

Water Treatment Plant Ammonia Feed System Modifications

Ann Arbor, Michigan
ITB No. 4571

Issued for Bids and Construction - February 6, 2019
FTCH Project Number 170681

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Water Treatment Plant
Ann Arbor, Michigan
Ammonia Feed System Modifications
Cover sheet

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GENERAL

G-1 COVER SHEET

CIVIL

C-1 EXISTING SITE PLAN

DEMOLITION

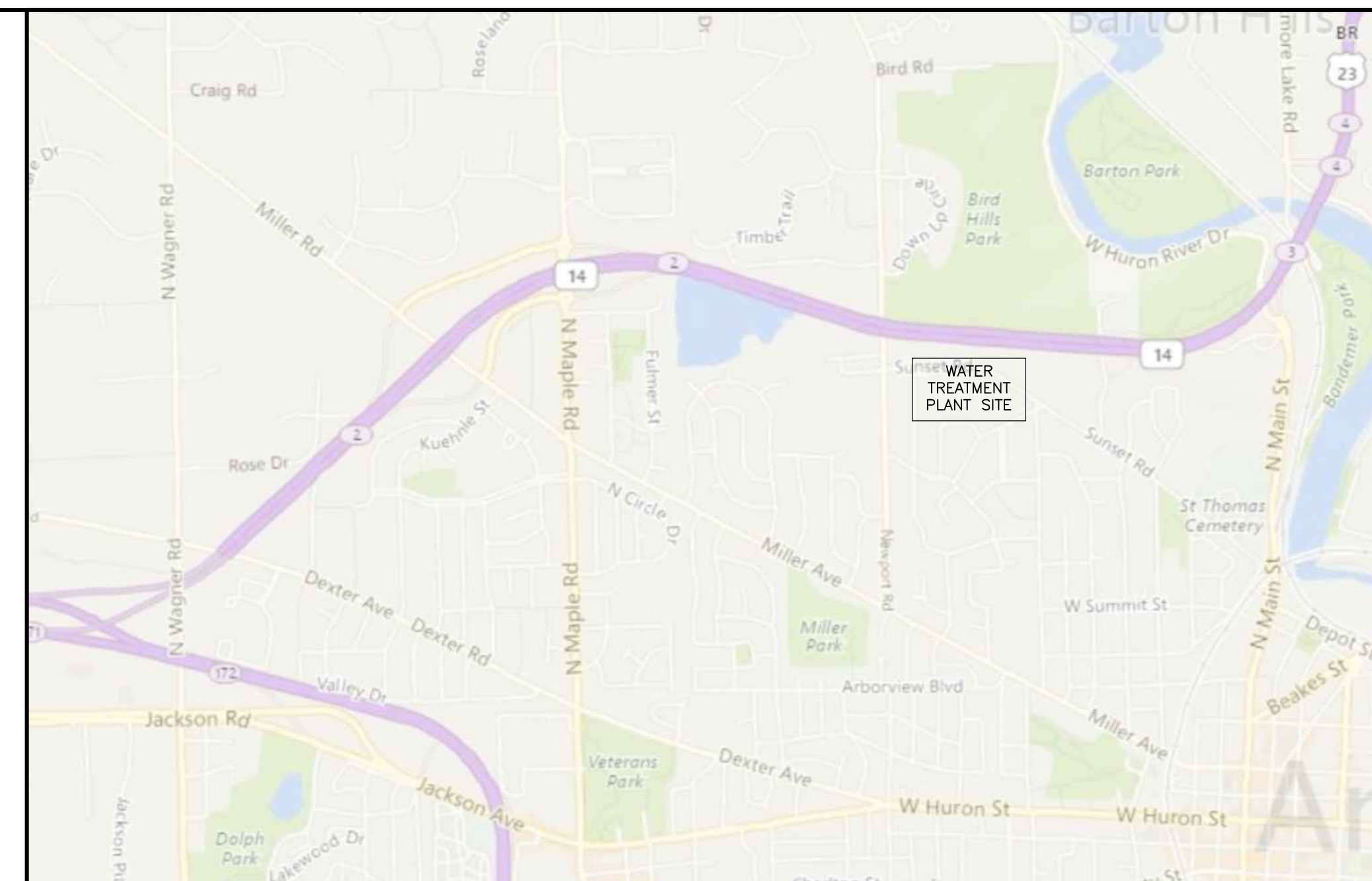
D-1 AMMONIA BUILDING DEMOLITION PLAN

PROCESS

P-1 GENERAL NOTES, ABBREVIATIONS AND SYMBOLS
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ELECTRICAL

E-1 AMMONIA BUILDING ELECTRICAL PLAN



LOCATION MAP
NO SCALE

PROJECT LOCATION:
919 SUNSET RD
ANN ARBOR, MI
48103

CLIENT INFORMATION:
CITY OF ANN ARBOR
WATER TREATMENT SERVICES UNIT
File No. 19005

PROJECT DESCRIPTION:
REPLACEMENT OF AMMONIA FEED SYSTEM PIPING
FEED EQUIPMENT, AND RELATED WORK

GENERAL ABBREVIATIONS

<p>AFF ABOVE FINISH FLOOR AHU AIR HANDLING UNIT AL ALUMINUM ALT. ALTERNATE BF BARRIER FREE BRG. BEARING CJ CONTROL JOINT CL. CENTERLINE CLG. CEILING CMU CONCRETE MASONRY UNIT CO. CLEANOUT CONC. CONCRETE CONST. CONSTRUCTION CONT. CONTINUOUS DIA. DIAMETER DN. DOWN DS. DOWNSPOUT EF EXHAUST FAN EL. ELEVATION EJ EXPANSION JOINT EQ. EQUAL EWC ELECTRIC WATER COOLER</p>	<p>FD FLOOR DRAIN FRT FIRE RETARDANT TREATED FT. FOOT/FEET GA. GAUGE/GAGE GALV. GALVANIZED GC GENERAL CONTRACTOR HB HOSE BIBB HP HIGH POINT HORIZ. HORIZONTAL HVAC HEATING VENTILATING AIR CONDITIONING ID INSIDE DIAMETER IE INVERT ELEVATION IN. INCH/INCHES INSUL. INSULATION LAV. LAVATORY LED LIGHT EMITTING DIODE LLH LONG LEG HORIZONTAL LLV LONG LEG VERTICAL LP LOW POINT MFR. MANUFACTURER MAX. MAXIMUM</p>	<p>MEZZ. MEZZANINE MIN. MINIMUM MO. MASONRY OPENING MTD. MOUNTED N/A NOT APPLICABLE NC NOISE CRITERIA NIC NOT IN CONTRACT NO. NUMBER NRC NOISE REDUCTION COEFFICIENT NTS NOT TO SCALE OC ON CENTER OD OUTSIDE DIAMETER OH. OVERHEAD OPP. OPPOSITE ORD OVERFLOW ROOF DRAIN PERP. PERPENDICULAR PL. PLATE PSF POUNDS PER SQUARE FOOT PSI POUNDS PER SQUARE INCH PVC POLYVINYL CHLORIDE R RADIUS REQD. REQUIRED</p>	<p>RD ROOF DRAIN RO ROUGH OPENING RO. ROUGH OPENING SCH. SCHEDULE SF SQUARE FOOT SIM. SIMILAR SP. SPACE/SPACING SQ. SQUARE SS STAINLESS STEEL STD. STANDARD TAN. TANGENT TYP. TYPICAL UL. UNDERWRITERS LABORATORY UNO UNLESS NOTED OTHERWISE VERT. VERTICAL VTR VENT THROUGH ROOF W/ WITH WC WATER CLOSET WH WATER HEATER W/O WITHOUT WP. WEATHERPROOF WT. WEIGHT</p>
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GRAPHIC SYMBOLS

<p>SECTION CUT LINE </p> <p>NORTH ARROW DESIGNATION </p> <p>ROOM NAME AND NUMBER </p> <p>DOOR NUMBER </p>	<p>ELEVATION, SECTION AND DETAIL DESIGNATION </p> <p>PLAN DESIGNATION FLOOR PLAN SCALE: 1/8" = 1'-0"</p> <p>ELEVATION TARGET </p> <p>ELEVATION TAG </p>	<p>EXTERIOR ELEVATION TAG </p> <p>INTERIOR ELEVATION TAG </p> <p>WALL TYPE TAG </p> <p>SIGNAGE TAG </p> <p>FINISH TAG </p>	<p>ENLARGED DETAIL FRAME </p> <p>BULLETIN IDENTIFICATION </p> <p>ADDENDUM IDENTIFICATION </p> <p>SKETCH IDENTIFICATION </p> <p>BARRIER FREE LOCATION </p> <p>KEY NOTE TAG </p> <p>DEMOLITION NOTE TAG </p>
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REVISIONS

2/6/2019 BIDS AND CONSTRUCTION

Drawn By RS2
Designer EMS
Reviewer TDM
Manager TLW

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PROJECT NO.
170681

FIGURE NO.

G-1


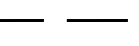

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SEAL

PLT: I:\P\Z\2017\17218\CADD\CADD\AMMONIA FEED SYSTEM MODIFICATIONS\C01\17081.DWG LAYOUT: C-1 DATE: 2/26/2019 TIME: 2:17:35 PM USER: RSG



LEGEND

-  WORK ZONE
-  CONSTRUCTION TRAFFIC ROUTE
-  CONTRACTOR STAGING AREA

NOTES

1. CONTRACTOR SHALL BARRICADE WORK AREA AND PROTECT ADJACENT FACILITIES, STRUCTURES AND EQUIPMENT.
2. CONTRACTOR SHALL MAINTAIN ACCESS FROM SUNSET ROAD TO WATER TREATMENT PLANT FACILITIES, MAINTAIN DELIVERIES, HAULING OFF OF SLUDGE, AND GENERAL ACCESS REQUIRED FOR MAINTENANCE AND OPERATIONS.
3. RESTORE ALL WORK AND STAGING AREAS TO A CONDITION THAT IS EQUAL TO, OR BETTER THAN, THAT WHICH EXISTED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.



