CITY OF OWOSSO
2018 STREET PROGRAM
CONTRACT 2
SHIAWASSEE COUNTY
SECTIONS 23 & 24, T7N-R2E, CITY OF OWOSSO
POP: 15,194 (2010 CENSUS)

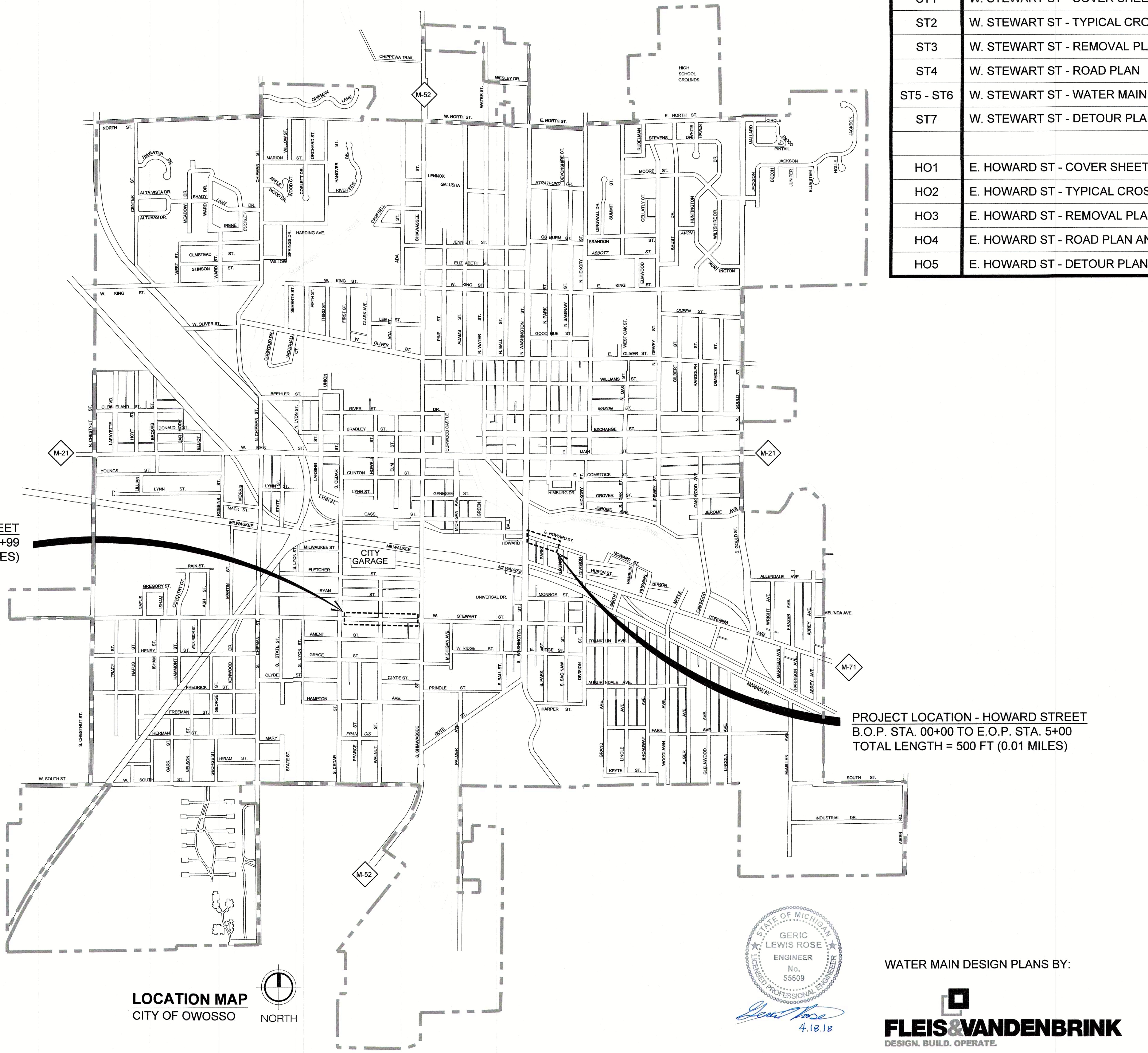
UTILITY CONTACTS

THE EXISTING UTILITIES LISTED BELOW AND SHOWN ON THE PLANS REPRESENT THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARING THESE PLANS. 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 989-725-0555 glenn.chinavare@ci.owosso.mi.us
CONSUMERS ENERGY ATT: JACOB CHALUT 530 W. WILLOW STREET P.O. BOX 30162 LANSING MI 48909	ELECTRIC OFFICE: 517-374-2329 CELL: 517-580-2049 jacob.chalut@cmsenergy.com
CONSUMERS ENERGY ATT: ADAM BERTRAM 530 W. WILLOW STREET P.O. BOX 30162 LANSING MI 48906	GAS OFFICE: 517-374-2375 CELL: 517-614-8570 adam.bertram@cmsenergy.com
DAYSTARR COMMUNICATIONS ATT: CASEY ROSE 307 N. BALL STREET OWOSSO, MI 48867	FIBER PHONE: 989-720-1000 FAX: 989-720-6060 casey.rose@corp.daystarr.net
FRONTIER COMMUNICATIONS ATT: MARK V. STEVENS 1943 W. M-21 OWOSSO, MI 48867	FIBER PHONE: 989-723-0373 mark.stevens@ftr.com
SHIAWASSEE COUNTY HEALTH DEPARTMENT ENVIRONMENTAL HEALTH DIVISION ATT: CASEY ELLIOT, REHS 201 N. SHIAWASSEE STREET CORUNNA, MI 48817	SOIL EROSION AND SEDIMENTATION CONTROL PHONE: 989-743-2289 FAX: 989-743-2413 CElliot@shiawasseechd.net

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

SHEET NO.	DESCRIPTION
CS	COVER SHEET
D1	NOTES AND MISCELLANEOUS ESTIMATES
D2	ROAD AND STORM SEWER DETAILS
D3	WATER MAIN NOTES AND DETAILS
D4	WATER MAIN STANDARD DETAILS
D5	SESC STANDARD NOTES AND DETAILS
ST1	W. STEWART ST - COVER SHEET
ST2	W. STEWART ST - TYPICAL CROSS SECTIONS
ST3	W. STEWART ST - REMOVAL PLAN
ST4	W. STEWART ST - ROAD PLAN
ST5 - ST6	W. STEWART ST - WATER MAIN PLAN AND PROFILE
ST7	W. STEWART ST - DETOUR PLAN
HO1	E. HOWARD ST - COVER SHEET
HO2	E. HOWARD ST - TYPICAL CROSS SECTIONS
HO3	E. HOWARD ST - REMOVAL PLAN
HO4	E. HOWARD ST - ROAD PLAN AND PROFILE
HO5	E. HOWARD ST - DETOUR PLAN



PROJECT LOCATION - WEST STEWART STREET
B.O.P. STA. 00+95 TO E.O.P. STA. 12+99
TOTAL LENGTH = 1,204 FT (0.23 MILES)

PROJECT LOCATION - HOWARD STREET
B.O.P. STA. 00+00 TO E.O.P. STA. 5+00
TOTAL LENGTH = 500 FT (0.01 MILES)

LOCATION MAP
CITY OF OWOSSO

MDOT ROAD STANDARD PLANS

WHERE THE FOLLOWING ITEMS ARE CALLED FOR ON PLANS. THEY ARE TO BE CONSTRUCTED ACCORDING TO THE MDOT STANDARD PLAN GIVEN BELOW OPPOSITE EACH ITEM UNLESS OTHERWISE INDICATED.

DRAINAGE STRUCTURES	R-1-G*
COVER B	R-7-F
MONUMENT BOXES	R-11-E
COVER K	R-15-F
COVER Q	R-18-F
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS	R-28-J*
DRIVEWAY OPENINGS & APPROACHES AND CONCRETE SIDEWALKS	R-29-I
CONCRETE CURB AND CONCRETE CURB GUTTER	R-30-G
BUMPER & PARKING RAILS AND MISC. WOOD POSTS	R-74-D
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS	R-80-E
FOR UNDERDRAINS, AND SEWER BULKHEADS	R-82-D
BEDDING AND FILLING AROUND PIPE CULVERTS	R-83-C
UTILITY TRENCHES	R-96-E
SOIL EROSION & SEDIMENTATION CONTROL MEASURES	R-100-H
SEEDING AND TREE PLANTING	

*SPECIAL DETAILS INCLUDED IN PROPOSAL OR MODIFIED IN GENERAL PLANS

GERIC LEWIS ROSE
No. 55609
4.18.18

WATER MAIN DESIGN PLANS BY:

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

811
Know what's **below.**
Call before you dig.

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

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CHECKED BY
ORIGINAL PLAN
APPROVED BY

BENCH MARK DATA

ELEV.	DESCRIPTION

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COVER SHEET
CONTRACT 2
FIELD BOOK
PG.
MARCH 2018
PROJECT NO. 832190
CS

GENERAL NOTES

UNDERGROUND UTILITIES / MISS DIG
FOR PROTECTION OF UNDERGROUND UTILITIES AN IN CONFORMANCE WITH PUBLIC ACT 174, 2013, THE CONTRACTOR SHALL DIAL 1-800-482-7171 OR A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE EXISTING UTILITIES ON THESE DRAWINGS HAVE BEEN SHOWN ACCORDING TO THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION AND SHALL NOTIFY THE ENGINEER AS TO WHERE POSSIBLE CONFLICTS EXISTS.

EXISTING WATER MAINS AND SEWERS
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO PROPERLY IDENTIFIED EXISTING WATER MAINS AND / OR EXISTING SEWERS DURING THE CONSTRUCTION OF THE PROJECT.

ADJUSTING OF MONUMENT BOXES
ALL GOVERNMENT CORNERS ON THIS PROJECT SHALL BE PRESERVED, WHETHER SHOWN OR NOT. IT MAY BE NECESSARY TO PLACE OR ADJUST MONUMENT BOXES, AS REQUIRED.

PAVEMENT MARKINGS AND SIGNS
ALL PERMANENT PAVEMENT MARKINGS, SHAPES AND DIMENSIONS SHALL CONFORM WITH MDOT PAVEMENT MARKING TYPICALS PAVE - 900 SERIES.

SOIL EROSION MEASURES
APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTH - DISTURBING ACTIVITIES. PLACE LAWN RESTORATION ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODABLE SLOPES AS DIRECTED BY THE ENGINEER. CRITICAL DITCH GRADES SHALL BE PROTECTED WITH EITHER SOD OR SEED / MULCH BLANKET AS DIRECTED BY THE ENGINEER.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ARE IN PLACE AND MAINTAINED UNTIL THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MEASURES SHALL ONLY BE PAID FOR ONCE.

RUBBISH DISPOSAL
SEE MAINTAINING TRAFFIC SPECIAL PROVISIONS.

MAIL DELIVERY
SEE MAINTAINING TRAFFIC SPECIAL PROVISIONS.

STORM SEWER REMOVAL
REMOVAL OF SEWER WITH DIAMETERS LESS THAN 12 INCHES, WITHIN THE EXCAVATION LIMITS OF NEW SEWER, IS INCLUDED IN THE UNIT PRICE FOR NEW SEWER AND WILL NOT BE PAID FOR SEPARATELY.

STORM SEWER STRUCTURES
ALL STORM ORIFICES TO RECEIVE SEWER PIPE SHALL BE FITTED WITH KOR-N-SEAL FLEXIBLE CONNECTOR(S), OR APPROVED EQUAL CONNECTOR. THE FLEXIBLE CONNECTOR WILL NOT BE PAID FOR SEPARATELY; BUT ARE CONSIDERED AS PART OF THE DRAINING STRUCTURE PAY ITEM.

STORM SEWER CONNECTIONS
PROPOSED STORM SEWERS SHALL BE CONNECTED TO EXISTING STORM SEWERS WITH A FERNCO COUPLER, OR APPROVED EQUAL, AS DIRECTED BY THE BEGINNER. CONNECTION SHALL BE ACCOMPLISHED WITH COUPLER OF SIMILAR SIZE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. PAYMENT FOR ALL MATERIALS AND LABOR NECESSARY TO ACCOMPLISH THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE CONSIDERED AS PART OF OTHER WORK ITEMS.

STREET APPROACHES
STREET APPROACHES SHALL BE PAID FOR AS PART OF THE MAINLINE PAVING PAY ITEMS.

STRUCTURE ADJUSTMENTS
ADJUSTMENTS TO STORM AND SANITARY STRUCTURES LOCATED WITHIN PAVEMENT OR CURB AND GUTTER SHALL BE PAID FOR AS: Dr Structure Cover, Adj, Case 1.

SIDEWALK RAMPS AND SIDEWALKS
SIDEWALK RAMPS SHALL BE COMPLETED IN ACCORDANCE WITH THE MDOT 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MDOT STANDARD PLAN R-28 SERIES, EXCEPT AS MODIFIED HEREIN. THE PORTION OF RAMP NEAREST THE CURB AND GUTTER SHALL BE 7-INCHES THICK AS IDENTIFIED ON THE SIDEWALK RAMP THICKNESS DETAIL. THE REMAINDER OF THE RAMP SHALL BE 4-INCHES THICK. THE PAY ITEMS FOR Sidewalk Ramp, Conc, 4 inch AND Sidewalk, Conc, _ inch SHALL INCLUDE ALL EXCAVATION AND EMBANKMENT NECESSARY TO CONSTRUCT EACH ITEM AND ALL WORK NECESSARY TO SAW AND TRIM EDGES OF EXISTING CONCRETE. EXCAVATION AND EMBANKMENT WILL NOT BE PAID FOR SEPARATELY.

