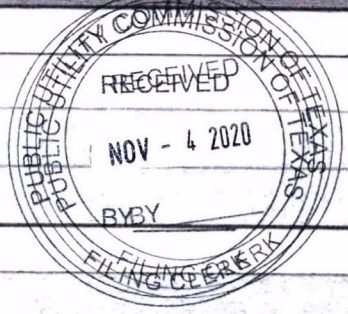
Control Number: 51488

Item Number: 1

Addendum StartPage: 0

51488

TCEQ PUBLIC WATER SYSTEM PLAN REVIEW SUBMITTAL FORM
(Complete, Seal and Attach to Submittal Package)



WATER SYSTEM INFORMATION

Date:	07/17/2019
TCEQ PWS Identification No.: (Facilities will be assigned this PWS No.)	
Water System Name:	Sandhurst Water System

OWNER INFORMATION

Water System Owner:	Nafta Freeway Joint Ventures		
Address:	1718 State St., Houston, TX 77007	(AC) Phone:	713-681-0070 ext. 101
Responsible Official:	Ray Schneider	Title:	Manager
County (System Location):	Medina	Mechanism & Source of Financing: (i.e. loans, rates, self-financed, etc.)	Loan
Subdivision Sec., Phase, Unit, Etc.	Section 1-4 - Sandhurst		

ENGINEER INFORMATION

Engineer Name:	Steve Mangold	Registration No.:	PE 57956
Firm Name:	Mangold Engineering	Firm No.:	F-5549
(AC) Phone:	210-213-3912	(AC) Fax:	713-681-[illegible]0570 NONE
Firm Address:	5596 CR 5710, Devine TX 78016		

SUBMITTAL INFORMATION

Is this submittal for a new public water system? YES: ☒ NO: ☐

If no, proceed to the *Project Information* section on Page 2. If no PWS number exists, the owner must submit a core data form and business plan, if required, in accordance with §290.39(f) and (g).

NEW (PROPOSED) WATER SYSTEMS
(Only complete this section if this submittal is for a NEW water system)

For new (proposed) system submittals, please provide 2 copies of the submittal and attach the following:

☒	A list of all water utilities within ½ mile of the proposed service area boundaries (reference 30 TAC 290.39(c)(1))	
☐	Copies of written responses from each of the entities listed above (reference 30 TAC 290.39(c)(1))	
☐	Copies of formal applications for service from each of the following (reference 30 TAC 290.39(c)(1)) :	
☐	Any municipality if the system is within its ETJ	NONE
☐	Any district or other political subdivision whose corporate boundaries are within ½ mile of the proposed service area boundaries	NONE
☐	Any other water service provider whose certificated service area boundary is within ½ mile of the proposed service area boundaries	NONE
☐	Documentation that all application requirements, including fee payments, are current.	
	Business plan: Please complete the financial ability form, provide a cost summary for the proposed project, and submit a business plan (reference 30 TAC 290.39 (f)). The business plan must confirm capital available to construct the system according to TCEQ requirements. Acceptable financial information can include some of the following: Financial statements (preferably audited), CPA compilation report, tax returns, statements of net worth, bank statements. If the project is being funded with loan proceeds, provide a loan commitment letter from the lender specific to this project. If the plan submittal is for a community system, also provide a copy of the Certificate of Convenience and Necessity (CCN) application submitted to the Public Utility Commission of Texas (PUC), and complete items referenced in 30 TAC 290.39 (f) (1 - 13).	

TCEQ PUBLIC WATER SYSTEM PLAN REVIEW SUBMITTAL FORM
(Complete, Seal and Attach to Submittal Package)

☐	Justification for constructing a separate system (if one of the entities listed above is willing to provide service)
☐	TCEQ Core Data Form (No. 10400)
☐	Emergency Preparedness Plan (No. 20536) if serving water in Harris or Fort Bend Counties and have overnight accommodations

CERTIFICATE OF CONVENIENCE AND NECESSITY (CCN)

Certificates of Convenience and Necessity (CCN) applications are processed by the Public Utility Commission of Texas (PUC) and are required for privately owned systems and water supply corporations. If a CCN is required and a CCN does not exist, the applicant must obtain a CCN number or have the application accepted for filing at the PUC before a PWS project submittal can be technically reviewed. In addition, if a submittal is for a project located outside the CCN area, a CCN amendment application must be submitted before a project may be reviewed for construction approval. Please refer to PUC for additional information at: http://www.puc.texas.gov/industry/water/guidance/UtilRulesGuidance.aspx.

Will the proposed PWS be owned by either an investor owned utility (IOU) or water supply corporation (WSC)? If yes, please indicate which type of entity _____.	YES: ☑	NO: ☐
Has a CCN application been submitted to the PUC? If yes, please provide the date of acceptance _____.	YES: ☐	NO: ☑
List the name, license number and class of the operator for the proposed system:		

PROJECT INFORMATION

If a system does NOT have a PWS number, the sections above must be filled out

All engineering documents must be sealed, signed, and dated by a Texas registered professional engineer. An engineering report that includes the number of connections to be served must accompany each project.
Please check each box that is applicable.

If this submittal is a revision of previously submitted plans, please provide the assigned TCEQ log number:

New Projects/Facilities		Modifications to Existing Facilities	
☐	Water well construction – Proposed	☐	Surface water treatment plant modifications
☐	Well completion data for approved well	☐	Storage capacity modifications
☐	Ground water treatment plant – New	☐	Distribution system modifications
☐	Surface water treatment plant – New	☐	Pressure maintenance facilities modifications
☐	Proposed Innovative/Alternative Treatment	☐	Disinfection facilities or other modifications
☐	Request for rule exception	☒	
☐	Preliminary engineering report without plans		
☐	Texas Water Development Board Project No.:		
☐	As-Built Plans & Engineering Report		
☐	Other (please describe):		

SIGNATURE AND CERTIFICATION

The following certification indicates I have the authority to make submittals on behalf of the PWS referenced on Page 1. I hereby certify that the above information is, to the best of my knowledge, true and correct:

Engineer's Signature:	Steph Mangold
Engineer's Printed Name:	STEPHEN MANGOLD
Date:	9/4/2019

Signature/P.E. Seal Required below:

Steph Mangold

STATE OF TEXAS
Stephen Alan Mangold
57956
REGISTERED PROFESSIONAL ENGINEER
9/4/19

ase call (512) 239-4691 if you have questions regarding this form. Your cooperation will help us vide better service. Additional helpful information and rules are available at the Public Water System Plan Review website.

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)

☒ New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)

☐ Renewal (Core Data Form should be submitted with the renewal form) ☐ Other

2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN		RN

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	07/17/2019

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (If an individual, print last name first: e.g.: Doe, John)	If new Customer, enter previous Customer below:
Nafta Freeway Joint Venture	

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
		205677723	

11. Type of Customer:	☐ Corporation	☐ Individual	Partnership: ☒ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other		☐ Sole Proprietorship	☐ Other:

12. Number of Employees	13. Independently Owned and Operated?
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher	☐ Yes ☐ No

14. Customer Role (Proposed or Actual) - as it relates to the Regulated Entity listed on this form. Please check one of the following:

☒ Owner ☐ Operator ☐ Owner & Operator

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:	1718 State Street						
	City	Houston	State	TX	ZIP	77007	ZIP + 4

16. Country Mailing Information (if outside USA)	17. E-Mail Address (if applicable)
	sandhurstwater@gmail.com

18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)
(713) 681 - 0070	101	(713) 681 - 0570

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If "New Regulated Entity" is selected below this form should be accompanied by a permit application)

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)

Sandhurst Water System

23. Street Address of the Regulated Entity: (No PO Boxes)	1718 State Street							
	City	Houston	State	TX	ZIP	77007	ZIP + 4	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			State	Nearest ZIP Code	
Devine			TX	78016	

27. Latitude (N) In Decimal:			28. Longitude (W) In Decimal:		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)
6552			

33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)

Providing Water to development

34. Mailing Address:	1718 State Street						
	City	Houston	State	TX	ZIP	77007	ZIP + 4

35. E-Mail Address:		
36. Telephone Number	37. Extension or Code	38. Fax Number (if applicable)
(713) 681 - 0070	101	(713) 681 - 0570

39. **TCEQ Programs and ID Numbers** Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☒ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Ray Schneider		41. Title: Manager
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(832) 731 - 3937		(71) 68 - 0570	raymschneider@yahoo.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company	NAFTA FREEWAY JOINT VENTURE	Job Title:	WATER PLANT MANAGER
Name(*In Print*):	Ray Schneider	Phone:	(713) 681-0070
Signature: X	Ray M Schneider	Date: X	Sept. 10, 19

ENGINEERING REPORT

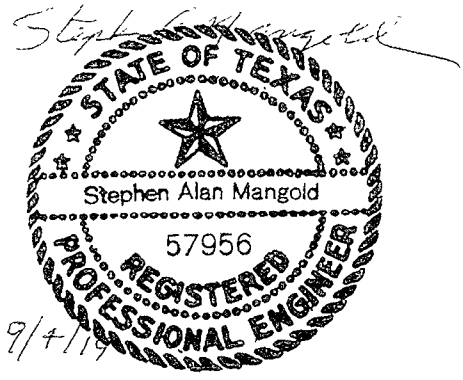
for

Sandhurst Water System

Report #: 400-204R

Date: 9/4/2019

Report as required by
30 TAC 290.39(e)



MANGOLD ENGINEERING COMPANY
5596 CR 5710
DEVINE, TEXAS 78016
PHONE: (830) 931-0400
PHONE: (210) 213-3912
FIRM NO. F-5549

MANGOLD Engineering Company
5596 CR 5710
Devine, TX 78016
Phone: (830) 931-0400 Cell: (210) 213-3912
FIRM NO. F-5549

SUMMARY

This report presents a design for the Sandhurst Water System. The water system has been designed to provide potable water to residential lots in a subdivision which will consist of 75 lots. There are no future plans for expansion of the water system and the system well and equipment have been designed for the 75 connections. A new public water well shall be drilled as the water source. A survey of existing and potential pollution hazards was completed for the new well site and is contained in Appendix 1 of this report. The new well shall have an 8" well casing and the annular space surrounding the casing shall be pressure cemented down to the aquifer being developed. A submersible pump capable of pumping at least 59 gpm against the total developed head shall be set in the well. The water system shall have one 2,500 gallon pressure tank and a 25,000 gallon ground storage tank. Two service pumps capable of delivering at least 128 gpm to the distribution system shall be installed. The distribution system shall consist of Class 200 pipe sufficiently sized to maintain at least 35 psi in all parts of the distribution system, with a flow rate of 113 gpm which is the estimated peak flow rate. This report is written in compliance with 30 TAC 290.39 (e).

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1.0 Introduction / Statement of problem

The new Sandhurst Subdivision is being developed in Medina County, Texas. The subdivision lots require potable water to serve the residents. Since the water system will be serving the general public, and will be serving more than 14 connections, it qualifies as a public water system. A new public water well along with water treatment, pressure maintenance facilities, and a distribution system, which currently does not exist, is required. This report presents the design of the new water system and demonstrates compliance with the applicable requirements of 30 TAC, Chapter 290, Subchapter D, Rules and Regulations for Public Water Systems.

2.0 Present and future areas to be served with population data

The proposed water system shall serve 75 connections at present. To the best of my knowledge, there are no plans for expansion. The pressure maintenance design presented here is for 75 connections. To increase the number of connections above the 75 which are currently shown, will require upgrades to the entire system.

3.0 Water source with quantity and quality

The water source for the new subdivision shall be a new public water well. It is estimated that the well yield will be 50 gpm. Information obtained from a study of other wells in the area of the proposed new public well indicates that the water quality will meet all TCEQ standards without additional treatment. Additional water treatment other than chlorination will be added if water tests show deficiencies in the water quality.

4.0 Present and future water use

At present it is estimate that the maximum daily demand on the water system will be 25,125 gallons per day with a peak flow rate of 113 gpm. See 2.0 above for information on future use.

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5.0 Description of proposed site and surroundings

The new water well and water system is located along the northwest access road of Interstate Hwy. 35, approximately 4.2 southwest of Devine, Texas. The property where the Sandhurst Water System is being constructed is bordered on one side by the I.H. 35 access road and on all other sides by undeveloped land. See Appendix 3 for General maps and Appendix 2 for scale drawings of the site.

6.0 Water treatment

The new water supply shall have a liquid chlorination treatment system. The system shall consist of a 30 gallon liquid chlorine solution tank, a Stenner Classic Series 45 feed pump capable of delivering 3 gpd of chlorine solution against pressures ranging from 0.2 to 25 psi. The pump is self priming up to 25 feet and has an adjustable feed rate with a 20:1 turndown ratio. The system also has feed tubing routed to the storage tank inlet line to meter the chlorine solution to the flow into the storage tank. See Appendix 4 for manufacturer's specifications for both the pump and tank. See Appendix 2 for design drawings.

7.0 Basic design data

7.1 Pumping capacities

The well pump shall be a 6" submersible jet pump capable of delivering 59 gpm against the calculated dynamic head of 302 feet. The pump setting depth is estimated to be 280 feet and the static water level in the

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well is estimated to be 200 feet. There shall be two service pumps installed which shall be capable of delivering at least 128 gpm to the distribution system against the maximum pressure tank setting of 65 psig. The peak flow rate for the system is estimated to be 113 gpm. See Appendix 2 for specific pump callouts for both the well and service pumps. Also see Appendix 4 for pump curves and manufacturer's specifications for the pumps.

7.2 Water Storage

The ground storage tank shall be a steel tank, fiberglass tank or other approved material which is covered and designed, fabricated, erected, tested, and disinfected in strict accordance with current American Water Works Association (AWWA) standards and shall be provided with the minimum number of inlets and outlets, size and type of roof vents, man ways, drains, sample connections, access ladders, overflows, liquid level indicators, and other appurtenances as specified in the applicable TCEQ rules. See Appendix 2 for more specific information. Also see Appendix 4 for tank manufacturer's specifications.

7.3 Pressure Maintenance

The system shall be provided with an air over water hydropneumatic tank. The tank shall be located wholly above grade and must be of steel construction with welded seams. The metal thickness of the tanks must be sufficient to withstand the highest expected working pressure (65 psig for this system) with a four to one factor of safety. The tanks selected have a minimum burst pressure of 450 psig which gives them an 6.9 factor of safety. See Appendix 2 for more specific information. Also see Appendix 4 for tank manufacturer's specifications.

