CITY OF OWOSSO

2020 WATER MAIN REPLACEMENT PROJECT

SHIAWASSEE COUNTY

SECTION 14, T7N-R2E, CITY OF OWOSSO
SECTION 19, T7N-R3E, CITY OF OWOSSO
POP: 15,194 (2010 CENSUS)

SHEET NO.	DESCRIPTION
CS	COVER SHEET
D1	WATER MAIN NOTES AND DETAILS
D2	WATER MAIN STANDARD DETAILS
D3	SESC STANDARD NOTES AND DETAILS
D4	TRAFFIC CONTROL PLAN
CL1-CL2	CLEVELAND ST - WATER MAIN PLAN AND PROFILE
LF1	LAFAYETTE BLVD - WATER MAIN PLAN AND PROFILE
MR1	MORRIS ST - WATER MAIN PLAN AND PROFILE
RB1	ROBBINS ST - WATER MAIN PLAN AND PROFILE

UTILITY CONTACTS

THE EXISTING UTILITIES LISTED BELOW AND SHOWN ON THE PLANS REPRESENT THE BEST INFORMATION AVAILABLE AT THE TOME OF PREPARING THESES PANS. THIS INFORMATION DOES NOT RELIEVE THE CONTRACTOR OF THE REASONABILITY TO BE SATISFIED AS TO ITS ACCURACY AND LOCATION OF EXISTING UTILITIES.

CHARTER COMMUNICATIONS
ATT: MARK KELLY
1480 S. VALLEY CENTER DRIVE
BAY CITY, MI 48706

CABLE TV
PHONE: 989-233-9404
mark.kelly@chartercom.com

CITY OF OWOSSO
ATT: RANDY CHESNEY, P.E.
301 W. MAIN STREET
OWOSSO, MI 48867

ROAD
989-725-0550
randy.chesney@ci.owosso.mi.us

CITY OF OWOSSO
ATT: GLENN CHINAVARE
301 W. MAIN STREET
OWOSSO, MI 48867

SANITARY SEWER & WATER MAIN
989-725-0550
glenn.chinavare@ci.owosso.mi.us

CONSUMERS ENERGY
ATT: TRACY MAHAR
1801 W. MAIN ST
OWOSSO, MI 48867

ELECTRIC
OFFICE: 989-729-3250
CELL: 517-204-9018
tmmahar@cmsenergy.com

CONSUMERS ENERGY
ATT: ADAM BERTRAM
530 W. WILLOW STREET
P.O. BOX 30162
LANSING, MI 48909

GAS
OFFICE: 517-374-2375
CELL: 517-614-8570
adam.bertram@cmsenergy.com

DAYSTARR COMMUNICATIONS
ATT: BRENT KLEIN
307 N. BALL STREET
OWOSSO, MI 48867

FIBER
PHONE: 989-720-6000
FAX: 989-720-6060
brent.klein@daystarrfiber.net

FRONTIER COMMUNICATIONS
ATT: MARK V. STEVENS
1943 W. M-21
OWOSSO, MI 48847

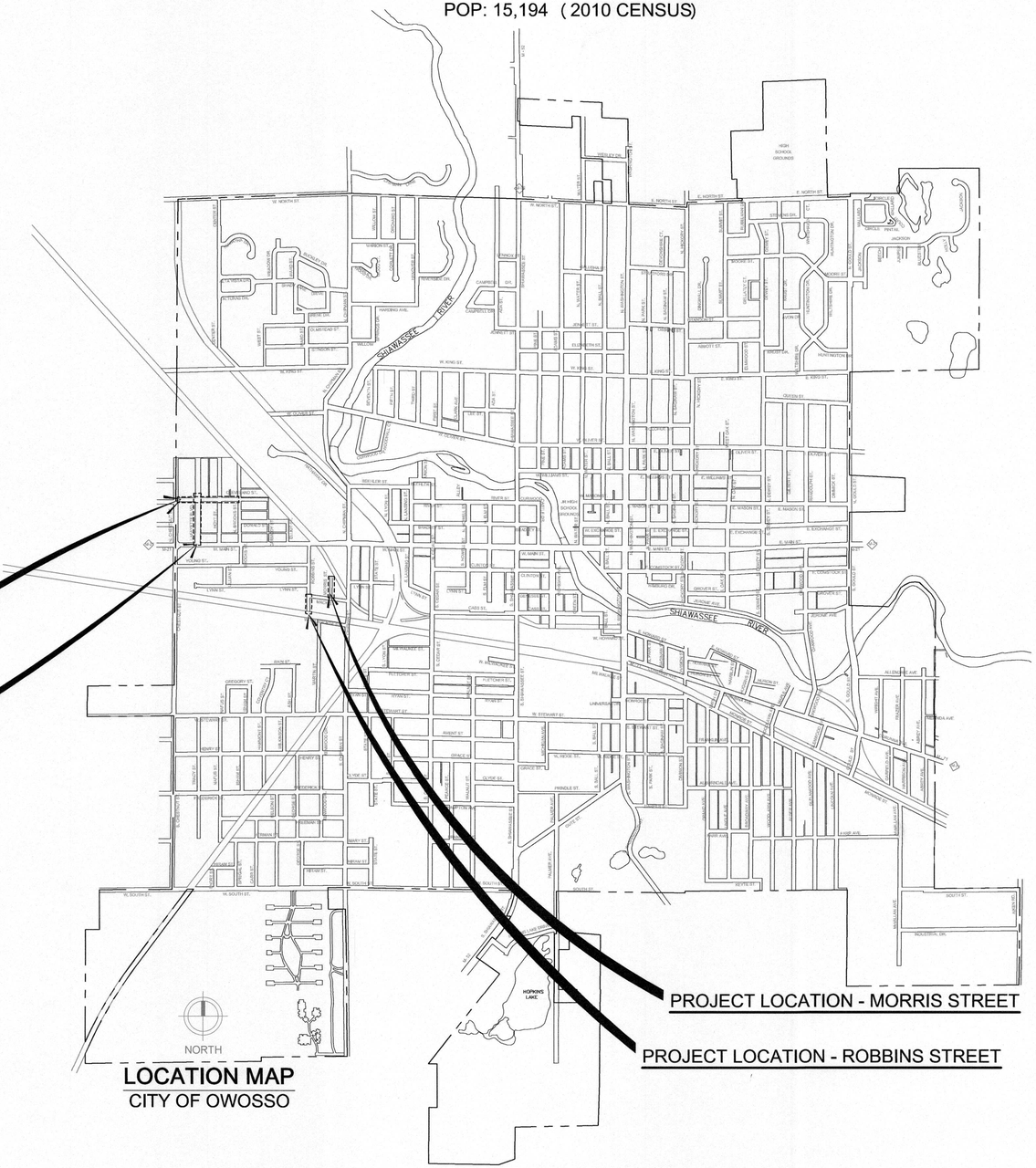
FIBER
PHONE: 989-723-0373
mark.stevens@ftr.com

SHIAWASSEE COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ATT: STEVE ALWORDEN
201 N. SHIAWASSEE STREET
CORUNNA, MI 48817

SOIL EROSION AND SEDIMENTATION CONTROL
PHONE: 989-743-2289
FAX: 989-743-2413
salworden@shiawasseechd.net

CALL MISS DIG AT 1-800-482-7171 OR 811 THREE DAYS, EXCLUDING SATURDAY, SUNDAY, AND HOLIDAY, BEFORE STARTING YOUR PROJECT.

Know what's **below.**
Call before you dig.



LOCATION MAP
CITY OF OWOSSO

THE MATERIAL AND METHODS FOR WATER MAIN CONSTRUCTION CONFORM TO THE STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA) AND THE MICHIGAN SAFE DRINKING WATER ACT 1976 PA 399, AS AMENDED, AND THE ADMINISTRATIVE RULES.

CONTRACT FOR: 0.41 MILES OF WATER MAIN AND SERVICES REPLACEMENT.

CITY OF OWOSSO APPROVAL

STATE OF MICHIGAN
RANDY J. CHESNEY
ENGINEER
No. 33154
LICENSED PROFESSIONAL ENGINEER

CITY ENGINEER	RANDY CHESNEY, PE	33154 REGISTRATION NUMBER	11-8-2019 DATE

CITY OF OWOSSO, MICHIGAN
ENGINEERING DIVISION
DEPT. OF PUBLIC SERVICE

NO.	REVISIONS	DATE	BY

ORIGINAL PLAN
CHECKED BY APPROVED BY

BENCHMARK DATA

ELEV.	DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1
COVER SHEET

CS

WATER MAIN CONSTRUCTION NOTES

1. ALL WATER MAIN MAIN LINE PROPOSED FOR THIS PROJECT HAS BEEN DESIGNED FOR AND SHALL BECOME A PUBLIC SYSTEM.

2. A WATER MAIN CONSTRUCTION PERMIT FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY MUST BE ISSUED PRIOR TO BEGINNING THE CONSTRUCTION OF ANY WATER MAIN IN THIS PROJECT.

3. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF OWOSSO SPECIAL PROVISION FOR WATER MAIN INSTALLATION AND THE STANDARD DETAILS.

4. ALL PUBLIC WATER MAIN SHALL BE OWNED AND MAINTAINED BY THE CITY OF OWOSSO UPON COMPLETION OF THE PROJECT.

5. ALL PUBLIC WATER MAIN SHALL BE PVC AWWA C900/C909. TRACER WIRE AND BOXES SHALL CONFORM TO THE CITY OF OWOSSO SPECIAL PROVISION FOR WATER MAIN INSTALLATION.

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

7. GATE VALVES SHALL BE EAST JORDAN RESILIENT SEATED GATE VALVES CONFORMING TO AWWA C509. VALVES SHALL BE VERTICAL, NON-RISING STEM AND OPEN CLOCKWISE. SEE CITY OF OWOSSO SPECIAL PROVISION FOR WATER MAIN INSTALLATION AND STANDARD DETAILS.

8. FIRE HYDRANTS SHALL CONFORM TO THE SPECIFICATION SHOWN ON THIS SHEET.

9. WHERE SANITARY SERVICE LEADS OR OTHER UTILITIES ARE ENCOUNTERED DURING THE CONSTRUCTION OF THE WATER MAIN, THE CONTRACTOR SHALL MAKE ADJUSTMENTS TO EITHER THE WATER MAIN OR EXISTING UTILITY TO PROVIDE CONTINUOUS SERVICE TO PROPERTIES ALONG THE ROUTE OF CONSTRUCTION. ALL WORK INCLUDING THE REBORING OF SANITARY SEWER SERVICE LEADS TO ACCOMMODATE CONSTRUCTION OR ADJUSTING WATER MAIN CONSTRUCTION TO CLEAR EXISTING SERVICES SHALL BE CONSIDERED INCLUSIVE TO CONSTRUCTION OF THE WATER MAIN.