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Water Treatment Plant
Ann Arbor, Michigan
Ammonia Feed System Modifications
Existing Site Plan

REVISIONS

2/26/2019 BIDS AND CONSTRUCTION

Drawn By	RS2
Designer	EMS
Reviewer	TLW
Manager	TLW

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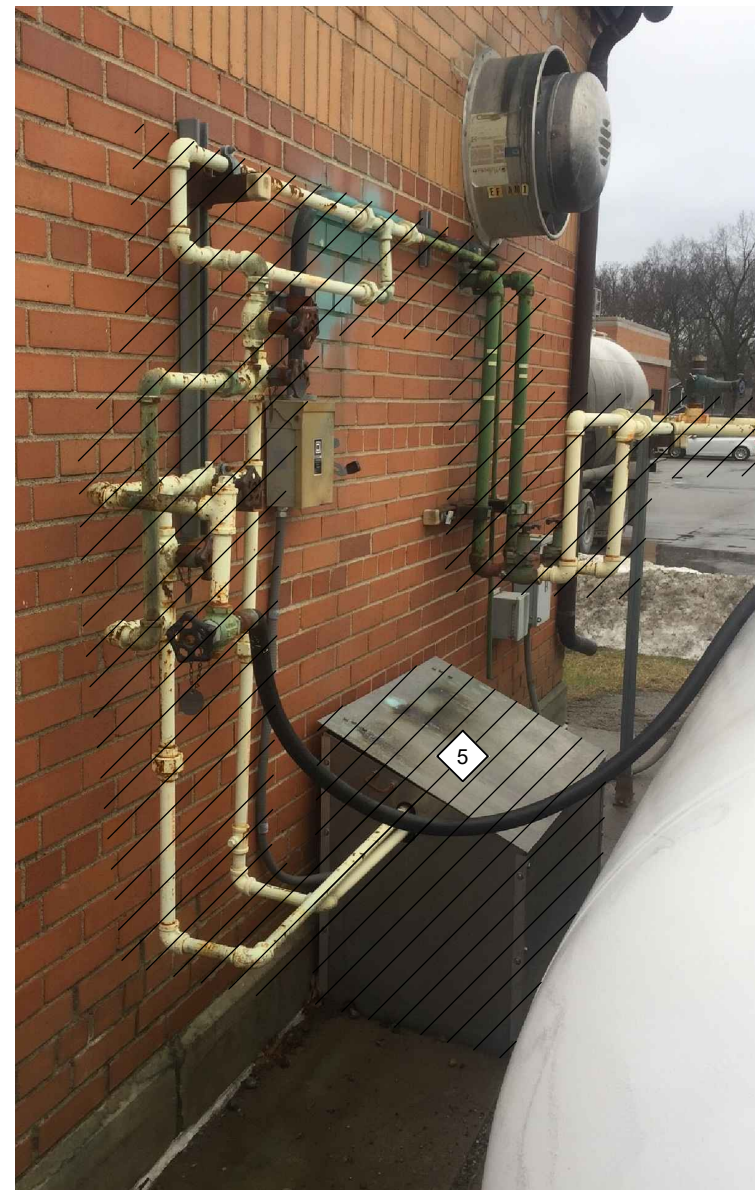
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FIGURE NO.

C-1

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 **EXISTING SITE PLAN**
NO SCALE
NORTH



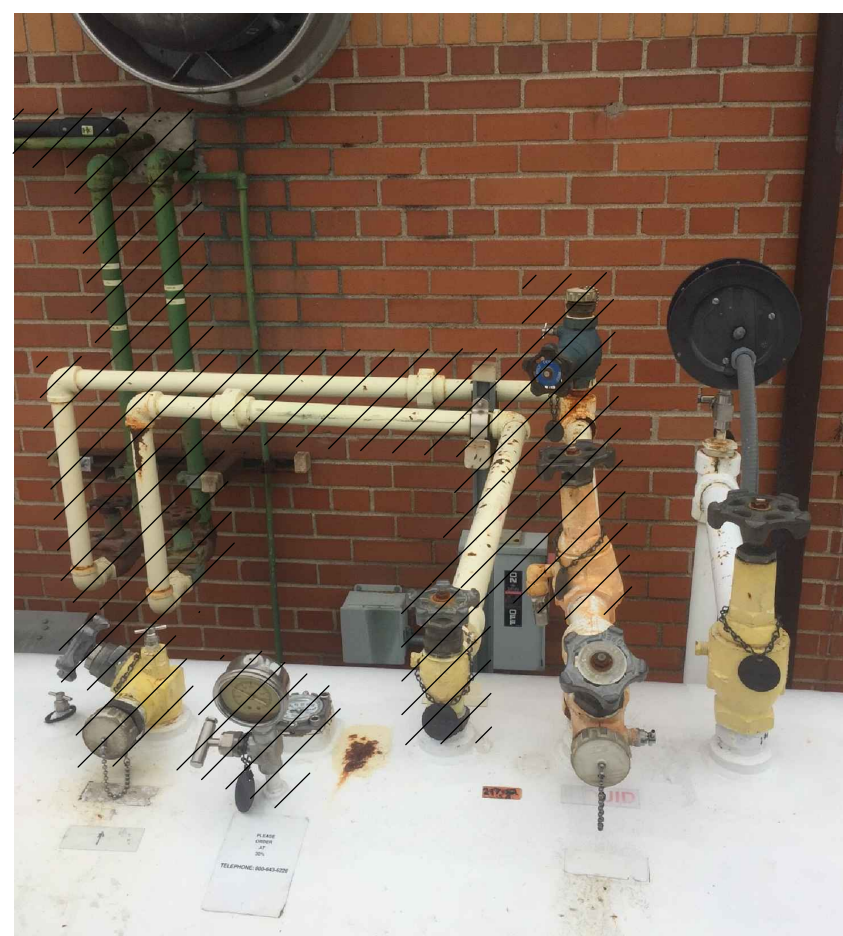
D PHOTO
NO SCALE



C PHOTO
NO SCALE

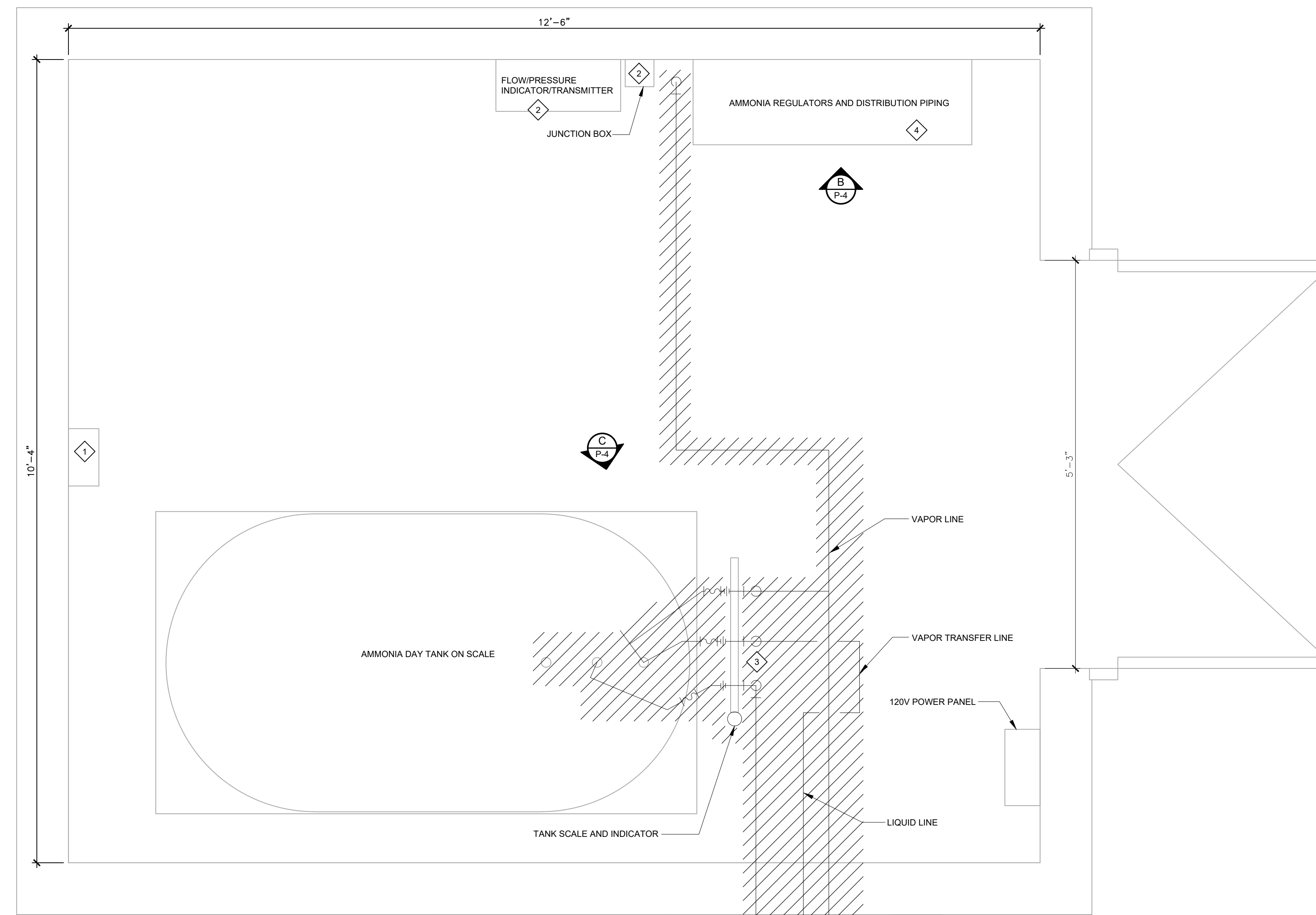


B PHOTO
NO SCALE



A PHOTO
NO SCALE

SYMBOL LEGEND



NOTES

1. ALL EXISTING PIPING AND EQUIPMENT SHOWN TO BE REMOVED, INCLUDING VACUUM REGULATORS, ROTAMETERS, FLOW METERS AND GAUGES, ARE TO BE REMOVED AFTER CONNECTION OF NEW OR TEMPORARY FEED SYSTEM TO EXISTING PLANT FEED LINES.
2. EXISTING EYE WASH, RESERVOIR AND ASSOCIATED PIPING TO REMAIN AND SHALL BE PROTECTED.
3. DAY TANK TO BE FULLY EVACUATED BY CONTRACTOR PRIOR TO ANY WORK ON THE DAY TANK CONNECTIONS.
4. FIELD VERIFY EQUIPMENT AND STRUCTURE DIMENSIONS, LOCATIONS, AS WELL AS AVAILABLE SPACING FOR PIPE INSTALLATION. PLANS SHOW PIPING SCHEMATICALLY.
5. BULK TANK TO BE FULLY EVACUATED BY THE CONTRACTOR PRIOR TO ANY WORK ON THE BULK TANK CONNECTIONS.
6. REPAINT WEST INTERIOR WALL AFTER PATCHING PLASTER AND DRYWALL. SEE SPECIFICATION 09 91 00.