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7.4 Flexibility of operation

The pressure switch for the pressure tank shall be set to maintain the tank pressure between 45 psig and 65 psig. An 8" PVC main line shall supply water to the subdivision lots. The peak flow rate is 113 gpm. With these parameters, the calculations show that the pressure will be well above 35 psig at all points in the system at minimum hydropneumatic tank pressure. The required pressure of 35 psig in the system could be maintained with a wide range of flow rates to the system.

8.0 Plans and Drawings

Complete engineering plans and drawings for the water well, pressure maintenance facilities, distribution system, and treatment system were completed and are contained in Appendix 2.

9.0 Abandoned or inoperative wells

To the best of my knowledge there are no abandoned or inoperative wells within 1/4 mile of the proposed site for the new propose public water well. See Appendix 1 for a Survey of Existing and Potential Pollution Hazards.

10.0 Staged construction

To the best of my knowledge the entire system consisting of a new water well, pressure maintenance facilities and distribution system shall be constructed together. No staged construction is anticipated.

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11.0 General maps

See Appendix 3 for a USGS Quadrangle map and a general locator map showing the location of the site for the new proposed public water well.

12.0 System capacities

The system is a community water system with ground storage which is designed to serve 75 connections.

12.1 Well capacity (designed for 75 connections)

The required minimum well capacity is 0.6 gpm per connection. The required minimum well yield is, therefore, 45 gpm for 75 connections.

12.2 Ground storage capacity (designed for 75 connections)

The required ground storage capacity must be at least 200 gallons per connection. The proposed storage tank is 25,000 gallons. The required capacity is 15,000 gallons.

12.3 Pressure tank capacity (designed for 75 connections)

The minimum required pressure tank capacity is 20 gallons per connection. The proposed pressure tank capacity is 2,500 gallons. The required capacity is 1,500 gallons.

13.0 Well description

The new proposed public water well shall be located as shown on the scale drawings in Appendix 2 and as shown on the general maps in Appendix 3. The drilled hole shall be 12 1/4" diameter down to 300 ft. total depth. The well casing shall be 8 5/8" outside diameter and the well shall be cased to a depth of 200 ft. The annular space between the well casing and the drilled hole shall be sealed by using enough cement under pressure to completely fill and seal the annular space from the top of the shallowest formation to be developed to the earth's surface. The static water level is

expected to be at approximately 200 ft. The well slab shall be reinforced concrete and shall slope downward away from the well casing at 1/4" per foot, minimum. It shall be a minimum of 6" thick and shall extend laterally at least 38" from the edge of the well casing. The casing shall have a cap which is securely attached and sealed to the well casing in a way which prevents tampering and the entrance of pollutants into the well. The well casing shall extend at least 18 inches above the upper surface of the well slab adjacent to the casing. The foregoing description is a partial description which highlights the major parts of the water well. See Appendix 2 for a complete description.

14.0 Conclusions and Recommendations

The design for Sandhurst Water System has been presented and discussed in this report. The major items comprising the system are a new public water well, a 25,000 gallon ground storage tank, one 2,500 gallon pressure tank, one submersible well pump, two service pumps, a chlorination system, and a distribution system. The water system must be under the direct supervision of a certified water works operator holding a valid certificate of competency issued under the direction of the TCEQ.

15.0 References

30 TAC, Chapter 290, Subchapter D, Rules and Regulations for Public Water Systems, Effective July 30, 2015.

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Appendix 1

Survey of existing and potential pollution hazards

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FIRM NO F-5549

September 18, 2019
Sheet 1 of 1

Water Utilities Division
P.O. Box 13087
Austin, Texas 78711-3087

Subject: Survey of existing and potential pollution hazards for the proposed well which will serve Sandhurst Water System located as shown on the attached plans in Medina County, Texas.

Dear Sirs:

A survey of existing and potential pollution hazards relating to the subject well was conducted with the following findings.

To the best of my knowledge, there are no improperly constructed, abandoned, or inoperative wells or existing/potential pollution hazards as described in the TCEQ "Guidance For a Survey of Existing/ Potential Sources of Ground Water Pollution", within a 1/4 mile radius of the proposed site of the subject well.

To the best of my knowledge, there are no sewage treatment plants, lands on which sewage plant or septic tank sludge or effluent is applied, lands irrigated by sewage plant effluent, animal feed lots, or (livestock and animal pens), or solid waste disposal sites, within a 500 ft. radius of the proposed site of the subject well.

To the best of my knowledge, there are no sewage wet wells, sewage pump stations, or ditches containing sewage treatment waste, municipal wastes or industrial wastes, within a 300 ft. radius of the proposed site of the subject well.

To the best of my knowledge, there are no septic tank perforated drainfields, absorption beds, evapotranspiration beds, privies, underground fuel storage tanks, cemeteries, areas irrigated by low pressure dosage, drip irrigation drainfields, low angle spray on-site sewage facilities, underground petroleum or chemical storage tanks or liquid transmission pipelines, military and industrial facilities, landfills and dumpsites, or water wells that do not meet Public Drinking Water Standards, within a 150 ft. radius of the proposed site of the subject well.

To the best of my knowledge, there are no tile or concrete sanitary sewers, septic tanks, livestock in pastures, or storm sewers within a 50 ft. radius of the proposed site of the subject well.

If further information is required, please don't hesitate to call.

Sincerely,

Stephen A. Mangold, P.E.

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Devine. TX 78016
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Appendix 2

Scale drawings

GENERAL NOTES:

The water well shall not be installed any closer than 150 Ft. from a septic tank perforated drainfield, area irrigated by low dosage low angle spray on-site sewage facilities, absorption bed, evapotranspiration bed, improperly constructed water well, underground petroleum and chemical storage tank or liquid transmission pipeline

The water well shall not be installed any closer than 50 Ft. from a tile or concrete sanitary sewer, sewerage appurtenance, septic tank, storm sewer, cemetery, or pasture with livestock

The premises, materials, tools and drilling equipment shall be maintained so as to minimize contamination of the underground water during the drilling operation.

Water used in any drilling operation shall be of safe sanitary quality. Water used in the mixing of drilling fluids or mud shall contain a chlorine residual of at least 0.5 mg/ltr.

The mud pit shall be constructed and maintained so as to minimize contamination of the drilling mud.

No temporary toilet facilities shall be maintained within 150 Ft. of the well being constructed unless they are of a sealed, leakproof type.

Before placing the well in service, the TCEQ Water Utilities Division shall be furnished a copy of the well completion data, which includes the following items: the Driller's Log (geological log and material setting report), a cementing certificate, the results of a 36-hour pump test, the results of the microbiological and chemical analyses required by subparagraphs (F) and (G) of paragraph 290.41(c)(3) of the Rules and Regulations for Public Water Systems published by the TCEQ Water Utilities Division; a copy of the Sanitary Control Easements; and an original of legible copy of a United States Geological Survey 7.5-minute topographic quadrangle showing the accurate well location.

Well construction materials containing more than 0.25% lead are prohibited.

The well driller will utilize the following pressure cementation methods in accordance with the AWWA Standard for Water Wells (A100-15): Appendix B; Section B.3 (Positive displacement – exterior method), Section B.4 (Interior method – without a plug); (Placement through float shoe attached to the bottom of the casing). A cement bonding log may be required by the executive director to assure complete sealing of the annular space.

If a gravel packed well is constructed, all gravel shall be of selected and graded quality and shall be thoroughly disinfected with a 50 mg/ltr chlorine solution as it is added to the well cavity.

Safeguards shall be taken to prevent possible contamination of the water or damage by trespassers following the completion of the well and prior to installation of permanent pumping equipment.

Upon well completion, the well shall be disinfected in accordance with current AWWA standards for well disinfection except that the disinfectant shall remain in the well for at least six hours.

Before placing the well in service, the water containing the disinfectant shall be flushed from the well and then samples of water shall be collected and submitted for microbiological analysis until three successive daily raw water samples are free of coliform organisms. The analysis of these samples must be conducted by a laboratory approved by the Texas Commission on Environmental Quality.

Appropriate facilities for treatment of the water shall be provided where a satisfactory microbiological record cannot be established after repeated disinfection. The extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination and perhaps on the basis of quantitative microbiological analyses.

The well unit shall be protected by an intruder resistant fence, the gates of which are provided with locks or shall be enclosed in a locked, ventilated well house. The gates or well house shall be locked during periods of darkness and when the plant is unattended.

An all weather access road shall be provided to the well site.

Based on current acceptable design standards, the total capacity of the water system's production and treatment facilities must always be greater than its anticipated maximum daily demand.

Disinfection facilities shall be provided for all ground water supplies for the purpose of microbiological control and distribution protection and shall be in conformity with applicable disinfection requirements of Section 290.42(e) of the TCEQ Rules and Regulations for Public Water Systems RG-195 dated December 1998.

Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

The disinfection point of application must be ahead of the hydropneumatic tank which is provided for the water distribution system.

Disinfection equipment shall provide continuous and effective disinfection under all conditions.

Disinfection equipment shall have a capacity at least 50% greater than the highest expected dosage to be applied at any time.

Automatic proportioning of the disinfectant dosage to the flow rate of the water being treated shall be provided.

Facilities shall be provided for determining the amount of disinfectant used daily as well as the amount of disinfectant remaining for use.

All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.

All plastic pipe for use in public water systems must bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less.

No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for the use in any public drinking water supply.

Water transmission and distribution lines must be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface.

The use of pipes and pipe fittings that contain more than 0.25% lead or solders and flux that contain more than 0.2% lead is prohibited.

No new water line under two inches in diameter will be allowed to be installed in a public water system distribution system.

Water lines shall not be installed closer than ten feet to septic tanks or septic tank drainfields.

Pipe shall not be laid in water or placed where it can be flooded with water or sewage during its storage or installation.

New mains shall be thoroughly disinfected in accordance with AWWA Standard C651 and then flushed and samples before being placed in service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure, which shall be repeated if contamination persists. A minimum of one sample for each 1000 feet of completed water line will be required.

A minimum pressure tank capacity as specified in the design is required. The pressure tank shall meet requirements of TCEQ RG-195, Section 290.43(a).

The water system must be under the direct supervision of a certified water works operator holding a valid certificate of competency issued under the direction of the TCEQ. The operator must hold at a minimum a Grade D certificate.

Mechanical disinfection facilities capable of maintaining an acceptable disinfectant residual shall be provided and operated at all times to maintain a minimum free chlorine residual of 0.2 mg/l in the far reaches of the distribution system.

The disinfectant residual in the distribution system must be tested at representative locations in the distribution system at least once every seven days. The tests must be done using a test kit which employs a diethyl-p-phenylenediamine (DPD) Indicator. Records of the these test results shall be maintained for at least three years.

Disinfection, by or under the direction of water system personnel must be performed when repairs are made to existing facilities and before new facilities are placed into service. Disinfection must be performed in accordance with AWWA requirements and water samples must be submitted to a laboratory approved by the Texas Department of Health. The sample results must indicate that the facility is free of microbiological contamination before it is placed into service. When it is necessary to return repaired mains to service as rapidly as possible, doses may be increased to 300 mg/l and the contact time reduced to one-half hour.

A supply of calcium hypochlorite disinfectant shall be kept on hand for use when making repairs.

A customer service inspection certification shall be completed prior to providing continuous water service. Customer service inspections can be performed by people with the following credentials: Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners, Certified Waterworks Operators and members of other water related professional groups who have completed a training course passed an examination administered by the TCEQ or its designated agent and hold an endorsement granted by the TCEQ or its designated agent.

The system's pressure tank shall be inspected annually by water system personnel or a contracted inspection service and results of these inspections recorded and maintained for at least five years. The tank inspection must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces and that the tank remains in a watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

The TCEQ shall be provided with information regarding water system ownership and management in accordance with applicable TCEQ requirements.

All water system electrical wiring must be installed in a securely mounted conduit in compliance with a local or national electrical code.

All portions of the roof of the storage tank shall drain toward the edges of the tank and shall have a slope of not less than 0.75 inch per foot. The roof opening in the tank shall be a minimum of 20 inches in diameter and shall have a raised curbing at least 4 inches high. The opening shall be covered by a lockable cover that overlaps the curbing at least 2 inches in a downward direction. The cover shall be locked at all times except during periods of necessary access to the tank.

The storage tank roof shall be vented with a gooseneck vent. The vent opening shall be securely covered by a 16 mesh or finer screen made of corrosion resistant material.

The storage tank shall be equipped with a 1" or larger overflow line which shall terminate between 0.5 feet and 2.0 feet above ground level. The opening to the overflow line shall be fitted with a gravity hinged and weighted cover which fits tightly and has no gap greater than 1/16". The storage tank shall also be equipped with a means of visually determining the water level in the tank from outside of the tank.

All coatings for the inside surface of the storage tank must conform to ANSI/NSF Standard 61 and must be certified by an organization accredited by ANSI.

The well site shall be fine graded so the the site is free from depressions, reverse grades or areas too rough for proper ground maintenance so as to ensure that the surface water will drain away from the well. In all cases, arrangements shall be made to convey well pump discharge, packing gland leakage and floor drainage away from wellhead. Suitable drain pipes located at the outer edge of the concrete floor shall be provided to collect this water and prevent its ponding or collecting around the wellhead. This wastewater shall be disposed of in a manner that will not cause any nuisance from mosquito breeding or stagnation. Drains shall not be directly connected to the storm or sanitary sewers.

Vaultheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well.

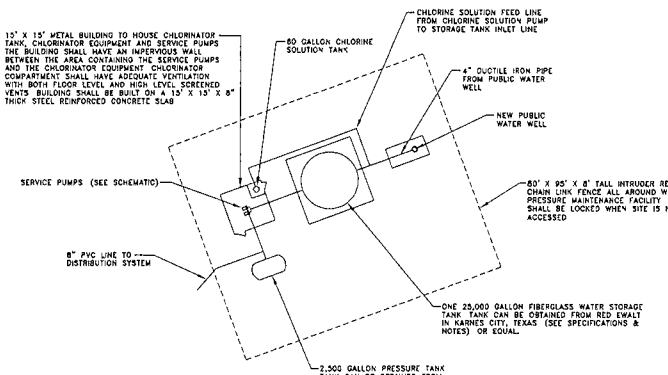
Dechlorination of disinfecting water shall be in strict accordance with current AWWA Standard C655-09 or more recent.

