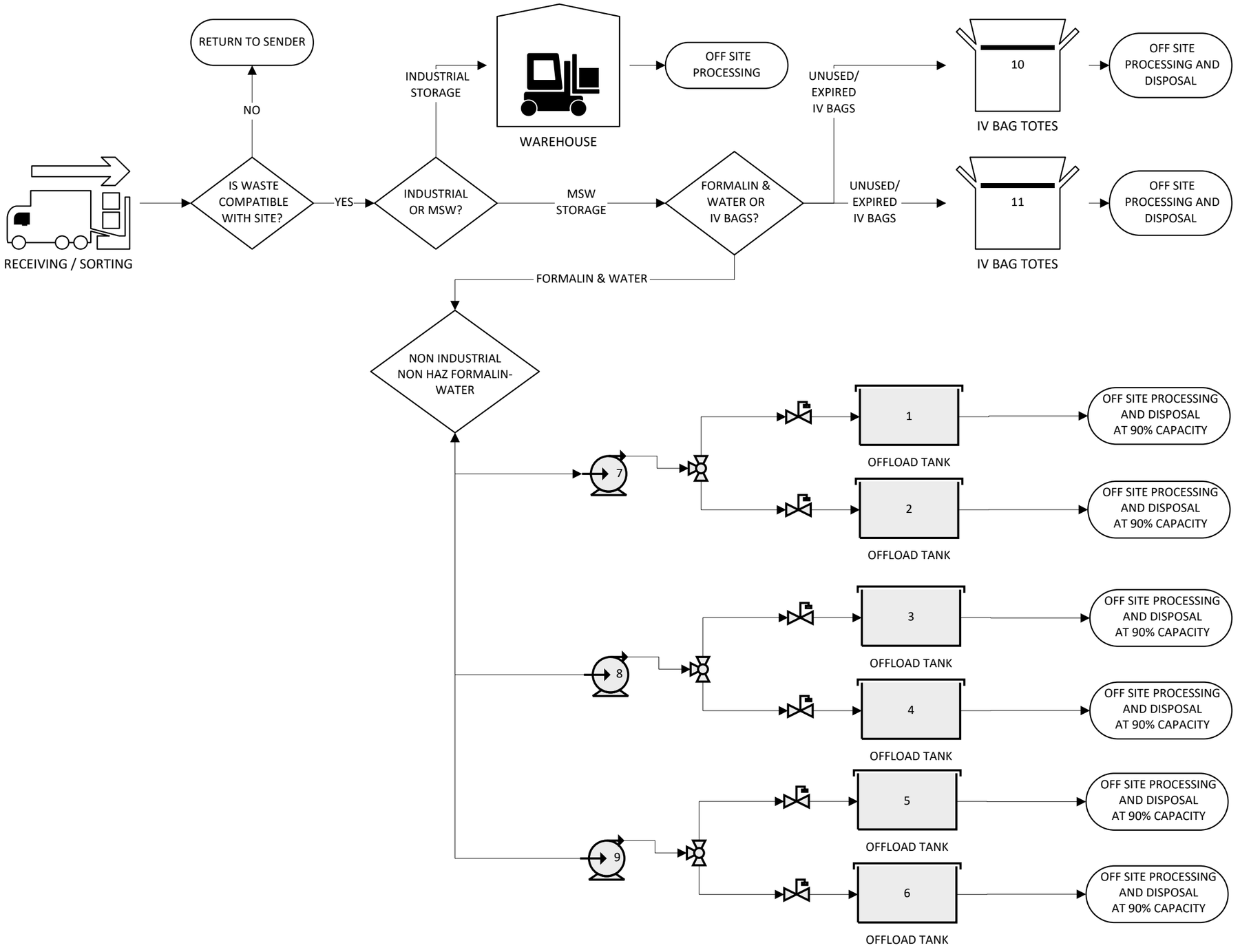
In accordance with 30 TAC 330.505(a)(3), an increase in closure cost estimate and the amount of financial assurance will be made if changes to the facility conditions increase the maximum cost of closure at any time during the active life of the facility.

In accordance with 30 TAC 330.505(a)(4), if the closure cost estimate exceeds the maximum cost of closure at any time during the remaining life of the facility, the owner or operator of the facility may submit a registration modification request with detailed justification to reduce the closure cost estimate and the amount of financial assurance.

ATTACHMENT 1

WASTE PROCESSING SCHEMATIC

PROCESS FLOW DIAGRAM



June 25, 2020

STATE OF TEXAS
HILDA R. QUINONES
111655
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR BY	APP BY

PREPARED BY

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Building a practice focused on trust

PROJECT

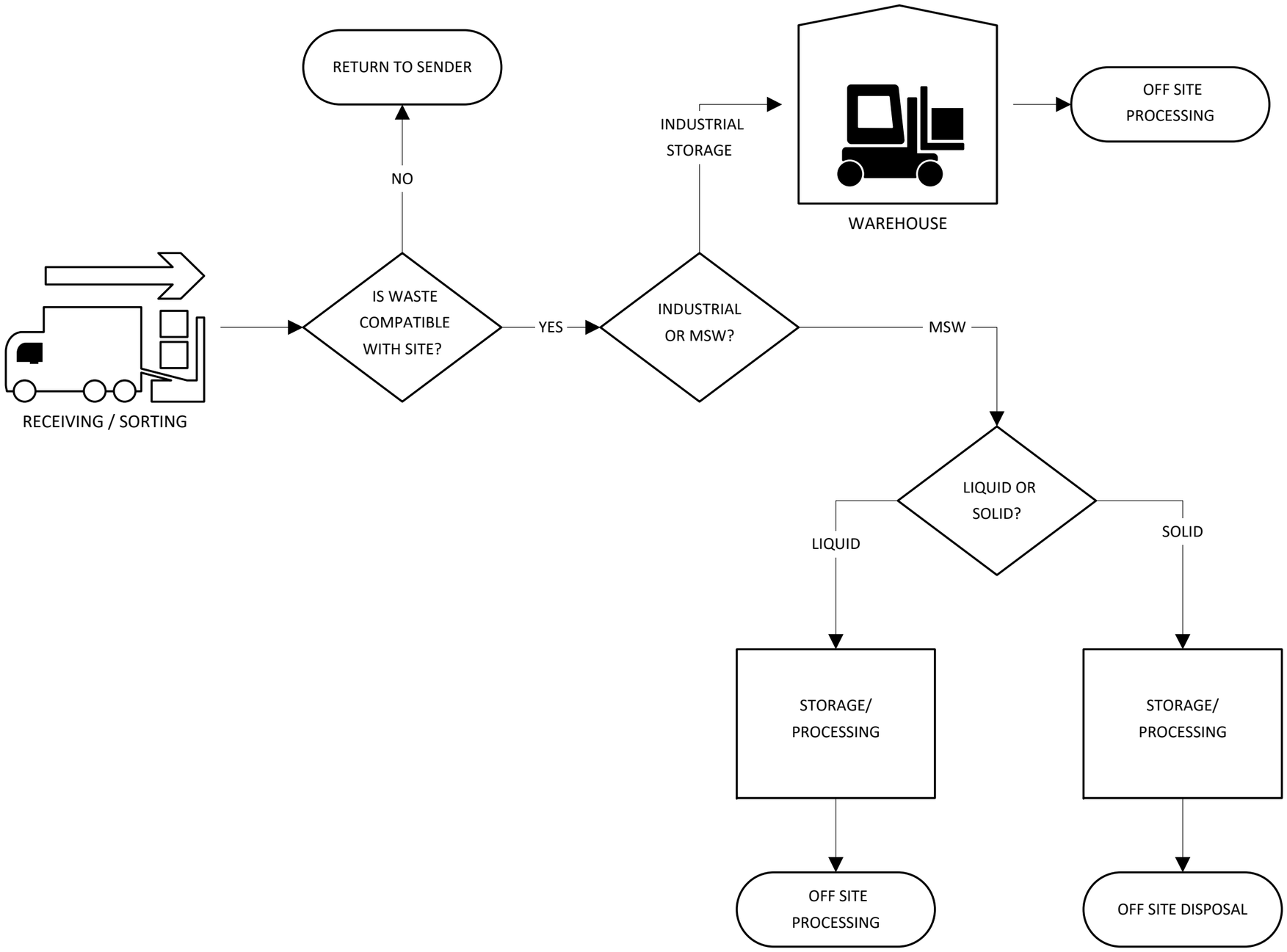
Terrabella Environmental Services
RN 110896578
433 Zander Lane
Pleasanton, TX 78064

TERRABELLA Environmental Services

SHEET TITLE

Waste Processing Schematic

DES BY		MAP SOURCE	
DR BY			
CHK BY		PURPOSE	
APP BY	HQ	**FOR PERMITTING PURPOSES ONLY**	
DATE		FIGURE	
JUNE 2020		**ATTACHMENT 2**	



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SHEET TITLE

Process Flow Diagram

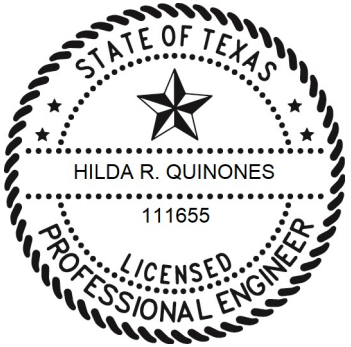
DES BY		MAP SOURCE	
DR BY			
CHK BY		PURPOSE	
APP BY	HQ	**FOR PERMITTING PURPOSES ONLY**	
DATE		FIGURE	
JUNE 2020		**ATTACHMENT 1**	

ATTACHMENT 2

EQUIPMENT LIST

Equipment List

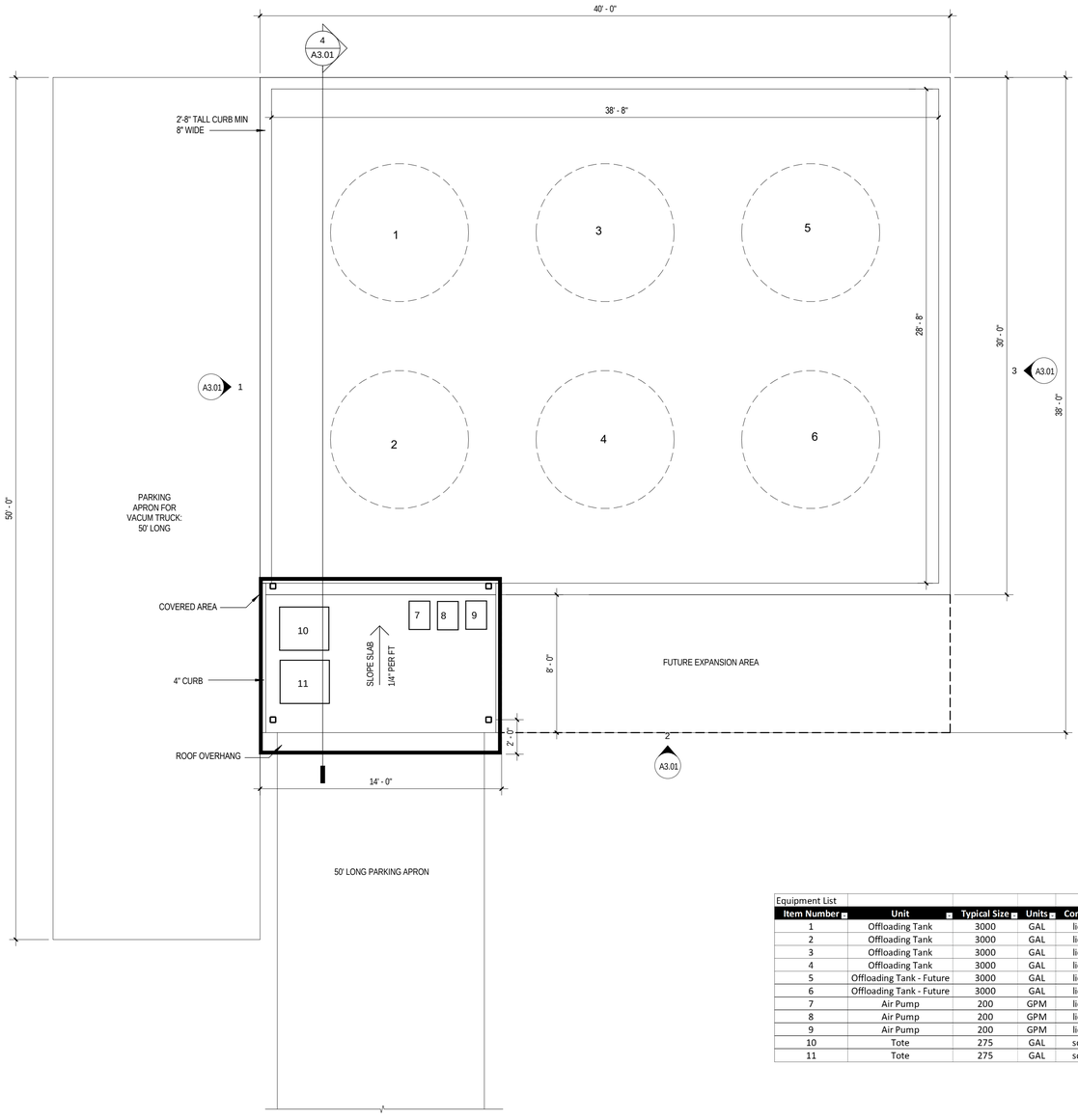
Item Number	Unit	Typical Size	Units	Contents	Function	Construction	Vents	Covers	Enclosure
1	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
2	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
3	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
4	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
5	Offloading Tank - Future	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
6	Offloading Tank - Future	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
7	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
8	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
9	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
10	Tote	275	GAL	solids	Storage	Polypropylene	Outdoor	Yes	Yes
11	Tote	275	GAL	solids	Storage	Polypropylene	Outdoor	Yes	Yes



