FORM EQP 5111 ATTACHMENT MODULE C2
TANK SYSTEMS

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) *Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities*. See Form EQP 5111 for details on how to use this attachment.

R 299.9615 and R 299.9627 of the administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); R 29.4101 to R 29.4505 promulgated pursuant to the provisions of the Michigan Fire Protection Act, PA 207, as amended (Act 207); and Title 40 of the Code of Federal Regulations (CFR) §§270.14(d), 270.16, 270.24, and 270.27 (Part 264, Subpart J and Part 60, Appendix A) establish requirements for tank systems. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application module addresses requirements for tank systems at the Dow Silicones Corporattion Facility in Midland, Michigan. This module includes assessments of new and existing tank systems; installation of new tank systems; secondary containment systems and release detection; variances for secondary containment; controls and practices to prevent spills and overfills; inspections; response to leaks or spills and disposition of leaking or unfit-for-use tank systems; closure and postclosure requirements; requirements for storing or treating ignitable, reactive, or incompatible wastes

This module is organized as follows:

(Check as appropriate)

☒ Existing Tank System

☐ New Tank System

This module is organized as follows:

C2.A ASSESSMENT OF EXISTING TANK SYSTEM
- C2.A.1 Design Standards
- C2.A.2 Dimensions and Capacity of Each Tank
- C2.A.3 Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls
  - C2.A.3(a) Feed Systems
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  - C2.A.3(c) Pressure Controls
- C2.A.4 Diagram of Piping, Instrumentation, and Process Flow
- C2.A.5 Characteristics of Waste
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C2.A ASSESSMENT OF EXISTING TANK SYSTEM

[R 299.9615(1) and 40 CFR, Part 264, Subpart J]

All the tanks located at the facility have secondary containment. This section describes the six hazardous waste storage tanks at this facility and the procedures used to prevent hazards. See Appendix C2-1 for complete drawings of these tanks and ancillary equipment. All six hazardous waste storage tanks at this facility were installed after July 14, 1986 and the assessment was done within 12 months of the date that the waste became a hazardous waste.

The written tank assessment for all the tanks located at the facility, reviewed and certified by an independent, qualified, registered professional engineer, attesting that the hazardous waste storage tank systems installed at this facility have sufficient structural integrity and are acceptable for the storage of hazardous wastes was provided to the State of Michigan on November 20, 1989. Appendix C2-2 contains excerpts of the tank assessment. This assessment is kept at the facility and includes the following information:

1. The relevant design standards to which the tanks and ancillary equipment were constructed;
2. The hazardous characteristics of the wastes stored in the tanks;
3. The design considerations used to ensure that the tank foundations will withstand the weight of the fully loaded tanks and the forces of frost heave.

The tanks are not installed in a seismic fault zone or in a saturated zone. The tanks are not installed underground, so requirement for a determination of their ability to withstand the forces of vehicular traffic does not apply.

C2.A.1 Design Standards

[R 299.9615 \(1) and 40 CFR §264.191(b)(1)]

Design standards of the tanks and ancillary equipment are provided in the drawings included in Appendix C2-1.

C2.A.2 Dimensions and Capacity of Each Tank

[R 299.9615(1) and 40 CFR §270.16(b)]

The maximum capacities of each of the six hazardous waste storage tanks (Tank Numbers 19781, 19782, 19783, 19784, 19785 and 19786) are designed to be 10,000 gallons each. See Appendix C2-1 for complete information and drawings on the dimensions and capacities of the licensed facility hazardous waste storage tanks.

C2.A.3 Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls

[R 299.9615(1) and 40 CFR §270.16(c)]

C2.A.3(a) Feed Systems
[R 299.9615(1) and 40 CFR §270.16(c)]

See Appendix C2-1 for complete information and drawings on the feed systems, safety cutoff, bypass systems, and pressure controls of the licensed facility hazardous waste storage tanks.

C2.A.3(b) Safety Cutoff or Bypass Systems
[R 299.9615(1) and 40 CFR §270.16(c)]

See Appendix C2-1 for complete information and drawings on the feed systems, safety cutoff, bypass systems, and pressure controls of the licensed facility hazardous waste storage tanks.

C2.A.3(c) Pressure Controls
[R 299.9615(1) and 40 CFR §270.16(c)]

See Appendix C2-1 for complete information and drawings on the feed systems, safety cutoff, bypass systems, and pressure controls of the licensed facility hazardous waste storage tanks.

C2.A.4 Diagram of Piping, Instrumentation, and Process Flow
[R 299.9615(1) and 40 CFR §270.16(c)]

See Appendix C2-1 for complete information and drawings on the piping and instrumentation of the licensed facility hazardous waste storage tanks. There is no processing conducted in the facility tanks.

C2.A.5 Characteristics of Waste
[R 299.9615(1) and 40 CFR §264.191(b)(2)]

See Module A2 (Chemical and Physical Analyses), Module A3 (Waste Analysis Plan), and Appendix C2-2 for a description of the wastes handled at the facility and the tank assessment.

C2.A.6 Existing Corrosion Protection Measures
[R 299.9615(1) and 40 CFR §264.191(b)(3)]

(Check as appropriate)

External corrosion protection required:

☐ External shell of metal tank will be in contact with soil or water.

☐ Any external metal components of the tank system will be in contact with soil or water.

The characteristics of tank construction and lining materials for all tanks are compatible with stored materials and hazardous wastes to reduce the effects of tank corrosion and

erosion. All the tanks at the Dow Silicones Facility are fixed roof tanks and therefore water does not come in contact with the materials stored in the tank. All tanks, ancillary equipment and piping were surface prepared by sandblasting and then coated with a primer (0.003" thick), an intermediate coat (0.005" thick) and a finish coat (0.003" thick) to protect against external corrosion.

C2.A.7 Documented Age of Tank System
[R 299.9615(1) and 40 CFR §264.191(b)(4)]

The hazardous waste storage tanks were installed in 1989, with completion of installation certified on November 22, 1989 by a registered professional engineer. These tanks are therefore subject to the requirements of 40 CFR 264.193(a)(3) for secondary containment.

C2.A.8 Leak Tests, Inspections, and Other Examinations
[R 299.9615(1) and 40 CFR §264.191(b)(5)]

Leak tests are not performed. See Module A5 (Inspection Schedules) and Appendix A5-1 for details.

C2.A.8(a) Nonenterable Underground Tanks
[R 299.9615(1) and 40 CFR §264.191(b)(5)(i)]

There are no non-enterable underground tanks at the Dow Silicones facility.

C2.A.8(b) Other than Nonenterable Underground Tanks and for Ancillary Equipment
[R 299.9615(1) and 40 CFR §264.191(b)(5)(ii)]

There are no underground tanks (non-enterable or otherwise) at the Dow Silicones facility.

C2.A.8(c) Internal Inspections
[R 299.9615(1) and 40 CFR §264.191(b)(5)(ii)]

See Module A5 (Inspection Schedules) and Appendix A5-1.

C2.A.9 Ancillary Equipment Assessment
[{ 299.9615(1) and 40 CFR §264.191(b)(5)(ii)]

Each tank has its own pipeline with fittings and valves properly labeled, and is provided with one or more of the following equipment and devices for monitoring and controlling safety cut-off during material flows: level switch, pneumatic activated valve with manual override and limit switches, manual valve, and solenoid valve.

All ancillary equipment to the hazardous waste storage tanks is located either within the 806 tank farm secondary containment dike or within the secondary containment provided for the tanker and container loading/unloading areas immediately adjacent to the 806

tank farm. The loading/unloading areas drain to the spill pond, as does the tank farm. Adequate containment for ancillary equipment is therefore provided. Leak detection for the ancillary equipment is provided by visual inspection by facility personnel. This consists of both a regular daily inspection and visual observation during all waste transfer operations.

C2.A.10 Leaking or Unfit-for-Use Tank Systems
[R 299.9615(1) and 40 CFR §264.191(b)(5)(ii)]

During an inspection of the facility, if a tank holding hazardous waste is found to be in poor condition (such as apparent structural defects or evident corrosion and leakage), the hazardous waste will be transferred to another tank in good condition. If the inspection identifies an unsatisfactory condition, such as an actual release or the potential for release, remedial actions as specified in Module A7 (Contingency Plan) will be promptly implemented.

C2.A.11 Tank Labels
[R 299.9615 (5)]

The tank systems are labeled in accordance with the NFPA Standard No. 704.

C2.B ASSESSMENT OF NEW TANK SYSTEM
[R 299.9615(1) and 40 CFR §264.192]

No new tanks have been installed at the facility since the last permit modification application was prepared and submitted.

C2.C INSTALLATION OF NEW TANK SYSTEMS
[R 299.9615(1) and 40 CFR §§264.192(b) through (g)]

No new tanks have been installed at the facility since the last permit modification application was prepared and submitted. There are no plans for installation of additional tank systems in the future.

C2.D SECONDARY CONTAINMENT SYSTEMS AND RELEASE DETECTION
[R 299.9615(1) and 40 CFR §264.193(a)]

C2.D.1 Secondary Containment Implementation Schedule
[R 299.9615(1) and 40 CFR §264.193(a)]

Secondary containment for existing tanks has been implemented in accordance with the schedule established in 40 CFR 264.193(a).

C2.D.2 Secondary Containment Type and Performance Criteria
[R 299.9615(1) and 40 CFR §264.193(b)]

(Check all that apply):

☐ *Liner external to the tank*

☐ *Vault*

☐ *Double-walled tank*

☒ *Device approved by the director*

C2.D.3 Design Parameters
[R 299.9615(1) and 40 CFR §264.193(c)]

The 806 tank farm is provided with a concrete dike and floor, with a containment trench around the inside of the containment area that serves as an external liner. A drawing showing the details of the design and construction of the tank farm secondary containment is provided in Appendix C2-1, "Tank Farm Slab and Foundation Plan' (drawing X1-60882).

The 806 tank farm secondary containment area is constructed of reinforced concrete and is sealed with a chemical resistant epoxy coating which is compatible with the waste stored in the tanks. This information is representative of the types of coatings used to coat and maintain secondary containment structures at this facility; other products of equivalent performance characteristics may be substituted.

The dike walls, floor, and trench are free from cracks and gaps and are designed to accumulate liquids draining from the two tanker loading areas to the east and west of the tank farm. The tank farm secondary containment drains to a round sump at the south end of the tank farm that is equipped with a pump for transferring accumulated liquids to the wastewater sewer. If accumulated liquids are not pumped out and the volume exceeds the capacity of the sump and tank farm secondary containment, overflow from the sump flows through a coated concrete trench to the spill pond. The spill pond drawing (Y1-35727) is provided as Appendix C1-2.

The total containment capacity of the spill pond is 106,000 gallons. The effective containment capacity after subtracting for rainwater accumulation from 24 hours of a 100-year storm event is 76,806 gallons. The required capacity for the 809 Building container storage area, which is also served by the spill pond, is 10% of its maximum storage of 85,000 gallons, or 8,500 gallons. Subtracting this from the spill pond capacity leaves 68,306 gallons, which is more than the entire capacity of all six tanks in the 806 tank farm. Adequate containment is therefore provided.

C2.D.3(a) Compatibility and Strength
[R 299.9615(1) and 40 CFR §264.193(c)(1)]

All the tanks located in the 806 tank farm are constructed of or lined with materials that

are compatible with the wastes(s) to be placed in the tank system and have sufficient strength and thickness to prevent failure. The 806 tank farm is provided with a concrete dike and floor, with a containment trench around the inside of the containment area that serves as an external liner.

C2.D.3(b) Foundation Integrity
[R 299.9615(1) and 40 CFR §264.193(c)(2)]

The design considerations of the hazardous waste storage tank systems installed at this facility ensure that the tank foundations will withstand the weight of the fully loaded tanks and the forces of frost heave. The tanks are not installed in a seismic fault zone or in a saturated zone.

C2.D.3(c) Leak Detection Capability
[R 299.9615(1) and 40 CFR §264.193(c)(3)]

Detection of releases is provided by visual inspection and by an audible overfill alarm. Facility personnel are present during all waste transfers and visually monitor the containers and tanks used in the transfer to ensure immediate detection of any hazardous condition. Facility tanks and ancillary equipment are inspected daily whenever hazardous wastes are present, to promptly detect any releases, or conditions that could lead to releases.

Containment of releases is provided by the 806 tank farm secondary containment dike and the spill pond.

C2.D.3(d) Adequate Drainage
[R 299.9615(1) and 40 CFR §264.193(c)(4)]

The 806 tank farm is provided with a concrete dike and floor, with a containment trench around the inside of the containment area that serves as an external liner. The tank farm secondary containment drains to a round sump at the south end of the tank farm that is equipped with a pump for transferring accumulated liquids to the wastewater sewer. If accumulated liquids are not pumped out and the volume exceeds the capacity of the sump and tank farm secondary containment, overflow from the sump flows through a coated concrete trench to the spill pond. Spilled or leaked waste and accumulated precipitation will be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and the environment.

C2.D.4 External Liner Requirements
[R 299.9615(1) and 40 CFR §264.193(e)(1)]

There are no external liners for the tanks at the facility.

C2.D.5 Vault systems Requirements
[R 299.9615(1) and 40 CFR §264.193(e)(2)]

There are no vaults associated with the Tank system.

C2.D.6 Double-walled Tank Requirements
[R 299.9615(1) and 40 CFR §264.193(e)(3)(i)]

There are no double-walled tanks at the facility.

C2.D.7 Ancillary Equipment with Secondary Containment
[R 299.9615(1) and 40 CFR §264.193 (f)]

See Appendix C2-1 for complete information and drawings on the piping and instrumentation of the hazardous waste storage tanks. There is no processing conducted in the tanks.

C2.D.7(a) Secondary Containment Type and Performance Criteria
[R 299.9615(1) and 40 CFR §264.193(f)]

All ancillary equipment to the hazardous waste storage tanks is located either within the 806 tank farm secondary containment dike or within the secondary containment provided for the tanker and container loading/unloading areas immediately adjacent to the 806 tank farm. The loading/unloading areas drain to the spill pond, as does the tank farm. Adequate containment for ancillary equipment is therefore provided. Leak detection for the ancillary equipment is provided by visual inspection by facility personnel. This consists of both a regular daily inspection and visual observation during all waste transfer operations.

C2.D.7(b) Design Parameters
[R 299.9615(1) and 40 CFR §264.193(f)]

All ancillary equipment to the hazardous waste storage tanks is located either within the 806 tank farm secondary containment dike or within the secondary containment provided for the tanker and container loading/unloading areas immediately adjacent to the 806 tank farm. All ancillary equipment at the facility are constructed of or lined with materials that are compatible with the wastes(s) to be placed in the tank system and have sufficient strength and thickness to prevent failure. Leak detection for the ancillary equipment is provided by visual inspection by facility personnel. The loading/unloading areas drain to the spill pond, as does the tank farm.

C2.D.7(c) Exempted Ancillary Equipment and Inspections
[R 299.9615(1) and 40 CFR §264.193(f)]

There is no ancillary equipment at the facility that would be exempt from the secondary containment requirement and the required daily inspections.

C2.D.8 Requirements for Tank Systems That Are Not in Compliance With Secondary Containment
[R 229.9615(2)]

All tanks that are used for storage at the facility have secondary containment structures. Concrete dike walls completely surround the treatment and storage tanks, providing secondary containment so as to be able to contain not less than 100% of the volume of the largest tank within the area. Therefore, requirements for secondary containment have been met and this section is not applicable.

C2.D.8(a) Aboveground Tanks
[R 229.9615(2)(a)]

Incompatible wastes are not mixed/stored in the hazardous waste storage tanks. Hazardous wastes are not placed in a tank that previously contained an incompatible waste, because each tank is dedicated to one type of waste. Aboveground tank systems that are used for the treatment of storage of liquid hazardous wastes, or hazardous wastes, which could generate free liquids during storage, are located in areas that are paved, diked, curbed, or otherwise structurally enclosed so as to be able to contain not less than 100 percent of the largest tank system within the enclosed area.

C2.D.8(b) Underground Tanks
[R 229.9615(2)(a)]

There are no underground storage tanks at the Dow Silicones facility; therefore, this section is not applicable.

C2.E VARIANCES FOR SECONDARY CONTAINMENT
[R 299.9615(1) and 40 CFR §264.193(g)]

(Check as appropriate)

☐ Technology-based Variance

☐ Risk-based Variance

There are no variances for secondary containment in accordance with R 299.9615(1) and 40 CFR §264.193(g) at the Dow Silicones facility.

C2.F CONTROLS AND PRACTICES TO PREVENT SPILLS AND OVERFILLS
[R 299.9615(1) and 40 CFR §264.194(b)]

C2.F.1 Spill Prevention Controls
[R 299.9615(1) and 40 CFR §264.194(b)]

All hazardous waste storage tanks are equipped with a high level (“High-High”) sensor with audible alarm. See Appendix C2-4, Tank Farm Standard Operating Procedures used at this facility to prevent spills and overflows at the 806 tank farm.

C2.F.2 Overfill Prevention Controls
[R 299.9615(1) and 40 CFR §264.194(b)]

All hazardous waste storage tanks are equipped with a high level (“High-High”) sensor

with audible alarm and automatic shutoffs to prevent overflow.

C2.F.3 Freeboard Maintenance
[R 299.9615(1) and 40 CFR §264.194(b)]

High-level sensors are set at a volume to maintain freeboard.

C2.G INSPECTIONS
[R 299.9615(1) and 40 CFR §264.195(a)]

See Module A5 (Inspection Schedules) and Appendix A5-1.

C2.G.1 Schedule and Procedures for Overfill Control System Inspections
[R 299.9615(1) and 40 CFR §264.195(a)]

Overfill control system is included as an appurtenance system to tanks and is inspected with each tank.

C2.G.2 Daily Inspections of Aboveground Portions of Tank Systems and Monitoring and Leak Detection Data
[R 299.9615(1) and 40 CFR §264.195(b)]

Leak detection is included as an appurtenance system to tanks and is inspected with each tank.

C2.G.3 Daily Inspection of Construction Materials, Local Areas, and Secondary Containment System for Erosion and Leakage
[R 299.9615(1) and 40 CFR §264.195(b)(3)]

Erosion and Leakage are included as an appurtenance system to tanks and is inspected with each tank.

C2.G.4 Inspection of Cathodic Protection Systems
[R 299.9615(1) and 40 CFR §264.195(c)]

Cathodic protection system is included as an appurtenance system to tanks and is inspected with each tank.

C2.G.5 Inspection Requirements before Full Secondary Containment is Provided
[R 299.9615(1) and 40 CFR §264.193(i)]

The secondary containment for the tanks are inspected daily for cracks and/or gaps and are described in Module A5 (Inspection Schedules) and Appendix A5-1.

C2.G.5(a) Nonenterable Underground Tanks
[R 299.9615(1) and 40 CFR §264.193(i)(1)]

There are no non-enterable underground storage tanks at the Dow Silicones facility, therefore, this section is not applicable.

C2.G.5(b) Other Than Nonenterable Underground Tanks
[R 299.9615(1) and 40 CFR §264.193(i)(2)]

There are no underground storage tanks (non-enterable or otherwise) at the Dow Silicones facility.

C2.G.5(c) Ancillary Equipment
[R 299.9615(1) and 40 CFR §264.193(i)(3)]

See Module A5 (Inspection Schedules) and Appendix A5-1 for ancillary equipment inspection schedule and procedures.

C2.G.6 Reporting Requirements
[R 299.9615(1) and 40 CFR §264.193(i)(4)]

All inspections will be documented in the Operating Record maintained by the facility operations manager at the compliance room and are also backed up electronically on a CD and archived at the facility (see Appendix A5-1 for documentation forms).

C2.H RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF LEAKING OR UNFIT-FOR-USE TANK SYSTEMS
[R 299.9615(1) and 40 CFR §264.196]

See Module A7 (Contingency Plan).

C2.H.1 Response Actions for Leaks and Spills
[R 299.9615(1) and 40 CFR §264.196(a)]

See Module A7 (Contingency Plan) for response actions to be taken for leaks or spills at the facility.

C2.H.1(a) Waste Flow Stoppage
[R 299.9615(1) and 40 CFR §264.196(a)]

See Module A7 (Contingency Plan) for information on waste flow stoppage during leaks or spills and/or disposition of leaking or unfit-for-use tank systems at the facility.

C2.H.1(b) Waste Removal
[R 299.9615(1) and 40 CFR §264.196(b)]

See Module A7 (Contingency Plan) for information on waste removal in situations where leaks or spills and/or disposition of leaking or unfit-for-use tank systems occur at the facility.

C2.H.1(c) Visible Release Containment
[R 299.9615(1) and 40 CFR §264.196(c)]

See Module A7 (Contingency Plan) for information on visible release containment.

C2.H.1(d) Repair, Replacement, or Closure
[R 299.9615(1) and 40 CFR §264.196(e)]

See Module A7 (Contingency Plan) for information on repair, replacement or closure for leaks or spills and/or disposition of leaking or unfit-for-use tank systems at the facility.

C2.H.1(e) Certification of Major Repairs
[R 299.9615(1) and 40 CFR §264.196(f)]

See Module A7 (Contingency Plan) for information on certification of repairs.

C2.H.2 Required Notifications and Reports
[R 299.9615(1) and 40 CFR §264.194(d)]

See Module A7 (Contingency Plan) for required notifications and reports when there are leaks or spills and/or disposition of leaking or unfit-for-use tank systems at the facility.

C2.I CLOSURE AND POST CLOSURE REQUIREMENTS
[R 299.9615(1) and 40 CFR §270.14(b)]

(Check as appropriate)

☒ Category A - *where decontamination is practical and secondary containment is provided*

☐ Category B - *where decontamination or removal is not practical and where secondary containment is provided and tank system will be closed as a landfill*

☐ Category C - *where decontamination is practical and where secondary containment is not provided*

☐ Category D - *where decontamination or removal is not practical, and where secondary containment is not provided, and tank system will be closed as a landfill*

C2.I.1 Category A
[R 299.9615(1) and 40 CFR §264.197]

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I.1(a) Closure Plan
[40 CFR §264.112, except 264.112(d)(1)]

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I.1(b) Closure Activities
[40 CFR §264.111 through 114 and R 299.9613(3)]

See Module A11 (Closure/Post-Closure Plan) for a detailed description of closure activities.

C2.I.1(c) Cost Estimate for Closure
[R 299.9702 and 40 CFR §264.142]

See Module A12 (Closure and Postclosure Care Cost Estimates) for details on the closure cost estimate.

C2.I.1(d) Financial Assurance for Closure
[R 299.9703 and 40 CFR §264.143]

See Module A14 (Liability Mechanism and Financial Assurance Instrument) for a copy of the financial assurance mechanism for closure and post-closure care of the regulated units (800/1000 Block Landfill, 806 Tank Farm and 809 Container Storage Building).

C2.J SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES
[R 299.9615(1) and 40 CFR §270.16(j)]

Ignitable and reactive wastes stored in the hazardous waste storage tanks at the 806 tank farm are protected from materials and conditions that could cause the wastes to

ignite or react. All wastes stored are ignitable and all six storage tanks are protected from static electricity buildup by being grounded and electrically bonded to ancillary equipment. All six tanks are also provided with nitrogen blanket systems that ensure the presence of an inert atmosphere in the headspace of the tank by excluding oxygen so that combustion cannot be supported.

The wastes stored in tanks 19784 and 19785 are water-reactive and are protected from atmospheric moisture by being blanketed with dry nitrogen gas. They are protected from precipitation because they are fixed roof tanks. Protection from mixing with waste streams containing water is ensured by Dow Silicones's materials characterization system that contains information on the constituents of all waste streams and the generating processes.

All six hazardous waste storage tanks are located more than 1,000 feet from the nearest property line, as shown on Midland Location Plot Plan, located in Appendix A1-1 in Module A1 (General Facility Description).

C2.J.1 Ignitable or Reactive Wastes Precautions
[R 299.9615(1) and 40 CFR §264.198]

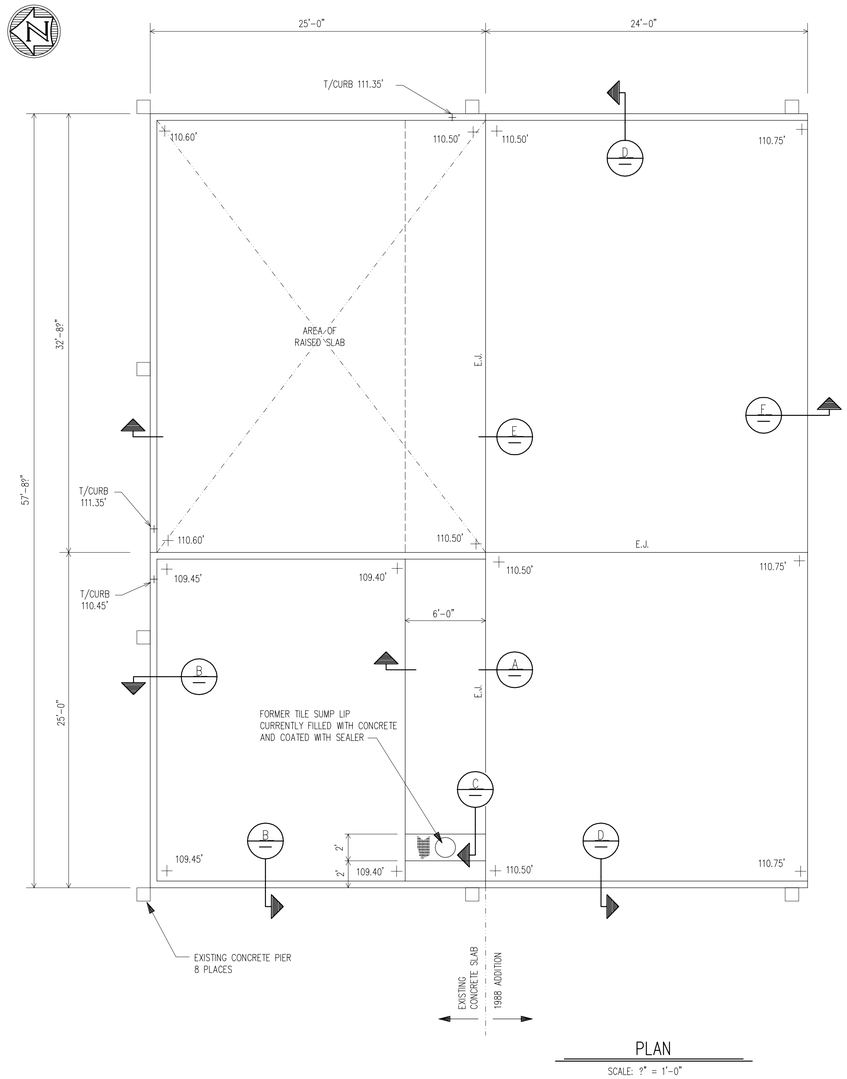
There is no potential for the waste materials, treatment reagents, or products of any reactions to be flammable or explosive or produce violent chemical or physical reactions in the tanks.

C2.J.2 Distance Requirements for Ignitable or Reactive Wastes
[R 299.9615(1) and 40 CFR §264.198(a) and (b)]

All the tanks at the Dow Silicones facility were installed in accordance with the National Fire Protection Association (NFPA) Standard No. 30 – Flammable and Combustible Liquids Code. The facility maintains the required protective distances (at least 50 feet from the nearest property line) between the waste management area and the public ways, streets, alleys, or an adjoining property line. All six hazardous waste storage tanks are located more than 1,000 feet from the nearest property line, as shown on Midland Location Plot Plan, located in Appendix A1-1 in Module A1 (General Facility Description).

C2.J.3 Incompatible Wastes
[R 299.9615(1) and 40 CFR §264.199]

Incompatible wastes are not mixed in the hazardous waste storage tanks. Hazardous wastes are not placed in a tank that previously contained an incompatible waste, because each tank is dedicated to one type of waste. Should Dow Silicones ever wish to use a tank for storage of a hazardous waste that is incompatible with the previous contents of the tank, the tank would be thoroughly decontaminated prior to placing the new waste in it.