10. PRESSURE TAPS TO EXISTING WATER MAINS AND CONNECTIONS TO EXISTING VALVES SHALL BE MADE ONLY UNDER CITY OF OWOSSO OBSERVATION. ALL VALVE OPENING AND CLOSING SHALL BE BY THE CITY OF OWOSSO PERSONNEL. A FULL DIAMETER STAINLESS STEEL TAPPING SLEEVE IS REQUIRED FOR ALL PRESSURE TAPS.

11. ALL WATER MAIN SHALL HAVE A MINIMUM COVER OVER THE TOP OF THE PIPE OF 5.5 FEET FROM FINISHED GRADE. THE STANDARD LAYING CONDITIONS FOR WATER MAIN SHALL BE A 30" TRENCH WIDTH OR PIPE DIAMETER PLUS 12". THE PIPE SHALL BE LAID ON A 4" PREPARED SAND CUSHION WITH RECESSES TO ACCOMMODATE PIPE BELLS.

12. ALL WATER SERVICE LEADS SHALL HAVE A MINIMUM COVER OVER THE TOP OF THE PIPE OF 5 FEET FROM FINISHED GRADE.

13. ALL TRENCH EXCAVATION UNDER OR WITHIN 5' OF EXISTING OR PROPOSED PAVING SHALL BE BACKFILLED WITH CLASS II COMPACTED GRANULAR MATERIALS.

14. MINIMUM HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SEWERS SHALL BE 10 FEET.

15. CONTRACTOR SHALL RESTRAIN ALL THRUST IN THE SYSTEM BY THE USE OF MEGA-LUG RESTRAINED JOINTS. ALL HYDRANTS, TEES, VERTICAL OR HORIZONTAL BENDS AND FUTURE VALVE CONNECTIONS SHALL BE RESTRAINED. RESTRAINTS SHALL HAVE APPROVAL PRIOR TO BEING INCORPORATED INTO PROJECT CONSTRUCTION.

16. WATER MAINS SHALL BE PRESSURE TESTED IN ACCORDANCE WITH AWWA STANDARD C605, AND DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651. WATER MAIN CHLORINATION SHALL BE OBSERVED AND MONITORED BY CITY OF OWOSSO REPRESENTATIVE.

17. WATER SERVICE LEADS SHALL BE TYPE "K" COPPER AND SHALL BE A MINIMUM OF ONE-INCH (1") IN DIAMETER. ALL SERVICE LEADS SHALL BE BORED UNDER ROADWAY. CORPORATIONS SHALL BE BRONZE ALLOY OR BRASS AND COMPLY WITH NSF/ANSI-372 OR NSF/ANSI-61G.

18. THE CONTRACTOR SHALL INSTALL TWO INCH CORPORATIONS ON THE WATERLINE FOR PRESSURE TESTING, CHLORINE ADDITION AND FOR BLOW-OFF PURPOSES. THE CORPORATIONS SHALL HAVE COPPER PIPE EXTENDING TO THE GROUND SURFACE. THE CONTRACTOR SHALL REMOVE THE CORPORATION AND COPPER LINE UPON A SATISFACTORY TEST AND INSTALL A PLUG.

19. THE CONTRACTOR SHALL ENCASE THE WATER MAIN IN PLASTIC OR CONCRETE PIPE WHERE VERTICAL SEPARATION BETWEEN STORM SEWER AND WATER MAIN OR SANITARY SEWER AND WATER MAIN IS LESS THAN EIGHTEEN (18) INCHES, AS PER MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIREMENTS.

20. WHERE WATER MAIN CROSSES BENEATH SANITARY OR STORM SEWER, A SOLID LENGTH OF PIPE SHALL BE POSITIONED BENEATH THE CROSSING TO AVOID PIPE JOINTS IN THE VICINITY OF THE CROSSING.

FREEBORE NOTE:
CONTRACTOR SHALL FREEBORE PROPOSED WATER MAIN WHERE NECESSARY TO SAVE/PROTECT TREES OR AVOID EXISTING UTILITIES AND POLES. COST OF FREEBORE SHALL BE INCLUDED IN THE WATER MAIN PAY ITEM. REQUIRED FREEBORE LOCATIONS SHALL BE DETERMINED IN THE FIELD AND ARE NOT SHOWN ON THE PLANS.

CONSUMERS ENERGY NOTE:
ALL UTILITY POLES SHALL BE PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE HIS CONSTRUCTION OPERATIONS WITH AFFECTED UTILITIES AND ADEQUATELY SUPPORT THE POLES.

WATER USAGE NOTE:
A SERVICE CHARGE OF $1,000 WILL BE REQUIRED AT TIME OF PERMIT APPLICATION. THIS FEE INCLUDES THE MINIMUM CHARGE OF $50 FOR 5,000 BULK GALLONS OF WATER, PLUS ADDITIONAL CHARGES OF $10 PER 1,000 GALLONS CONSUMED IN EXCESS OF THE MINIMUM QUANTITY. OWOSSO WATER SYSTEM PERSONNEL WILL ATTACH A WATER METER AND RPZ BACKFLOW PREVENTER TO THE HYDRANT FOR CONTRACTOR USE. IF THE WATER METER AND RPZ IS RETURNED IN GOOD OPERATING CONDITION, THE CONTRACTOR WILL RECEIVE A $450 REFUND, LESS ADDITIONAL WATER CONSUMED IN EXCESS OF MINIMUM QUANTITY.

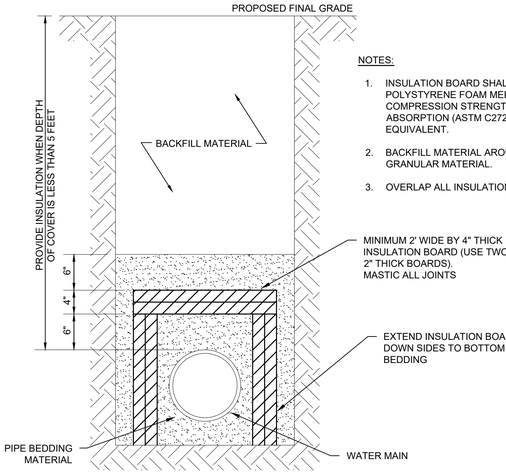
MISCELLANEOUS ESTIMATES

THE FOLLOWING ITEMS OF WORK SHALL BE DONE AS THEY APPLY THROUGHOUT THE PROJECT. THESE ITEMS ARE NOT DETAILED OR INCLUDED ON THE PLAN AND PROFILE SHEETS

1	LSUM	Mobilization, Max 10% (Water Main)
1	LSUM	Testing and Chlorination of Water Main
10	Ea	Sanitary Serv Conflict
10	Ea	Abandoned Gas Main Conflict
10	Ea	Sign, Type III, Rem
10	Ea	Sign, Type III, Erect, Salv
160	Ft	Post, Steel, 3 pound
1000	Ft	Sawcutting
30	Ton	Maintenance Gravel

MAINTAINING TRAFFIC QUANTITIES

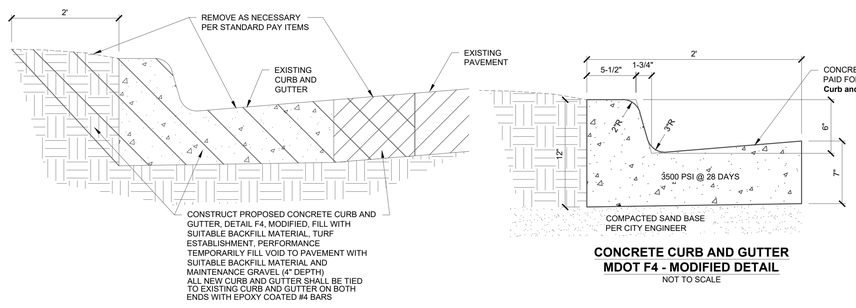
8	Ea	Barricade, Type III, High Intensity, Double Sided, Furn & Oper
6	Ea	Pedestrian, Type II Barricade, Temp
2	Ea	Lighted Arrow, Type C, Furn & Oper
25	Ea	Plastic Drum, High Intensity, Furn & Oper
335	Sft	Sign, Type B, Temp, Prismatic, Furn & Oper
1	LSUM	Minor Traffic Devices, Max $10,000



NOTES:

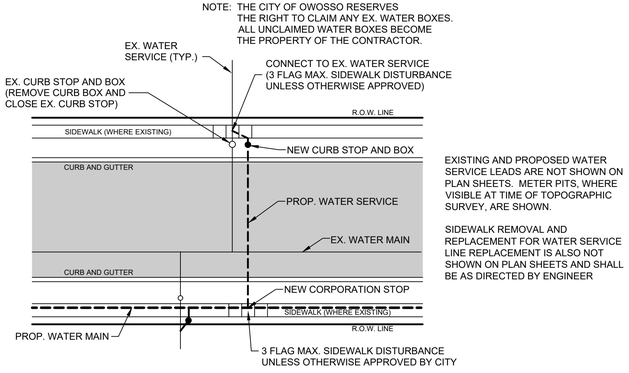
1. INSULATION BOARD SHALL BE CLOSED CELL, EXTRUDED POLYSTYRENE FOAM MEETING ASTM 578, TYPE VI, 40 PSI COMPRESSION STRENGTH (ASTM D1621) 0.1% MAX. WATER ABSORPTION (ASTM C272), OR OWNER APPROVED EQUIVALENT.
2. BACKFILL MATERIAL AROUND INSULATION SHALL BE CLASS II GRANULAR MATERIAL.
3. OVERLAP ALL INSULATION BOARD JOINTS.

WATER MAIN TRENCH INSULATION DETAIL
NOT TO SCALE



TYPICAL SELECT CURB AND GUTTER REPAIR DETAIL
NOT TO SCALE

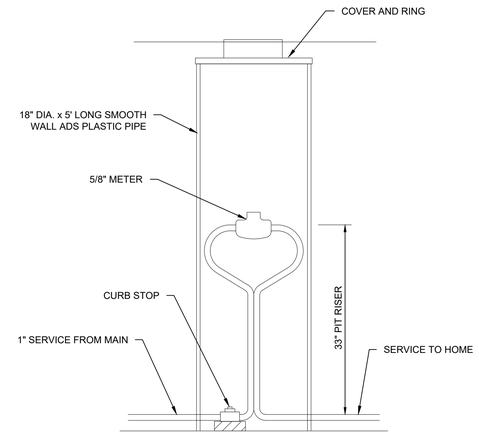
CONCRETE CURB AND GUTTER MDOT F4 - MODIFIED DETAIL
NOT TO SCALE



EXISTING AND PROPOSED WATER SERVICE LEADS ARE NOT SHOWN ON PLAN SHEETS. METER PITS, WHERE VISIBLE AT TIME OF TOPOGRAPHIC SURVEY, ARE SHOWN.