June 25, 2020

ATTACHMENT 3

CONSTRUCTION DETAILS



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3	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
4	Offloading Tank	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
5	Offloading Tank - Future	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
6	Offloading Tank - Future	3000	GAL	liquid	Storage	HDPE	Outdoor	Yes	No
7	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
8	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
9	Air Pump	200	GPM	liquid	Material Transfer	Polypropylene	N/A	No	Yes
10	Tote	275	GAL	solids	Storage	Polypropylene	Outdoor	Yes	Yes
11	Tote	275	GAL	solids	Storage	Polypropylene	Outdoor	Yes	Yes

1 A2.01 LEVEL 1- COMPOSITE FLOOR PLAN

1/4" = 1'-0"

Revisions:

June 25, 2020

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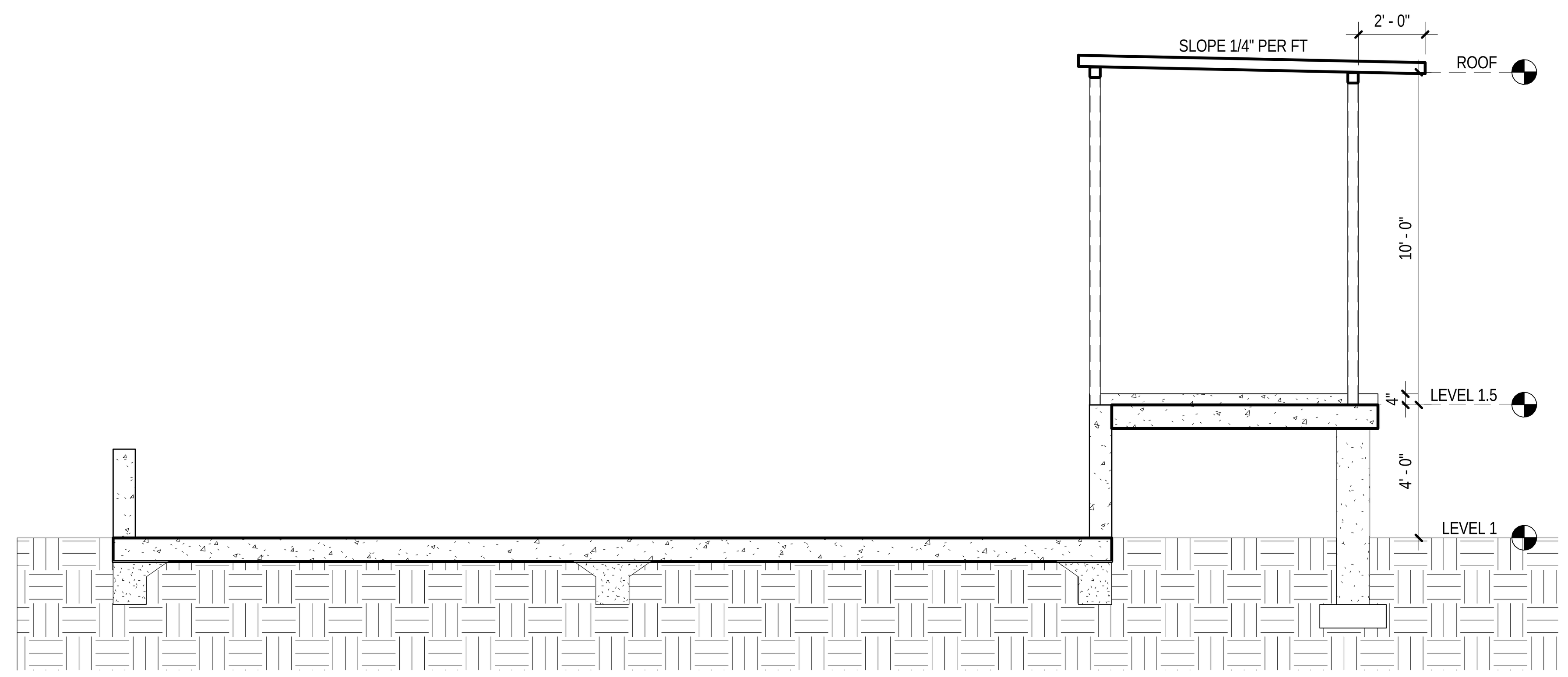
Sheet Title
COMPOSITE FLOOR PLAN

Terrabella Environmental Services Inc
433 Zander Ln, Pleasanton, TX Atascosa County

Project No:
Date:
Drawn By: JR
Checked By: Checker

Sheet No:
A2.01

NORTH



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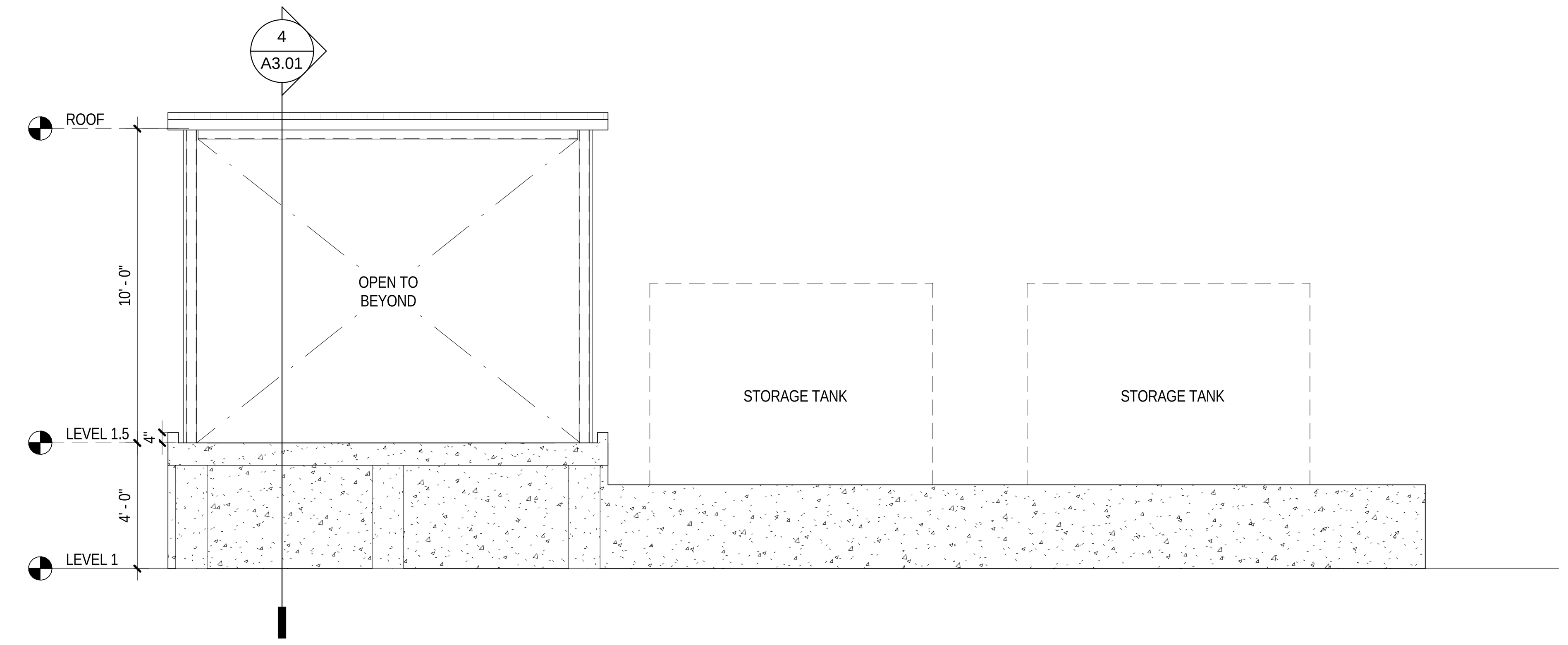
1/4" = 1'-0"



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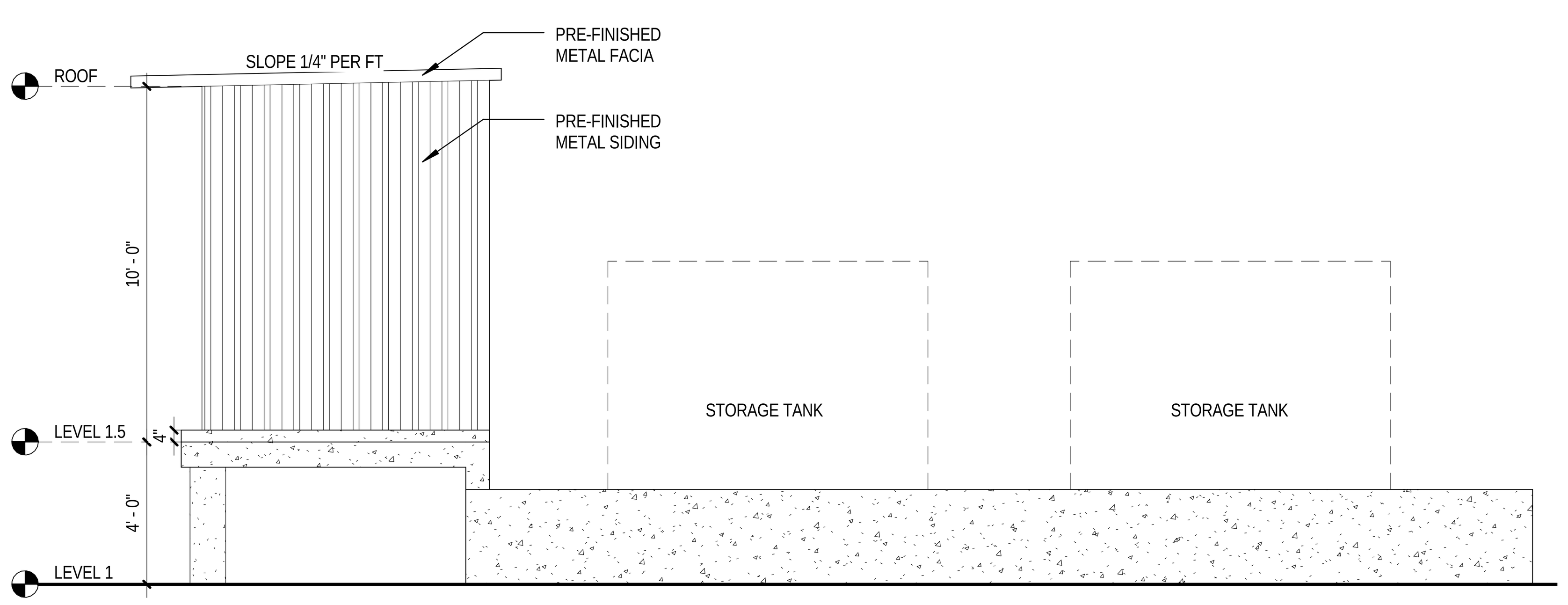

