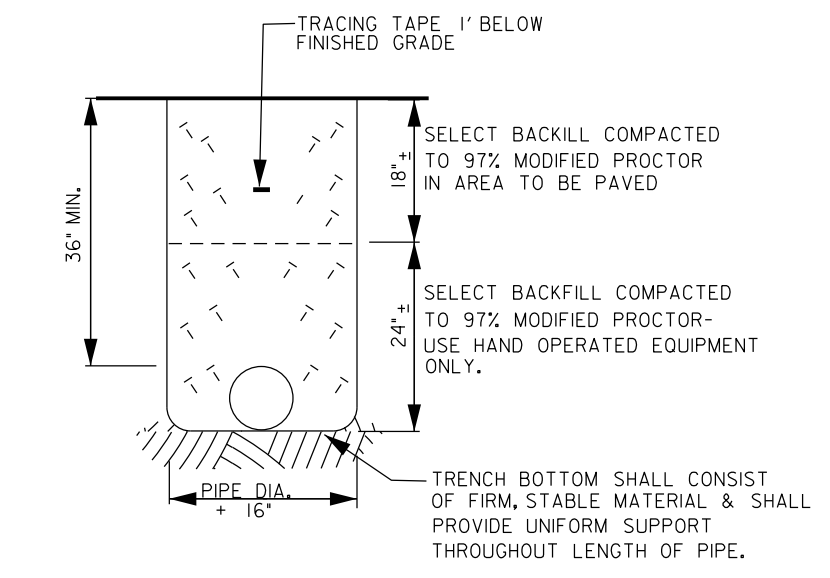


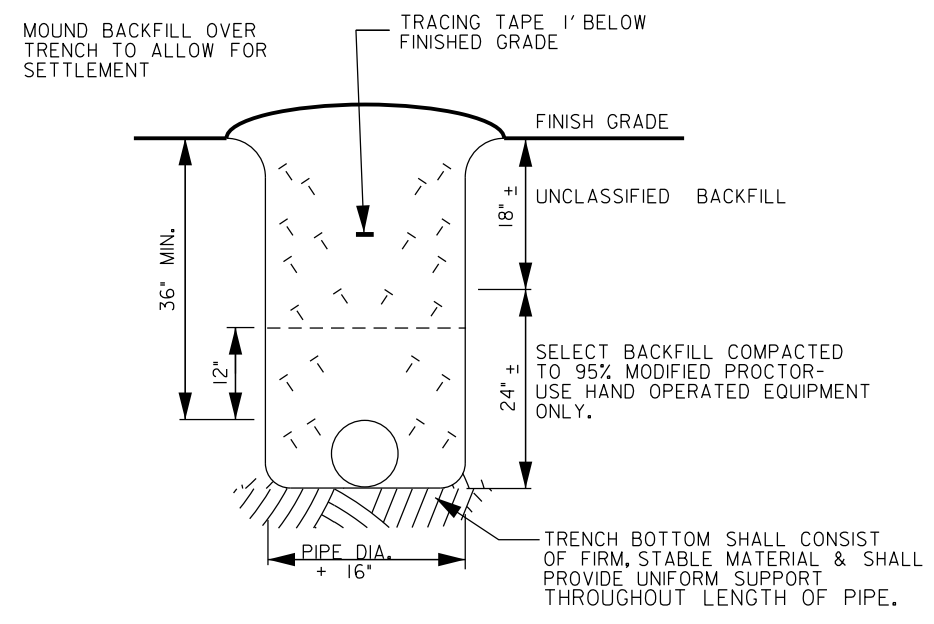


**UTILITY CONSTRUCTION**

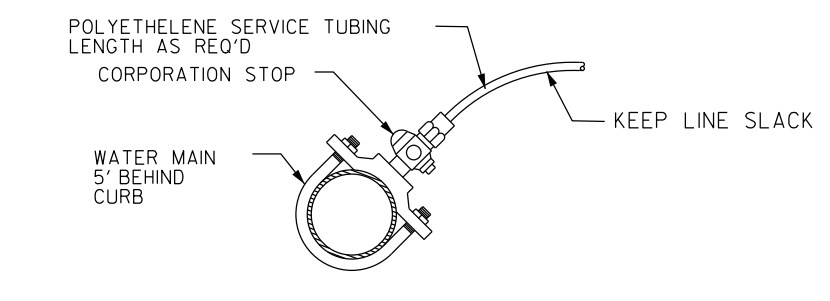
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**1**  
**WATER PIPE TRENCH DETAIL**  
(FOR AREA TO BE PAVED)  
**UC-3a**