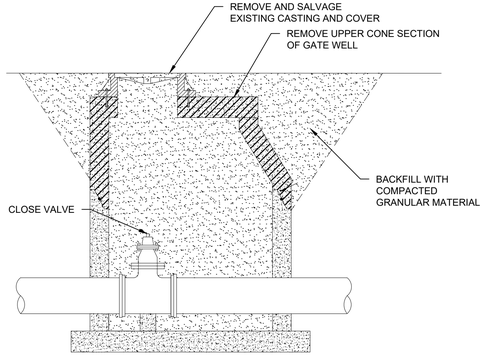
SIDEWALK REMOVAL AND REPLACEMENT FOR WATER SERVICE LINE REPLACEMENT IS ALSO NOT SHOWN ON PLAN SHEETS AND SHALL BE AS DIRECTED BY ENGINEER

NEW WATER SERVICE CONNECTION DETAIL
NOT TO SCALE



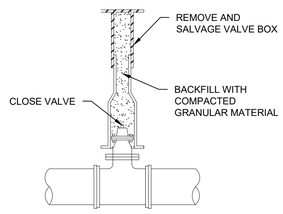
FOR DWELLINGS UTILIZING EXISTING METER PITS, NEW METER PITS WILL BE CONSTRUCTED BY THE CITY OF OWOSSO AS PART OF THIS PROJECT. CONTRACTOR SHALL CONNECT THE NEW SERVICE LEAD TO THE NEW WATER MAIN, RUN THE COPPER SERVICE LEAD TO THE DESIRED LOCATION OF THE METER PIT AS DIRECTED (TYPICALLY NEAR THE R.O.W. LINE), AND CAP.

METER PIT SCHEMATIC (FOR INFORMATION ONLY)
NOT TO SCALE



EXISTING VALVE WITH MANHOLE ABANDONMENT DETAIL
NOT TO SCALE

NOTE:
THE CITY RESERVES THE RIGHT TO CLAIM ANY EX. WATER VALVE BOXES AND GATE WELL COVERS AND CASTINGS. ALL UNCLAIMED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.



EXISTING VALVE WITH VALVE BOX ABANDONMENT DETAIL
NOT TO SCALE

WaterMaster® Fire Hydrant Specification

WaterMaster® Fire Hydrant Specifications for
City of Owosso hydrants with Stortz

1. Manufacturers shall provide sufficient documentation to assure that their hydrant will successfully meet the latest revisions of AWWA Standard C502. Fire hydrants shall be rated for 250 psi working pressure and be listed by Underwriters Laboratories Inc.(UL246) and meet the test requirements of Factory Mutual (1510) at this pressure.

2. Hydrants shall be of a true compression type, opening against the pressure and closing with the pressure. Composition of the main valve shall be a molded rubber having a durometer hardness of 91 +/- 5. The rubber seat valve shall fit a 5 ¼" opening and not be less than 1" thick.

3. Fire hydrants shall be **three-way** in design, having **Harrington 5" Storz C & X Dome** pumper nozzle, and **2 1/2" Nat Std 2 7/8" Base,C Dome** hose nozzle. Nozzles shall "thread" counterclockwise into hydrant barrel utilizing "o" ring pressure seals. A suitable nozzle lock shall be in place to prevent inadvertent nozzle removal. Wedging devices and/or ductile iron retainer rings to secure nozzles shall not be allowed.

4. The lubrication system shall be sealed from the waterway and any external contaminants by use of "o" ring pressure seals. Anti-friction washers shall be in place above and below the thrust collar of the operating nut to further minimize operating torque. The grease reservoir shall be factory filled with an FDA approved food grade lubricant. Oil shall not be used.

5. The operating nut shall be a one piece design, manufactured of ASTM B-584 bronze. It shall be **1 1/8" Pentagon- point to flat** in size/shape. The operating nut shall be affixed to the bonnet by means of an ASTM B-584 bronze hold down nut. The hold down nut shall be threaded into the bonnet in such a manner as to prevent accidental disengagement during the opening cycle of the hydrant. A resilient weather seal shall be incorporated with the hold down nut, for the purpose of protecting the operating mechanism from the elements.

6. The direction of opening shall be **right**. An arrow shall be cast on the top of the hydrant to indicate the opening direction.

7. The hydrant bonnet shall be attached to the upper barrel by no more than six bolts and nuts. All nuts and bolts below grade shall be 304 stainless steel.

8. The hydrant will have **6'** Depth of bury, unless otherwise noted.

9. Hydrants shall be of the "Traffic Model" design, provided with a safety coupling and flange design that will permit a full 360 degree facing of the nozzles. O-rings shall be the Quad-Ring® type and be installed in a groove on the bottom of the joint so that taping or gluing to the upper standpipe or extension is not required. The safety coupling shall be a one piece design. Multiple parts and cast iron not allowed.

10. The operating stem shall be a two piece design, not less than 1 ¼ " diameter (excluding threaded or machined areas). Threads shall be Acme type with no 60 deg. V threads allowed. Travel stops shall be in the inlet/shoe and are not allowed in the bonnet area. Screws, pins, bolts or fasteners used in conjunction with the stem coupling shall be stainless steel.

11. The inside diameter of the hydrant barrels shall not be less than 7 ¼ inches and the hydrant shall be painted **Yellow**.

12. Heavy duty drip shutoff (top plate) and valve seat shall be high strength manganese bronze. Valve seat shall be installed in a bronze seat ring. Drain shall be **tapped and plugged**, bronze lined and 3/8 inch diameter minimum. They shall operate without the use of springs, toggles, tubes, levers or other intricate synchronizing mechanisms. Lower valve plate shall be a one piece ductile iron casting and not require a separate cap nut. Drains shall be open and flushed during the first 4 turns of opening the hydrant before positively closing while operating the hydrant.

13. The shoe connection shall be **Mechanical Joint** or as specified. The inlet/shoe shall be fusion bonded epoxy coated per ANSI/AWWA C550 and with an NSF61 approved coating having ample blocking pads for sturdy setting. Six stainless steel bolts and nuts are required to fasten the shoe to the lower barrel. The shoe/inlet shall be directly connected to the standpipe flange. Designs using a sandwich piece in between the standpipe and shoe/inlet shall not be allowed.

14. External parts- the top bonnet, upper standpipe, lower standpipe and shoe shall be ductile iron to ensure strength throughout the exterior of the hydrant- Gray Iron hydrant body parts will not be allowed.

Municipality reserves the right to accept only those materials which are in full compliance with these specifications and deemed most advantageous to its interests.

Upon request, supplier shall furnish flow data indicating friction loss in psi at a flow of 1,000 gpm from the pumper nozzle. Such friction loss shall not exceed 2.5 psi. Also, the municipality may request the manufacturing "point of origin" for any/or all hydrant parts. All cast components shall be made in the USA.

Failure to comply with any of these above requirements is sufficient cause for rejection of proposed hydrants.

Hydrant shall be EJ WaterMaster® **5BR250**.
55726D

ejco.com 800 626 4653

CITY OF OWOSSO, MICHIGAN
ENGINEERING DIVISION
DEPT. OF PUBLIC SERVICE

NO.	REVISIONS	DATE	BY
	ORIGINAL PLAN		
	CHECKED BY	APPROVED BY	

BENCHMARK DATA

ELEV.	DESCRIPTION

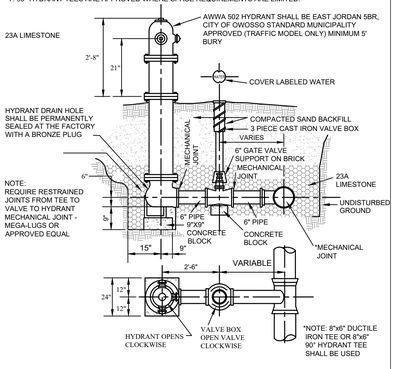
2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

WATER MAIN NOTES AND DETAILS

D1

NOTES:

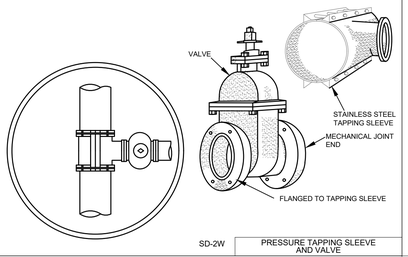
1. THE PUMPER CONNECTION SHALL FACE THE STREET.
2. SET THE HYDRANT FLANGE AT PROPOSED GRADE OR AS FIELD DIRECTED.
3. SET THE VALVE BOX COVER FLUSH WITH THE PROPOSED GRADE.
4. ALL WORK FROM THE CENTER LINE OF THE MAIN TO AND INCLUDING THE HYDRANT SHALL BE PAID FOR BY UNIT PRICE BID ITEM FOR HYDRANTS.
5. ALL MECHANICAL JOINTS SHALL BE RESTRAINED BY MEGA LUGS, OR APPROVED EQUAL.
6. HYDRANT BARRELS SHALL BE PAINTED YELLOW. CAPS SHALL BE COLOR GREEN
7. 90° HYDRANT TEES ARE APPROVED WHERE SPACE REQUIREMENTS ARE LIMITED.



SD-1W FIRE HYDRANT DETAIL

NOTES:

1. ALL TAPPING SLEEVES SHALL BE STAINLESS STEEL WITH FLANGED OUTLET. TAPPING SLEEVES SHALL BE APPROVED BY THE CITY OF OWOSSO PRIOR TO INSTALLATION.
2. THE GASKET FOR MAIN LINE SHALL BE MADE FOR THE PIPE MATERIAL IN PLACE, NORMALLY DUCTILE IRON CLASS 53.
3. OUTLET FLANGE IS CLASS 125 ANS/B16.1.
4. TAPPING TEE SHALL HAVE A BUILT-IN TEST PLUG.
5. THE VALVE SHALL BE FLANGED, CONNECTED TO THE SLEEVE BY MECHANICAL JOINT TO THE LINE TO BE CONSTRUCTED.
6. THE VALVE SHALL HAVE OVERSIZE SEAT RINGS TO PERMIT ENTRY OF THE TAPPING MACHINE CUTTERS.
7. THE VALVE SHALL MEET ALL REQUIREMENTS OF AWWA C-500.
8. THE MINIMUM SIZE MANHOLE SHALL BE 5' - 0' INTERNAL DIAMETER.
9. THE TOP OPENING SHALL BE CENTERED ON THE VALVE OPERATING NUT.
10. USE FLAT SLAB FOR COVER WITH 24" OPENING.



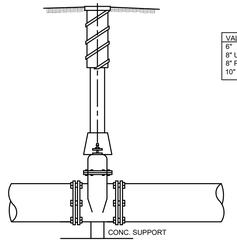
SD-2W PRESSURE TAPPING SLEEVE AND VALVE

NOTE:
ALL MECHANICAL JOINTS SHALL BE RESTRAINED WITH MEGA LUGS OR APPROVED EQUAL. LENGTH OF RESTRAINT SHALL BE DETERMINED BY MANUFACTURER AND DIPRA, AND APPROVED BY CITY OF OWOSSO. THE MINIMUM REQUIRED RESTRAINT LENGTHS ARE SHOWN IN DETAIL SD-7W. MANUFACTURER RESTRAINT LENGTHS THAT ARE LESS THAN SHOWN IN SD-7W MUST BE APPROVED BY CITY OF OWOSSO.

