FUEL SYSTEM LEGEND:

AAV	AUTOMATIC AIR VENT
BPCV	BACK PRESSURE CONTROL VALVE
CV	NON-SURGE CHECK VALVE W/RATE OF FLOW CONTROLLER
D/FV	DEFUEL/FLUSH VALVE
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
ESO	EMERGENCY SHUT-OFF VALVE
FP	FUELING PUMP
FSCV	FILTER SEPARATOR CONTROL VALVE
FSI	FILTER SEPARATOR ISSUE
FSR	FILTER SEPARATOR RECEIVING
HHLA	HIGH-HIGH LIQUID LEVEL SHUT-OFF VALVE
HLA	HIGH LEVEL ALARM
HLV	HIGH LIQUID LEVEL SHUT-OFF VALVE
IF	INSULATING FLANGE
LLA	LOW LEVEL ALARM
MAV	MANUAL AIR VENT
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
O.V.	OVER FILL VALVE
PCV	PRESSURE CONTROL VALVE
PS	PIPE SUPPORT
SFI	SIGHT FLOW INDICATOR
WC	WATER COLUMN
PRP	PRODUCT RETURN PUMP
(DP)	DIFFERENTIAL PRESSURE GAUGE
(DPT)	DIFFERENTIAL PRESSURE TRANSMITTER
(LI)	LIQUID LEVEL INDICATOR
(M)	METER
(PIT)	PRESSURE INDICATING TRANSMITTER
(PG)	PRESSURE GAGE - SEE DETAIL ON SHT. M-502
(PS)	PRESSURE SENSOR
(S)	BASKET STRAINER
(TS)	TEMPERATURE SENSOR
(FS)	FLOW SWITCH
	CONTROL VALVE
	SIGHT FLOW INDICATOR
	ANGLE TYPE CONTROL VALVE
	LINE SIZE REDUCER
	BALL VALVE
JP	JET FUEL LINE
	WYE STRAINER
	PLUG VALVE
	CAP
	CONNECTOR
	FLEXIBLE BALL JOINT
	FLEXIBLE HOSE
	CHECK VALVE
	NEEDLE VALVE
IF	INSULATING FLANGE
%	LIMIT SWITCH
	SAMPLE CONNECTION - SEE DETAIL ON SHEET M-502
S	CONTROL VALVE WITH SOLENOID OPERATED PILOT SYS.
	HYDRANT CONTROL VALVE
	NON-SURGE CHECK VALVE WITH RATE OF FLOW CONTROLLER
OR OR	RELIEF VALVE - SEE DETAIL ON SHEET M-502
M	ELECTRIC MOTOR OPERATED VALVE

DESIGNER NOTES:

1. OPERATING TANK SIZE SELECTION AND SYSTEM CAPACITY SHALL BE BY COMMAND FUEL FACILITIES ENGINEER IN COORDINATION WITH THE COMMAND FUELS MANAGER.

2. OPERATING TANK LEVEL ALARM ACTUATION POINTS SHALL BE COORDINATED WITH THE OPERATING TANKS SELECTED.

3. IF SUITABLE ON-BASE BULK STORAGE TANKS ARE LOCATED WITHIN ONE MILE OF THE FUELING APRON, THEY MAY BE USED AS OPERATING TANKS IF APPROVED BY COMMAND FUEL FACILITIES ENGINEER. HOWEVER, IT IS NOT RECOMMENDED TO USE TANKAGE THAT RECEIVES DIRECTLY FROM OFF BASE SOURCES VIA PIPELINE. USE OF THESE TANKS WILL REQUIRE APPROVAL OF THE COMMAND FUELS QUALITY MANAGER AND THE CHIEF, AIR FORCE TECHNICAL ASSISTANCE TEAM. IF EXISTING STORAGE TANKS ARE USED, THEY SHALL BE MODIFIED TO CONFORM TO REQUIREMENTS FOR OPERATING TANKS.

4. FIRE DETECTION/SUPPRESSION SYSTEM SHALL BE PROVIDED IN THE PUMP HOUSE AS REQUIRED BY THE COMMAND SERVICE HEADQUARTERS AND PER UFC 3-460-01.

5. COMMAND FUEL FACILITIES ENGINEER SHALL DETERMINE REQUIREMENTS FOR PANTOGRAPH FLUSHING CONNECTION VS. HYDRANT HOSE TRUCK CHECK-OUT STATION.

6. RELIEF VALVES SHALL BE PROVIDED AT EACH LOCATION WHERE SEGMENTS OF PIPE CAN BE ISOLATED BY VALVING OR BLINDING. CASCADING RELIEF VALVES SHALL BE PREVENTED AS MUCH AS POSSIBLE TO PREVENT ADDITIVE PRESSURES FROM GETTING TOO LARGE.

7. PROVIDE FLANGES WITH INSULATING GASKET KITS AT ALL LOCATION WHERE DISSIMILAR METALS BETWEEN PIPELINES THAT MAY CONTACT ONE ANOTHER OR WHERE ISOLATION OF CATHODIC PROTECTION SYSTEM IS REQUIRED.

8. ALL THERMAL RELIEF VALVES, W/O SPECIFIED SET PRESSURE SHALL BE SET AT A PRESSURE 10% GREATER THAN THE PUMP DEAD HEAD PRESSURE, NOT TO EXCEED 265 PSIG (1827 K Pa).

9. SEE SHEET REQUIREMENTS. A/E SHALL VERIFY "IF" LOCATIONS.

10. PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQUIRED TO ENSURE COMPLETE DRAINAGE AND COMPLETE AIR VENTING OF FUEL PIPING.

11. PIPE SIZE 12" (300mm) OR LARGER PER SURGE ANALYSIS.

12. TAKE OFF TO TRUCK FILL STAND IS ON LOOP OR IN PUMP HOUSE PER COMMAND FUEL FACILITIES ENGINEER. INSTALL LOOP ISOLATION VALVES WITH CROSS OVER TO ALLOW CONTINUED OPERATION OF THE FILLSTAND WHILE ISOLATING THE HYDRANT LOOP.

13. EMERGENCY SHUT OFF IS EITHER BY CLOSING MANUAL VALVE OR BY PROVIDING A SOLENOID CONTROL ON THE PUMP NON-SURGE CHECK CONTROL VALVE, PER COMMAND FUEL FACILITIES ENGINEER.

14. SEE TYPE III FOR DETAILS.

15. SIZE OF HYDRANT LOOP PIPING SHALL BE BASED ON SURGE ANALYSIS AS WELL AS THE NEED, LOCATION, AND SIZE OF HYDRAULIC SURGE ARRESTORS.

16. THE USE OF SURGE ARRESTORS SHALL BE BASED ON THE SURGE ANALYSIS OR AS DIRECTED BY THE COMMAND FUELS FACILITY ENGINEER.

17. DRAWINGS ARE BASED ON TYPE III STANDARD. SEE PRESSURIZED HYDRANT DIRECT FUELING SYSTEM STANDARD FOR TYPE IV/V STYLE LAYOUT SYSTEM AND USE TANKS AND BUILDINGS FROM THIS STANDARD.

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

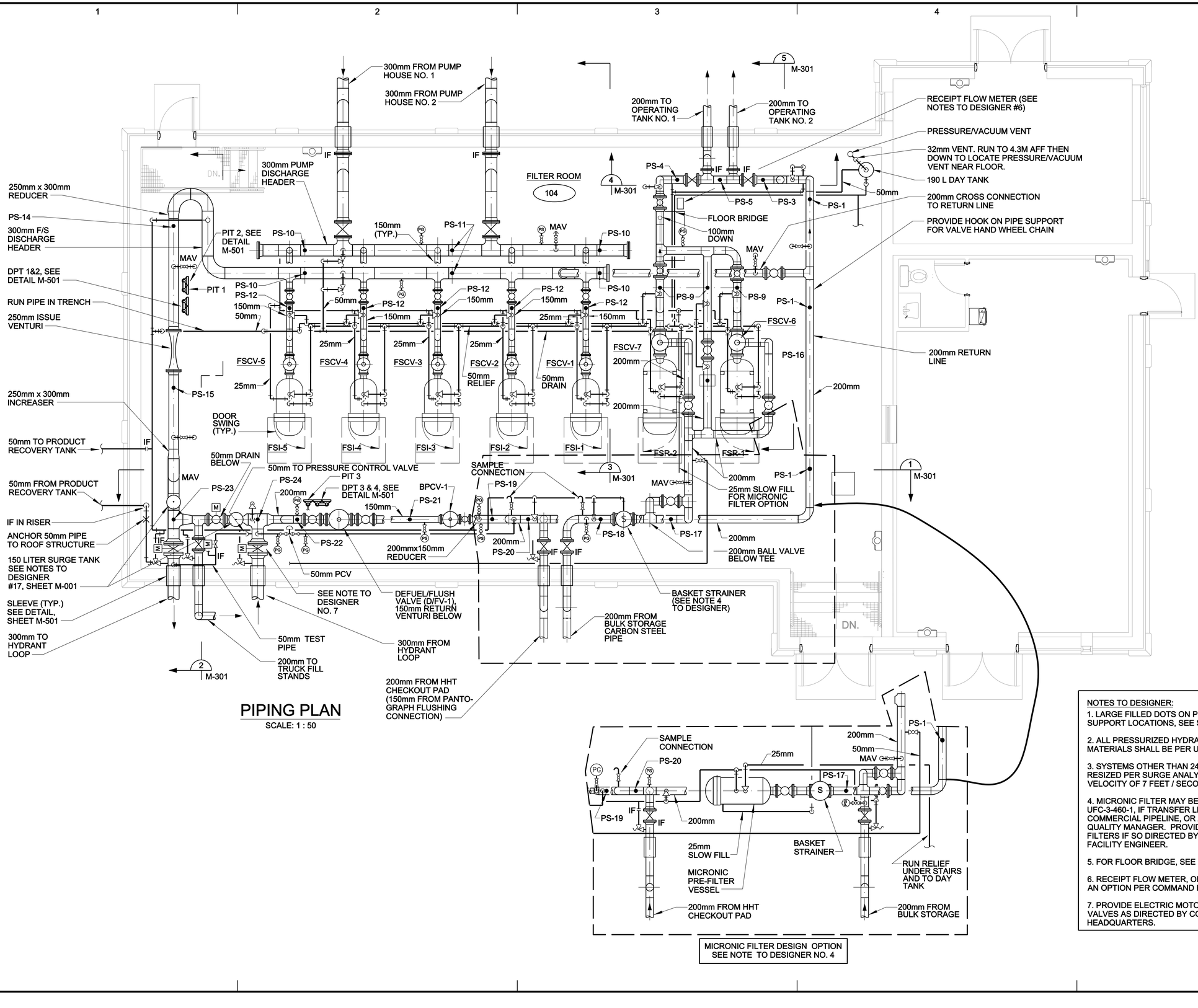
DESIGNED BY: JOSEPH J. PESEK
DRAWN BY: T.D.F.
CKD BY: C.R.M.
SUBMITTED BY: MICHAEL L. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-0X-X-00XX
CONTRACT NO.: W912BF-0X-C-00XX
FILE NAME: 004M-001.dwg
FILE NUMBER: X
SIZE: 841x559
PLOT SCALE: 0"-1" = 1'-0"
PLOT DATE: 7/9/2010

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DOD, CUTNCOVER STANDARDS
FILTER BUILDING

FUEL SYSTEM LEGEND AND NOTES

SHEET IDENTIFICATION NUMBER
M-001



PIPING PLAN

SCALE: 1 : 50

MICRONIC FILTER DESIGN OPTION
SEE NOTE TO DESIGNER NO. 4

NOTES TO DESIGNER:

1. LARGE FILLED DOTS ON PIPING INDICATE PIPE SUPPORT LOCATIONS, SEE SHEET S-203.
2. ALL PRESSURIZED HYDRANT FUELING SYSTEM PIPE MATERIALS SHALL BE PER UFC-3-460-01.
3. SYSTEMS OTHER THAN 2400 GPM SHALL HAVE PIPING RESIZED PER SURGE ANALYSIS WITH A MAXIMUM VELOCITY OF 7 FEET / SECOND.
4. MICRONIC FILTER MAY BE NECESSARY. SEE UFC-3-460-1, IF TRANSFER LINE IS FROM OFF-BASE COMMERCIAL PIPELINE, OR AS DIRECTED BY THE FUELS QUALITY MANAGER. PROVIDE A PAIR OF MICRONIC FILTERS IF SO DIRECTED BY THE COMMAND FUELS FACILITY ENGINEER.
5. FOR FLOOR BRIDGE, SEE SPEC. 05500
6. RECEIPT FLOW METER, ORIFICE, AND BALL VALVES ARE AN OPTION PER COMMAND FUELS FACILITY ENGINEER.
7. PROVIDE ELECTRIC MOTOR OPERATORS ON THE 12" VALVES AS DIRECTED BY COMMAND SERVICE HEADQUARTERS.

