Volume 3

Tank Farm #2

DLS7

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FORM EQP 5111 Module A1

A1: GENERAL FACILITY DESCRIPTION

(Volume 3)

See Volume 1

A1: General Facility Description

FORM EQP 5111 MODULE

A2: CHEMICAL AND PHYSICAL ANALYSES

(Volume 3)

See Volume 1

A2: Chemical and Physical Analysis

FORM EQP 5111 MODULE

A3: WASTE ANALYSIS PLAN (WAP)

(Volume 3)

See Volume 1

A3: Waste Analysis Plan

A4: SECURITY PROCEEDURES AND EQUIPMENT

40 CFR §264.14

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A4: Security Procedures and Equipment

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A5: INSPECTION REQUIREMENTS

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A5: Inspection Requirements

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A6: Preparedness and Prevention or Waiver

FORM EQP 5111 TEMPLATE MODULE A7

A7: CONTINGENCY PLAN

(Volume 3)

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.

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 299.9501, R 299.9508(1)(b), R 299.9504(1)(c), R 299.9521(3)(b), R 299.9607, and Title 40 of the Code of Federal Regulations (CFR) §§264.50 through 264.56, and 270.14(b)(7), establish requirements for contingency plans at hazardous waste management facilities. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003. This license application template addresses requirements for a contingency plan at the hazardous waste management facility for *DLD Environmental Services, Inc* (DLD) in *Plainwell,*, Michigan. It is recommended that DLD perform annual drill exercises with the local fire department and emergency responders using the contingency plan to make sure all staff are familiar with the plan and determine whether the plan needs any updating.

(Check as appropriate)

☐ Applicant for Operating License for Existing Facility

☒ Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility

Table of Contents

This template is organized as follows:

A7.D.5 Procedures to Be Used to Ensure That Fires, Explosions, and Releases Do Not Occur, Reoccur, or Spread During the Emergency

A7.D.6 Procedures to Be Used to Monitor Equipment Should Facility Operations Cease

A7.D.7 Procedures to Provide Proper Treatment, Storage, and Disposal for Any Released Materials

A7.D.8 Procedures for Cleanup and Decontamination

A7.E RESUMPTION OF OPERATIONS AND RECORD KEEPING REQUIREMENTS

A7.E.1 Procedures to Be Used Prior to Resuming Operations

A7.E.2 Record Keeping Requirements

A7.E.2(a) Operating Record

A7.E.2(b) Written Incident Report

*A7.*F PROCEDURE FOR ASSESSING OFFSITE RISK DURING AND AFTER A FIRE/EXPLOSION INCIDENT OR SIGNIFICANT RELEASE

A7.G PROCEDURES FOR REVIEWING AND AMENDING THE CONTINGENCY PLAN

Attachment A7-1 Evacuation Plan and Routes

Attachment A7-2 Emergency Equipment Description

Attachment A7-4 Checklist for Tracking Facility Response Actions During and After a Fire/Explosion Incident ***(See Volume 1)***

INTRODUCTION

A7.A BACKGROUND INFORMATION

A7.A.1 Purpose of the Contingency Plan
[R 299.9607 and 40 CFR §264.51and 264.53]

See Volume 1, Section A7.A.1

A7.A.2 Description of Facility Operations

Reference is made to Volume 1, Section A7.A.2, with the addition of the following information specific to new hazardous waste management unit DLS-7:

DLS-7: This area will be a tank farm, consisting of 15 approximately 6,000 gallon tanks. The building will be made of a hydrophobic cement mixture and the walls a combination of cement and steel. Each group of three tanks will have their own secondary containment, which will meet or exceed containment standards. The fire suppression system will consist of a CO_2 foam which will be automatically released when a fire breaks out. This fire suppression system will also have the capability of being manually operated if necessary. DLS-7 will be a bulk storage area storing the same type of hazardous waste as DLS-3 and DLS-4.

See Volume 3, Section B6 for engineering drawings applicable to DLS-7.

A7.A.3 Identification of Potential Situations

See volume 1, Section A7.A.3

A7.B EMERGENCY COORDINATORS
[R 299.9607 and 40 CFR §264.52 and 264.55]

A7.B.1 Identification of Primary and Alternate Emergency Coordinators
[R 299.9607 and 40 CFR §264.52 and 264.55]

See Volume 1, Section A7.B.1.

A7.B.2 Qualifications of the Emergency Coordinators
[R 299.9607 and 40 CFR §264.55]

See Volume 1, Section A7.B.2.

Table A7.B.1 Identification of Primary and Alternate Emergency Coordinators

See Volume 1, Table A7.B.1.

A7.B.3 Authority to Commit Resources
[R 299.9607 and 40 CFR §264.55]

See Volume 1, Section A7.B.3.

A7.C IMPLEMENTATION OF THE CONTINGENCY PLAN
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

See Volume 1, Section A7.C.

A7.D EMERGENCY PROCEDURES
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

A7.D.1 Immediate Notification Procedures for Facility Personnel and State and Local Agencies with Designated Response Roles
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

See Volume 1, Section A7.D.1.

A7.D.2 Procedures to Be Used for Identification of Releases
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

See Volume 1, Section A7.D.2.

A7.D.3 Procedures to Be Used to Assess Potential Hazards to Human Health and the Environment
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

See Volume 1, Section A7.D.3.

A7.D.4 Procedures to Determine if Evacuation Is Necessary and Immediate Notification of Michigan Pollution Emergency Alerting System, and the National Response Center

[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

Reference is made to Volume 1, Section A7.D.4, with the addition of the following information specific to DLS-7:

- A DLS-7 Evacuation Diagrams can be found in Volume 4, Attachment A7-1.
- A detailed Emergency Equipment List for DLS-7 can be found in Volume 4, Attachment A7-2.

A7.D.5 Procedures to Be Used to Ensure that Fires, Explosions, and Releases Do Not Occur, Reoccur, or Spread During the Emergency

[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(e), 264.227, and 264.200]

Reference is made to Volume 1, Section A7.D.5, with the addition of the following information specific to DLS-7:

DLS-7 will have sufficient secondary containment, and is designed to prevent releases to the environment. A CO_2 foam fire suppression system will be activated automatically upon evidence of a fire in DLS-7. This fire suppression system will also have the capability of being manually operated if necessary.

- DLS-7 Evacuation Diagrams can be found in Volume 3, Attachment A7-1
- An Emergency Equipment List for both DLS-8 & DLS-9 can be found in Volume 4, Attachment A7-3.

A7.D.6 Procedures to Be Used to Monitor Equipment Should Facility Operations Cease

[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(f)]

See Volume 1, Section A7.D.6.

A7.D.7 Procedures to Provide Proper Treatment, Storage, and Disposal for Any Released Materials

[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(g)]

See Volume 1, Section A7.D.7.

A7.D.8 Procedures for Cleanup and Decontamination
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(h)]

See Volume 1, Section A7.D.8.

A7.E NOTIFICATION AND RECORD KEEPING REQUIREMENTS
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(I) and (j)

A7.E.1 Procedures to Be Used to Notify State and Federal Officials Prior to Commencement of Operations
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56]

See Volume 1, Section A7.E.1.

A7.E.2 Record Keeping Requirements
[R 299.9607 and 40 CFR §264.51, 264.52, and 264.56(j)]

See Volume 1, Section A7.E.2.

A7.E.2(a) Operating Record

See Volume 1, Section A7.E.2(a)

A7.E.2(b) Written Incident Report

See Volume 1, Section A7.E.2(b)

A7.F Procedure for Assessing Offsite Risk During and After a fire/explosion incident or Significant Release
[R 299.9521(3)(b) and R 299.9607 and 40 CFR §264.56(d)]

See Volume 1, Section A7.F

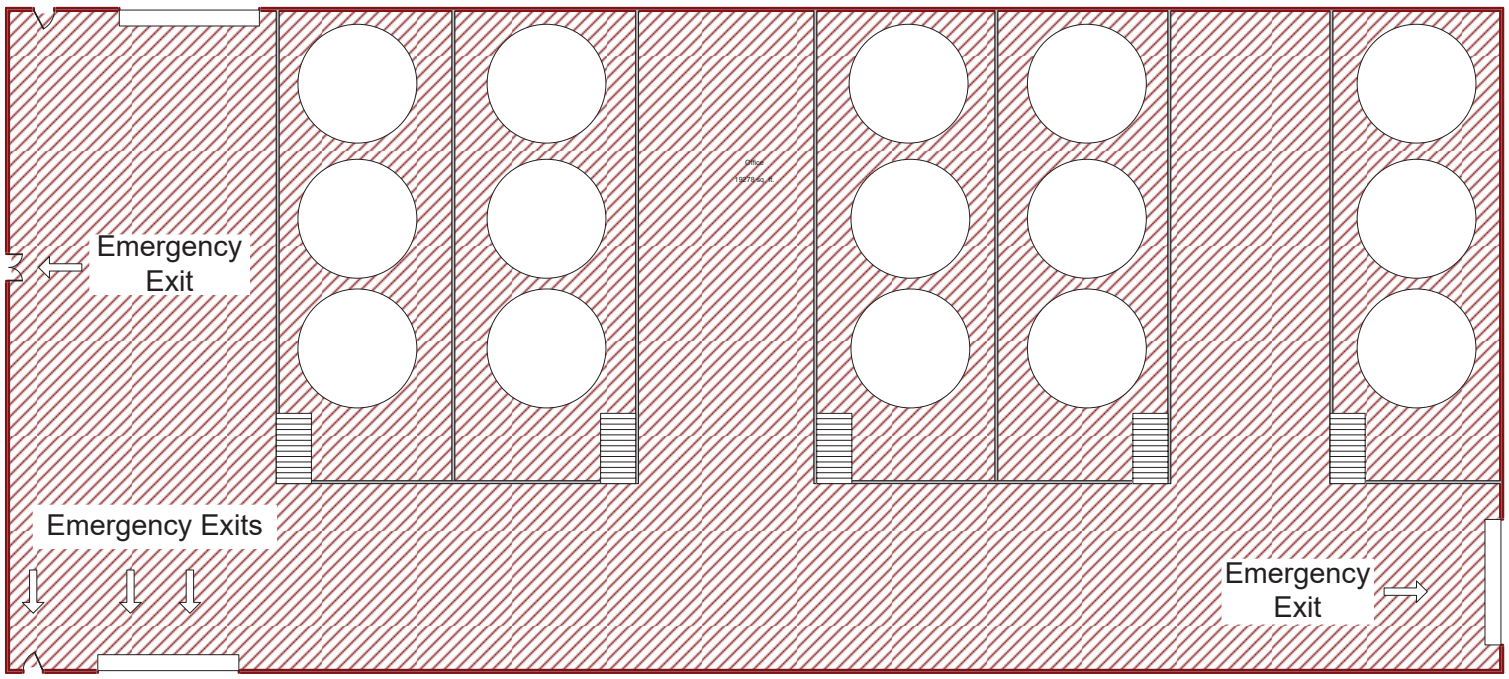
A7.G PROCEDURES FOR REVIEWING AND AMENDING THE CONTINGENCY PLAN
[R 299.9607 and 40 CFR §264.54]

See Volume 1, Section A7.G.

Attachment A7-1
(Volume 3)

EVACUATION ROUTE

DLS-7



DLD

Attachment V3-A7-2 - Emergency Equipment

Emergency Equipment

Emergency equipment that will be available at DLD includes the following:

EQUIPMENT DESCRIPTION	LOCATION	EMERGENCY RESPONSE USAGE
1. Type ABC fire extinguishers Type D-type fire extinguisher	DLS-7	Extinguishing Type A (e.g. trash, wood, paper), Type B (e.g. liquids and grease), Type C (e.g. electrical equipment) and Type D (e.g. alkaline earth metal) fires.
2. 110 V AC suction Pumps		Suction of liquids from sump area if not served by compressed air.
3. Hand-operated pumps		Suction of small volumes of liquid from areas not served by compressed air or electricity.
4. Air-driven vacuum pumps with 1½" inlet and outlet.		Transfer of liquids, both viscous and non-viscous, as in spill clean-up.
5. Air-driven vacuum pump with 3" inlet and outlet		Transfer of liquids, both viscous and non-viscous, as in spill clean-up.
6. Spill clean-up material: Oil dry, sawdust, brooms, pads, booms		As appropriate to the type of material spilled. Sawdust is not used on spills with potential for oxidation.
7. Personnel equipment—modified Level C (hard hats, face shields, rubber gloves, respirators, coveralls)		Clean-up of spills requiring not higher than Level C protection.
8. Personal equipment—modified Level C (same as # 9 plus supplied air)		Clean-up of spills requiring not higher than Level C protection.
9. Telephone/Intercom • Driver's Phones • Two-way radio set • Radio System (5)		Communication with office via intercom and with emergency responders.

EQUIPMENT DESCRIPTION	LOCATION	EMERGENCY RESPONSE USAGE
10. Alarm system consisting of seven loud horns and seven activation locations		Evacuation signal
11. Visual alarms consisting of flashing red lights		Additional evacuation signal for outside areas when noise is a factor.
12. Mercury Vacuum		Clean-up of mercury spills
13. Decontamination Equipment: bucket, 1A2 drum, brushes, pump		Clean-up of PCB spills
14. Emergency Gate Opener		Emergency evacuation of employees and access to facility by emergency vehicles

FORM EQP 5111 Template

A8: Traffic Information

(Volume 3)

See Volume 1

A8: Traffic Information

A9 - FACILITY LOCATION INFORMATION

40 CFR §270.14(b)(11)

(Volume 3)

See Volume 1

A9: Facility Location Information

A10: PERSONNEL TRAINING PROGRAM

(Volume 3)

See Volume 1

A10: Personnel Training Program

FORM EQP 5111 Template

A11: Closure and Postclosure Plan

(Volume 3)

See Volume 1

A11: Closure and Postclosure Plan

FORM EQP 5111 TEMPLATE

A12: CLOSURE AND POSTCLOSURE CARE COST ESTIMATES

(Volume 3)

(Proposed Licensed Hazardous Waste Unit DLS-7)

This document is an attachment to the Michigan Department of Environmental Quality's *Instructions for Completing Form EQP 5111, Construction Permit and Operating License Applications, Hazardous Waste Treatment Storage and Disposal Facilities.* See Form EQP 5111 for details on how to use this attachment.

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 299.9702 and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart H, establishes requirements for providing financial assurance for closure and, if necessary, postclosure care. Specifically, R 299.9702(1) requires the preparation of associated cost estimates. This license application template addresses the requirement for preparing a closure cost estimate and, if necessary, a postclosure care cost estimate. The cost estimates provided in this attachment are based on the closure and postclosure care activities detailed in Template A11. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This template is organized as follows:

A12.A CLOSURE COST ESTIMATE

A12.A.1 Closure Cost Estimate Breakdown

Table A12.A.1 Facility Closure Cost Estimate Breakdown by Unit

Table A12.A.2 Container Storage Areas Closure Cost Estimate

Table A12.A.3 Tank Systems Closure Cost Estimate

Table A12.A.4 Miscellaneous Units Closure Cost Estimate

A12.B POSTCLOSURE COST ESTIMATE

(Since no hazardous waste will be left behind at closure, the following template sections are not applicable)

A12.A CLOSURE COST ESTIMATE

[R 299.9702(1) and 40 CFR §264.142]

Reference is made to Volume 1, Section A12.A, with the addition of the following information specific to DLS-7.

The cost closure information found in Tables A12.A.2, A12.A.3, and A12.A.4, below, shall be cumulative with those tables found in Volume 1 and any other volumes whose hazardous waste management units are approved and operational.

A12.A.1 Closure Cost Estimate Breakdown

Table A12.A.1 Facility Closure Cost Estimate Breakdown for DLS-7

1.	Container Storage Areas	$ NA
2.	Tank Systems	$ 136,959
3.	Surface Impoundments	$ NA
4.	Waste Piles	$ NA
5.	Landfills	$ NA
6.	Incinerators	$ NA
7.	Miscellaneous Units	$ NA
8.	Boilers and Industrial Furnaces	$ NA
Total Facility Closure and Postclosure Care Estimate (add lines 1 through 11)		$ 136,959

Table A12.A.2 Container Storage Areas Closure Cost Estimate

Not applicable to hazardous waste unit DLS-7

Table A12.A.3 Tank Systems Closure Cost Estimate

	Activity If certain activities are not expected to be performed, enter "NA" as the Estimated Cost.	**Estimated Cost**
1.	Removal of Waste	$450
2.	Tank System Purging (ignitable wastes *only*)	$ 900
3.	Flushing of Tank and Piping	$ 900
4.	Excavation, Disassembly, and Loading	$ NA
5.	Demolition and Removal of Containment System	$ NA
6.	Removal of Soil	$ NA
7.	Backfill	$ NA
8.	Decontamination	$ 2000
9.	Sampling and Analysis	$ 2250
10.	Monitoring Well Installation	$ NA
11.	Transportation	$ 75,000
12.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	$ 43,000
13.	**Subtotal of Closure Costs** (Add Lines 1 through 12)	$ 124,500
14.	Engineering Expenses (6% of closure costs, excluding certification of closure.)	$ 7470
15.	Certification of Closure	$ 1000
16.	**Subtotal** (Add Lines 13, 14, and 15)	$ 132,970
17.	Contingency Allowance (3% of closure costs, engineering expenses, and cost of certification of closure.)	$ 3989
18.	Landfill Closure	$ NA
	Total Cost of Closure (Add lines 16, 17, and 18)	$ 136,959

Table A12.A.4 Miscellaneous Units Closure Cost Estimate

Not applicable to hazardous waste unit DLS-7

FORM EQP 5111 TEMPLATE

A13: Topographical Map

(Volume 3)

See Volume 1

A13: Topographical map

A14: LIABILITY MECHANISM

40 CFR §270.14(b)(17)

(Volume 3)

To Be Determined

A15: FINANCIAL ASSURANCE INSTRUMENT

40 CFR §270.14(b)(17)

(Volume 3)

To Be Determined

B1: STATUS OF COMPLIANCE WITH OTHER FEDERAL LAWS

40 CFR 270.14(b)(20)

(Volume 3)

See Volume 1

B1: Status of Compliance with Other Federal Laws

FORM EQP 5111 TEMPLATE

B2: CORRECTIVE ACTION INFORMATION

(Volume 3)

See Volume 1

B2: Corrective Action Information

FORM EQP 5111 Template

B3: HYDROGEOLOGICAL REPORT

(Volume 3)

See Volume 1

B3: Hydrogeological Report

FORM EQP 5111 Template

B4: ENVIRONMENTAL ASSESSMENT

(Volume 3)

See Volume 1

B4: Environmental Assessment

B5: ENVIRONMENTAL MONITORING PROGRAMS

(Volume 3)

As Recommended

B6: ENGINEERING PLANS

(Volume 3)

Index of Attachments

ATTACHMENT DESCRIPTION

B6-70.0 Sheet Index
DLS-7 Tank Storage

B6-70.1 Drawing C001, Blueprint 09024CC001.dwg
Site Development Plan / DLS-7

B6-70.2 Drawing A101, Blueprint 09024CA101.dwg
DLS-7 Floor Plan and Roof Plan

B6-70.3 Drawing A201, Blueprint 09024CA201.dwg
DLS-7 Exterior Elevations

B6-70.4 Drawing A211, Blueprint 09024CA211.dwg
DLS-7 Building Sections

B6-70.5 Drawing S100, Blueprint 09024CS100.dwg
DLS-7 Foundation Plan

B6-70.6 Drawing S501, Blueprint 09024CS501.dwg
DLS-7 Foundation Details

B6-70.7 New Tank System Piping

B6-70.7.1 Drawing M304, Blueprint 2009-410_M-304.dwg
DLS-7 Tank System Piping/Pumping Hub & Tanks #16 - #21

B6-70.7.2 Drawing M305, Blueprint 2009-410_M-305.dwg
DLS-7 Tank System Piping/Tanks #7 - #15

B6-70.7.3 Drawing M306, Blueprint 2009-410_M-306.dwg
DLS-7 Tank System Piping Sections B & C

B6-70.7.4 Drawing M307, Blueprint 2009-410_M-307.dwg
DLS-7 Tank System Piping Sections D, E, & F

B6-70.7.5 Drawing M308, Blueprint 2009-410_M-308.dwg
New Tank System Piping List

B6-70.7.6 Drawing M303, Blueprint 2009-410_M-303.dwg
DLS-8 Tank System Piping

B6: Index of Attachments (continued)

ATTACHMENT DESCRIPTION

B6-70.8 New Tank System Vent/Pressure Equalization Piping

B6-70.8.1 Drawing M314, Blueprint 2009-425_M314.dwg
DLS-7 Tank System Vent/Pressure Equalization Piping

B6-70.8.2 Drawing M316, Blueprint 2009-425_M316.dwg
DLS-7 Tank System Vent/Pressure Equalization Piping – Elevations A, B & C

B6-70.8.3 Drawing M317, Blueprint 2009-425_M317.dwg
DLS-7 Tank System Vent/Pressure Equalization Piping – Elevations D & C

B6-70.8.4 Drawing M315, Blueprint 2009-425_M315.dwg
DLS-8 Tank System Vent/Pressure Equalization Piping

B6-70.8.5 Drawing M318, Blueprint 2009-425_M318.dwg
New Tank System Vent/Pressure Equalization Piping Part List

B6-70.9 Drawing M101, Blueprint 08-145_M101.dwg
DLS-7 Mechanical Plan

B6-70.10 Drawing E100, Blueprint E100-Phase_3-0803600.dwg
DLS-7 Electrical Symbols & Notes

B6-70.11 Drawing E400, Blueprint E400-Phase_3-0803600.dwg
DLS-7 Lighting Plan

B6-70.12 Drawing E500, Blueprint E500-Phase_3-0803600.dwg
DLS-7 Power Plan

B6-71 Drawing PBKQUOTE2
Storage Tank Design

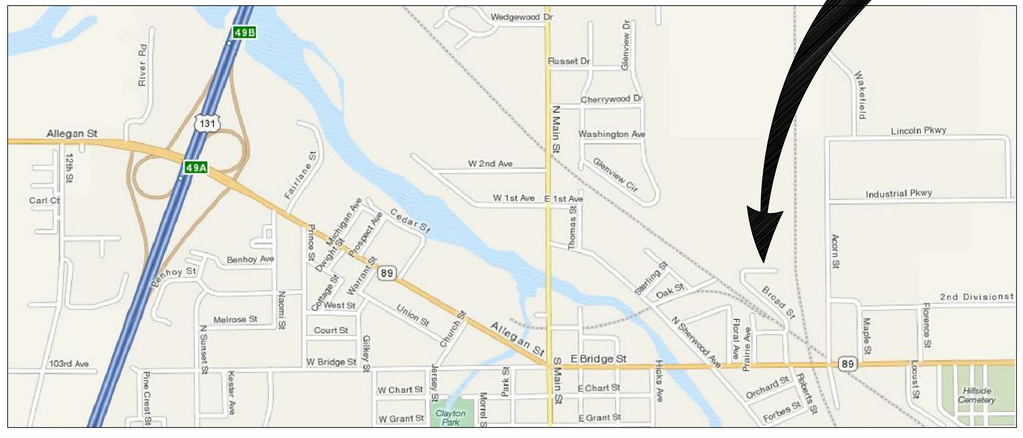
Drug & Laboratory Disposal

Phase 3 - Tank Storage

Broad Street, Plainwell, Michigan 49080

January 29, 2010 for State Submittal

PROJECT LOCATION



LOCATION MAP

NOT TO SCALE

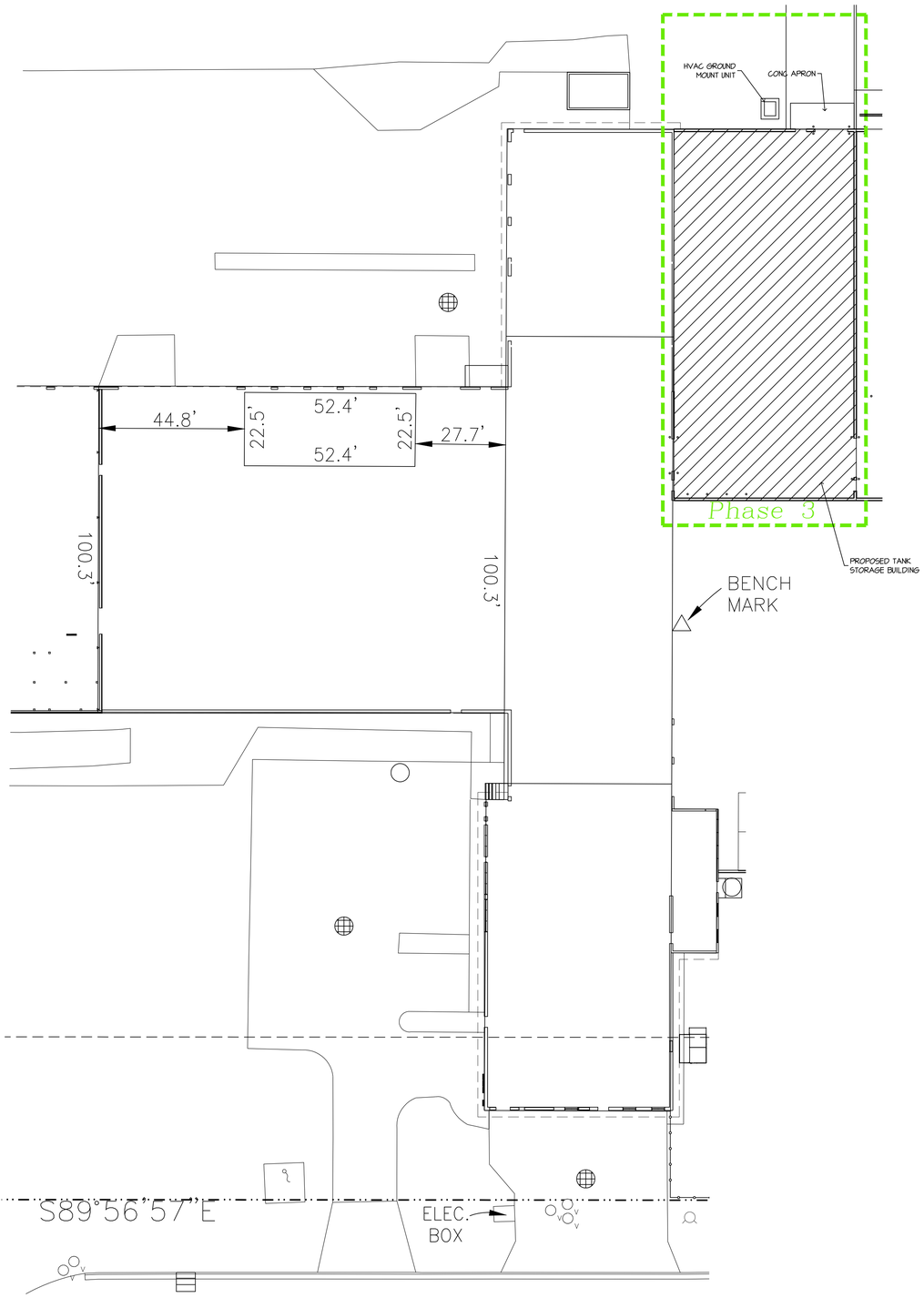
SHEET INDEX

Drug & Laboratory Disposal
Phase 3 - Tank Storage
Broad Street
Plainwell, Michigan 49080

ISSUED

bosch
ARCHITECTURE
ENGINEERING
INTERIOR DESIGN
8175 Creekside Drive, Ste. 220
Portage, Michigan 49024
ph: 269-321-5151
www.boscharch.com

JOB NUMBER
09024C



GENERAL NOTES (SITE WORK)

1. THE SOILS INVESTIGATION REPORT IS AVAILABLE TO THE GENERAL CONTRACTOR UPON REQUEST.

2. FOUNDATION DESIGN CAPACITIES:

	DESCRIPTION	CAPACITY
A.	STRIP FOOTINGS	GROSS 1500 PSF
B.	SPREAD FOOTINGS	GROSS 1500 PSF

3. DEMOLITION

   A. REMOVAL OF EXISTING UTILITIES, STRUCTURES AND SLABS SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS. IF REMOVAL LIMITS ARE NOT SHOWN, THEY SHALL BE THE MINIMUM REQUIRED TO COMPLETE THE PROJECT.

   B. DISCONNECTS OF ALL UTILITIES TO BE REMOVED SHALL BE BY THE TRADE INVOLVED OR THE APPROPRIATE UTILITY CO. AS DIRECTED BY THE GENERAL CONTRACTOR.

   C. DISPOSAL OF MATERIAL REMOVED SHALL BE OFF SITE BY THE GENERAL CONTRACTOR.

4. SITE PREPARATION:

   A. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE PERFORMED BY THE CONTRACTOR IN COMPLIANCE WITH ACT 347.

   B. ORGANIC TOPSOIL SHALL BE STRIPPED FROM THE CONSTRUCTION AREA TO DEPTHS RANGING FROM APPROXIMATELY 6" TO 30" AND STOCKPILED AS INSTRUCTED BY THE ARCHITECT FOR LATER USE.

   C. IT IS REQUIRED THAT DENSIFICATION OF THE EXISTING SOILS BE PERFORMED BEFORE ANY FOOTINGS ARE CONSTRUCTED. SEE DIVISION 2 OF THE SPECIFICATION FOR ADDITIONAL INFORMATION.

5. EARTHWORK:

   A. CALL MISS DIG AT 1-800-482-7171 BEFORE BEGINNING EXCAVATION.

   B. EXCAVATION SHALL BE LEVEL TO EXACT DEPTHS AND DIMENSIONS INDICATED ON DRAWINGS.

   C. CONSTRUCTION OF FOUNDATIONS AND SLABS ON GRADE WILL BE ON COMPACTED FILL IN MOST AREAS. LAYERED COMPACTION SHALL BE PERFORMED TO A MINIMUM DENSITY OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM DESIGNATION D 1557 VALUES AND AS OUTLINED IN THE SPECIFICATIONS DIVISION 2.

   D. EXTREME CARE SHALL BE TAKEN NOT TO DISTURB OR DAMAGE EXISTING FOOTINGS, FOUNDATIONS, FLOORS, AND UTILITY OR STORM LINES. CONTRACTOR SHALL PROVIDE ALL REQUIRED SHORING AND BRACING TO PREVENT CAVE-INS OR SETTLEMENT OF EXISTING STRUCTURES OR UTILITIES.

