* * * COMAL COUNTY OFFICE OF ENVIRONMENTAL HEALTH * * *

APPLICATION FOR PERMIT FOR AUTHORIZATION TO CONSTRUCT AN
ON-SITE SEWAGE FACILITY AND LICENSE TO OPERATE

Date November 16, 2015 Permit # _____

Owner Name	JUMBO EVANS SPORTS PARK	Agent Name:	GREG W. JOHNSON, P.E.
Mailing Address		Agent Address:	170 HOLLOW OAK
City, State, Zip		City, State, Zip:	NEW BRAUNFELS, TEXAS 78132
Phone #		Phone #:	(830) 905-2778
Email		Email:	gregjohnsonpe@yahoo.com

All correspondence should be sent to. ☐ Owner ☒ Agent ☐ Both ☐ Method: ☐ Mail ☒ Email

Subdivision Name _____ Unit/Phase/Section _____ Lot _____ Block _____

Acreage/Legal 21.189 ACRES OUT OF THE J.M. CHRISTIAN SURVEY No. 22, A-108 & JOHN ANGEL SURVEY No. 21, A-20

Street Name/Address HWY 281 City SPRING BRANCH Zip 78070

Type of Development:

☐ Single Family Residential

Type of Construction (House, Mobile, RV, Etc.) _____

Number of Bedrooms _____

Indicate Sq Ft of Living Area _____

☒ Commercial or Institutional Facility

(Planning materials must show adequate land area for doubling the required land needed for treatment units and disposal area)

Type of Facility CONCESSION STAND with RESTROOMS

Offices, Factories, Churches, Schools, Parks, Etc. - Indicate Number Of Occupants _____

Restaurants, Lounges, Theaters - Indicate Number of Seats _____

Hotel, Motel, Hospital, Nursing Home - Indicate Number of Beds _____

Travel Trailer/RV Parks - Indicate Number of Spaces _____

Miscellaneous _____

Is any portion of the proposed OSSF located in the United States Army Corps of Engineers (USACE) flowage easement?

☐ Yes ☒ No

(if yes, owner must provide approval from USACE for proposed OSSF improvements within the USACE flowage easement)

Source of Water ☒ Public ☐ Private Well ☐ Other: _____

Are Water Saving Devices Being Utilized Within the Residence? ☒ Yes ☐ No

I certify that the completed application and all additional information submitted does not contain any false information and does not conceal any material facts. Authorization is hereby given to the permitting authority and designated agents to enter upon the above described property for the purpose of site/soil evaluation and inspection of private sewage facilities. I also understand that a permit of authorization to construct will not be issued until the Floodplain Administrator has performed the reviews required by the Comal County Flood Damage Prevention Order.

b _____ November 16, 2015

Signature of Owner Date

195 David Jonas Dr., New Braunfels, Texas 78132-3760 (830) 608-2090 Fax (830) 608-2078

* * * COMAL COUNTY OFFICE OF ENVIRONMENTAL HEALTH * * *

APPLICATION FOR PERMIT FOR AUTHORIZATION TO CONSTRUCT AN ON-SITE SEWAGE FACILITY AND LICENSE TO OPERATE

Planning Materials & Site Evaluation as Required Completed By GREG W. JOHNSON, P.E.

System Description PROPRIETARY; AEROBIC TREATMENT AND DRIP TUBING

Size of Septic System Required Based on Planning Materials & Soil Evaluation

Tank Size(s) (Gallons) SEE ATTACHED DRAWING **Absorption/Application Area (Sq Ft)** 5000sf

Gallons Per Day (As Per TCEQ Table III) 875 Design Rate

(Sites generating more than 5000 gallons per day are required to obtain a permit through TCEQ)

Is the property located over the Edwards Recharge Zone? ☐ Yes ☒ No

(If yes, the planning materials must be completed by a Registered Sanitarian (R.S.) or Professional Engineer (P.E.))

Is there an existing TCEQ approved WPAP for the property? ☐ Yes ☒ No

(if yes, the R. S. or P. E. shall certify that the OSSF design complies with all provisions of the existing WPAP.)

If there is no existing WPAP, does the proposed development activity require a TCEQ approved WPAP? ☐ Yes ☐ No

(If yes, the R.S. or P. E. shall certify that the OSSF design will comply with all provisions of the proposed WPAP. A Permit to Construct will not be issued for the proposed OSSF until the proposed WPAP has been approved by the appropriate regional office.)

Is the property located over the Edwards Contributing Zone? ☒ Yes ☐ No

Is there an existing TCEQ approval CZP for the property? ☐ Yes ☒ No

(if yes, the P.E. or R.S. shall certify that the OSSF design complies with all provisions of the existing CZP)

If there is no existing CZP, does the proposed development activity require a TCEQ approved CZP? ☐ Yes ☒ No

(if yes, the P.E. or R.S. shall certify that the OSSF design will comply with all provisions of the proposed CZP. A Permit to construct will) not be issued for the proposed OSSF until the CZP has been approved by the appropriate regional office.)

Is this property within an incorporated city? ☐ Yes ☒ No

If yes, indicate the city: _____

I certify that the information provided above is true and correct to the best of my knowledge.

Signature of Designer

November 16, 2015
Date

195 David Jonas Dr., New Braunfels, Texas 78132-3760 (830) 608-2090 Fax (830) 608-2078

AFFIDAVIT

THE COUNTY OF COMAL
STATE OF TEXAS

CERTIFICATION OF OSSF REQUIRING MAINTENANCE

According to Texas Commission on Environmental Quality Rules for On-Site Sewage Facilities (OSSF's), this document is filed in the Deed Records of Comal County, Texas.

I

The Texas Health and Safety Code, Chapter 366 authorizes the Texas Commission on Environmental Quality (TCEQ) to regulate on-site sewage facilities (OSSFs). Additionally, the Texas Water Code (TWC), § 5.012 and § 5.013, gives the commission primary responsibility for implementing the laws of the State of Texas relating to water and adopting rules necessary to carry out its powers and duties under the TWC. The commission, under the authority of the TWC and the Texas Health and Safety code, requires owner's to provide notice to the public that certain types of OSSFs are located on specific pieces of property. To achieve this notice, the commission requires a recorded affidavit. Additionally, the owner must provide proof of the recording to the OSSF permitting authority. This recorded affidavit is not a representation or warranty by the commission of the suitability of this OSSF, nor does it constitute any guarantee by the commission that the appropriate OSSF was installed.

II

An OSSF requiring a maintenance contract, according to 30 Texas Administrative Code §285.91(12) will be installed on the property described as **(insert legal description):**

_____ **UNIT/PHASE/SECTION** _____ **BLOCK** _____ **LOT** _____ **SUBDIVISION**

IF NOT IN SUBDIVISION: 21.189 **ACREAGE** J.M. CHRISTIAN SURVEY No. 22, A-108 & JOHN ANGEL SURVEY No. 21, A-20 **SURVEY**

The property is owned by **(insert owner's full name):** JUMBO EVANS SPORTS PARK

This OSSF must be covered by a continuous maintenance contract for the first two years. After the initial two-year service policy, the owner of an aerobic treatment system for a single family residence shall either obtain a maintenance contract within 30 days or maintain the system personally.

