



**Central States
Water Environment Association**

**Fox River Water
Reclamation District
Conversion to
Liquid Sodium Hypochlorite**

Presented by:
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July 31, 2008



Presentation Outline

Introduction



South Wastewater Treatment Plant

- Plant Description
- Existing Building & Tank
- Basis of Design
- Proposed Equipment

North Wastewater Treatment Plant

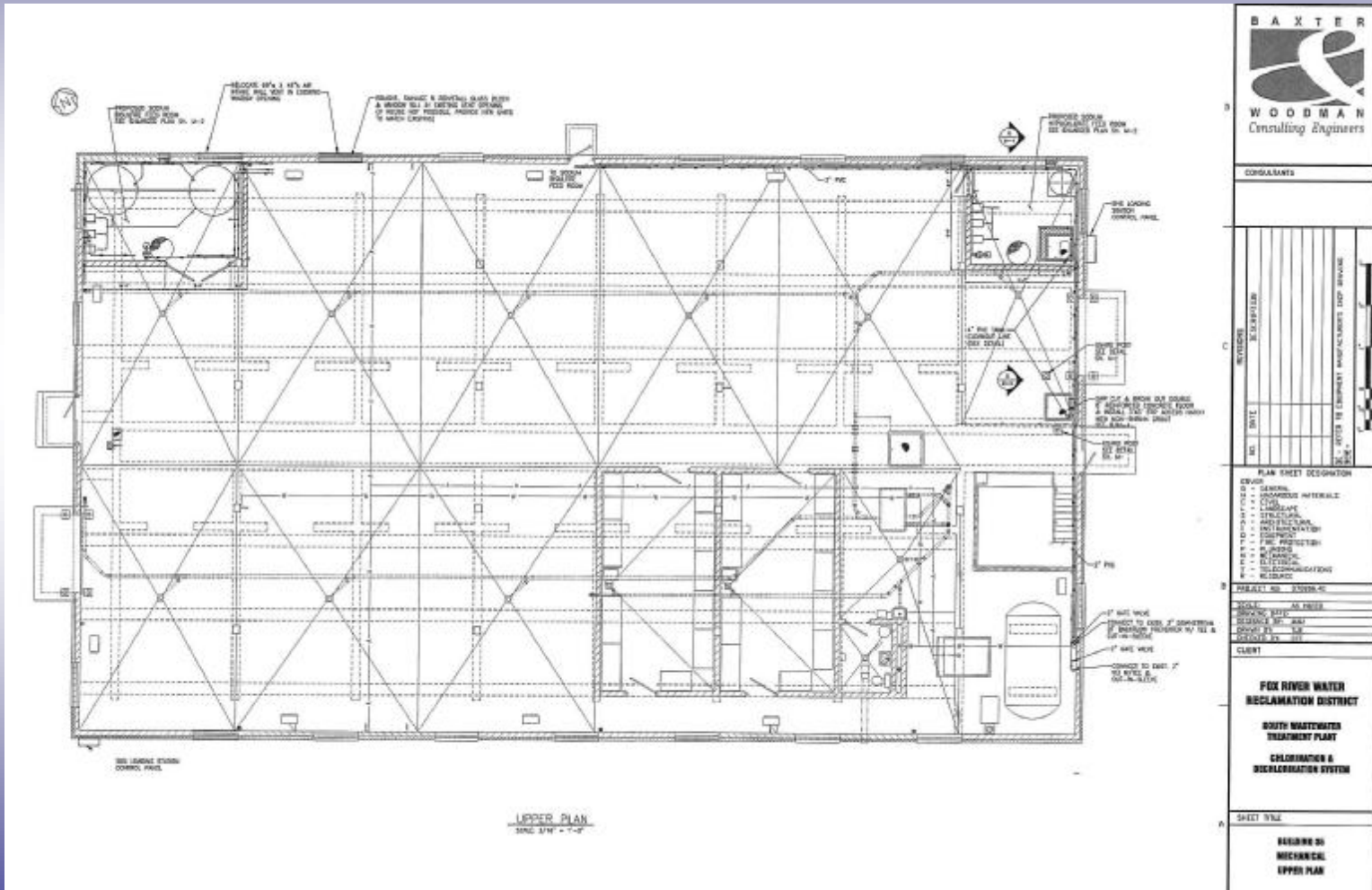
- Plant Description
- Basis of Design
- Proposed Equipment