   E. PLACE 6 INCHES OF BANK RUN SAND COMPACTED TO 95% OF MAXIMUM DENSITY UNDER ALL FLOOR SLABS ON GRADE.

   F. SOIL TESTING WILL BE CONTRACTED AND PAID FOR BY THE GENERAL CONTRACTOR.

   G. SITE SHALL BE FINE GRADED BEFORE PLACING TOP SOIL OR GRANULAR BASE MATERIAL.

   H. EXTERIOR SURFACE DRAINAGE SHALL BE AWAY FROM BUILDINGS.

   I. AFTER BACKFILL IS PLACED AND PRIOR TO PLACING CONCRETE FLOORS, THE SOIL WILL BE TREATED FOR TERMITE CONTROL.

SITE DEVELOPMENT PLAN
SCALE: 1" = 20'

Drug & Laboratory Disposal

Phase 3 - Tank Storage
Broad Street
Plainwell, Michigan 49080

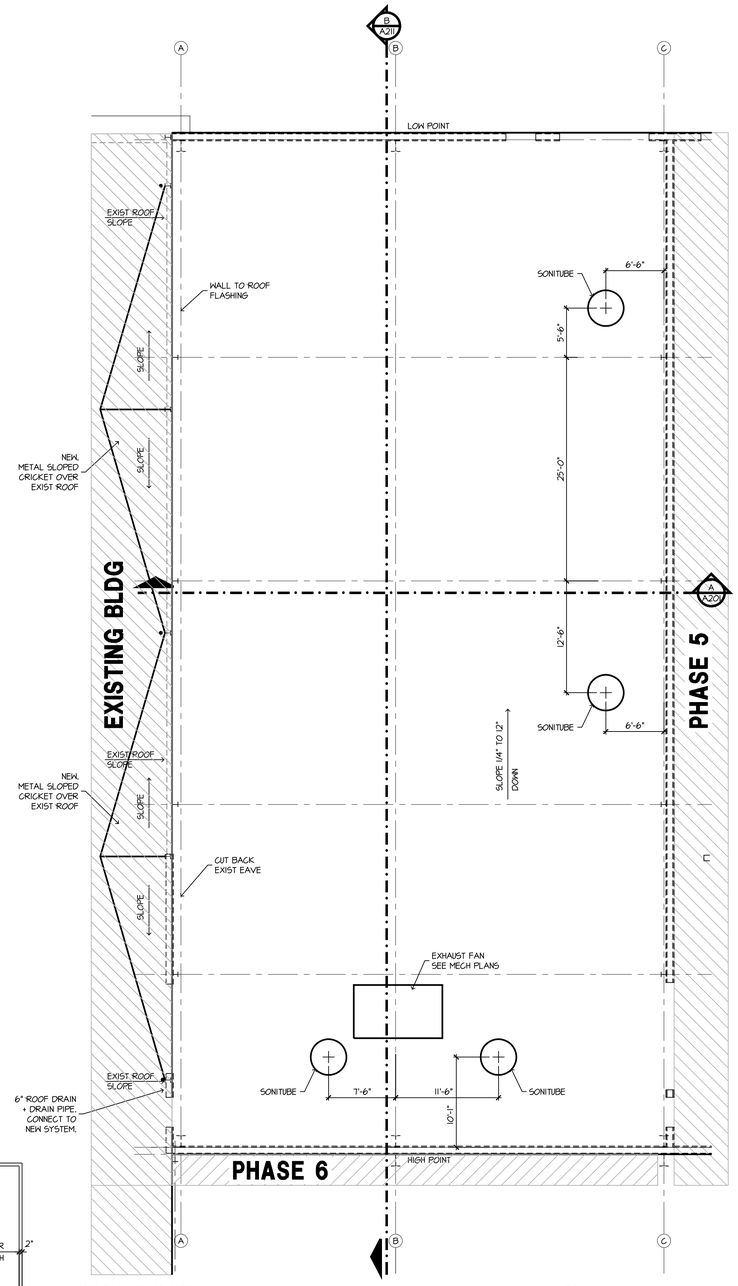
ISSUED
1-29-2010 FOR STATE SUBMITTAL

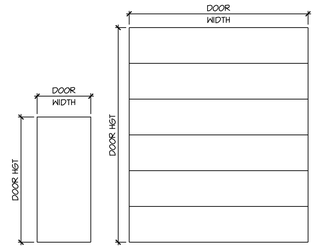
bosch
ARCHITECTURE
ENGINEERING
INTERIOR DESIGN
8175 Creekside Drive, Ste. 220
Portage, Michigan 49024
ph: 269-321-5151
www.boscharch.com

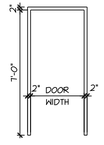
JOB NUMBER
09024C

SITE DEVELOPMENT PLAN

C001







HARDWARE GROUPS

SET NO. 1 (EXTERIOR: 101C, 101D, 101F)

1 1/2 PR.	BUTTS	
1 EA	EXIT DEVICE W/ EXTERIOR LEVER	
1 EA	CLOSER	
1 EA	THRESHOLD	
1 EA	WEATHER SEAL + SWEEP	
1 EA	CYLINDER	
1 EA	STOP AS REQ	

N ROOF PLAN
SCALE: 1/8" = 1'-0"

N FLOOR PLAN
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. ALL CUTTING AND PATCHING SHALL BE BY THE TRADE INVOLVED IN THE WORK.
2. SEE WALL KEY FOR WALL CONSTRUCTION.
3. VERIFY ALL DIMENSIONS IN THE FIELD BEFORE ORDERING ANY MATERIALS.
4. PROVIDE SOLID WOOD BLOCKING @ DOORS, CABINETS, SHELVING, BORROWED LITES, GRAB BARS, AND BEHIND DOOR STOPS, ETC.
5. ALL DIMENSIONS ARE NOMINAL TO FINISHED SURFACES UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE THE PREMISES.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO OBTAIN CLARIFICATION OF ANY DISCREPANCIES.
8. ALL FIRE EXTINGUISHERS TO BE FINAL PLACED BY THE LOCAL FIRE MARSHAL.

WALL TYPES:

TYPICAL EXTERIOR

1 — 8" PURLINS W/ 1-1/2" MTL SIDING ON EXTERIOR + 1-1/2" MTL LINER PANEL TO 1'-4" AFF + OPEN ABOVE.

2 — **LOW CONCRETE WALL @ CONTAINMENT BAY**
8" CONCRETE WALL TOP OF WALL AT 100'-8" TO BE POURED NEXT TO EXIST FND WALL.

3 — **EXISTING WALL**
EXISTING WALL TO REMAIN RESKIN AS REQ.

FOAM FIRE SUPPRESSION SYSTEM TO BE INSTALLED PER CODE THROUGH OUT ENTIRE TANK STORAGE AREA.

DOOR SCHEDULE

DOOR NUMBER	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICK.	TYPE	DOOR MAT.	FRAME	HDW GROUP	RATING	DETAILS J	DETAILS J	DETAILS H	REMARKS
101A	10'-0"	14'-0"	1 3/4"	B	INSUL MTL	----	-----	-----				OVERHEAD INSULATED DOOR W/REMOTE
101B	12'-0"	14'-0"	1 3/4"	B	INSUL MTL	----	-----	-----				OVERHEAD INSULATED DOOR W/REMOTE
101C	3'-0"	7'-0"	1 3/4"	A1	HM	HM	1	-----	-----	-----	-----	
101D	3'-0"	7'-0"	1 3/4"	A1	HM	HM	1	-----	-----	-----	-----	
101E	10'-0"	14'-0"	1 3/4"	B	INSUL MTL	----	-----	-----				OVERHEAD INSULATED DOOR W/REMOTE
101F	3'-0"	7'-0"	1 3/4"	A1	HM	HM	1	-----	-----	-----	-----	

ROOM FINISH SCHEDULE

ROOM NO	ROOM NAME	FLOOR	BASE	WALL MAT.	WALL FIN.	CEILING MAT.	CEILING FIN.	CLG HGT	REMARKS
101	TANK STOREAGE	CONC.	CONC.	MTL / EXPOSED	-----	EXPOSED	-----	-----	MTL LINER PNL UP TO 7'-4" AFF, OPEN ABOVE

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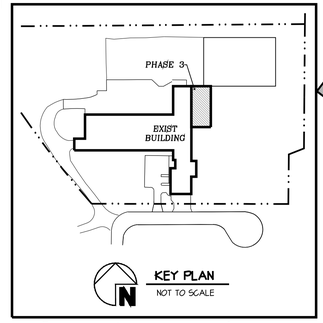
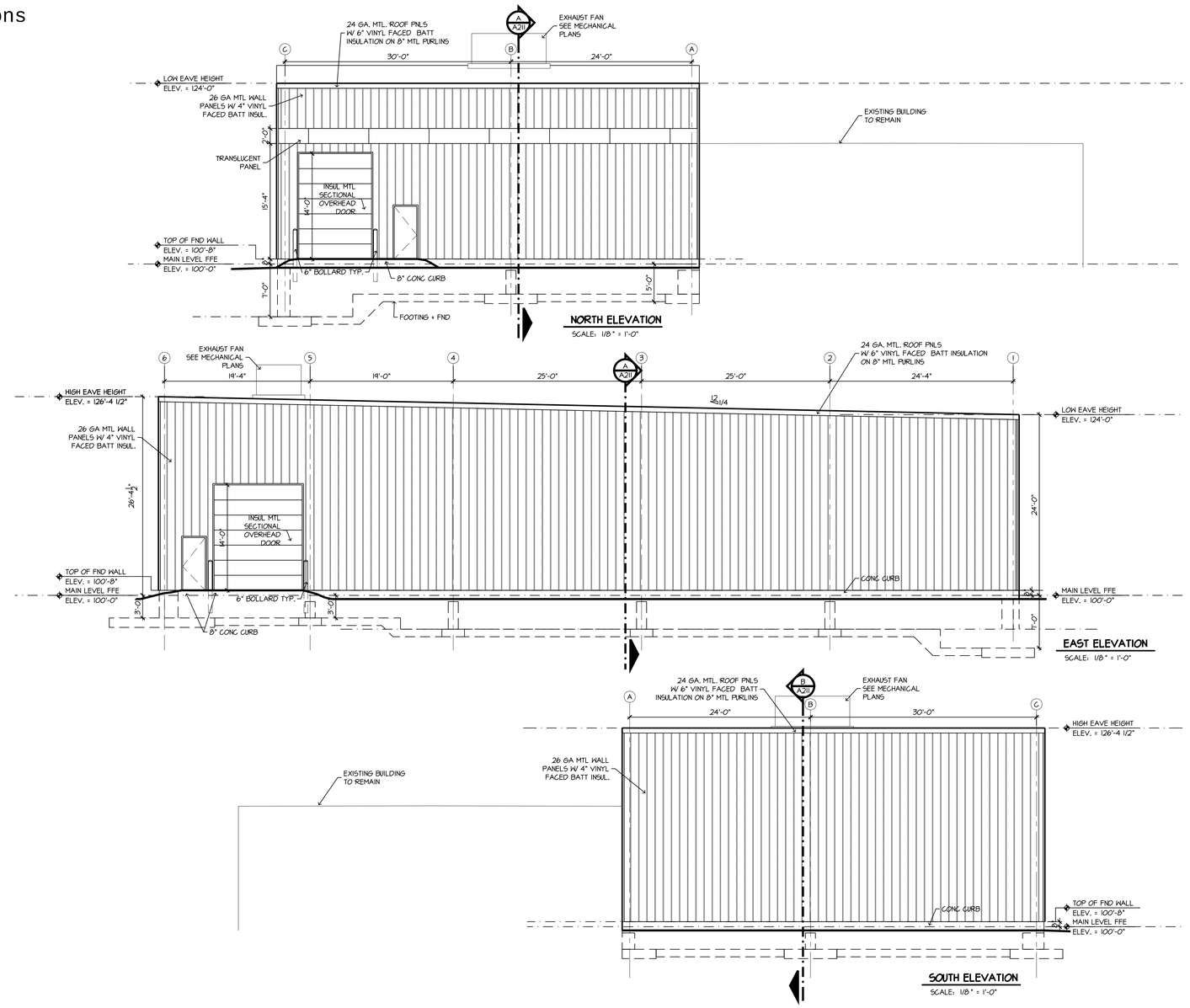


FLOOR PLAN + ROOF PLAN

A101



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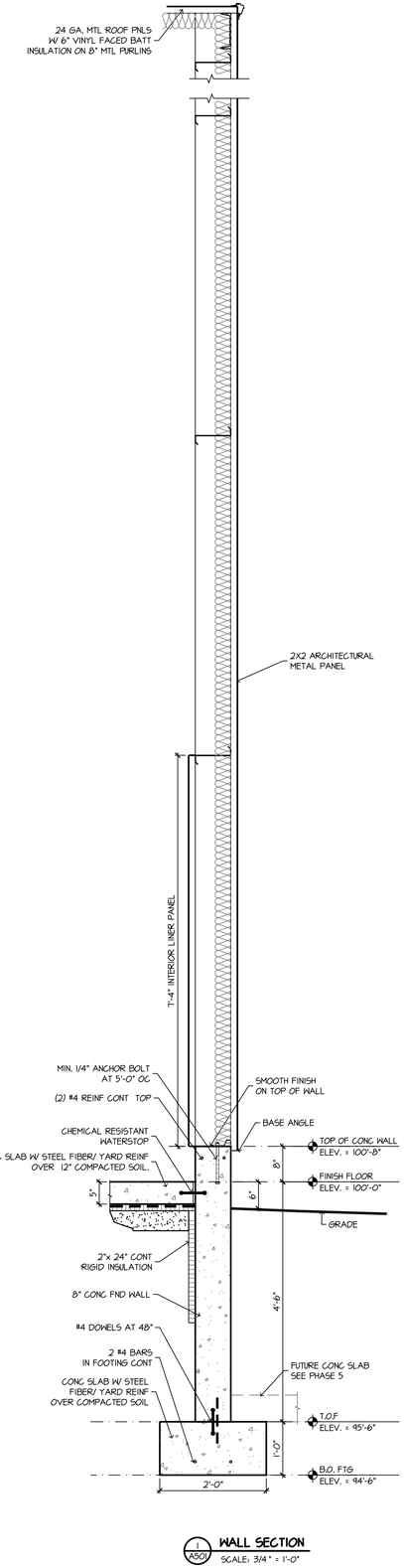
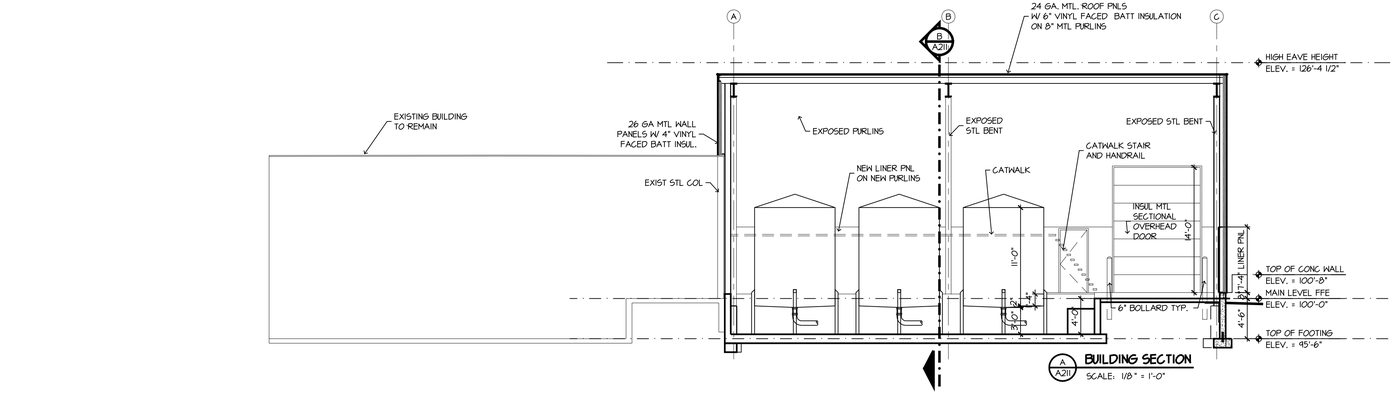
EXTERIOR ELEVATIONS

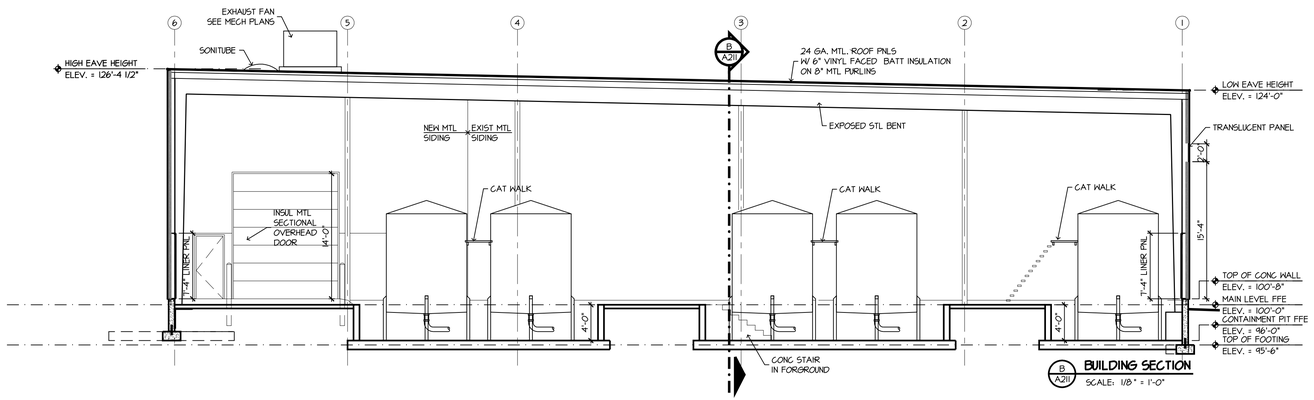
A201



1 A501 **WALL SECTION**
SCALE: 3/4" = 1'-0"



A A211 **BUILDING SECTION**
SCALE: 1/8" = 1'-0"



B A211 **BUILDING SECTION**
SCALE: 1/8" = 1'-0"

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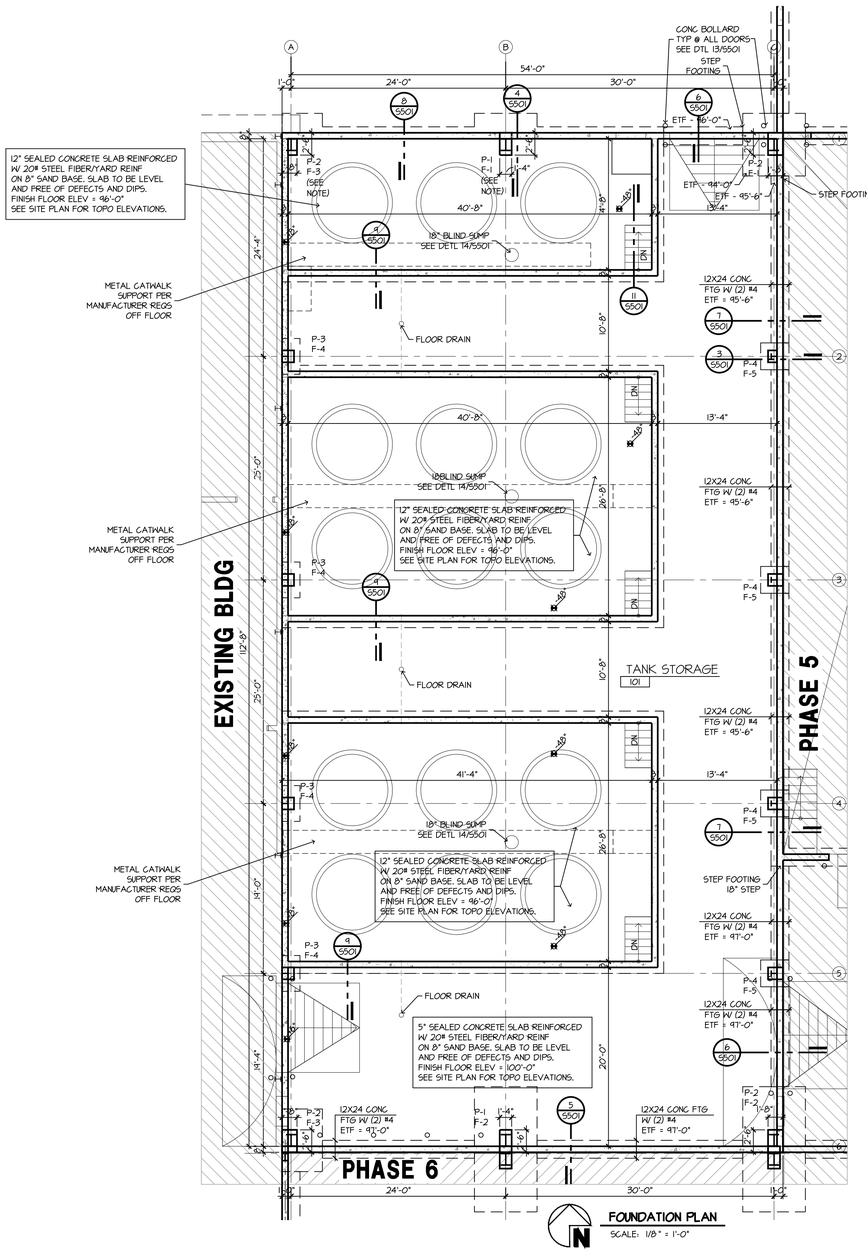
BUILDING SECTIONS

A211

09024CA211.dwg



CONCRETE

1. CONCRETE STRENGTH SHALL BE 4,000 PSI IN 28 DAYS FOR ALL INTERIOR SLABS, 3,500 PSI FOR FOUNDATION WALLS, 3,000 PSI FOR FOOTINGS. SEE SPECIFICATIONS DIVISION 3 FOR ADDITIONAL INFO.

2. MATERIAL PROPERTIES REINFORCING AND CONNECTION STEEL:

	FY PSI	ASTM
#3 BARS	40,000	A615
ALL BARS #4 AND LARGER, U.N.	60,000	A615
WELDED WIRE FABRIC (SMOOTH)	65,000	A615

3. CONCRETE PROTECTION FOR REINFORCEMENT: THE FOLLOWING MINIMUM CONCRETE SHALL BE PROVIDED FOR REINFORCEMENT.

	MIN. COVER (IN)
1. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.	3
2. CONCRETE EXPOSED TO EARTH OR WEATHER #6 THROUGH #18 BARS	2
#5 BAR, W31 OR D31 WIRE, AND SMALLER.	1 1/2
3. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND.	3/4

4. PROVIDE FOOTING/WALL DOWELS AND CORNER REBAR AS SHOWN ON THE DRAWINGS.

5. CONCRETE FINISHES:

1. EXTERIOR SLABS LIGHT BROOM FINISH.

2. INTERIOR SLABS STEEL TROWEL FINISH.

3. INTERIOR SLABS THAT DO NOT RECEIVE A FINISHED FLOORING MATERIAL SHALL BE SEALED AFTER CURING.

6. RECESS FOUNDATION WALL 8" AT DOORWAYS AND POUR SLAB THRU OPENING.

1. LOCATION OF CONSTRUCTION AND CONTRACTION JOINTS FOR THE SLAB ON/GRADE WILL BE THE CONTRACTOR'S RESPONSIBILITY.

2. ALL NON BEARING WALLS ON SLABS TO HAVE SILL PLATE ANCHORED WITH POWDER ACTUATED FASTENERS AT 24" O.C. HILTI OR EQUAL.

7. SOIL BEARING CAPACITY TO BE A MIN OF 3000 PSI AT THE WALLS AND 4000 PSI AT THE COLUMNS.
UNLESS NOTED OTHERWISE

ANCHOR BOLT NOTE:
FOR EXACT SIZE, LOCATION, AND NUMBER OF ANCHOR BOLTS SEE SHOP DRAWINGS BY METAL BUILDING COMPANY

PIER NOTE:
PIER SIZE SHALL BE DETERMINED BY SHOP DRAWINGS FROM METAL BUILDING COMPANY

SCHEDULE OF MINIMUM RECOMMENDED ANCHOR BOLT LENGTHS

DIAMETER	LENGTH
3 /4"	1'-3"
7 /8"	1'-6"
1"	1'-9"
1-1 /8"	2'-0"
1-1 /4"	2'-0"

ALL BOLT LENGTH AND DIAMETER TO BE AS SHOWN ON METAL BUILDING COMPANY SHOP DRAWINGS

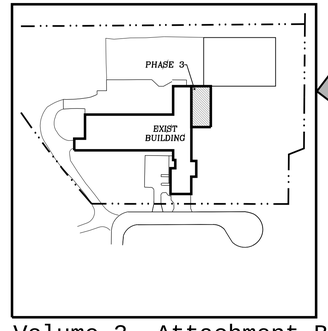
ALL ANCHOR BOLTS TO PROJECT A MINIMUM OF 3" ABOVE FOOTING

PIER SCHEDULE

MARK	MINIMUM PIER SIZE	REINFORCING	REMARKS
P-1	1'-4" X 2'-6"	4-#5 VERT & #3 TIES @ 10" OC.	--
P-2	1'-8" X 2'-6"	4-#5 VERT & #3 TIES @ 10" OC.	--
P-3	1'-4" X 1'-4"	4-#5 VERT & #3 TIES @ 10" OC.	--
P-4	1'-4" X 1'-8"	4-#5 VERT & #3 TIES @ 10" OC.	--

FOOTING SCHEDULE

MARK	FOOTING SIZE	REINFORCING	REMARKS
F-1	1'-0"x 1'-0"x 1'-6"	(1) #5 EA. WAY T&B	AT TANK CONTAINMENT, FOOTING IS 12" THICK TO MATCH SLAB
F-2	1'-0"x 14'-0"x 2'-0"	#6@12" EA. WAY T&B	FOOTING IS LARGER FOR PHASE 6 FUTURE COLUMNS
F-3	1'-0"x 4'-6"x 1'-6"	#5@12" EA. WAY T&B	AT TANK CONTAINMENT, FOOTING IS 12" THICK TO MATCH SLAB
F-4	2'-0"x 4'-0"x 12"	#4@12" EA. WAY	--
F-5	3'-2"x 3'-0"x 12"	(4) #4 EA. WAY	--



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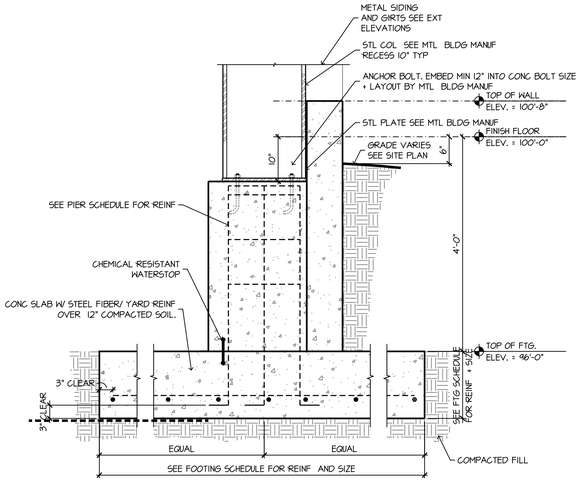
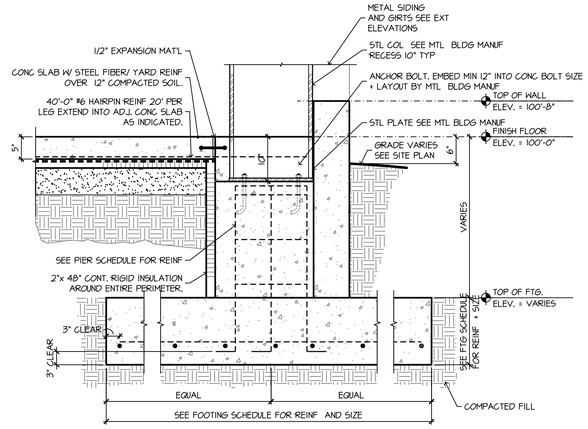
FOUNDATION PLAN

S100



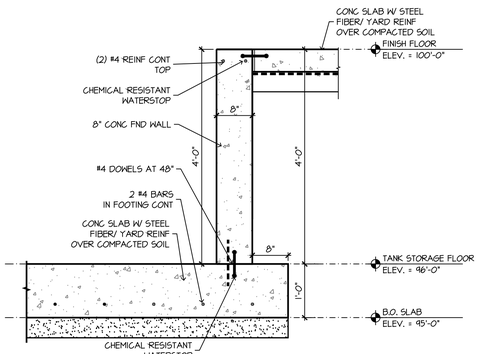
4 S501 **TYPICAL MAIN PIER/FTG @ TANK STORAGE**
SCALE: 3/4" = 1'-0"



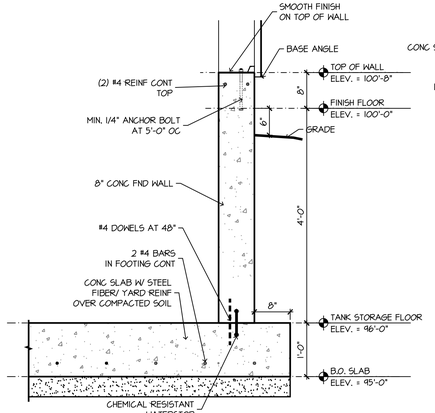
3 S501 **TYPICAL MAIN PIER/FTG**
SCALE: 3/4" = 1'-0"

2 S501 **NOT USED**
SCALE: 3/4" = 1'-0"

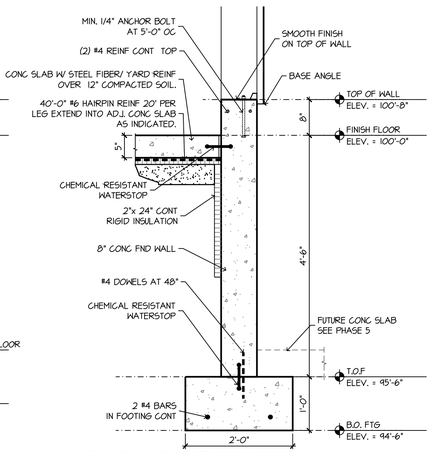
1 S501 **NOT USED**
SCALE: 3/4" = 1'-0"



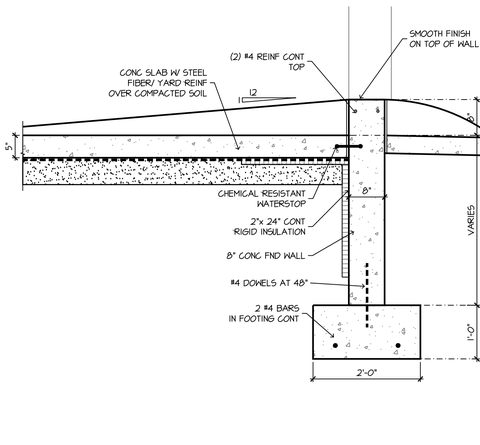
1 S501 **INTERIOR FND WALL @ TANK CONTAINMENT**
SCALE: 3/4" = 1'-0"



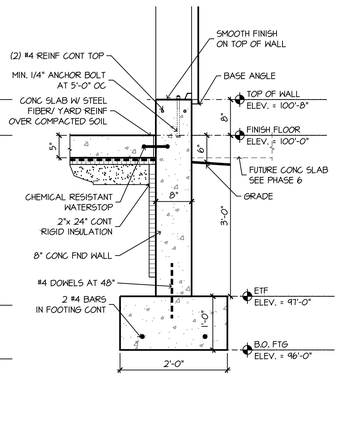
8 S501 **PERIMETER FND WALL @ TANK CONTAINMENT**
SCALE: 3/4" = 1'-0"



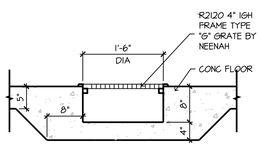
7 S501 **PERIMETER FND WALL @ EAST WALL**
SCALE: 3/4" = 1'-0"



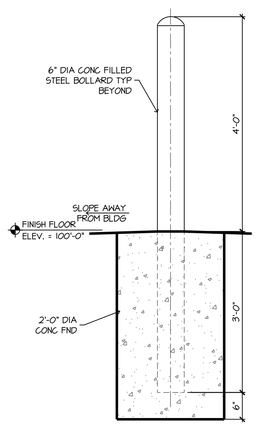
6 S501 **PERIMETER FROST WALL @ OH DOORS**
SCALE: 3/4" = 1'-0"



