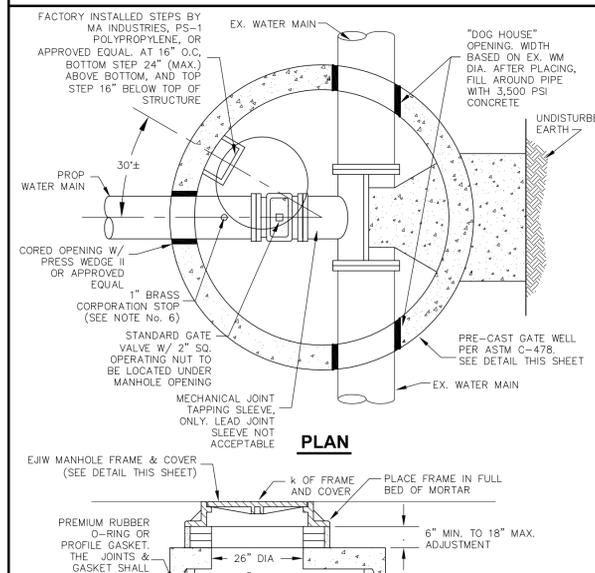
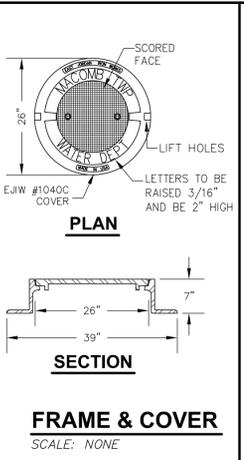


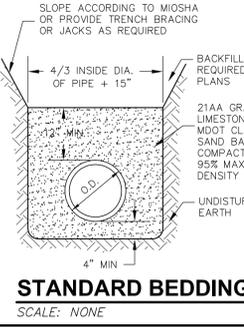
**8" & 12" DIA. WATER MAIN STANDARD GATE VALVE & WELL**  
SCALE: NONE



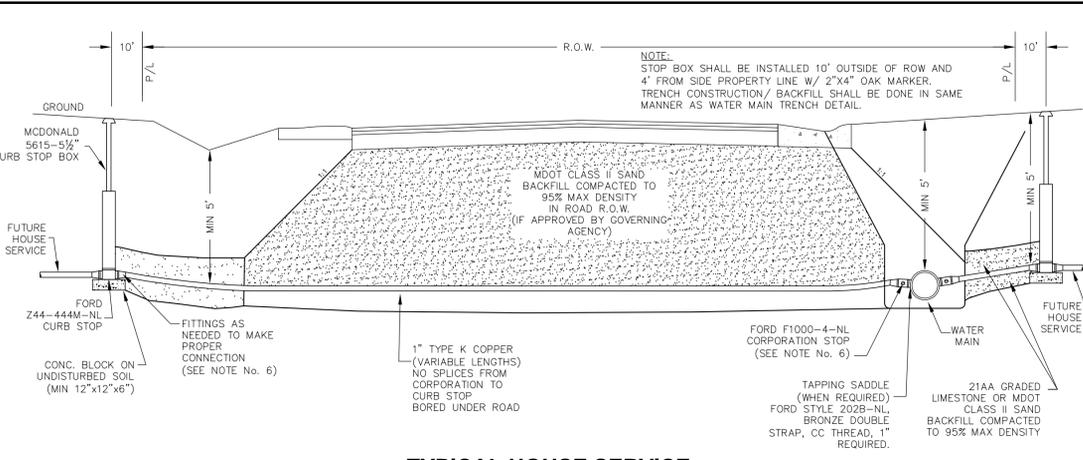
**TAPPING SLEEVE VALVE & WELL**  
SCALE: NONE