DETECTABLE WARNING SURFACES SHALL BE RED IN COLOR, INSTALLED ONTO FRESH CONCRETE, AND IN ACCORDANCE WITH MDOT STANDARD PLAN R-28 SERIES.

SIDEWALKS LOCATED WITHIN RESIDENTIAL DRIVEWAYS SHALL BE 6-INCHES THICK AND WILL BE PAID FOR AS Sidewalk, Conc, 6 inch.

SIDEWALKS LOCATED WITHIN COMMERCIAL DRIVEWAYS SHALL BE 7-INCHES THICK AND WILL BE PAID FOR AS Sidewalk, Conc, 7 inch.

LAWN SPRINKLERS / LANDSCAPING
OWNERS OF EXISTING LAWN SPRINKLER SYSTEMS AND / OR LANDSCAPING SHALL BE NOTIFIED (IN WRITING WITH A COPY SENT TO THE ENGINEER) BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF ANY WORK THAT WILL BE DONE THAT WILL AFFECT THOSE SYSTEMS AND / OR LANDSCAPING. IF THE PROPERTY OWNER FAILS TO RELOCATE THE LAWN SPRINKLER SYSTEM PRIOR TO THE CONTRACTOR BEGINNING WORK, AND IF THE CONTRACTOR CUTS THE SYSTEM DURING CONSTRUCTION, THE CONTRACTOR SHALL CAP THE SYSTEM PIPE AND WITNESS THE LOCATION OF THE CAP WITH A WOODEN STAKE FOR THE PROPERTY OWNERS USE. THE CONTRACTOR SHALL PLACE THE SALVAGED SPRINKLER HEADS ON THE BACK OF THE RIGHT OF WAY. IF THE PROPERTY OWNER FAILS TO RELOCATE THE LANDSCAPING PRIOR TO THE CONTRACTOR BEGINNING WORK, THE CONTRACTOR SHALL CAREFULLY SALVAGE THE LANDSCAPING ITEMS AND STOCKPILE THEM ON THE BACK OF THE RIGHT OF WAY OR AT A LOCATION DESIGNATED BY THE ENGINEER FOR THE PROPERTY OWNER. ANY OTHER MODIFICATION TO THE SPRINKLER SYSTEMS AND / OR LANDSCAPING IS THE RESPONSIBILITY OF THE OWNER AND IS NOT PART OF THIS CONTRACT. THIS WORK WILL NOT BE PAID FOR SEPARATELY.

PROPERTY OWNERS
PROPERTY OWNERS' NAMES, WHERE SHOWN, ARE FOR INFORMATION ONLY, AND THEIR ACCURACY IS NOT GUARANTEED.

MAINTAINING TRAFFIC
REFER TO THE CONTRACT SPECIAL PROVISIONS FOR WORK RESTRICTION RELATIVE TO MAINTAINING TRAFFIC.

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____ (ROAD AND STORM)
1	LSUM	Mobilization, Max____ (WATER MAIN)
200	Cyd	Subgrade Undercutting, Type II
200	Ton	Maintenance Gravel
4	Ea	Sanitary Serv Conflict
10	Ea	Abandoned Gas Main Conflict
100	Syd	Pavt, Rem
33	Syd	Sidewalk, Rem
200	Sft	Sidewalk, Conc, 4 inch
100	Sft	Sidewalk, Conc, 6 inch
5	Ton	Cement
200	Ft	Curb and Gutter, Rem
200	Ft	Curb and Gutter, Conc, Det F4, Modified
15	Ton	HMA Approach
30	Syd	Driveway, Nonreinf Conc, 6 inch
10	Cyd	Approach, CL II, LM
20	Ea	Post, Mailbox
14	Ea	Sign, Type III, Rem
14	Ea	Sign, Type III, Erect, Salv
208	Ft	Post, Steel, 3 Pound
2165	Syd	Turf Establishment, Performance

MAINTAINING TRAFFIC QUANTITIES

19	Ea	Barricade, Type III, High Intensity, Double Sided, Furn & Oper
12	Ea	Pedestrian Type II Barricade, Temp
2	Ea	Lighted Arrow, Type C, Furn & Oper
80	Ea	Plastic Drum, High Intensity, Furn & Oper
450	Sft	Sign, Type B, Temp, Prismatic, Furn & Oper
1	LSUM	Minor Traf Devices

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		RIGHT-OF-WAY 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	CATV	CABLE T.V.
	CURB STOP & BOX		PED CROSSING SIGNAL	T	TELEPHONE
W	WELL		YARD LIGHT	E	ELECTRIC
W	WATER MANHOLE		SIGN	G	GAS
W	WATER METER		MAILBOX	OH	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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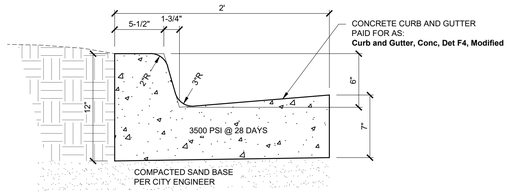
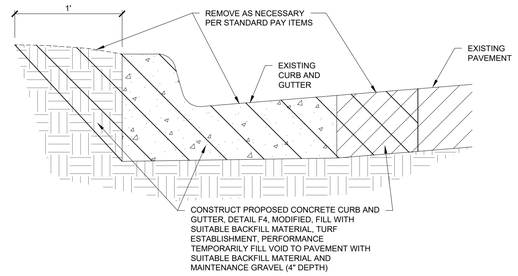
2018 STREET PROGRAM
NOTES AND MISCELLANEOUS ESTIMATES
MARCH, 2018
PROJECT NO. 832190
FIELD BOOK
PG.

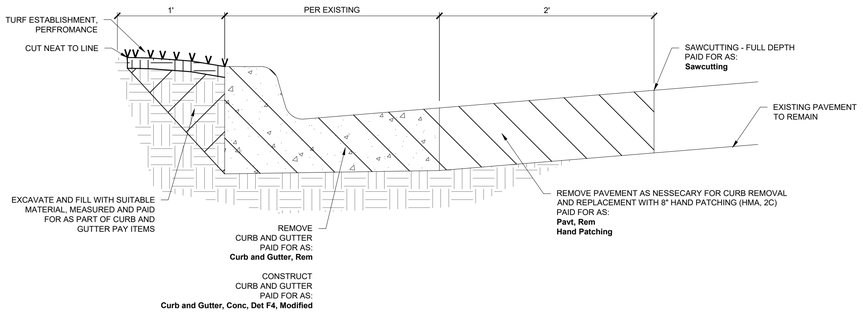
D1



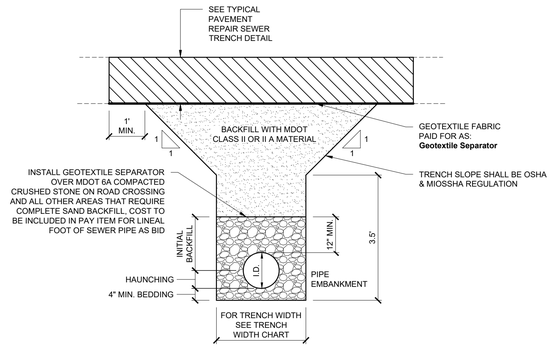
CONCRETE CURB AND GUTTER
MDOT F4 - MODIFIED DETAIL
NOT TO SCALE



TYPICAL SELECT CURB AND GUTTER REPAIR DETAIL
(WITHIN ROAD REHABILITATION LIMITS)
NOT TO SCALE

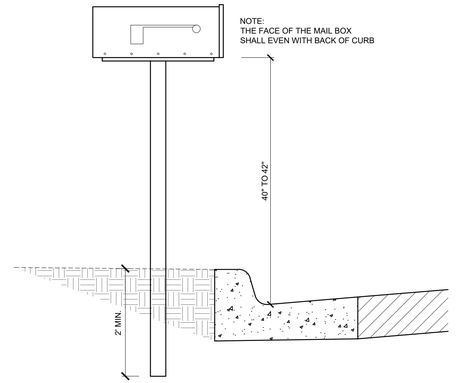


TYPICAL SELECT CURB AND GUTTER REPAIR DETAIL
(OUTSIDE OF ROAD REHABILITATION LIMITS)
NOT TO SCALE

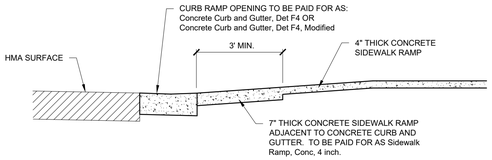


TRENCH DETAIL B - MODIFIED DETAIL
NOT TO SCALE

TRENCH WIDTH CHART		
PIPE SIZE	MINIMUM	MAXIMUM
6", 8" & 10"	24"	30"
12" & 15"	30"	36"
18"	34"	40"
21"	38"	42"
24"	42"	46"
27"	45"	49"
30"	49"	53"
36"	56"	60"
LARGER THAN 36"	I.D. +20"	I.D. +24

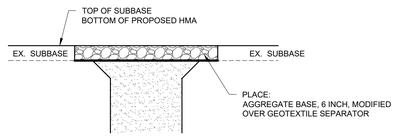


TYPICAL MAIL BOX CROSS SECTION DETAIL
NOT TO SCALE

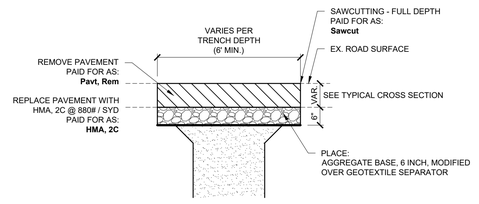


SIDEWALK RAMP THICKNESS DETAIL
NOT TO SCALE

RESIDENTIAL AGGREGATE DRIVE RESTORATION DETAIL
NOT TO SCALE



TYPICAL PAVEMENT REPAIR SEWER TRENCH DETAIL
(WITHIN ROAD REHABILITATION LIMITS)
NOT TO SCALE



TYPICAL PAVEMENT REPAIR SEWER TRENCH DETAIL
(OUTSIDE OF ROAD REHABILITATION LIMITS)
NOT TO SCALE

CITY OF OWOSSO, MICHIGAN
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2018 STREET PROGRAM
ROAD AND STORM SEWER
DETAILS

MARCH, 2018
PROJECT NO. 832190

FIELD BOOK
PG.

D2

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 ENVIRONMENTAL QUALITY 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.

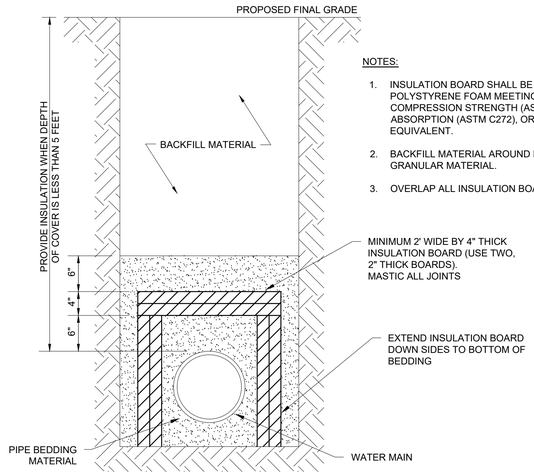
19. THE CONTRACTOR SHALL ENCASE THE WATER MAIN IN CONCRETE WHERE VERTICAL SEPARATION BETWEEN STORM SEWER AND WATER MAIN OR SANITARY SEWER AND WATER MAIN IS LESS THAN EIGHTEEN (18) INCHES, AS PER MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIREMENTS.

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.



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.

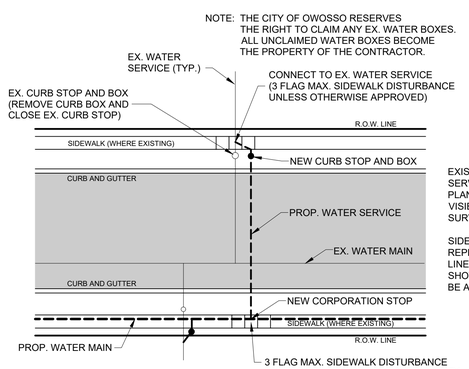
WATER MAIN TRENCH INSULATION DETAIL
NOT TO SCALE

NEW WATER SERVICE, OPEN CUT OR FREEBORE, SHALL INCLUDE ALL LABOR AND MATERIALS REQUIRED TO COMPLETELY INSTALL A NEW WATER SERVICE FROM THE NEW MAIN TO THE EXISTING SERVICE AT THE CURB STOP BOX, INCLUDING CORPORATION, COPPER SERVICE LINE, NEW CURB STOP AND BOX, REMOVING EXISTING CURB BOX AND CLOSING EXISTING CURB STOP, TAPPING THE NEW MAIN, AND MAKING CONNECTION WITH THE EXISTING SERVICE AT THE CURB STOP BOX. LEADS TO OPPOSITE SIDE OF THE ROAD OF THE NEW WATER MAIN WILL BE INSTALLED WITH MORE LENGTH THAN SERVICES INSTALLED ON THE WATER MAIN CONSTRUCTION SIDE.

WATER SERVICES ON THE OPPOSITE SIDE OF THE ROAD OF THE NEW WATER MAIN SHALL BE PAID FOR AS 'NEW WATER SERVICE, FREEBORE' (EA).

WATER SERVICES ON THE SAME SIDE OF THE ROAD AS THE NEW WATER MAIN SHALL BE PAID FOR AS 'NEW WATER SERVICE, OPEN CUT' (EA).