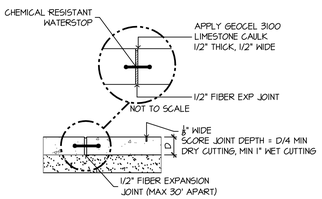
5 S501 **PERIMETER FROST WALL**
SCALE: 3/4" = 1'-0"



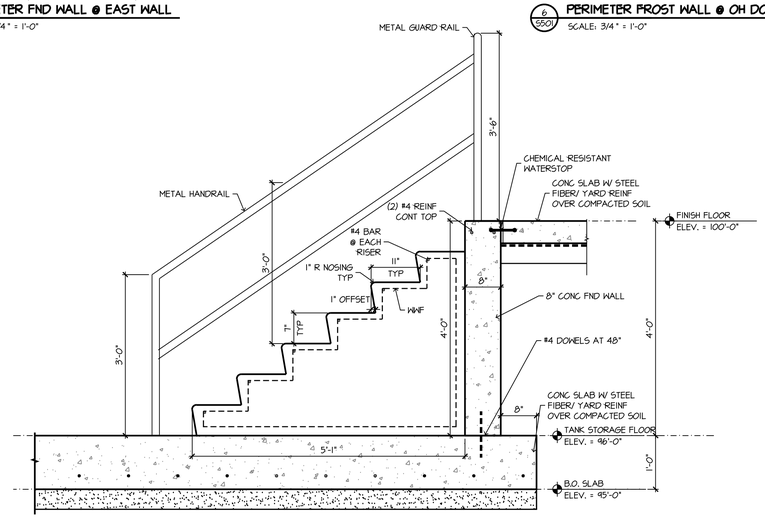
14 S501 **SMALL BLIND SUMP**
SCALE: 3/4" = 1'-0"



13 S501 **BOLLARD DTL**
SCALE: 3/4" = 1'-0"



12 S501 **CONCRETE DETAIL**
SCALE: 3/4" = 1'-0"



11 S501 **CONC STAIR @ TANK CONTAINMENT**
SCALE: 3/4" = 1'-0"

10 S501 **NOT USED**
SCALE: 3/4" = 1'-0"

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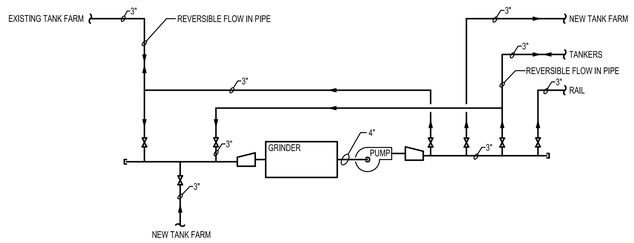
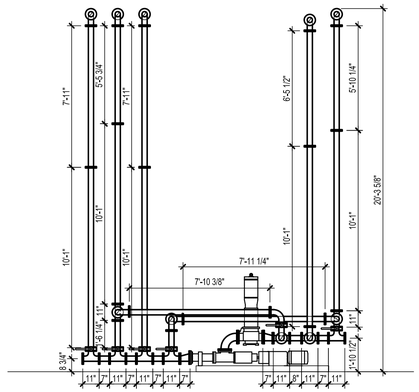
FOUNDATION DETAILS

S501



PIPING SCHEMATIC

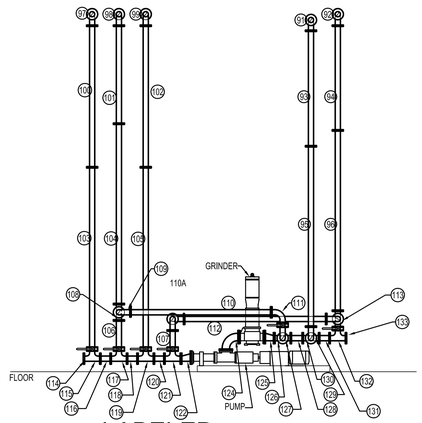
Scale: None



DIMENSIONED SECTION A

Scale 1/4" = 1'-0"

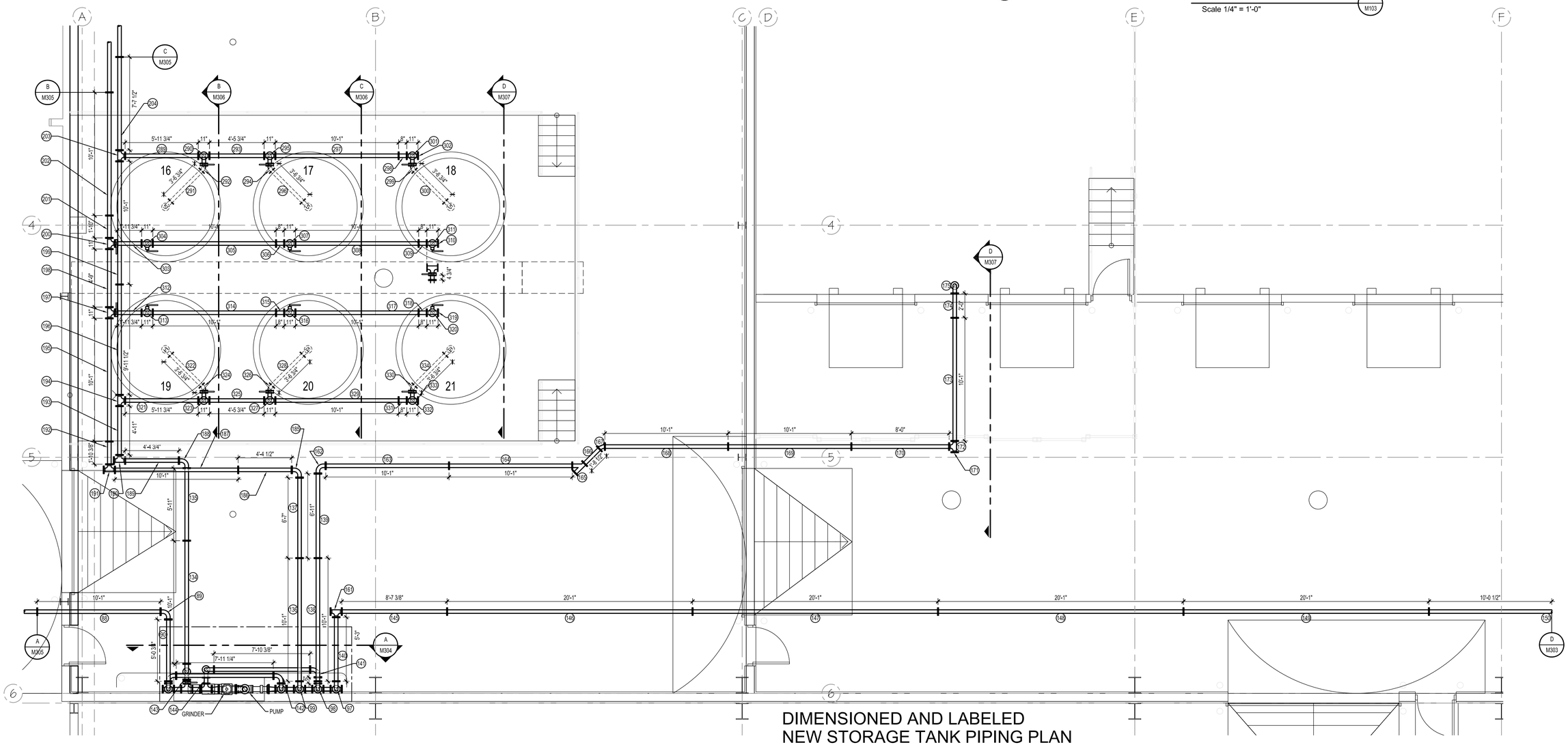
A M103



LABELED SECTION A

Scale 1/4" = 1'-0"

A M103



DIMENSIONED AND LABELED NEW STORAGE TANK PIPING PLAN

Scale 1/4" = 1'-0"

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PHASE 3
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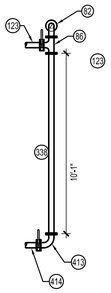
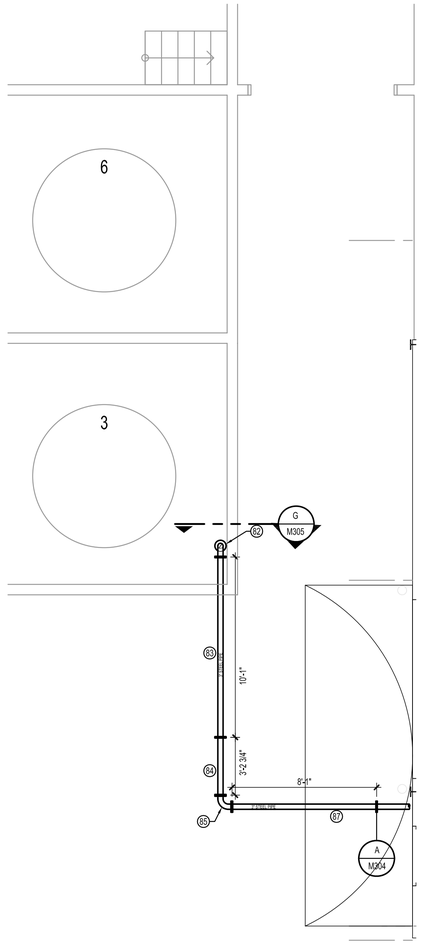
M304

2009-410 M-303-5.dwg



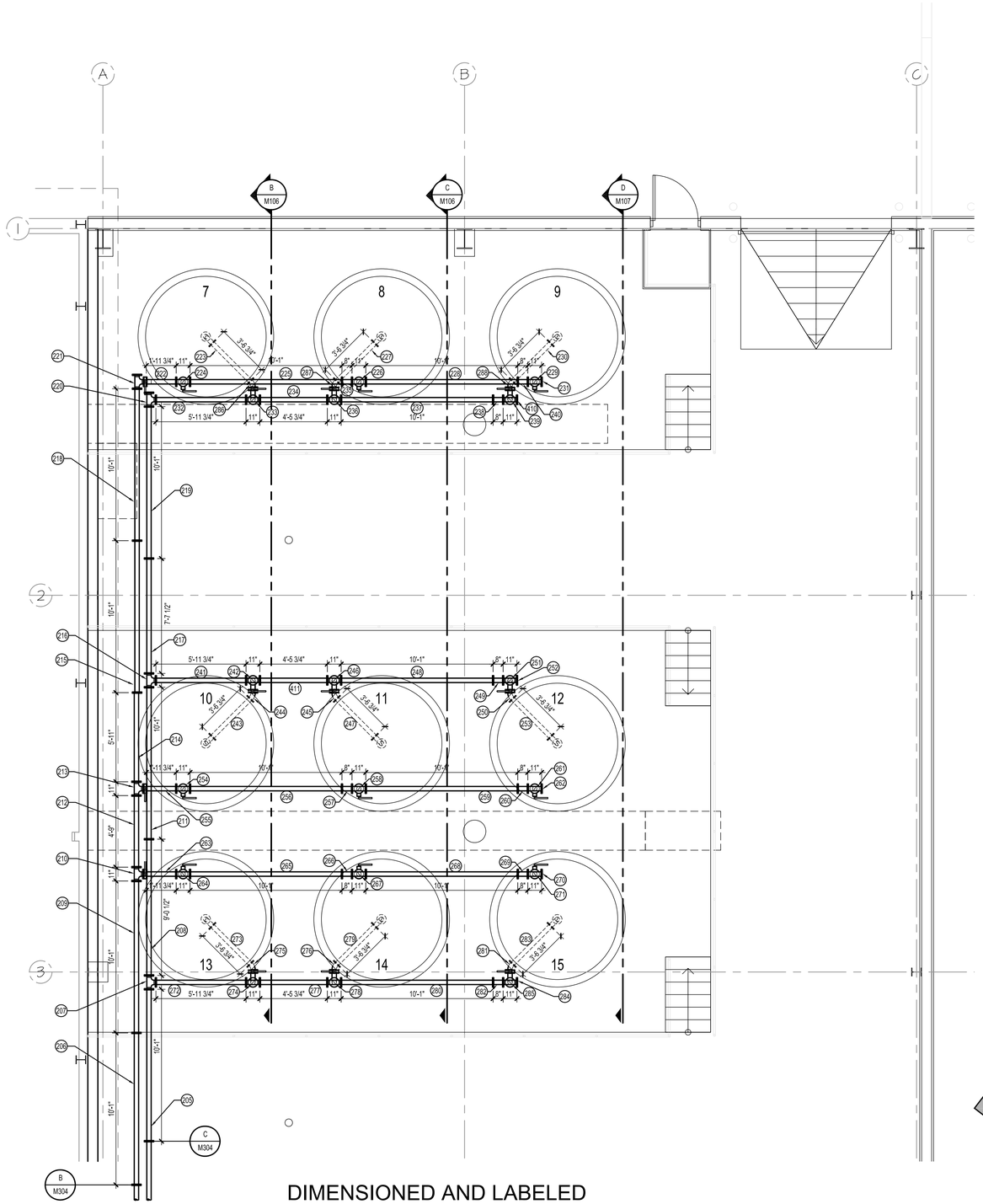
DIMENSIONED AND LABELEDSECTION A

Scale 1/4" = 1'-0"



DIMENSIONED AND LABELED
NEW STORAGE TANK PIPING PLAN

Scale 1/4" = 1'-0"



DIMENSIONED AND LABELED
NEW STORAGE TANK PIPING PLAN

Scale 1/4" = 1'-0"

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PHASE 3
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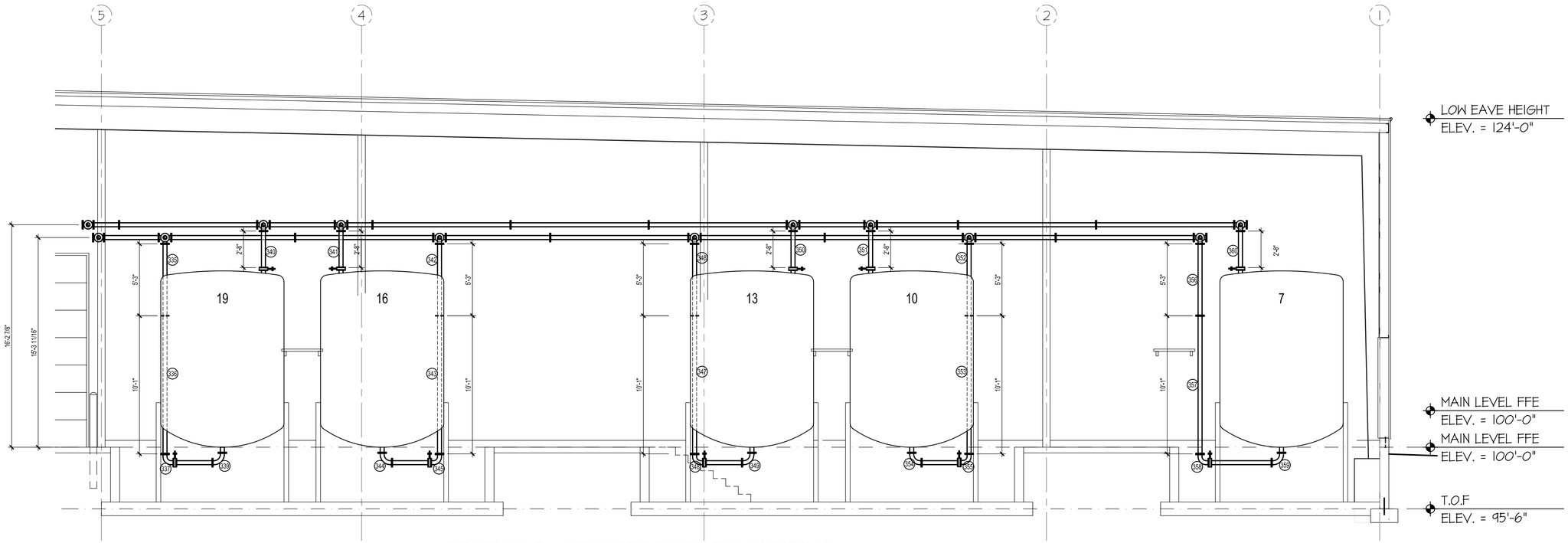
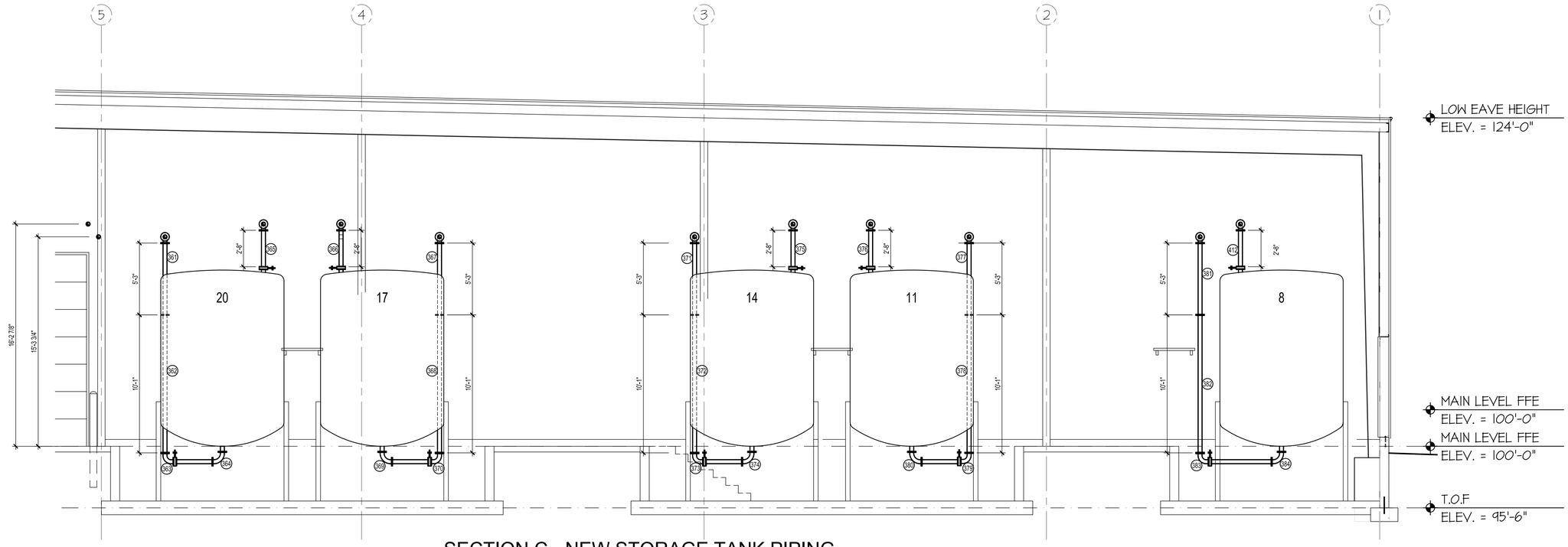
PIPING PLAN

M305

2009-410 M-303-5.dwg



B M104-5 SECTION B - NEW STORAGE TANK PIPING
Scale 1/8" = 1'-0"



C M104-5 SECTION C - NEW STORAGE TANK PIPING
Scale 1/4" = 1'-0"

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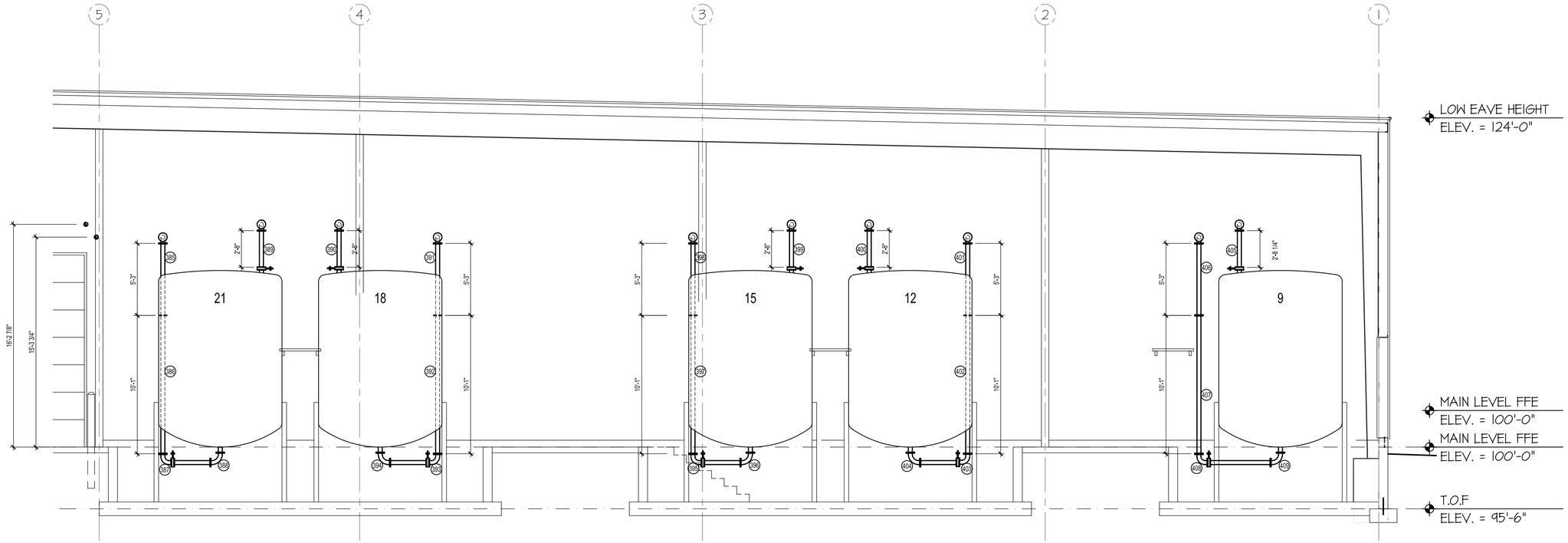
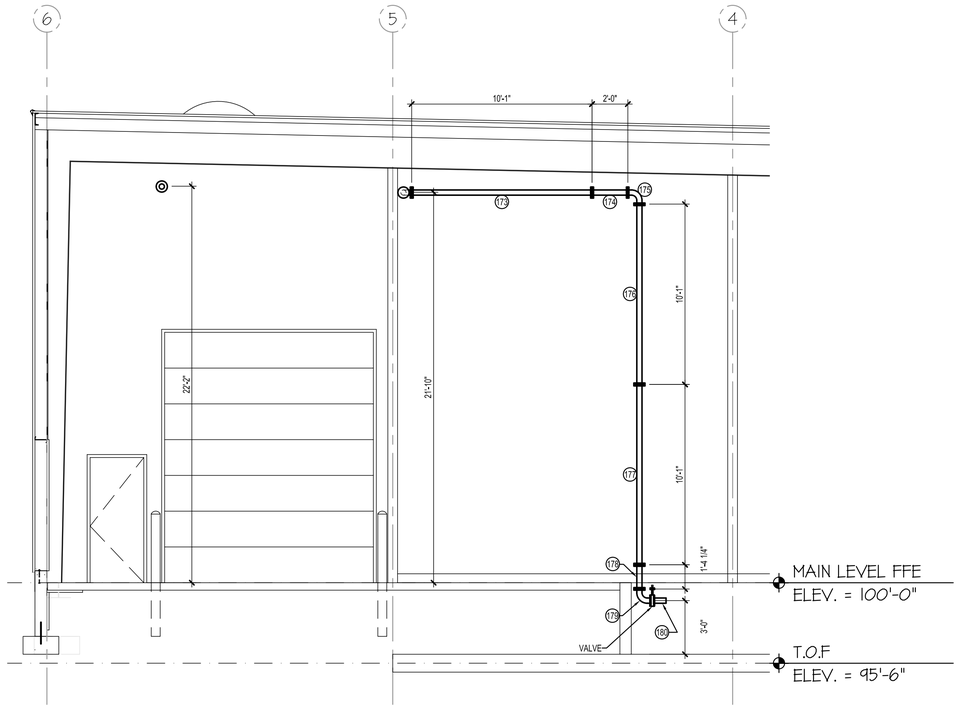
PHASE 3
NEW
STORAGE TANK
PIPING SECTIONS

M306

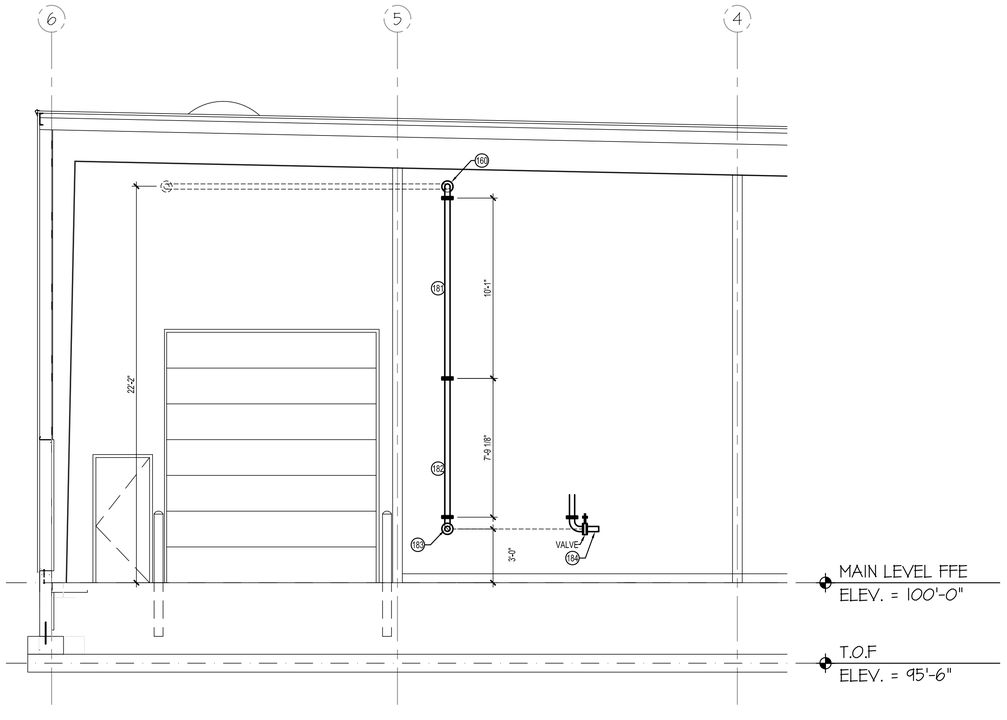
2009-410 M-306-7.dwg



D M104-5 SECTION D - NEW STORAGE TANK PIPING
Scale 1/4" = 1'-0"



E M104 SECTION E - TRUCK DOCK PIPING
Scale 1/4" = 1'-0"



F M104 SECTION F - TRAIN DOCK PIPING
Scale 1/4" = 1'-0"

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PHASE 3
NEW
STORAGE TANK
PIPING SECTIONS

M307

2009-410 M-306-7.dwg

STORAGE TANK FARM #1 (EXISTING)

PIPE NUMBER	PIPE SIZE	PIPE LENGTH	JOINT #	PIPE END	JOINT #	PIPE END	JOINT #	PIPE END	COMMENTS
1	3"	5"	1A	THREAD	1B	WELD			CONNECTS TO TANK
2	3"	90 BEND	1B	WELD	3A	WELD			
3	3"	7 1/4"	3A	WELD	3B	FLANGE			
4	3"	VALVE	3B	FLANGE	5A	FLANGE			
5	3"	9 1/2"	5A	FLANGE	7C	WELD			
6	3"	BLIND FLANGE	7B	FLANGE					END OF LINE CLEAN OUT
7	3"	6'-10 3/4"	7A	FLANGE	7B	FLANGE	7C	WELD	PIPE #5 IS WELDED TO PIPE SEE SCHEMATIC
8	3"	3"	7A	FLANGE	9B	WELD			
9	3"	TEE	9A	WELD	9B	WELD	9C	WELD	PIPE #30 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC
10	3"	3"	9A	WELD	11B	FLANGE			
11	3"	7'	11A	FLANGE	11B	FLANGE	11C	WELD	PIPE #12 IS WELDED TO PIPE SEE SCHEMATIC
12	3"	9-1/2"	11C	WELD	12A	FLANGE			
13	3"	VALVE	12A	FLANGE	14B	FLANGE			
14	3"	7"	14B	FLANGE	14A	WELD			
15	3"	90 BEND	14A	WELD	1B	WELD			
16	3"	6 1/2"	1B	WELD	1A	THREAD			CONNECTS TO TANK
17	3"	3"	11A	FLANGE	18B	WELD			
18	3"	TEE	18A	WELD	18B	WELD	18C	WELD	PIPE #27 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
19	3"	3"	18A	WELD	20B	FLANGE			
20	3"	6'-9 1/2"	20B	FLANGE	20A	FLANGE	20C	WELD	PIPE #22 IS WELDED TO PIPE. SEE SCHEMATIC.
21	3"	BLIND FLANGE	20A	FLANGE					END OF LINE CLEAN OUT
22	3"	8"	20C	WELD	22A	FLANGE			
23	3"	VALVE	22A	FLANGE	24B	FLANGE			
24	3"	7 1/2"	24B	FLANGE	24A	WELD			
25	3"	90 BEND	24A	WELD	26B	WELD			
26	3"	5 1/4"	26B	WELD	26A	THREAD			CONNECTS TO TANK
27	3"	3"	18C	WELD	28A	FLANGE			
28	3"	12'-9"	28A	FLANGE	28B	FLANGE			
29	3"	3"	28B	FLANGE	51C	WELD			
30	3"	3"	9C	WELD	31A	FLANGE			
31	3"	12'-9"	31A	FLANGE	31B	FLANGE			
32	3"	3"	31B	FLANGE	9C	WELD			
33	3"	BLIND FLANGE	39B	FLANGE					END OF LINE CLEAN OUT
34	3"	6 1/2"	39C	WELD	34A	FLANGE			
35	3"	VALVE	34A	FLANGE	36B	FLANGE			
36	3"	4"	36B	FLANGE	36A	WELD			
37	3"	90 BEND	36A	WELD	37B	WELD			
38	3"	3"	37B	WELD	37A	THREAD			CONNECTS TO TANK
39	3"	3'-11 1/4"	39B	FLANGE	39A	FLANGE	39C	WELD	PIPE #34 IS WELDED TO PIPE. SEE SCHEMATIC.
40	3"	2' 6"	40B	FLANGE	40A	FLANGE	40C	WELD	PIPE #69 IS WELDED TO PIPE. SEE SCHEMATIC.
41	3"	3"	42B	WELD	40A	FLANGE			
42	3"	TEE	42A	WELD	42B	WELD	42C	WELD	PIPE #32 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
43	3"	3"	42A	WELD	44B	FLANGE			
44	3"	6'-11 1/2"	44B	FLANGE	44A	FLANGE	44C	WELD	PIPE #45 IS WELDED TO PIPE. SEE SCHEMATIC.
45	3"	5"	44C	WELD	45A	FLANGE			
46	3"	VALVE	45A	FLANGE	47B	FLANGE			
47	3"	4"	47B	FLANGE	47A	WELD			
48	3"	90 BEND	47A	WELD	49B	WELD			
49	3"	3 1/4"	49B	WELD	49A	THREAD			CONNECTS TO TANK
50	3"	3"	51B	WELD	44A	FLANGE			
51	3"	TEE	51A	WELD	51B	WELD	51C	WELD	PIPE #29 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
52	3"	3"	51A	WELD	53B	FLANGE			
53	3"	6'-8 3/4""	53B	FLANGE	53A	FLANGE	53C	WELD	
54	3"	5"	53C	WELD	54A	FLANGE			
55	3"	VALVE	54A	FLANGE	56B	FLANGE			
56	3"	4'	56B	FLANGE	56A	WELD			
57	3"	90 BEND	56A	WELD	58B	WELD			
58	3'	2"	58B	WELD	58A	THREAD			CONNECTS TO TANK
59	2"	1'-2"	59B	FLANGE	59A	THREAD			
60	2"	20"	59A	THREAD	61A	THREAD			
61	2"	4'-7 1/4"	61A	THREAD	61B	THREAD			
62	2"	WYE W/ CO	61B	THREAD	63A	THREAD			
63	2"	2 3/4"	63A	THREAD	63B	THREAD			
64	2"	VALVE	63B	THREAD	65A	THREAD			
65	2"	1'-3 1/4"	65A	THREAD	65B	THREAD			
66	2"	VALVE	65B	THREAD	67A	THREAD			
67	2"	10"	67A	THREAD	67B	THREAD			
68	2"	CAM-LOCK	67B	THREAD					
69	2"	121 1/2"	40C	WELD	69A	THREAD			
70	2"	UNION	69A	THREAD	71A	THREAD			
71	2"	1'-11 1/2"	71A	THREAD	71B	THREAD			
72	2"	90 BEND	71B	THREAD	73A	THREAD			
73	2"	4 3/4"	73A	THREAD	73B	THREAD			
74	2"	90 BEND	73B	THREAD	75A	THREAD			
75	2"	3'-11 1/4"	75A	THREAD	75B	THREAD			
76	2"	WYE W/ CO	75B	THREAD	77A	THREAD			
77	2"	3/4"	77A	THREAD	77B	THREAD			
78	2"	VALVE	77B	THREAD	79A	THREAD			
79	2"	20"	79A	THREAD	79B	THREAD			
80	2"	VALVE	79B	THREAD	80A	THREAD			
81	2"	CAM-LOCK	80A	THREAD					