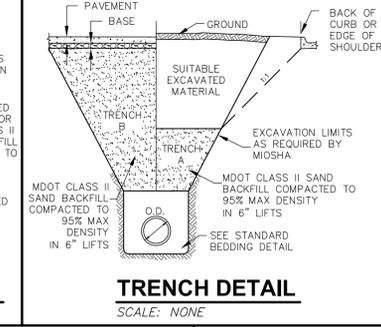
**FRAME & COVER**  
SCALE: NONE



**STANDARD BEDDING**  
SCALE: NONE

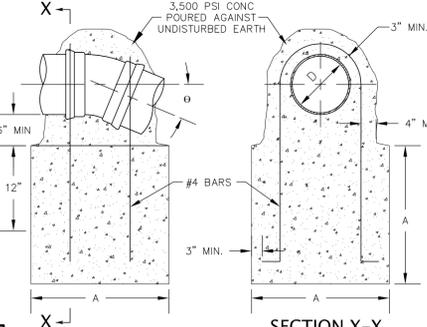


**TYPICAL HOUSE SERVICE**  
SCALE: NONE

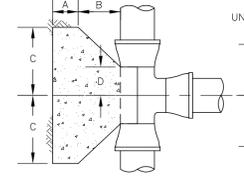


**TRENCH DETAIL**  
SCALE: NONE

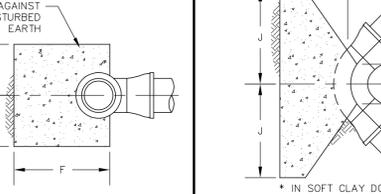
PIPE DIA "D"	BEND Ø	A	# OF BARS
6"	22"	2'-0"	2
8"	22"	3'-3"	2
12"	22"	4'-0"	2
16"	22"	4'-0"	3
20"	22"	5'-0"	3
24"	22"	5'-6"	3



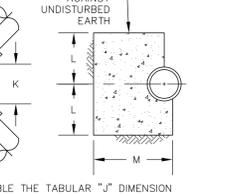
**VERTICAL ANCHORAGE**  
SCALE: NONE



**CONCRETE THRUST BLOCK FOR TEES**  
SCALE: NONE



**CONCRETE THRUST BLOCK FOR BENDS**  
SCALE: NONE



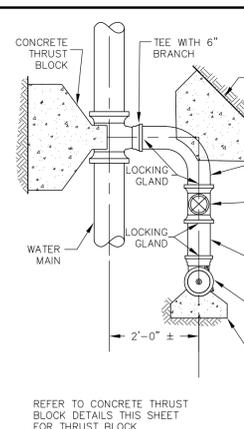
**CONCRETE THRUST BLOCK FOR PLUGS & CAPS**  
SCALE: NONE

CONCRETE THRUST BLOCK SCHEDULE FOR TEES

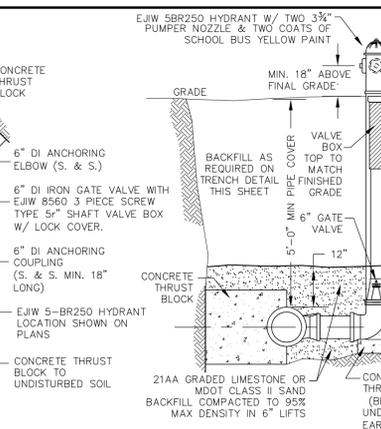
RUN	BRANCH	A	B	C*	D	E	F
8"	8"	0'-9"	0'-9"	1'-4"	0'-7"	1'-0"	2'-2"
12"	8"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	2'-10"
16"	8"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	2'-10"
12"	12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	3'-4"
16"	16"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	3'-6"
20"	8"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	3'-2"
12"	12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	3'-8"
16"	16"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	3'-10"
20"	20"	1'-0"	1'-5"	2'-8"	1'-2"	2'-8"	4'-0"
8"	12"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	3'-6"
12"	16"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	4'-0"
16"	20"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	4'-2"
20"	24"	1'-0"	1'-5"	2'-8"	1'-6"	2'-6"	5'-0"
24"	1'-0"	1'-6"	3'-2"	1'-8"	3'-2"	5'-0"	

