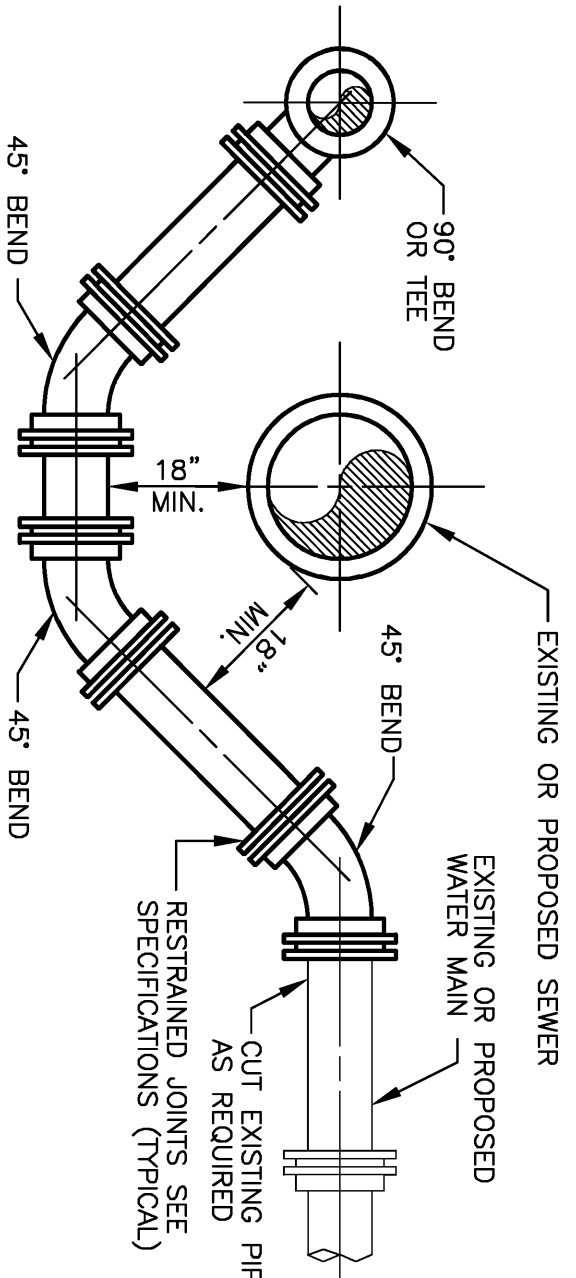


PIPE RESTRAINT SCHEDULE
GROUND BURIED PRESSURE PIPE – POLYETHYLENE ENCASED DUCTILE IRON PIPE

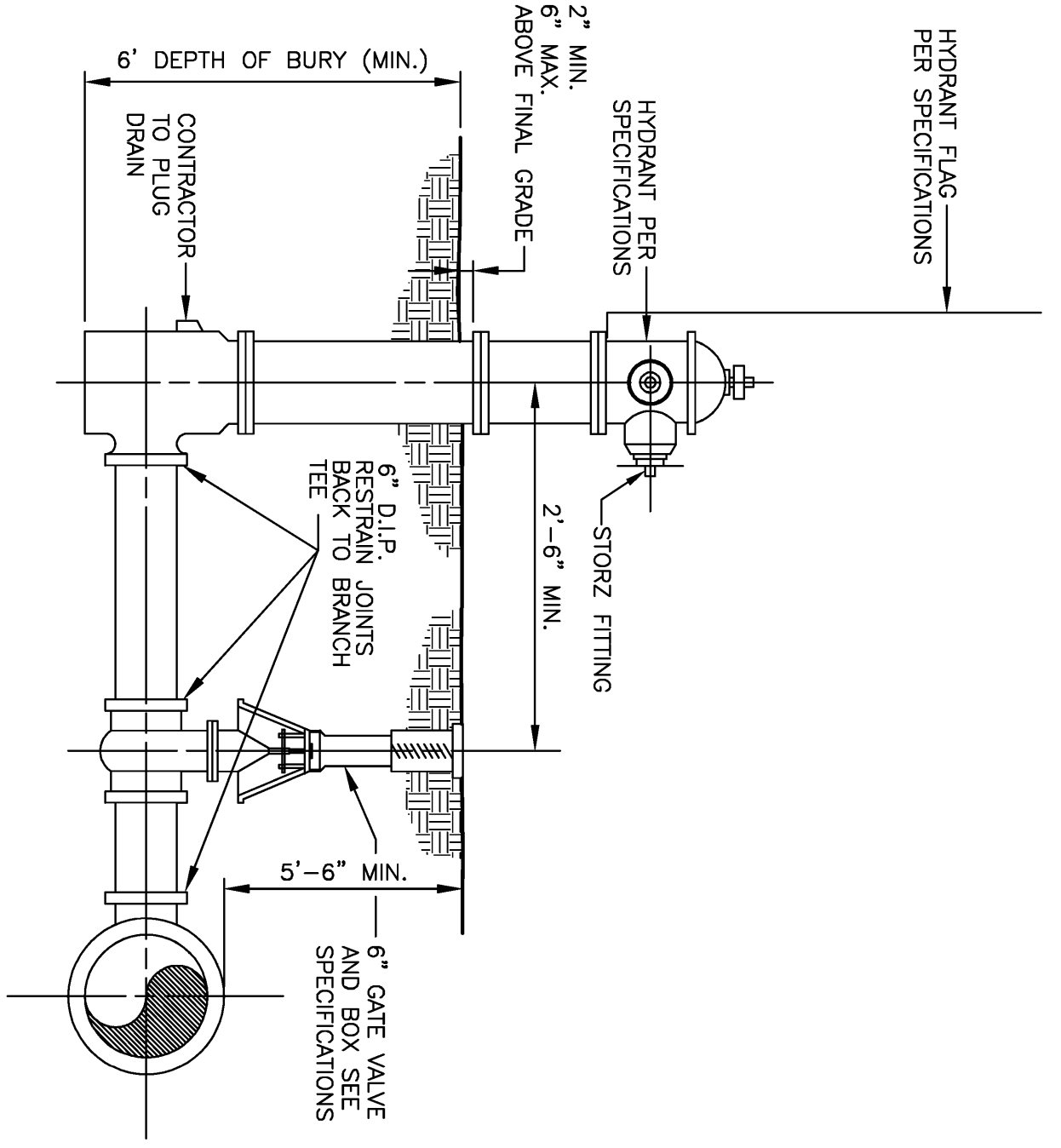
PIPE DIAMETER	TEES, 90° BENDS	45° BENDS	22-1/2° BENDS	11-1/4° BENDS	DEAD ENDS	REDUCERS (ONE SIZE REDUCTION)*	REDUCERS (TWO SIZE REDUCTION)*
4	13	5	3	1	40	---	---
6	19	8	4	2	58	31	---
8	24	10	5	2	75	30	70
12	34	14	7	3	107	57	116
16	43	18	9	4	139	59	137
20	52	22	10	5	169	59	134
24	61	25	12	6	199	60	132
30	73	30	15	7	242	85	168
36	84	35	17	8	281	84	188

- LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
- IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
- THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY.
- THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.
- IF THE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8-INCH TO BARK DIAMETER AS CORROSION ALLOWANCE.

