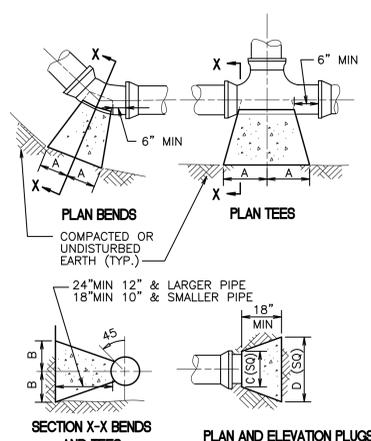
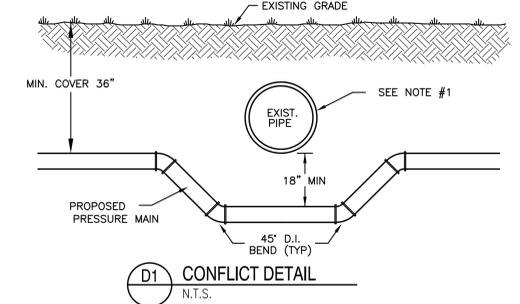
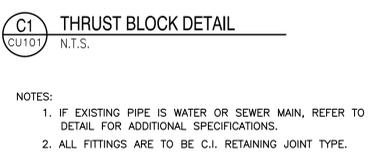


three inches = one foot  
 one and one half inches = one foot  
 one inch = one foot  
 one half inch = one foot  
 three quarters inch = one foot  
 one quarter inch = one foot  
 three eighths inch = one foot  
 one eighth inch = one foot  
 one quarter inch = one foot  
 one eighth inch = one foot



SIZE	1/4 BENDS		1/8 BENDS		1/6 BENDS		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"



SANITARY SEWER LINES (GRAVITY OR PRESSURE) SHALL HAVE 18" OR GREATER VERTICAL CLEARANCE BELOW ANY POTABLE WATER LINE WHEN CROSSING. A MINIMUM OF 6" VERTICAL CLEARANCE IS REQUIRED FOR OTHER UTILITIES. HORIZONTAL CLEARANCE BETWEEN SANITARY SEWER LINE THAT IS PARALLEL TO AND LESS THAN 18" BELOW A POTABLE WATER LINE SHALL BE 10' OR GREATER. A MINIMUM OF 30" IS REQUIRED FOR OTHER UTILITIES.

IF THIS IS NOT POSSIBLE OR PRACTICAL, SEE BELOW:

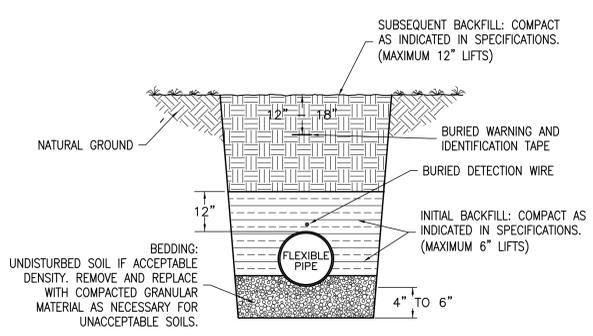
FOR CROSSING: ENCASE AS ABOVE SO THAT THE ENDS OF ENCASEMENT ARE AT LEAST 12" FROM ANY WATER LINE JOINT. WATER LINE JOINT MUST NOT BE CLOSER THAN 5' TO THE POINT OF CROSSING, OR IT MUST ALSO BE ENCASED.

ALTERNATE 1: USE EQUALLY (OR HIGHER) RATED PRESSURE PIPE FOR SEWER WITH NO JOINTS CLOSER THAN 12" APART AND 6" VERTICAL.

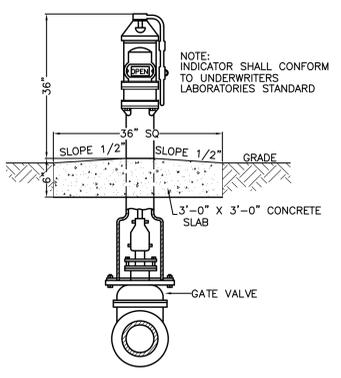
ALTERNATE 2: PLACE SEWER LINE INTO STEEL CASING AND CENTER 20" PIECE WITH 4" VERTICAL CLEARANCE AND SEAL ENDS.

