# MORTON STREET WATER MAIN REPLACEMENT SECTION 28, CITY OF ST. JOHNS CLINTON COUNTY, MICHIGAN

PUBLIC UTILITIES

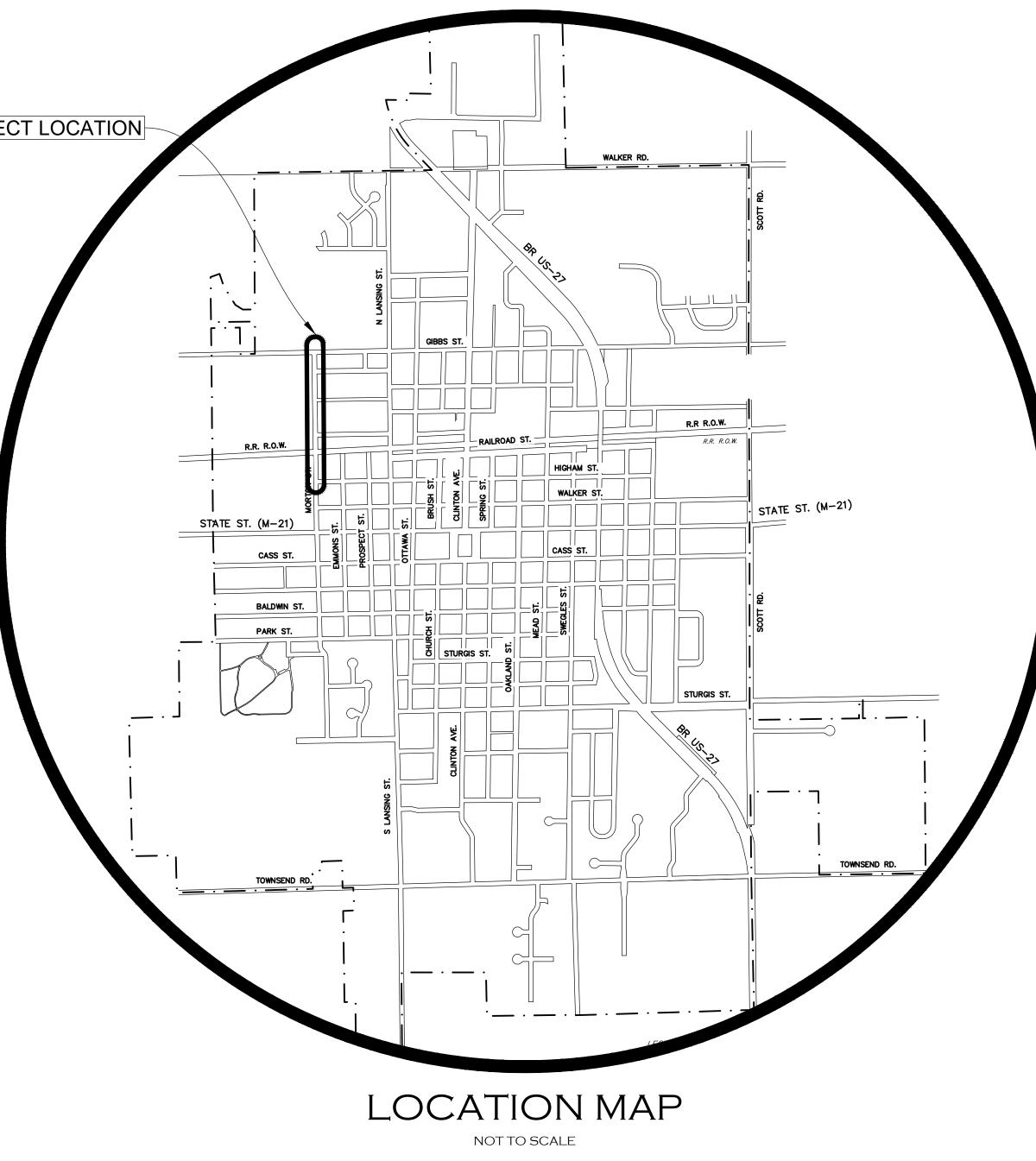
THE EXISTING UTILITIES LISTED BELOW AND SHOWN REPRESENT THE BEST INFORMATION AVAILABLE AS OBTAINED FROM SERVICE PROVIDER AND FIELD OBSERVATION. THIS INFORMATION DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO SATISFY HIMSELF AS TO THEIR ACCURACY OR OF HIS RESPONSIBILITY TO NOTIFY THE PROPER UTILITIES BEFORE COMMENCING WORK. THE FOLLOWING UTILITIES ARE LOCATED IN OR NEAR THE RIGHT OF WAY FOR THIS PROJECT.

NAME AND ADDRESS OF UTILITY	TYPE OF UTILITY	
Consumers Energy (Local Office)	Gas	
530 West Willow Street		
_ansing, MI 48909		PROJE
PH: 517-374-2375 CELL: 517-930-0879		TROOL
Doug Furman		
Consumers Energy (Local Office) 530 West Willow Street	Electric	
LANSING, MI 48909		
PH: 517-374-2329 CELL: 517-580-2049		
JACOB CHALUT		
JACOD CHALOT		
CHARTER COMMUNICATIONS	CABLE TELEVISION	
145 South Telegraph Road		
Monroe, MI 48161		
PH: 734-240-4015		
Mark Price		
Comlink	Fiber	
781 Hollway Drive		
HOLT, MI 48842		
PH: 517-742-4109		
Ryan Schaner		
-RONTIER COMMUNICATIONS	TELEPHONE	
943 WEST M-21		
Owosso, MI 48667		
PH: 989-723-0373		
Mark Stevens		
CITY OF ST. JOHNS	SANITARY SEWER &	
00 East State Street, Suite 1000	Water Main	
St. Johns, MI 48979		
PH: 989-224-8944		
JUSTIN SMITH		
CLINTON COUNTY DRAIN COMMISSION	STORM SEWER	
00 E STATE STREET, SUITE 2300		
St. Johns, MI 48879		
PH: 989-224-5160		
JON MORRISON		

