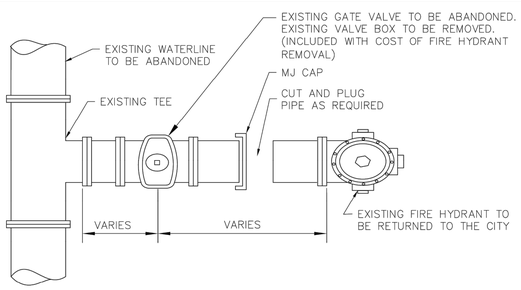
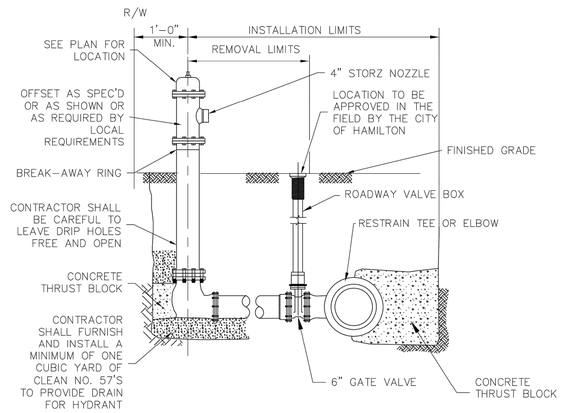


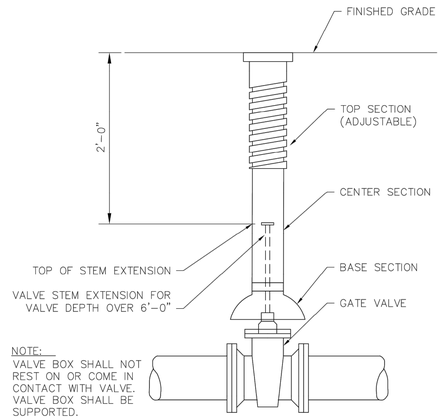
NOTES:

1. AFTER THE EXISTING WATERLINE IS TAKEN OUT OF SERVICE THE CONTRACTOR SHALL CLOSE EXISTING GATE VALVE AND CUT EXISTING WATERLINE. THE EXISTING FIRE HYDRANT SHALL THEN BE CAREFULLY REMOVED AND RETURNED TO THE CITY OF HAMILTON.
2. AFTER REMOVAL CONTRACTOR SHALL RESTORE EXISTING GROUND SURFACE TO MATCH BEFORE REMOVAL CONDITION.

EXISTING FIRE HYDRANT REMOVAL DETAIL

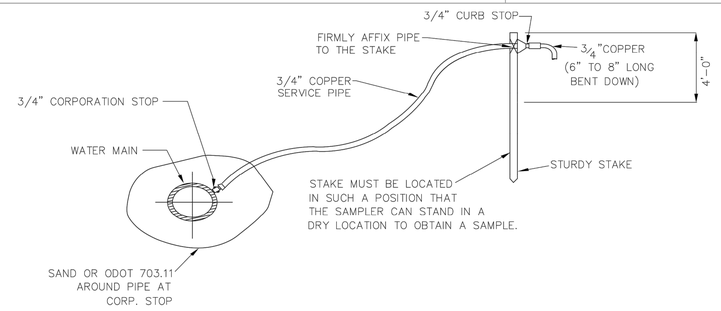


STANDARD FIRE HYDRANT ASSEMBLY DETAIL

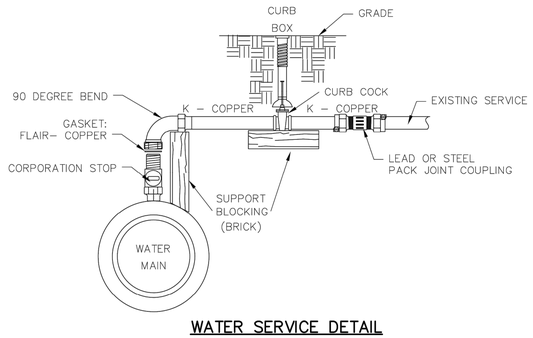


NOTE:
VALVE BOX SHALL NOT REST ON OR COME IN CONTACT WITH VALVE. VALVE BOX SHALL BE SUPPORTED.