KEY NOTES

1. AMMONIA MONITOR AND ALARM TO REMAIN AND BE PROTECTED.
2. REMOVE AND SALVAGE FLOW INDICATOR/TRANSMITTER. RELOCATE EXISTING PRESSURE INDICATOR/TRANSMITTER FOR USE ON NEW PIPING SYSTEM. RELOCATE EXISTING JUNCTION BOX AS REQUIRED.
3. EXISTING TANK SCALE INDICATOR/TRANSMITTER AND DAY TANK PRESSURE INDICATOR/TRANSMITTER TO REMAIN AND BE PROTECTED.
4. AMMONIA REGULATORS AND DISTRIBUTION PIPING TO BE REMOVED ONCE THE NEW AMMONIA FEED SYSTEM HAS BEEN TESTED AND IS OPERATIONAL.
5. REMOVE EXISTING COMPRESSOR AND HOUSING AFTER NEW FEED SYSTEM IS INSTALLED AND COMMISSIONED.

REVISIONS

2/8/2019 BIDS AND CONSTRUCTION

Drawn By EMS
Designer EMS
Reviewer TLW
Manager TLW

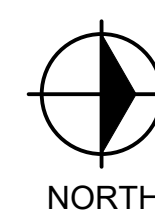
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FIGURE NO.

D-1

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AMMONIA BUILDING DEMOLITION PLAN

SCALE: 1" = 1'-0"
0 1/2 1 2

PROCESS GENERAL NOTES

- THE FOLLOWING NOTES SHALL APPLY TO ALL PROCESS SHEETS.
- ALL PROCESS NOTES, SYMBOLS, LEGENDS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY NOT BE ALL INCLUSIVE, AND ONLY APPLY TO PROCESS DRAWING SHEETS USED IN THIS SET. ALSO, WHEN DESIGNATED, INCLUDING PROCESS DEMOLITION SHEETS UNLESS NOTES OTHERWISE.
- GRAPHICAL REPRESENTATION OF EXISTING SYSTEMS WERE OBTAINED FROM PREVIOUS CONSTRUCTION AND/OR RECORD DRAWINGS AND MAY NOT FULLY REPRESENT EXISTING CONDITIONS AND IS FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS TO DETERMINE EXTENT OF WORK.
- FIELD VERIFY ALL DIMENSIONS SHOWN.
- REFER TO PIPING PLAN VIEWS FOR CORRECT PIPE ORIENTATION TO BUILDINGS AND STRUCTURES.
- WALL SLEEVES AND WALL PIPE SHALL BE PAINTED PRIOR TO EMBEDMENT/PIPE INSTALLATION.
- PAINT PIPE SURFACES THAT WILL BE CONCEALED BY PIPE SUPPORTS PRIOR TO INSTALLING PIPE.
- WHEN A PROJECT REQUIRES DEMOLITION, COORDINATE NEW WORK WITH DEMOLITION.
- FIELD VERIFY THAT ALL EXISTING PIPE PENETRATIONS, WALL SLEEVES AND WALL PIPES ARE AS SHOWN ON PLANS.
- FOR PURPOSE OF CLARITY, NOT ALL PIPING AND VALVES MAY BE SHOWN IN PLAN VIEWS. SEE PROCESS SCHEMATICS FOR COMPLETE DETAILS.

PROCESS DEMOLITION NOTES

- REMOVE ALL PORTIONS OF WORK IDENTIFIED BY DEMOLITION HATCHING UNLESS NOTED OTHERWISE.
- DEMOLITION NOTES AND PLANS DO NOT FULLY REPRESENT ALL DEMOLITION WORK REQUIRED TO INSTALL NEW WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS, BUT ARE INTENDED TO SERVE AS GENERAL DEMOLITION GUIDELINES.
- COORDINATE PHASING AND SEQUENCING OF DEMOLITION IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AND WITH OTHER CONTRACTORS IN ORDER TO MAINTAIN CONTINUING OPERATIONS FOR OWNER. ALSO, TO MAINTAIN BUILDING SECURITY AND WEATHER TIGHTNESS.
- COORDINATE ITEMS, IF ANY TO BE TURNED OVER TO THE OWNER PRIOR TO BEGINNING DEMOLITION. CONTRACTOR TO REMOVE, PROTECT AND RELOCATE ITEMS TO BE TURNED OVER TO THE OWNER.
- PROTECT EXISTING STRUCTURES AND PIPING TO REMAIN. SOME PIPING TO BE REMOVED OR ABANDONED MAY BE UNDER PRESSURE. COORDINATE WITH OWNER TO ISOLATE SECTIONS TO BE DISTURBED.
- BULKHEAD ENDS OF PIPES ABANDONED IN PLACE. BULKHEAD AT A STRUCTURE WHEN POSSIBLE. BULKHEAD METHODS AND DETERMINATION OF PIPES TO BE ABANDONED ARE SUBJECT TO THE APPROVAL OF OWNER AND ENGINEER.
- USE APPROPRIATE FITTINGS AND/OR PIPE JOINT DEFLECTION AS NECESSARY TO INSTALL PIPE & ELEVATIONS INDICATED.
- SUPPORT PIPING TO REMAIN IN PLACE DURING AND AFTER DEMOLITION.
- REMOVE ALL UTILITIES ASSOCIATED WITH EQUIPMENT TO BE REMOVED. REMOVE ALL PIPING, SUPPORTS, ANCHOR BOLTS, AND APPURTENANCES TO SOURCE AND PROVIDE SUITABLE CAP.
- REMOVE EMBEDDED EQUIPMENT AND HARDWARE A MINIMUM OF 1" BELOW THE SURFACE IT IS ATTACHED TO. PATCH OVER REMAINING PORTION OF ANCHOR BOLT IN ACCORDANCE WITH SPECIFICATIONS.
- WHERE ITEMS ARE REMOVED AND OPENINGS ARE CREATED BY DEMOLITION, IN ROOFS, WALLS, FLOORS AND ADJACENT SURFACES, PATCH TO MATCH ADJACENT SURFACES OR APPLY NEW FINISHES WHERE SCHEDULED.
- REMOVE SIGNAGE RELATED TO EXISTING SYSTEMS AFTER THE EXISTING SYSTEMS ARE DECOMMISSIONED AND ANY RELATED CHEMICALS HAVE BEEN REMOVED FROM THE SITE. REPAIR DAMAGED SURFACES RESULTING FROM REMOVAL OF SIGNAGE AND REPAINT DISTURBED AREAS TO MATCH ADJACENT SURFACES.
- EXISTING EQUIPMENT LIST (WHEN USED) IS NOT ALL INCLUSIVE OF EQUIPMENT IN AREA SHOWN.

PROCESS CHEMICAL FEED NOTES

- CHEMICAL FEED PIPING SHOWN FOR GENERAL ROUTING AND CHEMICAL FEED POINT LOCATIONS ONLY. CONTRACTOR SHALL ROUTE PIPING AS NECESSARY TO AVOID CONFLICTS AND SHALL INSTALL PIPING AND VALVES IN ACCORDANCE WITH THE CHEMICAL FEED SYSTEM SCHEMATIC DIAGRAMS.
- DO NOT MOUNT VALVES HIGHER THAN 6 FEET ABOVE FINISHED FLOOR. VALVE HANDLES TO BE EASILY ACCESSIBLE FOR OPERATION.

REVISIONS

2/26/2019	BIDS AND CONSTRUCTION
Drawn By	RS2
Designer	EMS
Reviewer	TDM
Manager	TLW

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FIGURE NO.

