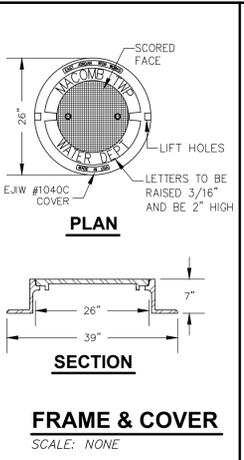
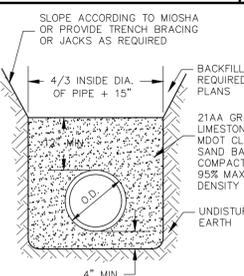


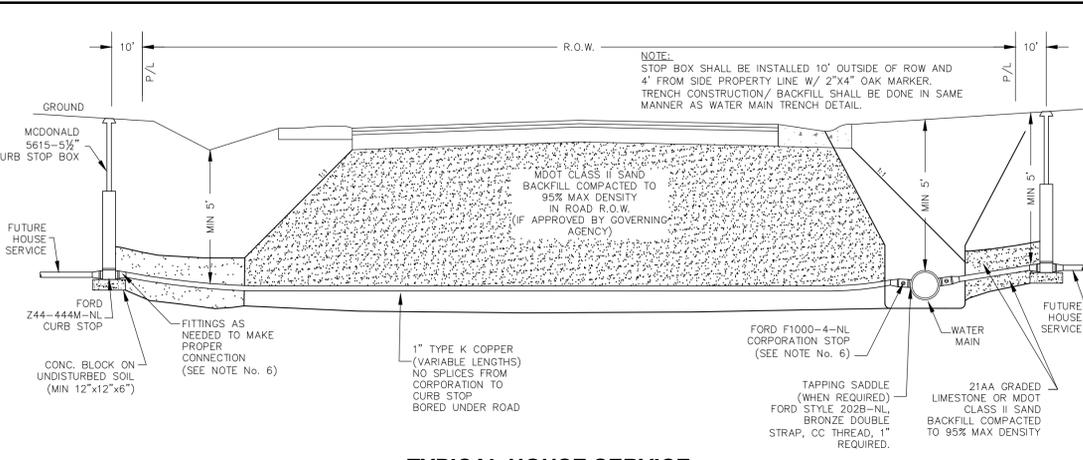
8" & 12" DIA. WATER MAIN STANDARD GATE VALVE & WELL
SCALE: NONE



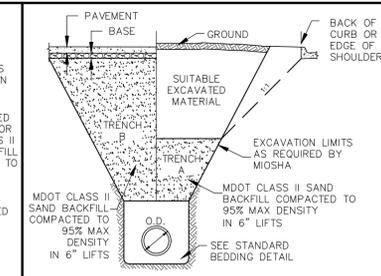
FRAME & COVER
SCALE: NONE



STANDARD BEDDING
SCALE: NONE

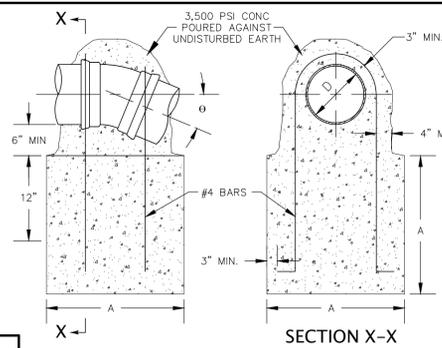


TYPICAL HOUSE SERVICE
SCALE: NONE

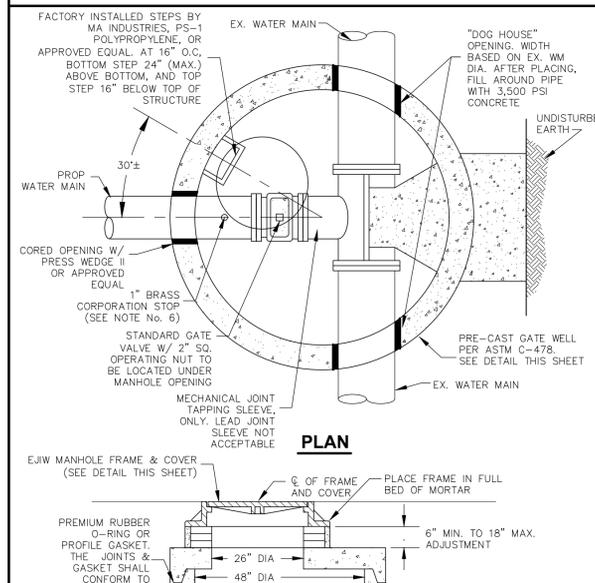


TRENCH DETAIL
SCALE: NONE

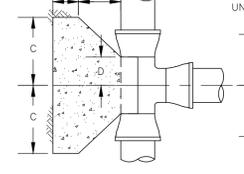
PIPE DIA "D"	BEND Ø	A	# OF BARS
6"	22 1/2"	2'-0"	2
8"	45"	3'-3"	2
12"	22 1/2"	3'-3"	2
16"	45"	4'-0"	3
20"	22 1/2"	5'-0"	3
24"	45"	5'-6"	3



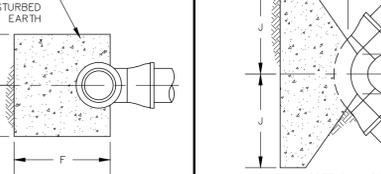
VERTICAL ANCHORAGE
SCALE: NONE



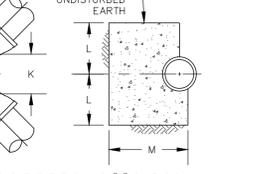
TAPPING SLEEVE VALVE & WELL
SCALE: NONE



CONCRETE THRUST BLOCK FOR TEES
SCALE: NONE



CONCRETE THRUST BLOCK FOR BENDS
SCALE: NONE



CONCRETE THRUST BLOCKS FOR PLUGS & CAPS
SCALE: NONE

* IN SOFT CLAY DOUBLE THE TABULAR "C" DIMENSION

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"	0'-9"	1'-4"	0'-8"	1'-0"	2'-6"
12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	1'-11"	2'-10"
16"	8"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	2'-10"
12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	3'-4"	3'-4"