Upon sale or transfer of the above-described property, the permit for the OSSF shall be transferred to the buyer or new owner. A copy of the planning materials for the OSSF can be obtained from the Comal County Engineer's Office.

WITNESS BY HAND(S) ON THIS_____**DAY OF** _____ ,20 15

_____ _____

Owner(s) signature(s) Owner (s) Printed name (s)

_____ **SWORN TO AND SUBSCRIBED BEFORE ME ON THIS**_____**DAY OF**

_____ ,20 15

_____

Notary Public, State of Texas

Notary's Printed Name: _____

My Commission Expires: _____

ON-SITE SEWERAGE FACILITY
SOIL EVALUATION REPORT INFORMATION

Date Soil Survey Performed: **October 06, 2015**

Site Location: **21.189 ACRES OUT OF THE J.M. CHRISTIAN SURVEY No. 22, A-108 & JOHN ANGEL SURVEY No. 21, A-20**

Proposed Excavation Depth: **N/A**

Requirements:

At least two soil excavations must be performed on the site, at opposite ends of the proposed disposal area.
Locations of soil boring or dug pits must be shown on the site drawing.
For subsurface disposal, soil evaluations must be performed to a depth of at least two feet below the proposed excavation depth. For surface disposal, the surface horizon must be evaluated.
Describe each soil horizon and identify any restrictive features on the form. Indicate depths where features appear.

SOIL BORING NUMBER **SURFACE EVALUATION**

Depth (Feet)	Texture Class	Soil Texture	Gravel Analysis	Drainage (Mottles/ Water Table)	Restrictive Horizon	Observations
0 – 12"	III	SILTY LOAM				BROWN
12" – 48"	III	SILTY LOAM	N/A	NONE OBSERVED	LIMESTONE @ 48"	TAN CALICHE

SOIL BORING NUMBER **SURFACE EVALUATION**

Depth (Feet)	Texture Class	Soil Texture	Gravel Analysis	Drainage (Mottles/ Water Table)	Restrictive Horizon	Observations
0 – 5	SAME		AS		ABOVE	

I certify that the findings of this report are based on my field observations and are accurate to the best of my ability.

Greg W. Johnson, P.E. 67587-F2585, S.E. 11561

10/06/2015
Date

OSSF SOIL EVALUATION REPORT INFORMATION

Date: November 16, 2015

Applicant Information:

Name: JUMBO EVANS SPORTS PARK
Address: _____
City: _____ State: _____
Zip Code: _____ Phone: _____

Site Evaluator Information:

Name: Greg W. Johnson, P.E., R.S, S.E. 11561
Address: 170 Hollow Oak
City: New Braunfels State: Texas
Zip Code: 78132 Phone & Fax (830)905-2778

Property Location:

Lot ____ Unit ____ Blk ___ Subd. _____
Street Address: _____
City: _____ Zip Code: _____
Additional Info.: _____
_____

Installer Information:

Name: _____
Company: _____
Address: _____
City: _____ State: _____
Zip Code: _____ Phone _____

Topography: Slope within proposed disposal area: 10 %

Presence of 100 yr. Flood Zone:	YES X NO ___
Existing or proposed water well in nearby area.	YES ___ NO X
Presence of adjacent ponds, streams, water impoundments	YES ___ NO X
Presence of upper water shed	YES ___ NO X
Organized sewage service available to lot	YES ___ NO X

I HAVE PERFORMED A THOROUGH INVESTIGATION BEING A REGISTERED PROFESSIONAL ENGINEER AND SITE EVALUATOR IN ACCORDANCE WITH CHAPTER 285, SUBCHAPTER D, §285.30, & §285.40 (REGARDING RECHARGE FEATURES), TEXAS COMMISSION OF ENVIRONMENTAL QUALITY. (EFFECTIVE DECEMBER 27, 2012).

GREG W. JOHNSON, P.E. 67587 - F#2585

11/16/2015
DATE

AEROBIC SPRAY DESIGN
DESIGNED FOR:
JUMBO EVANS SPORTS PARK
HWY 281 NORTH
SPRING BRANCH, TX 78070

SITE DESCRIPTION

Located in the J.M. Christian Survey No. 22, A-108 & John Angel Survey No. 21, A-20, being a 21.89 acre tract off Highway 281 North, the system will serve a concession stand with public restrooms for a football and tennis facility. Native grasses with Live Oak and Mountain cedar are found throughout. Aerobic Treatment with drip irrigation was chosen as the most appropriate system for the conditions on this lot.

PROPOSED SYSTEM:

A 3 or 4 inch SCH-40 PVC pipe discharges from the kitchen to a 750 gallon grease trap and joins flow from the restrooms to 1000 gallon trash tank. Flow continues to a 3300 gallon flow equalization tank fitted with a dual effluent pumps controlled by a dual alternating control panel and cycle timer. Effluent is pumped to a Hoot 1200AD/N 1200 gpd TCEQ/NSF approved aerobic plant will be controlled by throttling a 2" ball valve to maintain flow to at a rate not to exceed 3 gpm with the remaining flow being re-circulated in the pump tank and timed to cycle every hour for twelve minutes using Grasslin Model 60A810 cycle timer. After treatment, flow continues to the 1500 gallon pump chamber with dual Blaster Model 20EB 1/2hp well/effluent pumps. The well pumps are activated by a dual alternating control panel and cycle timer. A Grasslin Model 60A810 cycle timer will be installed allowing the distribution to the field eight times per day with a 8.5 minute run time with float setting at 800 gallons. A water flow meter will be installed on the supply line. A high level audible and visual alarm will activate should the pump fail. Distribution is through a self flushing 100 micron Arkal 1.5" Super Filter, disk filter then through a 1.25" SCH-40 manifold to the 5000 sf drip tubing field for a total of 1250 emitters set every two feet, as per the attached schematic. A pressure regulator Model PMR30HF, installed in the pump tank on the manifold to the field, will maintain pressure at 30 psi. A 1.25" SCH-40 return line is installed to constantly flush the system by adjusting a 1.25" ball valve. Solids caught in the disk filter are flushed each cycle back to the pump tank. Vacuum breakers installed at the highest point on each manifold will prevent siphoning of effluent from higher to lower parts of the field. Field area will be scarified and then built up with two inches of Type II or Type III soil, then the drip tubing will be laid and capped with 8" of Type II or Type III soil ***(NOT SAND)***. ***(The drip field will be partially over a buried electrical line. Care should be taken not to excavate more than twelve inches in that part of the field.***) The field area will be sodded with grass prior to system startup.

Tanks must have at grade risers on each opening with watertight caps that must be at least 65# or have a padlock or can only be removed with tools. A secondary plug, cap, or suitable restraint must be provided below riser cap to prevent tank entry should the cap be damaged or removed, in compliance with Chapter §285.38.