P-1

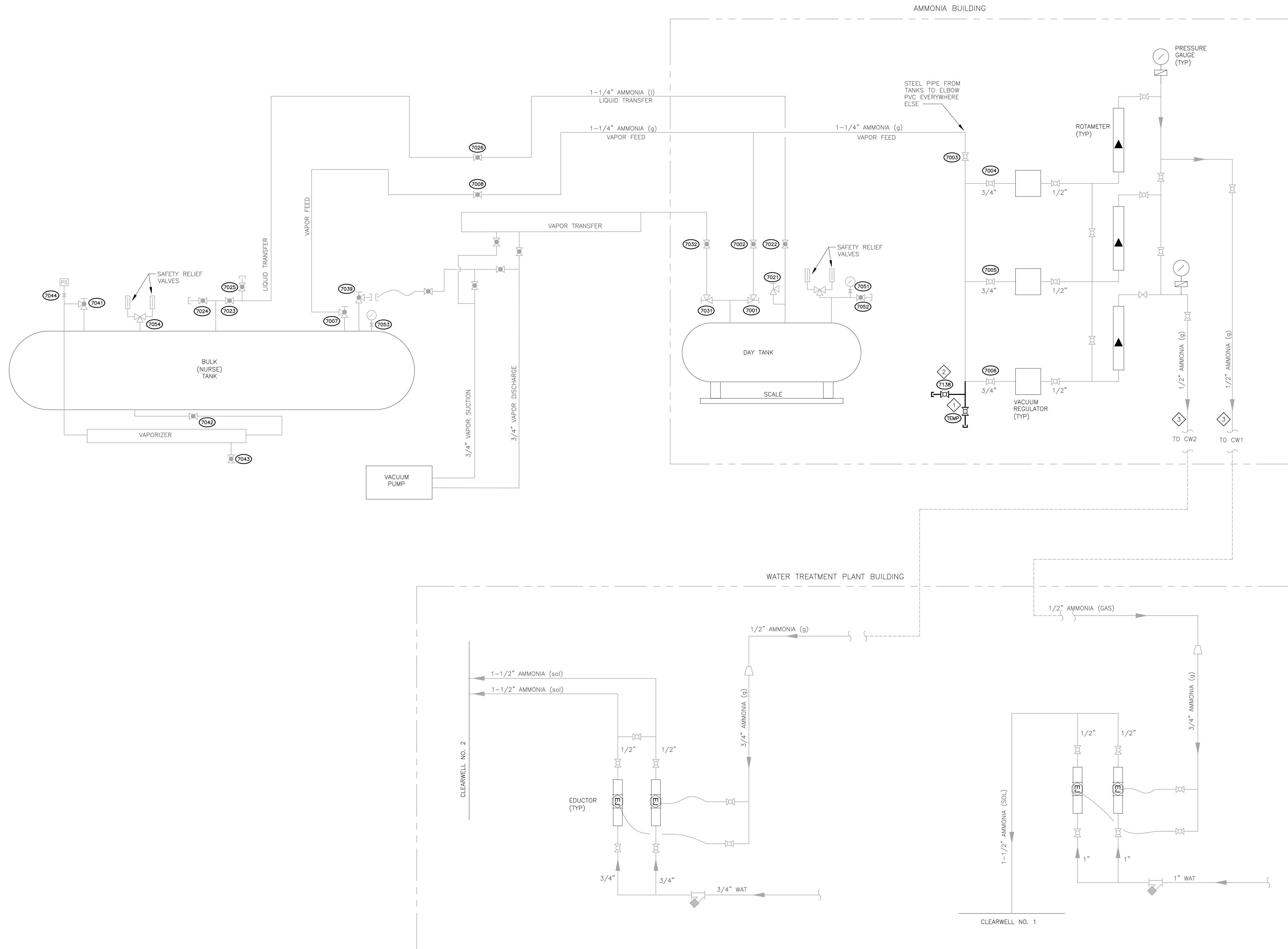
PROCESS SYMBOL LEGEND

PIPE/FITTINGS SYMBOLS	MISC. SCHEMATIC SYMBOLS	SCHEMATIC VALVE SYMBOLS	WALL/FLOOR PIPES	WALL/FLOOR SLEEVES
	<p> END CAP FLEXIBLE CONNECTION IN-LINE MIXER AIR PUMP CONNECTION FITTING HOSE CONNECTION ULTRASONIC LEVEL INDICATOR SP - SAMPLE POINT CF - CHEMICAL FEED INJECTION POINT PROBE - PROBE LOCATION PROCESS FLOW DIRECTION PRESSURE GAUGE TEMPERATURE GAUGE AIR FLOW METER CALIBRATION COLUMN ROTOMETER FLOW METER AFM PUMP SIGHT GAUGE BLOWER GATE PULSEATION DAMPER MIXER FIT - PRESSURE INDICATING TRANSMITTER FIT - FLOW INDICATING TRANSMITTER FE - FLOW ELEMENT TSH - HIGH TEMPERATURE SWITCH PI - PRESSURE INDICATOR </p>	<p> GATE VALVE CHECK VALVE BALL CHECK VALVE PLUG VALVE BUTTERFLY VALVE BALL VALVE GLOBE VALVE ANGLE VALVE MULTI-FUNCTION VALVE 3-WAY VALVE VALVE W/ MOTOR ACTUATOR VALVE W/ PNEUMATIC ACTUATOR PRESSURE RELIEF VALVE SURGE RELIEF VALVE EJECTOR CONTROL VALVE SOLENOID VALVE PRESSURE REDUCING VALVE PRESSURE RELIEF COMBINATION AIR/VACUUM RELEASE VALVE MANUAL AIR RELEASE VALVE AUTOMATIC AIR RELEASE VALVE VACUUM BREAKER ANTI-SIPHON VALVE (CHEMICAL) ANTI-SIPHON VALVE (PIPING) SPECIAL VALVE C - CONTROL CHECK VALVE D - DIAPHRAGM VALVE F - FLAP GATE G - GLOBE GATE K - KNIFE GATE VALVE MD - MUD VALVE N - NEEDLE VALVE S - STOP COCK CORPORATION STOP </p>	<p> EQUIPMENT TAG NUMBERS [XY-00] MAJOR EQUIPMENT TAG NUMBER (X) VALVE NUMBER </p>	

PROCESS ABBREVIATIONS

A	AIR	EXC	EXCAVATE (ION)	MH	MANHOLE	SL	SLIDE GATE
ABAN	ABANDON	EXIST	EXISTING	MIN	MINIMUM	SP	STOP PLATE
ADJ	ADJACENT	EXT	EXTERIOR	MISC	MISCELLANEOUS	SPNT	SAMPLE POINT
AG	AGGREGATE	F/F	FACE TO FACE	MJ	MECHANICAL JOINT	SQ	SQUARE FOOT
AGOR	AGGREGATE	FIG	FIGURE	NA	NOT APPLICABLE	SQ	SQUARE YARD
ALT	ALTERNATE (IVE)	FF	FINISHED FLOOR	NC	NORMALLY CLOSED	SRV	SURGE RELIEF VALVE
APPROX	APPROXIMATE	FIT	FLOW INDICATING TRANSMITTER	NIC	NOT IN CONTACT	SS	STAINLESS STEEL
AS	AMMONIA SOLUTION	FPN	FLOOR PENETRATION	NO	NORMALLY OPENED	SSP	STAINLESS STEEL PIPE
ASSY	ASSEMBLY	FRP	FIBERGLASS REINFORCED PLASTIC	NPW	NON POTABLE WATER	STD	STANDARD
B/B	BACK TO BACK	FS	FLOOR SLEEVE	NTS	NOT TO SCALE	STL	STEEL
BIP	BLACK IRON PIPE	FSP	FABRICATED STEEL PIPE	OC	ON CENTER	SUCT	SUCTION
BLDG	BUILDING	F.V.	FIELD VERIFY	O.D.	OUTSIDE DIAMETER	SYS	SYSTEM
BLWDN	BLOW DOWN	GA	GAUGE	OE	OVERHEAD ELECTRICAL	TDH	TOTAL DYNAMIC HEAD
BOT	BOTTOM	GPD	GALLONS PER DAY	OPNG	OPENING	TEMP	TEMPORARY
BSMT	BASEMENT	GPM	GALLONS PER MINUTE	ORIG	ORIGINAL	TYP	TYPICAL
BSP	BLACK STEEL PIPE	GSP	GALVANIZED STEEL PIPE	PE	POLYETHYLENE	UTIL	UTILITY
CA	COMPRESSED AIR	HDPE	HIGH DENSITY POLYETHYLENE EXTRUSION	PERF	PERFORATED	VB	VALVE BOX
C/C	CENTER TO CENTER	HORIZ	HORIZONTAL	PIT	PRESSURE INDICATING TRANSMITTER	VERT	VERTICAL
CF	CUBIC FEET	HP	HIGH POINT	P/V	POST INDICATOR VALVE	W/	WITH
CL	CENTERLINE	HT	HEIGHT	PP	POLYPROPYLENE PIPE	W/O	WITH OUT
CONC	CONCRETE	IA	INSTRUMENT AIR	PROP	PROPOSED	WG	WEIR GATE
CONST	CONSTRUCTION	I.E.	INVERT ELEVATION	PRV	PRESSURE REDUCING VALVE	WL	WATER LEVEL
COORD	COORDINATE	I.D.	INSIDE DIAMETER	PS	PRESSURE SWITCH	WPN	WALL PENETRATION
CP	CHLORINATED POLYVINYL CHLORIDE	INCL	INCLUDE	PSF	POUNDS PER SQUARE FOOT	WS	WALL SLEEVE
CPVC	CHLORINATED POLYVINYL CHLORIDE	INT	INTERIOR	PSI	POUNDS PER SQUARE INCH		
CW	CLEAR WELL	INT	INTERIOR	PSV	PRESSURE SUSTAINING VALVE		
D	DIAMETER	INV	INVERT	PV	PLUG VALVE		
D/C	DISTANCE	IPS	IRON PIPE SIZE	PVC	POLYVINYL CHLORIDE PIPE		
D/JR	DEGREE	IR	ISOLATION RING	PT	PRESSURE TRANSMITTER		
DEG	DEGREE	LAT	LATERAL	PIT	PRESSURE INDICATING TRANSMITTER		
DEMO	DEMOLITION	LFT	LINAL FEET	QTY	QUANTITY		
DIA	DIAMETER	LGTH	LENGTH	RCP	REINFORCED CONCRETE PIPE		
DNM	DIMENSION	LIO	LIQUID	RECIRC	RECIRCULATE (ING, ION)		
DIP	DUCTILE IRON PIPE	LP	LOW POINT	RED	REDUCER		
DISCH	DISCHARGE	LWL	LOW WATER LEVEL	REF	REFERENCE		
DIST	DISTANCE	MAINT	MAINTENANCE	REQD	REQUIRED		
EL	ELEVATION	MATL	MATERIAL	REV	REVISION		
ELL	ELBOW	MAX	MAXIMUM	RJ	RESTRAINED JOINT		
ENGR	ENGINEER	MFG	MANUFACTURER	SAN	SANITARY		
EQHP	EQUIPMENT	MGD	MILLION GALLONS PER DAY	SG	SI UICF GATF		

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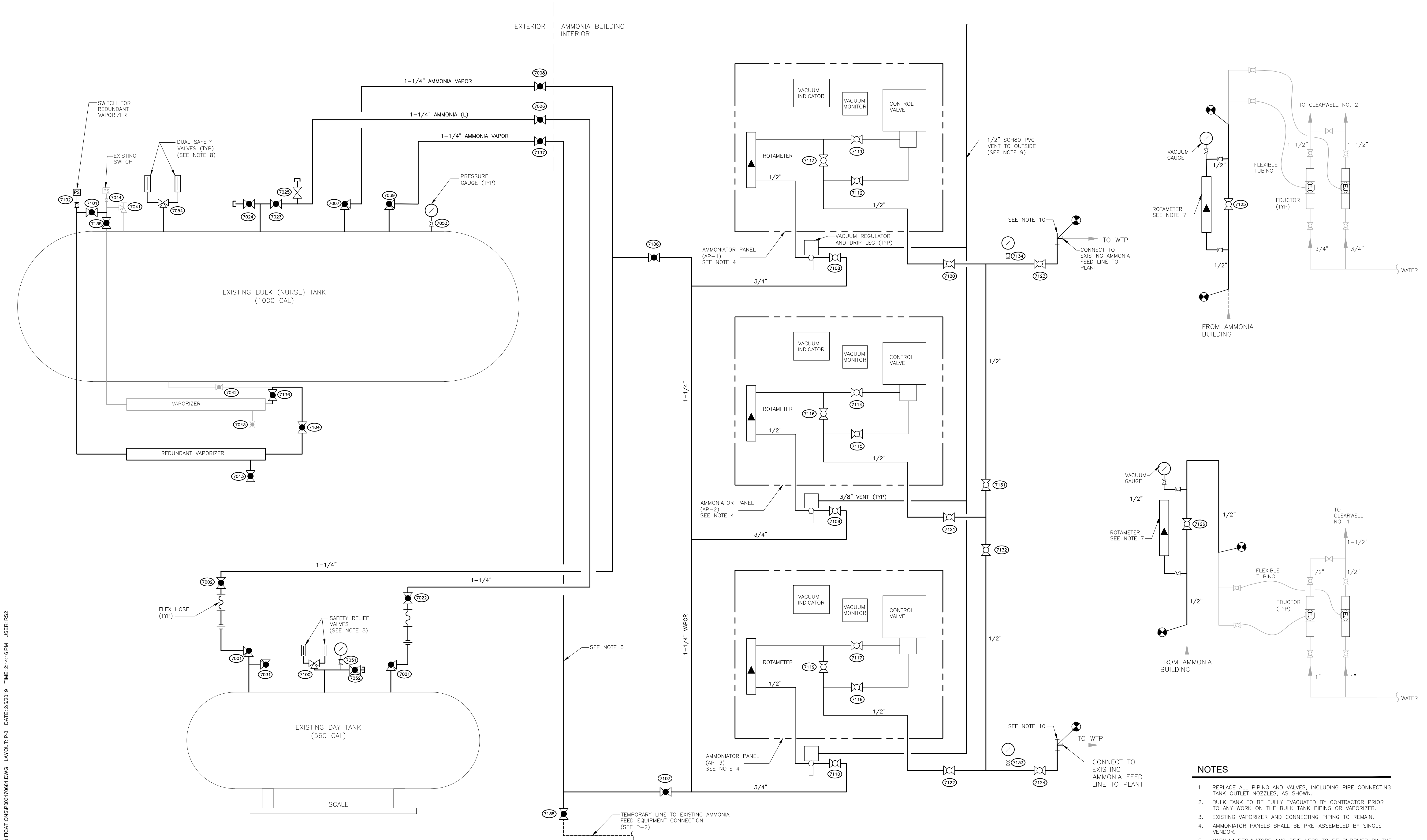
NOTES