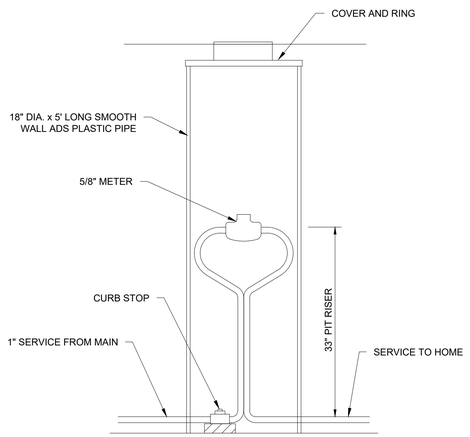
WHERE THE EXISTING CURB STOP BOX IS LOCATED IN PAVEMENT, PAVEMENT REMOVAL AND DRIVE RESTORATION WILL BE PAID SEPARATELY. CONTRACTOR SHALL MINIMIZE PAVEMENT DISTURBANCE AS DIRECTED BY THE ENGINEER.



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

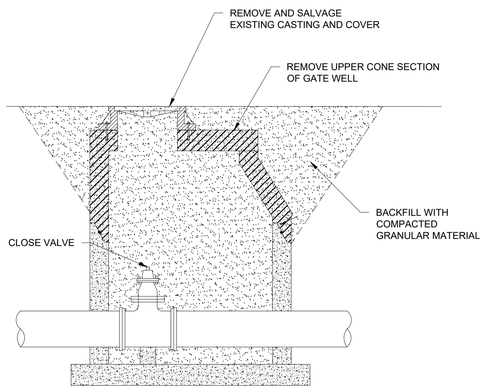
SIDEWALK REMOVAL AND REPLACEMENT FOR WATER SERVICE LINE REPLACEMENT IS ALSO NOT SHOWN ON PLAN SHEETS AND SHALL BE AS DIRECTED BY ENGINEER

NEW WATER SERVICE CONNECTION DETAIL
NOT TO SCALE



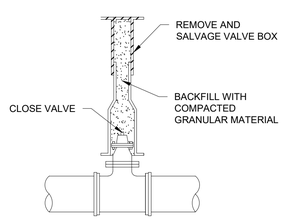
FOR DWELLINGS UTILIZING EXISTING METER PITS, NEW METER PITS WILL BE CONSTRUCTED BY THE CITY OF OWOSSO AS PART OF THIS PROJECT. CONTRACTOR SHALL CONNECT THE NEW SERVICE LEAD TO THE NEW WATER MAIN, RUN THE COPPER SERVICE LEAD TO THE DESIRED LOCATION OF THE METER PIT AS DIRECTED (TYPICALLY NEAR THE R.O.W.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

ej

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

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
9475 Holly Rd, Suite 201
Grand Blanc, MI 48439
P: 810.743.9120
F: 810.743.1797

REVISION:

CITY OF OWOSSO
SHIAWASSEE COUNTY, MICHIGAN
2018 STREET PROGRAM

WATER MAIN NOTES AND DETAILS

DESIGN TEAM: GLR, DPH
CHECK BY: SMB MAR 2018
DRAWING INFORMATION: 832190_04_D3_WM 031518 gericr

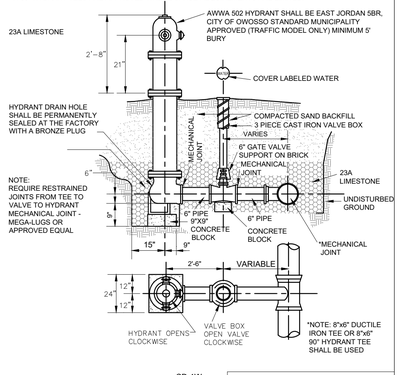
MARCH, 2018

F&V PROJECT NO. 832190

D3

NOTES:

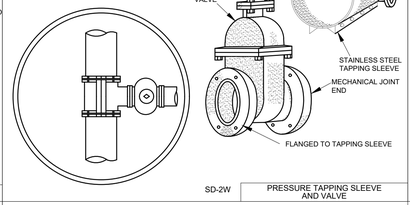
1. THE PUMPER CONNECTION SHALL FACE THE STREET.
2. SET THE HYDRANT FLANGE AT PROPOSED GRADE OR AS FIELD DIRECTED.
3. SET THE VALVE BOX COVER FLUSH WITH THE PROPOSED GRADE.
4. ALL WORK FROM THE CENTER LINE OF THE MAIN TO AND INCLUDING THE HYDRANT SHALL BE PAID FOR BY UNIT PRICE BID ITEM FOR HYDRANTS.
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.



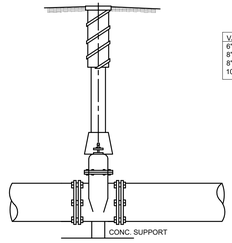
SD-2W | PRESSURE TAPPING SLEEVE AND VALVE

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

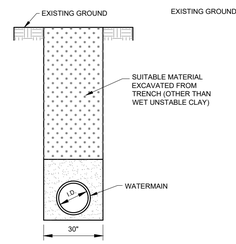
NOTES:

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.

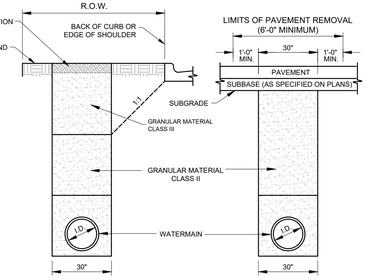


VALVE SIZE	MIN. BASIN SIZE
6"	BOX-3 PIECE
8" UNPAVED	BOX-3 PIECE
8" PAVED	BOX-3 PIECE
10" - 12"	BOX-3 PIECE

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)*

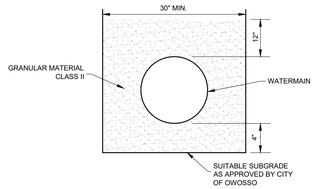
LENGTH (IN FEET) OF RESTRAINT REQUIRED (2)

DEFLECTION ANGLE	22½°	33 3/4°	45°	56 1/4°	67 1/2°	78 3/4°	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

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.
9475 Holly Rd, Suite 201
Grand Blanc, MI 48439
P: 810.743.9120
F: 810.743.1797

REVISION:

CITY OF OWOSSO
SHIAWASSEE COUNTY, MICHIGAN
2018 STREET PROGRAM

WATER MAIN STANDARD DETAILS

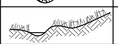
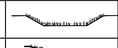
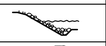
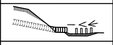
DESIGN TEAM: GLR, DPH
CHECK BY: SMB MAR 2018
DRAWING INFORMATION: 832190_05_D4_WM 031518 gericr

MARCH, 2018

F&V PROJECT NO. 832190

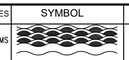
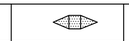
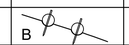
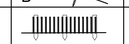
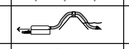
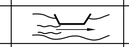
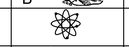
D4

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.

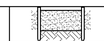
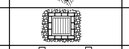
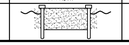
B = BIOENGINEERING

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, WATER MAIN 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						—	—	—				
TEMP CONSTRUCTION ROADS									N/A			
FOUNDATION/ BLDG. CONSTRUCTION									N/A			
SITE CONSTRUCTION							—	—				
PERM CONTROL MEASURES								—				
FINISH GRADING								—				
LANDSCAPING									N/A			

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9475 Holly Rd, Suite 201
Grand Blanc, MI 48439
P: 810.743.9120
F: 810.743.1797

REVISION:

CITY OF OWOSSO
SHIAWASSEE COUNTY, MICHIGAN
2018 STREET PROGRAM

SESC STANDARD NOTES AND DETAILS

DESIGN TEAM: INITIALS
CHECK BY: SMB MAR 2018
DRAWING INFORMATION: 832190_06_DS_SESC 031518 gericr

MARCH, 2018

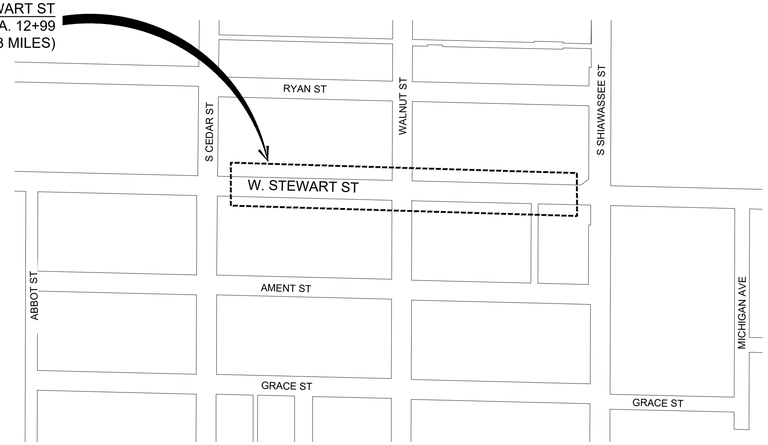
F&V PROJECT NO. 832190

D5

W. STEWART STREET

CITY OF OWOSSO
2018 STREET PROGRAM
CONTRACT 2

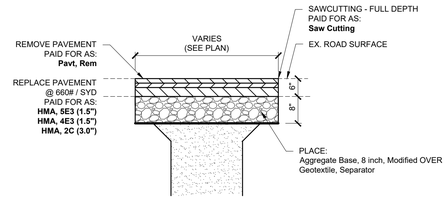
PROJECT LOCATION - W. STEWART ST
B.O.P. STA. 00+95 TO E.O.P. STA. 12+99
TOTAL LENGTH = 1,204 FT (0.23 MILES)



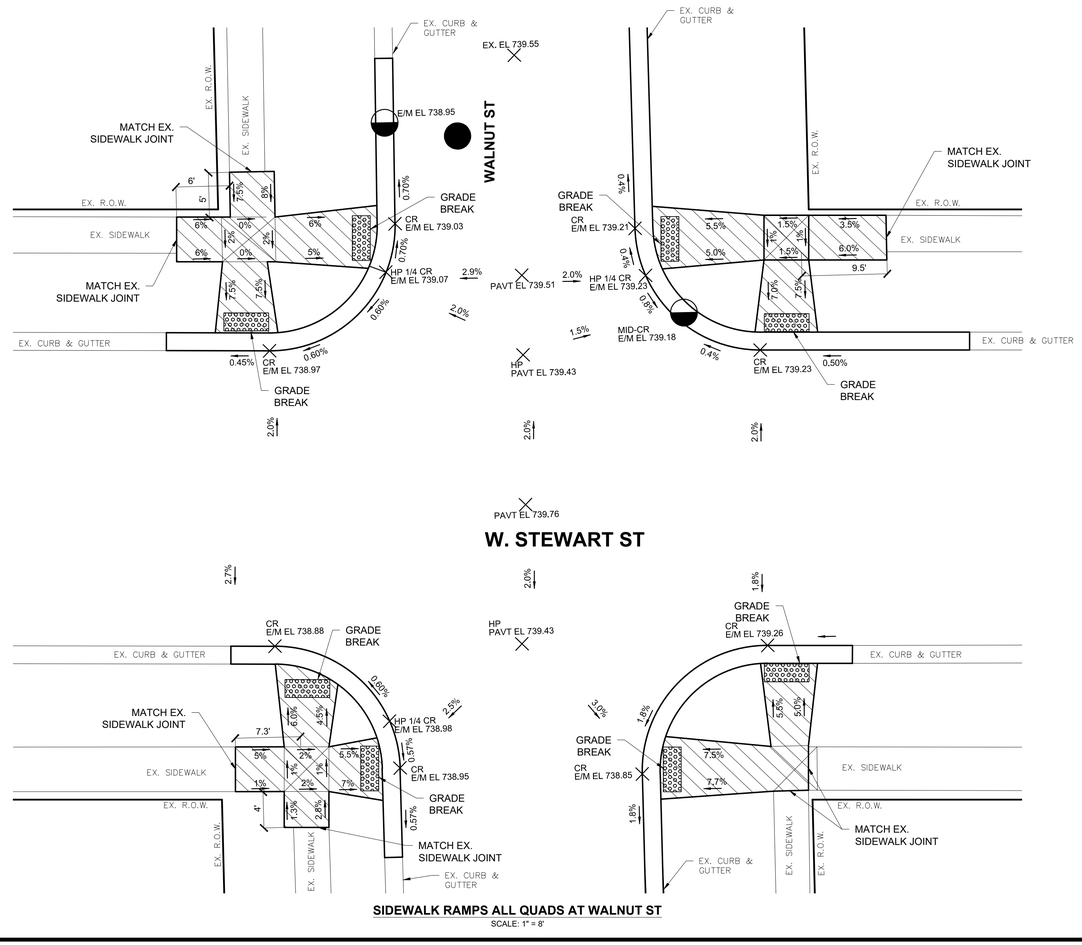
VICINITY MAP
SUMMIT STREET

NORTH

SHEET NO.	DESCRIPTION
ST1	W. STEWART ST - COVER SHEET
ST2	W. STEWART ST - TYPICAL CROSS SECTIONS
ST3	W. STEWART ST - REMOVAL PLAN
ST4	W. STEWART ST - ROAD PLAN
ST5 - ST6	W. STEWART ST - WATER MAIN PLAN AND PROFILE
ST7	W. STEWART ST - DETOUR PLAN



TYPICAL WATER MAIN TRENCH PAVEMENT REPAIR DETAIL
APPLIES TO ROAD AREAS OUTSIDE OF PROPOSED STREET REHABILITATION
NOT TO SCALE



SIDEWALK RAMPS ALL QUADS AT WALNUT ST
SCALE: 1" = 8'

LEGEND:

- LANDING AREA
- DETECTABLE WARNING SURFACE
- SIDEWALK RAMP PAY ITEM
- SIDEWALK PAY ITEM
- CURB & GUTTER REMOVAL & REPLACEMENT

