



# APPLICATION - PERMIT ON-SITE WASTEWATER SYSTEM



(Please Type or Print Legibly)

OWNER'S NAME: STATE OF DELAWARE PHONE: 302-739-7400

ADDRESS: 29 NORTH STATE STREET, DOVER, DELAWARE 19901

PROJECT LOCATION: KITTS HUMMOCK ROAD S/E OF BAYSIDE DRIVE (RTE. 9)

TAX/MAP #: 2 00 09600 01 2000 000

APPLICATION

PREPARER: SHARON K. CRUZ

DNREC

LICENSE #: 4328

PREPARER'S ADDRESS: 1 PARK AVE., MILFORD DELAWARE 19963

PHONE: 302-424-1441

I hereby affirm that the information provided on this document is accurate and complete.

Preparer's Signature: [Signature] Date: 12/19/2024

By signing this permit application, the preparer further certifies they were physically present at the site.

## -SEPTIC DESIGN CRITERIA-

(Please check all boxes that apply)

**System Type:** (CF = Cap & Fill / FD = Full Depth)

- |  |  |
|--|--|
| <input type="checkbox"/> Gravity (FD)                  | <input type="checkbox"/> Permanent Holding Tank      |
| <input type="checkbox"/> Gravity (CF)                  | <input type="checkbox"/> Elevated Sand Mound         |
| <input type="checkbox"/> Pressure Dose (FD)            | <input type="checkbox"/> Wisconsin At-Grade          |
| <input checked="" type="checkbox"/> Pressure Dose (CF) | <input type="checkbox"/> Subsurface Micro Irrigation |
| <input type="checkbox"/> Low Pressure Pipe (FD)        | <input type="checkbox"/> Peat Bio- Filter            |
| <input type="checkbox"/> Low Pressure Pipe (CF)        | <input type="checkbox"/> Other _____                 |
| <input type="checkbox"/> Temporary Holding Tank        |  |

- ☐ Bed or ☒ Trench
- ☐ Gravelless Chamber ☒ Stone/Gravel ☐ Tire Chips
- Sand-lined ☐ Yes ☒ No

Existing System Malfunctioning ☐ Yes ☐ No ☒ N/A

Pre-Treatment Units

- ☒ Septic Tank
- ☐ Other \_\_\_\_\_

Central Water Available ☐ Yes ☒ No

(If yes, please state Utility Name: \_\_\_\_\_)

## Type of Construction:

- ☐ Replacement
- ☒ New Construction
- ☐ Component Replacement
- Component: \_\_\_\_\_
- ☐ Repair to Existing System
- Reason: \_\_\_\_\_

☐ Authorization to Use Existing System

Permit #: \_\_\_\_\_

Present Condition: \_\_\_\_\_

Structure to be connected: \_\_\_\_\_

# of Bedrooms: \*SEE BELOW

Avg. Percolation Rate: 80 MPI

Gallons Per Day Flow: 2,400

Minimum Sq. Ft. Req'd: 6,624

Sq. Ft. Proposed: 7,254

\*800 SEATS @ 3 GPD /  
SEAT = 2,400 GPD  
SEE ATTACHED  
CALCULATIONS



## DESIGNATION OF AUTHORIZED AGENT

The purpose of this form is to allow the owner(s) of a parcel to authorize an agent to act on their behalf when applying for a permit with the Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Water. When properly completed, this form allows the agent to sign their name on the permit application in place of the owner(s) signature.

Additionally, the authorized agent may sign all future correspondence to the Department as it relates to the permit application. The authorized agent will become the primary point of contact for all correspondence from and to the Department.

The section below must be completed in full, signed, and dated. An electronic original of this form must be submitted to the Department with the application.

I, Suzanne Savery hereby designate and authorize the person named below to act as my authorized agent in filing a permit application and to furnish any additional information requested by the Department for the project listed below:

Street Address: Bay Road, Dover, DE

Tax Map Parcel ID: 2-00-09600-01-2000-000

Authorized Agent Name: Ring Lardner

Company Name: Davis, Bowen & Friedel, Inc.

Address: 1 Park Avenue, Milford, DE 19963

Phone #: 302-424-1441

E-mail: rwl@dbfinc.com

☐ The application for the project mentioned above has been previously submitted and this form acts as a submission for a change in the authorized agent.

Suzanne Savery Digitally signed by Suzanne Savery  
Date: 2024.10.03 08:21:54 -04'00'  
Property Owner's Signature

10/03/2024  
Date

Suzanne Savery  
Property Owner's Printed Name

10/03/2024  
Date

  
Authorized Agent's Signature

10/09/2024  
Date

Ring W. Lardner  
Authorized Agent's Printed Name

10/09/2024  
Date



# Site Evaluation

Reference #:  
571702

SITE EVALUATION provided by ENVIRONMENTAL RESOURCE INSIGHTS  
Approval Page

RECEIVED

08/07/2024

GROUNDWATER

The soils on this site are approved when the following is completed in full and signed by the approving authority. The information contained in this site evaluation reflects Delaware Department of Natural Resources and Environmental Control (DNREC) policies and procedures at the time of the review. Exhibits and Regulations cited in this report refer to DNREC "Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems." Isolation distance requirements, limited area of suitable soils, filling, removal, and/or compaction of the soil may negate construction permit approval or modify the type of system that can be permitted. All information should be verified by interested parties prior to design and installation of the septic system. This is not a construction permit.

Owner's Name: State of Delaware

Tax Map: # 2-00-09600-01-2000-00001

Initial Disposal System: Capping Fill Gravity trench or bed design.

All new and replacement small systems requiring advanced treatment units must adhere to the performance standard nitrogen level 3 (PSN3).

Location: As indicated on the drawing in the shaded area around Soil Borings 1, 2, 3, 4, and 5.

Depth to limiting zone: 48 (to 72+) inches to indications of seasonal high-water table (SHWT). A consistent 50 inch, or greater, LZ is located upslope of SB 1 and 4 as shown on the plan.

Design Considerations and Comments: See Exhibit M (Typical Aggregate Trench/Bed Design-Capping Fill Gravity Design). Final system selection is up to the applicant and designer. All new and replacement small systems requiring advanced treatment units must adhere to the performance standard nitrogen level 3 (PSN3).

A 100 ft. Isolation distance is required from all domestic, irrigation, and geothermal supply wells (50 ft. from geothermal dump wells) and commercial wells and 150 ft. from all public and industrial wells (See Exhibit C). A lesser well isolation distance may be approved for domestic wells on a case-by-case basis; contact the Water Supply Branch at 302-739-3665. This evaluated area, which slopes gently southwest, is in a large agricultural field with limited nearby development. Other isolations distances may apply. This evaluation is for a new, small OWTDS. The Approved Area is well drained soil situated on a gentle slope. It is the permittees' responsibility to prevent soil compaction of this proposed drain field area. Please see the attached DNREC Barricading the Proposed Disposal Area figure. It is highly recommended that orange construction fencing on metal post be established around the entire Approved Area prior to beginning any site disturbance and a specific inspection be completed each day to maintain this protective fence.

The applicant needs to work closely with the designer to address their needs as the disposal area is some distance from the proposed facility.

Replacement Disposal System Type: As above if space permits.

Location: Within the Approved Area if possible.

Depth to limiting zone: As above.

PAID

\$ 75.00 08/07/2024

## Instructions to Property Owner

- 1 Contact a Class B or C System Designer.
- 2 A permeability rate of 80 minutes per inch has been assigned to the soils on your property based upon rates as provided in section 5.0 and Exhibit Y of the regulations and site-specific conditions. Minimum design rates may be applicable.
- 3 If you have questions, call the evaluator at (302) 436-9637 or DNREC at (302) 856-4561.

This report has been prepared by: , License #2240

Thomas D. Nobile

Project 2541A007.A01

Environmental Resource Insights, Division of Davis, Bowen & Friedel, 1 Park Avenue, Milford, Delaware 19963

**Disclaimer:** Approval of this site evaluation indicates only that the site evaluation, based on information presented to us, was conducted in compliance with the Regulations. It is not an indication of the correctness or quality of the evaluation, nor does it guarantee the evaluation is free of omissions.

For office use only

Field Checked

**DNREC APPROVED**

DNREC Reviewing Soil Scientist

Date **8/30/2024**

Expiration Date **8/30/2029**

If there are questions regarding this report  
contact the Class D licensee.

The Class D licensee is  
responsible for errors/omissions.



## KENT COUNTY LEVY COURT

555 Bay Road, Dover, Delaware 19901-3615  
(302) 744-2300 -- FAX (302) 736-2279

*"Serving Kent County With Pride"*

### PROPERTY RECORD REPORT

#### Parcel Information:

**Parcel ID:** 2 00 09600 01 2000 000

**User Account #:** 9010

**Tax Account ID:** 9010

**Property Code:** E -

**Property Type:** Govt/Inst - Vacant Land

**Improvement Status:** N/A

**Deed BVP:** D 225-335

**Plat Book:** 00000

**GIS Cord:** E-489561 N-400557

**Flood Plain:** N/A

**Zoning:** AC - Agricultural Conservation

**Lot #:** Acres: 95.4

**Total Living Area:** 0 SQFT

**Total Beds/Baths/Half Baths:** 0 / 0 / 0

**Legal Description:** IN ST JONES NECK BOUNDED ON N  
BY CO RD 68 95.4437 A

#### Owner Information:

**Name(s):** DELAWARE, STATE OF

**Address:** 89 KINGS HWY, DOVER, DE  
19901

#### District Information:

**Levy Court District:** 3RD

**Fire:** 55\_F Magnolia

**Ambulance:** 55\_A Magnolia

**School:** SC20 CAESAR RODNEY

**Sewer:**

**Sewer ID:**

**Trash:**

**Light:**

**Stormwater:**

**Tax Ditch:**

#### Assessed Values:

**Land:** \$2,520,400

**Buildings:** \$0

**Yard:** \$0

**Total:** \$2,520,400

#### Location Information:

**Location Address:** BAY RD, DOVER, DE  
19901

**Subdivision:**

#### Transfers:

**Recorded Date:** 7/31/1997

**Sale Date:** 7/29/1997

**Price:** \$250,000

**Legal Ref:** D 225-335

#### County Billing:

**Pending:** \$0.00

**Base Tax:** \$0.00

**Penalty / Interest:** \$0.00

**Other:** \$0.00

**Total Due:** \$0.00

#### Permits:

**Permit #:** 1996-1898-COFO

**Status:** AP

**Application:** 7/22/1996

**Issued:** 7/22/1996

**C of O:**

#### Sewer Billing:

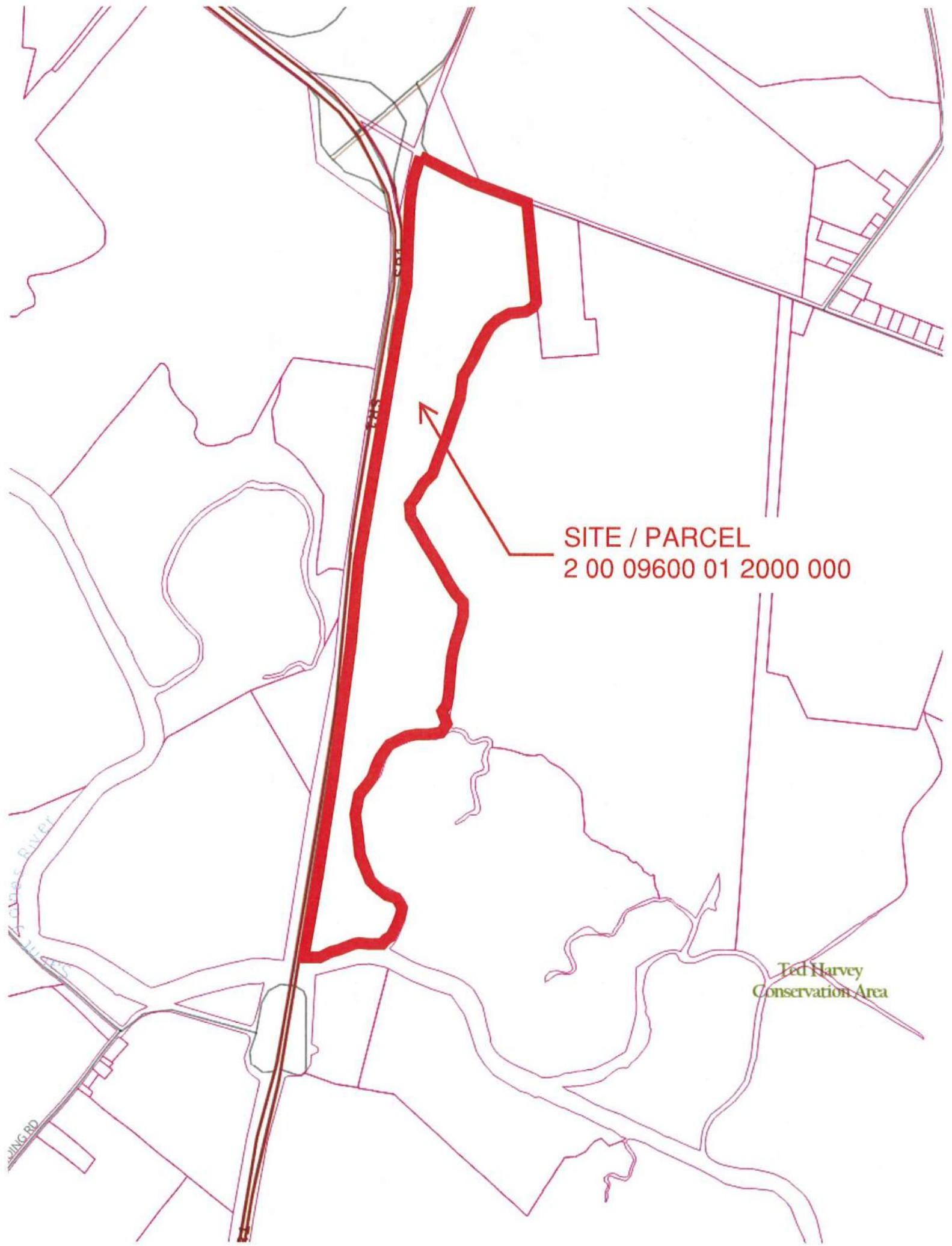
**Account #:**

**Customer #:**

**Units:** 0.0

**Balance:** \$0.00





SITE / PARCEL  
2 00 09600 01 2000 000

OWTDS NOTES:

1. ALL TANKS SHALL HAVE WATERTIGHT RISERS AND SHALL EXTEND ABOVE GRADE.
2. SEPTIC TANK SHALL HAVE AN EFFLUENT FILTER APPROVED BY DNREC.
3. SPARE TO BE SANDLINED UPGRADE IN INITIAL AREA.
4. TREES NEED TO BE REMOVED WITH EXTREME CARE PER DNREC GUIDELINES (COPY ATTACHED), INSTALLING A SUBSTANTIAL BARRIER AROUND THE ENTIRE PROPOSED DISPOSAL AREA WHILE LOT DEVELOPMENT IS TAKING PLACE MAY HELP TO AVOID ACCIDENTAL SOIL COMPACTION OR SYSTEM DISTURBANCE.
5. TRENCHES SHALL BE INSTALLED PERPENDICULAR TO SLOPE OF LAND AND SHALL BE STEPPED AS NECESSARY TO PROVIDE REQUIRED TRENCH DEPTH AND COVER.
6. CAPPING FILL MAY BE REQUIRED OVER DOWNSLOPE DRAINFIELD TRENCHES. TRENCHES SHALL NOT BE INSTALLED DEEPER THAN MAXIMUM DESIGN DEPTH.
7. ALL SITE FEATURES ARE EXISTING UNLESS OTHERWISE NOTED.
8. ALL WELLS WITHIN 150' OF SUBJECT PROPERTY ARE SHOWN ON PLAN (UNLESS OTHERWISE NOTED.)
9. NO FLOOR DRAINS FROM THE BUILDINGS TO BE CONNECTED TO THE SYSTEM.
10. EXISTING OWTDS ARE GREATER THAN 150' FROM PROPOSED WELL AS PER OWNER
11. NO COOKING WILL BE PERFORMED ONSITE
12. ALL TRANSMISSION PIPING INSTALLED IN AREAS SUBJECT TO VEHICULAR TRAFFIC SHALL BE BURIED A MINIMUM OF 3-FEET, OR SLEEVED OR ENCASED IN CONCRETE. SLEEVE OR CONCRETE ENCASEMENT SHALL EXTEND MINIMUM 5-FEET BEYOND EDGE OF TRAFFIC AREA
13. DNREC APPROVED LIFT STATION PACKAGE MAY BE REQUIRED TO OVERCOME ELEVATION DIFFERENCES FROM SEPTIC TANK TO DRAINFIELD



OWNER'S/AUTHORIZED AGENT SIGNATURE

DATE 10/9/2024

LEGEND:

- |           |                       |
|-----------|-----------------------|
| — WET —   | = WETLANDS LINE       |
| — 25WLB — | = 25' WETLANDS BUFFER |
| — W —     | = EDGE OF WOODS       |
| - - - -   | = BOUNDARY            |

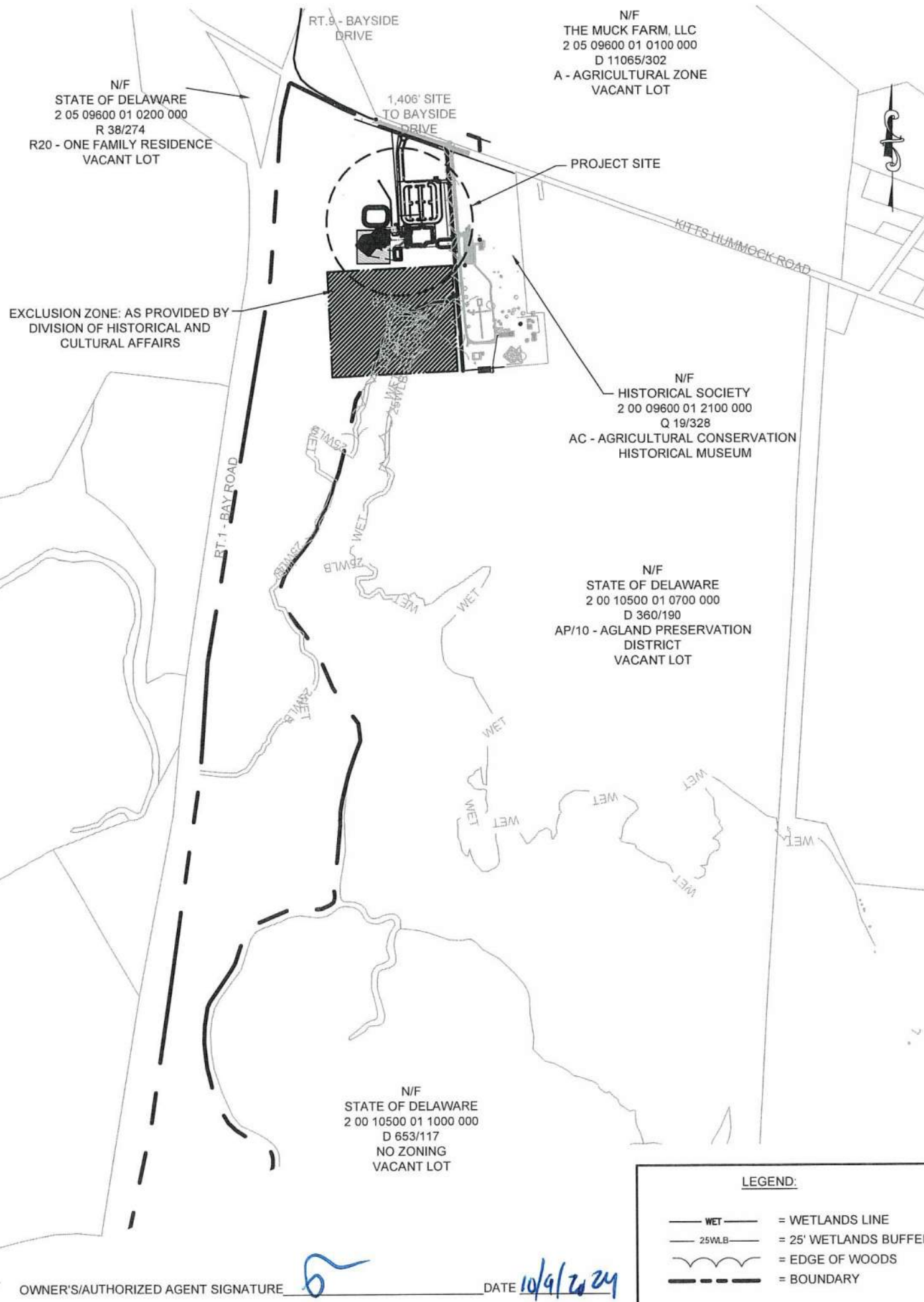
ONSITE WASTEWATER PLAN SET  
JOHN DICKINSON PLANTATION

VISITORS CENTER  
KITTS HUMMOCK ROAD

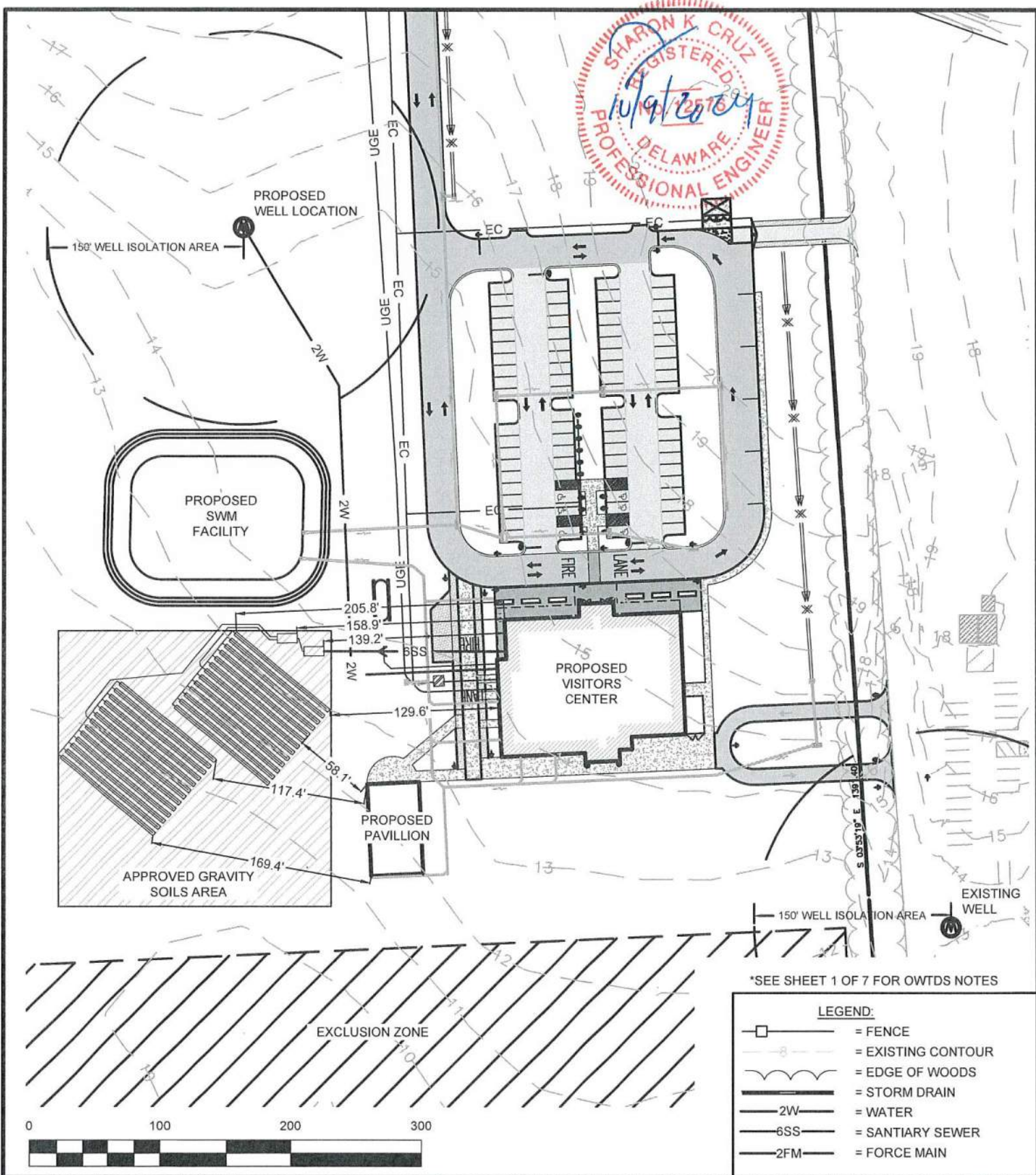
EAST DOVER HUNDRED, KENT COUNTY, DELAWARE

Date:	10/09/2024
Scale:	1"=800'
Dwn.By:	CLB
Proj.No.:	2541A007.A01
OVERALL SITE PLAN	
Dwg.No.:	1 OF 7

**DAVIS BOWEN & FRIEDEL, INC.**  
ARCHITECTS • ENGINEERS • SURVEYORS  
BALTIMORE, MARYLAND 410.770.4744  
MILFORD, DELAWARE 302.424.1441  
SALESBURY, MARYLAND 410.543.9091







\*SEE SHEET 1 OF 7 FOR OWTDS NOTES

Date:	10/09/2024
Scale:	1"=100'
Dwn.By:	CLB
Proj.No.:	2541A007.A01
PROJECT SITE PLAN	
Dwg.No.:	2 OF 7

**ONSITE WASTEWATER PLAN SET**  
**JOHN DICKINSON PLANTATION**  
**VISITORS CENTER**  
**KITTS HUMMOCK ROAD**  
**EAST DOVER HUNDRED, KENT COUNTY, DELAWARE**