FOR PARALLEL: AND 6' TO 10' APART USE ALTERNATE 2, BUT IF MORE THAN 40' IN LENGTH, ALTERNATE 1 MUST BE USED AND JOINTS ARE TO BE STAGGERED. IF LINES MUST BE 3' TO 6' APART, ALTERNATE 1 MUST BE USED WITH A HIGHER RATED PRESSURE PIPE FOR SEWER (i.e., WATER LINE IS DR25 THEN USE DR18 OR 21 FOR SEWER).

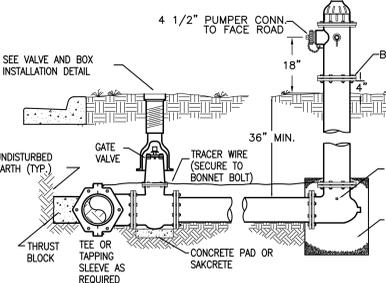
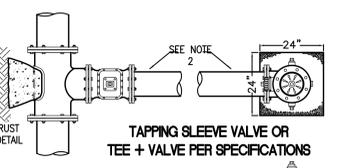
F1 SEWER-WATER SEPARATION & CLEARANCES DETAIL  
 N.T.S.



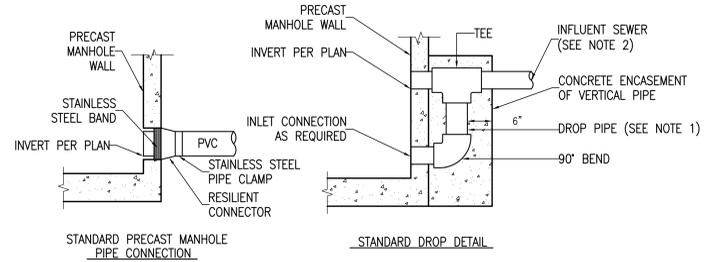
A3 FLEXIBLE PIPE BEDDING DETAIL  
 N.T.S.



C3 POST INDICATOR VALVE DETAIL  
 N.T.S.

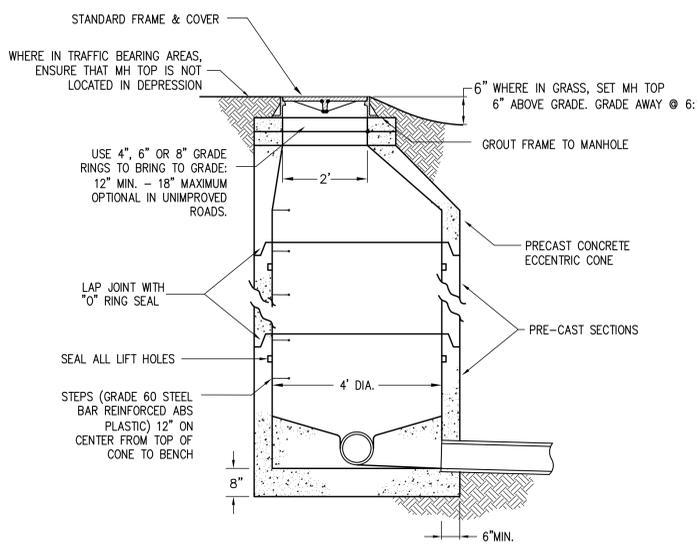


E3 TYPICAL FIRE HYDRANT INSTALLATION DETAIL  
 N.T.S.



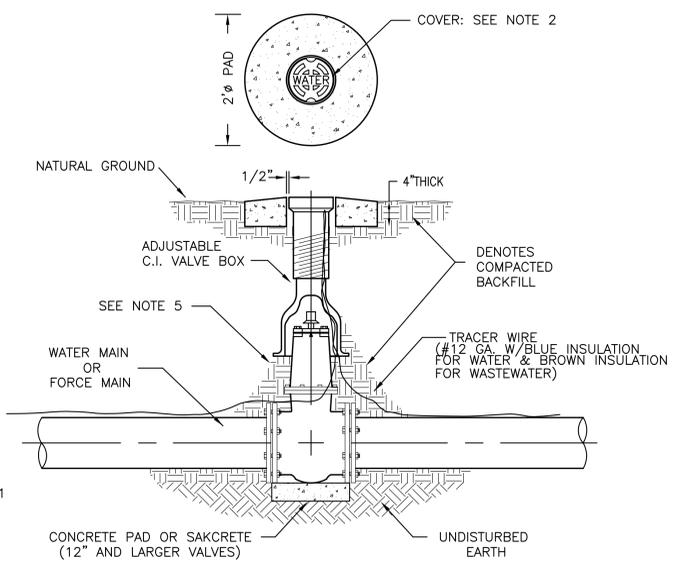
NOTES:  
 1. DROP PIPE AND FITTINGS SHALL BE OF EQUAL SIZE AND MATERIAL AS THE INFLUENT SEWER.  
 2. AN OUTSIDE DROP CONNECTION SHALL BE REQUIRED FOR ALL INFLUENT WHICH HAVE AN INVERT 2' OR MORE ABOVE THE MANHOLE INVERT.