**2**  
**WATER PIPE TRENCH DETAIL**  
(OUTSIDE OF PAVED AREAS)  
**UC-3a**

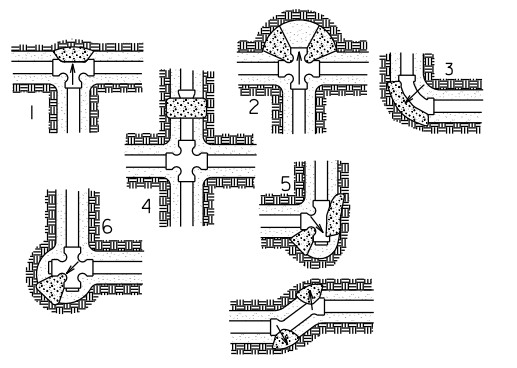


**3**  
**TYPICAL 1" WATER SERVICE**  
**UC-3a**

NOTES:  
 1. SERVICE SADDLES SHALL BE USED ON ALL WATER LINES 4" AND SMALLER IN DIAMETER.  
 2. SERVICE SADDLES SHALL ALSO BE USED ON 6" AND LARGER PVC WATER MAINS WHICH DO NOT MEET THE REQUIREMENTS OF AWWA C-900 CLASS 150.  
 3. MINIMUM COVER OVER SERVICE LINES SHALL BE 24"

RESULTANT THRUST AT FITTING AT 150 PSI WATER PRESSURE

NOM. PIPE DIA.	DEAD END	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4"	2,700	3,800	2,100	1,100	530
6"	5,600	8,000	4,300	2,200	1,100
8"	9,700	13,600	7,400	3,800	1,900
10"	14,500	20,500	11,100	5,700	2,900
12"	20,500	29,000	15,700	8,000	4,000
14"	27,600	39,000	21,100	11,000	5,400
16"	35,700	50,400	27,300	14,000	7,000
18"	44,800	63,400	34,400	17,500	8,800
20"	55,000	77,600	42,100	21,500	10,800
24"	78,500	111,000	60,200	31,600	15,400
30"	120,600	170,600	92,300	47,100	23,600
36"	172,800	244,400	132,300	67,500	33,900
42"	233,300	330,200	178,600	91,200	46,700
48"	304,000	430,000	232,700	118,600	59,600
54"	384,100	543,200	294,000	149,000	75,300



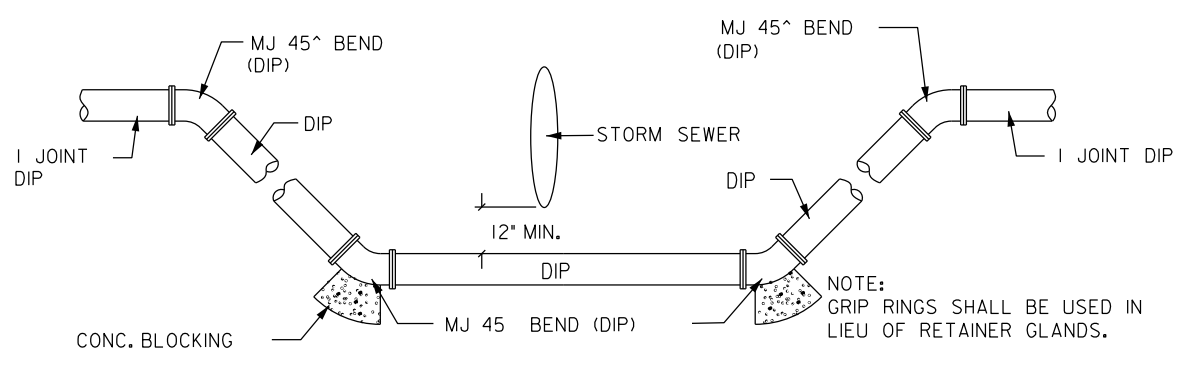
BEARING LOAD (LB/SQ.FT.)