0 500 1000 2000
SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: JOSEPH J. PESEK
DWN BY: T.D.F.
CKD BY: C.A.M.
SUBMITTED BY: MICHAEL J. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-0X-X-00XX
CONTRACT NO.: W912BF-0X-C-00XX
FILE NAME: 0040M-101.dwg
FILE NUMBER: X
SIZE: 841x559
PLOT SCALE: 1.25 / in.
PLOT DATE: 7/9/2010

DOD, CUT/NCOVER STANDARDS
FILTER BUILDING

PIPING PLAN

SHEET IDENTIFICATION NUMBER
M-101

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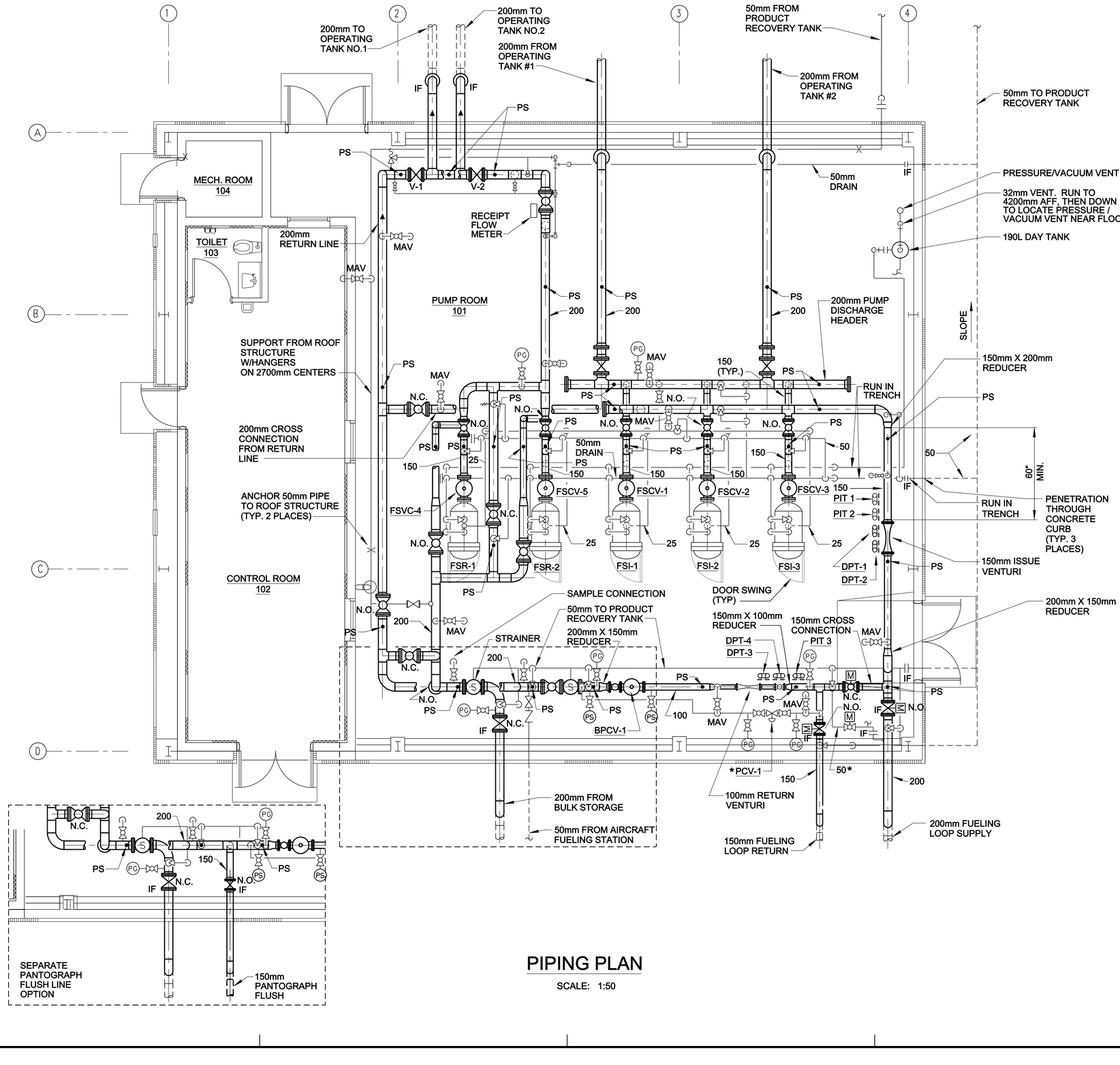


NOTES TO DESIGNER:

1. LAYOUT BASED ON PRESSURIZED HYDRANT DIRECT FUELING SYSTEM (TYPE IV). SEE NOTES TO DESIGNER #18, SHEET M-001.

*OMIT PCV-1 AND 50mm BYPASS WHEN USING SEQUENCE OF OPERATION SCHEME A.

PIPING PLAN

SCALE: 1:50

0 500 1000 2000

SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

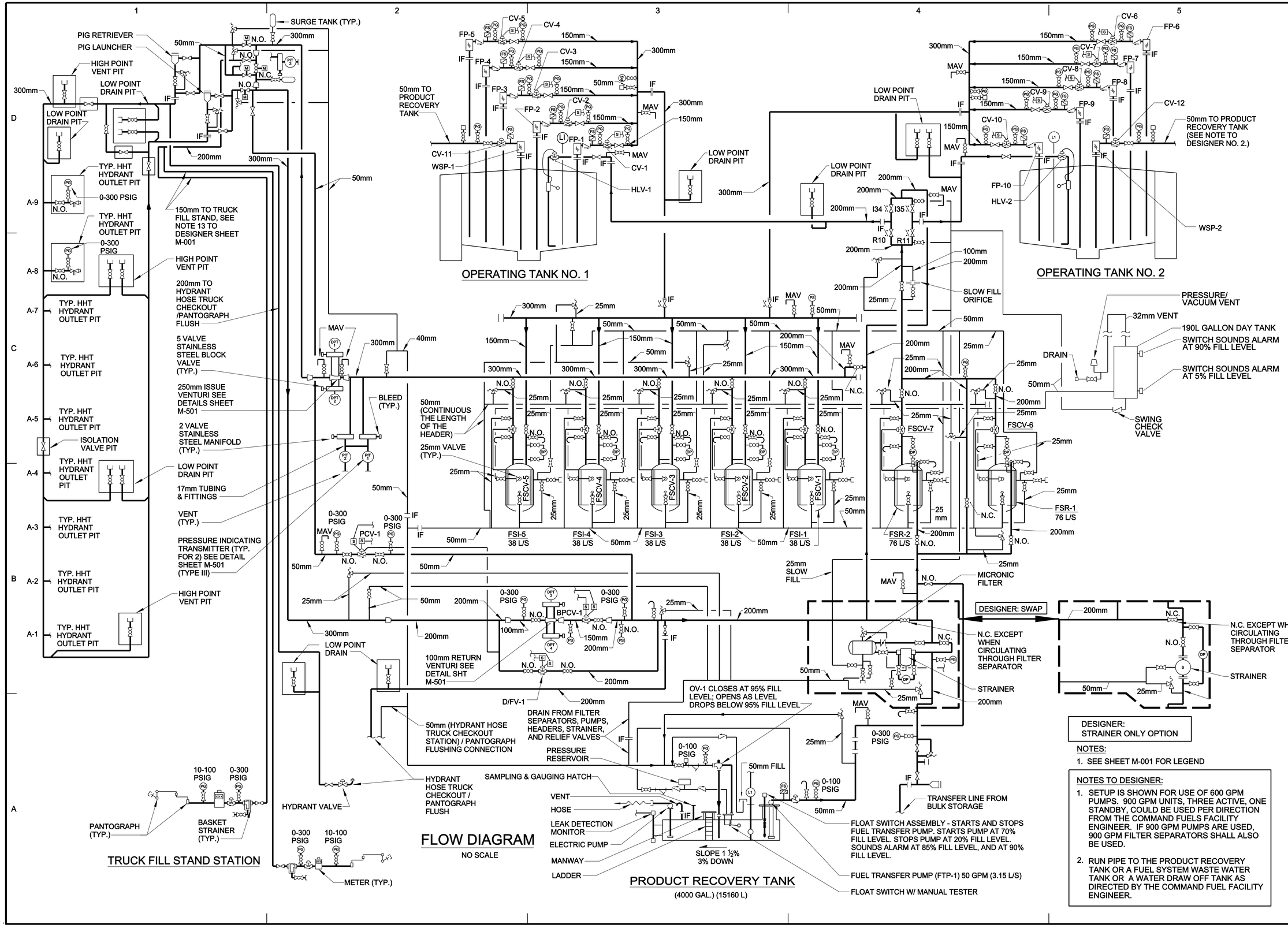
DESIGNED BY: JOSEPH J. PESEK
DWN BY: T.D.F.
CKD BY: C.R.M.
SUBMITTED BY: MICHAEL C. SMITH
DATE: JULY 2010
SOLICITATION NO.: W9128F-10-X-00XX
CONTRACT NO.: W9128F-10-C-00XX
FILE NAME: 0D40M-101a.dwg
FILE NUMBER: X
SIZE: 841x559
PLOT SCALE: 1 / in.
PLOT DATE: 7/9/2010