STORAGE TANK FARM #2 (NEW)

PIPE NUMBER	PIPE SIZE	PIPE LENGTH	JOINT #	PIPE END	JOINT #	PIPE END	JOINT #	PIPE END	COMMENTS
82	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
83	3"	10-1"	83A	WELD	83B	WELD			SOCKET FLANGES WELDED ON ENDS
84	3"	3'-2.75"	84A	WELD	84B	WELD			SOCKET FLANGES WELDED ON ENDS
85	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
86	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
87	3"	10-1"	87A	WELD	87B	WELD			SOCKET FLANGES WELDED ON ENDS
88	3"	10-1"	88A	WELD	88B	WELD			SOCKET FLANGES WELDED ON ENDS
89	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
90	3"	3'-6.75"	90A	WELD	90B	WELD			SOCKET FLANGES WELDED ON ENDS
91	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
92	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
93	3"	6'-5.5"	93A	WELD	93B	WELD			SOCKET FLANGES WELDED ON ENDS
94	3"	5'-10.25"	94A	WELD	94B	WELD			SOCKET FLANGES WELDED ON ENDS
95	3"	10'-1"	95A	WELD	95B	WELD			SOCKET FLANGES WELDED ON ENDS
96	3"	10'-1"	96A	WELD	96B	WELD			SOCKET FLANGES WELDED ON ENDS
97	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
98	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
99	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
100	3"	7'-11"	100A	WELD	100B	WELD			SOCKET FLANGES WELDED ON ENDS
101	3"	5'-5.75"	101A	WELD	101B	WELD			SOCKET FLANGES WELDED ON ENDS
102	3"	7'-11"	102A	WELD	102B	WELD			SOCKET FLANGES WELDED ON ENDS
103	3"	10-1"	103A	WELD	103B	WELD			SOCKET FLANGES WELDED ON ENDS
104	3"	10-1"	104A	WELD	104B	WELD			SOCKET FLANGES WELDED ON ENDS
105	3"	10-1"	105A	WELD	105B	WELD			SOCKET FLANGES WELDED ON ENDS
106	3"	1'-8.5"	106A	WELD	106B	WELD			SOCKET FLANGES WELDED ON ENDS
107	3"	11.5"	107A	WELD	107B	WELD			SOCKET FLANGES WELDED ON ENDS
108	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
109	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
110	3"	7'-10.375"	110A	WELD	110B	WELD			SOCKET FLANGES WELDED ON ENDS
111	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
112	3"	7'-11.25"	112A	WELD	112B	WELD			SOCKET FLANGES WELDED ON ENDS
113	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
114	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
115	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
116	3"	7"	115A	WELD	115B	WELD			SOCKET FLANGES WELDED ON ENDS
117	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
118	3"	7"	118A	WELD	118B	WELD			SOCKET FLANGES WELDED ON ENDS
119	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
120	3"	7"	120A	WELD	120B	WELD			SOCKET FLANGES WELDED ON ENDS
121	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
122	4" TO 3"	ECCENTRIC REDUCER							3" TO 4" 125 lb flanged fittings (ANSI B 16.1)
123	3"	12"	184A	WELD	184B	THREAD			FLANGE TO TREAD WITH CAMLOCK
124	4"	90° Elbow LR							4" 125 lb flanged fittings (ANSI B 16.1)
125	4" TO 3"	ECCENTRIC REDUCER							3" TO 4" 125 lb flanged fittings (ANSI B 16.1)
126	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
127	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
128	3"	8"	128A	WELD	128B	WELD			SOCKET FLANGES WELDED ON ENDS
129	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
130	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
131	3"	7"	131A	WELD	131B	WELD			SOCKET FLANGES WELDED ON ENDS
132	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
133	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
134	3"	10'-1"	134A	WELD	134B	WELD			SOCKET FLANGES WELDED ON ENDS
135	3"	4'-5"	135A	WELD	135B	WELD			SOCKET FLANGES WELDED ON ENDS
136	3"	10'-1"	136A	WELD	136B	WELD			SOCKET FLANGES WELDED ON ENDS
137	3"	6'-7"	137A	WELD	137B	WELD			SOCKET FLANGES WELDED ON ENDS
138	3"	10'-1"	138A	WELD	138B	WELD			SOCKET FLANGES WELDED ON ENDS
139	3"	6'-11"	139A	WELD	139B	WELD			SOCKET FLANGES WELDED ON ENDS
140	3"	5'-3"	140A	WELD	140B	WELD			SOCKET FLANGES WELDED ON ENDS
141	3"	2'-0"	141A	WELD	141B	WELD			SOCKET FLANGES WELDED ON ENDS
142	3"	1'-3.75"	142A	WELD	142B	WELD			SOCKET FLANGES WELDED ON ENDS
143	3"	2"	143A	WELD	143B	WELD			SOCKET FLANGES WELDED ON ENDS
144	3"	6"	144A	WELD	144B	WELD			SOCKET FLANGES WELDED ON ENDS
145	3"	8'-7.375"	145A	WELD	145B	WELD			SOCKET FLANGES WELDED ON ENDS
146	3"	20'-1"	146A	WELD	146B	WELD			SOCKET FLANGES WELDED ON ENDS
147	3"	20'-1"	147A	WELD	147B	WELD			SOCKET FLANGES WELDED ON ENDS
148	3"	20'-1"	148A	WELD	148B	WELD			SOCKET FLANGES WELDED ON ENDS
149	3"	20'-1"	149A	WELD	149B	WELD			SOCKET FLANGES WELDED ON ENDS
150	3"	20'-1"	150A	WELD	150B	WELD			SOCKET FLANGES WELDED ON ENDS
151	3"	20'-1"	151A	WELD	151B	WELD			SOCKET FLANGES WELDED ON ENDS
152	3"	20'-1"	152A	WELD	152B	WELD			SOCKET FLANGES WELDED ON ENDS
153	3"	20'-1"	153A	WELD	153B	WELD			SOCKET FLANGES WELDED ON ENDS
154	3"	20'-1"	154A	WELD	154B	WELD			SOCKET FLANGES WELDED ON ENDS
155	3"	WYE							3" 125 lb flanged fittings (ANSI B 16.1)
156	3"	20'-1"	156A	WELD	156B	WELD			SOCKET FLANGES WELDED ON ENDS
157	3"	1'-3"	157A	WELD	157B	WELD			SOCKET FLANGES WELDED ON ENDS
158	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
159	3"	9'-4.75"	159A	WELD	159B	WELD			SOCKET FLANGES WELDED ON ENDS
160	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
161	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
162	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
163	3"	10'-1"	163A	WELD	163A	WELD			SOCKET FLANGES WELDED ON ENDS
164	3"	10'-1"	164A	WELD	164B	WELD			SOCKET FLANGES WELDED ON ENDS
165	3"	WYE							3" 125 lb flanged fittings (ANSI B 16.1)
166	3"	1'-8.5"	166A	WELD	166B	WELD			SOCKET FLANGES WELDED ON ENDS
167	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
168	3"	10'-1"	168A	WELD	168B	WELD			SOCKET FLANGES WELDED ON ENDS
169	3"	10'-1"	169A	WELD	169B	WELD			SOCKET FLANGES WELDED ON ENDS
170	3"	8'-0"	170A	WELD	170B	WELD			SOCKET FLANGES WELDED ON ENDS
171	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
172	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
173	3"	10'-1"	173A	WELD	173B	WELD			SOCKET FLANGES WELDED ON ENDS
174	3"	2'-0"	174A	WELD	174B	WELD			SOCKET FLANGES WELDED ON ENDS
175	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
176	3"	10'-1"	176A	WELD	176B	WELD			SOCKET FLANGES WELDED ON ENDS
177	3"	10'-1"	177A	WELD	177B	WELD			SOCKET FLANGES WELDED ON ENDS
178	3"	1'-4.25"	178A	WELD	178B	WELD			SOCKET FLANGES WELDED ON ENDS
179	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
180	3"	12"	180A	WELD	180B	THREAD			FLANGE TO TREAD WITH CAMLOCK
181	3"	10'-1"	181A	WELD	181B	WELD			SOCKET FLANGES WELDED ON ENDS
182	3"	7'-9.25"	182A	WELD	182B	WELD			SOCKET FLANGES WELDED ON ENDS
183	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
184	3"	12"	184A	WELD	184B	THREAD			FLANGE TO TREAD WITH CAMLOCK
185	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
186	3"	4'-4.5"	186A	WELD	186B	WELD			SOCKET FLANGES WELDED ON ENDS
187	3"	10'-1"	187A	WELD	187B	WELD			SOCKET FLANGES WELDED ON ENDS
188	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
189	3"	4'-4.75	189A	WELD	189B	WELD			SOCKET FLANGES WELDED ON ENDS
190	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
191	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
192	3"	1'-10.375"	192A	WELD	192B	WELD			SOCKET FLANGES WELDED ON ENDS
193	3"	4'-11"	193A	WELD	193B	WELD			SOCKET FLANGES WELDED ON ENDS
194	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
195	3"	10'-1"	195A	WELD	195B	WELD			SOCKET FLANGES WELDED ON ENDS
196	3"	9'-11.5"	196A	WELD	196B	WELD			SOCKET FLANGES WELDED ON ENDS
197	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
198	3"	4'-9"	198A	WELD	198B	WELD			SOCKET FLANGES WELDED ON ENDS
199	3"	10'-1"	199A	WELD	199B	WELD			SOCKET FLANGES WELDED ON ENDS
200	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
201	3"	1'-10"	201A	WELD	201B	WELD			SOCKET FLANGES WELDED ON ENDS
202	3"	10'-1"	202A	WELD	202B	WELD			SOCKET FLANGES WELDED ON ENDS
203	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
204	3"	7'-7.5"	204A	WELD	204B	WELD			SOCKET FLANGES WELDED ON ENDS
205	3"	10'-1"	205A	WELD	205B	WELD			SOCKET FLANGES WELDED ON ENDS
206	3"	10'-1"	206A	WELD	206B	WELD			SOCKET FLANGES WELDED ON ENDS
207	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
208	3"	9'-0.5"	208A	WELD	208B	WELD			SOCKET FLANGES WELDED ON ENDS
209	3"	10'-1"	209A	WELD	209B	WELD			SOCKET FLANGES WELDED ON ENDS
210	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
211	3"	10'-1"	211A	WELD	211B	WELD			SOCKET FLANGES WELDED ON ENDS
212	3"	4'-9"	212A	WELD	212B	WELD			SOCKET FLANGES WELDED ON ENDS
213	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
214	3"	5'-11"	214A	WELD	214B	WELD			SOCKET FLANGES WELDED ON ENDS
215	3"	10'-1"	215A	WELD	215B	WELD			SOCKET FLANGES WELDED ON ENDS
216	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
217	3"	7'-7.5"	217A	WELD	217B	WELD			SOCKET FLANGES WELDED ON ENDS
218	3"	10'-1"	218A	WELD	218B	WELD			SOCKET FLANGES WELDED ON ENDS
219	3"	10'-1"	219A	WELD	219B	WELD			SOCKET FLANGES WELDED ON ENDS
220	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
221	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
222	3"	1'-11.75"	222A	WELD	222B	WELD			SOCKET FLANGES WELDED ON ENDS
223	3"	3'-6.75"	223A	WELD	223B	WELD			SOCKET FLANGES WELDED ON ENDS
224	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
225	3"	10'-1"	225A	WELD	225B	WELD			SOCKET FLANGES WELDED ON ENDS
226	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
227	3"	3'-6.75"	227A	WELD	227B	WELD			SOCKET FLANGES WELDED ON ENDS
228	3"	10'-1"	228A	WELD	228B	WELD			SOCKET FLANGES WELDED ON ENDS
229	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
230	3"	3'-6.75"	230A	WELD	230B	WELD			SOCKET FLANGES WELDED ON ENDS
231	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
232	3"	5'-11.75"	232A	WELD	232B	WELD			SOCKET FLANGES WELDED ON ENDS
233	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
234	3"	4'-5.75"	234A	WELD	234B	WELD			SOCKET FLANGES WELDED ON ENDS
235	3"	8"	235A	WELD	235B	WELD			SOCKET FLANGES WELDED ON ENDS
236	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
237	3"	10'-1"	237A	WELD	237B	WELD			SOCKET FLANGES WELDED ON ENDS
238	3"	8"	238A	WELD	238B	WELD			SOCKET FLANGES WELDED ON ENDS
239	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
240	3"	8"	240A	WELD	240B	WELD			SOCKET FLANGES WELDED ON ENDS
241	3"	5'-11.75"	241A	WELD	241B	WELD			SOCKET FLANGES WELDED ON ENDS
242	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
243	3"	3'-6.75"	243A	WELD	243B	WELD			SOCKET FLANGES WELDED ON ENDS
244	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
245	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
246	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
247	3"	3'-6.75"	247A	WELD	247B	WELD			SOCKET FLANGES WELDED ON ENDS
248	3"	10'-1"	248A	WELD	248B	WELD			SOCKET FLANGES WELDED ON ENDS

249	3"	8"	249A	WELD	249B	WELD			SOCKET FLANGES WELDED ON ENDS
250	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
251	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
252	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
253	3"	3'-6.75"	253A	WELD	253B	WELD			SOCKET FLANGES WELDED ON ENDS
254	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
255	3"	1'-11.75"	255A	WELD	255B	WELD			SOCKET FLANGES WELDED ON ENDS
256	3"	10'-1"	256A	WELD	256B	WELD			SOCKET FLANGES WELDED ON ENDS
257	3"	8"	257A	WELD	257B	WELD			SOCKET FLANGES WELDED ON ENDS
258	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
259	3"	10'-1"	259A	WELD	259B	WELD			SOCKET FLANGES WELDED ON ENDS
260	3"	8"	260A	WELD	260B	WELD			SOCKET FLANGES WELDED ON ENDS
261	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
262	3"	BLIND FLANGE							SOCKET FLANGES WELDED ON ENDS
263	3"	1'-11.75"	263A	WELD	263B	WELD			SOCKET FLANGES WELDED ON ENDS
264	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
265	3"	10'-1"	265A	WELD	265B	WELD			SOCKET FLANGES WELDED ON ENDS
266	3"	8"	266A	WELD	266B	WELD			SOCKET FLANGES WELDED ON ENDS
267	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
268	3"	10'-1"	268A	WELD	268B	WELD			SOCKET FLANGES WELDED ON ENDS
269	3"	8"	269A	WELD	269B	WELD			SOCKET FLANGES WELDED ON ENDS
270	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
271	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
272	3"	5'-11.75"	272A	WELD	272B	WELD			SOCKET FLANGES WELDED ON ENDS
273	3"	3'-6.75"	273A	WELD	273B	WELD			SOCKET FLANGES WELDED ON ENDS
274	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
275	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
276	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
277	3"	4'-5.75"	277A	WELD	277B	WELD			SOCKET FLANGES WELDED ON ENDS
278	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
279	3"	3'-6.75"	279A	WELD	279B	WELD			SOCKET FLANGES WELDED ON ENDS
280	3"	10'-1"	280A	WELD	280B	WELD			SOCKET FLANGES WELDED ON ENDS
281	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
282	3"	8"	282A	WELD	282B	WELD			SOCKET FLANGES WELDED ON ENDS
283	3"	3'-6.75"	283A	WELD	283B	WELD			SOCKET FLANGES WELDED ON ENDS
284	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
285	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
286	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
287	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
288	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
289	3"	5'-11.75"	289A	WELD	289B	WELD			SOCKET FLANGES WELDED ON ENDS
290	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
291	3"	3'-6.75"	291A	WELD	291B	WELD			SOCKET FLANGES WELDED ON ENDS
292	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
293	3"	4'-5.75"	293A	WELD	293B	WELD			SOCKET FLANGES WELDED ON ENDS
294	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
295	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
296	3"	3'-6.75"	296A	WELD	296B	WELD			SOCKET FLANGES WELDED ON ENDS
297	3"	10'-1"	297A	WELD	297B	WELD			SOCKET FLANGES WELDED ON ENDS
298	3"	8"	298A	WELD	298B	WELD			SOCKET FLANGES WELDED ON ENDS
299	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
300	3"	3'-6.75"	300A	WELD	300B	WELD			SOCKET FLANGES WELDED ON ENDS
301	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
302	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
303	3"	1'-11.75"	303A	WELD	303B	WELD			SOCKET FLANGES WELDED ON ENDS
304	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
305	3"	10'-1"	305A	WELD	305B	WELD			SOCKET FLANGES WELDED ON ENDS
306	3"	8"	306A	WELD	306B	WELD			SOCKET FLANGES WELDED ON ENDS
307	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
308	3"	10'-1"	307A	WELD	308B	WELD			SOCKET FLANGES WELDED ON ENDS
309	3"	8"	308A	WELD	309B	WELD			SOCKET FLANGES WELDED ON ENDS
310	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
311	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
312	3"	1'-11.75"	312A	WELD	312B	WELD			SOCKET FLANGES WELDED ON ENDS
313	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
314	3"	10'-1"	314A	WELD	314B	WELD			SOCKET FLANGES WELDED ON ENDS
315	3"	8"	315A	WELD	315B	WELD			SOCKET FLANGES WELDED ON ENDS
316	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
317	3"	10'-1"	317A	WELD	317B	WELD			SOCKET FLANGES WELDED ON ENDS
318	3"	8"	318A	WELD	318B	WELD			SOCKET FLANGES WELDED ON ENDS
319	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
320	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
321	3"	5'-11.75"	321A	WELD	321B	WELD			SOCKET FLANGES WELDED ON ENDS
322	3"	3'-6.75"	322A	WELD	322B	WELD			SOCKET FLANGES WELDED ON ENDS
323	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
324	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
325	3"	4'-5.75"	325A	WELD	325B	WELD			SOCKET FLANGES WELDED ON ENDS
326	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
327	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
328	3"	3'-6.75"	328A	WELD	328B	WELD			SOCKET FLANGES WELDED ON ENDS
329	3"	10'-1"	329A	WELD	329B	WELD			SOCKET FLANGES WELDED ON ENDS
330	3"	45° Elbow							3" 125 lb flanged fittings (ANSI B 16.1)
331	3"	8"	331A	WELD	331B	WELD			SOCKET FLANGES WELDED ON ENDS
332	3"	TEE							3" 125 lb flanged fittings (ANSI B 16.1)
333	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
334	3"	3'-6.75"	334A	WELD	334B	WELD			SOCKET FLANGES WELDED ON ENDS
335	3"	5'-3"	335A	WELD	335B	WELD			SOCKET FLANGES WELDED ON ENDS
336	3"	10'-1"	336A	WELD	336B	WELD			SOCKET FLANGES WELDED ON ENDS
337	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
338	3"	10'-1"	338A	WELD	338B	WELD			SOCKET FLANGES WELDED ON ENDS
339	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
340	3"	2'-8"	340A	WELD	340B	WELD			SOCKET FLANGES WELDED ON ENDS
341	3"	2'-8"	341A	WELD	341B	WELD			SOCKET FLANGES WELDED ON ENDS
342	3"	5'-3"	342A	WELD	342B	WELD			SOCKET FLANGES WELDED ON ENDS
343	3"	10'-1"	343A	WELD	343B	WELD			SOCKET FLANGES WELDED ON ENDS
344	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
345	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
346	3"	5'-3"	346A	WELD	2**B	WELD			SOCKET FLANGES WELDED ON ENDS
347	3"	10'-1"	347A	WELD	346B	WELD			SOCKET FLANGES WELDED ON ENDS
348	3"	90° Elbow LR			347B				3" 125 lb flanged fittings (ANSI B 16.1)
349	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
350	3"	2'-8"	350A	WELD	350B	WELD			SOCKET FLANGES WELDED ON ENDS
351	3"	2'-8"	351A	WELD	351B	WELD			SOCKET FLANGES WELDED ON ENDS
352	3"	5'-3"	352A	WELD	352B	WELD			SOCKET FLANGES WELDED ON ENDS
353	3"	10'-1"	353A	WELD	353B	WELD			SOCKET FLANGES WELDED ON ENDS
354	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
355	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
356	3"	5'-3"	356A	WELD	356B	WELD			SOCKET FLANGES WELDED ON ENDS
357	3"	10'-1"	357A	WELD	357B	WELD			SOCKET FLANGES WELDED ON ENDS
358	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
359	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
360	3"	2'-8"	360A	WELD	360B	WELD			SOCKET FLANGES WELDED ON ENDS
361	3"	5'-3"	361A	WELD	361B	WELD			SOCKET FLANGES WELDED ON ENDS
362	3"	10'-1"	362A	WELD	362B	WELD			SOCKET FLANGES WELDED ON ENDS
363	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
364	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
365	3"	2'-8"	365A	WELD	365B	WELD			SOCKET FLANGES WELDED ON ENDS
366	3"	2'-8"	366A	WELD	366B	WELD			SOCKET FLANGES WELDED ON ENDS
367	3"	5'-3"	367A	WELD	367B	WELD			SOCKET FLANGES WELDED ON ENDS
368	3"	10'-1"	368A	WELD	368B	WELD			SOCKET FLANGES WELDED ON ENDS
369	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
370	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
371	3"	5'-3"	371A	WELD	371B	WELD			SOCKET FLANGES WELDED ON ENDS
372	3"	10'-1"	372A	WELD	372B	WELD			SOCKET FLANGES WELDED ON ENDS
373	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
374	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
375	3"	2'-8"	375A	WELD	375B	WELD			SOCKET FLANGES WELDED ON ENDS
376	3"	2'-8"	3756A	WELD	376B	WELD			SOCKET FLANGES WELDED ON ENDS
377	3"	5'-3"	377A	WELD	377B	WELD			SOCKET FLANGES WELDED ON ENDS
378	3"	10'-1"	378A	WELD	378B	WELD			SOCKET FLANGES WELDED ON ENDS
379	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
380	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
381	3"	5'-3"	381A	WELD	381B	WELD			SOCKET FLANGES WELDED ON ENDS
382	3"	10'-1"	382A	WELD	382B	WELD			SOCKET FLANGES WELDED ON ENDS
383	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
384	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
385	3"	5'-3"	385A	WELD	385B	WELD			SOCKET FLANGES WELDED ON ENDS
386	3"	10'-1"	386A	WELD	386B	WELD			SOCKET FLANGES WELDED ON ENDS
387	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
388	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
389	3"	2'-8"	389A	WELD	389B	WELD			SOCKET FLANGES WELDED ON ENDS
390	3"	2'-8"	390A	WELD	390B	WELD			SOCKET FLANGES WELDED ON ENDS
391	3"	5'-3"	391A	WELD	391B	WELD			SOCKET FLANGES WELDED ON ENDS
392	3"	10'-1"	392A	WELD	392B	WELD			SOCKET FLANGES WELDED ON ENDS
393	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
394	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
395	3"	5'-3"	395A	WELD	395B	WELD			SOCKET FLANGES WELDED ON ENDS
396	3"	10'-1"	396A	WELD	396B	WELD			SOCKET FLANGES WELDED ON ENDS
397	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
398	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
399	3"	2'-8"	399A	WELD	399B	WELD			SOCKET FLANGES WELDED ON ENDS
400	3"	2'-8"	400A	WELD	400B	WELD			SOCKET FLANGES WELDED ON ENDS
401	3"	5'-3"	401A	WELD	401B	WELD			SOCKET FLANGES WELDED ON ENDS
402	3"	10'-1"	402A	WELD	402B	WELD			SOCKET FLANGES WELDED ON ENDS
403	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
404	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
405	3"	5'-3"	405A	WELD	405B	WELD			SOCKET FLANGES WELDED ON ENDS
406	3"	10'-1"	406A	WELD	406B	WELD			SOCKET FLANGES WELDED ON ENDS
407	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
408	3"	90° Elbow LR							3" 125 lb flanged fittings (ANSI B 16.1)
409	3"	2'-8"	409A	WELD	409B	WELD			SOCKET FLANGES WELDED ON ENDS
410	3"	BLIND FLANGE							3" 125 lb flanged fittings (ANSI B 16.1)
411	3"	4'-5.75"	411A	WELD	411B	WELD			SOCKET FLANGES WELDED ON ENDS
412	3"	5'-3"	412A	WELD	412B	WELD			SOCKET FLANGES WELDED ON ENDS
413	3"	90° Elbow LR	411A	WELD	411B	WELD			3" 125 lb flanged fittings (ANSI B 16.1)
414	3"	12"	414A	WELD	412B	THREAD			FLANGE TO TREAD WITH CAMLOCK
415									
416									

Drug & Laboratory Disposal
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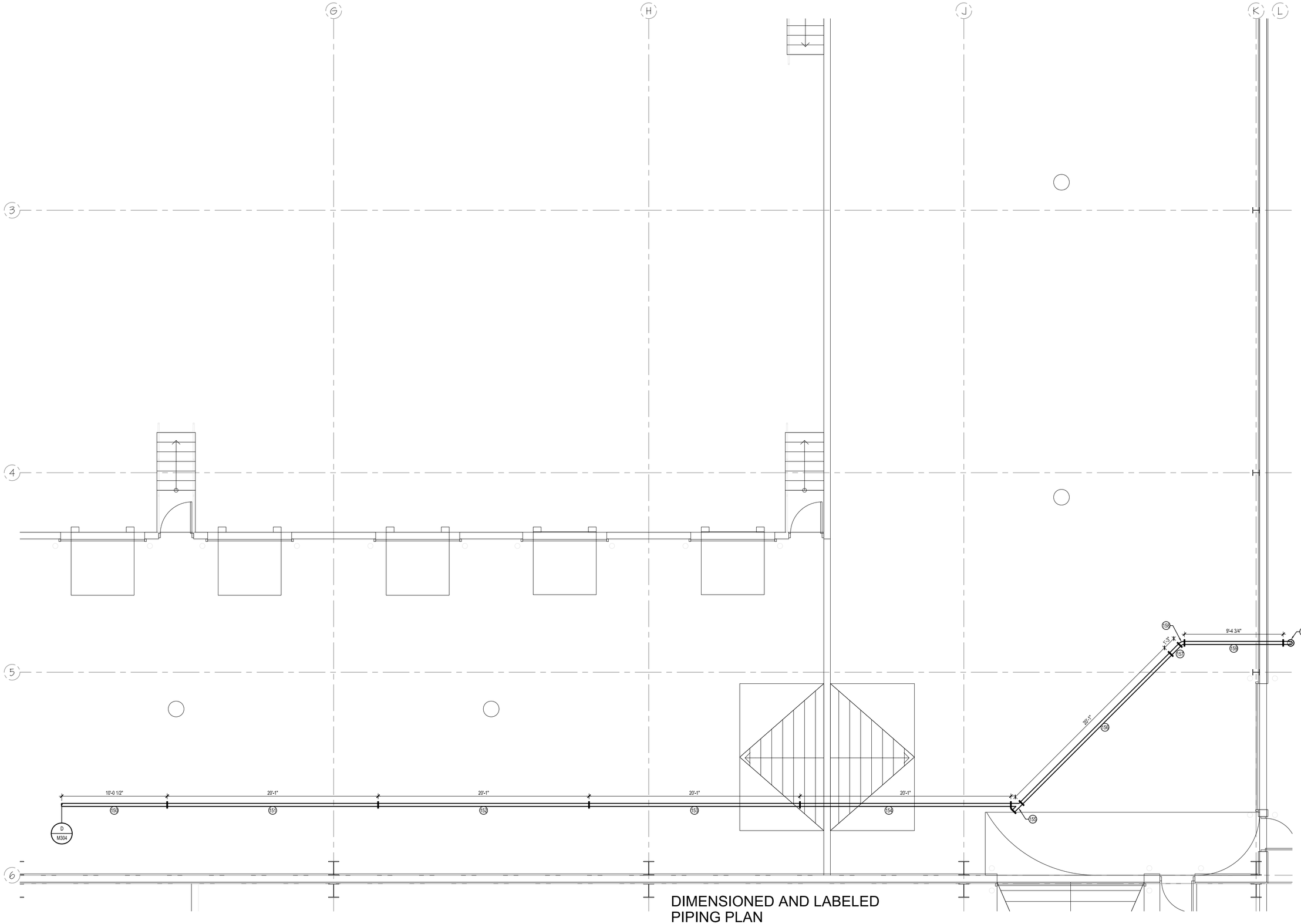
www.boscharch.com
JOB NUMBER
09024C

PHASE 3
NEW
STORAGE TANK
PIPING LISTS

M308



DIMENSIONED AND LABELED PIPING PLAN

Scale 1/4" = 1'-0"