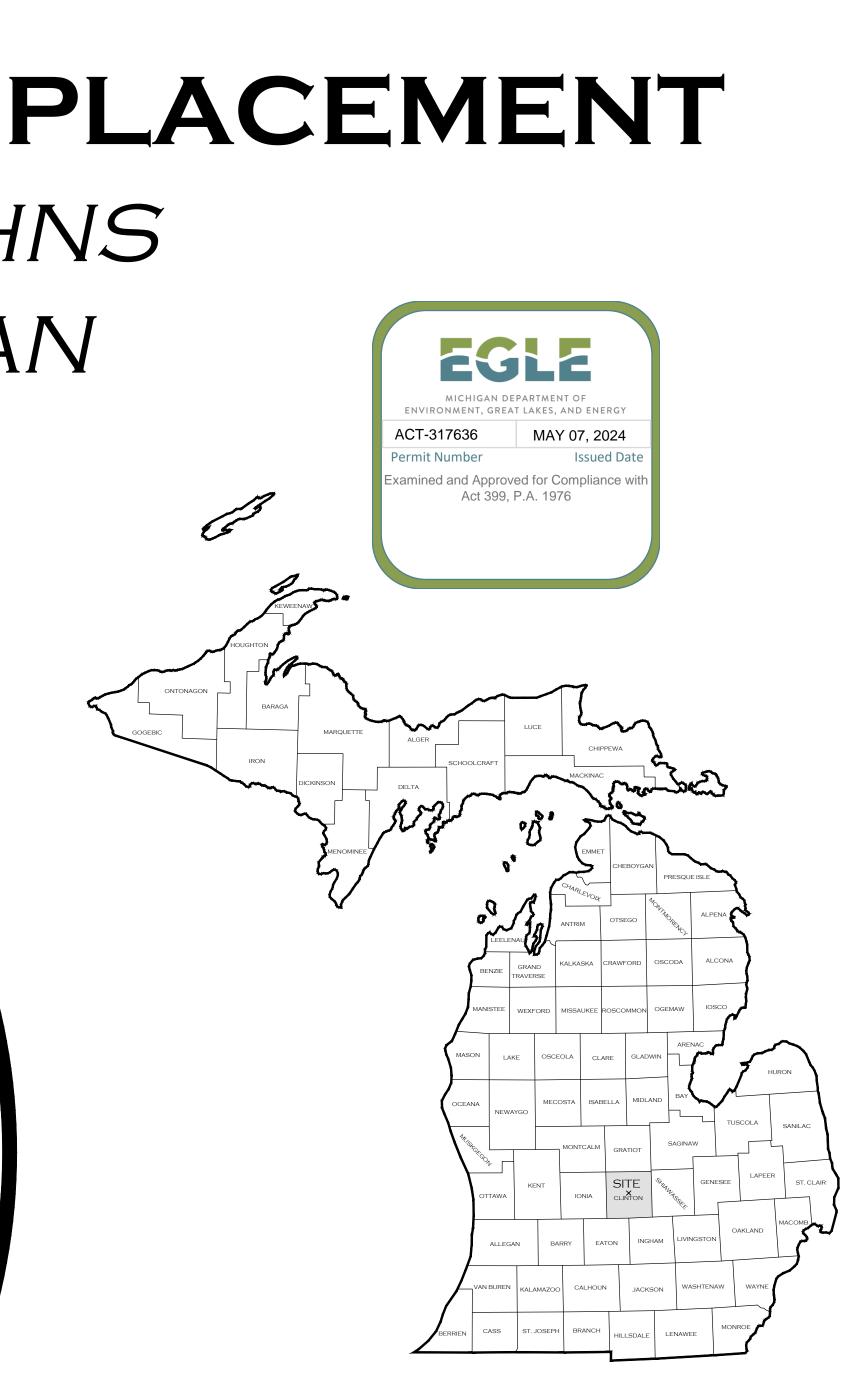
OWNERS OF PUBLIC UTILITIES WILL NOT BE REQUIRED TO MOVE POLES OR STRUCTURES THAT ARE NOT WITHIN GRADING OR STRUCTURE LIMITS IN ORDER TO FACILITATE THE OPERATION OF CONSTRUCTION EQUIPMENT, UNLESS IT IS DETERMINED BY THE ENGINEER THAT SUCH LINES OR STRUCTURES CONSTITUTE A HAZARD TO THE PUBLIC OR ARE EXTRA- ORDINARILY DANGEROUS TO THE CONTRACTOR'S OPERATIONS. (SEE SPECIAL PROVISIONS FOR UTILITY COORDINATION)

OWNER CONTACT INFORMATION CITY OF ST. JOHNS CONTACT: JUSTIN SMITH 100 E STATE STREET, SUITE 2900 ST. JOHNS, MICHIGAN 48879 PH: 517-224-8944 Ext. 235 Fx: 517-224-2204 EMAIL: JSMITH@STJOHNSMICH.COM





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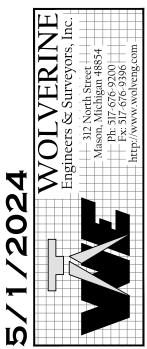


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# Sheet List Table

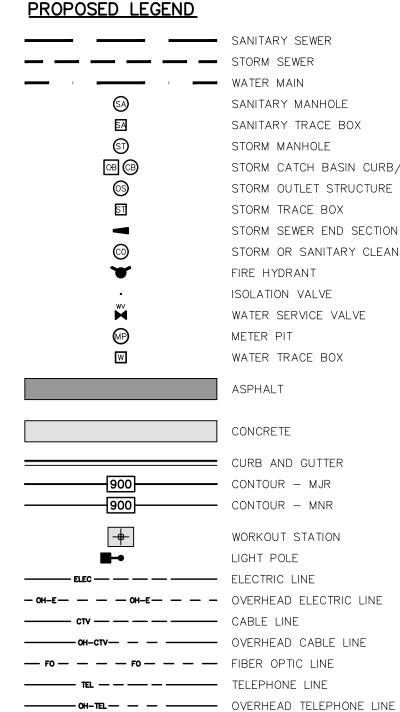
SHEET NUMBER SHEET TITLE

COVER ABBREVIATIONS GENERAL NOTES LEGEND NOTES AND SPECIFICATIONS DETAILS MORTON ST PLAN AND PROFILE MORTON ST PLAN AND PROFILE



"C" OF CITY ON HYDRANT, NW CORNER OF M-25 HWY AND PORTLAND STREETS			
ELEVATION= 605.95 ABBREVIATIONS		EXISTING LEGEND	
AB	AS-BUILT	900	CONTOUR - MJR
BIT	BITUMINOUS	<u> </u>	CONTOUR - MNR
BLK	BULK HEAD		SANITARY SEWER
ВМ	BENCH MARK		STORM SEWER
BOC	BACK OF CURB		WATER MAIN
СВ	CATCH BASIN	GAS GAS GAS GAS	GAS MAIN
CI	CAST IRON	OHU OHU OHU OHU	OVERHEAD UTILITY
CIP	CAST IN PLACE	сом	COMMUICATION LINE
CL	CENTER LINE		CHAIN LINK FENCE
CON	CONDUIT		WOOD FENCE
CONC	CONCRETE	-00	VINYL FENCE
DI	DUCTILE IRON		CURB
DIA	DIAMETER		ROW
EGL	EXISTING GROUND LEVEL	PARCEL-L-PARCEL-L-	PARCEL LINE
EL	ELEVATION	GOVT GOVT	GOVERNMENT LINE
EOP	EDGE OF PAVEMENT		CENTERLINE
EX	EXISTING		TREE LINE
FF	FINISHED FLOOR		
FOC	FACE ON CURB		STRUCTURE
HA	HYDRANT ASSEMBLY		
НМА	HOT MIX ASPHALT		ASPHALT
НҮД	HYDRANT		
LT	LEFT		CONCRETE
0:	OFFSET	<u></u>	
мн	MANHOLE	$\begin{array}{c} 80 \stackrel{\circ}{=} 40 \stackrel{\circ}{=} 70 \stackrel{\circ}{=} 50 \stackrel$	GRAVEL
PAV	PAVEMENT		
PR	PROPOSED	20202020202020202020202020202020202020	STONE
PSF	POUNDS PER SQUARE FOOT		
PSI	POUNDS PER SQUARE INCH		SURFACE WATER
PVC	POLYVINYL CHLORIDE		
FM	FORCE MAIN	<u>مەر مەر مەر مەر مەر مەر مەر مەر مەر مەر </u>	WETLANDS
REC	RECORD	$\frown$	
REC	RELOCATE	$\left( \begin{array}{c} \bullet \end{array} \right)$	DECIDUOUS TREE
REM	REMOVE		
RT	RIGHT		EVERGREEN TREE
S:	STATION		SHRUB
s. SAN	SANITARY		STUMP
SAN	STORM		
	TOP OF CONCRETE	SA SA	SANITARY MANHOLE
TOC		$\bigcirc$	SANITARY CLEAN OUT
TOP	TOP OF PIPE OR TOP OF PAVEMENT	SA	SANITARY TRACE BOX
TOW	TOP OF WALL OR TOP OF WALK	(T2)	STORM MANHOLE
WTR		$\odot$	STORM CLEAN OUT
ТОРО	TOPOGRAPHIC SURVEY	СВ	STORM CATCH BASIN-CUR
		(CB)	STORM CATCH BASIN-YAR
		$\triangleright$	STORM END SECTION
		E] ₩	STORM TRACE BOX
		¥ ×	HYDRANT
			WATER SERVICE VALVE
		8	WATER ISOLATION VALVE
			WATER MANHOLE
			WATER METER PIT
			WATER WELL
		W	WATER TRACE BOX
		ــــ	