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

PIPING PLAN
SCHEME A

SHEET IDENTIFICATION NUMBER
M-101a



US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

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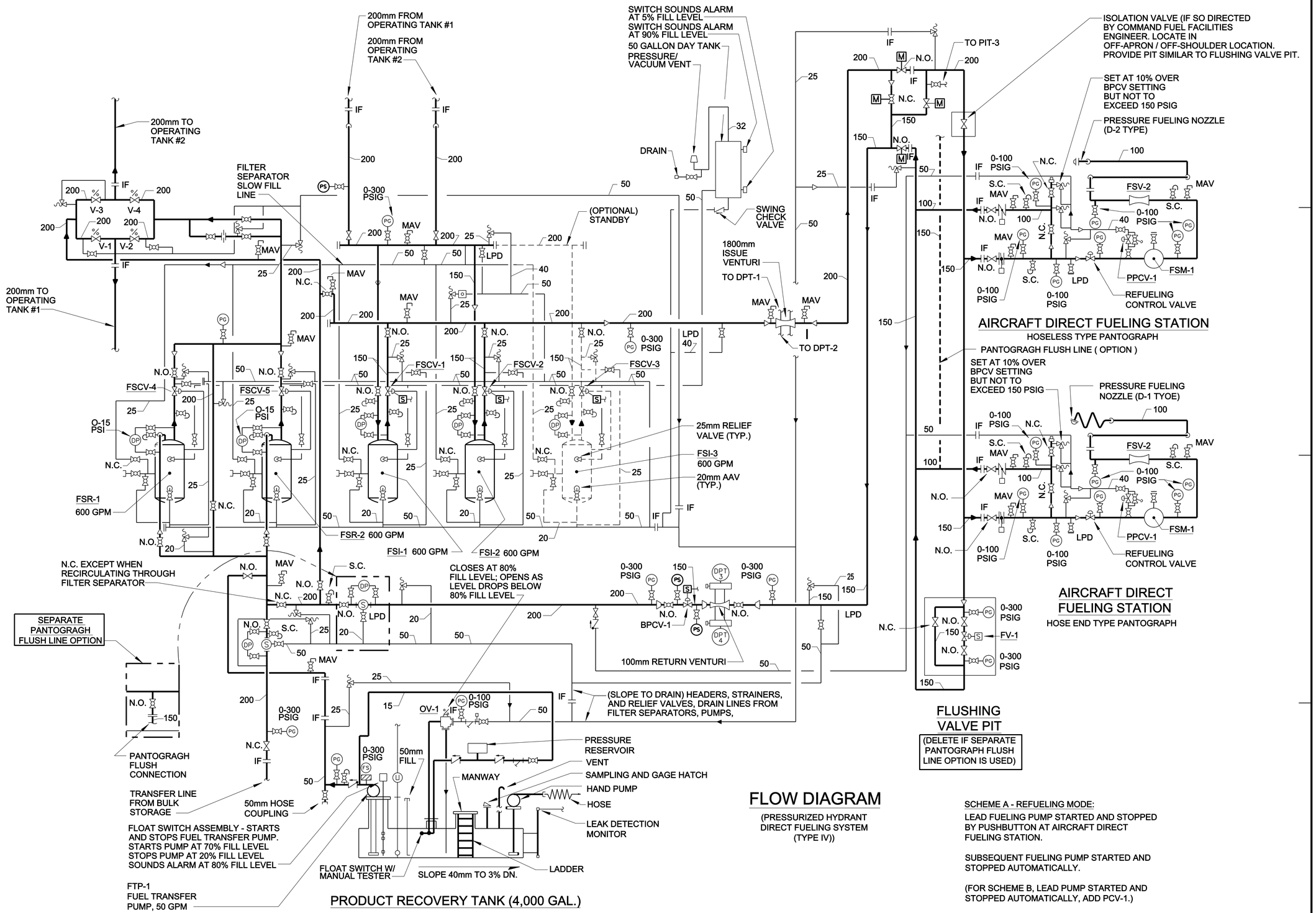
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: JOSEPH J. PESEK
DWN BY: T.D.F.
CKD BY: C.R.M.
SUBMITTED BY: MICHAEL J. SMITH
FILE NAME: 0D40M-201.dwg
SIZE: 841x559
PLOT SCALE: 25 / in.
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-00XX
CONTRACT NO.: W912BF-10-C-00XX
FILE NUMBER: X
PLOT DATE: 7/9/2010

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

FLOW DIAGRAM

SHEET IDENTIFICATION NUMBER
M-201



FLOW DIAGRAM

(PRESSURIZED HYDRANT DIRECT FUELING SYSTEM (TYPE IV))

SCHEME A - REFUELING MODE:

LEAD FUELING PUMP STARTED AND STOPPED BY PUSHBUTTON AT AIRCRAFT DIRECT FUELING STATION.

SUBSEQUENT FUELING PUMP STARTED AND STOPPED AUTOMATICALLY.

(FOR SCHEME B, LEAD PUMP STARTED AND STOPPED AUTOMATICALLY, ADD PCV-1.)

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

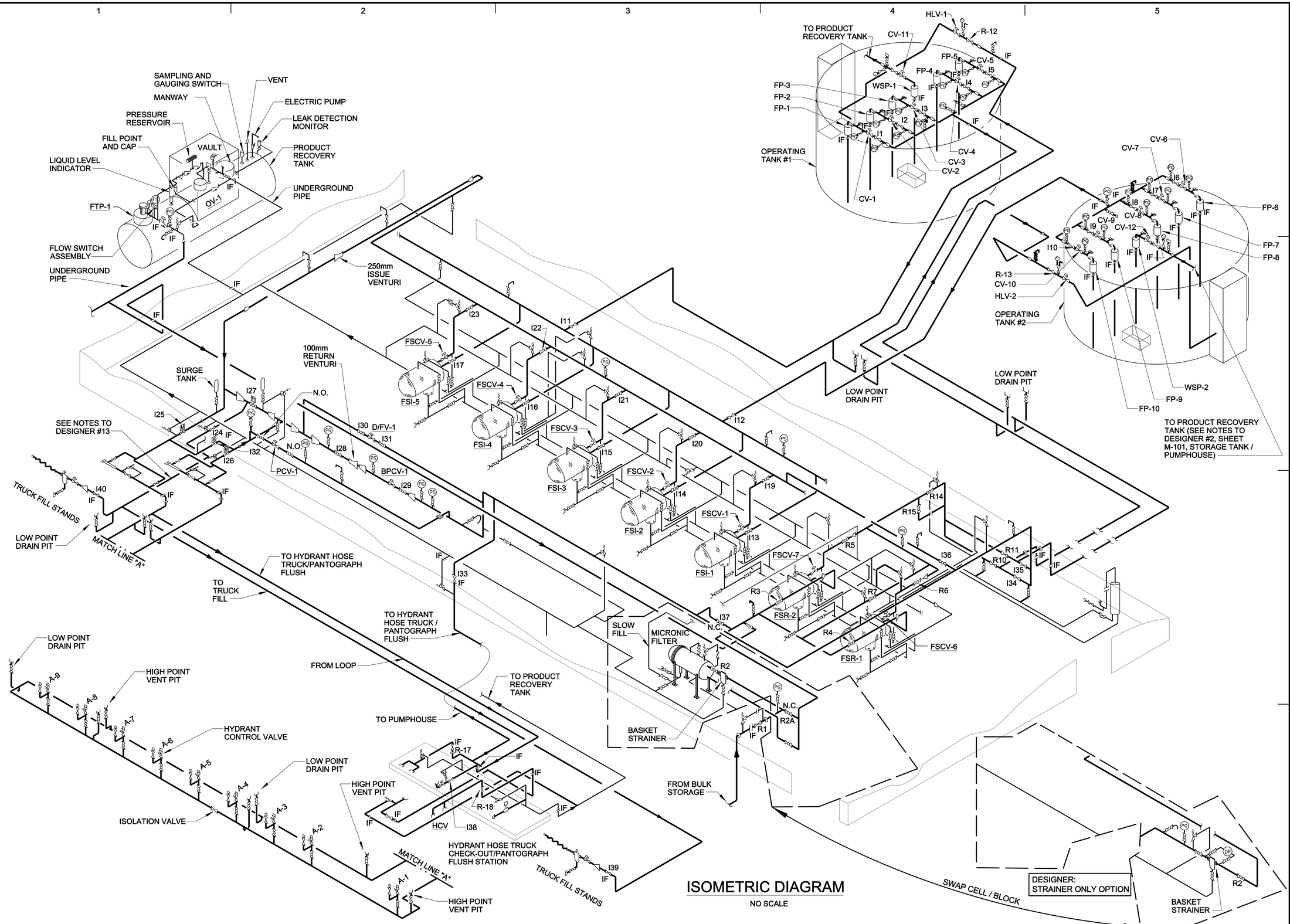
DESIGNED BY: JOSEPH J. PESEK
DWN BY: T.D.F.
SUBMITTED BY: MICHAEL J. SMITH
FILE NAME: 0M-DM-201a.dwg
SIZE: 841x559

DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-00XX
CONTRACT NO.: W912BF-10-C-00XX
FILE NUMBER: X
PLOT SCALE: 1 " / " in.
PLOT DATE: 7/9/2010

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

FLOW DIAGRAM
SCHEME A

SHEET IDENTIFICATION NUMBER
M-201a



ISOMETRIC DIAGRAM

NO SCALE

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

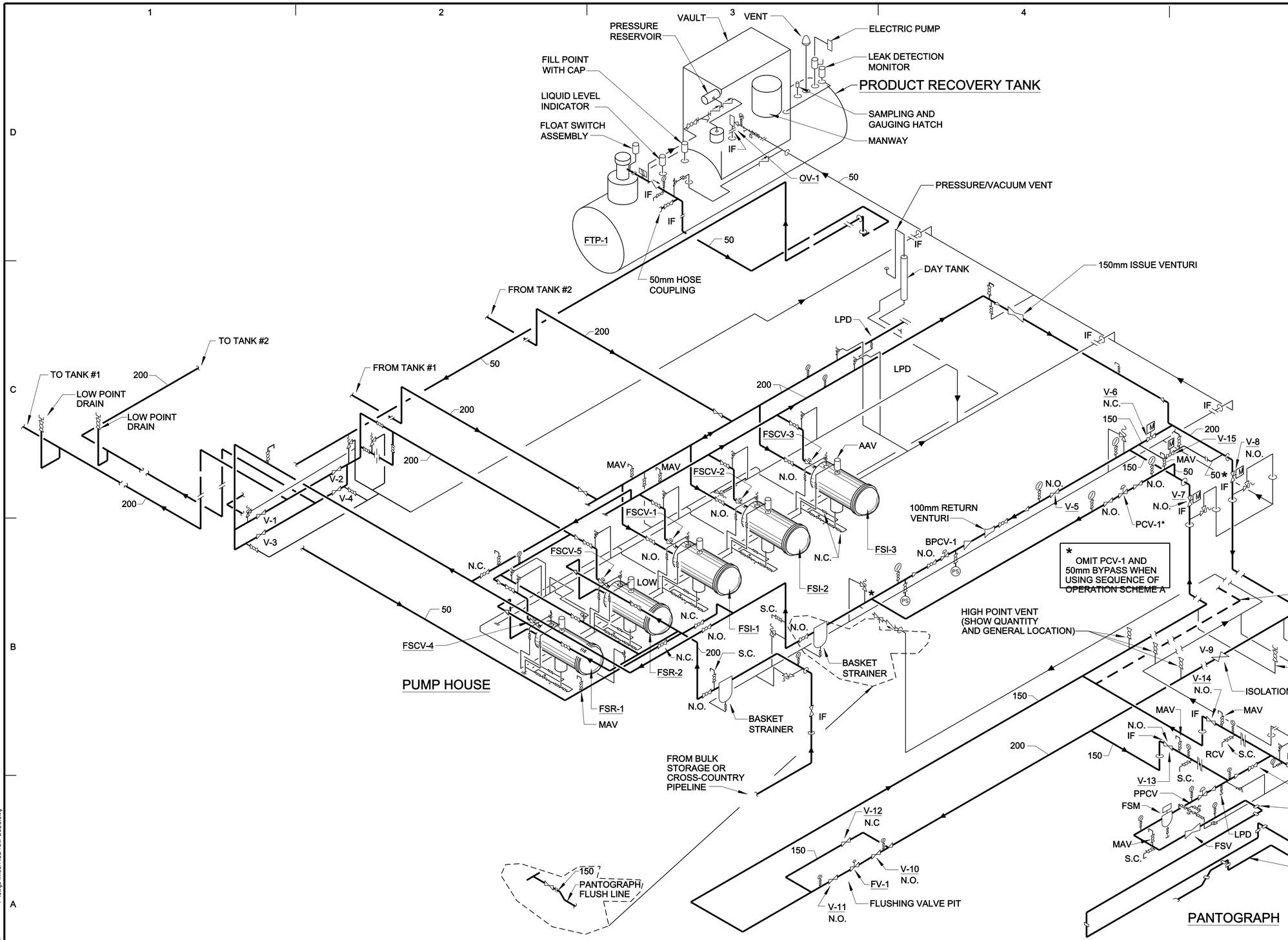
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: JOSEPH J. PESEK
DWN BY: T.D.T.
CKD BY: C.K.M.
SUBMITTED BY: MICHAEL J. SMITH
FILE NAME: OD40M-202.dwg
SIZE: 841x559
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-003X
CONTRACT NO.: W912BF-10-D-00XX
FILE NUMBER: X
PLOT SCALE: 25 / in.
PLOT DATE: 7/9/2010

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

ISOMETRIC DIAGRAM

SHEET IDENTIFICATION NUMBER
M-202



ISOMETRIC PIPING DIAGRAM

(PRESSURIZED HYDRANT DIRECT FUELING SYSTEM (TYPE IV))

NO SCALE

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: JOSEPH J. PESEK
DRN BY: TJF
CKD BY: C.R.M.
SUBMITTED BY: MICHAEL T. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-00XX
CONTRACT NO.: W912BF-10-C-00XX
FILE NUMBER: X
FILE NAME: 0040M-202a.dwg
SIZE: 841x559
PLOT SCALE: 1 " / n.
PLOT DATE: 7/9/2010

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

ISOMETRIC DIAGRAM
SCHEME A

SHEET IDENTIFICATION NUMBER
M-202a

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SEQUENCE OF OPERATION
(SEE NOTE TO DESIGNER NO. 1, THIS SHEET)

SYSTEM IN "AUTOMATIC" MODE IDLE CONDITION

THE TYPE III SYSTEM IS INTENDED TO REMAIN CONTINUOUSLY PRESSURIZED WHILE IN THE IDLE CONDITION. THIS ALLOWS THE SYSTEM TO RESPOND AUTOMATICALLY/IMMEDIATELY TO AIRCRAFT REFUELING AND DEFUELING MISSION REQUIREMENTS.