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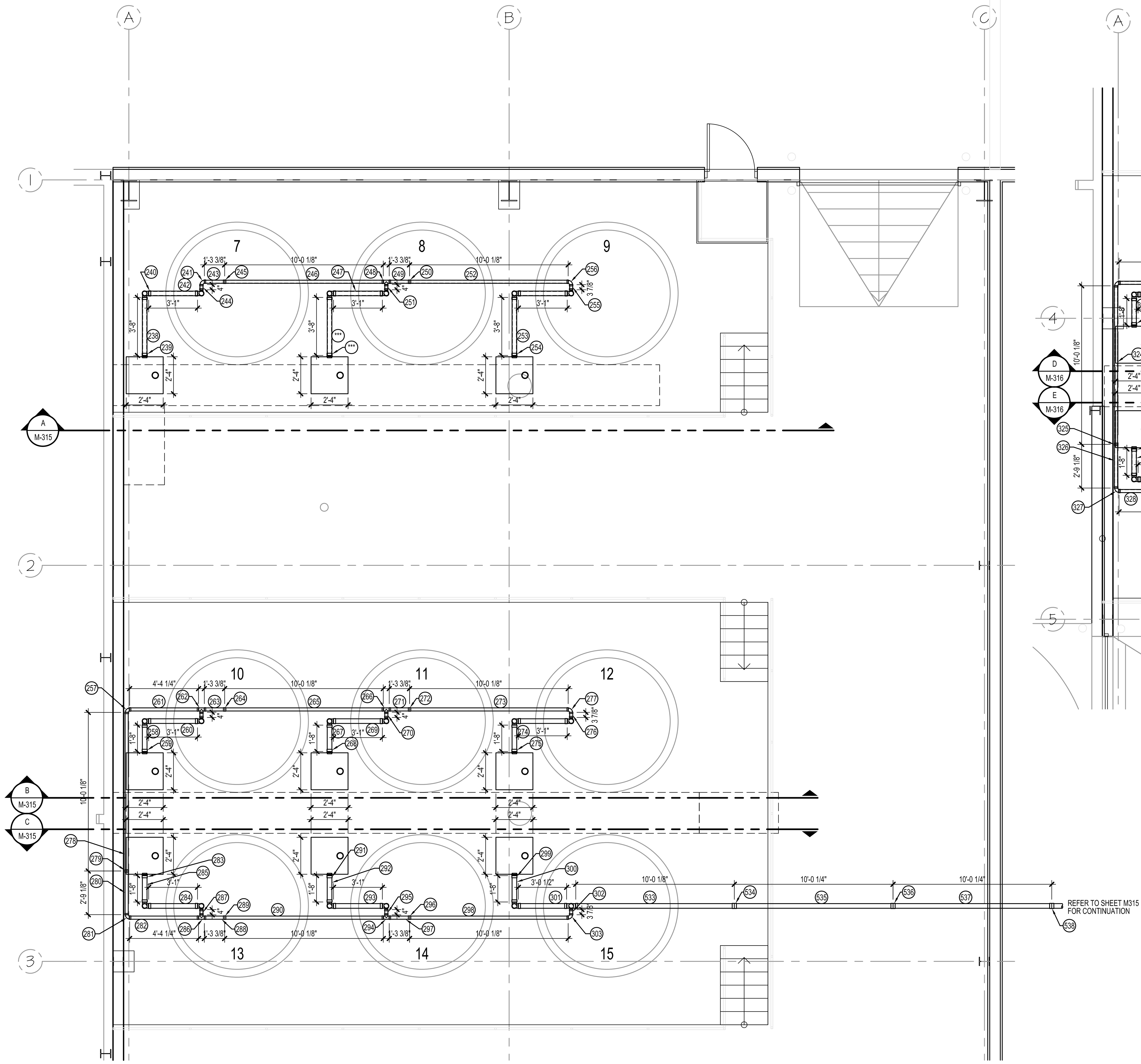
PHASE 3
NEW
STORAGE TANK
PIPING PLAN

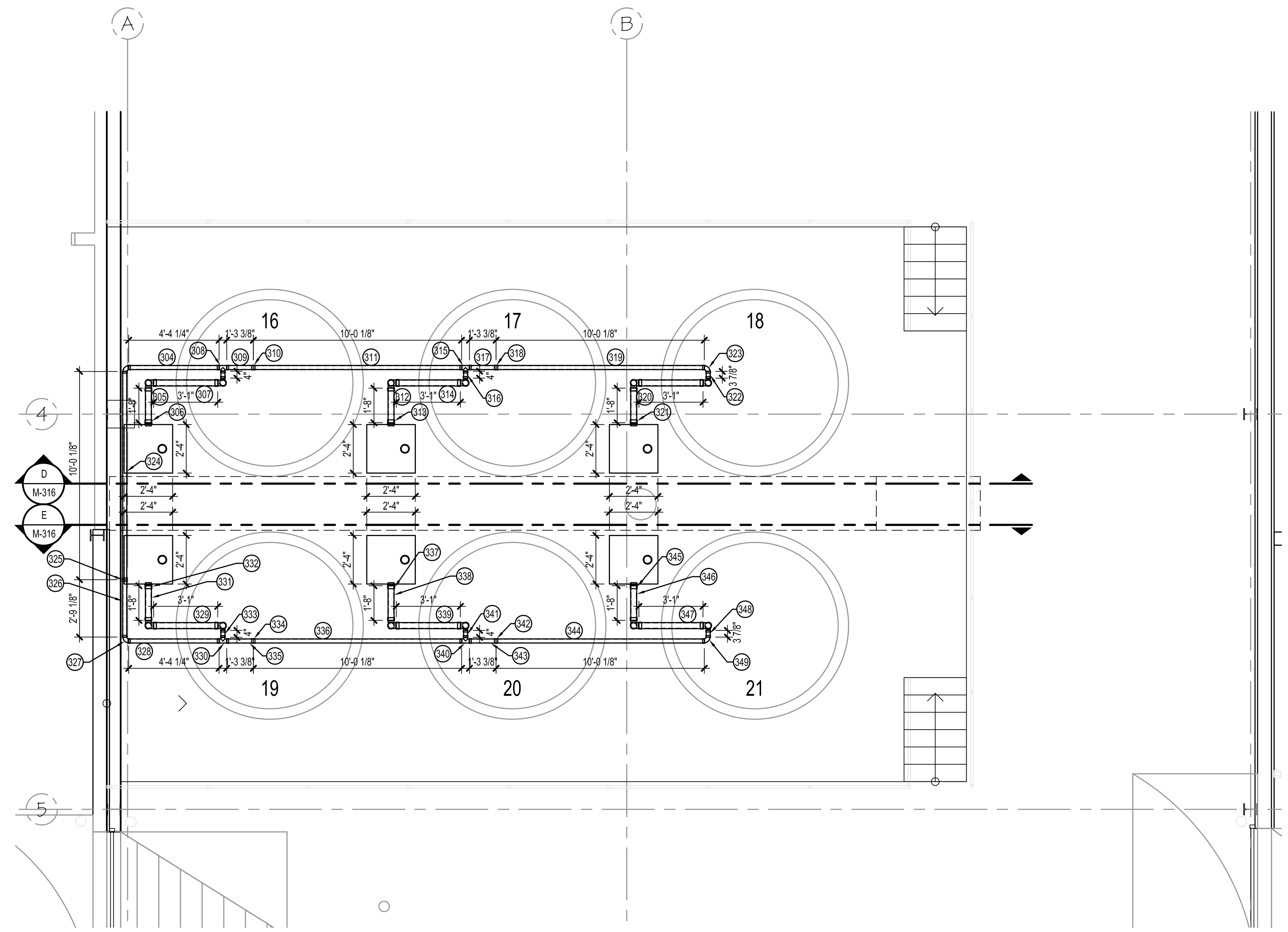
M303

2009-410 M-303-5.dwg



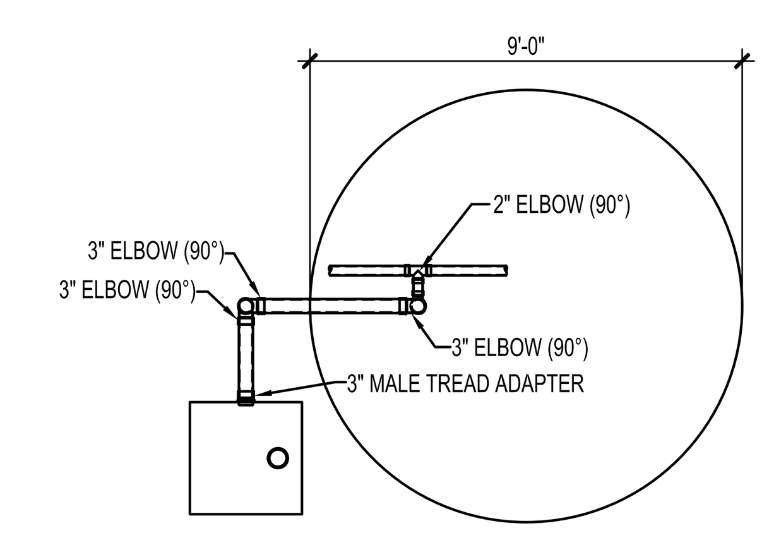
NEW STORAGE TANK VENT PIPING PLAN

Scale 1/4" = 1'-0"



NEW STORAGE TANK VENT PIPING PLAN

Scale 1/4" = 1'-0"



NEW STORAGE TANK VENT PIPING DETAIL

Scale 1/4" = 1'-0"

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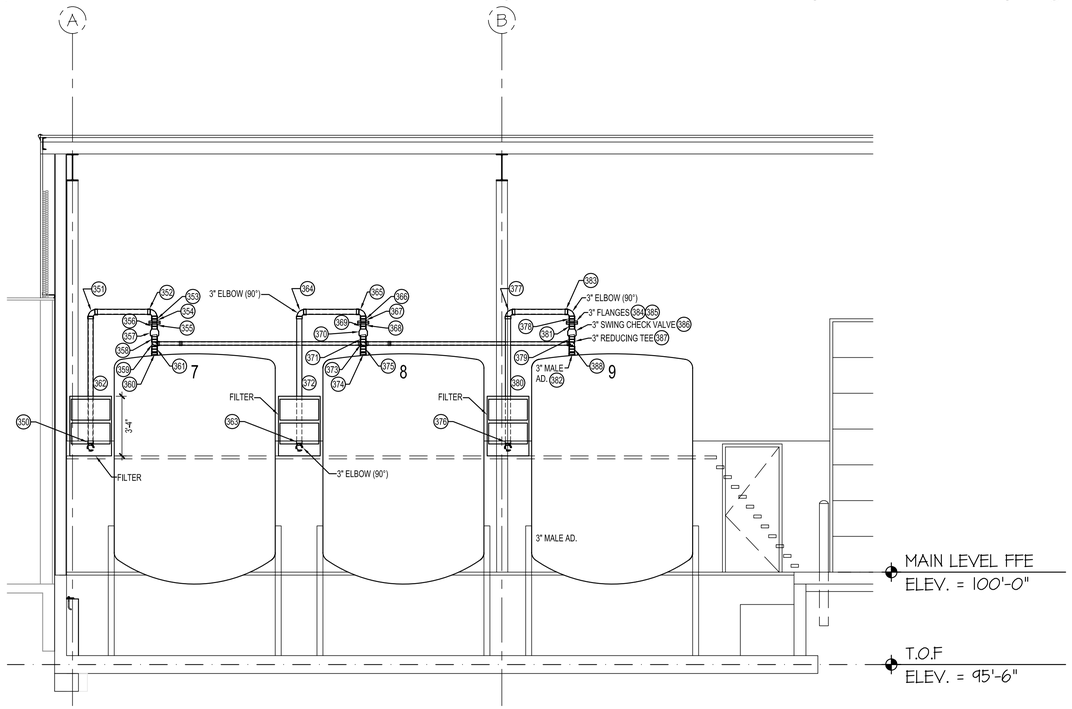
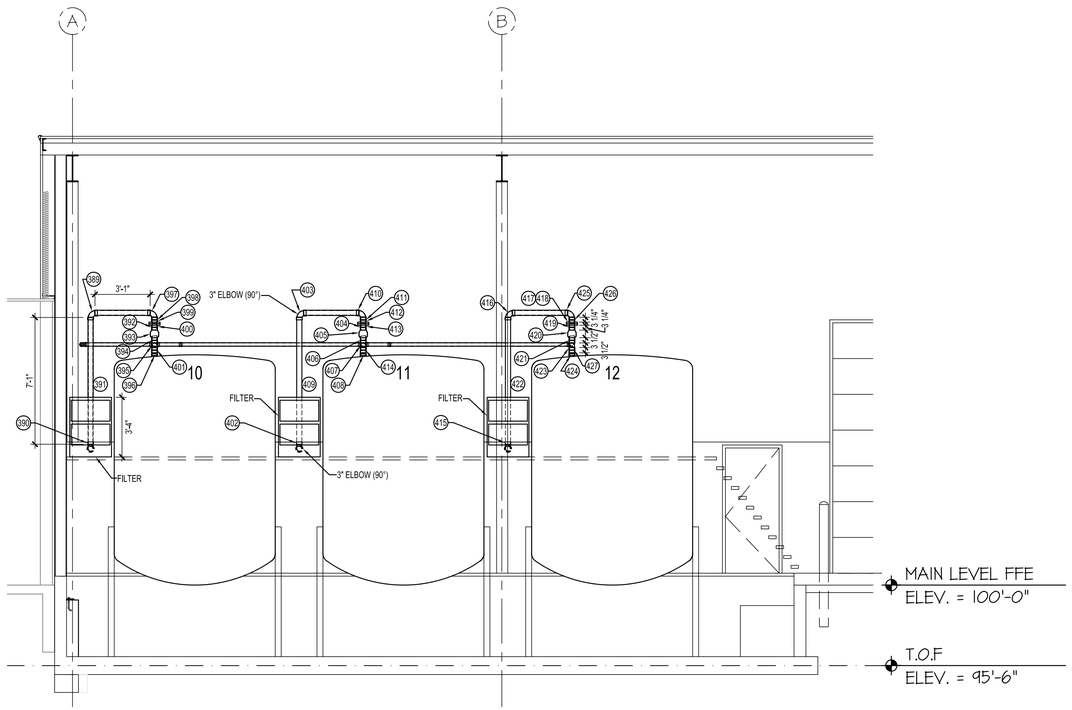
PHASE 3 NEW STORAGE TANK VENT PIPING PLAN

M314



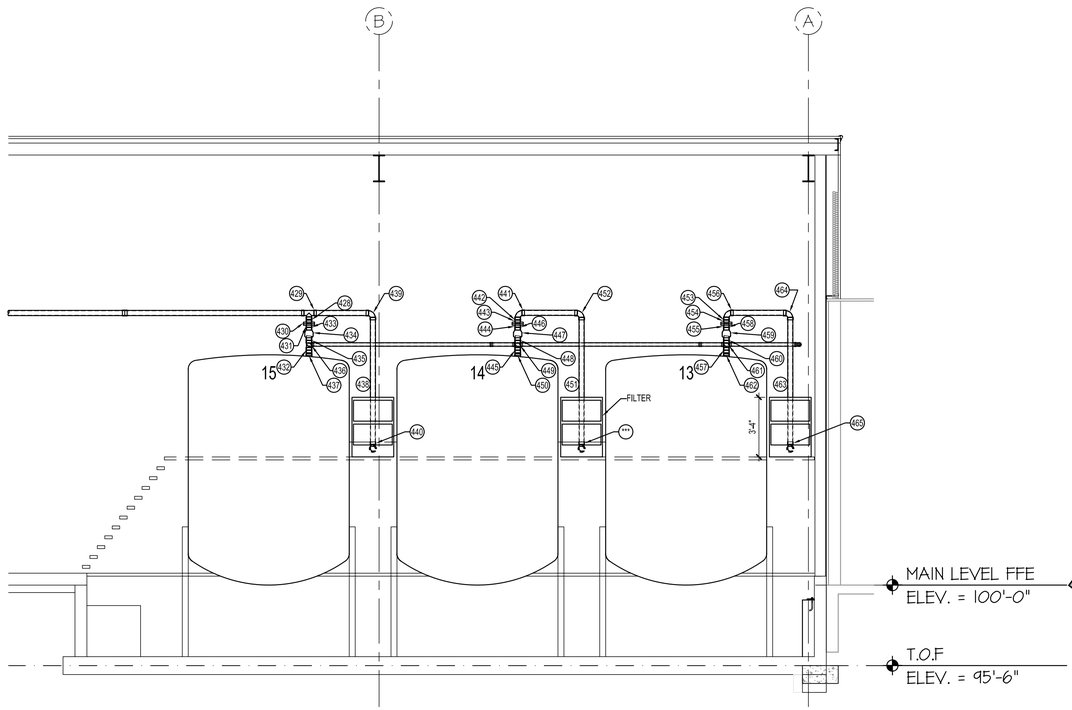
A M-314 NEW STORAGE TANK VENT PIPING - ELEVATION A

Scale 1/4" = 1'-0"



B M-314 NEW STORAGE TANK VENT PIPING - ELEVATION B

Scale 1/4" = 1'-0"



C M-314 NEW STORAGE TANK VENT PIPING - ELEVATION C

Scale 1/4" = 1'-0"

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JOB NUMBER
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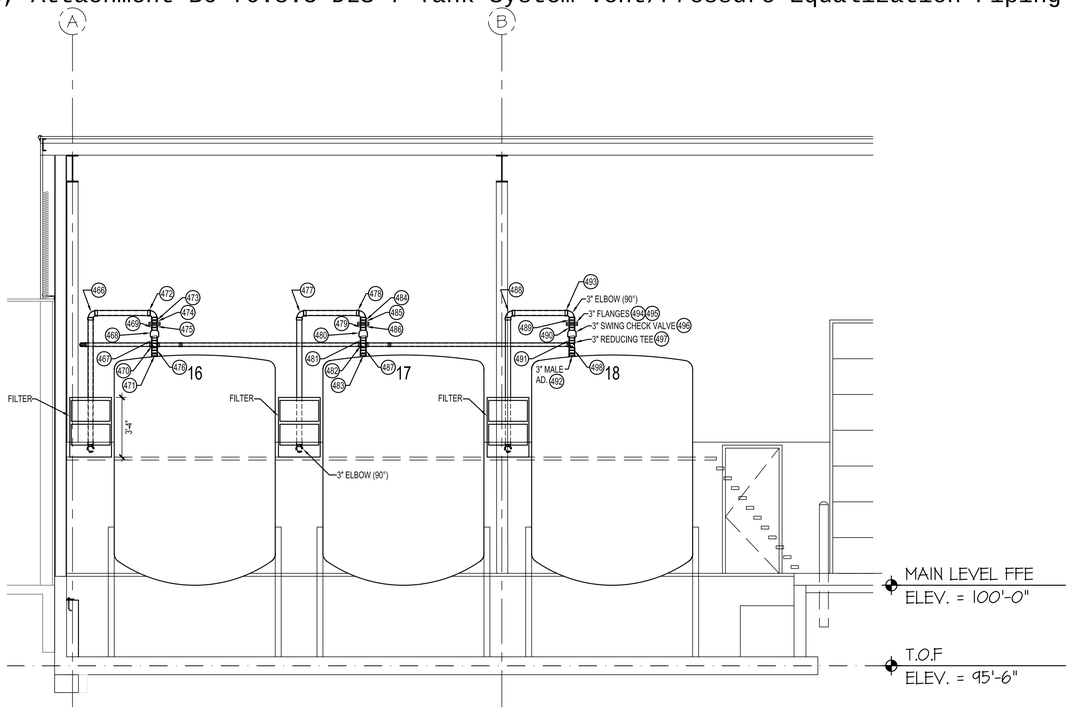
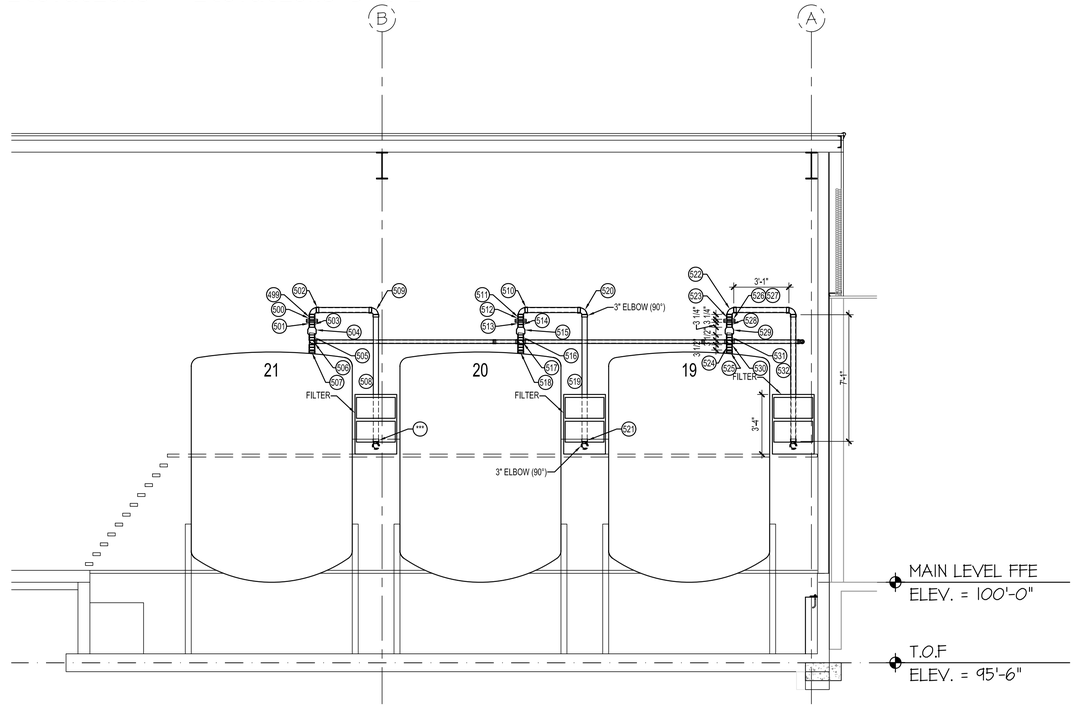
PHASE 3
NEW STORAGE
TANK VENT
PIPING ELEVATIONS

M316



B M-314 NEW STORAGE TANK VENT PIPING - ELEVATION D
Scale 1/4" = 1'-0"



D M-314 NEW STORAGE TANK VENT PIPING - ELEVATION E
Scale 1/4" = 1'-0"

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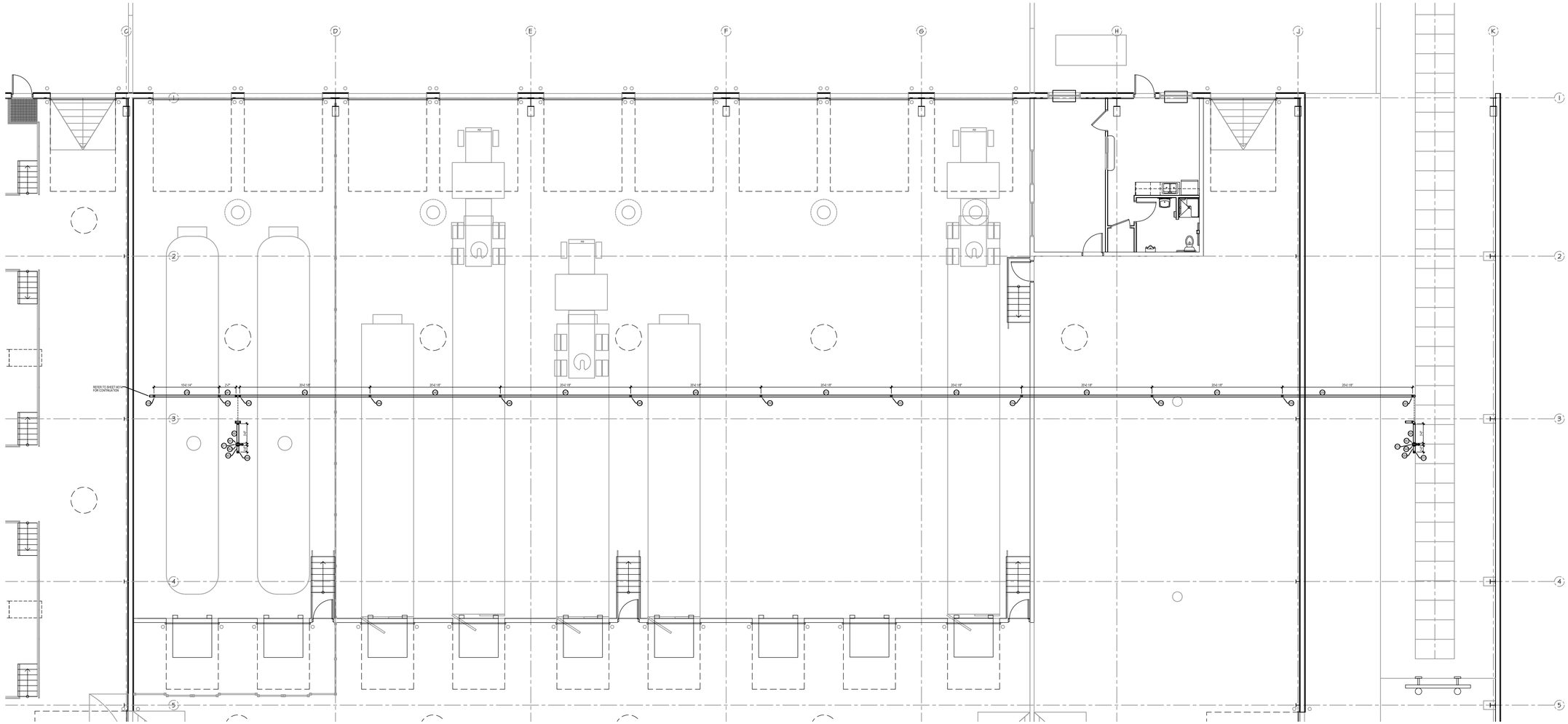
PHASE 3
NEW STORAGE
TANK VENT
PIPING ELEVATIONS

M317

2009-425 M316-317.dwg



NEW STORAGE TANK VENT PIPING PLAN

Scale 1/8" = 1'-0"

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PHASE 3
NEW STORAGE
TANK VENT
PIPING PLAN

M315

2009-425 M315.dwg

STORAGE TANK FARM #2 (NEW)