#### REMOVALS LEGEND SAW CUT, INTERMEDIATE ·X·X·X·X·X·X·X·X·X·X·X·X·X·· CURB AND GUTTER, REM PAVT, REM ASPHALT PAVT, REM CONCRETE ABANDON **R** REMOVAL **`**(S) SAVE **S** SAWCUT REL RELOCATE REL B/O RELOCATE BY OTHERS PROTECT PROTECT EROSION CONTROL ITEM NUMBER (xx) (SEE STANDARD PLAN R-96 SERIES) ----- ss ----- ---- SLOPE STAKE LINE



# SANITARY MANHOLE SANITARY TRACE BOX STORM MANHOLE STORM CATCH BASIN CURB/YARD STORM OUTLET STRUCTURE STORM TRACE BOX STORM SEWER END SECTION STORM OR SANITARY CLEANOUT FIRE HYDRANT ISOLATION VALVE WATER SERVICE VALVE METER PIT WATER TRACE BOX ASPHALT CONCRETE

GENERAL	PLAN	NOTES:	

## EXISTING WATER MAINS, SANITARY SEWERS, STORM SEWERS, COMBINED SEWERS, ETC.:

THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITIES DURING ALL CONSTRUCTION ACTIVITIES. INSPECT ALL EXISTING SEWER PIPES ENCOUNTERED DURING CONSTRUCTION AND CONNECT TO APPROPRIATE SEWER AS DIRECTED BY THE ENGINEER.

## **MIOSHA:**

PERFORM ALL WORK UNDER THIS CONTRACT IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS, POLICIES, RULES, AND STANDARDS OF THE MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ACT (MIOSHA).

#### DUST CONTROL:

PROVIDE DUST CONTROL AS DIRECTED BY THE ENGINEER.

#### TREE PROTECTION:

DO NOT CUT ROOTS OR LIMBS OF ANY TREES WITHIN THE PROJECT LIMITS NOT BEING REMOVED UNLESS APPROVED BY THE MUNICIPALITY'S ARBORIST. PROVIDE MUNICIPALITY WITH 72 HOURS WRITTEN NOTICE TO COORDINATE WITH ARBORIST. PROCEED WITH WORK AFTER 72 HOURS IF ARBORIST IS UNRESPONSIVE.

#### EXISTING UTILITY CONFLICTS:

RELOCATE EXISTING BURIED UTILITY LINES THAT CONFLICT WITH NEW CONSTRUCTION. COORDINATE WITH ENGINEER AND SERVICE PROVIDER. PAYMENT FOR RELOCATING EXISTING UTILITY LINES IS INCLUDED IN RELATED ITEMS OF WORK.

#### UNDERGROUND UTILITY ACCURACY:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND FROM UTILITY COMPANY INFORMATION. THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

#### SIDEWALK REMOVAL:

EXACT LOCATIONS OF CONCRETE SIDEWALK TO BE REMOVED WILL BE DETERMINED IN THE FILED BY THE ENGINEER.

#### SANITARY SEWER, STORM SEWER, AND WATER SERVICES:

THE LOCATION OF EXISTING SERVICES IS APPROXIMATE. FIELD VERIFY TO DETERMINE THE ACTUAL LOCATION DURING CONSTRUCTION. PAYMENT FOR FIELD LOCATING SERVICES IS INCLUDED IN RELATED ITEMS OF WORK.

LIGHT POLE

GUY POLE

GUY WIRE

GAS VALVE

STREET SIGN

SECTION CORNER

MONUMENT BOX SET PROPERTY IRON

BENCHMARK

SOIL BORING

SATELLITE DISH

FOUND PROPERTY IRON

MAILBOX POST

TELEPHONE RISER

TELEPHONE MANHOLE

UTILITY POLE

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TR

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MB

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# SURVEY NOTES:

COORDINATE SYSTEM:
ZONE:
ELLISOID:
HORIZONTAL DATUM:
VERTICAL DATUM:
GEOID:
UNITS:

**BENCHMARKS:** 

MICHIGAN SOUTH 2113 GRS 80 NAD 83 (MSRN CORS96) NAVD 88 GEIOD 12B INTERNATIONAL FEET

STATE PLANE GRID

BM #1 ELEV. XXX.XX DESCRIPTION/LOCATION

# **GOVERNMENT CORNERS:**

SECTION CORNER XXXXXX

MAILENALS APPEARING HEREIN CONSILIULE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.	REVISION     DATE     DRAWN     DESCRIPTION       1     4/19/2024     TAP     EGLE REVIEW COMMENTS       1     4/19/2024     TAP     EGLE REVIEW COMMENTS       1     1     1     1       1     1     1     1	
	WOLVERINE         Engineers & Surveyors, Inc.         312 North Street         Mason, Michigan 48854         Ph: 517-676-9306         http://www.wolveng.com	
	MORTON STREET WATER MAIN REPLACEMENT CITY OF ST. JOHNS CLINTON COUNTY, MICHIGAN ABBREVIATIONS GENERAL NOTES LEGEND	
	APPROVED APPROVED CHECKED DBH CHECKED DBH DBH DBH CHECKED CHECKED DBH CHECKED CHECKED DBH CHECKED C	

# WATER MAIN SPECIFICATIONS

#### SCOPE OF THE WORK 1.

THIS WORK INCLUDES THE FURNISHING AND INSTALLING OF ALL PIPE, FITTINGS, FIRE HYDRANTS WITH VALVES, VALVE BOXES, AND VALVES, INCLUDING ALL CONNECTIONS TO EXISTING WATERMAINS AS SHOWN ON THE PLANS. PIPE IS SPECIFIED IN CLASSIFICATIONS SPECIFIED BY THE AMERICAN WATER WORKS ASSOCIATION, HEREIN DESIGNATED AS AWWA. ALL AWWA SPECIFICATIONS REFERRED TO HEREIN SHALL BE THE MOST RECENT VERSION OF THAT SPECIFICATION.

#### <u>PIPE MATERIALS</u> 2.

JOINTS SHALL BE OF THE "SLIP ON" TYPE EXCEPT FOR SPECIAL FITTINGS, WHERE MECHANICAL JOINTS MAY BE USED. SLIP ON JOINTS SHALL CONSIST OF A BELL PROVIDED WITH A RECESS TO RECEIVE A CIRCULAR MOLDED RUBBER GASKET TO EFFECT THE JOINT SEAL. A RUBBER GASKET AND SUFFICIENT LUBRICANT TO ASSEMBLE THE JOINT SHALL BE FURNISHED WITH EACH JOINT. THE LUBRICANT SHALL HAVE NO DELETERIOUS EFFECT UPON THE COLOR, TASTE, OR ODOR OF POTABLE WATER AND SHALL NOT BE CORROSIVE TO THE PIPE OR GASKET. PIPE FURNISHED WITH SLIP ON TYPE JOINTS SHALL BE EQUAL IN STRENGTH AND LEAK TIGHTNESS TO PIPE FURNISHED WITH MECHANICAL JOINTS AS SPECIFIED ABOVE WHEN INSTALLED UNDER IDENTICAL CONDITIONS AND SHALL MEET ALL OTHER REQUIREMENTS OF THESE SPECIFICATIONS. SLIP ON TYPE JOINTS TO BE APPROVED BY ENGINEER.