SOIL	BEARING LOAD (LB/SQ.FT.)
MUCK	0
SOFT CLAY	1,000
SILT	1,500
SANDY SILT	3,000
SAND	4,000
SANDY CLAY	6,000
HARD CLAY	9,000

TO DETERMINE THE SIZE OF A CONCRETE THRUST BLOCK, DIVIDE THE TOTAL FORCE BY THE BEARING VALUES OF THE SOIL. THE QUOTIENT WILL BE THE SIZE OF THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET. APPROXIMATE VALUES FOR VARIOUS TYPES OF SOIL ARE LISTED IN TABLE.

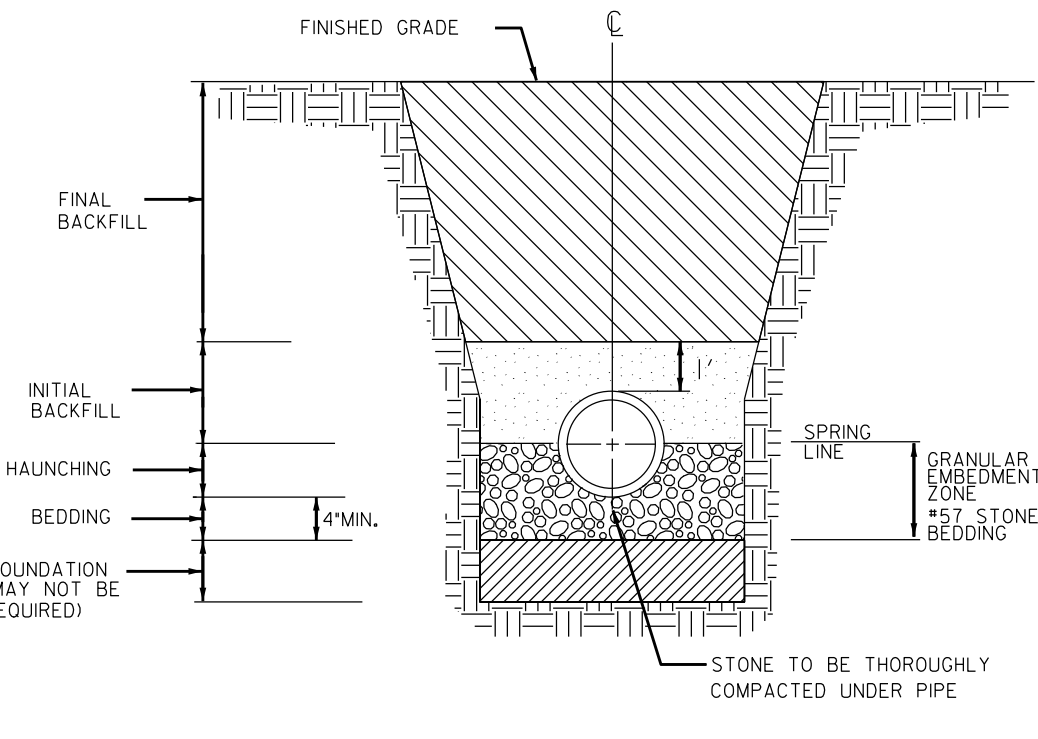
NO RESPONSIBILITY CAN BE ASSUMED FOR THE ACCURACY OF THE DATA IN THIS TABLE DUE TO THE WIDE VARIATION OF BEARING LOAD CAPABILITIES FOR EACH SOIL TYPE.