**DAVIS  
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FRIEDEL, INC.**  
ARCHITECTS • ENGINEERS • SURVEYORS

**EASTON, MARYLAND** 410.770.4744  
**MILFORD, DELAWARE** 302.424.1441  
**SALISBURY, MARYLAND** 410.543.9091



1	CLEANOUT
2	6" SCH 40 PIPE (170.3' LENGTH)
3	4,400 GAL SEPTIC TANK
4	4" SCH 40 PVC PIPE (12.4' LENGTH)
5	4,400 GAL DOSING TANK
6	3" TRANSMISSION LINE (185.4' LENGTH)
7	3" TRANSMISSION LINE (81.0' LENGTH)
8	2" MANIFOLD (72' LENGTH EA.)
9	1" DISTRIBUTION LATERAL (93' LENGTH), 5/32" HOLES 8" O.C., 11 HOLES / LATERAL

PROPOSED  
SWM FACILITY

FIRE SUPPRESSION  
WATER TANK

FIRE

R.D. XING INV. 9.41

6" INV. 13.50

SAN. INV. 12.01  
(SEE NOTE 2  
BELOW)

6" INV. 11.80

CO 1

PROPOSED  
VISITORS  
CENTER

PROPOSED  
PAVILLION

- NOTES:
1. SEE SHEET 1 OF 7 FOR OWTDS NOTES
  2. 18" MINIMUM VERTICAL SEPARATION FROM WATER LINE

LEGEND:

- = STORM DRAIN
- 2W— = WATER
- 6SS— = SANITARY SEWER
- 2FM— = FORCE MAIN
- UGE— = UNDERGROUND ELECTRIC
- EC— = ELECTRIC CONDUIT



ONSITE WASTEWATER PLAN SET  
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EASTON, MARYLAND 410.770.4744

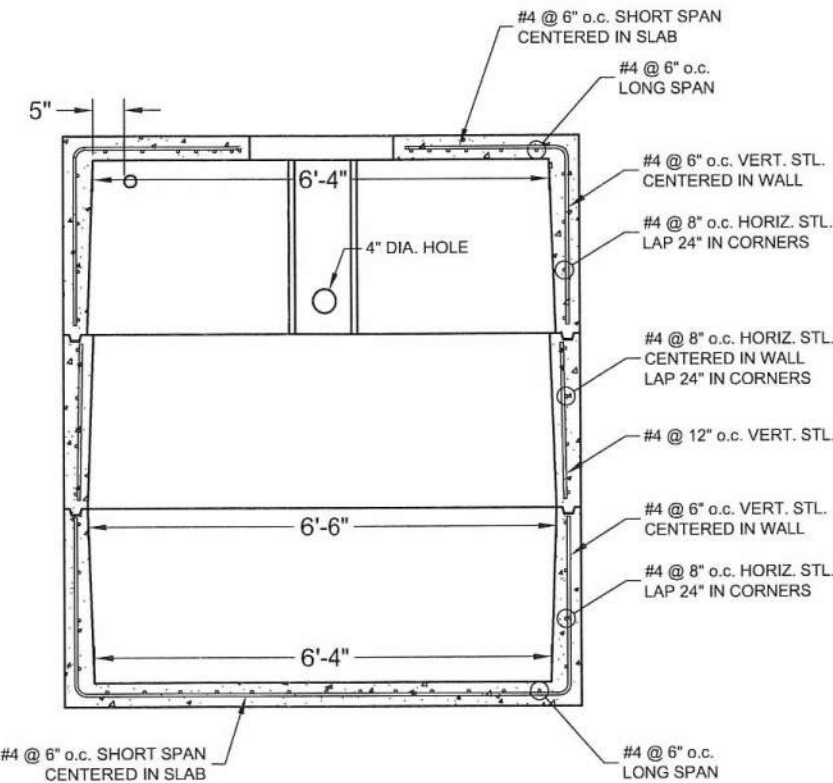
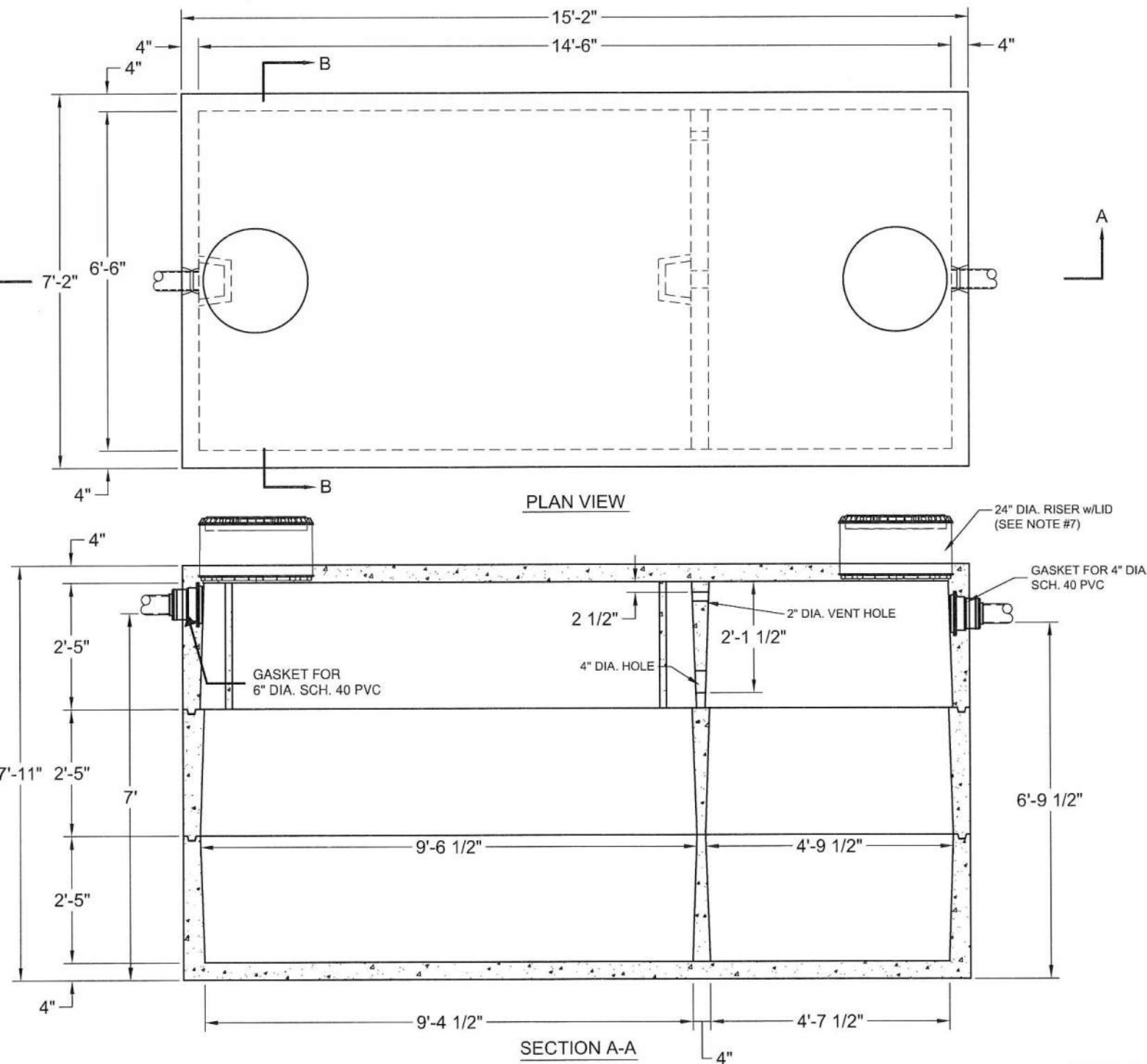
Date:	10/09/2024
Scale:	1"=30'
Dwn.By:	CLB
Proj.No.:	2541A007.A01
Detailed Septic Plan	
Dwg.No.:	3 OF 7



**GENERAL NOTES:**

1. Concrete 5,000 psi @ 28 days.
2. Rebar ASTM A-615 GR. 60
3. WWF ASTM A-185
4. All joints to be sealed with Conseal CS-102.
5. Poly-Lok Poly IV open end boot
6. Effluent filter (optional) Polylok #PL-122
7. 24" Ø risers & cover Polylok #3008 & #3009
8. Tank designed for 0-2' of cover with 300 psf live load.
9. Weight:

Top Section: 11,640 lbs.  
Riser Section: 6,440 lbs.  
Base Section: 11,800 lbs.



- REINFORCING NOTES:**
1. (2) #4 TRIM BARS AT CORNERS OF ALL OPENINGS.
  2. (2) EXTRA BARS EACH SIDE OF OPENINGS.

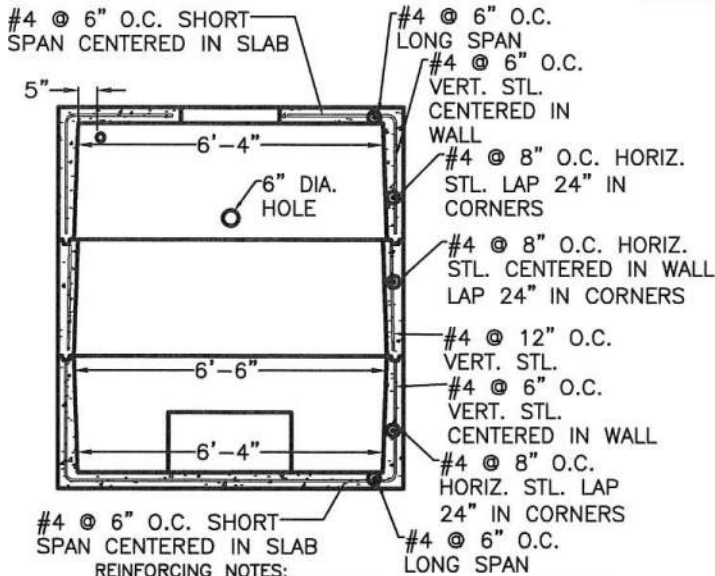
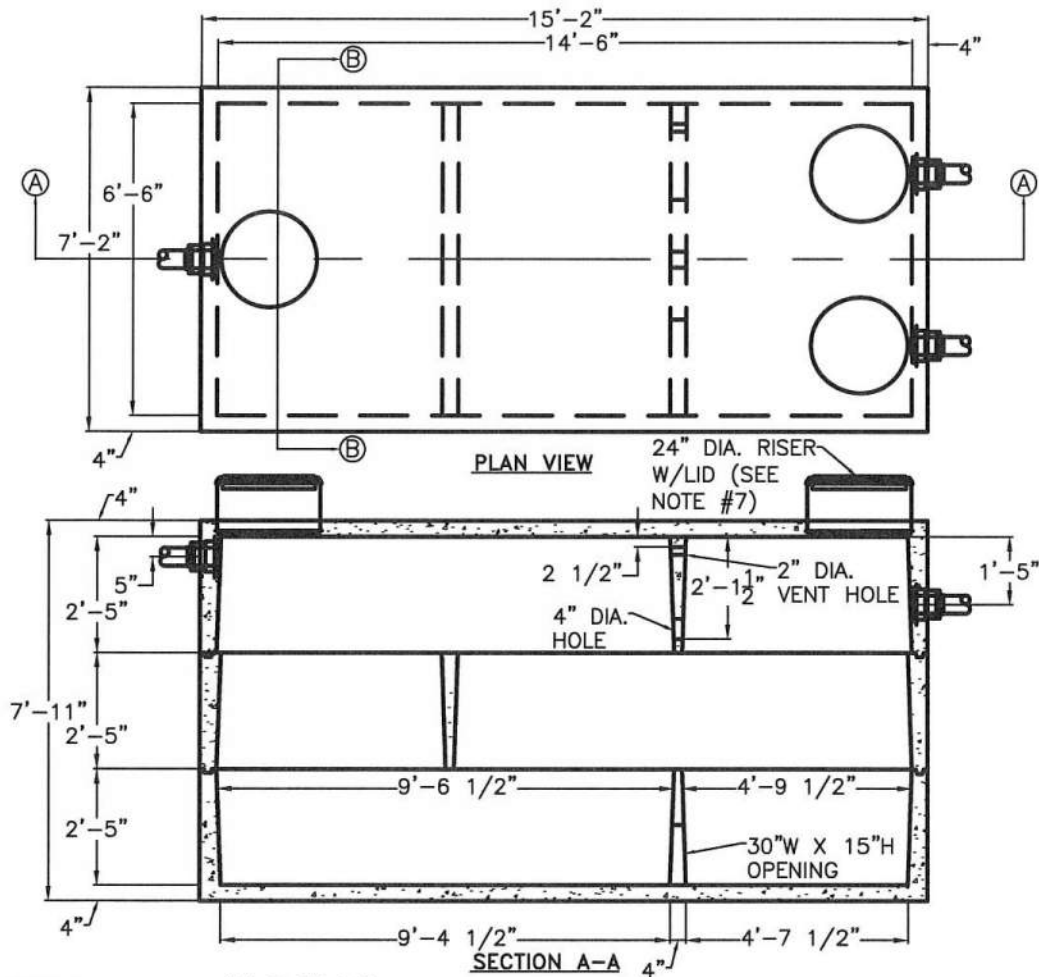
PLANT 3 - GREENWOOD

**GILLESPIE**  
**PRECAST** LLC

1-800-638-6884  
www.gillespieprecast.com

4400 Gallon Septic Tank - Shallow Cover	
DRAWN BY: JHP	DWG.: 1 of 1
SCALE: 3/8" = 1'-0"	DATE: 11/17/14





- (2) #4 TRIM BARS AT CORNERS OF ALL OPENINGS.
- (2) EXTRA BARS EACH SIDE OF OPENINGS.