DESIGN SPECIFICATIONS:

Daily waste flow: 875 gpd Avg.
2 - Public restrooms & Concession Stand
Waste strength: 400 mg/ltr BOD5 (Minimal food prep, hamburgers/hot dogs)
Football events with up to 500 people @ 4 gpd = 2000 gal/event with up to 2 events per week
Flow equalization will distribute wastewater to the tank at a rate not to exceed 875 gallons per day.
Grease trap size: 750 gal
Pretreatment tank size: 1000 gal
Equalization tank: 2000 gal with effluent pump Goulds Model 3871 EP411A 0.4 hp
Plant Size: Nu-Water E-1500 1500gpd (TCEQ/ NSF Approved)
Pump tank size: 2000 Gal with effluent pump
Cycle Timer: Grasslin Model 60A810 cycle timer
Reserve capacity after High Level: 500 Gal (>4 hrs flow Req'd)
Application Rate: Ra = 0.2 gal/sf
Total absorption area: Q/Ra = 875 GPD/0.2 = 4,375 sf. (Actual 5,000 sf)
Total linear feet drip tubing: 2,500'***Netifim Bioline*** drip tubing .61 GPH
Pump requirement: 1250 emitters @.61 gph @30 psi =12.71gpm
Pump Requirement (cont.): (Blaster Model 20EB 1/2hp) x 2

MINIMUM SCOUR VELOCITY (**MSV**) > 2 FPS
IN DRIP TUBING W/ NOM. DIA. 0.55" ID
MSV = 2 FPS (Πd↑2)/4*7.48 gal/cf*60 sec/min
MSV = 2(3.14159((.55/12)↑2)/4)*7.48*60
MSV = 1.5 gpm PER LINE * 6 LINES = 9 GPM MIN FLOW RATE

IN RETURN MANIFOLD W/ NOM. DIA 1.25" ID
MSV = 2 FPS (Πd↑2)/4*7.48 gal/cf*60 sec/min
MSV = 2(3.14159((1.25/12)↑2)/4)*7.48*60
MSV = 7.6 GPM

WASTE FLOW CALCULATIONS

Expected #BOD5 @ 875 gpd x 400 mg/l x 8.34 #/gal / 1,000,000 = 2.92 lbs BOD5
1200 gpd aerobic plant processes 1200 gal/day residential strength waste (300 mg/ltr BOD5)

#BOD5 = $\frac{\text{Q gpd * BOD5 mg/ltr * 8.34 \#/gal}}{1{,}000{,}000}$

#BOD5 = $\frac{1200\text{gpd * 300 mg/ltr * 8.34 \#/gal}}{1{,}000{,}000}$

Hoot 1200 sized to handle 3 lbs of BOD5 per day.

#BOD 5 = 3 lbs > 2.92 lbs required

PIPE AND FITTINGS:

All pipes and fittings in this drip tubing system shall be 1.25" schedule 40 PVC. All joints shall be sealed with approved solvent-type PVC cement. Clipper type cutters are recommended to prevent PVC burrs during cutting of pipes causing possible plugging.

Designed in accordance with Chapter 285, Subchapter D, §285.30 and §285.40 Texas Commission On Environmental Quality. (Effective December 2012)

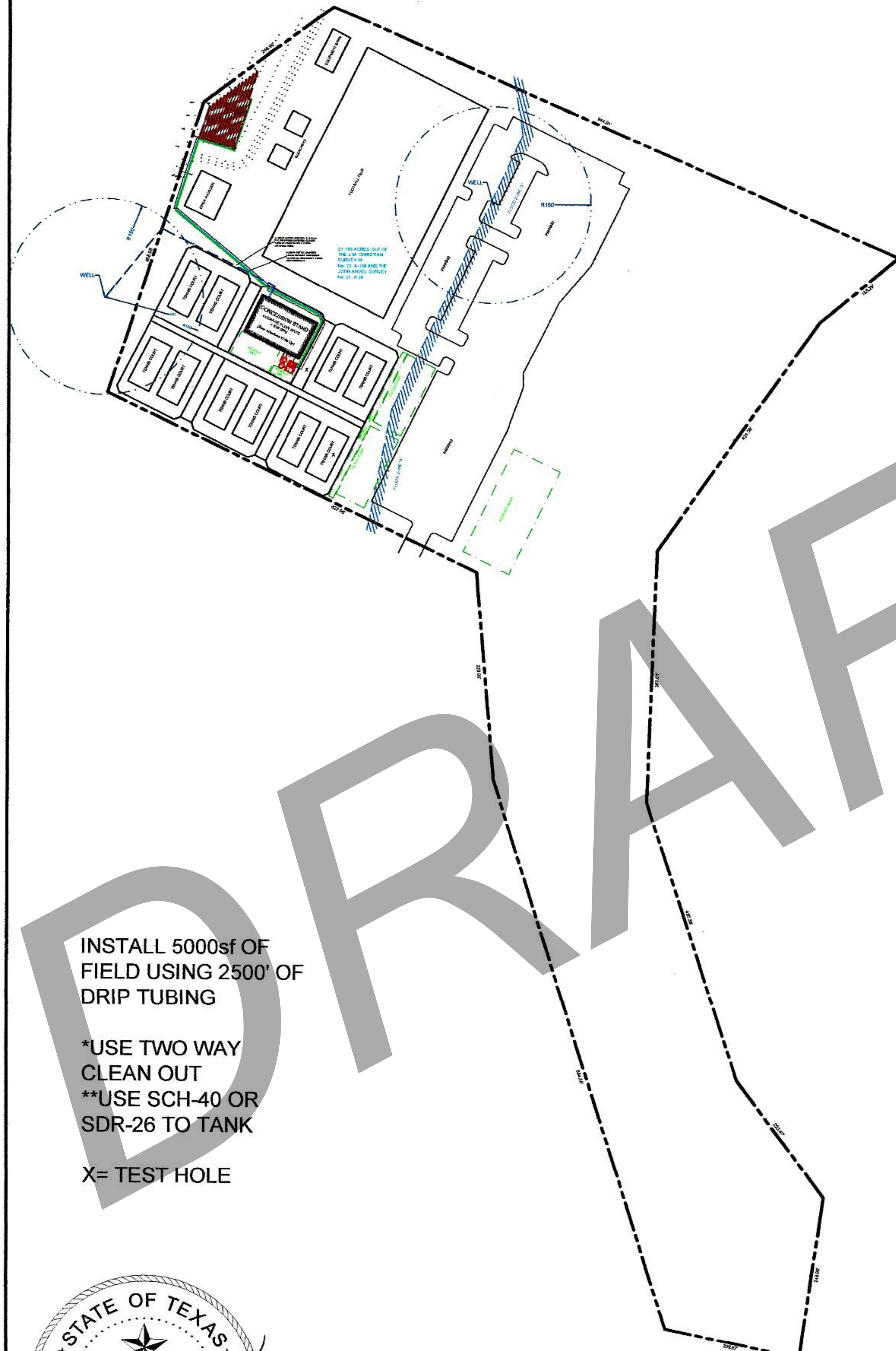
12/10/2015

Greg W. Johnson, P.E. No. 67587 F#2585
170 Hollow Oak
New Braunfels, Texas 78132
830/905-2778

STATE OF TEXAS
GREG W. JOHNSON
67587
REGISTERED
PROFESSIONAL ENGINEER

TANK LAYOUT:

A = 750 GAL. GREASE TRAP
B = 1000 GAL. SEPTIC TANK
C = 3300 GAL. EQUALIZATION TANK
D = HOOT 1200 AD/N AEROBIC TREATMENT PLANT