**4**  
**THRUST BLOCKING DETAIL**  
**UC-3a**

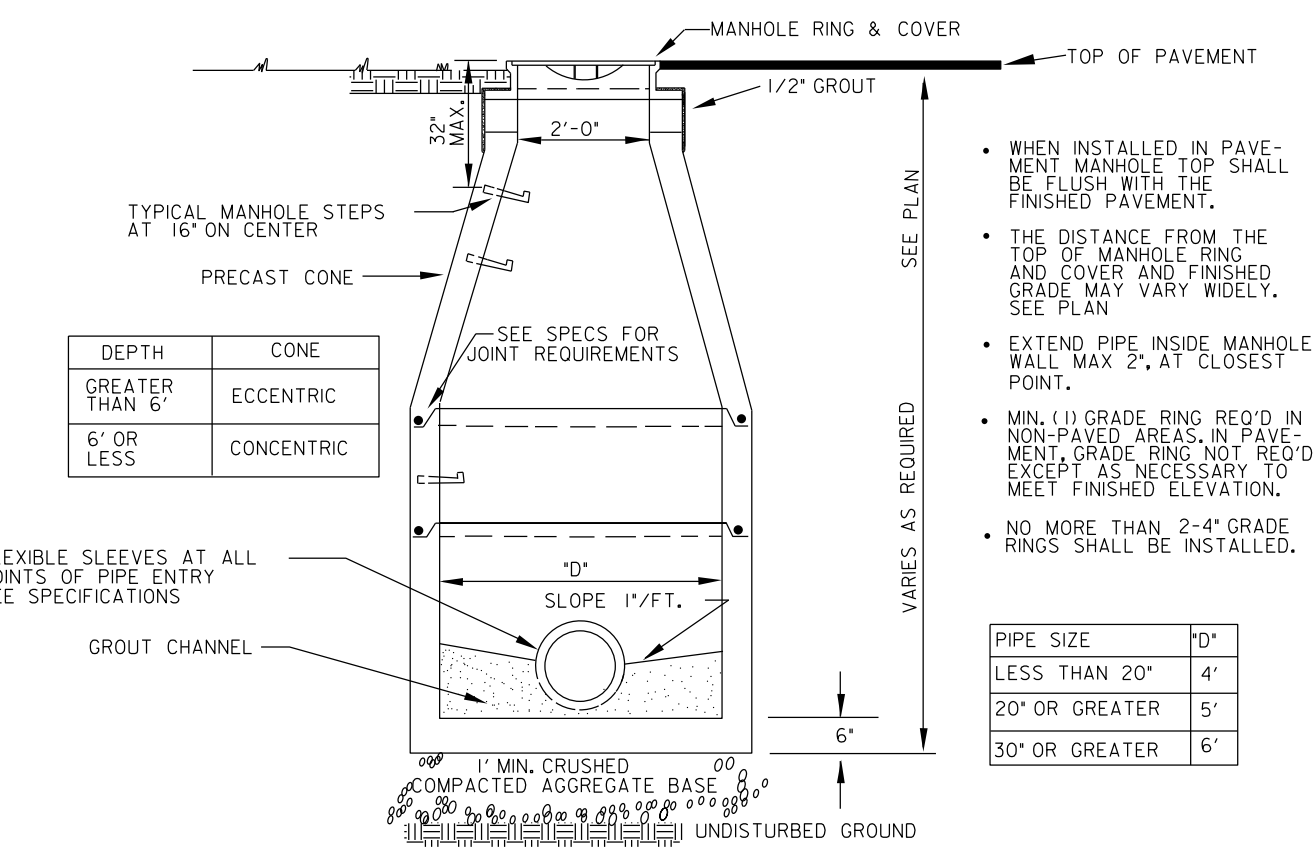


**5**  
**WATER MAIN & STORM SEWER CROSSING DETAIL**  
**UC-3a**

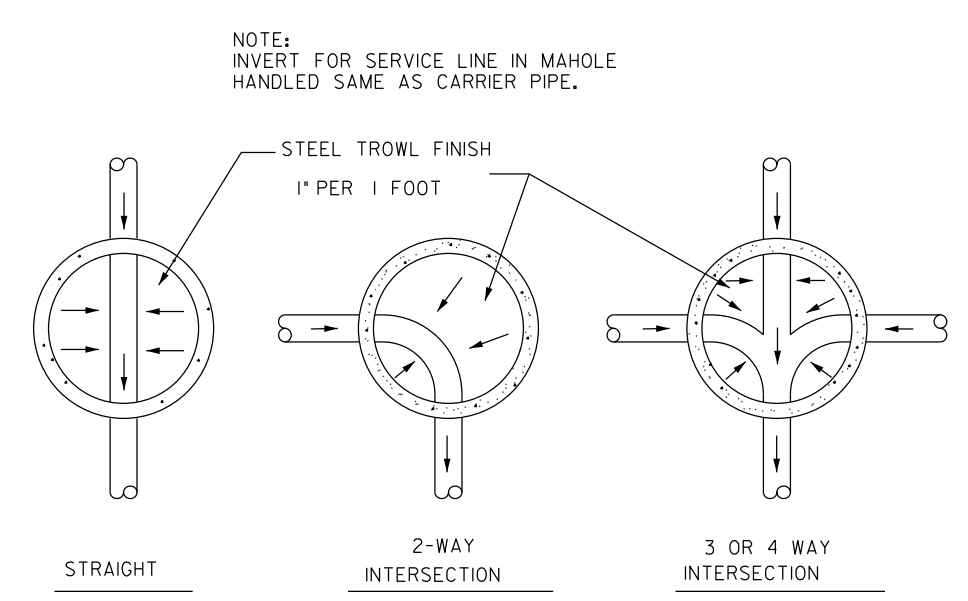
NOTE:  
 1. PIPE LENGTHS SHALL BE AS REQUIRED TO CONSTRUCT CROSSING. ALL INTERNAL JOINTS TO BE RESTRICTED.