#### ASTM INTERNATIONAL ASTM D 1784 STANDARD SPECIFICATION FOR RIGID PVC COMPOUNDS AND CHLORINATED PVC COMPOUNDS STANDARD TEST METHOD FOR OBTAINING HYDROSTATIC ASTM D 2837 DESIGN BASIS FOR THERMOPLASTIC PIPE MATERIALS ASTM D 3139 STANDARD SPECIFICATION FOR JOINTS FOR PLASTIC PRESSURE PIPES USING FLEXIBLE ELASTOMERIC SEALS STANDARD SPECIFICATION FOR ELASTOMERIC SEALS ASTM F 477 (GASKETS) FOR JOINING PLASTIC PIPE AMERICAN WATER WORKS ASSOCIATION (AWWA)

STANDARD FOR POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AWWA C900 AND FABRICATED FITTINGS, 4 IN. THROUGH 12 IN. (100 MM THROUGH 300 MM) FOR WATER DISTRIBUTION

NSF INTERNATIONAL NSF 61

C900

в.

DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS

### MATERIALS

PIPE SHALL BE MADE FROM UNPLASTICIZED PVC COMPOUNDS HAVING A MINIMUM CELL CLASSIFICATION OF 12454 AS DEFINED IN ASTM D 1784. THE COMPOUND SHALL QUALIFY FOR HYDROSTATIC DESIGN BASIS (HDB) OF 4000 PSI FOR WATER AT 73.4°F, IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D 2837.

#### DIMENSIONS

NOMINAL OUTSIDE DIAMETERS AND WALL THICKNESSES OF RESTRAINED JOIN PIPE SHALL CONFORM TO THE REQUIREMENTS OF AWWA C900. INTEGRAL BELL JOINT PIPE SHALL BE FURNISHED IN 4", 6", 8", 10" AND 12" SIZES CLASS 200(DR14). PIPE SHALL BE FURNISHED IN STANDARD LENGTHS OF 20 FEET.

### JOINTS

PIPE SHALL INCORPORATE A FORMED BELL COMPLETE WITH A SINGLE RUBBER GASKET CONFORMING TO ASTM F477. JOINTS SHALL BE DESIGNED TO MEET THE ZERO LEAKAGE TEST REQUIREMENTS OF ASTM D 3139. <u>WORKMANSHIP</u>

PIPE SHALL BE HOMOGENEOUS THROUGHOUT AND FREE FROM VOIDS, CRACKS, INCLUSIONS AND OTHER DEFECTS, AND SHALL BE AS UNIFORM AS COMMERCIALLY PRACTICABLE IN COLOR, DENSITY AND OTHER PHYSICAL CHARACTERISTICS.

PIPE SHALL BE LEGIBLY AND PERMANENTLY MARKED IN INK WITH THE FOLLOWING MINIMUM INFORMATION

- NOMINAL SIZE (FOR EXAMPLE, 4")
- PVC
- DIMENSION RATIO (FOR EXAMPLE, DR25)
- AWWA PRESSURE CLASS (FOR EXAMPLE, PC 150)
- ANSI/AWWA C900-97 (OR LATEST EDITION)
- MANUFACTURER'S NAME OR TRADEMARK AND PRODUCTION RECORD CODE
- SEAL (MARK) OF THE TESTING AGENCY VERIFYING THE SUITABILITY OF THE PIPE MATERIAL FOR POTABLE WATER SERVICE

#### FITTINGS

C.

FITTINGS SHALL CONFORM TO AWWA C104/A21.53 SPECIFICATIONS FOR DUCTILE-IRON COMPACT FITTINGS. 3" THROUGH 12". FOR WATER AND OTHER LIQUIDS. OR AWWA C110/A21.10 SPECIFICATIONS FOR DUCTILE IRON AND GRAY-IRON FITTINGS, 3" THROUGH 48", FOR WATER AND OTHER LIQUIDS.

ALL PIPES, PIPING FITTINGS, PLUMBING FITTINGS, AND FIXTURES THAT ARE USED FOR D. POTABLE WATER MUST COMPLY WITH THE LEAD-FREE REQUIREMENT AND MUST BEAR THE MARK NSF/ANSI STANDARD 61, NSF/ANSI 61 - ANNEX G, NSF/ANSI 14 AND/OR NSF 372.

## TRACER WIRE

ALL UNDERGROUND PIPING (WATER MAIN) SHALL HAVE COPPERHEAD INDUSTRIES #12 SOLID CCS HIGH STRENGTH - BREAK LOAD 452 LBS. (COLOR BLUE). OR AN ENGINEER APPROVED FOUAL. TRACER WIRE INSTALLED WITH AND TAPED TO THE NEW PIPE EVERY FIVE FEET. THIS WIRE SHALL EXTEND FROM THE NEW WATER MAIN CONNECTION POINT TO THE NEW WATER MAIN TERMINATION POINT. THE TRACER WIRE SHALL TERMINATE IN A SNAKEPIT MAGNETIZED TRACER BOX, PRODUCT # LD14\*TP (COLOR BLUE), OR ENGINEER APPROVED EQUAL, (IN A VISIBLE LOCATION) ABOVE GROUND AT ALL NEW HYDRANT SNAKEBITE DRYCONN DIRECT BURY LUG, PRODUCT # 3WB-01 (COLOR BLUE). OR ENGINEER APPROVED EQUAL, SHALL BE INSTALLED TO CONNECT WATER TRACER WIRE. WATER MAIN WILL NOT BE ACCEPTED UNTIL THE TRACER WIRE HAS BEEN LOCATED AND TESTED.

## VALVES & BOXES

VALVES SHALL MEET THE REQUIREMENTS OF AWWA C515 & C153 GATE VALVES WITH NON-RISING STEM WITH "O" RING SEAL (0-12"). ALL VALVES SHALL AMERICAN FLOW CONTROL, WITH STAINLESS STEEL STEMS AND SHALL OPEN LEFT.. CAST IRON BOXES SHALL BE PROVIDED FOR ALL VALVES. VALVE BOXES SHALL BE MUELLER H-10357 - 3 PIECE.

#### 4. <u>LAYING PIPE</u>

MANUFACTURER'S SPECIFICATIONS.

PIPE SHALL BE LAID TO LINE AND GRADE AND SHALL HAVE BEARING OVER ITS ENTIRE LENGTH EXCEPT AT JOINTS WHERE JOINT HOLES SHALL BE OF SUCH SIZE AS TO GIVE ADEQUATE ROOM FOR WORKING. DEPTH OF EXCAVATION SHALL BE SUCH AS TO GIVE AT LEAST FIVE FEET OF COVER OVER THE PIPE EXCEPT WHERE PIPE IS BEING LAID IN FUTURE STREETS, THE DEPTH OF EXCAVATION SHALL BE SUFFICIENT TO PROVIDE A MINIMUM OF FIVE FEET OF COVER BELOW ESTABLISHED GRADES AS INDICATED ON THE PLANS.

#### <u>JOINTS</u> 5. SLIP-ON JOINTS SHALL BE USED AND INSTALLED IN STRICT ACCORDANCE WITH THE

6. THRUST BLOCKS

#### AT 28 DAYS, PLACED BETWEEN THE PIPE AND UNDISTURBED EARTH OF THE TRENCH WALL THRUST BLOCKS SHALL BE PLACED AT ALL BENDS AND FITTINGS. CONCRETE SHALL EXTEND FROM THE BOTTOM OF THE TRENCH TO THE TOP OF THE PIPE WITHIN THE LIMITS OF LAYING LENGTH OF THE FITTING.