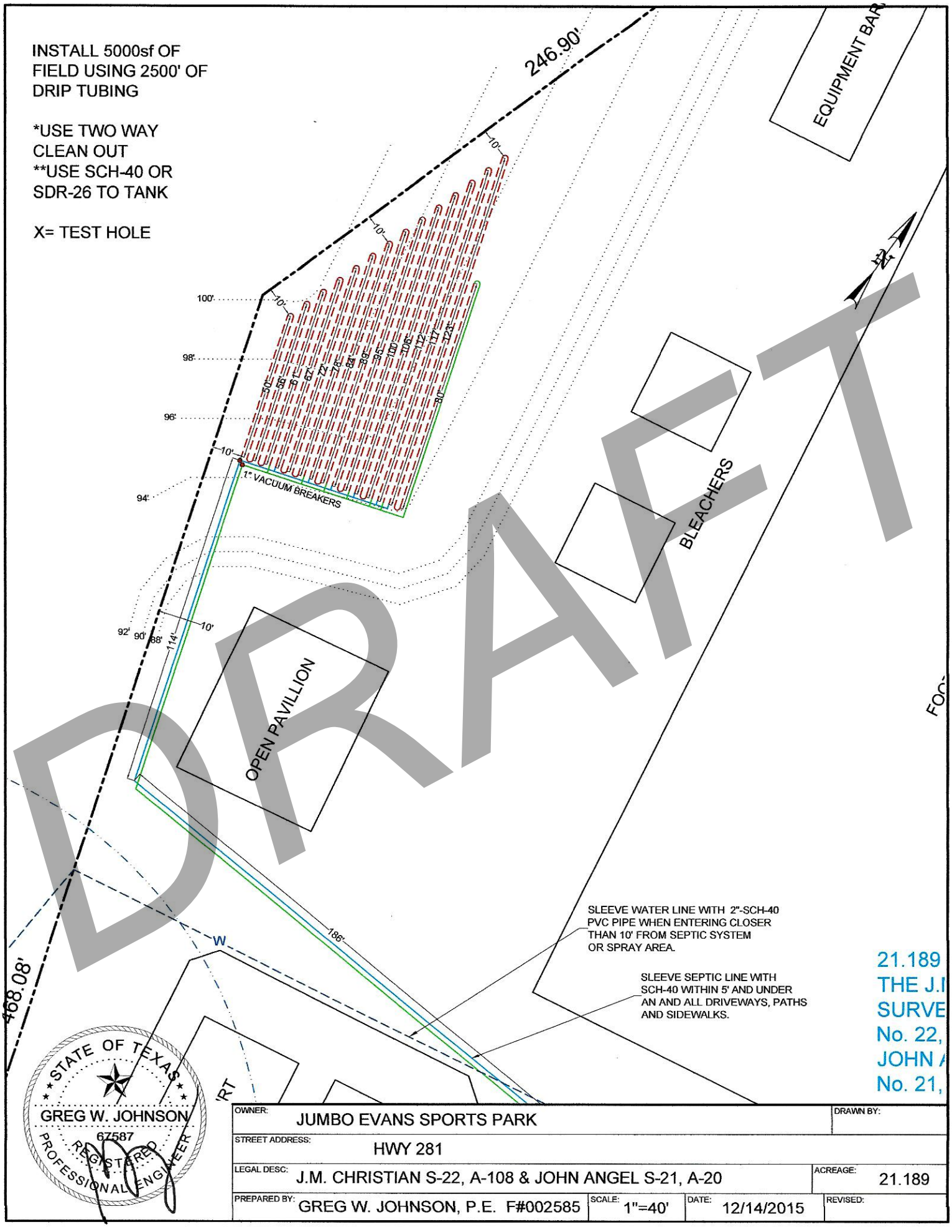
INSTALL 5000sf OF FIELD USING 2500' OF DRIP TUBING

