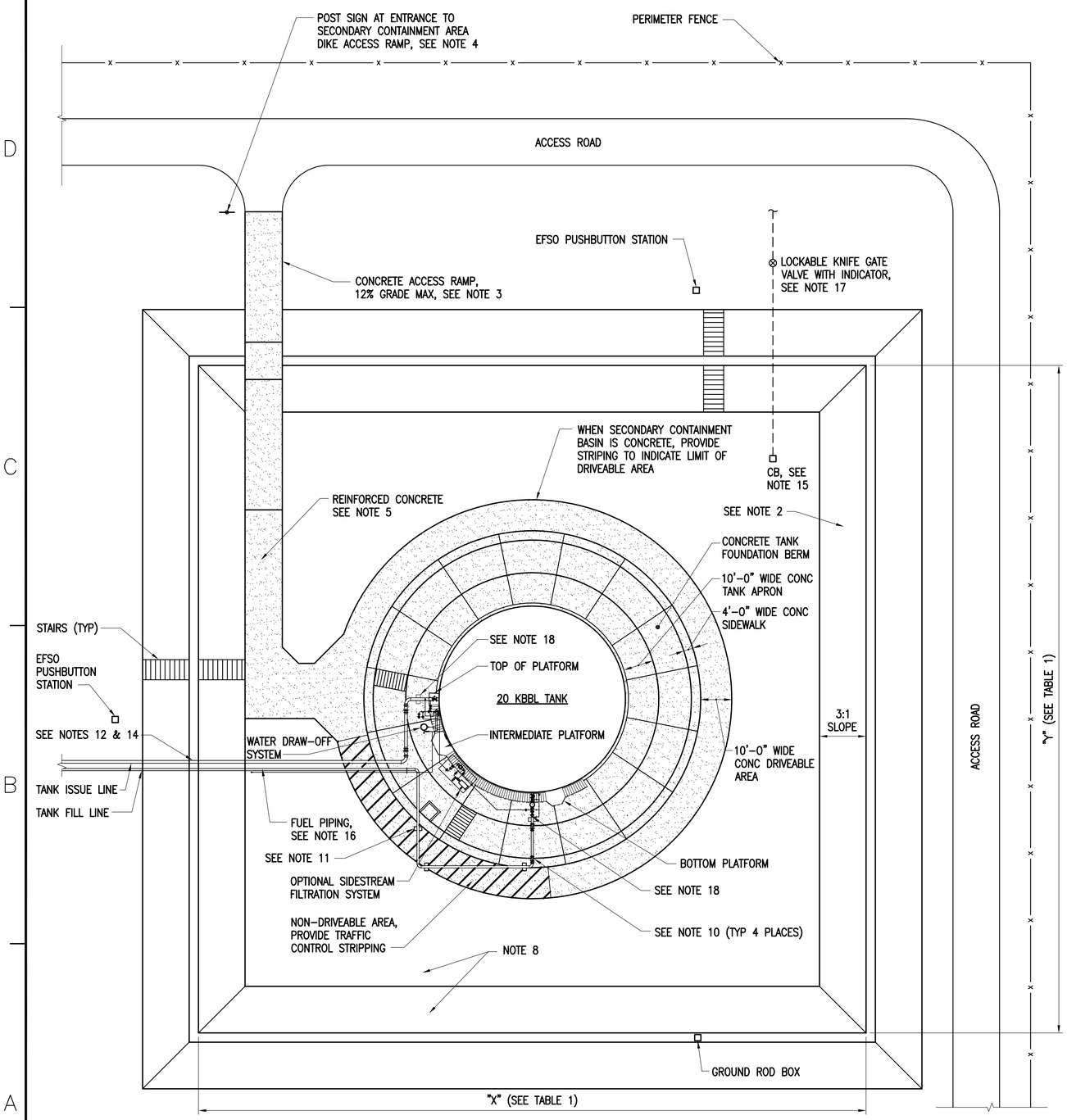

PLAN NORTH

TYPICAL SITE PLAN

SCALE: 1"=20'-0"

NOTES:

