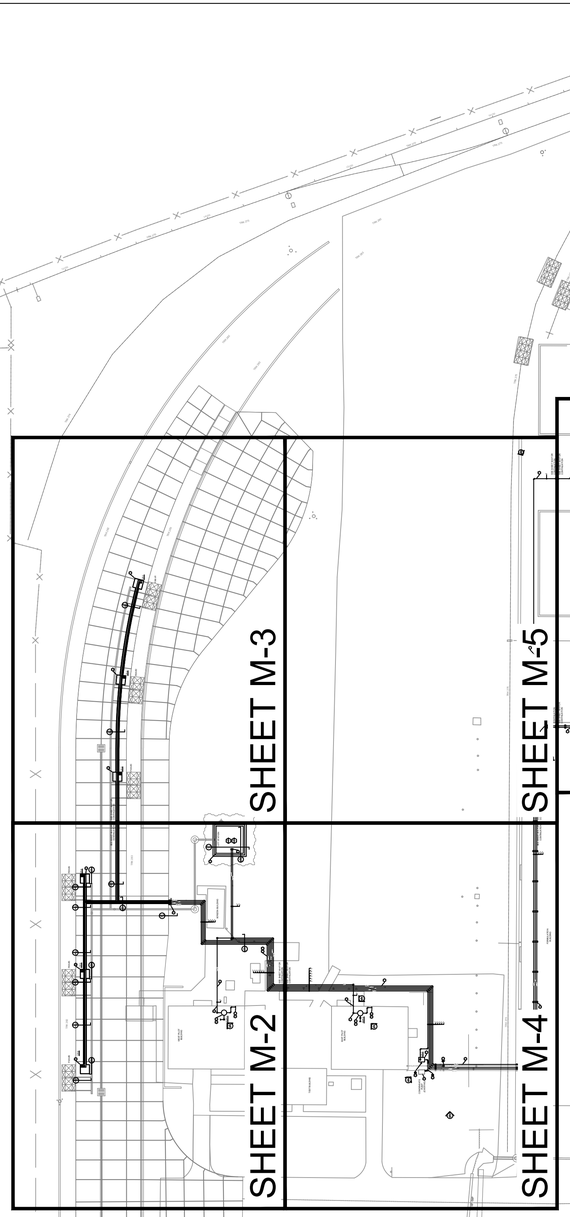


DRAWING INDEX

MECHANICAL

M-0	MECHANICAL SITE PLAN
M-1	MECHANICAL LAYOUT PLAN
M-2	MECHANICAL LAYOUT PLAN
M-3	MECHANICAL LAYOUT PLAN
M-4	MECHANICAL LAYOUT PLAN
M-5	MECHANICAL LAYOUT PLAN
M-6	MECHANICAL LAYOUT PLAN
M-7	MECHANICAL LAYOUT PLAN
M-8	MECHANICAL LAYOUT PLAN
M-9	SITE PHOTOS
M-10	SITE PHOTOS
M-11	UTILITY TRENCH AND RAIL CAR CONNECTION CROSS SECTIONS
M-12	UTILITY TRENCH AND RAIL CAR CONNECTION CROSS SECTIONS
M-13	RAIL CAR CONNECTION PLAN AND SCHEMATIC
M-14	RAIL CAR CONNECTION SCHEMATIC
M-15	PIPE RACK CROSS SECTIONS
M-16	LIFT STATION CROSS SECTIONS
M-17	EQUALIZATION TANK CONNECTION SCHEMATIC
M-18	MECHANICAL DETAILS
M-19	MECHANICAL SCHEDULES AND DETAILS
M-20	MECHANICAL DETAILS
M-21	MECHANICAL DETAILS
M-22	MECHANICAL SPECIFICATIONS
M-23	MECHANICAL SPECIFICATIONS
M-24	MECHANICAL SPECIFICATIONS
M-25	MECHANICAL SPECIFICATIONS

N

120 0 120

SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

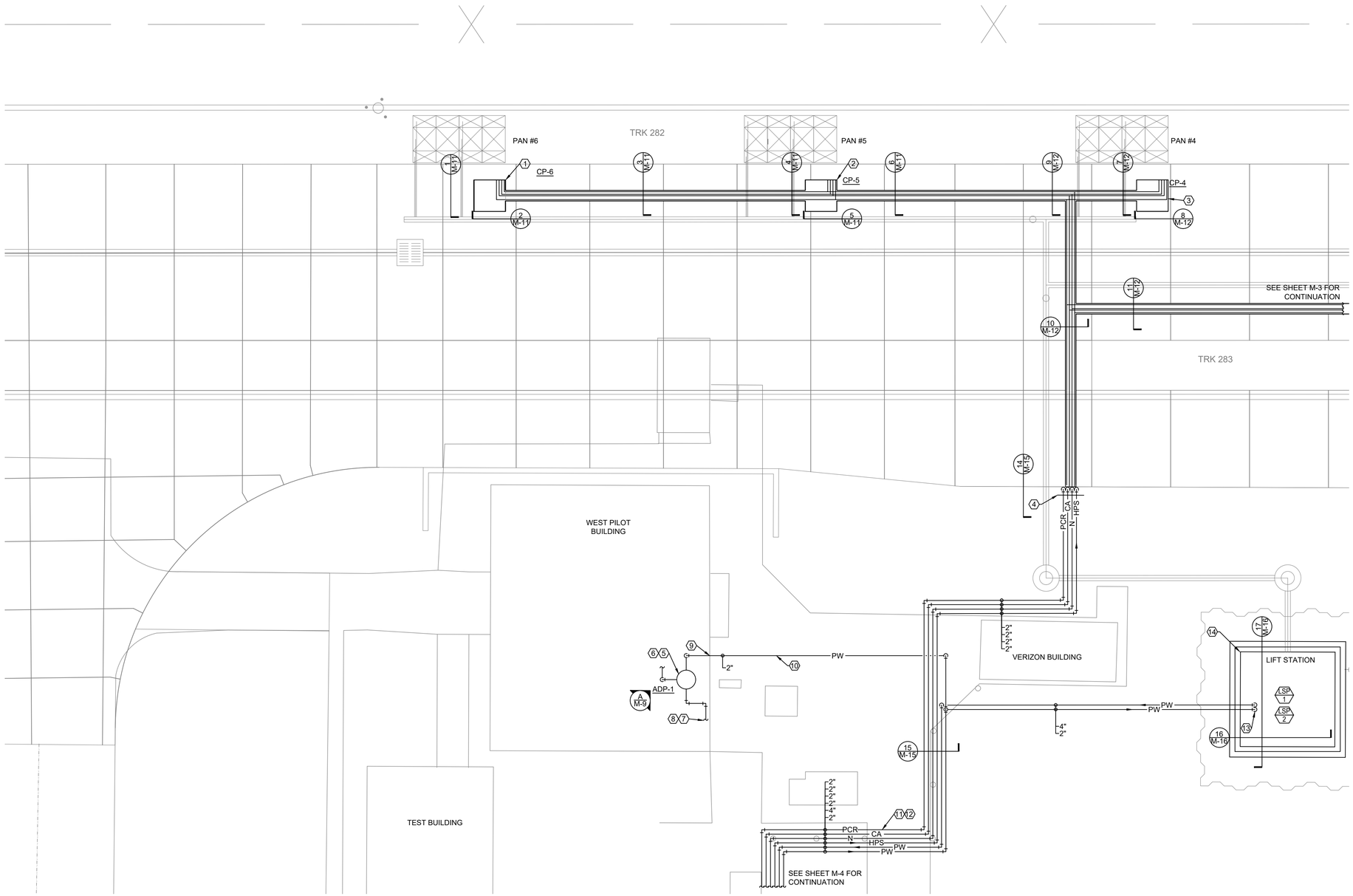
NOT DISCLOSED

PROJECT NO. 16531057

DATE MARCH 7, 2018

SHEET NO. M-1

PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$ PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVS$ FILE: $FILE$



KEYED MECHANICAL NOTES: ⓧ

1. RAIL CAR CONNECTION PIT. SEE DETAIL 1/M-13 AND SCHEMATIC 2/M-13.
2. RAIL CAR CONNECTION PIT. SEE DETAIL 1/M-13 AND SCHEMATIC 2/M-14.
3. RAIL CAR CONNECTION PIT. SEE DETAIL 1/M-13 AND SCHEMATIC 1/M-14.
4. MOUNT VERTICAL PIPING ON PROVIDED SUPPORT. SEE STRUCTURAL. COORDINATE WITH ELECTRICAL.
5. AIR DIAPHRAGM PUMP. PROVIDE ANGLE IRON STAND AND 1/2" NITROGEN/COMPRESSED AIR CONNECTION. SEE DETAIL 1/M-18. COORDINATE EXACT LOCATION WITH HARCROS PROJECT MANAGER.
6. FIELD ROUTE 1-1/2" PUMPED WASTE AS REQUIRED INTO EXISTING TRENCH.
7. FIELD ROUTE 1/2" NITROGEN/COMPRESSED AIR TO NEAREST CONNECTION POINT 1" OR LARGER. PROVIDE ISOLATION VALVE AND PRESSURE REGULATOR AT TERMINATION.
8. MOUNT COMPRESSED AIR PIPING TO STRUCTURAL BEAMS AND COLUMNS. DO NOT MOUNT ON BUILDING WALLS.
9. 1-1/2" PUMPED WASTE SHALL EXIT BUILDING THROUGH METAL PANEL ABOVE MAN DOOR ONLY. DO NOT EXIT THROUGH BUILDING WALLS. SEAL PENETRATION WEATHER TIGHT.
10. RACK 1-1/2" PUMPED WASTE ON NEW PIPE RACKS.
11. SEE PIPE RACK DETAIL.
12. MOUNT PIPING ON PIPE RACKS. SEE STRUCTURAL.
13. RACK PUMPED WASTE ON PIPE STAND. SEE 3/M-16 ENLARGED VIEW SECTION 17.
14. LIFT STATION SEE 1/M-16 AND 2/M-16.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.

N

10 0 10

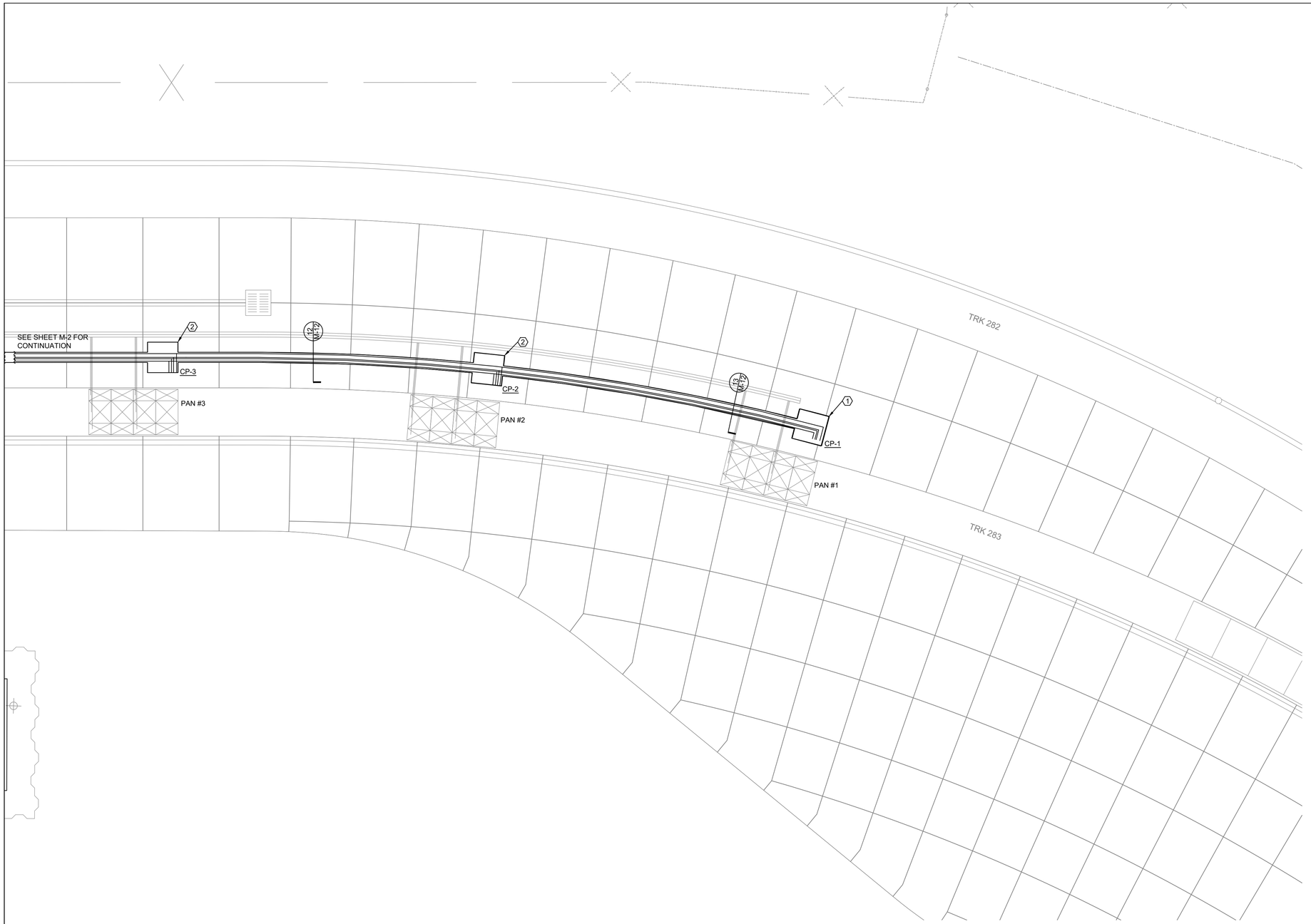
SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-2

PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$ PLOT DRIVER: $PLTDRVS$ PENTABLE: $PENTABLE$ FILE: $FILE$



KEYED MECHANICAL NOTES: (X)

1. RAIL CAR CONNECTION PIT. SEE DETAIL 1/M-13 AND SCHEMATIC 2/M-13.
2. RAIL CAR CONNECTION PIT. SEE DETAIL 1/M-13 AND SCHEMATIC 2/M-14.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.

N

10 0 10

SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-3

PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVR$ BY: $USERNAME$
PLOT DATE: $DATE$ TIME: $TIME$
FILE: $FILE$

KEYED MECHANICAL NOTES: ⓧ

1. FIELD ROUTE 1-1/2" PUMPED WASTE IN BUILDING. DO NOT FASTEN HANGERS ON WALLS. MOUNT ON EXISTING STRUCTURAL STEAL MEMBERS.
2. 1-1/2" PUMPED WASTE SHALL EXIT BUILDING AT METAL PANEL ABOVE MAN DOOR ONLY. DO NOT PENETRATE BUILDING WALLS. SEAL PENETRATION WEATHER TIGHT. SEE PHOTO B/M.9.
3. AIR DIAPHRAGM PUMP. PROVIDE ANGLE IRON STAND AND 1/2" NITROGEN/COMPRESSED AIR CONNECTION. SEE DETAIL 1/M-18. COORDINATE EXACT LOCATION OF PUMP WITH HARCROS PROJECT MANAGER.
4. FIELD ROUTE 2" PUMPED WASTE AS NECESSARY INTO EXISTING WASTE TRENCH. PROVIDE WITH SCREEN. SEE PHOTO A/M-9.
5. FIELD ROUTE 1/2" NITROGEN/COMPRESSED AIR PIPING TO NEAREST CONNECTION POINT 1" OR LARGER. PROVIDE ISOLATION VALVE AND PRESSURE REGULATOR AT TERMINATION.
6. MOUNT COMPRESSED AIR PIPING TO STRUCTURAL BEAMS AND COLUMNS. DO NOT MOUNT ON BUILDING WALLS.
7. MOUNT PIPING ON EXISTING PIPE RACK. SEE STRUCTURAL.
8. CONNECT 1" MOTIVE STEAM TO CP-2. PROVIDE WITH PRESSURE GAUGE, REGULATOR, AND ISOLATION VALVES. SEE DETAIL 3/M-18 AND PHOTO D/M-9 FOR POINT OF CONNECTION.
9. PROVIDE CHECK VALVE AND ISOLATION VALVE ON EXISTING CONDENSATE RETURN PIPING.
10. CONNECT 2" PUMPED CONDENSATE INTO EXISTING CONDENSATE RETURN LINE. SEE PHOTO D/M-9 FOR POINT OF CONNECTION. PROVIDE CHECK VALVE AND ISOLATION VALVE.
11. STEAM DRIVEN CONDENSATE PUMP. SEE DETAIL 3/M-18.
12. SEE PHOTO E/M-9 FOR CONNECTION LOCATION OF 2" STEAM.
13. RACK PIPING ON EXISTING PIPE RACKS.
14. RACK PIPING ON ROOF BLOCKS. SEE DETAIL 1/M-19.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.