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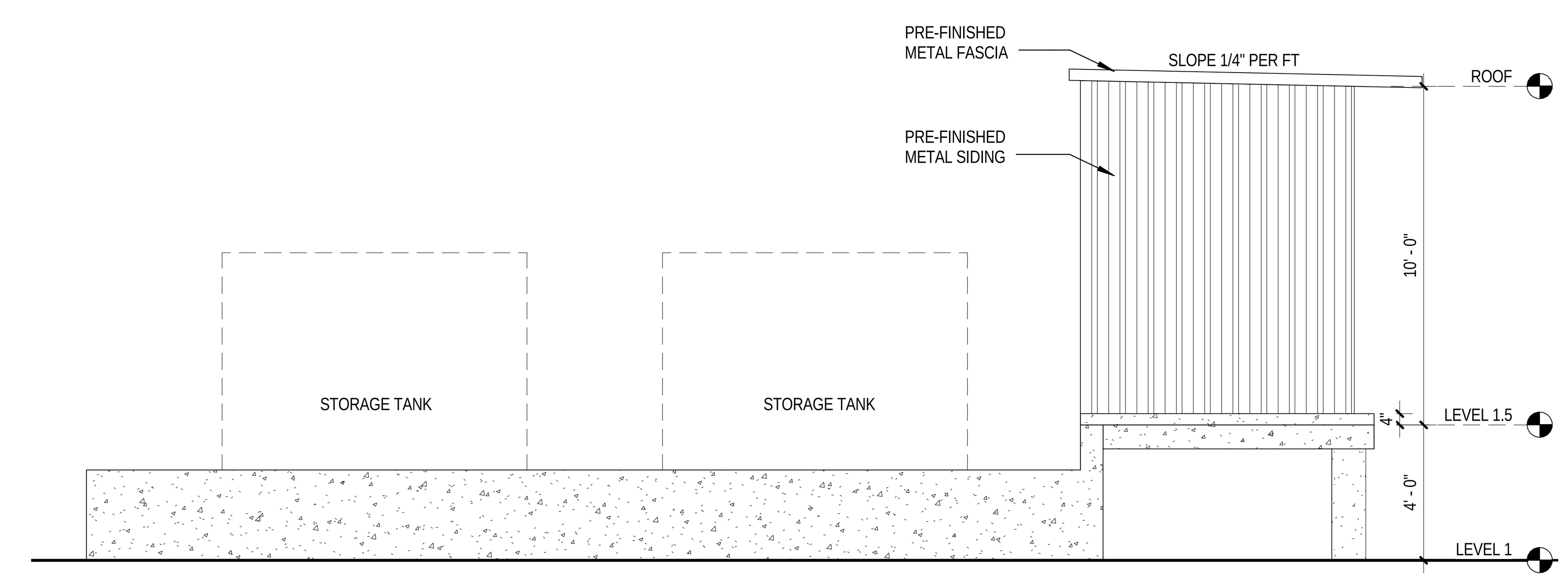

1 A3.01 ELEVATION - A
1/4" = 1'-0"

Revisions:

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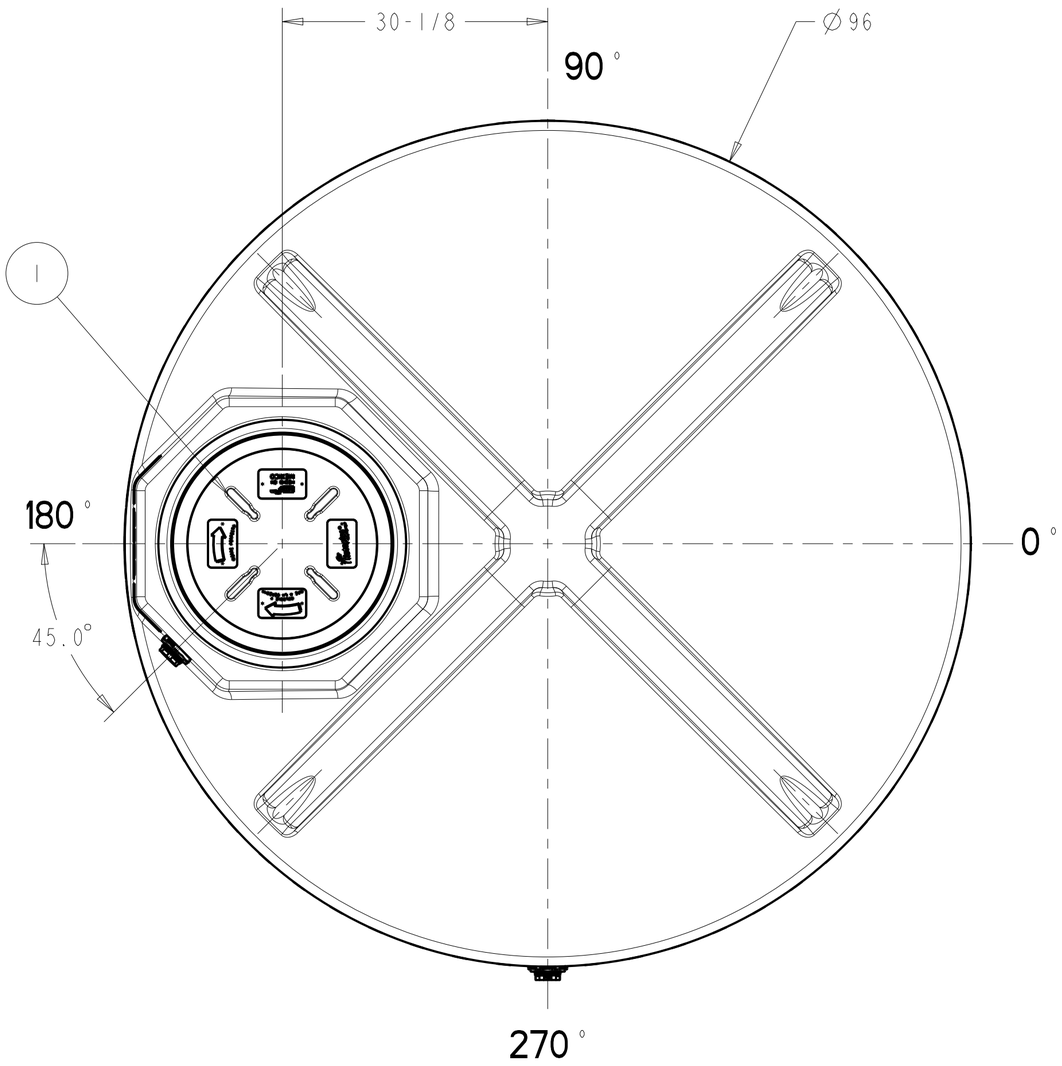
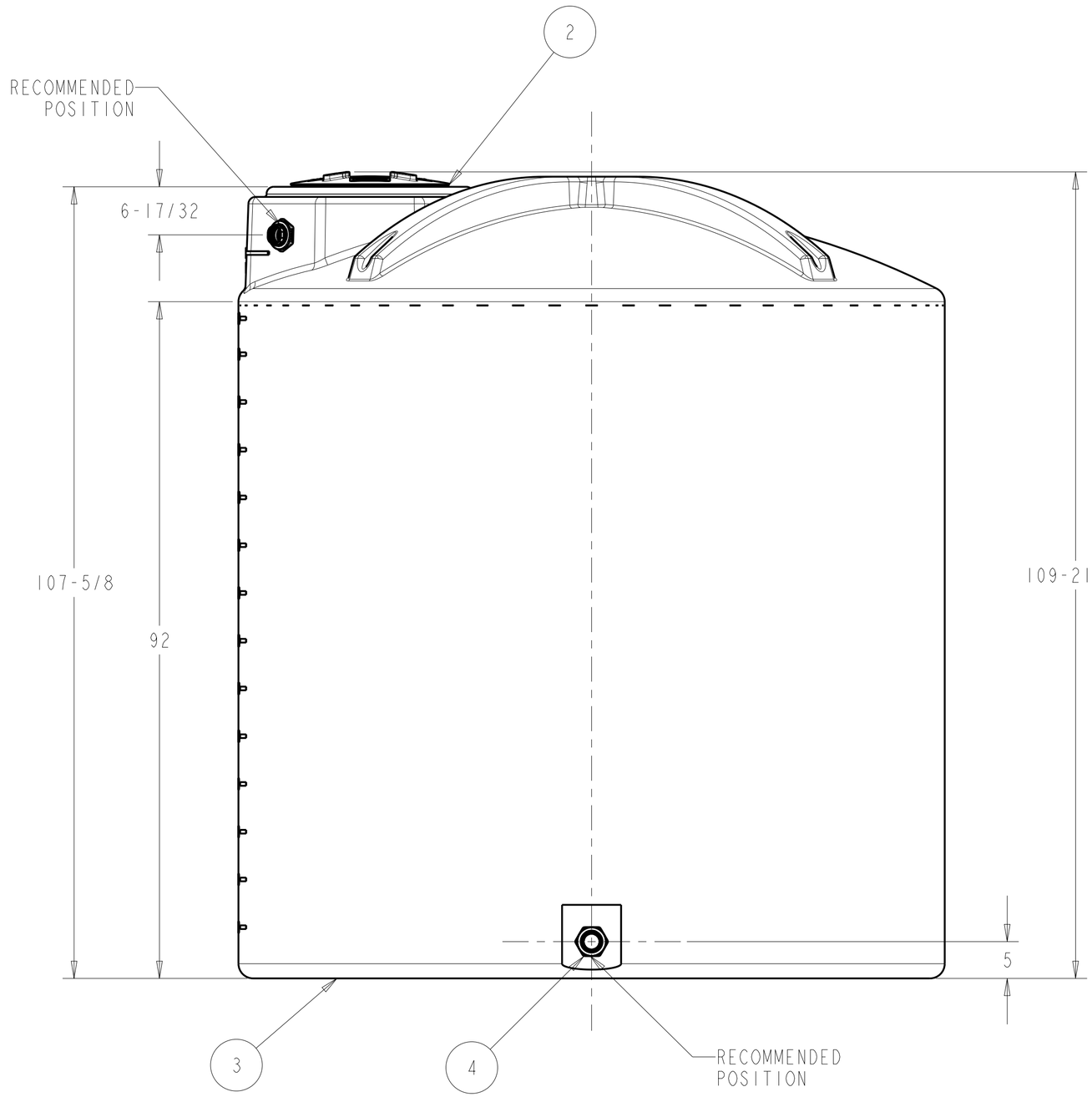
Sheet Title
BUILDING SECTION / ELEVATIONS

Terrabella Environmental Services Inc
433 Zander Ln, Pleasanton, TX Atascosa County

Project No:
Date:
Drawn By: Author
Checked By: Checker

Sheet No:
A3.01





NOTES:

1-THE MANHOLE OF THE TANK HAVE THE FLEXIBILITY TO PUT UP END CAPS OF 18", 22" AND 24"

No.	QTY	CODE	DESCRIPTION	MATERIAL	OBSERVATIONS
1	1	A-D-142	18" CAP ROTOPLAS	PP	BLACK COLOR
2	1	A-D-235	18" CAP RING ROTOPLAS	PP	BLACK COLOR
3	1	R-D-152	VERTICAL TANK 3000 GAL	HDPE	
4	2	TF-200	2" BULKHEAD TANK FITTING BANJO	PP	BLACK COLOR

INNOVATION AND DEVELOPMENT CENTER — Rotoplas más y mejor agua

PROJECT: VERTICAL TANKS USA IG

DESCRIPTION: ASSY VERTICAL TANK 3000 GAL

MATERIAL: HDPE

FINISHED SURFACE:

REFERENCE DRAWING:

CODE: R-B-549

REV: 1

PTC CREO 3.0

Husky 2200 Plastic Pumps
Air-Operated Double Diaphragm

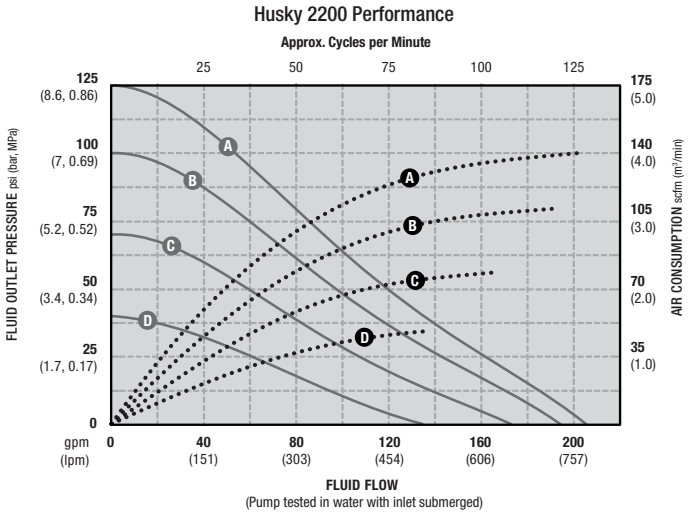
Technical Specifications

Husky 2200 Pumps	Polypropylene	PVDF
Maximum fluid working pressure	125 psi (8.6 bar, 0.86 MPa)	125 psi (8.6 bar, 0.86 MPa)
Maximum free flow delivery*	200 gpm (757 lpm)	200 gpm (757 lpm)
Maximum pump speed		
Standard diaphragm	125 cpm	125 cpm
Overmolded diaphragm	155 cpm	155 cpm
Displacement per cycle**		
Standard diaphragm	1.6 gallon (6.1 liter)	1.6 gallon (6.1 liter)
Overmolded diaphragm	1.3 gallons (4.9 liter)	1.3 gallons (4.9 liter)
Maximum suction lift (DB2366)	16 ft (4.9 m) dry	16 ft (4.9 m) dry
Maximum size pumpable solids	0.25 in (6.3 mm)	0.25 in (6.3 mm)
Maximum operating temperature***	150°F (65.5°C)	225°F (107°C)
Maximum diaphragm operating temperature***		
PTFE	150°F (65.5°C)	220°F (104.4°C)
PTFE overmolded diaphragm	150°F (65.5°C)	180°F (82.2°C)
Santoprene	150°F (65.5°C)	180°F (82.2°C)
Buna-N	150°F (65.5°C)	180°F (82.2°C)
TPE	150°F (65.5°C)	150°F (65.5°C)
Fluoroelastomer	150°F (65.5°C)	225°F (107°C)
Geolast	150°F (65.5°C)	150°F (65.5°C)
Typical sound power at 70 psi (4.9 bar, 0.49 MPa) air @ 50 cpm	95.2 dBa	90.9 dBa
Maximum air consumption		
Standard diaphragm	140 scfm (4.0 m^3/min.)	140 scfm (4.0 m^3/min.)
Overmolded diaphragm	157 scfm (4.4 m^3/min.)	157 scfm (4.4 m^3/min.)
Air pressure operating range	20 to 125 psi (1.4 to 8.6 bar, 0.14 to 0.86 MPa)	20 to 125 psi (1.4 to 8.6 bar, 0.14 to 0.86 MPa)
Air inlet size	3/4 npt(f)	3/4 npt(f)
Fluid inlet & outlet size	2 npt(f) or bspt(f)	2 npt(f) or bspt(f)
Weight	80 lb (36.3 kg)	106 lb (48.1 kg)
Instruction manual	3A2578	3A2578

**Flow rates are with muffler and do not vary based on diaphragm material*
***Displacement per cycle may vary based on suction condition, discharge head, air pressure and fluid type*
**** Actual pump performance may be affected by prolonged usage at temperature*

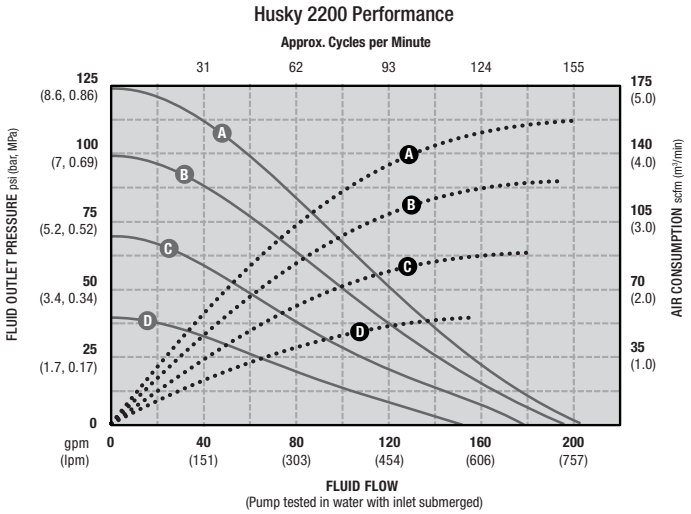
Performance Charts

Bolt Through Design



AIR PRESSURE	LEGEND
(A) = at 125 psi (8.3 bar, 0.83 MPa)	Air Consumption •••••
(B) = at 100 psi (7 bar, 0.7 MPa)	Fluid Pressure ——
(C) = at 70 psi (4.8 bar, 0.48 MPa)	
(D) = at 40 psi (2.8 bar, 0.28 MPa)	

Overmolded Design



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(D) = at 40 psi (2.8 bar, 0.28 MPa)	

GENERAL

1. The general contractor is responsible for coordination of all resulting revisions to the structural system or other trades as a result of acceptance of contractor proposed alternatives or substitutions.

2. Methods, procedures, and sequences of construction are the responsibility of the contractor and must satisfy the minimum requirements of the 2015 International Building Code. The contractor shall take all necessary precautions to maintain and insure the integrity of the structure at all stages of construction.

3. The general contractor and sub-contractors shall determine the scope of the structural work from the contract documents taken as a whole. The structural drawings shall not be considered separately for purposes of bidding the structural work. Due consideration shall be given to other structural work or work related to the structure, including necessary coordination described or implied by the architectural, civil and MEP drawings.

4. The reproductive use of the structural contract documents or electronic files as structural shop drawing documents by the contractor or sub-contractors is not allowed.

5. Scales noted on the drawings are for general reference only. No dimensional information shall be obtained by direct scaling of the drawing.
6. These drawings do not, nor are intended to, locate property lines, building set backs nor height limitations. It is the contractor's responsibility to locate the building and construct it to, and within, applicable code restrictions. Further, it is the civil engineer's responsibility to address site drainage appropriate to the site and in consideration to adjoining properties.

CODES

1. The structure and components shown in these drawings have been designed under the guidelines of the structural requirements listed in the 2015 International Building Code with required amendments.

2. Minimum Design Loads for Buildings & Other Structures, ASCE/SEI 7-10.

3. Structural Steel: AISC Steel Construction Manual, Fourteenth Edition.

4. Structural Concrete: American Concrete Institute, ACI 318-11.

DESIGN LOADS

1. The design gravity loads are as follows:

Superimposed Dead Loads (included, but not limited to):

Roof Assemblies:	10 psf
Self Weight of Concrete:	as required

Live Loads:

Roof:	20psf
Roof Net Uplift:	10psf
Slab:	125psf
Elevated Platform:	125 psf

2. Except for areas of public assembly, and except for live loads which exceed 100 psf, floor live loads are reduced for slab systems, beams, girders, columns, piers, walls, and foundations which support a floor area of 150 square feet or greater. The floor live load is reduced at the rate of 0.08 percent per square foot of floor area supported in excess of 150 square feet. The reduction does not exceed 40 percent for members receiving loads from one level only, 50 percent for other members, nor "R" as determined by R= 23.1(1+dead load/live load), in accordance with section 1607 of the building code.

3. The floor system has been designed to withstand a concentrated load of 2000 pounds placed upon any space 2'-6" square, in accordance with Section 1607.4 of the International Building Code.

4. Wind: The structure has been designed to withstand the wind pressures specified in ASCE 7-10.

Basic wind speed (3 second gust)	110 miles per hour.
Wind Importance factor,	1.15
Occupancy Category	3
Wind Exposure	B
Internal Pressure Coefficient	± 0.18.

6. Ground Snow Load Pg = 5 psf.

7. Earthquake

The seismic lateral load on the structure is based on the following:

Seismic Design Category: A

Due to the Seismic Design Category, IBC Section 1603.1.5 does not apply for the project.

SPECIAL INSPECTIONS

1. Inspection of fabricators: Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, special inspection of the fabricated items shall be required by the 2015 IBC and the building official.

2. Steel Construction: The special inspections for steel elements of buildings and structures shall be as required by the 2015 IBC and the building official.

3. Concrete Construction: The special inspections and verifications for concrete construction shall be as required by the 2015 IBC and the building official.

4. Soils: Special inspections for fill placement shall be as required by the 2015 IBC and the building official.. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional in responsible change shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions and the approved soils report, as specified in Section 1803.5.

FOUNDATION BUILDING PAD

1. Due to the absence of a site specific subsurface analysis and report from a registered Geotechnical Engineer, the foundation design is based on assumptions and/or site observations of the existing site conditions. These assumptions may not be verifiable without the expending of additional fees. Foundation conditions noted during construction that differ than those shown in the structural drawings shall be noted to the Structural Engineer before further construction is to proceed.

2. Within the foundation outline and 2'-0" beyond, remove all fat clay and/or unstable, completely weathered limestone strata, all organics (I.E., roots, trees, grass, and other humus), any building foundations or rubble, and any other deleterious materials to a minimum depth of 12".

3. The floor subgrade shall be properly compacted and proofrolled and shall be free of standing water, mud and frozen soil.

4. A vapor barrier with a performance equivalent to a 15 mil stego wrap vapor barrier shall be placed beneath the slab on grade and wrap around perimeter beams.

5. In areas where limestone is exposed at the cut surface, remove a depth of limestone to provide for at least 6" of compacted select fill. In areas where soil or completely weathered limestone is exposed, scarify at least six inches of the cut soil subgrade and recompact to at least 95% of the maximum dry density determined using Texas State Department of Highways and Public Transportation (SDHPT) Test Method TEX-113-E conducted with a laboratory compacted effort of 6.63 FT lbs/cu. in. Hold water contents within ± 2%.

6. Bring the building pads to grade with select material conforming to the following:

Retained on 2-1/2" screen	0%
Retained on 7/8" screen	5% - 50%
Retained on 3/8" screen	25% - 65%
Retained on 1/4" screen	35% - 75%
Retained on #40 mesh sieve	60% - 90%

Material passing the #40 sieve shall meet the following plasticity requirements:

PASSING	MAXIMUM	MINIMUM
No. 40 Sieve	Plasticity Index	Plasticity Index
25% - 40%	15	3
10% - 25%	20	4

Sandy loam is not acceptable fill material.

7. Contractor shall certify the compaction of the select material to at least 95% of the maximum dry density as determined using SDHPT Test Method TEX-113-E conducted with a laboratory compactive effort of 6.63 ft lbs/cu. in. Hold water contents to within + 2% of the optimum, and maintain compacted lift thickness to 6" or less.

8. On top of the compacted, select fill or the cut excavation bottom, place a capillary moisture barrier / drainage layer (minimum thickness of four inches) of free draining, clean, crushed stone with sizes ranging mostly between 1/4 and 1/2 inch. A material conforming to ASTM C 33, Grade 67, is suggested since it is readily available in the central Texas area. The purpose of this layer is to:

A: Provide satisfactory support for slab reinforcement, and

B: Break the transmission of capillary moisture to the underside of the slab.

12. On top of the free draining, clean, crushed stone, place a vapor barrier. A material equivalent to a reinforced paper product known as Moistop 395, manufactured by the Fortifiber Corporation, is suggested. Placement of the vapor barrier should be in accordance with the manufacturer's recommendations.

13. In areas beneath the slab where compacted fill depths exceed 4'-0", all utilities, exhaust lines and conduit, including but not limited to plumbing, gas, and electric conduit lines, shall be adequately attached to the underside of the concrete floor slab. Means and method of attachment shall be the responsibility of the contractor and do not fall under the scope of these structural documents.