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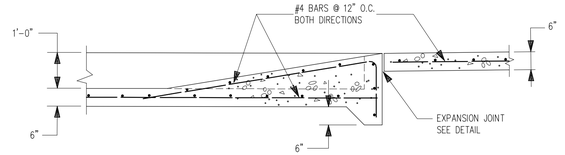

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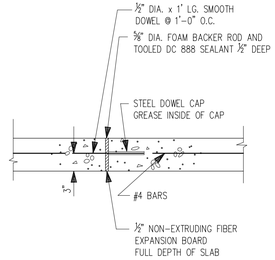

EXPANSION JOINT DETAIL

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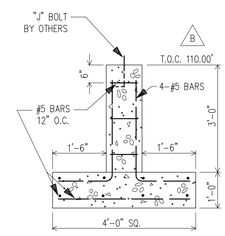

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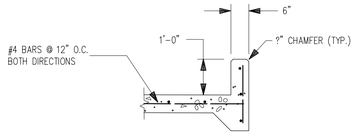

SECTION B

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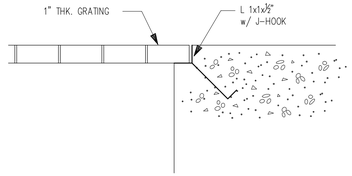
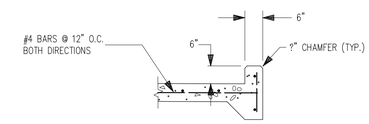


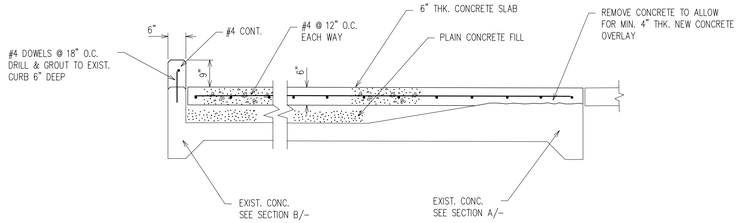
SECTION C

SCALE: 3" =1'-0"



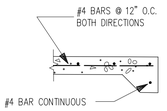
SECTION D

SCALE: ?" =1'-0"



SECTION E

SCALE: ?" =1'-0"



SECTION E

SCALE: ?" =1'-0"

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP.
A	GEN	ADDED 50' EXTENSION TO SOUTH OF SLAB	RJF	04-05-89	PJM
B	L-7	CHANGED T.O.C. TO 110.00', WAS 111.50'	LSA	06-23-89	PJM
C	GEN	REMOVED PLANNED 1989 ADDITION, RAISED SLAB IN N.E. QUADRANT	RJF	02MAR93	PC
D	GEN	REVISED SUMP DESCRIPTION	NLW	02-02-10	MG
E					
F					
G					
H					
J					

		DATE
DESIGNED	J.L. VanderMale	04-22-88
DRAWN	R.J. Fortier	04-22-88
CHECKED	M.W. Thomas	04-25-88
APPROVED	M.L. Marchione	04-25-88

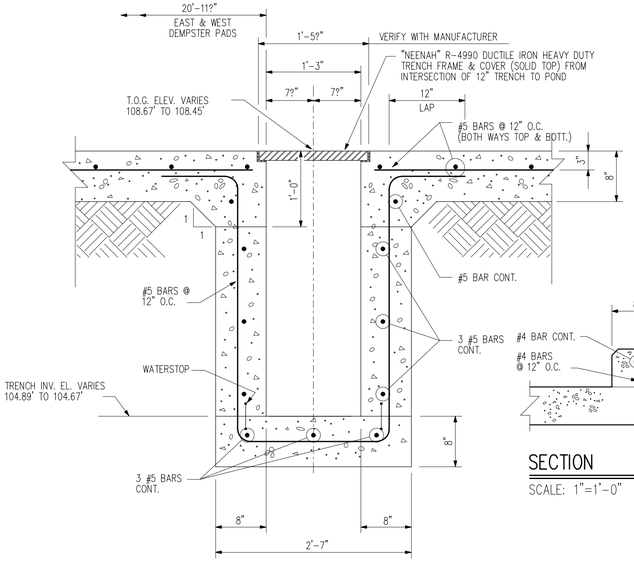
DOW CORNING CORPORATION

MIDLAND PLANT BLDG. 801

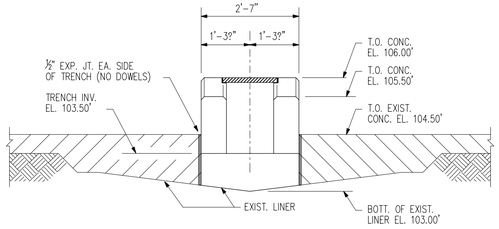
SLAB

PLAN AND DETAILS

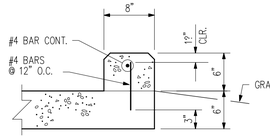
SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	AS NOTED		X1-38058	C



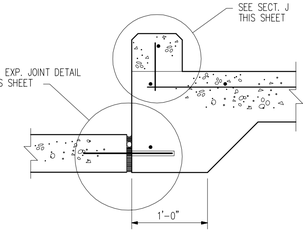
SECTION B
SCALE: 1"=1'-0" X1-60882



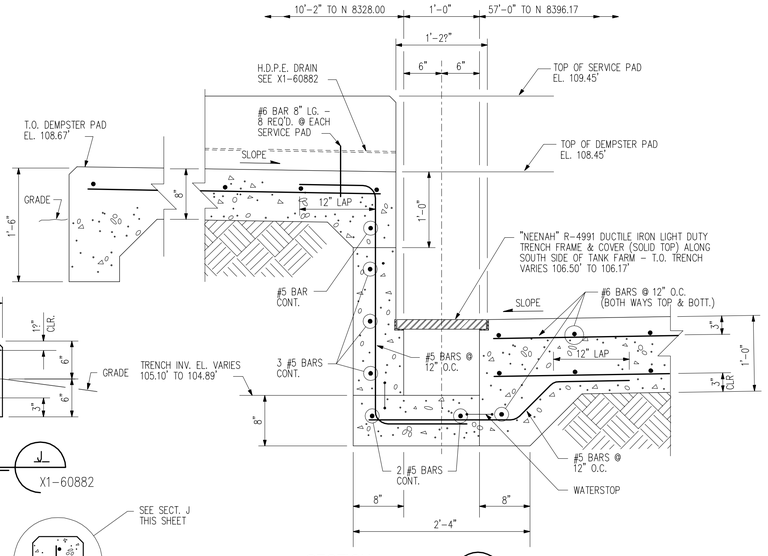
SECTION H
SCALE: ?" =1'-0" X1-60882



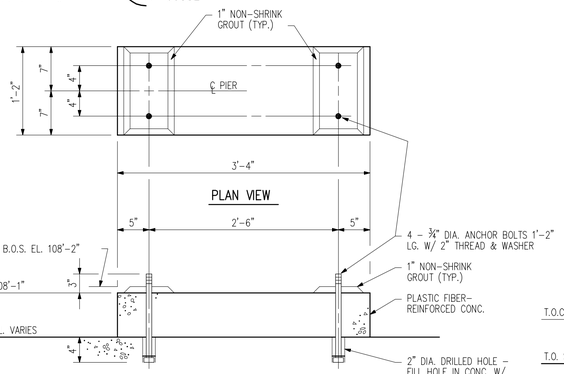
SECTION J
SCALE: 1"=1'-0" X1-60882



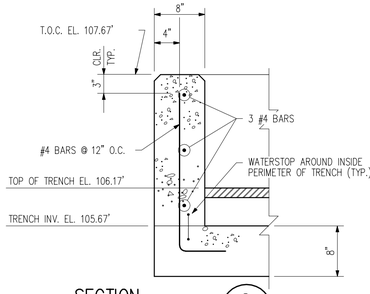
SECTION K
SCALE: 1"=1'-0" X1-60882



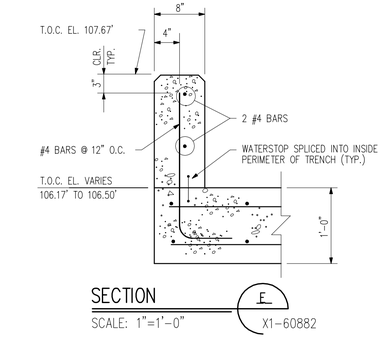
SECTION C
SCALE: 1"=1'-0" X1-60882



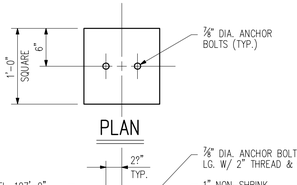
SECTION L
SCALE: 1"=1'-0" X1-60882



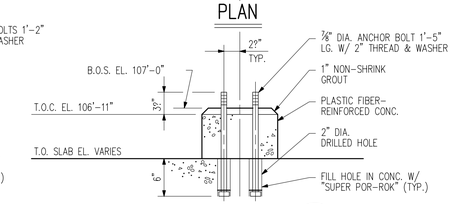
SECTION D
SCALE: 1"=1'-0" X1-60882



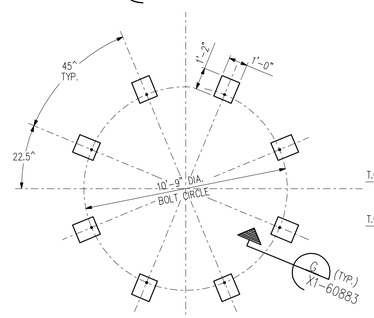
SECTION F
SCALE: 1"=1'-0" X1-60882



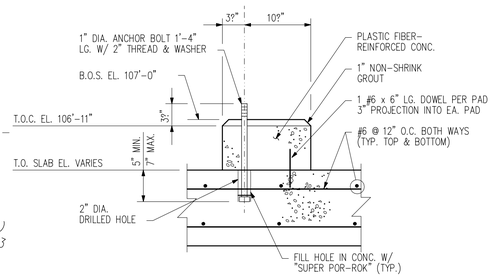
PLAN



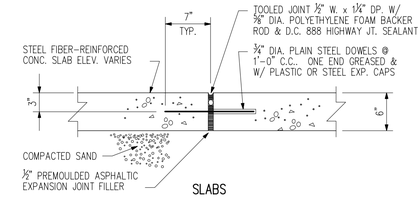
SECTION F
SCALE: 1"=1'-0" X1-60882



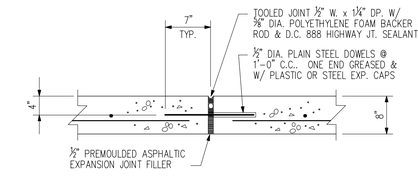
TYPICAL EQUIP.PAD LAYOUT
SCALE: ?"=1'-0"



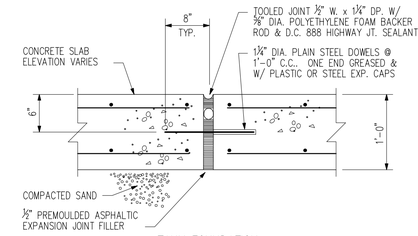
SECTION G
SCALE: 1"=1'-0" X1-60882



SLABS



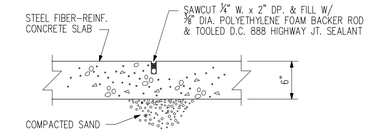
TRENCH WALLS



TANK FOUNDATION

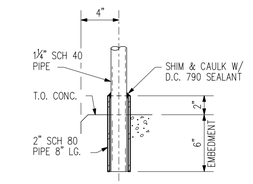
TYPICAL EXPANSION JOINTS

NO SCALE SEE DWG. X1-60882



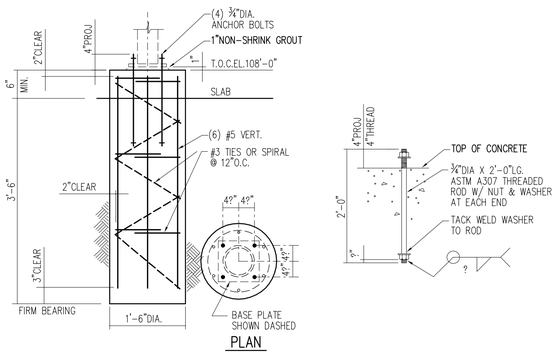
TYPICAL CONTROL JOINT

NO SCALE SEE DWG. X1-60882



TYPICAL HANDRAIL CONNECTION

SCALE: 1½"=1'-0" SEE DWG. X1-60882



PIPE POLE FOUNDATION DETAIL " 1 "

SCALE: ?"=1'-0"

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H						
J						
K						
L						
M						
N						
P						

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
A	C-2	09-26-89	AS BUILT	D.A.W.	K.J.W.	09-26-89
B	A-2	27FEB04	ADDED PIPE POLE FOUNDATION	RFP	ABK	09-26-89
C						
D						
E						
F						
G						

DESIGNED	K.J.WALKER	DATE 01-11-88
DRAWN	L.K.O./ D.A.W.	DATE 01-29-88
CHECKED	K.J.WALKER	DATE 06-08-88
APPROVED	R.L.ZITTA	DATE 06-10-88

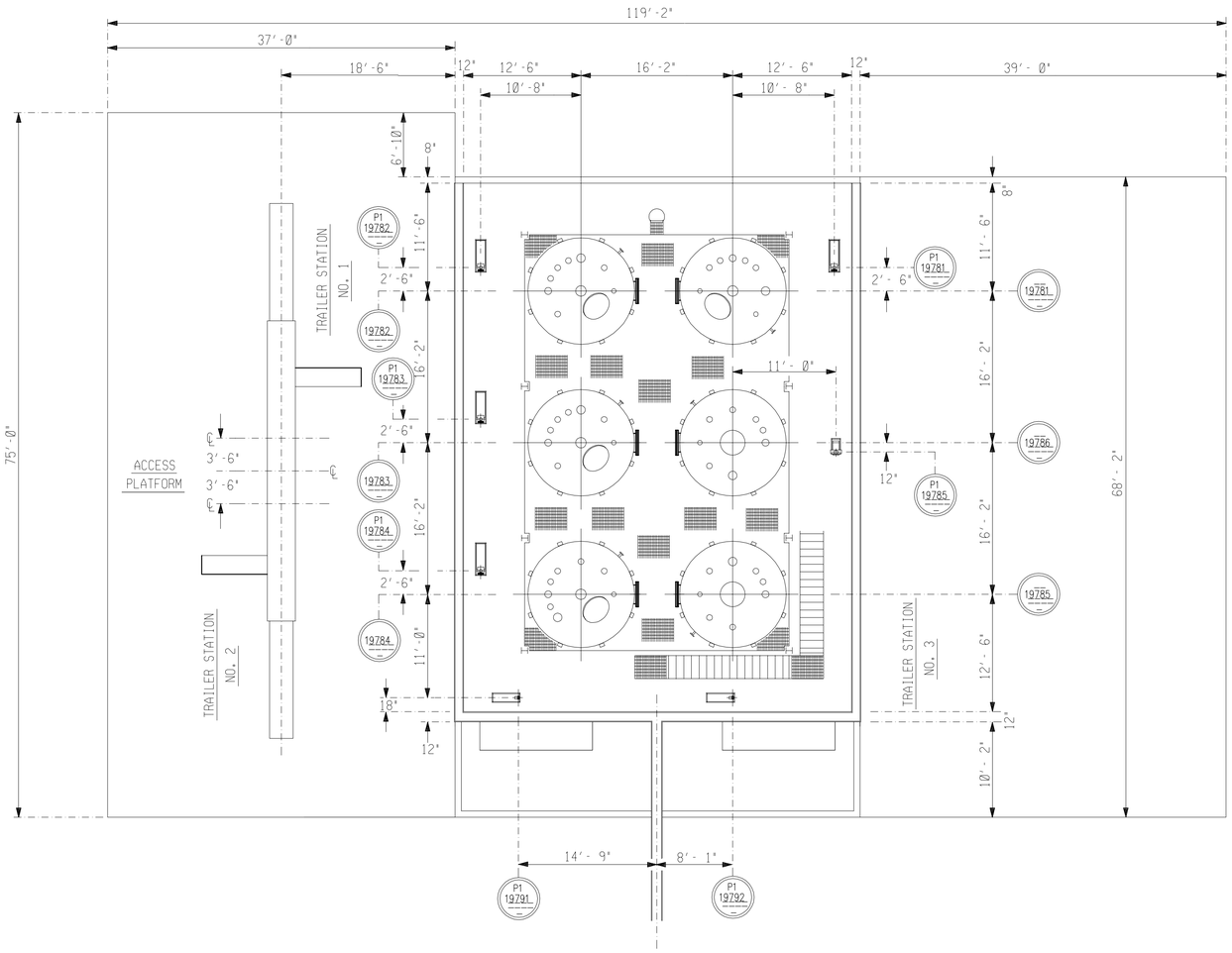
DOW CORNING CORPORATION

WASTE CONTROL BLDG. 806

TANK FARM

SLAB AND FOUNDATION DETAILS

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	AS NOTED		X1-60883	B



PLAN VIEW TANK FARM 806 BLDG.

SCALE: 1 / 8"=1'-0"

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H						
J						
K						
L						
M						
N						
P						

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
A						
B						
C						
D						
E						
F						
G						

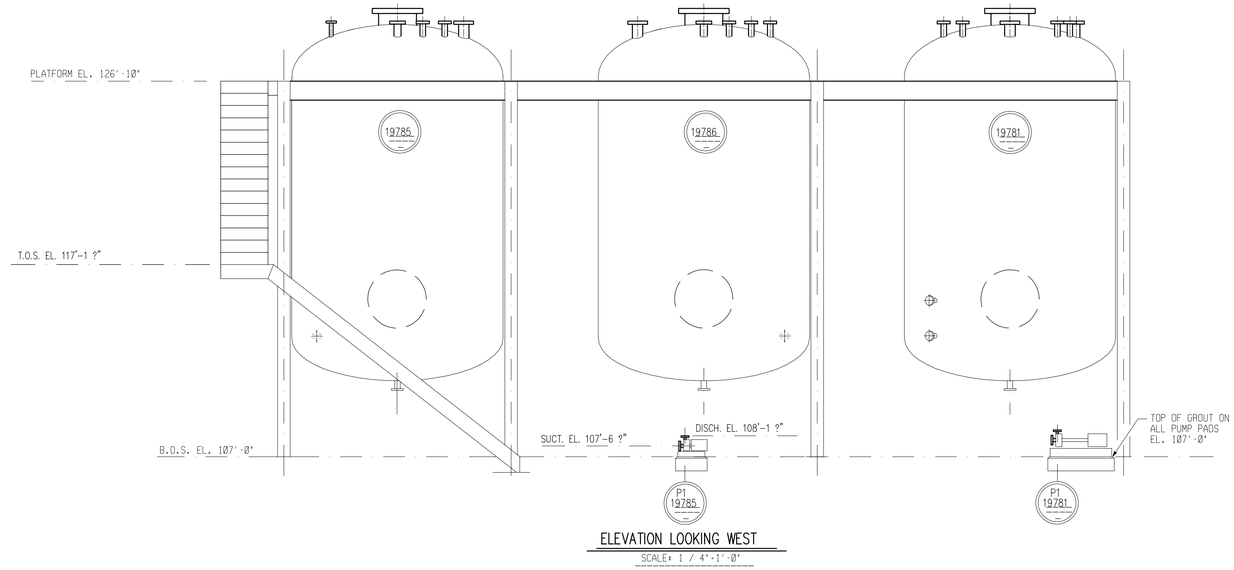
DESIGNED	J. MOQUIN	DATE 04-13-88
DRAWN	DEBOLT DESIGN	DATE 05-15-88
CHECKED	S.K. SAHA	DATE 05-15-88
APPROVED	S.K. SAHA	DATE 05-15-88

DOW CORNING CORPORATION

MIDLAND PLT BLDG 806

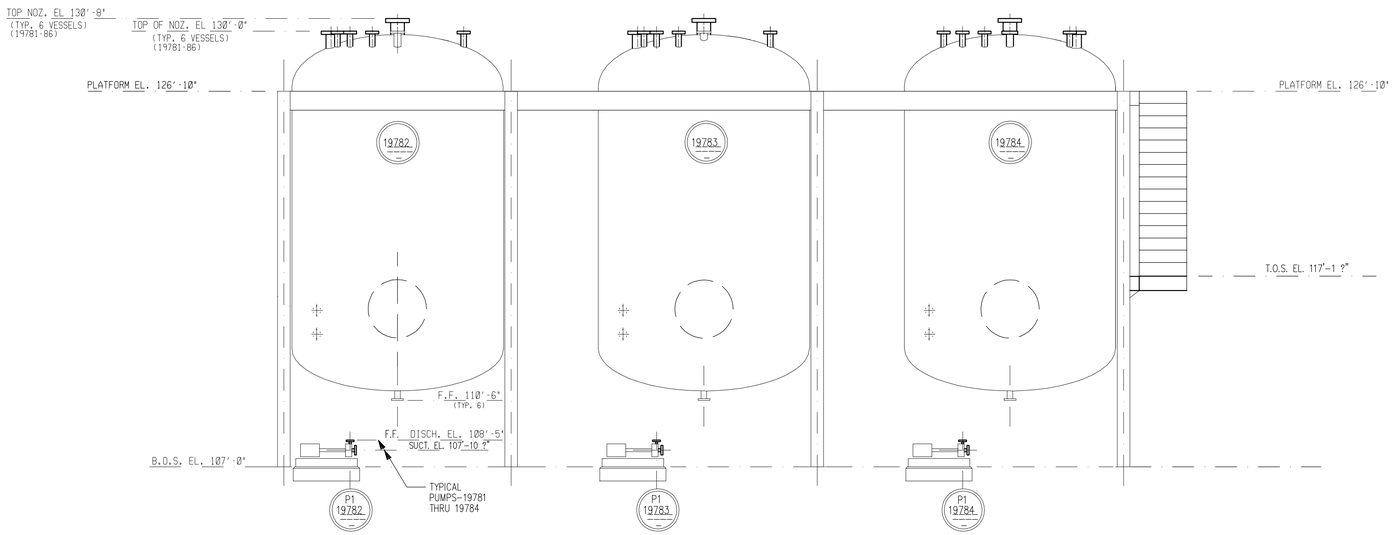
TANK FARM
EQUIPMENT LOCATION PLAN

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	1	8"=1'-0"	W1-71228	0



ELEVATION LOOKING WEST

SCALE: 1 / 4"-1'-0"



ELEVATION LOOKING EAST

SCALE: 1 / 4"-1'-0"

LAST GENERAL UPDATE: 04JAN2010

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H						
J						
K						
L						
M						
N						
P						

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
A	D-1	8-8-88	CHANGED SUCT.& DISCH.ELEV.ON PUMPS P1-19781 THRU P1-19784	J.MOQUIN	SKS	8-8-88
B						
C						
D						
E						
F						
G						

DESIGNED	J. MOQUIN	DATE 04-13-88
DRAWN	DEBOLT DESIGN	DATE 05-03-88
CHECKED	S.K. SAHA	DATE 05-15-88
APPROVED	S.K. SAHA	DATE 05-15-88

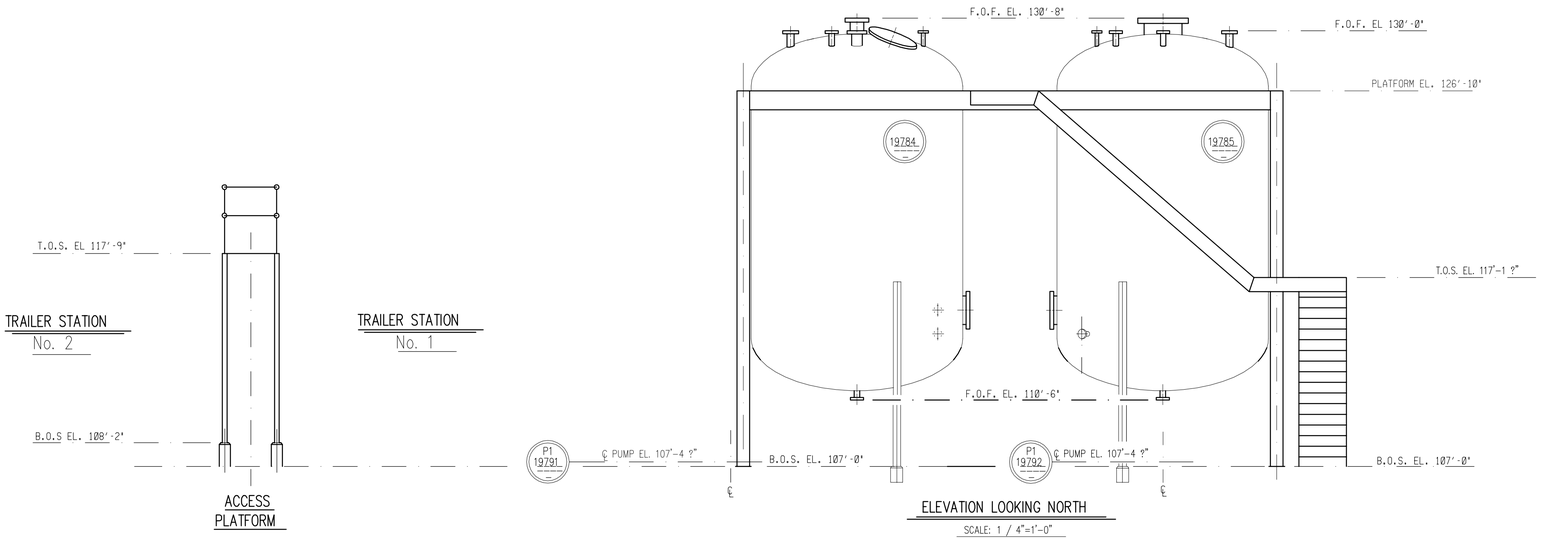
DOW CORNING CORPORATION

MIDLAND PLT. BLDG 806

TANK FARM

EQUIPMENT - EAST & WEST ELEVATION

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	1	4"-1'-0"	W1-71229	A



ELEVATION LOOKING NORTH

SCALE: 1 / 4"=1'-0"

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H						
J						
K						
L						
M						
N						
P						

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
A						
B						
C						
D						
E						
F						
G						

DESIGNED	J. MOQUIN	DATE 03-29-88
DRAWN	DEBOLT DESIGN	DATE 05-15-88
CHECKED	S.K. SAHA	DATE 05-15-88
APPROVED	S.K. SAHA	DATE 05-15-88

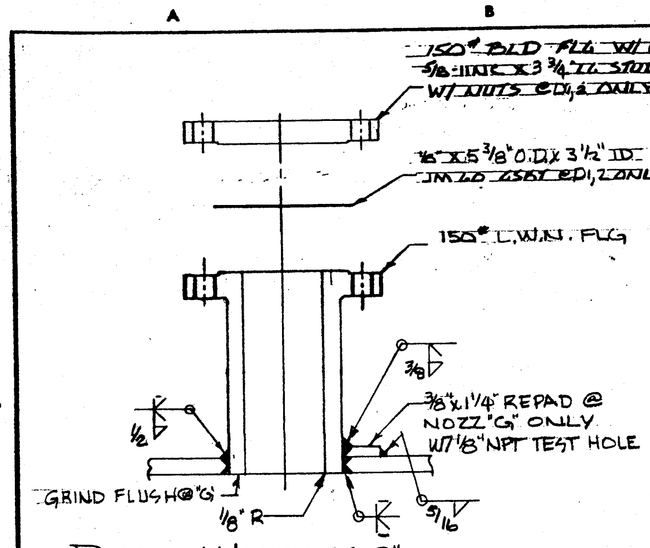
DOW CORNING CORPORATION

MIDLAND PLT BLDG 806

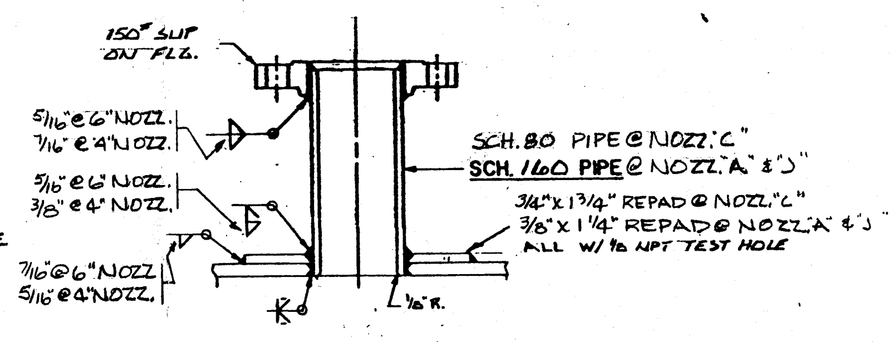
TANK FARM

EQUIPMENT - SOUTH ELEVATION

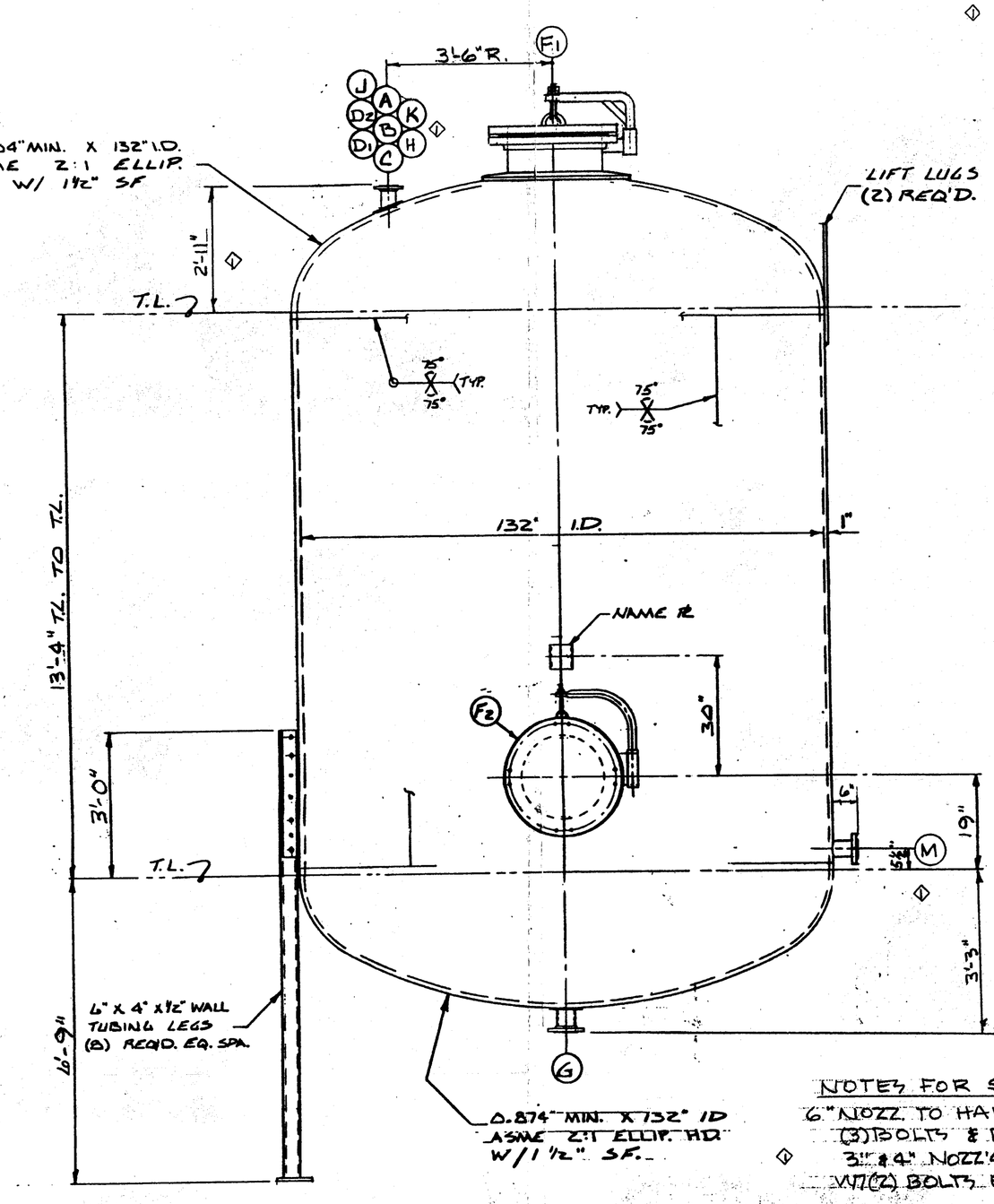
SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	1	4'-1'-0"	W1-71230	0



DETAIL: NOZZLES 3"



DETAIL NOZZLES 'A', 'C' & 'J'

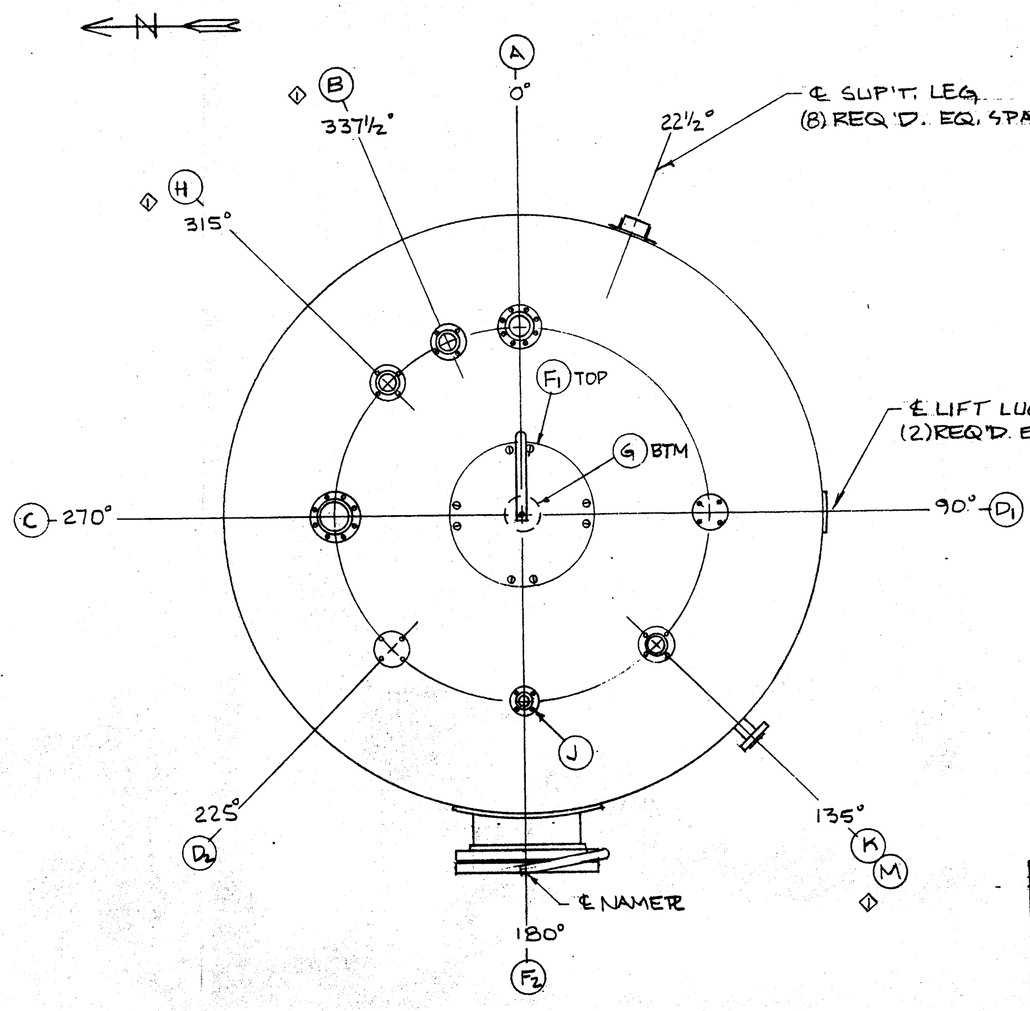


ELEVATION

NOTES FOR SHIPPING COVERS

6" NOZZ. TO HAVE 1/4" R SHIPPING COVER W/ (3) BOLTS & RUBBER GASKETS

◇1 3" & 4" NOZZ'S. TO HAVE 150# BLD. FLG'S. W/ (2) BOLTS EA. & RUBBER GASKETS



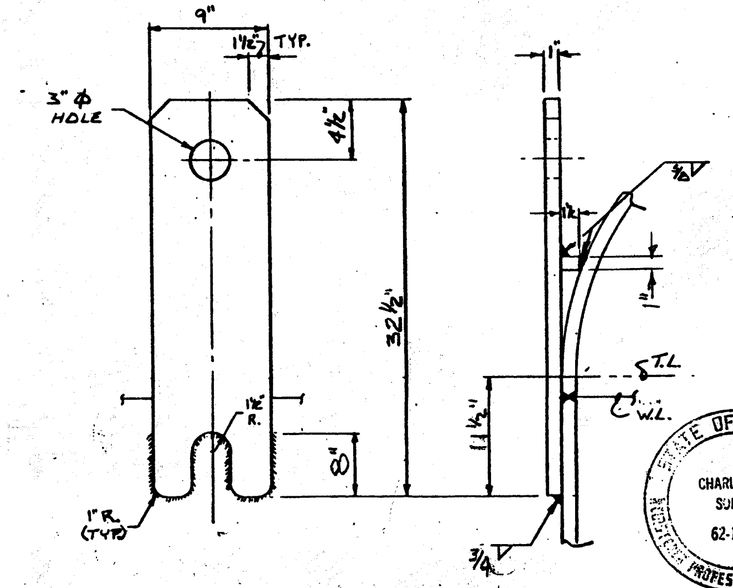
ORIENTATION

SPARE PARTS LIST

(2) 1/8" x 28 1/4" O.D. x 24" I.D. GASKET

◇1 (2) 1/8" x 5 3/8" O.D. x 3½" I.D. GASKET

CERTIFIED FOR CONSTRUCTION
SUPERIOR WELDING COMPANY
DATE- 5-20-88
APPVD. BY RB



DETAIL LIFT LUGS
(2) REQ'D. EQ. SPA.