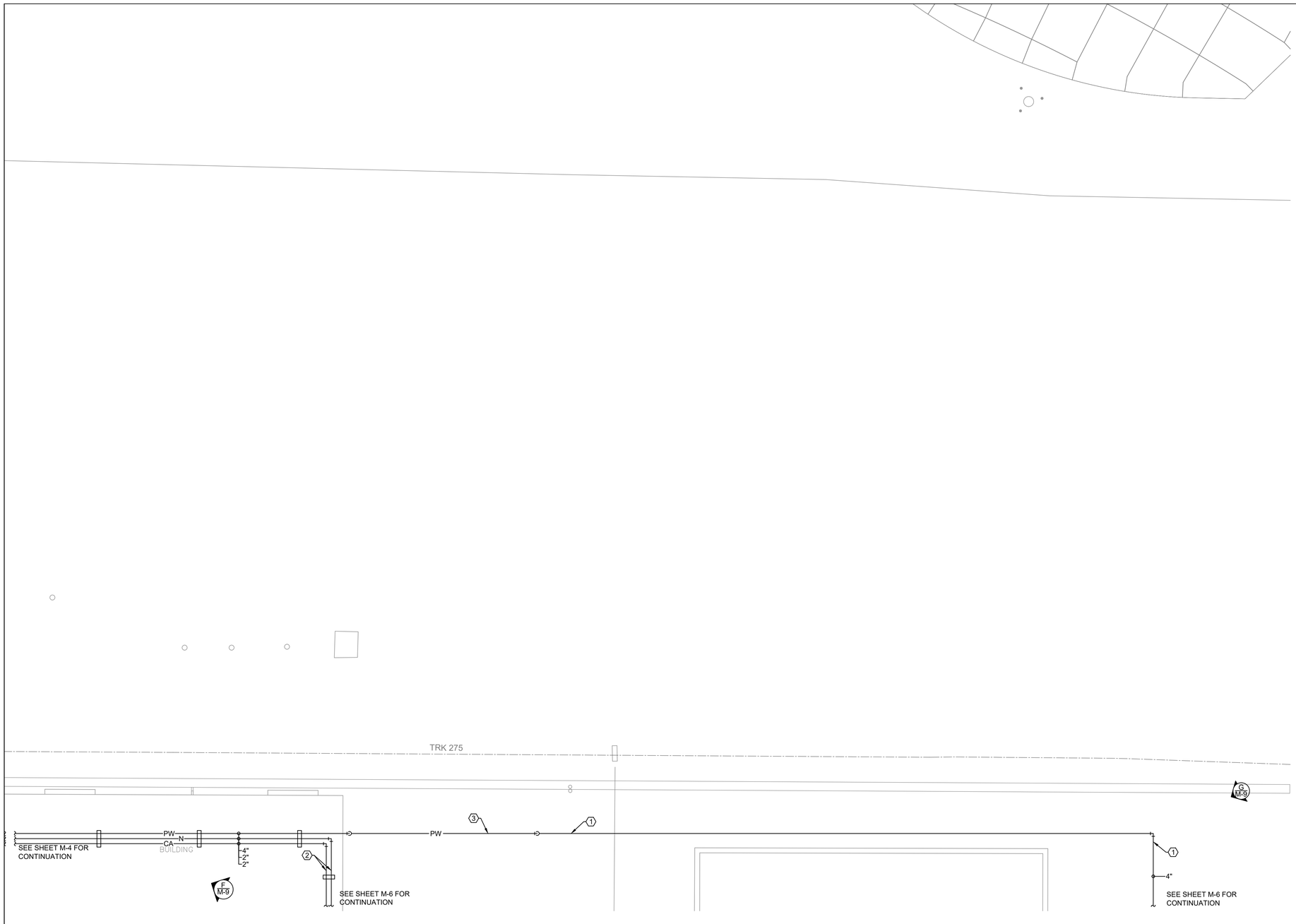
10 0 10
SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-4

PLOT DRIVER: $PLTDRV$ PENTABLE: $PENTABLE$
BY: $USERNAME$ TIME: $TIME$
PLOT DATE: $DATE$ FILE: $FILE$



KEYED MECHANICAL NOTES: ⓧ

1. RACK PIPING ON EXISTING PIPE RACKS. SEE PHOTO G/M-9.
2. RACK PIPING ON ROOF BLOCKS. SEE DETAIL 1/M-19.
3. RACK PIPING ON NEW PIPE RACKS SEE STRUCTURAL PIPE RACK LAYOUT.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.

N

10 0 10

SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

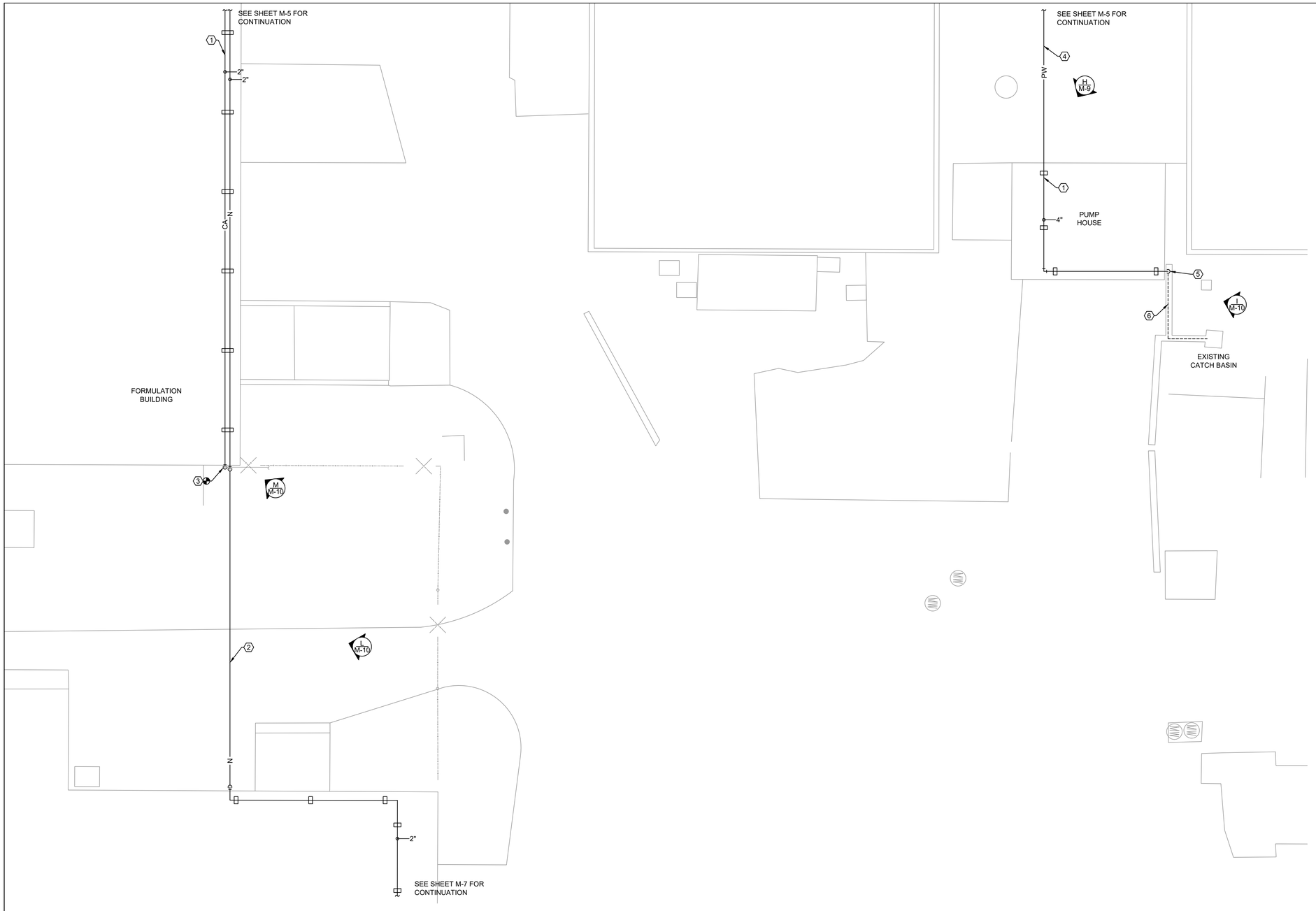
NOT DISCLOSED

PROJECT NO. 16531057

DATE MARCH 7, 2018

SHEET NO. M-5

PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVR$ PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$ FILE: $FILE$



KEYED MECHANICAL NOTES: (X)

1. RACK PIPING ON ROOF BLOCKS. SEE DETAIL 1/M-19.
2. RACK PIPING ON EXISTING PIPE RACKS. SEE PHOTO L/M-10.
3. CONNECT 2" COMPRESSED AIR TO EXISTING. SEE PHOTO M/M-10 FOR CONNECTION LOCATION.
4. RACK PIPING ON EXISTING PIPE RACKS. SEE PHOTO H/M-9.
5. 4" PUMPED WASTE PIPING DOWN INTO TRENCH. CUT METAL GRATING AS NEEDED. SEE PHOTO I/M-10 FOR SPILL LOCATION.
6. ROUTE 4" PUMPED WASTE BELOW OPEN GRATE TO EXISTING CATCH BASIN.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.

N

10 0 10

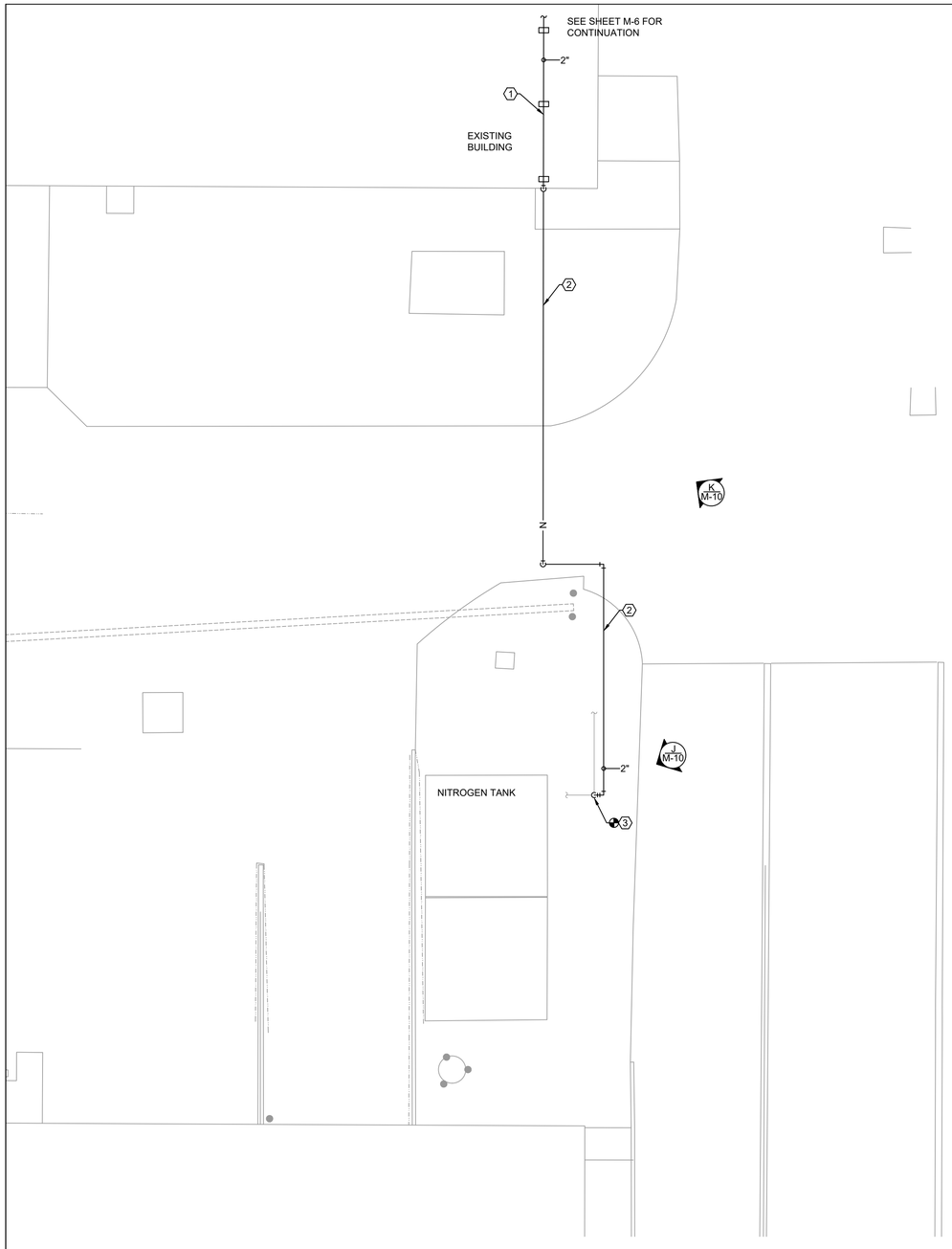
SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-6

PENTABLE: $PENTABLE$
PLOT DRIVER: $$LTDRVS$
BY: $USERNAME$
TIME: $TIME$
PLOT DATE: $DATE$
FILE: $FILE$

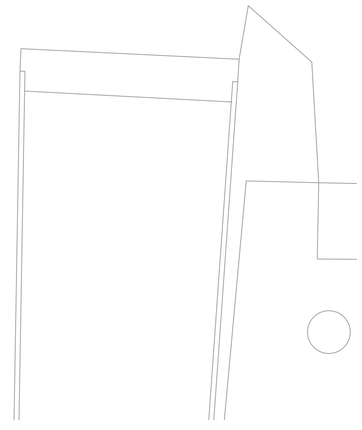


KEYED MECHANICAL NOTES: (X)

1. RACK PIPING ON ROOF BLOCKS. SEE DETAIL 1/M-19.
2. RACK PIPING ON EXISTING PIPE RACKS. SEE PHOTO K/M-10.
3. CONNECT 2" NITROGEN TO EXISTING. SEE PHOTO J/M-10 FOR CONNECTION LOCATION.

GENERAL NOTES:

1. ALL STEAM PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 3" INSULATION AND WEATHERTIGHT JACKET. ALL STEAM PIPING LESS TAHN 1-1/2" SHALL BE INSUALTED WITH 2" INSULATION AND WEATHERTIGHT JACKET.
2. ALL CONDENSATE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
3. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.
4. PROVIDE DRAIN VALVES ON LOW POINTS OF ALL PIPING.