1. EXISTING SCHEMATIC IS PRESENTED FOR REFERENCE PURPOSES, EXCEPT AS INDICATED IN KEY NOTES.

KEY NOTES

1. INSTALL TEMPORARY CONNECTION TO EXISTING FEED EQUIPMENT FOR CONNECTION TO TEMPORARY FEED SYSTEM DURING CONSTRUCTION (TEMP VALVE) AND FUTURE CONNECTION TO NEW FEED EQUIPMENT (VALVE 7138).
2. AFTER NEW AMMONIA FEED EQUIPMENT IS INSTALLED, TESTED AND ACCEPTED, TEMP VALVE AND ASSOCIATED PIPING TO BE REMOVED ALONG WITH EXISTING AMMONIA FEED EQUIPMENT AND PIPING AS SHOWN ON D-1. VALVE 7138 TO REMAIN AS PART OF NEW SYSTEM TO BE USED AS TEMPORARY CONNECTION AS NEEDED IN FUTURE.
3. APPROXIMATE TIE-IN LOCATION TO EXISTING AMMONIA FEED LINE TO PLANT. REMOVE EXISTING ELBOWS PRIOR TO EXITING THE BUILDING. REPLACE WITH TEES AND VALVES 7123 AND 7124 AS SHOWN ON P-3.

EXISTING AMMONIA FEED SYSTEM SCHEMATIC
NO SCALE



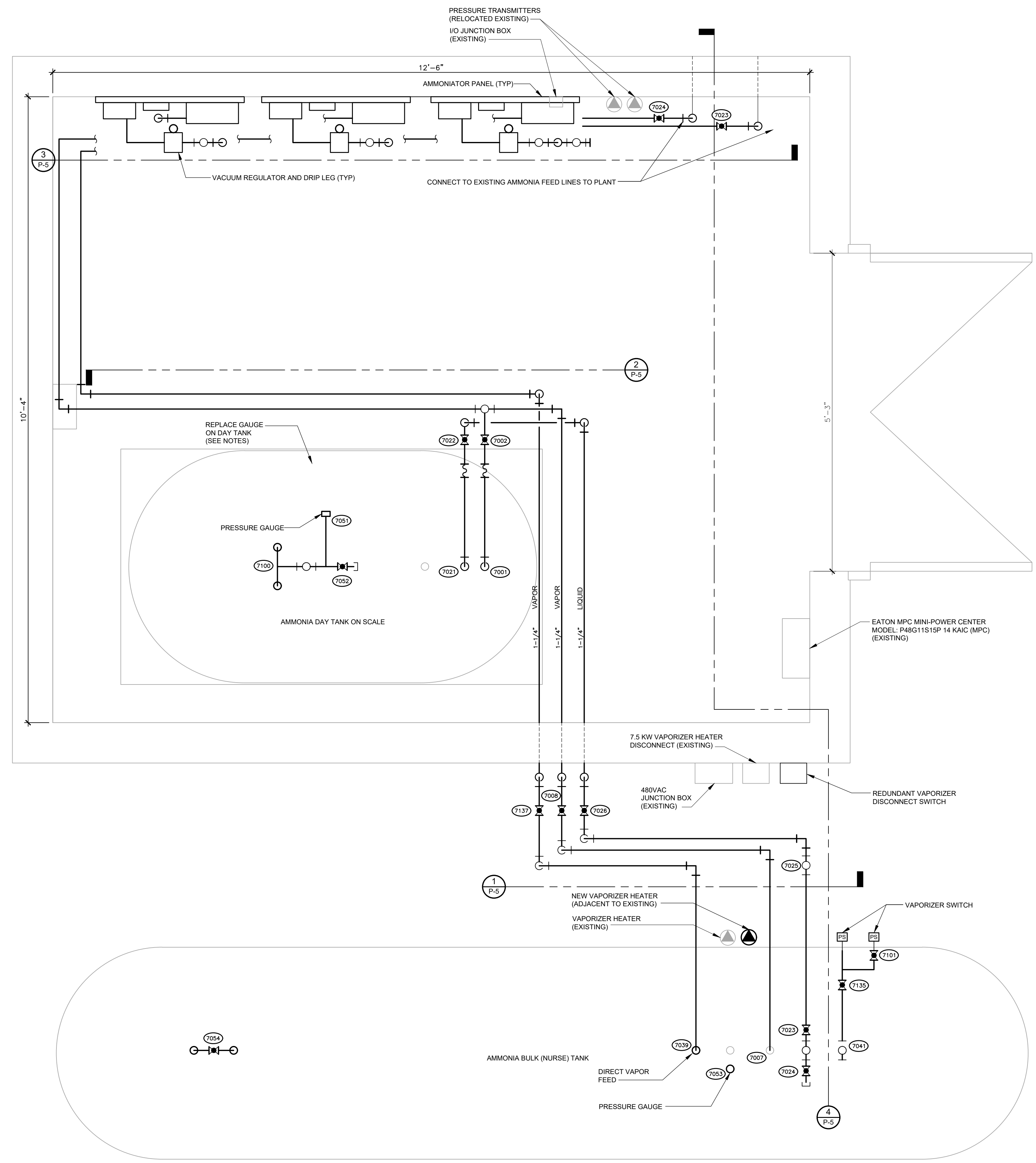
NEW AMMONIA FEED SYSTEM SCHEMATIC
NO SCALE

NOTES

1. REPLACE ALL PIPING AND VALVES, INCLUDING PIPE CONNECTING TANK OUTLET NOZZLES, AS SHOWN.
2. BULK TANK TO BE FULLY EVACUATED BY CONTRACTOR PRIOR TO ANY WORK ON THE BULK TANK PIPING OR VAPORIZER.
3. EXISTING VAPORIZER AND CONNECTING PIPING TO REMAIN.
4. AMMONIATOR PANELS SHALL BE PRE-ASSEMBLED BY SINGLE VENDOR.
5. VACUUM REGULATORS AND DRIP LEGS TO BE SUPPLIED BY THE AMMONIATOR VENDOR, NOT PRE-ASSEMBLED ON PANEL, AND SHALL BE INSTALLED BY THE CONTRACTOR.
6. INSTALL LINE FROM BULK TANK TO TEMPORARY CONNECTION TO EXISTING OR NEW AMMONIA FEED EQUIPMENT PRIOR TO BEGINNING ANY WORK ON THE DAY TANK. SEE SPECIFICATIONS.
7. PROVIDE ROTAMETER WITHOUT ADJUSTMENT CAPABILITIES.
8. SAFETY RELIEF VALVES TO BE PROVIDED BY TANNER INDUSTRIES, INC. CONTACT: JEREMY JOHNSON, (317) 410-4544.
9. ROUTE VENT OUTSIDE, SLOPED SLIGHTLY DOWNWARD FOR LAST FEW FEET BEFORE EXITING BUILDING. VENT LINE SHALL TERMINATE AWAY FROM HVAC INTAKES, POINTING DOWNWARD AND CAPPED WITH INSECT SCREEN.
10. AFTER NEW AMMONIA FEED EQUIPMENT IS INSTALLED, TESTED AND ACCEPTED, CAP TEES TO OLD SYSTEM.

PLOT INFO: Z:\01\171218\CADD\NEW AMMONIA FEED SYSTEM MODIFICATION\DWG LAYOUT\P-3 DATE: 2/8/2019 TIME: 2:14:16 PM USER: RRS2

PLOT INFO: Z:\01\171\18\CADD\CADD\AMMONIA FEED SYSTEM\MODIFICATION\04170818.DWG LAYOUT: P-4 DATE: 2/20/2019 TIME: 2:13:52 PM USER: RRS2



AMMONIA BUILDING PROCESS PLAN
 SCALE: 1" = 1'-0"
 NORTH

NOTES

1. FIELD VERIFY EQUIPMENT AND STRUCTURE DIMENSIONS, LOCATIONS, AS WELL AS AVAILABLE SPACING FOR PIPE INSTALLATION. PLANS SHOW PIPING SCHEMATICALLY.
2. CONTRACTOR SHALL SUBMIT PROPOSED PIPING TO OWNER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. REPAINT WEST INTERIOR WALL AFTER PATCHING PLASTER AND DRYWALL, AND PRIOR TO MOUNTING AMMONIA FEED PANELS. SEE SPECIFICATION 09 91 00.
4. CONTRACTOR SHALL ENSURE DAY TANK IS FULLY EVACUATED AND DEPRESSURIZED PRIOR TO REMOVING AND REPLACING TANK GAUGE.
5. SEE SHEET P-3 AND P-5 FOR DETAIL ON VALVES ASSOCIATED WITH AMMONIATOR PANELS.

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Water Treatment Plant
 Ann Arbor, Michigan
Ammonia Feed System Modifications
 Ammonia Building Process Plan

REVISIONS

DATE	DESCRIPTION
2/8/2019	BIDS AND CONSTRUCTION

Drawn By: RRS2
 Designer: EMS
 Reviewer: TDM
 Manager: TLW

Hard copy is intended to be 24"x36" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

PROJECT NO.
170681

FIGURE NO.