14. The foundation design assumptions do allow for a limited amount of potential vertical rise that will not affect structural stability. This allowance in design does not cover architectural, mechanical, electrical or plumbing features.

15. Refer to project specifications for all information concerning foundation construction. The contractor shall perform excavations, footing construction and preparation of the subgrade in accordance with the project specifications.

CONCRETE

1. Concrete in the following areas shall have the following compressive strength (f'c) at 28 days:

Spread footings	3000 PSI
Grade beams	3000 PSI
Slabs on grade	3000 PSI
Walls	3000 PSI

2. All concrete mix designs shall be reviewed and approved by the testing agency prior to sending to the engineer of record for approval.

3. Use the following cementitious materials, of the same type, brand and source throughout the Project:

Portland Cement: ASTM C 150, Type I/II

4. Fly ash may be used as a pozzolan to replace a portion of the portland cement in a concrete mix, subject to the approval of the structural engineer. Fly ash, when used, shall conform to ASTM C618, Type C or F. Concrete mixes using fly ash shall be proportioned to account for the properties of the specific fly ash used and to account for the specific properties of the fly ash concrete thus resulting. The ratio of the amount of the fly ash to the total amount of fly ash and cement in the mix shall not exceed 40 percent.

5. Use the following normal-weight aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source conforming to the following:

Maximum Coarse-Aggregate Size: typically ¾" nominal diameter
Fine Aggregate: free of materials with deleterious reactivity to alkali in cement

6. Lightweight aggregate shall conform to ASTM C 330.

7. Water shall conform to ASTM C 94/C 94M and be potable.

8. Admixtures if used shall be subject to the approval of the structural engineer.

9. Mixing, transporting, and placing of concrete shall conform to ACI 301 and ASTM C 94.

10. Conformance to ACI 305.1 "Specification for Hot Weather Concreting" is required when air temperature is above 90 deg F.

11. Conformance to ACI 306 "Cold Weather Concreting" is required when a period for more than three (3) consecutive days, the average daily air temperature is below 40 deg F and the air temperature is not greater than 50 deg F for more than one-half of any 24 hour period.

12. The fire protection rating for this project is based upon the use of normal weight aggregate concrete made with carbonate aggregates. Carbonate aggregates consist mainly of calcium or magnesium carbonate, e.g., limestone or dolomite, and contain 40 percent or less quartz, chert and flint.

13. General contractor shall notify the architect and Gogo Structural Engineers 48 hours prior to placement of concrete in the foundation.

14. During construction, the contractor shall provide temporary shoring of walls which are ultimately supported top and bottom. Such shoring shall not be removed until the supporting elements are in place, the concrete in the walls and supporting elements has attained the specified 28 day compressive strength (fc') and compaction of the backfill against the wall has been completed.

15. Detailing of concrete reinforcement bars and accessories shall conform to the recommendations of ACI 315 "Details and Detailing of Concrete Reinforcement" and ACI SP-66 "Detailing Manual". Placing of reinforcing bars shall conform to the recommendations of ACI 315R "Manual of Engineering" and placing drawings for reinforced concrete structures" and CRSI "Manual of Standard Practice".

16. No conduit or piping larger than 1" I.D. shall be run in structural concrete members unless shown on structural drawings.

17. All pipe sleeves in concrete members shall be schedule 40 pipe unless shown otherwise on the structural drawings. Location of the sleeves shall be as approved by the Structural Engineer. Provide 3 additional stirrups each side of each sleeve in beams and space as directed by the Engineer.

18. Reinforced steel shall be deformed new billet steel bars in accordance with A.S.T.M. Specification A615 Grade 60.

19. All stirrups shall be Grade 60 with standard 90 degree hooks.

20. Provide 2-#5 x 4'-0" "L" shaped bars top and bottom at all corners and "T" intersections of beams.

21. All hooks and bends in reinforcing bars shall conform to ACI Standards unless shown otherwise.

22. Reinforcement designated as "continuous" may be spliced using Type "B" splices. Reinforcement bar splice lengths in beams which are located at the centerline of supports for bottom bars and at mid-span for top bars may be 36 bar diameters, unless noted otherwise. Provide standard ACI hooks for top and bottom bars at discontinuous ends of all grade beams.

23. Vertical joints may occur at center of spans at locations reviewed by Gogo Structural Engineers.

24. Horizontal construction joints in concrete pours shall be permitted only where indicated on the drawings. All construction joints shall be made in the center of spans - see drawings for typical detail. The location of the construction joints shall be as approved by the Architect and the Structural Engineer. Additional reinforcing at construction joints shall be as specified by the Engineer without additional cost to the owner.

25. Construction joints between piers and pier caps, footings and walls or columns, or walls, columns, beams, and the floor system they support shall be prepared by roughening the contact surface to a full amplitude of approximately 1/4 inch leaving the contact surface clean and free of laitance.

26. Reinforcement bars shall not be tack welded, welded, heated, or cut unless indicated on the contract documents or reviewed by the structural engineer.

27. Welding of reinforcement bars, when accepted by the structural engineer, shall conform to the American Welding Society Standard D1.4. Electrodes for shop and field welding of reinforcement bars shall conform to ASTM A233, Class E90XX.

28. Minimum concrete cover protection for reinforcement bars shall be as follows: (see ACI 318 Section 7.7 for conditions not noted)

Concrete exposed to weather	
#5 bars and smaller	1 - 1/2 inches
All other bars	2 inches
Concrete cast against earth	3 inches
Grade beams:	
Top	1 - 1/2 inches
Board formed sides	2 inches
Earth formed sides	3 inches
Bottom	3 inches
Slabs on grade:	
Single layer or top layer	2 inches
Bottom layer cast against soil	3 inches
Bottom layer not cast against soil	2 inches
Columns	1 - 1/2 inches

29. Horizontal wall steel shall be continuous with 90 degree bends and 12" returns along each wall at corners.

30. Concrete pours shall not exceed 5000 square feet or 100 linear feet on any side.

STRUCTURAL STEEL

1. Contractor shall fabricate and erect steel in accordance with OSHA's safety requirements, including 29 CFR Part 1926 Safety Standards for Steel Erection.

2. Other steel shapes such as plates, angles, & channels shall conform to ASTM Specification A36.

3. Tubing (HSS sections) shall conform to ASTM Specification A500, Grade B for rectangular & square sections. Round sections (HSS sections) shall conform to ASTM Specification A500, Grade B.

4. Typical beam connection details are detailed on the drawings. For non-composite beams, the end reaction of the connected beam shall be determined As one-half of the total uniform load capacity shown in the tables of uniform load constants as noted in the latest edition of the AISC manual for the given beam span and grade steel specified, unless a design reaction is indicated on plan. The effect of any concentrated loads must be taken into account. In no case shall the end reaction be taken as less than 12.0 kips. If alternate beam connection designs are used and for all other connections not detailed on the drawings, the fabricator shall have a registered professional engineer prepare the connection designs in accordance with AISC "Manual of Steel Construction-Volume II Connections "and" Hollow Structural sections-connections Manual." Such designs shall be submitted prior to preparation of the shop drawings and shall bear the seal of this responsible professional engineer.

5. Grout for base plates shall be non-shrink and non-metallic conforming to ASTM C827, and shall have a specified compressive strength at 28 days of 5000 psi. Pre-grouting of base plates will not be permitted.

6. The wet setting of base plates shall not be allowed.

7. Splicing of structural steel members is prohibited without prior approval of the Engineer as to location and type of splice to be made. Any member having splice not shown and detailed on shop drawings will be rejected.

8. Welding shall conform to the American Welding Society (AWS) Standard D1.1. Electrodes for shop and field welds shall conform to AWS A5.1 or AWS A5.5, Class E70XX, low hydrogen.

9. Tube columns as noted on drawings shall be slotted to receive connection plates.

10. Anchor bolts (Anchor rods) shall conform to ASTM A307 or F1554 Grade 36, unless noted otherwise.

11. Penetrations shall not be cut in structural steel members unless so indicated in the drawings or as reviewed by the engineer.

12. Headed concrete anchors (H.C.A.) shall be Nelson or KSM deformed bar anchors (or acceptable equal), and shall conform to ASTM A108, Grades C-1010 though C-1020. Anchors shall be automatically end welded with suitable stud welding equipment. Welding shall be in accordance with the recommendations of the Nelson Stud Welding Company or the KSM Welding Systems Company.

13. Beams shall be cambered upward where shown on the contract documents. where no upward camber is indicated, any mill camber shall be detailed upward in the beams.

14. Clean and prepare all steel surfaces according to SSPC-SP 2 and prime with SSPC-Paint 25 Type 2 primer, U.N.O. on plans or in project specifications. Members embedded in concrete or receiving fireproofing shall not be primed.

STEEL ROOF DECK

1. Roof deck shall be galvanized type "B" steel roof deck. Type "B" steel roof deck shall be 16 gage cold-formed steel conforming to ASTM A653 Structural Quality, Grade 33, G60 coating. Steel roof deck shall be 1 1/2 inches deep with a minimum section modulus (Sp) of 0.408 inches cubed per foot of width.

2. Properties and allowable stresses of steel roof decks shall be based on the AISI "Specification for the Design of Cold-Formed Steel Structural Members". Steel roof deck shall be placed to have at least a two span configuration unless noted otherwise. General contractor shall coordinate with deck supplier to determine deck gage required for single span conditions.

3. PLG weld steel deck to supporting steel and adjoining deck sheets in accordance with the recommendations of The American Welding Standard D1.3. 30 inch wide deck sheets shall be welded at end laps and end supports using A 12-6-12 pattern (a weld at each side lap and at the third and fourth flutes). 36 inch wide deck sheets shall be welded at end laps, end supports and intermediate supports using 4 welds per sheet (a weld at each side lap and at every other flute).

COORDINATION

1. Only certain of the required sleeve openings in structural framing component members, and only certain of the required framed openings in and/or through structural assembly are indicated on the structural series drawings. However, all sleeves, inserts and openings, including frames and/or sleeves, therefore, shall be provided for passage, provision and/or incorporation of the work of the contract, including but not limited to Mechanical, Electrical, and Plumbing work. The providing for sleeves or framed openings shall include the verification of sizes, alignment, dimension, position, locations, elevations, and grades as required to serve the intended purpose. Openings not indicated on the structural series drawings, but required as above, shall have been approved by the engineer.

2. Refer to Architectural, Mechanical, Electrical, and Plumbing series drawings for floor elevations, slopes, drains, and location of depressed and elevated floor areas.

3. Structural series drawings shall be compared with drawings of other series; differences shall be referred to the Architect for instruction.

4. Compatibility of accommodation and provision for building equipment supported on or from structural components shall be verified as to size, dimension, clearances, accessibility, weights, and reaction with the equipment for which the accommodation has been designed prior to submission of shop drawings and submittal data for each equipment and for structural components; differences shall be referred to the Architect for review and approval and notation.

5. The structural system of this building is designed to perform as a completed unit. Prior to completion of the structure, structural components may be unstable and it is the responsibility of the contractor, or the client in the absence of a general contractor, to provide temporary shoring and/or bracing as required for the stability of the incomplete structure and for the safety of all on-site personnel.