Plans For:
SANDHURST
WATER SYSTEM

MANGOLD ENGINEERING COMPANY
5596 CR 5710
Devine, Texas 78016
FIRM NO. F-5549
Phone: (830) 931-0400
Phone: (210) 213-3912

Dwg: 400-203
Date: 9/4/18
Revision: IR
Drawn: S Mangold
Sheet: 1 of 4

STATE OF TEXAS
Stephen Alan Mangold
57956
REGISTERED
PROFESSIONAL ENGINEER
9/4/18



EXPLODED VIEW OF PRESSURE MAINTENANCE FACILITIES

W E

SCALE: 1" = 200'

SYSTEM LAYOUT

0 200 400 600

MATERIALS LIST FOR WATER DISTRIBUTION SYSTEM

ITEM	DESCRIPTION	UNIT	QUANTITY
1	2" PVC Class 200 Water Pipe	LF	0
2	3" PVC Class 200 Water Pipe	LF	3572
3	4" PVC Class 200 Water Pipe	LF	0
4	6" PVC Class 200 Water Pipe	LF	0
5	8" PVC Class 200 Water Pipe	LF	4802
6	3/4" Gate Valve & Box	EA	0
7	2" Gate Valve & Box	EA	0
8	3" Gate Valve & Box	EA	4
9	6" Gate Valve & Box	EA	0
10	8" Gate Valve & Box	EA	5
11	Single Service	EA	43
12	Dual Service	EA	16
13	2" Blowoff	EA	6
14	Fire Hydrant (Standard)	EA	0
15	3/4" Meter	EA	A/R
16	Plastic Meter Boxes	EA	A/R

LEGEND
① = 2" GATE VALVE & BOX
② = 3" GATE VALVE & BOX
③ = 6" GATE VALVE & BOX
④ = 8" GATE VALVE & BOX

SIZING OF SYSTEM CAPACITY

THE WATER SYSTEM SHALL BE SIZED TO SERVE CONNECTIONS TO 125 RESIDENTIAL LOTS

Q_{Total} = 41,875 GPD

ESTIMATED PEAK FLOW RATE = 188 GALLONS/MINUTE

EXPECTED WELL YIELD = 150 GALLONS/MINUTE

STORAGE 25,000 GALLONS

PRESSURE TANK ONE 2,500 GALLON TANK

SERVICE PUMPS TWO BERKELEY B2TPM, 10 HP, 230 VOLT, SINGLE PHASE PUMPS, OR EQUAL

WELL PUMP ONE GOULDS MODEL 16GL-30, 30 HP, 6" DIA., THREE PHASE PUMP, OR EQUAL

1 ALL WATER MAINS WILL BE PRESSURE TESTED BY THE WATER SYSTEM CONTRACTOR

2 ALL PIPES IN THE DISTRIBUTION SYSTEM SHALL BE PVC CLASS 200-SDR 21, WITH GASKETED INTEGRAL BELL JOINTS. PIPE DESIGN SHALL MEET ASTM D-2241

3 4 INCHES OF SAND WILL BE PLACED IN THE TRENCH BELOW ALL MAINS WHERE THERE IS NO ROCK. IF ROCK IS ENCOUNTERED THE MAIN WILL BE COVERED WITH SAND ALSO

4 ALL VALVES IN THE DISTRIBUTION SYSTEM ARE TO BE LEFT CLOSED UNTIL AFTER THE SYSTEM HAS BEEN DISINFECTED AND ACCEPTED

5 ALL FIRE HYDRANTS AND VALVE TOPS ARE TO BE SET TO GRADE BY THE WATER SYSTEM CONTRACTOR, IF APPLICABLE

6 THE TOPS OF ALL MAINS SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE

7 CONSTRUCTION OF THE DISTRIBUTION SYSTEM SHALL NOT BEGIN UNTIL ALL ROADS, AND PARKING AREAS HAVE BEEN CUT OR FILLED TO FINAL SUBGRADE

8 ALL WATER LINES CONNECTING THE WATER MAIN TO A BUILDING OR OTHER SITE SHALL BE AS SPECIFIED ON THE DRAWING

9 ALL CONCRETE REINFORCING SHALL BE 1/2" DIA. REBARS SPACED @ 12" O.C. EACH WAY LOCATED @ THE CENTER OF THE SLAB THICKNESS, UNLESS OTHERWISE DETAILED

10 ALL EXPOSED WATER PIPES AND OTHER EXPOSED EQUIPMENT SHALL BE INSULATED FOR PROTECTION AGAINST FREEZING

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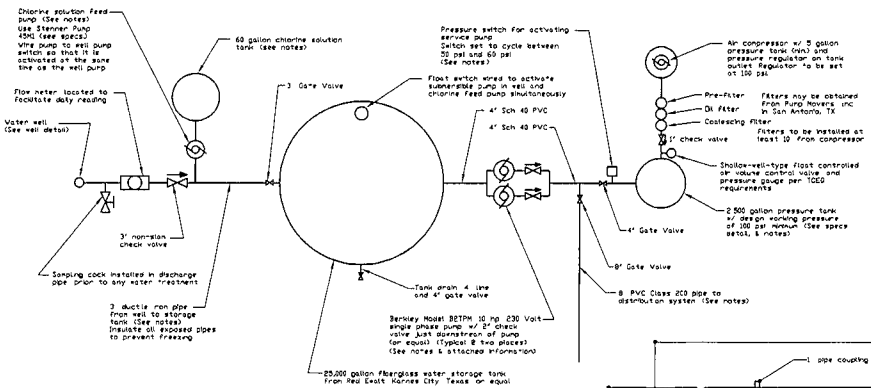
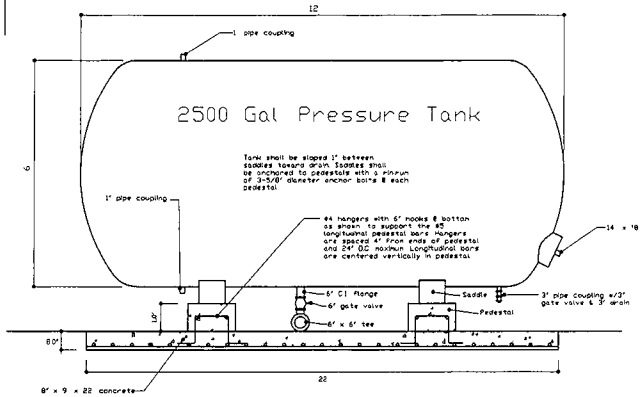


Schematic of Pressurization system

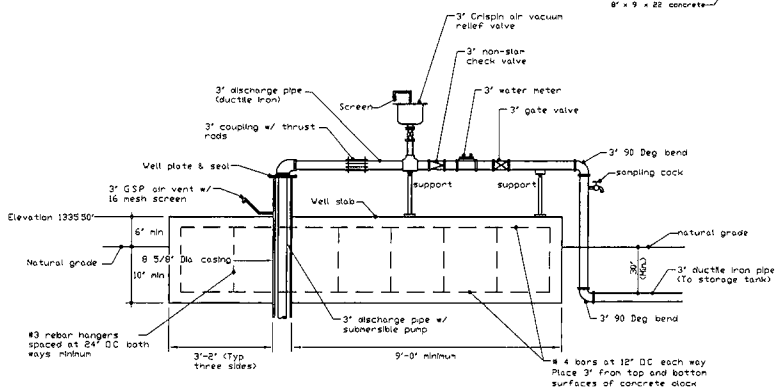
(See general notes)



PRESSURE TANK DETAIL

The pressure tank shall conform to the ASME section VIII Division 1 codes and construction regulations ASME name plate to be permanently attached Pressure tank shall be equipped with a pressure release device per TCEQ requirements

Tank shall have a minimum working pressure of 150 psig and a minimum burst pressure of 450 psig which gives the tank more than a 4 to 1 safety factor over the expected working pressure of 60 psig



Discharge Piping Detail

STORAGE TANK NOTES:

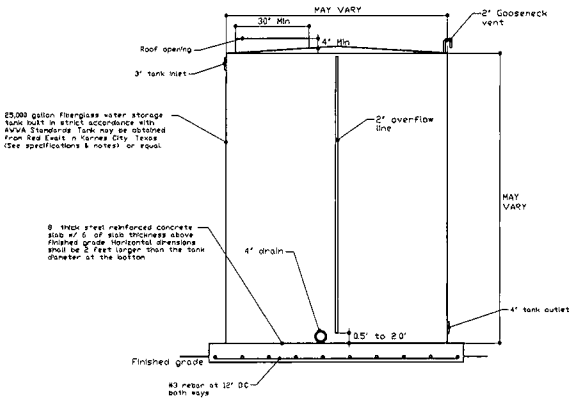
All portions of the roof of the storage tank shall drain toward the edges of the tank and shall have a slope of not less than 0.75 inch per foot The roof opening in the tank shall be a minimum of 30 inches in diameter and shall have a raised curbing at least 4 inches high The opening shall be covered by a lockable cover that overlaps the curbing at least 2 inches in a downward direction The cover shall be locked at all times except during periods of necessary access to the tank

The storage tank roof shall be vented with a gooseneck vent The vent opening shall be securely covered by a 16 mesh or finer screen made of corrosion resistant material

The storage tank shall be equipped with a 1" or larger overflow line which shall terminate between 0.5 Feet and 2.0 Feet above ground level The opening to the overflow line shall be fitted with a gravity hinged and weighted cover which fits tightly and has no gap greater than 1/16" The storage tank shall also be equipped with a means of visually determining the water level in the tank from outside of the tank This shall be accomplished by installing a pressure gauge at the tank bottom The gauge shall be 3" diameter or larger and shall be calibrated in 1 Foot increments

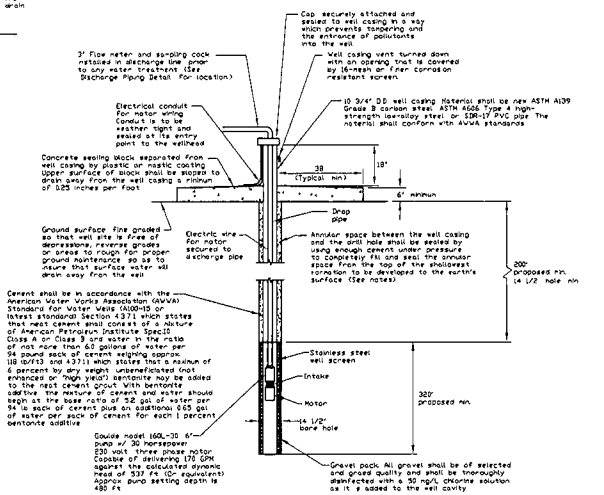
All coatings for the inside surface of the storage tank must conform to ANSI/NSF Standard 61 and must be certified by an organization accredited by ANSI

All coatings for the inside surface of the storage tank must conform to ANSI/NSF Standard 61



STORAGE TANK DETAIL

The storage tank shall be covered and designed, fabricated, erected tested, and disinfected in strict accordance with current American Water Works Association (AWWA) standards and shall be provided with all items as specified in 30 TAC 290.43(c)



Well Detail (Minimum)

Expected well yield is 150 gpm

(See general notes)

Plans For:

SANDHURST WATER SYSTEM

MANGOLD ENGINEERING COMPANY
5596 CR 5710
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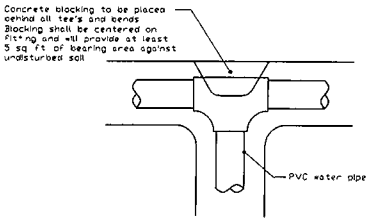
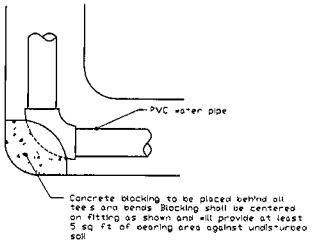
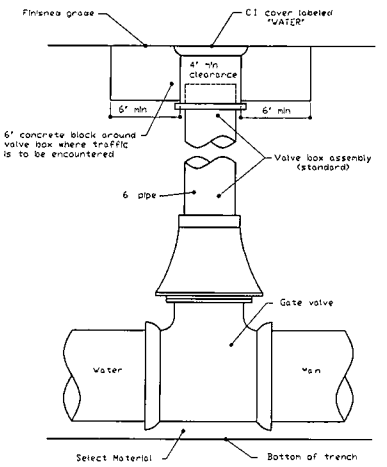
9/4/18

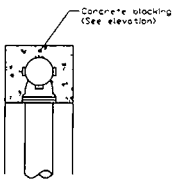




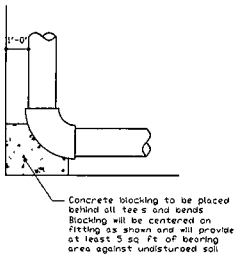
Concrete Support Behind Fittings



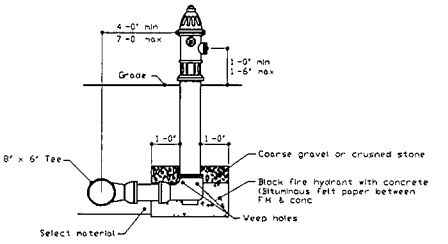
Valve and Box Installation
(Typical)



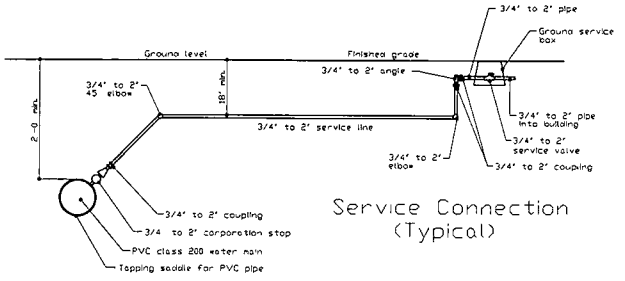
Plan
(Fire Hydrant)



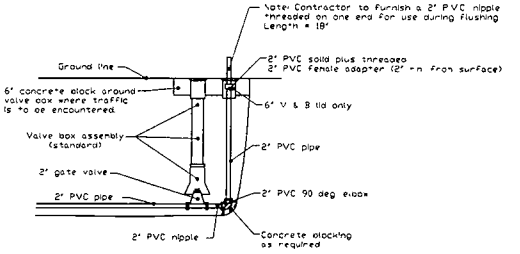
Elevation
(Fire Hydrant)



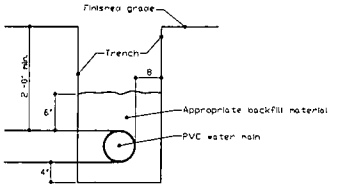
Fire Hydrant Assembly
(Typical)



Service Connection
(Typical)



2" Blowoff Installation
(Typical)



Trench Section
(Typical)

STANDARD DETAILS SHEET

ONLY USE THOSE DETAILS WHICH APPLY TO THIS DESIGN

Plans For:
SANDHURST
WATER SYSTEM

MANGOLD ENGINEERING COMPANY
5596 CR 5710
Devine, Texas 78016
FIRM NO. F-5549
Phone: (830) 931-0400
Phone: (210) 213-3912