**6**  
**DIP PIPE**  
**UC-3a**

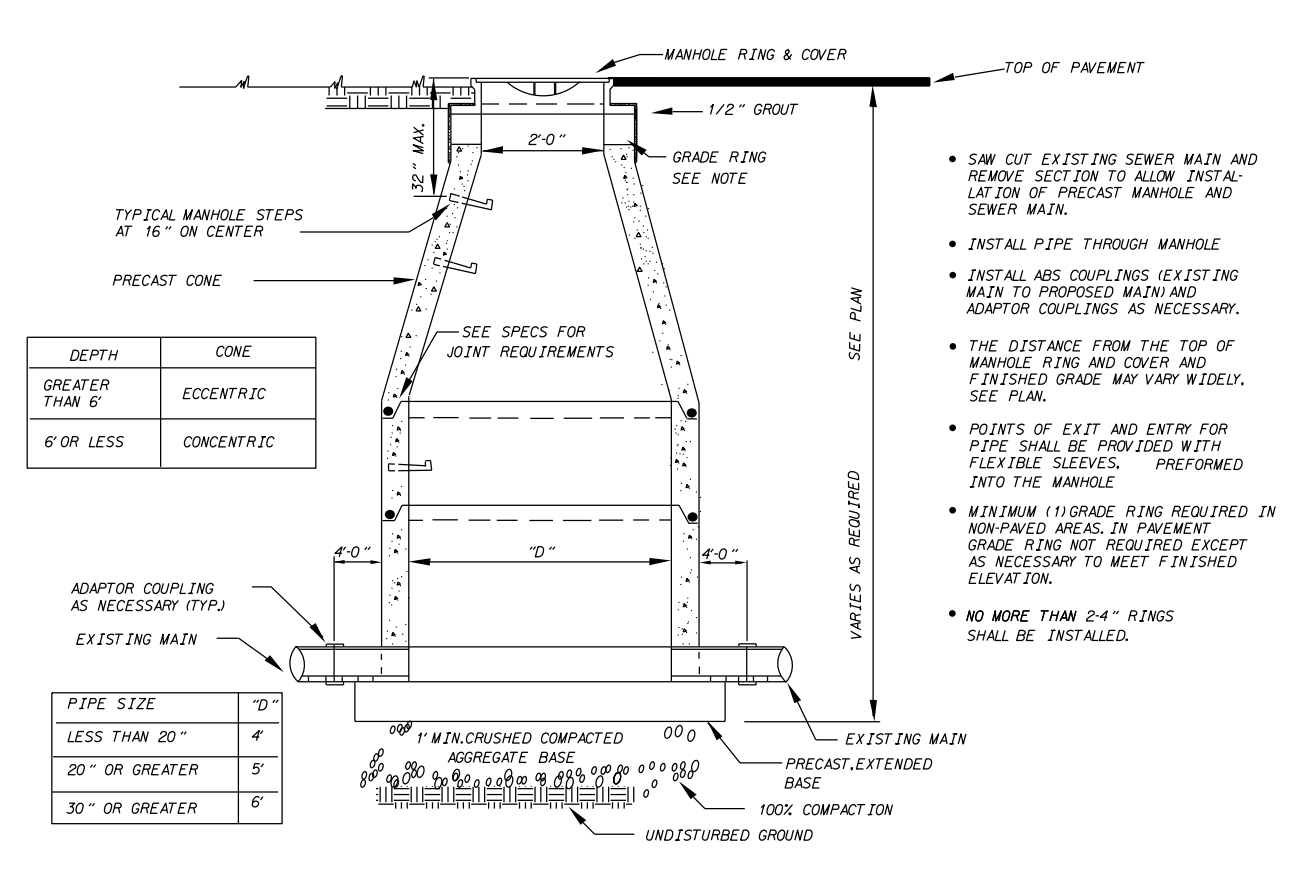


**7**  
**TYPICAL MANHOLE DETAIL**  
MANHOLES LESS THAN 12' IN DEPTH  
**UC-3a**

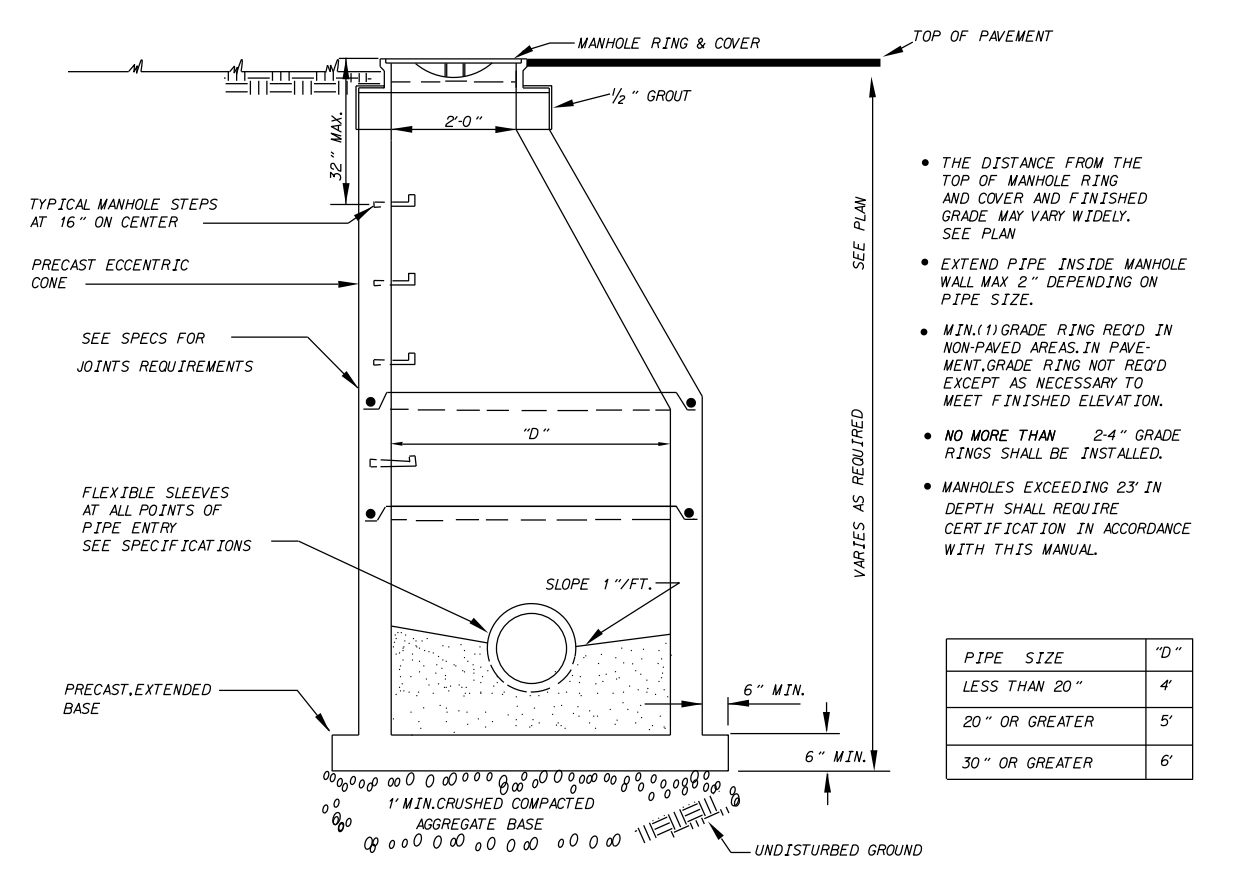


**8**  
**MANHOLE INVERT DETAIL**  
**UC-3a**

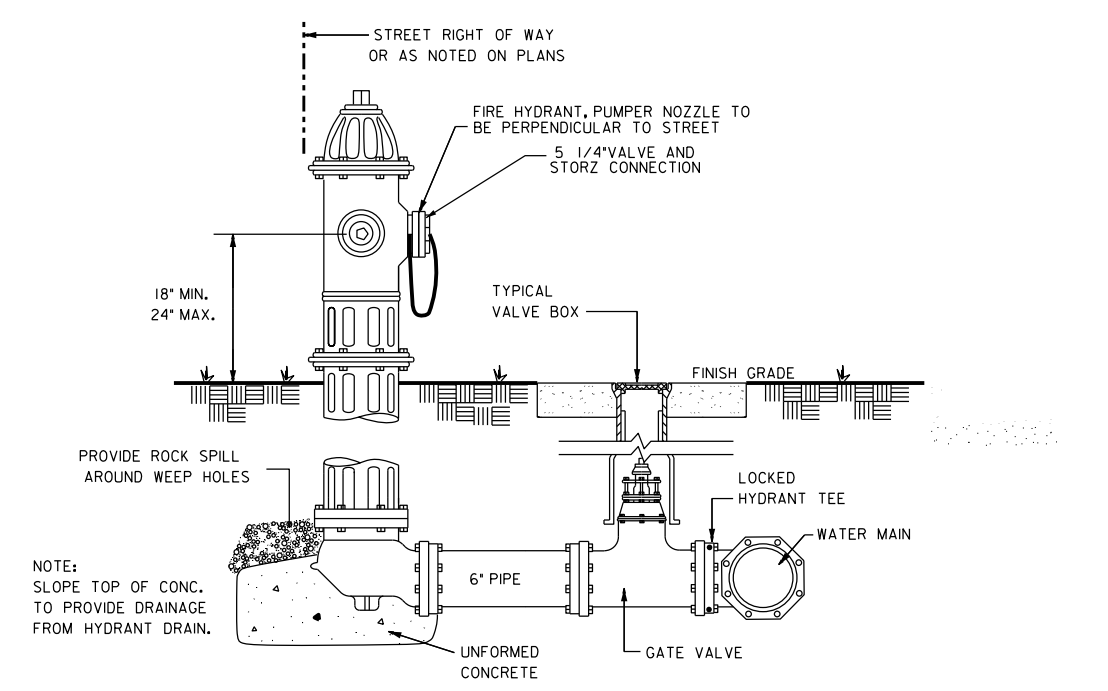
NOTE:  
 ACCURATELY SHAPE THE INVERTS TO A SMOOTH SEMI-CIRCLE CONFORMING TO THE INSIDE CONTOUR OF