GOGO STRUCTURAL ENGINEERS, LLC

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STATE OF TEXAS
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123223
LICENSED
PROFESSIONAL ENGINEER

03/29/2020

100% CD
FOR PERMIT USE ONLY

TANK FARM FOUNDATION
433 ZANDER LN
PLEASANTON, TEXAS

DRAWN BY: VHM

CONTACT: VHM

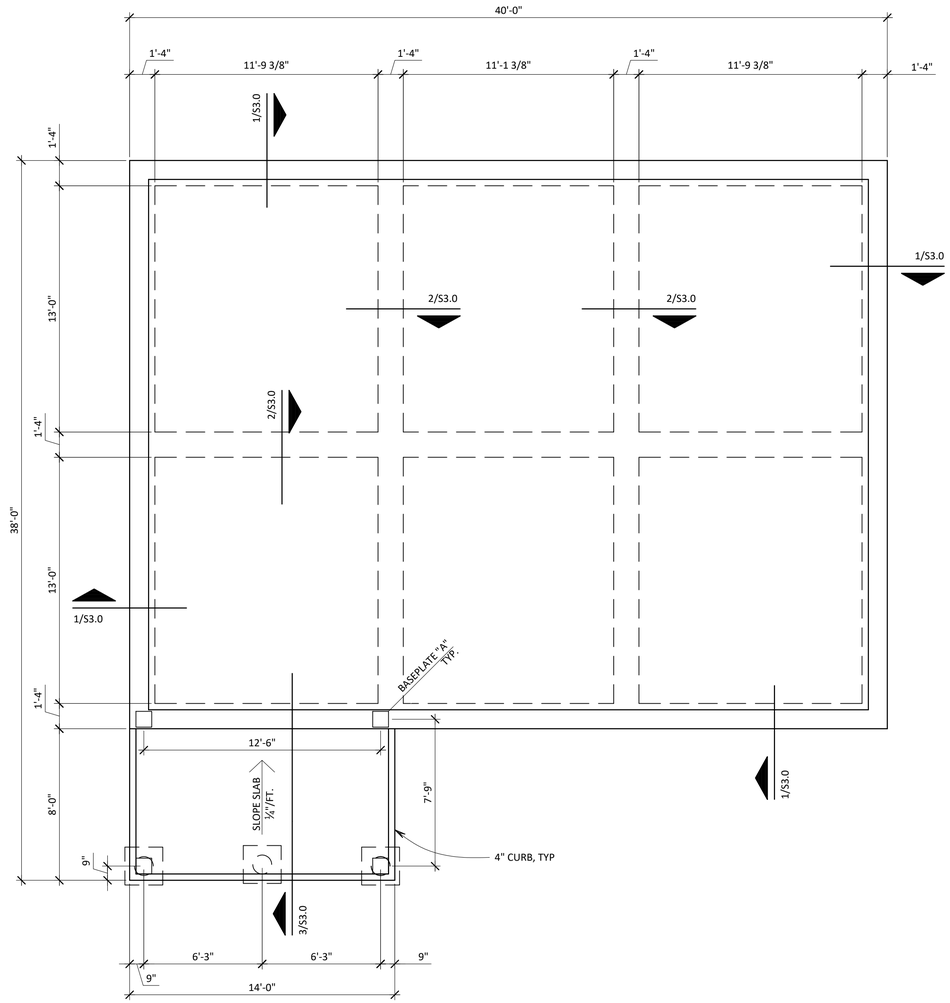
DATE: 03.29.2020

JOB #: 17.033

REVISION	DATE

GENERAL NOTES

S0.0

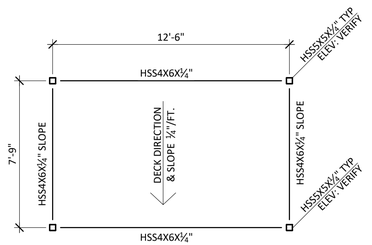


FOUNDATION PLAN

1 / 4" = 1' - 0" FOR 22" X 34" (REDUCE BY 50% FOR 11" X 17")

FOUNDATION PLAN NOTES

1. SEE SHEET S0.0 FOR BUILDING PAD SPECIFICATIONS.
2. VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, DROPS AND SLOPES WITH ARCHITECTURAL PLANS.
3. TOP OF SLAB (T.O.S) ELEVATION SHALL BE XXX'-XX"
4. SLAB SHALL BE 6" MINIMUM THICKNESS ON 95% COMPACTED SELECT FILL, REINFORCED WITH #4 @ 12" O.C., EACH WAY AT MID-DEPTH OF SLAB.
5. PROVIDE (2) #5 X 4'-0" "L" SHAPED BARS TOP AND BOTTOM AT ALL CORNERS AND "T" INTERSECTIONS OF BEAMS.
6. THE FOUNDATION DESIGN PROVIDED IS BASED ON ASSUMED SUPERIMPOSED FRAMING LOAD PATHS ONLY. AN ANALYSIS OF THE FRAMING SUPERSTRUCTURE WAS NOT PROVIDED NOR IMPLIED. THE GENERAL CONTRACTOR SHALL INSURE THAT ALL ASSUMED LOADS FROM SUPERIMPOSED FRAMING LOADS ARE ADEQUATELY TRANSFERRED TO FOUNDATION GRADE BEAMS, WOOD BEAMS, OR ISOLATED PIERS AND FOOTINGS BY FRAMING ELEMENTS ABOVE. POINT LOADS FROM COLUMNS SHALL BEAR DIRECTLY OVER GRADE BEAMS OR ISOLATED PIERS AND FOOTINGS ONLY. NO COLUMN LOADS SHALL BEAR ON WOOD BEAMS, JOIST, OR SLAB AREAS WITHOUT APPROVAL FROM LICENSED ENGINEER.
7. THESE STRUCTURAL DOCUMENTS DO NOT ADDRESS WATER ISSUES AS IT RELATES TO BUT NOT LIMITED TO SITE DRAINAGE, ROOF RUNOFF, OR WATER INTRODUCED BY ADJACENT PROPERTIES. ADEQUATE DRAINAGE SHALL BE PROVIDED TO LIMIT THE EFFECTS OF EROSION AND TO MAINTAIN THE INTEGRITY OF THE STRUCTURAL SYSTEM DESCRIBED. WATER ISSUES AND/OR WATERPROOFING ARE THE RESPONSIBILITY OF THE ARCHITECT AND CONTRACTOR AND ARE BEYOND THE SCOPE OF THESE DOCUMENTS.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CERTIFY THAT THE COMPOSITION OF THE FILL MATERIAL USED AND ITS COMPACTION ARE IN ACCORDANCE WITH THE BUILDING PAD NOTES SPECIFIED ON SHEET S0.0.
9. SEE SHEET S4.0 FOR BASE PLATE DETAILS.
10. SEE SHEET S3.1 FOR FOUNDATION DETAILS.
11. SEE SHEET S0.0 FOR ADDITIONAL NOTES.



STEEL AWNING FRAMING PLAN

1 / 4" = 1' - 0" FOR 22" X 34" (REDUCE BY 50% FOR 11" X 17")

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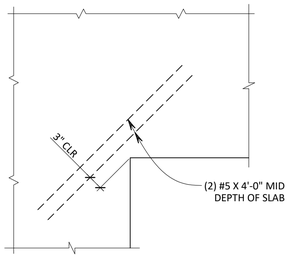
FOUNDATION PLAN

S1.0

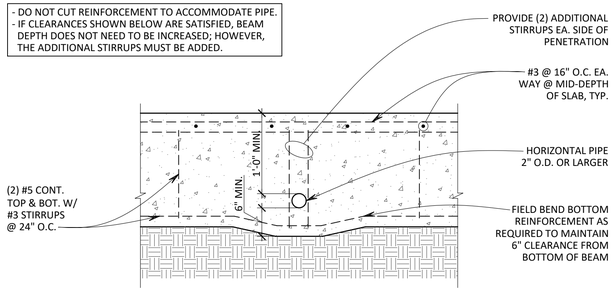


X PLAN @ INSIDE CORNER

3 / 4" = 1' - 0"

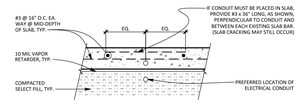
NOTE:

- DO NOT CUT REINFORCEMENT TO ACCOMMODATE PIPE.
- IF CLEARANCES SHOWN BELOW ARE SATISFIED, BEAM DEPTH DOES NOT NEED TO BE INCREASED; HOWEVER, THE ADDITIONAL STIRRUPS MUST BE ADDED.



X HORIZONTAL PENETRATION OF GRADE BEAM

3 / 4" = 1' - 0"

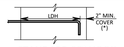


X SLAB REINFORCING @ CONDUIT

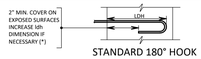
1 1/2" = 1' - 0"

'LDH' TENSION DEVELOPMENT LENGTH (EMBEDMENT LENGTH) FOR STANDARD END HOOKS

(GRADE 60 UNCOATED BARS)
NORMAL WEIGHT CONCRETE



STANDARD 90° HOOK
SIDE COVER ≥ 2 1/2"



STANDARD 180° HOOK
SIDE COVER ≥ 2 1/2"

BAR SIZE	f'c=3000 PSI	f'c=4000 PSI	f'c=5000 PSI	f'c=6000 PSI	f'c=8000 PSI
	LDH	LDH	LDH	LDH	LDH
#3	6"	6"	6"	6"	6"
#4	8"	7"	6"*	6"*	6"*
#5	10"	9"	8"	7"	6"*
#6	12"	10"	9"	8"	7"*
#7	14"	12"	11"	10"	9"
#8	16"	14"	12"	11"	10"
#9	18"	15"	14"	13"	11"
#10	20"	17"	15"	14"	12"*
#11	22"	19"	17"	16"	14"*

NOTES:
1. WHEN EITHER SIDE OR END COVER IS SMALLER THAN 2 ½", MULTIPLY "LDH" BY 1.4.
2. END CONCRETE COVER (90° HOOKS) ≥ 2".
3. * FOR 180° HOOKS AT RIGHT ANGLES TO EXPOSED SURFACES, 2" MINIMUM COVER TO TAIL SHALL BE PROVIDED.

'LDC' COMPRESSION DEVELOPMENT LENGTH AND COMPRESSION LAP SPLICES

(GRADE 60 UNCOATED BARS)
NORMAL WEIGHT CONCRETE

BAR SIZE	f'c ≥ 3000 PSI	MINIMUM LAP SPLICE	
	LDC	STANDARD LAP	WITH COLUMN SPIRALS
#3	9"	12"	12"
#4	11"	15"	12"
#5	14"	19"	14"
#6	17"	23"	17"
#7	20"	26"	20"
#8	22"	30"	23"
#9	25"	34"	25"
#10	28"	38"	29"
#11	31"	42"	32"

NOTES:
1. STANDARD LAP SPLICE LENGTH FOR COMPRESSION BARS = 30 BAR DIAMETERS, BUT NOT LESS THAN 12".
2. WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED, SPLICE LENGTH SHALL BE THE LARGER OF LDC.
3. SPIRALS SHALL CONFORM TO ACI 7.10.4 & 10.9.3.

TENSION LAP SPLICES - CLASS B - TOP & BOTTOM BARS

(GRADE 60 UNCOATED BARS)
NORMAL WEIGHT CONCRETE

BAR SIZE	f'c = 3000 PSI		f'c = 4000 PSI		f'c = 5000 PSI		f'c = 6000 PSI		f'c = 8000 PSI	
	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM
#3	28"	22"	24"	19"	22"	17"	20"	16"	17"	16"
#4	37"	29"	32"	25"	29"	22"	26"	20"	23"	18"
#5	47"	36"	40"	31"	36"	28"	33"	25"	29"	22"
#6	56"	43"	48"	37"	43"	33"	40"	31"	34"	26"
#7	81"	63"	70"	54"	63"	49"	58"	44"	50"	38"
#8	93"	72"	80"	62"	72"	55"	66"	51"	57"	44"
#9	105"	81"	91"	70"	81"	63"	74"	57"	64"	49"
#10	118"	91"	102"	79"	91"	70"	83"	64"	72"	56"
#11	131"	101"	113"	87"	101"	78"	93"	71"	80"	62"

NOTES:
1. TABULATED VALUES ARE APPLICABLE ONLY IF CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED IS NOT LESS THAN 'db', CLEAR COVER IS NOT LESS THAN 'db', AND STIRRUPS OR TIES THROUGHOUT 'ld' IS NOT LESS THAN CODE MINIMUM OR CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED IS NOT LESS THAN 2X 'db' AND CLEAR COVER IS NOT LESS THAN 'db'. WHERE db IS THE NOMINAL DIAMETER OF THE BAR.
2. 'TOP' BARS ARE HORIZONTAL REBAR WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THE BARS AT THE END DEVELOPMENT LENGTH.
3. FOR LIGHT WEIGHT CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.
4. FOR EPOXY COATED BARS, MULTIPLY TABULATED VALUES BY THE RATIO OF THE REINFORCEMENT YIELD STRENGTH DIVIDED BY 60 KSI.
5. FOR CLASS "A" SPLICE USE VALUE AS NOTED IN THE TENSION DEVELOPMENT LENGTH TABLE.