Project Status

South Wastewater Treatment Plant



Existing Building 35



Basis of Design

Solution Weight (lbs/gal) = 8.33
Solution Strength (%) = 12
Available Chlorine Per Gallon of Solution (lbs/gal)¹ = 1.00

Complete Treatment Effluent

Minimum Complete Treatment Effluent Flow (mgd) = 5
Chlorine Dosage (mg/l) = 1.5
Minimum Chemical Solution Required (gpd) = 62.6
Minimum Chemical Solution Required (gph) = 2.61

Average Complete Treatment Effluent Flow (mgd) = 20
Chlorine Dosage (mg/l) = 1.5
Average Chemical Solution Required (gpd) = 250
Average Chemical Solution Required (gph) = 10.4

Peak Complete Treatment Effluent Flow (mgd) = 70
Chlorine Dosage (mg/l) = 6
Peak Chemical Solution Required (gpd) = 3,504
Peak Chemical Solution Required (gph) = 146

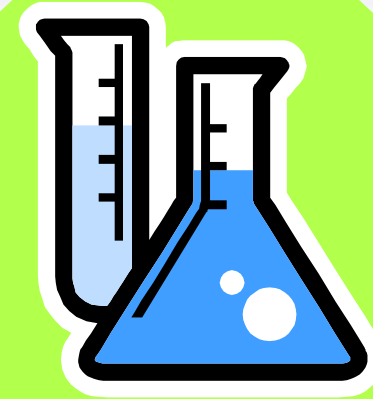
Excess Flow Effluent

Peak Excess Flow Effluent Flow (mgd) = 20
Chlorine Dosage (mg/l) = 20
Peak Chemical Solution Required (gpd) = 3337
Peak Chemical Solution Required (gph) = 139