STATE OF ILLINOIS
CHARLES C. SUNGER
62-16970
REGISTERED PROFESSIONAL ENGINEER

Reviewed 6/23/89
CC Sunger

FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. SO	INLET
B	1	3"-150# NOZZ. LW.N.	RECIRC.
C	1	6"-150# NOZZ. SO	RELIEF
D1	1	3"-150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F1/2	2	24" 150# NOZZ SO	MANWAY
G	1	3"-150# NOZZ L.W.N.	OUTLET
H	1	3"-150# NOZZ L.W.N.	LEVEL SWITCH
D2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
◇1 J	1	4"-150# NOZZ S.O.	N2 BLANKET
◇1 M	1	3" 150# NOZZ. LW.N.	LEVEL SWITCH

WELD NOTES

CS-TO CS	MG-1D	R-70 WIRE	
" "	M1B	E 7018 STICK	
" "	SA1-70	L-50 WIRE 860 FLUX	

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE- ASME SECT. VIII DIV. I 1986 EDIT. 12-31-86 ADD

DESIGN CONDITIONS:	SHELL	JACKET, COIL OR TUBE
PRESS. & TEMP. F.V. & 150 PSIG @ -20° TO 520°F		
TEST - HYDROSTATIC HORIZ. @ 245 PSIG		

MATERIAL

SHELL: SA-516-70		
HEADS: SA-516-70		
JACKET SHELL:		
JACKET HEADS:		
SHELL NOZZLES: NECKS SA-106-B	FLANGES SA-105	
JACKET NOZZLES: NECKS	FLANGES	
COILS:		
BOLTING: SA-193-B7 W/ SA-194-2H NUTS	SHIPPING: CS	
	RE-PADS: SA-516-70	LIFT LUGS: SA-516-70
GASKETS: JM-60	SHIPPING GSKTS.: RUBBER	
SUPPORTS: SA-36		

CODE INSPECTION & STAMP: ASME B4 LUMBERMENS MUTUAL CASUALTY CO.
INSPECTION-OTHER- B4 CUSTOMER
RADIOGRAPH: HEAD TO SHELL: PER UW-11(a)(5)(b) SPOT X-RAY THERMAL TREATMENT NOT REQ'D.
CORR. ALLOW: BTM HD: 1 0.25" TOP HD & SHELL: 0.125" SANDBLAST: NOT REQ'D.
PAINT: NOT REQ'D.
◇1 WORKING VOLUME: 10000 GAL.
WEIGHT: EMPTY = 34549 LBS FULL OF H2O = 135507 LBS. VOL = 12115 GAL.
REFERENCE DWG. & SPECS: DOW CORNING DATA SHTS. M800-1007 SHT 1&2. SPEC. NO. 2149 REV. 1, SK. NO. M800 19875 & 6
REFERENCE ORDER: 132610
◇1 ITEM: # 19785
PROJECT 107021
REF DWG L88-0054-C NO. REQ'D (1)

NO.	REVISIONS	DATE
◇1	REV. PER APPL. 5/12/88 CERT. FOR CONST.	5-11-88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO 05-88-0054-01
DWG L88-0054-A

DOW CORNING CORPORATION

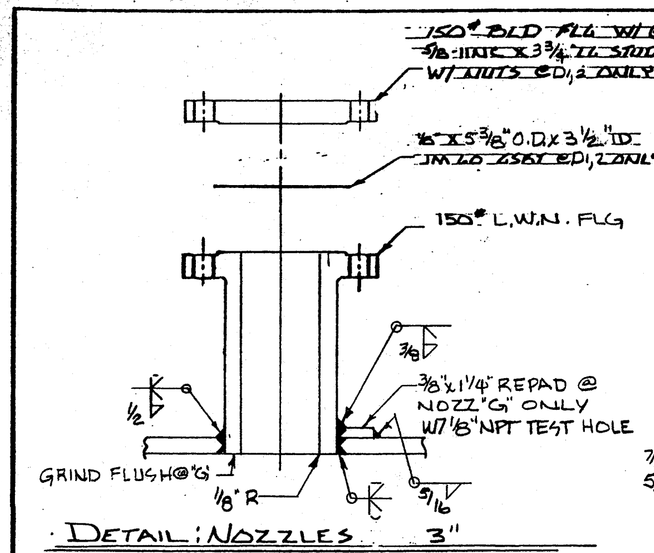
MIDLAND PLANT 600 TANK FARM
WASTE IPA/SILOXANE STORAGE TANK

SCALE	INCH:	FOOT:	DRAWING NUMBER:	REVISION:
			71485	0

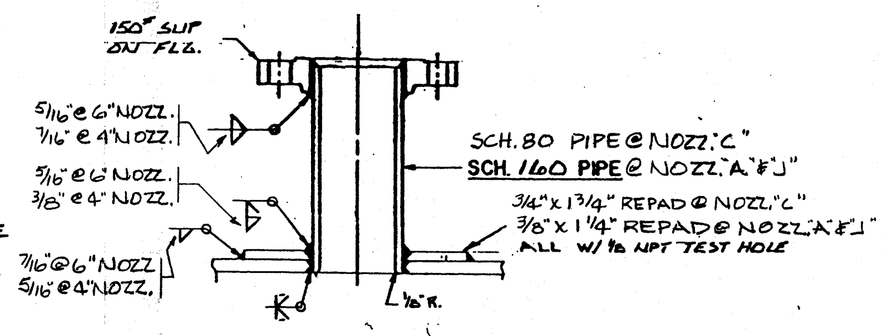
MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE

◇1 REV. PER APPL. DWG. 5/11/88 CERT. FOR CONST. 5-11-88

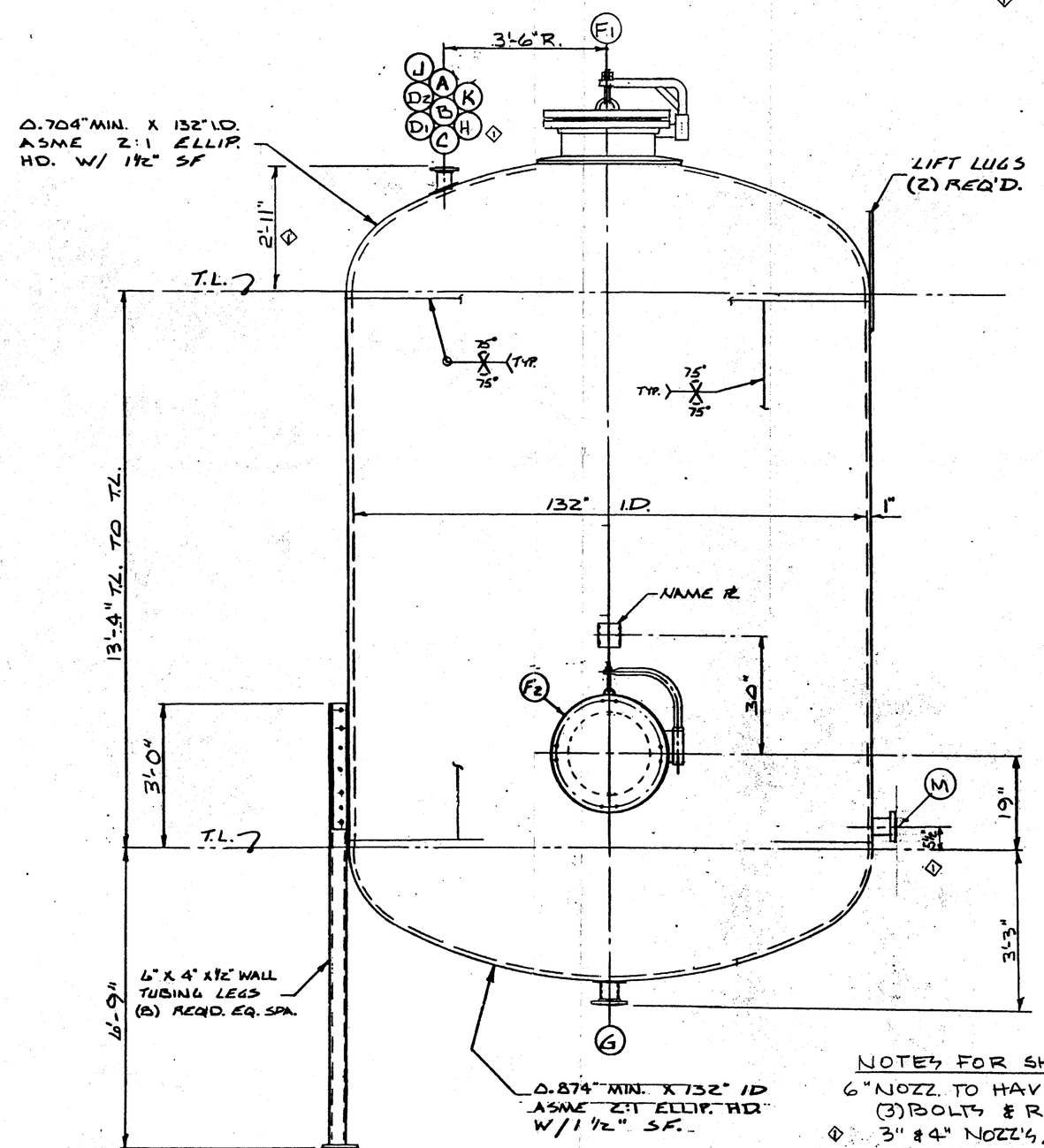
DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE



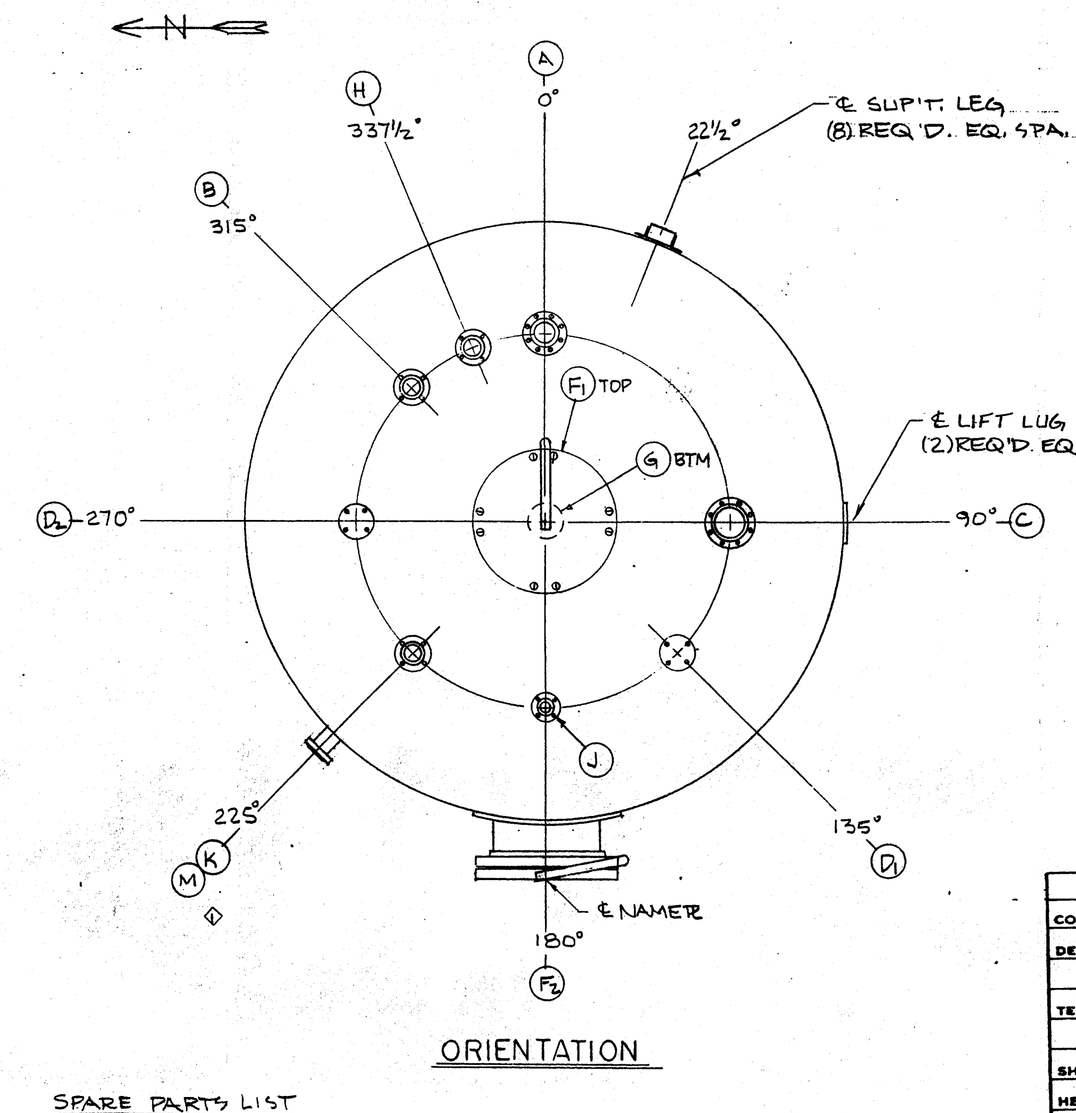
DETAIL: NOZZLES 3"



DETAIL NOZZLES 'A', 'C' & 'J'



ELEVATION



ORIENTATION

SPARE PARTS LIST

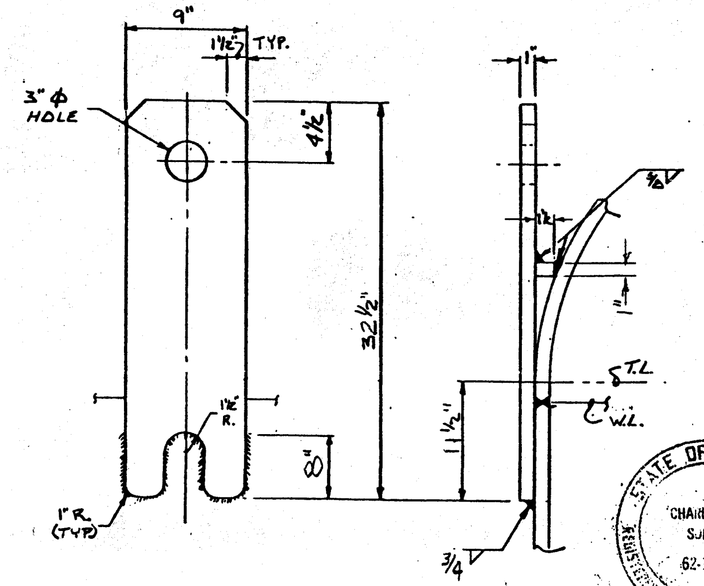
(2) 1/8" X 28 1/4" O.D. X 24" I.D. GASKET

◊ (2) 1/8" X 5 3/16" O.D. X 3 1/2" I.D. GASKET

NOTES FOR SHIPPING COVERS

6" NOZZ. TO HAVE 1/4" R SHIPPING COVER W/ (3) BOLTS & RUBBER GASKETS

◊ 3" & 4" NOZZ'S. TO HAVE 150# BLD. FLG'S. W/ (2) BOLTS EA. & RUBBER GASKETS



DETAIL LIFT LUGS (2) REQ'D. EQ. SPA.

CERTIFIED FOR CONSTRUCTION
SUPERIOR WELDING COMPANY
DATE - 5-20-88
APPVD. - RB

STATE OF ILLINOIS
CHARLES G. SUNGER
62-16970
REGISTERED PROFESSIONAL ENGINEER
Reviewed 6/23/88
C.G. Sunger

FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. SO	INLET
B	1	3"-150# NOZZ. LW.N.	RECIRC.
C	1	6"-150# NOZZ. SO	RELIEF
D1	1	3"-150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F1, F2	2	24" 150# NOZZ SO	MANWAY
G	1	3"-150# NOZZ L.W.N.	OUTLET
H	1	3"-150# NOZZ L.W.N.	LEVEL SWITCH
D2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
◊ J	1	4"-150# NOZZ S.O.	N2 BLANKET
◊ M	1	3" 150# NOZZ, L.W.N.	LEVEL SWITCH

WELD NOTES

CS-TO CS		MG-ID	R-70 WIRE
"	"	MIG	E 70 IB STICK
"	"	SA1-70	L-50 WIRE B&D FLUX

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE - ASME SECT. VIII DIV. 1 1986 EDIT. 12-31-86 ADD

DESIGN CONDITIONS:	SHELL	JACKET, COIL OR TUBE
PRESS. & TEMP. F.V. & 150 PSIG @ -20° TO 520° F		
TEST - HYDROSTATIC HORIZ. @ 245 PSIG		

MATERIAL

SHELL: SA-516-70

HEADS: SA-516-70

JACKET SHELL:

JACKET HEADS:

SHELL NOZZLES: NECKS SA-106-B | FLANGES SA-105

JACKET NOZZLES: NECKS | FLANGES

COILS:

BOLTING: SA-193-B7 W/ SA-194-2H NUTS SHIPPING: CS

RE-PADS: SA-516-70 | LIFT LUGS: SA-516-70

GASKETS: JM-60 SHIPPING GSKTS.: RUBBER

SUPPORTS: SA-36

CODE INSPECTION & STAMP: ASME BY LUMBERMENS MUTUAL CASUALTY CO.

INSPECTION - OTHER - BY CUSTOMER

RADIOGRAPH: HEAD TO SHELL PER UW-11(a)(5)(b) SPOT X-RAY | THERMAL TREATMENT NOT REQ'D.

CORR. ALLOW: TOP HD & SHELL: 0.125" BTM HD.: 0.25" | SANDBLAST: NOT REQ'D.

PAINT: NOT REQ'D.

◊ WORKING VOLUME: 10000 GAL.

WEIGHT: EMPTY = 34549 LBS FULL OF H2O = 135507 LBS. VOL = 12115 GAL.

REFERENCE DWG. & SPECS: DOW CORNING DATA SHTS. M800-V002 SHT 1&2 SPEC. NO. 2149 REV. 1, SK. NO. M800 19875#6

REFERENCE ORDER: 132610

◊ ITEM: # 19786

PROJECT 107021

REF DWG L88-0054-C | NO. REQ'D. (1)

NO.	REVISIONS	DATE
◊	REV. PER APPL 5/2/88 CERT. FOR CONST.	5-11-88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO 05-88-0054-02

DWG. L88-0054-B

REV. -

DOW CORNING CORPORATION

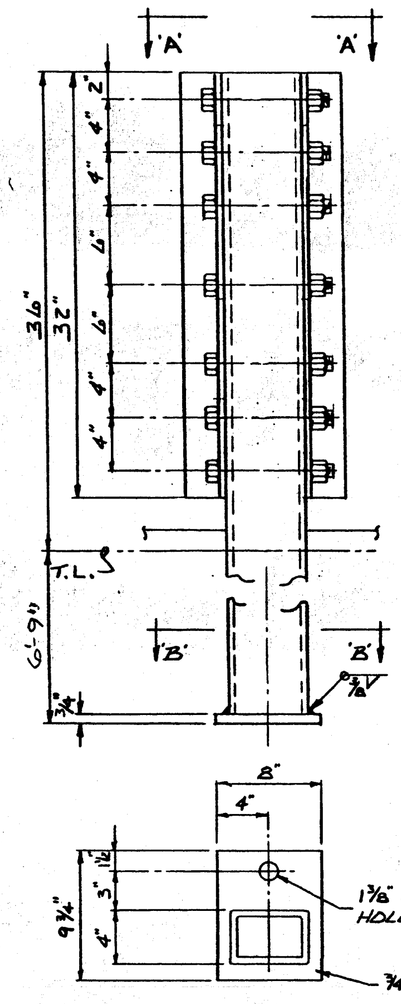
MIDLAND PLANT 806 TANK FARM

WASTE IPA/SILOXANE STORAGE TANK

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
			WI-71486	0

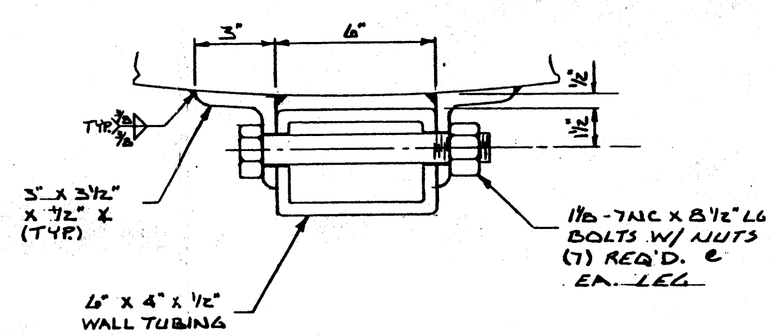
MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE

DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE

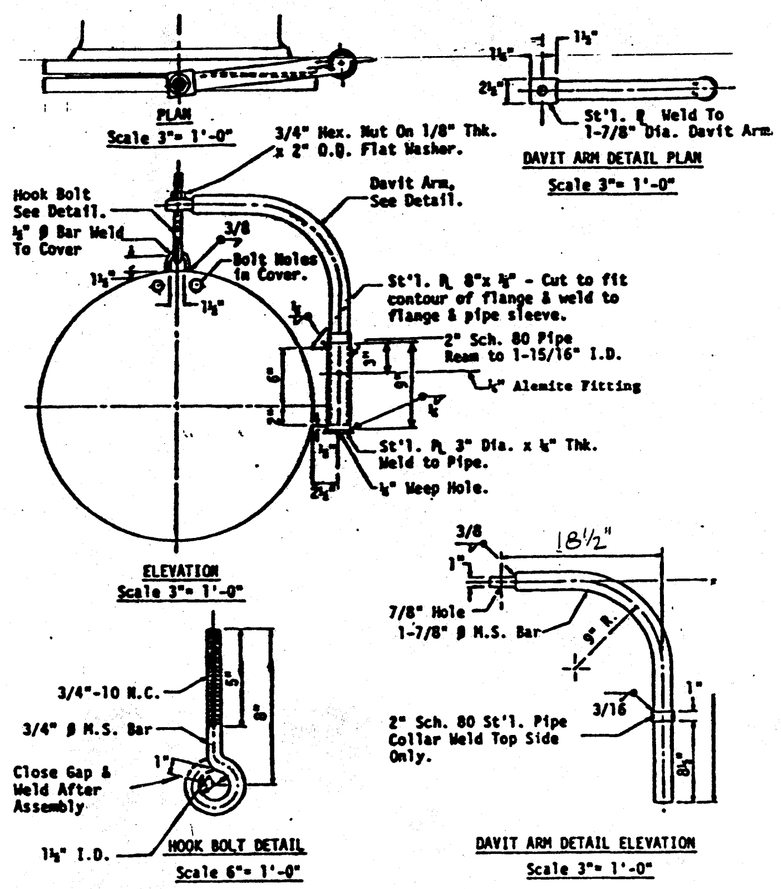


VIEW "B - B"

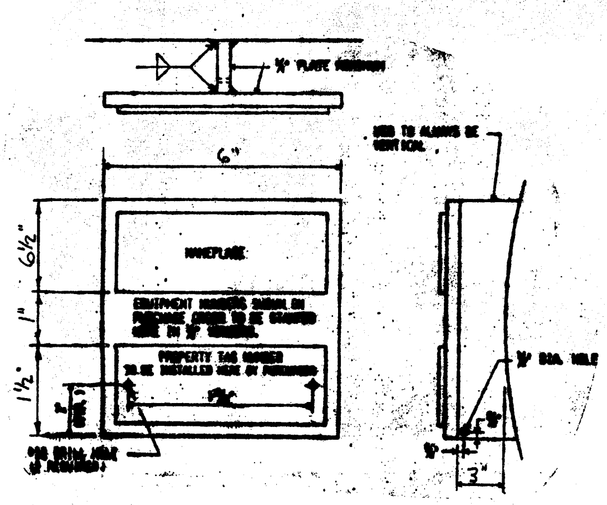
DETAIL SUP'T. LEGS
(8) REQ'D. EQ. SPA.



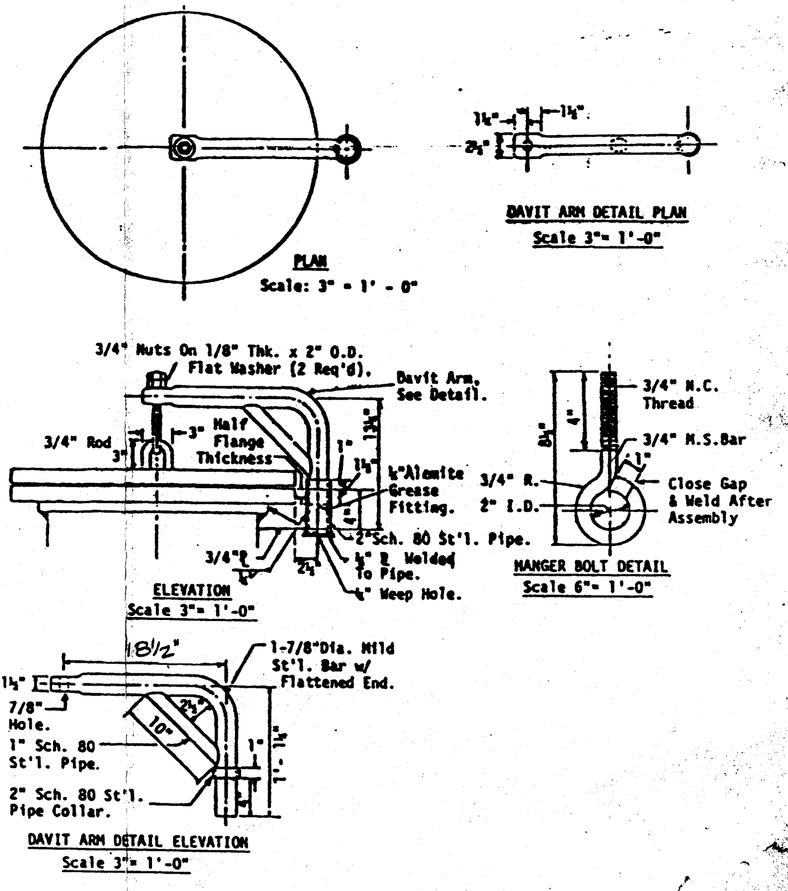
VIEW "A - A"



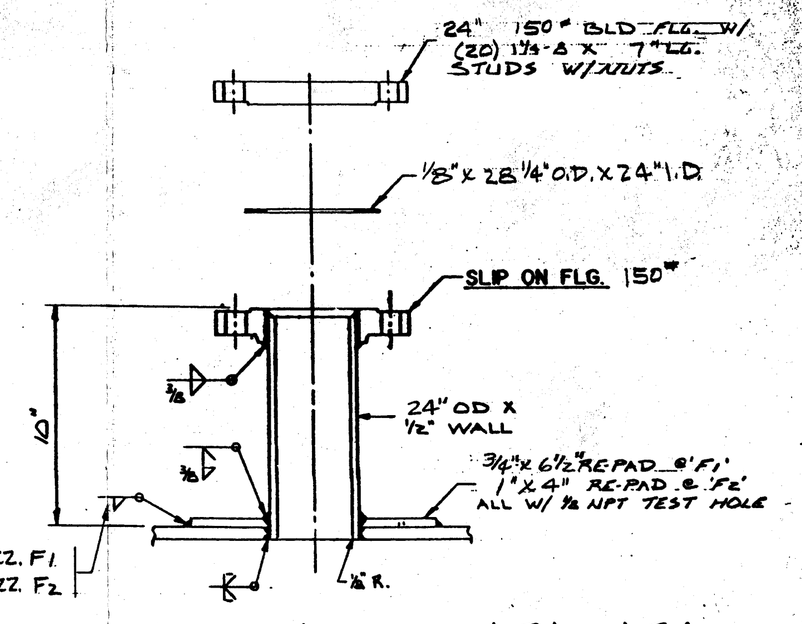
DETAIL NOZZLE 'F2' DAVIT



DETAIL: NAME PL BRKT.



DETAIL NOZZLE 'F1' DAVIT



DETAIL NOZZLES F1 & F2

STATE OF ILL.
CHARLES C. SUNGER
62-16970
REGISTERED PROFESSIONAL ENGINEER

Reviewed 6/23/88
T C Sunger

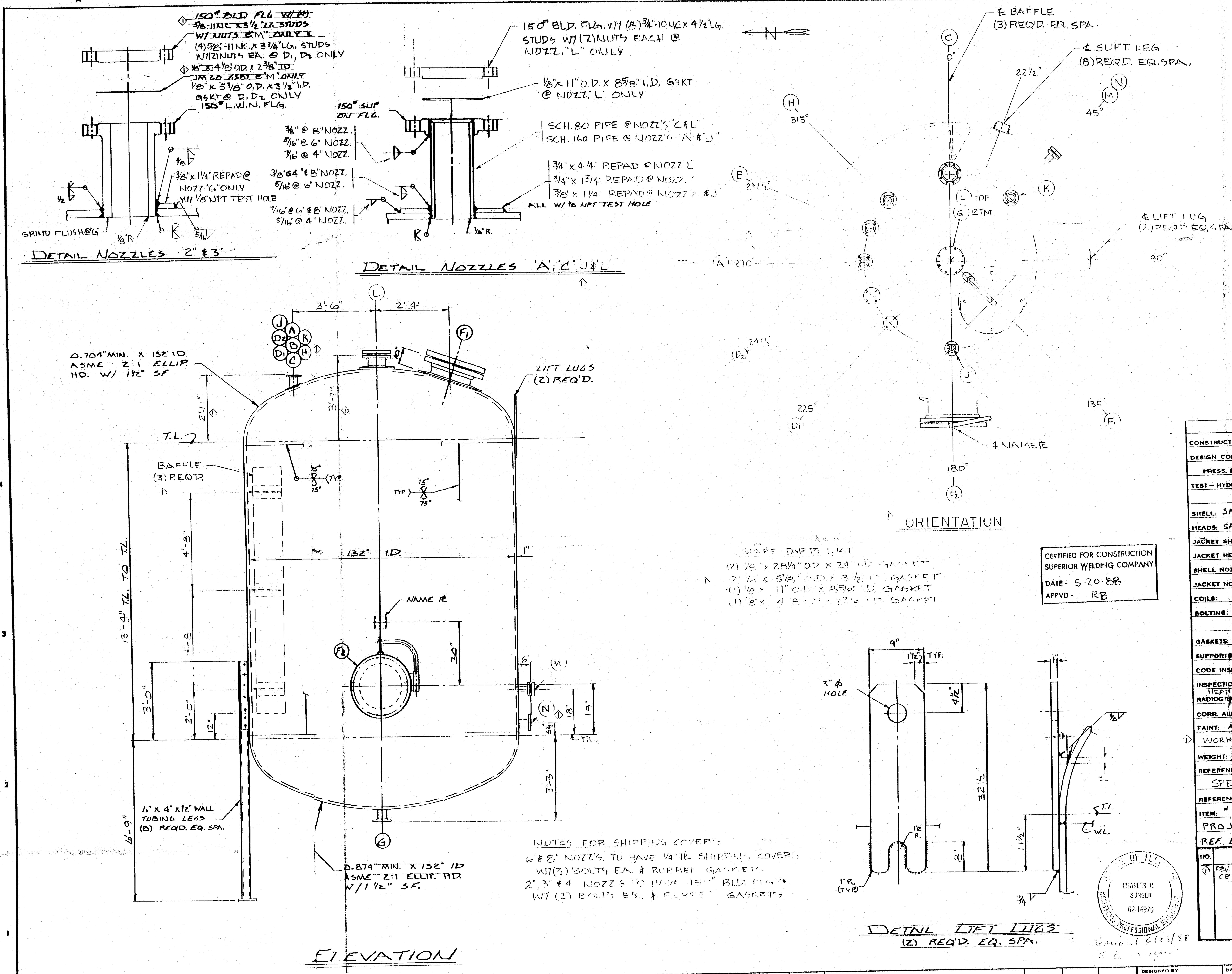
CERTIFIED FOR CONSTRUCTION
SUPERIOR WELDING COMPANY
DATE - 5-20-88
APPVD - RB

REF. DWG'S, L88-0054-A & B
PROJECT # 107.021
ITEM # 19785 & 19786
P.O. # 132610

SUPERIOR WELDING COMPANY
DWG. NO. L88-0054-C
DOW CORNING CORPORATION
MIDLAND PLANT - 806 TANK FARM
WASTE IPA/SILOXANE STORAGE TANK
ADDITIONAL DETAILS
SCALE | INCH | FOOT | DRAWING NUMBER | REV.
W1-71487

MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE
2		5-11-88	REV. PER APP'L. 5-2-88 CERT. FOR CONSTR.			

DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE
APPROVED BY — DATE



FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. SO	INLET
B	1	3"-150# NOZZ. L.W.N.	RECIRC.
C	1	6"-150# NOZZ. SO	RELIEF
D1	1	3" 150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F2	2	24" 150# NOZZ SO	MANWAY
G	1	3" 150# NOZZ L.W.N.	OUTLET
H	1	3" 150# NOZZ L.W.N.	LEVEL SWITCH
D2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
J	1	4"-150# NOZZ SO	N2 BLANKET
—	1	8" 150# NOZZ. SO	AGITATOR W/ BLIND
A	1	2" 150# NOZZ. L.W.N.	SPARE W/ BLIND
H	1	3" 150# NOZZ. L.W.N.	LEVEL SWITCH

WELD NOTES

CS-TO CS		MG-1D	R-70 WIRE
"	"	M1B	E 7018 STICK
"	"	SA1-70	L-50 WIRE 860 FLUX

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE - ASME SECT. VIII DIV. I 1986 EDIT. 12-31-86 ADD

DESIGN CONDITIONS: SHELL | JACKET, COIL OR TUBE

PRESS. & TEMP. F.V. & 150 PSIG @ -20°F TO 520°F

TEST - HYDROSTATIC HORIZ. @ 245 PSIG

MATERIAL

SHELL: SA-516-70

HEADS: SA-516-70

JACKET SHELL:

JACKET HEADS:

SHELL NOZZLES: NECKS SA-106-B | FLANGES SA-105

JACKET NOZZLES: NECKS | FLANGES

COILS:

BOLTING: SA-193-B7 W/ SA-194-2H NUTS SHIPPING: CS

RE-PADS: SA-516-70 | LIFT LUGS: SA-516-70

GASKETS: JM-60 SHIPPING GSKTS.: RUBBER

SUPPORTS: SA-36

CODE INSPECTION & STAMP: ASME BY LUMBERMENS MUTUAL CASUALTY CO.

INSPECTION—OTHER— BY CUSTOMER

RADIOGRAPH: SPOT X-RAY | THERMAL TREATMENT NOT REQ'D.

CORR. ALLOW: TOP HD & SHELL: 0.125" BTM. HD.: 0.25" | SANDBLAST: NOT REQ'D.

PAINT: NOT REQ'D.

WORKING VOLUME: 10000 GAL.

WEIGHT: EMPTY = 36016 LBS FULL OF H2O = 137034 LBS VOL. = 12115 GAL.

REFERENCE DWG. & SPECS: DOW CORNING DATA SHTS. M800-V001 SHT 1 & 2, SPEC. 2149 REV. 1 SK. NO. M800-19781 THRU 4

REFERENCE ORDER: 132610

ITEM: # 19781

PROJECT 10721

REF. DWG L88-0055-E | NO. REQ'D. (1)

NO.	REVISIONS	DATE
1	REV. FOR APP'L. 5/2/88 CERT. FOR CONST.	5-11-88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO. 05-88-0055-01
DWG. L88-0055-A
REV. 1

DOW CORNING CORPORATION

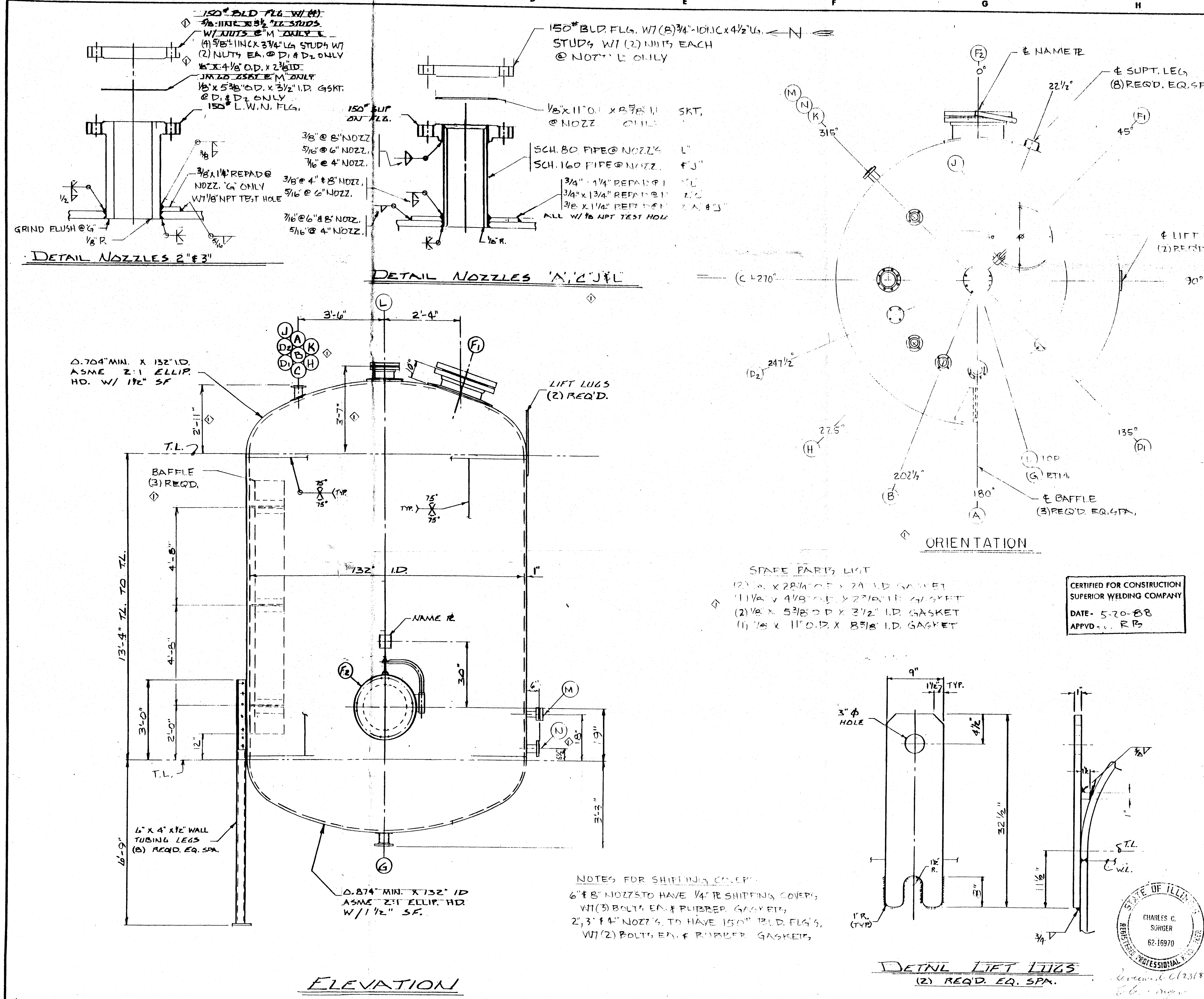
MIDLAND PLANT, 806 TANK FARM
WASTE SOLVENT STORAGE TANK

SCALE | INCH | FOOT | DRAWING NUMBER WI-71488 | REVISION 0

MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE	MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE

DESIGNED BY / DATE; DRAWN BY / DATE; CHECKED BY / DATE; APPROVED BY / DATE

03/24/99



CERTIFIED FOR CONSTRUCTION
SUPERIOR WELDING COMPANY
DATE- 5-20-88
APPVD- RB

STATE OF ILLINOIS — CHARLES C. SINGER 62-16970 — REGISTERED PROFESSIONAL ENGINEER

FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. SO	INLET
B	1	3"-150# NOZZ. L.W.N.	RECIRC.
C	1	6"-150# NOZZ. SO	RELIEF
D_1	1	3" 150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F_2	2	24" 150# NOZZ SO	MANWAY
G	1	3" 150# NOZZ L.W.N.	OUTLET
H	1	3" 150# NOZZ L.W.N.	LEVEL SWITCH
D_2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
J	1	4"-150# NOZZ S.O.	N_2 BLANKET
L	1	8" 150# NOZZ. S.O.	AGITATOR W/ BLIND
M	1	2" 150# NOZZ. L.W.N.	SPARE W/ BLIND
N	1	3" 150# NOZZ. L.W.N.	LEVEL SWITCH

WELD NOTES

CS-TO CS	MG-ID	R-70 WIRE
" "	M13	E 7018 STICK
" "	SA1-70	L-50 WIRE 860 FLUX

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE- ASME SECT. VIII DIV. I 1986 EDIT. 12-31-86 ADD.

DESIGN CONDITIONS:	SHELL	JACKET, COIL OR TUBE
PRESS. & TEMP.	F.V. & 150 PSIG @ -20°TO 520°F.	
TEST-HYDROSTATIC	HORIZ. @ 245 PSIG	

MATERIAL

SHELL: SA-516-70
HEADS: SA-516-70
JACKET SHELL:
JACKET HEADS:
SHELL NOZZLES: NECKS SA-106-B — FLANGES SA-105
JACKET NOZZLES: NECKS — FLANGES
COILS:
BOLTING: SA-193-B7 W/ SA-194-2H NUTS — SHIPPING: CS
RE-PADS: SA-516-70 — LIFT LUGS: SA-516-70
GASKETS: JM-60 — SHIPPING GSKTS.: RUBBER
SUPPORTS: SA-36
CODE INSPECTION & STAMP: ASME BY LUMBERMENS MUTUAL CASUALTY CO.
INSPECTION-OTHER- BY CUSTOMER
RADIOGRAPH: SPOT X-RAY — THERMAL TREATMENT NOT REQ'D.
CORR. ALLOW: TOP HD & SHELL: 0.125" BTM. HD.: 0.25" — SANDBLAST: NOT REQ'D.
PAINT: NOT REQ'D.
WORKING VOLUME: 10000 GAL.
WEIGHT: EMPTY = 36016 LBS — FULL OF H_2O = 137034 LBS — VOL = 12115 GAL
REFERENCE DWG. & SPECS.: DOW CORNING DATA SHTS. M800-V001 SHT. 1 & 2
SPEC. 2149 REV. 1 SK. NO. M800-19781 THRU 4
REFERENCE ORDER: 132610
ITEM: # 19782
PROJECT 10721
REF. DWG L88-0055-E — NO. REQ'D. (1)

NO.	REVISIONS	DATE
1	REV. PER APPL. DATED 5/3/88 CERT. FOR CONST.	5/18/88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO. 05-88-0055-02 — REV. 1
DWG L88-0055-B

DOW CORNING CORPORATION

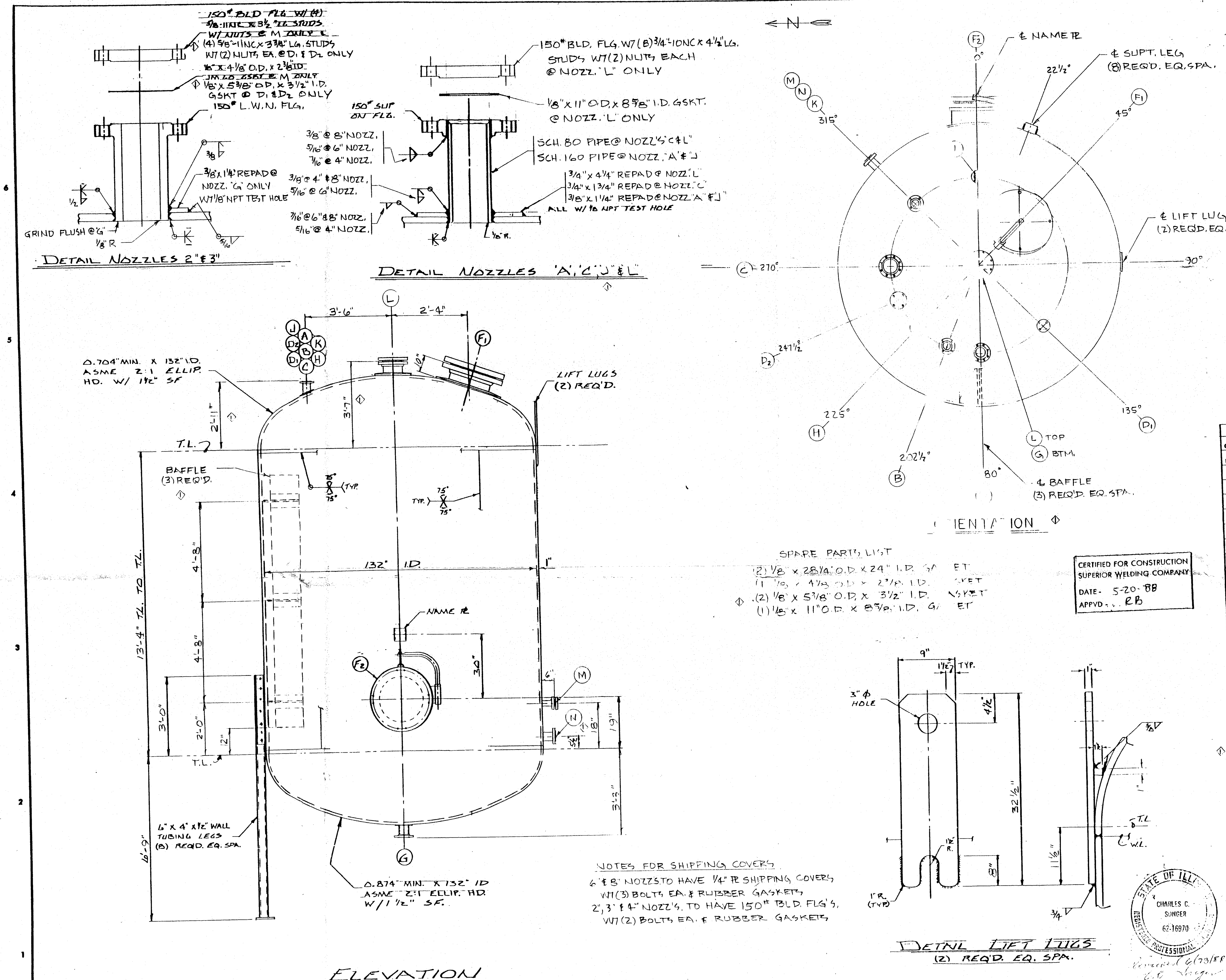
MIDLAND PLANT 806 TANK FARM
WASTE SOLVENT STORAGE TANK

SCALE — DRAWING NUMBER WI-71489 — REVISION 0

MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE	MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE

DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE
APPROVED BY — DATE

83/24/99



FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. S.O.	INLET
B	1	3"-150# NOZZ. L.W.N.	RECIRC.
C	1	6"-150# NOZZ. S.O.	RELIEF
D1	1	3"-150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F1, F2	2	24" 150# NOZZ S.O.	MANWAY
G	1	3" 150# NOZZ L.W.N.	OUTLET
H	1	3" 150# NOZZ L.W.N.	LEVEL SWITCH
D2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
J	1	4"-150# NOZZ S.O.	N2 BLANKET

WELD NOTES

CS - TO CS	MG-1D	R-70 WIRE
" "	MIB	E 7018 STICK
" "	SA1-70	L-50 WIRE 860 FLUX

L	1	8" 150# NOZZ. S.O.	AGITATOR W/ BLIND
M	1	2" 150# NOZZ. L.W.N.	SPARE W/ BLIND
N	1	3" 150# NOZZ. L.W.N.	LEVEL SWITCH

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE - ASME SECT. VIII DIV. I 1986 EDIT. 12-31-86 ADD

DESIGN CONDITIONS: SHELL	JACKET, COIL OR TUBE
PRESS. & TEMP. F.V. & 150 PSIG @ -20°TO 520°F.	
TEST - HYDROSTATIC HORIZ. @ 245 PSIG	

MATERIAL

SHELL: SA-516-70

HEADS: SA-516-70

JACKET SHELL:

JACKET HEADS:

SHELL NOZZLES: NECKS SA-106-B — FLANGES SA-105

JACKET NOZZLES: NECKS — FLANGES

COILS:

BOLTING: SA-193-B7 W/ SA-194-2H NUTS — SHIPPING: CS

RE-PADS: SA-516-70 — LIFT LUGS: SA-516-70

GASKETS: JM-60 — SHIPPING GSKTS.: RUBBER

SUPPORTS: SA-36

CODE INSPECTION & STAMP: ASME BY LUMBERMENS MUTUAL CASUALTY CO.

INSPECTION - OTHER - BY CUSTOMER

RADIOGRAPH: SPOT X-RAY — THERMAL TREATMENT NOT REQ'D.

CORR. ALLOW: TOP HD & SHELL: 0.125" BTM. HD.: 0.25" — SANDBLAST: NOT REQ'D.

PAINT: NOT REQ'D.

WORKING VOLUME: 10000 GAL.

WEIGHT: EMPTY = 36276 LBS — FULL OF H2O = 137034 LBS — VOL. = 12115 GAL.

REFERENCE DWG. & SPECS: DOW CORNING DATA SHTS. M800-V001 SHT. 1 & 2

SPEC. 2149 REV. 1 SK. No. M800-19781 THRU 4

REFERENCE ORDER: 132610

ITEM: # 19783

PROJECT 10721

REF DWG L88-0055-E — NO. REQ'D. (1)

NO.	REVISIONS	DATE
1	REV. PER APP'L. 5/2/88 CERT. FOR CONST.	5/16/88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO. 05-88-0055-03 — REV. 1

DWG L88-0055-C

DOW CORNING CORPORATION

MIDLAND PLANT 806 TANK FARM

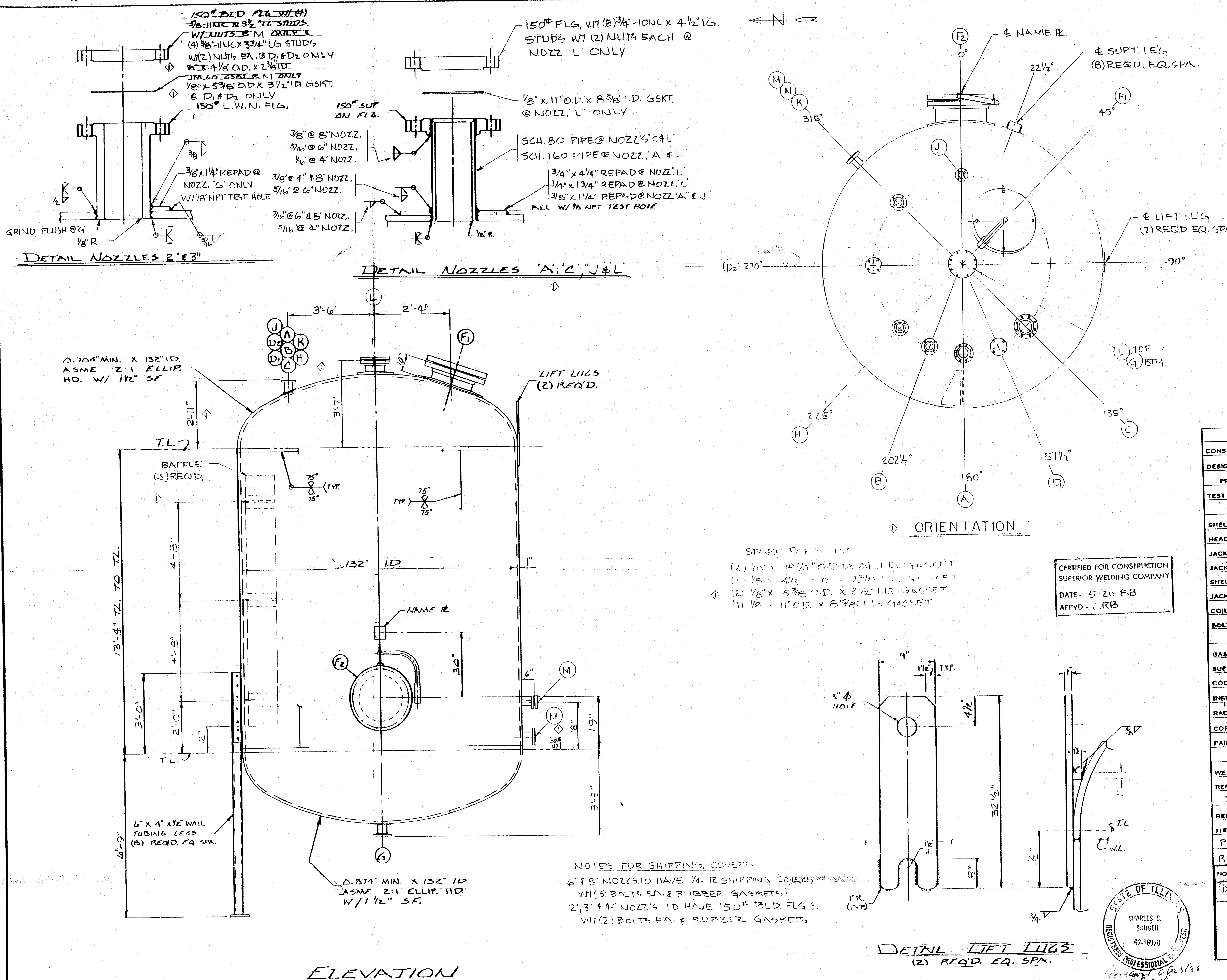
WASTE SOLVENT STORAGE TANK

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
			W-71490	0

MARK	LOCATION	DATE	REVISIONS	CHANGED BY	APPROVED BY	DATE

DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE
APPROVED BY — DATE

K&E 19 1253 2/66 1190F



CERTIFIED FOR CONSTRUCTION
SUPERIOR WELDING COMPANY
DATE - 5-20-88
APPVD - RB

STATE OF ILLINOIS — CHARLES C. SONGER — 62-16970 — REGISTERED PROFESSIONAL ENGINEER

FITTING SCHEDULE

MK	NO. REQ'D	DESCRIPTION	REMARKS
A	1	4"-150# NOZZ. S.O.	INLET
B	1	3"-150# NOZZ. L.W.N.	RECIRC.
C	1	6"-150# NOZZ. S.O.	RELIEF
D1	1	3" 150# NOZZ. L.W.N.	SPARE W/ BLIND
E			
F1 F2	2	24" 150# NOZZ S.O.	MANWAY
G	1	3" 150# NOZZ L.W.N.	OUTLET
H	1	3" 150# NOZZ L.W.N.	LEVEL SWITCH
D2	1	3"-150# NOZZ L.W.N.	SPARE W/ BLIND
K	1	3"-150# NOZZ L.W.N.	LEVEL INST.
J	1	4"-150# NOZZ S.O.	N2 BLANKET

WELD NOTES

CS - TO CS	MG-ID	R-70 WIRE
"	M1B	E 7018 STICK
"	SA1-70	L-50 WIRE 860 FLUX

L	1	8" 150# NOZZ. S.O.	AGITATOR W/ BLIND
M	1	2" 150# NOZZ. L.W.N.	SPARE W/ BLIND
N	1	3" 150# NOZZ. L.W.N.	LEVEL SWITCH

NOZZLE FLANGE DIMENSIONS TO CONFORM TO 150# ANSI SLIP ON FLG STDS. BOLT HOLES TO STRADDLE ℄'s PARALLEL TO PRINCIPAL VESSEL ℄'s.

VESSEL SPECIFICATIONS

CONSTRUCTION: CODE - ASME SECT. VIII DIV. I 1986 EDIT. 12-31-86 ADD.

DESIGN CONDITIONS:	SHELL	JACKET, COIL OR TUBE
PRESS. & TEMP.	F.V. & 150 PSIG @ -20°F TO 520°F.	
TEST - HYDROSTATIC	HORIZ. @ 245 PSIG	

MATERIAL

SHELL: SA-516-70
HEADS: SA-516-70
JACKET SHELL:
JACKET HEADS:
SHELL NOZZLES: NECKS SA-106-B [illegible] SA-105
JACKET NOZZLES: NECKS FLANGES
COILS:
BOLTING: SA-193-B7 W/ SA-194-2H NUTS SHIPPING: CS
RE-PADS: SA-516-70 LIFT LUGS: SA-516-70
GASKETS: JM-60 SHIPPING GSKTS.: RUBBER
SUPPORTS: SA-36
CODE INSPECTION & STAMP: ASME BY LUMBERMENS MUTUAL CASUALTY CO.
INSPECTION - OTHER - BY CUSTOMER
RADIOGRAPH: SPOT X-RAY THERMAL TREATMENT: NOT REQ'D.
CORR. ALLOW: TOP HD & SHELL: 0.125" BTM. HD.: 0.25" SANDBLAST: NOT REQ'D.
PAINT: NOT REQ'D.
WEIGHT: EMPTY = 36276 LBS FULL OF H2O = 137034 LBS VOL. = 12115 GAL.
REFERENCE DWG. & SPECS: DOW CORNING DATA SHTS. M800-V001 SHT. 1 & 2
SPEC. 2143 PE/1 SR. NO. M800-19781 THRU 4
REFERENCE ORDER: 132610
ITEM: # 19704
PROJECT 10721
REF DWG L88-0055-E NO. REQ'D. (1)

NO.	REVISIONS	DATE
1	REVISED NOTE, (5) 1/88 CERT. FOR CONST.	5-12-88

SUPERIOR WELDING COMPANY
DECATUR, ILLINOIS

JOB NO. 05-88-0055-04 REV. 1
DWG L88-0055-D

DOW CORNING CORPORATION

MIDLAND PLANT - 806 TANK FARM
WASTE SOLVENT STORAGE TANK

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
			WI-71491	0

03/24/99


FROM TRAILER STN. 1 & 2
DWG.W1-60792
3"-095 -PS27
FROM DEMPSTER STNS. 1
DWG.W1-60794
1½"-138 -PS27
NITROGEN
DWG. W1-60793
2" - 176 -SN2
4"-049 -PS27
EQUALIZATION LINE
DWG.W1-60790
TO TRAILER STATION 1
DWG. W1-60790
3"- 003-PS27
TO 19786 (RECYCLE)
DWG. W1-60791
2"- 027-PS27
TO 19786 (HI/HI LEVEL)
1"- 028-PS27
TO 19786
3"- 026-PS27
FROM TRAILER STN. 1 & 2
3"-094 -PS27
FROM DEMPSTER STNS. 1
1½"-139 -PS27
NITROGEN FROM UNDERGROUND
DWG. W1-60793
1"- 125-SN2
PSV-0001
FS1-19781
EMTN
15.065.001.003
135/150
PSV-0002
FS1-19782
PCVA 0013
PCVB 0013
ATM
FROM LY-8
W1-60793
NOTE 3
NOTE 4
19781
19782
NOTES:
1. ALL ALARMS ON W1-60789 TO W1-60791 ARE ECHOED UX-39B, A HORN IN THE FIELD CONTROLLERS OFFICE AREA
2. ALL "TSV" FIRE SHUTOFF VALVES ON W1-60789 TO W1-60791 WILL HAVE NITROGEN SUPPLIED BY A DEDICATED NITROGEN HEADER, AND CAN BE CLOSED BY A SINGLE VALVE ON THAT HEADER OR ESD SOLENOID XY-112.
3. THESE VALVES WILL CLOSE AND PUMPS WILL SHUT DOWN WHEN ESD BUTTON HS-18A OR HS-18B IS PRESSED.
4. WET TEST WELL FOR LEVEL SWITCH HIGH HIGH.
RESET
TRAILER ESD
SHUTDOWN
FIELD ESD
CABINET PURGE LOW
NOTE 3
LV-7 P1-19781
LV-8 P1-19782
LV-9 P1-19783
LV-10 P1-19784
LV-11 P1-19785
LV-12
FV-29
FV-30
FV-31
TSV-19
TSV-20
TSV-21
TSV-22
TSV-23
TSV-24
HV-13852
HV-13853
W2-123415, W2-123380
W2-71204 & W1-71213
ESD NOTE 3
NOTE 2
3"-001 -PS27
3"-012 -PS27
3"-013 -PS27
3"-003-PS27
P1-19781
P1-19782
FROM TANK 19786
DWG. W1-60791
3"- 025-PS27

LINE NUMBER SCHEDULE			FLANGE NUMBER SCHEDULE		
FROM	TO	LAST NUMBER USED	FROM	TO	LAST NUMBER USED
001	030	028	001	099	022

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	10-24-94	ADDED FALNGE NUMBERS AND SCHEDULE	MRN	MET	10-24-94
J	GEN	10-29-96	ADDED ACTUATORS TO PLUG VALVES 3 & 9	JAM	DLW	10-29-96
K	GEN	14OCT98	FIELD REVISIONS	RDR	SVP	14OCT98
L	GEN	05NOV98	ADDED ESD TO TSV'S AND PUMPS	DLB	FPY	05NOV98
M	GEN	22JUL99	FIELD REVISIONS	DLB	MDS	22JUL99
N	GEN	29OCT99	ADDED SEAL POTS/PIPING TO P1-19781/19782	RDR	JLW	29OCT99
P	GEN	05NOV99	ADDED LINE #2"-176-SN2 & HV-13852	RKW	RKW	05NOV99

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
Q	GEN	9-7-00	REVISED PER PCR 800-99-5	PAP	MRN	9-7-00
R	GEN	25FEB04	REVISE PER HAZOP WALK DOWN	RLB	MGS	25FEB04
S	GEN	12JAN09	REVISED PER HAZOP WALKDOWN	LCA	MGS	12JAN09
T						
E	GEN	6-30-94	800 BLOCK HAZOP AS-BUILT REVISIONS	KDM	KDM	6-30-94
F	GEN	8-19-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	8-19-94
G	GEN	9-22-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	9-22-94

01-04-2010

** PROPRIETARY ** CADD

DESIGNED C.G.ROWE	DATE 11-19-87
DRAWN S.UDELL	DATE 11-23-87
CHECKED SBR/TSW	DATE 02-26-88
APPROVED S.B.ROELOFS	DATE 03-04-88

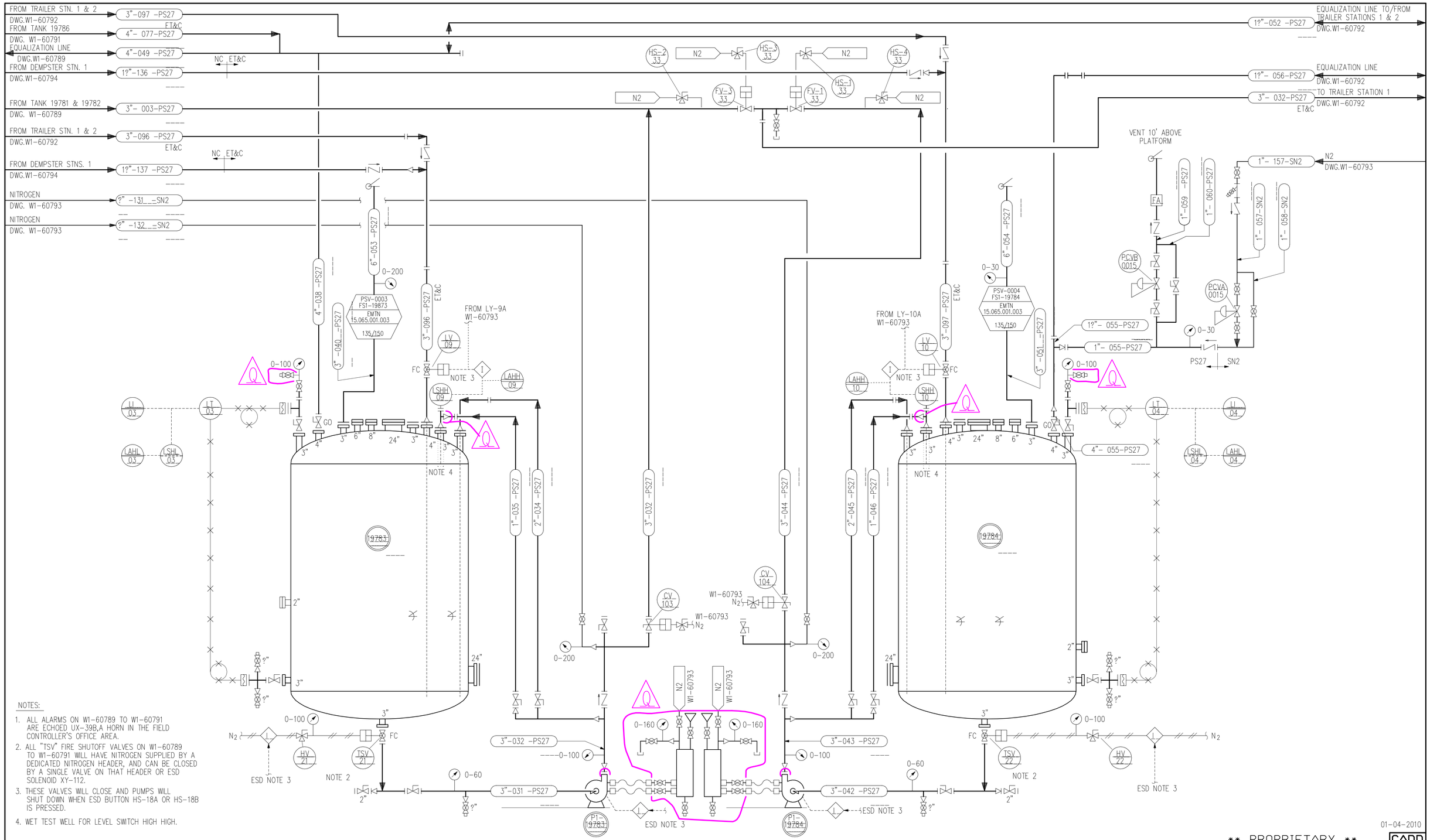
DOW CORNING CORPORATION

MIDLAND PLT 806 TANK FARM

WASTE SOLVENT STORAGE

P&ID SHEET 1 OF 6

SCALE	INCH / FOOT	DRAWING NUMBER	REVISION
	NONE	W1-60789	S



NOTES:

1. ALL ALARMS ON W1-60789 TO W1-60791 ARE ECHOED UX-39B,A HORN IN THE FIELD CONTROLLER'S OFFICE AREA.
2. ALL "TSV" FIRE SHUTOFF VALVES ON W1-60789 TO W1-60791 WILL HAVE NITROGEN SUPPLIED BY A DEDICATED NITROGEN HEADER, AND CAN BE CLOSED BY A SINGLE VALVE ON THAT HEADER OR ESD SOLENOID XY-112.
3. THESE VALVES WILL CLOSE AND PUMPS WILL SHUT DOWN WHEN ESD BUTTON HS-18A OR HS-18B IS PRESSED.
4. WET TEST WELL FOR LEVEL SWITCH HIGH HIGH.