N

10 0 10

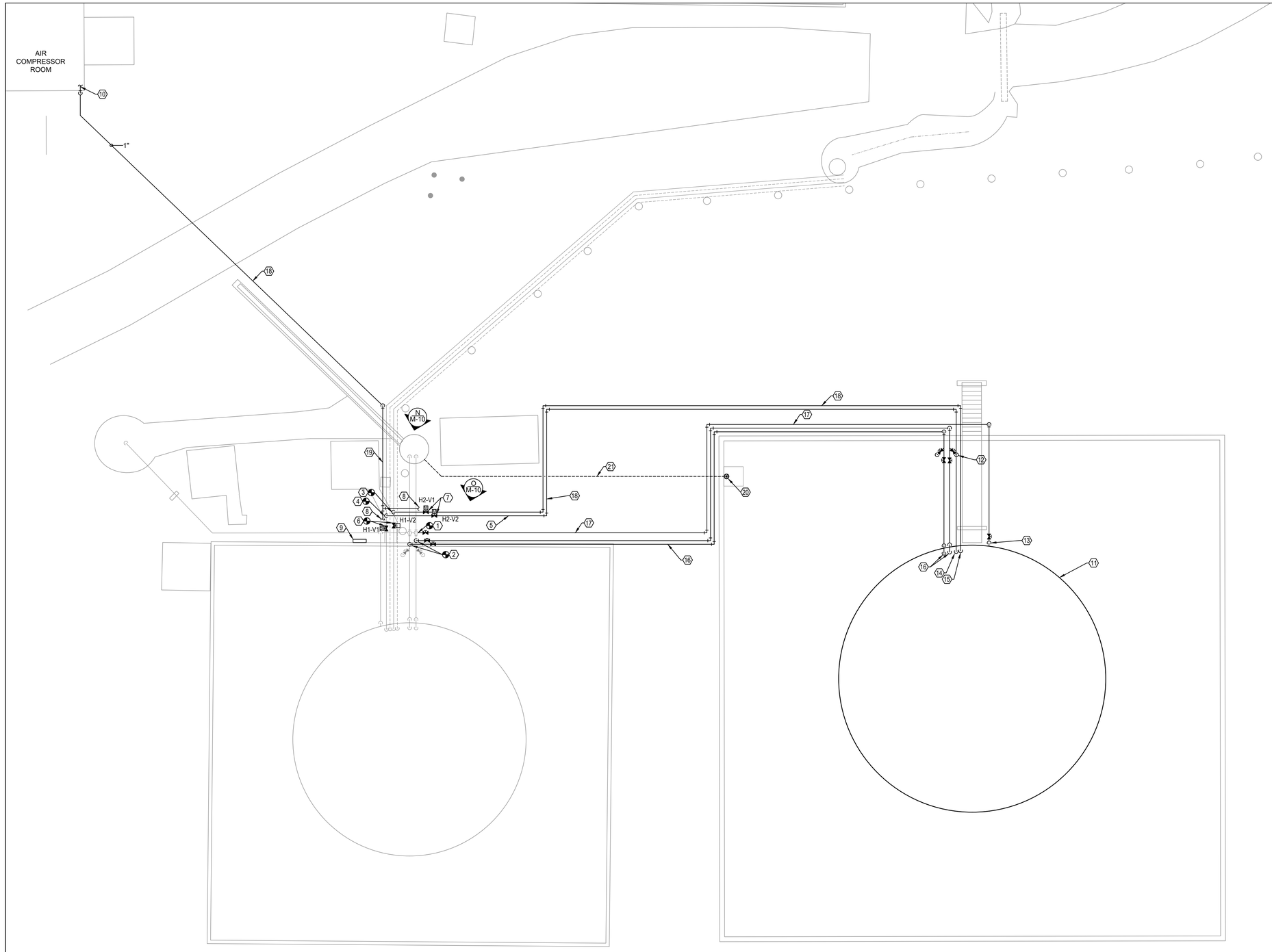
SCALE IN FEET

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-7

PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVS$ BY: $USERNAME$ PLOT DATE: $DATE$ TIME: $TIME$ FILE: $FILE$



KEYED MECHANICAL NOTES: (X)

1. CONNECT DRAIN DOWN LINE FROM NEW EQUALIZATION TANK TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO O/M-10 AND FOR CONNECTION POINT.
2. CONNECT PUMPED WASTE LINES TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO O/M-10 FOR CONNECTION POINT.
3. CONNECT EMERGENCY RETENTION BASIN DISCHARGE LINE TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO N/M-10 FOR CONNECTION POINT.
4. CONNECT SCRUBBER TANK DISCHARGE LINE TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO N/M-10 FOR CONNECTION POINT.
5. STEAM TRACE SCRUBBER TANK DISCHARGE LINE FROM POINT OF CONNECTION TO NEW EQUALIZATION TANK.
6. WORCHESTER F819 PNEUMATIC OPERATED VALVE WITH AUTOMAX B175S10 ACTUATOR, LIMIT SWITCH, SOLENOID, AND INTEGRAL PRESSURE REGULATOR. VALVE TO DEFAULT OPEN. PROVIDE MINIMUM 80PSI COMPRESSED AIR FOR OPERATION.
7. WORCHESTER F819 PNEUMATIC OPERATED VALVE WITH AUTOMAX B175S10 ACTUATOR, LIMIT SWITCH, SOLENOID, AND INTEGRAL PRESSURE REGULATOR. VALVE TO DEFAULT CLOSED. PROVIDE MINIMUM 80PSI COMPRESSED AIR FOR OPERATION.
8. ROUTE 1/4" COMPRESSED AIR FROM 1" MAIN TO EACH PNEUMATIC VALVE.
9. LOCATE OPERATOR AT GROUND LEVEL BY PIT PUMP CONTROLS. PROVIDE ONE SWITCH PER VALVE.
10. CONNECT 1" COMPRESSED AIR INSIDE BUILDING.
11. NEW EQUALIZATION TANK. SEE MANUFACTURER'S DRAWINGS SHEETS M-20 AND M-21 FOR REFERENCE.
12. PUMPED WASTE TO SPILL INSIDE CONTAINMENT DYKE. PROVIDE BUTTERFLY VALVES SIMILAR TO NIBCO WD-2000, DUCTILE IRON WITH EDPM SEATS. SEE EQUALIZATION TANK CONNECTION SCHEMATIC SHEET M-17 FOR CLARITY.
13. DRAIN DOWN LINE FROM EQUALIZATION TANK. SIZE TO MATCH EXISTING DRAIN DOWN PIPING. COORDINATE EXACT CONNECTION SIZE AND LOCATION WITH OWNER PRIOR TO TANK FABRICATION. SEE EQUALIZATION TANK CONNECTION SCHEMATIC SHEET M-17 FOR CLARITY.
14. CONNECT EMERGENCY RETENTION BASIN DISCHARGE LINE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE AND LOCATION PRIOR TO FABRICATION. SEE EQUALIZATION TANK CONNECTION SCHEMATIC SHEET M-17 FOR CLARITY.
15. CONNECT SCRUBBER TANK DISCHARGE LINE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE AND LOCATION PRIOR TO FABRICATION. SEE EQUALIZATION TANK CONNECTION SCHEMATIC SHEET M-17 FOR CLARITY.
16. CONNECT PUMPED WASTE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE AND LOCATION PRIOR TO FABRICATION. SEE EQUALIZATION TANK CONNECTION SCHEMATIC SHEET M-17 FOR CLARITY.
17. RACK PIPING ON CONTAINMENT DYKE WALL. SEE STRUCTURAL.
18. ROUTE COMPRESSED AIR PIPING BELOW GRADE.
19. RACK PIPING ON EXISTING PIPE STANDS.
20. PROVIDE 6" KNIFE GATE VALVE WITH EXTENDED HAND WHEEL OPERATION SIMILAR TO CLARKSON KGD VALVE WITH TRUMBULL EXTENSION SPINDLE. COORDINATION INSTALLATION WITH STRUCTURAL.
21. 6" UNDERGROUND WASTE LINE FROM GATE VALVE TO LIFT STATION WITH MINIMUM 1% SLOPE. FELID VERIFY INVERT ELEVATION AND ALIGN WITH EXISTING LIFT STATION.

GENERAL NOTES:

1. ALL PIPING IS INTENDED TO REDIRECT FULL FLOW FROM THE EXISTING EQUALIZATION TANK TO THE NEW EQUALIZATION TANK. THEREFORE, ALL PIPING SHALL BE SIZED TO MATCH EXISTING PIPING. VERIFY PIPE SIZES PRIOR TO CONSTRUCTION.
2. ALL PUMPED WASTE PIPING SHALL BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.

N

10 0 10

SCALE IN FEET

RDH
ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-8

PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRV$ BY: $USERNAME$ TIME: $TIME$ PLOT DATE: $DATE$ FILE: $FILE$

Photo A

Waste Connection Location in Existing Trench. West Pilot Building.

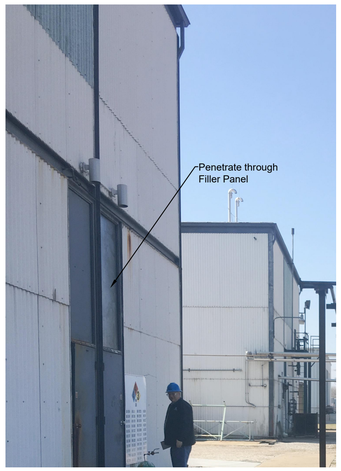


Photo B

Penetration location for pumped waste from Air Operated Diaphragm Pump.

Photo C

Penetration location for pumped waste from Air Operated Diaphragm Pump.

Photo D

Connection Location for Motive Steam and Pumped Condensate.

Photo E

Connection Location for Steam Supply.

Photo F

Formulation Building Roof. Provide Roof Blocks for New 2" Compressed Air, 2" Nitrogen, and 4" Pumped Waste.

Photo G

Pumped Waste Routing on Existing Pipe Stands.

Photo H

Pumped Waste Routing on Existing Pipe Stands.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-9

PENTABLE: $PENTABLE$ PLOT DRIVER: $$LTDRVS$ BY: $USERNAME$ PLOT DATE: $DATE$ TIME: $TIME$ FILE: $FILE$

Photo I

Route Pumped Waste under Open Grate to Catch Basin.

Photo J

Connection Location for 2" Nitrogen.

Photo K

Existing Pipe Bridge for Routing of 2" Nitrogen. Route Over Existing Building.

Photo L

Existing Pipe Racks for Routing of 2" Nitrogen.

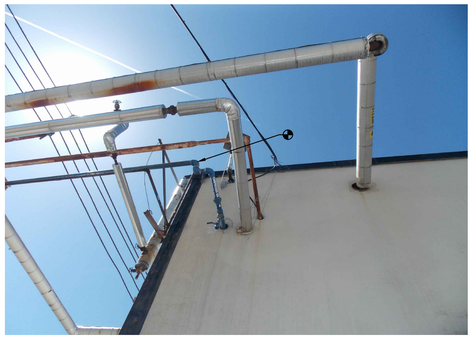


Photo M

Connection Location for 2" Compressed Air.

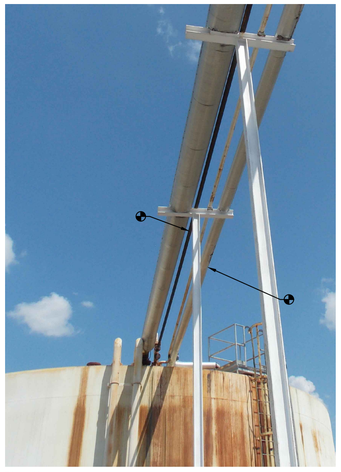


Photo N

Connection Location for Diversion of Scrubber Tank Discharge and Emergency Retention Basin Discharge.

Photo O

Connection Location for Diversion of Pumped Waste.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

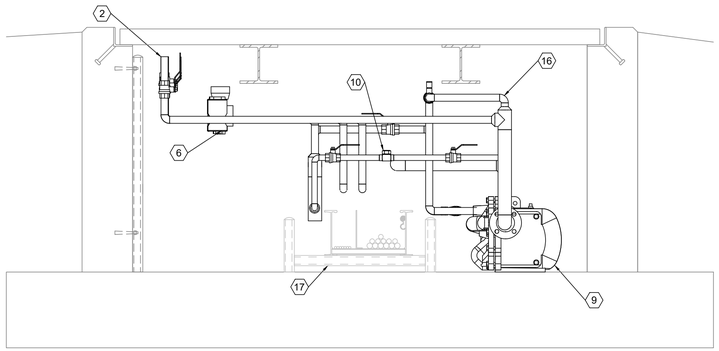
NOT DISCLOSED

PROJECT NO. 16531057

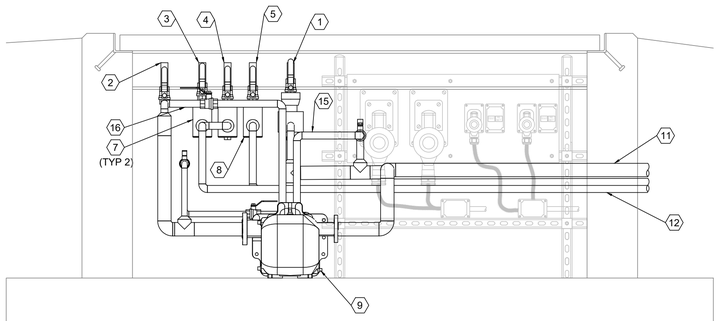
DATE MARCH 7, 2018

SHEET NO. M-10

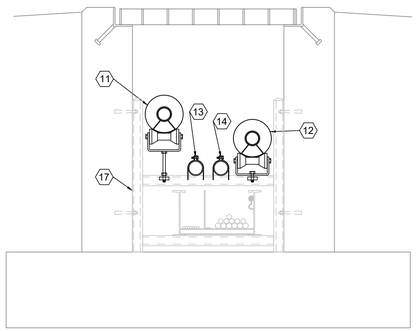
PENTABLE: $PENTABLE$ PLOT DRVER: $$LTDRVS$ BY: $USERNAME$ PLOT DATE: $DATE$ TIME: $TIME$ FILE: $FILE$



1 M-11 SECTION 1
1" = 1'-0"



2 M-11 SECTION 2
1" = 1'-0"



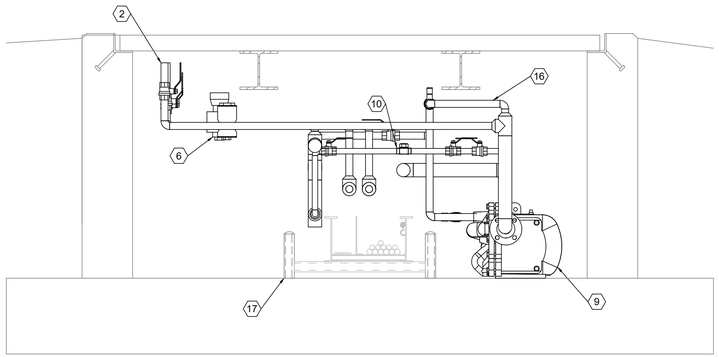
3 M-11 SECTION 3
1" = 1'-0"

KEYED MECHANICAL NOTES: (X)

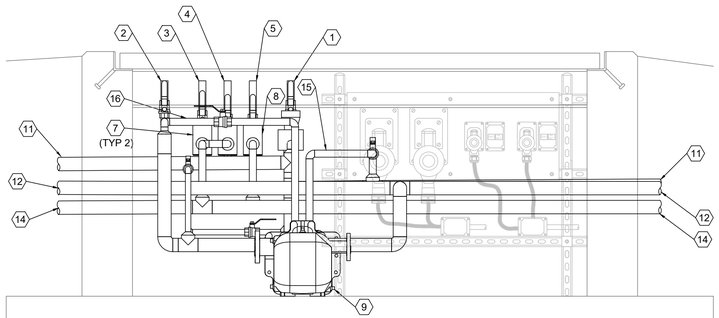
1. 1" RAIL CAR STEAM CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
2. 1" RAIL CAR CONDENSATE CONNECTION. PROVIDE WITH MNPT CONNECTON AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
3. 1" RAIL CAR COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
4. 1" TOOL COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
5. 1" RAIL CAR NITROGEN CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
6. STEAM PRESSURE REGULATOR VALVE SIMILAR TO SPENCE ED. REDUCE TO 15PSI.
7. HIGH PRESSURE COMPRESSED AIR REGULATOR SIMILAR TO SIMILAR TO PARKER R119-08CG/M2. ADJUSTABLE 125PSI MAX.
8. HIGH PRESSURE REGULATOR FOR NITROGEN SIMILAR TO CASH ACME E-55.
9. AUTOMATIC PUMP TRAP SPIREX SARCO APT14HC. PROVIDE WITH LIQUID EXPANSION STREAM TRAP SPIREX SARCO THERMOTRON.
10. THERMODYNAMIC STEAM TRAP SIMILAR TO SPIREX SARCO TD42. INSTALL WITH STRAINER IN THE HORIZONTAL POSITION.
11. 2" STEAM MAIN. PROVIDE WITH 3" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. SLOPE AT 1:100. SEE DETAIL 7/M-18. RACK ON ADJUSTABLE HEIGHT ROLLER ON PIPE STAND.
12. 2" PUMPED CONDENSATE. PROVIDE WITH HEAT TRACE AND 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. RACK ON ROLLER ON PIPE STAND.
13. 2" NITROGEN. RACK ON PIPE STAND.
14. 2" COMPRESSED AIR. RACK ON PIPE STAND.
15. 3/4" MOTIVE STEAM FOR APT-1. PROVIDE PRESSURE GAUGE AND PRESSURE REDUCING VALVE SIMILAR TO BRV25. REGULATE TO 100 PSI. FIELD ADJUST.
16. 3/4" RESERVOIR PIPE. SEE MANUFACTURERS DATA FOR MINIMUM LENGTH. VENT PER DETAILS 2/M-18 & 4/M-18.
17. 3/4"X1-1/4" UNISTRUT PIPE STAND. LOCATE AT 8' INTERVALS.