PERIODICALLY, WHILE IN THE IDLE CONDITION WITH NO AIRCRAFT REFUELING OR DEFUELING DEMANDS, THE SYSTEM WILL LOSE MINIMUM PRESSURE REQUIREMENTS. WHEN THIS OCCURS, THE CONTROL SYSTEM WILL AUTOMATICALLY REPRESSURIZE IN THE FOLLOWING SEQUENCE:

1. AS SYSTEM PRESSURE AT PRESSURE INDICATING TRANSMITTER PIT-1 OR PIT-2 DROPS BELOW SET POINT OF 60 PSIG, THE CONTROL SYSTEM WILL START THE SELECTED LEAD FUELING PUMP, AND CONTROL SIGNALS WILL BE INITIATED FOR THE FOLLOWING FUNCTIONS:

   -- THE BACK PRESSURE CONTROL VALVE (BPCV-1) SOLENOID WILL BE ENERGIZED TO ENABLE BPCV-1 TO MODULATE OPEN AT ITS SET POINT.

   -- THE DEFUEL/FLUSH VALVE IS EQUIPPED WITH TWO SOLENOIDS. SOLENOID "A" WILL BE DE-ENERGIZED TO DISABLE OR HOLD THE DEFUEL/FLUSH VALVE CLOSED AND SOLENOID "B" WILL BE DE-ENERGIZED ANY TIME SYSTEM IS IN "AUTOMATIC" MODE.

2. THE LEAD FUELING PUMP WILL ESTABLISH A FLOW OF [600 +] [900 +] GPM THROUGH THE SYSTEM ISSUE VENTURI AND THE PRESSURE UPSTREAM OF THE BPCV-1 WILL INCREASE UNTIL THE BPCV-1 SET POINT OF 113 PSIG (AS DETERMINED BY HYDRAULICS OF SYSTEM) IS REACHED. AT THIS PRESSURE, THE BPCV-1 WILL START TO OPEN AND THE VALVE WILL MODULATE AS REQUIRED TO PASS SUFFICIENT FLOW THROUGH THE RETURN VENTURI TO MAINTAIN PRESSURE UPSTREAM OF THE VALVE.

3. WITH NO FUELING DEMAND, THE RETURN VENTURI WILL SEE TOTAL FLOW OF [600 +] [900 +] GPM FROM THE LEAD PUMP. IF DPT-3 OR DPT-4 SENSES DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE GREATER THAN [560] [840] GPM FOR A PERIOD OF 60 SECONDS, THE CONTROL SYSTEM WILL INITIATE CONTROL SIGNALS FOR THE FOLLOWING FUNCTIONS:

   -- THE BPCV-1 SOLENOID WILL BE DE-ENERGIZED TO CLOSE THE BPCV-1. SIGNAL TO STOP LEAD PUMP SHALL OCCUR WHEN PRESSURE INDICATING TRANSMITTER PIT-1 OR PIT-2 RISES ABOVE SET POINT OF 140 PSIG FOR A A PERIOD OF 2 SECONDS (AS DETERMINED BY HYDRAULICS OF THE SYSTEM

   -- THE DEFUEL/FLUSH VALVE SOLENOID "A" ADJUSTABLE TIMER WILL BE ENERGIZED (SIMULTANEOUSLY WITH SIGNAL TO STOP LEAD PUMP) TO BLEED SYSTEM PRESSURE TO 80 PSIG.

   -- THE PCV-1 SOLENOID WILL BE DE-ENERGIZED (SIMULTANEOUSLY WITH SIGNAL TO STOP LEAD PUMP AND THE ENERGIZING OF THE TIMER FOR DEFUEL/FLUSH VALVE SOLENOID "A") TO BLEED SYSTEM TO 75 PSIG.

AT THIS POINT THE SYSTEM HAS RETURNED TO A PRESSURIZED IDLE CONDITION.

SYSTEM IN "AUTOMATIC" MODE REFUELING CONDITION

TO INITIATE AN AIRCRAFT FUELING OPERATION, AN OPERATOR CONNECTS FUELING EQUIPMENT SUCH AS A HYDRANT HOSE TRUCK (HHT), TO AN AIRCRAFT AND TO A SELECTED HYDRANT CONTROL VALVE. HYDRANT CONTROL VALVES ARE AN AIR OPERATED "DEADMAN" SYSTEM.
WHEN THE OPERATOR OPENS THE HYDRANT CONTROL VALVE BY USE OF THE "DEADMAN", THE FOLLOWING SEQUENCE OCCURS:

1. AS SYSTEM PRESSURE AT PRESSURE INDICATING TRANSMITTER PIT-1 OR PIT-2 DROPS BELOW SET POINT OF 60 PSIG, THE CONTROL SYSTEM WILL BE INITIATED FOR THE FOLLOWING FUNCTIONS:

   -- THE BACK PRESSURE CONTROL VALVE (BPCV-1) SOLENOID WILL BE ENERGIZED TO ENABLE BPCV-1 TO MODULATE OPEN AT ITS SET POINT.

   -- THE DEFUEL/FLUSH VALVE IS EQUIPPED WITH TWO SOLENOIDS. SOLENOID "A" WILL BE DE-ENERGIZED TO DISABLE OR HOLD THE DEFUEL/FLUSH VALVE CLOSED AND SOLENOID "B" WILL BE DE-ENERGIZED ANY TIME SYSTEM IS IN "AUTOMATIC" MODE.

   NOTE: SOLENOID "B" IS ENERGIZED WHEN SYSTEM IS IN THE "DEFUEL/ FLUSH" MODE.

2. THE LEAD FUELING PUMP WILL ESTABLISH A FLOW OF [600 + -] [900 + -] GPM THROUGH THE SYSTEM ISSUE VENTURI AND THE PRESSURE UPSTREAM OF THE BPCV-1 WILL INCREASE UNTIL THE BPCV-1 SET POINT OF 130 PSIG (AS DETERMINED BY THE SYSTEM HYDRAULICS) IS REACHED. AT THIS PRESSURE, THE BPCV-1 WILL START TO OPEN AND THE VALVE WILL MODULATE AS REQUIRED TO PASS SUFFICIENT FLOW THROUGH THE RETURN VENTURI TO MAINTAIN PRESSURE UPSTREAM OF THE VALVE.

3. WITH DPT-1 OR DPT-2 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE OF [600 + -] [900 + -] GPM AND DPT- 3 OR DPT-4 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE THRU THE RETURN VENTURI OF GREATER THAN [40 + -] [60 + -] GPM AND LESS THAN [560 + -] [840 + -} GPM, THE LEAD FUELING PUMP WILL CONTINUE TO RUN AND THE BPCV-1-1 WILL CONTINUE MODULATING TO PASS FLOW AS NECESSARY TO MAINTAIN UPSTREAM PRESSURE REQUIREMENT AND NO ADDITIONAL CONTROL FUNCTIONS WILL BE INITIATED UNTIL SYSTEM OPERATING CONDITIONS CHANGE.

   A. IF DPT-3 OR DPT-4 SENSES A DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE THRU THE RETURN VENTURI OF GREATER THAN [560 + -] [840 + -] GPM FOR 60 SECONDS, THE CONTROL SYSTEM WILL INITIATE CONTROL SIGNALS FOR THE FOLLOWING FUNCTIONS:

   -- THE BPCV-1 SOLENOID WILL BE DE-ENERGIZED TO CLOSE THE BPCV-1. SIGNAL TO STOP LEAD PUMP SHALL OCCUR WHEN PRESSURE INDICATING TRANSMITTER PIT-1 OR PIT-2 RISES ABOVE SET POINT OF 140 PSIG FOR A PERIOD OF 2 SECONDS.

   -- THE DEFUEL/FLUSH VALVE SOLENOID "A" ADJUSTABLE TIMER WILL BE ENERGIZED (SIMULTANEOUSLY WITH SIGNAL TO STOP LEAD PUMP) TO BLEED SYSTEM PRESSURE TO 80 PSIG.

   -- THE PCV-1 SOLENOID WILL BE DE-ENERGIZED (SIMULTANEOUSLY WITH SIGNAL TO STOP LEAD PUMP AND THE ENERGIZING OF THE TIMER FOR DEFUEL/FLUSH VALVE SOLENOID "A") TO BLEED SYSTEM TO 75 PSIG.

4. WITH DPT-1 OR DPT-2 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE OF [600 + -] [900 + -] GPM THRU THE ISSUE VENTURI AND DPT-3 OR DPT-4 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE OF ~~LESS THAN~~ [40 + -] [60 + -] GPM THRU THE RETURN VENTURI FOR A PERIOD OF 10 SECONDS, (TIME INTERVAL FOR ALL SUBSEQUENT PUMPS) A SUBSEQUENT PUMP (SECOND) WILL BE STARTED.

5. WITH DPT-1 OR DPT-2 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE OF [1200 + -] [1800 + -] GPM THRU THE ISSUE VENTURI AND DPT-3 OR DPT 4 SENSING DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE ~~GREATER THAN~~ [40 + -] [60 + -] GPM BUT ~~LESS THAN~~ [700 + -] [1000 + -] GPM. THE LEAD FUELING PUMP AND SECOND FUELING PUMP WILL CONTINUE TO RUN AND THE BPCV-1-1 WILL CONTINUE MODULATING TO PASS FLOW AS NECESSARY TO MAINTAIN UPSTREAM PRESSURE REQUIREMENT AND NO ADDITIONAL CONTROL FUNCTIONS WILL BE INITIATED UNTIL SYSTEM OPERATING CONDITIONS CHANGE.

   A. IF DPT-3 OR DPT-4 SENSES A DIFFERENTIAL PRESSURE CORRESPONDING TO A FLOW RATE THRU THE RETURN VENTURI OF ~~GREATER THAN~~ [700 + -] [1000 + -] GPM FOR 15 SECONDS (TIME INTERVAL FOR ALL SUBSEQUENT PUMPS). THE CONTROL SYSTEM WILL INITIATE CONTROL SIGNALS TO SHUT DOWN THE SUBSEQUENT (SECOND) FUELING PUMP, LEAVING THE SYSTEM TO OPERATE AS DESCRIBED IN PARAGRAPH 3.

   NOTE:
   THE REMAINING SUBSEQUENT FUELING PUMPS WILL BE STARTED USING DPT-1 OR DPT-2 AND STOPPED AS DESCRIBED HERE IN BEFORE IN PARAGRAPH 4, 5, AND 5A. THE LEAD FUELING PUMP SHUT DOWN AND RETURN TO IDLE CONDITION WILL BE AS DESCRIBED IN PARAGRAPH 3A.

   IN THE EVENT A FUELING PUMP IS AUTOMATICALLY CALLED ON AND FAILS TO START OR FAILS AFTER SUCCESSFULLY STARTING (AS INDICATED BY OPEN CONTACTS ON THE ASSOCIATED PUMP DISCHARGE FLOW SWITCH FOR A 15 SECOND INTERVAL), THE AFFECTED FUELING PUMP WILL BE CALLED OFF AND THE NEXT IDLE FUELING PUMP IN THE PRE-DETERMINED SEQUENCE OF 4 PUMPS THAT WILL BE CALLED ON AUTOMATICALLY.