*USE TWO WAY CLEAN OUT
**USE SCH-40 OR SDR-26 TO TANK

X= TEST HOLE

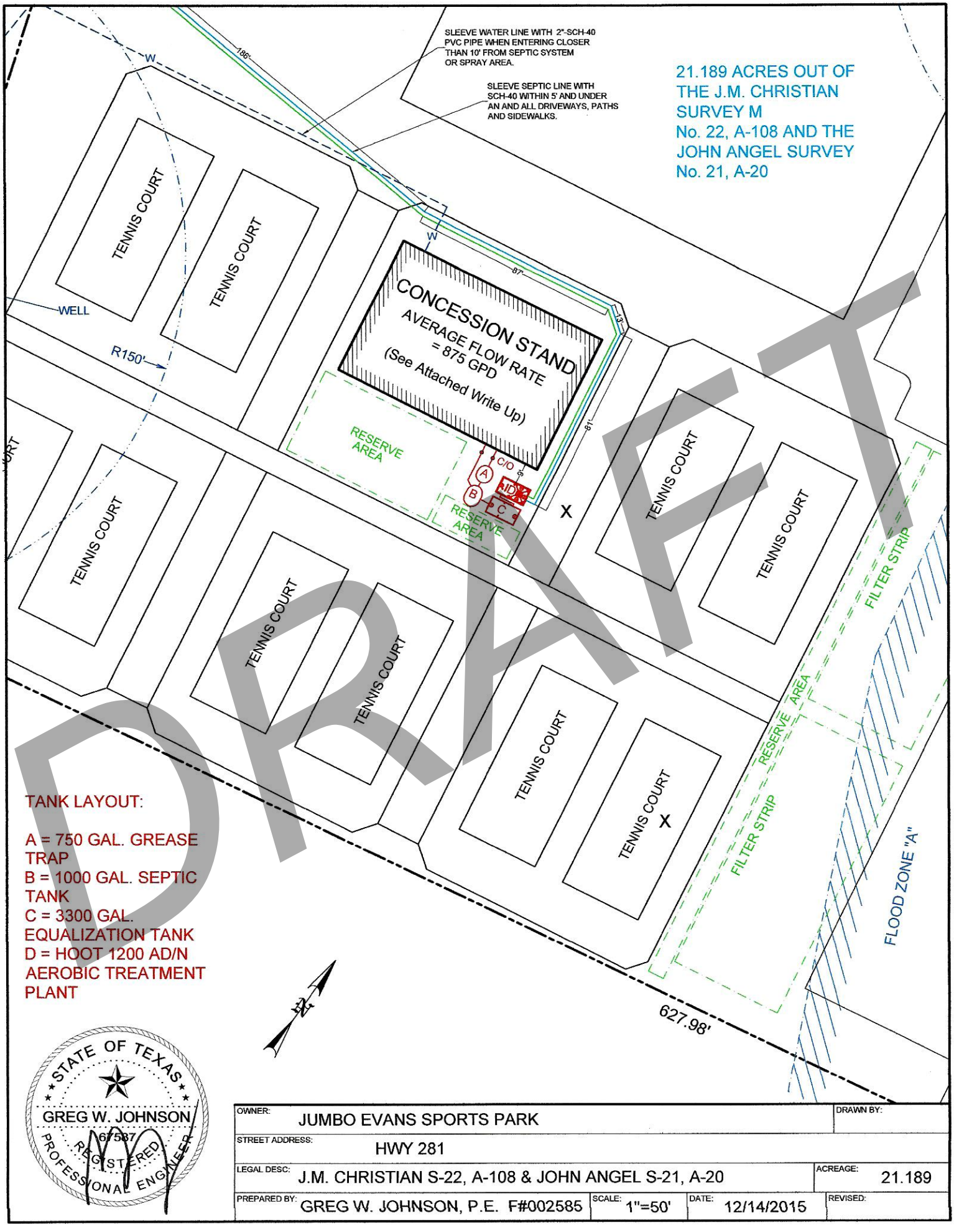
STATE OF TEXAS
GREG W. JOHNSON
67587
REGISTERED
PROFESSIONAL ENGINEER

OWNER: JUMBO EVANS SPORTS PARK				DRAWN BY:
STREET ADDRESS: HWY 281				
LEGAL DESC: J.M. CHRISTIAN S-22, A-108 & JOHN ANGEL S-21, A-20			ACREAGE: 21.189	
PREPARED BY: GREG W. JOHNSON, P.E. F#002585	SCALE: N.T.S.	DATE: 12/14/2015	REVISED:	

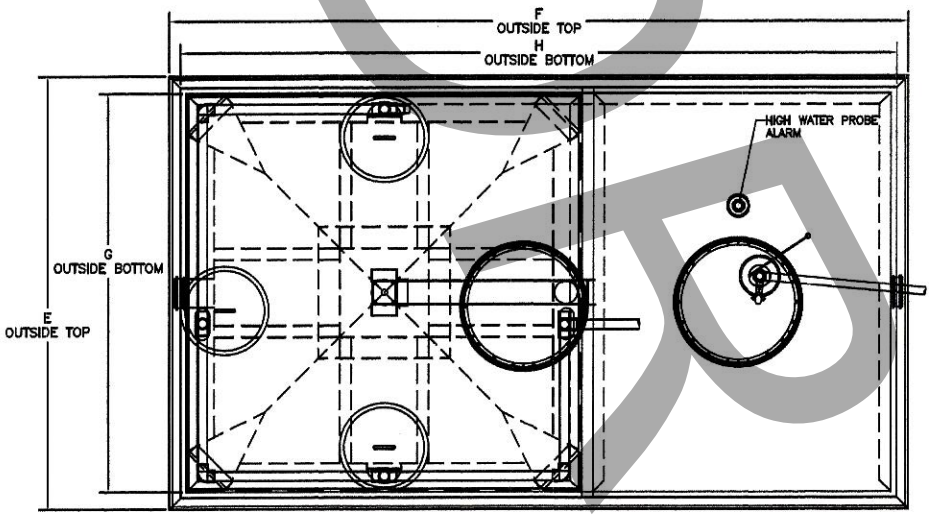


21.189
THE J.I
SURVE
No. 22,
JOHN A
No. 21,

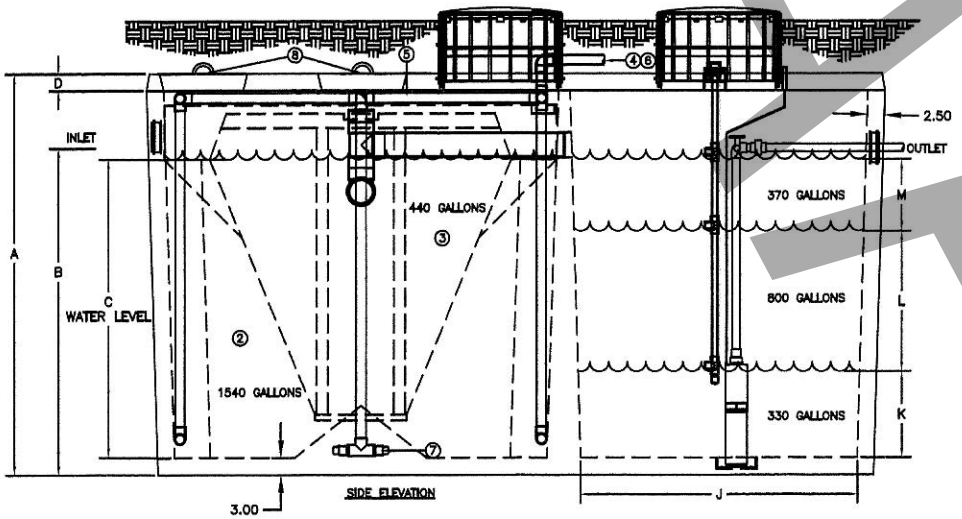
OWNER: JUMBO EVANS SPORTS PARK				DRAWN BY:
STREET ADDRESS: HWY 281				
LEGAL DESC: J.M. CHRISTIAN S-22, A-108 & JOHN ANGEL S-21, A-20			ACREAGE: 21.189	
PREPARED BY: GREG W. JOHNSON, P.E. F#002585	SCALE: 1"=40'	DATE: 12/14/2015	REVISED:	



OWNER: JUMBO EVANS SPORTS PARK			DRAWN BY:
STREET ADDRESS: HWY 281			
LEGAL DESC: J.M. CHRISTIAN S-22, A-108 & JOHN ANGEL S-21, A-20			ACREAGE: 21.189
PREPARED BY: GREG W. JOHNSON, P.E. F#002585	SCALE: 1"=50'	DATE: 12/14/2015	REVISED:



PLAN VIEW



SIDE ELEVATION

CRITICAL DIMENSIONS	
A	79.00"
B	71.25"
C	68.00"
D	3"
E	89.00"
F	157.00"
G	85.50"
H	152.75"
J	61.25"
K	N/A
L	N/A
M	N/A

THE H-SERIES HOOT AEROBIC TREATMENT SYSTEM

1) SEPARATE PRETREATMENT TANK REQUIRED (MIN. 800 GALLONS, PROVIDED THROUGH HOOT DISTRIBUTOR)- WHERE ANAEROBIC DIGESTION OCCURS AND STORAGE FOR NON-BIODEGRADEABLE MATERIALS.

2) AERATION CHAMBER- WHERE AIR IS INTRODUCED INTO SEWAGE FOR DIGESTION.

3) CLARIFIER- A STILL CHAMBER WHERE SOLIDS SETTLE OUT AND THE CLEAR EFFLUENT RISES.

4) TROY AIR LINEAR AIR BLOWER- LONG LIFE, EFFICIENT LINEAR BLOWER WHICH COMPRESSED ATMOSPHERIC AIR AND UNDER PRESSURE DELIVERS IT TO THE TANK. MAY BE REMOTELY MOUNTED UP TO 50' FROM SYSTEM. MUST MAINTAIN 1/8" SLOPE TOWARDS TANK FOR DRAINAGE.

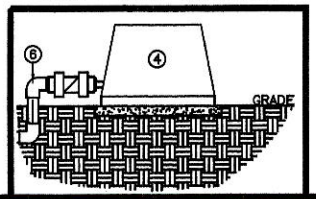
5) AIR MANIFOLD- DELIVERS THE AIR FROM THE LINE TO THE STONES FOR DIFFUSION INTO THE SEWAGE.