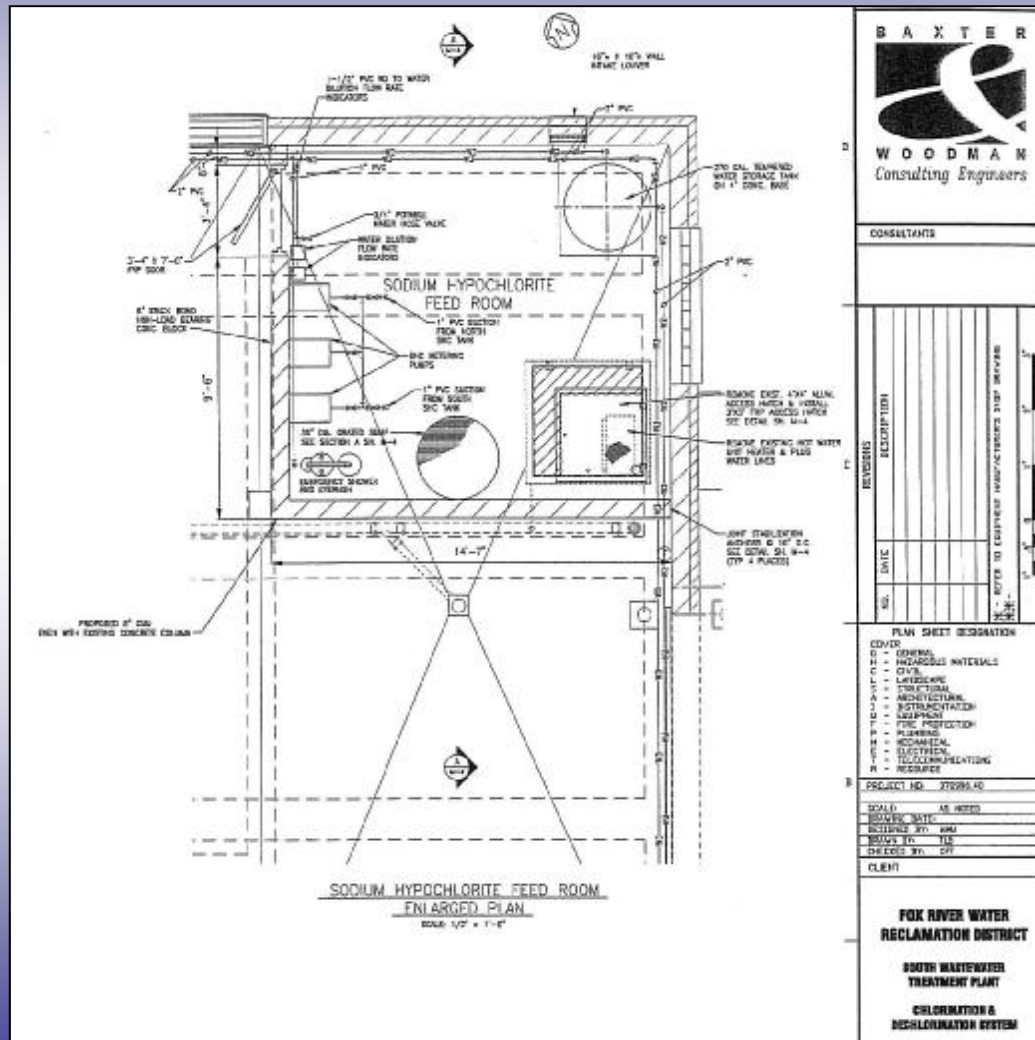
Chemical Storage Capacity

Proposed Storage Tank Capacity (gals) = 24,100
Storage Capacity for Total Peak Flow (days) = 6.88
Storage Capacity for Average Flow @ 1.5 mg/l Cl₂ (days) = 96

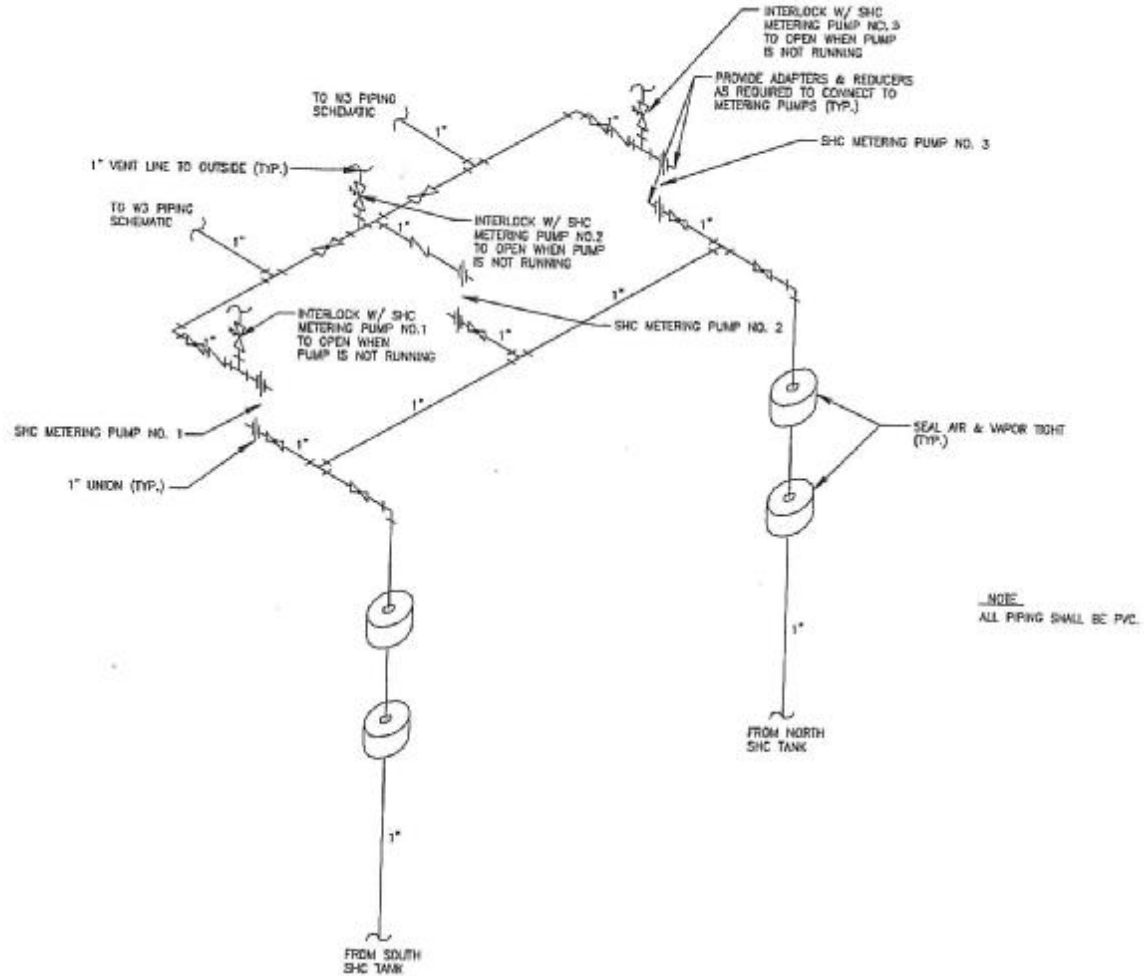
¹ Available Chlorine as used here does not refer to an actual chlorine content. It is a quantitative measure of the oxidizing power of sodium hypochlorite expressed in terms of elemental chlorine. A fresh batch of 15% NaOCl solution has 1.25 lbs. of "available chlorine" per gallon of solution. However, NaOCl solution deteriorates over time. The potency drops to about 0.66 lbs. of "available chlorine" per gallon after 90 days. We used 1.00 lbs. of "available chlorine" as the potency to compute the peak usage.