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

NO.	REVISIONS	DATE	BY
	ORIGINAL PLAN		APPROVED BY
			CHECKED BY

BENCH MARK DATA

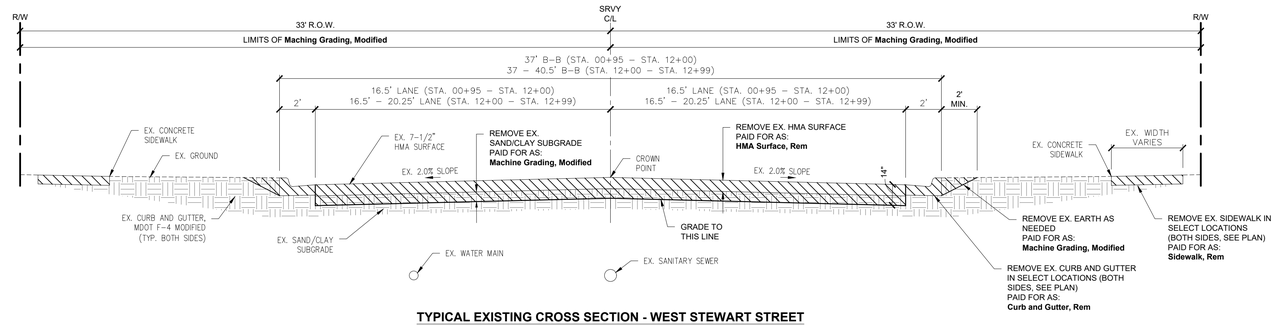
ELEV.	DESCRIPTION

2018 STREET PROGRAM
W. STEWART ST - COVER SHEET, SIDWALK RAMP DETAILS

MARCH, 2018
PROJECT NO. 832190

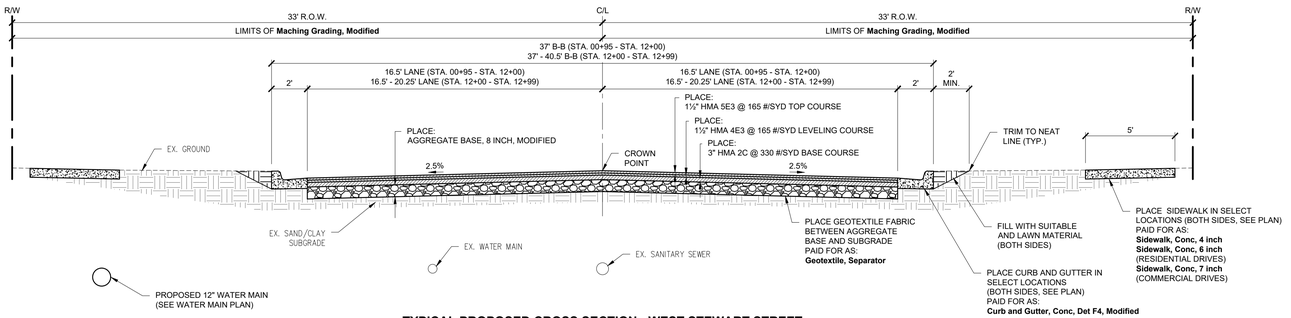
FIELD BOOK
PG.

ST1



TYPICAL EXISTING CROSS SECTION - WEST STEWART STREET

APPLIES TO STATIONS:
0+95 (B.O.P.) TO 12+99 (E.O.P.)
SCALE: 1" = 4'



TYPICAL PROPOSED CROSS SECTION - WEST STEWART STREET

APPLIES TO STATIONS:
0+95 (B.O.P.) TO 12+99 (E.O.P.)
SCALE: 1" = 4'

W. STEWART STREET - HMA APPLICATION CHART					
ITEM	PAY ITEM	RATE PER SYD	PERFORMANCE GRADE	ESTIMATED THICKNESS, INCH	REMARKS
HMA	HMA, 5E3	165 LBS.	64 - 28	1.5"	TOP COURSE - AWI = 260 (MIN.)
	HMA, 4E3	165 LBS.	64 - 28	1.5"	LEVELING COURSE
	HMA, 2C	330 LBS.	64 - 28	3.0"	BASE COURSE
HAND PATCHING	Hand Patching	110 LBS / SYD / INCH	64 - 28		HMA, 2C (PLACED IN EQUAL LIFTS)
COMMERCIAL DRIVE APPROACH	HMA Approach	165 LBS.	58 - 28	1.5"	TOP COURSE - AWI = 220 (MIN.) (HMA, 13A)
	HMA Approach	935 LBS.	58 - 28	8.5"	BASE COURSE (HMA, 13A) PLACED IN 3 EQUAL LIFTS
RESIDENTIAL DRIVE APPROACH	HMA Approach	220 LBS.	58 - 28	2"	TOP COURSE - AWI = 220 (MIN.) HMA, 13A
	HMA Approach	330 LBS.	58 - 28	3"	BASE COURSE HMA, 13A
HMA BOND COAT		0.10 GAL.			SS-1H (FOR INFORMATION ONLY)

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

REVISIONS | NO. | DATE | BY | DESCRIPTION

ORIGINAL PLAN | APPROVED BY | CHECKED BY

BENCH MARK DATA
ELEV.

2018 STREET PROGRAM
W. STEWART ST
TYPICAL CROSS SECTIONS

MARCH, 2018
PROJECT NO. 832190

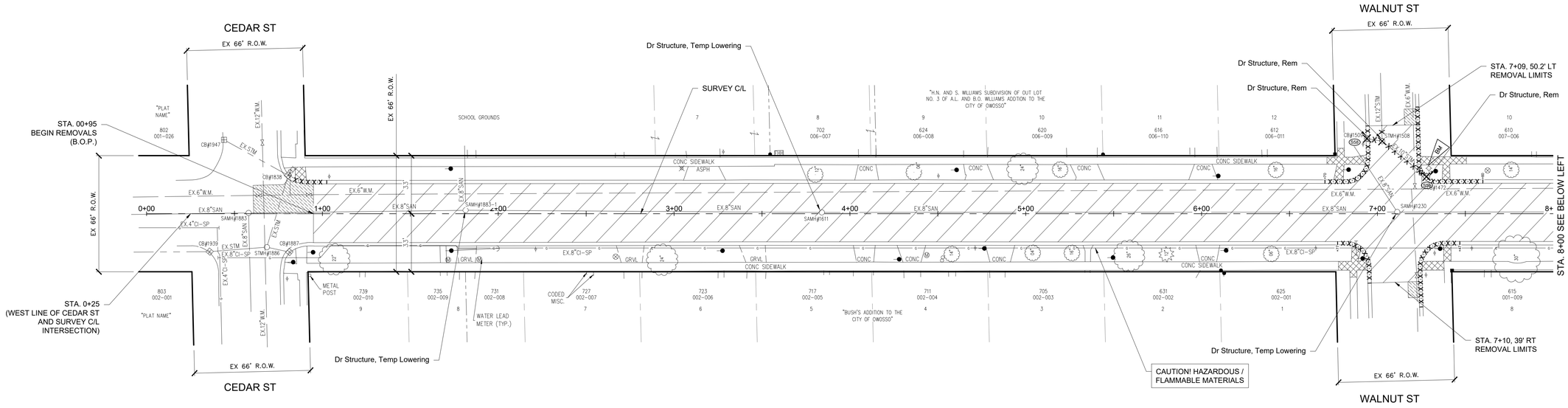
FIELD BOOK
P.G.

ST2

BM EL. 741.77
CHISELED ' X ' ON ESE BOLT OF HYDRANT AT NORTHEAST CORNER OF WEST STEWART STREET AND WALNUT STREET.
(NAVD 88)

NORTH

0 30 60
SCALE IN FEET



NOTE:
CONTRACTOR SHALL PROVIDED SUFFICIENT PROTECTION FOR BOTH MOTORISTS AND WORKERS THROUGHOUT WORKSITE SO AS TO ALLOW SAFE PASSAGE AROUND WORK AREAS - AS DIRECTED BY THE ENGINEER

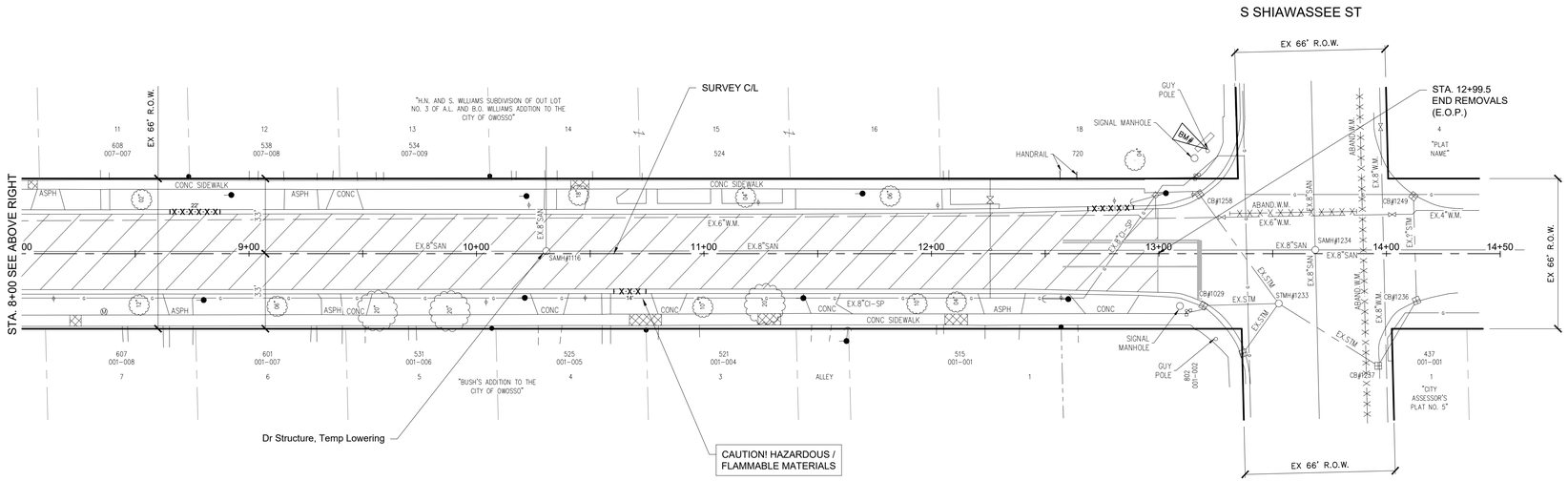
WEST STEWART STREET
REMOVAL PLAN

LEGEND

- Curb and Gutter, Rem
- Sewer, Rem
- Dr Structure, Rem
- HMA Surface, Rem
- Pavt, Rem
- Sidewalk, Rem
- Excavation Earth (Cost inclusive to Machine Grading, Modified)
- STANDARD SOIL EROSION KEY

BM EL. 741.15
CHISELED ' X ' ON SE BOLT OF GUY POLE FOR TRAFFIC LIGHT AT NORTHWEST CORNER OF WEST STEWART STREET AND SHIAWASSEE STREET (NAVD 88).

REMOVAL QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
4641	Syd	HMA Surface, Rem
75	Syd	Pavt, Rem
92	Syd	Sidewalk, Rem
301	Ft	Curb and Gutter, Rem
3	Ea	Dr Structure, Rem
6	Ea	Erosion Control, Inlet Protection, Fabric Drop
25	Sta	Machine Grading, Modified
4	Ea	Dr Structure, Temp Lowering



WEST STEWART STREET
REMOVAL PLAN

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

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

REVISIONS | NO. | DATE | BY | DESCRIPTION

ORIGINAL PLAN APPROVED BY
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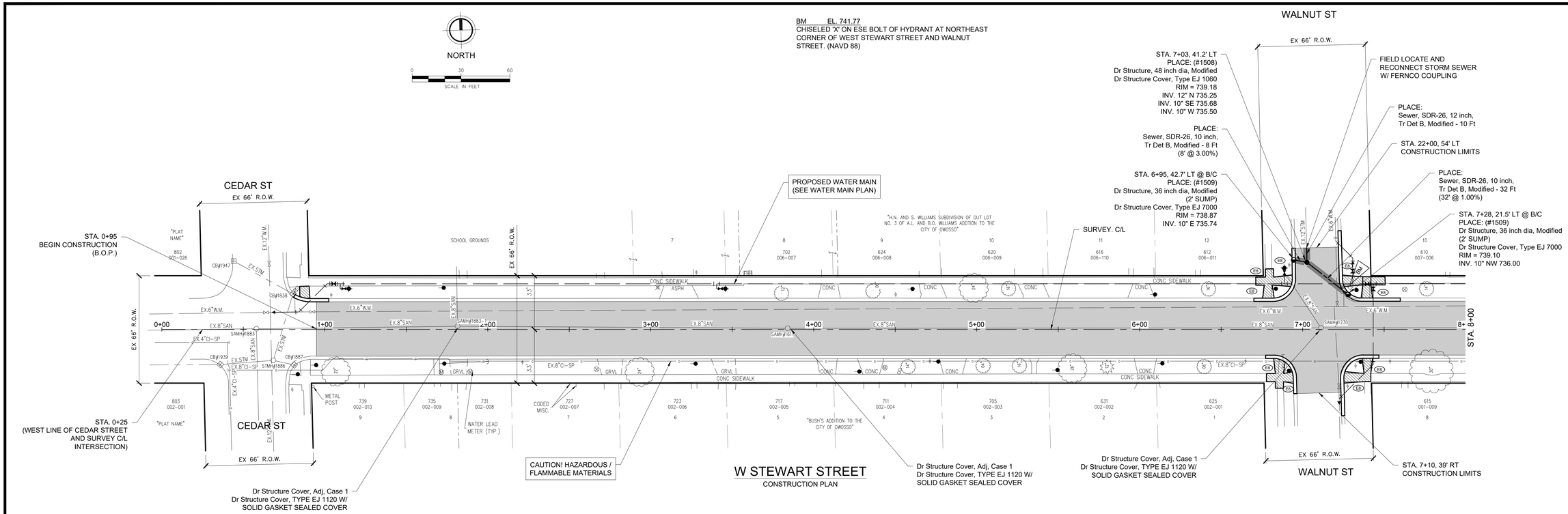
BENCH MARK DATA
ELEV.