THRUST BLOCKS SHALL BE OF CONCRETE HAVING A COMPRESSIVE STRENGTH OF 2 000 POUNDS

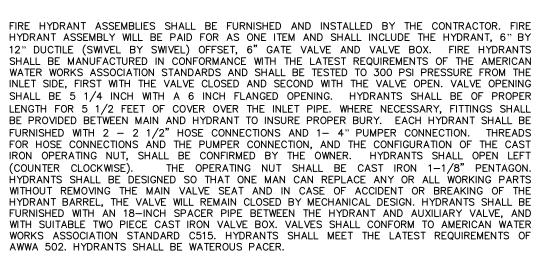
- 7. JOINT RESTRAINT GASKETS OR MECHANICAL JOINT RESTRAINTS
- WHERE SOIL OR INSTALLATION CONDITIONS PRECLUDE THE USE OF CONCRETE THRUST BLOCKS AS

#### GASKET SYSTEM IN LIEU OF THE THRUST BLOCK ON DUCTILE IRON PIPE. THE GASKET SHALL BE COMPATIBLE TO THE PIPE SUPPLIED AND FURNISHED BY THE PIPE MANUFACTURER. THE GASKET SHALL BE CAPABLE OF JOINT RESTRAINT FOR PIPE UNDER WORKING PRESSURES UP TO 250 PSI. THE GASKET SHALL BE CAPABLE OF JOINT RESTRAINT FOR PIPE UNDER WORKING PRESSURES UF O 250 PSI. PRIOR TO INSTALLATION OF THE JOINT RESTRAINT GASKET SYSTEM, THE SUPPLIER SHALL PROVIDE ASSISTANCE TO THE CONTRACTOR AND ENGINEER IN CALCULATING THE REQUIRED LENGTH OF PIPE TO BE RESTRAINED AT THRUST LOCATIONS SUCH AS FITTINGS AND DEAD ENDS. JOINT RESTRAINT GASKETS SHALL BE SIMILAR AND/OR EQUAL TO U.S. PIPE'S FIELD LOK (TM) GASKET SYSTEM. PAYMENT SHALL BE INCIDENTAL TO THE COST OF THE PIPE.

#### 8. FITTINGS FOR WATERMAIN CONSTRUCTION

AND TURNS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CAST IRON PIPE AND NO PAYMENT WILL BE ALLOWED THEREFORE.

9. <u>FIRE HYDRANTS</u>



#### 10. WATER SERVICE LINES

ALL SERVICES SHALL BE INSTALLED UNDER THE SUPERVISION OF THE VILLAGE ENGINEER OR QUALIFIED VILLAGE AGENT. MATERIALS FOR SERVICE LEADS SHALL BE AS FOLLOWS:

A. COF	RPORATION STOP,	CURB STOP, AND CURB BOX:
1" CORPORATION VALV	E	FORD CORPORATION VALVE 1"-F-1000-4-Q-NL OR ENGINEER APPROVED EQUAL.
1" CURB VALVE		FORD CURB VALVE 1"-B43-4-44-M-NL OR ENGINEER APPROVED EQUAL.
1" UNION COUPLING		FORD THREE PART UNION 1"-C66-44-Q-NL OR ENGINEER APPROVED EQUAL.
1" CURB VALVE BOX		FORD CURB BOX EXTENSION EM2-55-66-36R-TW OR ENGINEER APPROVED EQUAL.
1-1∕2" CORPORATION V	ALVE	FORD CORPORATION VALVE 1-½"-F1000-6-Q-NL OR ENGINEER APPROVED EQUAL.
1−½" CURB VALVE		FORD CURB VALVE 1–½"–B43–6–66–M–NL OR ENGINEER APPROVED EQUAL.
1−½" UNION COUPLING		FORD THREE PART UNION 1-½"-C66-66-Q-NL OR ENGINEER APPROVED EQUAL.
1−½" CURB VALVE BO	x	FORD CURB BOX EXTENSION EM2-55-66-36R-TW OR ENGINEER APPROVED EQUAL.
2" CORPORATION VALV	Έ	FORD CORPORATION VALVE 2"-F1000-7-Q-NL OR ENGINEER APPROVED EQUAL.
2" CURB VALVE		FORD CURB VALVE 2"-B43-7-77-M-NL OR ENGINEER APPROVED EQUAL.
2" UNION COUPLING		FORD THREE PART UNION 2"—C66—77—Q—NL OR ENGINEER APPROVED EQUAL.
2" CURB VALVE BOX		FORD CURB BOX EXTENSION EM2-55-66-36R-TW OR ENGINEER APPROVED EQUAL.

#### DEVIATION FROM THE ABOVE INCLUDING LARGER SERVICE LEADS SHALL BE AS APPROVED BY THE VILLAGE ENGINEER OR QUALIFIED VILLAGE AGENT.

# SERVICE PIPE:

REQUIRED WHEN U							
С.	FITTINGS	SHAL	L BE C	OMPRES	SION	TYPE	OR
D. COPPER.	LEAD SE	RVICE	PIPING	SHALL	BE	COMPLI	ETE

#### BACKFILLING 11.

ALIGNMENT, THE 1 INCHES ABOVE TH TO 95% MAXIMUN REMAINING UNFILL	ER LINE HAS BEEN PROPERLY POSITIONE IRENCH SHALL BE BACKFILLED FROM THE SU E TOP OF THE PIPE WITH MDOT CLASS II M UNIT WEIGHT BY MODIFIED PROCTOR, A ED PORTION OF THE TRENCH SHALL BE IN IBED METHODS AS REQUIRED IN THE SPECIA
(a)	CLASS A BACKFILL——BACKFILLING UNDER TH FURNISHING AND PLACING MDOT CLASS II LAYERS, COMPACTED TO 95% MAXIMUM UNI LATEST A.A.S.H.T.O. METHODS, FOR THE CONTRACTOR SHALL BE RESPONSIBLE F BACKFILLING. UNLESS OTHERWISE PROVIDED COST OF FURNISHING, PLACING AND COMF MATERIAL SHALL BE INCLUDED IN THE UNIT AND NO ADDITIONAL PAYMENT WILL BE MATERIAL SHALL BE HAULED FROM TH ACCORDANCE WITH THE REQUIREMENTS EXCAVATED MATERIALS" UNDER THE STANDA
(b)	CLASS B BACKFILLINGBACKFILLING UNDER

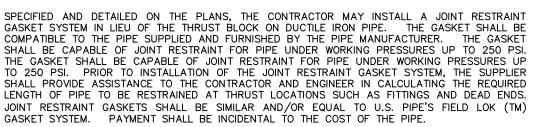
OF BACKFILLING THE TRENCH FROM 12 INCHES ABOVE THE TOP OF THE PIPE TO THE TOP OF THE TRENCH, WITH SELECTED MATERIAL EXCAVATED FROM THI TRENCH, COMPACTED WITH HEAVY CONSTRUCTION EQUIPMENT IN LAYERS NOT EXCEEDING 24 INCHES IN DEPTH. BACKFILLING SHALL BE DONE BY RAMPING THE BACKFILL DOWN THE TRENCH TO PROVIDE COMPACTION BY THE HEAVY EQUIPMENT AT ALL LEVELS OF THE BACKFILL AS REQUIRED BY THE ENGINEER. WHERE TRENCHES ARE TOO NARROW IN WIDTH TO PROVIDE ACCESS BY HEAVY EQUIPMENT, OTHER METHODS AND EQUIPMENT SHALL BE USED TO ACHIEVE TH REQUIRED DEGREE OF COMPACTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PIPE DURING BACKFILLING.