Proposed Sodium Hypochlorite Feed Room



Sodium Hypochlorite Piping Schematic



Peristaltic Metering Pump

620 LoadSure® Elements

Like the 520, the 620 offers LoadSure® element pumpheads for positive connection and error free tube loading. Both the 620RE two roller and 620RE4 four roller LoadSure® element pumpheads are capable of pressures to 60 psi and feature retractable rollers for SIP or CIP cleaning cycles through the pump. Industrial LoadSure® elements are available in 12mm and 17mm bore tubing with 3/4" Cam and Groove style connectors.



Choose two roller 620RE for maximum throughput. Choose four roller 620RE4 for low pulsation.

Continuous tubing pumphead

When pressures are less than 30 psi, the 620R pumphead allows continuous source to discharge tubing connection without in-line breaks or joints. 620R accepts four tube sizes in a wide range of materials from 6.4mm to 15.9 mm bore and 3.2mm wall thickness.



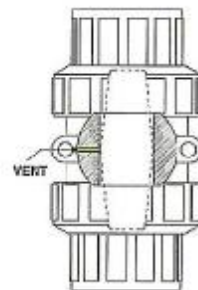
Vented PVC Ball Valve

An optional vent is added to all Trac Blue trunnion ball valves specified for bleach applications. Without a vent of some sort, sodium hypochlorite would be trapped inside the ball whenever it is in the closed position, and give off gas (outgas). In the majority of poorly sealing valves, this gas wouldn't be a problem...but due to the absolute bubble-tight seal of the Trac Blue ball valve, the trapped gas could eventually cause an explosion inside the ball.

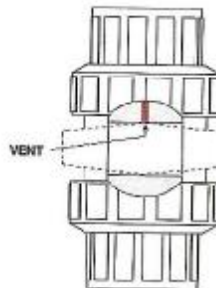
The vent is designed as a hole through the side of the ball. When turned to the closed position, the hole allows any liquid or gas in the ball to flow freely in and out of the ball. Thus the liquid remains in contact with the upstream side, or it simply vents away downstream, depending on which direction the valve is installed.

NOTE: Plast-O-Matic recommends that the valve be installed so that the vent is directed back upstream.

To specify the vent, and eliminate the possibility of an explosive headache, use option #Z-MBV-VENT