P-4

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REVISIONS

2/8/2019 BIDS AND CONSTRUCTION	
Drawn By	RS2
Designer	EMS
Reviewer	TDM
Manager	TLW

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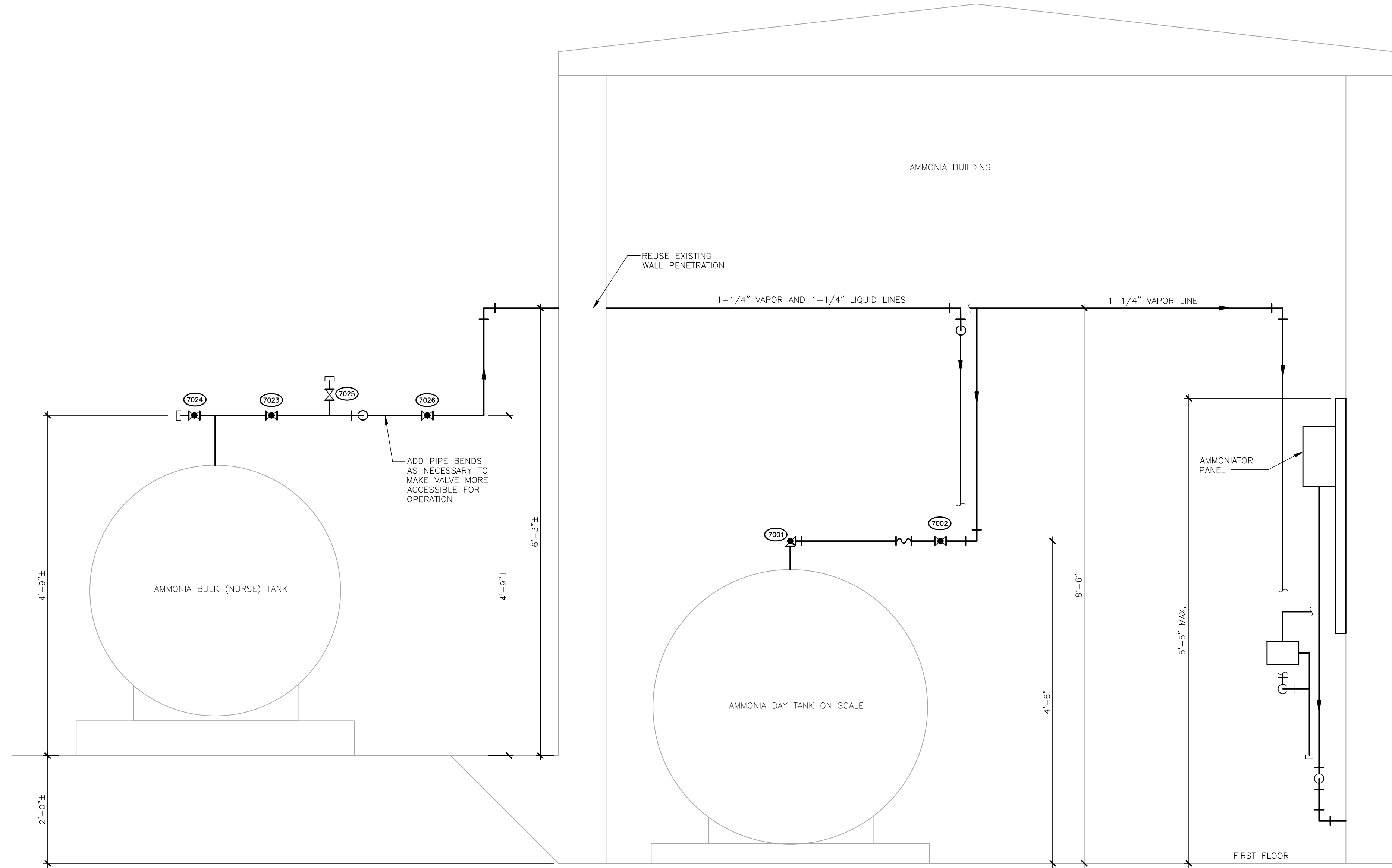
PROJECT NO.
170681

FIGURE NO.