#### STONES EXCEEDING SIX (6) INCHES IN DIAMETER, LOGS, STUMPS, AND OTHER DEBRIS SHALL NOT BE ALLOWED IN THE BACKFILL MATERIAL. MUCK OR OTHER UNSTABLE ORGANIC SOILS WHICH MAY BE ENCOUNTERED IN EXCAVATION SHALL BE HAULED AND DISPOSED OF AND THE CONTRACTOR SHALL FURNISH SUFFICIENT APPROVED MATERIAL TO COMPLETE THE BACKFILL AS REQUIRED. SURPLUS EXCAVATED MATERIAL SHALL BE HAULED AND DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS FOR "DISPOSITION OF SURPLUS EXCAVATED MATERIALS" UNDER THE STANDARD PROJECT REQUIREMENTS.

GRANULAR MATERIAL WHICH IS ENCOUNTERED IN THE EXCAVATED MATERIAL MAY BE USED FOR THE REQUIRED MDOT CLASS II GRANULAR MATERIAL IF APPROVED BY THE ENGINEER. THE USE OF SUCH MATERIAL SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL OF THE ENGINEER.

BE AS REQUIRED UNDER THE SPECIAL CONDITIONS SECTION OF THESE SPECIFICATIONS OR AS REQUIRED ON THE PLANS.

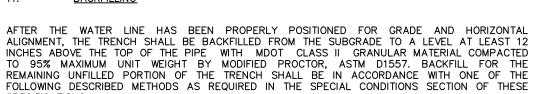
ANY PIPE OR STRUCTURES WHICH SHALL BE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

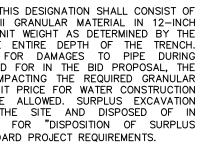


THE COST OF ALL FITTINGS FOR WATERMAIN CONSTRUCTION, INCLUDING ADAPTERS, TEES, ELBOWS

ASTM D2737 SDR-9 POLYETHYLENE (PE) TUBING. SPLICING OF TUBING IS PROHIBITED. LINERS ARE NSTALLED WITH TRACER WIRE.

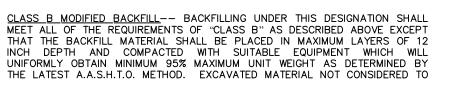
> ENGINEER APPROVED EQUAL. ELY REMOVED AND REPLACED WITH





IDER THIS DESIGNATION SHALL CONSIST

REQUIREMENTS FOR RESTORATION OF THE SURFACE AREA OF TRENCHES SHALL



CONNECTIONS TO EXISTING WATER LINES 12.

THE CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING WATER LINES AS SHOWN ON CONSTRUCTION DRAWINGS. THE CONTRACTOR SHALL INCLUDE THE COST OF SAID CONNECTIONS IN HIS UNIT PRICE BID FOR WATERMAIN CONSTRUCTION AND NO EXTRA PAYMENT WILL BE ALLOWED FOR CONNECTIONS TO EXISTING WATER LINES, UNLESS OTHERWISE PROVIDED FOR IN THE BID PROPOSAL.

ALL NEW WATER SYSTEM MAINS SHALL BE CONSTRUCTED, BACKFILLED, PRESSURE TESTED, CHLORINATED AND APPROVED BY THE ENGINEER OR OWNER, AND WATER TESTS SHALL BE TAKEN AND APPROVED FOR POTABLE USE BY THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) PRIOR TO CONNECTING THE NEW SYSTEM MAINS TO EXISTING WATER DISTRIBUTION MAINS. À TEMPORARY CONNECTION MAY BE MADE FOR FILLING, CHLORINATING, AND TESTING NEW MAINS

WHERE WATERMAIN CONSTRUCTION UNDER THIS CONTRACT REQUIRES SHUTTING OFF WATER SUPPLY IN EXISTING MAINS SUPPLYING RESIDENTS, THE CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO THE OWNER AND TO ALL RESIDENTS WHO WILL BE AFFECTED. WATER SUPPLY SHUTOFF SHALL BE LIMITED TO A PERIOD OF NOT LONGER THAN FOUR (4) HOURS AND THIS PERIOD SHALL BE SELECTED FOR THE TIME OF DAY WHICH WILL LEAST AFFECT THE RESIDENTS. WATERMAINS SHALL NOT BE SHUT-OFF UNTIL APPROVED BY THE OWNER. THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN AN ADEQUATE WATER SUPPLY AT ALL TIMES (EXCEPT AS DESCRIBED ABOVE FOR BRIEF PERIODS) TO ALL RESIDENTS ADJACENT TO THE PROJECT AND CHANGE OVER TO NEW MAINS OR SERVICES SHALL BE COORDINATED TO ELIMINATE ANY LONG PERIODS FOR RESIDENTS WITHOUT WATER. NEW WATER MAINS SHALL NOT BE CONNECTED TO THE EXISTING WATER DISTRIBUTION SYSTEM MAINS UNTIL ALL TESTING, STERILIZATION AND WATER TESTS HAVE BEEN APPROVED BY THE ENGINEER OR OWNER AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY.

13. DISINFECTION OF MAINS

MAINS SHALL BE DISINFECTED IN CONJUNCTION WITH TESTING AND AS SPECIFIED AWWA C 651 CURRENT EDITION. THE CHLORINATED WATER SHALL REMAIN IN THE MAIN UNTIL CONSTRUCTION IS COMPLETED AND THE MAIN IS READY FOR SERVICE, AT WHICH TIME THE MAIN SHALL BE FLUSHED UNTIL THE CHLORINE RESIDUAL IS REDUCED TO 0.5 PPM. FOLLOWING FLUSHING. THE OWNER SHALL OBTAIN A MINIMUM OF TWO CONSECUTIVE SAMPLES, AT 24 HOUR INTERVALS, OF WATER FROM HE CHLORINATED MAIN FOR BACTERIAL EXAMINATION. IF SAID SAMPLES ARE NOT FREE OF COLIFORM BACTERIA, THE CONTRACTOR SHALL TAKE SUCH MEASURES AS ARE NECESSARY TO ASSURE THAT THE MAIN IS PROPERLY AND FULLY STERILIZED, AND FREE OF COLIFORM BACTERIA. THE CONTRACTOR SHALL FURNISH ALL CHLORINE FOR STERILIZATION AND PERFORM ALL LABOR AND FURNISH ALL EQUIPMENT FOR THIS WORK. THE OWNER SHALL FURNISH THE WATER.

<u>TESTING</u> 14.

EACH SECTION OF COMPLETED MAIN SHALL BE PRESSURE TESTED AS REQUIRED BY AWWA C605 (PVC/PVCO), CURRENT EDITION.

EACH SECTION OF COMPLETED MAIN SHALL BE DISINFECTED AND BACTERIOLOGICAL TESTED AS REQUIRED BY AWWA C651 (PVC/PVCO), CURRENT EDITION.

TESTING SHALL BE BETWEEN VALVES OR IN OTHER SUCH MANNER AS TO ASSURE THAT THE HLORINATED WATER USED FOR TESTING AND STERILIZATION SHALL NOT BE LOST. IF A HYDRANT S WITHIN THAT SECTION OF MAIN BEING TESTED, THE TEST SHALL INCLUDE THE FIRE HYDRANT. THE CONTRACTOR SHALL FURNISH ALL PIPING, BULKHEADS, PUMPS, GAUGES AND OTHER EQUIPMENT REQUIRED TO CARRY OUT THE TESTS. UPON COMPLETION OF ALL TESTING AND ACCEPTANCE OF THE MAIN, THE CONTRACTOR SHALL VERIFY THAT ALL MAIN LINE AND HYDRANT VALVES ARE OPEN.