SD-3W LOCATION OF RESTRAINED JOINTS

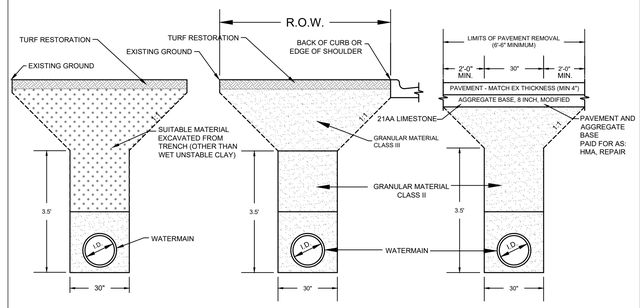
NOTES:

1. RESILIENT SEATED WEDGE GATE VALVES SHALL BE PER PROJECT SPECIFICATIONS.
2. ALL PRESSURE TAPS 4" AND OVER MUST BE ENCLOSED WITH A CONCRETE VALVE MANHOLE.
3. CONCRETE ADJUSTING BRICK OR RINGS ALLOWABLE TO A MAXIMUM ADJUSTMENT OF 12".
4. VALVE BOXES SHALL BE MADE OF GOOD QUALITY CAST IRON AND SHALL BE OF THE SECTIONAL TYPE. THE LOWER SECTION SHALL BE A MINIMUM OF FIVE (5) INCHES IN DIAMETER, ENLARGED AT THE BASE TO FIT AROUND THE BONNET OF THE VALVE. THE UPPER SECTION SHALL BE ARRANGED TO SLIDE OR SCREW DOWN OVER THE ADJOINING LOWER SECTION AND SHALL BE FULL DIAMETER THROUGHOUT. VALVE BOXES SHALL BE PROVIDED WITH CAST IRON LIDS OR COVERS. LIDS OR COVERS SHALL BE MARKED "WATER". THE OVER-ALL LENGTH OF VALVE BOXES SHALL BE SUFFICIENT TO PERMIT THE TOP TO BE SET FLUSH WITH THE FINAL GROUND SURFACE GRADE. VALVE BOXES SHALL BE AS MANUFACTURED BY TRAVERSE CITY IRON WORKS, CLOW CORPORATION OR APPROVED EQUAL.



VALVE SIZE	MIN. BASIN SIZE
6"	BOX-3 PIECE
8" UNPAVED	BOX-3 PIECE
8" PAVED	BOX-3 PIECE
10" - 12"	BOX-3 PIECE

SD-4W WATER VALVE AND VALVE BOX DETAIL



TRENCH BACKFILL DETAIL 'F'
TYPICAL WATERMAINS NOT WITHIN INFLUENCE OF ROADBED, DRIVEWAY, OR SIDEWALK, AND LOCATED OUTSIDE OF ROAD RIGHT-OF-WAY

TRENCH BACKFILL DETAIL 'G'
TYPICAL WATERMAINS UNDER ROADBED AND/OR WITHIN INFLUENCE OF ROADBED, DRIVEWAY, OR SIDEWALK, OR LOCATED WITHIN THE ROAD RIGHT-OF-WAY

SD-5W WATERMAIN TRENCH BACKFILL DETAILS

MINIMUM PIPE RESTRAINT LENGTH SCHEDULE FOR GROUND BURIED PRESSURE PIPES(1)*

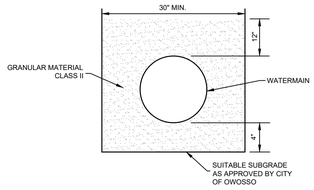
LENGTH (IN FEET) OF RESTRAINT REQUIRED (2)

DEFLECTION ANGLE	22½°	33¾°	45°	56¼°	67½°	78¾°	90° OR DEAD END
PIPE							
6"	3	6	11	16	23	29	37
8"	4	8	15	22	31	41	50
10"	5	11	18	28	38	49	61

* WHEN MANUFACTURER SPECIFICATIONS CALL FOR GREATER RESTRAINT LENGTHS THE GREATER LENGTHS SHALL BE INSTALLED, WHEN THE MANUFACTURER SPECIFICATIONS CALL FOR LESSER RESTRAINT LENGTHS THEN THE ABOVE LENGTHS SHALL BE INSTALLED

1. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PROCEDURES, ALL VALUES ARE TO BE INCREASED PROPORTIONALLY.
2. IN EACH DIRECTION FROM POINT OF DEFLECTION OR TERMINATION EXCEPT FOR A TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.
3. IF TIE RODS ARE USED, PLACE 2 RODS 5/8 INCH DIAMETER MINIMUM FOR WATERMAIN 6 INCH TO 10 INCH.

SD-7W MINIMUM PIPE RESTRAINT SCHEDULE



SD-10W WATERMAIN BEDDING DETAIL

EXISTING FEATURES LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	TREE (DECIDUOUS)	CB	CABLE BOX		SURVEY CONTROL POINT
	BUSH	T	TELEPHONE RISER	BM#1	BENCHMARK
	TREE (CONIFEROUS)	T	TELEPHONE MANHOLE		SECTION CORNER
	DEAD TREE	TH	TELEPHONE HANDHOLE		BOUNDARY LINE
	STUMP	E	ELECTRICAL RISER		PROPERTY LINE
	MANHOLE	E	ELECTRICAL MANHOLE		WATERMAIN
	SANITARY CLEANOUT	EH	ELECTRICAL HANDHOLE		SANITARY SEWER
	RD. CATCH BASIN		POWER POLE		STORM SEWER
	SQ. CATCH BASIN		LIGHT POLE		CULVERT (21" AND UNDER)
	FIRE HYDRANT		GUY POLE		CULVERT (24" AND UP)
	WATER VALVE		GUY ANCHOR		CABLE T.V.
	CURB STOP & BOX		PED CROSSING SIGNAL		TELEPHONE
W	WELL		YARD LIGHT		ELECTRIC
W	WATER MANHOLE		SIGN		GAS
W	WATER METER		MAILBOX		OVERHEAD LINES
B#	SOIL BORING		GUARD POST		GUARDRAIL
	MONITORING WELL		FOUND CONC. MONUMENT		FENCE
			FOUND IRON ROD		WOODLINE
			SET IRON ROD		

NOTE: ALL ITEMS LISTED ON THE LEGEND MAY NOT BE PRESENT ON DRAWING.

CITY OF OWOSSO, MICHIGAN
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BENCHMARK DATA

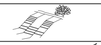
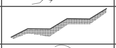
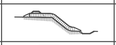
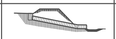
ELEV.	DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

WATER MAIN STANDARD DETAILS

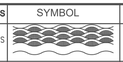
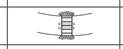
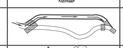
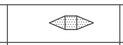
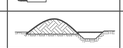
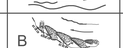
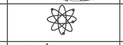
D2

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
EROSION CONTROLS			
E1	SELECTIVE GRADING AND SHAPING		To reduce steep slopes and erosive velocities.
E2	GRUBBING OMITTED		For use on steep slopes to prevent rilling, gullying, and reduce sheet flow velocity or where clear vision corridors are necessary.
E3	SLOPE ROUGHENING AND SCARIFICATION		Where created grades cause increased erosive velocites. Promotes infiltration and reduces runoff velocity.
E4	TERRACES		On relatively long slopes up to 8% grades with fairly stable soils.
E5	DUST CONTROL		For use on construction sites, unpaved roads, etc. to reduce dust and sedimentation from wind and construction activities.
E6	MULCH		For use in areas subject to erosive surface flows or severe wind or on newly seeded areas.
E7	TEMPORARY SEEDING		Stabilization method utilized on construction sites where earth change has been initiated but not completed within a 2 week period.
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKETS		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E10	SODDING		On areas and slopes where immediate stabilization is required.
E11	VEGETATED CHANNELS		For use in created stormwater channels. Vegetation is used to slow water velocity and reduce erosion within the channel.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
E13	GABION WALLS		On newly created or denuded stream banks to reduce velocity until permanent stabilization is achieved or on existing banks to retard erosive velocities.
E14	ENERGY DISSIPATOR		Where the energy transmitted from a concentrated flow of surface runoff is sufficient to erode receiving area or watercourse.
E15	TEMPORARY SLOPE DRAIN		Where surface runoff temporarily accumulates or sheet flows over the top of a slope and must be conveyed down a slope in order to prevent erosion.
E16	SLOPE DRAIN		Where concentrated flow of surface runoff must be permanently conveyed down a slope in order to prevent erosion.

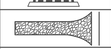
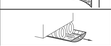
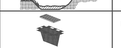
B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E17	CELLULAR CONFINEMENT SYSTEMS		Used on steep slopes and high velocity channels.
E18	PLASTIC SHEETS		Used on exposed slopes, seeded areas, new ditch bottoms, and areas subject to surface runoff and erosion. Used as a liner in temporary channels and to stabilize stockpiles.
E19	TEMPORARY DRAINAGEWAY/ STREAM CROSSING		Use on construction sites where stream/drainageway crossings are required.
E20	TEMPORARY BYPASS CHANNEL		Use within existing stream corridors when existing flow cannot be interrupted, and at culvert and bridge repair sites
E21	LIVE STAKING	 B	In areas requiring protection of slopes against surface erosion and shallow mass wasting.
	EROSION / SEDIMENT CONTROLS		
ES31	CHECK DAM		Used to reduce surface flow velocities within constructed and existing flow corridors.
ES32	STONE FILTER BERM		Use primarily in areas where sheet or rill flow occurs and to accommodate dewatering flow.
ES33	FILTER ROLLS	 B	In areas requiring immediate protection of slopes against surface erosion and gully formation and for perimeter sediment control.
ES34	SAND FENCE		For use in areas susceptible to wind erosion, especially where the ground has not yet been stabilized by other means.
ES35	DEWATERING		Use where construction activities are limited by the presence of water and dry work is required.
ES36	DIVERSION DIKE/BERM		Within existing flow corridors to address or prevent erosion and sedimentation, or on disturbed or unstable slopes subject to erosive surface water velocities.
ES37	DIVERSION DITCH		In conjunction with a diversion dike, or where diversion of upslope runoff is necessary to prevent damage to unstabilized or disturbed construction areas.
ES38	COFFERDAM/SHEET PILINGS		Constructed along or within water corridor or waterbody to provide dry construction area.
ES39	STREAMBANK BIOSTABILIZATION	 B	For use along banks where stream and riparian zones may have difficulty recovering from the long-term effects of erosion.
ES40	POLYMERS		To minimize soil erosion and reduce sedimentation in water bodies by increasing soil particle size.
ES41	WATTLES	 B	In areas requiring protection of slopes against surface erosion and gully formation.