16"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	3'-6"	3'-6"
8"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	3'-2"	3'-2"
12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	3'-8"	3'-8"
20"	16"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	3'-10"
20"	1'-0"	1'-5"	2'-8"	1'-2"	2'-8"	4'-0"	4'-0"
8"	0'-9"	0'-9"	1'-4"	0'-8"	1'-0"	3'-6"	3'-6"
12"	0'-9"	1'-3"	2'-0"	0'-10"	1'-6"	4'-0"	4'-0"
20"	16"	1'-0"	1'-4"	2'-4"	1'-0"	2'-4"	4'-2"
20"	1'-0"	1'-5"	2'-6"	1'-6"	2'-6"	5'-0"	5'-0"
24"	1'-0"	1'-6"	3'-2"	1'-8"	3'-2"	5'-0"	5'-0"

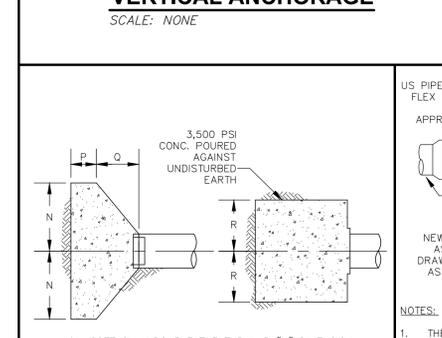
* IN SOFT CLAY DOUBLE THE TABULAR "J" DIMENSION

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 1/2°	0'-9"	1'-0"	0'-9"	0'-6"	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"
12"	22 1/2°	0'-9"	1'-0"	1'-3"	0'-10"	1'-0"	2'-0"
16"	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 1/2°	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 1/2°	1'-0"	2'-6"	2'-0"	1'-2"	1'-3"	3'-6"
24"	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 1/2°	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"
24"	90°	1'-0"	3'-2"	5'-0"	2'-2"	3'-6"	5'-4"

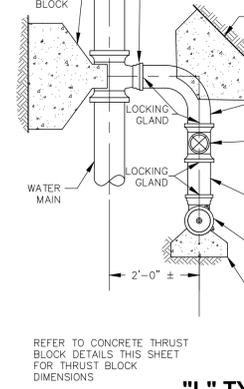
CONCRETE THRUST BLOCK FOR TEES
SCALE: NONE