6) AERATION LINE- DELIVERS THE AIR FROM THE PUMP TO THE MANIFOLD. CHECK VALVE INCLUDED.

7) AERATION STONE- AIR IS FINELY DIFFUSED FROM THE STONE INTO THE AERATION CHAMBER.

8) 15" COVERS- PROVIDE ASSEMBLY PORT ACCESS INSIDE OF THE SYSTEM. (NOT REQUIRED FOR REGULAR SERVICE)

TROY AIR BLOWER

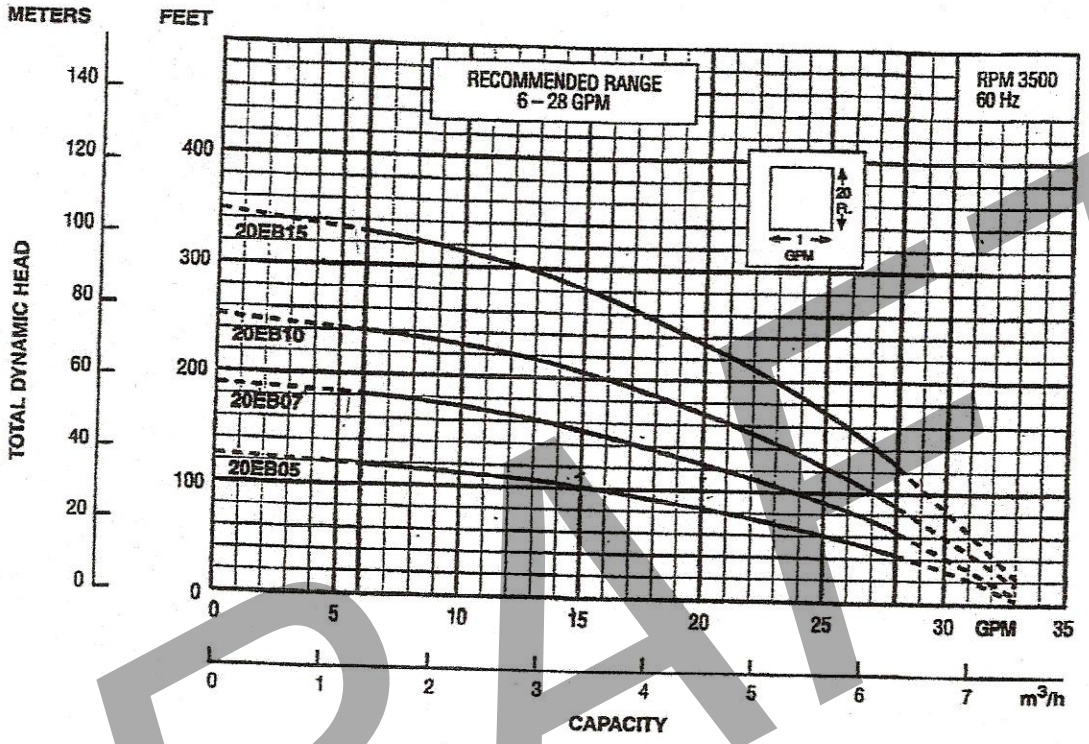


HOOT SYSTEMS, LLC
www.hootsystems.com

DESCRIPTION:				PART #
1200 GPD PUMP DISCHARGE SYSTEM HOOT SYSTEMS H-1200 w/ 1,500 GAL. P.T.				H-1200-1500
DATE:	DRAWN BY:	CHECK BY:	SCALE:	
03-17-2014	AY	RS	N.T.S.	

–Model 20EB

FILTERED EFFLUENT BLASTER.



LOW ANGLE NOZZLE PERFORMANCE CHART

Nozzle	PSI	Radius	GPM
#1	30	22'	1.5
	40	24'	1.7
	50	26'	1.8
	60	28'	2.0
#3	30	29'	3.0
	40	32'	3.1
	50	35'	3.5
	60	37'	3.8
#4	30	31'	3.4
	40	34'	3.9
	50	37'	4.4
	60	38'	4.7
#6	40	38'	6.5
	50	40'	7.3
	60	42'	8.0
	70	44'	8.6

#3 LOW ANGLE

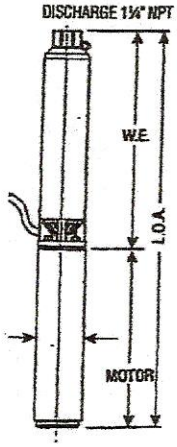
K-RAIN K-2 PLUS

DATA REPRESENTS TEST RESULTS IN ZERO WIND. ADJUST FOR LOCAL CONDITIONS. RADIUS MAY BE REDUCED WITH NOZZLE RETENTION SCREW.

DIMENSIONS AND WEI

Order Number	
20EB0522, 20EB0521	

W.E. = water end or pum
L.O.A. = length of assem



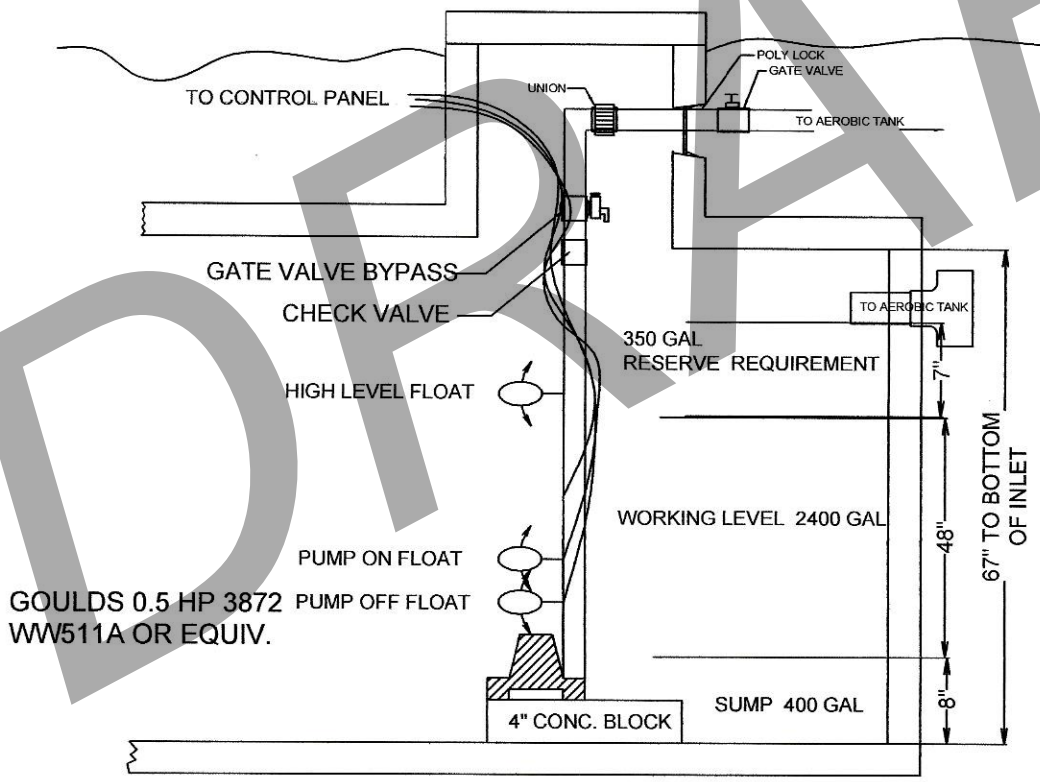
Printed on recycled pa

Effective April, 1996
Printed in the U.S.A.
BBLASTER

TANK NOTES:

A minimum of 4" of sand, sandy loam, clay loam free of rock shall be placed under and around tanks

ALL WIRING MUST BE IN COMPLIANCE WITH THE MOST RECENT NATIONAL ELECTRIC CODE



STATE OF TEXAS
GREG W. JOHNSON
67587
REGISTERED
PROFESSIONAL ENGINEER

10/8/2015

EQUALIZATION TANK 3300 GAL PUMP TANK

VOLUME = 50 GAL/IN

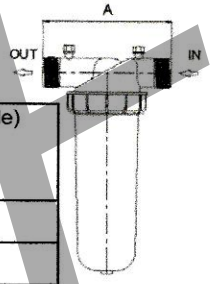
ARKAL
FILTRATION SYSTEMS

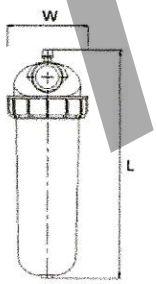
Arkal 1½" Super Filter

Catalog No. 1152 0_ _ _

Features

- A "T" shaped filter with two 1½" male threads.
- A "T" volume filter for in-line installation on 1½" pipelines.
- The filter prevents clogging due to its enlarged filtering area that collects sediments and particles.
- Manufactured entirely from fiber reinforced plastic.
- A cylindrical column of grooved discs constitutes the filter element.
- A sealing spring keeps the discs compressed.
- Screw-on filter cover.
- Filter discs are available in various filtration grades.





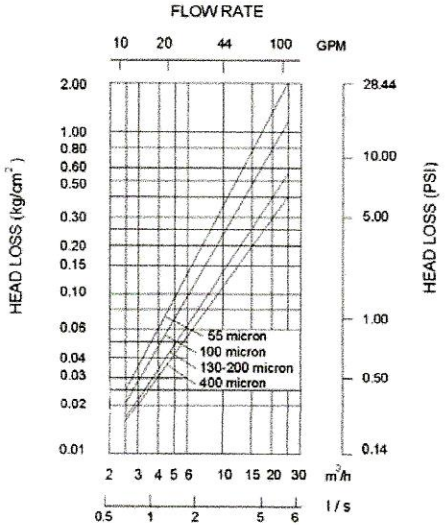
Technical Data

Inlet/outlet diameter	1½" BSPT (male) 40 mm – nominal diameter 48.2 mm – pipe diameter (O. D.)	1½" NPT (male)
Maximum pressure	10 atm	145 psi
Maximum flow rate	12 m^3/h (2.22 l/sec)	52.8 gpm
General filtration area	500 cm^2	77.5 in^2
Filtration volume	600 cm^3	37 in^3
Filter length L	350 mm	13 25/32"
Filter width W	130 mm	5 3/32"
Distance between end connections A	200 mm	7 7/8"
Weight	1.51 kg	3.32 lbs.
Maximum temperature	70° C	158° F
pH	5-11	5-11

Filtration Grades

Blue (400 micron / 40 mesh)
Yellow (200 micron / 80 mesh)
Red (130 micron / 120 mesh)
Black (100 micron / 140 mesh)
Green (55 micron)

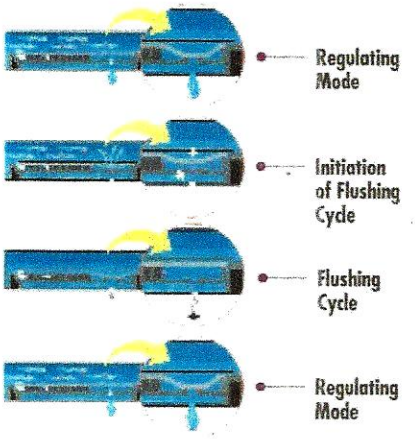
Head Loss Chart



NETAFIM™

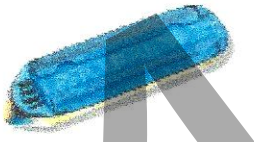
Bioline® Dripperline

Pressure Compensating Dripperline for Wastewater



BioLine's Self-Cleaning, Pressure Compensating Dripper is a fully self-contained unit molded to the interior wall of the dripper tubing.

As shown at left, BioLine is continuously self-cleaning during operation, not just at the beginning and end of a cycle. The result is dependable, clog free operation, year after year.



Product Advantages

The Proven Performer

- Tens of millions of feet used in wastewater today.
- Bioline is permitted in every state allowing drip disposal.
- Backed by the largest, most quality-driven manufacturer of drip products in the U.S.
- Preferred choice of major wastewater designers and regulators.
- Proven track record of success for many years of hard use in wastewater applications.

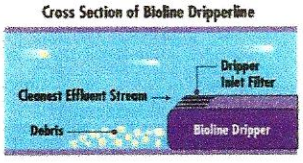
Quality Manufacturing with Specifications Designed to Meet Your Needs

- Pressure compensating drippers assure the highest application uniformity - even on sloped or rolling terrain.
- Excellent uniformity with runs of 400 feet or more - reducing installation costs.
- Highest quality-control standards in the industry: Cv of 0.25 (coefficient of manufacturer's variation).
- A selection of flows and spacings to satisfy the designer's demand for almost any application rate.

Long-Term Reliability

- Protection against plugging:
  - Dripper inlet raised 0.27" above wall of tubing to prevent sediment from entering dripper.
  - Drippers impregnated with Vinyzene to prevent buildup of microbial slime.
  - Unique self-flushing mechanism passes small particles before they can build up.

Cross Section of Bioline Dripperline



Root Safe

- A physical barrier on each BioLine dripper helps prevent root intrusion.
- Protection never wears out - never depletes - releases nothing to the environment.
- Working reliably for up to 15 years in subsurface wastewater installations.
- Additional security of chemical root inhibition with Techfilter - supplies Trifluralin to the entire system, effectively inhibiting root growth to the dripper outlets.

Applications

- For domestic strength wastewater disposal.
- Installed following a treatment process.
- Can be successfully used on straight septic effluent with proper design, filtration and operation.
- Suitable for reuse applications using municipally treated effluent designated for irrigation water.

Specifications

Wall thickness (mil): 45*

Nominal flow rates (GPH): .4, .6, .9*

Common spacings: 12", 18", 24"*

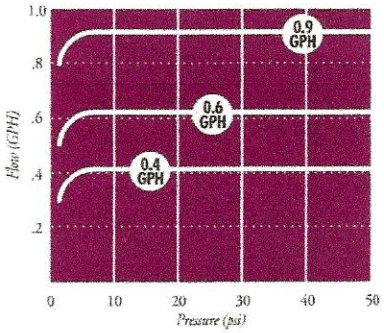
Recommended filtration: 120 mesh

Inside diameter: .570*

Color: Purple tubing indicates non-potable source

*Additional flows, spacings, and pipe sizes available by request. Please contact Netafim USA Customer Service for details.