PIPE NUMBER	PIPE SIZE	PIPE LENGTH	JOINT #	PIPE END	JOINT #	PIPE END	JOINT #	PIPE END	COMMENTS
238	3"	3'-7½"	238A	GLUE	238B	GLUE			
239	3"	MALE ADAPTER	239A	THREAD					
240	3"	90° ELBOW							
241	2"	90° ELBOW							
242	3"	3'-½"	242A	GLUE	242B	GLUE			
243	2"	1'-3 ½"	243A	GLUE	243B	GLUE			
244	2"	3½"	244A	GLUE	244B	GLUE			
245	2"	COUPLER							
246	2"	10'-0"	246A	GLUE	246B	GLUE			
247	3"	3'-½"	247A	GLUE	247B	GLUE			
248	2"	TEE							
249	2"	1'-3 13/16"	249A	GLUE	249B	GLUE			
250	2"	COUPLER							
251	2"	3-½"	251A	GLUE	251B	GLUE			
252	2"	10'-0"	252A	GLUE	252B	GLUE			
253	3"	3'-7½"	253A	GLUE	253B	GLUE			
254	3"	MALE ADAPTER	254A	THREAD					
255	2"	3½"	255A	GLUE	255B	GLUE			
256	2"	90° ELBOW							
257	2"	90° ELBOW							
258	3"	1'-7½"	258A	GLUE	258B	GLUE			
259	3"	MALE ADAPTER	259A	THREAD					
260	3"	3'-½"	260A	GLUE	260B	GLUE			
261	2"	4'-4"	261A	GLUE	261B	GLUE			
262	2"	TEE							
263	2"	1'-3½"	263A	GLUE	263B	GLUE			
264	2"	COUPLER							
265	2"	10'-0"	265A	GLUE	265B	GLUE			
266	2"	TEE							
267	3"	1'-7½"	267A	GLUE	267B	GLUE			
268	3"	MALE ADAPTER	268A	THREAD					
269	3"	3'-½"	269A	GLUE	269B	GLUE			
270	2"	3-½"	270A	GLUE	270B	GLUE			
271	2"	1'-3½"	271A	GLUE	271B	GLUE			
272	2"	COUPLER							
273	2"	10'-0"	273A	GLUE	273B	GLUE			
274	3"	1'-7½"	274A	GLUE	274B	GLUE			
275	3"	MALE ADAPTER	275A	THREAD					
276	2"	3½"	276A	GLUE	276B	GLUE			
277	2"	90° ELBOW							
278	2"	10'-0"	278A	GLUE	278B	GLUE			
279	2"	COUPLER							
280	2"	2'-8½"	280A	GLUE	280B	GLUE			
281	2"	90° ELBOW							
282	2"	4'-4"	282A	GLUE	282B	GLUE			
283	3"	MALE ADAPTER	283A	THREAD					
284	3"	3'-½"	284A	GLUE	284B	GLUE			
285	3"	1'-7½"	285A	GLUE	285B	GLUE			
286	2"	TEE							
287	2"	3½"	287A	GLUE	287B	GLUE			
288	2"	1'-3½"	288A	GLUE	288B	GLUE			
289	2"	COUPLER							
290	2"	10'-0"	290A	GLUE	290B	GLUE			
291	3"	MALE ADAPTER	291A	THREAD					
292	3"	1'-7½"	292A	GLUE	292B	GLUE			
293	3"	3'-½"	292A	GLUE	293B	GLUE			
294	2"	TEE							
295	2"	3½"	295A	GLUE	295B	GLUE			
296	2"	COUPLER							
297	2"	1'-3½"	297A	GLUE	297B	GLUE			
298	2"	10'-0"	298A	GLUE	298B	GLUE			
299	3"	MALE ADAPTER	299A	THREAD					
300	3"	1'-7½"	300A	GLUE	300B	GLUE			
301	3"	3'-½"	301A	GLUE	301B	GLUE			
302	2"	3½"	302A	GLUE	302B	GLUE			
303	2"	90° ELBOW							
304	2"	4'-4"	304A	GLUE	304B	GLUE			
305	3"	1'-7½"	305A	GLUE	305B	GLUE			
306	3"	MALE ADAPTER	306A	THREAD					
307	3"	3'-½"	307A	GLUE	307B	GLUE			
308	2"	TEE							
309	2"	1'-3½"	309A	GLUE	309B	GLUE			
310	2"	COUPLER							
311	2"	10'-0"	311A	GLUE	311B	GLUE			
312	3"	1'-7½"	312A	GLUE	312B	GLUE			
313	3"	MALE ADAPTER	313A	THREAD					
314	3"	3'-13/16"	314A	GLUE	314B	GLUE			
315	2"	TEE							
316	2"	3½"	316A	GLUE	316B	GLUE			
317	2"	1'-3½"	317A	GLUE	317B	GLUE			
318	2"	COUPLER							
319	2"	10'-0"	319A	GLUE	319B	GLUE			
320	3"	1'-7½"	320A	GLUE	320B	GLUE			
321	3"	MALE ADAPTER	321A	THREAD					
322	2"	3½"	322A	GLUE	322B	GLUE			
323	2"	90° ELBOW							
324	2"	10'-0"	324A	GLUE	324B	GLUE			
325	2"	COUPLER							
326	2"	2'-8½"	326A	GLUE	326B	GLUE			
327	2"	90° ELBOW							
328	2"	4'-4"	328A	GLUE	328B	GLUE			
329	3"	3'-½"	329A	GLUE	329B	GLUE			
330	2"	TEE							
331	3"	1'-7½"	331A	GLUE	331B	GLUE			
332	3"	MALE ADAPTER	332A	THREAD					
333	2"	3½"	333A	GLUE	333B	GLUE			
334	2"	COUPLER							
335	2"	1'-3½"	335A	GLUE	335B	GLUE			
336	2"	10'-0"	336A	GLUE	336B	GLUE			
337	3"	MALE ADAPTER	337A	THREAD					
338	3"	1'-7½"	338A	GLUE	338B	GLUE			
339	3"	3'-½"	339A	GLUE	339B	GLUE			
340	2"	TEE							
341	2"	3½"	341A	GLUE	341B	GLUE			
342	2"	COUPLER							
343	2"	1'-3½"	343A	GLUE	343B	GLUE			
344	2"	10'-0"	344A	GLUE	344B	GLUE			
345	3"	MALE ADAPTER	345A	THREAD					
346	3"	1'-7½"	346A	GLUE	346B	GLUE			
347	3"	3'-½"	347A	GLUE	347B	GLUE			
348	2"	3½"	348A	GLUE	348B	GLUE			
349	2"	90° ELBOW							
350	3"	90° ELBOW							
351	3"	90° ELBOW							
352	3"	90° ELBOW							
353	3"	3½"	353A	GLUE	353B	GLUE			
354	3"	FLANGE	354A	BOLT					
355	3"	FLANGE							
356	3"	3½"	356A	GLUE	356B	GLUE			
357	3"	CHECK VALVE							
358	3"	3½"	358A	GLUE	358B	GLUE			
359	3"	REDUCING TEE							
360	3"	MALE ADAPTER	360A	THREAD					
361	3"	3½"	361A	GLUE	361B	GLUE			
362	3"	7'-½"	362A	GLUE	362B	GLUE			
363	3"	90° ELBOW							
364	3"	90° ELBOW							
365	3"	90° ELBOW							
366	3"	3½"	366A	GLUE	366B	GLUE			
367	3"	FLANGE	367A	BOLT					
368	3"	FLANGE							
369	3"	3½"	369A	GLUE	369B	GLUE			
370	3"	CHECK VALVE							
371	3"	3½"	371A	GLUE	371B	GLUE			
372	3"	7'-½"	332A	GLUE	332B	GLUE			
373	3"	REDUCING TEE							
374	3"	MALE ADAPTER	374A	THREAD					
375	3"	3½"	375A	GLUE	375B	GLUE			
376	3"	90° ELBOW							
377	3"	90° ELBOW							
378	3"	3½"	378A	GLUE	378B	GLUE			
379	3"	3½"	379A	GLUE	379B	GLUE			
380	3"	7'-½"	380A	GLUE	380B	GLUE			
381	3"	3½"	381A	GLUE	381B	GLUE			
382	3"	MALE ADAPTER	382A	THREAD					
383	3"	90° ELBOW							
384	3"	FLANGE	384A	BOLT					
385	3"	FLANGE							
386	3"	CHECK VALVE							
387	3"	REDUCING TEE							
388	3"	3½"	388A	GLUE	388B	GLUE			
389	3"	90° ELBOW							
390	3"	90° ELBOW							
391	3"	7'-½"	391A	GLUE	391B	GLUE			
392	3"	3½"	392A	GLUE	392B	GLUE			
393	3"	CHECK VALVE							
394	3"	3½"	394A	GLUE	394B	GLUE			
395	3"	REDUCING TEE							
396	3"	MALE ADAPTER	396A	THREAD					
397	3"	90° ELBOW							
398	3"	3½"	398A	GLUE	398B	GLUE			
399	3"	FLANGE	349A	BOLT					
400	3"	FLANGE							
401	3"	3½"	401A	GLUE	401B	GLUE			
402	3"	90° ELBOW							
403	3"	90° ELBOW							
404	3"	3½"	404A	GLUE	404B	GLUE			
405	3"	CHECK VALVE							
406	3"	3½"	406A	GLUE	406B	GLUE			
407	3"	REDUCING TEE							
408	3"	MALE ADAPTER	408A	THREAD					
409	3"	7'-½"	409A	GLUE	409A	GLUE			
410	3"	90° ELBOW							
411	3"	3½"	411A	GLUE	411B	GLUE			
412	3"	FLANGE	412A	BOLT					
413	3"	FLANGE							
414	3"	3½"	414A	GLUE	414B	GLUE			
415	3"	90° ELBOW							
416	3"	90° ELBOW							
417	3"	FLANGE	417A	BOLT					
418	3"	FLANGE							
419	3"	3½"	419A	GLUE	419B	GLUE			
420	3"	CHECK VALVE							
421	3"	3½"	421A	GLUE	421B	GLUE			
422	3"	7½"	422A	GLUE	422B	GLUE			
423	3"	REDUCING TEE							
424	3"	MALE ADAPTER	424A	THREAD					
425	3"	90° ELBOW							
426	3"	3½"	426A	GLUE	426B	GLUE			
427	3"	3½"	427A	GLUE	427B	GLUE			
428	3"	4½"	428A	GLUE	428B	GLUE			
429	3"	VENT TEE							
430	3"	FLANGE	430A	BOLT					
431	3"	FLANGE							
432	3"	3½"	432A	GLUE	432B	GLUE			
433	3"	3½"	433A	GLUE	433B	GLUE			
434	3"	CHECK VALVE							
435	3"	3½"	435A	GLUE	435B	GLUE			
436	3"	REDUCING TEE							
437	3"	MALE ADAPTER	437A	THREAD					
438	3"	7'-½"	438A	GLUE	438B	GLUE			
439	3"	90° ELBOW							
440	3"	90° ELBOW							
441	3"	90° ELBOW							
442	3"	3½"	442A	GLUE	442B	GLUE			
443	3"	FLANGE	443A	BOLT					
444	3"	FLANGE							
445	3"	3½"	445A	GLUE	445B	GLUE			
446	3"	3½"	446A	GLUE	446B	GLUE			
447	3"	CHECK VALVE							
448	3"	3½"	448A	GLUE	448B	GLUE			
449	3"	REDUCING TEE							
450	3"	MALE ADAPTER	450A	THREAD					
451	3"	7'-½"	451A	GLUE	451B	GLUE			
452	3"	90° ELBOW							
453	3"	3½"	453A	GLUE	453B	GLUE			
454	3"	FLANGE	454A	BOLT					
455	3"	FLANGE							
456	3"	90° ELBOW							
457	3"	3½"	457A	GLUE	457B	GLUE			
458	3"	3½"	458A	GLUE	458B	GLUE			
459	3"	CHECK VALVE							
460	3"	3½"	460A	GLUE	460B	GLUE			
461	3"	REDUCING TEE							
462	3"	MALE ADAPTER	462A	THREAD					
463	3"	7'-½"	463A	GLUE	463B	GLUE			
464	3"	90° ELBOW							
465	3"	90° ELBOW							
466	3"	90° ELBOW							
467	3"	3½"	467A	GLUE	467B	GLUE			
468	3"	CHECK VALVE							
469	3"	3½"	469A	GLUE	469B	GLUE			
470	3"	REDUCING TEE							
471	3"	MALE ADAPTER	471A	THREAD					
472	3"	90° ELBOW							
473	3"	3½"	473A	GLUE	473B	GLUE			
474	3"	FLANGE	474A	BOLT					
475	3"	FLANGE							
476	3"	3½"	476A	GLUE	476B	GLUE			
477	3"	90° ELBOW							
478	3"	90° ELBOW							
479	3"	3½"	479A	GLUE	479B	GLUE			
480	3"	CHECK VALVE							
481	3"	3½"	481A	GLUE	481B	GLUE			
482	3"	REDUCING TEE							
483	3"	MALE ADAPTER	483A	THREAD					
484	3"	3½"	484A	GLUE	484B	GLUE			
485	3"	FLANGE	485A	BOLT					
486	3"	FLANGE							
487	3"	3½"	487A	GLUE	487B	GLUE			
488	3"	90° ELBOW							
489	3"	3½"	489A	GLUE	489B	GLUE			
490	3"	3½"	490A	GLUE	490B	GLUE			
491	3"	3½"	491A	GLUE	491B	GLUE			
492	3"	MALE ADAPTER	492A	THREAD					
493	3"	90° ELBOW							
494	3"	FLANGE	494A	BOLT					
495	3"	FLANGE							
496	3"	CHECK VALVE							
497	3"	REDUCING TEE							
498	3"	3½"	498A	GLUE	498B	GLUE			
499	3"	3½"	499A	GLUE	499B	GLUE			
500	3"	FLANGE	500A	BOLT					
501	3"	FLANGE							
502	3"	90° ELBOW							
503	3"	3½"	503A	GLUE	503B	GLUE			
504	3"	CHECK VALVE							
505	3"	3½"	505A	GLUE	505B	GLUE			
506	3"	REDUCING TEE							
507	3"	MALE ADAPTER	507A	THREAD					
508	3"	7'-½"	508A	GLUE	508B	GLUE			
509	3"	90° ELBOW							
510	3"	90° ELBOW							
511	3"	3½"	511A	GLUE	511B	GLUE			
512	3"	FLANGE	512A	BOLT					
513	3"	FLANGE							
514	3"	3½"	514A	GLUE	514B	GLUE			
515	3"	CHECK VALVE							
516	3"	3½"	516A	GLUE	516B	GLUE			
517	3"	REDUCING TEE							
518	3"	MALE ADAPTER	518A	THREAD					
519	3"	7'-½"	519A	GLUE	519B	GLUE			
520	3"	90° ELBOW							
521	3"	90° ELBOW							
522	3"	90° ELBOW							
523	3"	3-15/16"	523A	GLUE	523B	GLUE			
524	3"	3½"	524A	GLUE	524B	GLUE			
525	3"	MALE ADAPTER	525A	THREAD					
526	3"	FLANGE	526A	BOLT					
527	3"	FLANGE							
528	3"	3½"	528A	GLUE	528B	GLUE			
529	3"	CHECK VALVE							
530	3"	REDUCING TEE							
531	3"	3½"	531A	GLUE	531B	GLUE			
532	3"	7'-¼"	532A	GLUE	532B	GLUE			
533	3"	10'-0"	533A	GLUE	533B	GLUE			
534	3"	COUPLING							
535	3"	10'-0"	535A	GLUE	535B	GLUE			
536	3"	COUPLING							
537	3"	7'-1½"	537A	GLUE	537B	GLUE			
538	3"	VENT TEE							
539	3"	10'-0"	539A	GLUE	5439B	GLUE			
540	3"	COUPLER							
541	3"	2'-7"	541A	GLUE	541B	GLUE			
542	3"	VENT TEE							
543	3"	20'-0"	543A	GLUE	543B	GLUE			
544	3"	COUPLER							
545	3"	20'-0"	545A	GLUE	545B	GLUE			
546	3"	COUPLER							
547	3"	20'-0"	547A	GLUE	547B	GLUE			
548	3"	COUPLER							
549	3"	20'-0"	549A	GLUE	549B	GLUE			
550	3"	COUPLER							
551	3"	20'-0"	551A	GLUE	551B	GLUE			
552	3"	COUPLER							
553	3"	20'-0"	553A	GLUE	553B	GLUE			
554	3"	COUPLER							
555	3"	20'-0"	555A	GLUE	555B	GLUE			
556	3"	COUPLER							
557	3"	20'-0"	557A	GLUE	557B	GLUE			
558	3"	COUPLER							
559	3"	20'-0"	559A	GLUE	559B	GLUE			
560	3"	3'-0"	560A	GLUE	560B	GLUE			
561	3"	FLANGE							
562	3"	FLANGE							
563	3"	1'-0"	563A	GLUE	563B	GLUE			
564	3"	MALE ADAPTER							COORDINATE TANKER CONNECTION WITH OWNER
565	3"	90° ELBOW							
566	3"	3'-0"							
567	3"	FLANGE							
568	3"	FLANGE							
569	3"	1'-0"	569A	GLUE	569B	GLUE			
570	3"	MALE ADAPTER							COORDINATE TANKER CONNECTION WITH OWNER
571	3"	VALVE							
572	3"	VALVE							

Drug & Laboratory Disposal
Phase 3 - Tank Storage
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Plainwell, Michigan 49080

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E2W JOB # 2008-145

ISSUED
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bosch
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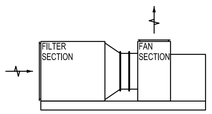
ENGINEERING
INTERIOR DESIGN
8175 Creekside Drive, Ste. 220
Portage, Michigan 49024
ph: 269-321-5151
www.boschcharch.com

JOB NUMBER
09024

PHASE 3
NEW STORAGE
TANK VENT PINING
PARTS LIST

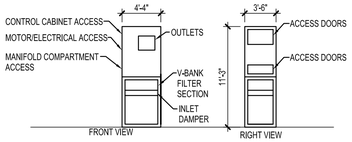
M318

M318.dwg



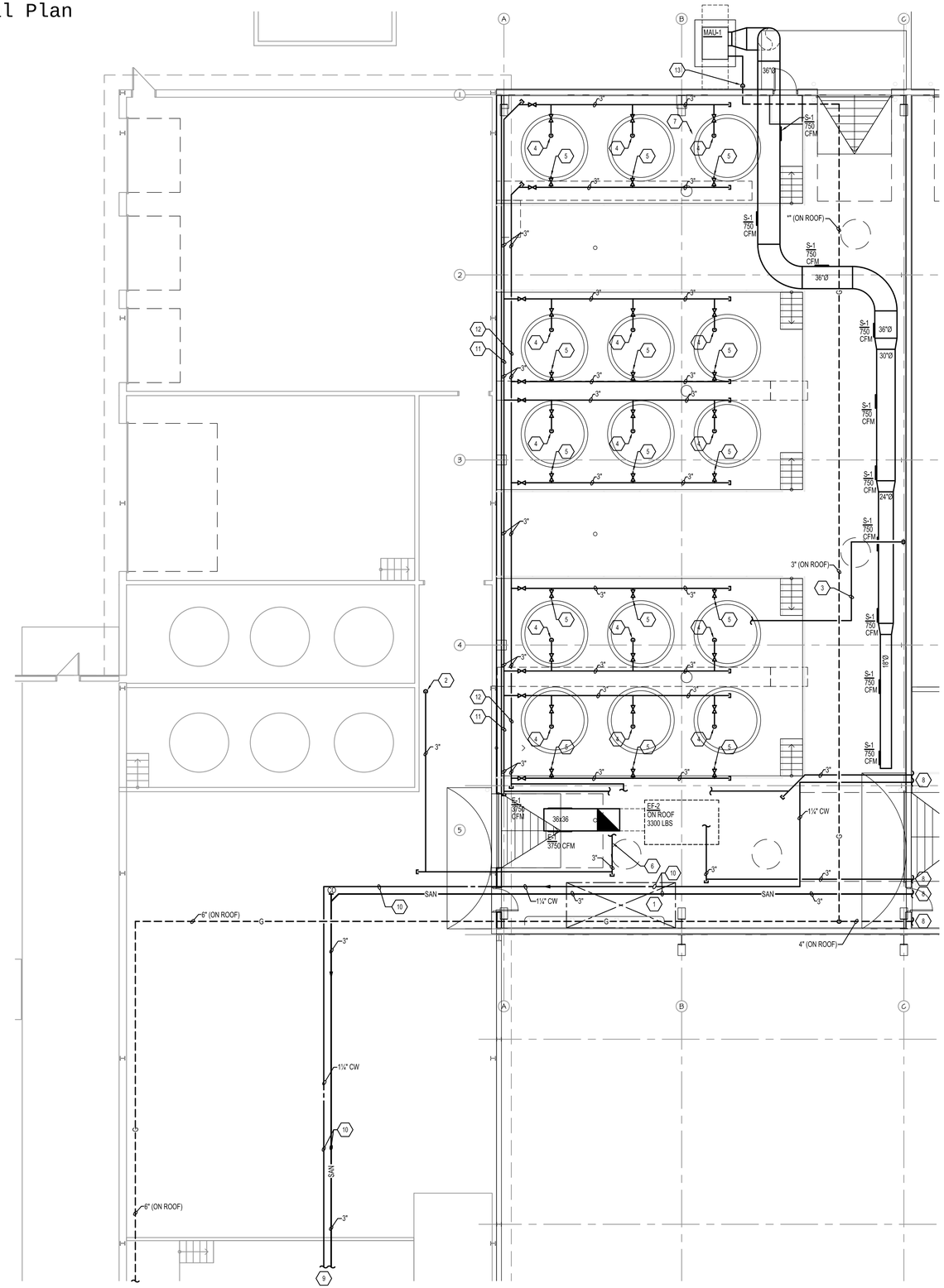
EXHUAST FAN

Scale: None



MAKE-UP AIR UNIT

Scale: None



PHASE 3 MECHANICAL PLAN

Scale 1/8" = 1'-0"

GENERAL NOTES

1. REFER TO SHEETS M301-315 FOR TANK PIPING AND VENT PIPING

NOTES

1. REFER TO PIPING SCHEMATIC ON THIS SHEET.
2. 3" PIPING DOWN FOR CONNECTION TO EXISTING TANK FARM.
3. VENT LINE CONNECTION TO TANKERS. RUN LINE OVER TO AIR FILTER FOR TANK.
4. CONNECT 3" PIPING TO TOP OF TANK. COORDINATE CONNECTION WITH NEW TANK.
5. CONNECT 3" PIPING AT LOWER CONNECTION OF TANK. COORDINATE CONNECTION WITH NEW TANK.
6. 36x36 DUCT UP THROUGH ROOF TO EXHAUST FAN EF-1.
7. PROVIDE CONCRETE PAD 1'-0" IN EACH DIRECTION LARGER THAN FOOTPRINT OF UNIT.
8. REFER TO PHASE 5 DRAWING M101 FOR CONTINUATION.
9. REFER TO PHASE 2 DRAWING P101 FOR CONTINUATION.
10. PROVIDE HEAT TRACING CABLE ON COLD WATER PIPING AND SANITARY PIPING.
11. SUPPORT PIPING FROM ROOF STRUCTURE. COORDINATE ELEVATION WITH NEW TANKS.
12. SUPPORT PIPING FROM LOWER WALL. COORDINATE ELEVATION WITH NEW TANKS.
13. DROP 3" GAS DOWN TO MAKE-UP AIR UNIT. PROVIDE PRESSURE REDUCING VALVE FROM *** TO 7".

EQUIPMENT LIST

MAKE-UP AIR UNIT MAU-1
BASED ON TRANE MODEL DFOA118FNH, 7500 CFM, 5 HP MODULATING ROOM TEMP CONTROL, FM GAS TRAIN, 5HP MOTOR, VERTICAL ARRANGEMENT 4 - SIDE DISCHARGE, MOTORIZED INLET DAMPER.
HEATING DATA: 825 MBH INPUT, 675 MBH OUTPUT, NATURAL GAS.
ELECTRICAL DATA: 460/3/60

EXHAUST FAN EF-2
BASED ON AER CONTROL SYSTEMS LCC MODEL DC12000-HMC2, 7500 CFM, 7.5 HP, FAN MODEL SQA-22.25, 460/3/60

EXHAUST FAN SPECIFICATION
GENERAL
THE DC-12000-HMC2 IS A TWO-STAGE MEDIA FILTER COLLECTION SYSTEM.

CONSTRUCTION:
HOUSING CONSTRUCTION IS 16 GAUGE COLD ROLLED STEEL WITH INTERNAL COMPONENTS MADE FROM 14, 16, AND 18-GAUGE COLD ROLLED STEEL. A MOUNTING FLANGE IS AVAILABLE ON BOTH THE AIR ENTERING SIDE (TO CONNECT TO DUCTING) AND THE AIR LEAVING SIDE (TO CONNECT TO THE RECTANGULAR TO ROUND TRANSITION). STANDARD HOUSINGS ARE POWDER PAINTED INSIDE AND OUT KELLY GREEN WITH CONTRASTING BLACK SUB COMPONENTS AND RATED FOR ±10-IN. W.G. PRESSURE. ALTERNATE COLORS AND GRADES OF POWDER COATING ARE AVAILABLE.

HIGH CAPACITY CARBONMODULE (DC-9000-HMC2):
THE PRIMARY PARTICULATE FILTRATION SECTION EXISTS TO PROTECT THE CARBON SECTION FROM PARTICULATE BUILD-UP, AND IS COMPOSED OF PLEATED FILTERS WITH 80% ASHRAE EFFICIENCY. A STATIC PRESSURE GAUGE MONITORS THE PRESSURE DROP ACROSS THIS SECTION TO INDICATE WHEN FILTER CHANGE-OUT IS REQUIRED.

THE CARBON MODULE HAS FILTERS THAT USE REFILLABLE AND RECHARGEABLE ACTIVATED CARBON MEDIA AND CONSISTS OF 1" X 24" X 22.5" REFILLABLE POLYSTYRENE PANELS FOR REMOVAL OF ODORS. A SECOND STAGE FILTER AFTER THE CARBON PANELS IS A 1" X 24" X 24" PLEATED FILTER TO PREVENT CARBON DUST FROM EXHAUSTING THROUGH THE BLOWER. A STATIC PRESSURE GAUGE MONITORS THE PRESSURE DROP ACROSS THIS SECTION TO INDICATE WHEN FILTER CHANGE-OUT IS REQUIRED.

EACH SECTION IS EQUIPPED WITH HINGED ACCESS DOORS ON EACH SIDE OF THE UNIT, AND REQUIRES NO TOOLS TO OPEN OR CLOSE THE DOORS. A MATCHING RECTANGULAR TO ROUND TRANSITION, WITH NO MORE THAN A 45 DEGREE TAPER ANGLE, IS FABRICATED OF 16 GAUGE COLD ROLLED STEEL AND POWDER PAINTED WITH KELLY GREEN, AND IS PRE-ASSEMBLED AT THE FACTORY.

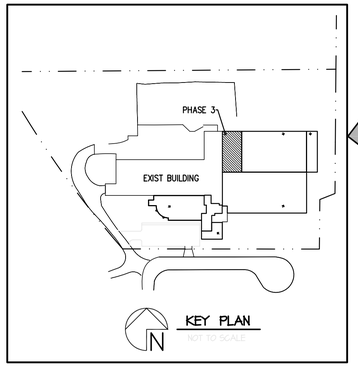
MAIN EXHAUST BLOWER:
THE FAN IS A CHICAGO BLOWER DESIGN 36A INDUSTRIAL DUTY, BELT-DRIVEN, AIRFOIL CENTRIFUGAL BLOWER, IN AN ARRANGEMENT 9H, COMPLETE WITH 6" STRUCTURAL STEEL VIBRATION ISOLATION BASE WITH HEIGHT SAVING BRACKETS AND 1" DEFLECTION VIBRATION ISOLATION SPRINGS, FLANGED INLET AND OUTLET, ACCESS DOOR, EXTENDED LUBRICATION LINES, FLEXIBLE INLET CONNECTION SIMILAR TO FLEX-COM U-BELT STYLE #SAL-0300, AND BELT, SHAFT AND BEARING GUARDS. THE MOTOR IS 7½ HP TEFC, 1800 RPM, 460/60/3. THE CONSTANT SPEED DRIVE PACKAGE IS COMPLETE WITH A MINIMUM OF 2 BELTS AND SERVICE FACTOR OF 1.5. THE FAN OUTLET IS CONNECTED TO AN ACGIH NO LOSS STACK CAP THAT TERMINATES AT 10'-0" ABOVE THE ROOF DECK. AN ELECTRICAL DISCONNECT AND MOTOR STARTER SHALL BE SUPPLIED BY OTHERS. THE USE OF FORWARD CURVED OR DIRECT DRIVE BLOWERS SHALL NOT BE ALLOWED.

UNIT SKID TO SUPPORT CARBON HOUSING AND BLOWER:
THE FRAME OF THE SKID SUPPORT IS MANUFACTURED FROM 4" X 4" X 3/16" THICK SQUARE CARBON STEEL TUBING WELDED TOGETHER TO SUPPORT THE CARBON MODULE AND BLOWER. THE FRAME SHALL PROVIDE SPOT LOADING POINTS FOR THE FAN'S VIBRATION ISOLATION SPRINGS. THE UNITARY FRAME SHALL BE POWDER COAT PAINTED TO MATCH THE CARBON HOUSING AND BLOWER. A PERIMETER EQUIPMENT SUPPORT RAIL SYSTEM SHALL BE SUPPLIED BY OTHERS.

SUPPLY DIFFUSER S-1
BASED ON TITUS MODEL S301FL, 18x12 DUCT OPENING, 20x14 FACE SIZE, 750 CFM. PROVIDE WITH OPTIONAL AIR SCOOP DAMPER.

EXHAUST GRILLE E-1
BASED ON TITUS MODEL 33RL, 36x34 OPENING, 38x36 FACE SIZE, 3750 CFM.

HEAT TRACING CABLE
HEAT TRACING CABLE TO BE 240V RAYCHEM SELF-REG HEATING CABLE CAT # 5HBTV2-CT. PROVIDE WITH DIGITRACE LINE-SENSING T-STAT CAT # E507S-LS AND ALL ACCESSORIES.



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PHASE 3 MECHANICAL PLAN

M101

08-145 M101.dwg

GENERAL ELECTRICAL NOTES

1. PROVIDE COMPLETE AND ADEQUATE TEMPORARY POWER AND LIGHTS DURING CONSTRUCTION USING APPROVED LAMPHOLDERS AND GFCI CIRCUITING. MAINTAIN ALL LAMPS AS REQUIRED.
2. ELECTRICAL CONTRACTOR TO INCLUDE PLAN REVIEW FEES.
3. CUTTING AND PATCHING FOR ELECTRICAL ITEMS BY ELECTRICAL CONTRACTOR.
4. AS-BUILT DRAWINGS WILL BE REQUIRED TO BE UPDATED ON A WEEKLY BASIS THESE AS-BUILTS WILL BE EXPECTED TO BE IN A LEGIBLE AND NEAT FORM.
5. ALL WIRING TO BE COPPER. ALL WIRING ABOVE 50 VOLTS TO BE IN CONDUIT UNLESS NOTED OTHERWISE. PROPER WIRE TYPE AND SIZE AND CONDUIT SIZE IS REQUIRED FOR BRANCH CIRCUITS. AC/MC CABLE IS ACCEPTABLE PER CODE FOR BRANCH CIRCUITS EXCEPT FOR HOME RUNS.
6. MAKE SURE THAT EXPOSED CABLE IS RATED FOR THE ENVIRONMENT THAT IT IS IN.
7. PROVIDE TYPEWRITTEN DIRECTORIES ON ALL PANELS. LABEL ALL DISCONNECTS AND PANELS.
8. EXPOSED CABLE AND CONDUIT TO RUN PARALLEL WITH STRUCTURE AND SECURELY ATTACHED TO BUILDING STEEL.
9. CONNECT ALL EXIT SIGNS AHEAD OF LOCAL LIGHTING CIRCUIT
10. ELECTRICAL CONTRACTOR TO PROVIDE SUBMITTALS PRIOR TO ORDERING EQUIPMENT FOR LIGHTING, SWITCHGEAR, SPECIAL EQUIPMENT, ETC.
11. UNLESS NOTED OTHERWISE, ALL DEVICE ELEVATIONS REFER TO CENTER OF OUTLET BOX. ELECTRICAL CONTRACTOR SHALL VERIFY ALL OUTLET LOCATIONS WITH OTHER TRADES. MINIMUM OF 18" ABOVE FINISHED FLOOR TO MEET BARRIER FREE REQUIREMENTS.
12. SHARING NEUTRALS BETWEEN CIRCUITS IS NOT PERMITTED UNLESS WIRING IS COLOR CODED OR LABELED AT PANEL TO IDENTIFY THE PHASE. ALL HOME RUN NEUTRALS FOR ELECTRONIC EQUIPMENT AND FLUORESCENT LIGHTING TO BE #10.
13. REFER TO MECHANICAL DRAWINGS FOR ELECTRICAL DATA PERTAINING TO ALL MECHANICAL EQUIPMENT. VERIFY ACTUAL REQUIREMENTS WITH EQUIPMENT ORDERED AND MAKE ADJUSTMENTS ACCORDINGLY. LOCATIONS SHOWN ARE APPROXIMATE. FIELD VERIFY.
14. PROVIDE A CONNECTION, SWITCH AND SO FOR ALL SINK DISPOSERS. DISHWASHERS AND SIMILAR EQUIPMENT TO HAVE SSU OR EQUAL.
15. WIRING IN AREA SEPARATION WALLS TO COMPLY WITH ARTICLE 300-22 OF THE N.E.C.
16. PROVIDE FIRESTOPPING AT ALL REQUIRED PENETRATIONS.
17. SLEEVE ELECTRICAL PENETRATIONS FROM FERROUS SLEEVES AND ALL AREA SEPARATION WALLS.
18. AN ELECTRICAL PERMIT SHALL BE ACQUIRED BY A STATE LICENSED ELECTRICAL CONTRACTOR.
19. PROVIDE GROUNDING AS PER N.E.C. SECTION 250.
20. ALL ELECTRICAL WORK IS SUBJECT TO FIELD REVIEW BY THE ELECTRICAL INSPECTOR AND THE PROJECT ENGINEER.
21. PROVIDE PROPER WORKING CLEARANCES AT ALL ELECTRICAL EQUIPMENT.
22. MAXIMUM OF EIGHT (8) DUPLEX OUTLETS PER 20 AMP CIRCUIT UNLESS NOTED OTHERWISE.
23. ALL WORK TO COMPLY WITH STATE AND LOCAL CODES.
24. DO NOT LAY WIRES, FLEX, ETC. ON CEILING TILE.
25. WHERE A FLOOR COVERING OR FINAL FLOOR FINISH IS OTHER THAN CARPET OR VINYL TILE, CONDUIT SHALL NOT BE RUN WITHIN CONCRETE SLABS. 1" OF CONCRETE OVER THE TOP OF CONDUITS AND SLABS MUST BE MAINTAINED. 1-1/2" OVER IS PREFERRED.
26. PROVIDE SEAL-OFFS WHEN PIPING PASSES THROUGH AREAS OF DIFFERENT AMBIENT TEMPERATURES AND/OR HAZARDOUS AREAS.
27. PROPER PROTECTION AGAINST CORROSION REQUIRED FOR ALL ELECTRICAL EQUIPMENT. IT SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH THEY ARE TO BE INSTALLED.
28. BRANCH CIRCUIT CONDUCTORS SUPPLYING A SINGLE MOTOR SHALL HAVE AN AMPACITY NOT LESS THAN 125% OF THE MOTOR FULL LOAD CURRENT RATING.
29. PROPER THERMAL OVERLOAD PROTECTION SHALL BE REQUIRED FOR ALL MOTORS.
30. FURNITURE SYSTEM PARTITIONS TO BE FED FROM UNDER FLOOR OR ADJACENT WALL. DO NOT FEED FROM OVERHEAD.
31. PROVIDE OPERATION AND MAINTENANCE MANUALS AT PROJECT COMPLETION.
32. PROVIDE NECESSARY TRAINING ON ELECTRICAL SYSTEMS TO OWNER.
33. PROPER TIME IS TO BE GIVEN TO PRE-CONSTRUCTION COORDINATION OF ALL OTHER SYSTEMS. ELECTRICAL CONTRACTOR TO VERIFY MOUNTING HEIGHTS OF DEVICES WITH FINAL FURNITURE AND CABINET PLANS. FLOOR OUTLETS TO BE FIELD VERIFIED FOR EXACT PLACEMENT.
34. PROVIDE PROPER SEPARATION BETWEEN LOW VOLTAGE CONDUCTORS AND HIGHER VOLTAGE CONDUCTORS.
35. MAKE SURE THERE ARE RECEPTACLES WITHIN 25 FEET OF MECHANICAL EQUIPMENT FOR SERVICEABILITY.