CONCRETE THRUST BLOCK FOR BENDS
SCALE: NONE

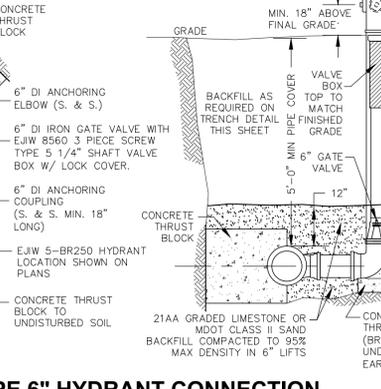
CONCRETE THRUST BLOCKS FOR PLUGS & CAPS
SCALE: NONE



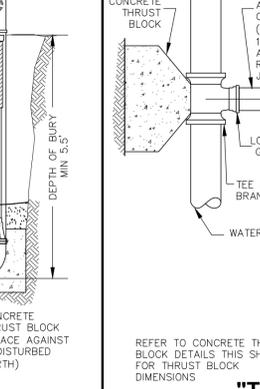
NEW TEE ON EXISTING MAIN
SCALE: NONE



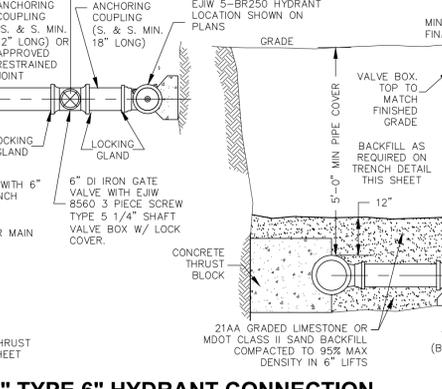
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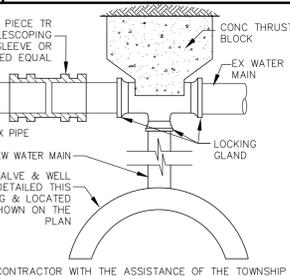


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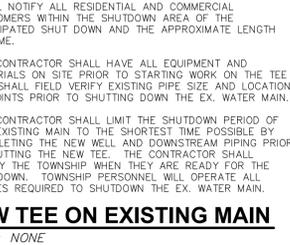