B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
	SEDIMENT CONTROLS		
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S52	CATCH BASIN SEDIMENT GUARD		Use in or at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S54	TIRE WASH		For use on construction sites where vehicular traffic requires sediment removed from its tires in highly erosive areas.
S55	SEDIMENT BASIN		At the outlet of disturbed areas and at the location of a permanent detention basin.
S56	SEDIMENT TRAP		In small drainage areas, along construction site perimeters, and above check dams or drain inlets.
S57	VEGETATED BUFFER/FILTER STRIP		Use along shorelines, waterways, or other sensitive areas. Slows velocity, reduces sediment load, and reduces erosion in areas of sheet flow.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.
S59	INLET PROTECTION FABRIC FENCE		Use at stormwater inlets, especially at construction sites.
S60	INLET PROTECTION STONE		Use around urban stormwater inlets.
S61	TURBIDITY CURTAIN		Use during construction adjacent to a water esource, to contain sediment within the work area when other BMP's cannot be used.

B = BIOENGINEERING

CONSTRUCTION SEQUENCE

1. INSTALLATION OF TEMPORARY EROSION CONTROL MEASURES.
2. TRENCH EXCAVATION, STORM SEWER INSTALLATION, AND BACKFILL.
3. PERMANENT MEASURES, FINAL GRADING, SEEDING AND MULCHING.

SOIL EROSION/SEDIMENTATION CONTROL
OPERATION TIME SCHEDULE

CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
STRIP AND STOCKPILE TOPSOIL												
ROUGH GRADE/ SEDIMENT CONTROL												
TEMP CONTROL MEASURES												
STORM FACILITIES							N/A					
TEMP CONSTRUCTION ROADS							N/A					
FOUNDATION/ BLDG. CONSTRUCTION							N/A					
SITE CONSTRUCTION												
PERM CONTROL MEASURES												
FINISH GRADING												
LANDSCAPING							N/A					

CITY OF OWOSSO, MICHIGAN
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ELEV. | DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
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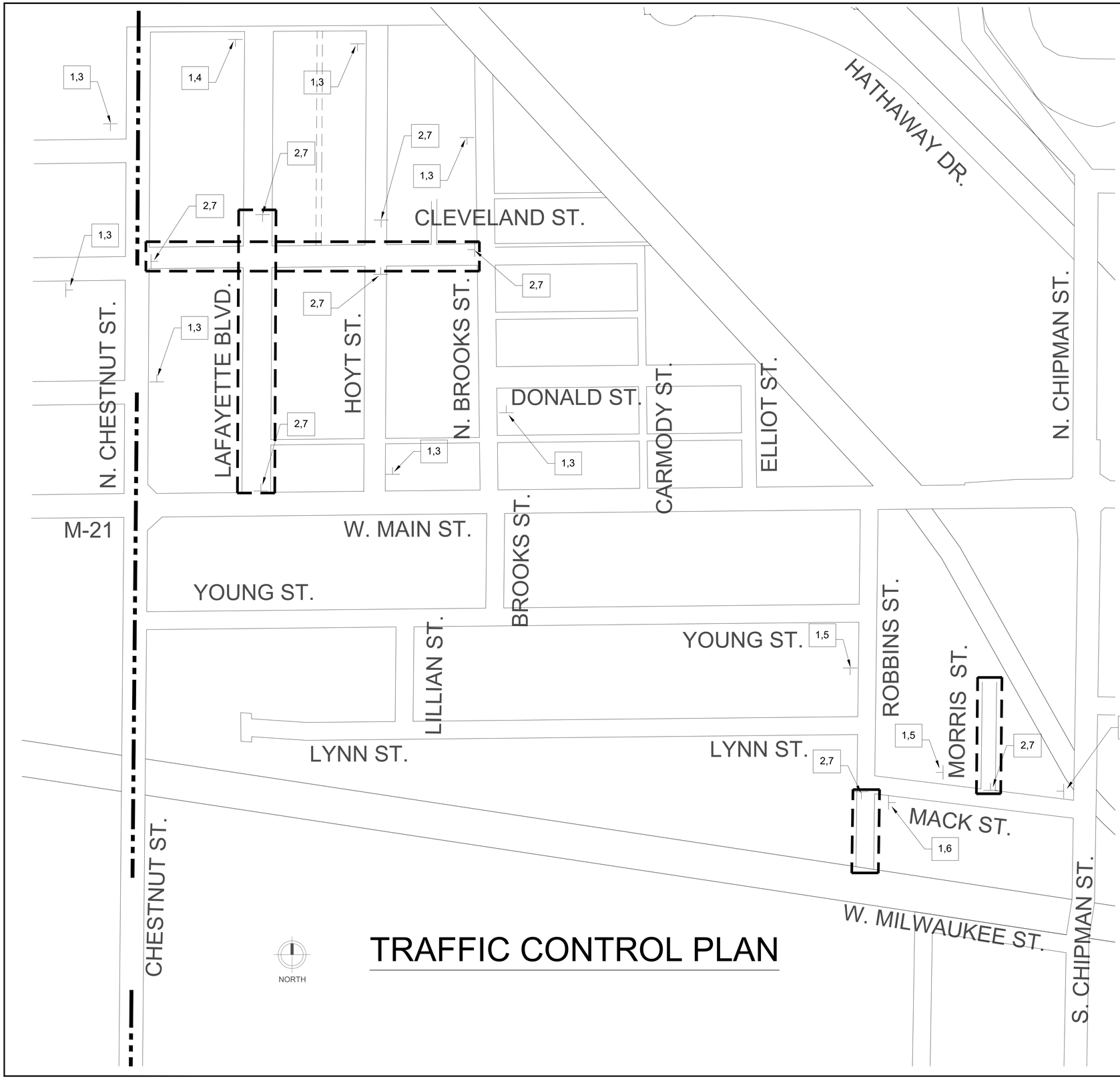
SESC STANDARD NOTES AND DETAILS

D3



TRAFFIC CONTROL PLAN

SIGNING REQUIREMENTS

NO.	SIGN	SIGN DESIGNATOIN	SIZE	NO. REQ.
1	ROAD WORK AHEAD	W20-1	48 x 48	11
2	ROAD CLOSED LOCAL TRAFFIC ONLY	R11-3A	60 x 30	8
3	CLEVELAND ST	M4-8 MOD	30 x 8	7
4	LAFAYETTE BLVD	M4-8 MOD	30 x 8	1
5	ROBBINS ST	M4-8 MOD	30 x 8	2
6	MORRIS ST	M4-8 MOD	30 x 8	2
7		TYPE III BARRICADE		8

CITY OF OWOSSO, MICHIGAN
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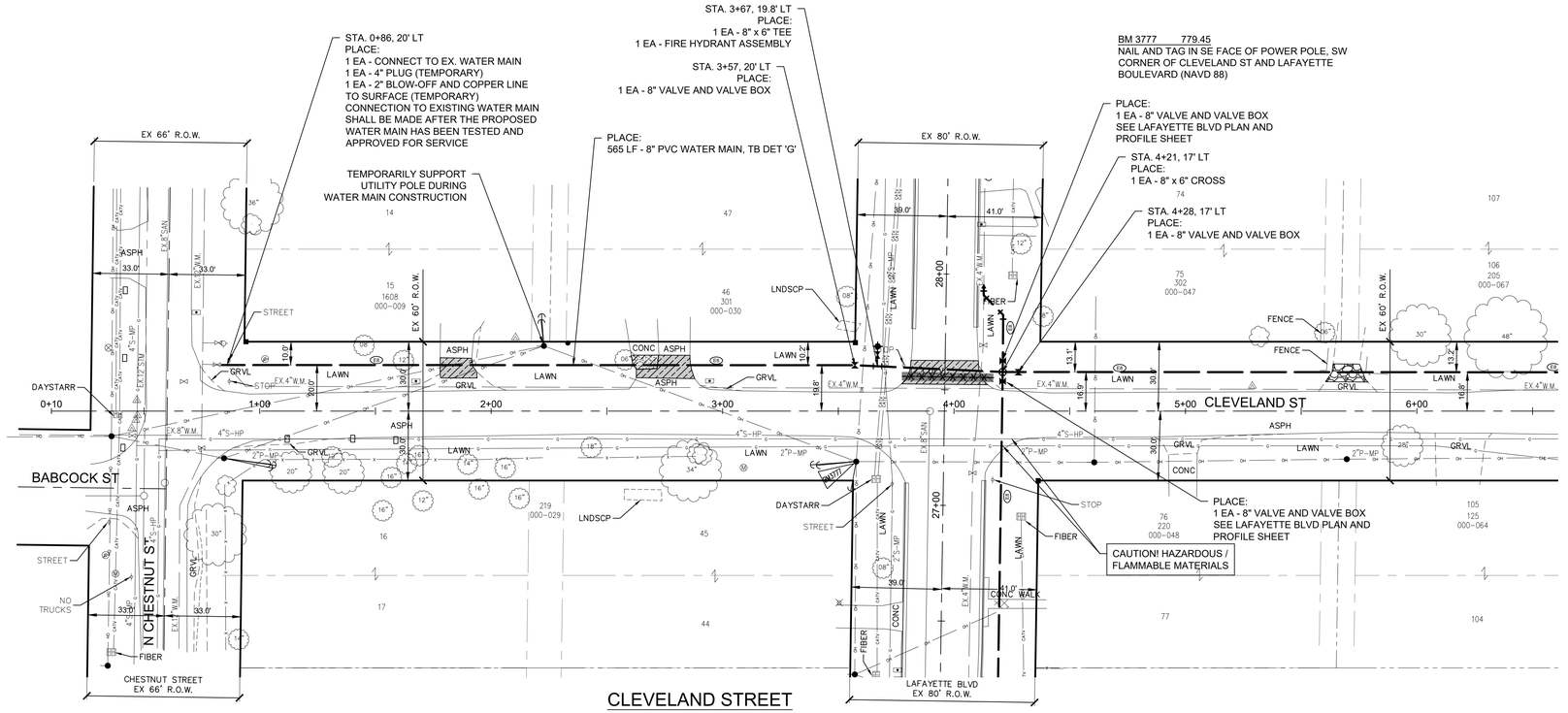
BENCHMARK DATA
ELEV. | DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1
TRAFFIC CONTROL PLAN

