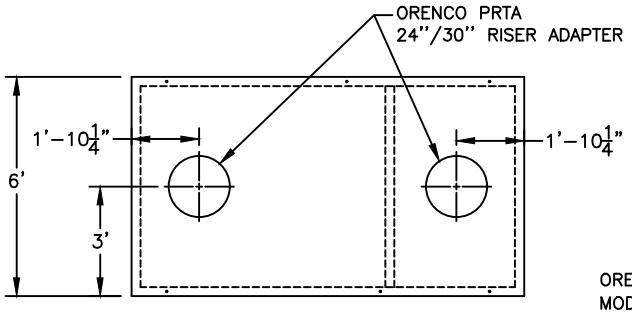
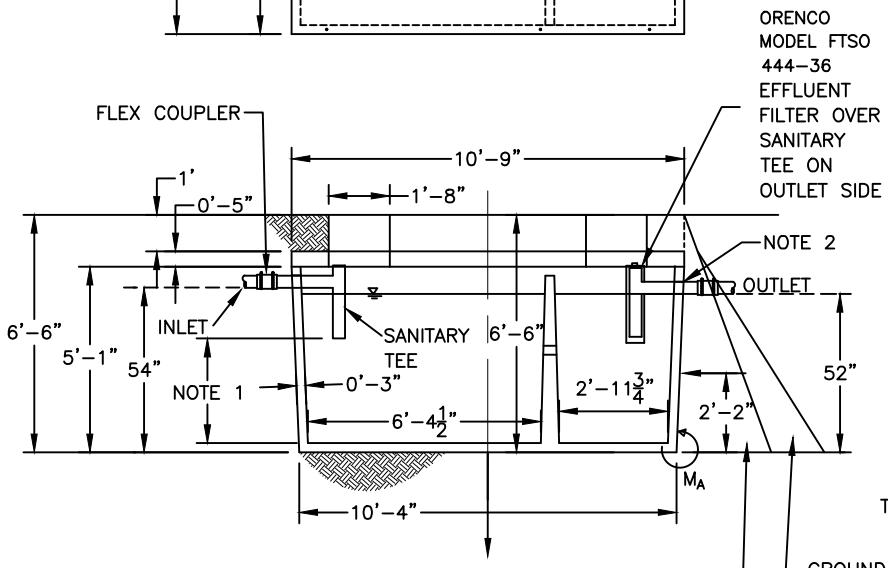
POPE ENGINEERING

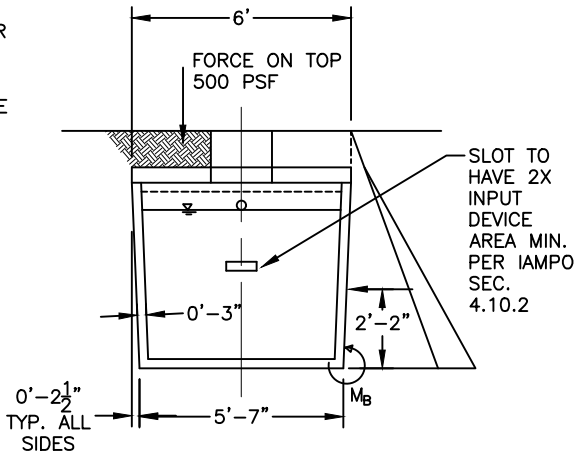
CIVIL ENGINEERING - LAND SURVEYING

R.C.E. 65228 – P.L.S. 8903

1500 GAL. SEPTIC TANK SKETCH







EMPTY WEIGHT OF TANK = 13,478.0 LB
FULL WEIGHT OF TANK = 26,614.4 LB

GROUND WATER FORCE
1/2*H^2*DENSITY WATER
=1/2*5.5^2*62.4 LB/CF = 943.8 LB/FT OF WALL WIDTH (NOTE THIS IS INCLUDED IN THE SOIL DENSITY BECAUSE SATURATED SOIL WAS USED)

BUOYANCY FORCE
= 342.4 * 62.4
= 21365.7 LB
(ASSUMES WATER TABLE AT TOP OF TANK)

SOIL FORCE
1/2*H^2*DENSITY OF SOIL
=1/2*6.5^2*150 LB/CF = 3168.8 LB/FT OF WALL WIDTH

NOTES
1. INLET TO INLET AND OUTLET TEE TO BE 24.5" TO 36.75" FROM TANK BOTTOM
2. PRESS–SEAL 4" CAST–A–SEAL COUPLER. ALL SEALS BETWEEN PIPE AND TANK MUST MEET ASTM C1644

MOMENT FORCE ON TOP

2134.2 LB–FT/FT AS DETERMINED BY AUTODESK ROBOT STRUCTURAL ANALYSIS PROGRAM

OUTER FORCE ON WALL FROM SOIL LOAD IS:
M_A = 1157.5 LB–FT/FT (END WALL) AS DETERMINED BY AUTODESK ROBOT STRUCTURAL ANALYSIS PROGRAM

M_B (SHORT TANK COMPARTMENT) = 390.3 LB–FT/FT AS DETERMINED BY AUTODESK ROBOT STRUCTURAL ANALYSIS PROGRAM

M_B (LONG TANK COMPARTMENT) 1157.5 LB–FT/FT

INNER FORCE ON WALL FROM SEWAGE LOAD IS:

END WALLS = 1/2*(4.083 FT)^2 * 62.4 PCF * 5.28 FT = 2746.3 LB
MOMENT = 362.3 LB–FT/FT

SIDE WALL LARGE COMPARTMENT = 1/2*(4.083 FT)^2 * 62.4 PCF * 6.5 FT = 3380.9 LB
MOMENT = 362.3 LB–FT/FT

SIDE WALL SMALL COMPARTMENT = 1/2*(4.083 FT)^2 * 62.4 PCF * 3.13 FT = 1628.0 LB
MOMENT = 123.9 LB–FT/FT

TANK AIR SPACE = 41.2 CF

WORKING LIQUID VOLUME = 1500 GAL. = 200.5 CF