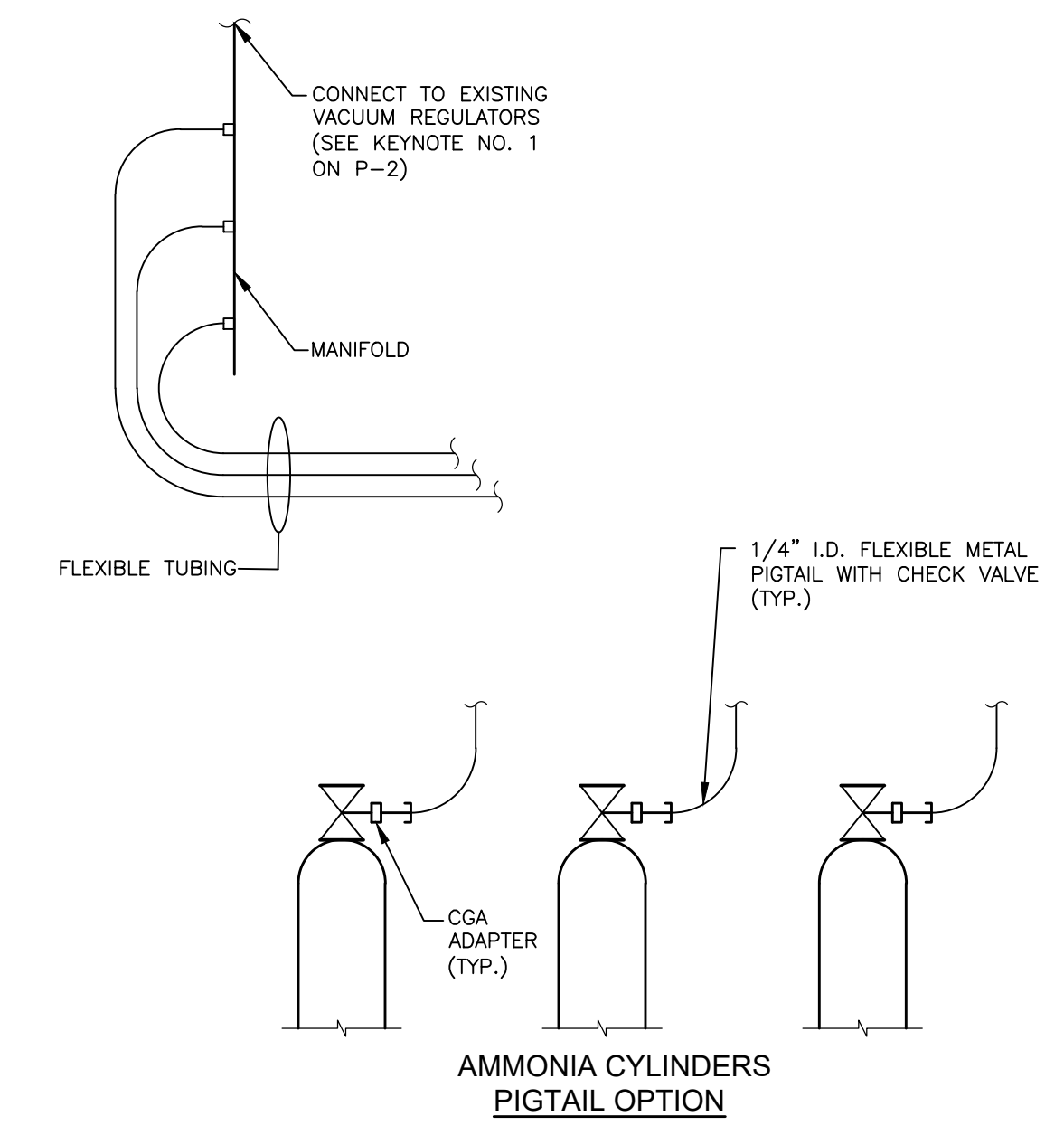
P-5

TEMPORARY AMMONIA FEED SYSTEM SPECIFICATIONS

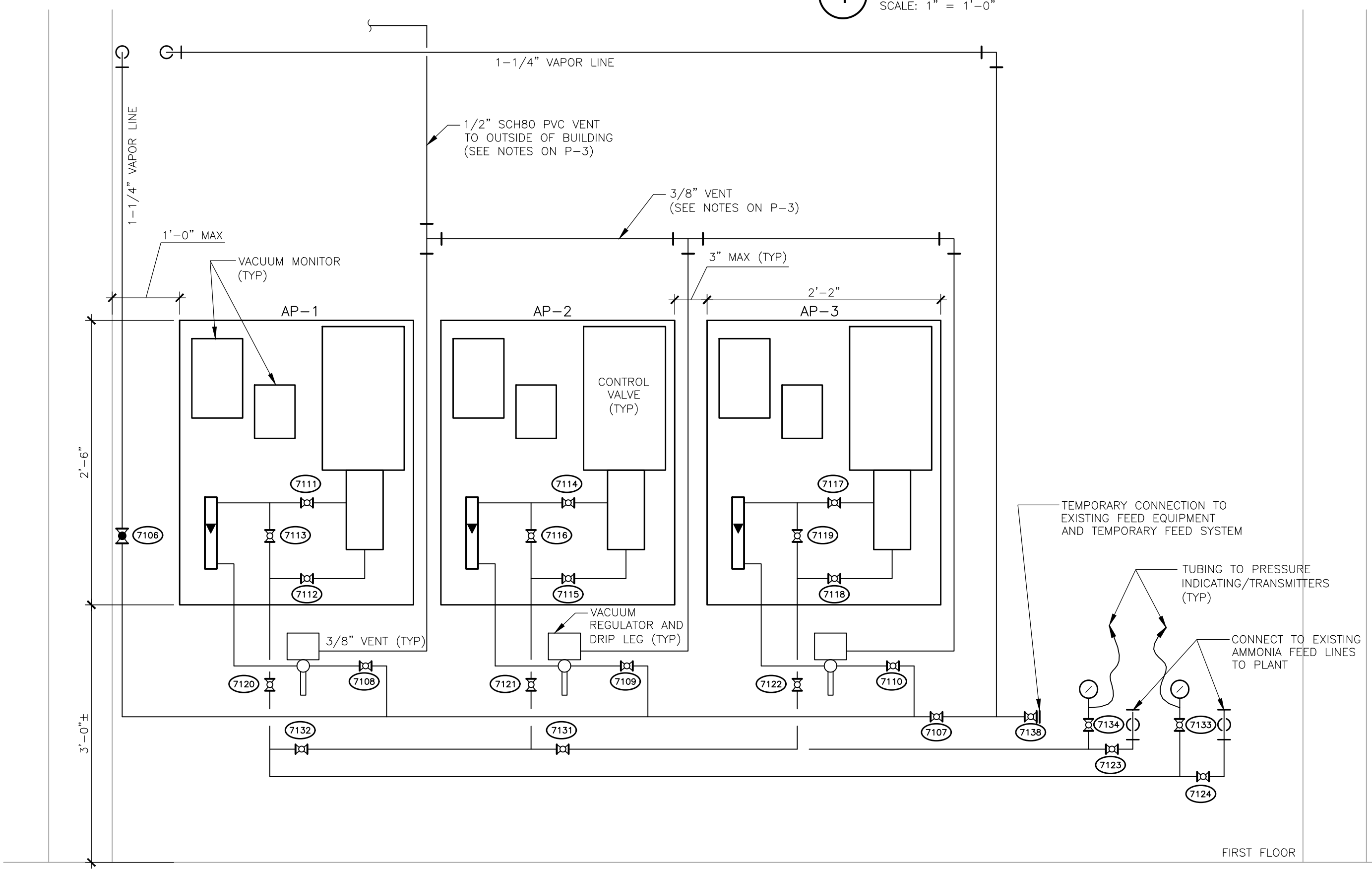
1. AMMONIA CYLINDER
 - 1.1. TEMPORARY AMMONIA SUPPLY TO BE PROVIDED IN CYLINDERS FROM METRO WELDING SUPPLY CORP.
 - 1.2. CONTACT: DOUG CAMPBELL, (313) 834-1660
2. MANIFOLD
 - 2.1. CONSTRUCTED OF 3/4-INCH SEAMLESS CARBON STEEL PIPE, GRADE B, SCHEDULE 80, ASTM A-106.
 - 2.2. FITTINGS TO BE 3/4-INCH FORGED STEEL FITTINGS, 300LB CWP, A-105. USE TEFLON TAPE OR LITHARGE GLUE ON ALL JOINTS.
 - 2.3. PROVIDE THREE (3) FLEXIBLE TUBING CONNECTIONS.
 - 2.4. PROVIDE MOUNTING BRACKETS TO TEMPORARILY MOUNT TO EXISTING WALL.
- 2.5. MANUFACTURERS:
 - 2.5.1. HYDRO INSTRUMENTS
 - 2.5.2. ENCHLOR
 - 2.5.3. OR EQUAL
- 2.6. SUPPLIERS:
 - 2.6.1. METRO WELDING SUPPLY CORP.
3. FLEXIBLE TUBING
 - 3.1. STEEL TUBING, 3/8-INCH OD, 6-FT LENGTH (MIN).
 - 3.2. PROVIDE CGA-240 NIPPLE ASSEMBLY AND CONNECTORS FOR CONNECTING BETWEEN AMMONIA ISOLATION VALVE AND MANIFOLD.
- 3.3. SUPPLIERS
 - 3.3.1. HYDRO INSTRUMENTS
 - 3.3.2. ENCHLOR
 - 3.3.3. OR EQUAL
4. FLEXIBLE METAL PIGTAIL
 - 4.1. FLEXIBLE STAINLESS STEEL HOSE ASSEMBLY WITH ARMOR CASING.
 - 4.2. 1/4-INCH FEMALE NPT FITTINGS WITH CHECK VALVE ON ONE END.
 - 4.3. 3,000PSIG RATED, 1/4-INCH MINIMUM ID, 36 OR 48-INCH LENGTH.
 - 4.4. PROVIDE CGA 705/240 STAINLESS STEEL ADAPTER FOR CONNECTING TO CYLINDER VALVE.
5. SUBMITTALS
 - 5.1. CONTRACTOR SHALL SUBMIT PROPOSED TEMPORARY AMMONIA FEED SYSTEM, INCLUDING INDIVIDUAL COMPONENTS, FOR REVIEW AND APPROVAL.
 - 5.2. SEE SPECIFICATIONS FOR GENERAL SUBMITTAL REQUIREMENTS.
6. TRAINING
 - 6.1. CONTRACTOR SHALL PROVIDE TWO (2) SEPARATE 4-HOUR TRAINING ON TEMPORARY FEED SYSTEM TO WTP STAFF.
 - 6.2. TRAINING SHALL BE SCHEDULED ON NON-CONSECUTIVE WEEKS.



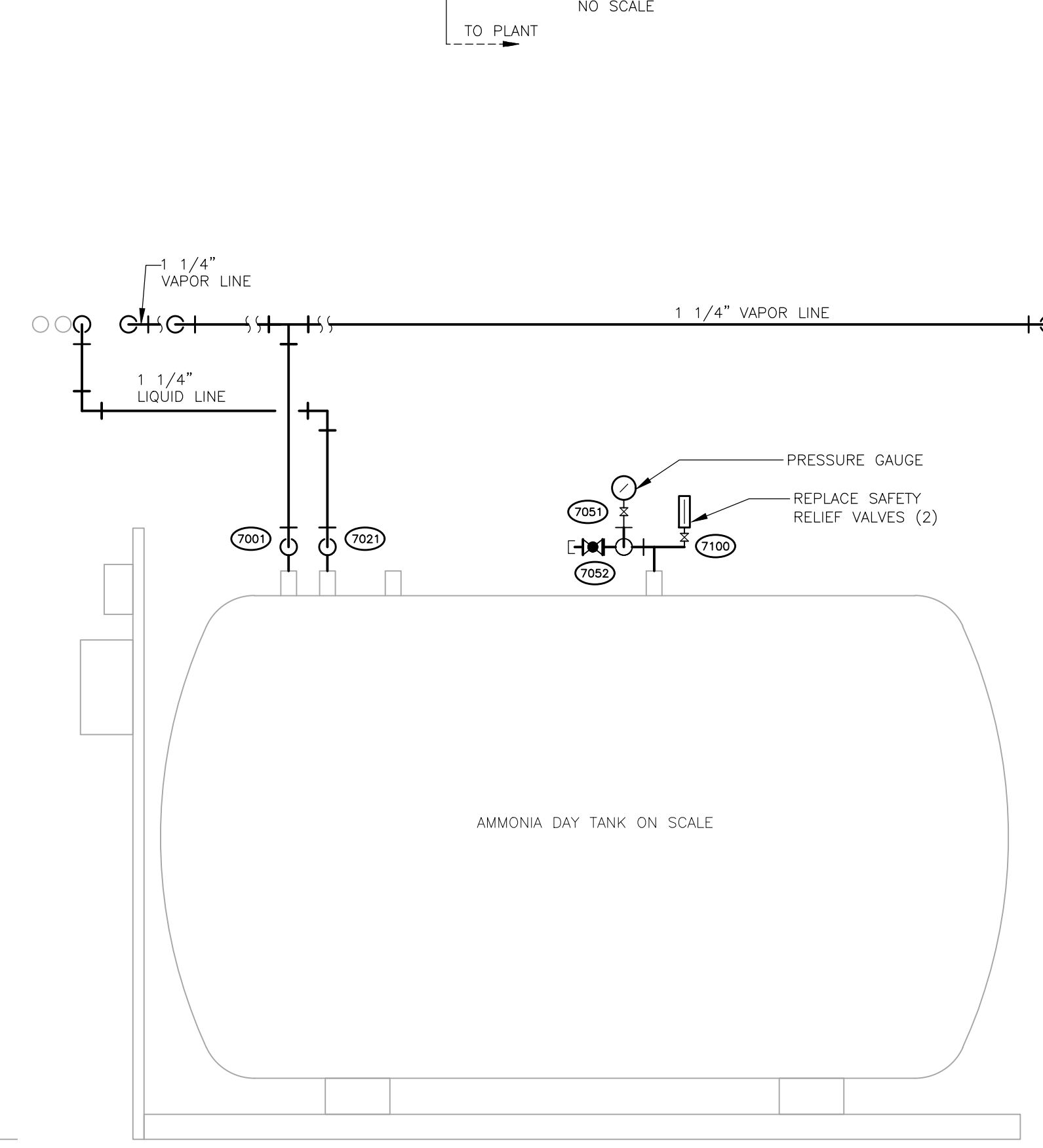
4 SECTION
SCALE: 1" = 1'-0"



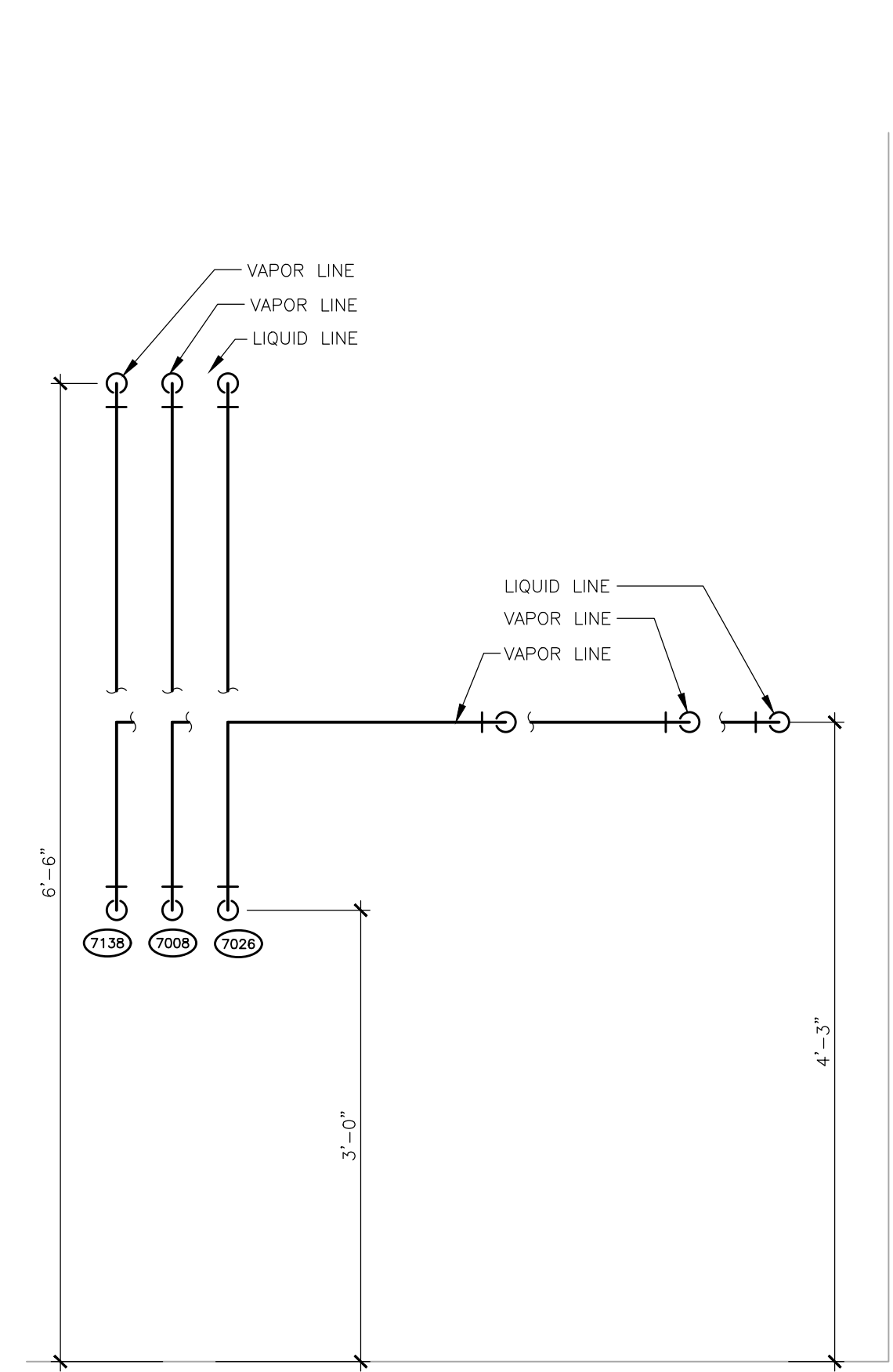
TEMPORARY AMMONIA FEED SYSTEM SCHEMATIC
NO SCALE