Dwg: 400-203
Date: 9/4/18
Revision: TR
Drawn: S. Mangold
Sheet: 4 of 4

STATE OF TEXAS
Stephen Allen Mangold
87956
REGISTERED
PROFESSIONAL ENGINEER
9/4/18

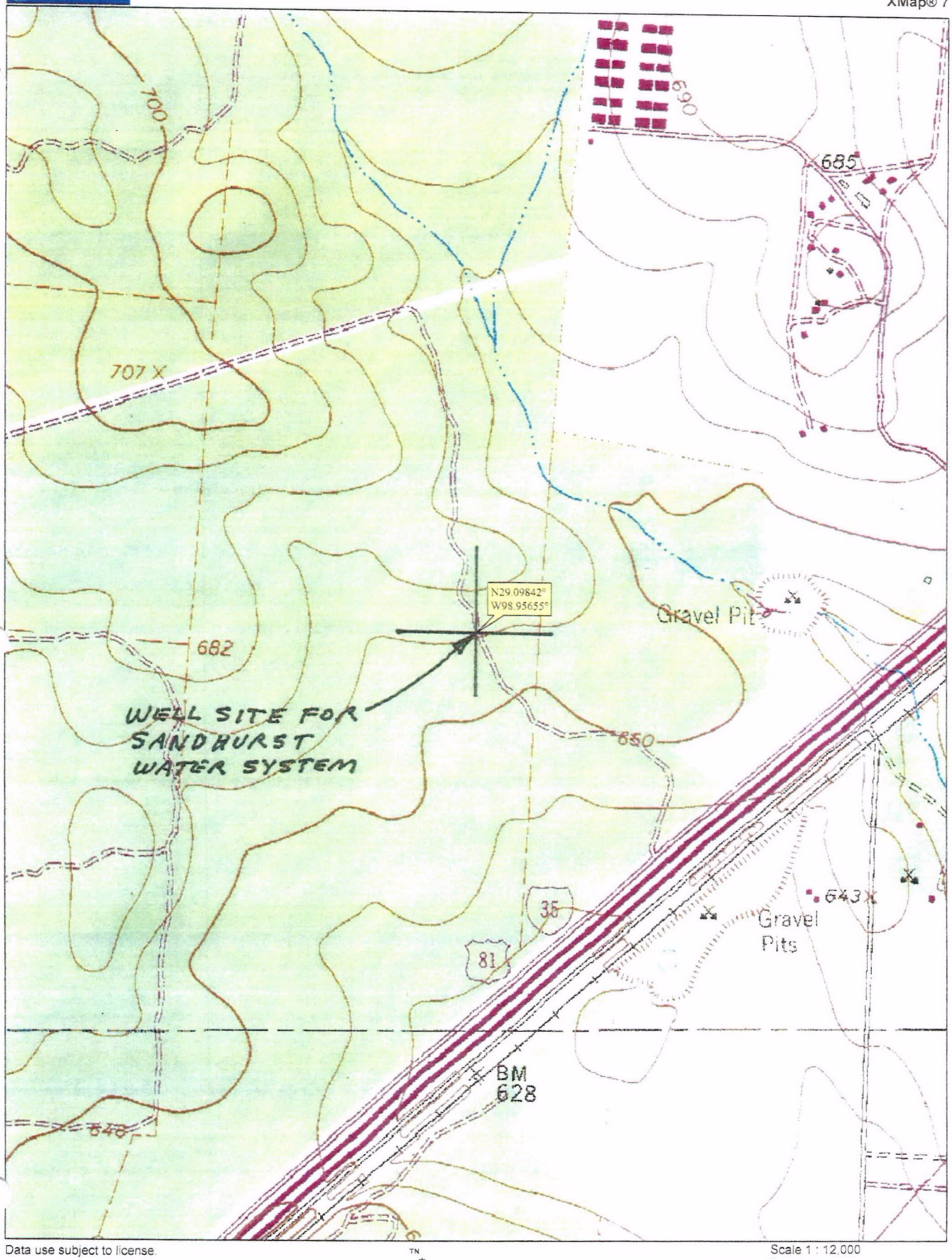
MANGOLD Engineering Company
5596 CR 5710
Devine, TX 78016
Phone (830) 931-0400 Cell (210) 213-3912
FIRM NO. F-5549

Appendix 3

General maps

DeLORME

XMap® 7



TN
MN (4.2°E)

Scale 1 : 12,000

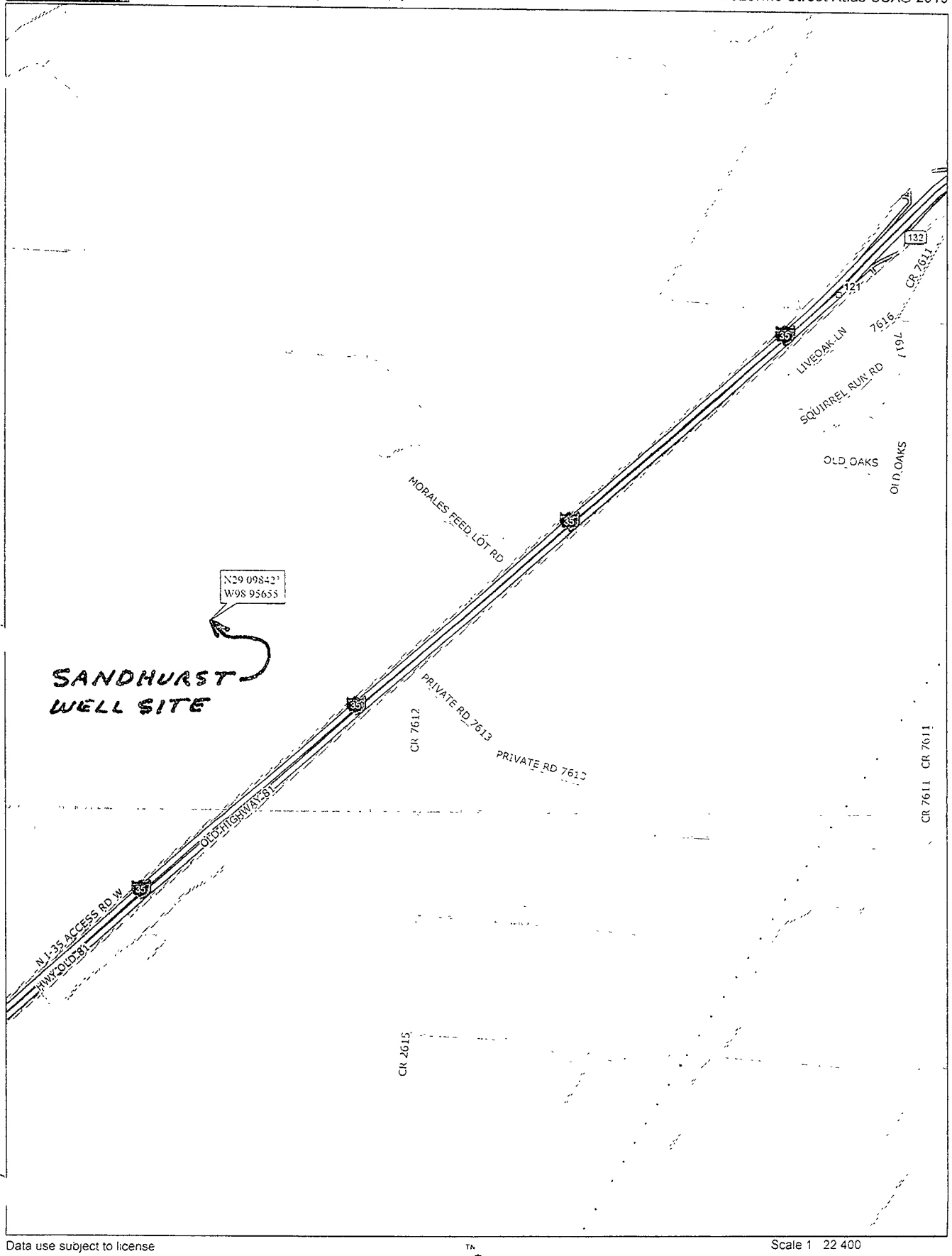
1" = 1,000.0 ft

Data Zoom 14-1

DeLORME

LOCATOR MAP

DeLorme Street Atlas USA® 2013



Data use subject to license

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www delorme com

TN

MN (4 2°E)

Scale 1 22 400

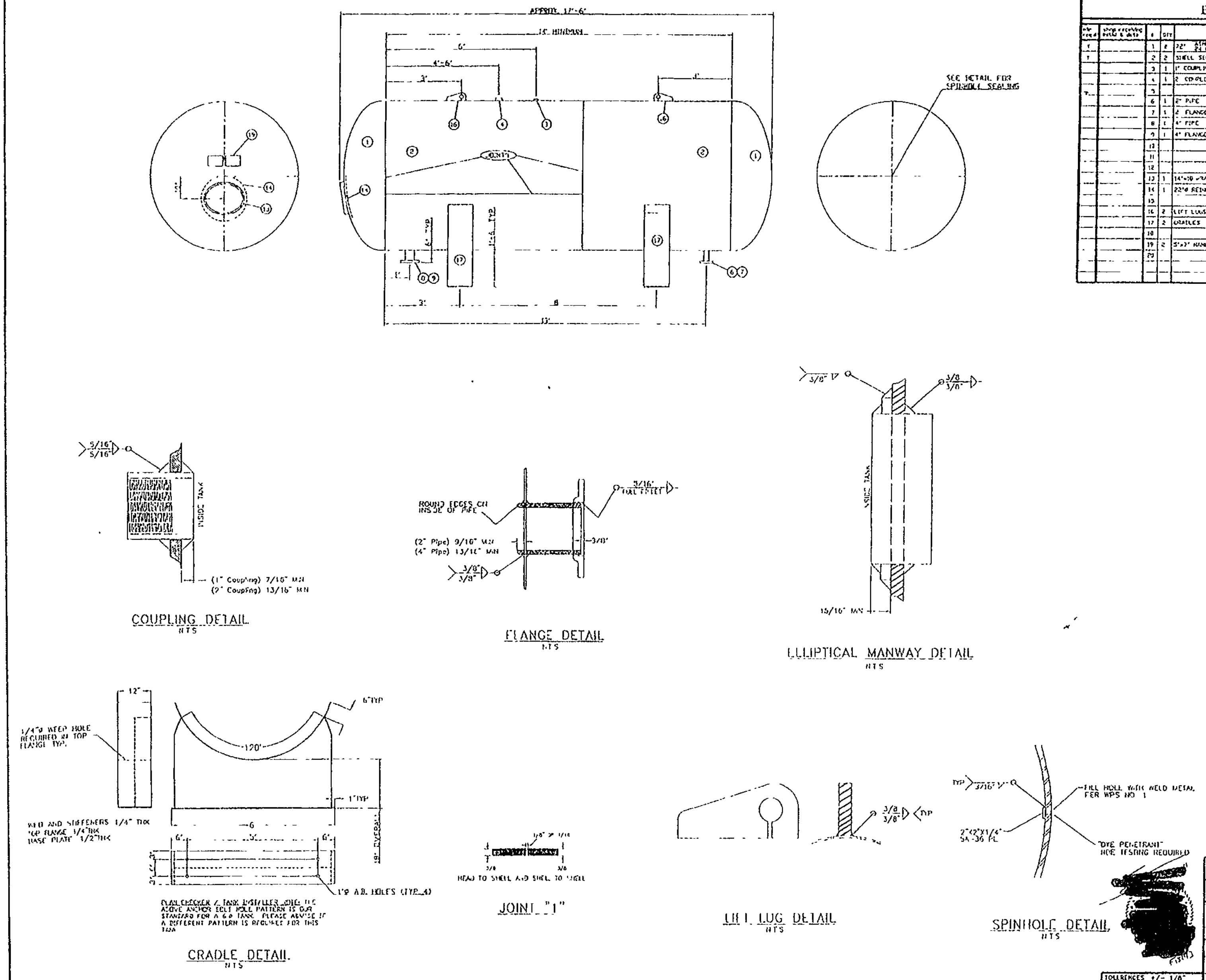
1" = 1,866 7 ft

Data Zoom 13-2

MANGOLD Engineering Company
5596 CR 5710
Devine, TX 78016
Phone: (830) 931-0400 Cell: (210) 213-3912
FIRM NO. F-5549

Appendix 4

Manufacturer's specifications of equipment used in water system design



BILL OF MATERIALS
BULLDOG STEEL PRODUCTS, INC.

SERIAL NO: BS418617 REV: 0

		#	QTY	DESCRIPTION	MATERIAL SPEC.	SPECIAL REQUIREMENTS	NOTES
1		1	2	72" ASME CODE HEADS 2:1 ELLIPSOIDAL	3/8" SA516-70		
1		2	2	SHELL SECTIONS	3/8" SA516-70		
		3	1	1" COUPLING	SA105	3000#	
		4	1	2" COUPLING	SA105	3000#	
		5					
		6	1	2" PIPE		SEAMLESS	
		7	1	2" FLANGE	SA105	150 RFSO FLG	
		8	1	4" PIPE		SEAMLESS	
		9	1	4" FLANGE	SA105	150 RFSO FLG	
		10					
		11					
		12					
		13	1	14"x18" MANWAY			
		14	1	22"Ø REINFORCING PAD			
		15					
		16	2	LIFT LUGS			
		17	2	CRADLES		SEE DETAIL FOR DIMS	
		18					
		19	2	5"x3" NAME PLATE BRACKET	1/4" SA36		
		20					

DESIGN + TEST DATA

VESSEL DESIGN DATA
DESIGN PRESSURE .... 150 PSI
MAXIMUM ALLOWED WORKING PRESSURE .... 150 PSI
DESIGN TEMPERATURE .... -20 TO 120 F°
MAXIMUM ALLOWED WORKING TEMPERATURE .... 120 F°
CORROSION ALLOWANCE .... NONE
APPROXIMATE TANK WEIGHT .... LBS.