**SECTION B-B**

**GENERAL NOTES:**

- Concrete 5,000 psi @ 28 days,
- Rebar ASTM A-615 GR. 60
- WWF ASTM A-185
- All joints to be sealed with Conseal CS-102
- Poly-Lok Poly IV open end boot
- Effluent filter (optional) Polylok #PL-122
- 24" Ø riser & cover Polylok #3008 & #3009
- Tank designed for 0-2' of cover with 300 psf live load.
- Weight:  
Top Section: 11,640 lbs.  
Riser Section: 6,440 lbs.  
Base Section: 11,800 lbs.

\*TANK TO BE MANUFACTURED BY GILLESPIE PRECAST, LLC

Date:	10/09/2024
Scale:	NTS
Dwn.By:	CLB
Proj.No.:	2541A007.A01
DOSING TANK DETAIL	
Dwg.No.:	4 OF 7

**ONSITE WASTEWATER PLAN SET**  
**JOHN DICKINSON PLANTATION**  
**VISITORS CENTER**  
**KITTS HUMMOCK ROAD**

EAST DOVER HUNDRED, KENT COUNTY, DELAWARE



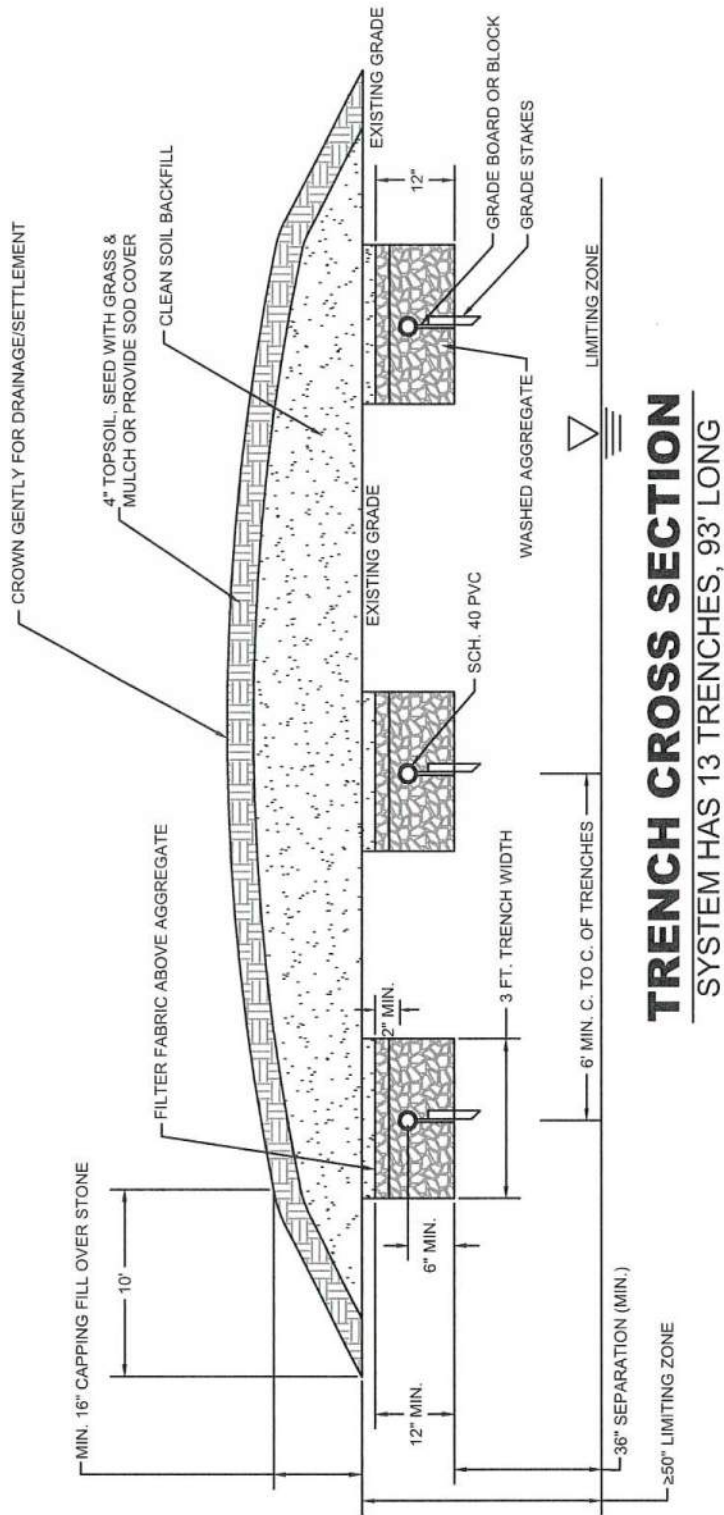
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**ARCHITECTS • ENGINEERS • SURVEYORS**

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MILFORD, DELAWARE  
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SALISBURY, MARYLAND  
410.543.9091



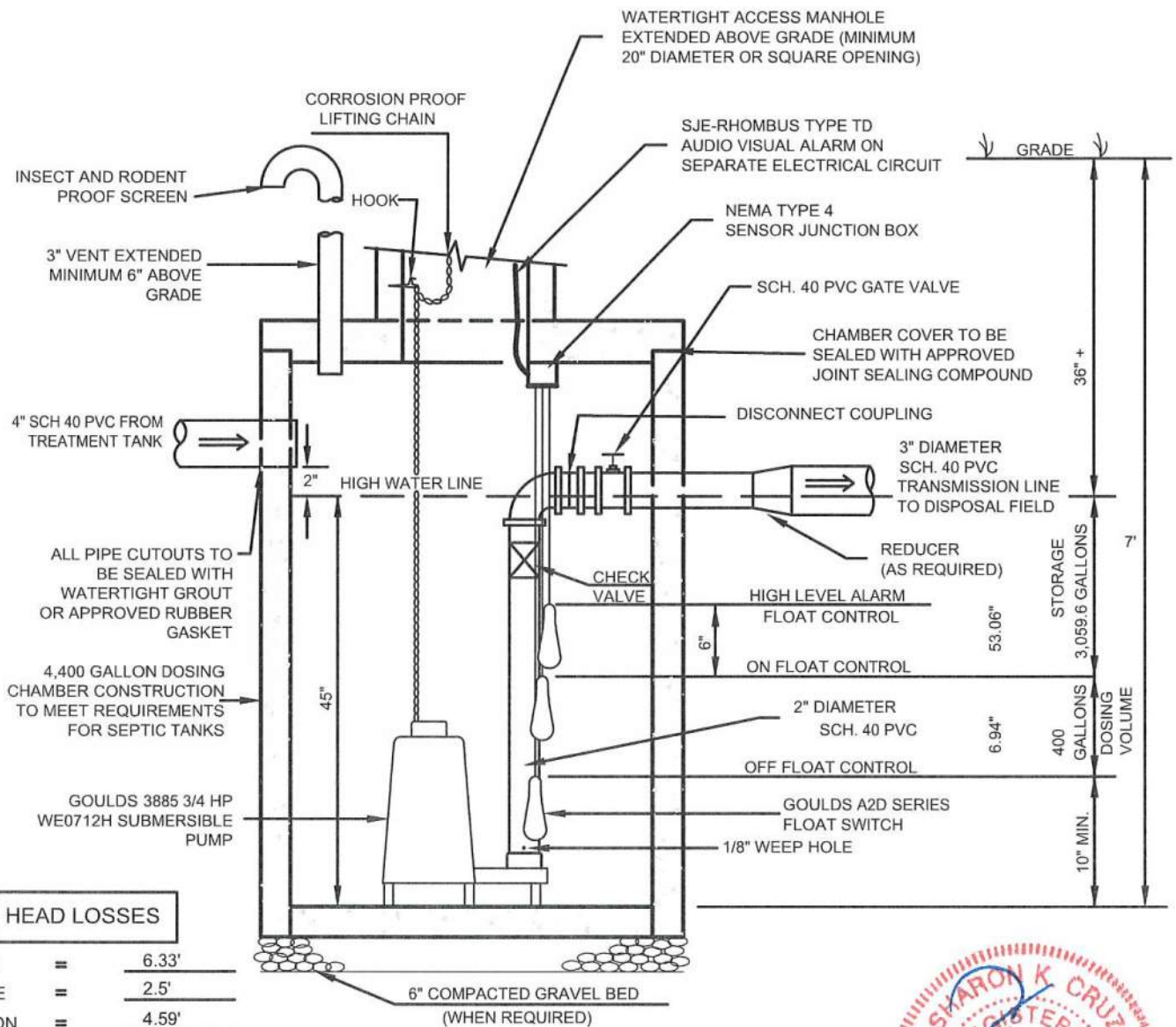


Date:	10/09/2024
Scale:	NTS
Dwn.By:	CLB
Proj.No.:	2541A007.A01
CROSS SECTION	
Dwg.No.:	5 OF 7

**ONSITE WASTEWATER PLAN SET**  
**JOHN DICKINSON PLANTATION**  
**VISITORS CENTER**  
**KITTS HUMMOCK ROAD**  
**EAST DOVER HUNDRED, KENT COUNTY, DELAWARE**

**dbf** **DAVIS BOWEN & FRIEDEL, INC.**  
**ARCHITECTS • ENGINEERS • SURVEYORS**

**EASTON, MARYLAND** 410.770.4744  
**MILFORD, DELAWARE** 302.424.1441  
**SALISBURY, MARYLAND** 410.543.9091



#### NOTES:

- MAXIMUM DEPTH FROM GRADE TO INVERT OF DOSING CHAMBER TO BE 9'-0"
- EXCAVATION LIMITS SHALL EXTEND AT LEAST 2 FEET BEYOND TANK PERIMETER
- ALL PIPE TO BE PVC SCHEDULE 40 OR SDR 26
- CHAMBER TO BE SIZED ACCORDING TO REQUIREMENTS OF DOSING VOLUME AND STORAGE. SEE EXHIBIT
- ALL DOSING CHAMBER COMPONENTS SHALL BE FIELD TESTED TO INSURE ACCURACY, WATERTIGHTNESS AND PROPER OPERATION OF ALL PUMPS AND ALARM CONTROLS
- ALL ELECTRICAL CONNECTIONS SHALL BE WATERPROOF, CORROSION RESISTANT AND EXPLOSION PROOF



Date: 10/09/2024

Scale: NTS

Dwn.By: CLB

Proj.No.: 2541A007.A01

PUMP #1 DOSING TANK DETAIL

Dwg.No.: 6 OF 7

## ONSITE WASTEWATER PLAN SET JOHN DICKINSON PLANTATION VISITORS CENTER KITTS HUMMOCK ROAD

EAST DOVER HUNDRED, KENT COUNTY, DELAWARE

**DAVIS  
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410.770.4744

MILFORD, DELAWARE  
302.424.1441

SALISBURY, MARYLAND  
410.543.9091



## SEPTIC CALCULATIONS

Job #: 2541A007.A01  
 Calc'd by: S. CRUZ  
 Date: 10/9/24



Design flow: 1200  
 Perc. rate: 80 *mpi*  
 Required area: 3542 *ft.^2*  
 Septic width: 75 *ft.*  
 Septic length: 93 *ft.*  
 Lateral Spacing: 6  
 Proposed Area: 3569 *ft.^2* Per Field, Dual Fields Proposed  
 Transmission Length: 86 (INCLUDES 5-FEET INSIDE OF TANK)

Type of System: CAPPING FILL PRESSURE DOSE

Depth to Limiting Zone: 50 *in.*

Bed Size: 3569 *ft.^2*

Berm Width: 0.00 *ft.*

Orifice Head: 2.5 *ft.*

## Laterals:

No. of laterals:	13
Length of laterals:	91.5 <i>ft.</i>
Hole diameter:	0.16 <i>in. 5/32"</i>
Length O.C./hole:	8.00 <i>ft.</i>
No. of holes/lateral:	11.4375
No. holes/lat. used:	11
Flow/hole:	0.48 <i>gpm/hole</i>
Lateral flow:	5.26 <i>gpm/lateral</i>

Total flow in field: 68.42 *gpm*

Total flow used: 69 *gpm*

Height of lat. above grnd: -8 *in.*

Static Head: 6.33 *ft.*

**Check Head:**

<b>Pump:</b>	Goulds 3885 3/4 HP-WEO712H
<b>Allowable TDH:</b>	<input type="text" value="29"/> ft.
<b>Flow of:</b>	69 gpm
<b>Allowable friction head:</b>	20.17 ft.