3 SECTION
SCALE: 1" = 1'-0"

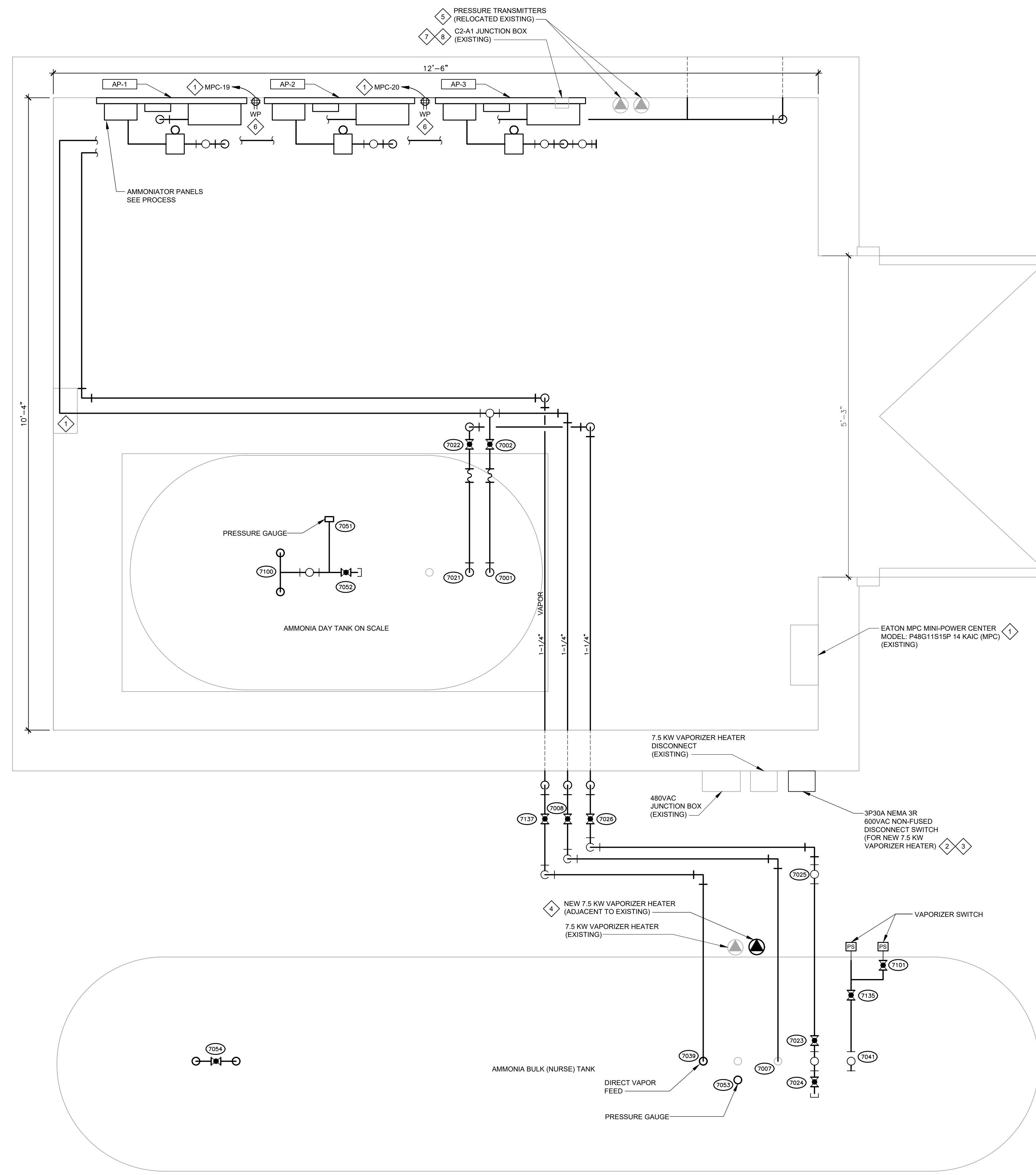


2 SECTION
SCALE: 1" = 1'-0"



1 SECTION
SCALE: 1" = 1'-0"

PLT: IFC-Z:2017171219\CAD\CDD\AMMONIA FEED SYSTEM MODIFICATION\BID\170681.DWG LAYOUT: E-1 DATE: 2/20/19 TIME: 2:16:01 PM USER: RRS



AMMONIA BUILDING ELECTRICAL PLAN
 SCALE: 1" = 1'-0"
 NORTH

SYMBOLS

- WP DOUBLE DUPLEX RECEPTACLE

NOTES

- FIELD VERIFY EQUIPMENT AND STRUCTURE DIMENSIONS AND LOCATIONS. COORDINATE WORK WITH PIPE AND AMMONIATOR INSTALLATION.
- CONTRACTOR SHALL SUBMIT PROPOSED CONDUIT LAYOUT TO OWNER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- CONDUCTORS AND CABLES:
 POWER WIRE: NO. 12 AWG MINIMUM, THHN/THWN.
 CONTROL CABLE: NO. 14 AWG MINIMUM, THHN/THWN.
 INSTRUMENT CABLE: NO. 16 AWG MINIMUM, INSULATED COPPER CONDUCTORS, TWISTED SHIELDED PAIR.
- ALL WIRES SHALL BE INSTALLED IN CONDUIT.
- CONDUIT TYPES:
 MINIMUM CONDUIT SIZE IS 3/4".
 CONDUIT IN AMMONIA BUILDING SHALL BE SCHEDULE 80 PVC.
 CONDUIT OUTSIDE SHALL BE (RGS).

KEY NOTES

- PROVIDE NEW 1-POLE 20 AMP CIRCUIT BREAKERS IN LOCATIONS 19 AND 20 (FOR RECEPTACLES).
- PANEL RED PP-2 (FED FROM MCC-2 IN FILTER PRESS CONTROL ROOM IN WTP BUILDING): REMOVE EXISTING 3-POLE 20 AMP CIRCUIT BREAKER LOCATED IN LOCATION 5 (FOR EXISTING 7.5 KW VAPORIZER HEATER) AND PROVIDE NEW 3-POLE 30 AMP CIRCUIT BREAKER.
- PROVIDE 3/4-INCH CONDUIT WITH 3 #10 #10G WIRES BETWEEN EXISTING 7.5 KW VAPORIZER HEATER DISCONNECT SWITCH AND NEW 7.5 KW VAPORIZER HEATER DISCONNECT SWITCH.
- PROVIDE 1-INCH LIQUID TIGHT FLEXIBLE METAL CONDUIT (LTFMC) WITH 3 #10 AWG #10G WIRES FROM NEW DISCONNECT SWITCH TO NEW 7.5 KW VAPORIZED HEATER.
- DISCONNECT WIRING TO PRESSURE TRANSMITTERS AND RELOCATE PRESSURE TRANSMITTERS. PROVIDE NEW 3/4-INCH CONDUIT BETWEEN EACH RELOCATED PRESSURE TRANSMITTERS AND EXISTING C2-A1 JUNCTION BOX. REWIRE TRANSMITTERS USING EXISTING WIRING.
- PROVIDE (2) WEATHER-PROOF, GFCI DUPLEX RECEPTACLES WITH TWO GANG WEATHER-PROOF WHILE-IN-USE EXTRA DUTY COVER. MOUNT AT 60-INCHES ABOVE FINISHED FLOOR.
- USE (3) OF THE SPARE WIRES LOCATED IN C2-A1 JUNCTION BOX FOR THE CHEMICAL FEED RATE FEEDBACK (AO1) FROM THE AMMONIATOR CONTROL VALVES BACK TO RIO-C2 PANEL. WIRE TO THE FOLLOWING SPARE ANALOG INPUTS:
 A. PLC-2 RACK R2 SLOT 2 INPUT 6: AP-1 CHEMICAL FEED RATE
 B. PLC-2 RACK R2 SLOT 2 INPUT 7: AP-2 CHEMICAL FEED RATE
 C. PLC-2 RACK R2 SLOT 3 INPUT 6: AP-3 CHEMICAL FEED RATE
- REUSE CONDUIT. INSTALL NEW CABLE FOR THE EXISTING CW1 FEED RATE SET POINT AND CW2 FEED RATE SET POINT FROM GREEN PANEL IN CONTROL ROOM. WIRE AS FOLLOWS:
 A. AMMONIATOR PANEL AP-1: CW1 FEED RATE SET POINT.
 B. AMMONIATOR PANEL AP-2: EITHER CW1 OR CW2 FEED RATE SET POINT AS DETERMINED BY SELECTOR SWITCH.
 C. AMMONIATOR PANEL AP-3: CW2 FEED RATE SET POINT.



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Water Treatment Plant
 Ann Arbor, Michigan
Ammonia Feed System Modifications
 Ammonia Building Electrical Plan

REVISIONS

NO.	DATE	DESCRIPTION
1	2/20/19	BIDS AND CONSTRUCTION

Drawn By: RS2
 Designer: EMS
 Reviewer: TDM
 Manager: TLW

Hard copy is intended to be 24"x36" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

PROJECT NO.
170681

FIGURE NO.

E-1

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