ASME CODE REQUIREMENTS SEC. VIII DIV 1 EDITION AND ADDENDA AS LISTED ON CALCS
JOINT EFF. ... HEADS, ... SHELL, RADIOGRAPH ... RT-4
STRESS RELIEF ... N/A
ASME CODE F&D HEADS
ELLIPSOIDAL RATIO ... 2:1
NOMINAL THICKNESS ... 3/8"

WELDING REQUIREMENTS
JOINT "1" WPS
HEAD/SHELL OPENINGS WPS
HEAD/SHELL ATTACHMENTS WPS

TESTING REQUIREMENTS
LIQUID DYE PENETRANT ON SPIN HOLE SEALING
NDE - RADIOGRAPH RT-4
HYDROSTATIC TEST PRESSURE ... PSI

PAINT SCHEDULE
INSIDE: BLAST TO SSPC SP-10 "NEAR WHITE FINISH"
OUTSIDE: BLAST TO SSPC SP-6 "COMMERCIAL FINISH"
MINIMUM DRY FILM THICKNESS ... MILS
FINISH COLOR TO BE SELECTED BY OWNER

INSPECTION: [X] STANDARD
[ ] 3RD PARTY NACE CERTIFIED, BLAST AND FINAL PAINT INSPECTION REQUIRED
[ ] OTHER

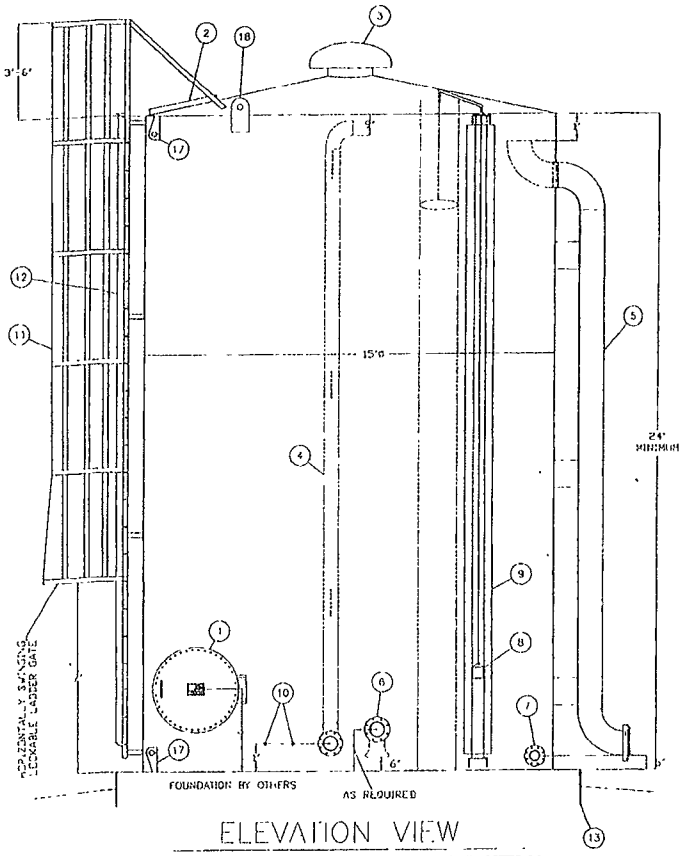
CERTIFIED BY
BULLDOG STEEL PRODUCTS, INC.
150 PSI AT 120 DEGREE F°
(MAX. ALLOWABLE WORKING PRESSURE)
-20 DEGREE F° AT 150 PSI
(MIN. DESIGN METAL TEMPERATURE)
3/8 HEADS 3/8 SHELL
SERIAL NUMBER BS418617
YEAR BUILT 2018
U
W
RT-4
PO BOX 569 EAST I-20 CLYDE TX 79510-0569

[redacted]

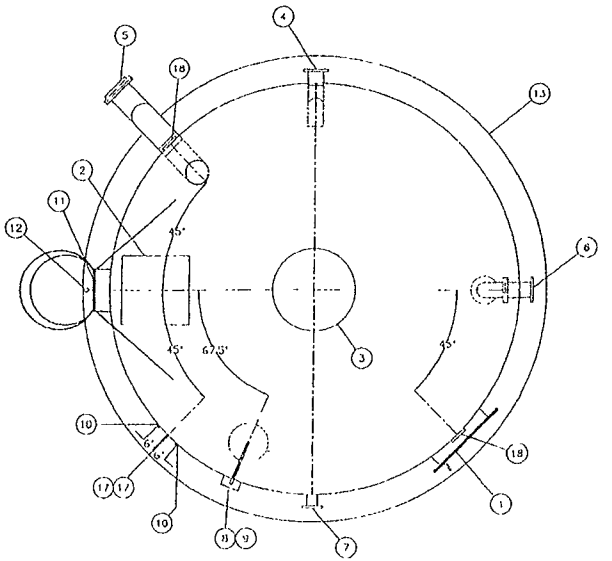
60 Ø x 14' LONG / 3,000 GALLON CAPACITY
NOT TO SCALE
[redacted]
BULLDOG STEEL PRODUCTS, INC
P O BOX 569 EAST I-20
CLYDE, TX 79510-0569 (325)893-5806

		REV	DATE	DESCRIPTION
DRAWN BY	4/30/18	A	5/1/18	ISSUED FOR COMMENT
CHK'D		B	5/10/18	ISSUED FOR CONSTRUCTION
APP'D	5/10/18			

TOLERENCES +/- 1/8" UNLESS MARKED OTHERWISE

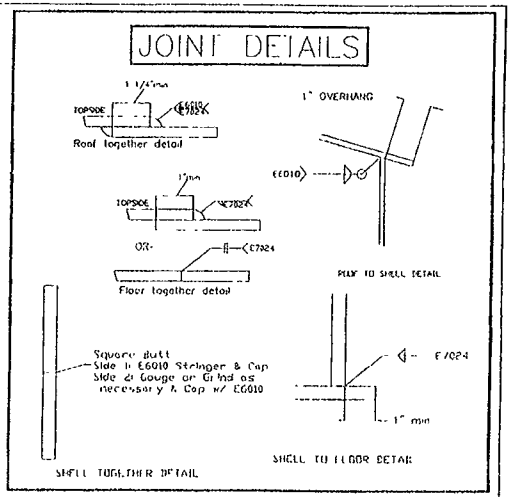


ELEVATION VIEW



ORIENTATION VIEW

JOINT DETAILS



CONSTRUCTION NOTES:

ROOF FLAT Ø 15'-6"
ROOF PITCH (2.5:12) CONED 19°
SHELL RING 1-4, 2 SHEETS/RING 72" x 282 11/16 x 1/4" A36

ROOF FLAT Ø 15'-2"

COMPLETE TANK WEIGHT 18,000 LBS

ANGULAR CONVERSIONS
ARC LENGHTS (at shell O.D.)
45° = 5'-10 11/16"
67.5°= 8'-10"
90 = 11'-9 1/8"

TANK SCHEDULE *

1 30" FLANGED & HINGED MANWAY
2 30" x 30" ROOF HATCH
3 20" MUSHROOM-TYPE ROOF VENT
4 6" FLANGED INLET w/ FULL HEIGHT RISER & WELDED ST ELL
5 10" FULL LENGTH OVERFLOW w/ FLANGED FLAP VALVE
6 6" FLANGED OUTLET w/ DI FLG x FLARE 90 ELL
7 4" FLANGED DRAIN
8 BULLDOG STEEL FLOAT-TYPE LIQUID LEVEL INDICATOR
9 SELF ADHESIVE STRIP OF GRADUATIONS
10 (TWO) 1" THREADED COUPLINGS
11 WELDED STEEL CAGED LADDER - RETRACTABLE
12 CABLE-TYPE FALL PROTECTION SYSTEM - GALVANIZED
13 12'9" x 15" TALL x 1/4"THK STEEL REINFORCING RING GALVANIZED
14
15
16
17 (TWO) SIDE LIFT LUGS FOR UNLOADING AND WEIGHTING
18 (TWO) TOP LIFT LUGS FOR FINAL PLACING
19
20
21
22

ITEMS ROTATED FOR CLARITY

PAINT SCHEDULE

INSIDE: BLAST TO SSPC SP-10 "NEAR WHITE FINISH"
2-3 COATS TNEMEC SERIES 20 POTA-POX
MINIMUM TOTAL DRY FILM THICKNESS 10 MILS

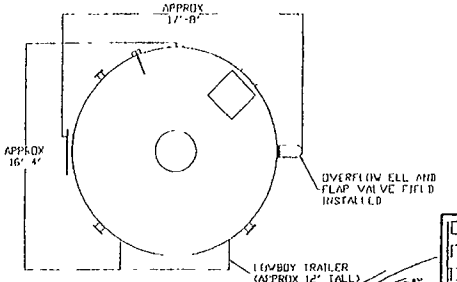
OUTSIDE: BLAST TO SSPC SP-6 "COMMERCIAL FINISH"
1 COAT TNEMEC SERIES 91H20 HYDROZINC
1-2 COAT(S) TNEMEC SERIES 20 POTA-POX
1 COAT TNEMEC SERIES 1075U ENDURASHIELD
MINIMUM TOTAL DRY FILM THICKNESS 8 MILS.
FINISH COLOR TO BE CHOSEN BY OWNER

FLOOR UNDERSIDE: ROLLED WITH ONE COAT OF COAL TAR EPOXY

MATERIAL SCHEDULE

ROOF	1/4" A36
SHELL	1/4" A36
FLOOR	1/4" A36

* ALL PIPING FLANGES ARE A105, 150#, RFSO UNO ALL FILLET WELDS ON TANK OPENINGS AND ATTACHMENTS ARE COMPLETE SEAL WELDS



SHIPPING DIMENSIONS

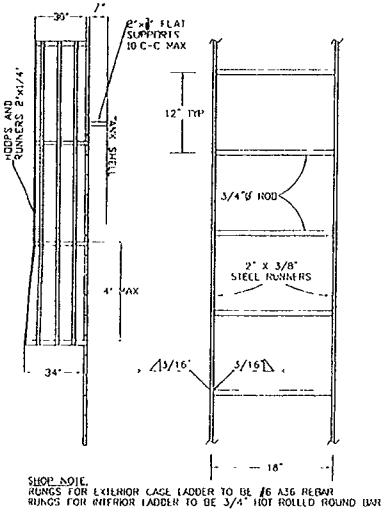
[redacted]

15'ø x 24' TALL / 30,000 GALLON CAPACITY

NOT TO SCALE
DRAWN SFG
10/10/18
JOB NO. [redacted]

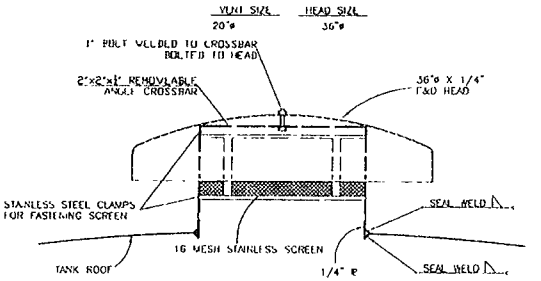
BULLDOG STEEL PRODUCTS, INC.
P O BOX 569 EAST I-20
CLYDE, TEXAS 79510 (325)893-5806