LINE NUMBER SCHEDULE			FLANGE NUMBER SCHEDULE		
FROM	TO	LAST NUMBER USED	FROM	TO	LAST NUMBER USED
031	060	060	100	199	132

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	10-24-94	ADDED FLANGE NUMBERS AND SCHEDULE	MRN	MET	10-24-94
J	GEN	10-29-96	ADDED ACTUATORS TO PLUG VALVES 15 & 21	JAM	DLW	10-29-96
K	GEN	150CT98	FIELD REVISIONS	DLB	CVP	150CT98
L	GEN	05NOV98	ADDED ESD TO TSV'S AND PUMPS	DLB	FPY	05NOV98
M	GEN	200CT99	AS BUILT REVISIONS	JDW	MGS	200CT99
N	GEN	290CT99	ADDED SEAL POT/PIPING TO P1-19783/4	RDR	JLW	290CT99
P	GEN	07SEP00	REVISED PER PCR 800-99-5	PAP	MRN	07SEP00
Q	GEN	26FEB04	REVISE PER HAZOP WALK DOWN	RLB	MGS	26FEB04
R	GEN	12JAN08	REVISED PER HAZOP WALKDOWN	LCA	MGS	12JAN08
S						
D	GEN	2-3-92	ADDED VALVE NUMBERS	HAD	JRH	2-92
E	GEN	6-30-94	800 BLOCK HAZOP AS-BUILT REVISIONS	KDM	KDM	6-30-94
F	B-5 F-5	7-25-94	CHANGED EQID #'S ON N2 REGS & RELIEF VALVES	MRN	JAW	7-25-94
G	GEN	8-19-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	8-19-94

DESIGNED	C.G.ROWE	DATE 11-19-87
DRAWN	S.UDELL	DATE 11-23-87
CHECKED	SBR/TSW	DATE 02-26-88
APPROVED	S.B.ROELOFS	DATE 03-04-88

01-04-2010

** PROPRIETARY **

CADD

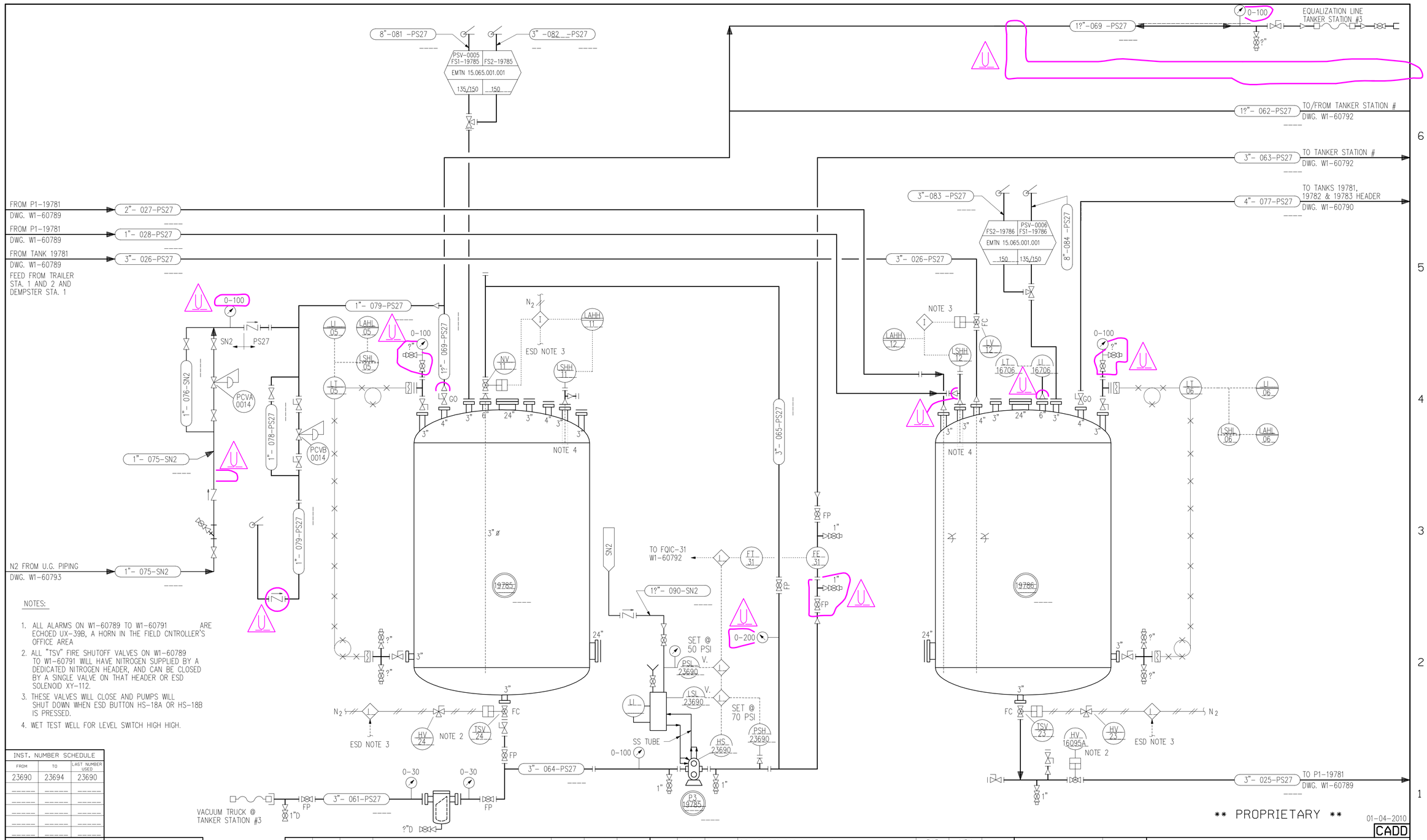
DOW CORNING CORPORATION

MIDLAND PLT — 806 TANK FARM

WASTE SOLVENT STORAGE

P&ID — SHEET 2 OF 6

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	NONE		W1-60790	R



NOTES:

1. ALL ALARMS ON W1-60789 TO W1-60791 ARE ECHOED UX-39B, A HORN IN THE FIELD CNTROLLER'S OFFICE AREA
2. ALL "TSV" FIRE SHUTOFF VALVES ON W1-60789 TO W1-60791 WILL HAVE NITROGEN SUPPLIED BY A DEDICATED NITROGEN HEADER, AND CAN BE CLOSED BY A SINGLE VALVE ON THAT HEADER OR ESD SOLENOID XY-112.
3. THESE VALVES WILL CLOSE AND PUMPS WILL SHUT DOWN WHEN ESD BUTTON HS-18A OR HS-18B IS PRESSED.
4. WET TEST WELL FOR LEVEL SWITCH HIGH HIGH.

INST. NUMBER SCHEDULE

FROM	TO	LAST NUMBER USED
23690	23694	23690

LINE NUMBER SCHEDULE

FROM	TO	LAST NUMBER USED
061	090	090

FLANGE NUMBER SCHEDULE

FROM	TO	LAST NUMBER USED
200	299	220

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	8-19-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	8-19-94
J	GEN	10-25-94	ADDED FLANGE NUMBERS AND SCHEDULE	MRN	MET	10-25-94
K	D-5	04-23-96	REPLACED CHECK VALVE W/ SHUT OFF VALVE	JKL	SWN	04-23-96
L	GEN	150CT98	FIELD REVISIONS	DLB	CVP	150CT98
M	GEN	05NOV98	ADDED ESD TO PUMPS AND TSV'S	DLB	FPY	05NOV98
N	GEN	17DEC98	ADDED LINE 089 TO DRAWING	WRL	JEH	17DEC98
P	J-5	21JAN99	REVISED VALVE PER AS-BUILT	WRL	GMP	21JAN99
Q	GEN	9-06-00	REVISED PER PCR 800-99-5	PAP	MRN	9-06-00
R	GEN	8-27-03	REMOVED LINES, PUMP AND RESERVOIR REVISED FOR TEMPORARY PCR	CAF	MCS	8-27-03
S	GEN	07JAN04	REVISED/ADDED EQUALIZATION LINES	RFP	ABK	03MAR04
T	E-1	16NOV05	REPLACED P3-19785 PER PCR#806-06-01	TAK	LES	14JUN06
U	GEN	12JAN09	REVISED PER HAZOP WALKDOWN	LCA	MCS	12JAN09
V						

DESIGNED	C.G.ROWE	11-19-87
DRAWN	S.UDELL	11-23-87
CHECKED	SBR/TSW	02-26-88
APPROVED	S.B.ROELOFS	03-04-88

DOW CORNING CORPORATION

MIDLAND PLT — 806 TANK FARM

WASTE IPA/SILOXANE STORAGE

P&ID — SHEET 3 OF 6

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
		NONE	W1-60791	U

EQUALIZATION LINE TO/FROM EQ.#19785 DWG. W1-60791

1?"-062__-PS27

0-60

TO / FROM TRAILER STATION 1 (UPPER LEVEL)

?"

EQUALIZATION LINE TO/FROM EQ.# 19781, 19782 & 19783 DWG.W1-60790

1?"-052 -PS27

0-30

1?"-052 -PS27

TO / FROM TRAILER STATION 1 (LOWER LEVEL)

1?"- 99 -PS27

0-60

1?"- 111-PS27

?"

1"

TO / FROM TRAILER STATION 1 (LOWER LEVEL)

EQUALIZATION LINE TO/FROM EQ 19784 DWG.W1-60790

1?"- 056-PS27

1?"- 056-PS27

PS27 SN2

0-30

?"- 103 -SN2

1?"-112 -PS27

TO / FROM TRAILER STATION 2 (LOWER LEVEL)

?"

1?"- 119-PS27

0-30

TO / FROM TRAILER (UPPER LEVEL) STATION #1

?"

FC

F/A

2"- 100-PS27

HV 13853

I

FROM EQ.#19785 DWG. W1-60791

3" -063__-PS27

N2 FROM UNDERGROUND DWG. W1-60793

1"-117__-SN2

3"- 032 -PS27 ET&C

3"- 092 -PS27 ET&C

3"- 094 -PS27

3"-093 -PS27 ET&C

0-100

P

SIDE LOADING TO TRAILER

3"-093 -PS27 ET&C

0-100

1?"-098 -PS27 ET&C

3"- 091 -PS27

0-30

?"-117 -SN2

0-100

SIDE UNLOADING FROM TRAILER

P1 19789

P

TRAILER STATION 2

FROM EQ. # P1-19783 , P1-19784 P1-19781 & P1-19782 VIA. DWG. W1-60790

3"-033__-PS27

?"- 103 -SN2

FROM W1-60791 ESD NOTE 3

I

FQIC 31

TO FT-31 W1-60791

NV 31

FC FP

3" -063__-PS27

3"- 109 -PS27 C

3"-094 -PS27 C

3"- 113-PS27 C

3"-095 -PS27 C

3"-105 -PS27 C

3"-096 -PS27 C

3"-106 -PS27 C

3"-097 -PS27 C

3"-107 -PS27 C

TO EQ.#19781 DWG. W1-60789 ET&C

TO EQ.#19782 DWG.W1-60789 ET&C

TO EQ.#19783 DWG.W1-60790 ET&C

TO EQ.#19784 DWG.W1-60790 ET&C

0-60

1"

PS27

SN2

END LOADING TO TRAILER

1"-131 -SN2

TO DEMPSTERS 1 & 2 DWG.W1-60794

?"- 114-SN2

PSH 13494

PIT 13494

PI 13494

I

0-60

3"-104 -PS27 ET&C

NOTE 3

I

FQIC 30

FV 30

FC

FE 30

MASS

CV 105

0-60

END LOADING TO TRAILER

3"-104 -PS27

0-100

1?"-108 -PS27 ET&C

N_2

SIDE LOADING TO TRAILER

3"-110 -PS27 ET&C

3"-102 -PS27 ET&C

3"- 102-PS27 ET&C

?"-118 -SN2

0-100

0-30

SIDE UNLOADING FROM TRAILER

3"-101 -PS27 ET&C

N_2

CV 106

P2 19789

P

TRAILER STATION 1

3. THESE VALVES WILL CLOSE WHEN ESD BUTTON HS-18A OR HS-18B IS PRESSED

P1 19789 DQ UNLOADING PUMP

19788 STRAINERS

19790 STRAINERS

P2 19789 UNLOADING PUMP

01-04-2010

** PROPRIETARY **

CADD

LINE NUMBER SCHEDULE			FLANGE NUMBER SCHEDULE		
FROM	TO	LAST NUMBER USED	FROM	TO	LAST NUMBER USED
091	120	119	300	399	328

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	10-25-94	ADDED FLANGE NUMBERS AND SCHEDULE	MRN	MET	10-25-94
J	GEN	10-29-96	ADDED ACTUATORS TO PLUG VALVES 56 & 57	JAM	DLW	10-29-96
K	GEN	14OCT98	FIELD REVISIONS	RDR	SVP	14OCT98
L	GEN	05NOV99	REVISED LINES #056,99,103,112,100 & 119	RKW	MGS	05NOV99
M	GEN	07SEP00	REVISED PER PCR 800-99-5	PAP	MRN	07SEP00
N	GEN	09JAN04	ADDED/REVISED EQUALIZATION LINES	RFP	ABK	03MAR04
P	GEN	12JAN09	REVISED PER HAZOP WALKDOWN	LCA	MGS	12JAN09

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
B	D,J-2	5-3-89	ADDED P1,P2-19789	MOQUIN	SBR	5-3-89
C	GEN	3-16-90	ADDED EQUALIZATION LINE (1?"-056)	HAD	JJ	3-90
D	GEN	2-4-92	ADDED VALVE NUMBERS	HAD	JRH	2-92
E	GEN	6-30-94	800 BLOCK HAZOP AS-BUILT REVISIONS	KDM	KDM	6-30-94
F	GEN	8-19-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	8-19-94
G	GEN	9-22-94	REVISED VALVE NUMBERS TO DATE	MRN	MET	9-22-94

DESIGNED	C.G.ROWE	11-19-87
DRAWN	T.A.KAMINSKI	11-24-87
CHECKED	SBR/TSW	02-26-88
APPROVED	S.B.ROELOFS	03-04-88

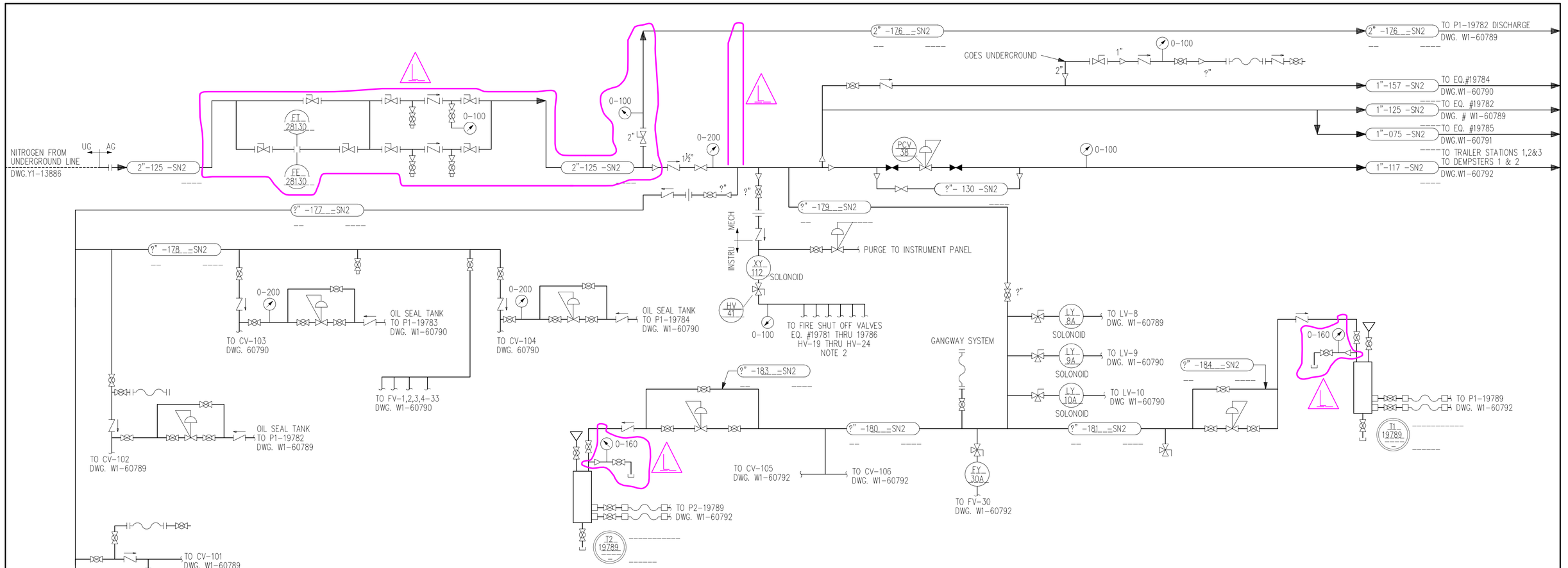
DOW CORNING CORPORATION

MIDLAND PLT — 806 TANK FARM

WASTE SOLVENT TRAILER LOADING/UNLOADING STATION

P&ID — SHEET 4 OF 6

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	NONE		W1-60792	P



2. ALL "TSV" FIRE SHUTOFF VALVES ON W1-60789 TO W1-60791 WILL HAVE NITROGEN SUPPLIED BY A DEDICATED NITROGEN HEADER, AND CAN BE CLOSED BY A SINGLE VALVE ON THAT HEADER

3. THESE VALVES WILL CLOSE WHEN ESD BUTTON HS-18A OR HS-18B IS PRESSED

LINE NUMBER SCHEDULE			FLANGE NUMBER SCHEDULE		
FROM	TO	LAST NUMBER USED	FROM	TO	LAST NUMBER USED
121	130	130	400	499	406
176	195	184			

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	07SEP00	REVISED PER PCR 800-99-5	PAP	MRN	07SEP00
J	GEN	28AUG03	REMOVED LINES 62, 121, 122 AND 123	CAF	MGS	27AUG03
K	GEN	02MAR04	REVISE PER HAZOP WALK DOWN	RLB	MGS	02MAR04
L	GEN	14JAN09	REVISED PER HAZOP WALKDOWN	LCA	MGS	14JAN09
M						
N						
P						

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
A			ISSUED FOR CONSTRUCTION		SBR	3-25-88
B	K-6	10-4-91	ADDED LINE FOR EQUIP # 197840	HAD	JRH	10-4-91
C	GEN	2-5-92	ADDED VALVE NUMBERS	HAD	JRH	2-92
D	GEN	9-22-94	REVISED VALVES AND VALVE NUMBERS TO DATE	MRN	MET	9-22-94
E	GEN	10-25-94	ADDED FLANGE NUMBERS AND SCHEDULE	MRN	MET	10-25-94
F	GEN	15OCT98	FIELD REVISIONS	DLB	CVP	15OCT98
G	GEN	03NOV99	FIELD REVISIONS AND ADDED LINE #176	JDW	MGS	03NOV99

04JAN2010

** PROPRIETARY **

CADD

DESIGNED	C.G. ROWE	DATE 11-23-87
DRAWN	P.W NELSON	DATE 11-23-87
CHECKED	SBR/TSW	DATE 02-26-88
APPROVED	S.B.ROELOFS	DATE 03-04-88

DOW CORNING CORPORATION

WASTE CONTROL 806 TANK FARM

NITROGEN DISTRIBUTION

P&ID SHEET 5 OF 6

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	NONE		W1-60793	L

N2
DWG.W1-60792

1"-131 -SN2

1?"-136 -PS27

NORMALLY CLOSED VALVE
NOTE: WHEN PUMPING TO EQ.#19784 VALVE MUST BE CLOSED
AND LINE MUST BE PURGED BEFORE PUMPING.

1?"-139 -PS27 TO EQ.#19781 DWG.W1-60789

1?"-138 -PS27 TO EQ.#19782 DWG.W1-60789

1?"-137 -PS27 TO EQ.#19783 DWG.W1-60790

1?"-136 -PS27 TO EQ.#19784 DWG.W1-60790

Ø-100

?"-127 -SN2 TRAILER STATION #3

PSV-0009
EMTN 15.065.001.004
75

1"-141 -PS27

?"-140 -PS27

0-100

1?"-135 -PS27

1?"-136 -PS27

?"

P 19791

?"-131 -SN2

1?"-135 -PS27

0-100

STATION 1

SOLVENT DEMPSTERS

?"-132 -SN2

0-100

0-100

P 19791

STATION 2

CW PCW

CW

?"

TO WATER HOSE REEL

ABOVE GROUND
BELOW GROUND
CHEMICAL

ABOVE GROUND
BELOW GROUND
CHEMICAL

01-04-2010

** PROPRIETARY **

CADD

LINE NUMBER SCHEDULE			FLANGE NUMBER SCHEDULE		
FROM	TO	LAST NUMBER USED	FROM	TO	LAST NUMBER USED
131	160	155	500	599	511

MARK	LOCATION	DATE	REVISIONS	CHANGED	APPROVED	DATE
H	GEN	9-22-94	REVISED VALVES & VALVE NUMBERS TO DATE	MRN	MET	9-22-94
J	GEN	10-25-94	ADDED FLANGE NUMBERS AND SCHEDULE	MRN	MET	10-25-94
K	G-3	12-24-97	ADDED DURA CIRULATOR PUMP & COOLER COIL	WRL	DLW	12-24-97
L	GEN	14OCT98	FIELD REVISIONS	RDR	CVP	14OCT98
M	GEN	07SEP00	REVISED PER PCR 800-99-5	PAP	MRN	07SEP00
N	GEN	08AUG03	REMOVED LINES AND PUMP P2-19785	CAF	MGS	27AUG03
P	GEN	02MAR04	REVISE PER HAZOP WALK DOWN	RLB	MGS	02MAR04
Q	GEN	14JAN09	REVISED PER HAZOP WALKDOWN	LCA	MGS	14JAN09
R						
C	G-3	4-2-90	ADDED DRAIN VALVE, AND NOTE	HAD	JMJ	4-90
D	GEN	2-5-92	ADDED VALVE NUMBERS	HAD	JRH	2-92
E	GEN	10-13-92	ADDED LINE #151	KDM	KDM	3-93
F	GEN	6-30-94	800 BLOCK HAZOP AS-BUILT REVISIONS	KDM	KDM	6-30-94
G	GEN	8-19-94	REVISED VALVES & VALVE NUMBERS TO DATE	MRN	MET	8-19-94

DESIGNED	C.G. ROWE
DATE	11-23-87
DRAWN	PW NELSON
DATE	11-23-87
CHECKED	SBR/TSW
DATE	02-26-88
APPROVED	S.B.ROELOFS
DATE	03-04-88

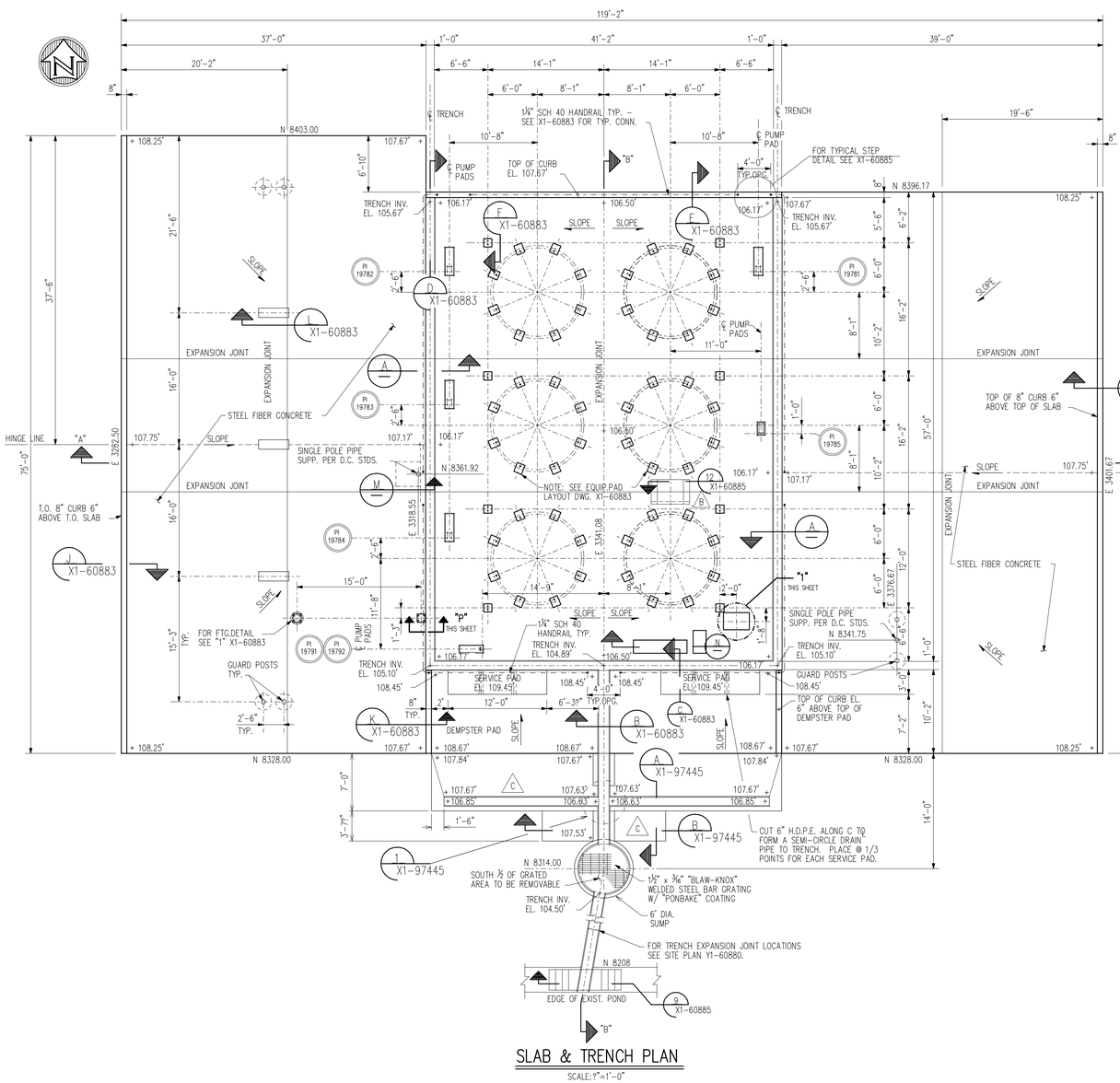
DOW CORNING CORPORATION

MIDLAND PLT — 806 TANK FARM

WASTE SOLVENT DEMPSTER UNLOADING STATION

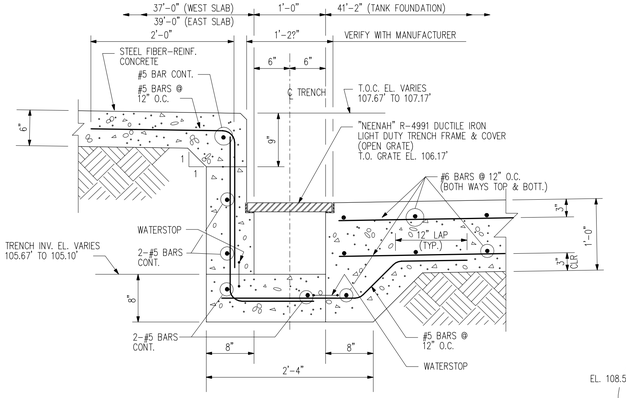
P&ID — SHEET 6 OF 6

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	NONE		W1-60794	Q



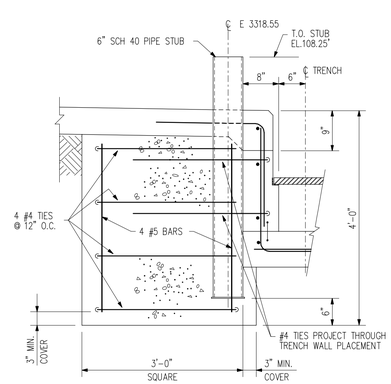
SLAB & TRENCH PLAN

SCALE: ?"=1'-0"



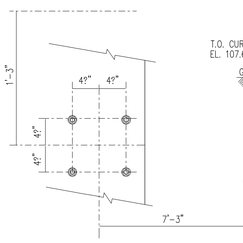
SECTION A

SCALE: 1"=1'-0"

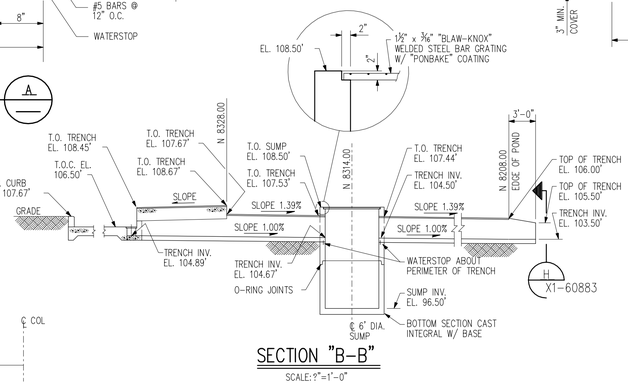


SECTION M

SCALE: ?"=1'-0"



PARTIAL PLAN



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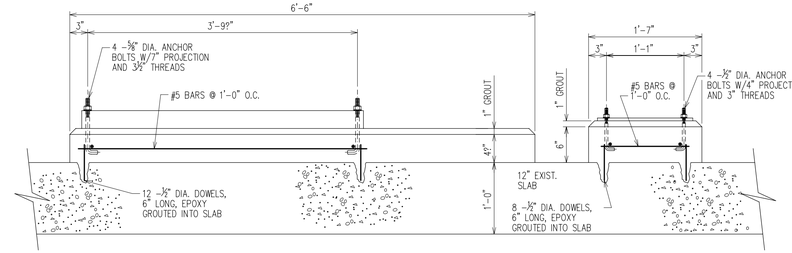

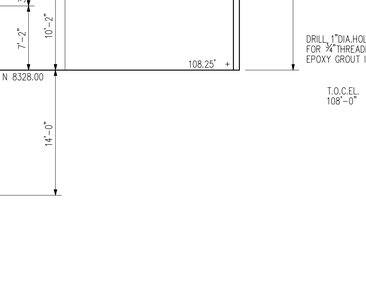

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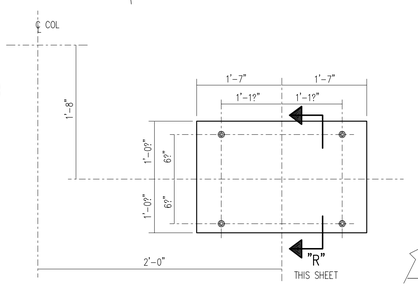
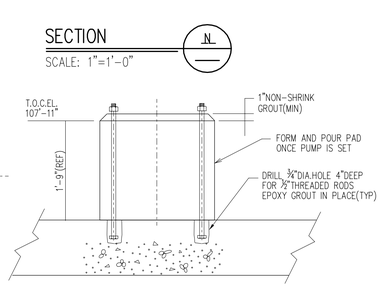
SCALE: NONE



DETAIL " 1 "

SCALE: NONE REF: THIS SHEET



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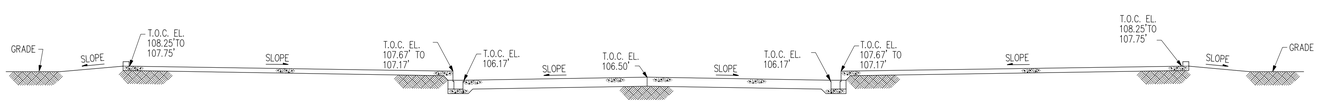

SECTION "A-A"

SCALE: ?"=1'-0"

GENERAL CONCRETE NOTES:

LAST GENERAL UPDATE: 04JAN2010

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESIVE STRENGTH OF 4000 PSI IN 28 DAYS.
2. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE, DEFORMED, NEW BILLET-STEEL MEETING ASTM SPECIFICATIONS A615-87, GRADE 60.
3. ALL FILL SHALL BE COMPACTED TO 95% MODIFIED PROCTOR.
4. ALL FILL SHALL BE COMPACTED SAND; 6" MINIMUM THICKNESS UNDER SLABS.
5. ALL EXPOSED CONCRETE CORNERS CHAMFERED ?" x 45°.
6. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM SPEC. A-36.
7. ALL CONCRETE SHALL BE AIR-ENTRAINED.
8. WORK SHALL BE DONE IN ACCORDANCE WITH ACI-318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
9. PLASTIC FIBER-REINFORCED CONCRETE SHALL BE "FORTA FIBRE".
10. STEEL FIBER-REINFORCED CONCRETE SHALL BE "DRAMIX".
11. UNLESS OTHERWISE NOTED, #4 BARS SHALL BE LAPPED 21" MINIMUM, #5 BARS SHALL BE LAPPED 26" MINIMUM AND #6 BARS SHALL BE LAPPED 31" MINIMUM.
12. NO JOINTS ALLOWED OTHER THAN THOSE SHOWN ON DRAWINGS.
13. ALLOWABLE SOIL PRESSURE 2000 P.S.F.. FOR SOILS REPORT SEE FILE #87-356 IN RECORD PRINT #5839.