'LD' TENSION DEVELOPMENT LENGTH

(GRADE 60 UNCOATED BARS)
NORMAL WEIGHT CONCRETE

BAR SIZE	f'c = 3000 PSI		f'c = 4000 PSI		f'c = 5000 PSI		f'c = 6000 PSI		f'c = 8000 PSI	
	LD TOP	LD BOTTOM	LD TOP	LD BOTTOM	LD TOP	LD BOTTOM	LD TOP	LD BOTTOM	LD TOP	LD BOTTOM
#3	22"	17"	19"	15"	17"	13"	15"	12"	13"	12"
#4	29"	22"	25"	19"	22"	17"	20"	16"	18"	14"
#5	36"	28"	31"	24"	28"	22"	25"	20"	22"	17"
#6	43"	33"	37"	29"	33"	26"	31"	24"	26"	20"
#7	63"	48"	54"	42"	49"	37"	44"	34"	38"	30"
#8	72"	55"	62"	48"	55"	43"	51"	39"	44"	34"
#9	81"	62"	70"	54"	63"	48"	57"	44"	49"	38"
#10	91"	70"	79"	61"	70"	54"	64"	49"	56"	43"
#11	101"	78"	87"	67"	78"	60"	71"	55"	62"	48"

NOTES:
1. TABULATED VALUES ARE APPLICABLE ONLY IF CLEAR COVER OF BARS BEING DEVELOPED OR SPLICED IS NOT LESS THAN 'db', AND STIRRUPS OR TIES THROUGHOUT 'LD' IS NOT LESS THAN CODE MINIMUM, OR CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED IS NOT LESS THAN 2X 'db' AND CLEAR COVER IS NOT LESS THAN 'db'. WHERE db IS THE NOMINAL DIAMETER OF THE BAR.
2. 'TOP' BARS ARE HORIZONTAL REBAR WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THE BARS AT THE DEVELOPMENT LENGTH.
3. FOR LIGHT WEIGHT CONCRETE, MULTIPLY TABULATED VALUES BY 1.3.
4. FOR EPOXY COATED BARS, MULTIPLY TABULATED VALUES BY 1.5 FOR BOTTOM BARS, AND BY 1.3 FOR TOP BARS.
5. FOR REINFORCEMENT OTHER THAN GRADE 60, MODIFY THE TABULATED VALUES BY THE RATIO OF THE REINFORCEMENT YIELD STRENGTH DIVIDED BY 60 KSI.

GOGO STRUCTURAL ENGINEERS, LLC

PO BOX 91102
AUSTIN,TX 78709
PHONE 512 777 1733

STATE OF TEXAS — VICTOR W. MENA — 123223 — LICENSED PROFESSIONAL ENGINEER

03/29/2020

100% CD
FOR PERMIT USE ONLY

TANK FARM FOUNDATION
433 ZANDER LN
PLEASANTON, TEXAS

DRAWN BY: VHM

CONTACT: VHM

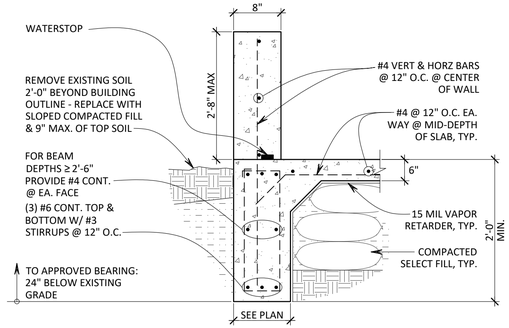
DATE: 03.29.2020

JOB #: 17.033

REVISION	DATE

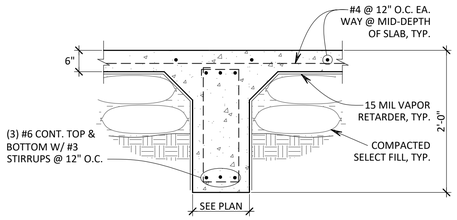
TYP FOUNDATION DETAILS

S2.0



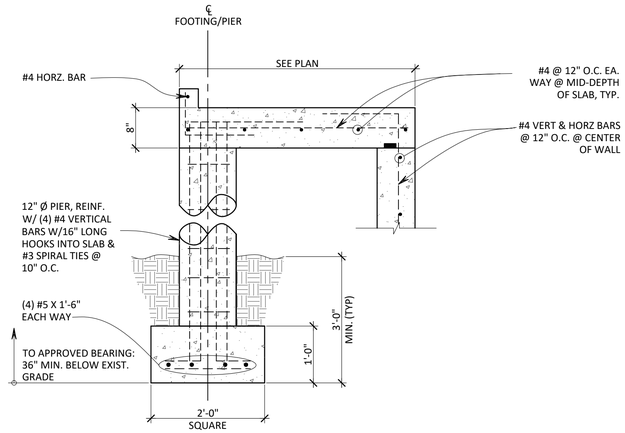
1 TYP. PERIMETER GRADE BEAM

3 / 4" = 1' - 0"



2 TYP. INTERIOR GRADE BEAM

3 / 4" = 1' - 0"



3 TYP. PERIMETER PIER & SLAB DETAIL

3 / 4" = 1' - 0"

BASEPLATE "A"

4 TYP. BASE PLATE DETAIL

N.T.S.

5 TYPICAL HSS BEAM TO HSS COLUMN SHEAR CONNECTION

1" = 1' - 0"

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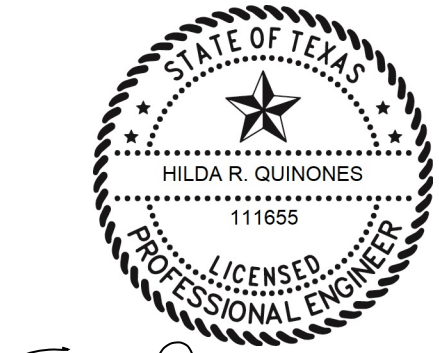
FOUNDATION DETAILS

S2.1

ATTACHMENT 4

CONTAINMENT CALCULATIONS

	A	B	C	D	E	F
1	**Tank Farm Calculation**					
2						
3	Item	width (ft)	height (ft)	depth (ft)	Volume (cf)	Volume (gal)
4	Formula				(B5/2)^2*PI()*C5	E5*7.48
5	Tanks (1-6)	8.00	7.67		385.37	2,882.56
6		interior width (ft)	height (ft)	interior depth (ft)	Containment Volume (CF)	Containment Volume (gal)
7	Formula				D8*C8*B8	E8*7.48
8	Berm	38.67	2.67	28.67	2,955.85	22,109.77
9		rad (ft)	height (ft)	# tanks	Displacement Vol (CF)	Displacement Vol (gal)
10	Formula				B11^2*PI()*C11*D11	E11*7.48
11	Displacement	4.00	2.67	6.00	804.25	6,015.77
12						
13					Containment Requirements (gal)	Containment Capacity (gal)
14	Formula				F5*1.1	F8-F11
15					3,170.81	16,094.00
16		width (ft)	depth (ft)	Area (SF)		
17	Formula			B18*C18		
18	Surface Area	38.67	28.67	1,108.44		
19		rad (ft)	# tanks	Displacement Area (SF)	Available Area (SF)	Tank Volume (cf)
20	Formula			B21^2*PI()*C21	D18-D21	E5
21	Displacement Area	4.00	6.00	301.59	806.85	385.37
22						
23				25 YR-24 HR Rainfall	Freeboard (in)	Inches of Product (in)
24	Formula			PART III ATT 6	30 TAC 330	F21/E21*12
25				7.25	12.00	5.73
26						
27					**Height of Berm (in)**	**Total Containment Requirement (in)**
28	Formula				**Part IV Att 22**	**SUM(D25:F25)**
29					**32.00**	**24.98**



June 25, 2020

ATTACHMENT 5

ENDANGERED SPECIES LIST

Last Update: 3/4/2020

ATASCOSA COUNTY

AMPHIBIANS

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

Franklin's gull *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G4T3Q	State Rank: S1B

mountain plover *Charadrius montanus*

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

ATASCOSA COUNTY

BIRDS

piping plover *Charadrius melodus*

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

reddish egret *Egretta rufescens*

Resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3B

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1N

ATASCOSA COUNTY

BIRDS

wood stork *Mycteria americana*

Prefers to nest in large tracts of baldcypress (Taxodium distichum) or red mangrove (Rhizophora mangle); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SHB,S2N

CRUSTACEANS

Nueces crayfish *Procambarus nueces*

Known only from one small sluggish stream tributary to the Nueces River; slightly sinuous channel with natural debris impeding flow; substrate of sand and gravel, also silt covered in deeper pooled areas; riparian edges of grasses, sedges, and herbaceous plants in mostly unshaded area

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

INSECTS

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

MAMMALS

American badger *Taxidea taxus*

Generalist. Prefers areas with soft soils that sustain ground squirrels for food. When inactive, occupies underground burrow. Young are born in underground burrows.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

big free-tailed bat *Nyctinomops macrotis*

Habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5	State Rank: S3

ATASCOSA COUNTY

MAMMALS

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S4

eastern red bat *Lasiurus borealis*

Found in a variety of habitats in Texas. Usually associated with wooded areas. Found in towns especially during migration.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S4

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S1S3

hoary bat *Lasiurus cinereus*

Known from montane and riparian woodland in Trans-Pecos, forests and woods in east and central Texas.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S4

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

Mexican free-tailed bat *Tadarida brasiliensis*

Roosts in buildings in east Texas. Largest maternity roosts are in limestone caves on the Edwards Plateau. Found in all habitats, forest to desert.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

mink *Neovison vison*

Intimately associated with water; coastal swamps & marshes, wooded riparian zones, edges of lakes. Prefer floodplains.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S4

ATASCOSA COUNTY

MAMMALS

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

ocelot *Leopardus pardalis*

Restricted to mesquite-thorn scrub and live-oak mottes; avoids open areas. Dense mixed brush below four feet; thorny shrublands; dense chaparral thickets; breeds and raises young June-November.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

plains spotted skunk *Spilogale putorius interrupta*

Generalist; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G4T4	State Rank: S1S3

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

thirteen-lined ground squirrel *Ictidomys tridecemlineatus*

Prefers short grass prairies with deep soils for burrowing. Frequently found in grazed ranchland, mowed pastures, and golf courses.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S3S4

western hog-nosed skunk *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

ATASCOSA COUNTY

MAMMALS

western spotted skunk *Spilogale gracilis*

Brushy canyons, rocky outcrops (rimrock) on hillsides and walls of canyons. In semi-arid brushlands in U.S., in wet tropical forests in Mexico. When inactive or bearing young, occupies den in rocks, burrow, hollow log, brush pile, or under building.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

white-nosed coati *Nasua narica*

Woodlands, riparian corridors and canyons.Most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible to hunting, trapping, and pet trade

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

MOLLUSKS

golden orb *Quadrula aurea*

Sand and gravel in some locations and mud at others; found in lentic and lotic; Guadalupe, San Antonio, Lower San Marcos, and Nueces River basins

Federal Status: C	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S2

REPTILES

American alligator *Alligator mississippiensis*

Aquatic: Coastal marshes; inland natural rivers, swamps and marshes; manmade impoundments.

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4

keeled earless lizard *Holbrookia propinqua*

Terrestrial: Habitats include coastal dunes, barrier islands, and other sandy areas (Axtell 1983). Although it occurs well inland, this species is most abundant on coastal dunes, were it seeks shelter in the burrows of small mammals or crabs (Bartlett and Bartlett 1999).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

Tamaulipan spot-tailed earless lizard *Holbrookia subcaudalis*

Terrestrial: Habitats include moderately open prairie-brushland regions, particularly fairly flat areas free of vegetation or other obstructions (e.g., open meadows, old and new fields, graded roadways, cleared and disturbed areas, prairie savanna, and active agriculture including row crops); also, oak-juniper woodlands and mesquite-prickly pear associations (Axtell 1968, Bartlett and Bartlett 1999).

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: GNR	State Rank: S2

ATASCOSA COUNTY

REPTILES

Texas garter snake *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T4	State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

Texas indigo snake *Drymarchon melanurus erebennus*

Terrestrial: Thornbush-chaparral woodland of south Texas, in particular dense riparian corridors.Can do well in suburban and irrigated croplands Requires moist microhabitats, such as rodent burrows, for shelter.