SYSTEM IN "AUTOMATIC" MODE DEFUELING CONDITION

TO INITIATE AN AIRCRAFT DEFUELING OPERATION, AN OPERATOR CONNECTS A HYDRANT HOSE TRUCK (HHT) TO AIRCRAFT AND TO AN AIR OPERATED "DEADMAN" HYDRANT CONTROL VALVE, THE HHT HAS AN ON-BOARD DEFUEL PUMP. THIS PUMP IS CAPABLE OF DELIVERING 300 GPM AT 165 PSIG. AS THE OPERATOR STARTS THE ON-BOARD HHT DEFUEL PUMP THE FOLLOWING SEQUENCE OCCURS.

1. IF PUMPS ARE RUNNING (DEFUEL/FLUSH VALVE CLOSED) THE FUEL BEING REMOVED FROM THE AIRCRAFT WILL EITHER GO TO THE OTHER AIRCRAFT(S) CONNECTED TO THE SYSTEM OR WILL MODULATE BPCV-1 OPEN TO RETURN FUEL TO OPERATING TANKS.

   - OR -

2. IF PUMPS ARE NOT RUNNING (DEFUEL/FLUSH VALVE ENABLED) THE FUEL BEING REMOVED FROM THE AIRCRAFT WILL MODULATE BOTH PCV-1 (AT 75 PSIG) AND DEFUEL/FLUSH VALVE (AT 80 PSIG) OPEN TO ALLOW FUEL TO PASS TO OPERATING TANKS.

SYSTEM IN "FLUSH" MODE

IF SYSTEM HAS NOT BEEN USED FOR SEVERAL DAYS OR IF FUEL SAMPLES INDICATE THE PRESENCE OF WATER OR EXCESSIVE SEDIMENT, PROCEDURE SHALL BE INITIATED IN THE FOLLOWING SEQUENCE.

1. PLACE THE MODE SELECTOR SWITCH IN THE "FLUSH" MODE. THIS WILL DE-ENERGIZE BPCV-1 SOLENOID LOCKING THE BPCV-1 CLOSED AND ENERGIZE DEFUEL/FLUSH VALVE SOLENOID "B" ALLOWING DEFUEL/FLUSH VALVE TO OPEN.

2. POSITION MANUALLY OPERATED VALVES IN THE SYSTEM TO REQUIRED POSITIONS TO DIRECT FUEL THROUGH THE DESIRED FLOW PATH (I.E., TRANSFERRING FUEL FROM ONE OPERATING TANK TO ANOTHER, FLUSHING SUSPECT FUEL FROM APRON LOOP PIPING AND ROUTING THIS FUEL THROUGH THE RECEIVING FILTER SEPARATORS, ETC.).

3. SELECT PUMP TO BE USED FOR FLUSHING, PLACE THE FUELING PUMPS HAND-OFF-AUTO SELECTOR SWITCH IN THE "HAND" POSITION. THIS WILL START PUMP.

   NOTE: ADDITIONAL PUMP(S) MAY BE STARTED MANUALLY TO OBTAIN THE DESIRED FLUSHING FLOW RATE.

4. FOLLOWING THE FLUSHING PROCEDURE, POSITION MANUALLY OPERATED VALVES TO THEIR NORMALLY OPENED OR CLOSED POSITIONS.

5. PLACE THE FUELING PUMPS HAND-OFF-AUTO SELECTOR SWITCH IN THE "AUTO" POSITION.

6. PLACE THE MODE SELECTOR SWITCH IN THE "AUTOMATIC" MODE FROM THE "FLUSH" MODE.

7. OBSERVE SYSTEM OPERATION TO ENSURE SYSTEM RETURNS TO PRESSURED IDLE CONDITION.

AN ADDITIONAL FEATURE OF THIS "FLUSH" MODE INCLUDES CAPABILITY FOR "DEFUEL" OPERATIONS. WHILE IN THIS MODE, SYSTEM PRESSURE IS REDUCED TO A STATIC PRESSURE EQUAL TO THE LEVEL OF FUEL IN THE OPERATING TANK(S). THEREFORE, IT IS POSSIBLE TO ACCOMPLISH "HOT DEFUELS" FOR KC-135'S UTILIZING SUITABLE REFUELING EQUIPMENT ("HOT DEFUEL" IS WITH AIRCRAFT ENGINES RUNNING).

-------- FOR CONTINUATION SEE SHEET M-204 --------

NOTE TO DESIGNER:

1. "GPM" OPTIONS ARE GIVEN. CHOOSE THE FIRST BRACKET FOR USE WITH 600 GPM PUMPS. CHOOSE THE SECOND BRACKET FOR USE WITH 900 GPM PUMPS.

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: JOSEPH J. PESEK
DRN BY: T.D.F.
CKD BY: C.K.M.
SUBMITTED BY: MICHAEL K. SMITH
FILE NAME: OD40M-203.dwg
SIZE: 841x559
PLOT SCALE: 1.25 / in.
DATE: JULY 2010
SOLICITATION NO.: W912BF-08-X-003X
CONTRACT NO.: W912BF-10-C-00XX
FILE NUMBER: X
PLOT DATE: 7/9/2010

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DOD, CUTNCOVER STANDARDS
FILTER BUILDING

SEQUENCE OF OPERATION
SHEET 1 OF 2

SHEET IDENTIFICATION NUMBER
M-203

- - - - - - - - CONTINUED FROM SHEET M-203 - - - - - - - -
(SEE NOTE TO DESIGNER NO. 1, THIS SHEET)

SYSTEM IN TIGHTNESS TEST MODE

TO INITIATE A SYSTEM TIGHTNESS TEST:

1. PLACE THE MODE SELECTOR SWITCH IN THE "TIGHTNESS TEST" MODE. THIS WILL ENERGIZE THE PRESSURE TEST PANEL. ELECTRIC MOTOR OPERATORS CLOSE VALVES I25 AND I26 AND OPEN VALVE I27. ENERGIZE D/FV SOLENOIDS "A" & "B" TO HOLD VALVE CLOSED. MANUALLY CLOSE I24.

2. FOLLOWING THE TEST PROCEDURES, SWITCH THE MODE SELECTOR SWITCH TO "AUTO" POSITION, THE ELECTRIC MOTOR OPERATORS CLOSE VALVE I27, OPEN VALVES I25 AND I26, AND THE SYSTEM WILL RUN THROUGH A NORMAL SHUTDOWN PROCEDURE. MANUALLY OPEN I24.

EMERGENCY OPERATION - PLC'S DOWN

IN THE EVENT BOTH MICROPROCESSORS ARE DOWN, THE SYSTEM MAY BE ACTIVATED FOR EMERGENCY FUELING AS FOLLOWS:

1. PLACE ALL FUELING PUMP SELECTOR SWITCHES IN THE "OFF" POSITION.

2. ENSURE SELECTED OPERATING TANK(S) INLET AND OUTLET VALVES ARE OPEN.

3. CLOSE INLET SIDE BALL VALVE TO PCV-1.

4. MANUALLY BY-PASS SOLENOID ON BPCV-1 ALLOWING VALVE TO MODULATE AT SET POINT.

5. MANUALLY START FUELING PUMP(S) AS REQUIRED BY PLACING SELECTOR SWITCHES IN THE "HAND" POSITION. OPERATOR TO READ MECHANICAL INDICATORS ON DIFFERENTIAL PRESSURE TRANSMITTERS (DPT) LOCATED AT THE RETURN VENTURI. IF DPT'S SHOW LESS THAN 40 GPM RETURNING TO OPERATING TANK(S), MANUALLY START AN ADDITIONAL FUELING PUMP. IF DPT'S SHOW MORE THAN 700 GPM, MANUALLY STOP A FUELING PUMP, MANUALLY STOP LAST FUELING PUMP AFTER EMERGENCY OPERATION IS COMPLETE.

NOTE: OPERATOR IS REQUIRED TO CONTINUOUSLY VERIFY OPERATING TANK(S) FUEL LEVEL TO ENSURE ADEQUATE FUEL SUPPLY IS AVAILABLE. FUEL LEVEL VERIFICATION SHALL BE BY MEANS OF THE OPERATING TANK(S) GROUND LEVEL READING GAGE. UPON COMPLETION OF EMERGENCY OPERATION, OPERATOR SHALL OPEN INLET SIDE BALL VALVE TO PCV-1. CLOSE SOLENOID BY-PASS VALVE ON BPCV-1 AND RETURN FUELING PUMP SELECTOR SWITCHES TO ORIGINAL POSITIONS.

STORAGE TANK SELECTION
"AUTOMATIC MODE" OR "PRESSURE TEST MODE"

TO INITIATE FUELING OPERATION IN THE "AUTOMATIC MODE" OR THE "TIGHTNESS TEST MODE", THE 4-VALVE MANIFOLD AND THE TANK ISSUE VALVE IN THE FILTER BUILDING MUST BE IN THE PROPER POSITION, AS SHOWN IN THE VALVE POSITION MATRIX, TO ENABLE FUELING OPERATIONS.

NOTE TO DESIGNER:

1. THE SYSTEM IN TIGHTNESS TEST MODE ASSUMES I25 AND I26 HAVE ELECTRICAL MOTOR OPERATORS. IF DIRECTED BY THE COMMAND SERVICE HEADQUARTERS TO USE MANUAL VALVES, REWRITE TEST MODE ACCORDINGLY.

MANUAL VALVE OPERATION

1. FILLING OF THE OPERATION TANK T1 (T2)
OPEN VALVES: R1, R2, R3, R4, R5, R6, R10 (R11), R12 (R13)
CLOSE VALVES: I34 (I35), I36, I37, R7, R11 (R10), R2A

2. FUELING OF AIRCRAFT FROM OPERATING TANK T1 (T2)
OPEN VALVES: I1 I2, I3, I4, I5, (I6, I7, I8, I9, I10), I11, (I12), I13, I14, I15, I16, I17, I19, I20, I21, I22, I23, I25, I26, I28, I29, I30, I31, I34 (I35), R12 (R13)
CLOSE VALVES: I12 (I11), I27, I35, (I34), I36. I37, R10 (R11)

3. FILLING OF TANK TRUCKS AT PANTOGRAPH FLUSH STATION OR HHT CHECKOUT STATION FROM OPERATING TANK T1 (T2)
OPEN VALVES: I1 I2, I3, I4, I5, (I6, I7, I8, I9, I10), I11, (I12), I13, I14, I15, I16, I17, I19, I20, I21, I22, I23, I24, I25, I26, I28, I29, I30, I31, I38, I39, I40, R12 (R13)
CLOSE VALVES: I12 (I11), I27, I35 (I34), I36, I37, R10 (R11)

4. EMPTYING OF TANK TRUCKS VIA PANTOGRAPH FLUSH STATION OR HHT CHECKOUT STATION INTO OPERATING TANK T1 (T2)
OPEN VALVES: I33, I37, R3, R4, R5, R6, R10 (R11), R12 (R13), R16
CLOSE VALVES: I34 (I35), R2, R7, R11 (R10)

5. EMPTYING OF REMAINING FUEL FROM OPERATING TANK T1 (T2) TO OPERATING TANK T2 (T1)
OPEN VALVES: I1 I2, I3, I4, I5, (I6, I7, I8, I9, I10), I11, (I12), I13, I14, I15, I16, I17, I19, I20, I21, I22, I23, I36, I35 (I34), R13 (R12)
CLOSE VALVES: I12 (I11), I31, I29, I33, I34 (I35), I37, R11 (R10)

6. EMPTYING OF PRODUCT RECOVERY TANK INTO OPERATING TANK T1 (T2)
OPEN VALVES: R3, R4 R5, R6, R10 (R11), R12 (R13)
CLOSE VALVES: I34 (I35), I37, R11 (R10), R7

7. DEFUELING OF AIRCRAFT OR MULTIPLE REFUELING PUMP INTO OPERATING TANK T1 (T2)
OPEN VALVES: I26, I30, I31, I28, I29, I34 (I35), R12 (R13)
CLOSE VALVES: I27, I36, I37, I35 (I34), R10 (R11)

8. CROSS PUMPING FROM OPERATING TANK T1 (T2) INTO OPERATING TANK T2 (T1) VIA FILTER SEPARATORS
OPEN VALVES: I1 I2, I3, I4, I5, (I6, I7, I8, I9, I10), I11, (I12), I13, I14, I15, I16, I17, I19, I20, I23, I27, R3, R5, R4, I21, I22, I30, I31, I37, R6, R7, R10 (R11), R13 (R12)
CLOSE VALVES: I12 (I11), I25, I26, I28, I34 (I35), R11 (R10)

9. FLUSHING OF LOOP FROM OPERATING TANK T1 (T2), THRU RECEIVING FILTER SEPARATORS AND RETURNING TO OPERATING TANK T1 (T2)
OPEN VALVES: I1, I2, I3, I4, I5, (I6, I7, I8, I9, I10), I11, (I12), I13, I14, I15, I16, I17, I19, I20, I21, I22, I23, I26, R3, R4, R5, R6, R7, R10 (R11), R12 (R13), I25, I28, I30, I31
CLOSE VALVES: I12 (I11), I27, I28, I34 (I35), R11 (R10)

EMERGENCY STOP AND RESET

1. DEPRESSION OF ANY EMERGENCY STOP PUSHBUTTON OR ACTUATION OF THE FIRE ALARM SYSTEM SHALL STOP FUELING PUMPS AND DE-ENERGIZE THE PUMP NON-SURGE CONTROL VALVE'S SOLENOID CAUSING THE VALVES TO CLOSE. THIS ACTION IS EXECUTED WITHOUT REGARD FOR WHETHER PUMPS WERE AUTOMATICALLY CALLED ON OR MANUALLY STARTED.

