Appendix E
Preliminary Fire Protection Plan

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Unlading Rack Fire Protection Summary E-1
P&ID Firewater/Foam System E-2

Santa Maria Crude Oil Unloading Rack Fire Protection Summary

Foam/Water Deluge System

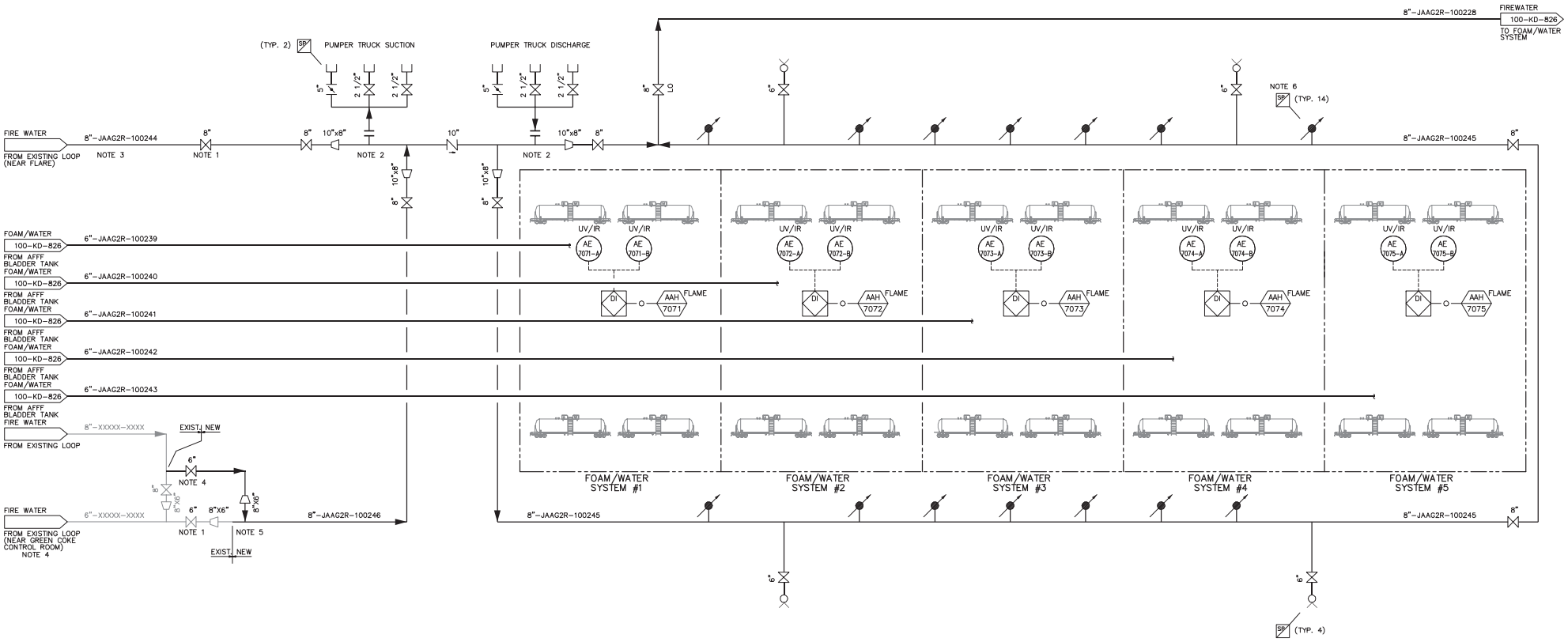
- Square footage under canopy: 32,860 ft^2
- Divide under canopy area into 5 zones of 6,572 ft^2 each
- Assume two adjacent zones will be activated in a fire
- Design density = 0.16 GPM/ft^2
- Flow rate required = 3 x 6572 x 0.16 = 3,155 GPM
- Provide additional flow of 2 x 500 GPM monitors = 1,000 GPM
- Total fire water flow required = 4,155 GPM
- Activation of deluge valves via manual pull stations (valves) or pilot sprinkler line
- Pilot sprinkler line shall have fusible heads rated at 175°F
- Bladder tank for foam concentrate storage sized for two consecutive activations of two adjacent zones.
- Pressurizing of line downstream of deluge valve activates pressure switch for remote alarm and pressurizes hydraulic valve that opens to allow foam concentrate flow to ratio proportioner
- Assumed foam concentrate is 3% type

Foam/Water Monitors

- Monitors shall be self-educting nozzles with foam totes
- Monitors will be mounted at grade approximately 50' away from unloading cars

Water Supply System

- Install approximately 1,200-feet of 8-inch pipe from the existing water line at the Coke Control Room to the unloading rack area. The supply for this pipe comes from incorporating the existing 6-inch water line and another 6-inch pipe in the area. There is an abandoned 6-inch line that will be cleaned and extended to the 8-inch portion of the existing firewater system. The two 6-inch lines will come together at the original location of the 8-inch line and will supply the lower portion of this 8-inch loop providing ample flow.
- Install approximately 2,200-feet of 8-inch pipe from the existing 10-inch water line to the unloading rack area.
- Provide 8-inch fire water loop around the unloading rack.
- Provide two FDC's with check valve between for boosting of pressure in fire water loop at unloading rack (if necessary).
- Two new lines will tie together for a short run to allow for repumping by refinery fire truck pump into looped system around rack.