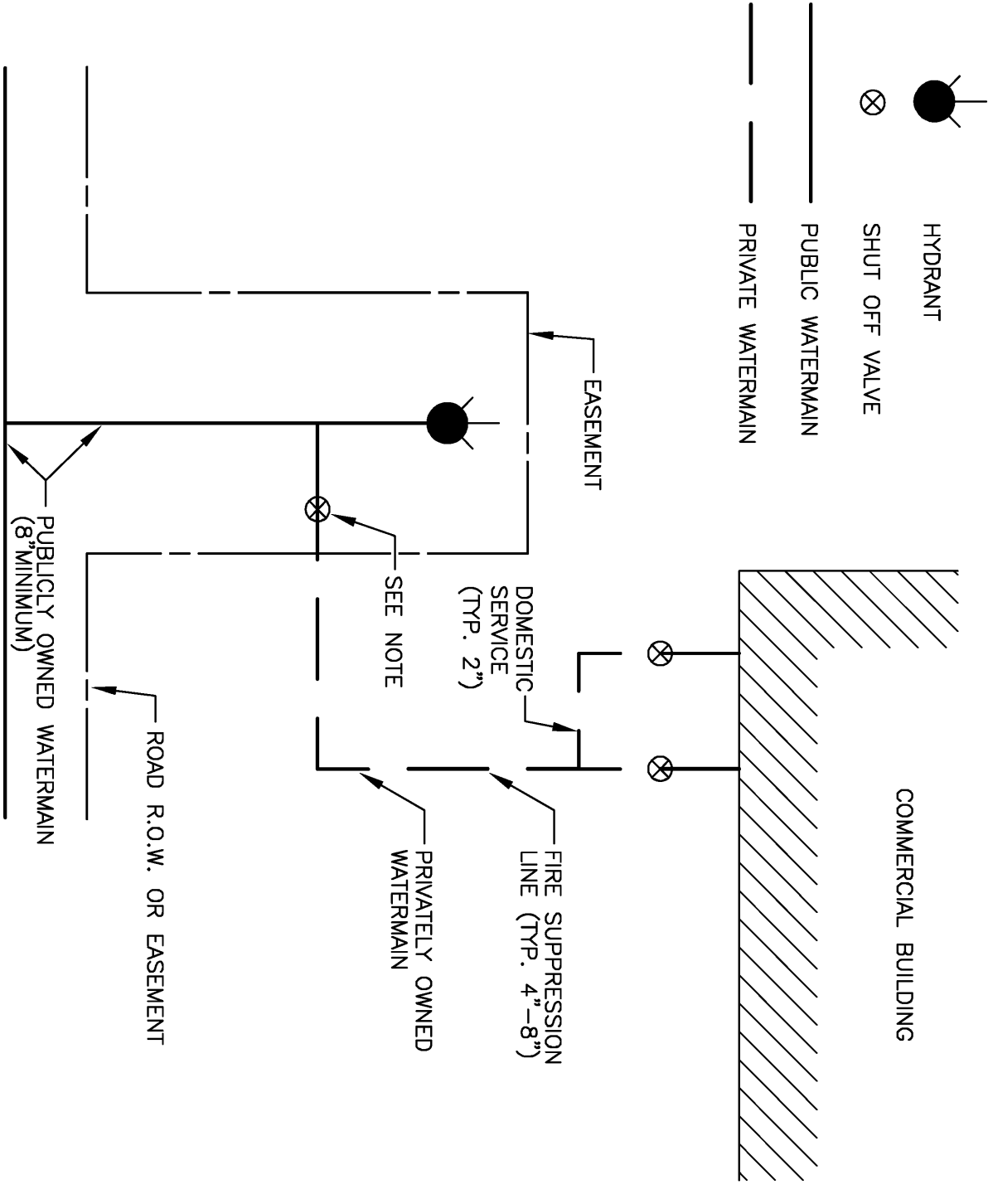
* SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.
INTERNAL PRESSURE: 180