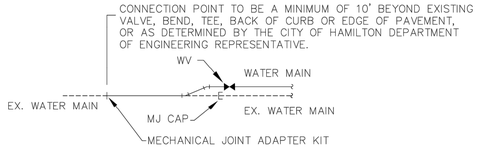
ROADWAY VALVE BOX DETAIL



PURITY TEST STATION



WATER SERVICE DETAIL



TYPICAL WM TIE-IN DETAIL

BEARING AREA OF THRUST BLOCKS IN SQUARE FEET

FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND OR PLUGGED CROSS	TEE PLUGGED ON RUN BEND A1	TEE PLUGGED ON RUN BEND A2	45° BEND	22-1/2° BEND	11-1/4° BEND
04	1.3	1.9	2.5	1.9	1.3	–	–
06	2.8	4.0	5.7	4.0	2.1	1.3	–
08	5.1	7.1	10.1	7.1	3.9	2.0	1.3
10	7.9	11.2	15.7	11.2	6.1	3.2	1.6
12	11.3	16.0	22.7	16.0	8.8	4.5	2.3
14	15.3	21.7	30.7	21.7	11.9	6.1	3.1
16	20.0	28.4	40.0	28.4	15.5	8.0	4.0
18	25.3	36.0	50.7	36.0	19.5	10.1	5.1
20	31.3	44.4	62.7	44.4	24.1	12.5	6.3
24	45.3	64.0	90.7	64.0	34.9	18.1	9.1

VERTICAL VOLUME OF THRUST BLOCK IN CUBIC YARDS

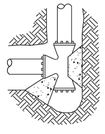
FITTING SIZE	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	1.1	0.4	0.2
6"	2.7	1.0	0.4
8"	4.0	1.5	0.6
12"	8.5	3.2	1.3
16"	14.8	5.6	2.3

VERTICAL BEND

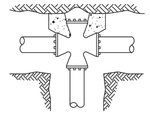
FITTING SIZE	BAR SIZE	EMBEDMENT DEPTH
4"-12"	#6	30"
14"-16"	#8	36"

PLUGGED CROSS

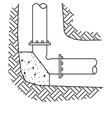
PLUGGED TEE



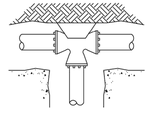
PLUGGED CROSS



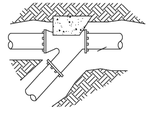
BEND



TEE



WYE

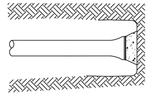


ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 P.S.I AND AN ALLOWABLE SOIL BEARING STRENGTH OF 1500 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:
BEARING AREA = (TEST PRESSURE/150) X (1500/SOIL BEARING STRESS) X (TABLE VALUE)

NOTES:

1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS: E.G. 15 INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
4. IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED ABOVE, ADJUST IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL. BEARING AREA OF THRUST BLOCKS IS IN SQUARE FEET.
6. VERTICAL CHANGES IN DIRECTION REQUIRE SPECIFIC DESIGNS FOR THRUST BLOCKS.

CAP



VERTICAL BEND

CONCRETE THRUST BLOCKING DETAIL

MINIMUM LENGTH OF PIPE TO BE RESTRAINED IN FEET					
FITTING SIZE (INCHES)	BRANCH OF TEE OR PLUG	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	48	18	8	4	2
6	68	26	11	5	3
8	88	34	14	7	3
10	106	42	17	8	4
12	125	49	20	10	5
14	143	57	24	11	6
16	160	65	27	13	6
18	178	72	30	14	7
20	194	79	33	16	8
24	227	94	39	19	9

NOTES:

1. FITTINGS SHALL BE RESTRAINED JOINT TYPE.
2. TABLE INDICATES THE MINIMUM LENGTH OF RESTRAINED JOINTS IN FEET ON EACH SIDE OF THE FITTING AND CHANGES IN DIRECTION. WHERE PRACTICAL, FULL LENGTHS OF PIPE SHALL BE LAID TO ACHIEVE THE REQUIRED MINIMUM RESTRAINT.
3. WHERE COMBINATIONS OF FITTINGS ARE USED, THE PIPING BETWEEN THE FITTINGS SHALL BE RESTRAINED. WHEN TWO OR MORE FITTINGS ARE TOGETHER, USE FITTING WHICH YIELDS GREATEST LENGTH OF RESTRAINED JOINT.
4. PROVIDE MECHANICAL RESTRAINT ON EITHER SIDE OF IN-LINE VALVES.
5. FOR FITTINGS OTHER THAN THOSE PRESENTED IN THE ABOVE TABLE, RESTRAINED JOINT LENGTHS SHALL BE DETERMINED IN ACCORDANCE WITH "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" BY THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA).
6. LENGTHS SHOWN IN THE TABLE HAVE BEEN CALCULATED IN ACCORDANCE WITH THE PROCEDURE OUTLINED IN "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE' AS PUBLISHED BY DIPRA, WITH THE FOLLOWING ASSUMPTIONS:
   a. WORKING PRESSURE = 150 PSI
   b. LAYING CONDITIONS = TYPE 4
   c. SOIL DESIGNATION = MOST CONSERVATIVE FOR FITTING TYPE
   d. ALL DIP TO BE POLYWRAPPED

RESTRAINED PIPE TABLE (DIP)

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ISSUE DATE:

1ST	SITE PLAN REVIEW	02-16-21
2ND	PERMIT/BID SET	04-09-21

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PANDA PROJECT #: S8-22-D8193
PANDA STORE #: -
ARCH PROJECT #: 20044.021

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04/14/2021
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