NOTES:

1. LOCATE VALVE APPROX. MIDWAY ALONG FIREWATER HEADER.
2. FIRE TRUCK CONNECTIONS FOR PRESSURE BOOST IF NEEDED.
3. TIE-IN AT EXISTING 6" SEGMENT TO BE REPLACED WITH 8".
4. TIE-IN ABANDONED 6" LINE IN AREA TO NEW 8" SEGMENT. BOTH 6" SEGMENTS WILL COMBINE TO PROVIDE NECESSARY FLOW FOR 8" SEGMENT.
5. NEAR GREEN COKE CONTROL ROOM.
6. HYDRO-FOAM MONITOR WITH FOAM TOTE.

NUMBER	SH.	REFERENCE DRAWINGS

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PIPING AND INSTRUMENT DIAGRAM
CRUDE RAIL
FIREWATER/FOAM SYSTEM

PHILLIPS 66 CO.
Santa Maria Refinery

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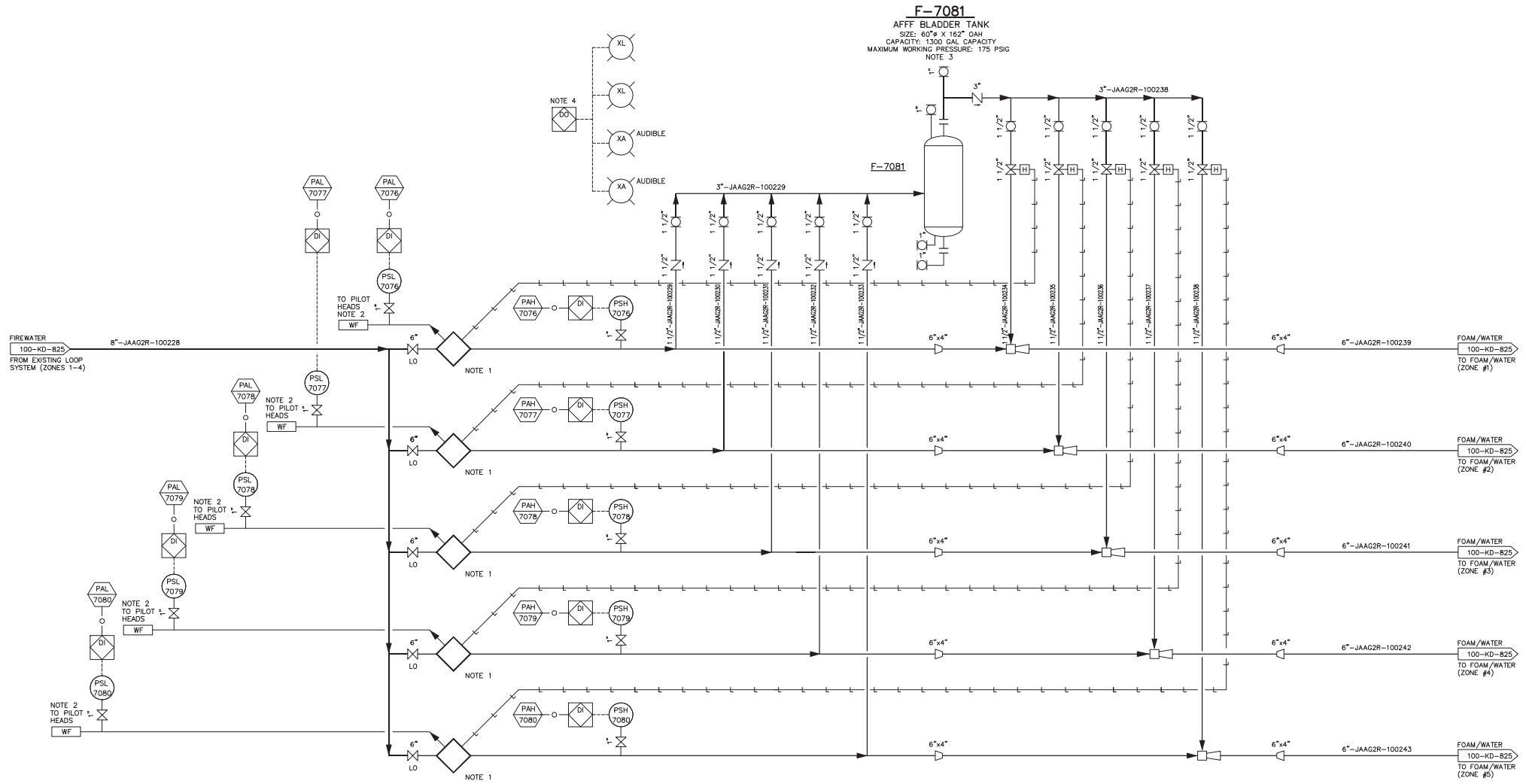

NOTES:

1. DELUGE VALVE SYMBOL (PER NFPA).
2. SYSTEM ACTIVATED BY PRESSURIZED PILOT SYSTEM. PILOT HEADS SHALL BE SET TO OPEN AT 200°F.
3. CONFIRM FIRE WATER PUMP RELIEF PRESSURE.
4. COMMON ALARM WITH BEACON & AUDIBLE ALARM AT EACH END OF RACK.

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PIPING AND INSTRUMENT DIAGRAM
CRUDE RAIL
FOAM/WATER SYSTEM

PHILLIPS 66 CO.
Santa Maria Refinery

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