REV	DATE	DESCRIPTION
2	10/16/18	ISSUED FOR COMMENT
1	11/5/18	ISSUED FOR CONSTRUCTION

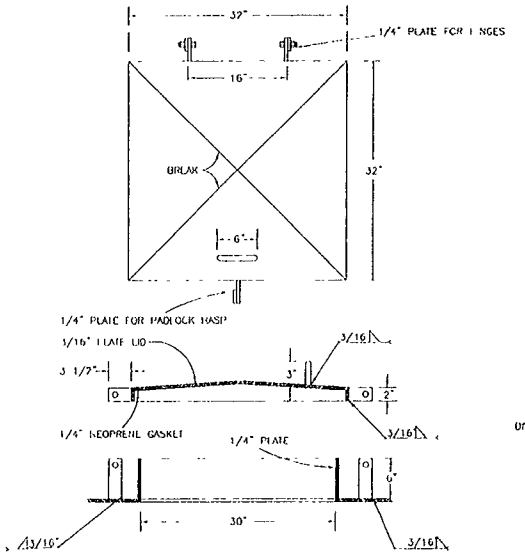


SHOP NOTE.
RUNGS FOR EXTERIOR CAGE LADDER TO BE #6 A36 REBAR
RUNGS FOR INTERIOR LADDER TO BE 3/4" HOT ROLLED ROUND BAR

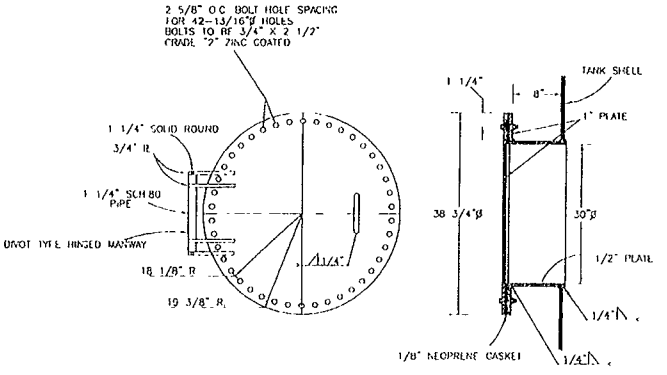
LADDER DETAILS



ROOF VENT DETAILS



30"X30" HATCH DETAILS



30"ø MANWAY DETAILS

BULLDOG STEEL PRODUCTS, INC
P O BOX 569 EAST I-20
CLYDE, TEXAS 79510 (325)893-5606

NOT TO SCALE

REVISIONS	DATE	COMMENTS

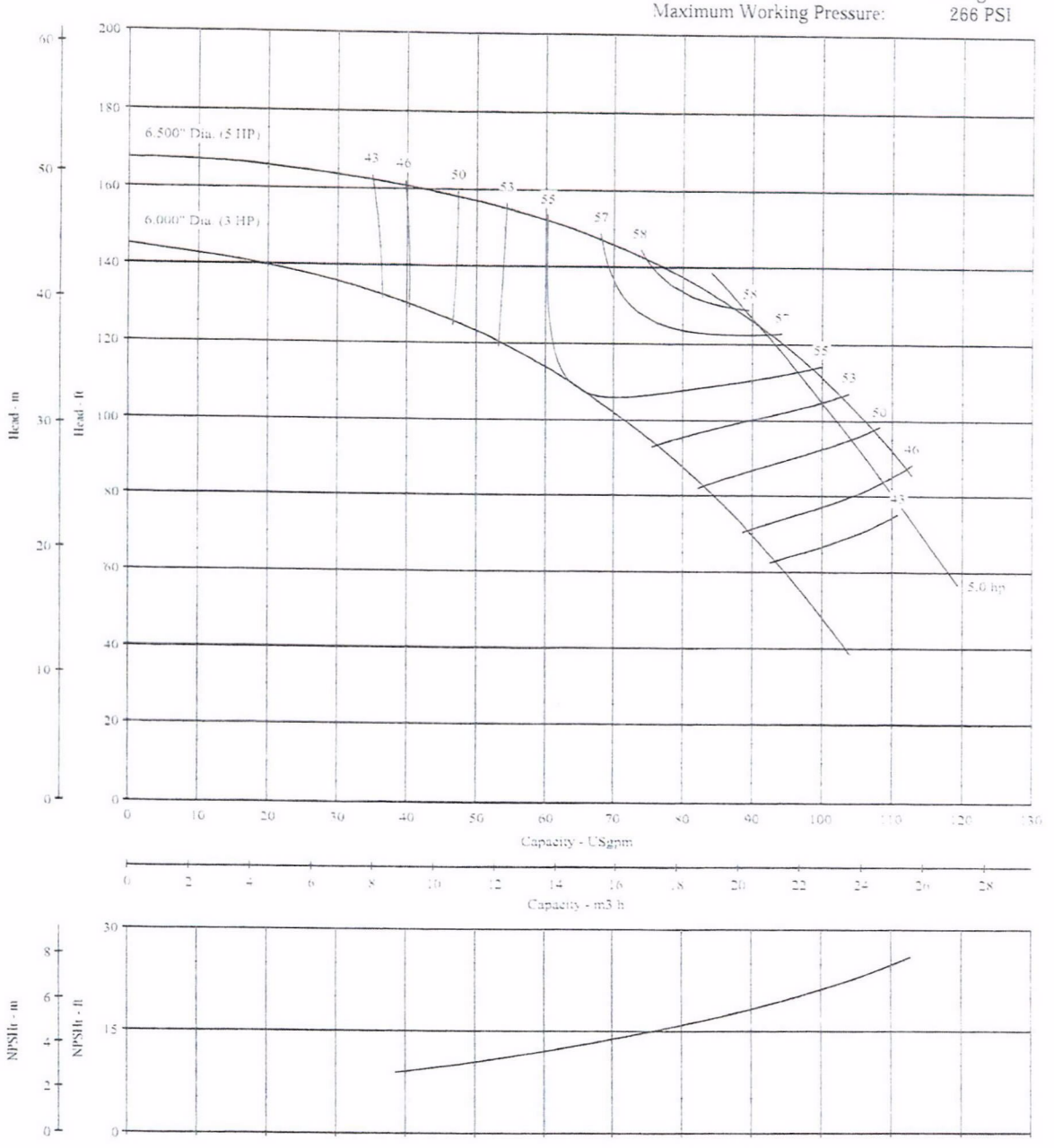
Pump Size: 1-1/2 x 2 x 6 L

Model: B1-1/2T_L

Curve No. 5035

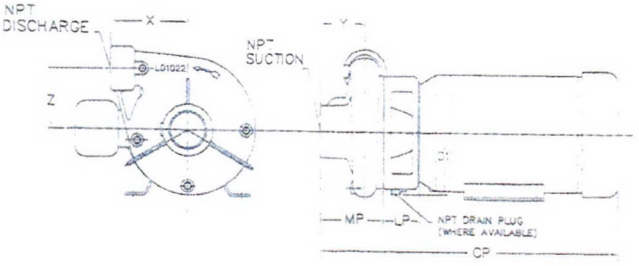
Type	CCMD	FM CPLG	FM BELT	SAE	Hydraulic	AC Engine
Model	B1-1/2TPL	B1-1/2TRLS	B1-1/2TRLS			

Nominal RPM: 3450
Based on Fresh Water@ 68 deg. F.
Maximum Working Pressure: 266 PSI

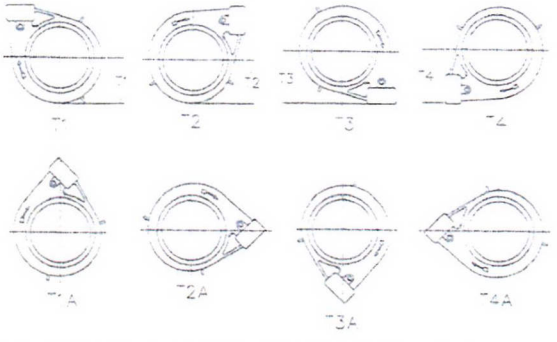


Motor Drive Dimensions

NPT (Threaded)



Volute Attachment Options



Note: Options T1A - T4A are rotated 45° from T1 - T4. Consult Factory for dimensions.

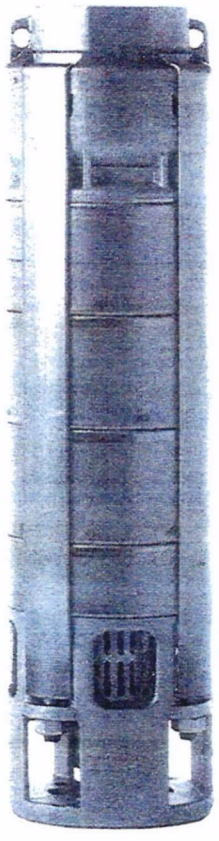
NPT (Threaded) – Single Stage

PUMP MODEL	SHAFT SEAL	RPM/ PHASE	FRAME GROUP*	SUCTION	DISCHARGE	X	Y	MP	LP	Z	T1	T2	T3	T4	D1†	CP (MAX)
B1WP	Packing	3600/1	C-1	1 1/2	1	5.00	2.50	4.19	5.44	4.12	4.94	4.94	5.00	5.06	5.25	23.80
						5.00	2.50	4.19	6.69	4.12	4.94	4.94	5.00	5.06		25.05
		3600/3	C-1	1 1/2	1	5.00	2.50	4.19	5.44	4.12	4.94	4.94	5.00	5.06	5.25	22.29
B1WPS	Mechanical	3600/1	C-1	1 1/2	1	5.00	2.50	4.19	2.38	4.12	4.94	4.94	5.00	5.06		20.74
		3600/3	C-1	1 1/2	1	5.00	2.50	4.19	2.38	4.12	4.94	4.94	5.00	5.06		19.23
B1-1/2TPL	Packing	3600/1	C-1	2	1-1/2	5.38	2.69	4.25	5.56	3.81	4.25	4.06	5.38	5.25		22.65
		3600/3	C-1	2	1-1/2	5.38	2.69	4.25	5.56	3.81	4.25	4.06	5.38	5.25		21.47
B1-1/2TPLS	Mechanical	3600/1	C-1	2	1-1/2	5.38	2.69	4.25	2.50	3.81	4.25	4.06	5.38	5.25		19.59
		3600/3	C-1	2	1-1/2	5.38	2.69	4.25	2.50	3.81	4.25	4.06	5.38	5.25		17.98
B1-1/2TPM	Packing	3600/1	C-1	2	1-1/2	5.38	2.69	4.25	6.56	3.81	4.25	4.06	5.38	5.25		26.48
						5.38	2.69	4.25	5.56	3.81	4.25	4.06	5.38	5.25		25.48
		3600/3	C-1	2	1-1/2	5.38	2.69	4.25	5.56	3.81	4.25	4.06	5.38	5.25		23.87
						5.38	2.69	4.25	5.56	3.81	4.25	4.06	5.38	5.25		24.87
B1-1/2TPMS	Mechanical	3600/1	C-1	2	1-1/2	5.38	2.69	4.25	2.50	3.81	4.25	4.06	5.38	5.25		22.42
		3600/3	C-1	2	1-1/2	5.38	2.69	4.25	2.50	3.81	4.25	4.06	5.38	5.25		20.81
B1-1/2ZPL	Packing	3600/1	C-1	2	1-1/2	5.38	2.88	4.50	6.69	5.06	5.06	5.94	5.38	6.25	5.25	26.86
		3600/3	C-1	2	1-1/2	5.38	2.88	4.50	5.44	5.06	5.06	5.94	5.38	6.25	5.25	25.50
B1-1/2ZPLS	Mechanical	3600/1	C-1	2	1-1/2	5.38	2.88	4.50	2.38	5.06	5.06	5.94	5.38	6.25		22.55
		3600/3	C-1	2	1-1/2	5.38	2.88	4.50	2.38	5.06	5.06	5.94	5.38	6.25		22.44
			C-2	2	2-1/2	5.38	2.88	4.50	3.75	5.06	5.06	5.94	5.38	6.25		25.42
B1-1/2ZPH	Packing	3600/3	C-1	2	1-1/2	5.38	2.88	4.50	6.69	5.06	5.06	5.94	5.38	6.25		26.75
			C-2	2	1-1/2	5.38	2.88	4.50	6.69	5.06	5.06	5.94	5.38	6.25		30.11
B1-1/2ZPHS	Mechanical	3600/3	C-1	2	1-1/2	5.38	2.88	4.50	2.38	5.06	5.06	5.94	5.38	6.25		22.44
			C-2	2	1-1/2	5.38	2.88	4.50	3.75	5.06	5.06	5.94	5.38	6.25		25.17
		1800/1	C-1	2	1-1/2	5.38	2.88	4.50	2.38	5.06	5.06	5.94	5.38	6.25		20.22
		1801/3	C-1	2	1-1/2	5.38	2.88	4.50	2.38	5.06	5.06	5.94	5.38	6.25		18.11
B1-1/2EPL	Packing	3600/3	C-2	2	1-1/2	6.50	2.63	4.19	6.25	5.69	6.19	6.63	6.50	6.94		29.36
B1-1/2EPLS	Mechanical	3600/3	C-2	2	1-1/2	6.50	2.63	4.19	3.38	5.69	6.19	6.63	6.50	6.94		26.49

NPT (Threaded) – Two Stage

PUMP MODEL	SHAFT SEAL	RPM/ PHASE	FRAME GROUP*	SUCTION	DISCHARGE	X	Y	MP	LP	Z	T1	T2	T3	T4	D1†	CP (MAX)
B1-1/2WP2S	Mechanical	3600 / 1	C-1	2	1-1/2	NA	1.78	6.13	3.69	7.44	NA	NA	NA	NA		23.50
						NA	1.78	6.13	3.69	7.44	NA	NA	NA	NA		24.63
		3600 / 3	C-1	2	1-1/2	NA	1.78	6.13	3.69	7.44	NA	NA	NA	NA		21.94
						NA	1.78	6.13	3.69	7.44	NA	NA	NA	NA		23.76
						NA	1.78	6.13	3.69	7.44	NA	NA	NA	NA		23.76

*See Motor Frame Size Chart.
† If Dimension "D1" is not referenced, no drain connection is available.



TECHNICAL BROCHURE
B50-320L R7

50L, 65L, 95L, 120L, 160L, 250L, 320L

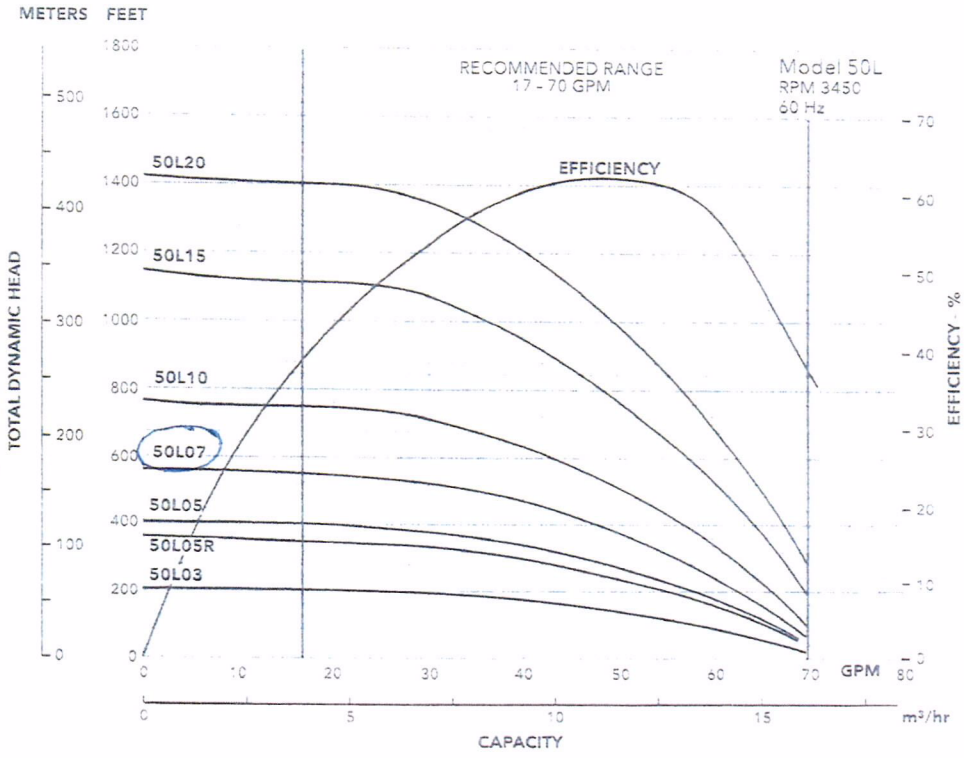
6" Stainless Steel Submersible Pumps

60 HZ HIGH CAPACITY - FOR 6" AND LARGER WELLS

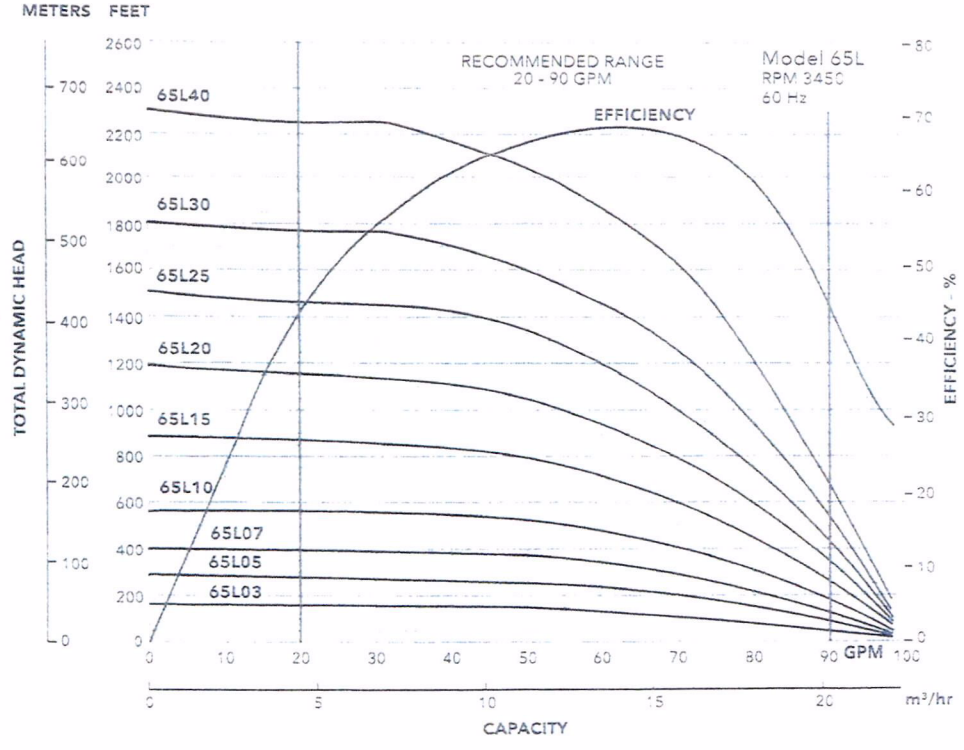
GOULDS

a xylem brand

MODEL 50L



MODEL 65L



FEATURES

Powered for Continuous Operation: All ratings are within the working limits of the motor. Pump can be operated continuously.