2018 STREET PROGRAM
W STEWART ST
REMOVAL PLAN

MARCH, 2018
PROJECT NO. 832190

FIELD BOOK
PG.

ST3

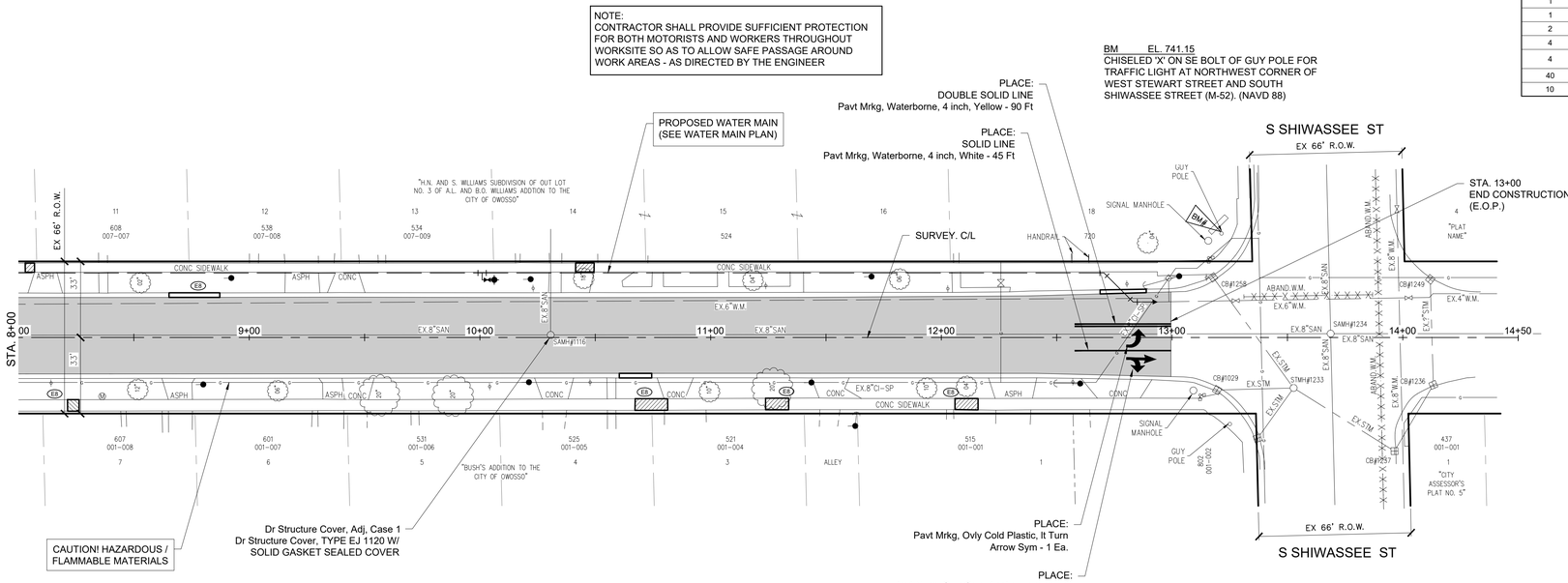


LEGEND

- **C**urb and Gutter, Conc, Det F4, Modified
- Sewer, SDR-26, _ inch, Tr Det B, Modified
- Dr Structure, _ inch dia, Modified (Catch Basin, Manhole)
- HMA / HMA Approach
- Driveway, Nonreinf, Conc, _ inch
- Aggregrate Approach, _ inch
- Sidewalk, Conc, _ inch
- Sidewalk, Ramp, Conc, _ inch
- Abn — Dr Structure, Abandon
- Adj — Dr Structure Cover, Adj, Case _ / Valve Box, Adj
- STANDARD SOIL EROSION KEY

CONSTRUCTION QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
856	Ton	HMA, 5E3
428	Ton	HMA, 4E3
428	Ton	HMA, 3C
4715	Syd	Aggregate Base, 8 inch, Modified
4715	Syd	Geotextile, Separator
45	Ft	Detectable Warning Surface
250	Sft	Sidewalk, Conc, 4 inch
735	Sft	Sidewalk Ramp, Conc, 4 inch
301	Ft	Curb and Gutter, Conc, Det F4, Modified
2	Ea	Dr Structure, 36 inch dia, Modified
1	Ea	Dr Structure, 48 inch dia, Modified
1	Ea	Dr Structure Cover, Type EJ 1060
2	Ea	Dr Structure Cover, Type EJ 7000
4	Ea	Dr Structure Cover, Adj, Case 1
4	Ea	Dr Structure Cover, Type EJ 1120 W/ SOLID GASKET SEALED COVER
40	Ft	Sewer, SDR-26, 10 inch, Tr Det B, Modified
10	Ft	Sewer, SDR-26, 12 inch, Tr Det B, Modified

NOTE:
CONTRACTOR SHALL PROVIDE SUFFICIENT PROTECTION FOR BOTH MOTORISTS AND WORKERS THROUGHOUT WORKSITE SO AS TO ALLOW SAFE PASSAGE AROUND WORK AREAS - AS DIRECTED BY THE ENGINEER



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

CITY OF OWOSSO, MICHIGAN
ENGINEERING DIVISION
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REVISIONS — NO. | DATE | BY | DESCRIPTION

ORIGINAL PLAN APPROVED BY

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BENCH MARK DATA — ELEV. | DESCRIPTION

FIELD BOOK PG.

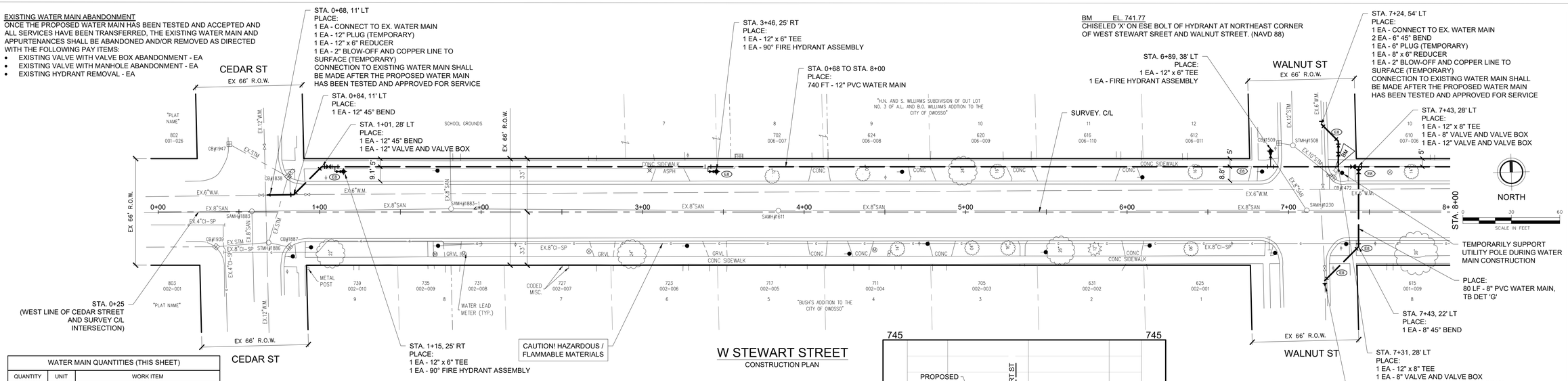
2018 STREET PROGRAM
W. STEWART ST
ROAD PLAN

MARCH, 2018
PROJECT NO. 832190

ST4

EXISTING WATER MAIN ABANDONMENT
ONCE THE PROPOSED WATER MAIN HAS BEEN TESTED AND ACCEPTED AND ALL SERVICES HAVE BEEN TRANSFERRED, THE EXISTING WATER MAIN AND APPURTENANCES SHALL BE ABANDONED AND/OR REMOVED AS DIRECTED WITH THE FOLLOWING PAY ITEMS:

- EXISTING VALVE WITH VALVE BOX ABANDONMENT - EA
- EXISTING VALVE WITH MANHOLE ABANDONMENT - EA
- EXISTING HYDRANT REMOVAL - EA

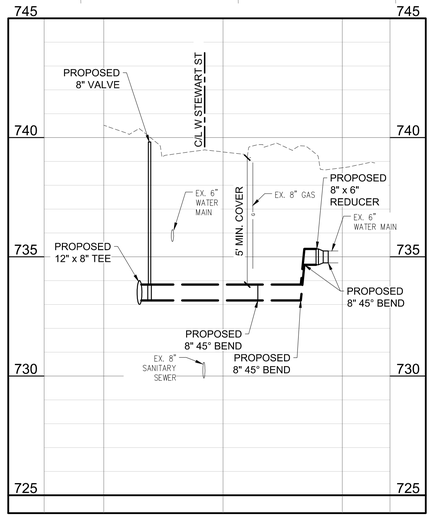


W STEWART STREET
CONSTRUCTION PLAN

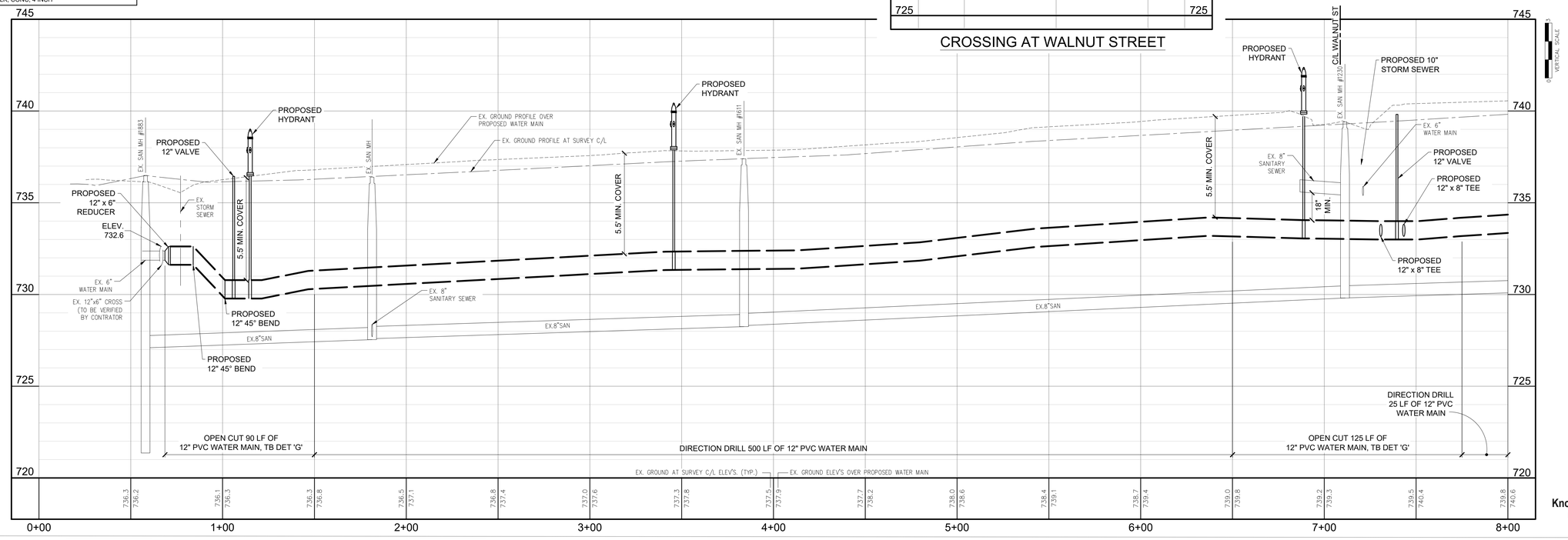
WATER MAIN QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
3	EA	CONNECT TO EX. WATER MAIN
5	EA	EXISTING VALVE AND VALVE BOX ABANDONMENT
2	EA	EXISTING HYDRANT REMOVAL
15	LF	6" PVC WATER MAIN, TRENCH BACKFILL DETAIL 'G'
96	LF	8" PVC WATER MAIN, TRENCH BACKFILL DETAIL 'G'
215	LF	12" PVC WATER MAIN, TRENCH BACKFILL DETAIL 'G'
525	LF	12" PVC WATER MAIN, DIRECTIONAL DRILL
3	EA	12" x 6" TEE
2	EA	12" x 8" TEE
2	EA	8" x 6" REDUCER
1	EA	12" x 6" REDUCER
3	EA	6" PLUG
2	EA	8" PLUG
1	EA	12" PLUG
2	EA	6" 45° BEND
4	EA	8" 45° BEND
2	EA	12" 45° BEND
2	EA	8" VALVE AND VALVE BOX
2	EA	12" VALVE AND VALVE BOX
1	EA	FIRE HYDRANT ASSEMBLY
2	EA	90° FIRE HYDRANT ASSEMBLY
8	EA	NEW WATER SERVICE, OPEN CUT
11	EA	NEW WATER SERVICE, FREEBORE
3	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
5	EA	SUPPLY & INSTALL METER PIT, COMPLETE
5	EA	WATER METER PIT, REM
175	SYD	SIDEWALK, REM
1800	SFT	SIDEWALK, CONC, 4 INCH

LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- STANDARD SOIL EROSION KEY



CROSSING AT WALNUT STREET



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REVISION:

CITY OF OWOSSO
SHIAWASSEE COUNTY, MICHIGAN
2018 STREET PROGRAM

W. STEWART ST - WATER MAIN PLAN AND PROFILE

DESIGN TEAM: GLR, DPH
CHECK BY: SMB MAR 2018
DRAWING INFORMATION: 832190_22_ST5_ST6_WMPP 031918 gericr

MARCH, 2018
F&V PROJECT NO. 832190

ST5

EXISTING WATER MAIN ABANDONMENT

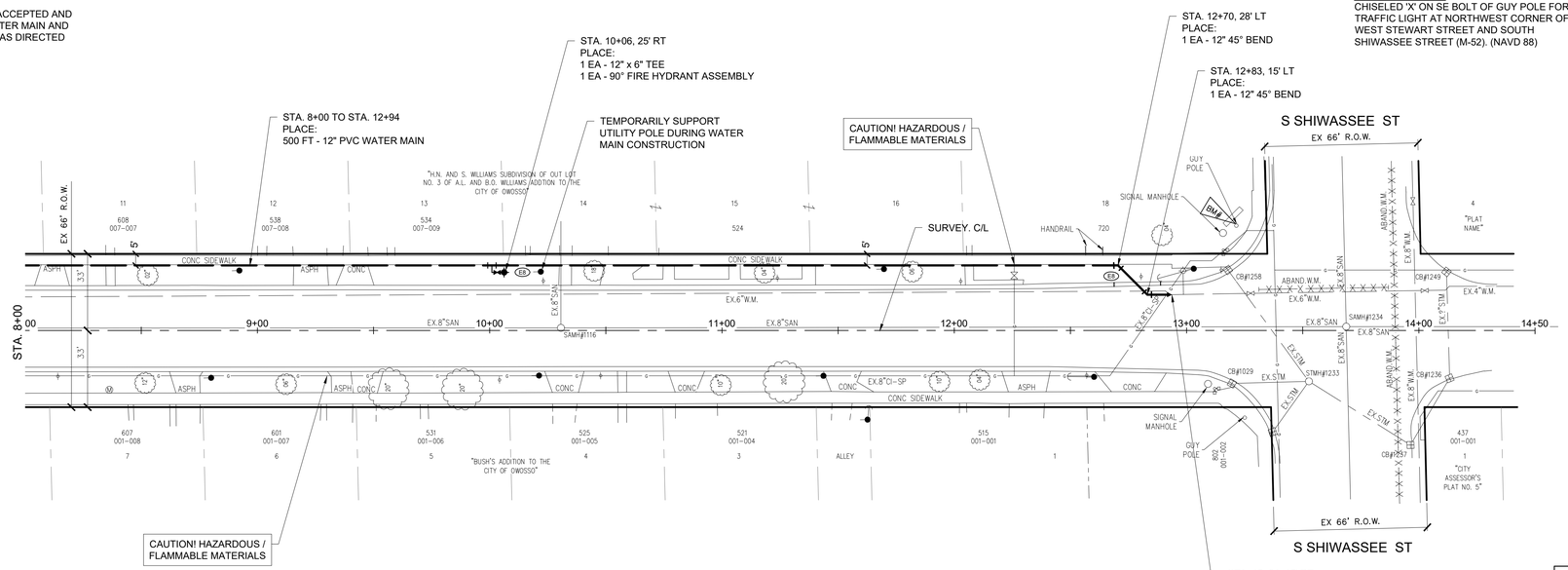
ONCE THE PROPOSED WATER MAIN HAS BEEN TESTED AND ACCEPTED AND ALL SERVICES HAVE BEEN TRANSFERRED, THE EXISTING WATER MAIN AND APPURTENANCES SHALL BE ABANDONED AND/OR REMOVED AS DIRECTED WITH THE FOLLOWING PAY ITEMS:

- EXISTING VALVE WITH VALVE BOX ABANDONMENT - EA
- EXISTING VALVE WITH MANHOLE ABANDONMENT - EA
- EXISTING HYDRANT REMOVAL - EA

BM EL. 741.15
CHISELED 'X' ON SE BOLT OF GUY POLE FOR TRAFFIC LIGHT AT NORTHWEST CORNER OF WEST STEWART STREET AND SOUTH SHIWASSEE STREET (M-52). (NAVD 88)

NORTH

0 30 60
SCALE IN FEET



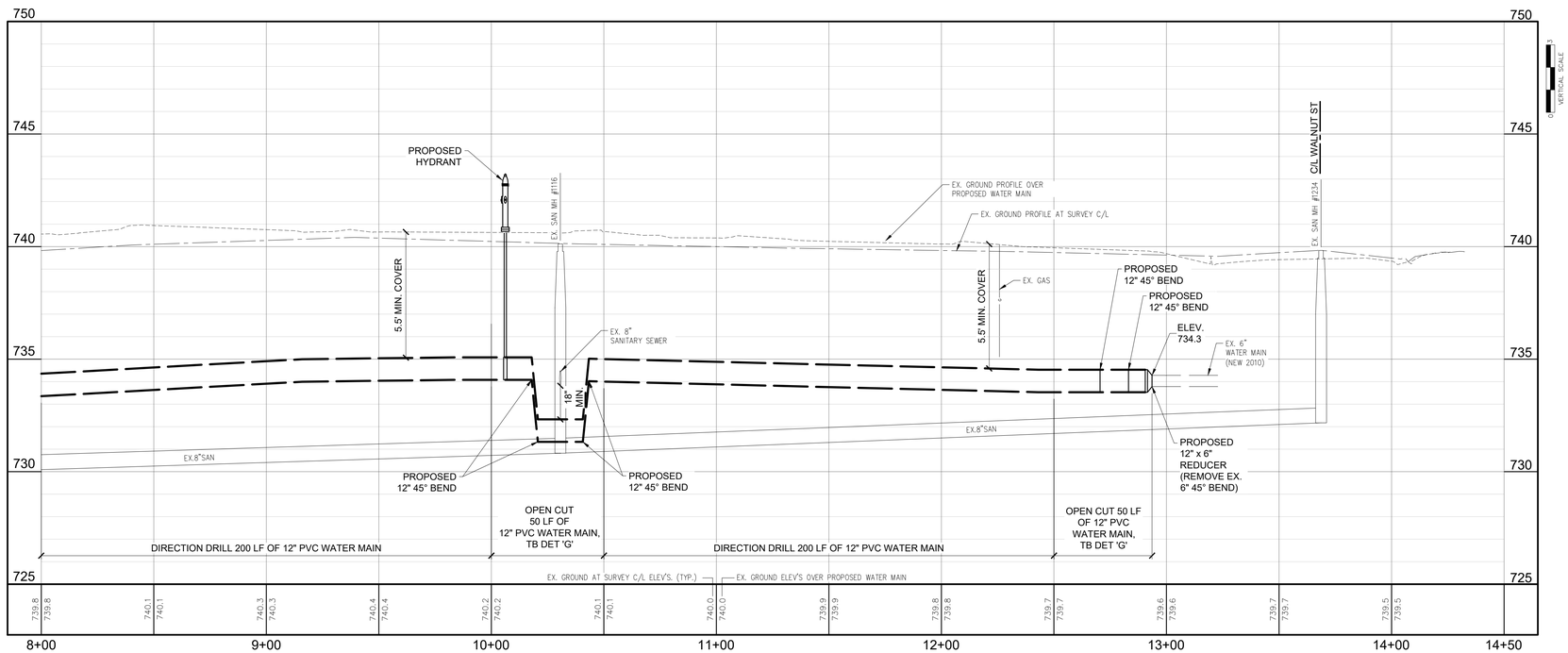
W STEWART STREET
CONSTRUCTION PLAN

LEGEND

- WATER MAIN
- GATE VALVE AND BOX, _INCH
- REDUCER
- HYDRANT / VALVE
- STANDARD SOIL EROSION KEY

WATER MAIN QUANTITIES (THIS SHEET)

QUANTITY	UNIT	WORK ITEM
1	EA	CONNECT TO EX. WATER MAIN
100	LF	12" PVC WATER MAIN, TRENCH BACKFILL DETAIL 'G'
400	LF	12" PVC WATER MAIN, DIRECTIONAL DRILL
1	EA	12" x 6" TEE
1	EA	12" x 6" REDUCER
1	EA	6" PLUG
1	EA	12" PLUG
6	EA	12" 45° BEND
1	EA	90° FIRE HYDRANT ASSEMBLY
8	EA	NEW WATER SERVICE, OPEN CUT
8	EA	NEW WATER SERVICE, FREEBORE
1	EA	2" BLOW-OFF AND COPPER LINE TO SURFACE
2	EA	SUPPLY & INSTALL METER PIT, COMPLETE
2	EA	WATER METER PIT, REM
135	SYD	SIDEWALK, REM
1250	SFT	SIDEWALK, CONC, 4 INCH



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REVISION:

CITY OF OWOSSO
SHIAWASSEE COUNTY, MICHIGAN
2018 STREET PROGRAM

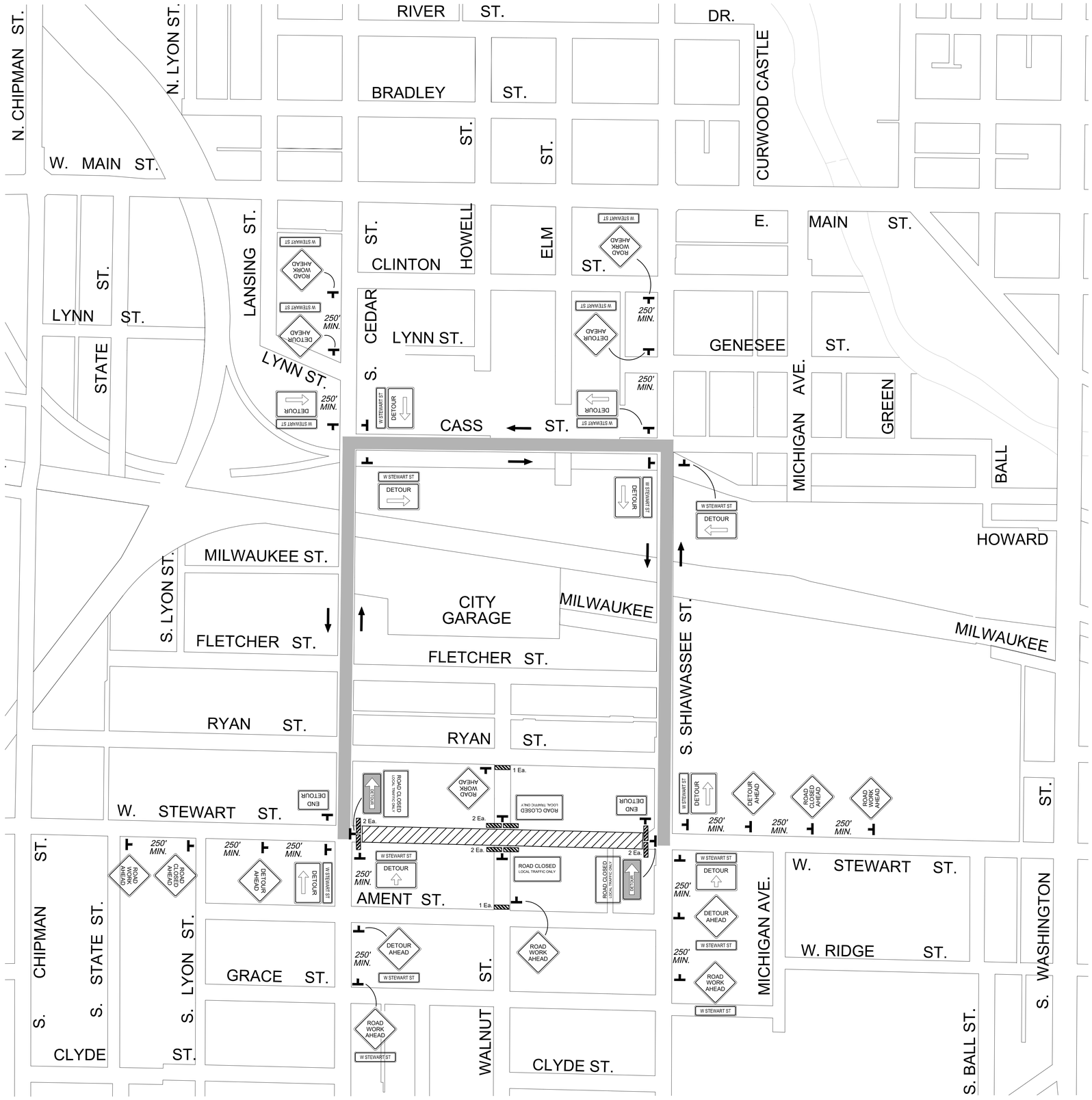
W. STEWART ST - WATER MAIN PLAN AND PROFILE

DESIGN TEAM:
GLR, DPH
CHECK BY:
SMB MAR 2018
DRAWING INFORMATION:
832190_22_ST6_ST6_WMPP
031918 gericr

MARCH, 2018

F&V PROJECT NO.
832190

ST6



LEGEND

- SIGNS
- TYPE III BARRICADE
- TRAFFIC FLOW
- DETOUR ROUTE
- WORK AREA

NORTH

ROAD WORK AHEAD
W20-1
48" x 48"

DETOUR AHEAD
W20-2
48" x 48"

ROAD CLOSED AHEAD
W20-3
48" x 48"

TYPE III BARRICADE

DETOUR
M4-10(R)
48" x 18"

DETOUR
M4-10(L)
48" x 18"

ROAD CLOSED
LOCAL TRAFFIC ONLY
R11-3a
60" x 30"

W STEWART ST
M4-8 (MOD)
30" X 8"

END DETOUR
M4-8a
24" x 18"

DETOUR
M4-9(S)
30" x 24"

DETOUR
M4-9(L)
30" x 24"

DETOUR
M4-9(R)
30" x 24"

THE BOTTOM HEIGHT OF ALL SIGNS SHALL BE 7 FEET.