PIPE DEPTH: 5
BEDDING CLASS: TYPE 4
SOIL TYPE: GOOD SAND 2
SAFETY FACTOR: 2



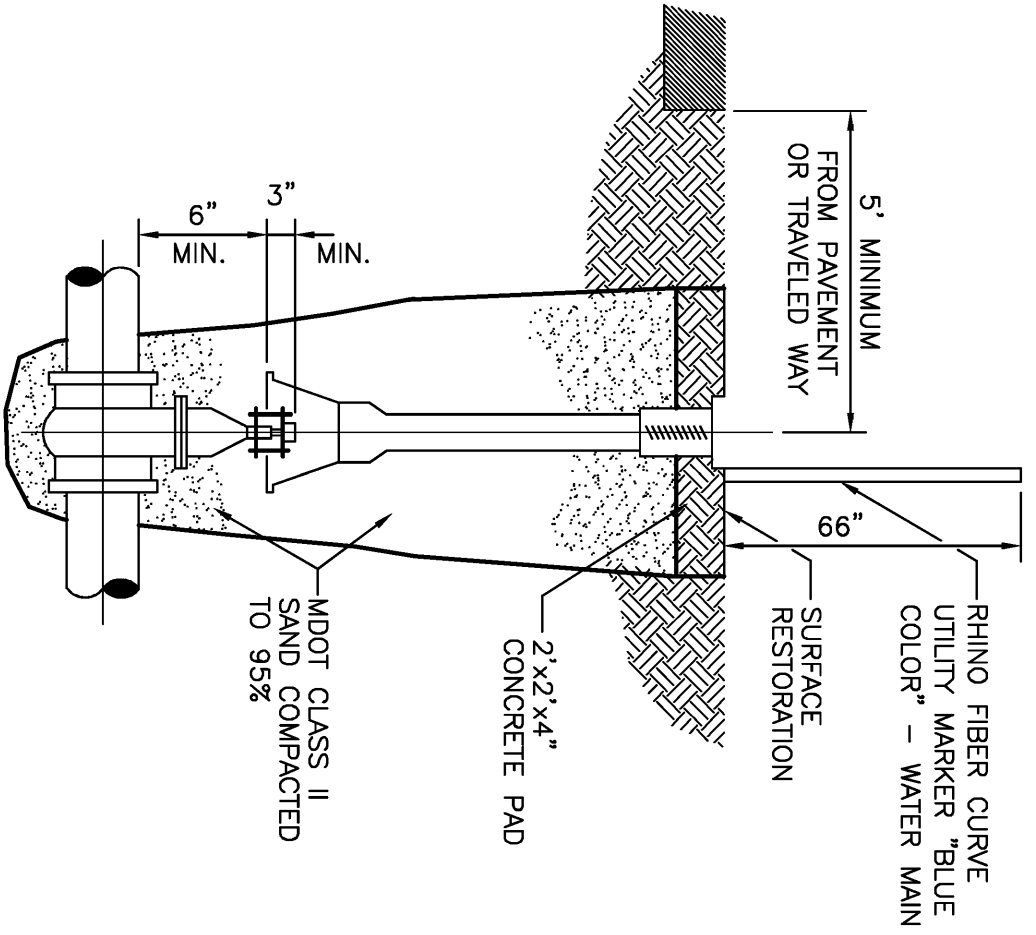