GENERAL NOTES:

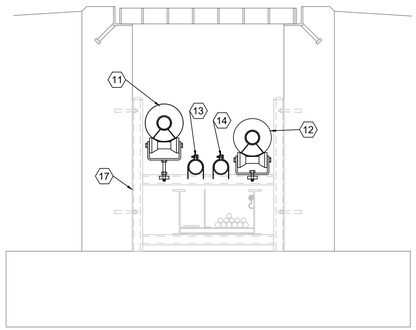
1. SEE STEAM AND CONDENSATE DETAILS 2/M-18 & 4/M-18 FOR REQUIRED UNIONS, STEAM TRAPS, CHECK VALVES, AND ISOLATION VALVES.
2. ALL CONDENSATE PIPING, ACESSORIES, AND PUMPS TO BE HEAT TRACED.



4 M-11 SECTION 4
1" = 1'-0"



5 M-11 SECTION 5
1" = 1'-0"



6 M-11 SECTION 6
1" = 1'-0"

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

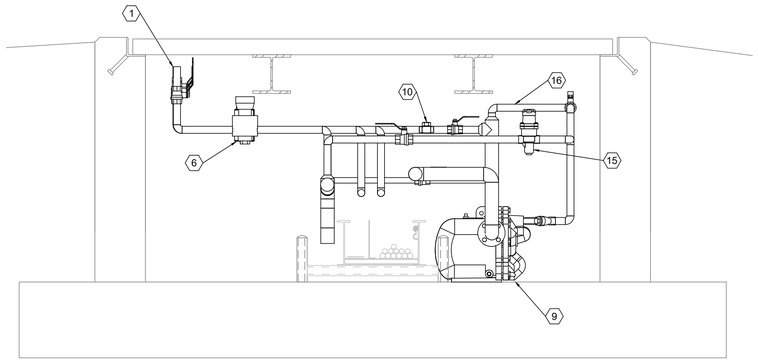
NOT DISCLOSED

PROJECT NO. 16531057

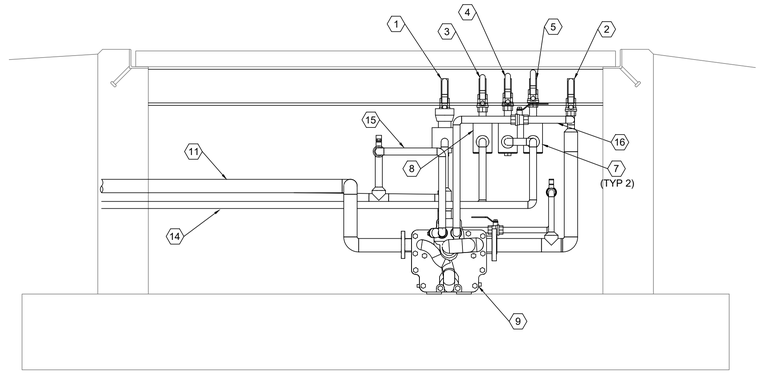
DATE MARCH 7, 2018

SHEET NO. M-11

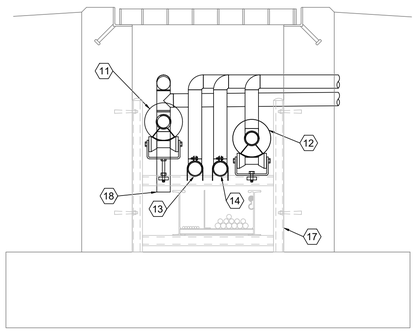
FILE: $FILE$ BY: $USERNAME$ PLOT DATE: $DATE$ TIME: $TIME$ PLOT DRIVER: $PLTDRVS$ PENTABLE: $PENTABLE$



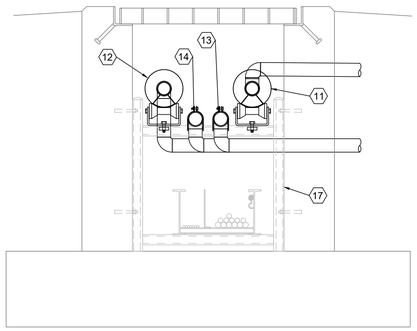
1 M-12 SECTION 7
1" = 1'-0"



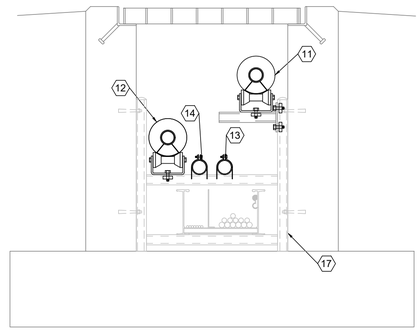
2 M-12 SECTION 8
1" = 1'-0"



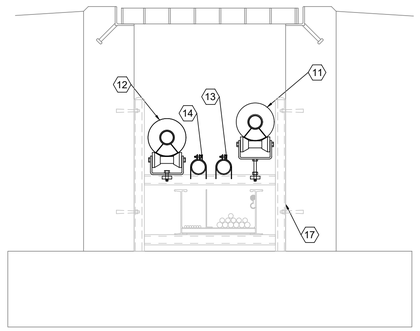
3 M-12 SECTION 9
1" = 1'-0"



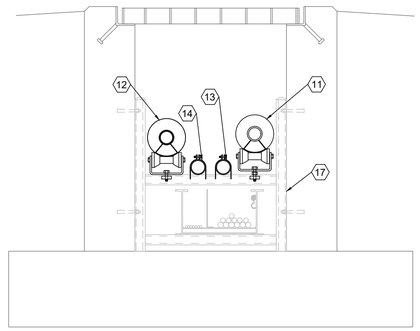
4 M-12 SECTION 10
1" = 1'-0"



5 M-12 SECTION 11
1" = 1'-0"



6 M-12 SECTION 12
1" = 1'-0"



7 M-12 SECTION 13
1" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. 1" RAIL CAR STEAM CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
2. 1" RAIL CAR CONDENSATE CONNECTION. PROVIDE WITH MNPT CONNECTON AND SHUTOFF SHARPE CLASS 800 CARBON STEEL GATE VALVE.
3. 1" RAIL CAR COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
4. 1" TOOL COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
5. 1" RAIL CAR NITROGEN CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
6. STEAM PRESSURE REGULATOR VALVE SIMILAR TO SPENCE ED. REDUCE TO 15PSI.
7. HIGH PRESSURE COMPRESSED AIR REGULATOR SIMILAR TO PARKER R119-08CG/M2 . ADJUSTABLE 125PSI MAX.
8. HIGH PRESSURE REGULATOR FOR NITROGEN SIMILAR TO CASH ACME E-55.
9. AUTOMATIC PUMP TRAP SPIREX SARCO APT14HC. PROVIDE WITH LIQUID EXPANSION STREAM TRAP SPIREX SARCO THERMOTRON.
10. THERMODYNAMIC STEAM TRAP SIMILAR TO SPIREX SARCO TD42. INSTALL WITH STRAINER IN THE HORIZONTAL POSITION.
11. 2" STEAM MAIN. PROVIDE WITH 3" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. SLOPE AT 1:100. SEE DETAIL 7/M-18. RACK ON ADJUSTABLE HEIGHT ROLLER ON PIPE STAND.
12. 2" PUMPED CONDENSATE. PROVIDE WITH HEAT TRACE AND 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. RACK ON ROLLER ON PIPE STAND.
13. 2" NITROGEN. RACK ON PIPE STAND.
14. 2" COMPRESSED AIR. RACK ON PIPE STAND.
15. 3/4" MOTIVE STEAM FOR APT-1. PROVIDE PRESSURE GAUGE AND PRESSURE REDUCING VALVE SIMILAR TO BRV25. REGULATE TO 100 PSI. FIELD ADJUST.
16. 3/4" RESERVOIR PIPE. SEE MANUFACTURERS DATA FOR MINIMUM LENGTH. VENT PER DETAILS 2/M-18 & 4/M-18.
17. 3/4"X1-1/4" UNISTRUT PIPE STAND. LOCATE AT 8' INTERVALS.
18. DRIP LEG SEE DETAIL 7/M-18 CONNECT TO AUTOMATIC PUMP TRAP AT PAN #4.

GENERAL NOTES:

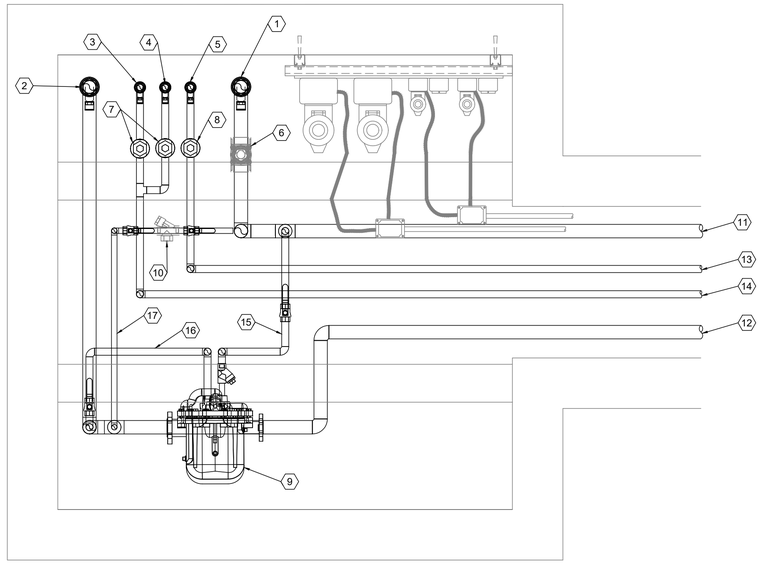
1. SEE STEAM AND CONDENSATE DETAILS 2/M-18 & 4/M-18 FOR REQUIRED UNIONS, STEAM TRAPS, CHECK VALVES, AND ISOLATION VALVES.
2. ALL CONDENSATE PIPING, ACESSORIES, AND PUMPS TO BE HEAT TRACED.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

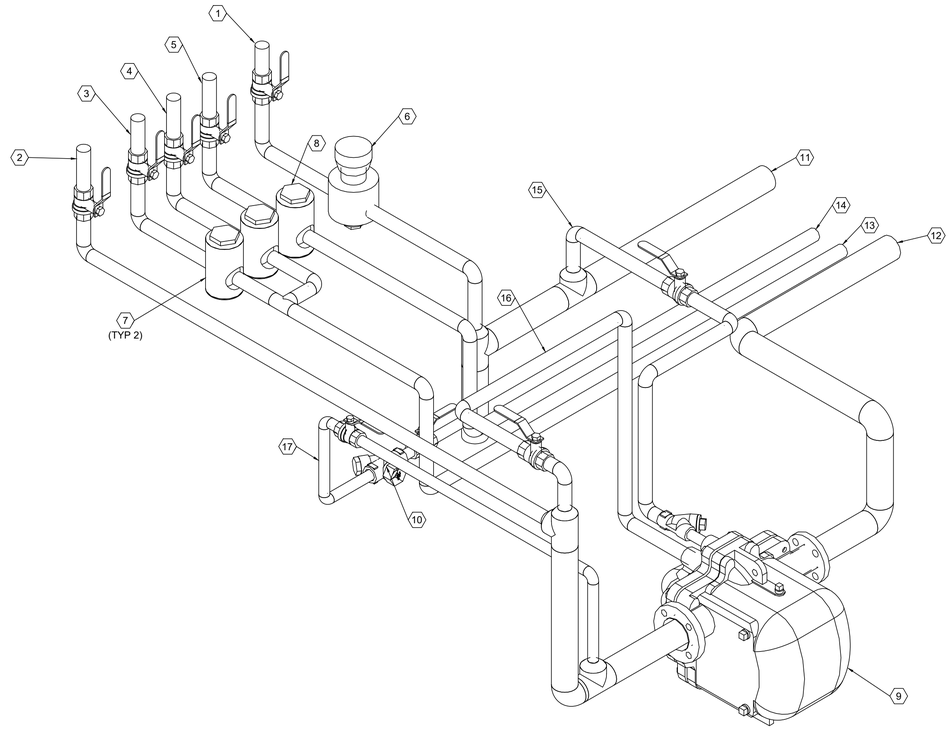
NOT DISCLOSED

PROJECT NO. 16531057
DATE MARCH 7, 2018
SHEET NO. M-12

PLOT DRIVER: $PLTDRV$ PENTABLE: $PENTABLE$
PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$
FILE: $FILE$



1 M-13 RAIL CAR CONNECTION PLAN VIEW
1" = 1'-0"



2 M-13 RAIL CAR CONNECTION SCHEMATIC - PANS 1 & 6
2" = 1'-0"

KEYED MECHANICAL NOTES: (X)