MARK	LOC.	REVISIONS	BY	DATE	TECH APPR	INITIALS
A	GEN	ADDED SECTION "N"	JAM	02JAN98	NSD	
B	GEN	ADDED SECTION "P"	RFP	27FEB04	ABK	

DESIGNED BY: K.J.WALKER	DATE 01-11-88	RELATED DRAWINGS	
DRAWN BY: D.A.W./L.K.O.	DATE 01-29-88	NUMBER	TITLE
TECHNICAL APPROVAL: K.J.WALKER	DATE 06-04-88	X1-60833	TANK FARM SLAB & FOUNDATION DETAIL
APPROVED FOR ISSUE: R.L.ZITTA	DATE 06-06-88		

CADD

DOW CORNING CORPORATION

MIDLAND PLANT BLDG. 806

TANK FARM

SLAB AND FOUNDATION PLAN

PMSS INFORMATION	ENGRG. DISC.	DWG. TYPE
	CA CONC	PLAN

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	1" = 1'-0"		X1-60882	B

SECTION 'A' **CERTIFICATION STATEMENTS**

DOW CORNING

November 22, 1989

Alan Howard, Chief
Waste Management Division
Department of Natural Resources
Stevens T. Mason Building
Box 30028
Lansing, Michigan 48909

Subject: Hazardous Waste Storage Facility MID 000 809 632

Dear Mr. Howard,

The installation is complete on the new storage facility in the 800 Block of Dow Corning's Midland Plant. Inspection and system tightness testing were completed on November 2, 1989. Enclosed are two copies of the assessment of construction, reviewed and certified by an independent, qualified registered professional engineer, William Kivela, P.E., as required by 40 CFR 264.192.

Also enclosed are two copies of the schedule and procedure for testing the overfill controls for the storage tanks.

If there are any questions regarding this certification, please feel free to call me on (517) 496-6182 or call William Kivela, P.E. on (517) 832-3097.

Sincerely,

Scott B. Roelofs

Scott B. Roelofs
Project Coordinator
Facilities Engineering Dept.

Copy: Name (Numer of sets of attachments)
James Sygo, MDNR Compliance Section (1)
Wayne Winslow, Dow Corning (1)
William Kivela, P.E. (1)

JAMES J. BLANCHARD
GOVERNOR

STATE OF MICHIGAN

DEPARTMENT OF LICENSING AND REGULATION

BOARD OF PROFESSIONAL ENGINEERS

PROFESSIONAL ENGINEER LICENSE

WILLIAM C KIVELA
2101 KENTUCKY ST
MIDLAND MI 48640

PERMANENT ID NO.	EXPIRATION DATE	
6201018455	10/31/91	0995082

THIS DOCUMENT IS DULY ISSUED UNDER THE LAWS OF THE STATE OF MICHIGAN

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number 806 TANK FARM
DC TANK NO. 33446-E
EQUIPMENT #19781

Seal or Stamp:

Signature William C. Kiefer
License No. 18455
Date NOVEMBER 20, 1989

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number 806 TANK FARM
DC TANK NO. 33450-E
EQUIPMENT # 19782

Seal or Stamp:

Signature William C. Kisela
License No. 18455
Date NOVEMBER 20, 1989

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number B06 TANK FARM
DC TANK NO. 33462-E
EQUIPMENT #19783

Seal or Stamp:

Signature William C. Kivela
License No. 18455
Date NOVEMBER 20.1989

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number 806 TANK FARM
DC TANK NO. 33461-E
EQUIPMENT # 19784

Seal or Stamp:

Signature William C. Kivela
License No. 18455
Date NOVEMBER 20, 1989

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number 806 TANK FARM
DC TANK NO. 33427-E
EQUIPMENT #19785

Seal or Stamp:

Signature William C. Kjesla
License No. 18455
Date NOVEMBER 20, 1989

CERTIFICATION 40CFR270.11(d)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tank Location and Number 806 TANK FARM
DC TANK NO. 33429-E
EQUIPMENT #19786

Seal or Stamp:

Signature William C. Kiefer
License No. 18455
Date NOVEMBER 20.1989

I, Matt Eddy and Scott Roelofs, have supervised a portion of the design or installation of a new tank system or component located at Dow Corning Corporation, Midland Plant, Midland, Michigan 48640, owned/operated by Dow Corning Corporation. My duties were: *supervising of the rigging and setting of the storage tanks on their foundations at the 806 Tank Farm.* for the following tank system components: *Tanks # 19781, 19782, 19783, 19784, 19785 and 19786.*

as required by the Resource Conservation and Recovery Act (RCRA) regulation(s), namely, 40 CFR 264.192 Paragraph b.

I certify that the work described above was done according to the Specification #2183; and that the tanks were lifted properly to prevent undue stress to the tanks; and that the tanks were not damaged during installation.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Scott Roelofs
Signature

PROJECT COORDINATOR
Title

DOW CORNING CORP., MIDLAND, MI 48686-0995
Address

NOV. 10, 1989
Date

N/A
Registration No., if applicable

Matt Eddy
Signature

Owner's Rep
Title

Dow Corning Corp. Midland Mi 48686
Address

11-10-1989
Date

N/A
Registration No., if applicable

I, Ron Wendt, have supervised a portion of the design or installation of a new tank system or component located at Dow Corning Corporation, Midland Plant, Midland, Michigan 48640, owned/operated by Dow Corning Corporation. My duties were: *supervising of the sandblasting, priming and finish coat painting of the storage tanks and piping at the 806 Tank Farm.* for the following tank system components: *Tanks # 19781, 19782, 19783, 19784, 19785 and 19786, and associated piping.*

as required by the Resource Conservation and Recovery Act (RCRA) regulation(s), namely, 40 CFR 264.192 Paragraph f.

I certify that the work described above was done according to the Painting Section 9901 of Specification #2183.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Ron Wendt
Signature

Painter superintendent
Title

PO Box 167 Midland MI
Address

11-10-89
Date

N/A
Registration No., if applicable

Effective Date: 30NOV07
Supersedes Date: 02JUN00

Filename: **DOCUMENTUM SERVER\806 TANK FARM RECIRCULATING TANKS 19781-19786**
Title: Recirculating Tanks 19781-19786

Midland Plant Environmental Services

Control Document Update Acknowledgment

Signature of 800 Block operators acknowledging that the update to this controlled document has been communicated to them.

PRINTED NAME	NAME (signature)	DATE

Reason for the current issue of this control document: Yearly review with minor updated and formatting changes.

New Document	☐	Revision	☐	Edit	☒

Underlining and left border indicates change in current issue.

Rev. Ref. (i.e. PCR #): Yes ☐ No ☒ MSDS Checked: Yes ☒ No ☐ NA ☐

Review Date: Reviewed By:

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1.1. Re-circulation of tanks (19781 through 19786) in 806 tank farm is done to keep their contents well-mixed and to prevent sludge build-up in the bottoms of the tanks. Typically, re-circulation is done prior to loading tankers to ensure more uniform density and composition during loading

2. SAFETY KEYPOINTS

2.1. MATERIAL HAZARDS

2.1.1. Refer to **806 Tank Farm Safety SOP**.

2.2. PERSONAL PROTECTIVE EQUIPMENT

2.2.1. Steel-toed shoes, safety glasses, hardhat and goggles are required in the tank farm.

2.3. SAFE OPERATING LIMITS

2.3.1. Refer to **806 Tank Farm Safety SOP.**

2.4. PRESSURE RELIEF DEVICES

2.4.1. Refer to **806 Tank Farm Safety SOP** for information on Tank pressure relief devices.

2.4.2. The pumps on Tanks 19781-6 do not have pressure relief devices. They will not over-pressure when dead-headed (when all discharge valves are closed); however, excess wear-and-tear on the pumps and pump seals occur when the pumps are dead-headed.

2.5. ALARMS AND INTERLOCKS

2.5.1. Refer to **806 Tank Farm Safety SOP**. Pumps and Fire Safe Valves on tanks 19781-6 will shutdown when the ESD button is tripped.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. Not applicable to this SOP.

3.2. STORM/WASTE WATER

3.2.1. Not applicable to this SOP.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. EMERGENCY SHUTDOWN CONDITIONS

4.1.1. Not applicable to this SOP.

4.2. STEPS TO TAKE IN CASE OF EMERGENCY SHUTDOWN

4.2.1. Tank recirculation may be shutdown by either tripping the emergency shutdown switch, or by shutting off the appropriate pump. Tripping the ESD will also shut the fire safe valves.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1. EQUIPMENT COVERED UNDER THIS SOP

6.1.1. Tank 19781 & 6, and associated piping; pump 19781 and associated seal flush.

6.1.2. Tank 19782 and associated piping; pump 19782 and associated seal flush.

6.1.3. Tank 19783 and associated piping; pump 19783 and associated seal flush.

6.1.4. Tank 19784 and associated piping; pump 19784 and associated seal flush.

6.1.5. Tank 19785 and associated piping; pump 19785 and associated seal flush.

6.2. MATERIALS USED IN THE PROCESS

6.2.1. Not applicable to this SOP.

7. INITIAL START UP PROCEDURES

7.1.1. Make sure all drain valves and other feed valves are shut off so no spill will occur during re-circulation. This should be a thorough check around the header of the pump inlet and discharge.

7.1.2. Verify that pump seal flushes are set-up properly:

7.1.2.1. Any valves in seal flush lines must be open.

7.1.2.2. N2 pressure on seal reservoirs should be at least 60 psig.

7.1.2.3. Seal flush reservoirs should be at least half-full.

8. NORMAL OPERATIONS AND SHUTDOWN

8.1. TANK 19781 RE-CIRCULATION

8.1.1. Make sure valve V-280 (fire shut valve) is open. This allows material to flow from the tank towards the pump.

8.1.2. Open valve V-1. This allows material to get to the intake of the pump.

8.1.3. Open valve V-4. This is the recycle line that leads to the top of the tank.

8.1.4. Turn pump P1-19781 on.

8.1.5. Let system re-circulate for the predetermined time.

8.1.6. Shut off pump P1-19781.

8.1.7. Shut valve V-1.

8.1.8. Leave valve V-4 open. This will eliminate any buildup of pressure in the lines around the pump.

8.2. TANK 19782 RE-CIRCULATION

8.2.1. Make sure valve V-281 (fire-shut valve) is open. This allows material to flow from the tank towards the pump.

8.2.2. Open valve V-7. This allows material to get to the intake pump.

8.2.3. Open valve V-10. This is the recycle line that leads to the top of the tank.

8.2.4. Turn on pump P1-19782.

8.2.5. Let system re-circulate for the predetermined time.

8.2.6. Shut off pump P1-19782.

8.2.7. Shut valve V-7.

8.2.8. Leave valve V-10 open. This will eliminate any build up of pressure in the lines around the pump.

8.3. TANK 19783 RE-CIRCULATION

8.3.1. Make sure valve V-282 (fire-shut valve) is open. This allows material to flow from the tank towards the pump.

8.3.2. Open valve V-13. This allows material to get to the intake of the pump.

8.3.3. Open valve V-16. This is the recycle line that leads to the top of the tank.

8.3.4. Turn on pump P1-19783.

8.3.5. Let system re-circulate for the predetermined time.

8.3.6. Shut off pump P1-19783.

8.3.7. Shut valve V-13.

8.3.8. Leave valve V-16 open. This will eliminate any build up of pressure in the lines around the pump.

8.4. TANK 19784 RE-CIRCULATION

8.4.1. Make sure valve V-283 (fire-shut valve) is open. This allows material to flow from the tank towards the pump.

8.4.2. Open valve V-19. This allows material to get to the intake pump.

8.4.3. Open valve V-22. This is the recycle line that leads to the top of the tank.

8.4.4. Turn on pump P1-19784.

8.4.5. Let system re-circulate for the predetermined time.

8.4.6. Shut off pump P1-19784.

8.4.7. Shut valve V-19.

8.4.8. Leave valve V-22 open. This will eliminate any build up of pressure in the lines around the pump.

8.5. TANK 19785 RE-CIRCULATION

8.5.1. Make sure valve V-284 (fire-shut valve) is open. This allows material to flow from the tank

towards the pump.

8.5.2. Open valves V-25 and V-29. This will allow material to get to the intake of the pump.

8.5.3. Open valve V-32. This is the recycle line that leads to the top of the tank.

8.5.4. Turn pump P1-19785 on.

8.5.5. Let the system re-circulate for predetermined amount of time.

8.5.6. Shut off pump P1-19785.

8.5.7. Shut valve V-25.

8.5.8. Leave valve V-32 open. This will eliminate any buildup of pressure in the lines around the pump.

8.6. TANK 19786 RE-CIRCULATION

8.6.1. Make sure valve V-285 (fire-shut valve) is open. This allows material to flow from the tank towards the pump.

8.6.2. Open valves V-26 and V-29. This allows material to get to the intake of the pump.

8.6.3. Open valve V-31. This is the recycle line that leads to the top of the tank.

8.6.4. Turn pump on. P1-19781 is the pump for both tanks 19781 and 19786.

8.6.5. Let system re-circulate for the predetermined time.

8.6.6. Shut off pump P1-19781.

8.6.7. Shut valve V-26.

8.6.8. Leave valve V-31 open. This will eliminate any build up of pressure in the lines around the pump.

9. OPERATING LIMITS

9.1.1. Critical instruments are noted in the "Type column: E = Environmental; S = Safety; Q = Quality

9.1.2. See troubleshooting section for corrective action guidelines.

DESCRIPTION	TYPE	TARGET (UNIT)	ALLOWED OP. LIMITS	IMPACT IF OUT OF OPERATING LIMITS	ACTIONS TO TAKE IF OUTSIDE THE ALLOWABLE LIMITS
N/A		N/A	N/A	N/A	N/A

10. TEMPORARY OPERATIONS

10.1.1. Not applicable to this SOP.

11. NORMAL SHUTDOWN PROCEDURES

11.1.1. Not applicable to this SOP.

12. START-UP AFTER EMERGENCY SHUTDOWN

12.1.1. Not applicable to this SOP.

13. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

13.1.1. Not applicable to this SOP.

14. TROUBLESHOOTING

14.1.1. Not applicable to this SOP.

Effective Date: 7DEC07
Supersedes Date: 19JAN05

Filename: **DOCUMENTUM SERVER\806 TANK FARM SAFETY INFORMATION**
Title: Tank Farm Safety Information

Midland Plant Environmental Services

Control Document Update Acknowledgment

Signature of 800 Block operators acknowledging that the update to this controlled document has been communicated to them.

PRINTED NAME	NAME (signature)	DATE

Reason for the current issue of this control document: Yearly review with minor updates and formatting changes.

New Document	☐	Revision	☐	Edit	☒

Underlining and left border indicates change in current issue.

Rev. Ref. (i.e. PCR #): Yes ☐ No ☒ MDMS Checked: Yes ☒ No ☐ NA ☐

Review Date: _____ Reviewed By: _____

_____ _____

_____ _____

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By Mark Arent

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1.1. Not applicable to this SOP.

2. SAFETY KEYPOINTS

2.1. TANK FARM MATERIAL HAZARDS

Material	Tank	Flash-point	Effects of Exposure	Reactivity
Q8-6017 Scrap Solvent	19781, 19786	59F	Acute: loss of consciousness & death if inhaled at high concentration; nervous system depression and respiratory irritation if inhaled; severe eye irritation; mild skin burns; harmful if absorbed through skin. Chronic: blindness and death if ingested; cardiac sensitization and possible heat attack if inhaled at high concentrations; blindness, organ and nervous system damage, cancer, and peripheral nerve damage via inhalation; allergic respiratory reaction after repeated inhalation; dermatitis & allergic reaction after repeated skin contact.	Avoid contact with aluminum.
Q8-6017 Scrap Solvent	19782, 19783	59F	Acute: loss of consciousness & death if inhaled at high concentration; nervous system depression and respiratory irritation if inhaled; severe eye irritation; mild skin burns; harmful if absorbed through skin. Chronic: blindness and death if ingested; cardiac sensitization and possible heat attack if inhaled at high concentrations; blindness, organ and nervous system damage, cancer, and peripheral nerve damage via inhalation; allergic respiratory reaction after repeated inhalation; dermatitis & allergic reaction after repeated skin contact.	Avoid contact with aluminum.
Q8-6062 Waste Alkoxysilane	19784	45F	Acute: severe eye irritation; mild skin irritation; respiratory irritation and nervous system depression via inhalation. Chronic: death or blindness if ingested; organ irritation and damage via skin absorption or inhalation; nervous system damage and blindness via inhalation.	Normally stable. Will react with water at high concentrations.
Q8-6026 IPA/1107 Blend	19785	54F	Acute: severe eye irritation, mod. skin irritation, vapor may irritate nose and throat Chronic: may cause irritation or dermatitis to skin, overexposure by inhalation may injure the liver or kidneys	Reacts with H2O/metals to form Hydrogen gas.

2.2. PERSONAL PROTECTIVE EQUIPMENT

2.2.1. General Requirements

2.2.1.1. Hardhat, safety glasses with side shields, chemical splash goggles, and steel-toed shoes are required for all operations in 806 tank farm. Uniforms with long-sleeved shirts are required as these are made from a flame resistant material.

2.2.2. Waste Specific Requirements

2.2.2.1. When disconnecting lines, collecting samples, or draining/opening lines, the hand protection specified below is required.

2.2.2.2. Respiratory protection is not required for normal operations. Respiratory protection may be required for non-routine operations or maintenance if vapor exposure could exceed limits as specified in the MSDS. Requirements for respiratory protection in those situations will be determined on a case-by-case basis and will be specified in temporary SOPs or safe work permits.

Material	Tank	Hand Protection	Respiratory Protection
Q8-6017 Scrap Solvent	19781, 19782, 19783, 19786	PE/EV(Silver Shield), Viton, Nitrile	Supplied-air respirator
Q8-6062 Waste Alkoxysilane	19784	PE/EV(Silver Shield), Viton, Nitrile	Supplied-air respirator
Q8-6026 IPA/1107 Blend	19785	PE/EV(Silver Shield), Viton, Nitrile	Supplied-air respirator

NOTE: Silver shield gloves may be worn under leather gloves.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. Not applicable to this SOP.

3.2. STORM/WASTE WATER

3.2.1. Not applicable to this SOP.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. EMERGENCY SHUTDOWN CONDITIONS

4.1.1. Not applicable to this SOP.

4.2. STEPS TO TAKE IN CASE OF EMERGENCY SHUTDOWN

4.2.1. Not applicable to this SOP.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1. EQUIPMENT COVERED UNDER THIS SOP

6.1.1. Not applicable to this SOP.

6.2. MATERIALS USED IN THE PROCESS

6.2.1. Not applicable to this SOP.

7. INITIAL START UP PROCEDURES

7.1.1. Not applicable to this SOP.

8. NORMAL OPERATIONS

8.1.1. Not applicable to this SOP.

9. OPERATING LIMITS

Instrument, Alarm or Operation Level:	**Safe Limits**	**Alarm Setpoint**	**Consequences of Improper Operation**	**Preventive and Corrective Actions**
LT/LAH 01 (level transmitter and high alarm on tank 19781)	0-80%	80%	Tank 19781 could overflow via vent equalization lines to tanks 2 &3. A spill could occur via overflow through the vent, or pressure build-up could rupture frangibles on the tanks.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%.
LAHH 07 (high-high level alarm on tank 19781)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve if auto valve did not close.
LT/LAH 02 (level transmitter and high alarm on tank 19782)	0-80%	80%	Tank 19782 could overflow via vent equalization lines to tanks 1 &3. A spill could occur via overflow through the vent, or pressure build-up could rupture frangibles on the tanks.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%.
LAHH 08 (high-high level alarm on tank 19782)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve if auto valve did not close.
LT/LAH 03 (level transmitter and high level alarm on tank 19783)	20-80%	80%	Tank 19783 could overflow via vent equalization lines to tanks 1 & 2. A spill could occur via overflow through the vent, or pressure build-up could rupture frangibles on the tanks.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%.
LAHH 09 (high-high level alarm on tank 19783)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve if auto valve did not close.
LT/LAH 04 (level transmitter and high level alarm on tank 19874)	0-80%	80%	A spill could occur via overflow through the vent, or pressure build-up could rupture frangible on the tank.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%.

Instrument, Alarm or Operation **Level (cont)**	**Safe Limits**	**Alarm Setpoint**	**Consequences of Improper Operation**	**Preventive and Corrective Actions**
LAHH 10 (high-high level alarm on tank 19784)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve if auto valve did not close.
LT/LAH 05 (level transmitter and high level alarm on tank 19785)	0-80%	80%	A spill could occur via overflow through the vent, or pressure build-up could rupture frangible on the tank.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%. Stop inflow immediately when alarm is triggered.
LAHH 11 (high-high level alarm on tank 19785)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve if auto valve did not close.
LT/LAH 06 (level transmitter and high level alarm on tank 19786)	20-80%	80%	A spill could occur via overflow through the vent, or pressure build-up could rupture frangible on the tank.	Check tank level before filling and verify level change during transfer. Stop flow into tank before level reaches 80%.
LAHH 12 (high-high level alarm on tank 19786)		92%	(see above)	(see above). Verify auto valve on feed line closed properly. Trip ESD, or manually close block valve.

Instrument, Alarm or Operation **Pressure:**	**Safe Limits**	**Alarm Setpoint**	**Consequences of Improper Operation**	**Preventive and Corrective Actions**
PG-19783 (Vent blanket pressure on tanks 19781,2,3)	3-20# (normally 3-8#)	none	Trailer could overpressure and release (25#); Tanks 19781,2,3 could overpressure and release (150#).	Verify proper operation of vent regulators. If pressure is abnormal, stop feed into or out of tank immediately. Check for regulator malfunction and repair if needed. Verify that proper material was loaded and that no reaction is taking place. Check for vent plugging.
PG-19784 (Vent blanket pressure on tank 19784)	3-20# (normally 3-8#)	none	Trailer could overpressure and release (25#); Tank 19784 could overpressure and release (150#).	Verify proper operation of vent regulators. If pressure is abnormal, stop feed into or out of tank immediately. Check for regulator malfunction and repair if needed. Verify that proper material was loaded and that no reaction is taking place. Check for vent plugging.
PG-19785 (Vent blanket pressure on tanks 19785)	3-8#	none	Trailer could overpressure and release (25#); Tank 19784 could overpressure and release (150#).	Verify proper operation of vent regulators. If pressure is abnormal, stop feed into or out of tank immediately. Check for regulator malfunction and repair if needed. Verify that proper material was loaded and that no reaction is taking place. Check for vent plugging.

Instrument, Alarm or Operation **Composition:**	**Safe Limits**	**Alarm Setpoint**	**Consequences of Improper Operation**	**Preventive and Corrective Actions**
Tanks 19781,2,3,6	solvents & water-containing wastes only	none	Reaction and release/spill could occur if wrong material is transferred.	Check pH of waste . Verify contents and correct valve positions before initiating transfer. Stop transfer immediately if there is evidence of reaction.
Tank 19784	alkoxy-silane containing wastes only	none	Reaction and release/spill could occur if wrong material is transferred.	Check pH of waste. Verify contents and correct valve positions before initiating transfer. Stop transfer immediately if there is evidence of reaction.
Tanks 19785	IPA/1107 wastes /siloxanes	none	Reaction and release/spill could occur if wrong material is transferred.	Verify contents and correct valve positions before initiating transfer. Stop transfer immediately if there is evidence of reaction.

Instrument, Alarm or Operation **Flowrate and Volume:**	**Safe Limits**	**Alarm Setpoint**	**Consequences of Improper Operation**	**Preventive and Corrective Actions**
FE/FQIT 30 (trailer loading Station #1)	Calc'd by operator based on trailer capacity.	no alarm	Solvent & Methoxy Trailers could be overfilled. Vent equalizer line would fill w/ liquid; rupture disks on trailers could burst resulting in spill/release.	Monitor transferred amount and liquid density during transfer. Verify that shutoff valve closes when setpoint reached. Manually stop transfer if auto valve does not close. Transfer excess material out of trailer.

10. PRESSURE RELIEF DEVICES

LOCATION	DESCRIPTION
PSV-09 Solvent dempster unloading station, relief loop around pump	Consolidated Safety Relief Valve Size ½" x 1", Type 1990C, set pressure 75#, Drawing W1- 60794
PSV-01, 02, 03, 04 Tanks 19781,2,3,4,6 vent stack relief valves	Consolidated Safety Relief Valve Size 3" x 4", Type 1905KT-1, set pressure 135#, Drawing# W1-60789.
Tank 19781, 19782, 19783, 19784, 19786 safety frangibles beneath pressure relief valves	OSECO Size 3", Type FAS, Mat'l nickel, design burst pressure 150#, 187 psig @ 72 degrees F, 146 psig @ 50 degrees F. Drawing #W1-60789 & W1-60790
PSV-05, 06 Tank 19785 vent stack relief valves	Consolidated Safety Relief Valve Size 3" x 4", Type 1905L-C1, set pressure 135#, Drawing # W-160791
Tank 19785 safety frangibles beneath pressure relief valves	OSECO Size 3", type FAS, Mat'l Nickel, design burst pressure 150#, 167 psig @ 72F, 146 psig # 307F, Holder Assembly #B031177025 Ansi rating 3" - 150# - FRDI Max pressure 275 psi. Drawing #W-160791
Tank 19785 vent stack back-up safety frangibles	ZOOK Size 3", Mat'l graphite, design burst rating 150# @ 72 degrees F, Drawing #W-160791

11. PRESSURE REGULATORS

LOCATION	DESCRIPTION
N2 line regulator. PCV-38	Fischer Controls Type 95H, Set pressure 30 psig. Spring range 25-75 psig, trim material VITON, Drawing #W1-60793.
N2 inlet regulator for N2 blanket on Solvent tanks19781-19783, 19786. PCVA-0013	Fischer Controls Type 95L, 3 psig set pressure, Spring range 2-6 psig, trim material VITON, Drawing #W1-60790,.
N2 inlet regulator for N2 blanket on Chlorosilane tanks19785. PCVA-0014	Fischer Controls Type 95L, 3 psig set pressure, Spring range 2-6 psig, trim material viton, Drawing #W1-60791
N2 inlet regulator for N2 blanket on Methoxy tank 19784, PCVA-0015	Fischer Controls Type 95L, 3 psig set pressure, Spring range 2-6 psig, trim material viton, Drawing #W1-60791
N2 exhaust regulator for N2 blanket on Solvent tanks19781-19783. PCVB-0013	Fischer Controls Type 98L, 8 psig set pressure, spring range 6-14 psig, trim material VITON, Drawing #W1-60790
N2 exhaust regulator for N2 blanket on IPA/1107 tank 19785. PCVB-0014	Fischer Controls Type 98L, 8 psig set pressure, spring range 6-14 psig, trim material VITON, Drawing #W1-60790.
N2 exhaust regulator for N2 blanket on Methoxysilane tank 19784. PCVB-0015	Fischer Controls Type 98L, 8 psig set pressure, spring range 6-14 psig, trim material VITON, Drawing #W1-60790.

12. TEMPORARY OPERATIONS

12.1.1. Not applicable to this SOP.

13. NORMAL SHUTDOWN PROCEDURES

13.1.1. Not applicable to this SOP.

14. START-UP AFTER EMERGENCY SHUTDOWN

14.1.1. Not applicable to this SOP.

15. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

15.1.1. Not applicable to this SOP.

16. TROUBLESHOOTING

16.1.1. Not applicable to this SOP.

Effective Date: 30NOV07
Supersedes Date: 27JAN04

Filename: **DOCUMENTUM SERVER\806 TANK FARM VENT PERMIT**
Title: Tank Farm Vent Permit

Midland Plant Environmental Services

Control Document Update Acknowledgment

Signature of 800 Block operators acknowledging that the update to this controlled document has been communicated to them.

PRINTED NAME	NAME (signature)	DATE

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Review Date: Reviewed By:

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By Mark Arent

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1.1. The 806 tank farm is regulated by State of Michigan Air Permit To Install # 334-88C. Venting of waste trailers during N2 inerting is covered by a Rule 290 Exemption. This SOP details requirements of the permit and 290 exemption.

2. SAFETY KEYPOINTS

2.1.1. Not applicable to this SOP.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. **Air Emission Sources:** only the following air emission sources are recognized in the 806 tank farm:

Vent	Permitted Equipment	Permitted Operations
Vent 800-01	Scrap Solvent Tanks (19781, 19782, 19783, 19786).	Dempster Transfers, Relieving Pressure from Dempsters.
Vent 800-02	IPA/1107 Blend Tank (19785).	Relieving Pressure from Dempsters, Drum Transfers.
Vent 800-03	Alkoxysilane Tank (19784).	Dempster Transfers, Relieving Pressure from Dempsters.
Vent 800-04	Solvent/Alkoxy Waste Trailers	Vent from Inerting Process.

3.2. VENT PERMIT SPECIAL CONDITIONS

3.2.1. N2 blanket systems on the tanks must be operating properly with a pressure differential (between outlet and inlet regulators) of not less than 5psi.

3.2.2. Records must be kept of all transfers to/from tanks.

3.2.3. All transfers from tanks to trailers (Solvent, IPA/1107 Blend and Alkoxysilane) must be vent equalized.

3.2.4. Monthly records must be kept to demonstrate compliance.

3.3. ADDITIONAL REQUIREMENTS

3.3.1. Vacuum truck transfers must be vent equalized.

3.3.2. Dempsters must be relieved through the tank vent blanket systems.

3.3.3. Visible emission can’t exceed 20% opacity.

3.3.4. The MDEQ must be notified if emissions exceed permitted levels for more than 1 hour.

3.4. AIR CONTAMINANT LIMITS

3.4.1.1. VOC, non VOC, and Toxic Air Contaminant emissions from the tank farm cannot exceed pound/hour limits specified in permit.