SOUND / SIGNAL

- SPEAKER
- VOLUME CONTROL
- MICROPHONE JACK
- INTERCOM JACK
- CATV COAX JACK
- DC — DOOR CONTACT
- MD — MOTION DETECTOR (PROVIDED BY OTHERS)
- KP — KEY PAD
- CR — CARD READER
- MD — MOTION DETECTOR
- BD — BEAM DETECTOR
- C — CAMERA
- C — CAMERA LOCATION BOX. AND 3/4" STUB ONLY
- IC — INTERCOM STATION BOX. 3/4" STUB ONLY
- SSCP — SECURITY SYSTEM CONTROL PANEL
- CCTV — CCTV CONTROL PANEL
- GAAP — GENERATOR ANNUNCIATOR PANEL

MISCELLANEOUS NOTES

- POINT OF CONNECTION BETWEEN NEW AND EXISTING
- POINT OF EXISTING TO REMAIN AND EXISTING TO BE REMOVED.
- 1 — KEY NOTE
- 1 — DEMOLITION NOTE
- 1 — REVISION NOTE (ADDENDUM)
- 1 / M900 — DETAIL BUBBLE: DETAIL NUMBER, PAGE LOCATION
- XX / XXXX — SECTION TAG & DIRECTION OF SECTION VIEW
- SECTION ARROW AND SECTION CUT LINE.

NURSE CALL

- MC M — MASTER CONSOLE
- MC B — EMERGENCY BATH STATION
- MC DU — DUTY STATION
- MC ST — STAFF STATION
- MC DA — DOOR ALARM
- MC P — SINGLE PATIENT STATION
- MC E — EMERGENCY PUSH BUTTON
- D — DOME LIGHT
- Z — ZONE LIGHT

FIRE ALARM

- SMOKE DETECTOR
- SMOKE DETECTOR INTERGATED WITH NURSE CALL
- HEAT DETECTOR
- DUCT SMOKE DETECTOR
- HORN
- VS 15 — AUDIOVISUAL DEVICE WITH CANDELA RATING
- V 15 — VISUAL ONLY UNIT WITH CANDELA RATING
- PULL STATION
- FACP — FIRE ALARM CONTROL PANEL
- FAAP — FIRE ALARM ANNUNCIATOR PANEL
- C — INTERCOMMUNICATION CABINET
- BD — FIRE ALARM BELL
- FS — FLOW SWITCH
- OSY — OUTSIDE STEM & YOKE VALVE
- TAMPER SWITCH (furnished by FP/C)
- EOL — END OF LINE DEVICE
- REMOTE INDICATING LIGHT, WALL MTD.
- REMOTE INDICATING LIGHT, CLG. MTD.
- MAGNETIC DOOR HOLDER
- MONITOR MODULE
- CONTROL MODULE
- DUCT SMOKE DAMPER

CONTROLS

- PHOTOCELL (voltage as required)
- TIME CLOCK (24 hour U.O.N.)
- 3 — PUSHBUTTON STATION (# of buttons indicated)
- LIGHTING CONTACTOR
- OC 1 — OCCUPANCY SENSOR: WALL MOUNT, WATTSTOPER WA-200
- OC 1-1 — OCCUPANCY SENSOR: WALL MOUNT, WATTSTOPER WA-300
- OC 2 — OCCUPANCY SENSOR: CLG MOUNT, DUAL TECHNOLOGY WATTSTOPER UT-300-2
- OC 3 — TIME SWITCH SET AT 2HR. MAX. WATTSTOPER TS-400
- OC 4 — OCCUPANCY SENSOR: WALL MOUNT, DIMMER, WATTSTOPPER WD-280
- PP — POWER PACK: WATTSTOPPER B120E-P.
- $ LVX — LOW VOLTAGE SWITCH
- T — THERMOSTAT
- SB — SWITCH BYPASS, BODINE GTD20 OR EQUAL

OUTLETS

- SINGLE RECEPTACLE (120 VOLT)
- EWC — ELECTRIC WATER COOLER RECEPTACLE (LOCATE PER EWC SHOP DRAWINGS)
- DUPLEX RECEPTACLE
- DOUBLE DUPLEX RECEPTACLE
- GFI — GFI DUPLEX RECEPTACLE
- WP — WEATHER PROOF DUPLEX RECEPTACLE
- AC — GFI DUPLEX CONVENIENCE OUTLET MTD "ABOVE COUNTER"
- EM — EMERGENCY RECEPTACLE
- DUPLEX OUTLET WITH ISOLATED GROUND
- DUPLEX W/ ISOLATED GROUND & TVSS
- 208 / 240V RECEPTACLE
- F — FLUSH FLOOR BOX
- S — SURFACE FLOOR BOX
- SPECIAL EQUIPMENT RECEPTACLE
- L — LOCKING RECEPTACLE
- TELEPHONE OUTLET
- DATA OUTLET
- TELEPHONE / DATA OUTLET
- FAX — FAX OUTLET
- F — FLUSH FLOOR TELEPHONE OUTLET
- S — SURFACE FLOOR TELEPHONE OUTLET
- TP — TELEPOWER POLE (T=telephone, P=power, C=computer)
- JUNCTION BOX
- WALL JUNCTION BOX
- PULL (JUNCTION) BOX
- UNDERFLOOR JUNCTION BOX
- JUNCTION BOX WITH FLEX PIGTAIL
- L — JUNCTION BOX UNDER CABINET LIGHTING (BY OTHERS)

CIRCUITING

- ELECTRICAL SERVICE
- TELEPHONE SERVICE
- CONDUIT
- UNDERGROUND CONDUIT
- "CONDUIT RUN CONTINUES" INDICATION
- CONDUIT STUB UP
- CONDUIT STUB DOWN
- END OF CONDUIT RUN
- END OF CONDUIT RUN, CAP AND STAKE
- WM — WIREMOLD AS SPECIFIED
- BD — BUS DUCT
- PP: 2 — CIRCUIT HOME RUN TO PANEL "PP".

POWER EQUIPMENT

- SINGLE PHASE MOTOR, # INDICATES HP
- THREE PHASE MOTOR, # INDICATES HP
- MOTORIZED DAMPER (BY M/C U.O.N.)
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSION
- VARIABLE FREQUENCY DRIVE
- T — TRANSFORMER, DRY (KVA shown)
- T OR — TRANSFORMER, PAD MOUNTED
- SPECIAL CONNECTION
- 30A FU — FUSED DISCONNECT (SAFETY) SWITCH. AMP RATING SHOWN. "F" - FUSED "C" - CIRC BRKR
- UNFUSED DISCONNECT (SAFETY) SWITCH
- COMBINATION FUSABLE SWITCH
- 50A — COMB FUSABLE STARTER/SWITCH - FULL VOLTAGE
- 50A — COMB FUSABLE STARTER/SWITCH - REDUCED VOLTAGE
- MAGNETIC STARTER (BY E/C U.O.N.)
- COMB. STARTER (BY E/C U.O.N.)
- PANELBOARD, 208/120V SURFACE MNT
- PANELBOARD, 480/277V SURFACE MNT
- PANELBOARD, 208/120V FLUSH MNT
- PANELBOARD, 480/277V FLUSH MNT
- M OR D — UTILITY METER, AS REQUIRED
- CT — CURRENT TRANSFORMERS
- SWITCHBOARD / MCC
- TTB — TELEPHONE TERMINAL BOARD
- GROUND CONNECTION PER N.E.C.
- WEATHERHEAD
- WW — WIREWAY
- TRANSFER SWITCH
- ENCLOSED CIRCUIT BREAKER
- C — CAPACITOR
- G OR GEN — GENERATOR, KW SHOWN
- TS OR TRANSFER SWITCH
- SWITCHBOARD, SHOWN WITH FUSIBLE SWITCHES
- SWITCHBOARD, SHOWN WITH CIRCUIT BREAKERS

SWITCHES

- $ — SINGLE-POLE SWITCH
- $3 — THREE-WAY SWITCH
- $4 — FOUR-WAY SWITCH
- $P — SWITCH WITH PILOT LIGHT
- $TO — THERMAL OVERLOAD SWITCH
- $M — MANUAL MOTOR SWITCH (FUSED)
- $K — KEY SWITCH
- $T — TIME SWITCH
- $D — DOOR-OPERATED SWITCH
- $WP — WEATHERPROOF SWITCH
- D — DIMMER SWITCH

ELECTRICAL ABBREVIATIONS

A	AMPS	LC	LIGHT CONTROL
AC	ABOVE COUNTER	LT	LIGHT
ACS	ACCESSIBLE CEILING SPACE	LTG	LIGHTING
ACU-	AIR CONDITIONING UNIT	LT FLEX	LIQUID TIGHT FLEX. METAL CONDUIT
AFF	ABOVE FINISHED FLOOR		
AHJ	AUTHORITY HAVING JURISDICTION	MAX	MAXIMUM
AHU-	AIR HANDLING UNIT	MC	MECHANICAL CONTRACTOR
AIC	AMPS INTERRUPTING CAPACITY	MCC	MOTOR CONTROL CENTER
AS	ABOVE SHELF	MIN	MINIMUM
ATS	AUTOMATIC TRANSFER SWITCH	MLO	MAIN LUG ONLY
		MT	MOUNT
B-	BOILER	MTD	MOUNTED
BC	BELOW COUNTER	MTG	MOUNTING
BLDG	BUILDING	MUAU-	MAKE-UP AIR UNIT
CHLR-	CHILLER	NC	NORMALLY CLOSED
CND (C)	CONDUIT	NIC	NOT IN CONTRACT
CKT	CIRCUIT	NL	NIGHT LIGHT
CKT BKR	CIRCUIT BREAKER	NO	NORMALLY OPEN
CT-	COOLING TOWER	NTS	NOT TO SCALE
CU-	CONDENSING UNIT		
CUH-	CABINET UNIT HEATER	P	POLE
		P-	PUMP
DFU-	DUCT FURNACE	PB	PULL BOX
DISC	DISCONNECT	PNL	PANEL
DWG	DRAWING	PRV-	POWER ROOF VENTILATOR
DWH-	DOMESTIC WATER HEATER	PVC	POLY VINYL CHLORIDE
		PWR	POWER
EBB-	ELECTRIC BASEBOARD		
EC	ELECTRICAL CONTRACTOR	RECEPT	RECEPTACLE
EF-	EXHAUST FAN	RGC	RIGID GALVANIZED STEEL CONDUIT
EMT	ELECTRICAL METALLIC TUBING	RTU-	ROOF TOP UNIT
EWC	ELECTRIC WATER COOLER		
EXIST (E)	EXISTING	SF-	SUPPLY FAN
		SPEC	SPECIFICATIONS
FLA	FULL LOAD AMPS	SW	SWITCH
FLEX	FLEXIBLE CONDUIT	SWBD	SWITCHBOARD
FLR	FLOOR		
FLUOR	FLUORESCENT	TCC	TEMPERATURE CONTROL CONTRACTOR
FU-	FURNACE	TR	TAMPER PROOF RECEPTACLE
		TS	TAMPER PROOF SWITCH
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GFI	GROUND FAULT INTERRUPTER		
GND	GROUND	UF	UNDER FLOOR
		UH-	UNIT HEATER
H-	HUMIDIFIER	UL	UNDERWRITERS' LABORATORIES, INC.
HID	HIGH INTENSITY DISCHARGE	UNO	UNLESS NOTED OTHERWISE
HOA	HAND-OFF-AUTO SWITCH		
HP	HORSEPOWER	V	VOLTS
HR	HOUR	VL	VERIFY LOCATION WITH OWNER
IG	ISOLATED GROUND	W	WATTS
IMC	INTERMEDIATE METAL CONDUIT	W/	WITH
		W/O	WITHOUT
JB	JUNCTION BOX	WP	WEATHER PROOF
		XFMR	TRANSFORMER

DEMOLITION NOTES

1. EXISTING LIGHT FIXTURE TO REMAIN.
2. EXISTING DEVICE TO REMAIN.
3. EXISTING EQUIPMENT TO REMAIN.
4. DISCONNECT & REMOVE EXISTING LIGHT FIXTURE. REMOVE ASSOCIATED CONDUIT & WIRE.
5. DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
6. DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.
7. DISCONNECT EQUIPMENT FOR REMOVAL BY OTHERS. REMOVE ASSOCIATED CONDUIT & WIRE.
8. DISCONNECT & RELOCATE EXISTING EQUIPMENT. EXTEND CONDUIT & WIRE TO NEW LOCATION.
9. DISCONNECT & RELOCATE EXISTING DEVICES. EXTEND EXISTING CONDUIT & WIRE TO NEW LOCATION.
10. DISCONNECT & REMOVE EXISTING LIGHT FIXTURES REINSTALL WHEN MECHANICAL WORK IS COMPLETED.
11. DISCONNECT & REMOVE EXISTING CONTROL PANEL. REMOVE ASSOCIATED CONDUIT & WIRE.
12.

ELECTRICAL PLAN NOTES:

1. JUNCTION BOX IN WALL WITH FLEX CONNECTIONS TO OFFICE FURNITURE. PROVIDE (6) CIRCUITS TO OFFICE FURNITURE. EC TO PROVIDE FINAL ELECTRICAL CONNECTIONS TO OFFICE FURNITURE
2. POWER CONNECTION TO SPECIFIED MACHINE. ALL WIRING TO BE CLASS 1, DIVISION 1
3. EXHAUST FAN TO OPERATE IN CONJUNCTION WITH LIGHTS
4. WALL MOUNT EXIT SIGN TYPE 'X2' CENTERED OVER DOORWAY. TIE INTO EXISTING GENERAL LIGHTING AHEAD OF SWITCHING. CLASS1, DIV. 1, WIRING, 227V.
5. WALL MOUNT WALL-PAK TYPE 'H' CENTERED OVER OVERHEAD DOOR AT APPROXIMATELY 18'-0" ABOVE GRADE. TIE INTO LIGHTING CIRCUITS, 227V. WALL PACKS NOT OVER DOORWAYS TO BE MOUNTED TO WALL AT 18'-0" ABOVE GRADE.
6. PROVIDE480 V, 3 PHASE POWER TO OVERHEAD DOOR OPERATOR CONTROL PANEL. RUN CONTROL WIRING TO DOOR OPERATOR CONTROL SWITCH AT 48" AFF AND TO DOOR INTERLOCK SAFETY DEVICE. CLASS 1, DIV. 1 INSTALLATION.
7. PROVIDE 480 V, 3 PHASE POWER TO MAIN LOCATED AT GRADE. PROVIDE WEATHERPROOF, 600V, 3 P FUSED SWITCH ON WALL NEAR UNIT. PROVIDE PROPERLY SIZED FUSES AND WIRE.
8. PROVIDE SIZE 1 COMBINATION, CLASS 1, DIV. 1 STARTER TO CONTROL EXHAUST FAN. STARTER TO BE 480V, 3 PHASE, 7½ HP, RED RUN PILOT, ON-OFF SWITCH. RUN POWER TO NON-FUSED, WEATHERPROOF, 30A, 600V SWITCH ON ROOF NEAR EXHAUST FAN FOR DISCONNECT.

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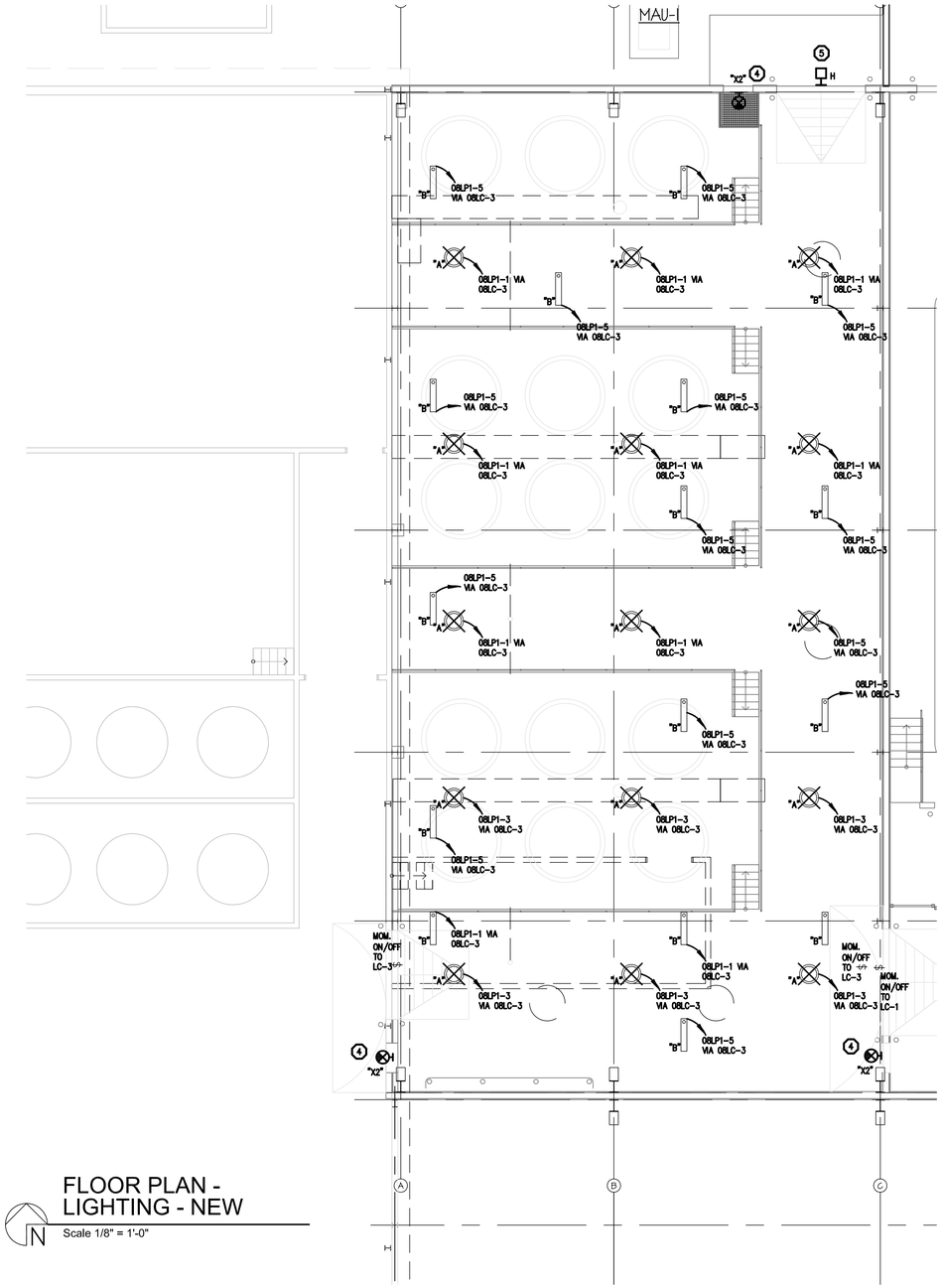
ELECTRICAL SYMBOLS & NOTES

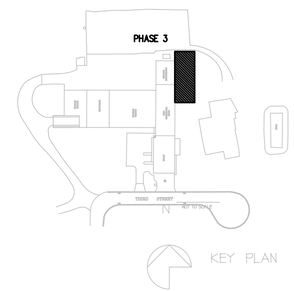
E100

LIGHT FIXTURE SCHEDULE								
TYPE	MANUFACTURER	MODEL NUMBER	LAMPS	INPUT WATTS	INPUT VOLTS	DESCRIPTION	NOTES	TAG
A	RIG A LITE	SXP40H04-GG-C	M59 400W MH	430	277	METAL HALIDE AREA LIGHT, CLASS 1, DIV. 1 LIGHT FIXTURE		A
B	RIG A LITE	XP265-4-2L-C-EM	(2) F32 T8	72	277	FLUORESCENT (2) F32 T8 LAMP CLASS 1, DIV. 1 LIGHT FIXTURE W/ EM BALLAST		B
C	LITHONIA	2SP G B 3 32 A12 MVOLT	(3) F32 T8	108	120	2x4 FLUORESCENT (3) F32 T8 LAMP PRISMATIC TROFFER		C
D	LITHONIA	SP G B 2 32 A12 MVOLT	(2) F32 T8	72	120	1x4 FLUORESCENT (3) F32 T8 LAMP PRISMATIC TROFFER		D
F	LITHONIA	LF6 2/18DTT FBLF3 MVOLT	(2) 18W DTT	39	120	6" SHOWER RECESSED 18W FLUORESCENT		F
G	LITHONIA	WP 2 32 MVOLT	(2) F32 T8	72	120	WALL MOUNT 4' (2) F32 T8 LAMP WALL MOUNT		G
H	LITHONIA	TWH-250M-MVOLT-PE	(1) 250W MH	300	120/277	METAL HAUDE WALL PACK		H
J	PHEONIX	DLX-70MH-277	(1) 70W MH	84	277	METAL HAUDE DOCK LITE CLASS 1, DIV. 1		J
X1	LITHONIA	LQC W 1 R EL N	INCLUDED LED	0.7	277			X1
X2	RIG A LITE	XPEX LED sign / exit sign	INCLUDED LED	0.7	277	CLASS 1, DIVISION 1 EXIT SIGN		X2



FLOOR PLAN - LIGHTING - NEW

Scale 1/8" = 1'-0"



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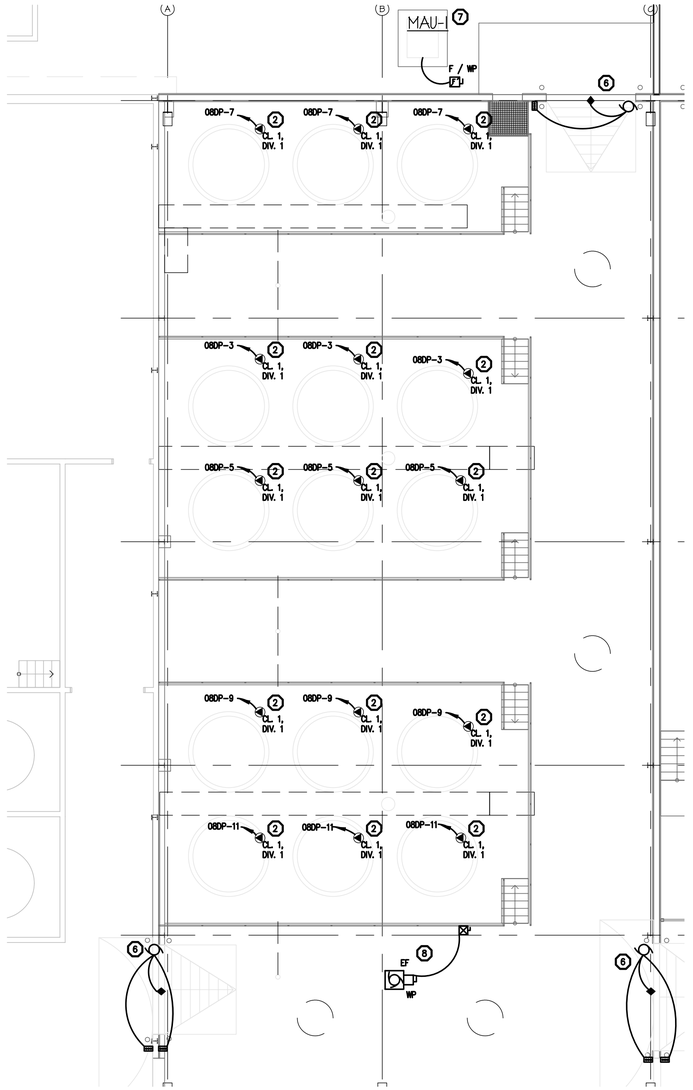
JOB NUMBER
09024C

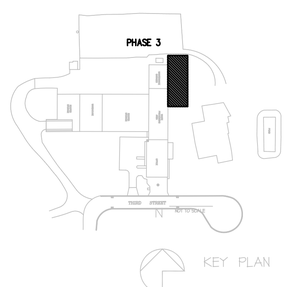
PHASE 3 LIGHTING PLAN

E400



FLOOR PLAN -
POWER - NEW

Scale 1/8" = 1'-0"



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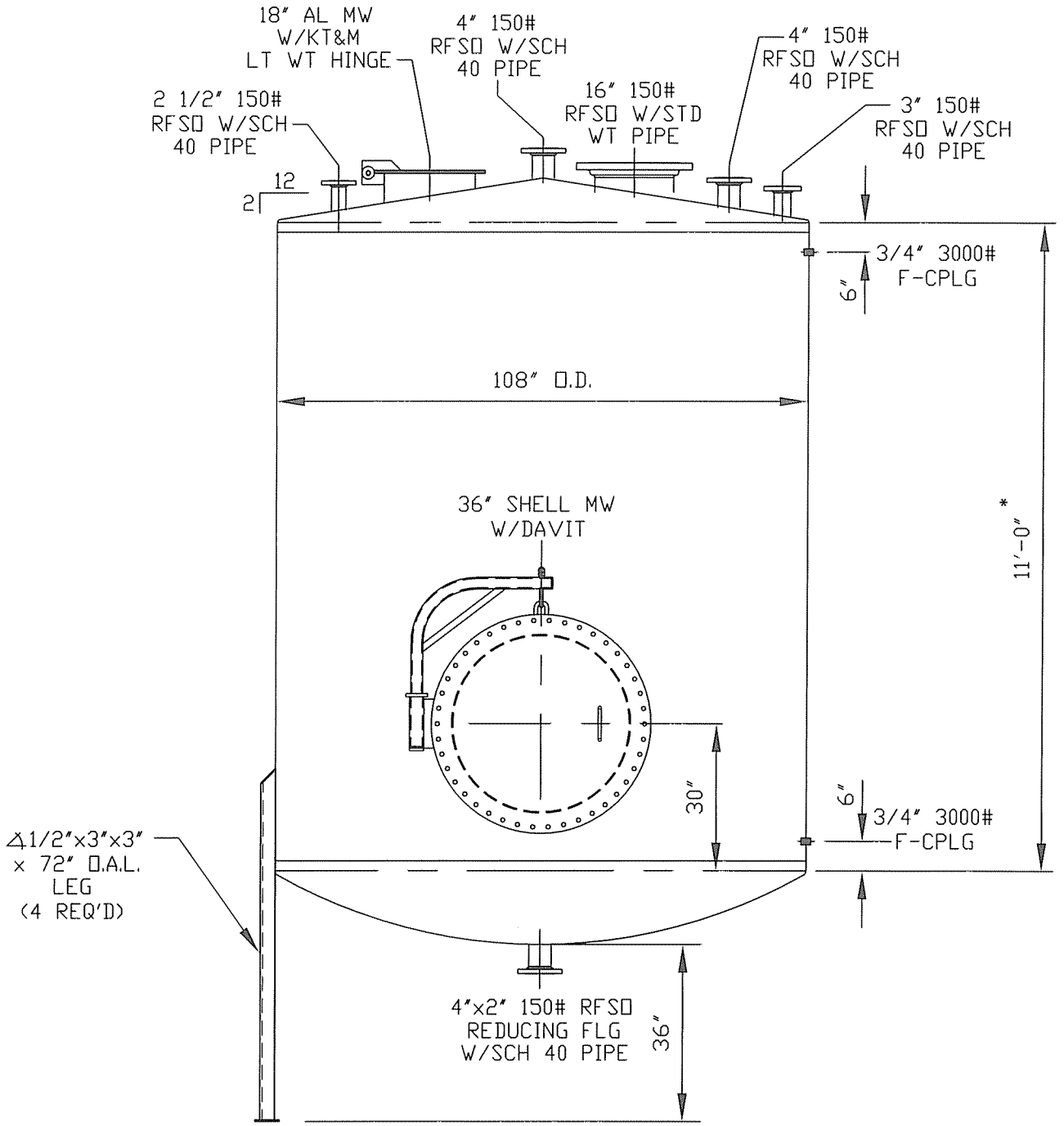
ph: 269-321-5151
www.boscharch.com

JOB NUMBER
09024C

PHASE 3
POWER
PLAN

E500



* Tank height 11'-0" for 5000 gal. nominal
Tank height 13'-0" for 6000 gal. nominal
BR 082410

FOR: *DRUG & LABORATORY DISPOSAL, INC.*		
REVISIONS	CAD: *MJM*	KENNEDY
NO. DATE BY	APP'D BY: --	
1	QC: *REN*	DRAWING NO.: PKBQUOTE2
2	DATE: 12/16/09	
3	JOB NO.: --	SHEET 1 OF 1
QUANTITY ONE	PLOT SCALE: 3/8'=12"	

FORM EQP 5111 TEMPLATE

C1: USE AND MANAGEMENT OF CONTAINERS

(Volume 3)

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's *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 299.9614 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), 270.15, and Part 264, Subpart I, establish requirements for the use and management of containers. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses requirements for the use and management of containers at the *DLD Environmental Services, Inc. (DLD)* facility in *Plainwell*, Michigan. This template addresses the condition of containers, compatibility of waste with containers, management of containers, inspections, containment, special requirements for ignitable or reactive waste, special requirements for incompatible wastes, and closure.

(Check as appropriate)

Applicant for Operating License for Existing Facility:

☐ R 299.9614 use and management of containers

Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility:

☒ R 299.9614 use and management of containers

Table of Contents

This template is organized as follows:

INTRODUCTION

Reference is made to Volume 1, Attachment C1 - “Introduction”

C1.A DESCRIPTION OF CONTAINERS
[R 299.9614 and 40 CFR §264.171]

Reference is made to Volume 1, Attachment C1.A

C1.B CONDITION OF CONTAINERS
[R 299.9614 and 40 CFR §264.171]

Reference is made to Volume 1, Attachment C1.B

C1.C COMPATIBILITY OF WASTE WITH CONTAINERS
[R 299.9614 and 40 CFR §264.172]

Reference is made to Volume 1, Attachment C1.C

C1.D MANAGEMENT OF CONTAINERS
[R 299.9614 and 40 CFR §264.173]

Reference is made to Volume 1, Attachment C1.D

C1.E INSPECTIONS
[R 299.9614 and 40 CFR §264.174]

Reference is made to Volume 1, Attachment C1.E

C1.F CONTAINMENT

[R 299.9614 and 40 CFR §§264.175 and 270.15]

C1.F.1 Secondary Containment System Design and Operation for Containers with Free Liquids

[R 299.9614 and 40 CFR §§264.175(a) and 270.15(a)]

Detailed design drawings for the DLS-7 secondary containment systems are provided in Volume 3, Section B6.

C1.F.1(a) Requirement for Base or Liner

[R 299.9614 and 40 CFR §§264.175(b)(1) and 270.15(a)(1)]

Reference is made to Volume 1, Attachment C1.F.1(a)

C1.F.1(b) Containment System Drainage

[R 299.9614 and 40 CFR §§264.175(b)(2) and 270.15(a)(2)]

DLS-7 consists of a main work-level floor and three recessed tank vaults. The work-level floor is designed with drains that channel liquids to collection vessels within the tank vaults. Each vault has been designed with blind collection sumps to facilitate removal of accumulated liquids.

C1.F.1(c) Containment System Capacity

[R 299.9614 and 40 CFR §§264.175(b)(3) and 270.15(a)(3)]

DLD proposes to a store a maximum volume of 105,600 gallons of waste in DLS-7 – 90,000 gallons of which may be stored in the tank system and 6,600 gallons of additional waste that may be stored in containers. The total containment capacity of DLS-7 will be 105,925 gallons, which exceeds the proposed storage volume. (see DLS-7 floor plan drawing in Volume 3, Attachment B6-70.2, and containment calculations shown in Volume 3, Attachment C1-70)

Note: The containment system capacity is greater than 100% of the volume of the largest tank and is greater than 10% of the volume of containers.