**Friction Head:**

<b>Lateral Diameter:</b>	<input type="text" value="1"/> in.
<b>Lateral Flow:</b>	5.26 gpm/lateral
<b>Head loss/100 ft.:</b>	2.12 ft./100 ft.
<b>Length of Lateral:</b>	91.5 ft.
<b>Multiplier for fittings:</b>	<input type="text" value="1.2"/>
<b>Lateral head loss:</b>	2.33 ft.

<b>Manifold Diameter:</b>	<input type="text" value="2"/> in.
<b>Head loss/100 ft.:</b>	2.359 ft./100 ft.
<b>Length of manifold:</b>	36 ft.
<b>Multiplier for fittings:</b>	<input type="text" value="1.2"/>
<b>Manifold head loss:</b>	1.02 ft.

<b>Trans. line diameter:</b>	<input type="text" value="3"/> in.
<b>Head loss/100 ft.:</b>	1.209 ft./100 ft.
<b>Length of trans. line:</b>	<input type="text" value="86"/> ft.
<b>Multiplier for fittings:</b>	<input type="text" value="1.2"/>
<b>Trans. line head loss:</b>	1.25 ft.

<b>Total friction head:</b>	4.59 ft.
<b>% of allow. frict. head:</b>	22.8

**TDH:** 13.43 ft.





**Check dosing volume:**

Lateral diameter: 1 in.  
Volume/ft. of lateral: 0.041 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of lateral: 1261.5 ft.  
Total Linear Feet 1513.8  
Lateral volume: 62.07 gal.

Manifold diameter: 2 in.  
Volume/ft. of lateral: 0.162 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of manifold: 72 ft.  
Total Linear Feet 86.4  
Manifold volume: 13.9968 gal.

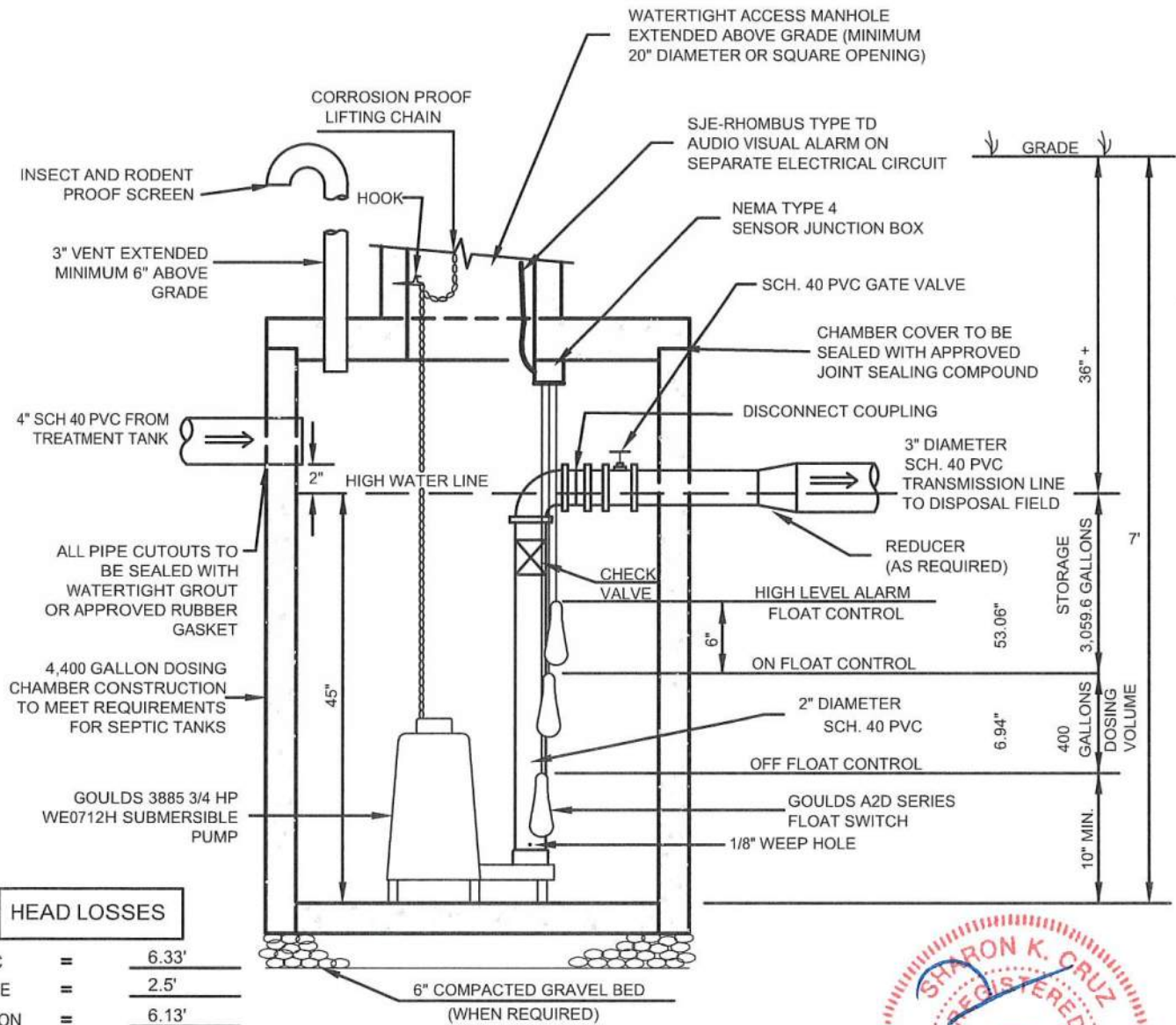
Trans. line diameter: 3 in.  
Volume/ft. of trans. line: 0.162 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of trans. line: 86 ft.  
Total Linear Feet 103.2  
Trans. line volume: 16.7184 gal.

Min. dosing volume: 310 gal. PER 5.3.9.6  
Dosing vol. used: 400 gal. PER 5.3.9.6  
Doses per day: 3.00 PER 5.3.9.6  
Size of dosing chamber: 4400 gal.  
Volume/in. of chamber: 57.66 gal/in.  
Set float at: 6.94 in.

**STORAGE VOLUME:**

TANK SIZE:	4400 gal.	6.5 X 14.5	INSIDE DIMENSIONS
TANK VOLUME:	4036.20	70	INCHES
DEAD WATER VOLUME:	576.6	10	INCHES
DOSE VOLUME:	400	6.94	INCHES
<b><u>REMAINING VOLUME:</u></b>	<b><u>3059.60</u></b>	<b><u>53.06</u></b>	<b><u>INCHES</u></b>





#### HEAD LOSSES

STATIC	=	6.33'
ORIFICE	=	2.5'
FRICTION	=	6.13'
<hr/>		
TOTAL HEAD	=	14.97'
LOSS		@69 GPM

#### NOTES:

- MAXIMUM DEPTH FROM GRADE TO INVERT OF DOSING CHAMBER TO BE 9'-0"
- EXCAVATION LIMITS SHALL EXTEND AT LEAST 2 FEET BEYOND TANK PERIMETER
- ALL PIPE TO BE PVC SCHEDULE 40 OR SDR 26
- CHAMBER TO BE SIZED ACCORDING TO REQUIREMENTS OF DOSING VOLUME AND STORAGE. SEE EXHIBIT
- ALL DOSING CHAMBER COMPONENTS SHALL BE FIELD TESTED TO INSURE ACCURACY, WATERTIGHTNESS AND PROPER OPERATION OF ALL PUMPS AND ALARM CONTROLS
- ALL ELECTRICAL CONNECTIONS SHALL BE WATERPROOF, CORROSION RESISTANT AND EXPLOSION PROOF



Date:	10/09/2024
Scale:	NTS
Dwn.By:	CLB
Proj.No.:	2541A007.A01
PUMP #2 DOSING TANK DETAIL	
Dwg.No.:	7 OF 7

**CONSTRUCTION PLAN SET**  
**JOHN DICKINSON PLANTATION**  
**VISITORS CENTER**  
**KITTS HUMMOCK ROAD**  
**EAST DOVER HUNDRED, KENT COUNTY, DELAWARE**

**DAVIS BOWEN & FRIEDEL, INC.**  
**ARCHITECTS • ENGINEERS • SURVEYORS**  
 EASTON, MARYLAND 410.770.4744  
 MILFORD, DELAWARE 302.424.1441  
 SALISBURY, MARYLAND 410.543.9091



## SEPTIC CALCULATIONS

Job #: 2541A007.A01  
 Calc'd by: S. CRUZ  
 Date: 10/9/24



Design flow: 1200  
 Perc. rate: 80 mpi  
 Required area: 3542 ft.<sup>2</sup>  
 Septic width: 75 ft.  
 Septic length: 93 ft.  
 Lateral Spacing: 6  
 Proposed Area: 3569 ft.<sup>2</sup> Per Field, Dual Fields Proposed  
 Transmission Length 192 (INCLUDES 5-FEET INSIDE OF TANK)

Type of System: CAPPING FILL PRESSURE DOSE

Depth to Limiting Zone: 50 in.

Bed Size: 3569 ft.<sup>2</sup>  
 Berm Width: 10.00 ft.

Orifice Head: 2.5 ft.

## Laterals:

No. of laterals: 13  
 Length of laterals: 91.5 ft.  
 Hole diameter: 0.16 in. 5/32"  
 Length O.C./hole: 8.00 ft.  
 No. of holes/lateral: 11.4375  
 No. holes/lat. used: 11  
 Flow/hole: 0.48 gpm/hole  
 Lateral flow: 5.26 gpm/lateral

Total flow in field: 68.42 gpm  
 Total flow used: 69 gpm

Height of lat. above grnd: -8 in.  
 Static Head: 6.33 ft.

**Check Head:**

**Pump:**

Goulds 3885 3/4 HP-WEO712H

**Allowable TDH:**

29 ft.

**Flow of:**

69 gpm

**Allowable friction head:**

20.17 ft.

**Friction Head:**

**Lateral Diameter:**

1 in.

**Lateral Flow:**

5.26 gpm/lateral

**Head loss/100 ft.:**

2.12 ft./100 ft.

**Length of Lateral:**

91.5 ft.

**Multiplier for fittings:**

1.2

**Lateral head loss:**

2.33 ft.

**Manifold Diameter:**

2 in.

**Head loss/100 ft.:**

2.359 ft./100 ft.

**Length of manifold:**

36 ft.

**Multiplier for fittings:**

1.2

**Manifold head loss:**

1.02 ft.

**Trans. line diameter:**

3 in.

**Head loss/100 ft.:**

1.209 ft./100 ft.

**Length of trans. line:**

192 ft.

**Multiplier for fittings:**

1.2

**Trans. line head loss:**

2.79 ft.

**Total friction head:**

6.13 ft.

**% of allow. frict. head:**

30.4

**TDH:**

14.97 ft.





**Check dosing volume:**

Lateral diameter: 1 in.  
Volume/ft. of lateral: 0.041 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of lateral: 1261.5 ft.  
Total Linear Feet 1513.8  
Lateral volume: 62.07 gal.

Manifold diameter: 2 in.  
Volume/ft. of lateral: 0.162 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of manifold: 72 ft.  
Total Linear Feet 86.4  
Manifold volume: 13.9968 gal.

Trans. line diameter: 3 in.  
Volume/ft. of trans. line: 0.162 gal/ft.  
Multiplier for fittings: 1.2  
Linear feet of trans. line: 192 ft.  
Total Linear Feet 230.4  
Trans. line volume: 37.3248 gal.

Min. dosing volume: 310 gal. PER 5.3.9.6  
Dosing vol. used: 400 gal. PER 5.3.9.6  
Doses per day: 3.00 PER 5.3.9.6  
Size of dosing chamber: 4400 gal.  
Volume/in. of chamber: 57.66 gal/in.  
Set float at: 6.94 in.

**STORAGE VOLUME:**

TANK SIZE:	4400 gal.	6.5 X 14.5	INSIDE DIMENSIONS
TANK VOLUME:	4036.20	70	INCHES
DEAD WATER VOLUME:	576.6	10	INCHES
DOSE VOLUME:	400	6.94	INCHES
<b><u>REMAINING VOLUME:</u></b>	<b><u>3059.60</u></b>	<b><u>53.06</u></b>	<b><u>INCHES</u></b>





# ITT

**B3885**

**Wastewater**

## Goulds Pumps

WE Series Model 3885

Submersible Effluent Pump

EXTENDED WARRANTY AVAILABLE FOR  
RESIDENTIAL APPLICATIONS.



### FEATURES

- **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.
- **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge.
- **Mechanical Seal:** Silicon Carbide vs. Silicon Carbide sealing faces. Stainless steel metal parts, BUNA-N elastomers.
- **Shaft:** Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.
- **Fasteners:** 300 series stainless steel.
- Capable of running dry without damage to components.
- Designed for continuous operation when fully submerged.



Goulds Pumps is a brand of ITT Corporation.