1. SITE PLAN SHOWN IS A TYPICAL 20,000 BBL TANK WITH AN ELEVATED TANK FOUNDATION AND IS PROVIDED FOR GENERAL PLANNING PURPOSES ONLY. DIMENSIONS SHOWN IN TABLE 1 ARE FOR PLANNING PURPOSES ONLY AND ARE INTENDED TO INDICATE THE AMOUNT OF AREA REQUIRED FOR SECONDARY CONTAINMENT IN GENERAL.
2. FOR PLANNING PURPOSES, THE SECONDARY CONTAINMENT AREA SIZE SHOWN HERE IS BASED UPON A 5'-0" HIGH TRAPEZOIDAL DIKE BERM INCLUDING 1'-0" OF FREEBOARD. THE DIKE HEIGHT SHOWN HERE IS NOT STANDARD BUT ONLY AN ASSUMED DIKE HEIGHT TO ALLOW FLEXIBILITY IN PLANNING. FOR DESIGN, DIKES MAY BE TALLER BUT ARE NOT PERMITTED TO BE TALLER THAN 6'-0" OR SLOPED STEEPER THAN 3 TO 1. VERTICAL CONCRETE DIKE WALLS ARE AN ACCEPTABLE ALTERNATIVE WHEN THERE IS NOT ENOUGH LAND AVAILABLE FOR TRAPEZOIDAL BERMS. SECONDARY CONTAINMENT AREA DESIGN SHALL COMPLY WITH UFC 3-460-01, 29 CFR 1910.106, AND LOCAL REGULATIONS.
3. CONCRETE ACCESS RAMP IS OPTIONAL IN DIKE AREAS OF 20,000 BBL TANKS OR GREATER, BUT IS NOT PERMITTED FOR SMALLER TANKS. VEHICLE ACCESS TO THE INTERIOR OF THE SECONDARY CONTAINMENT SHOULD BE STRICTLY CONTROLLED.
4. PROVIDE SIGN AT ENTRANCE TO DIKE AREA RAMP TO READ AS FOLLOWS: "ACCESS IS RESTRICTED TO AUTHORIZED VEHICLES NOT HEAVIER THAN A 1-TON PICKUP TRUCK AND RATED FOR USE IN CLASS 1, DIVISION 2 HAZARDOUS LOCATIONS".
5. DESIGN DIKE ACCESS AND BASIN/FLOOR TO WITHSTAND THE VEHICLE TRAFFIC INDICATED ABOVE.
6. LOCATION AND CONFIGURATION SHOWN FOR PIPING IS GENERAL AND IS NOT INTENDED TO LIMIT OR RESTRICT PIPING LOCATION, CONFIGURATION, OR PIPE SUPPORT ARRANGEMENT.
7. PROVIDE LIGHTING AND ACCESS TO LIGHTING IN ACCORDANCE WITH REFERENCED CRITERIA.
8. DIKE SECONDARY CONTAINMENT SHALL BE A FLEXIBLE MEMBRANE LINER. REINFORCE ANY CONCRETE PLACED OVER THE LINER WITH SYNTHETIC FIBER. LOCATE CONCRETE CONTROL JOINTS NO GREATER THAN 10 FEET APART AND SEAL THE JOINTS USING JET FUEL RESISTANT JOINT SEALANT (NON-SAG ON THE SLOPES).
9. PROVIDE FIRE HYDRANTS IN ACCORDANCE WITH APPLICABLE CODES AND REFERENCED CRITERIA.
10. PROVIDE BALL JOINTS. BALL JOINTS MAY BE USED IN EXTREME NORTHERN CLIMATES (E.G. ALASKA) PROVIDED SUITABLE SEAL MATERIALS FOR LOW TEMPERATURES ARE SPECIFIED. DISTANCE BETWEEN BALL JOINTS SHALL BE BASED ON ESTIMATED TANK SETTLEMENT.
11. LOCATE EXTERIOR PIPE 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 C3/D.13.
12. ALL FUEL PIPING SHALL BE ABOVE GRADE (EXCEPT PIPING SHALL NOT RUN UP AND OVER DIKE WALLS). PENETRATIONS THROUGH DIKE WALLS SHALL BE MADE THROUGH PIPE SLEEVES WITH BUNA-N COMPRESSION SEALS. FACILITY REQUIREMENTS (FORCE PROTECTION, VANDALISM, BLAST DAMAGE, FIRE PROTECTION, ETC.) MAY REQUIRE UNDERGROUND PIPING.
13. 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 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 OPERATORS OR PROVIDE MEANS TO MOVE SHIELDS OUT OF THE WAY AND PROVIDE CANOPIES OVER OTHER VALVES AND EQUIPMENT.
14. DIKE PENETRATIONS THROUGH BERMS SHALL BE MADE THROUGH PIPE SLEEVES WITH BUNA-N COMPRESSION SEALS. SLEEVES SHALL BE PROVIDED WITH LEAK TESTING CAPABILITY. 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.
15. SLOPE DIKE BASIN TO CATCH BASIN DROP INLETS AT A SLOPE OF 1% AND ADJUST THE NUMBER OF DROP INLETS SO AS TO AVOID EXCESSIVE LOSS OF SECONDARY CONTAINMENT VOLUME THAT MAY RESULT FROM BASIN ELEVATION DIFFERENTIALS OF MORE THAN ONE FOOT. NUMBER AND LOCATION OF CATCH BASIN IS DIAGRAMMATIC ONLY AND SHALL BE LOCATED BY THE DESIGNER.
16. WHEN THE TANK FOUNDATION IS ELEVATED AS SHOWN AT LEFT, 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 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 14.
17. DO NOT USE BURIED KNIFE GATE VALVES IN CLIMATES WITH LOWEST ONE-DAY MEAN TEMPERATURE BELOW -15°F PER API STANDARD 650 FIGURE 4-2. PROVIDE MEANS TO CONTROL DRAINAGE THAT WILL NOT NORMALLY REMAIN FROZEN AFTER THAW OF SECONDARY CONTAINMENT CONTENTS. CONTAINMENT DRAIN VALVE OR OTHER CONTROL MEANS, WHEN PROVIDED, SHALL BE LOCKABLE.
18. PIPING DESIGN SHALL ADDRESS SEISMIC. THE FIRST PIPE SUPPORT OF THE TANK SHALL BE AN ANCHOR WITH THE CONCRETE PIER TIED TO THE RINGWALL.
19. 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.