BIOLINE Flow Rate vs. Pressure



NETAFIM™

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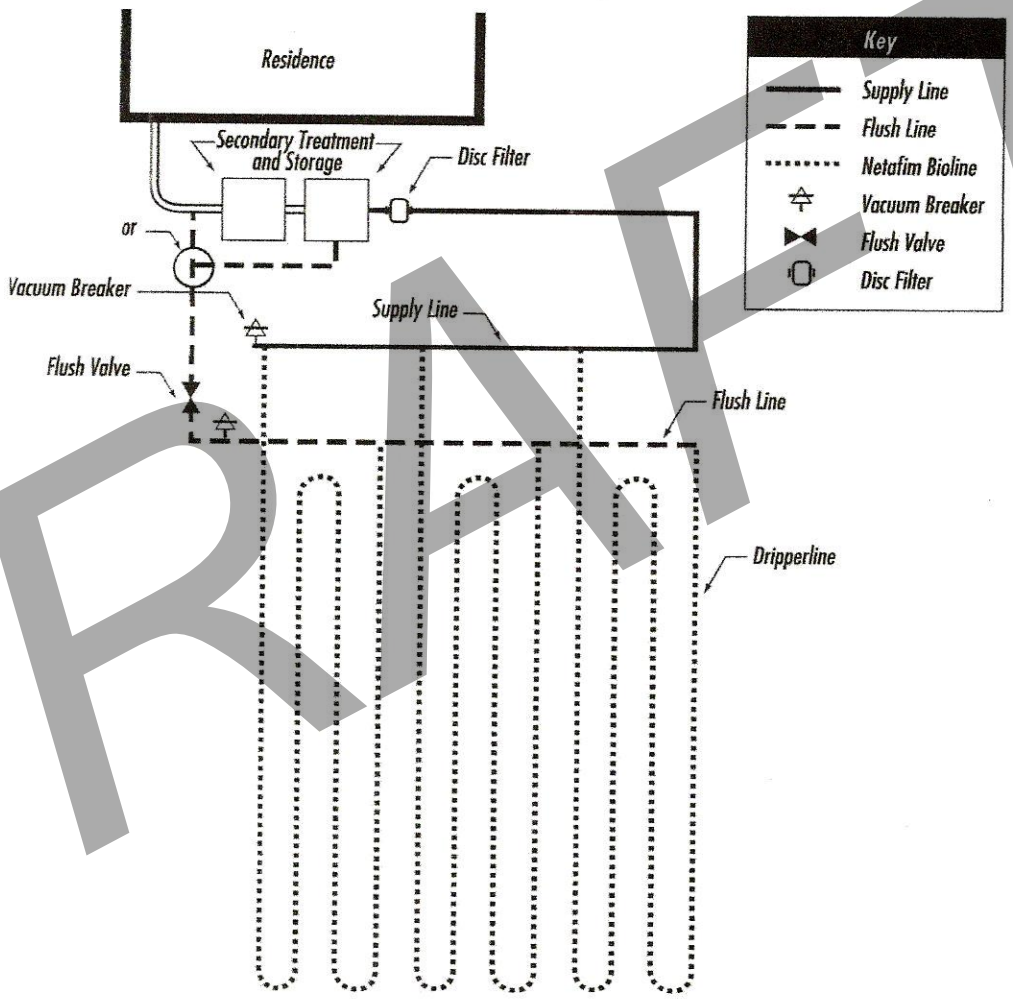
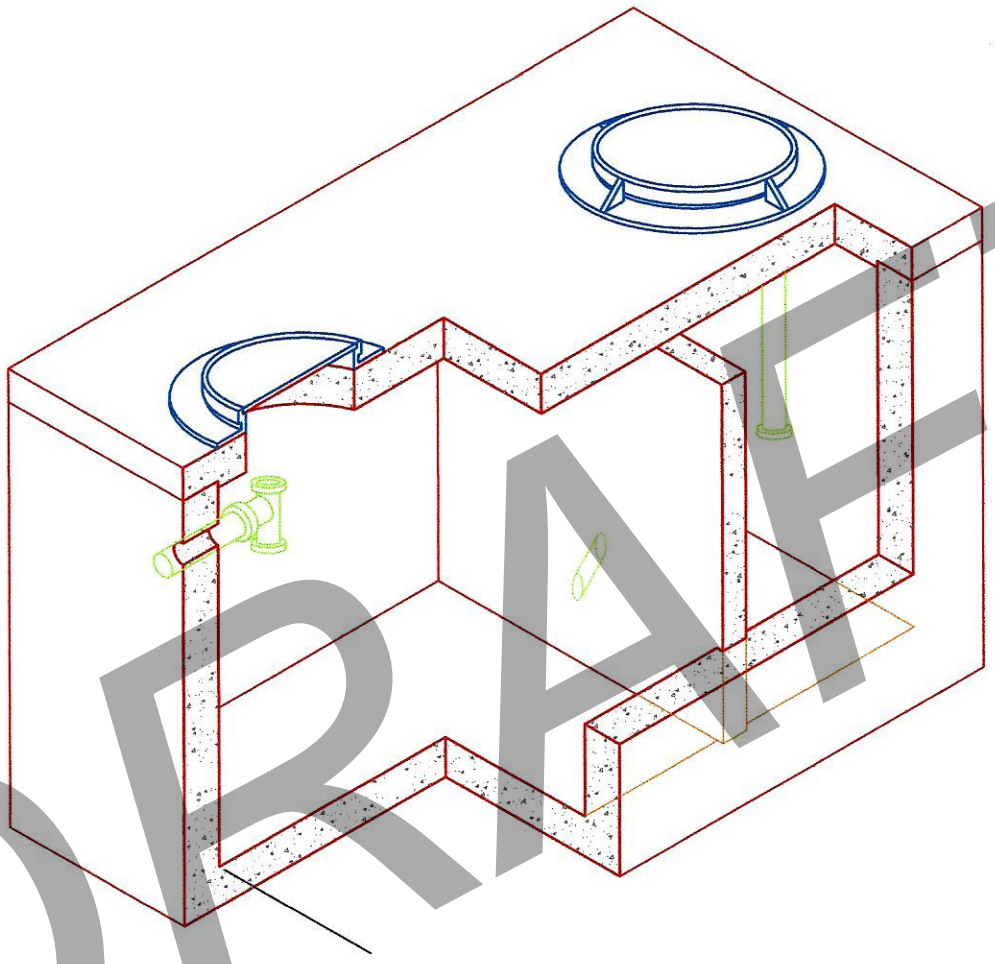
SAMPLE DESIGNS

SINGLE TRENCH LAYOUT

Rectangular field with supply and flush manifold on same side and in same trench;

- Locate supply and flush manifold in same trench
- Dripperlines are looped at the end opposite the supply and flush manifolds
- The longest Bioline length should not exceed 400 ft. Drip fields 200 ft. in length might loop the Bioline once; drip dispersal fields under 100 ft. might be looped twice, as illustrated





TYPICAL 750 GALLON GREASE TRAP

STATE OF TEXAS
GREG W. JOHNSON
67587
REGISTERED
PROFESSIONAL ENGINEER

12/1/2015