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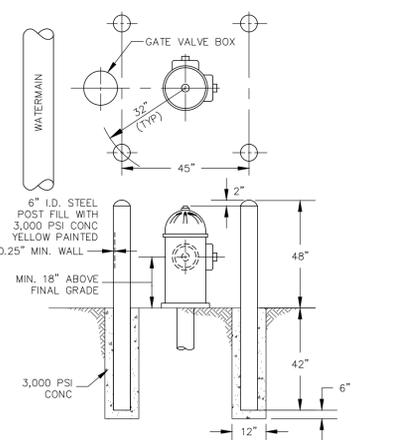
- ### GENERAL WATER MAIN NOTES
- CONTRACTOR SHALL NOTIFY MACOMB TOWNSHIP AND ALL OTHER AGENCIES HAVING JURISDICTION AT LEAST SEVENTY-TWO (72) HOURS IN ADVANCE OF CONSTRUCTION ACTIVITIES. ALL WATER MAIN CONSTRUCTION SHALL HAVE FULL TIME INSPECTION PROVIDED BY MACOMB TOWNSHIP.
 - PRIOR TO CONSTRUCTION START-UP, 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 CONSTRUCTING ANY WATER MAIN WHICH IS TO BE CONNECTED AND/OR EXTENDED FROM THE TOWNSHIP'S WATER SUPPLY SYSTEM, THE CONTRACTOR MUST HAVE IN THEIR POSSESSION A COPY OF A VALID PERMIT TO CONSTRUCT SAID WATER MAIN.
 - PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CALL MISS DIG AT 811 OR 800-482-7171 FOR LOCATION OF EXISTING UNDERGROUND FACILITIES, AND SHALL NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES LOCATED IN THE VICINITY OF 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 MCOFP, 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 WELDED 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 INCH AND LESS AND CLASS 56 FOR 18 INCHES IN ACCORDANCE WITH ANSI/AWWA C151/21.51 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 TYTON, SUPER BELTITE OR APPROVED EQUAL WITH SERRATED BRASS WEDGES. 6 INCH THRU 12 INCH PIPE REQUIRES TWO (2) WEDGES PER JOINT. 16 INCH AND LARGER PIPE REQUIRES FOUR (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 SEVEN (7) FEET UNLESS APPROVED BY THE TOWNSHIP ENGINEER. A MIN. CLEARANCE OF 18 INCHES SHALL BE MAINTAINED WHENEVER THE WATER MAIN CROSSES UNDER OTHER UTILITIES AND A MIN. DEPTH OF FIVE (5) FEET SHALL BE MAINTAINED WHEN CROSSING A DITCH. WHERE WATER MAIN MUST DIP UNDER OTHER UTILITIES OR DITCHES, PLACE 22 1/2" VERTICAL BENDS AND ANCHORAGES ACCORDING TO THE STANDARD DETAILS.
 - UNLESS OTHERWISE NOTED ON THE PLANS, HYDRANTS SHALL BE "L" TYPE AND SHALL BE SET TO THE ELEVATION OF THE EXISTING GROUND. WHEN THE EXISTING 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.
 - CONCRETE THRUST BLOCKS SHALL BE PLACED AT ALL BENDS, CAPS, PLUGS OR TEES ACCORDING TO THE STANDARD DETAILS. CONCRETE SHALL HAVE A MIN. 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 INCHES SHALL BE MEGA LUGS OR APPROVED EQUAL. RESTRAINED JOINTS FOR PIPE SIZES OVER 16 INCHES SHALL BE FLEX JOINT PIPE OR APPROVED EQUAL BOLTS/STAYS.
 - 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 AND COVERS SHALL BE SET TO THE ELEVATION OF THE EXISTING GROUND OF 0.5 FEET ABOVE THE EXISTING ROAD CENTERLINE, WHICHEVER IS HIGHER. COVERS SHALL INCLUDE 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 INCH SQUARE OPERATING NUT.
 - EXTENSION STEMS AND STEM GUIDES SHALL BE PROVIDED IN EACH GATE WELL WHERE THE VALVE OPERATING NUT IS FURTHER THAN FIVE FEET BELOW THE TOP OF THE GATE WELL COVER. EXTENSION STEMS SHALL EXTEND TO WITHIN FIVE FEET OF THE FINAL COVER ELEVATION. EXTENSION STEMS WILL BE SECURED IN PLACE WITH BRACKETS ATTACHED TO THE RISER SECTIONS.
 - AFTER THE WATER MAIN HAS BEEN PLACED AND BACKFILLED, EACH SECTION OF THE MAIN BETWEEN GATE VALVES OR TEST PLUGS/CAPS SHALL BE HYDROSTATICALLY TESTED FOR LEAKAGE. FOR DUCTILE IRON AND PVC PIPE, THE TEST SHALL BE IN ACCORDANCE WITH THE CURRENT ANSI/AWWA C600 (FOR DI) AND C605 (FOR PVC) STANDARDS. THE PIPE SHALL BE TESTED FOR LEAKAGE AT A PRESSURE OF 150 PSI MAINTAINED FOR A MINIMUM TWO-HOUR PERIOD. THE MAXIMUM PERMISSIBLE LEAKAGE UNDER TEST PRESSURE SHALL NOT EXCEED A RATE OF 0.0825 GAL/HR/INCH DIA. OF MAIN, PER 1,000 LINEAL FEET OF PIPE. HDPE PIPE SHALL BE TESTED IN ACCORDANCE WITH ASTM F2164. DISINFECT WATER MAINS IN ACCORDANCE WITH AWWA C651 AND THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) REQUIREMENTS. NO DIRECT CONNECTIONS SHALL BE MADE UNTIL ALL DISINFECTION AND HYDROSTATIC PRESSURE TESTS HAVE BEEN SATISFACTORILY COMPLETED. APPROVAL TO PROCEED WITH THE WATER MAIN CONNECTION SHALL BE RECEIVED FROM THE TOWNSHIP.
 - ALL GATES VALVES SHALL BE OPERATED BY MACOMB TOWNSHIP WATER AND SEWER DEPARTMENT PERSONNEL ONLY.



WATER MAIN UTILITY CROSSING
SCALE: NONE



DITCH AND STREAM CROSSING
SCALE: NONE



FIRE HYDRANT GUARD POSTS
SCALE: NONE



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	11-06-15	SHEET UPDATE
3	12-14-15	SHEET UPDATE
4	5-10-16	SHEET UPDATE
5	7-14-17	SHEET UPDATE
6	2-1-22	SHEET UPDATE

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