3.4.2. Emissions from the trailer inerting process cannot exceed 1000 pounds/month. To meet that limit, no more than the following number of trailers should be inerted per month:

3.4.2.1. 15 jumbo trailers,

3.4.2.2. 45 regular trailers per month.

3.4.3. Actual calculations should be completed to determine compliance if rates exceed those specified above.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. EMERGENCY SHUTDOWN CONDITIONS

4.1.1. Not applicable to this SOP.

4.2. STEPS TO TAKE IN CASE OF EMERGENCY SHUTDOWN

4.2.1. Not applicable to this SOP.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1. EQUIPMENT COVERED UNDER THIS SOP

6.1.1. Not applicable to this SOP.

6.2. MATERIALS USED IN THE PROCESS

6.2.1. Not applicable to this SOP.

7. INITIAL START UP PROCEDURES

7.1.1. Not applicable to this SOP.

8. NORMAL OPERATIONS

8.1.1. Not applicable to this SOP.

9. OPERATING LIMITS

9.1.1. Not applicable to this SOP.

DESCRIPTION	TYPE	TARGET (UNIT)	ALLOWED OP. LIMITS	IMPACT IF OUT OF OPERATING LIMITS	ACTIONS TO TAKE IF OUTSIDE THE ALLOWABLE LIMITS
N/A		N/A	N/A	N/A	N/A

10. TEMPORARY OPERATIONS

10.1.1. Not applicable to this SOP.

11. NORMAL SHUTDOWN PROCEDURES

11.1.1. Not applicable to this SOP.

12. START-UP AFTER EMERGENCY SHUTDOWN

12.1.1. Not applicable to this SOP.

13. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

13.1.1. Not applicable to this SOP.

14. TROUBLESHOOTING

14.1.1. Not applicable to this SOP.

Effective Date: 30NOV07
Supersedes Date: 27JAN04

Filename: **DOCUMENTUM SERVER\806 TANK FARM SETTING MASS FLOW METERS**
Title: Setting Mass Flow Meters

Midland Plant Environmental Services

Control Document Update Acknowledgment

Signature of 800 Block operators acknowledging that the update to this controlled document has been communicated to them.

PRINTED NAME	NAME (signature)	DATE

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Review Date: Reviewed By:

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By Mark Arent

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1.1. This SOP covers proper use of mass flow meters at 806 Tank Farm Trailer Loading Station. These meters are used to ensure that the amount loaded from Tanks 19781-19786 into trailers does not exceed the capacity of those trailers.

2. SAFETY KEYPOINTS

2.1. MATERIAL HAZARDS

2.1.1. Refer to 806 Tank Farm SOP for safety information on materials transferred through the mass flow meters and on proper PPE to be used during transfers.

2.1.2. In general, materials transferred through the mass flow meters are flammable, corrosive, and can cause organ and nervous system damage if inhaled. Typical PPE includes safety glasses with sideshields as well as chemical splash goggles, hard hat, Viton rubber gloves and steel-toed safety shoes.

2.2. ALARMS AND INTERLOCKS

2.2.1. The solvent/methoxysilane loading station mass flow totalizer FQIC-30 is interlocked with valve FV-30. When the set point is reached, FV-30 will close.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. Not applicable to this SOP.

3.2. STORM/WASTE WATER

3.2.1. Not applicable to this SOP.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. EMERGENCY SHUTDOWN CONDITIONS

4.1.1. Not applicable to this SOP.

4.2. STEPS TO TAKE IN CASE OF EMERGENCY SHUTDOWN

4.2.1. Transfers may be stopped immediately by tripping the ESD switch. This will shutoff the pumps at all waste tanks, and will shut loading station valves FV-30.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1. EQUIPMENT COVERED UNDER THIS SOP

6.1.1. Not applicable to this SOP.

6.2. MATERIALS USED IN THE PROCESS

6.2.1. Not applicable to this SOP.

7. INITIAL START UP PROCEDURES

7.1.1. Assure that the Initial startup section of the tanker loading has been performed.

7.1.2. Assure the correct loading station is being used.

7.1.3. Reset the mass flow meter by pushing the reset button on the front of the little blue box near the meter

8. NORMAL OPERATIONS

8.1.1. Open the mass flow meter control box.

8.1.2. Set the meter to the "SP" mode by using the Select/Enter key.

8.1.3. Use the >/Reset key to enter the value in pounds to be transferred.

8.1.4. Use the key to change the value of the flashing number. This has to be done for each of the digits on the control panel.

8.1.5. Once the pounds are entered in correctly, use the Select/Enter key to enter the new value.

8.1.6. At this point the set point will be displayed and no digits will be flashing. You now know that the pounds are set correctly.

8.1.7. Turn the switch **outside the control box** to the auto position.

8.1.8. Use the Start/Batch key to start the transfer.

8.1.9. Refer back to tanker loading SOP you are working on.

9. OPERATING LIMITS

9.1.1. Critical instruments are noted in the "Type column: E = Environmental; S = Safety; Q = Quality

9.1.2. Not applicable to this SOP.

DESCRIPTION	TYPE	TARGET (UNIT)	ALLOWED OP. LIMITS	IMPACT IF OUT OF OPERATING LIMITS	ACTIONS TO TAKE IF OUTSIDE THE ALLOWABLE LIMITS
N/A		N/A	N/A	N/A	N/A

10. TEMPORARY OPERATIONS

10.1.1. Not applicable to this SOP.

11. NORMAL SHUTDOWN PROCEDURES

11.1.1. No shutdown is necessary on the mass flow meter.

12. START-UP AFTER EMERGENCY SHUTDOWN

12.1.1. Not applicable to this SOP.

13. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

13.1.1. Not applicable to this SOP.

14. TROUBLESHOOTING

14.1.1. Not applicable to this SOP.

Effective Date: 01NOV07
Supersedes Date: 19JAN05

Filename: **DOCUMENTUM SERVER\806 TF SOLVENT & METHOXY TANKER LOADING PROCEDURES**
Title: Solvent & Methoxy Trailer Loading

Midland Plant Environmental Services

Control Document Update Acknowledgment

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Review Date: Reviewed By:

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By Mark Arent

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1.1. This SOP covers transfers of farm solvent and alkoxy wastes from 806 tank farm to trailers. The initial part of this procedure details items common to all tanks. Subsequent sections cover procedures and valves specific to each tank and loading station.

2. SAFETY KEYPOINTS

2.1. MATERIAL HAZARDS

2.1.1. This SOP covers transfers of the following waste streams to trailers from 806 tank farm: Q8-6017 solvent; Q8-6062 alkoxysilane.

2.1.2. Refer to **806 Tank Farm Safety SOP** for details on material hazards. In general, these materials are flammable, cause respiratory and skin irritation, and can cause organ and nervous system damage if inhaled. Inhalation or ingestion of large quantities can cause blindness or death.

2.1.3. Vendor supplied trailers may contain vapors and liquid of unknown composition. Assume that vapors from the trailers are flammable and potentially poisonous.

2.2. PERSONAL PROTECTIVE EQUIPMENT

2.2.1. Refer to **806 Tank Farm Safety SOP** for details on specific personal protective equipment. In general, hardhat, goggles, steel-toed shoes, and chemical resistant gloves are required when transferring from 806 tank farm tanks to solvent and methoxy trailers.

2.3. ALARMS AND INTERLOCKS

2.3.1. Refer to **806 Tank Farm Safety SOP** for alarms and interlocks in 806 tank farm.

2.3.2. The pressure transmitter (PT13494) at the loading station header is interlocked via a high pressure switch (PSH13494) with the N2 supply valve (HV13852) and the trailer vent valve (HV13853). If pressure at this transmitter exceeds 23 psig, the N2 automatic valve will close and the vent automatic valve will open. The valve positions will reset when pressure drops down to 22 psig.

2.4. INERTING SAFETY CONSIDERATIONS

2.4.1. For safe transfer of flammable materials, O2 levels in a trailer must be below the following specifications:

2.4.1.1. H2 and SiH materials: < 2% O2

2.4.1.2. Other Flammables: < 4% O2.

2.4.2. Pressure inerting utilizes N2 to dilute O2 levels. Each time the absolute pressure (gauge pressure + 14.7 psi) on the trailer is doubled, O2 levels are reduced by 50%. Pressure inerting is preferred because it provides better mixing of vapors in the trailer.

2.4.3. Inerting requires that the mass flow meter be bypassed. **When inerting is complete, close the bypass valve and open the mass flow meter valve to direct flow through the mass flow meter before loading.** Failure to set valves properly will result in overfilling the trailer!

2.4.4. Inerting also requires a significant amount of N2. Automatic valves in the tank farm require 60# N2 pressure to operate. If automatic valves in the tank farm close when the inerting process is initiated, N2 flow to the trailer must be restricted. The globe valve in the line leading to Tank 2 at the N2 header should be closed slowly until the automatic valves reopen. Adjust this globe valve ONLY IF problems are noted with the automatics.

2.4.5. When the trailer is venting down, flammable vapors are present at the vent outlet. Those vapors could be ignited by static electricity or lightning during thunderstorms, so venting should be stopped during thunderstorms.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. Not applicable to this SOP.

3.2. STORM/WASTE WATER

3.2.1. Not applicable to this SOP.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. EMERGENCY SHUTDOWN DURING INERTING

4.1.1. The inerting process may be shutdown by tripping the ESD switch. This will shut the N2 automatic valve and the vent valve.

4.1.2. If an emergency occurs during vent-down, the vent automatic valve may be shut by turning HS 13853 off.

4.1.3. If an emergency occurs during pressure-up, the N2 flow may be stopped by turning off HS 13852. If it is necessary to isolate the trailer hose, make sure that N2 is shut off **before** closing the manual valve on the trailer to avoid excess pressure in the loading hose.

4.2. EMERGENCY SHUTODWN DURING TRANSFERS

4.2.1. Transfers may be stopped immediately by tripping the ESD switch. This will shut off the pumps at ALL waste tanks, and will shut FV-30 near the mass flow meter.

4.2.2. Transfers may also be stopped by:

4.2.2.1. Turning the start/stop switch off for the pump from the appropriate tank, and

4.2.2.2. Either dumping N2 supply to load-line valve (V-67), or shutting the manual valve on the tanker loading line.

4.2.3. If time and conditions permit, shut the 3” valve on the trailer to isolate the trailer loading hose.

4.2.4. Vacate the area.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1.1. Five 10,000 gallon tanks in 806 tank farm store solvent and alkoxy wastes P

19781 Tank	Q8-6017 Scrap Solvent
19782 Tank	Q8-6017 Scrap Solvent
19783 Tank	Q8-6017 Scrap Solvent
19784 Tank	Q8-6062 Scrap Alkoxysilane
19785 Tank	Q8-6026
19786 Tank	Q8-6017

6.1.2. Two trailer loading stations are available for loading trailers.

6.1.2.1. Trailer Station #1 (South “outside” bay): normally used for loading trailers,

6.1.2.2. Trailer Station #2 (North “inside” bay): spare, not used.

7. INITIAL SET UP AND CONNECTION

7.1.1. Make sure trailer inspection has been performed by Crew Leader.

7.1.2. Make sure to complete the “800 Block Tank Trailer Inspection Check List” for each load. It is attached at the end of this SOP for reference.

7.1.3. Spot trailer in appropriate trailer bay.

7.1.4. Check DOT spec plate on trailer to see how many gallons the trailer can handle and determine how much material to load by completing a **"806 Tank Farm Loading Calculations Form".**

7.1.5. Ground trailer.

7.1.6. Place chocks at the front and rear of at least one wheel.

7.1.7. At this point, the driver of the truck must either:

7.1.7.1. Disconnect the tractor from the trailer and move the tractor outside the trailer station containment area. If the driver disconnects from the trailer, they may leave the tractor running and remain in the cab. They must turn the tractor around, however, so that they can observe the loading operation and respond to an emergency. A portable support must be placed under the trailer when disconnected from the tractor.

7.1.7.2. Or the driver may shutdown the tractor and remain connected to the trailer. The driver may remain in the cab during inerting, but they must leave the cab during loading. The driver must also observe the loading operation and be prepared to respond to an emergency.

7.1.7.3. These options have been approved by the Midland Plant Safety Department.

7.1.8. Install trailer connected sign.

7.1.9. Place drip pad under loading connection on trailer.

7.1.10. Check all sample drain valves and other valves to assure they are closed.

7.1.11. Check dome lid to make sure it is tightened down securely.

7.1.12. Hook up vent equalization line to trailer near the top dome lid, but keep the valve closed in the vent line to the tank blanket system. **Do NOT allow the trailer to vent equalize at this time.**

7.1.13. Hook up 3" flex hose to trailer from either the end loading or side loading pipe, depending on what type of trailer your have. Leave valves closed on the loading line until you are ready to pressure up the trailer.

8. INERTING PROCEDURE

8.1. COMPLETE 3 PRESSURE/VENT CYCLES ON THE TRAILER

8.1.1. Set valves to bypass the mass flow meter at the loading station.

8.1.2. Keep the valve on the equalization line leading back to the tank blankets closed throughout this procedure to ensure that vapors do not go to the tanks

8.1.3. Check initial trailer pressure and vent down to 0# if needed:

8.1.3.1. Open manual valve in the vent line between the trailer and the vent pressure gauge. Also open the manual valve in the vent line before the automatic valve (HV13853).

8.1.3.2. Vent down to 0 psig if needed by turning handswitch HV13853 at the panel. This will open the automatic valve to the vent stack.

8.1.4. Pressure up trailer to 21 psig (measured at PT 13494):

8.1.4.1. Close automatic valve to the vent stack by turning handswitch HV13853 off.

8.1.4.2. Open 3” valve on the trailer.

8.1.4.3. Open automatic valve in the loading line at trailer station #1.

8.1.4.4. Verify that the valve to the mass flow meter is closed. The mass flow meter can be damaged if N2 is directed through it. For now, also leave the valve in the bypass line closed.

8.1.4.5. At Tank 19782 discharge header, set valves to direct N2 flow through the load line to trailer station #1:

8.1.4.5.1. Close valve on inlet line to the pump,

8.1.4.5.2. Close valve in recycle line,

8.1.4.5.3. Make sure that all other header station valves are closed.

8.1.4.5.4. Open the automatic valve in the load line going to trailer station #1.

8.1.4.6. Open N2 automatic valve at Tank 2 by turning handswitch 13852 on.

8.1.4.7. Slowly open the manual valve in the mass flow meter bypass line to start N2 flow to the trailer. Monitor Pressure Transmitter (PT 13494) readout at the panel closely to ensure that pressure does not exceed 21 psig. Also check the pressure gauge on the vent line to make sure that it reaches 20 psig minimum. **This pressure-up cycle only takes 3-5 minutes, so monitor pressure closely!**

8.1.4.8. Stop N2 flow to the trailer by:

8.1.4.8.1. closing the N2 automatic valve at tank 19782 discharge header by turing handswitch HS13852 off; then

8.1.4.8.2. closing the manual valve in the mass flow meter bypass valve.

8.1.5. Check trailer for leaks:

8.1.5.1. If leaks are noted at the manway, attempt to tighten the manway. If that does not stop the leak, contact the 800-block crew leader.

8.1.5.2. If leaks are noted elsewhere, contact the 800-block crewleader.

8.1.5.3. The 800-block crew leader will determine whether the leak can be repaired or if the trailer must be rejected and returned to the vendor.

8.1.6. <u>Vent down trailer to 10 psig</u> (as measured at the Pressure Transmitter 13494):

8.1.6.1. Open the valve to the vent stack by turning on handswitch HS13853.

8.1.6.2. Monitor pressure at Pressure Transmitter 13494 until it drops to 10 psig.

8.1.6.3. Close the vent stack valve via handswitch HS 138953.

8.1.6.4. Check the pressure gauge on the vent line to make sure that it has dropped to 8 psig. If pressure exceeds 8 psig, resume venting down the trailer.

8.1.7. Repeat Pressure/Vent down cycle 3 times. On the last cycle, vent the trailer down to 5 psig if time permits.

8.1.8. When finished, set valve positions for loading:

8.1.8.1. Verify that the N2 and vent valve switches are both in the “off” (closed) positions.

8.1.8.2. Close the manual valve on the vent line before the automatic valve. This ensures that the vent line will not be open to the atmosphere during transfers.

8.1.8.3. Set up vent equalization by opening manual valves to the appropriate vent blanket system (Tank 4 for alkoxy waste; tanks 1-3 for solvent waste) at the trailer station vent header. Verify that the trailer is properly equalized by checking vent pressure gauge. The trailer should equalize to tank blanket pressure of 3 to 8 psig.

8.1.8.4. Close the mass flow meter bypass valve and open the valve to the mass flow meter. This is critical to ensure that trailers are not overfilled!

8.1.9. A **Yellow Tag** indicating that the trailer has N2 pressure must be filled out and attached to the dome and to the rear of the trailer before the trailer leaves the 800-block. Also, attach a **Green Tag** seal tag on top manway and on male camlock on the back of the trailer on the side-hookup. The green seal tags must be attached before leaving the 800 block.

9. INITIAL START UP PROCEDURES

9.1.1. Not applicable to this SOP.

10. NORMAL LOADING OPERATIONS – ALL TRANSFERS

10.1.1. Set mass flow meter valves and transfer amount:

10.1.1.1. Verify that mass flow meter bypass valve (V61) is closed.

10.1.1.2. Set mass flow meter amount by following **Mass Flow Meter SOP**.

10.1.2. Transfer material: refer to **specific tank and loading station section** of this SOP for proper valve positions and procedures.

10.1.3. Blow transfer lines clear: refer to **specific tank and loading station section** of this for proper valve positions and procedures.

10.1.4. After transfer is complete and transfer lines are blown clear, blow the hose clear:

10.1.4.1. Open valve V-60 and v-61 and turn on the 1/2" N2 valve attached to V-60.

10.1.4.2. Open V-67 or V-56 (bay 1) or V-72 (bay 2) (whichever is attached to the trailer) and blow the line empty for approximately 2-3 minutes.

10.1.4.3. Shut 3" valve on trailer.

10.1.4.4. Shut valve V-67 or V-56 (bay 1) or V72 (bay 2) (whichever is open) on the loading line.

10.1.4.5. Shut V-61 or V-80, bypass around mass flow meter.

10.1.4.6. Shut V-60 or V-81 and associated N2 valve.

10.1.5. Complete disconnects and ship trailer:

10.1.5.1. Shut valves on vent equalization line, both at tanker and at tank farm.

10.1.5.2. Bleed pressure off vent equalization line and disconnect.

10.1.5.3. Bleed pressure off 3" load line over bucket to catch any drainings and disconnect the 3" flex hose.

10.1.5.4. Remove ground and trailer connected signs. Also, remove chocks and trailer drip pad.

10.1.5.5. Record level from gauge and gallon outage along with Manifest # on tank level

form.

10.1.5.6. Send driver and paperwork to Shipping, 2602 Bldg.

10.2. LOADING OPERATION - TANK 19781 & 19786 TO LOADING STATION #1

10.2.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V-512. This will allow the trailer to begin to vent equalize with the tank farm.

10.2.2. Set valves:

10.2.2.1. Open 3" valve on trailer.

10.2.2.2. Open valve V-1, valve between tank and pump inlet, and open pump recycle line (V4).

10.2.2.3. Open valve V-218 and close V-456, loading line between tanks 19783 and 19784.

10.2.2.4. Open valve V-57, inlet to loading station # 1.

10.2.2.5. Open valve V-58, valve to mass flow meter.

10.2.2.6. Open valve V-65, discharge from mass flow meter.

10.2.2.7. Open valve V-67 to load trailer from side or if it is a rear load trailer open V-56 instead. Only Station #1 has both rear and side loading capabilities.

10.2.3. Turn on pump P1-19781 and observe pressure on pump discharge pressure gauge.

10.2.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.2.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.2.4. Initiate transfer:

10.2.4.1. Open valve V-3 to go to loading station # 1 and shut pump recycle valve V-4. Check pump for proper pressure.

10.2.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.2.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.2.5. When transfer is complete, shut off pump P1-19781, and close manual valve (V1) between tank and the pump.

10.2.6. Blow lines from tank to trailer station clear:

10.2.6.1. Close manual valve (V65) at the mass flow meter and open bypass valve (V61). N2 can damage the meter and/or affect readings.

10.2.6.2. Make sure that valves to pump recycle (V4), trailer station #2 (V2) and HH sensall test well (V5) are closed, and that the automatic to trailer station #1 (V3) is open.

10.2.6.3. Open quarter-turn valve on N2 line

10.2.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.2.6.5. Shut the quarter turn valve on N2 line.

10.2.6.6. Close the following transfer line valves: V67 or V56, V58, V57, and V3.

10.2.7. Open the pump recycle line valve (V4) to ensure no pressure build-up at the tank header.

10.3. LOADING OPERATION - TANK 19782 TO LOADING STATION #1

10.3.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V-512. This will allow the trailer to begin to vent equalize with the tank farm.

10.3.2. Set valves:

10.3.2.1. Open 3" valve on trailer.

10.3.2.2. Open valve V-7, valve between tank and pump inlet, and open pump recycle line (V10).

10.3.2.3. Open valve V-218 and close V-456, loading line between tanks 19783 and 19784.

10.3.2.4. Open valve V-57, inlet to loading station # 1.

10.3.2.5. Open valve V-58, valve to mass flow meter.

10.3.2.6. Open valve V-65, discharge from mass flow meter.

10.3.2.7. Open valve V-67 to load trailer from side or if it is a rear load trailer open V-56 instead. Only Station #1 has both rear and side loading capabilities.

10.3.3. Turn on pump P1-19782 and observe pressure on pump discharge pressure gauge.

10.3.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.3.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.3.4. Initiate transfer:

10.3.4.1. Open valve V-9 to go to loading station # 1 and shut pump recycle valve V-10. Check pump for proper pressure.

10.3.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.3.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.3.5. When transfer is complete, shut off pump P1-19782, and close manual valve (V7) between tank and the pump.

10.3.6. Blow lines from tank to trailer station clear:

10.3.6.1. Close manual valve (V65) at the mass flow meter and open bypass valve (V61). N2 can damage the meter and/or affect readings.

10.3.6.2. Make sure that valves to pump recycle (V10), trailer station #2 (V8) and HH sensall test well (V11) are closed, and that the automatic to trailer station #1 (V9) is open.

10.3.6.3. Open quarter-turn valve on N2 line

10.3.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.3.6.5. Shut the quarter turn valve on N2 line.

10.3.6.6. Close the following transfer line valves: V67 or V56, V58, V57, and V9.

10.3.7. Open the pump recycle line valve (V10) to ensure no pressure build-up at the tank header.

10.4. LOADING OPERATION - TANK 19783 TO LOADING STATION #1

10.4.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V-512. This will allow the trailer to begin to vent equalize with the tank farm.

10.4.2. Set valves:

10.4.2.1. Open 3" valve on trailer.

10.4.2.2. Open valve V-13, valve between tank and pump inlet, and open pump recycle line (V16)

10.4.2.3. Open valve V-218 and close V-456, loading line between tanks 19783 and 19784.

10.4.2.4. Open valve V-57, inlet to loading station # 1.

10.4.2.5. Open valve V-58, valve to mass flow meter.

10.4.2.6. Open valve V-65, discharge from mass flow meter.

10.4.2.7. Open valve V-67 to load trailer from side or if it is a rear load trailer open V-56 instead. Only Station #1 has both rear and side loading capabilities.

10.4.3. Turn on pump P1-19783 and observe pressure on pump discharge pressure gauge.

10.4.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.4.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.4.4. Initiate transfer:

10.4.4.1. Open valve V15 to go to loading station # 1 and shut pump recycle valve V16. Check pump for proper pressure.

10.4.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.4.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.4.5. When transfer is complete, shut off pump P1-19783, and close manual valve (V13) between tank and the pump.

10.4.6. Blow lines from tank to trailer station clear:

10.4.6.1. Close manual valve (V65) at the mass flow meter and open bypass valve (V61). N2 can damage the meter and/or affect readings.

10.4.6.2. Make sure that valves to pump recycle (V16), trailer station #2 (V14) and HH sensall test well (V17) are closed, and that the automatic to trailer station #1 (V15) is open.

10.4.6.3. Open quarter-turn valve on N2 line

10.4.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.4.6.5. Shut the quarter turn valve on N2 line.

10.4.6.6. Close the following transfer line valves: V67 or V56, V58, V57, and V15.

10.4.7. Open the pump recycle line valve (V16) to ensure no pressure build-up at the tank header.

10.5. LOADING OPERATION - TANK 19784 TO LOADING STATION #1

10.5.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V-409. This will allow the trailer to begin to vent equalize with the tank farm.

10.5.2. Set valves:

10.5.2.1. Open 3" valve on trailer.

10.5.2.2. Open valve V19, valve between tank and pump inlet, and pump recycle line (V22)

10.5.2.3. Open valve V-456 and close V-218, loading line between tanks 19783 and 19784.

10.5.2.4. Open valve V-57, inlet to loading station # 1.

10.5.2.5. Open valve V-58, valve to mass flow meter.

10.5.2.6. Open valve V-65, discharge from mass flow meter.

10.5.2.7. Open valve V-67 to load trailer from side or if it is a rear load trailer open V-56

instead. Only Station #1 has both rear and side loading capabilities.

10.5.3. Turn on pump P1-19784 and observe pressure on pump discharge pressure gauge.

10.5.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.5.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.5.4. Initiate transfer:

10.5.4.1. Open valve V21 to go to loading station # 1 and shut pump recycle valve V22. Check pump for proper pressure.

10.5.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.5.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.5.5. When transfer is complete, shut off pump P1-19784, and close manual valve (V19) between tank and the pump.

10.5.6. Blow lines from tank to trailer station clear:

10.5.6.1. Close manual valve (V65) at the mass flow meter and open bypass valve (V61). N2 can damage the meter and/or affect readings.

10.5.6.2. Make sure that valves to pump recycle (V22), trailer station #2 (V20) and HH sensall test well (V23) are closed, and that the automatic to trailer station #1 (V21) is open.

10.5.6.3. Open quarter-turn valve on N2 line

10.5.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.5.6.5. Shut the quarter turn valve on N2 line.

10.5.6.6. Close the following transfer line valves: V67 or V56, V58, V57, and V21.

10.5.7. Open the pump recycle line valve (V22) to ensure no pressure build-up at the tank header.

10.6. LOADING OPERATION - TANK 19781 & 19786 TO LOADING STATION #2

10.6.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V76. This will allow the trailer to begin to vent equalize with the tank farm.

10.6.2. Set valves:

10.6.2.1. Open 3" valve on trailer.

10.6.2.2. Open valve V-1, valve between tank and pump inlet, and pump recycle line (V4)

10.6.2.3. Open valve V-219 and close V-217, loading line between tanks 19783 and 19784.

10.6.2.4. Open valve V-84, inlet to loading station # 2.

10.6.2.5. Open valve V-82, valve to mass flow meter.

10.6.2.6. Open valve V-79, discharge from mass flow meter.

10.6.2.7. Open valve V-72 to load trailer from side.

10.6.3. Turn on pump P1-19781 and observe pressure on pump discharge pressure gauge.

10.6.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.6.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.6.4. Initiate transfer:

10.6.4.1. Open valve V-2 to go to loading station # 2 and shut pump recycle valve V-4. Check pump for proper pressure.

10.6.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.6.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.6.5. When transfer is complete, shut off pump P1-19781, and close manual valve (V1) between

tank and the pump.

10.6.6. Blow lines from tank to trailer station clear:

10.6.6.1. Close manual valve (V82) at the mass flow meter and open bypass valve (V80). N2 can damage the meter and/or affect readings.

10.6.6.2. Make sure that valves to pump recycle (V4), trailer station #1 (V3) and HH sensall test well (V5) are closed, and that the manual valve to trailer station #2 (V2) is open.

10.6.6.3. Open quarter-turn valve on N2 line

10.6.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.6.6.5. Shut the quarter turn valve on N2 line.

10.6.6.6. Close the following transfer line valves: V72, V82, V84, and V2.

10.6.7. Open the pump recycle line valve (V4) to ensure no pressure build-up at the tank header.

10.7. LOADING OPERATION - TANK 19782 TO LOADING STATION #2

10.7.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V76. This will allow the trailer to begin to vent equalize with the tank farm.

10.7.2. Set valves:

10.7.2.1. Open 3" valve on trailer.

10.7.2.2. Open valve V-7, valve between tank and pump inlet, and pump recycle line (V10).

10.7.2.3. Open valve V-219 and close V-217, loading line between tanks 19783 and 19784.

10.7.2.4. Open valve V-84, inlet to loading station # 2.

10.7.2.5. Open valve V-82, valve to mass flow meter.

10.7.2.6. Open valve V-79, discharge from mass flow meter.

10.7.2.7. Open valve V-72 to load trailer from side.

10.7.3. Turn on pump P1-19782 and observe pressure on pump discharge pressure gauge.

10.7.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.7.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.7.4. Initiate transfer:

10.7.4.1. Open valve V-8 to go to loading station # 2 and shut pump recycle valve V10. Check pump for proper pressure.

10.7.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.7.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.7.5. When transfer is complete, shut off pump P1-19782, and close manual valve (V7) between tank and the pump.

10.7.6. Blow lines from tank to trailer station clear:

10.7.6.1. Close manual valve (V82) at the mass flow meter and open bypass valve (V80). N2 can damage the meter and/or affect readings.

10.7.6.2. Make sure that valves to pump recycle (V10), trailer station #1 (V9) and HH sensall test well (V11) are closed, and that the manual valve to trailer station #2 (V8) is open.

10.7.6.3. Open quarter-turn valve on N2 line

10.7.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.7.6.5. Shut the quarter turn valve on N2 line.

10.7.6.6. Close the following transfer line valves: V72, V82, V84, and V8.

10.7.7. Open the pump recycle line valve (V10) to ensure no pressure build-up at the tank header.

10.8. LOADING OPERATION - TANK 19783 TO LOADING STATION #2

10.8.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V76. This will allow the trailer to begin to vent equalize with the tank farm.

10.8.2. Set valves:

10.8.2.1. Open 3" valve on trailer.

10.8.2.2. Open valve V13, valve between tank and pump inlet, and pump recycle line (V16).

10.8.2.3. Open valve V-219 and close V-217, loading line between tanks 19783 and 19784.

10.8.2.4. Open valve V-84, inlet to loading station # 2.

10.8.2.5. Open valve V-82, valve to mass flow meter.

10.8.2.6. Open valve V-79, discharge from mass flow meter.

10.8.2.7. Open valve V-72 to load trailer from side.

10.8.3. Turn on pump P1-19783 and observe pressure on pump discharge pressure gauge.

10.8.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.8.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.8.4. Initiate transfer:

10.8.4.1. Open valve V14 to go to loading station # 2 and shut pump recycle valve V10. Check pump for proper pressure.

10.8.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.8.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.8.5. When transfer is complete, shut off pump P1-19783, and close manual valve (V13) between tank and the pump.

10.8.6. Blow lines from tank to trailer station clear:

10.8.6.1. Close manual valve (V82) at the mass flow meter and open bypass valve (V80). N2 can damage the meter and/or affect readings.

10.8.6.2. Make sure that valves to pump recycle (V16), trailer station #1 (V15) and HH sensall test well (V17) are closed, and that the manual valve to trailer station #2 (V14) is open.

10.8.6.3. Open quarter-turn valve on N2 line

10.8.6.4. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge . Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.8.6.5. Shut the quarter turn valve on N2 line.

10.8.6.6. Close the following transfer line valves: V72, V82, V84, and V14.

10.8.7. Open the pump recycle line valve (V16) to ensure no pressure build-up at the tank header.

10.9. LOADING OPERATION - TANK 19784 TO LOADING STATION #2

10.9.1. Vent equalize the trailer by opening both the trailer vent valve and tank farm valve, V409. This will allow the trailer to begin to vent equalize with the tank farm.

10.9.2. Set valves:

10.9.2.1. Open 3" valve on trailer.

10.9.2.2. Open valve V19, valve between tank and pump inlet, and pump recycle line (V22).

10.9.2.3. Open valve V-217 and close V-219, loading line between tanks 19783 and 19784.

10.9.2.4. Open valve V-84, inlet to loading station # 2.

10.9.2.5. Open valve V-82, valve to mass flow meter.

10.9.2.6. Open valve V-79, discharge from mass flow meter.

10.9.2.7. Open valve V-72 to load trailer from side.

10.9.3. Turn on pump P1-19784 and observe pressure on pump discharge pressure gauge.

10.9.3.1. If pressure does not build up properly, shutdown pump and look for plugs or closed valves in the pump inlet line.