Federal Status:	State Status: T	SGCN: Y
Endemic:	Global Rank: G5T4	State Rank: S4

Texas tortoise *Gopherus berlandieri*

Terrestrial: Open scrub woods, arid brush, lomas, grass-cactus association; often in areas with sandy well-drained soils. When inactive occupies shallow depressions dug at base of bush or cactus; sometimes in underground burrow or under object. Eggs are laid in nests dug in soil near or under bushes.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2

western box turtle *Terrapene ornata*

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

PLANTS

awnless leastdaisy *Chaetopappa imberbis*

In woodlands on lomas of Carrizo sand (TEX-LL specimens Carr 23875, 12507). Mar- May.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

ATASCOSA COUNTY

PLANTS

bristle nailwort *Paronychia setacea*

Flowering vascular plant endemic to eastern southcentral Texas, occurring in sandy soils

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

Burridge greenthread *Thelesperma burridgeanum*

Sandy open areas; Annual; Flowering March-Nov; Fruiting March-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Drummond's rushpea *Caesalpinia drummondii*

Open areas on sandy clay; Perennial

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Elmendorf's onion *Allium elmendorfii*

Grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; Perennial; Flowering March-April, May

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S2

low spurge *Euphorbia peplidion*

Occurs in a variety of vernally-moist situations in a number of natural regions; Annual; Flowering Feb-April; Fruiting March-April

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Parks' jointweed *Polygonella parksii*

Mostly found on deep, loose, whitish sand blowouts (unstable, deep, xeric, sandhill barrens) in Post Oak Savanna landscapes over the Carrizo and Sparta formations; also occurs in early successional grasslands, along right-of-ways, and on mechanically disturbed areas; flowering June-late October or September-November

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S2

sandhill woolywhite *Hymenopappus carrizoanus*

Disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations; flowering April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S2

ATASCOSA COUNTY

PLANTS

South Texas spikesedge *Eleocharis austrotexana*

Occurring in miscellaneous wetlands at scattered locations on the coastal plain; Perennial; Flowering/Fruiting Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Texas beebalm *Monarda viridissima*

Endemic perennial herb of the Carrizo Sands; deep, well-drained sandy soils in openings of post oak woodlands; flowers white.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Texas peachbush *Prunus texana*

Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-Jun

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4	State Rank: S3S4

ATTACHMENT 6

25 YEAR 24 HR RAIN EVENT

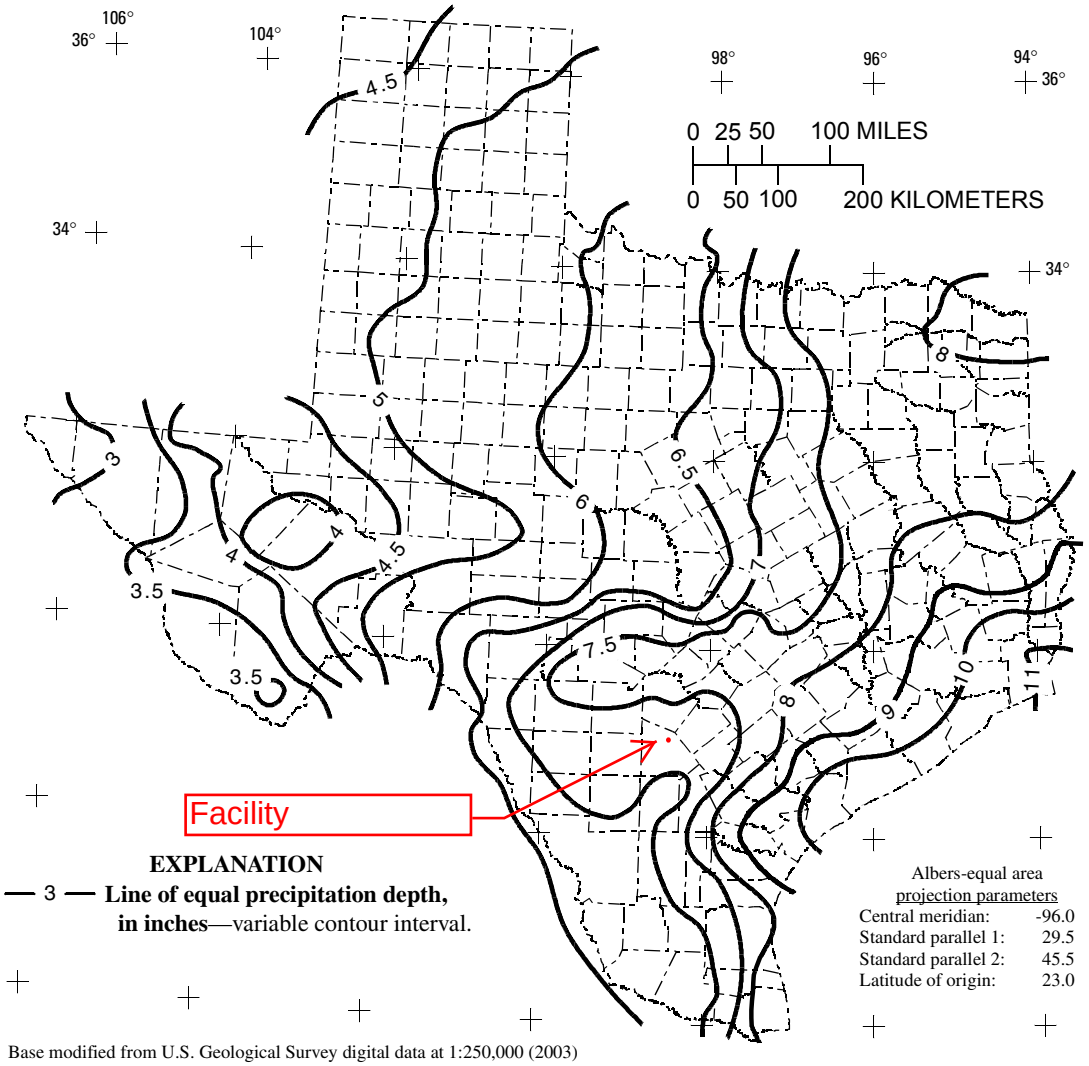


Figure 47. Depth of precipitation for 25-year storm for 1-day duration in Texas.

ATTACHMENT 7

CLOSURE PLAN

CLOSURE PLAN 330.63

The facility's closure plan is prepared in accordance with the applicable portions of Chapter 330, Subchapter K (330.451 through 330.465) relating to Closure and Post Closure.

CLOSURE REQUIREMENTS 330.457 (f)(3) – (4) and 330.459 (a) – (d)

Terrabella will begin closure no later than 30 days after final receipt of waste or no later than one year if the unit has remaining capacity and additional waste may be received. Closure activities will be completed within 180 days of initiation.

Upon closure, the owner or operator will remove all waste, waste residue, and any recovered materials. All facility units will be dismantled and removed off-site or decontaminated.

TES will evacuate all unprocessed waste materials on-site to a TCEQ authorized facility and disinfect all receiving, processing and post-processing areas. In the event of a release from the facility, the Executive Director may require an investigation into the nature and extent of the release and an assessment of measures necessary to correct an impact to the environment.

The facility will not recycle or store combustible material. Therefore, this section is not applicable.

CERTIFICATION OF FINAL FACILITY CLOSURE 330.461(a)-(d)

No later than 90 days prior to the initiation of final facility closure, TES will, through a public notice in the newspaper(s) of largest circulation in the vicinity of the facility, provide public notice for final facility closure. The notice will provide the name, address, and physical location of the facility; the registration number; and the last date of intended receipt of waste. TES will also make available an adequate number of copies of the approved final closure plan for public access and review.

The owner or operator will also provide written notification to the Executive Director of the intent to close the facility and place the notice of intent in the site operating record.

Upon notification to the Executive Director of the intent to close the site, the owner or operator will post a minimum of one sign at the main entrance and all other frequently used points of access for the facility. Signage will notify all persons who may utilize the facility/site of the date of closing for the entire facility/site and the prohibition against further receipt of waste materials after the stated date. Further, suitable barriers will be installed at all gates or access points to adequately prevent the unauthorized dumping of solid waste at the closed facility or site.

Within 10 days after completion of final closure activities of the facility, the owner or operator shall submit to the Executive Director by registered mail the following:

(1) A certification, signed by an independent licensed professional engineer, verifying final closure has been completed in accordance with the approved closure plan. The submittal to the Executive Director will include all applicable documentation necessary for the Commission's certification of final facility closure; and

(2) A request for a voluntary revocation of the registration.

No waste will be left on-site. Therefore an Affidavit to the Public in accordance with 330.19 and 330.457(g) are not required.

A certified notation on the deed to the facility property is not required for this Type V MSW facility since waste will not be left on-site. Therefore, this section is not applicable.

POST-CLOSURE CARE REQUIREMENTS 330.463

Post-closure care requirements are not applicable to this Type V MSW Facility. All waste and waste residue will be removed from the site during closure and there are no applicable post-closure monitoring programs.

ATTACHMENT 8

CLOSURE ESTIMATE

Closing Cost Estimate - Revision 2 (09/25/2020)

I. Estimated General Administrative Cost

Item No.	Item Description	Quantity	Units	Cost per unit	Total Cost
1	Newspaper Notice	1	LS	$ 1,500.00	$ 1,500.00
2	TCEQ Notification	1	LS	$ 150.00	$ 150.00
3	Sign at Entrance	1	LS	$ 250.00	$ 250.00
4	Securing all building and access gates	1	LS	$ 200.00	$ 200.00
5	Closure Certification	1	LS	$ 2,300.00	$ 2,300.00

Estimated General Administrative Cost Total $ 4,400.00

II. Estimated Facility Cleanup Cost

Item No.	Item Description	Quantity	Units	Cost per unit	Total Cost
1	Equipment Cleaning	1	LS	$ 750.00	$ 750.00
2	Facility Cleaning/Disinfection	1	LS	$ 1,250.00	$ 1,250.00
3	Waste Disposal	1	LS	$ 750.00	$ 750.00
4	Sampling/Analytical	1	LS	$ 1,500.00	$ 1,500.00

Estimated Facility Cleanup Cost Total $ 4,250.00

III. Equipment List (Cleaning, Transportation and Disposal of Waste Contained)

Item No.	Item Description	Quantity	Capacity/Size	Units	Waste Contained	Total Units of Disposal	Cost Per Unit	Tank Placement	Estimated Disposal Cost
1	Storage Tank	6	3000	Gallons	Formalin and Water at 2%	18,000	$ 0.60	on ground	$ 10,800.00
2	Storage Tote	2	275	Gallons	Non-industrial Non Haz	2	$ 200.00	on ground	$ 400.00
3	Drum	8	55	Gallons	Non-industrial Non Haz	8	$ 100.00	on ground	$ 800.00
4	Storage Tote	2	275	Gallons	Solids	2	$ 200.00	on ground	$ 400.00
5	Drum	8	55	Gallons	Solids	8	$ 100.00	on ground	$ 800.00
6	Air Operated Diaphragm Pumps	4	200	EA	liquid waste	4	$ 50.00	on ground	$ 200.00

Total Waste Volume at the Facility 19980

Estimated Disposal Cost Total $ 13,400.00

Closure Cost Subtotal $ 22,050.00

Contingency Cost 10% $ 2,205.00

TOTAL CLOSURE COST ESTIMATE **$ 24,255.00**

STATE OF TEXAS
HILDA R. QUINONES
111655
LICENSED
PROFESSIONAL ENGINEER

September 27, 2020

ASSUMPTIONS
1. All waste tanks are full
2. Total waste volume at the facility is approximately 20,000 gallons
3. Total waste volume does not include storage totes
4. Total waste volume does not include trucks on-site
5. Facilities that may have been in contact with waste are cleaned/disinfected by pressure washing.
6. Facility footprint to be cleaned/disinfected is approximately 1,310 SF
7. Closure estimates are based on typical prices for similar work performed. Additional estimates may be requested to ensure sufficient coverage is maintained and those costs are commensurate and not overly conservative with facility operations and equipment.
8. Contingency cost to cover unanticipated events during implementation of closure activities.
9. The closure cost estimate is based on the cost of hiring a third party.