THE ADJACENT SEWER SECTIONS. ALL ENTERING BRANCHES AND CHANGES IN DIRECTIONS SHALL BE FORMED BY A CIRCULAR CURVE IN THE INVERT OF AS LARGE A RADIUS AS THE SIZE OF MANHOLE WILL PERMIT. CHANGES IN SIZE AND GRADE OF THE CHANNELS SHALL BE MADE GRADUALLY AND EVENLY. THE INVERT CHANNELS SHALL BE FORMED DIRECTLY IN THE CONCRETE OF THE MANHOLE BASE, OR SHALL BE BUILT UP WITH BRICKS AND MORTAR. THE FLOOR OF THE MANHOLE OUTSIDE THE CHANNELS SHALL BE SMOOTH AND SHALL SLOPE TOWARD THE CHANNELS NOT LESS THAN ONE INCH PER FOOT NOR MORE THAN TWO INCHES PER FOOT.



**9**  
**PRECAST MANHOLE INSTALLATION OVER EXISTING SEWER MAIN**  
**UC-3a**



**10**  
**TYPICAL MANHOLE DETAIL**  
MANHOLES OVER 12' IN DEPTH  
**UC-3a**



**11**  
**FIRE HYDRANT INSTALLATION DETAIL**  
**UC-3a**