WATER MAIN RELOCATION



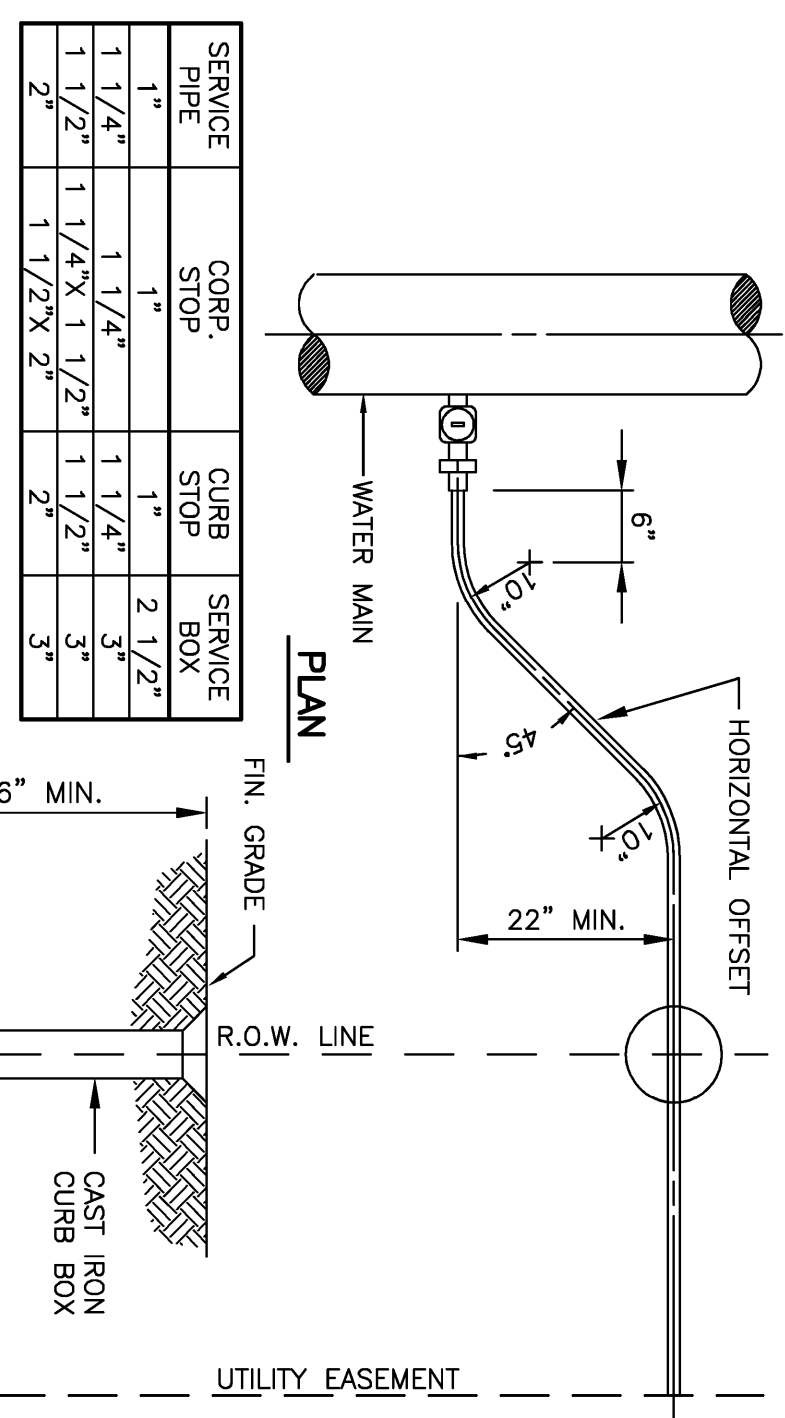
FIRE HYDRANT ASSEMBLY



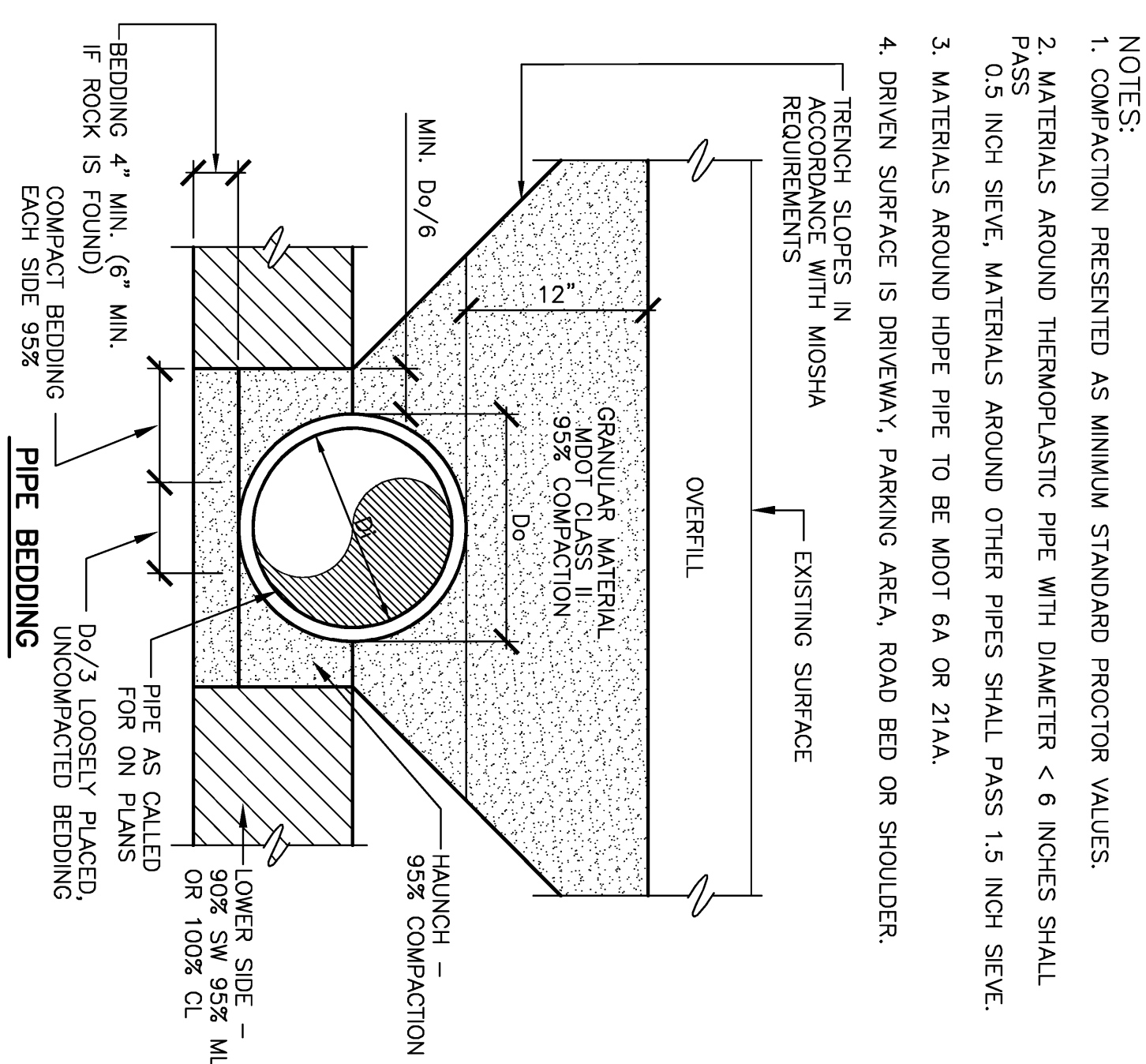