[www.goulds.com](http://www.goulds.com)

*Engineered for life*





# ITT

## GOULDS PUMPS Wastewater

### APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

### SPECIFICATIONS

#### Pump

- Solids handling capabilities:  $\frac{3}{4}$ " maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature:  
104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

### MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on  $\frac{1}{2}$  – 1½ HP models.
- Class F insulation on 2 HP models.

#### Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.

- $\frac{1}{2}$  – 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

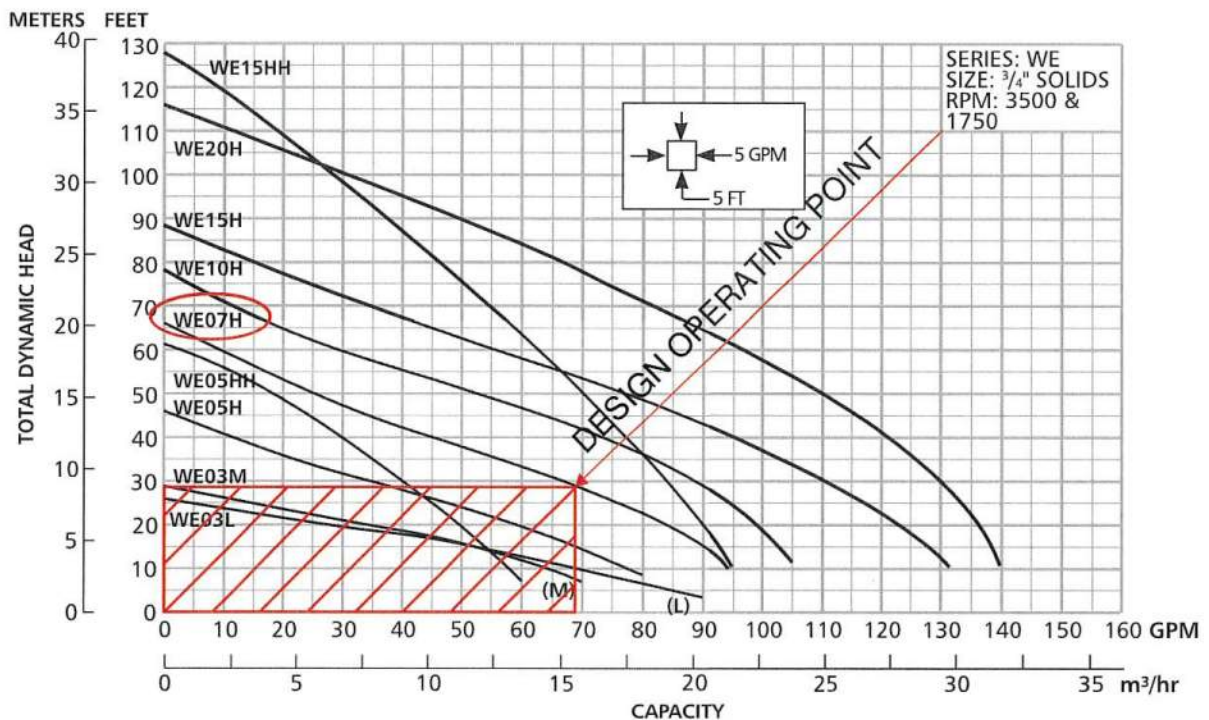
#### Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

### AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards  
By Canadian Standards Association File #LR38549  
Goulds Pumps is ISO 9001 Registered.





# ITT

## GOULDS PUMPS Wastewater

### MODELS

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency %	Resistance		Power Cable Size	Weight (lbs.)
										Start	Line-Line		
WE0311L	0.33	1	115	1750	5.38	10.7	30.0	M	54	11.9	1.7	16/3	56
WE0318L			208			6.8	19.5	K	51	9.1	4.2		
WE0312L			230			4.9	14.1	L	53	14.5	8.0		
WE0311M			115			10.7	30.0	M	54	11.9	1.7		
WE0318M			208			6.8	19.5	K	51	9.1	4.2		
WE0312M			230			4.9	14.1	L	53	14.5	8.0		
WE0511H	0.5	1	115	3450	3.56	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518H			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512H			230			7.3	34.5	M	53	9.6	4.0	14/4	60
WE0538H			200			4.9	22.6	R	68	NA	3.8		
WE0532H			230			3.3	18.8	R	70	NA	5.8		
WE0534H			460			1.7	9.4	R	70	NA	23.2		
WE0537H			575			1.4	7.5	R	62	NA	35.3		
WE0511HH		1	115		3.88	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518HH			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512HH			230			7.3	34.5	M	53	9.6	4.0	14/4	60
WE0538HH			200			4.9	22.6	R	68	NA	3.8		
WE0532HH			230			3.6	18.8	R	70	NA	5.8		
WE0534HH			460			1.8	9.4	R	70	NA	23.2		
WE0537HH			575			1.5	7.5	R	62	NA	35.3		
WE0718H		1	208		4.06	11.0	31.0	K	68	9.7	2.4	14/3	70
WE0712H			230			10.0	27.5	J	65	12.2	2.7	14/4	70
WE0738H			200			6.2	20.6	L	64	NA	5.7		
WE0732H			230			5.4	15.7	K	68	NA	8.6		
WE0734H			460			2.7	7.9	K	68	NA	34.2		
WE0737H			575			2.2	9.9	L	78	NA	26.5		
WE1018H	1	1	208	3450	4.44	14.0	59.0	K	68	9.3	1.1	14/3	70
WE1012H			230			12.5	36.2	J	69	10.3	2.1	14/4	70
WE1038H			200			8.1	37.6	M	77	NA	2.7		
WE1032H			230			7.0	24.1	L	79	NA	4.1		
WE1034H			460			3.5	12.1	L	79	NA	16.2		
WE1037H			575			2.8	9.9	L	78	NA	26.5		
WE1518H		1	208		4.56	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512H			230			15.7	50.0	H	68	11.3	1.6	14/4	80
WE1538H			200			10.6	40.6	K	79	NA	1.9		
WE1532H			230			9.2	31.7	K	78	NA	2.9		
WE1534H			460			4.6	15.9	K	78	NA	11.4		
WE1537H			575			3.7	13.1	K	75	NA	16.9		
WE1518HH		1	208		5.50	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512HH			230			15.7	50.0	H	68	11.3	1.6	14/4	80
WE1538HH			200			10.6	40.6	K	79	NA	1.9		
WE1532HH			230			9.2	31.7	K	78	NA	2.9		
WE1534HH			460			4.6	15.9	K	78	NA	11.4		
WE1537HH			575			3.7	13.1	K	75	NA	16.9		
WE2012H	2	3	230	3450	5.38	18.0	49.6	F	78	3.2	1.2	14/3	83
WE2038H			200			12.0	42.4	K	78	NA	1.7	14/4	83
WE2032H			230			11.6	42.4	K	78	NA	1.7		
WE2034H			460			5.8	21.2	K	78	NA	6.6		
WE2037H			575			4.7	16.3	L	78	NA	10.5		





# ITT

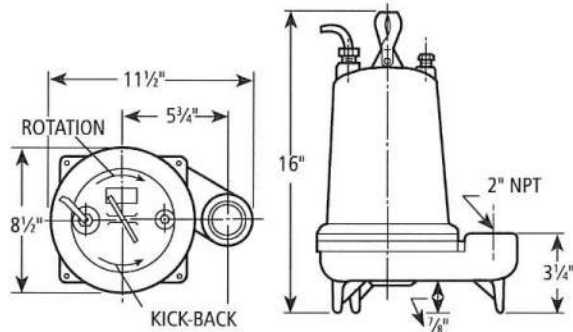
## Wastewater

### PERFORMANCE RATINGS (gallons per minute)

Order No.	WE03L	WE03M	WE05H	WE07H	WE10H	WE15H	WE05HH	WE15HH	WE20H
HP	1/3	1/3	1/2	3/4	1	1 1/2	1/2	1 1/2	2
RPM	1750	1750	3500	3500	3500	3500	3500	3500	3500
5	86	—	—	—	—	—	—	—	—
10	70	63	78	94	—	—	58	95	—
15	52	52	70	90	103	128	53	93	138
20	27	35	60	83	98	123	49	90	136
25	5	15	48	76	94	117	45	87	133
30	—	—	35	67	88	110	40	83	130
35	—	—	22	57	82	103	35	80	126
40	—	—	—	45	74	95	30	77	121
45	—	—	—	35	64	86	25	74	116
50	—	—	—	25	53	77	—	70	110
55	—	—	—	—	40	67	—	66	103
60	—	—	—	—	30	56	—	63	96
65	—	—	—	—	20	45	—	58	89
70	—	—	—	—	—	35	—	55	81
75	—	—	—	—	—	25	—	51	74
80	—	—	—	—	—	—	—	47	66
90	—	—	—	—	—	—	—	37	49
100	—	—	—	—	—	—	—	28	30

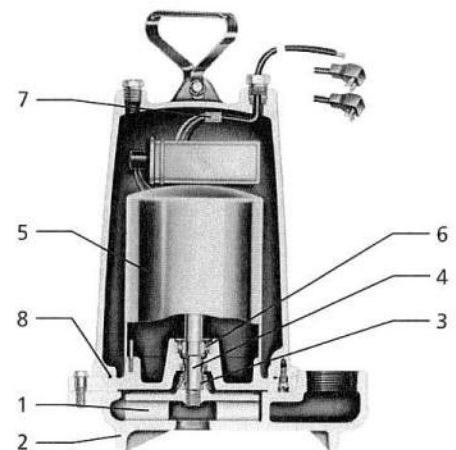
### DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



### COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring



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SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

B3885 June, 2009

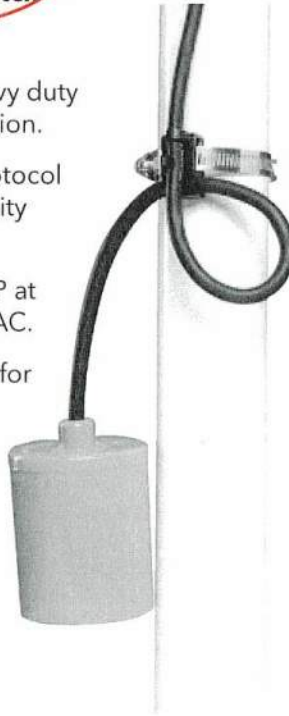
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## Wastewater

**A2D SERIES****SJE PumpMaster® Pump Switch****Features**

- Mechanically activated, heavy duty contacts, wide angle operation.
- Passed NSF standard 61 protocol by an approved Water Quality Association Laboratory.
- Controls pumps up to 1/2 HP at 120 VAC and 1 HP at 230 VAC.
- Non-corrosive PVC housing for use in liquids up to 140° F (60° C).
- Not sensitive to rotation or turbulence.
- Pumping range: 7" to 36".
- 16 AWG, SJOW cord is available with or without piggyback plug.
- Available as pump up, pump down and SPDT models, see Nomenclature Chart.
- For potable water, water or sewage applications.
- UL Recognized for use in water and sewage.
- CSA Certified.
- See chart for amperage range and other data.

**A2HT SERIES****High Temperature Float Switch****Features**

- Temperature Rating: 221° F (105° C)
- Wide Angle Switch: contacts open @ 45° below horizontal and close at 45° above horizontal
- Float Material: PC/ABS (Polycarbonate ABS)
- Cord Material: Teflon coating
- Ratings: 13 Maximum Amps, 1/2 HP, 115/230 V
- Float Dimensions: 4.63" Long x 2.63" Diameter
- Nomenclature: see page 9
- Available lengths: 20', 30' and 50' \*



**NOTE:** A2HTL High Temperature Rating: 185° F

\* No other lengths available in this Series.

**A2E SERIES****SJE PumpMaster Plus® Pump Switch****Features**

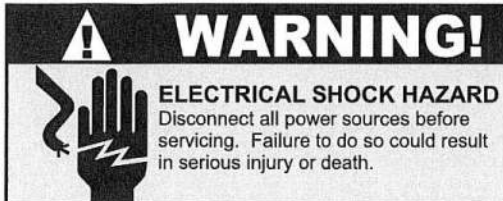
- Controls pumps up to 3/4 HP at 120 VAC and 2 HP at 230 VAC.
- 14 AWG, SJOW cord is available with or without piggyback plug.
- **All other features are the same as A2D PumpMaster Series above.**



# Timed Dosing Control

## SJE-Rhombus® Type TD

### Installation Instructions and Operation/Troubleshooting Manual



This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes.

All conduit running from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. **NEMA 4X enclosures are for indoor or outdoor use**, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water. **Cable connectors must be liquid-tight in NEMA 4X enclosures.**

## Installation

Type TD control panels are designed to operate with two, three or four float systems. The two float system utilizes one float as the "low level cutout", the second as "high level alarm". A three float system adds either a "redundant off" float or a "timer override" float to the "low level cutout" and "high level alarm" functions. A four float system includes a "redundant off float", a "low level cutout" float, a "timer override" float, and a "high level alarm" float.

**NOTE:** Options ordered may affect the number of floats and their functions. Please reference the schematic provided with the control panel.