10.9.3.2. If excessive pressure builds up, shutdown pump and check for closed valves or plugs between the pump and the trailer station.

10.9.4. Initiate transfer:

10.9.4.1. Open valve V20 to go to loading station # 2 and shut pump recycle valve V220. Check pump for proper pressure.

10.9.4.2. Observe tanker while filling to make sure the Mass Flow Meter is functioning and that there are no leaks. Also check to make sure the tank level gauge is going down.

10.9.4.3. Take several readings of the specific gravity to assure the material is staying in the same weight/pound ratio as it was when you started loading. You may even want to recalculate the loading weight if you see a big swing in specific gravity.

10.9.5. When transfer is complete, shut off pump P1-19784, and close manual valve (V19) between tank and the pump.

10.9.5.1. Blow lines from tank to trailer station clear:

10.9.5.2. Close manual valve (V82) at the mass flow meter and open bypass valve (V80). N2 can damage the meter and/or affect readings.

10.9.5.3. Make sure that valves to pump recycle (V22), trailer station #1 (V21) and HH sensall test well (V23) are closed, and that the manual valve to trailer station #2 (V20) is open.

10.9.5.4. Open quarter-turn valve on N2 line

10.9.5.5. Slowly open N2 globe valve and throttle supply to the trailer station. Watch the pressure gauge. Pressure will drop when the liquid has been cleared from the line, then will start to slowly build again. Stop N2 flow when pressure first starts to drop.

10.9.5.6. Shut the quarter turn valve on N2 line.

10.9.5.7. Close the following transfer line valves: V72, V82, V84, and V20.

10.9.6. Open the pump recycle line valve (V22) to ensure no pressure build-up at the tank header.

11. OPERATING LIMITS

11.1.1. Refer to **806 Tank Farm Safety Information SOP** for details on Safe Operating Limits in 806 tank farm.

11.1.2. The trailer loading station has the following safe operating limits:

Instrument, Alarm or Operation	Safe Limits	Alarm Setpoint	Consequences of Improper Operation	Preventive and Corrective Actions
PT13494 on trailer station loading line	< 25 psig	none	Release or spill from pressure relief device on trailer.	Monitor pressure on trailer closely when pressuring up with N2. Shut-off N2 flow if overpressure occurs.
N2 purge Pressure; lower half of south instrument cabinet.	> 60 psig	60 psig	Noncompliance with NFPA standards; instrumentation could ignite flammable vapors.	Check cabinet door for proper closure; adjust large N2 flow knob to increase N2 flow to cabinet

12. TEMPORARY OPERATIONS

12.1.1. Not applicable to this SOP.

13. NORMAL SHUTDOWN PROCEDURES

13.1.1. Not applicable to this SOP.

14. START-UP AFTER EMERGENCY SHUTDOWN

14.1.1. Not applicable to this SOP.

15. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

15.1.1. Not applicable to this SOP.

16. TROUBLESHOOTING

16.1.1. Not applicable to this SOP.

17. 800 BLOCK TANK TRAILER INSPECTION CHECK LIST

☐ **DOW CORNING OWNED** ☐ **PETROCHEM** ☐ **CLEAN HARBORS**

☐ **HAZMAT** ☐ **OTHER – Specify - _____**

_____ **_____** **_____**

TRAILER NUMBER **MATERIAL** **TANK(S) LOADED FROM**

BEFORE LOADING

ITEM	OK – Not OK
1. Are wheels chocked?	
2. Are ground cables attached?	
3. Is "Trailer Connected" sign in place?	
4. Visually check trailer for signs of leaks at all flanges, fittings, valves, etc. including the relief valve area from the ground.	
5. Inspect the trailer for anything that would prohibit loading etc. like bad dollies, tires, etc.	
6. When removing caps, etc., check for wear and the condition of gaskets.	
7. Note any obvious signs of valve leak thru.	
8. Put Catwalk in place and attach vent hose	
Operator must be in Attendance during the Entire loading Operation	

QUESTIONS ABOUT FAULTY EQUIPMENT - NOTIFY HEAD OPERATOR AT THE 800 BLOCK <u>BEFORE</u> PROCEEDING WITH ANY LOADING

AFTER LOADING

ITEM	Completed - check
1. Prepare lines for disconnect with Nitrogen	
2. Make sure all valves are closed.	
3. Replace all flanges and plugs.	
4. Seal caps and dome	Seal #'s = Seal #'s =
5. Make sure load lines or any platforms are out of the way and secured.	
6. Check for Proper Placards	
7. Remove "Trailer Connected" sign.	
8. Send Driver to Trailer to Complete Manifest	

Operators Initials: _____ **Date: _____**

Effective Date: 21SEP07
Supersedes Date: 19JAN05

Filename: **DOCUMENTUM SERVER\806 VAC TRUCK**
Title: Vac Truck

Midland Plant Environmental Services

Control Document Update Acknowledgment

Signature of 800 Block operators acknowledging that the update to this controlled document has been communicated to them.

PRINTED NAME	**NAME (signature)**	**DATE**
Mike Arnold		
Robin Ouderkirk		
Bob San Miguel		
Cal Walters		

Reason for the current issue of this control document: Yearly review with new pictures and updated formatting.

New Document	☐	Revision	☐	Edit	☒

Underlining and left border indicates change in current issue.

Rev. Ref. (i.e. PCR #): Yes ☐ No ☒ MSDS Checked: Yes ☐ No ☐ NA ☒

Review Date: _____ Reviewed By: _____

_____ _____

_____ _____

APPROVED BY: _____
800 Block Operations Leader DATE

Written or Revised By Mark Arent

STANDARD OPERATING PROCEDURES
SITE: MIDLAND PLANT ENVIRONMENTAL

1. DESCRIPTION OF THE PROCESS OR OPERATION

1.1. PERATIONS THAT REQUIRE USE OF A VACUUM TRUCK IN THE MIDLAND SITE INCLUDE:

1.1.1. Transferring waste solvents/siloxanes from process vessels to the 806 Tank Farm Tanks 19781 - 19786. This is done by either using vacuum from the truck or by vent equalizing the truck to the process vessel and utilizing the pump on the vessel to load the vacuum truck.

1.1.2. Emptying containment trenches or ponds during or after a spill has occurred. If spilled materials are flammable, this procedure will require the use of a pump instead of vacuum.

1.1.3. Drum Pumping for the purpose of commingling material. This procedure will be vacuum-operated and will involve only nonflammable materials.

1.1.4. Emptying scrub tubs that were used for venting of lines during normal maintenance procedures. This procedure will be vacuum-operated and will involve only nonflammable materials.

2. SAFETY KEYPOINTS

2.1. MATERIAL HAZARDS

2.1.1. The vacuum truck is used to transfer the following waste streams on a routine basis:

2.1.1.1. Q8-6509

2.1.1.2. Q8-6017

2.1.1.3. Q8-6026

2.1.1.4. Q8-6062

2.1.2. Refer to **806 Tank Farm Safety SOP** for details on material hazards. All of these materials are flammable, cause respiratory and skin irritation, and can cause organ and nervous system damage if inhaled.

2.1.3. For transfers of other materials, refer to applicable MSDS for hazards.

2.2. PERSONAL PROTECTIVE EQUIPMENT

2.2.1. Refer to **806 Tank Farm Safety SOP** for details on specific personal protective equipment for each type of solvent material. In general, hardhat, goggles, steel-toed shoes, and chemical resistant gloves are required when transferring materials to the solvent and methoxy tanks. Hearing protection is also required around the Vacuum truck anytime the vacuum pump is in operation.

2.2.2. Additional protective equipment may be required as specified in applicable MSDSs.

2.3. PRESSURE RELIEF DEVICES

2.3.1. The vacuum truck has a 25# pressure relief device.

2.4. ALARMS AND INTERLOCKS

2.4.1. Alarms: none

2.4.2. Interlocks: The vacuum Truck is equipped with a primary shutoff device, ball type check, and a secondary shutoff device, bullet type:

2.4.2.1. In the event that the truck is overfilled, the primary ball check should seat against the vacuum tube and prevent vacuum from building up. This will prevent additional transfer of material via vacuum.

2.4.2.2. If the primary shutoff fails, there is a secondary bullet type device that performs the same task. The secondary shutoff device has a sight glass that allows you to visually see if there is material in this trap tank, **see picture 1 in Section 17**. If there is material in this tank, the transfer should be shutoff immediately, and the truck and trap tank should be emptied as soon as possible.

3. ENVIRONMENTAL CONSIDERATIONS

3.1. VENT PERMIT INFORMATION

3.1.1. Not applicable to this SOP.

3.2. STORM/WASTE WATER

3.2.1. Not applicable to this SOP.

4. EMERGENCY SHUTDOWN PROCEDURES

4.1. HOSE FAILURES

4.1.1. **INLET HOSE:** There are three options to take in the event of an inlet hose failure.

4.1.1.1. Shut Intake Switch above driver side rear tail light. **See picture 2 in Section 17**. This shuts the air actuated 3" Inlet Valve and allows tank materials to stay in the Vacuum Truck. The building operator will also have to shut their Process Piping Valve.

4.1.1.2. Option b is to shut the 3" Brass Ball Valve on the back of the truck. This means you will have to be in close proximity of the leaking hose.

4.1.1.3. Option c is to shut off the Emergency Switch which is located under the driver's seat, **see picture 3 in Section 17**. This automatically shuts the 4" Discharge and the 3" Air Actuated Valve at the back of the tank.

4.1.2. **DISCHARGE HOSES:** There are three options to take in the event of a discharge hose failure.

4.1.2.1. Option a is to shut the Discharge switch above the drivers side rear taillight. **See picture 2 in Section 17**. This shuts the air actuated 4" Discharge Valve and allows the tank materials to stay in the Vacuum Truck. The building operator will also have to shut their Process Piping Valve.

4.1.2.2. Option b is to shut the 4" Brass Ball Valve on the back of the truck. This means you will have to be in close proximity of the leaking hose.

4.1.2.3. Option c is to shut off the Emergency Switch which is located under the driver's seat, **see picture 3 in Section 17**. This automatically shuts the 4" Discharge and the 3" Air Actuated Valve at the back of the tank.

4.2. RESTART AFTER EMERGENCY SHUTDOWN

4.2.1. In the event that the truck has been shut off for an emergency situation, follow the INITIAL START-UP SECTION of this SOP to resume work.

4.3. STEPS TO TAKE IN CASE OF EMERGENCY SHUTDOWN

4.3.1. Not applicable to this SOP.

5. EMERGENCY OPERATIONS

5.1.1. Not applicable to this SOP.

6. MATERIALS AND EQUIPMENT

6.1. EQUIPMENT COVERED UNDER THIS SOP

6.1.1. Not applicable to this SOP.

6.2. MATERIALS USED IN THE PROCESS

6.2.1. Not applicable to this SOP.

7. INITIAL START UP PROCEDURES

7.1. INSPECTIONS

NOTE: These inspections must be completed each day prior to use of the vacuum truck.

7.1.1. Check Exhaust Muffler collection tank. Drain any liquid and place in scrap solvent drum (Q8-6017). Make sure drain valve is closed and drain cap is in place when completed.

7.1.2. Check Secondary Shutoff device for accumulated liquids. Drain and place in scrap solvent drum (Q8-6017). Make sure drain valve is closed and drain cap is in place when completed.

7.1.3. Check vacuum pump oil level. Add oil as needed to ensure that oil level is full.

7.1.4. Check to assure the back of the tank seals properly. Refer to **SEALING BACK DOOR** section of this SOP if you suspect that the tank is not sealed properly.

7.1.5. Verify that loading and vent hoses have passed their most recent formal inspection. Appropriately colored tape for each quarter's inspection should be present on each hose. Also visually inspect ALL hoses for wear or evidence of cuts or cracks, abrasions, indentations or bulges before use. If damage or deformation is noted, contact supervision to replace hoses and DO NOT use vac truck until hoses are replaced.

7.1.6. Verify that parking brake works properly by setting the brake, then attempting to move the truck forward. The truck should stall before moving. Per Midland's safety department, there is no need to chock wheels as long as the emergency brake is used, and the emergency brake is checked routinely for proper operation.

7.1.7. Check for air leaks when drawing vacuum:

7.1.7.1. Draw 25" Hg on tank.

7.1.7.2. Shutdown vacuum pump and monitor vacuum on tank over 5 minutes.

7.1.7.3. Vacuum should drop no more than 2" Hg over those 5 minutes.

7.1.7.4. If truck does not hold sufficient vacuum, contact supervision to assist with troubleshooting and to correct.

7.2. INITIAL SET-UP

7.2.1. Make sure back valves (4" discharge and 3" inlet) are closed and that caps are in place. These are double valves. The air operated valves are controlled by air switches above the

driver's side rear tail-lights (**See picture 4 in Section 17**). The brass secondary valves are hand operated.

7.2.2. Make sure the pump engage lever is ON. **Refer to picture 5 in Section 17**. If the lever is pushed all the way toward the truck, it is OFF, half way back is Neutral, and away from the truck is ON.

7.2.3. Set the vacuum/pressure lever in the appropriate position. **See picture 6 in Section 17**. Handle pointed toward the truck is vacuum; handle in middle position is neutral. Do NOT move handle to point away from truck as this will pressure-up and introduce air into the tank.

7.2.4. Verify that the vacuum truck has been properly inerted. As long as the truck has not opened, has not been pressured up with air, and has not been used to transfer materials from uninerted tanks/vessels, inerting should not be needed. If inerting is needed, refer to **Inerting** section of this SOP.

7.3. SEALING BACK DOOR (if required)

7.3.1. Start vacuum pump.

7.3.1.1. With the truck idling, shift to Reverse. It is important to keep you foot on the brake.

7.3.1.2. Engage the PTO lever (on position). This lever is between the driver and passenger seat on the floor. **See picture 7 in Section 17**.

7.3.1.3. Shift the truck back to Neutral. The air brakes must be in the lock position during the transfer.

7.3.1.4. Increase idle speed. **See picture 7 in Section 17** for location of switch, right next to PTO switch.

7.3.1.5. At this point the pump should be running if all steps were completed correctly, and the tank should begin building vacuum.

7.3.1.6. Check vacuum pressure gauge to see if vacuum is being generated.

7.3.2. With full vacuum on the tank, tighten wing bolts on back door down as tight as possible by hand.

7.3.3. Shutdown vacuum pump:

7.3.3.1. Decrease idle speed by moving switch to off position. **See picture 7 in Section 17**.

7.3.3.2. With the truck idling, shift to Reverse. It is important that you keep your foot on the brake.

7.3.3.3. Disengage the PTO lever. This lever is between the driver and passenger seat on the floor. **See picture 7 in Section 17**.

7.3.3.4. Shift the truck back to Neutral position. Make sure air brake is in the lock position.

7.3.3.5. At this point the pump should be stopped if all steps were completed correctly, and the tank should not be building any vacuum.

7.3.3.6. If you move the Vacuum pump lever from Vacuum to the middle position, between Vacuum and Pressure, the tank vacuum or pressure will vent off through the muffler.

7.4. INERTING (if required)

7.4.1. INITIAL SET-UP: Refer to Solvent and Methoxy Tanker Loading Procedure SOP to connect the vacuum truck just like a trailer for off-site shipment. Follow procedure specified Initial Start-up section, except for the following:

7.4.1.1. **Do NOT allow vacuum truck to vent equalize**. Keep valves closed in vent lines to the tank blanket systems.

7.4.1.2. **Leave vacuum truck flex hose valve closed** until you're ready to pressure trailer.

7.4.1.3. Set valves to bypass the mass flow meter at the loading station.

7.4.2. Complete 3 pressure/vent cycles on the vacuum truck:

7.4.2.1. Check initial pressure on the vacuum truck and vent down to 0# if needed:

NOTE: Keep the valve on the equalization line leading back to the tank blankets closed throughout this procedure to ensure that vapors do not go to the tanks.

7.4.2.1.1. Open manual valve in the vent line between the vacuum truck and the vent pressure gauge. Also open the manual valve in the vent line before the automatic valve (HV13853).

7.4.2.1.2. Vent down to 0 psig if needed by turning hand switch HV13853 at the panel. This will open the automatic valve to the vent stack.

7.4.2.2. Pressure up vacuum truck to 21 psig (measured at PT 13494):

7.4.2.3. Close automatic valve to vent stack by turning hand switch HV13853 off.

7.4.2.4. Open 3" valve on the vacuum truck.

7.4.2.5. Open automatic valve in the loading line at trailer station #1.

7.4.2.6. Verify that valve to mass flow meter is closed. The flow element can be damaged if N2 is directed through it. For now, also leave valve in bypass line closed.

7.4.2.7. At Tank 19782 discharge header, set valves to direct N2 flow through the load line to trailer station #1:

7.4.2.8. Close valve on inlet line to the pump,

7.4.2.9. Close valve in recycle line,

7.4.2.10. Make sure that all other header station valves are closed.

7.4.2.11. Open the automatic valve in the load line going to trailer station #1.

7.4.2.12. Open N2 automatic valve at Tank 2 by turning hand switch 13852 on.

7.4.2.13. Slowly open the manual valve in the mass flow meter bypass line to start N2 flow to the vacuum truck. Monitor Pressure Transmitter (PT 13494) readout at the panel closely to ensure that pressure does not exceed 21 psig. **This pressure-up cycle only takes 1-2 minutes, so monitor pressure closely!**

7.4.3. Stop N2 flow to the vacuum truck by:

7.4.3.1. Closing the N2 automatic valve at tank 19782 discharge header by turning hand switch HS13852 off; then

7.4.3.2. Closing the manual valve in the mass flow meter bypass valve.

7.4.4. Vent down vacuum truck to 10 psig (as measured at Pressure Transmitter 13494):

7.4.4.1. Open the valve to the vent stack by turning on hand switch HS13853.

7.4.4.2. Monitor pressure at Pressure Transmitter 13494 until it drops to 10 psig.

7.4.4.3. Close the vent stack valve via hand switch HS 138953.

7.4.4.4. Check the pressure gauge on the vent line to make sure that it has dropped to 8 psig. If pressure exceeds 8 psig, resume venting down.

7.4.5. Repeat Pressure/Vent down cycle 3 times.

7.4.6. When finished, verify that the N2 and vent valve switches are both in the “off” (closed)

positions. Also, close the manual valve on the vent line before the automatic valve.

8. NORMAL OPERATIONS

8.1. GENERAL

8.1.1. Assure that the **START-UP SECTION** of this SOP has been followed and that the truck is ready to use.

8.1.2. Weigh the truck prior to picking up material and retain the weight ticket. This ticket will be utilized to record final weight, to calculate total amount transferred to 806 tank farm, and then to enter the weight into the environmental tracking database.

8.1.3. Follow building-specific SOPs for set-up at each building. If an SOP is not available, obtain a HOT Work Permit from responsible party at location where truck is to be utilized.

8.1.4. Utilize the one of the following procedures to complete transfer:

8.1.4.1. If vacuum will be used to complete transfer, follow **TRANSFERS UTILIZING VACUUM PUMP** section of this SOP.

8.1.4.2. If the building's process pump will be used to complete transfer, follow **TRANSFERS UTILIZING BUILDING PROCESS PUMPS** section of this SOP.

8.1.5. When transfer is complete, follow **EMPTYING FLEX HOSE WITH VACUUM** section of this SOP.

8.1.6. When step 5 is complete, follow **NORMAL SHUTDOWN PROCEDURES** section of this SOP.

8.2. TRANSFERS UTILIZING BUILDING'S PROCESS PUMP:

8.2.1. Position the vacuum truck appropriately.

8.2.2. Set air brakes and Turn engine off.

8.2.3. Ground the Vacuum Truck and display Trailer Connection sign.

8.2.4. Make the necessary connections to:

8.2.4.1. Process piping,

8.2.4.2. Vent equalization.

8.2.5. Start truck.

8.2.6. Open vent equalization valve on Vacuum Truck., then have building operator open their process piping vent equalization valve.

8.2.7. Open inlet 3" Air Operated Gate Valve on Vacuum Truck., then open secondary 3" Ball Valve on Vacuum Truck.

8.2.8. Have building operator start their process pump, then open their process piping valve to allow material to flow to truck.

8.2.9. Observe and monitor pressure on Vacuum Truck. Normal operating pressure should be between 0 - 15 PSI. You may have to valve the truck off to get an accurate reading during transfer.

NOTE: If pressure is above 15 PSI, shut transfer off immediately and allow truck to vent equalize to tank pressure before proceeding with the transfer. The Vacuum Truck has its own relief device that vents to atmosphere at 25 PSI.

8.2.10. Observe and monitor the tank filling process with external float level on truck. **See picture 8 in Section 17**.

NOTE: The "FULL" mark has been set at approximately 10" from top of tank. The Vacuum Truck has two shut off devices to prevent overfilling. UNDER NO CIRCUMSTANCES SHOULD YOU RELY ON THOSE DEVICES TO STOP A TRANSFER. THEY ARE STRICTLY BACKUP DEVICES. Your primary responsibility is to shut the truck off prior to triggering the automatic shutoff.

8.2.11. When the transfer is complete, ask building operator to shut their Process Piping Valve.

8.2.12. Shut off Secondary 3" Ball Valve on the vacuum truck.

8.3. TRANSFERS UTILIZING THE VACUUM PUMP:

8.3.1. Position vacuum truck appropriately.

8.3.2. Set air brakes and Turn engine off.

8.3.3. Ground the Vacuum Truck and display Trailer Connected sign.

8.3.4. Make the necessary connections to process vessel.

8.3.5. Start truck.

8.3.6. Start Vacuum Pump:

8.3.6.1. With the truck idling, shift to reverse while keeping your foot on the brake.

8.3.6.2. Engage the PTO lever ("on" position). This lever is between the driver and passenger seat on the floor. **See picture 7 in Section 17**.

8.3.6.3. Shift the truck back to Neutral and verify that air brakes are in the lock position.

8.3.6.4. Increase idle speed to about 800 rpm. At this engine speed, the vacuum pump is at its "ideal" speed (about 1350 rpm). **See picture 7 in Section 17** for location (next to PTO switch).

8.3.6.5. Verify that pump is working properly by checking vacuum pressure gauge.

8.3.7. Open Inlet 3" Air Operated Gate valve on Vacuum Truck, then open Secondary Inlet 3" Ball Valve on Vacuum Truck.

8.3.8. Have building operator open Process Piping Valve to allow material to flow to truck.

NOTE: try to minimize the time that the vacuum pump runs before the transfer starts. Running the vacuum pump without load can overheat and damage the pump.

8.3.9. Monitor vacuum on Vacuum Truck. Normal operating vacuum should be about 25" Hg. If vacuum goes beyond 28", the vacuum pump will overheat. Shut-off the vacuum pump temporarily to allow the pump to cool if vacuum reaches 28"

8.3.10. Monitor the tank filling process with external float level on truck. **See picture 8 in Section 17**.

NOTE: The "FULL" mark has been set at approximately 10" from top of tank. The Vacuum Truck has two shut off devices to prevent overfilling. UNDER NO CIRCUMSTANCES SHOULD YOU RELY ON THESE DEVICES TO STOP A TRANSFER.. THEY ARE STRICTLY BACKUP DEVICES. Your primary responsibility is to shut the truck off prior to triggering the automatic shutoff.

8.3.11. When the transfer is complete, ask the building operator to shut Process Piping Valve.

8.3.12. Shut off Secondary 3" Ball Valve.

8.4. EMPTYING FLEX HOSE WITH VACUUM

8.4.1. If vacuum was used to complete the transfer, skip to STEP #4.

8.4.2. Make sure the pump engage lever is in the ON position. **Refer to picture 5 in Section 17**. If the lever is pushed all the way toward the truck, it is in the OFF position, half way back is Neutral, and away from the truck is ON.

8.4.3. Switch the pump lever to Vacuum position, **see picture 6 in Section 17** to determine the appropriate setting.

8.4.4. Start Vacuum Pump:

8.4.4.1. With the truck idling, shift to reverse and keep your foot on the brake.

8.4.4.2. Engage the PTO lever (on position). This lever is between the driver and passenger seat on the floor. **See picture 7 in Section 17**.

8.4.4.3. Shift the truck back to Neutral. The air brakes must be in the lock position during the transfer.

8.4.4.4. Increase idle speed**. See picture 7 in Section 17** for location of switch, right next to PTO switch.

8.4.4.5. At this point the pump should be running if all steps were completed correctly, and the tank should begin building vacuum.

8.4.4.6. Check vacuum pressure gauge to see if vacuum is being generated.

8.4.5. With vacuum at normal operating level, open the 3” inlet brass secondary valve on the back of the truck. **See picture 9 in Section 17** to make sure you have the appropriate valve.

8.4.6. Open a drain valve between the 3” ball valve and the Process Piping to allow truck to suck the contents of the line into the Vacuum Truck. If there is no drain valve, carefully crack open he fitting at the Process Piping. Try to minimize the amount of air drawn into the truck during this process to reduce fire hazard. Also try to minimize the time spent w/ little to no load on the vacuum pump to prevent overheating and pump damage.

8.4.7. When you feel the line is empty, immediately shut the 3” brass valve on the Vacuum Truck, as well as the 3” air actuated gate valve.

9. OPERATING LIMITS

Instrument, Alarm or Operation	Safe Limits	Alarm Setpoint	Consequences of Improper Operation	Preventive and Corrective Actions
Pressure gauge	0-25 psig	none	Overpressure tank and spill/release material	Monitor pressure during transfer; stop transfer if pressure exceeds 15 psig.
Vacuum Gauge	0-28" Hg	none	Will overheat vacuum pump which could lead to fire/explosion.	Monitor vacuum during vacuum transfer; stop pump if vacuum reaches 28" Hg.
Level Gauge	no more than 10" from top	none	Spill from overfilling tank.	Monitor level during transfer; stop transfer when level reaches 10" from top.

10. NORMAL OPERATING CONDITIONS AND SPECIFICATIONS

10.1.1. Temperature - ambient

10.1.2. Pressure - (o-25) psi

10.1.3. Vacuum - (0-28)" hg

10.1.4. Volume - 3000 us gallons maximum

10.1.5. Mt tare weight - 26,220# with full fuel tanks

10.1.6. Full weight - 49,820# filled to full mark with h2o and full fuel tanks

10.1.7. Pump oil - 30 weight non-detergent

10.1.8. Pump rpm - 1350

10.1.9. Engine rpm - 800

10.1.10. Hydraulic oil – naw 32, 150 visc. Temp range 140 - 150 f

11. TEMPORARY OPERATIONS

11.1.1. Not applicable to this SOP.

12. NORMAL SHUTDOWN PROCEDURES

12.1.1. Shutdown the vacuum pump

12.1.1.1. Decrease idle speed by moving switch to off position. **See picture 7 in Section 17**.

12.1.1.2. With the truck idling, shift to Reverse. It is important that you keep your foot on the brake.

12.1.1.3. Disengage the PTO lever. This lever is between the driver and passenger seat on the floor. **See picture 7 in Section 17**.

12.1.1.4. Shift the truck back to Neutral position. Make sure air brake is in the lock position.

12.1.1.5. At this point the pump should be stopped if all steps were completed correctly, and the tank should not be building any vacuum.

12.1.2. Disconnect flex hose from Vacuum Truck.

12.1.3. Cap the 3” inlet with Kam-Loc Cap.

12.1.4. Disconnect ground clamp and trailer connected sign.

12.1.5. Return safe work permit, if used.

12.1.6. Weigh full transfer at scales.

12.1.7. Take transfer to 806 Tank Farm for Off-loading.

13. START-UP AFTER EMERGENCY SHUTDOWN

13.1.1. Not applicable to this SOP.

14. DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS

14.1.1. Not applicable to this SOP.

15. MAINTENANCE

15.1.1. **During winter operations, at the end of each day** the vacuum pump must be drained by utilizing the drain valve in **picture 12 in Section 17**. This will keep the pump from freezing up and causing damage while trying to engage a frozen pump.

15.2. DAILY BEFORE OPERATING

15.2.1. Check oil in vacuum pump

15.2.2. Check hydraulic oil in storage tank

15.2.3. Check both muffler and secondary shut off device trap tanks for liquid. If present, drain and put into Q8-6017 drum in 800 block. **See pictures 1 and 11 in Section 17**.

15.3. WEEKLY

15.3.1. Flush vacuum pump with oil and fuel oil mixture:

15.4. MONTHLY

15.4.1. Grease all fittings on operating equipment.

15.4.2. Inspect all 3” and 4” valves on rear of tank for operation and wear.

15.5. QUARTERLY

15.5.1. Inspect hoses and if acceptable, tape with appropriate tape. Q1 - red, Q2 - white, Q3 - blue, Q4 - yellow. If the hoses are not acceptable, replace them. Record results on Hose Inspection Form.

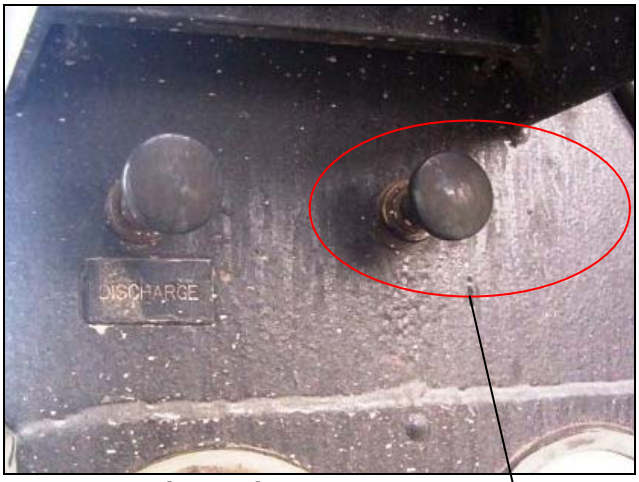
16. TROUBLESHOOTING

16.1.1. Not applicable to this SOP.

17. APPENDIX A

Picture 1 – Sight glass on trap tank

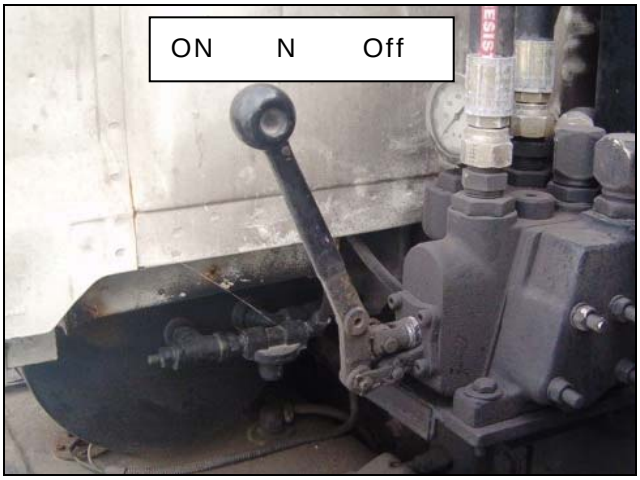
Picture 3 – Emergency switch



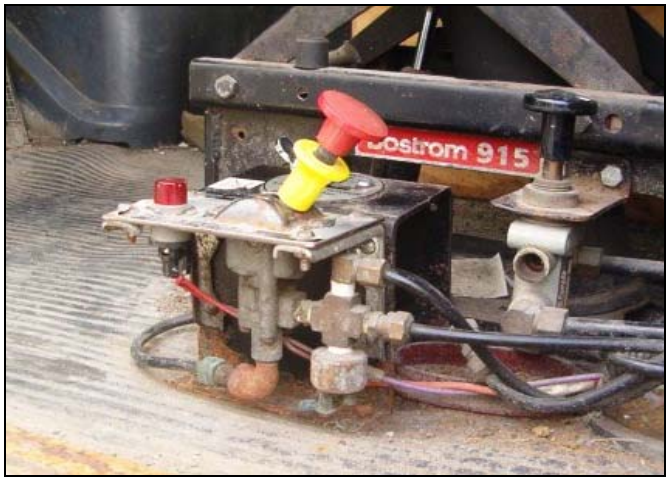
Picture 2 – Intake switch

Picture 4 – Air operated valves

Filename: **DOCUMENTUM SERVER\806 VAC TRUCK**
Title: Vac Truck



Picture 5 – Pump engage lever



Picture 7 – PTO lever


Picture 6 – Vacuum/Pressure lever


Picture 8 – External float level

Picture 9 – Inlet brass secondary valve

Picture 10 – Drain valve on vac pump

Picture 11 – Muffler & secondary shut off device trap tanks