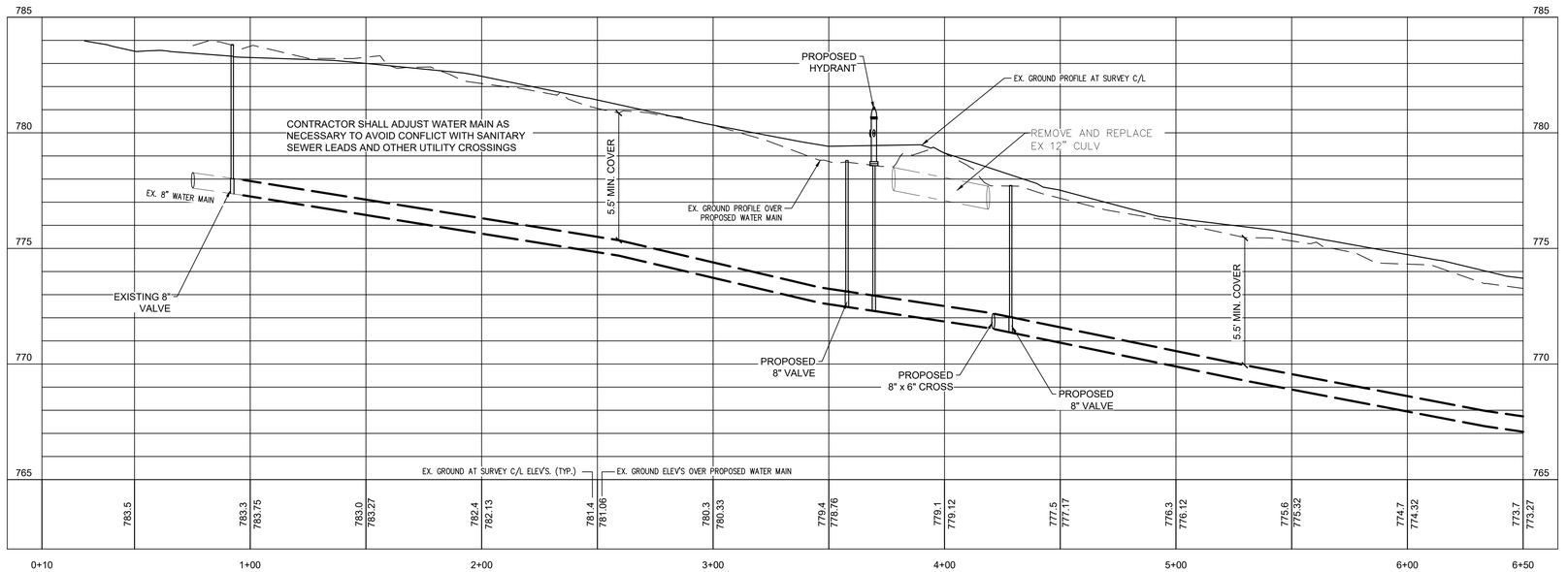
D4



LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- Curb and Gutter, Rem
- Culv, Rem
- Pavt, Rem
- Sidewalk, Rem and Sidewalk, Conc, __ inch
- Curb and Gutter, Conc, Det F4, Modified
- Culv, Cl __, (material), __ inch
- HMA, Repair
- Driveway, Nonreinf Conc, __ inch
- Approach, Cl II, LM
- STANDARD SOIL EROSION KEY

CONSTRUCTION QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
1	EA	CONNECT TO EX. WATER MAIN
565	LF	WATER MAIN, C909 PVC, 8 INCH, TB DETAIL G, MODIFIED
1	EA	WATER MAIN, 4 INCH CUT AND PLUG, MODIFIED
2	EA	GATE VALVE AND BOX, 8 INCH, MODIFIED
1	EA	FIRE HYDRANT AND VALVE ASSEMBLY
190	FT	1 INCH COPPER SERVICE LEAD, TYPE "K", MODIFIED
7	EA	CURB BOX, STOP, 3/4 INCH CORPORATION STOP AND CONNECTION, MODIFIED
1	EA	SUPPLY & INSTALL METER PIT, COMPLETE
1	EA	METER PIT, REM
1	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
80	SYD	PAVT, REM
8	SYD	DRIVEWAY, NONREINF CONC, 6 INCH
72	SYD	HMA, REPAIR
5	CYD	APPROACH, CL II, LM
630	SYD	TURF ESTABLISHMENT PERFORMANCE
1	EA	CULV, REM, LESS THAN 24 INCH
50	FT	CULV, CL E, CONC, 12 INCH



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BENCHMARK DATA

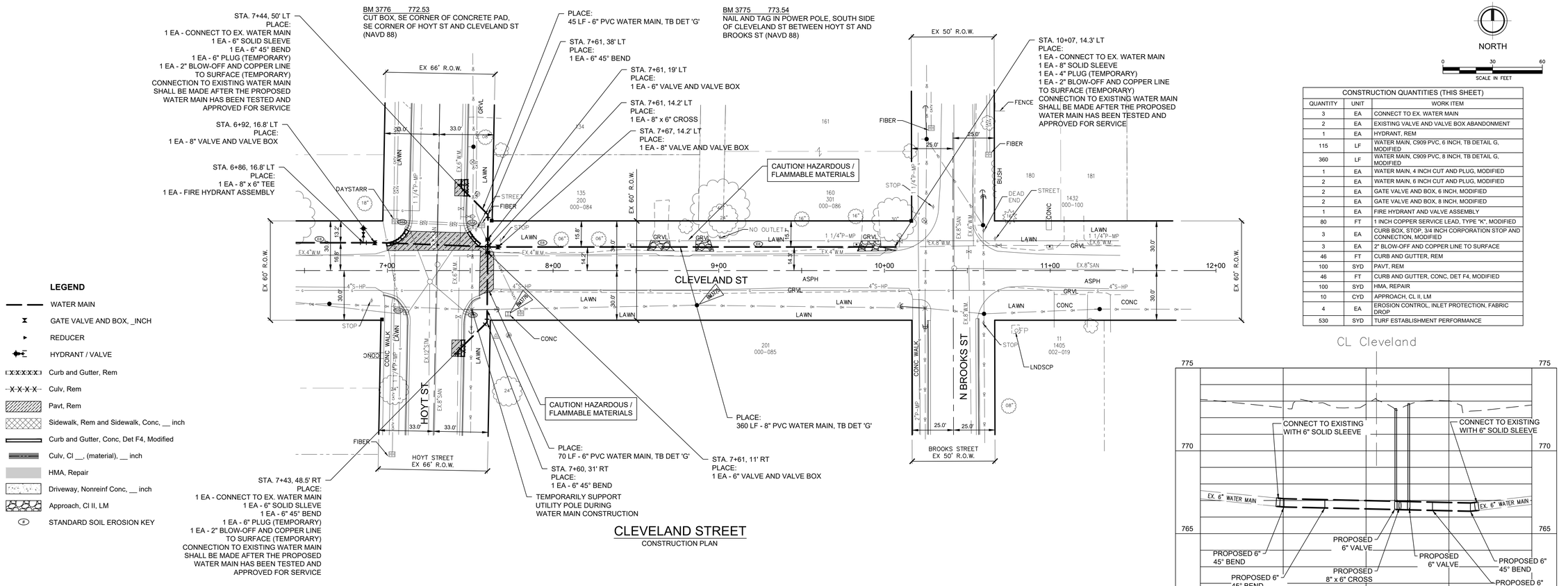
ELEV.	DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

CLEVELAND STREET
WATER MAIN PLAN

DATE
PROJECT NO.

CL1



CLEVELAND STREET
CONSTRUCTION PLAN

LEGEND

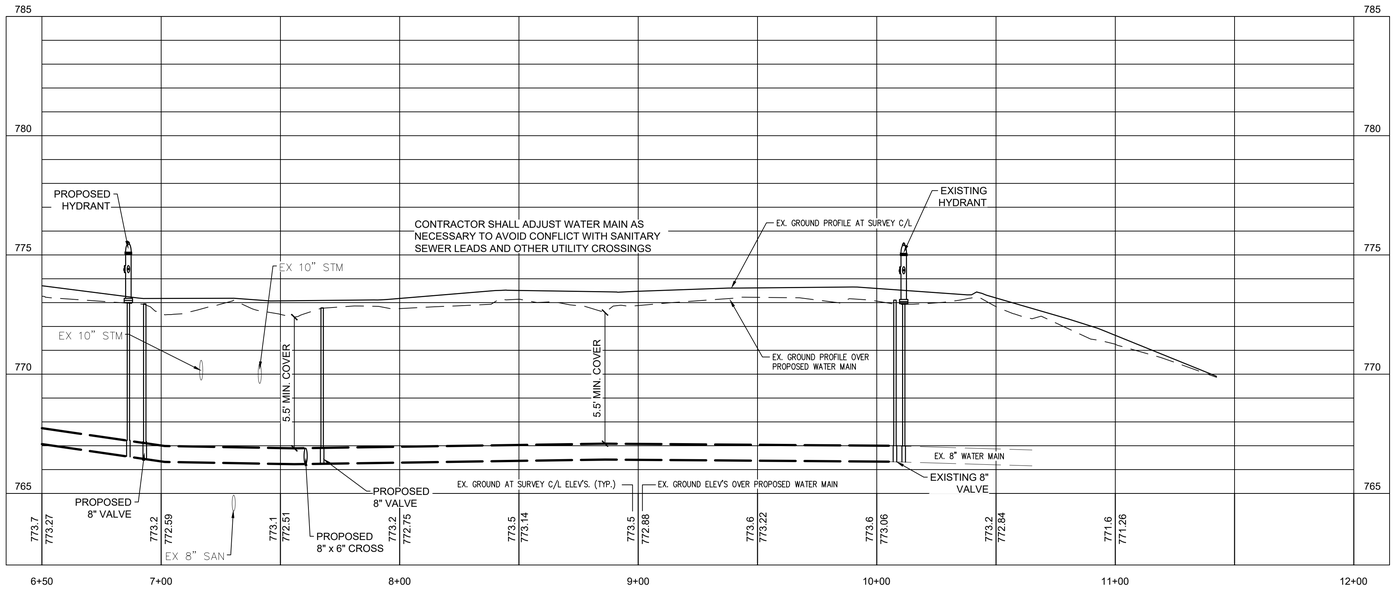
- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- Curb and Gutter, Rem
- Culv, Rem
- Pavt, Rem
- Sidewalk, Rem and Sidewalk, Conc, __ inch
- Curb and Gutter, Conc, Det F4, Modified
- Culv, Cl __, (material), __ inch
- HMA, Repair
- Driveway, Nonreinf Conc, __ inch
- Approach, CI II, LM
- STANDARD SOIL EROSION KEY

NORTH

0 30 60
SCALE IN FEET

CONSTRUCTION QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
3	EA	CONNECT TO EX. WATER MAIN
2	EA	EXISTING VALVE AND VALVE BOX ABANDONMENT
1	EA	HYDRANT, REM
115	LF	WATER MAIN, C909 PVC, 6 INCH, TB DETAIL G, MODIFIED
360	LF	WATER MAIN, C909 PVC, 8 INCH, TB DETAIL G, MODIFIED
1	EA	WATER MAIN, 4 INCH CUT AND PLUG, MODIFIED
2	EA	WATER MAIN, 6 INCH CUT AND PLUG, MODIFIED
2	EA	GATE VALVE AND BOX, 6 INCH, MODIFIED
2	EA	GATE VALVE AND BOX, 8 INCH, MODIFIED
1	EA	FIRE HYDRANT AND VALVE ASSEMBLY
80	FT	1 INCH COPPER SERVICE LEAD, TYPE "K", MODIFIED
3	EA	CURB BOX, STOP, 3/4 INCH CORPORATION STOP AND CONNECTION, MODIFIED
3	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
46	FT	CURB AND GUTTER, REM
100	SYD	PAVT, REM
46	FT	CURB AND GUTTER, CONC, DET F4, MODIFIED
100	SYD	HMA, REPAIR
10	CYD	APPROACH, CL II, LM
4	EA	EROSION CONTROL, INLET PROTECTION, FABRIC DROP
530	SYD	TURF ESTABLISHMENT PERFORMANCE

HOYT STREET CROSSING



HOYT STREET CROSSING

CITY OF OWOSSO, MICHIGAN
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DEPT. OF PUBLIC SERVICE

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BENCHMARK DATA

ELEV.	DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
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CLEVELAND STREET
WATER MAIN PLAN

DATE
PROJECT NO.