## Installation of Floats

**CAUTION:** If control switch cables are not wired and mounted in the correct order, the pump system will not function properly.

**WARNING:** Turn off all power before installing floats in pump chamber. Failure to do so could result in serious or fatal electrical shock.

1. Use float label kit to identify and label cables on both the float and stripped ends (low level cutout, alarm, etc.). See schematic for float options.
2. Determine your normal operating level and desired float configuration, as illustrated in **Figures 1-4**.
3. Mount float switches at appropriate levels as illustrated in **Figures 1-4**. Be sure that floats have free range of motion without touching each other or other equipment in the basin.
4. For mounting clamp installation: place the cord into the clamp as shown in **Figure 5**. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in **Figure 5**.

**NOTE:** Do not install cord under hose clamp.

5. Tighten the hose clamp using a screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.

**NOTE:** All hose clamp components are made of 18-8 stainless steel material. See your SJE-Rhombus® supplier for replacements.

6. If using an optional redundant off float, mount slightly below the low level cutout float, but above the pump as illustrated in **Figures 2 & 4**.
7. If using an optional timer override float, position it at a level in the basin as shown in **Figure 3 & 4**.

Warranty void if panel is modified.

Call factory with servicing questions:

**1-800-RHOMBUS**  
(1-800-746-6287)

Manufactured by:

**SJE**  
**Rhombus®**

22650 County Highway 6 ■ P.O. Box 1708  
Detroit Lakes, Minnesota 56502 USA  
1-888-DIAL-SJE (1-888-342-5753)  
Phone: 218-847-1317 ■ Fax: 218-847-4617  
E-mail: customer.service@sjerhombus.com  
Website: www.sjerhombus.com

# Installation Instructions

## Mounting the Control Panel

1. Determine mounting location for panel. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation, we recommend the use of an SJE-Rhombus® liquid-tight junction box with liquid-tight connectors to make required connections. **You must use conduit sealant to prevent moisture or gases from entering the panel.**
2. Mount control panel with mounting devices furnished.
3. Determine conduit entrance locations on control panel. Check local codes and schematic for the number of power circuits required.

**NOTE:** Be sure the proper power supply voltage, amperage, and phase meet the requirements of the pump motor being installed. If in doubt, see the pump identification plate for voltage/phase requirements.

4. Drill proper size holes for type of connectors being used.

**NOTE:** If using conduit, be sure that it is of adequate size to pull the pump and switch cables through.

5. Attach cable connectors and/or conduit connectors to control panel.

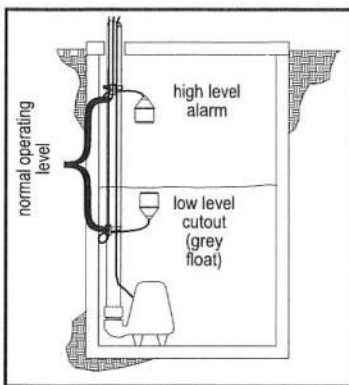
**FOR INSTALLATION REQUIRING  
A SPLICE, FOLLOW STEPS 6-10;  
FOR INSTALLATION WITHOUT A  
SPLICE, GO TO STEP 11.**

**3 DOSES PER DAY (PER PUMP) =  
1 DOSE EVERY 8 HOURS**

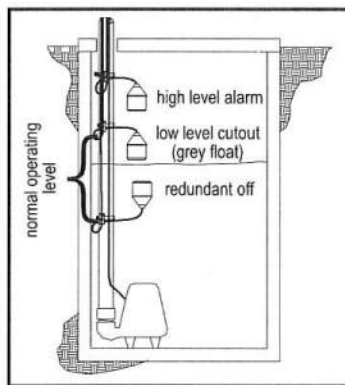
6. Determine location for mounting junction box according to local code requirements. **Do not** mount the junction box inside the sump or basin.
7. Mount junction box to proper support.
8. Run conduit to junction box. Drill proper size holes for the type of conduit used.
9. Identify and label each wire before pulling through conduit into control panel and junction box. Make wire splice connections at junction box.
10. Firmly tighten all fittings on junction box.
11. If a junction box is not required, pull cables through conduit into control panel.
12. Connect pump wires and float switch cables to the proper terminals as seen in **Figures 6 & 7**. If the redundant off float is not required, place a jumper wire across TB1-7 and TB1-8.
13. Connect pump/control and alarm incoming power conductors to proper position on terminals. See schematic and wiring diagram for terminal connections.

**VERIFY CORRECT OPERATION OF CONTROL PANEL  
AFTER INSTALLATION IS COMPLETE.**

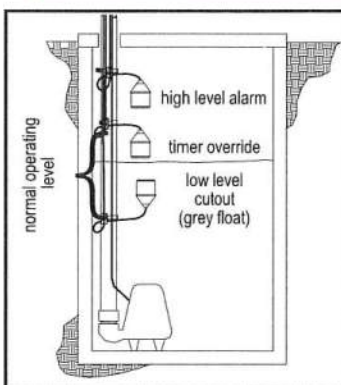
**RUN TIME TO BE SET AT**  
**5** MIN. **48** SEC.  
**EACH; DOSE FOR** **3**  
**DOSES PER DAY**



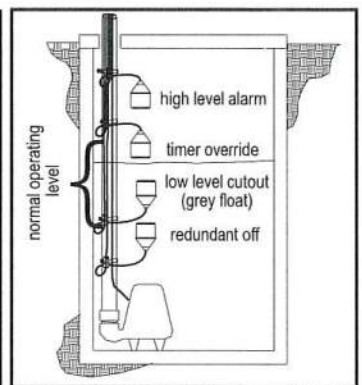
**FIGURE 1 -  
Two float system**



**FIGURE 2 -  
Three float system  
with redundant off**



**FIGURE 3 -  
Three float system  
with timer override**



**FIGURE 4 -  
Four float system**

**DOSING TIMES;**  
**PUMP 1: 4:00 AM, 12:00 PM & 8:00 PM**  
**PUMP 2: 12:00 AM, 8:00 AM & 4:00 PM**



# Installation Instructions

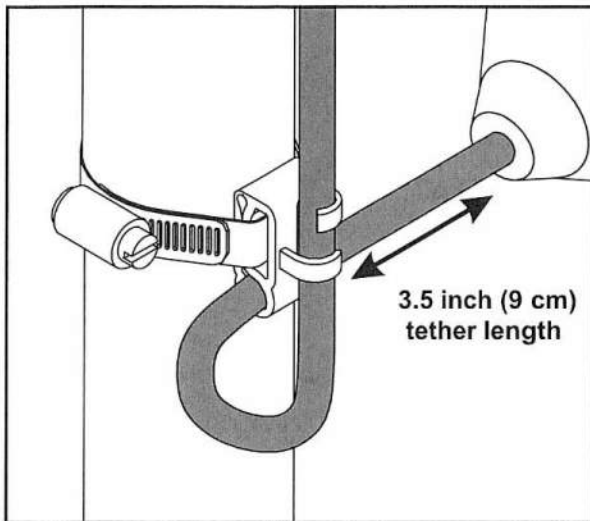


FIGURE 5 - Mounting clamp detail.

**Option 4E**  
Redundant Off / Alarm Activation  
Wiring Diagram

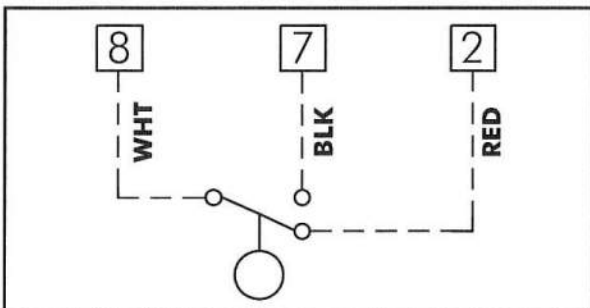


FIGURE 7 -  
Redundant off pump  
wiring diagram

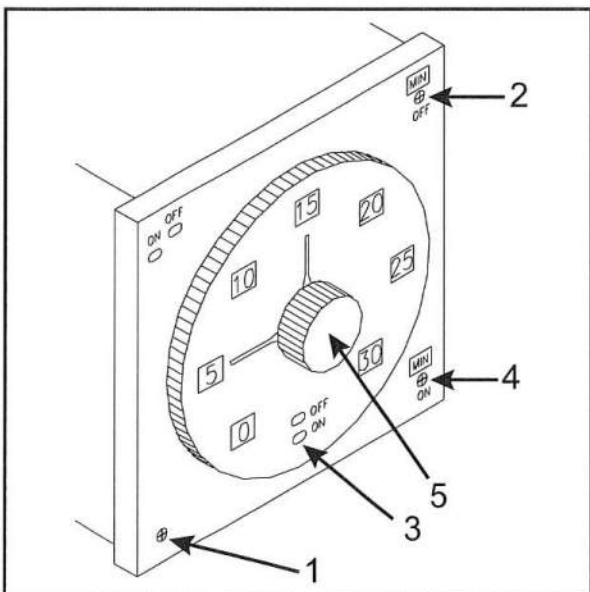


FIGURE 8 - Timer detail

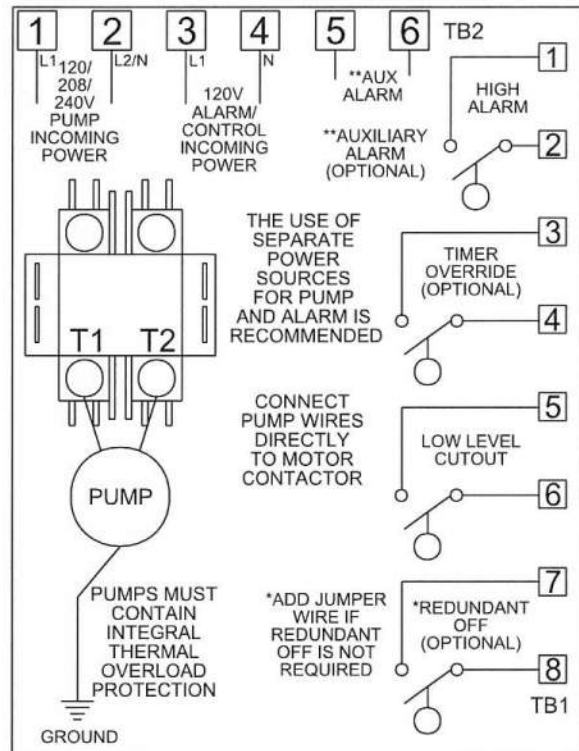


FIGURE 6 -  
TD wiring diagram

## Setting the timer

Remove the timer by clipping the tie strap and pulling it straight out of the socket.

1. Determine the pump "on & off" time and turn the adjustment screw (1) so that the most appropriate range of numbers (usable for both the on and off cycles) is visible in the windows on the dial face.
2. Adjust the off time range selector (2) to the appropriate period. (e.g.: minutes).
3. Adjust the outer dial (3) so the green pointer indicates the off time period required. (e.g.: 15)
4. Adjust the on timer range selector (4) to the appropriate period (e.g.: minutes).
5. Adjust the inner dial (5) so the red pointer indicates the on time period required. (e.g.: 5)
6. When setting is complete, place the timer back in the socket.
7. In the example shown, the pump would be off for 15 minutes and then on for 5 minutes. This cycle would continue as long as there was enough liquid in the tank to float the low level cutoff switch.

**NOTE:** "OFF" time is cycled first.

# Operations & Troubleshooting

TD series control panels are available for use with two, three or four float combinations. In a two float system, one float in the tank is the "low level cutout" float while the other is a "high

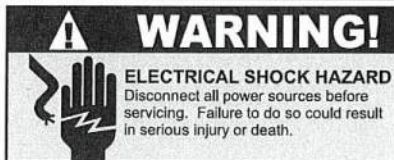
level alarm" float. The normal operating level should be between the "low level cutout" position and the "high level alarm" position. The TD panel can be installed with a choice of three float systems. One choice adds a "redundant off" float which is positioned slightly below the "low level cutout" grey float, but above the pump. The normal operating level shall be between the "low level cutout" position and the "high level alarm" position. The other choice adds a "timer override" float which is positioned between the "low level cutout" (grey float) and the "high level alarm" float. Normal operating level should be between the "low level cutout" float and the "timer override" float.

A four float system includes a "redundant off" float, a "low level cutout" float, a "timer override" float and a "high level alarm" float. The "timer override" float gives you the option of pumping from the basin while the timer is in the "off" cycle. It is only intended for times of abnormally high liquid level intrushes. The normal operating level should be between the "low level cutout" float and the "timer override" float.

The control panel begins timing the "off" sequence when the "low level cutout" float is activated. Once the timer completes the "off" sequence, the timer will start the pump and continue to run until the programmed "on" sequence is complete. At this point the "off" sequence begins timing again and the cycle repeats.

## Float Controls

1. Check the floats during their entire range of operation. Clean, adjust, replace and repair damaged floats.
2. Measure the float resistance to determine if the float is operating properly.