2. IN ORDER TO RESET SYSTEM AFTER AN ALARM, DEPRESS "RESTART" PUSHBUTTON LOCATED AT PUMP CONTROL PANEL.

OPERATION	VALVE POSITION					
	TANK #1			TANK #2		
	I 1	I 34	R 10	I 2	I 35	R 11
RECIRCULATION TO TANK NO. 1 & BULK RECEIPT TO TANK NO. 2	OPEN	OPEN	CLOSED	CLOSED	CLOSED	OPEN
RECIRCULATION TO TANK NO. 2 & BULK RECEIPT TO TANK NO. 1	CLOSED	CLOSED	OPEN	OPEN	OPEN	CLOSED
RECIRCULATION THROUGH RECEIPT FILTER SEPARATORS TO TANK NO. 1	OPEN	CLOSED	OPEN	CLOSED	CLOSED	CLOSED
RECIRCULATION THROUGH RECEIPT FILTER SEPARATORS TO TANK NO. 2	CLOSED	CLOSED	CLOSED	OPEN	CLOSED	OPEN

BACK PRESSURE CONTROL VALVE OPERATION - ONE SOLENOID			
CONDITION	VALVE ACTION	SOLENOID "A"	SOLENOID "B"
"AUTOMATIC" MODE PUMP START-UP	ENABLE	ENERGIZED	DE-ENERGIZED
"AUTOMATIC" MODE PRIOR TO LEAD PUMP SHUT-OFF	CLOSE	DE-ENERGIZED	DE-ENERGIZED
"FLUSH" MODE	CLOSE	DE-ENERGIZED	DE-ENERGIZED
TIGHTNESS TEST MODE	ENABLE	DE-ENERGIZED	ENERGIZED

PRESSURE CONTROL VALVE (PCV-1) OPERATION - ONE SOLENOID			
CONDITION	VALVE ACTION	SOLENOID "A"	SOLENOID "B"
"AUTOMATIC" MODE LEAD PUMP OFF	ENABLE	DE-ENERGIZED	DE-ENERGIZED
"AUTOMATIC" MODE PUMP(S) ON	CLOSE	ENERGIZED	DE-ENERGIZED
"FLUSH" MODE PUMP(S) ON	CLOSE	ENERGIZED	DE-ENERGIZED
"FLUSH" MODE PUMP(S) OFF	ENABLE	DE-ENERGIZED	DE-ENERGIZED
TIGHTNESS TEST MODE	CLOSE	ENERGIZED	ENERGIZED

DEFUEL/FLUSH VALVE OPERATION - TWO SOLENOID			
CONDITION	VALVE ACTION	SOLENOID "A"	SOLENOID "B"
"FLUSH" MODE	OPEN	DE-ENERGIZED	ENERGIZED
"AUTOMATIC" MODE PUMP(S) ON	CLOSE	DE-ENERGIZED	DE-ENERGIZED
"AUTOMATIC" MODE LEAD PUMP OFF	ENABLE	ENERGIZED	DE-ENERGIZED
TIGHTNESS TEST MODE	CLOSE	DE-ENERGIZED	DE-ENERGIZED

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

	APPR.	DATE	DESCRIPTION	MARK

	APPR.	DATE	DESCRIPTION	MARK

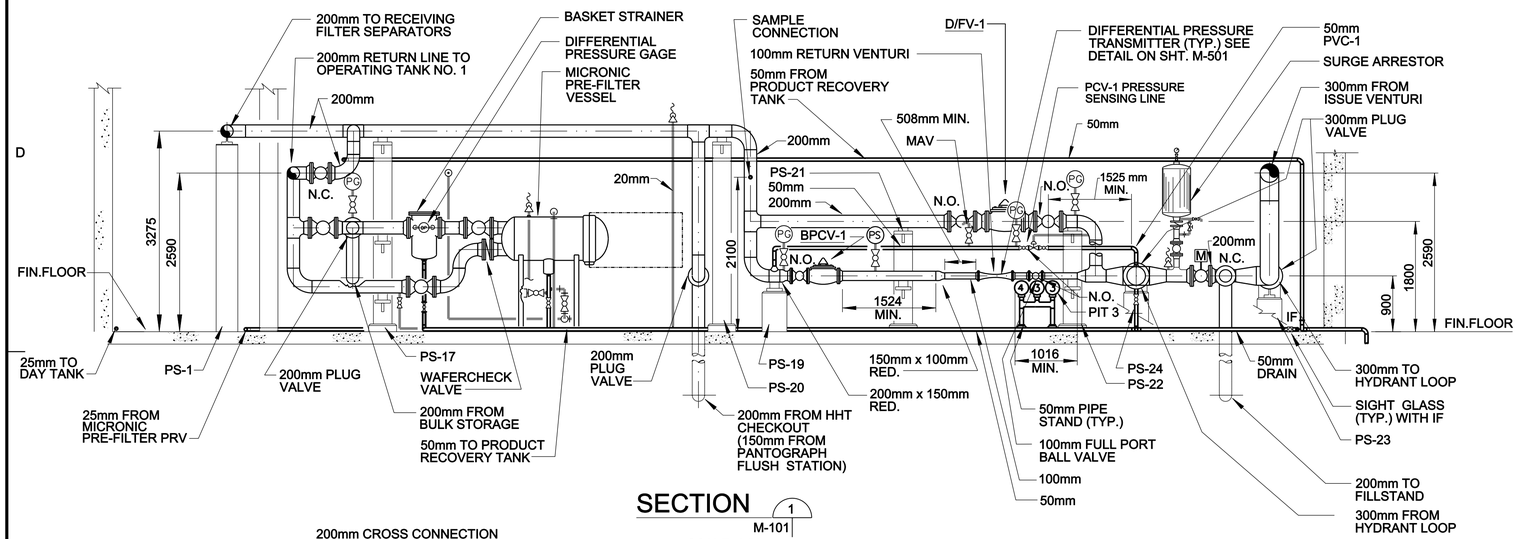
DESIGNED BY: JOSEPH J. PESEK
DRWN BY: T.S.F.
CKD BY: C.R.M.
SUBMITTED BY: MICHAEL J. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-00XX
CONTRACT NO.: W912BF-10-C-00XX
FILE NUMBER: X
FILE NAME: OD40M-254.dwg
SIZE: 841x559
PLOT SCALE: 25.4 / in.
PLOT DATE: 7/9/2010

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

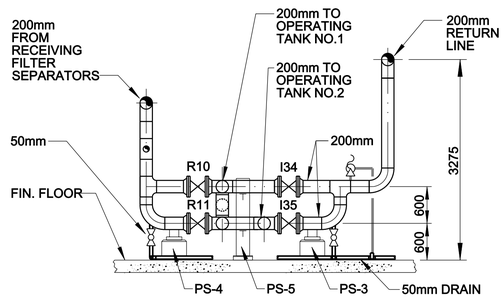
DOD, CUTN'COVER STANDARDS
FILTER BUILDING

SEQUENCE OF OPERATION
SHEET 2 OF 2

SHEET IDENTIFICATION NUMBER
M-204



SECTION 1
M-101
SCALE: 1:50



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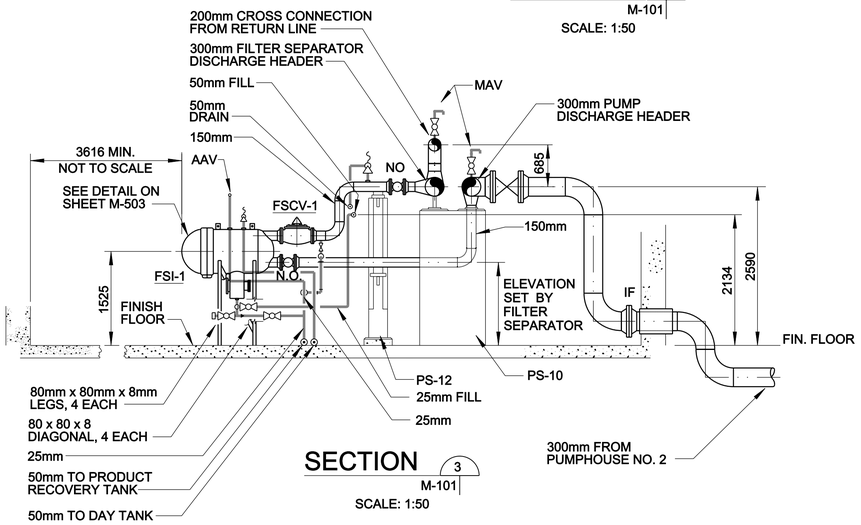
M-101
SCALE: 1:50



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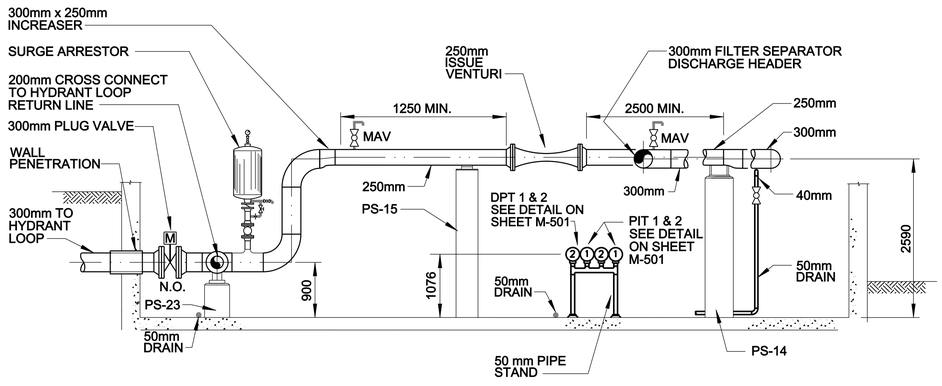
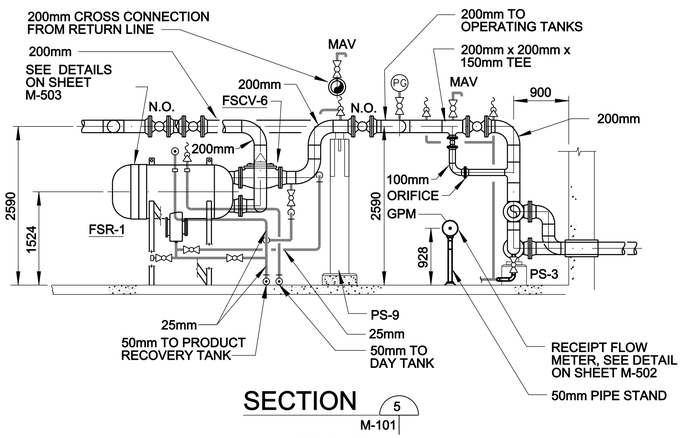
M-101
SCALE: 1:50



SECTION 2
M-101
SCALE: 1:50



SECTION 5
M-101
SCALE: 1:50

NOTES:

1. VALVE STEMS ON ALL MANUAL VALVES SHALL BE HORIZONTAL OR ABOVE WITH OPERATORS ON TOP OF VALVES.

2. SUPPORT 50mm DRAIN LINES WITH PIPE CENTERLINE 75mm ABOVE FINISHED FLOOR USE CHANNEL SUPPORTS WITH U BOLT ANCHORING.

3. MAV'S SHALL HAVE THREADED CAP.

4. DIMENSIONS BASED ON FLOOR ELEVATION OF 9400.

DESIGNER NOTES:

1. SHOWN WITH MICRONIC FILTER. USE SHEET M-301b FOR STRAINER ONLY

0 500 1000 2000
SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

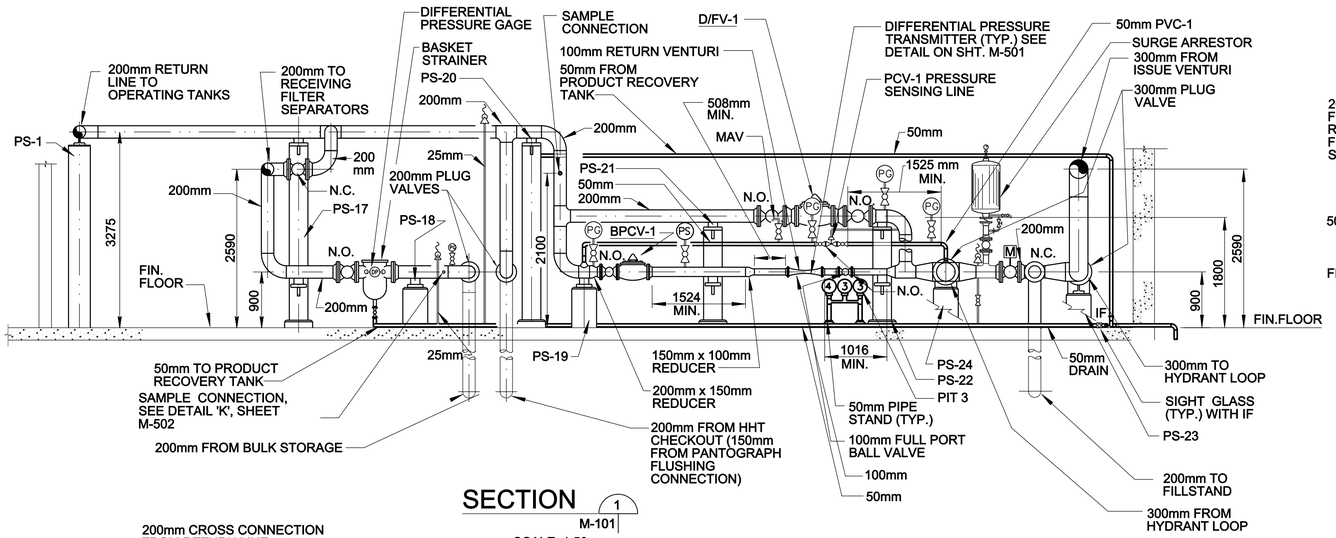
DESIGNED BY: JOSEPH J. PESEK
DRN BY: T.J.F.
CKD BY: C.M.M.
SUBMITTED BY: MICHAEL J. SMITH
FILE NAME: 0040M-301a.dwg
SIZE: 841x559
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-003X
CONTRACT NO.: W912BF-10-D-003X
FILE NUMBER: X
PLOT DATE: 7/9/2010
PLOT SCALE: 25 / in.

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

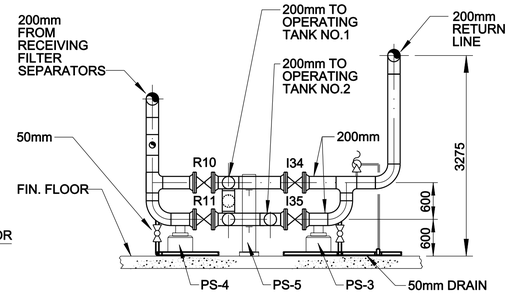
DOD, CUTN'COVER STANDARDS
FILTER BUILDING

PIPING SECTIONS

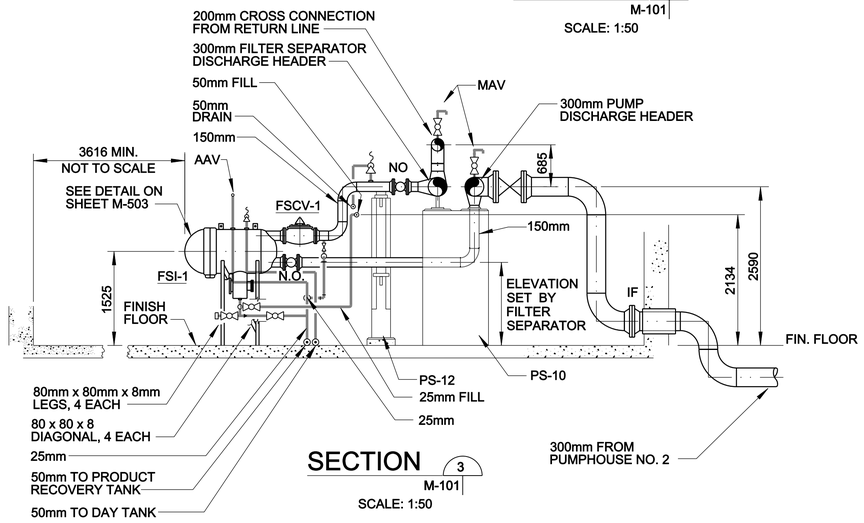
SHEET IDENTIFICATION NUMBER
M-301a



SECTION 1
M-101
SCALE: 1:50



SECTION 4
M-101
SCALE: 1:50



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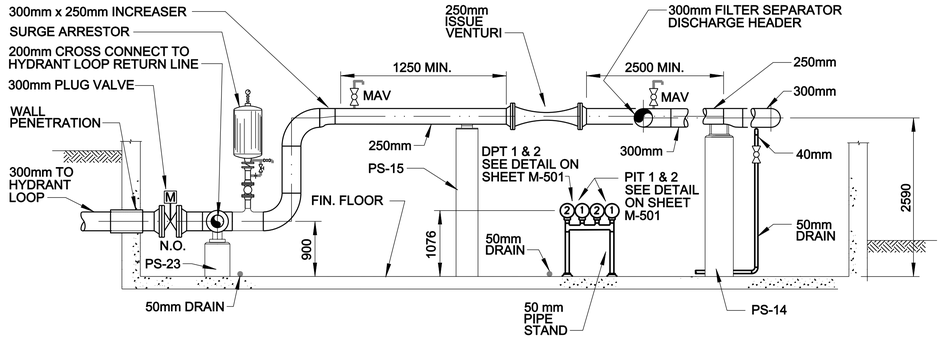
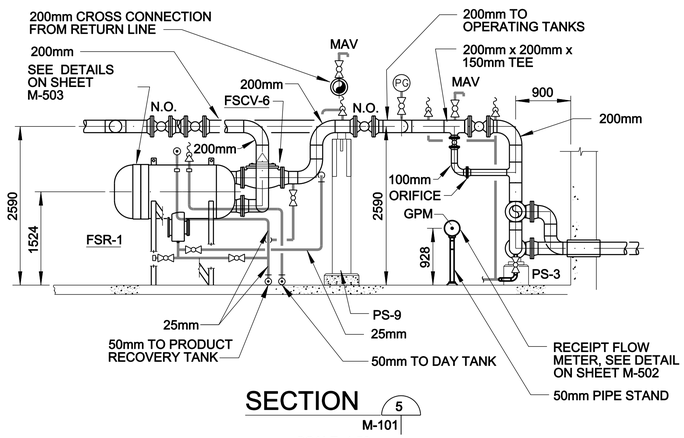
M-101
SCALE: 1:50



SECTION 2
M-101
SCALE: 1:50



SECTION 5
M-101
SCALE: 1:50

NOTES:

1. VALVE STEMS ON ALL MANUAL VALVES SHALL BE HORIZONTAL OR ABOVE WITH OPERATORS ON TOP OF VALVES.

2. SUPPORT 50mm DRAIN LINES WITH PIPE CENTERLINE 75mm ABOVE FINISHED FLOOR USE CHANNEL SUPPORTS WITH U BOLT ANCHORING.

3. MAV'S SHALL HAVE THREADED CAP.

4. DIMENSIONS BASED ON FLOOR ELEVATION OF 9400.

DESIGNER NOTES:

1. SHOWN WITHOUT MICRONIC FILTER. USE SHEET M-301a FOR MICRONIC FILTER

0 500 1000 2000
SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: JOSEPH J. PESEK
DRN BY: T.J.F.
CKD BY: C.M.M.
SUBMITTED BY: MICHAEL J. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-003X
CONTRACT NO.: W912BF-10-C-003X
FILE NUMBER: X
FILE NAME: 0040M-301b.dwg
SIZE: 841x559
PLOT SCALE: 25 / in.
PLOT DATE: 7/9/2010

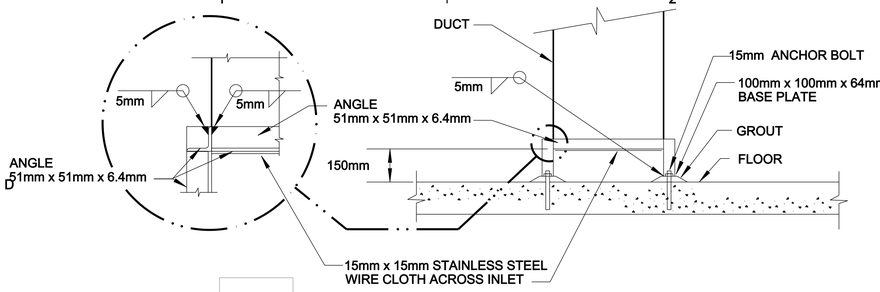
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DOD, CUTNCOVER STANDARDS
FILTER BUILDING