CONCRETE THRUST BLOCK SCHEDULE FOR BENDS

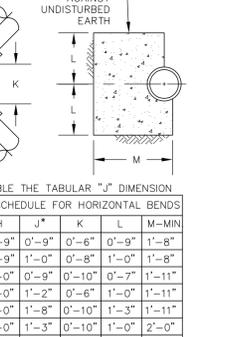
SIZE	ANGLE	C-MIN	H	J*	K	L	M-MIN
6"	45°	0'-9"	0'-9"	0'-9"	0'-6"	0'-9"	1'-8"
8"	90°	0'-9"	0'-9"	1'-0"	0'-8"	1'-0"	1'-8"
12"	22°	0'-9"	1'-0"	0'-9"	0'-10"	0'-7"	1'-11"
8"	45°	0'-9"	1'-0"	1'-2"	0'-6"	1'-0"	1'-11"
12"	90°	0'-9"	1'-0"	1'-8"	0'-10"	1'-3"	1'-11"
16"	22°	0'-9"	1'-0"	1'-3"	0'-10"	1'-0"	2'-0"
12"	45°	0'-9"	1'-4"	1'-9"	0'-10"	1'-3"	2'-4"
16"	90°	0'-9"	1'-4"	2'-9"	1'-2"	1'-6"	2'-4"
20"	22°	1'-0"	1'-8"	1'-8"	0'-10"	1'-3"	3'-0"
16"	45°	1'-0"	1'-8"	2'-8"	0'-10"	1'-6"	3'-0"
20"	90°	1'-0"	1'-8"	3'-0"	1'-6"	2'-6"	3'-0"
24"	22°	1'-0"	2'-6"	2'-0"	1'-2"	1'-3"	3'-6"
20"	45°	1'-0"	2'-6"	3'-0"	1'-0"	1'-9"	3'-6"
24"	90°	1'-0"	2'-6"	4'-0"	1'-10"	2'-6"	4'-0"
24"	22°	1'-0"	3'-2"	2'-6"	1'-3"	1'-6"	4'-0"
24"	45°	1'-0"	3'-2"	3'-0"	1'-2"	2'-6"	5'-0"
90°	1'-0"	3'-2"	5'-0"	2'-2"	3'-6"	3'-6"	5'-4"



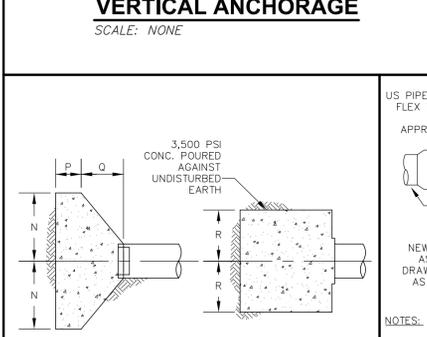
**"L" TYPE 6" HYDRANT CONNECTION**  
SCALE: NONE



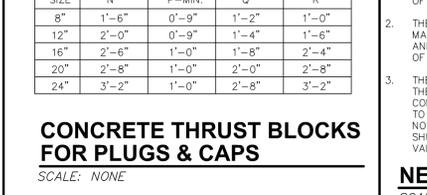
**"T" TYPE 6" HYDRANT CONNECTION**  
SCALE: NONE