W STEWART ST DETOUR ROUTE QUANTITIES

DESCRIPTION	NO. REQUIRED	AREA (Sft)
Barricade, Type III, High Intensity, Double Sided, Furn & Oper	10	
Plastic Drum, High Intensity, Furn & Oper	50	
M4-8 (MOD), Type B, Temp, (2.5' x 0.67') 1.67 Sft	18	30
M4-8a, Type B, Temp, (2.0' x 1.5') 3.0 Sft	2	6
M4-9(L), Type B, Temp, (2.5' x 2.0') 5.0 Sft	4	20
M4-9(R), Type B, Temp, (2.5' x 2.0') 5.0 Sft	4	20
M4-9(S), Type B, Temp, (2.5' x 2.0') 5.0 Sft	2	10
M4-10(L), Type B, Temp, (4.0' x 1.5') 6.0 Sft	1	6
M4-10(R), Type B, Temp, (4.0' x 1.5') 6.0 Sft	1	6
R11-3a, Type B, Temp, (5.0' x 2.5') 12.5 Sft	4	50
W20-1, Type B, Temp, (3.0' x 3.0') 9.0 Sft	8	72
W20-2, Type B, Temp, (3.0' x 3.0') 9.0 Sft	6	54
W20-3, Type B, Temp, (3.0' x 3.0') 9.0 Sft	2	18
TOTAL		292

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BENCH MARK DATA
DESCRIPTION
ELEV.

FIELD BOOK
PG.

2018 STREET PROGRAM
STEWART ST -
DETOUR ROUTE

MARCH, 2018
PROJECT NO. 832190

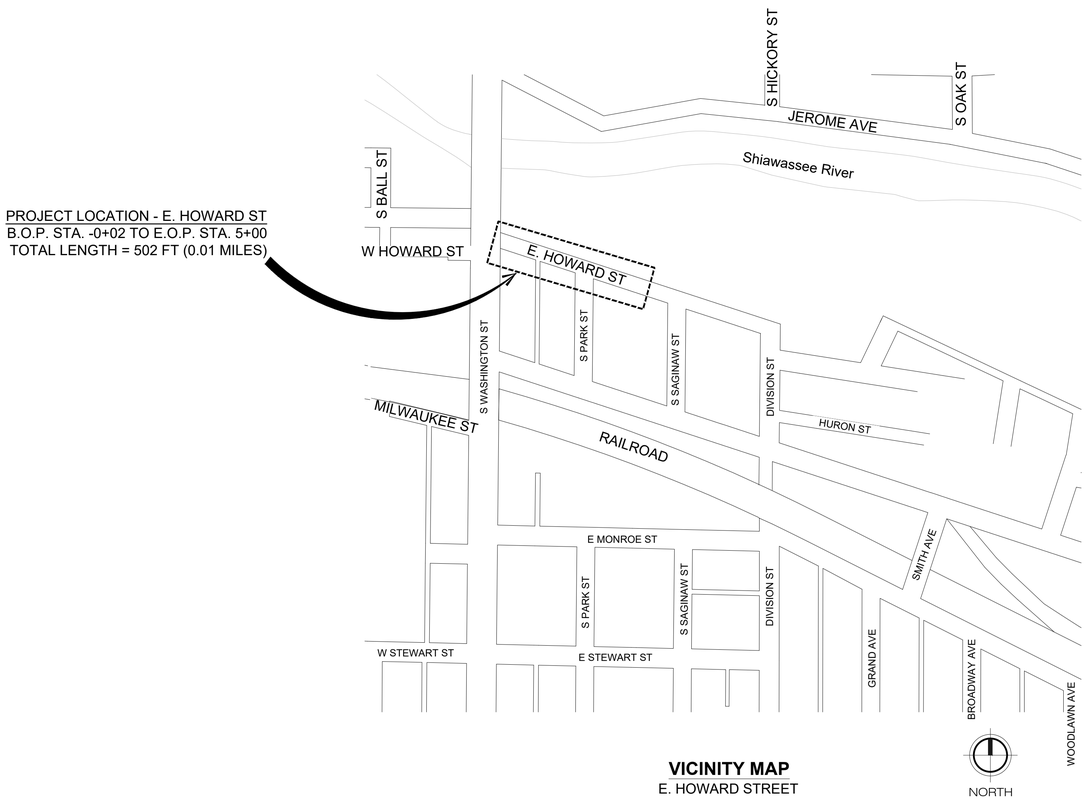
ST7

E. HOWARD STREET

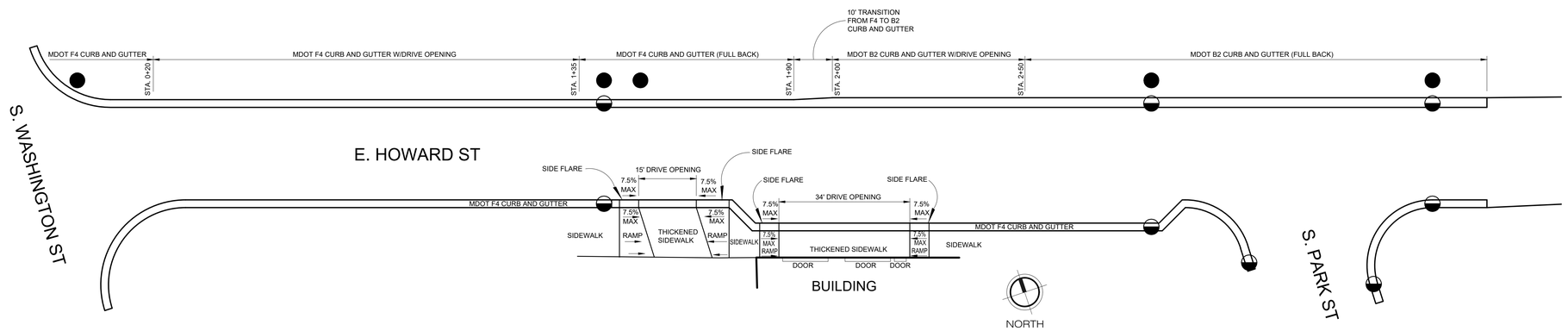
CITY OF OWOSSO
2018 STREET PROGRAM
CONTRACT 2

SHEET NO.	DESCRIPTION
HO1	E. HOWARD ST - COVER SHEET
HO2	E. HOWARD ST - TYPICAL CROSS SECTIONS
HO3	E. HOWARD ST - REMOVAL PLAN
HO4	E. HOWARD ST - ROAD PLAN AND PROFILE
HO5	E. HOWARD ST - DETOUR PLAN

PROJECT LOCATION - E. HOWARD ST
B.O.P. STA. -0+02 TO E.O.P. STA. 5+00
TOTAL LENGTH = 502 FT (0.01 MILES)



VICINITY MAP
E. HOWARD STREET



DRIVEWAY OPENING AND CURB & GUTTER DETAIL
NOT TO SCALE

CITY OF OWOSSO, MICHIGAN
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2018 STREET PROGRAM
E. HOWARD ST
COVER SHEET

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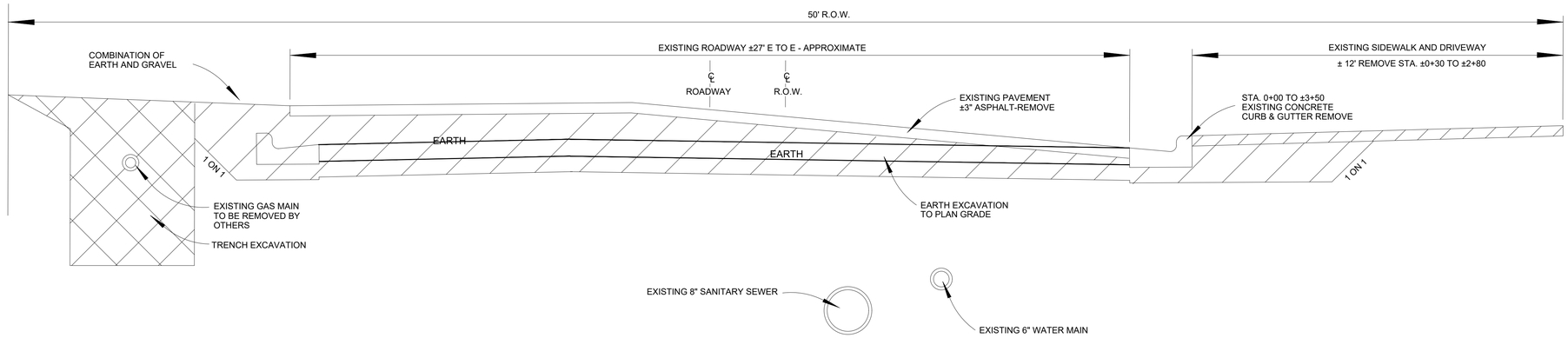
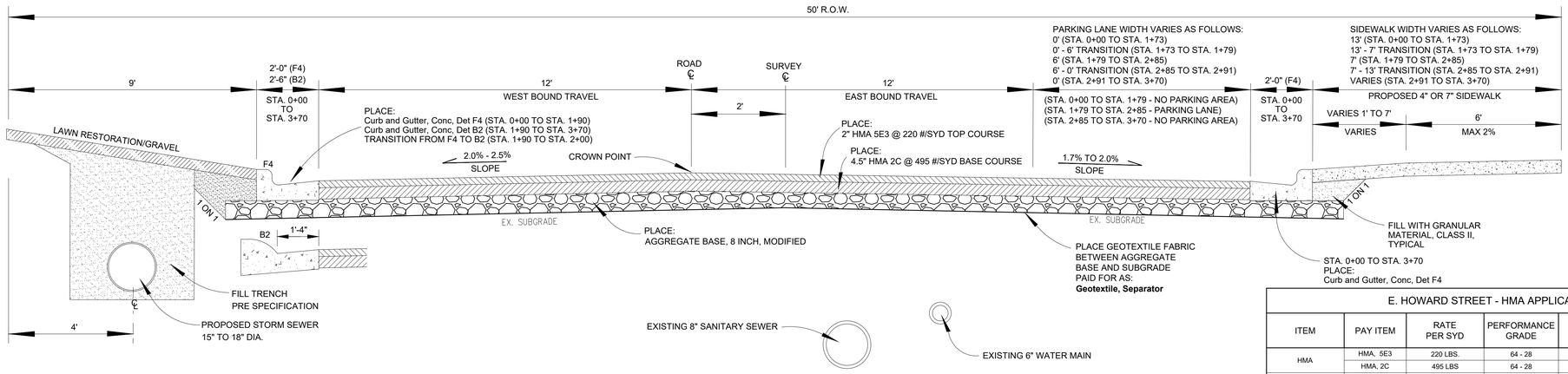
MARCH, 2018
PROJECT NO. 832190

HO1



TYPICAL EXISTING CROSS SECTION - E. HOWARD STREET

APPLIES TO STATIONS:
0+00 (B.O.P.) TO 5+00 (E.O.P.)



TYPICAL PROPOSED CROSS SECTION - E. HOWARD STREET

APPLIES TO STATIONS:
0+00 (B.O.P.) TO 5+00 (E.O.P.)

E. HOWARD STREET - HMA APPLICATION CHART					
ITEM	PAY ITEM	RATE PER SYD	PERFORMANCE GRADE	ESTIMATED THICKNESS, INCH	REMARKS
HMA	HMA, 5E3	220 LBS.	64 - 28	2.0"	TOP COURSE - AWI = 260 (MIN.)
	HMA, 2C	495 LBS	64 - 28	4.5"	BASE COURSE
HAND PATCHING	Hand Patching	110 LBS / SYD / INCH	64 - 28		HMA, 2C (PLACED IN EQUAL LIFTS)
COMMERCIAL DRIVE APPROACH	HMA Approach	165 LBS.	58 - 28	1.5"	TOP COURSE - AWI = 220 (MIN.) (HMA, 13A)
	HMA Approach	935 LBS.	58 - 28	8.5"	BASE COURSE (HMA, 13A) PLACED IN 3 EQUAL LIFTS
RESIDENTIAL DRIVE APPROACH	HMA Approach	220 LBS.	58 - 28	2"	TOP COURSE - AWI = 220 (MIN.) HMA, 13A
	HMA Approach	330 LBS.	58 - 28	3"	BASE COURSE HMA, 13A
HMA BOND COAT		0.10 GAL.			SS-1H (FOR INFORMATION ONLY)