To measure float resistance:

- a. Isolate the float by disconnecting one or both of the float leads from the float terminals.
- b. Place one ohmmeter lead on one of the float wires, and the other ohmmeter lead on the other float wire.
- c. Set the ohmmeter dial to read ohms and place on the R X 1 scale. With the float in the "off" position, the scale should read infinity (high resistance), if not replace the float.

With the float in the "on" position, the scale should read close to zero, if not replace the float. **Readings may vary depending on the accuracy of the measuring device.**

## Magnetic Contactor Coil

To measure the coil, disconnect one of the coil leads. Measure the coil resistance by setting the ohmmeter on the R X 1 scale. A defective coil will read zero indicating a short, or infinity (high resistance) indicating an opened coil. Replace defective contactor.

## Fuses

To check the continuity of the fuse, pull the fuse out of the fuse holder. With the ohmmeter on the R X 1 scale, measure resistance. A reading of infinity (high resistance) indicates a blown fuse that must be replaced with a fuse of the same type, voltage, and amp rating.

## Alarm Light

Activate the alarm float. The alarm light should turn on. If not, replace the light with that of the same type.

## Alarm Horn

Activate the alarm float. The alarm horn should turn on. If not, replace the horn with that of the same type.

# SJE-Rhombus® Five-Year Limited Warranty

**SJE-RHOMBUS®** warrants to the original consumer that this product shall be free of manufacturing defects for five years after the date of consumer purchase. During that time period and subject to the conditions set forth below, **SJE-RHOMBUS®** will repair or replace, for the original consumer, any component which proves to be defective due to defective materials or workmanship of **SJE-RHOMBUS®**.

**ELECTRICAL WIRING AND SERVICING OF THIS PRODUCT MUST BE PERFORMED BY A LICENSED ELECTRICIAN.**

**THIS WARRANTY DOES NOT APPLY:** (A) to damage due to lightning or conditions beyond the control of **SJE-RHOMBUS®**; (B) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided; (C) to failures resulting from abuse, misuse, accident, or negligence; (D) to units which are not installed in accordance with applicable local codes, ordinances, or accepted trade practices, and (E) to units repaired and/or modified without prior authorization from **SJE-RHOMBUS®**.

*Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.*

**TO OBTAIN WARRANTY SERVICE:** The consumer shall assume all responsibility and expense for removal, reinstallation, and freight. Any item to be repaired or replaced under this warranty must be returned to **SJE-RHOMBUS®**, or such place as designated by **SJE-RHOMBUS®**.

**ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. SJE-RHOMBUS® SHALL NOT, IN ANY MANNER, BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES AS A RESULT OF A BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY.**

## NOTICE!

Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment to ensure that employees will not be exposed to health hazards in handling said material. All applicable laws and regulations shall apply.



## GENERAL AND CONSTRUCTION NOTES TO INSTALLER

- All required inspections (Initial Inspection and Cap Inspection) will be billed on a Time and Material basis to the Contractor. Any additional site visits required for designer approval will be billed as an extra to the contractor. Contact Duffield Associates for inspection pricing.
- The Contractor shall field verify all existing conditions and features prior to construction. All Piping and Fittings shall be Pressure Rated Schedule 40 PVC. No substitutes will be permitted unless noted on the approved plans or approved by the designer prior to construction.
- The Contractor shall field verify all isolation distances prior to initiating construction of system. If discrepancies are found in the field, the Contractor shall immediately contact the designer at 302-424-1441.
- Any changes in the specified/approved equipment, i.e. pumps, alarms, timers, etc., shall be approved by the designer prior to construction.
- No System shall be installed during inclement conditions, i.e. rain, snow, saturated conditions, frozen conditions, or any other condition that would create compaction, smearing or destruction of the soil structure in the disposal area.
- The designer is not responsible for the placement of the dwelling or the actual location of the property lines shown on the approved site plan as no perimeter survey was performed by Davis, Bowen & Friedel, Inc.
- All Low Pressure Pipe (LPP) disposal systems must be installed with a trencher. **NO SYSTEM WILL BE INSPECTED OR APPROVED BY THE DESIGNER IF INSTALLED WITH A BACKHOE.**
- Gravity disposal systems may require a DNREC approved lift station package to overcome elevation differences from the septic tank to the drainfield.
- All site features including slope direction, slope percentage, etc. shown on the approved plans are approximate. Contractor shall field verify existing conditions prior to construction.
- Any changes made to the location of the approved system must have a preconstruction as-built done and approved by DNREC. NO change shall be made unless approved by the designer and DNREC. Any change made to the approved permit without the prior approval of the designer or DNREC shall be the responsibility of the contractor.
- All systems requiring a pump shall be pressure tested by the designer and the contractor during the inspection. Any equipment necessary for providing this service, i.e. generator, hoses, water, pressure gauges shall be provided by the Contractor.
- The contractor or his/her representative shall be present during the inspection. The contractor shall notify the designer a minimum of 24 hours in advance to schedule the final inspection.
- The system shall be installed based on the approved permit and the regulations and memorandums set forth by the Department of Natural Resources and Environmental Control, Division of Water Resources.



# K Series

## SINGLE PHASE SIMPLEX/DUPLEX WASTEWATER PANELS

### FEATURES

- Control one single phase wastewater pumps (20 amps max) with Simplex panel
- Alternation: Duplex panel alternately controls two single phase wastewater pumps (20 amps max) and continues operation in case of primary pump failure
- Float Switches Included: Panel comes standard with three normally open floats (Off/On/High Level Alarm) 20' cords
- Construction: Rated NEMA 4X Thermoplastic Enclosure for both indoor & outdoor use
- Easy Installation: Modern panel design and integrated mounting tabs and padlock latch make for an easier installation
- Flexible: One panel handles 3 voltages (120/208/230V)
- UL and CUL Listed





## PRODUCT SPECIFICATIONS

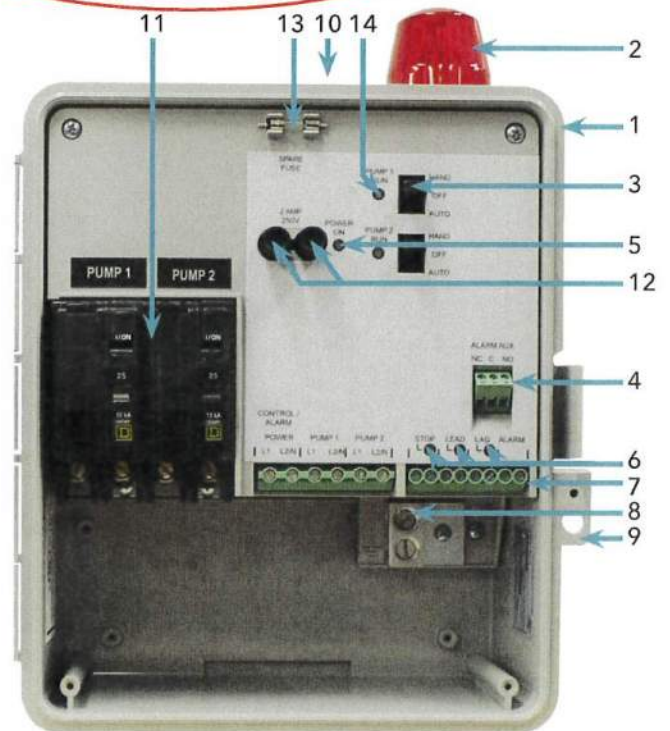
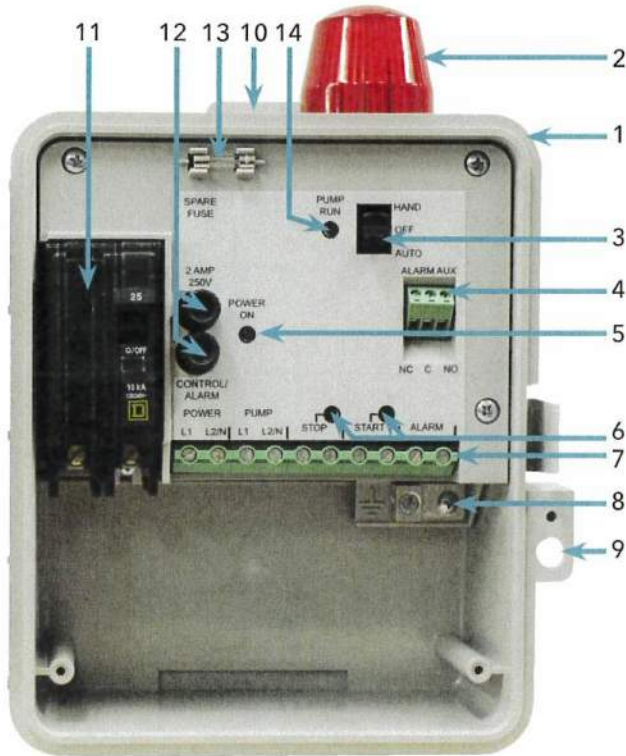
Series	Model #	Dimensions
KS - Simplex	KS19020WF	8" x 6" x 4"
KD - Duplex	KD19020WF	10" x 8" x 4"

### SIMPLEX SINGLE PHASE PANEL

KS19020WF

### DUPLEX SINGLE PHASE PANEL

KD19020WF



## COMPONENTS

1. NEMA 4X outdoor rated enclosure
2. Red LED alarm beacon
3. HOA selector switch
4. Auxiliary alarm contacts
5. Green control/alarm power indicator
6. Red float status indicators
  - Simplex: start/stop
  - Duplex: stop/lead/lag
7. Field wiring terminal block

8. Ground lug
9. Integral padlockable latch
10. Integral mounting tabs
11. Pump circuit breaker
12. Control/alarm fuses
13. Spare fuse
14. Green pump run indicator(s)

Not Shown: Alarm piezo horn and test/silence push button



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[www.xylem.com/goulds](http://www.xylem.com/goulds)

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## NOTES TO PROPERTY OWNER

- Unless otherwise stated in the Department of Natural Resources and Environmental Control (DNREC), Division of Water Resources regulations, all septic tanks shall be pumped every two (2) to three (3) years. At the time of pumping, the tank shall be inspected for any deficiencies such as: concrete deterioration, cracks, holes, leaking, etc. The baffles should be inspected for cracks, concrete deterioration, etc.
- If a filtering device has been installed, at the time of cleanout and/or per the manufacturer's specifications, the device should be rinsed thoroughly into the septic tank with a garden hose and reinstalled. This should be done so that accumulated debris can be pumped out while the waste hauler is there.
- Maintain your septic tank in good operating condition.
- Keep automobiles and all heavy vehicles and equipment off the field and tanks.
- Do not allow water ponding to collect over the field.
- Do not allow downspouts to drain onto or into your drain field or tanks.
- Do not stockpile snow or soil on the drain field and tanks.
- Dense grass cover and other shallow rooted plants are beneficial over a drain field. Think ahead when planting trees and shrubs. Although they promote moisture removal from the drain field, their roots may clog the drain tiles.
- Check with DNREC for vegetation that will be helpful to your system.
- Mark the boundaries of your system as a reminder.
- Do not use chemicals to clean or sweeten your system except on the advice of DNREC.
- Do not use a kitchen garbage disposal.
- Do not place harmful materials in the tanks. Avoid fats, solvents, oils, disinfectants, paints, chemicals, poisons, coffee grounds, paper towels, disposable diapers, sanitary napkins, tampons and condoms.
- Inspect for scum and sludge depth once each year.
- Limit water entering your tanks.
- Use water-saving fixtures, i.e. faucets, showers, toilets, etc. as required by the local building code.
- Do not connect basement sump pump to the tanks.
- Always drain appliances one at a time.
- Spread clothes washing over the entire week and avoid half-loads.
- Always fix faucet and toilet float valve leaks promptly.

**FAILURE TO FOLLOW THESE REQUIREMENTS AND THE REQUIREMENTS SET FORTH BY DNREC, DIVISION OF WATER RESOURCES, WILL RESULT IN A REDUCED LIFE SPAN OF THE SEPTIC SYSTEM, AND INCREASE THE LIKELY HOOD OF FAILURE.**

## Lot Clearing Guidelines

1. All trees, shrubs and underbrush should be cut by chain saw, bush hog or mower and dragged away without allowing the heavy equipment to enter onto the proposed disposal area.
2. Stumps should be removed by excavator or backhoe from the perimeter of the proposed disposal area without treading onto the area<sup>1</sup>. Small stump grinders can enter the proposed disposal area and are acceptable to be used to remove stumps.
3. The stump holes should be backfilled with native soils and returned to original condition, as practical. Small tractors, bulldozers and skidsteer equipment are acceptable for this purpose.
4. If the system is not to be immediately installed then the proposed disposal area should be seeded to prevent erosion. The area should also be roped or barricaded to prevent any vehicular traffic from entering.
5. During wetter times of the year (December – May), on poorly drained soils and lower landscape positions discretion should be exercised to minimize the threat of compaction and smearing.

\* The purpose of these guidelines is to minimize the threat of compaction & to avoid excessive disturbance to the soils within the proposed disposal area.

<sup>1</sup> Stump removal is not required as some systems may be installed with the stumps in place.