TABLE 1

NOMINAL TANK SIZE (KBBL)*	NOMINAL DIAMETER (FT)	NOMINAL SHELL HEIGHT (FT)*	FLOWRATE FILL/ISSUE (GPM)	NOZZLE SIZE FILL/ISSUE (INCHES)	SHELL VOLUME (KBBL)***	USABLE VOLUME (KBBL)	LLLA VOLUME (BBL)**	SECONDARY CONTAINMENT DIMENSIONS	
								"X" (FT)	"Y" (FT)
5	39	32	1200/1200	8"/12"	6.8	5.0	625	130	130
10	49	40	1200/3000	8"/16"	13.4	10.0	1175	170	170
20	61	48	1200/3000	8"/16"	25.0	20.0	1825	220	220
30	73	48	1200/3000	8"/16"	35.8	28.9	2675	255	255
40	89	48	7000/7000	18"/24"	53.2	41.1	5300	305	305
50	90	56	7000/7000	18"/24"	63.5	50.6	5425	330	330
80	113	56	7000/7000	18"/24"	100.1	80.1	8825	405	405
100	126	56	7000/7000	18"/24"	124.5	100.1	11150	450	450

* NOMINAL TANK SIZE = APPROXIMATE USABLE VOLUME = VOLUME FROM LLA TO HLA.
** APPROXIMATE VOLUME BETWEEN SUMP AND LLLA.
*** SHELL VOLUME = VOLUME INSIDE ALL OF THE SHELL

GRAPHIC SCALE(S):
1"=20' 0' 20' 40' 60'

SYM	DESCRIPTION	DATE	APPR

NAVFAC

SEAL

Brockenbrough
ENGINEERING . CONSULTING
1211 Boulder Springs Drive, Suite 200 | Richmond, Virginia 23225
804.592.3900 main | 804.592.3901 fax
www.brockenbrough.com

A/E INFO

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY
XXXXX

SATISFACTORY TO DATE DD/MM/YY
DES MSO DRW MHK CHK WVB
<<PM/DM>> XXXX
BRANCH MANAGER XX
CHIEF ENG/ARCH XXX
DATE OCTOBER 2011

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
LANT CAPITAL IMPROVEMENTS
NAVAL FACILITIES ENGINEERING COMMAND ~ ATLANTIC
NORFOLK, VIRGINIA

DOD STANDARD DESIGN AW 78-24-27
ABOVEGROUND VERTICAL STEEL FUEL TANKS WITH FIXED ROOFS

TYPICAL SITE PLAN & NOTES

SCALE: AS NOTED
EPROJECT NO.:
CONSTR. CONTR. NO.
NAVFAC DRAWING NO.
SHEET 7 OF 38

G.07

DRAWFORM REVISION: 10 MARCH 2009

FILE NAME: G:\10 Jobs\10-042 Re-start Update AST Standard\CAD\G\G.07 TYPICAL SITE PLAN & NOTES.dwg LAYOUT NAME: G.07 TYPICAL SITE PLAN & NOTES PLOTTED: Thursday, October 06, 2011 - 2:37pm USER: Guest