PROPER TECHNIQUES SHALL BE FOLLOWED DURING CONSTRUCTION TO KEEP WATER MAINS CLEAN AND DRY. NEW WATER MAINS SHALL BE FLUSHED THOROUGHLY BEFORE DISINFECTION. DISINFECTION OF NEW WATER MAINS IS REQUIRED. BEFORE PLACING A NEW WATER MAIN IN SERVICE, ALL OF THE FOLLOWING SHALL OCCUR:

BEFORE COLLECTION OF EACH BACTERIOLOGIC SAMPLE, HEAVILY CHLORINATED WATER SHALL BE FLUSHED AND NEUTRALIZED FROM THE MAIN AND APPURTENANCES UNTIL THE CHLORINE MEASUREMENTS IN THE WATER LEAVING THE MAIN IS ABSENT OR NO HIGHER THAN THAT NORMALLY MAINTAINED IN THE DISTRIBUTION SYSTEM. HEAVILY CHLORINATED WATER SHALL BE NEUTRALIZED IN ACCORDANCE WITH AWWA SPECIFICATIONS. CARE MUST BE EXERCISED WHEN DISPOSING OF WATER WITH EXCESSIVE CHLORINE RESIDUALS. DISPOSAL OF CHLORINATED WATER INTO STORM SEWERS WITHOUT PRIOR NEUTRALIZATION OF THE CHLORINE RESIDUAL MUST BE AVOIDED IF RESIDUAL CHORINE WILL STILL BE PRESENT WHEN THE WATER DIRECTLY OR INDIRECTLY REACHES A STREAM, RIVER OR LAKE.

NEUTRALIZATION OF THE CHLORINE RESIDUAL REMAINING IN THE WATER CAN BE ACCOMPLISHED BY APPLICATION OF A DE-CHLORINATION CHEMICAL IN THE HIGHLY CHLORINATED WATER IN A TEMPORARY RETENTION POND OR CONTAINER. TYPICAL DE-CHLORINATION CHEMICALS EMPLOYED ARE SULFUR DIOXIDE, SODIUM BISULFITE, SODIUM SULFITE AND SODIUM THIOSULFATE.

NOT FEWER THAN 2 CONSECUTIVE WATER SAMPLES FOR BACTERIOLOGICAL ANALYSIS SHALL BE COLLECTED 24 HOURS APART UNLESS AN ALTERNATE INTERVAL IS APPROVED BY THE EGLE.

<u>CLEANUP</u> 16.

CLEANUP SHALL BE IN COORDINATION WITH THE LOCAL STREET, CONTAMINATION CLEANUP AND BUILDING RESTORATION PROJECTS OCCURRING AT THE SAME TIME AS THIS WATER MAIN IMPROVEMENTS PROJECT.

17. MEASUREMENT FOR PAYMENT FOR WATERMAIN CONSTRUCTION

WHEN SET FORTH IN THE BID PROPOSAL, THE FOLLOWING METHODS SHALL BE USED TO ESTABLISH PAYMENT FOR WORK COMPLETED AND ACCEPTED UNDER THIS CONTRACT. WHEN THE FOLLOWING ITEMS ARE PART OF THE PROJECT AND NOT SET FORTH IN THE BID PROPOSAL, THEY SHALL BE DEEMED INCLUDED WITHIN OTHER ITEMS OF WORK.

WATERMAINS -- WATERMAINS WILL BE PAID FOR AT THE UNIT PRICE BID TIMES THE ACTUAL NUMBER FEET CONSTRUCTED. UNIT PRICE SHALL INCLUDE ALL FITTINGS AND THRUST BLOCKS.

HYDRANTS--PAYMENT WILL BE MADE FOR THE NUMBER OF UNITS INSTALLED TIMES THE UNIT PRICE BID FOR EACH HYDRANT. UNIT PRICE BID FOR COMPLETE VALVED HYDRANT ASSEMBLY SHALL INCLUDE HYDRANT, SPOOL (1' MINIMUM), 6" GATE VALVE WITH VALVE BOX AND CONNECTING TEE.

VALVES IN BOXES -- PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH SIZE VALVE TIMES THE ACTUAL NUMBER OF VALVES FURNISHED AND INSTALLED. UNIT PRICE SHALL INCLUDE CAST IRON BOX INSTALLED WITH VALVE.

COPPER SERVICES -- PAYMENT FOR SERVICES SHALL BE PAID AT THE UNIT PRICE BID TIMES THE ACTUAL NUMBER OF FEET CONSTRUCTED. PAYMENT FOR TAPING, CORPORATION COCKS, CURB STOPS, CURB BOXES AND FITTINGS TO BE INCLUDED IN THE UNIT PRICE BID PER FOOT

CONNECTING NEW WATERMAINS TO EXISTING WATERMAINS -- PAYMENT WILL BE MADE FOR EACH NEW MAIN AS BID IN THE PROPOSAL. PRICE SHALL INCLUDE ALL FITTINGS AND LABOR REQUIRED FOR THE COMPLETE CONNECTION. COST OF CONNECTIONS WHEN NOT BID SEPARATELY IN THE PROPOSAL SHALL BE CONSIDERED INCIDENTAL TO NEW WATERMAIN CONSTRUCTION.

NEW WATER SERVICE SHUTOFF VALVES (CURB STOPS) -- WHEN BID SEPARATELY IN THE PROPOSAL, SHUTOFF VALVES WILL BE PAID FOR AT UNIT PRICE EACH TIMES THE ACTUAL NUMBER OF SHUTOFF VALVES INSTALLED.

RECONNECTING EXISTING WATER SERVICES TO EXISTING OR NEW MAINS--PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH RECONNECTION TIMES THE ACTUAL NUMBER OF RECONNECTIONS MADE. PRICE SHALL INCLUDE ALL FITTINGS INCLUDING CORPORATION COCK OF PROPER SIZE AND ALL LABOR FOR COMPLETE RECONNECTION.

NEW WATER SERVICE LINES (RESIDENTIAL OR COMMERCIAL) -- PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH SIZE AND MATERIAL, TIMES THE ACTUAL NUMBER OF UNITS CONSTRUCTED.

7.

# **GENERAL NOTES**

PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES.

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF THE LOCAL GOVERNING AUTHORITY.

THE LOCATION OF THE EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON MISS DIG MARKINGS OR ABOVE GROUND UTILITIES LOCATED IN THE FIELD OR PLANS MADE AVAILABLE BY VARIOUS UTILITY PROVIDERS. WOLVERINE ENGINEERS AND SURVEYORS, INC. MAKES NO WARRANTIES AS TO THE ACCURACY OR COMPLETENESS OF UTILITY INFORMATION PROVIDED BY VARIOUS UTILITY COMPANIES. UTILITIES NOT VISIBLE AT THE TIME OF THE FIELD SURVEY HAVE NOT BEEN SHOWN AND WOLVERINE ENGINEERS AND SURVEYORS, INC. TAKES NO RESPONSIBILITY OF THESE UNKNOWN UTILITIES. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION AND NO ADDITIONAL COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR DAMAGE AND REPAIR TO THESE FACILITIES CAUSED BY HIS WORK FORCE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 53 OF 1974.

ALL DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.

MAINTAIN A MINIMUM OF 18" VERTICAL AND 10' HORIZONTAL SEPARATION BETWEEN THE WATER MAIN AND SEWER LINES.