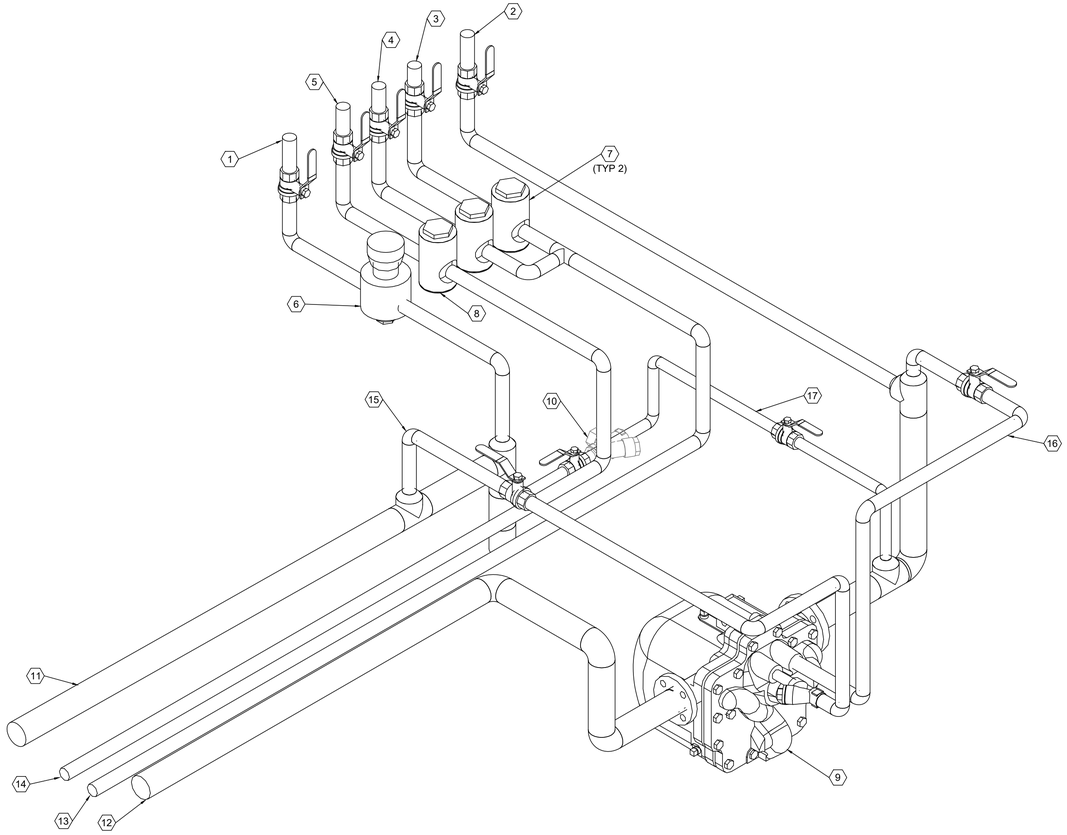
1. 1" RAIL CAR STEAM CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
2. 1" RAIL CAR CONDENSATE CONNECTION. PROVIDE WITH MNPT CONNECTON AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
3. 1" RAIL CAR COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
4. 1" TOOL COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
5. 1" RAIL CAR NITROGEN CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
6. STEAM PRESSURE REGULATOR VALVE SIMILAR TO SPENCE ED. REDUCE TO 15PSI.
7. HIGH PRESSURE COMPRESSED AIR REGULATOR SIMILAR TO SIMILAR TO PARKER R119-08CG/M2. ADJUSTABLE 125PSI MAX.
8. HIGH PRESSURE REGULATOR FOR NITROGEN SIMILAR TO CASH ACME E-55.
9. AUTOMATIC PUMP TRAP SPIREX SARCO APT14hc. PROVIDE WITH LIQUID EXPANSION STREAM TRAP SPIREX SARCO THERMOTRON.
10. THERMODYNAMIC STEAM TRAP SIMILAR TO SPIREX SARCO TD42. INSTALL WITH STRAINER IN THE HORIZONTAL POSITION.
11. 2" STEAM MAIN. PROVIDE WITH 3" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. SLOPE AT 1:100. SEE DETAIL 7/M-18. RACK ON ADJUSTABLE HEIGHT ROLLER ON PIPE STAND.
12. 2" PUMPED CONDENSATE. PROVIDE WITH HEAT TRACE AND 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. RACK ON ROLLER ON PIPE STAND.
13. 2" NITROGEN. RACK ON PIPE STAND.
14. 2" COMPRESSED AIR. RACK ON PIPE STAND.
15. 3/4" MOTIVE STEAM FOR APT-1. PROVIDE PRESSURE GAUGE AND PRESSURE REDUCING VALVE SIMILAR TO BRV25. REDUCE TO 100 PSI.
16. 3/4" RESERVOIR PIPE. SEE MANUFACTURERS DATA FOR MINIMUM LENGTH. VENT PER DETAILS 2/M-18 & 4/M-18.
17. CONDENSATE FROM END OF MAIN DRIP. SEE DETAIL 7/M-18.

GENERAL NOTES:

1. SEE STEAM AND CONDENSATE DETAILS 2/M-18 & 4/M-18 FOR REQUIRED UNIONS, STEAM TRAPS, CHECK VALVES, AND ISOLATION VALVES.
2. ALL CONDENSATE PIPING, ACESSORIES, AND PUMPS TO BE HEAT TRACED.

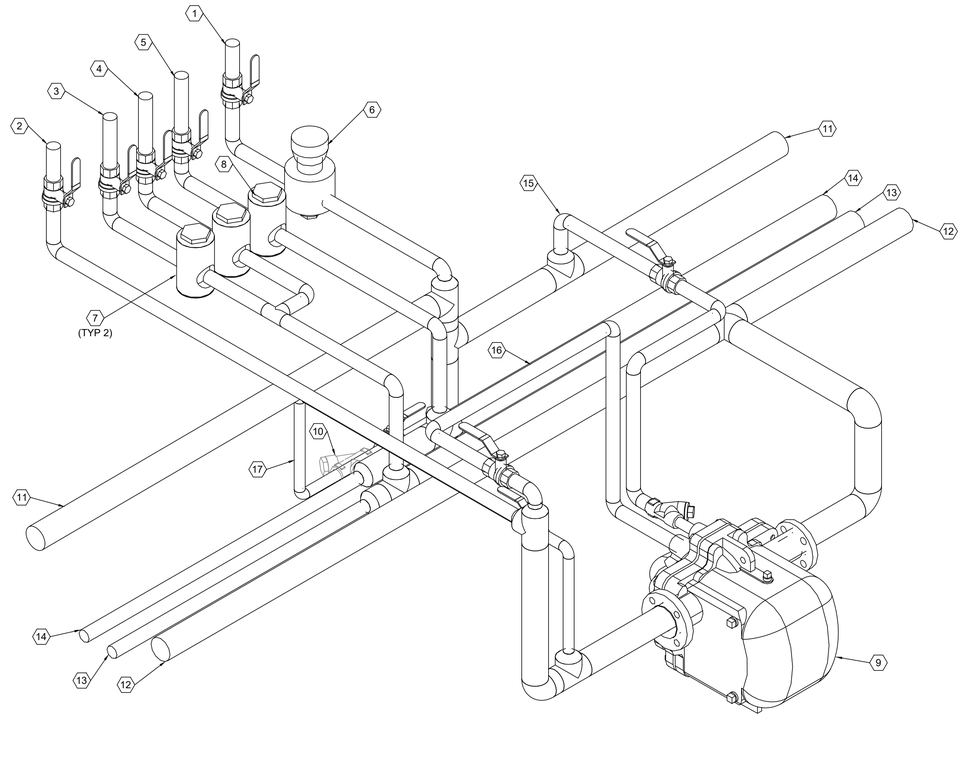
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

PROJECT NO. 16531057
DATE MARCH 7, 2018
SHEET NO. M-13



1 M-14 RAIL CAR CONNECTION SCHEMATIC - PAN 4

2" = 1'-0"



2 M-14 RAIL CAR CONNECTION SCHEMATIC - PANS 2, 3 & 5

2" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. 1" RAIL CAR STEAM CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
2. 1" RAIL CAR CONDENSATE CONNECTION. PROVIDE WITH MNPT CONNECTON AND SHUTOFF VALVE SIMILAR TO SHARPE CLASS 800 CARBON STEEL GATE VALVE.
3. 1" RAIL CAR COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
4. 1" TOOL COMPRESSED AIR CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
5. 1" RAIL CAR NITROGEN CONNECTION. PROVIDE WITH MNPT CONNECTION AND SHUTOFF VALVE SIMILAR TO NIBCO T-FP-600A.
6. STEAM PRESSURE REGULATOR VALVE SIMILAR TO SPENCE ED. REDUCE TO 15PSI.
7. HIGH PRESSURE COMPRESSED AIR REGULATOR SIMILAR TO SIMILAR TO PARKER R119-08CG/M2. ADJUSTABLE 125PSI MAX.
8. HIGH PRESSURE REGULATOR FOR NITROGEN SIMILAR TO CASH ACME E-55.
9. AUTOMATIC PUMP TRAP SPIREX SARCO APT14hc. PROVIDE WITH LIQUID EXPANSION STREAM TRAP SPIREX SARCO THERMOTRON.
10. THERMODYNAMIC STEAM TRAP SIMILAR TO SPIREX SARCO TD42. INSTALL WITH STRAINER IN THE HORIZONTAL POSITION.
11. 2" STEAM MAIN. PROVIDE WITH 3" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. SLOPE AT 1:100. SEE DETAIL 7/M-18. RACK ON ADJUSTABLE HEIGHT ROLLER ON PIPE STAND.
12. 2" PUMPED CONDENSATE. PROVIDE WITH HEAT TRACE AND 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. RACK ON ROLLER ON PIPE STAND.
13. 2" NITROGEN. RACK ON PIPE STAND.
14. 2" COMPRESSED AIR. RACK ON PIPE STAND.
15. 3/4" MOTIVE STEAM FOR APT-1. PROVIDE PRESSURE GAUGE AND PRESSURE REDUCING VALVE SIMILAR TO BRV25. REDUCE TO 100 PSI.
16. 3/4" RESERVOIR PIPE. SEE MANUFACTURERS DATA FOR MINIMUM LENGTH. VENT PER DETAILS 2/M-18 & 4/M-18.
17. CONDENSATE FROM END OF MAIN DRIP. SEE DETAIL 7/M-18.

GENERAL NOTES:

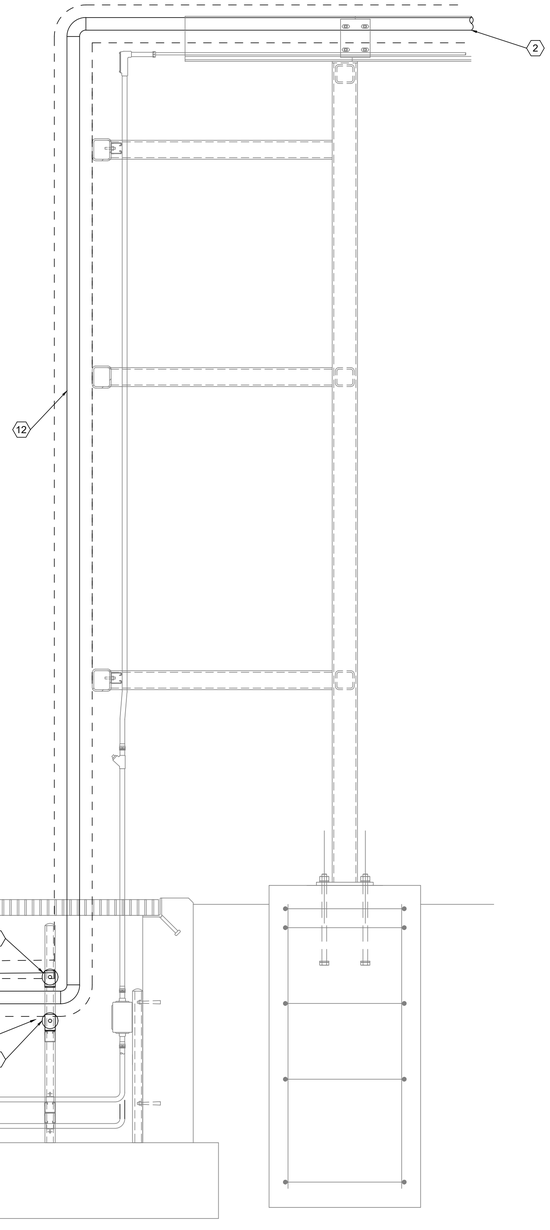
1. SEE STEAM AND CONDENSATE DETAILS 2/M-18 & 4/M-18 FOR REQUIRED UNIONS, STEAM TRAPS, CHECK VALVES, AND ISOLATION VALVES.
2. ALL CONDENSATE PIPING, ACESSORIES, AND PUMPS TO BE HEAT TRACED.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

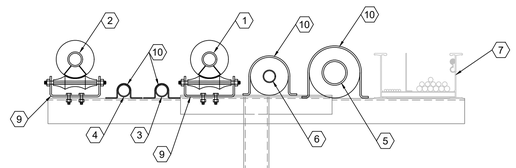
PROJECT NO. 16531057

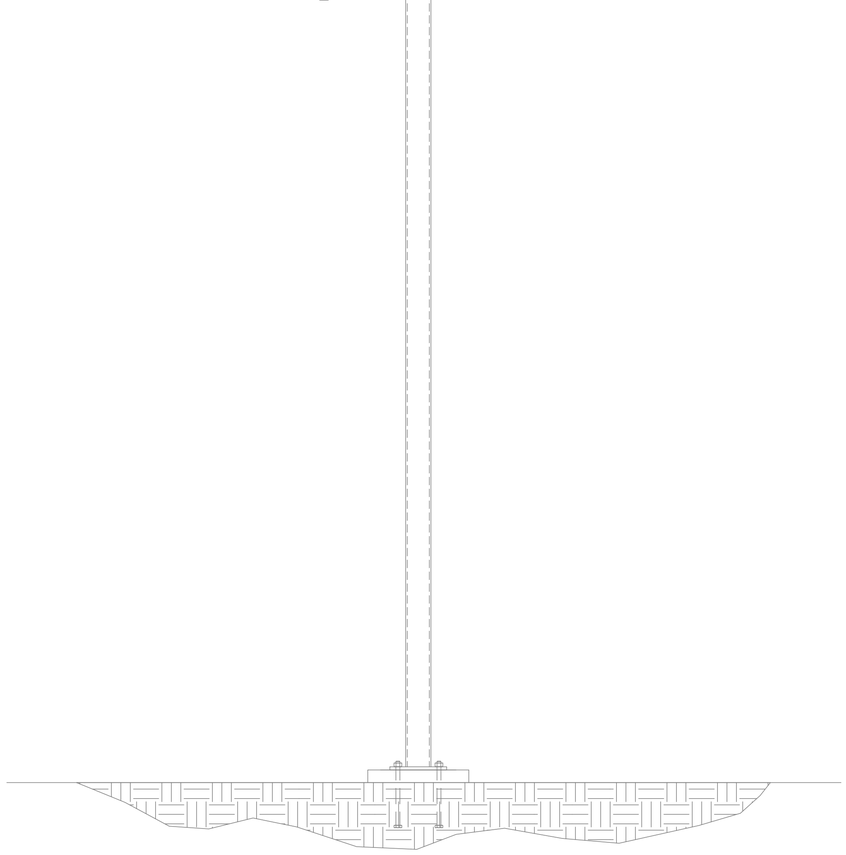
DATE MARCH 7, 2018

SHEET NO. M-14



1 M-15 SECTION 14
1" = 1'-0"





2 M-15 SECTION 15
1" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. 2" STEAM MAIN. PROVIDE WITH 3" INSULATION AND WEATHERTIGHT ALUMINUM JACKET. SLOPE AT 1:100. SEE DETAIL 7/M-18. RACK ON ADJUSTABLE HEIGHT ROLLER ON PIPE STAND. PROVIDE WITH PIPE SADDLE BLINE B3162 OR SIMILAR.
2. 2" PUMPED CONDENSATE. PROVIDE WITH HEAT TRACE, 2" INSULATION, AND WEATHERTIGHT ALUMINUM JACKET. RACK ON ROLLER. PROVIDE WITH PIPE SADDLE BLINE B3162 OR SIMILAR.
3. 2" NITROGEN.
4. 2" COMPRESSED AIR.
5. 4" PUMPED WASTE. PROVIDE WITH HEAT TRACE, 2" INSULATION, AND WEATHERTIGHT ALUMINUM JACKET. PROVDE WITH PIPE SADDLE OR CALCIUM SILICATE SHIELD.
6. 2" PUMPED WASTE. PROVIDE WITH HEAT TRACE, 2" INSULATION, AND WEATHERTIGHT ALUMINUM JACKET. PROVDE WITH PIPE SADDLE OR CALCIUM SILICATE SHIELD.
7. CABLE TRAY. SEE ELECTRICAL.
8. ADJUSTABLE HEIGHT ROLLER CHAIR. BLINE B3124 OR SIMILAR.
9. ROLLER CHAIR BLINE B3120 OR SIMILAR.
10. PIPE STRAP BLINE B3180 OR SIMILAR.
11. STRUT MOUNTED PIPE CLIPS BLINE B2417 OR SIMILAR.
12. RACK VERTICAL PIPING ON STRUCTURAL OUTRIGGERS.