New Design Features: Cast 304 SS discharge head and motor adapter.

Field Serviceable: Easy to install and service. All parts easily dismantled if field service is ever necessary.

Diverse Application: Designed for commercial, municipal and agricultural water needs.

Stainless Steel Construction: Durable in most waters.

Bearings: Replaceable, silicon carbide bearings allow excellent abrasives handling and wear resistance.

Built-in Check Valve: Positive sealing, stainless steel check valve assembly incorporated into discharge head.

Impellers: New stainless steel impeller design provides improved efficiency.

Maximum Temperature: 140°F (60°C) for pump.

Four-Fluted Shaft Design: Four sided stainless steel shaft eliminates impeller keys and provides positive drive.

Coupling: Removable heavy duty stainless steel, splined coupling for maximum load-carrying capability

Suction Strainer: Stainless steel strainer restricts gravel and other debris from entering the pump.

Cable Guard: Stainless steel cable guard surrounds and protects motor leads.

Fasteners: All fasteners are stainless steel.

CentriPro Motors: Designed to NEMA standards. Stainless steel casing resists corrosion. Water filled design provides a constant supply of lubrication. Hermetically sealed stator assures moisture free windings. Durable Kingsbury type thrust bearing absorbs all thrust. Replaceable motor lead assembly.

Certified to NSF/ANSI 61, Annex G.

SPECIFICATIONS

Model	Horsepower Range	Discharge Connection	Recommended GPM Operating Range	GPM at Best Efficiency	Minimum* Well Size	Rotation at Discharge End
50L	3 - 20	3" NPT	17 - 70	50	6" / 8" *	CCW
65L	3 - 40		20 - 90	65		
95L	5 - 40		25 - 130	90		
120L	5 - 50		40 - 170	120		
160L	3 - 60		50 - 240	160	8"	
250L	7.5 - 60		70 - 300	250		
320L	7.5 - 60	4" NPT	100 - 400	320		

* Minimum well size refers only to dimensional fit in a well. the specifier or installer must determine the minimum required well diameter that will insure an adequate supply of water to the pump and also properly cool the motor. See Water End Data Chart for specific diameter by model number.

AGENCY LISTINGS

NSF/ANSI 372 - Drinking Water System Components - Lead Content

CLASS 6853 01 - Low Lead Content Certification Program - - Plumbing Products

Pump/Water End - Drinking Water System Components - Certified to NSF/ANSI 61, Annex G

NSF/ANSI 61-G

MOTOR DATA

NOTE: 4" diameter motors are required for 3 and 5 HP "L" Series pumps.
4" or 6" diameter motors can be used for 7.5 HP "L" Series pumps. See Water End Data Chart.
6" diameter motors are required for 10 HP and larger "L" Series pumps.

CENTRIPRO 4" MOTORS

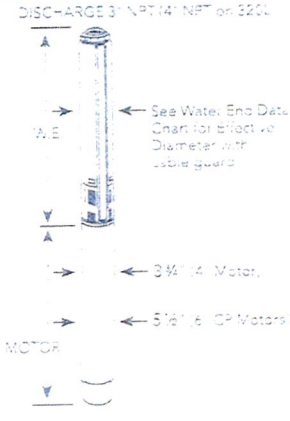
Single Phase Motors - Dimensions and Weights					
Motor Order No.	HP	Motor Dia.	Volts	Length in. (mm)	Weight lbs. (Kg)
M30412	3	4"	230	18.3 (466)	40 (18.1)
M50412	5			27.7 (703)	70 (31.8)
Three Phase Motors - Dimensions and Weights					
M30430	3	4"	200	15.3 (389)	32 (14.5)
M30432			230		
M30434			460		
M50430	5	4"	200	21.7 (550)	55 (24.9)
M50432			230		
M50434			460		
M75430	7.5	4"	200	27.7 (703)	70 (31.8)
M75432			230		
M75434			460		

CENTRIPRO 6" MOTORS

Single Phase Motors - Dimensions and Weights					
Motor Order No.	HP	Motor Dia.	Volts	Length (inches)	Weight (lbs)
6M071	7.5	6"	230	29.9	128
6M101	10	6"	230		
6M151	15	6"	230	33.5	148
Three Phase Motors - Dimensions and Weights					
6M078	7.5	6"	200	24.8	99
6M072			230		
6M074			460		
6M108	10		200	27.0	110
6M102			230		
6M104			460		
6M158	15		200	29.9	128
6M152			230		
6M154			460		
6M208	20		200	31.5	137
6M202			230		
6M204			460		
6M258	25		200	36.2	161
6M252			230		
6M254			460		
6M308	30		200	38.2	176
6M302			230		
6M304			460		
6M404	40			40.6	187
66M504	50			41.7	198
86M504	50	6" x 8"		46.4	353

CENTRIPRO FM-SERIES 6" MOTORS

Single Phase Motors Dimensions and Weights					
Motor Order No.	HP	Motor Dia.	Volts	Length (inches)	Weight (lbs)
6F051	5	6"	230	25.6	143
6F071	7.5			28.1	161
6F101	10			30.3	161
6F151	15			32.8	181
Three Phase Motors Dimensions and Weights					
6F058	5	6"	200-208	23.0	107.0
6F052			230		
6F054			460		
6F078	7.5		200-208	24.3	117.0
6F072			230		
6F074			460		
6F108	10		200-208	25.6	124.0
6F102			230		
6F104			460		
6F158	15		200-208	28.1	127.0
6F152			230		
6F154			460		
6F208	20		200-208	30.3	152.0
6F202			230		
6F204			460		
6F258	25		200-208	32.8	164.0
6F252			230		
6F254			460		
6F308	30		200-208	35.6	185.0
6F302			230		
6F304			460		
6F404	40		460	39.3	207.0
6F504	50		460	54.1	285.0

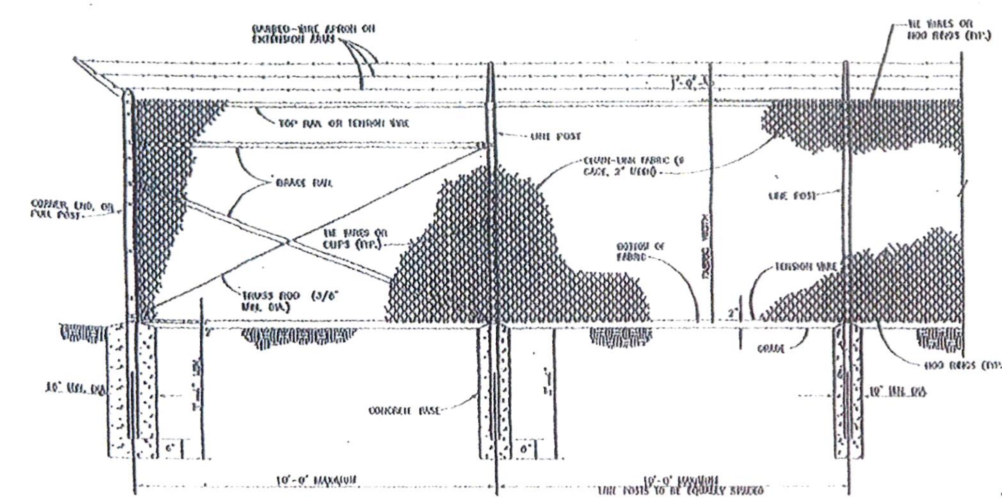


WATER END (PUMP) DATA

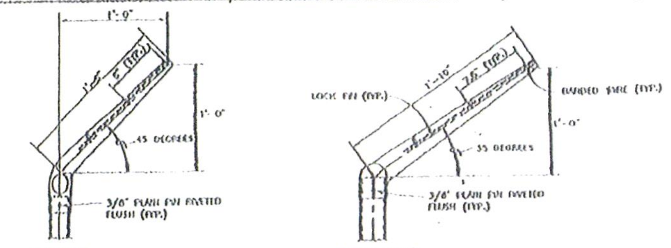
Model	Order No.	No. Stages	Min. HP Required	Required Motor Dia.	Dimensions & Weights					
					Length		Diameter		Weight	
					in.	mm	in.	mm	lbs.	kg.
50L	50L03	4	3	4	20.6	522	5.59	142	25	11
	50L05R**	7	5	4/6	25.8	656	5.67	144	35	16
	50L05**	8	5		27.8	706			40	18
	50L07**	11	7.5		33.3	844			49	22
	50L10	15	10	6	40.2	1020			57	26
	50L15	23	15		56.9	1446			82	37
	50L20	28	20		65.8	1670			94	43
65L	65L03	3	3	4	18.6	472	5.59	142	26	12
	65L05**	5	5	4/6	22.2	564	5.67	144	31	14
	65L07**	7	7.5		25.8	656			35	16
	65L10	10	10	6	31.3	794			44	20
	65L15	16	15		42.1	1070			60	27
	65L20	21	20		53.0	1346			75	34
	65L25	27	25		63.9	1622			90	41
	65L30*	32	30		98.7	2508	6.97*	177	220	100
	65L40*	41	40		115.0	2922			253	115
95L	95L05**	3	5	4/6	18.6	472	5.59	142	26	12
	95L07**	5	7.5		22.2	564	5.67	144	31	14
	95L10	7	10	6	25.8	656			35	16
	95L15	10	15		31.3	794			44	20
	95L20	14	20		38.5	978			53	24
	95L25	17	25		43.9	1116			62	28
	95L30	21	30		53.0	1346			75	34
	95L40*	28	40		67.3	1710	6.97*	177	156	71
120L	120L05**	2	5	4/6	16.8	426	5.59	142	22	10
	120L07**	3	7.5		19.5	495	5.67	144	26	12
	120L10	5	10	6	24.9	633			33	15
	120L15	7	15		30.4	772			40	18
	120L20	10	20		38.5	978			51	23
	120L25	12	25		43.9	1116			57	26
	120L30	15	30		52.1	1323			68	31
	120L40	20	40		65.7	1668			86	39
	120L50*	24	50		80.9	2055	6.97*	177	179	81
160L	160L03	1	3	4	14.5	367	5.59	142	18	8
	160L05**	2	5	4/6	17.2	436	5.67	144	22	10
	160L07**	3	7.5		19.9	505			26	12
	160L10	4	10	6	22.6	574			31	14
	160L15	6	15		28.0	712			37	17
	160L20	8	20		33.5	850			44	20
	160L25	9	25		36.2	919			46	21
	160L30	11	30		41.6	1057			53	24
	160L40	15	40		52.5	1333			66	31
	160L50	18	50		60.6	1540			77	35
	160L60	20	60		65.7	1668			86	39
250L	250L07**	2	7.5	4/6	20.8	528	5.67	144	26	12
	250L10	3	10	6	25.3	643			33	15
	250L15	5	15		34.4	873			44	20
	250L20	7	20		43.4	1103			55	25
	250L25	8	25		48.0	1218			60	27
	250L30	9	30		52.5	1333			66	30
	250L40	13	40		70.6	1793			88	40
	250L50	16	50		84.2	2138			104	47
	250L60	19	60		97.8	2484			128	58
320L	320L07**	2	7.5	4/6	21.8	553	5.67	144	27	12
	320L15	4	15	6	30.8	783			38	17
	320L20	5	20		35.4	898			45	20
	320L25	6	25		39.9	1013			50	22
	320L30	8	30		49.0	1243			61	27
	320L40	11	40		62.5	1588			78	35
	320L50	13	50		71.6	1818			89	40
	320L60	16	60		84.2	2138			104	47

* Note pump diameter - High pressure models have an exterior casing and larger diameters. Verify they w... ** Pump we...

** Pumps can be configured to accommodate a 4" or 6" motor. See product order code

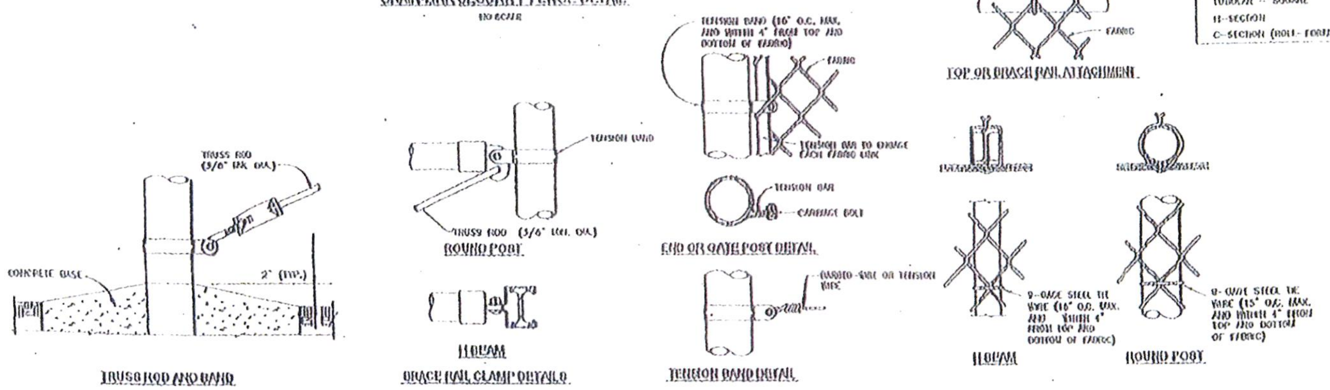


CHAIN-LINK SECURITY FENCE DETAIL
NO SCALE



EXTENSION ARM DETAILS
NO SCALE

USE AND SECTION	FABRIC LESS THAN 72"	FABRIC 72" TO 96"	FABRIC OVER 96"
STEEL POST SCHEDULE — MINIMUM OUTSIDE DIMENSIONS (NOMINAL)			
CORNER, END & PULL POSTS			
TUBULAR - ROUND	2.375" O.D.	2.875" O.D.	4.00" O.D.
TUBULAR - SQUARE	2.00" SQ.	2.50" SQ.	3.00" SQ.
C-SECTION (ROLL FORMED)	3.50" X 3.50"	3.50" X 3.50"	-------
LINE POSTS			
TUBULAR - ROUND	1.90" O.D.	2.375" O.D.	2.875" O.D.
H-SECTION	2.25" X 1.70"	2.25" X 1.70"	2.25" X 70"
C-SECTION (ROLL-FORMED)	1.875" X 1.625"	2.25" X 1.70"	-------
TOP, BOTTOM & BRACE RAILS			
TUBULAR - ROUND		1.66" O.D.	
TUBULAR - SQUARE		1.50" O.D.	
H-SECTION		1.626" X 1.60"	
C-SECTION (ROLL-FORMED)		1.625" X 1.25"	



FASTENING DETAILS
NO SCALE

NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION.

2. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE SECURE AREA.

3. UNLESS SPECIFICALLY SHOWN OR SPECIFIED, ALL FE6 FENCE SHALL HAVE AN APRON EXTENDED OUTWARD FROM THE AREA BEING PROTECTED.

4. C-SECTION POSTS SHALL BE INSTALLED SO THAT THE VOID INSIDE THE POST IS COMPLETELY FILLED WITH CONCRETE UP TO THE TOP OF THE FOUNDATION.

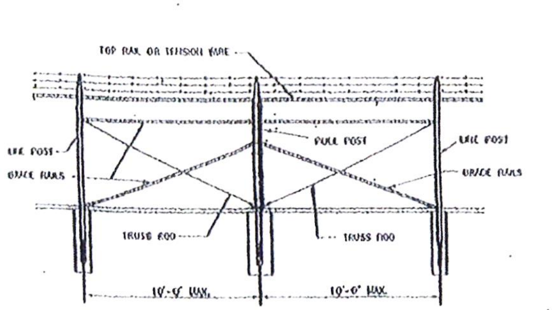
FENCE LEGEND:

TYPE FE5 - CHAIN-LINK FENCE WITHOUT BARBED-WIRE APRON
TYPE FE6 - CHAIN-LINK FENCE W/BARBED-WIRE ON SINGLE OUTRIGGER
TYPE FE7 - CHAIN-LINK FENCE W/BARBED WIRE ON DOUBLE OUTRIGGER
TYPE FE8 - CHAIN-LINK FENCE W/BARBED-WIRE AND BARBED-TAPE ON DOUBLE OUTRIGGER
TR - FENCE WITH TOP RAIL AND TENSION WIRE AT BOTTOM
TBR - FENCE WITH TOP AND BOTTOM RAILS
TWB - TENSION WIRE TOP AND BOTTOM
TWBR - FENCE WITH TOP TENSION WIRE AND BOTTOM RAIL
FINAL NUMBER IS FABRIC WIDTH IN INCHES.

EXAMPLES

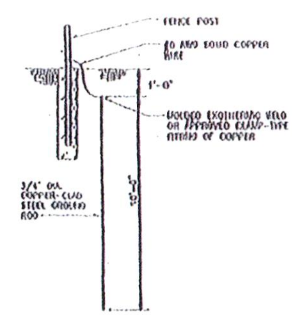
FE6-TR-72 - CHAIN-LINK SECURITY FENCE WITH BARBED-WIRE ON SINGLE OUTRIGGER, TOP RAIL, AND 72 INCH FABRIC WIDTH.

FE5-TWB-48 - CHAIN-LINK SECURITY FENCE WITH NO APRON, TOP AND BOTTOM TENSION WIRE, AND 48 INCH FABRIC WIDTH.



BRACE PANEL DETAIL
NO SCALE

NOTE:
PROVIDE BRACE PANEL WHENEVER STRAIGHT RUNS EXCEED 500 FEET.



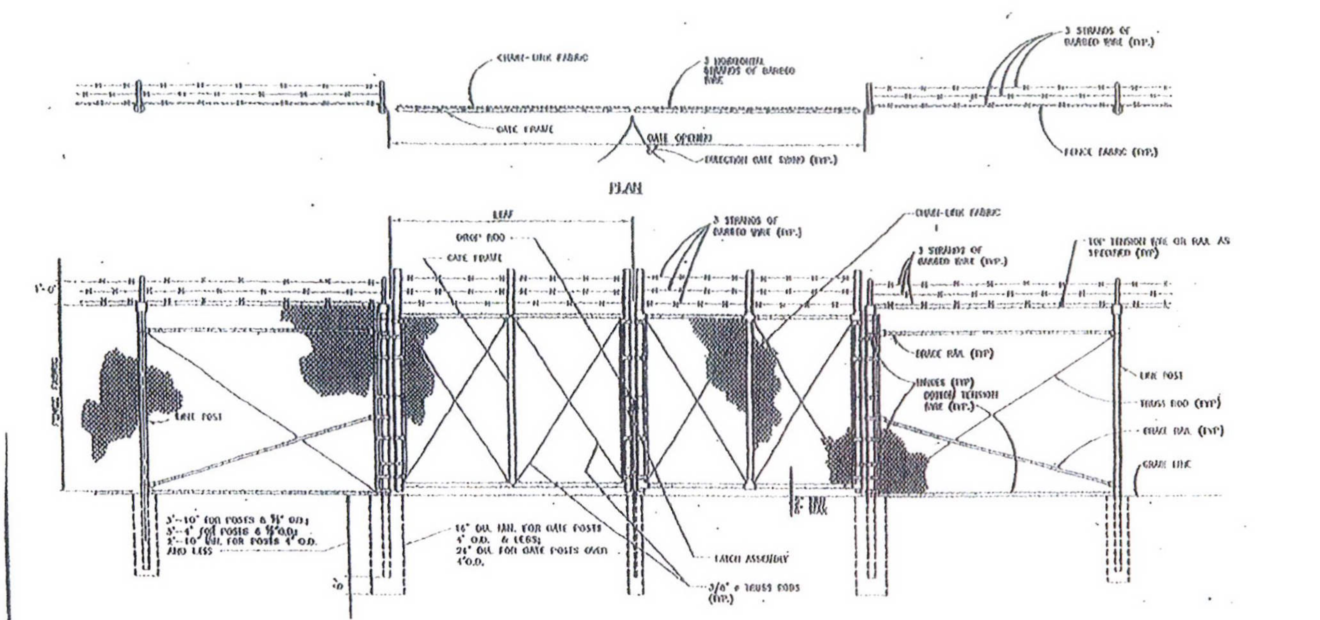
GROUNDING DETAIL
NO SCALE

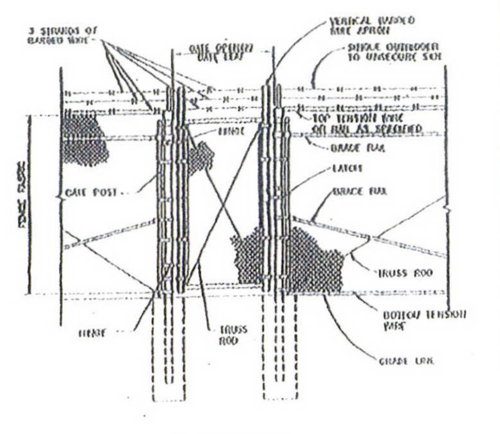
$$ - THINK VALUE ENGINEERING - $$

STANDARD DETAILS FOR CHAIN LINK SECURITY FENCES AND FARM STYLE FENCES

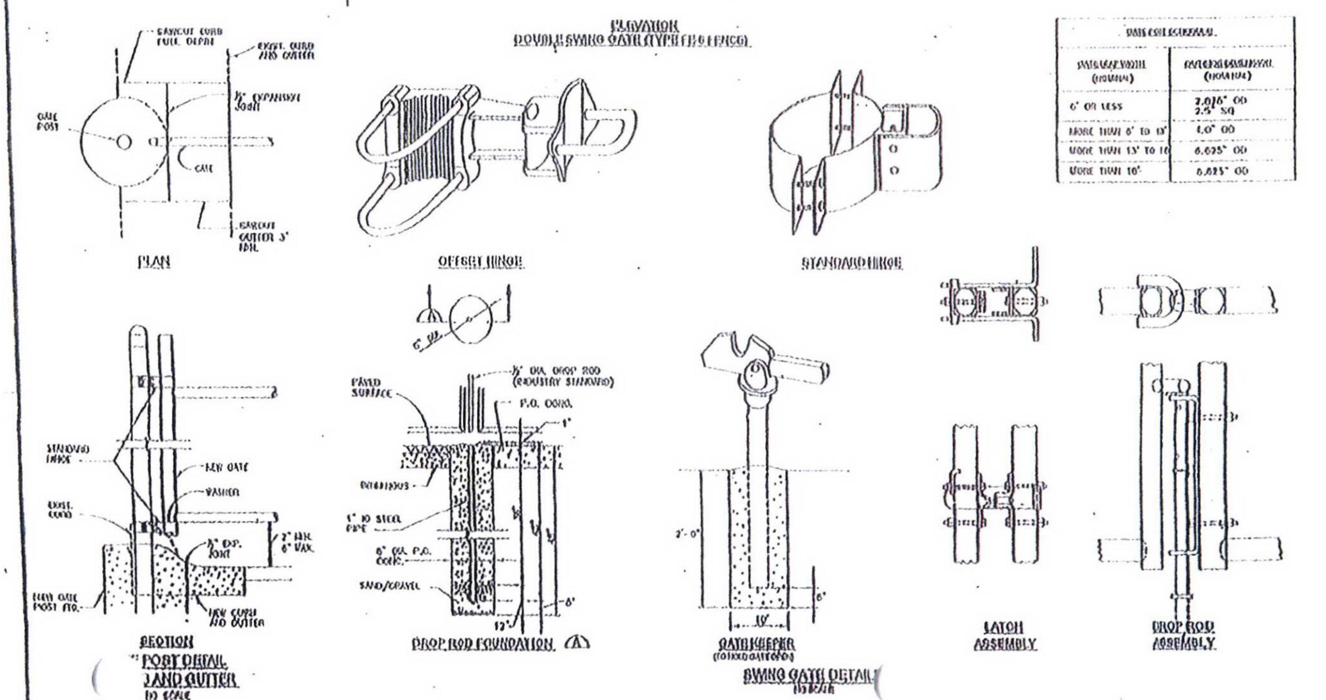
CHAIN-LINK SECURITY FENCE DETAILS

03





PERSONNEL GATE
TYPE FE-6 FENCE



GATE POST SCHEDULE	
GATE LEAF WIDTH (NOMINAL)	GATE POST DIMENSIONAL (NOMINAL)
6' OR LESS	2.875" OD 2.5" SQ
MORE THAN 6' TO 13'	4.0" OD
MORE THAN 13' TO 18'	6.625" OD
MORE THAN 18'	8.625" OD

NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPE OF FENCE SECTIONS AND METHODS OF INSTALLATION.

2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.

3. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.

4. GATES SHALL BE DESIGNATED AS FOLLOWS:

FENCE TYPE -- FE6, FE8, ETC.
FENCE HEIGHT -- INCHES
TYPE OPENING -- SG (SINGLE)
-- DG (DOUBLE)
HINGE -- SA (STANDARD)
-- HO (OFFSET)
OPENING -- FEET (CLEAR OPENING BETWEEN GATE POSTS)

EXAMPLES: FE6-84-DG-SA-24
FE5-46-SG-HO-6

$$ - THINK VALUE ENGINEERING - $$

Symbol	Description	Date	Approved

Designed by: X
Drawn by: X
Checked by: X
Reviewed by: X
Submitted by:

BASE NAME — BASE LOCATION

STANDARD DETAILS FOR CHAIN-LINK SECURITY FENCES AND FARM STYLE FENCES

CHAIN-LINK SECURITY FENCE
GATE DETAILS

08

SPEEDAIRE

OPERATING INSTRUCTIONS & PARTS MANUAL

COMPRESSOR PUMPS

MODELS 2Z498B, 4B244 AND 4B245

FORM 5S1185
02433
0395/036/VCPVP

READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Description

Speedaire compressor pumps are equipped with a solid cast iron cylinder and crankcase, an aluminum head and Swedish steel valves. Models 4B244 and 4B245 also include ball bearings, felt filter element and oil level dipstick.

Unpacking

When unpacking, inspect carefully for any damage that may have occurred during transit. Make sure any loose fittings, bolts, etc., are tightened before putting unit into service.

General Safety Information

Since the air compressor and other components (material pump, spray guns, filters, lubricators, hoses, etc.) used, make up a high pressure pumping system, the following safety precautions must be observed at all times:

1. Read all manuals included with this product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
2. Only persons well acquainted with these rules of safe operation should be allowed to use the compressor.

⚠ DANGER ⚠

Breathable Air Warning

This compressor/pump is not equipped and should not be used "as is" to supply breathing quality air. For any application of air for human consumption, the air compressor/pump will need to be fitted with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification G 7.1 -1966, OSHA 29 CFR 1910.134, and/or Canadian Standards Association (CSA).

DISCLAIMER OF WARRANTIES
In the event the compressor is used for the purpose of breathing air application and proper in-line safety and alarm equipment is not simultaneously used, existing warranties shall be voided, and Dayton Electric Mfg. Co. disclaims any liability whatsoever for any loss, personal injury or damage.

Specifications and Dimensions

MODEL	BORE & STROKE		DISCHARGE PIPE SIZE	CYL.	WEIGHT	MAX PSI	H	W	D	MOUNTING HOLES CENTER TO CENTER
2Z498B	2¾"	1½"	3/8"	1	21	125	9½	8¼	5¾	5⅛ x 3¾
4B244	2¾	1½	3/8	2	32	125	10½	6¾	11	5²⁵/₃₂ x 5⅞
4B245	2¾	2	3/8	2	33	125	10½	7½	11½	5¹⁵/₁₆ x 5⅞

Performance

MODEL	AT RUNNING MOTOR HP	PUMP RPM	OD OF 3450 RPM MOTOR SHEAVE, IN	MAXIMUM PSI	DISPLACEMENT CFM	FREE AIR CFM @ PSI 40	90
2Z498B	1/3	530	2.65	125	2.7	1.9	1.6
	1/2	640	3.25	125	3.3	2.4	2.0
	3/4	715	3.63	125	3.7	2.7	2.3
4B244	1	620	2.00	100	6.4	4.8	3.7
	1½	800	2.50	100	8.2	6.8	5.6
	2	955	2.95	125	9.8	8.1	6.6
4B245	3	955	2.95	125	13.1	10.5	9.2
	4	1030	3.15	125	14.1	11.2	9.6

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