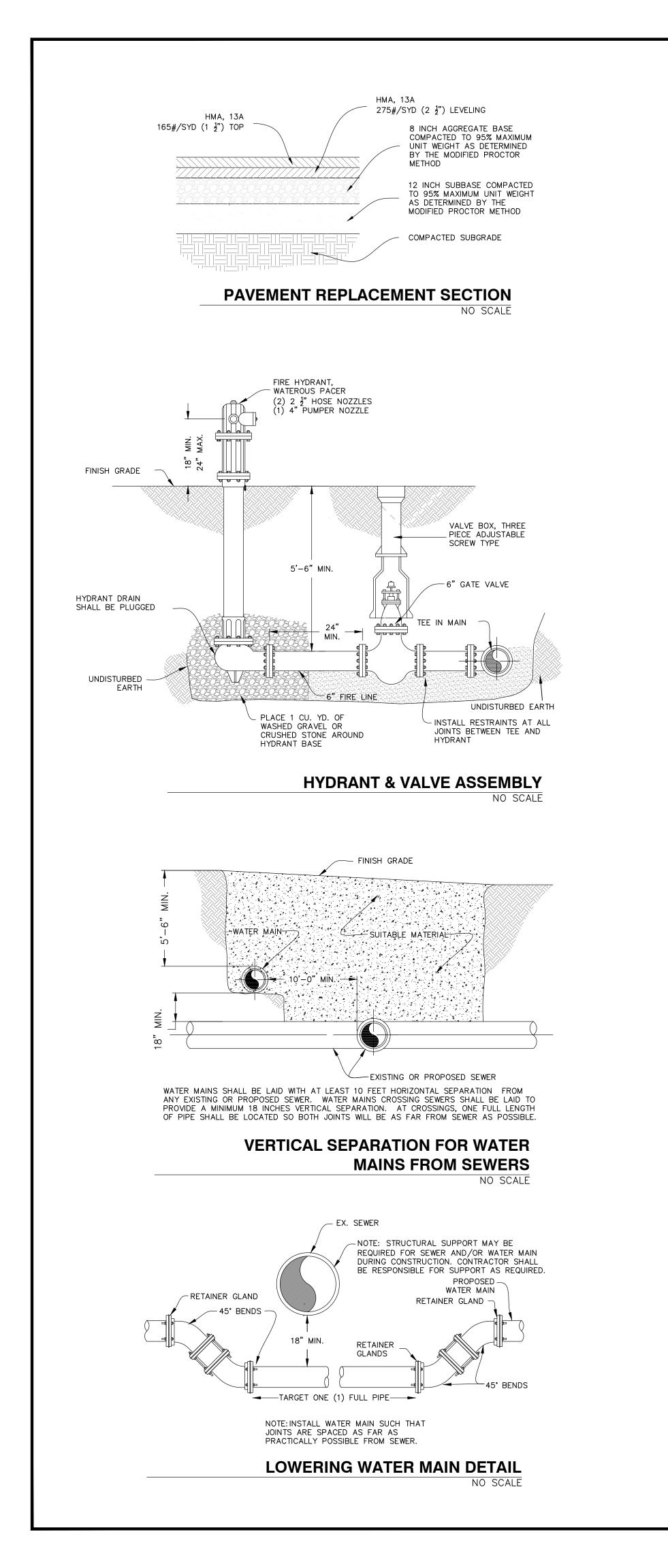
UTILITY CONNECTIONS MUST BE WITNESSED BY THE CITY OF ST. JOHNS WATER DEPARTMENT AND SHALL BE IN ACCORDANCE WITH AWWA STANDARDS. A MINIMUM 24 HOUR NOTICE IS REQUIRED.

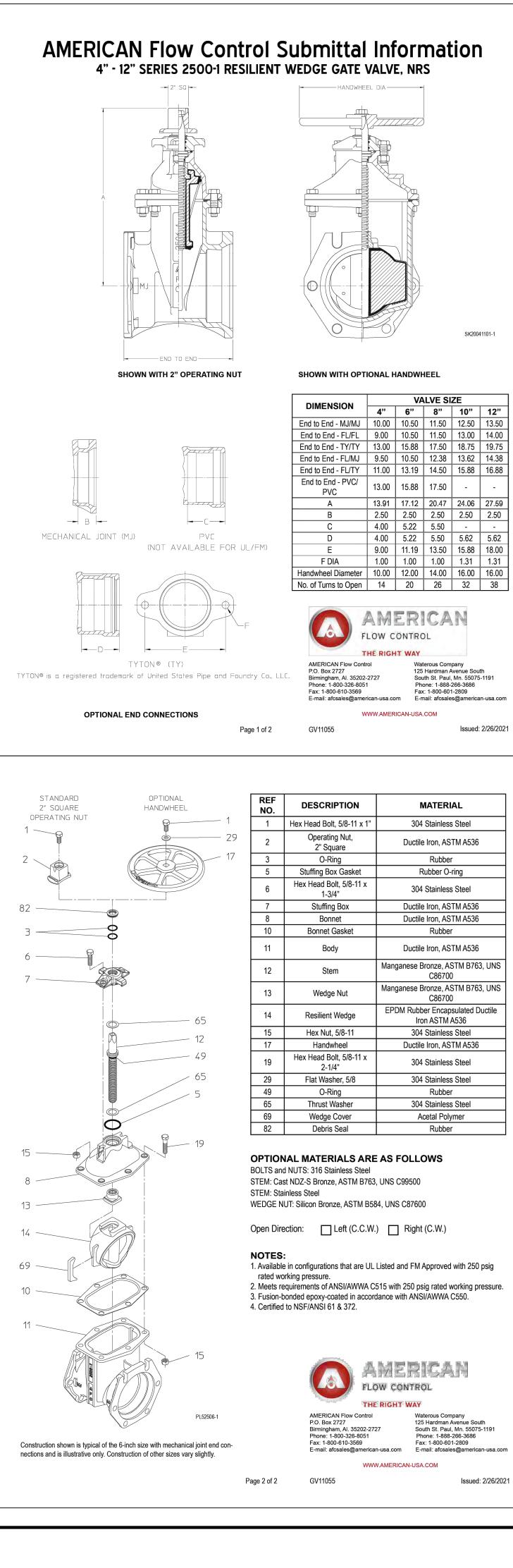
CONTRACTOR TO RELOCATE EXISTING BURIED UTILITY LINES THAT CONFLICT WITH NEW WATER MAIN LOCATION. COORDINATE WITH CONSTRUCTION MANAGER, SERVICE PROVIDER AND OTHER PROJECTS IN CONJUNCTION WITH WATER MAIN IMPROVEMENTS.

PRIOR TO CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL VERTICAL AND HORIZONTAL CONTROL, IE., BENCHMARKS, MANHOLE RIMS, PIPE INVERTS AND ALL UNDERGROUND UTILITIES.

CONTRACTOR TO FIELD LOCATE ALL EXISTING WATER SERVICE LEADS AND CONNECT THE LEADS TO THE NEW WATER MAIN.

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	WOLVERINE       Engineers & Surveyors, Inc.       312 North Street       Mason, Michigan 48854	FN: 517-676-9200 FX: 517-676-9200 FX: 517-676-9396 FX: 517-676-93200 FX: 517-676-95200 FX: 517-676-9500 FX: 517-676-9700 FX: 517-676-97000 FX: 517-676-9700 FX: 517-676-97000 FX: 517-676-9700 F	
	MORTON STREET WATER MAIN REPLACEMENT CITY OF ST. JOHNS CLINTON COUNTY, MICHIGAN	NOTES AND SPECIFICATIONS	
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# SEED ALL DISTURBED AREAS