GENERAL NOTES:

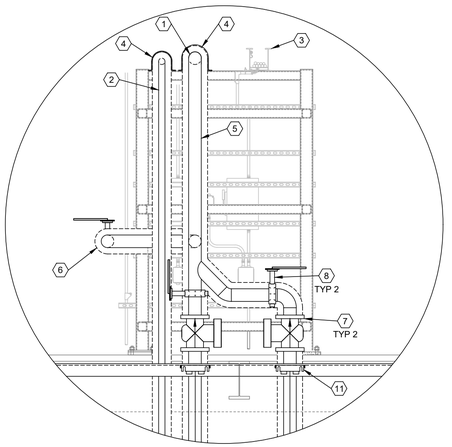
1. SPACE IS LIMITED IN THE UTILTIY TRENCH. COORDINATE PIPE SUPPORT SYSTEM WITH TRENCH PRIOR TO CONSTRUCTION.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-15

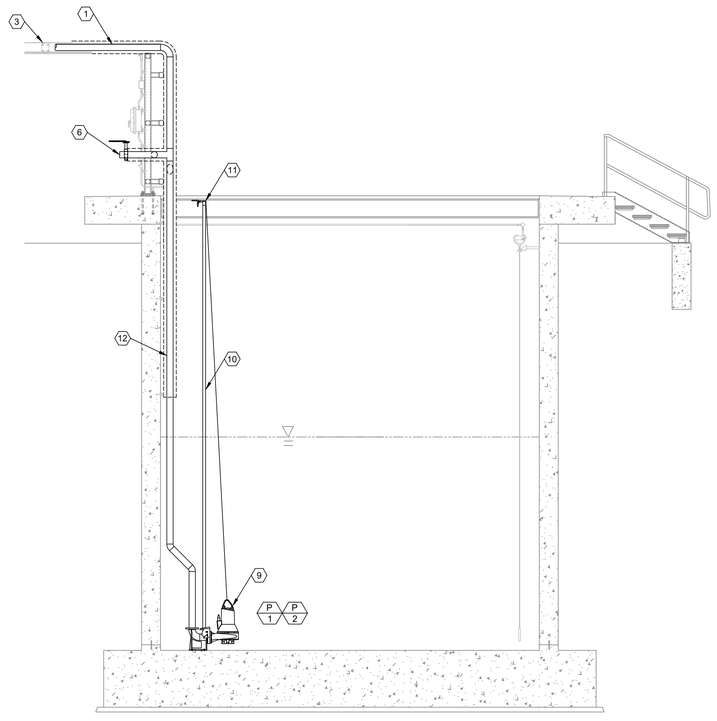
PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVR$ BY: $USERNAME$ TIME: $TIME$ PLOT DATE: $DATE$ FILE: $FILE$



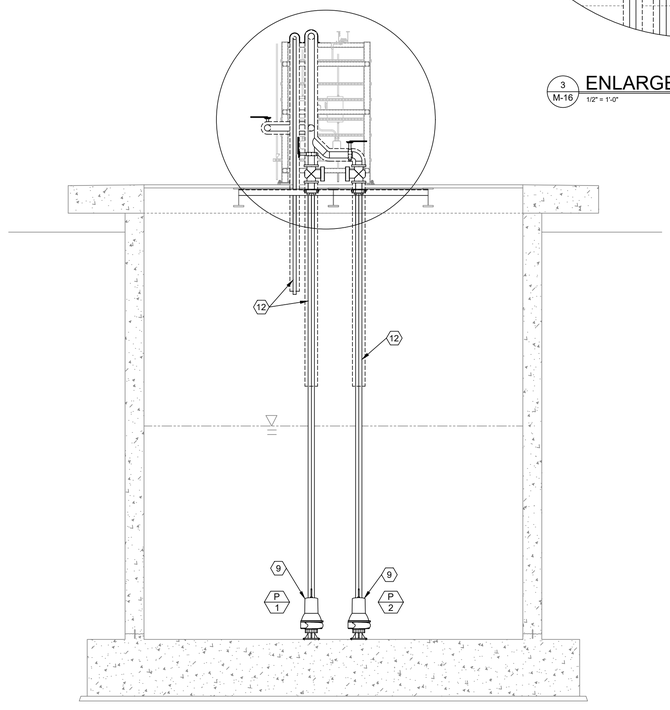
3 M-16 ENLARGED VIEW - SECTION 17
1/2" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. 4" PUMPED WASTE. PROVIDE WITH HEAT TRACE, 2" INSULATION, AND WEATHERTIGHT ALUMINUM JACKET. PROVIDE WITH PIPE SADDLE OR CALCIUM SILICATE SHIELD.
2. 2" PUMPED WASTE. PROVIDE WITH HEAT TRACE, 2" INSULATION, AND WEATHERTIGHT ALUMINUM JACKET. PROVIDE WITH PIPE SADDLE OR CALCIUM SILICATE SHIELD. TERMINATE 6' BELOW TRENCH OPENING.
3. CABLE TRAY. SEE ELECTRICAL.
4. PIPE STRAP BLINE B3180 OR SIMILAR.
5. RACK VERTICAL PIPING ON STRUCTURAL OUTRIGGERS.
6. 4" PUMPED WASTE CONNECTION POINT. PROVIDE WITH BUTTERFLY VALVES SIMILAR TO NIBCO WD-2000, DUCTILE IRON WITH EDPM SEATS AND MNPT CONNECTION.
7. CHECK VALVE. NIBCO CLASS 125 NICKEL IRON F-918-13 OR SIMILAR.
8. BUTTERFLY VALVE NIBCO WD-2000 DUCTILE IRON WITH EDPM SEATS OR SIMILAR.
9. SUBMERSIBLE PUMP, SEE ELECTRICAL FOR CONTROLS AND SEQUENCE OF OPERATIONS. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
10. LIFT RAIL.
11. LIFT RAIL BRACKET. PROVIDE ANGLE IRON SUPPORT BRACING.
12. RACK VERTICAL PIPING ON LIFT STATION WALL.



2 M-16 SECTION 16
1/4" = 1'-0"



2 M-16 SECTION 17
1/4" = 1'-0"

GENERAL NOTES:

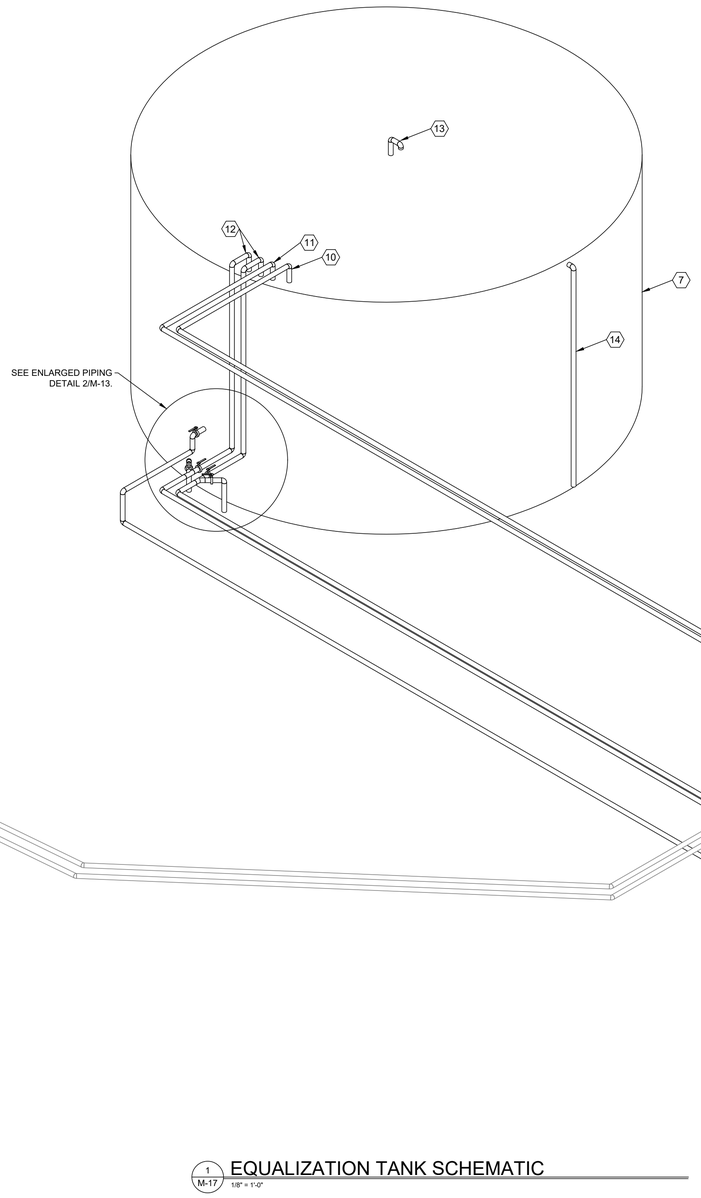
1. HEAT TRACE AND PIPE INSULATION SHALL EXTEND TO 2' ABOVE HIGH LEVEL LIMIT OF PUMP CONTROLS. SEE ELECTRICAL FOR PUMP CONTROL SEQUENCE.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

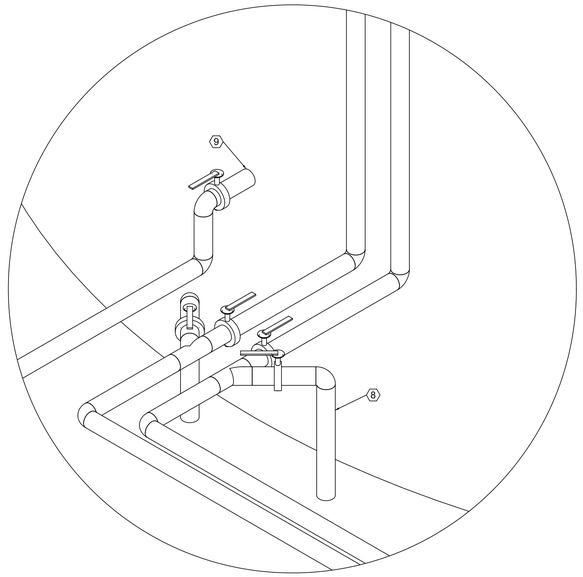
NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-16

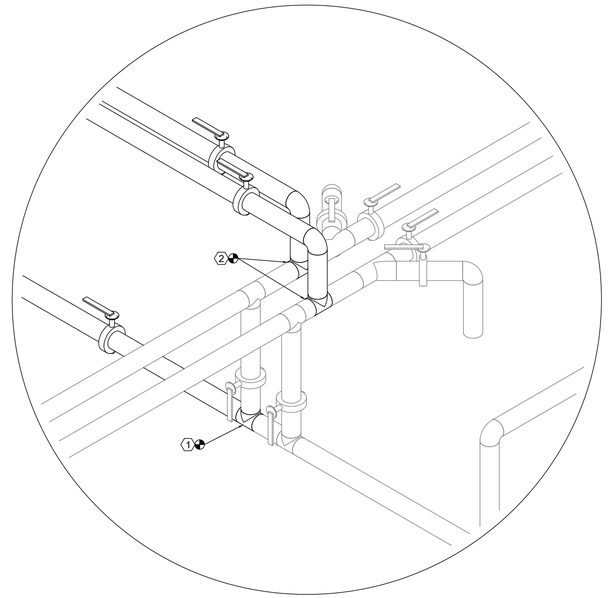
PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$ PLOT DRIVER: $PLTDRVS$ PENTABLE: $PENTABLE$ FILE: $FILE$



1 M-17 EQUALIZATION TANK SCHEMATIC
1/8" = 1'-0"



2 M-17 ENLARGE PIPING DETAIL



1 M-17 ENLARGE PIPING DETAIL

KEYED MECHANICAL NOTES: ⓧ

1. CONNECT DRAIN DOWN LINE FROM NEW EQUALIZATION TANK TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO I/M-9 AND FOR CONNECTION POINT.
2. CONNECT PUMPED WASTE LINES TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO I/M-9 FOR CONNECTION POINT.
3. CONNECT EMERGENCY RETENTION BASIN DISCHARGE LINE (UNINSULATED) TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO H/M-9 FOR CONNECTION POINT.
4. CONNECT SCRUBBER TANK DISCHARGE LINE (INSULATED) TO EXISTING. SIZE TO MATCH EXISTING. SEE PHOTO H/M-9 FOR CONNECTION POINT.
5. STEAM TRACE SCRUBBER TANK DISCHARGE LINE FROM POINT OF CONNECTION TO NEW EQUALIZATION TANK.
6. PNEUMATIC OPERATED BUTTERFLY VALVES SIMILAR TO NIBCO WD-2000, DUCTILE IRON WITH EDPM SEATS. PROVIDE PNEUMATIC OPERATOR LOCATED AT GROUND LEVEL BY THE PIT PUMP CONTROLS.
7. NEW EQUALIZATION TANK. SEE MANUFACTURER'S DRAWINGS SHEETS M-20 AND M-21 FOR REFERENCE.
8. PUMPED WASTE TO SPILL INSIDE CONTAINMENT DYKE. PROVIDE BUTTERFLY VALVES SIMILAR TO NIBCO WD-2000, DUCTILE IRON WITH EDPM SEATS.
9. DRAIN DOWN LINE FROM EQUALIZATION TANK. SIZE TO MATCH EXISTING DRAIN DOWN PIPING. COORDINATE EXACT CONNECTION SIZE AND LOCATION WITH OWNER PRIOR TO TANK FABRICATION.
10. CONNECT SCRUBBER TANK DISCHARGE LINE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE (4" OR SMALLER) AND LOCATION PRIOR TO FABRICATION.
11. CONNECT EMERGENCY RETENTION BASIN DISCHARGE LINE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE (4" OR SMALLER) AND LOCATION PRIOR TO FABRICATION.
12. CONNECT PUMPED WASTE TO NEW EQUALIZATION TANK. COORDINATE EXACT CONNECTION SIZE (4" OR SMALLER) AND LOCATION PRIOR TO FABRICATION.
13. 4" VENT. COORDINATE EXACT LOCATION PRIOR TO FABRICATION.
14. 4" OVERFLOW. COORDINATE EXACT LOCATION PRIOR TO FABRICATION.