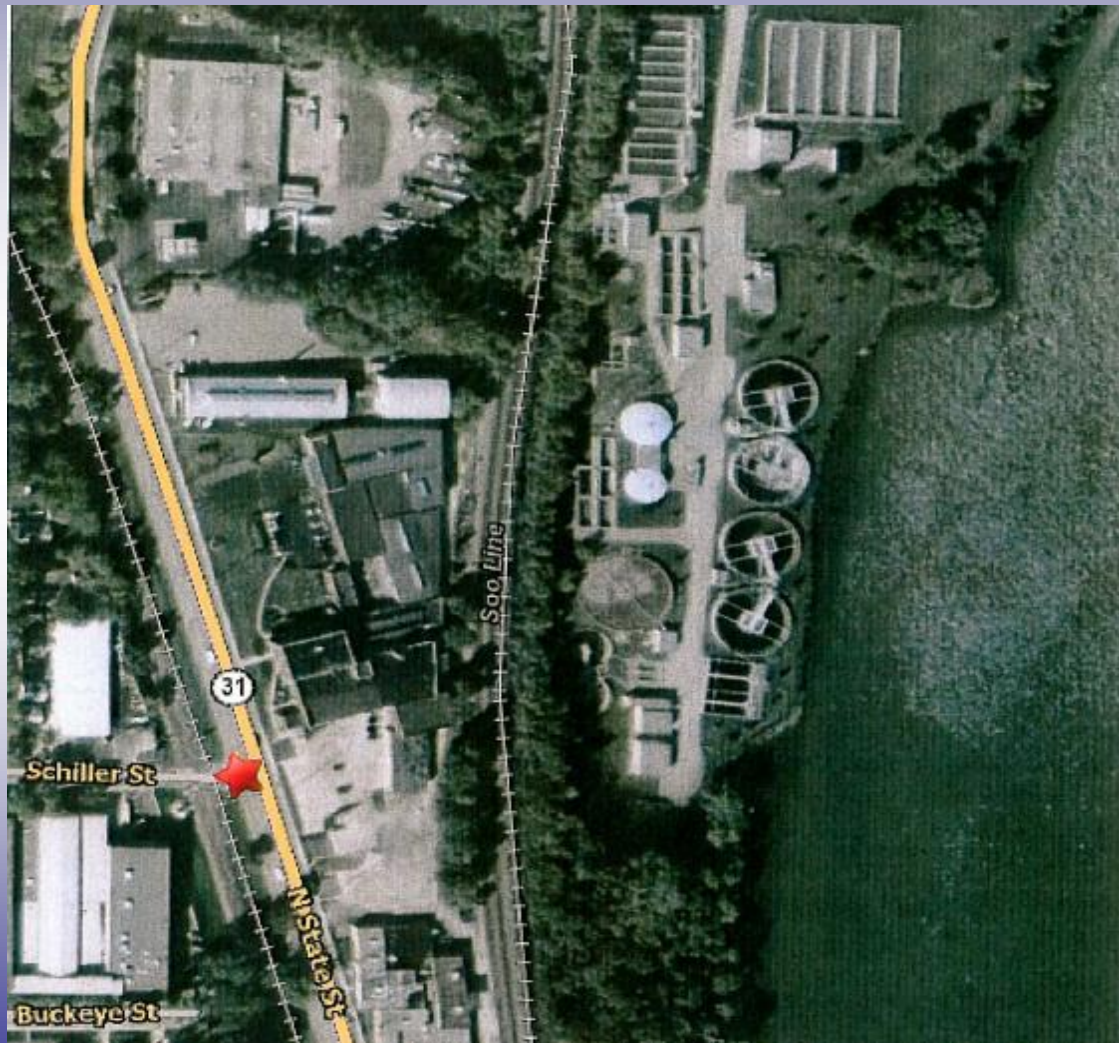


*This "top view" illustration shows the ball in the **open** position (the dashed line represents the handle) and shows the vent directed to the side. When open, the vent has no bearing on flow or performance.*



*This "top view" illustration shows the ball in the **closed** position (the dashed line represents the handle) and shows the vent directed to the process. This allows outgases to vent harmlessly away. We recommend that Plast-O-Matic vented ball valves be installed to vent back upstream.*

North Wastewater Treatment Plant



Basis of Design

Solution Weight (lbs/gal) = 8.33
Solution Strength (%) = 12
Available Chlorine Per Gallon of Solution (lbs/gal)¹ = 1.00

Complete Treatment Effluent

Minimum Complete Treatment Effluent Flow (mgd) = 1.3
Chlorine Dosage (mg/l) = 1.5
Minimum Chemical Solution Required (gpd) = 16.3
Minimum Chemical Solution Required (gph) = 0.68

Average Complete Treatment Effluent Flow (mgd) = 5.2
Chlorine Dosage (mg/l) = 1.5
Average Chemical Solution Required (gpd) = 65
Average Chemical Solution Required (gph) = 2.7