CL2

BM 4352 761.63
RAILROAD SPIKE IN SOUTH FACE OF POWER POLE, NE CORNER OF WEST M21 AND LAFAYETTE BLVD (NAVD 88)

BM 3777 779.45
NAIL AND TAG IN SE FACE OF POWER POLE, SW CORNER OF CLEVELAND ST AND LAFAYETTE BOULEVARD (NAVD 88)

NORTH
SCALE IN FEET

UPON COMPLETION OPEN EX. VALVE AND REMOVE BOX

STA. 20+95, 10' RT
PLACE:
1 EA - 6" 45° BEND

PLACE:
25 LF - 6" PVC WATER MAIN, TB DET 'G'

STA. 21+12, 25' RT
PLACE:
1 EA - 6" VALVE AND VALVE BOX

STA. 21+17, 25' RT
PLACE:
1 EA - 6" x 6" TEE
1 EA - FIRE HYDRANT ASSEMBLY

CAUTION! HAZARDOUS / FLAMMABLE MATERIALS

STA. 27+54, 25' RT
PLACE:
1 EA - 6" VALVE AND VALVE BOX

STA. 27+83, 25' RT
PLACE:
1 EA - 6" 45° BEND

PLACE:
15 LF - 6" PVC WATER MAIN, TB DET 'G'

STA. 27+91, 16.2 RT
PLACE:
1 EA - CONNECT TO EX. WATER MAIN
1 EA - 4" x 6" REDUCER
1 EA - 6" 45° BEND
1 EA - 4" PLUG (TEMPORARY)
1 EA - 2" BLOW-OFF AND COPPER LINE TO SURFACE (TEMPORARY)
CONNECTION TO EXISTING WATER MAIN SHALL BE MADE AFTER THE PROPOSED WATER MAIN HAS BEEN TESTED AND APPROVED FOR SERVICE

STA. 27+63, 25' RT
PLACE:
1 EA - 6" VALVE AND VALVE BOX

CAUTION! HAZARDOUS / FLAMMABLE MATERIALS

BUSHES AND PAVERS SHALL BE REMOVED AS NECESSARY

STA. 21+07, 25' RT
PLACE:
1 EA - 6" 45° BEND

STA. 20+90, 10.1 RT
PLACE:
1 EA - CONNECT TO EX. WATER MAIN
1 EA - 4" PLUG (TEMPORARY)
1 EA - 2" BLOW-OFF AND COPPER LINE TO SURFACE (TEMPORARY)
CONNECTION TO EXISTING WATER MAIN SHALL BE MADE AFTER THE PROPOSED WATER MAIN HAS BEEN TESTED AND APPROVED FOR SERVICE

TEMPORARILY SUPPORT UTILITY POLE DURING WATER MAIN CONSTRUCTION

PLACE:
675 LF - 6" PVC WATER MAIN, TB DET 'G'

STA. 24+00, 25' RT
PLACE:
1 EA - 6" x 6" TEE
1 EA - FIRE HYDRANT ASSEMBLY

TEMPORARILY SUPPORT UTILITY POLE DURING WATER MAIN CONSTRUCTION

TEMPORARILY SUPPORT UTILITY POLE DURING WATER MAIN CONSTRUCTION

LAFAYETTE BLVD
CONSTRUCTION PLAN

LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- Curb and Gutter, Rem
- Culv, Rem
- Pavt, Rem
- Sidewalk, Rem and Sidewalk, Conc, __ inch
- Curb and Gutter, Conc, Det F4, Modified
- Culv, Cl __, (material), __ inch
- HMA, Repair
- Driveway, Nonreinf Conc, __ inch
- Approach, Cl II, LM
- STANDARD SOIL EROSION KEY

PROPOSED HYDRANT
EX. GROUND PROFILE AT SURVEY C/L
5.5' MIN. COVER
CONTRACTOR SHALL ADJUST WATER MAIN AS NECESSARY TO AVOID CONFLICT WITH SANITARY SEWER LEADS AND OTHER UTILITY CROSSINGS
CONNECT TO EXISTING WITH 6" SOLID SLEEVE
EX. 4" WATER MAIN
EX. GROUND PROFILE OVER PROPOSED WATER MAIN
PROPOSED 6" VALVE
PROPOSED 8" x 6" CROSS
PROPOSED 6" VALVE
PROPOSED 6" 45° BEND
PROPOSED 6" 45° BEND
PROPOSED HYDRANT
5.5' MIN. COVER
EX. 10" STM
EX. 6" WATER MAIN
EXISTING 6" VALVE
PROPOSED 6" VALVE
PROPOSED 6" 45° BEND
PROPOSED 6" 45° BEND
EX. GROUND AT SURVEY C/L ELEV'S. (TYP.)
EX. GROUND ELEV'S OVER PROPOSED WATER MAIN

STA	EX. GROUND AT SURVEY C/L ELEV'S. (TYP.)	EX. GROUND ELEV'S OVER PROPOSED WATER MAIN
20+00	760.8	760.67
21+00	761.9	761.18
	764.4	763.79
22+00	767.0	766.34
	769.6	768.98
23+00	771.8	771.41
	773.3	772.82
24+00	774.4	773.88
	775.6	775.79
25+00	776.8	776.68
	777.5	777.21
26+00	777.8	777.31
	778.1	777.71
27+00	778.7	778.01
	779.3	778.10
28+00	779.3	779.13
	779.7	779.31
29+00		

CONSTRUCTION QUANTITIES (THIS SHEET)

QUANTITY	UNIT	WORK ITEM
2	EA	CONNECT TO EX. WATER MAIN
1	EA	HYDRANT, REM
3	EA	EXISTING VALVE AND VALVE BOX ABANDONMENT
715	LF	WATER MAIN, C909 PVC, 6 INCH, TB DETAIL G, MODIFIED
2	EA	WATER MAIN, 4 INCH CUT AND PLUG, MODIFIED
3	EA	GATE VALVE AND BOX, 6 INCH, MODIFIED
2	EA	FIRE HYDRANT AND VALVE ASSEMBLY
545	FT	1 INCH COPPER SERVICE LEAD, TYPE "K", MODIFIED
13	EA	CURB BOX, STOP, 3/4 INCH CORPORATION STOP AND CONNECTION, MODIFIED
4	EA	SUPPLY & INSTALL METER PIT, COMPLETE
4	EA	METER PIT, REM
2	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
20	FT	CURB AND GUTTER, REM
5	SYD	SIDEWALK, REM
110	SYD	PAVT, REM
20	FT	CURB AND GUTTER, CONC, DET F4, MODIFIED
45	SFT	SIDEWALK, CONC, 4 INCH
40	SYD	DRIVEWAY, NONREINF CONC, 6 INCH
70	SYD	HMA, REPAIR
5	CYD	APPROACH, CL II, LM
3	EA	EROSION CONTROL, INLET PROTECTION, FABRIC DROP
795	SYD	TURF ESTABLISHMENT PERFORMANCE

CITY OF OWOSSO, MICHIGAN
ENGINEERING DIVISION
DEPT. OF PUBLIC SERVICE

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	CHECKED BY		

BENCHMARK DATA
ELEV. DESCRIPTION

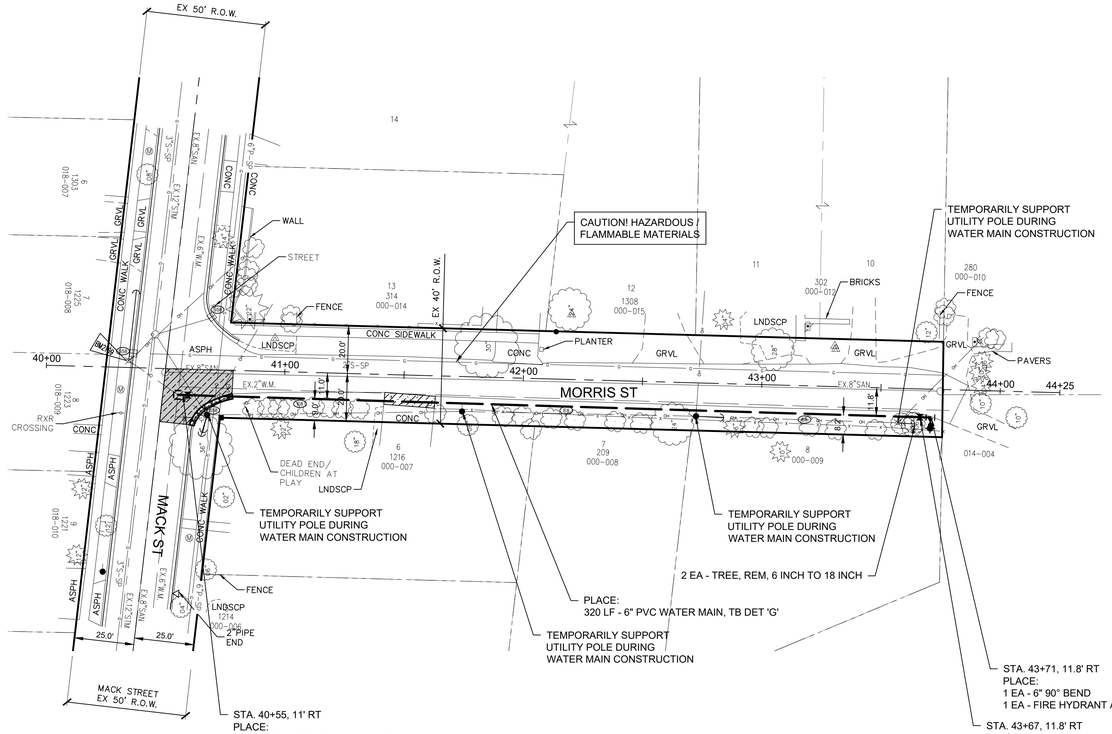
2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

LAFAYETTE BLVD
WATER MAIN PLAN

DATE
PROJECT NO.

