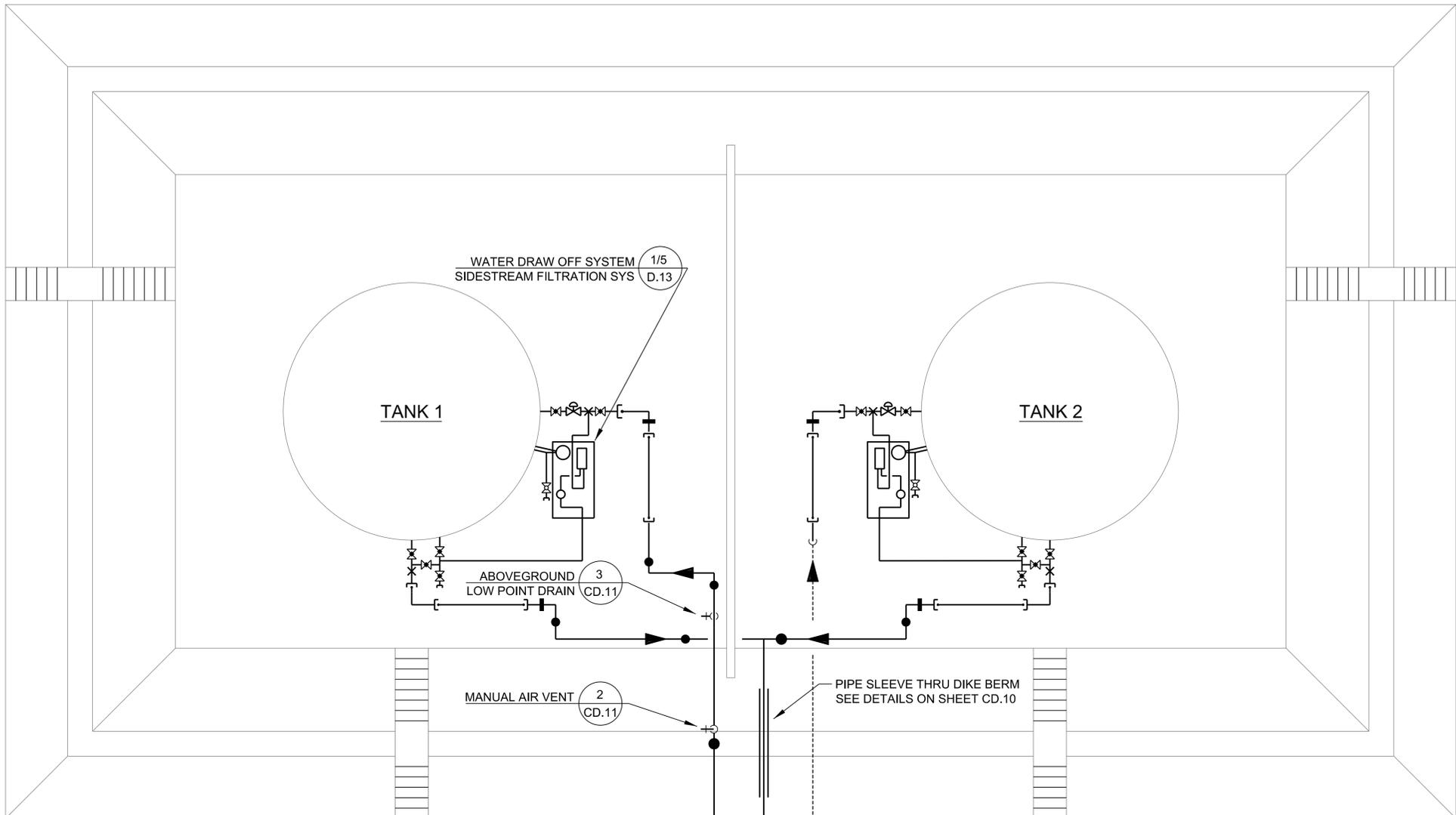


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- LEGEND:**
- ANCHOR SUPPORT SEE CD.12 AND CD.13
 - SADDLE SUPPORT SEE CD.11 AND CD.12
 - FLEXIBLE BALL JOINT SEE CD.11
 - GUIDED SUPPORT SEE CD.12 AND CD.13
 - FREE SUPPORT SEE CD.12 AND CD.13

TANK 1 FILL (RECEIPT)
 TANK WITHDRAWAL (ISSUE)
 TANK 2 FILL (RECEIPT, UNDERGROUND)

TYPICAL PIPING LAYOUT
 SCALE: 1" = 10'-0"



DESIGNER NOTES:

- LOCATION AND CONFIGURATION SHOWN FOR PIPING IS GENERAL AND IS NOT INTENDED TO LIMIT OR RESTRICT PIPING LOCATION, CONFIGURATION OR PIPE SUPPORT ARRANGEMENT.
- PIPE SUPPORT TYPES SHOWN ARE TYPICAL. IN GENERAL, WITHIN CONTAINMENT (AFTER THE FIRST SUPPORT, WHICH IS AN ANCHOR SUPPORT), USE OF AN ADJUSTABLE PIPE SADDLE SUPPORT (SEE SHEET CD.11) OR FREE SUPPORT (SEE SHEETS CD.12 & CD.13 IS COMMON. ON THE PEAK OF THE DIKE, USE OF A GUIDED SUPPORT (SEE SHEETS CD.12 & CD.13) IS COMMON. ACTUAL PIPE LAYOUT, SITE CONDITIONS, RESULTS OF PIPE STRESS ANALYSIS, AND HYDRAULIC TRANSIENT ANALYSIS SHALL DICTATE ACTUAL SUPPORT TYPES AND LOCATIONS.
- PROVIDE BALL JOINTS. BALL JOINTS MAY BE USED IN EXTREME NORTHERN CLIMATES (E.G. ALASKA) PROVIDED SUITABLE SEAL MATERIALS FOR LOW TEMPERATURES ARE SPECIFIED. A PAIR OF BALL JOINTS SHOULD BE PLACED INTO THE PIPING RUN AND SHALL BE A MINIMUM OF 8' APART. PLACE A THIRD BALL JOINT INTO THE PIPING RUN SUCH THAT LINEAR MOVEMENT FROM THE PIPING WITH THE TWO BALL JOINTS SEPARATED BY 8' IS ABSORBED. THE THIRD BALL JOINT SHOULD BE MOUNTED IN PIPING RUNNING PERPENDICULAR TO THE PIPING WITH THE TWO BALL JOINTS SEPARATED BY 8'. SEE FLEXIBLE BALL JOINT DETAIL ON SHEET CD.11.
- AT LOCATIONS EXPERIENCING FREEZING CONDITIONS, ALL DRAIN PIPING ON THE PRODUCT SAVER TANK AND FILTER SEPARATOR, IF PROVIDED, SHALL BE HEAT TRACED WITH APPROPRIATE HAZARD RATED TAPE AND INSULATED.
- LOCATE EXTERIOR PIPING SUPPORTS TO PROVIDE ADEQUATE PIPE FLEXIBILITY FOR TANK SETTLEMENT, SEISMIC DESIGN AND THERMAL EXPANSION. EXCEPT FOR THE FIRST PIPE SUPPORT OFF OF THE TANK SHELL, SPRING PIPE SUPPORTS MAY BE USED IN HIGH SEISMIC AREAS WHEN DIRECTED BY SERVICE HEADQUARTERS, SEE DETAIL ON SHEET D.13.
- ALL FUEL PIPING SHALL BE ABOVE GRADE (ONLY ISSUE PIPING IS ALLOWED TO RUN THROUGH EARTHEN DIKE WALLS). FACILITY REQUIREMENTS (FORCE PROTECTION, VANDALISM, BLAST DAMAGE, FIRE PROTECTION, ETC. MAY REQUIRE UNDERGROUND PIPING).
- PENETRATIONS THROUGH DIKE WALLS SHALL BE MADE THROUGH PIPE SLEEVES WITH BUNA-N COMPRESSION SEALS. SLEEVES SHALL BE PROVIDED WITH LEAK TESTING CAPABILITY. SEE SHEET CD.10.
- PENETRATIONS THROUGH THE FML SHALL BE MADE WITH A BOOT MADE BY THE MANUFACTURER OF THE FML FOR THAT PURPOSE AND SEALED TO THE PENETRATION SLEEVE. SEE CD.01.
- IN LOCATIONS SUBJECT TO ICE AND SNOW, ORIENT STAIRWAYS AND HIGH LEVEL PIPING TO RECEIVE WINTER SUN SO AS TO MINIMIZE ACCUMULATIONS. IF PIPING AT TANK IS NOT BELOW A STAIRWAY, PROVIDE ICE SHIELDS OVER PRODUCT PIPING AND VALVES AT TANK. ENSURE ICE SHIELDS HAVE SUFFICIENT CLEARANCE ABOVE VALVES TO ALLOW MAINTENANCE OF VALVES AND VALVE OPERATIONS OR PROVIDE MEANS TO MOVE SHIELDS OUT OF THE WAY AND PROVIDE CANOPIES OVER OTHER VALVES AND EQUIPMENT.
- WHEN THE TANK FOUNDATION IS ELEVATED, MAINTAIN ELEVATION OF PIPING IN DIKE AREA SO THAT PIPING IS SLOPED CONTINUOUSLY TO THE TANK NOZZLES AND TO ALLOW PERSONNEL TO WALK UNDER PIPING. WHEN TANK FOUNDATION IS THE NON ELEVATED TYPE (AS SHOWN) WITH A BURIED LEAK DETECTION MONITORING WELL, MAINTAIN ELEVATION OF PIPING IN DIKE AREA SO THAT PIPING IS SLOPED CONTINUOUSLY TO THE TANK NOZZLES AND PERSONNEL MAY STEP MORE EASILY OVER PIPING. WHEN THIS REQUIRES PIPING TO PENETRATE THE DIKE BERM, PENETRATIONS SHALL BE CONSTRUCTED PER NOTE 7.
- PIPING DESIGN SHALL ADDRESS SEISMIC. THE FIRST PIPE SUPPORT OF THE TANK SHALL BE AN ANCHOR WITH THE CONCRETE PIER TIED TO THE RINGWALL.

NO.	DATE	DESCRIPTION	BY	CHK	APPR



APPROVED	A/E INFO
FOR COMMANDER NAVFAC	
ACTIVITY	
SATISFACTORY TO	
DES CCH	DRW CCH
CHK CRM	
SUBMITTED BY:	
DATE: APRIL 2015	

NAVAL FACILITIES ENGINEERING COMMAND - ATLANTIC
 DOD STANDARD DESIGN AW78-24-27
FUEL TANKS WITH FIXED ROOFS ABOVEGROUND VERTICAL STEEL
 TYPICAL PIPING LAYOUT

SCALE: AS NOTED
PROJECT NO.: XXXXX
CONSTR. CONTR. NO. XXXXX
NAVFAC DRAWING NO. XXXXX
SHEET 10 OF 57

C.05