Peak Complete Treatment Effluent Flow (mgd) = 20
Chlorine Dosage (mg/l) = 6
Peak Chemical Solution Required (gpd) = 1,001
Peak Chemical Solution Required (gph) = 42

Excess Flow Effluent

Peak Excess Flow Effluent Flow (mgd) = 1
Chlorine Dosage (mg/l) = 20
Peak Chemical Solution Required (gpd) = 167
Peak Chemical Solution Required (gph) = 7

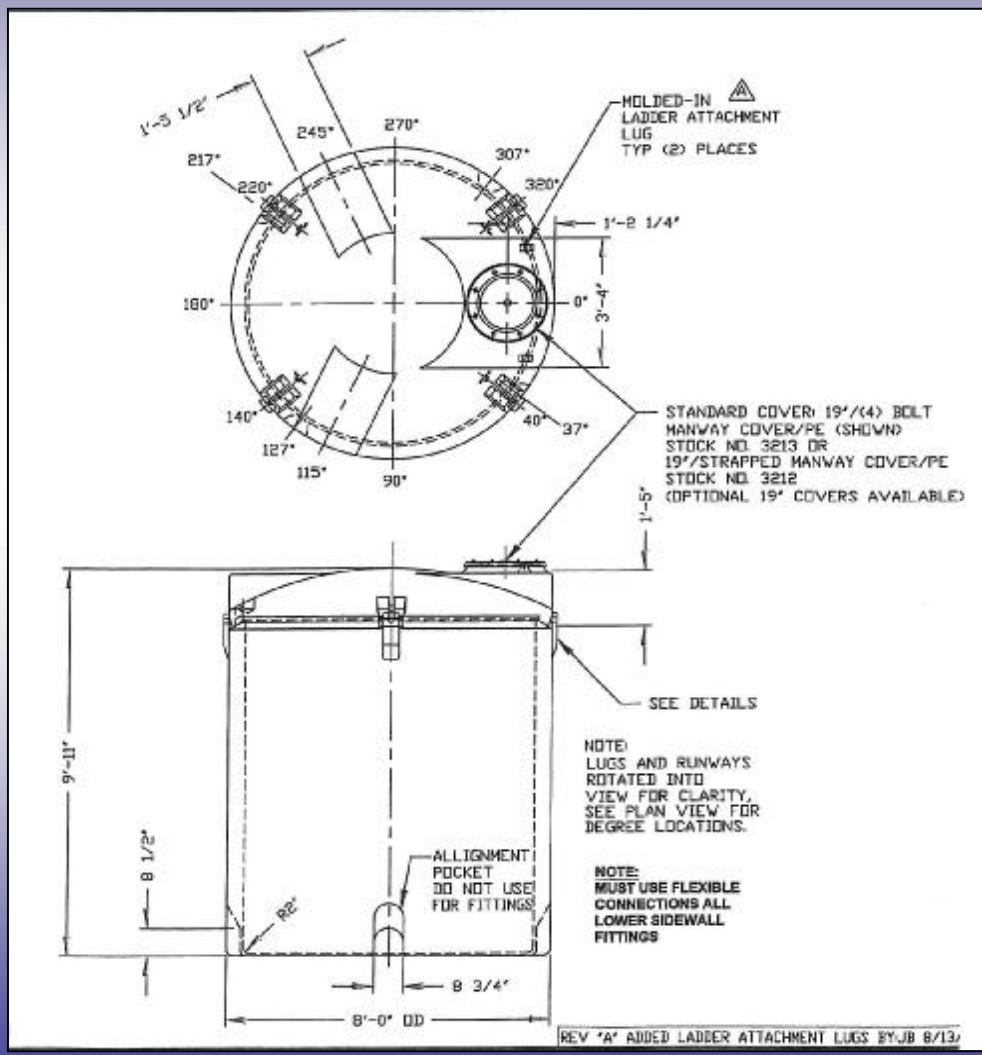
Chemical Storage Capacity

Proposed Storage Tank Capacity (gals) = 5,000
Storage Capacity for Total Peak Flow (days) = 4.28
Storage Capacity for Average Flow @ 1.5 mg/l Cl₂ (days) = 77

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Double Wall Storage Tank





**Central States
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**Questions
&
Answers**