COMMERCIAL BUILDING WATER SERVICE LAYOUT



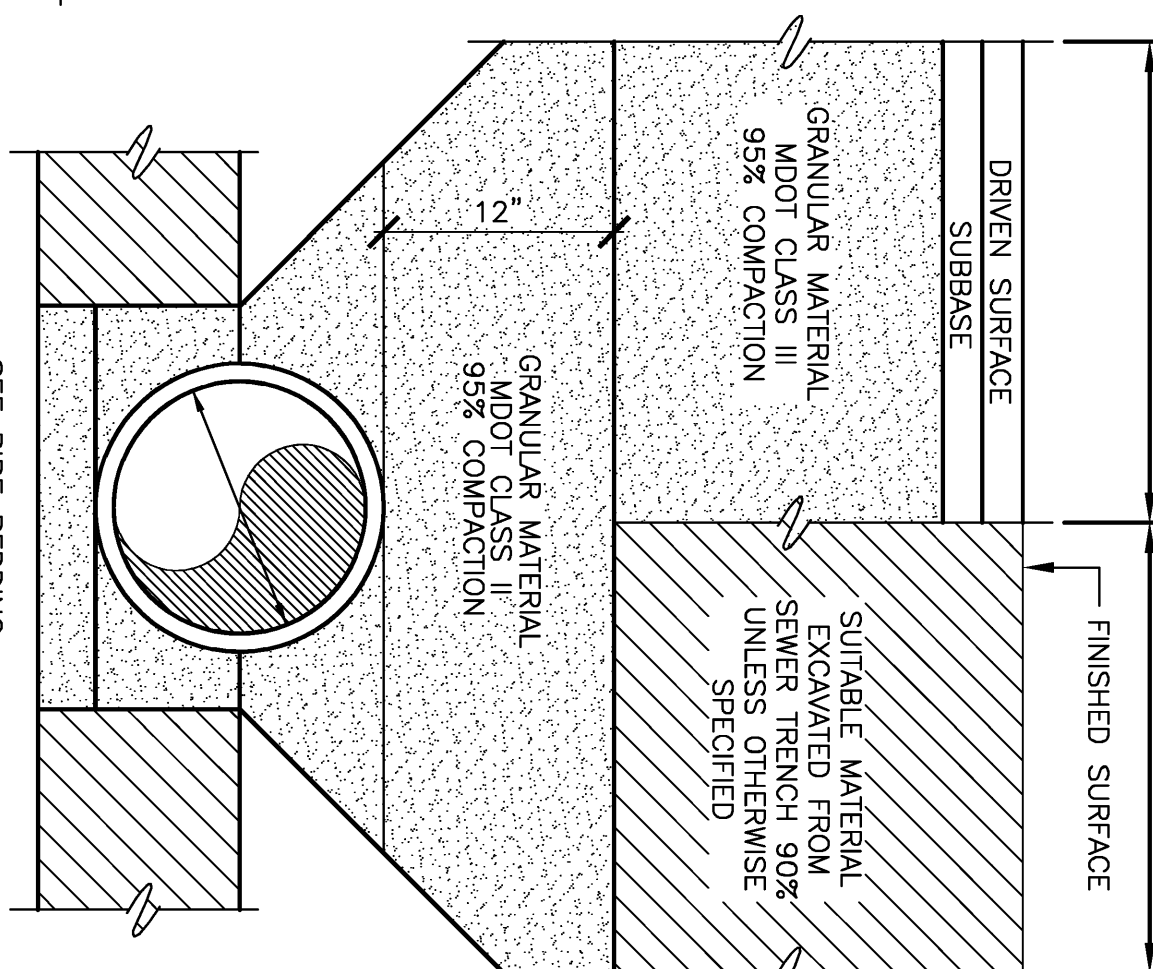
GATE VALVE AND BOX