**NEW TEE ON EXISTING MAIN**  
SCALE: NONE



**WATER MAIN UTILITY CROSSING**  
SCALE: NONE



**DITCH AND STREAM CROSSING**  
SCALE: NONE

- ### GENERAL WATER MAIN NOTES
- AT LEAST SEVENTY TWO (72) HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL GIVE NOTIFICATION OF THEIR INTENTION TO BEGIN CONSTRUCTION TO MACOMB TOWNSHIP, THE OFFICE OF THE PUBLIC WORKS COMMISSIONER, MCDOR, MDOT, AND OTHER AGENCIES HAVING JURISDICTION. ALL WATER MAIN CONSTRUCTION SHALL HAVE FULL TIME INSPECTION PROVIDED BY MACOMB TOWNSHIP.
  - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING, AT A TIME AND PLACE AS ARRANGED BY MACOMB TOWNSHIP, AT WHICH VARIOUS UTILITY COMPANIES AND GOVERNMENTAL AGENCY REPRESENTATIVES WILL BE PRESENT.
  - PRIOR TO CONSTRUCTION OF ANY WATER MAIN WHICH IS TO BE CONNECTED TO THE TOWNSHIP WATER SUPPLY SYSTEM, THE CONTRACTOR MUST HAVE IN THEIR POSSESSION A COPY OF A VALID PERMIT TO CONSTRUCT A CONNECTION TO, OR AN EXTENSION OF THE WATER SUPPLY SYSTEM OF THE TOWNSHIP.
  - PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (800-482-7171) FOR THE LOCATION OF UNDERGROUND FACILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH MAY NOT BE HANDLED BY MISS DIG.
  - ALL WATER MAIN SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF MACOMB TOWNSHIP, MCDOR, MDOT, AND/OR THE OFFICE OF THE MACOMB COUNTY PUBLIC WORKS COMMISSIONER, AS REQUIRED.
  - ALL WATER MAIN SYSTEM CONSTRUCTION SHALL CONFORM TO THE "REDUCTION OF LEAD IN DRINKING WATER ACT" NOT CONTAINING MORE THAN 0.2% LEAD WHEN USED WITH RESPECT TO SOLDER AND FLUX AND NOT MORE THAN A WEIGHTED AVERAGE OF 0.25% LEAD WHEN USED WITH RESPECT TO THE WETTED SURFACES OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS AND FIXTURES.
  - UNLESS OTHERWISE INDICATED ON THE PLANS, ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 FOR 16" AND LESS AND CLASS 56 FOR > 16" IN ACCORDANCE WITH ANSI/AWWA C 151/A21.51 DOUBLE THICKNESS CEMENT LINING WITH PUSH ON JOINTS. ONLY NEW UNDAMAGED PIPE SHALL BE USED. THE TOWNSHIP HAS THE RIGHT TO REJECT ANY AND ALL PIPE. PUSH ON JOINTS SHALL BE BY TYTON SUPER BELLITE OR APPROVED EQUAL WITH SERIATED BRASS WEDGES. 6" THRU 12" PIPE REQUIRES 2 WEDGES PER JOINT. 16" AND LARGER PIPE REQUIRES 4 WEDGES PER JOINT.
  - UNLESS OTHERWISE INDICATED IN A WATER MAIN PROFILE, WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF FIVE (5) FEET AS MEASURED FROM THE PERMANENT PAVEMENT CENTERLINE (OR EXISTING ROAD ELEVATION IF THE PERMANENT PAVEMENT ELEVATION IS NOT KNOWN) ELEVATION OR EXISTING GROUND AT THE WATER MAIN, WHICHEVER RESULTS IN A LOWER ELEVATION. WATER MAIN SHALL BE INSTALLED WITH A MAX COVER OF 7 FT UNLESS APPROVAL IS GRANTED BY THE ENGINEER. A MINIMUM CLEARANCE OF 18" SHALL BE MAINTAINED WHENEVER THE WATER MAIN CROSSES UNDER OTHER UTILITIES AND A MINIMUM DEPTH OF 5" SHALL BE MAINTAINED WHENEVER THE WATER MAIN CROSSES UNDER A DITCH, WHERE WATER MAIN MUST DIP UNDER OTHER UTILITIES OR DITCHES, PLACE 22" VERTICAL BENDS AND ANCHORAGES ACCORDING TO STANDARD DETAILS.
  - UNLESS OTHERWISE NOTED, HYDRANTS SHALL BE "L" TYPE AND SHALL BE SET TO THE ELEVATION OF THE EX. GROUND. WHEN THE EX. GROUND IS HIGHER THAN 0.5 FEET ABOVE THE ROAD CENTERLINE, THE HYDRANT SHALL BE EXTENDED UPWARD FROM 0.5 FEET ABOVE THE ROAD CENTERLINE BY INSERTING BARREL EXTENSIONS BETWEEN THE HEAD AND THE TOP BARREL FLANGE.
  - PLACE CONCRETE THRUST BLOCKS FOR ALL BENDS, CAPS, PLUGS OR TEES ACCORDING TO THE STANDARD DETAILS. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS. LOCKING GLANDS SHALL BE PLACED ON ALL BENDS.
  - RESTRAINED JOINTS FOR PIPE SIZES UP TO 16" SHALL BE MEGA LUGS OR APPROVED EQUAL. RESTRAINED JOINTS FOR PIPE SIZES OVER 16" SHALL BE FLEX JOINT PIPE OR APPROVED EQUAL BOLLTLESS SYSTEM.
  - UNLESS OTHERWISE SHOWN ON THE PLANS, ALL WATER MAIN BEDDING SHALL BE STANDARD BEDDING.
  - WATER MAIN SHALL BE PLACED LEVEL THROUGH ALL GATE WELLS.
  - ALL END OF LINE GATE WELLS SHALL HAVE STUBS EXTENDING TEN (10) FEET FROM THE CENTERLINE OF THE WELL AND ENDING WITH A CAP AND ADEQUATE THRUST BLOCK.
  - UNLESS OTHERWISE INDICATED ON THE PLANS, ALL GATE WELL FRAME & COVERS SHALL BE SET TO THE ELEVATION OF THE EX GROUND OR 0.5 FEET ABOVE THE EX ROAD CENTERLINE, WHICHEVER IS HIGHER. COVERS SHALL BE MARKED WITH THE TOWNSHIP'S STANDARD MARKINGS.
  - GATE VALVES SHALL BE RESILIENT SEATED VALVES CONFORMING TO THE REQUIREMENTS OF ANSI/AWWA C-515. ALL GATE VALVES SHALL BE STANDARD TURN LEFT TO OPEN. EACH VALVE SHALL HAVE A SMOOTH UNOBSTRUCTED WATERWAY FREE FROM ANY SEDIMENT DEPOSITS. THE VALVE SHALL BE FURNISHED WITH A 2" SQUARE OPERATING NUT.
  - EXTENSION STEMS AND STEM GUIDES SHALL BE PROVIDED IN EACH GATE WELL WHERE THE VALVE OPERATING NUT IS FURTHER THAN 5" BELOW THE TOP OF THE GATE WELL COVER OR VALVE BOX COVER. EXTENSION STEM SHALL EXTEND TO WITHIN 5" OF THE TOP OF THE TOP OF COVER FINAL ELEVATION. EXTENSION STEMS WILL BE SECURED IN PLACE WITH BRACKETS ATTACHED TO THE RISER SECTIONS.
  - AFTER THE WATER MAIN HAS BEEN LAID AND BACKFILLED, EACH SECTION OF THE MAIN, BETWEEN GATE VALVES OR TEST PLUGS/CAPS, SHALL BE HYDROSTATICALLY TESTED FOR LEAKAGE AT A PRESSURE OF 150 PSI. THE FULL PRESSURE SHALL BE MAINTAINED BY PUMPING WATER INTO THE PIPE FOR A PERIOD OF AT LEAST 2 HOURS. THE MAXIMUM PERMISSIBLE LEAKAGE UNDER HYDROSTATIC TEST PRESSURE SHALL NOT EXCEED A RATE OF 0.10 GALLONS PER HOUR PER INCH DIAMETER OF MAIN, PER 1,000 LINEAL FEET OF PIPE. STERILIZATION OF WATER MAINS SHALL BE ACCORDING TO MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY (MDEQ) REQUIREMENTS. NO DIRECT CONNECTIONS SHALL BE MADE UNTIL ALL SAMPLING AND PRESSURE TESTS HAVE BEEN COMPLETED AND PASSED.
  - GATE VALVES ARE TO BE OPERATED BY MACOMB TOWNSHIP WATER AND SEWER DEPARTMENT PERSONNEL ONLY.