GENERAL NOTES:

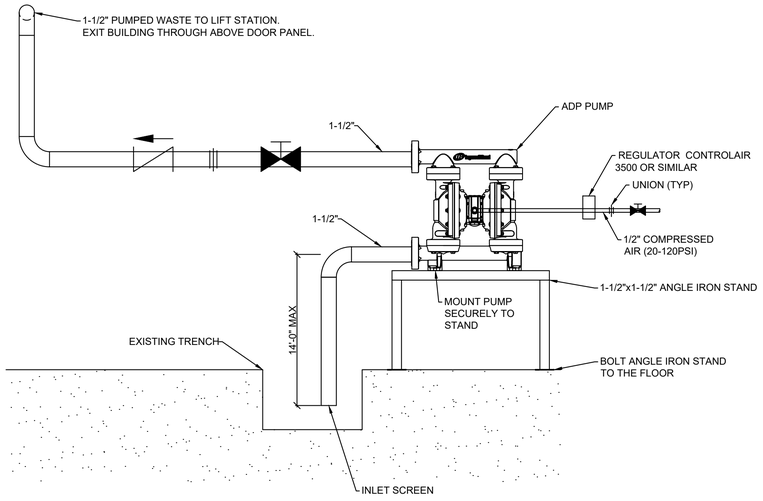
1. ALL PIPING IS INTENDED TO REDIRECT FULL FLOW FROM THE EXISTING EQUALIZATION TANK TO THE NEW EQUALIZATION TANK. THEREFORE, ALL PIPING SHALL BE SIZED TO MATCH EXISTING PIPING. VERIFY PIPE SIZES PRIOR TO CONSTRUCTION.
2. ALL PUMPED WASTE PIPING MUST BE HEAT TRACED AND INSULATED WITH 2" INSULATION AND WEATHERTIGHT ALUMINUM JACKET.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

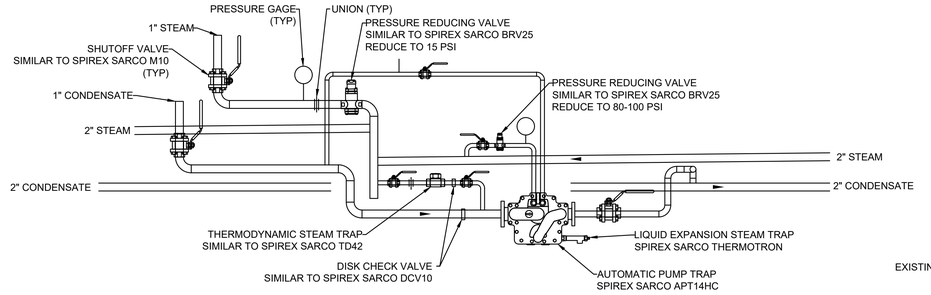
NOT DISCLOSED

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-17

PLOT DRIVER: $PLTDRVR$ PENTABLE: $PENTABLE$
BY: $USERNAME$
PLOT DATE: $DATE$ TIME: $TIME$
FILE: $FILE$

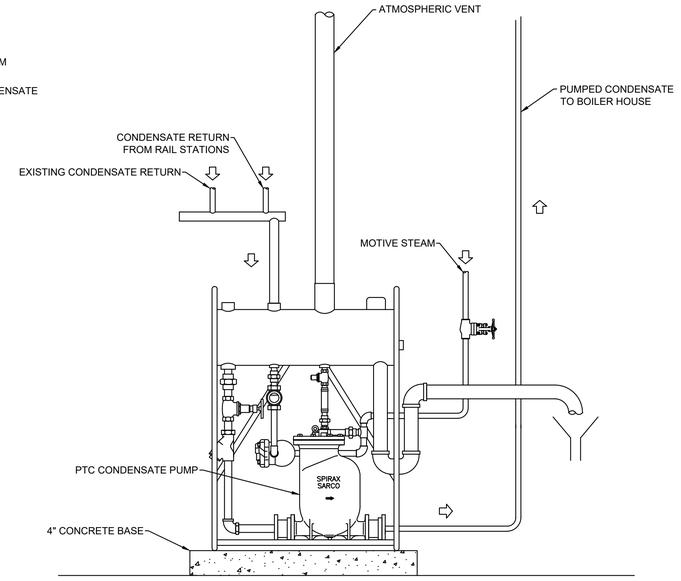


1 M-18 **AIR OPERATED DIAPHRAM PUMP**
SCALE: NONE

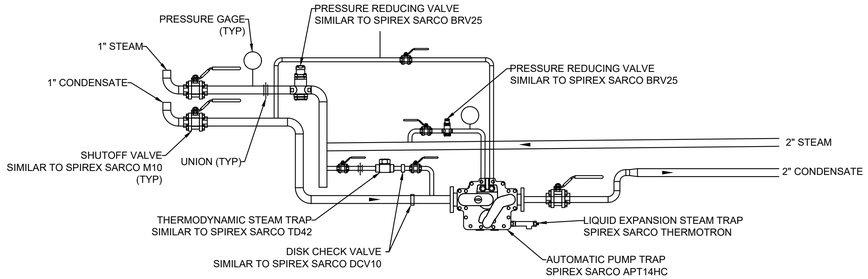


NOTES:
1. DIAGRAMATIC. DETAIL TO SHOW CONNECTIONS, EQUIPMENT, AND FITTINGS ONLY

2 M-18 **STEAM AND CONDENSATE DETAIL INTERMEDIATE RAILCAR STATION**
SCALE: NONE

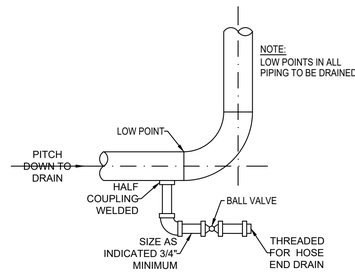


3 M-18 **STEAM DRIVEN CONDENSATE PUMP**
SCALE: NONE

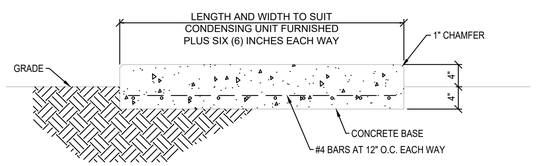


NOTES:
1. DIAGRAMATIC. DETAIL TO SHOW CONNECTIONS, EQUIPMENT, AND FITTINGS ONLY

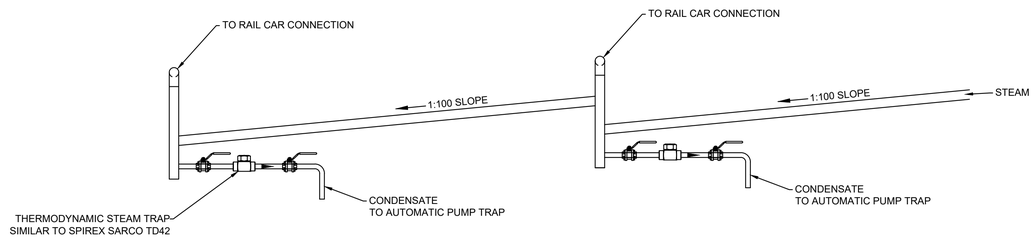
4 M-18 **STEAM AND CONDENSATE DETAIL END RAIL CAR STATION**
SCALE: NONE



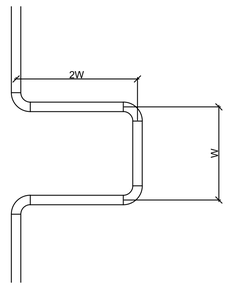
5 M-18 **DRAIN DETAIL**
SCALE: NONE



6 M-18 **EQUIPMENT UNIT BASE DETAIL**
SCALE: NONE



7 M-18 **STEAM SLOPE**
SCALE: NONE

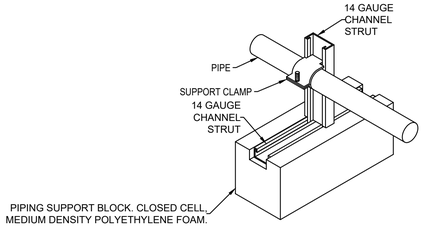


NOTES:
1. LOCATE EVERY 100FT OR LESS OF STRAIGHT PIPING.
2. LOCATE EXPANSION LOOP IN THE HORIZONTAL POSITION.
3. EXPANSION COMPENSATORS MAY BE USED IN LIEU OF EXPANSION LOOP PER CONTRACTORS DISCRETION. EXPANSION COMPENSATORS SHALL BE SIZED BY A QUALIFIED FACTORY REPRESENTATIVE.

8 M-18 **EXPANSION LOOP**
SCALE: NONE

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

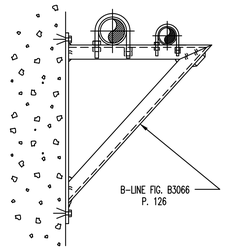
PROJECT NO. 16531057
DATE MARCH 7, 2018
SHEET NO. M-18



1 M-19 ROOF BLOCK PIPE SUPPORT DETAIL

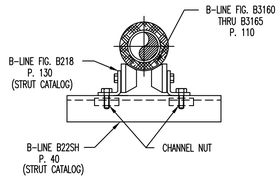
SCALE: NONE

ASSEMBLY 74



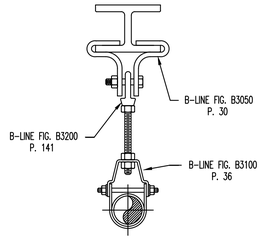
NOTES:
1. SIZE BRACKET TO PROPERLY SUPPORT LOAD (REFER TO B-LINE HANGER CATALOG).
2. FOR HEAVIER LOADS USE B-LINE FIG. B3067.

ASSEMBLY 84



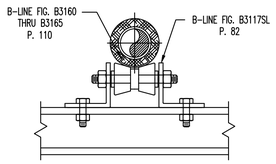
NOTES:
1. SIZE STRUT TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE STRUT CATALOG).
2. USE B218 FOR 1/2" THRU 8" PIPE. FOR LARGER PIPE USE B219, B379 OR B479.
3. SIZE B3160 THRU B3165 TO PIPE SIZE AND INSULATION THICKNESS.
4. USE INSULATION SHIELDS FOR COLD LINES AND PROTECTION SADDLES FOR HOT LINES.

ASSEMBLY 16



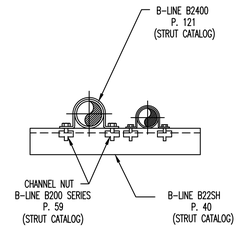
NOTES:
1. SIZE HANGER AND CLAMP TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE HANGER CATALOG).
2. FOR COPPER TUBING USE COPPER PLATED OR PAINTED B3104CT, FELT LINED B3100F, OR PLASTIC COATED B3100C HANGERS.
3. HANGER AVAILABLE IN STAINLESS STEEL, B3105.
4. HANGER AVAILABLE FOR AWWA DUCTILE IRON PIPE, B3102.

ASSEMBLY 75



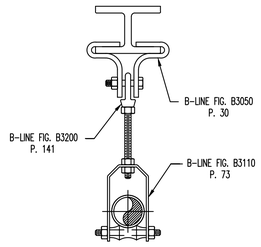
NOTES:
1. SIZE ROLLER TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE HANGER CATALOG).
2. SIZE B3160 THRU B3165 TO PIPE SIZE AND INSULATION THICKNESS.
3. B3117SL MAY ALSO BE WELDED TO STRUCTURE.
4. USE INSULATION SHIELDS FOR COLD LINES AND PROTECTION SADDLES FOR HOT LINES.

ASSEMBLY 86



NOTES:
1. SIZE STRUT AND CLAMP TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE STRUT CATALOG).
2. STRUT AVAILABLE IN DURAGREEN® EPOXY PAINTED, GALVANIZED, HOT-DIP GALVANIZED, PVC COATED, STAINLESS STEEL AND ALUMINUM.

ASSEMBLY 47



NOTES:
1. SIZE HANGER AND CLAMP TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE HANGER CATALOG).
2. IF USED WITH INSULATED PIPE, SIZE HANGER PROPERLY AND USE INSULATION SHIELDS FOR COLD LINES AND PROTECTION SADDLES FOR HOT LINES.

2 M-19 TYPICAL PIPE SUPPORT ASSEMBLY DETAILS

SCALE: NONE

PUMP - ELECTRIC

MARK	SERVES	PUMP TYPE	GPM	PUMP HEAD (FT)	MOTOR DATA					SUCTION SIZE (IN)	DISCH SIZE (IN)	BASIS FOR DESIGN	WEIGHT (LBS)	NOTES
					AMPS	HP	V	PH	RPM					
P-1	LIFT STATION	WASTE WATER	213	68.22	13.8	10	460	3	1750	4	4	GRUNDFOS SL1.30.A40.100.EX.4.61R.C	450	1,2,3,4,5
P-2	LIFT STATION	WASTE WATER	213	68.22	13.8	10	460	3	1750	4	4	GRUNDFOS SL1.30.A40.100.EX.4.61R.C	450	1,2,3,4,5

NOTES:
1. PROVIDE WITH MOISTURE SENSOR.
2. PUMP TO BE RATED FOR THE PASSAGE OF 3" SPHERICAL SOLIDS.
3. PUMP TO BE SUITABLE FOR RAW SEWAGE.
4. MOTOR TO BE EXPLOSION PROOF.
5. PUMP TO HAVE ANSI FLANGE PIPE CONNECTIONS.

PUMP - STEAM OPERATED

MARK	SERVES	PUMP TYPE	LB/HR	PUMP BACKPRESSURE	SUCTION SIZE (IN)	DISCH SIZE (IN)	MOTIVE STEAM CONNECT (IN)	MOTIVE STEAM (PSI)	BASIS FOR DESIGN	WEIGHT (LBS)	NOTES
CP-1	RAIL PAN 1	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-2	RAIL PAN 2	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-3	RAIL PAN 3	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-4	RAIL PAN 4	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-5	RAIL PAN 5	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-6	RAIL PAN 6	CONDENSATE PUMP TRAP	3,500	50	2	1-1/2	1/2"	100	SPIREX SARCO APT14HC	143	1, 2
CP-7	RETURN TO BOILERS	CONDENSATE	-	50	2	1-1/2	1/2"	100	SPIREX SARCO 2X2 PTC SIMPLEX PUMP PACKAGE	-	1, 2, 3, 4

NOTES:
1. PROVIDE WITH SPIREX SARCO THERMOTRON LIQUID EXPANSION STEAM TRAP.
2. HEAT TRACE.
3. PROVIDE WITH FULLY TRAPPED PUMP MOTIVE INLET AND EXHAUST PIPING, OVERFLOW PIPE, PRESSURE GAUGE, CHECK VALVE, AND, INLINE STRAINER.
4. PROVIDE WITH 26 GALLON ATMOSPHERIC RECIEVER TANK AND FABRICATED STEEL FRAME.

PUMP - AIR DIAPHRAGM OPERATED

MARK	SERVES	PUMP TYPE	MAX GPM	PUMP HEAD (FT)	SUCTION SIZE (IN)	DISCH SIZE (IN)	MOTIVE GAS CONNECT (IN)	MOTIVE GAS (PSI)	BASIS FOR DESIGN	WEIGHT (LBS)	NOTES
ADP-1	EAST PILOT TRENCH	WASTE WATER	123	68.22	1-1/2	1-1/2	1/2"	20-120	ARO EXPERT SERIES PD15P	64	1, 2
ADP-2	WEST PILOT TRENCH	WASTE WATER	123	68.22	1-1/2	1-1/2	1/2"	20-120	ARO EXPERT SERIES PD15P	64	1, 2

NOTES:
1. PROVIDE WITH POLYPROPYLENE HOUSING.
2. PROVIDE WITH EPDM DIAPHRAGMS, BALL, AND SEALS.

TANK

MARK	LOCATION	APPLICATION	CAPACITY (GAL)	DIMENSIONS (FT)			MOUNTING	BASIS OF DESIGN	NOTES
				HT	DIA				
T-1	OUTSIDE	EQUALIZATION	500,000	30.0	55		FOUNDATION	CST CPQ-C-17064293	1-14

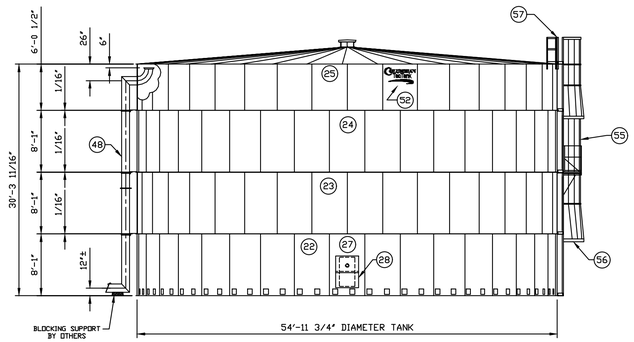
NOTES:
1. CARBON STEEL BOLTED TANK CONSTRUCTION.
2. PROVIDE WITH GALVANIZED FASTENERS.
3. PROVIDE PLASTIC ENCAPULATION ON VERTICAL AND ROOF BOLTS.
4. PROVIDE ENCAPSULATED NUTS FOR FLOOR SEAMS.
5. TRICO BOND EP OR SIMILAR ON INSIDE AND OUTSIDE OF BOTTOM.
6. TRICO BOND EP OF SIMILAR ON EXTERIOR OF WALLS AND ROOF.
7. PROVIDE WITH ALUMINUM OUTSIDE LADDER AND SAFETY CAGE PER OSHA REQUIREMENTS.
8. PROIVDE WITH MUSHROOM VENT AND 1/2" MESH SCREEN.
9. PROVIDE WITH 24" SQUARE ROOF MANWAY WITH HINGED COVER OR EQUIVALENT.
10. PROVIDE WITH TWO (2) 24" DIA SHELL MANWAY WITH BOLT ON COVER OR EQUIVALENT.
11. PROVIDE WITH 1/2" THICK ASPHALT-INREGNATED COATING OVER FULL BOTTOM.
12. PROVIDE WITH A LIQUID LEVEL INDICATOR W/ GAUAGE BOARD.
13. PROVIDE WITH 6" INLET AND DRAIN 150# FLAT FACE SIP ON SINGLE FLANGE NOZZLES.
14. PROVIDE WITH 8" INTERNAL OVERFLOOR WEIR CONE WITH EXTERNAL SCH 10 DOWNCOMER PIPE AND FLAP GATE.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