C1.F.1(d) Control of Run-on

[R 299.9614 and 40 CFR §§264.175(b)(4) and 270.15(a)(4)]

Reference is made to Volume 1, Attachment C1.F.1(d)

C1.F.1(e) Removal of Liquids from Containment System

[R 299.9614 and 40 CFR §§264.175(b)(5) and 270.15(a)(5)]

Reference is made to Volume 1, Attachment C1.F.1(e)

C1.F.2 Secondary Containment System Design and Operation for Containers with No Free Liquids

[R 299.9614 and 40 CFR §§264.175 and 270.15(b)(1)]

Within DLS-7, DLD shall manage containers with no free liquids using the operating guidelines presented in Section C1.F.1.

C1.F.2(a) Containment System Drainage

[R 299.9614 and 40 CFR §§264.175 and 270.15(b)(2)]

Within DLS-7, DLD shall manage containers with no free liquids using the operating guidelines presented in Section C1.F.1.

C1.F.2(b) Containment Management

[R 299.9614 and 40 CFR §§264.175 and 270.15(b)(2)]

Within DLS-7, DLD shall manage containers with no free liquids using the operating guidelines presented in Section C1.F.1.

C1.G SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE

[R 299.9614 and 40 CFR §§264.176 and 270.15(b)(2)]

Reference is made to Volume 1, Attachment C1.G.

C1.H SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTES

[R 299.9614 and 40 CFR §§264.177(c) and 270.15(b)(2)]

Reference is made to Volume 1, C1.H, with the addition of the following information specific to DLS-7:

4. For the DLS-7 containment area, the separation for incompatibile materials is illustrated in Volume 3, Attachment C1-71, showing Sections 1 and 2 which provide separation for incompatible materials. [R 299.9614 and 40 CFR §264.177(c)]

   Note: Reactive wastes will not be stored in DLS-7.

C1.I CLOSURE

[R 299.9614 and 40 CFR §264.178]

Reference is made to Volume 1, Attachment C1.I

C1: Containers

Index of Attachments

ATTACHMENT	DESCRIPTION
C1-70	Spreadsheet DLS-7 Vault & Secondary Containment Capacity Calculations
C1-71	DLS-7 Storage Area Allocation

DLS-7 Vault and Secondary Containment Capacity Calculations

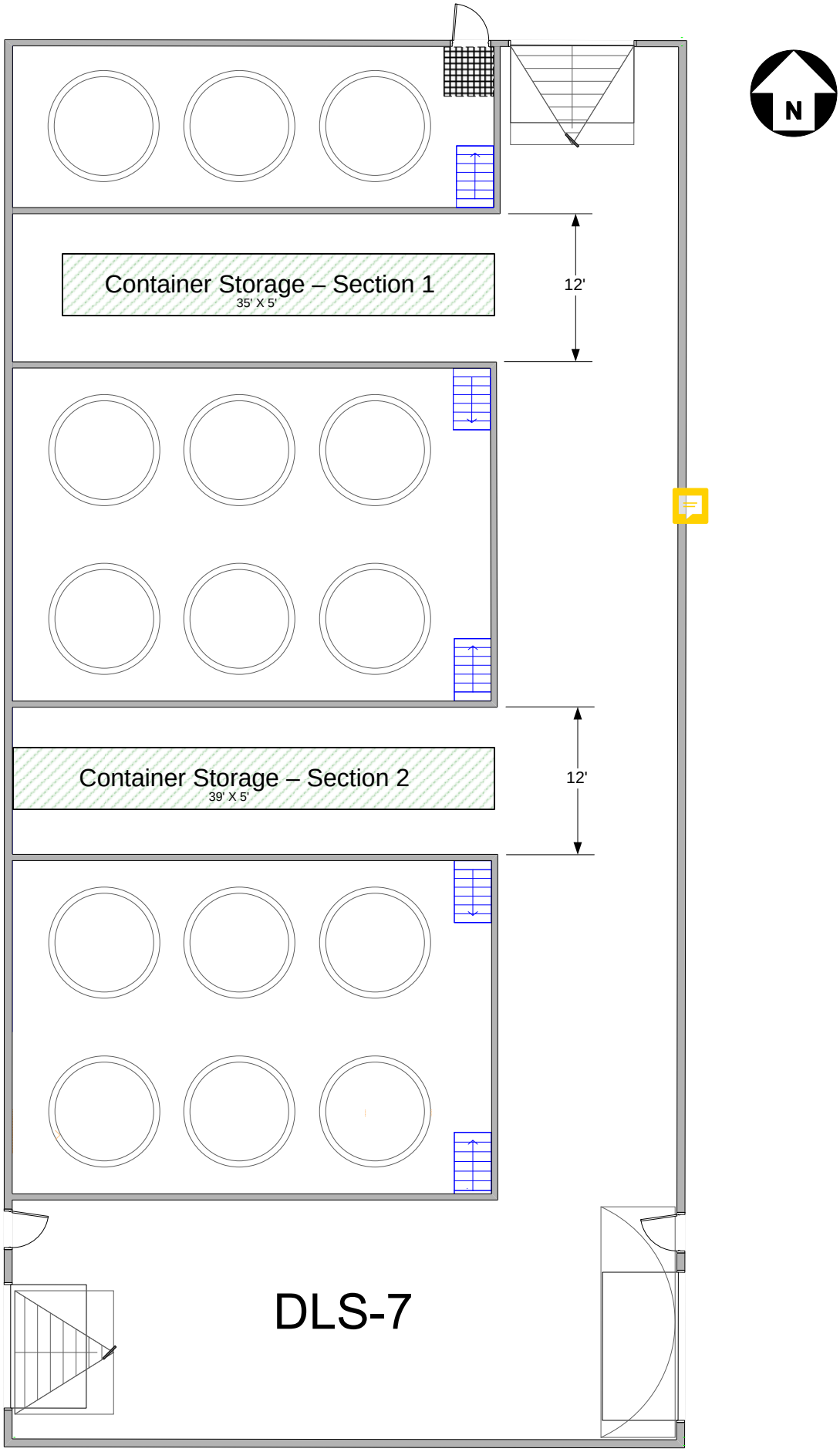
* All Lengths are East/West Measurements
* All Widths are North/South Measurements

Length (ft)	Width (ft)	Height (ft)	Number of	+ Volume (	- Volume (ft^3)	
Tank Farms						
38.83	26.67	4.67	2	9672		Tank farms w/ 6 tanks
38.83	13	4.67	1	2358		Tank farm w/ 3 tanks
Area's Secondary Containment						
39.5	11.92	0.67	2	631		Area between tank farms
39.5	19.17	0.67		507		South of southern most tank farm
14	112.67	0.67		1057		East of all tank farms
Ramps						
10	6	0.67			20	Ramp exiting North
6	12	0.67			24	Ramp exiting East
6	10	0.67			20	Ramp exiting West
				14,224	64	

DLS - 7 - Each Tank Farm

Total Volume (ft^3)	14,160
Total Volume (gal)	**105,925**

Volume 3, Attachment C1-71 Storage Area Allocation



FORM EQP 5111 ATTACHMENT C2

C2: TANK SYSTEMS

(Volume 3)

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 template addresses requirements for tank systems at the DLD Environmental Services, Inc facility in Plainwell, Michigan. This template 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 template is organized as follows:

(Check as appropriate)

☐ Existing Tank System

☒ New Tank System

This template is organized as follows:

C2.A ASSESSMENT OF EXISTING TANK SYSTEM

This Volume 3 pertains to new tanks. This Section is not applicable.

C2.B ASSESSMENT OF NEW TANK SYSTEM

C2.B.1 Design Standards

C2.B.2 Dimensions and Capacity of Each Tank

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

- C2.B.3(a) Feed
- C2.B.3(b) Safety Cutoff or Bypass Systems
- C2.B.3(c) Pressure Controls

C2.B.4 Diagram of Piping, Instrumentation, and Process Flow

C2.B.5 Characteristics of Waste

C2.B.6 External Corrosion Protection

C2.B.7 Protection from Vehicular Traffic

C2.C INSTALLATION OF NEW TANK SYSTEMS

C2.C.1 Proper Handling Procedures

- C2.C.1(a) Installation Inspectors
- C2.C.1(b) Installation Inspection Procedures
- C2.C.1(c) Repairs

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- C2.C.2(a) Backfill Material
- C2.C.2(b) Backfill Placement

C2.C.3 Pre-service Tank and Ancillary Equipment

- C2.C.3(a) Tanks
- C2.C.3(b) Piping
- C2.C.3(c) Repairs

C2.C.4 Ancillary Equipment Installation

C2.C.5 Corrosion Protection Installation

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C2.D.2 Secondary Containment Type and Performance Criteria

C2.D.3 Design Parameters

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C2.D.3(b) Foundation Integrity

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C2.D.5 Vault Systems Requirements

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C2.D.5(c) Joint Construction

C2.D.5(d) Coating or Lining for Concrete

C2.D.5(e) Prevention of Vapor Formation and Ignition

C2.D.5(f) Exterior Moisture Barrier

C2.D.6 Double-walled Tank Requirements

C2.D.7 Ancillary Equipment with Secondary Containment

C2.D.7(a) Secondary Containment Type and Performance Criteria

C2.D.7(b) Design Parameters

C2.D.7(c) Exempted Ancillary Equipment and Inspections

C2.D.8 Requirements for Tank Systems That Are Not in Compliance with Secondary Containment

C2.D.8(a) Aboveground Tanks

C2.D.8(b) Underground Tanks

C2.E VARIANCES FOR SECONDARY CONTAINMENT

Not Applicable: No Variances Requested, for proposed tanks in Volume 3.

C2.F CONTROLS AND PRACTICES TO PREVENT SPILLS AND OVERFILLS

C2.F.1 Spill Prevention Controls

C2.F.2 Overfill Prevention Controls

C2.F.3 Freeboard Maintenance

C2.G INSPECTIONS

C2.G.1 Schedule and Procedures for Overfill Control System Inspections

C2.G.2 Daily Inspections of Aboveground Portions of Tank Systems and Monitoring and Leak Detection Data

C2.G.3 Daily Inspection of Construction Materials, Local Areas, and Secondary Containment System for Erosion and Leakage

C2.G.4 Inspection of Cathodic Protection Systems

C2.G.5 Inspection Requirements Before Full Secondary Containment is Provided

C2.G.5(a) Nonenterable Underground Tanks

C2.G.5(b) Other than Nonenterable Underground

C2.G.5(c) Ancillary Equipment

C2.G.6 Reporting Requirements

C2.H RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF LEAKING OR UNFIT-FOR-USE TANK SYSTEMS

C2.H.1 Response Actions for Leaks and Spills

C2.H.1(a) Waste Flow Stoppage

C2.H.1(b) Waste Removal

C2.H.1(c) Visible Release Containment

C2.H.1(d) Repair, Replacement, or Closure

C2.H.1(e) Certification of Major Repairs

C2.H.2 Required Notifications and Reports

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C2.I.1 Category A

C2.I.1(a) Closure Plan

C2.I.1(b) Closure Activities

C2.I.1(c) Cost Estimate for Closure

C2.I.1(d) Financial Assurance for Closure

C2.I.2 Category B

Not Applicable

C2.I.3 Category C

Not Applicable

C2.I.4 Category D

Not Applicable

C2.J SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

C2.J.1 Ignitable or Reactive Wastes Precautions

C2.J.2 Distance Requirements for Ignitable or Reactive Wastes

C2.J.3 Incompatible Wastes

C2.A ASSESSMENT OF EXISTING TANK SYSTEM
[R 299.9615(1) and 40 CFR, Part 264, Subpart J]

This section is Not Applicable to this license.

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

C2.B.1 Design standards
[R 299.9615(1) and 40 CFR §264.192(a)(1)]

The tanks for the DLS-7 containment area were designed by the Kennedy Tank and Manufacturing Co., Inc. of Indianapolis, IN with the intent to house ignitable wastes. The tanks will be built using stainless steel following the criteria of the American Welding Society for stainless weldments of non-pressure vessels, structural design to Kennedy Tank and Manufacturing standards, and in accordance with American Institute of Steel Construction codes and specifications (see Volume 3, Attachment B6-71).

C2.B.2 Dimensions and Capacity of Each Tank
[R 299.9615(1) and 40 CFR §270.16(b)]

The proposed nominal capacity of the tank design is 6000 gallons with an actual capacity of 6,286 gallons. The dimensions and appurtenances are enumerated in Volume 3, Attachment C2-70.

C2.B.3 Description of Feed Systems, Safety Cutoff, Bypass System, and Pressure Controls
[R 299.9615(1) and 40 CFR §270.16(c)]

Reference is made to Volume 1, Section C2.A.3.

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

Reference is made to Volume 1, Section C2.A.3(a).

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

Reference is made to Volume 1, Section C2.A.3(b).

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

Reference is made to Volume 1, Section C2.A.3(c).

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

See Volume 3, Attachments B6-70.7.1 - B6-70.7.6 and B6-70.8.1 - B6-70.8.5 for diagrams of the piping system.

C2.B.5 Characteristics of Waste
[R 299.9615(1) and 40 CFR §264.192(a)(2)]

Reference is made to Volume 1, Section C2.A.5, with the addition of the following information specific to DLS-7:

> The tanks for the DLS-7 containment area are dish-bottom design and may employ mixing units to prevent the accumulation of solids in the bottom of the tanks.

C2.B.6 External Corrosion Protection
[R 299.9615(1) and 40 CFR §264.192(a)(3)]

Not Applicable.

C2.B.7 Protection from Vehicular Traffic
[R 299.9615(1) and 40 CFR §264.192(a)(4]

Not Applicable.

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

The installation of the new tank system and component installation will be supervised by professional engineers to insure proper installation procedure is used. A written certification statement will be prepared by the professional engineers involved in the installation.

C2.C.1 Proper Handling Procedures
[R 299.9615(1) and 40 CFR §264.192(b)]

C2.C.1(a) Installation Inspectors
[R 299.9615(1) and 40 CFR §264.192(b)]

Qualifications for the inspector(s) or engineer(s) overseeing the installation shall be provided prior to commencement of the tank system and component installation.

C2.C.1(b) Installation Inspection Procedures
[R 299.9615(1) and 40 CFR §264.192(b)]

Procedures to inspect the tank systems and components for weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, and other structural damage or inadequate construction/installation will be determined and presented to DLD Environmental Services, Inc by the inspector(s)/engineer(s) overseeing the installation prior to the commencement of installation.

C2.C.1(c) Repairs
[R 299.9615(1) and 40 CFR §264.192(b)]

Prior to placing any portion of the tank system in use, all discrepancies in the tank system and components identified by the inspector(s)/engineer(s) overseeing the installation shall be repaired.

C2.C.2 Backfilling Underground Tank or Components
[R 299.9615(1) and 40 CFR §264.192(c)]

Not Applicable.

C2.C.2(a) Backfill Material
[R 299.9615(1) and 40 CFR §264.192(c)]

Not Applicable.

C2.C.2(b) Backfill Placement
[R 299.9615(1) and 40 CFR §264.192(c)]

Not Applicable.

C2.C.3 Pre-Service Tank and Ancillary Equipment
[R 299.9615(1) and 40 CFR §264.192(d)]

The tank system is designed for operation at atmospheric pressure and will be operated as such.

C2.C.3.a Tanks
[R 299.9615(1) and 40 CFR §264.192(d)]

Each tank will be filled tested prior to use. The test will consist of filling a tank with water, holding it full for 48 hours, and inspecting for leaks on all surfaces. The water will then be transferred to the remaining tanks in 48 hour intervals and the inspection of leaks will be repeated for each tank. Results for the leak tests will be recorded.

C2.C.3(b) Piping
[R 299.9615(1) and 40 CFR §264.192(d)]

Concurrent with the leak testing for the tanks, the piping will also be leak tested. During the filling and transfer of water in each of the tanks, the piping and ancillary equipment will be inspected for leaks. As the water is being transferred through the tank system and for each 48 hour storage interval, the pipes and ancillary equipment will be inspected for leaks. This leak inspection will be repeated each time the water is transferred from tank to tank. Results for the leak test will be recorded.

C2.C.3(c) Repairs
[R 299.9615(1) and 40 CFR §264.192(d)

All repairs of detected leaks will be supervised by the inspector(s)/engineer(s) overseeing the project. Repair of detected leaks will be recorded.

C2.C.4 Ancillary Equipment Installation
[R 299.9615(1) and 40 CFR §264.192(e)]

The piping, valves, and transfer equipment will be installed to National Plumbing Code using proper industry standards materials. Non-rigid hangers and independent pipe brackets will be employed to permit settlement, expansion, and contraction without stress build-up or vibration transfer.

C2.C.5 Corrosion Protection Installation
[R 299.9615(1) and 40 CFR §264.192(f)]

The storage tanks shall be constructed of corrosion resistant stainless steel. Each tank is to be emptied yearly and inspected by an independent professional engineer. No other corrosion protection is employed.

C2.C.6 Certification of Design and Installation
[R 299.9615(1) and 40 CFR §264.192(g)]

DLD Environmental Services, Inc will maintain all written statements and certifications required under 40 CFR 264.192(g), including the requirements from 40 CFR 264.192 (b) through (f) and 40 CFR 270.11(d), in its operating record.

C2.C.7 Description of Tank System Installation
[R 299.9615(1) and 40 CFR §270.16(f)]

Tank system installation procedures will be submitted by the inspector(s)/engineer(s) overseeing the project prior to the commencement of the installation process.

C2.C.8 Tank Labels
[R 299.9615]

The new tank system will be labeled in accordance to the provisions of NFPA Standard No. 704. Examples of the labeling to be placed on the tanks are provided in Volume 1, Attachment C2-6.

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 the new tank system (see Volume 3, Attachment B6-70.5), including the tanks and ancillary equipment, shall be implemented in accordance with 40 CFR 264.193(a).

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

- ☐ *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 DLS-7 containment area will house three tank vaults, two capable of holding six storage tanks and one capable of holding three storage tanks. Each vault is designed to comply with the requirements of 40 CFR 270.16 (a) through (f) and 40 CFR 264 Subpart J. For design specifications see Volume 3, Attachment B6-70.7.4.

Each vault within the DLS-7 containment area shall be constructed using the following parameters:

(1) The vault walls will be 8" reinforced, 3500 psi, 4%-6% air entrained, poured concrete with 2% calcium stearate hydrophobic additive (see Volume 1, Attachments C1-4.3 and C1-4.4).

(2) The floor of the vault will be 12" reinforced, 4000 psi, 4%-6% air entrained, poured concrete with stainless steel fiber and 2% calcium stearate hydrophobic additive.

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

The concrete is compatible with the materials that are designated to be stored in the stainless steel storage tanks, but if necessary for added protection against deterioration, a two -part, chemically resistant epoxy will be applied to the walls and floors of each vault.

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

The vault floor is designed to support full tank static loads and single tank eccentric loads.

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

Reference is made to Volume 1, Section C2.D.3(c)

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

Reference is made to Volume 1, Section C2.D.3(d)

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

Reference is made to Volume 1, Section C2.D.4

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

C2.D.5(a) Capacity
[R 299.9615(1) and 40 CFR §264.193(e)(2)(i)]

Each of the two proposed six-tank vaults within the DLS-7 containment area are designed to hold 36,176 gallons and the proposed three-tank vault is designed to hold 17,639 gallons (see Volume 3, Attachment C1-70, Vault And Secondary Containment Capacity Calculations). This capacity exceeds the 6,000 gallon capacity of each of the tanks that may be placed in the vault.

C2.D.5(b) Stormwater Control
[R 299.9615(1) and 40 CFR §264.193(e)(2)(ii)]

Storm water run-on in the DLS-7 containment area will not be appreciable because it will be fully enclosed. Access to the exterior is accomplished via a ramp over 6" curbing, with the exterior grade sloping away from the access doors (see Volume 3, Attachment B6-70.5).

C2.D.5(c) Joint Construction
[R 299.9615(1) and 40 CFR §264.193(e)(2)(iii)]

The joints in each vault in DLS-7 will utilize chemical resistant dumbbell waterstops to insure containment of accumulated liquids until removal can be performed (see Volume 3, Attachment B6-70.6).

C2.D.5(d) Coating or Lining for Concrete
[R 299.9615(1) and 40 CFR §264.193(e)(2)(iv)]

The concrete used in the construction of each vault will contain an additive which gives it inherent liquid repellant and chemical resistant properties (see Volume 1, Attachments C1-.4.3, C1-4.4, C1-4.5, and C1-4.6). As an added measure of insurance against seepage and corrosion, if necessary, the floor and walls of each vault within DLS-7 will be coated with a two-part epoxy sealant. This coating will be compatible with the materials that will be encountered in our tank storage operations.

C2.D.5(e) Prevention of Vapor Formation and Ignition
[R 299.9615(1) and 40 CFR §264.193(e)(2)(v)]

Reference is made to Volume 1, C2.D.5(e), with the addition of the following information specific to DLS-7:

See Volume 3, Attachment B6-70.8 for DLS-7 vent system diagrams.

C2.D.5(f) Exterior Moisture Barrier
[R 299.9615(1) and 40 CFR §264.193(e)(2)(vi)]

DLD does not employ an exterior moisture barrier. The vaults within DLS-7 are not subject to hydraulic pressure and will be constructed using a hydrophobic concrete additive and dumbbell waterstops at all joints. These factors preclude the need for an exterior moisture barrier.

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

Reference is made to Volume 1, Section C2.D.6

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

Secondary containment is not required for the tank system within DLS-7. Ancillary equipment in the tank system will all be above ground and will be visually inspected each day of facility operation. However, secondary containment is provided as precaution and relevant information is presented in Volume 3, Section C1.F: Containment.

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

Reference is made to Volme 1, Section C2.D.7(a)

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

Reference is made to Volme 1, Section C2.D.7(b)

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

Reference is made to Volme 1, Section C2.D.7(c)

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

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

Not Applicable.

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

Not Applicable. DLD does not employ underground tanks

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

Not Applicable: No Variances Requested, for proposed tanks in Volume 3

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)]

Reference is made to Volume 1, Section C2.F.1

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

Reference is made to Volume 1, Section C2.F.2

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

Reference is made to Volume 1, Section C2.F.3

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

Inspection procedures for the tank system enumerated here are also documented in Volume 1, Section A5.

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

Reference is made to Volume 1, Section C2.G.1

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)]

Reference is made to Volume 1, Section C2.G.2

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)]

Reference is made to Volume 1, Section C2.G.3

C2.G.4 Inspection of Cathodic Protection Systems

Reference is made to Volume 1, Section C2.G.4

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

Reference is made to Volume 1, Section C2.G.5

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

Reference is made to Volume 1, Section C2.G.6

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]

C2.H.1 Response Actions for Leaks and Spills

[R 299.9615(1) and 40 CFR §264.196(a)]

Reference is made to Volume 3, Section A7

C2.H.1(a) Waste Flow Stoppage

[R 299.9615(1) and 40 CFR §264.196(a)]

Reference is made to Volume 3, Section A7

C2.H.1(b) Waste Removal

[R 299.9615(1) and 40 CFR §264.196(b)]

Reference is made to Volume 3, Section A7

C2.H.1(c) Visible Release Containment

[R 299.9615(1) and 40 CFR §264.196(c)]

Reference is made to Volume 3, Section A7

C2.H.1(d) Repair, Replacement, or Closure

[R 299.9615(1) and 40 CFR §264.196(e)]

Reference is made to Volume 3, Section A7

C2.H.1(e) Certification of Major Repairs

[R 299.9615(1) and 40 CFR §264.196(f)]

Reference is made to Volume 3, Section A7

C2.H.2 Required Notifications and Reports

[R 299.9615(1) and 40 CFR §264.194(d)]

Reference is made to Volume 3, Section A7

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

See Volume 3, Section A11, Closure and Postclosure Plan.

(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]

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

Reference is made to Volume 3, Section A11, Closure and Postclosure Plan.

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

Reference is made to Volume 3, Section A11, Closure and Postclosure Plan.

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

Reference is made to Volume 3, Section A12 Closure and Postclosure Cost Estimates.

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

Reference is made to Volume 3, Section A15

C2.I.2 Category B
[R 299.9615(1) and 40 CFR §264.197]

Reference is made to Volume 1, Section C2.I.2

C2.I.3 Category C
[R 299.9615(1) and 40 CFR §264.197]

Reference is made to Volume 1, Section C2.I.3

C2.I.4 Category D
[R 299.9615(1) and 40 CFR §264.197]

Reference is made to Volume 1, Section C2.I.4

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

DLD tank system are designed specifically for the storage of ignitable wastes. Special consideration is given to prevent conditions which may cause the waste to ignite.

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

Reference is made to Volume 1, Section C2.J.1

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

Reference is made to Volume 1, Section C2.J.2

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

Reference is made to Volume 1, Section C2.J.3

C2: TANKS ATTACHMENT INDEX

(Volume 3)

ATTACHMENT	DESCRIPTION
C2-70	Tank Capacity and Appurtenances

Attachment C2-70

Tank Capacity and Appurtenances

TANK DESCRIPTION

Tank Designation	Shape	Materials of Construction	Inside Diameter (feet)	Nominal Capacity (gallons)	Nominal Capacity (gallons)	Maximum Capacity (gallons)	Wall Thickness (inches)
Tanks #7 - #21	Cylindrical	stainless steel	9	13	6,000	6,286	0.1875

APPURTANENCE DESCRIPTION

Tanks Designation	Appurtenance Type	Size (inches)	Location	Comments
Tanks #7 - #21	API-650 Shell Manway	36	Shell	See Volume 3, Appendix B6-71
	Top Hatch	18	Top	See Volume 3, Appendix B6-71
	Mixer Nozzle	4"	Top	See Volume 3, Appendix B6-71
	Fill Pipe Nozzle	3"	Top	See Volume 3, Appendix B6-71
	Fan Nozzle	16"	Top	See Volume 3, Appendix B6-71
	Alarm Nozzle	2.5 "	Top	See Volume 3, Appendix B6-71
	Air Emissions Nozzle	4"	Top	See Volume 3, Appendix B6-71
	Sampling Nozzles (4)	0.75"	Shell	See Volume 3, Appendix B6-71
	Drain Nozzle	4"	Bottom	See Volume 3, Appendix B6-71

C4: TREATMENT

(Volume 3)

Table of Contents

This template is organized as follows:

C4: TREATMENT

(Volume 3)

C4.A LAB PACKING

Lab packing conducted in the DLS-7 Containment Area will follow the guidelines presented in Volume 1, Section C4.A, Lab Packing. Lab packing activities will be conducted in the areas indicated in the Storage Area Allocation diagram (Volume 3, Attachment C1-71) that are not occupied by containers of stored waste.

C4.B COMMINGLING

Reference is made to Volume 1, Section C4.B.

C4.G STORAGE

See Volume 3, Attachment C1, Containers, for storage information.

FORM EQP 5111 Template

C13: AIR EMISSIONS FROM EQUIPMENT LEAKS, TANKS, AND CONTAINERS

(Volume 3)

See Volume 1

C13: Air Emissions from Equipment Leaks, Tanks, and Containers

FORM EQP 5111 TEMPLATE MODULE C11 - SUBPART BB

C13-BB: AIR EMISSIONS FROM EQUIPMENT LEAKS

(Volume 3)

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.

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 299.9504, R 299.9508, R 299.9605, and R 299.9631; and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart BB, and 40 CFR §270.25 establish requirements for controlling organic air emissions from equipment leaks. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses air emission control requirements for equipment leaks at the hazardous waste management facility for the Drug & Laboratory Disposal, Inc. facility in Plainwell, Michigan.

(Check as Appropriate)

☐ Applicant for Operating License for Existing Facility

☒ Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility

☒ Equipment Subject 40 CFR Part 264, Subpart BB (R 299.9631)

☐ No Equipment Exists That Is Subject to 40 CFR Part 264, Subpart BB (R 299.9631)

☐ Applicant Elects to Document Compliance with the Relevant Provisions of the Regulations at 40 CFR Part 60, Part 61, or Part 63 Rather than 40 CFR Part 264, Subpart BB

This template is organized as follows:

C11.B AIR EMISSIONS FROM EQUIPMENT LEAKS

C11.B.1 Waste Streams

C11.B.1(b) Organic Concentration Determination Via Process Knowledge

C11.B.1(c) Date and Frequency of Determination

C11.B.1(d) Light or Heavy Liquid Designation

C11.B.2 Equipment Identification

C11.B.3 Equipment with No Detectable Emissions

C11.B.3(a) Identification Numbers

C11.B.3(b) Monitoring Procedures

C11.B.3(d) Pump Standards

C11.B.3(f) Valve Standards

C11.B.4(g)(3)(iv) Total Organic Compound Mass Flow Rate

C11.B.4(g)(3)(v) Total Organic Compound Emissions

C11.B.5 Pumps in Light Liquid Service

C11.B.10 Valves in Gas/Vapor Service or in Light Liquid Service

C11.B AIR EMISSIONS FROM EQUIPMENT LEAKS

[R 299.9631 and 40 CFR Part 264, Subpart BB]

☒ Pumps in Light Liquid Service

☐ Compressors

☐ Pressure Relief Devices in Gas or Vapor Service

☐ Sampling Connection Systems

☐ Open-ended Valves or Lines

☒ Valves in Gas or Vapor or Light Liquid Service

☐ Pumps and Valves in Heavy Liquid Service

☒ Flanges and Other Connectors

C11.B.1 Waste Streams

[R 299.9631 and 40 CFR §264.1050(b)]

C11.B.1(b) Organic Compound Concentration Determination Via Process Knowledge

[R 299.9631 and 40 CFR §264.1063(d)(3)]

Reference is made to Volume 1, C11.B.1(b)

C11.B.1(c) Date and Frequency of Determination

[R 299.9631 and 40 CFR §264.1063(d)]

Reference is made to Volume 1, C11.B.1(c)

C11.B.1(d) Light or Heavy Liquid Designation

[R 299.9631 and 40 CFR §264.1063(h)]

Reference is made to Volume 1, C11.B.1(d)

C11.B.2 Equipment Identification
[R 299.9631 and 40 CFR §§264.1050 and 270.25(a)]

Subpart BB applies to DLD's pump and piping system.
See Volume 3, Attachments C11-BB-1 and C11-BB-2 for the piping diagrams.

C11.B.3 Equipment with No Detectable Emissions
[R 299.9631 and 40 CFR §264.1064(g)(2)]

Reference is made to Volume 3, Attachment C11.B.3.

C11.B.3(a) Identification Numbers
[R 299.9631 and 40 CFR §264.1064(g)(1)]

Reference is made to Volume 3, Attachments B6-70.7

C11.B.3(b) Monitoring Procedures
[R 299.9631 and 40 CFR §264.1063]

Reference is made to Volume 1, C11.B.3(b).

C11.B.3(d) Pump Standards
[R 299.9631 and 40 CFR §§264.1052 and 264.1058]

Reference is made to Volume 1, Attachment C11-BB-4.

C11.B.3(f) Valve Standards
[R 299.9631 and 40 CFR §264.1057 and 264.1058]

Reference is made to Volume 1, C11.B.3(f).

C11.B.5 Pumps in Light Liquid Service
[R 299.9631 and 40 CFR §270.25(d)]

Reference is made to Volume 1, C11.B.5.

C11.B.10 Valves in Gas/Vapor Service or in Light Liquid Service
[R 299.9631 and 40 CFR §270.25(d)]

Reference is made to Volume 3, Attachment B6.