A6 SANITARY SEWER MANHOLE CONNECTIONS DETAIL  
 N.T.S.

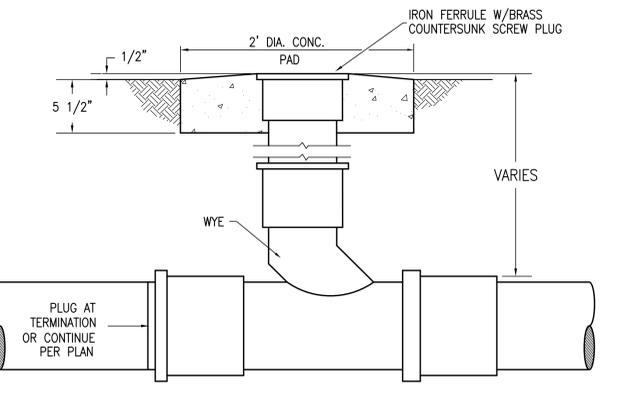


NOTES:  
 1. ALL SANITARY SEWER MANHOLES FOR THIS PROJECT SHALL BE 4' INSIDE DIAMETER.  
 2. MANHOLE SHALL CONFORM TO A.S.T.M. C 478 SPECIFICATIONS.  
 3. DIAMETER OF OPENING FOR PIPE SHALL BE 1" LARGER DIAMETER THAN BELL OF THE PIPE BEING USED.  
 4. JOINTING COMPOUND SHALL BE RAM NECK, TYPE 1, ROPE FORM PLASTIC GASKET OR EQUAL.  
 5. ALL PATCHING TO BE DONE WITH HYDRAULIC CEMENT. NO MORTAR REPAIRS PERMITTED.  
 6. CONCRETE TO BE 2500 P.S.I., REINFORCING STEEL TO BE A.S.T.M. A 615 GRADE 60.  
 7. SEAL WITH A-LOK, KORE-N-SEAL OR LOCK-JOINT PER SPECIFICATIONS.  
 8. CAST IN PLACE MANHOLE MAY BE ALLOWED IN PRE-APPROVED LOCATIONS.  
 9. ALL NEW LINE TIE-INS SHALL BE CORE-DRILLED WITH RUBBER BOOT ADDED.  
 10. BITUMASTIC COATING SHALL BE FACTORY APPLIED.  
 11. FRAME AND COVER SHALL BE VULCAN 1337-2 (ASTM SPEC. A-48, CLASS 30 CAST IRON) OR APPROVED EQUAL. REFER TO SPECIFICATIONS.  
 12. ALL MANHOLE TOPS SHALL BE ADJUSTED TO WITHIN 0.1' OF FINISH GRADE.

E6 SANITARY SEWER MANHOLE DETAIL  
 N.T.S.



C8 TYPICAL VALVE & BOX INSTALLATION (WITHIN PROPERTY) DETAIL  
 N.T.S.



E8 CLEAN-OUT DETAIL  
 N.T.S.

NOTES:  
 1. VALVE BOX AND BOOT SHALL BE CAST IRON.  
 2. VALVE COVER SHALL BE MARKED "WATER" OR "SEWER" AS APPLICABLE.  
 3. VALVE BOX TOP SHALL BE FLUSH WITH FINISHED GRADE OR 1/2" ABOVE NATURAL GROUND LEVEL.  
 4. GATE VALVE SHALL BE RESILIENT SEAT WITH MECHANICAL JOINT ENDS OR APPROVED EQUAL.  
 5. EARTH UNDER FLANGE OF VALVE BOX & COLLAR TO BE FIRM AND WELL TAMPED TO ENSURE AGAINST VALVE BOX SETTLING.

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Approved Project Director		Location <b>PANAMA CITY, FLORIDA</b>		Drawing Number <b>CU501</b>		Date <b>MARCH 2012</b>		Checked <b>KCH</b>		Drawn <b>LFR</b>		Dwg 13 of 21			

FINAL SUBMISSION