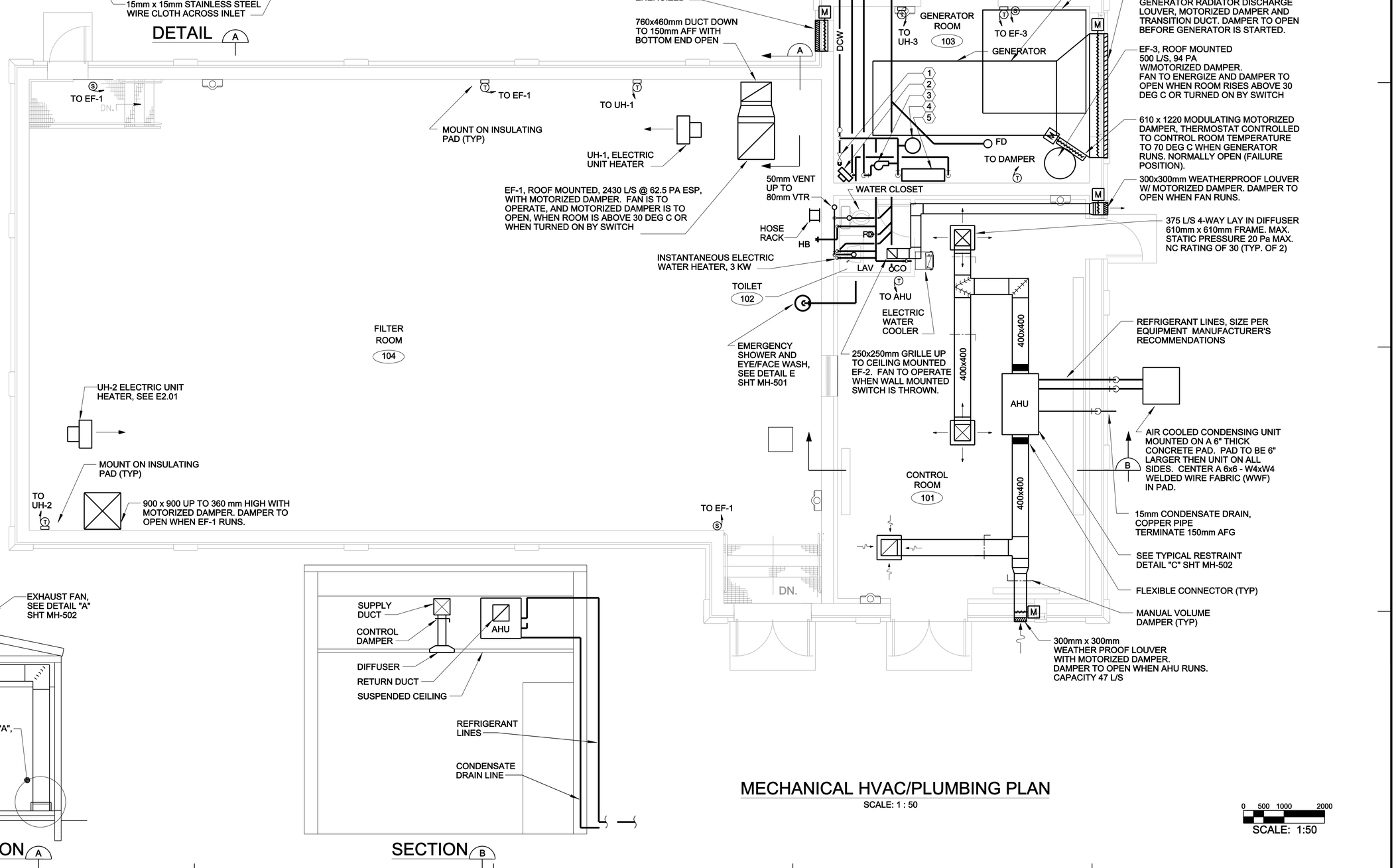
PIPING SECTIONS

SHEET IDENTIFICATION NUMBER
M-301b

1 WATER SERVICE ENTRANCE, SEE DETAIL "A" SHEET MH-501
2 UNIT HEATER, 3 KW
3 CIRCULATING PUMP, SEE DETAIL "C" SHEET MH-501
4 EXPANSION TANK
5 INSTANTANEOUS WATER HEATER, SEE DETAIL "D" SHT MH-501



DETAIL A



SECTION A

SECTION B

MECHANICAL HVAC/PLUMBING PLAN

SCALE: 1 : 50

0 500 1000 2000
SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

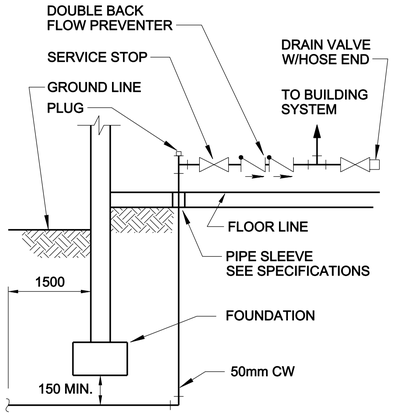
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: CRAIG R. MARGRAVE
DRN BY: T.D.F.
CKD BY: J.J.P.
SUBMITTED BY: MICHAEL J. SMITH
DATE: JULY 2010
SOLICITATION NO.: W912BF-10-X-003X
CONTRACT NO.: W912BF-10-C-00XX
FILE NAME: 0D-10MH101.dwg
FILE NUMBER: X
SIZE: 841x559
PLOT SCALE: 25 / in.
PLOT DATE: 7/9/2010

DOD, CUTNCOVER STANDARDS
FILTER BUILDING

MECHANICAL PLAN

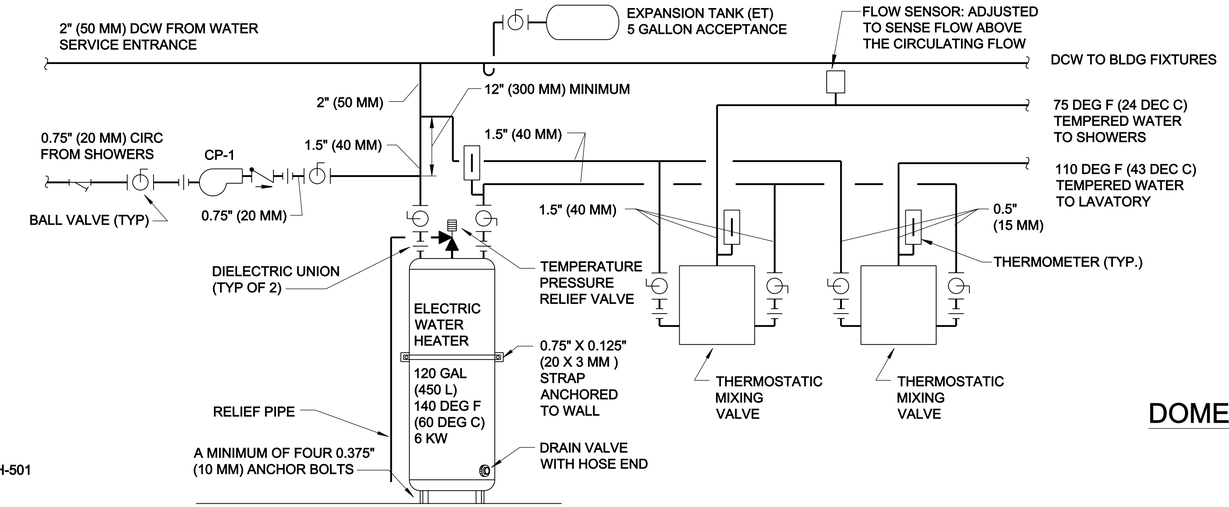
SHEET IDENTIFICATION NUMBER
MH101



WATER SERVICE ENTRANCE

NO SCALE

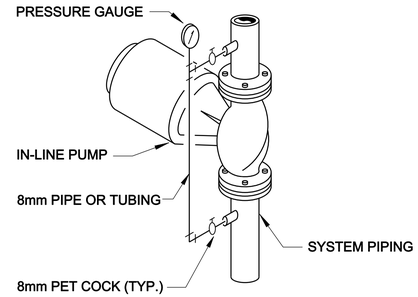
A MH-101 | MH-501



ELECTRIC WATER HEATER DETAIL

NO SCALE

B MH-101 | MH-501

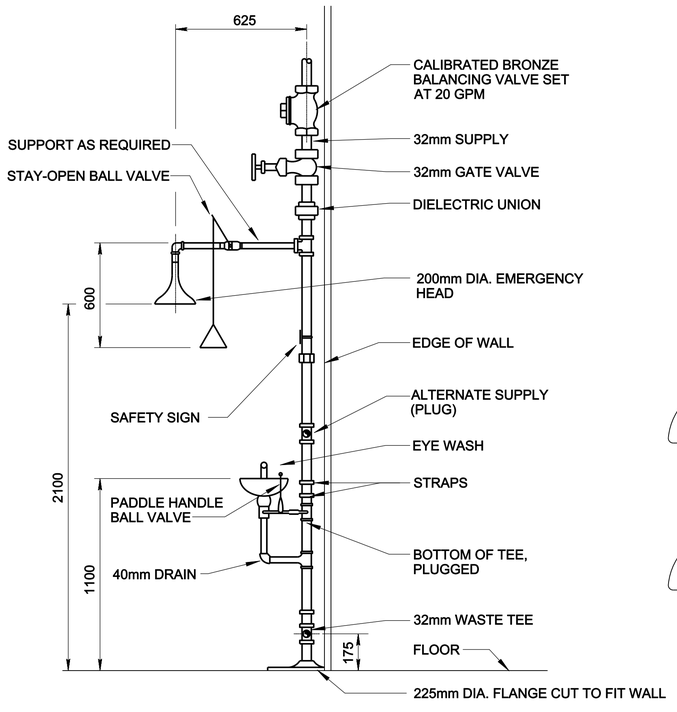


NOTE:
EXTERNAL GAGE TAPS ON PIPES SHALL NOT BE REQUIRED WHEN PUMP IS PROVIDED WITH FLANGE GUAGE CONNECTOR.

DOMESTIC HOT WATER PUMP DETAIL

NO SCALE

C MH-101 | MH-501

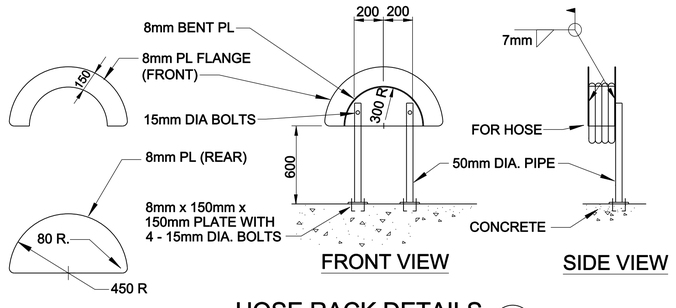


FROST PROOF EMERGENCY EYE WASH AND SHOWER DETAIL (PUMP ROOM)

NO SCALE

D MH-101 | MH-501

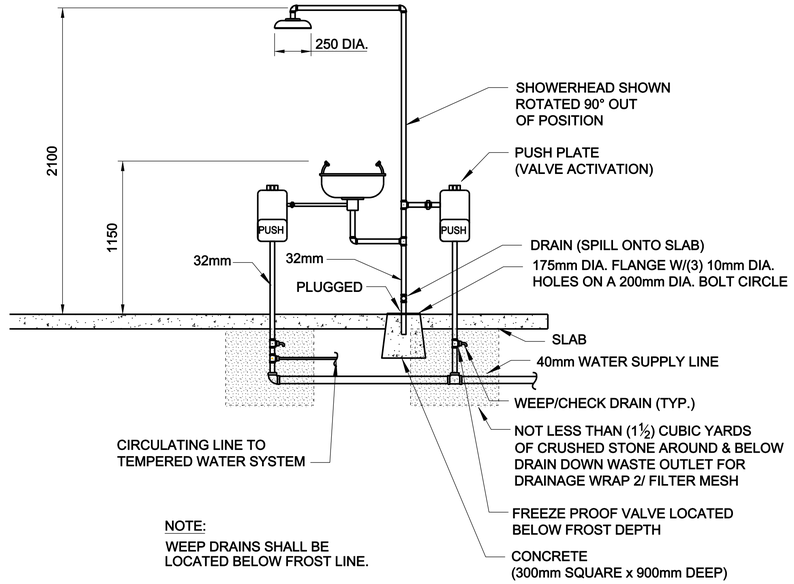
NOTE TO DESIGNER:
IN AREAS SUBJECT TO FREEZING CONDITIONS SHOWER AND APPURTENANCES SHALL BE HEAT TRACED (WITH THERMOSTATIC CONTROL), INSULATED, AND COVERED BY MOLDED ABS PLASTIC JACKETING, ALL OF WHICH SHALL BE A STANDARD PRODUCT OF THE SHOWER MANUFACTURER. HOSE BIBB ADJACENT TO SHOWER SHALL BE HEAT TRACED ALSO.



HOSE RACK DETAILS

SCALE: 1:50

E MH-101 | MH-501



NOTE:
WEEP DRAINS SHALL BE LOCATED BELOW FROST LINE.

EXTERIOR EMERGENCY SHOWER AND EYE/FACE WASH DETAIL

NO SCALE

F GEN | MH-501

NOTE TO DESIGNER:

1. RECOMMENDED SHOWER AND EYEWASH IN UNHEATED PUMP SHELTERS WHERE FREEZING COULD OCCUR.
2. EMERGENCY SHOWER/EYEWASH NOT REQUIRED AT EVERY FILLSTAND OR CHECKOUT, BUT WITHIN 100 FEET OF THEM.

0 500 1000 2000

SCALE: 1:50

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

MARK	DESCRIPTION	DATE	APPR

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DESIGNED BY: CRAIG R. MARGRAVE
DRAWN BY: T.D.P.
CKD BY: J.J.P.
SUBMITTED BY: MICHAEL E. SMITH
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FILE NUMBER: X
PLOT DATE: 7/21/2010

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DOD, CUTN'COVER STANDARDS
FILTER BUILDING

PUMPHOUSE
MECHANICAL DETAILS

SHEET IDENTIFICATION NUMBER
MH501

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