**MACOMB TOWNSHIP**  
54111 BROUGHTON ROAD  
MACOMB, MI 48042  
586-992-0710

**3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171**  
For free location of public utility lines

NOTE: UTILITY INFORMATION ON THIS DRAWING MAY BE FROM INFORMATION DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANIES, CITY/COUNTY AGENCIES AND OTHER VARIOUS SOURCES. UNDERGROUND UTILITIES WHICH ARE ON PRIVATE PROPERTY ARE USUALLY NOT DELINEATED UPON A UTILITY COMPANY'S PUBLISHED PLANS. THEIR LOCATION, IF SHOWN UPON THIS SURVEY, ARE APPROXIMATED FROM FOUND PAINT MARKS/STAKES, ETC. AS LOCATED BY THIS FIRM FROM SOURCES WHICH ARE UNKNOWN. NO GUARANTEE IS GIVEN AS TO THE COMPLETENESS OR ACCURACY THEREOF.

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES (IN CONFLICT WITH PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. CALL MISS DIG 3 WORKING DAYS PRIOR TO CONSTRUCTION.

**TOWNSHIP OF MACOMB**

**WATER MAIN STANDARD DETAILS**

TOWN 3 NORTH RANGE 13 EAST  
MACOMB TOWNSHIP  
MACOMB COUNTY

NO.	DATE	REVISION
1	10-15-14	SHEET UPDATE
2	11-08-15	SHEET UPDATE
3	12-14-15	SHEET UPDATE
4	5-10-16	SHEET UPDATE

**FIRE HYDRANT GUARD POSTS**  
SCALE: NONE

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. DRAWING NO. MA-DET-WM  
SCALE: N.T.S. SHEET NO. W1