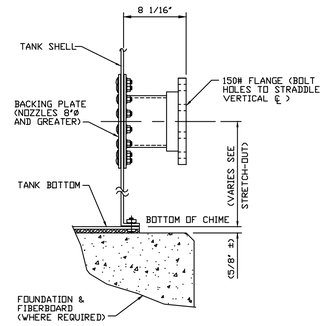
PROJECT NO. 16531057

DATE MARCH 7, 2018

SHEET NO. M-19



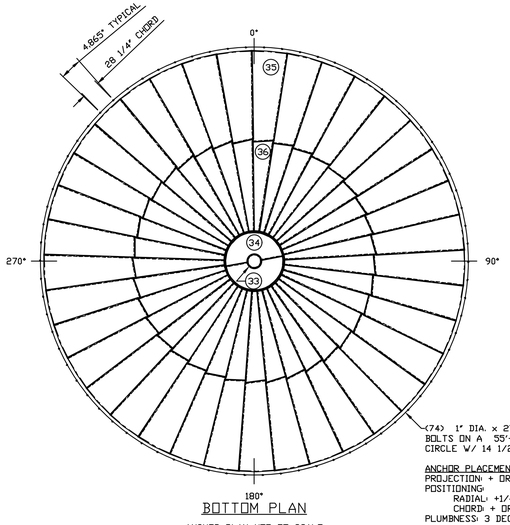
ELEVATION



TYPICAL EXTERIOR NOZZLE INSTALLATION

NOTE:
ALL NOZZLES ARE RADIAL UNLESS NOTED AS PARALLEL

FOR REFERENCE ONLY

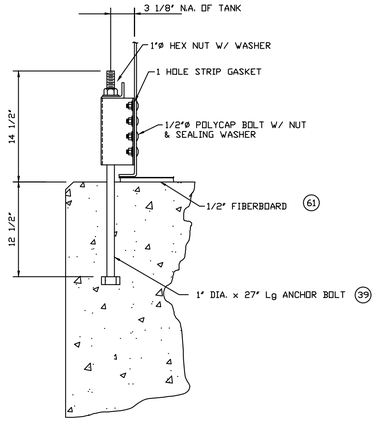


BOTTOM PLAN

ANCHOR PLAN NOT TO SCALE

(74) 1" DIA. x 27" Lg ANCHOR BOLTS ON A 55'-5 13/16" BOLT CIRCLE W/ 14 1/2" PROJECTION

ANCHOR PLACEMENT TOLERANCES
PROJECTION: + OR - 1/4"
POSITIONING:
RADIAL: +1/4", -0"
CHORD: + OR - 1/8" (NON-ACCUMULATIVE)
PLUMBNESS: 3 DEGREES FROM VERTICAL



ANCHOR BOLT DETAIL

NOTES:

1. THIS BILL OF MATERIAL IS FOR ONE COMPLETE TANK.
* 2. DRAWINGS REQUIRED FOR FIELD USE.
3. INTERIOR AND BOTH SIDES OF BOTTOM PAINTED ONE COAT TRICO BOND EP ® THERMOSET CORROSION RESISTANT POWDER EPOXY (5 MILS AVERAGE, DFT). EXTERIOR ONE COAT TRICO BOND EP ® POWDER EPOXY WITH FINISH COAT OF BAKED ON TAN PERFORMANCE URETHANE (4.5 MILS AVERAGE, DFT).
4. WATER STORAGE TANK DESIGNED IN ACCORDANCE WITH AWWA D103-97 SPEC. SEISMIC ZONE 4, I=1.25, RW=4.50, S=1.50, 100 MPH WINDLOAD, 25 PSF LIVE DECK LOAD, SPECIFIC GRAVITY = 1.0.
+ 5. STAVE SHOP DRAWING REQUIRED FOR FABRICATION. OTHERWISE, USE STRETCH OUT DRAWING FOR FABRICATION.
6. STANDARD CENTER DOME WITH VENT (20") WILL RELIEVE 24 CFS (11,000 GPM) WHEN CLEAN. ADDITIONAL VENTING TO PREVENT A VACUUM GREATER THAN 0.4 oz PER SQUARE INCH IS THE RESPONSIBILITY OF THE OWNER.
7. FIBERBOARD SHALL BE INSTALLED IN ACCORDANCE WITH AWWA D103-97, SECTION 11.4.

MATERIAL LIST FOR TANK

	ITEM	PART NUMBER	DESCRIPTION	QUANTITY
	1	202T12055	STD. 12 GA DECK SHEET- OUTER	34
	2	202T12655	12 GA DECK SHEET - OUTER W/24" SQ. MANWAY OPNG	1
	3	8356BPW0024P	DECK MANWAY - 24" SQ.	1
*	4	353T00002	MANHOLE COLLAR W/20"Ø VENT (30 HL)	1
	5	202T12555	12 GA DECK SHEET - OUTER W/ LIQUID LEVEL IND. OPNG	1
*	6	715C00130P	LIQUID LEVEL INDICATOR FOR 30' HIGH TANK	1
	7	202T12455	STD. 12 GA DECK SHEET- OUTER W/ RIM VENT OPNG.	1
	8	203T12055	STD. 12 GA DECK SHEET - INNER	37
	9	353B00001P	20" Ø MANWAY COLLAR WITH FREE FLOWING VENT (28 HOLES)	1
	10	351T12055	DECK COVER PLATE	2
	11	754W00028	MANHOLE GASKET (28 HOLE)	1
	12	378T05004	RAFTER HANGER - 3/16" PLATE X 9 15/16" X 11" (4 SLOTS)	37
	13	403T08166	RAFTER - INNER/OUTER C8 X 11.5 X 13'-10" LG	38
	14	404T04159	JACK RAFTER - C4 X 5.4 X 13'-3" LG	18
	15	410T04056	RAFTER BRACE - C4 X 5.4 X 4'-8 1/16" LG	18
	16	390T02001	RAFTER BRACE CLIP- 1/4" BAR X 2" X 9" LG (105° BREAK)	36
	17			
	18	602T0600127A	COLUMN BOTTOM SECTION - 6" DIA. SCH 40 PIPE X 127 7/16"	1
	19	606T0600252A	COLUMN TOP SECTION - 6" DIA. SCH 40 PIPE X 252 9/16"	1
	20	328T00055	RAFTER BEARING ASSEMBLY - 6" DIA. COLUMN	1
	21			
	22	112T0255-058448A	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI)	31
	23	112T0425500	7/32" X 60" DP STV X 97"	37
	24	112T0925500	9 GA X 60" DP STV X 97"	37
	25	145T1025500	10 GA X 60" DP STV X 72 1/2"	36
	26			
	27	112T0255-058448E	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/24X46 CLEANOUT OPNG	1
	28	8371BPW02455	24X46, 1/4". DOUBLE PUNCH CLEAN- OUT KIT	1
	29			
	30	112T0255-058448G	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/24"Ø SHELL MW OPNG	1
	31	8366BPW06455	24" DIA. DOUBLE PUNCH SHELL MANWAY KIT	1
	32			
	33	351T10002	10 GA BOTTOM CENTER COVER (30 HL)	1
	34	330T10055	10 GA BOTTOM CENTER PLATE	2
	35	227T10055	10 GA FLAT BOTTOM SHEET - OUTER	37
	36	228T10055	10 GA FLAT BOTTOM SHEET - INNER	37
	37			
	38			
	39	8PW1010703P	ANCHOR BOLT KIT 1" DIA. X 27" LG	74
	40			
	41	112T0255-058448B	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/3/4"Ø UNI T.FLG OPNG	1
	42	112T0255-058448C	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/1"Ø UNI T.FLG OPNG	1
	43	112T0255-058448D	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/12"Ø NZL OPNG	1
	44	112T0255-058448F	1/4" X 60" DP STV X 97" W/2 STR PCH (50 KSI) W/12"Ø NZL OPNG	1
	45	145T1055-058448H	10 GA X 60" DP STV X 72 1/2" W/12"Ø D-FLOW OPNG	1
	46			
	47	8704BPW121F2	12"Ø EXTERIOR FF NOZZLE KIT	2
	48	802BPW12302	12"Ø OVERFLOW DOWNCOMER KIT	1
	49	HUNITANK0075	3/4" Ø UNI TANK FLANGE (KIT)	1
	50	HUNITANK0100	1" Ø UNI TANK FLANGE (KIT)	1
	51			
	52	10-00-0000-00	COLUMBIAN TECTANK LOGO	1
	53	L50-88-058448A	SAF-T-CLIMB (INTERNAL)	1
	54	L50-88-058448B	SAF-T-CLIMB SYSTEM HARDWARE (INTERNAL)	1
*	55	L82-11-0030-11	30' EXTERIOR LADDER W CAGE (GALV.)	1
	56	L50-88-0353-87	EXTERIOR LADDER LOCKABLE HOOP COVER	1
*	57	L50-55-9504-02	GUARDRAIL - 10' EACH SIDE OF LADDER W/ TOE BOARD (GALV)	1
	58	L82-51-0030-12	30' INSIDE LADDER- STAINLESS STEEL	1
	59			
*	60	L-M 01/02	ERECTION MANUAL	1
	61	795ASPEXJT08	ASPHALT IMPREGNATED FIBERBOARD 5'-0" X 8"	38
	62	795ASPEXJT48	ASPHALT IMPREGNATED FIBERBOARD 5'-0" X 48"	3
*	63	955T030-058448A	ELEVATION, BOTTOM PLAN & BILL OF MATERIAL	1
*	64	955T030-058448B	STRUCTURE & DECK PLAN - CENTER COLUMN SUPPORTED	1
*	65	955T030-058448C	TANK STRETCH-OUT	1
*	66	955T030-058448D	LIQUID TANK DETAILS	1
	67			

APPROVAL DRAWING ONLY
DO NOT USE FOR CONSTRUCTION

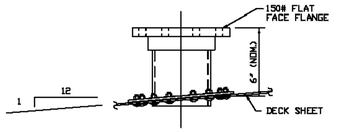
NOT DISCLOSED

NOT DISCLOSED

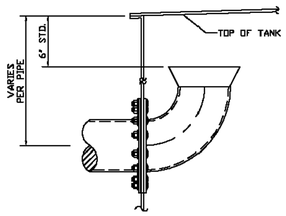
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

PROJECT NO. 16531057
DATE MARCH 7, 2018
SHEET NO. M-20

PLOT DATE: $DATE$ TIME: $TIME$ BY: $USERNAME$
PENTABLE: $PENTABLE$ PLOT DRIVER: $PLTDRVR$
FILE: $FILE$

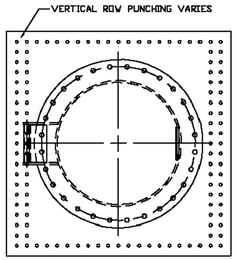


TYPICAL HILLSIDE NOZZLE INSTALLATION

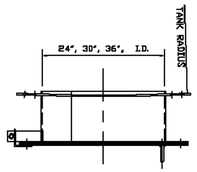


TYPICAL OVERFLOW WIER CONE INSTALLATION

NOTE:
ALL NOZZLES ARE RADIAL UNLESS NOTED AS PARALLEL

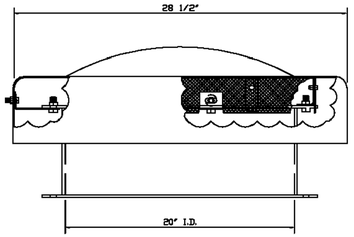


FRONT



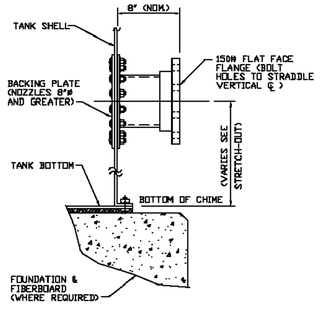
PLAN

TYPICAL SHELL MANWAY



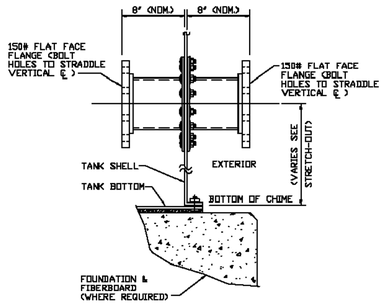
TYPICAL MANHOLE COLLAR W/ VENTILATOR ASSEMBLY

VORTEX NOZZLE DIMENSIONS	
PIPE SIZE	DIMENSIONS "A"
2"	9 1/4"
3"	10 3/4"
4"	12 1/4"
5"	13 3/4"
6"	15 1/4"
8"	18 1/4"
10"	21 1/4"
12"	24 9/16"
14"	28 9/16"
16"	32 1/4"
18"	36 1/4"
20"	40 1/4"
24"	48 1/4"



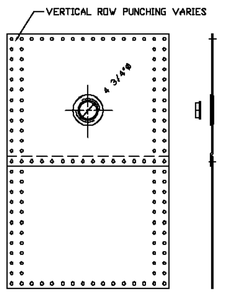
TYPICAL EXTERIOR NOZZLE INSTALLATION

NOTE:
ALL NOZZLES ARE RADIAL UNLESS NOTED AS PARALLEL

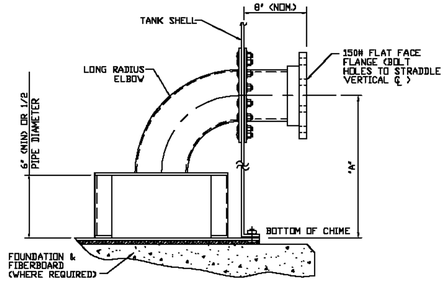


TYPICAL DOUBLE NOZZLE INSTALLATION

NOTE:
ALL NOZZLES ARE RADIAL UNLESS NOTED AS PARALLEL

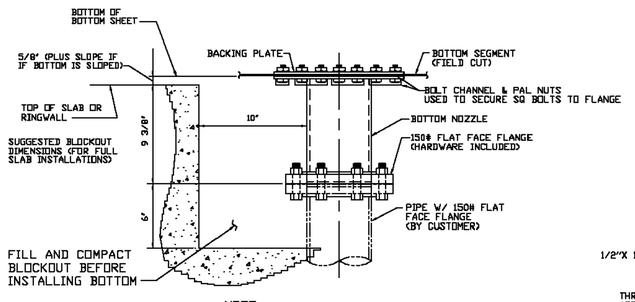


TYPICAL CLEAN OUT
24" X 46" / 30" X 46"



TYPICAL SUCTION NOZZLE INSTALLATION

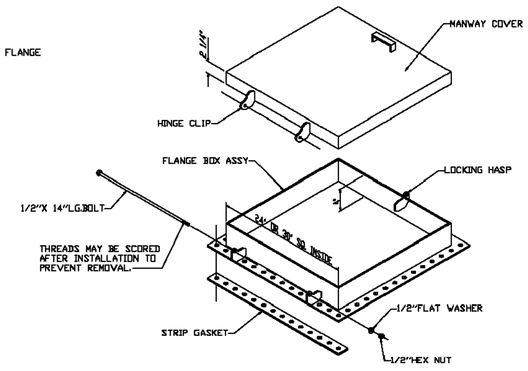
NOTE:
ALL NOZZLES ARE RADIAL UNLESS NOTED AS PARALLEL



NOTE:
PVC PIPING IS NOT RECOMMENDED BY CTT DUE TO IMPOSED STRESSES.

TYPICAL BOTTOM PENETRATION DETAIL

(OPENING IN BOTTOM SEGMENT FIELD LOCATED & CUT)



TYPICAL BOLT-ON MANWAY W/ LOCKABLE HASP

FOR REFERENCE ONLY

NOT DISCLOSED

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

PROJECT NO.	16531057
DATE	MARCH 7, 2018
SHEET NO.	M-21