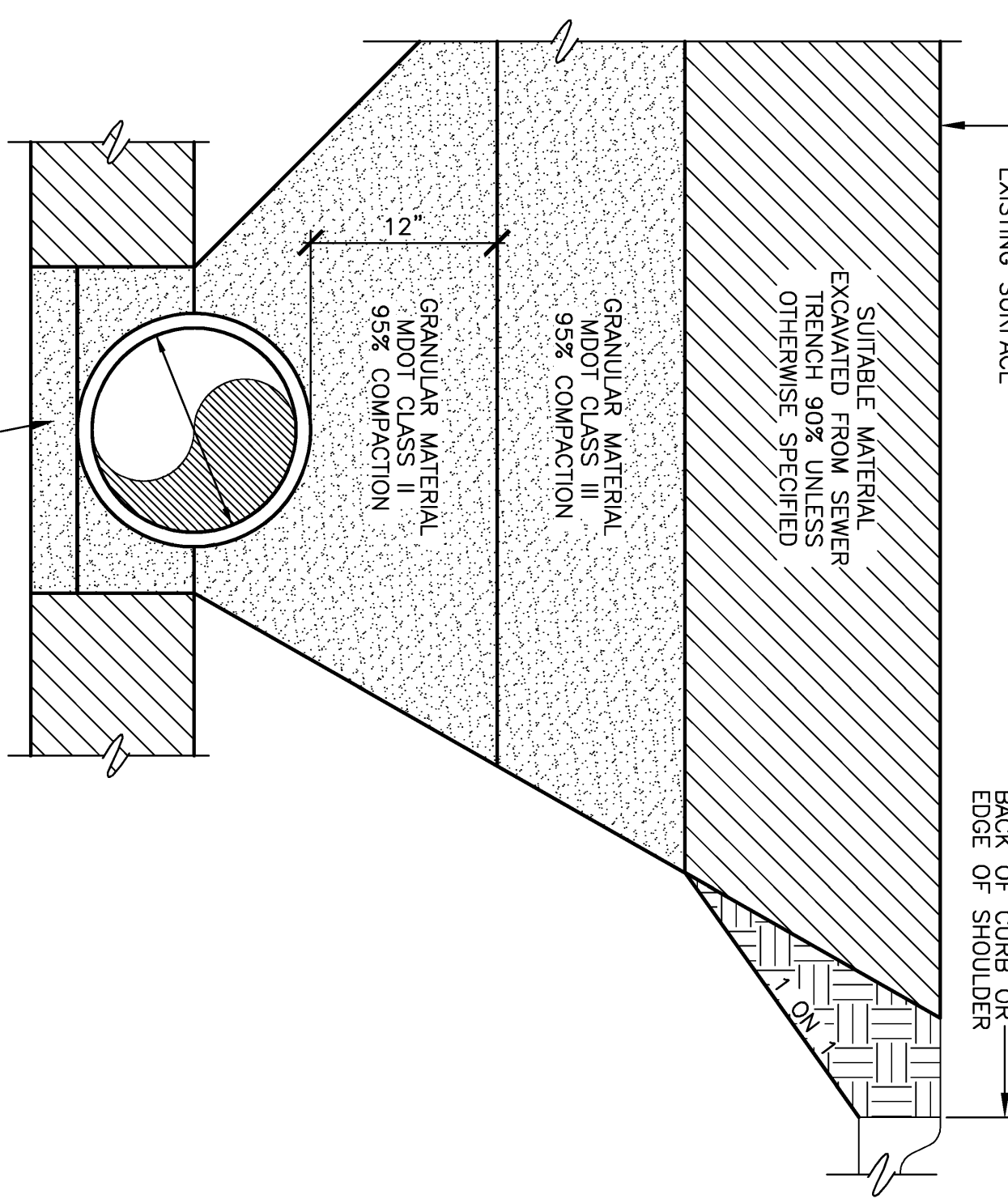
WATER SERVICE LATERAL



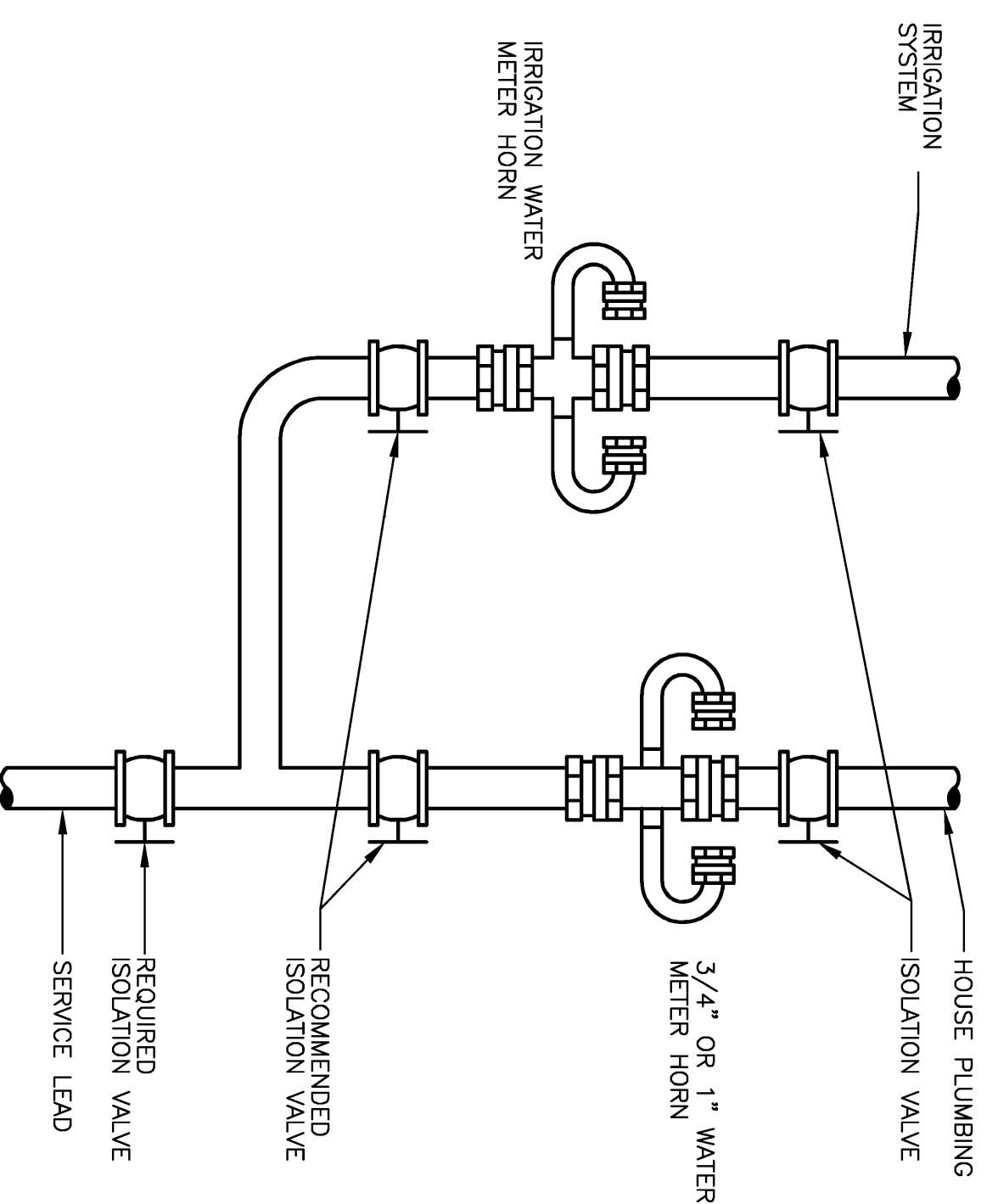
PIPE UNDER DRIVEN SURFACE



TRENCH EXCAVATION & PIPE BEDDING



PIPE WITHIN INFLUENCE OF DRIVEN SURFACE



TYPICAL METER HORN INSTALLATION