LF1

BM 2169 739.92
RAILROAD SPIKE IN NORTH FACE OF POWER POLE, SOUTH SIDE OF MACK ST AT MORRIS ST (NAVD 88)



NORTH

0 30 60

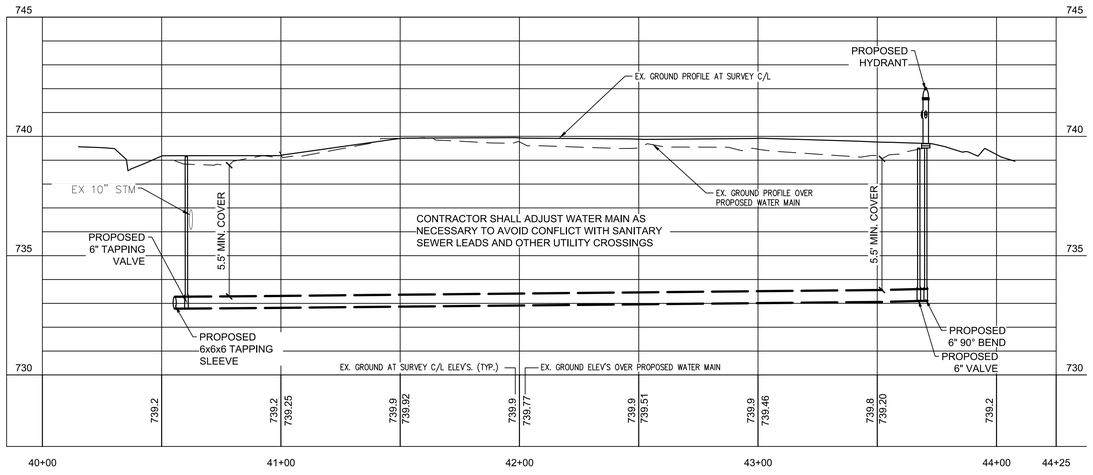
SCALE IN FEET

CONSTRUCTION QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
1	EA	CONNECT TO EX. WATER MAIN
1	EA	EXISTING VALVE AND VALVE BOX ABANDONMENT
320	LF	WATER MAIN, C909 PVC, 6 INCH, TB DETAIL G, MODIFIED
1	EA	WATER MAIN, 2 INCH CUT AND PLUG, MODIFIED
1	EA	GATE VALVE AND BOX, 6 INCH, MODIFIED
1	EA	FIRE HYDRANT AND VALVE ASSEMBLY
45	FT	1 INCH COPPER SERVICE LEAD, TYPE "K", MODIFIED
5	EA	CURB BOX, STOP, 3/4 INCH CORPORATION STOP AND CONNECTION, MODIFIED
1	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
22	FT	CURB AND GUTTER, REM
5	SYD	SIDEWALK, REM
70	SYD	PAVT, REM
22	FT	CURB AND GUTTER, CONC, DET F4, MODIFIED
45	SFT	SIDEWALK, CONC, 4 INCH
12	SYD	DRIVEWAY, NONREINF CONC, 6 INCH
58	SYD	HMA, REPAIR
2	EA	TREE, REM, 6 INCH TO 18 INCH
3	EA	EROSION CONTROL, INLET PROTECTION, FABRIC DROP
355	SYD	TURF ESTABLISHMENT PERFORMANCE

LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- Curb and Gutter, Rem
- Culv, Rem
- Pavt, Rem
- Sidewalk, Rem and Sidewalk, Conc, __ inch
- Curb and Gutter, Conc, Det F4, Modified
- Culv, Cl __, (material), __ inch
- HMA, Repair
- Driveway, Nonreinf Conc, __ inch
- Approach, Cl II, LM
- STANDARD SOIL EROSION KEY

MORRIS STREET
CONSTRUCTION PLAN



CITY OF OWOSSO, MICHIGAN
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BENCHMARK DATA

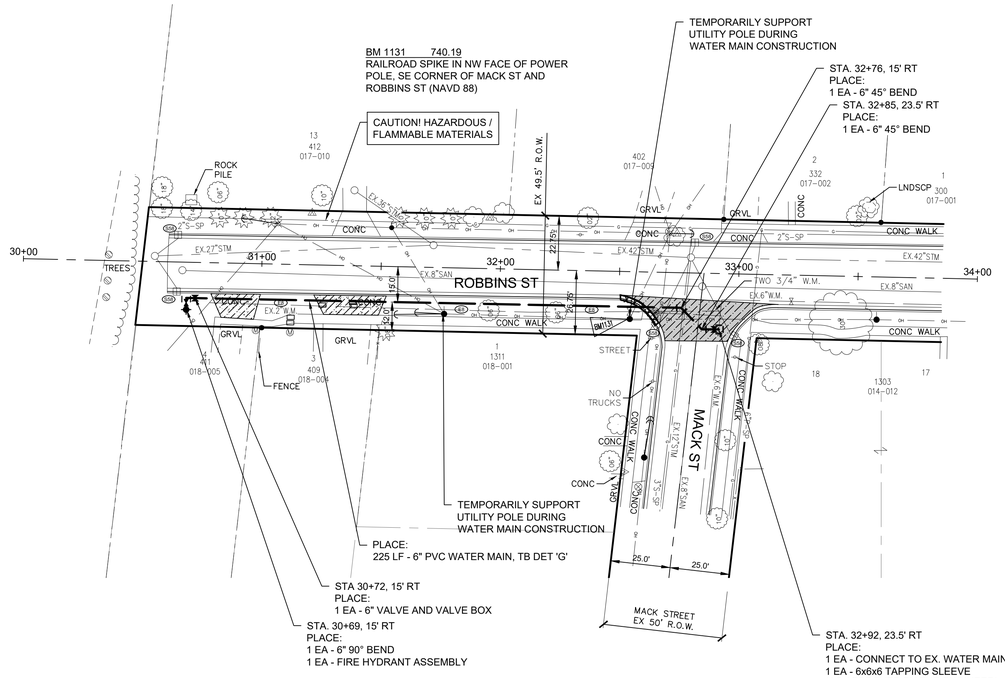
ELEV.	DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

MORRIS STREET
WATER MAIN PLAN

DATE
PROJECT NO.

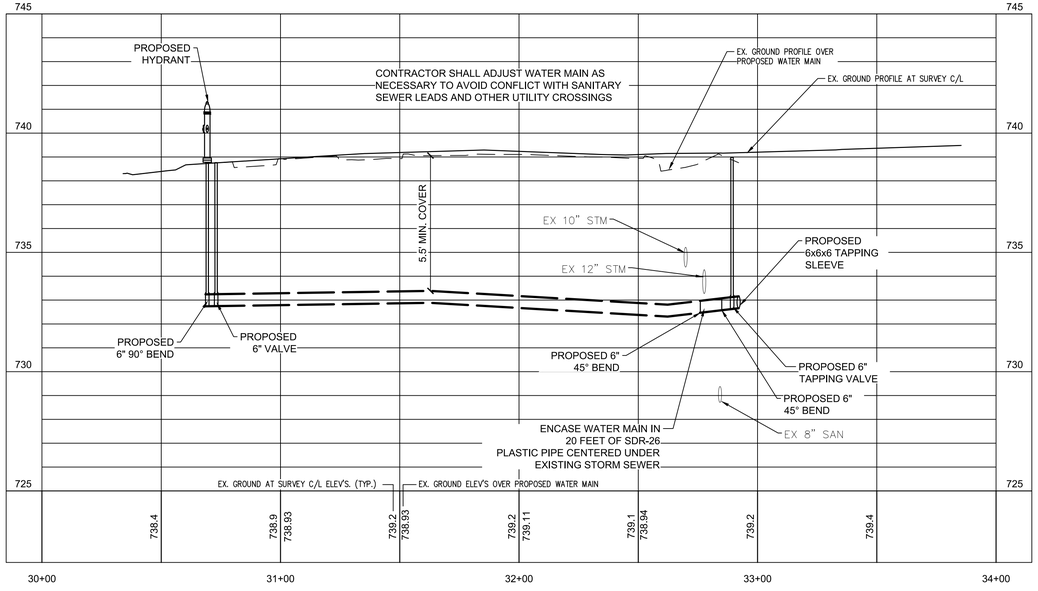
MR1

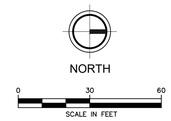


ROBBINS STREET
CONSTRUCTION PLAN

LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- Curb and Gutter, Rem
- Culv, Rem
- Pavt, Rem
- Sidewalk, Rem and Sidewalk, Conc, __ inch
- Curb and Gutter, Conc, Det F4, Modified
- Culv, Cl __, (material), __ inch
- HMA, Repair
- Driveway, Nonreinf Conc, __ inch
- Approach, Cl II, LM
- STANDARD SOIL EROSION KEY





CONSTRUCTION QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
1	EA	CONNECT TO EX. WATER MAIN
1	EA	EXISTING VALVE AND VALVE BOX ABANDONMENT
225	LF	WATER MAIN, C909 PVC, 6 INCH, TB DETAIL G, MODIFIED
1	EA	WATER MAIN, 2 INCH CUT AND PLUG, MODIFIED
1	EA	GATE VALVE AND BOX, 6 INCH, MODIFIED
1	EA	FIRE HYDRANT AND VALVE ASSEMBLY
110	FT	1 INCH COPPER SERVICE LEAD, TYPE "K", MODIFIED
5	EA	CURB BOX, STOP, 3/4 INCH CORPORATION STOP AND CONNECTION, MODIFIED
2	EA	SUPPLY & INSTALL METER PIT, COMPLETE
2	EA	WATER METER PIT, REM
1	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
20	FT	CURB AND GUTTER, REM
10	SYD	SIDEWALK, REM
120	SYD	PAVT, REM
20	FT	CURB AND GUTTER, CONC, DET F4, MODIFIED
50	SFT	SIDEWALK, CONC, 4 INCH
40	SFT	SIDEWALK, CONC, 6 INCH
45	SYD	DRIVEWAY, NONREINF CONC, 6 INCH
75	SYD	HMA, REPAIR
5	EA	EROSION CONTROL, INLET PROTECTION, FABRIC DROP
250	SYD	TURF ESTABLISHMENT PERFORMANCE

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BENCHMARK DATA
ELEV. | DESCRIPTION

2020 WATER MAIN REPLACEMENT PROJECT
DWRF PROJECT NUMBER 7457-01 PHASE 1

ROBBINS STREET
WATER MAIN PLAN

DATE
PROJECT NO.

RB1