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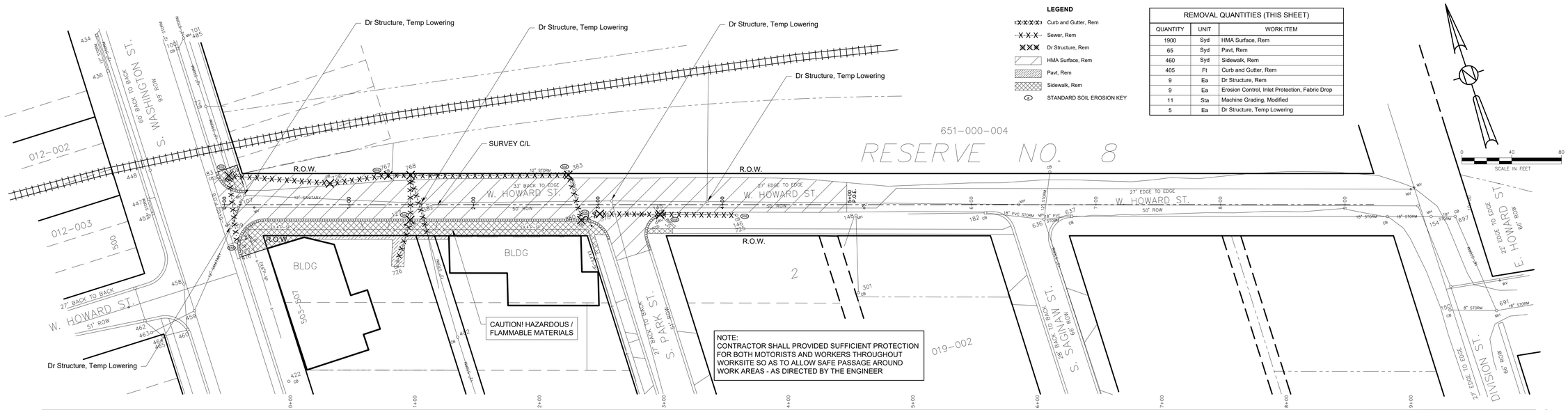
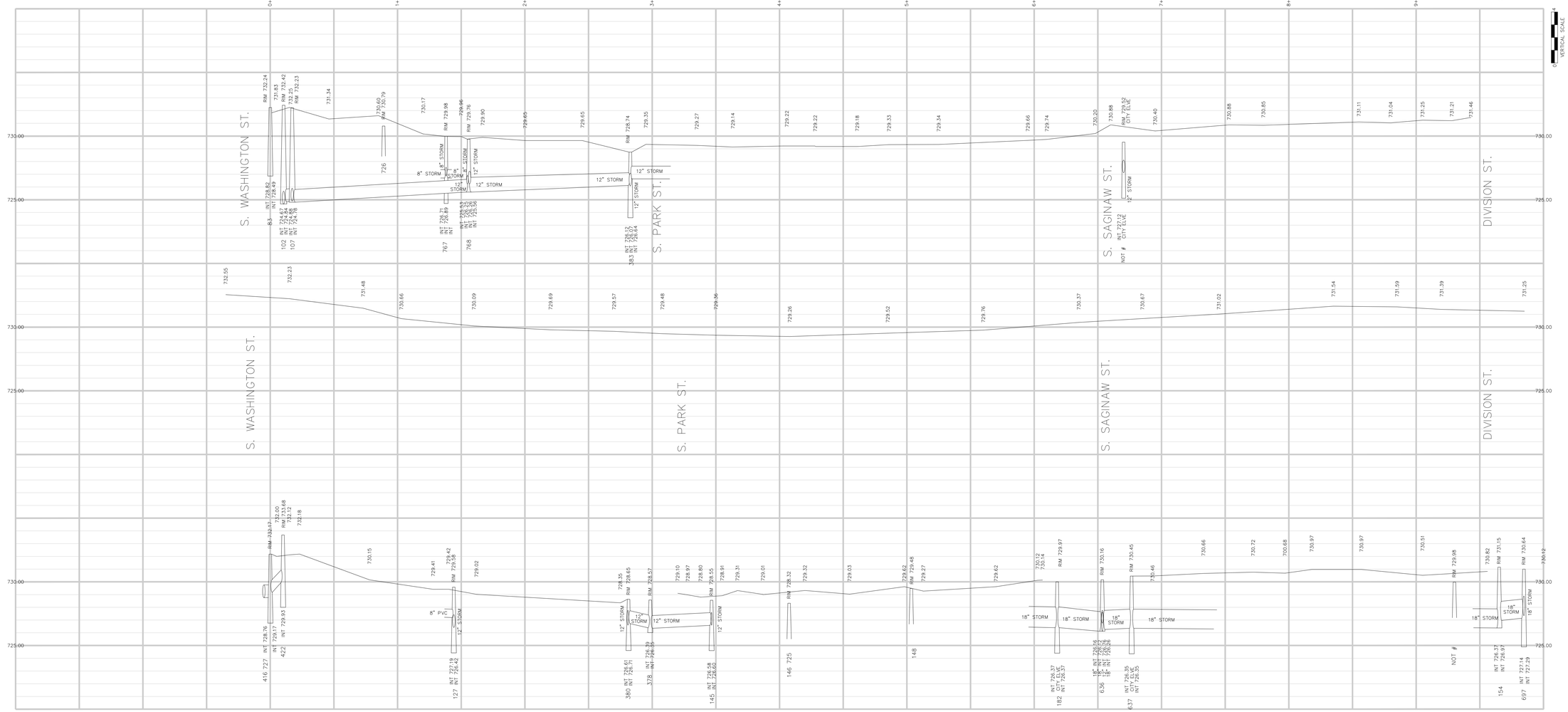
2018 STREET PROGRAM
E. HOWARD STREET
TYPICAL CROSS SECTIONS
MARCH, 2018
PROJECT NO. 832190
FIELD BOOK
P.G.

H02



REMOVAL QUANTITIES (THIS SHEET)		
QUANTITY	UNIT	WORK ITEM
1900	Syd	HMA Surface, Rem
65	Syd	Pavt, Rem
460	Syd	Sidewalk, Rem
405	Ft	Curb and Gutter, Rem
9	Ea	Dr Structure, Rem
9	Ea	Erosion Control, Inlet Protection, Fabric Drop
11	Sta	Machine Grading, Modified
5	Ea	Dr Structure, Temp Lowering



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2018 STREET PROGRAM

E. HOWARD STREET
REMOVAL PLAN

MARCH, 2018
PROJECT NO. 832190

FIELD BOOK
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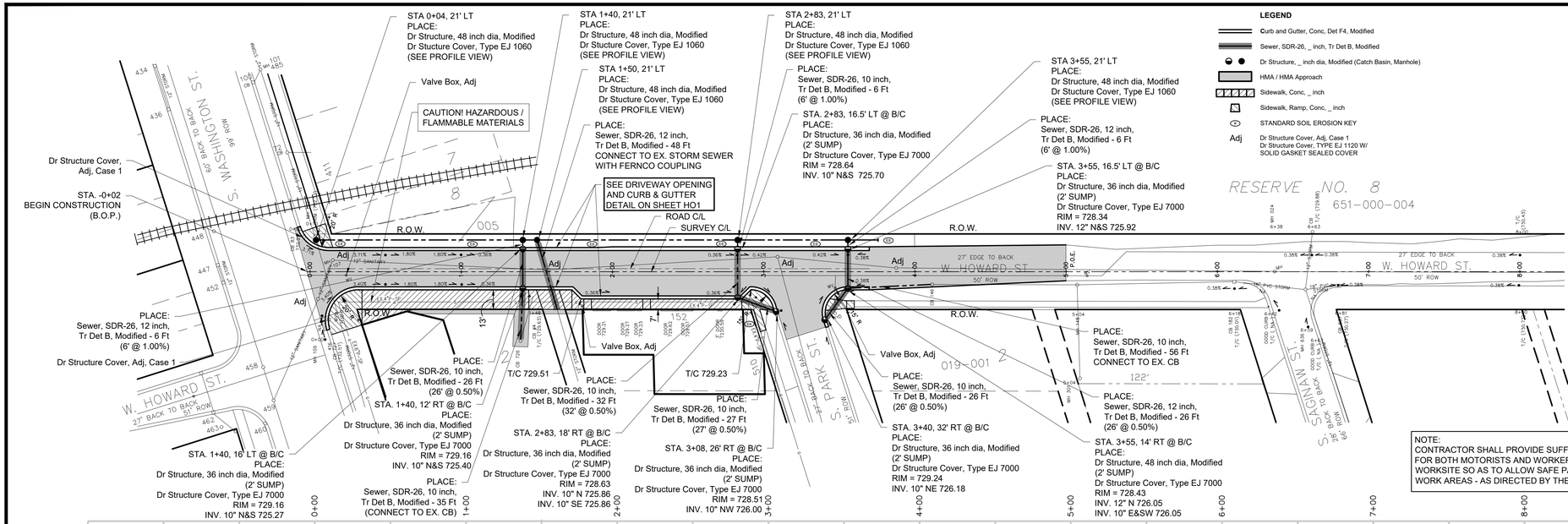
HO3



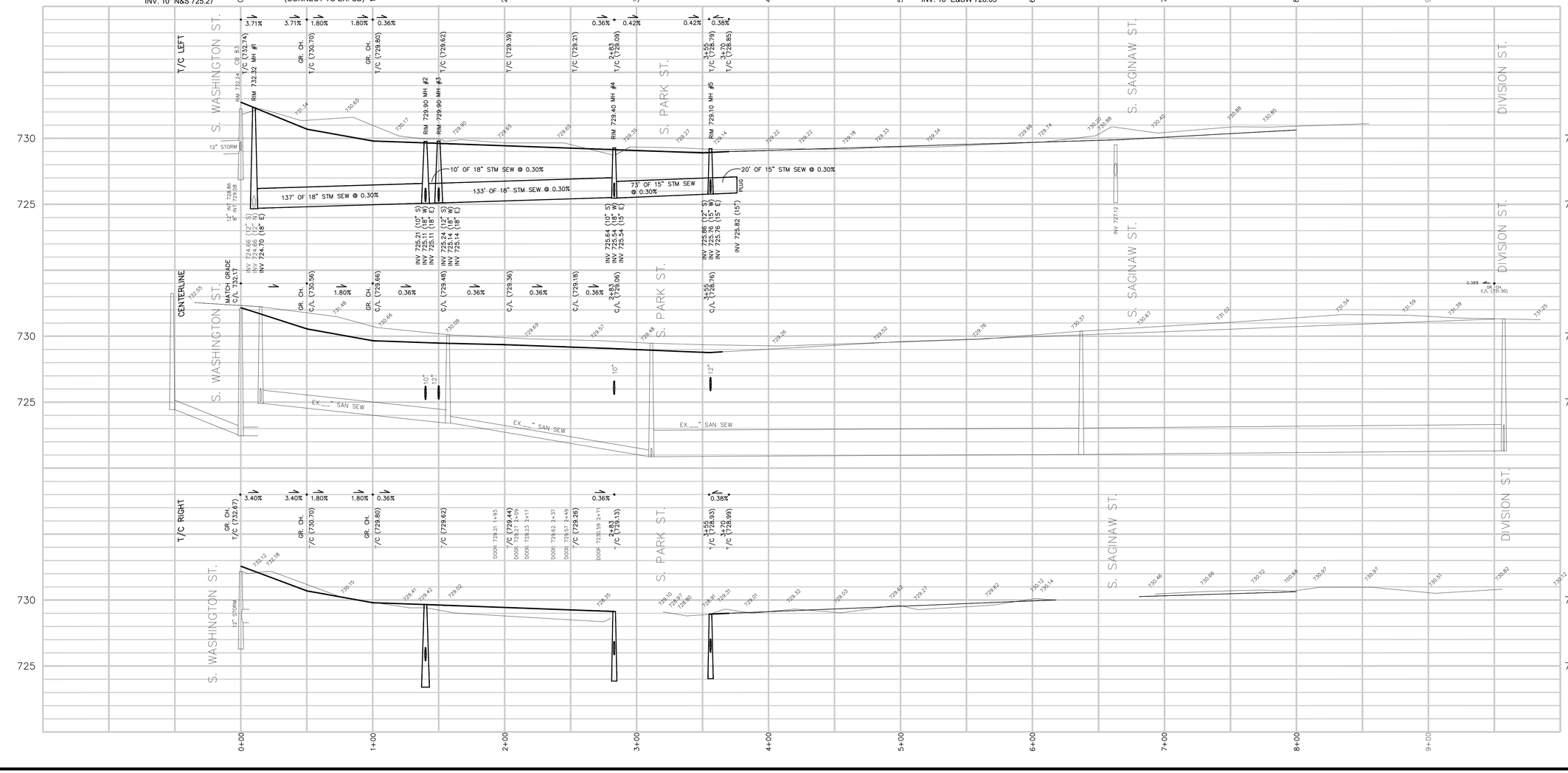
LEGEND

- Curb and Gutter, Conc, Det F4, Modified
- Sewer, SDR-26, _ inch, Tr Det B, Modified
- Dr Structure, _ inch dia, Modified (Catch Basin, Manhole)
- HMA / HMA Approach
- Sidewalk, Conc, _ inch
- Sidewalk, Ramp, Conc, _ inch
- STANDARD SOIL EROSION KEY
- Adj — Dr Structure Cover, Adj, Case 1; Dr Structure Cover, TYPE EJ 1120 W/ SOLID GASKET SEALED COVER

CONSTRUCTION QUANTITIES (THIS SHEET)

QUANTITY	UNIT	WORK ITEM
190	Ton	HMA, 5E3
425	Ton	HMA, 2C
1600	Syd	Aggregate Base, 8 inch, Modified
1600	Syd	Geotextile, Separator
40	Ton	HMA Approach
20	Ft	Detectable Warning Surface
2325	Sft	Sidewalk, Conc, 4 inch
450	Sft	Sidewalk, Conc, 7 inch
1060	Sft	Sidewalk Ramp, Conc, 4 inch
595	Ft	Curb and Gutter, Conc, Det F4
180	Ft	Curb and Gutter, Conc, Det B2
7	Ea	Dr Structure, 36 inch dia, Modified
6	Ea	Dr Structure, 48 inch dia, Modified
5	Ea	Dr Structure Cover, Type EJ 1060
8	Ea	Dr Structure Cover, Type EJ 7000
2	Ea	Valve Box, Adj
7	Ea	Dr Structure Cover, Adj, Case 1
5	Ea	Dr Structure Cover, Type EJ 1120 W/ SOLID GASKET SEALED COVER
208	Ft	Sewer, SDR-26, 10 inch, Tr Det B, Modified
86	Ft	Sewer, SDR-26, 12 inch, Tr Det B, Modified
93	Ft	Sewer, SDR-26, 15 inch, Tr Det B, Modified
280	Ft	Sewer, SDR-26, 18 inch, Tr Det B, Modified
1	Ea	Plug, 15 inch

NOTE:
CONTRACTOR SHALL PROVIDE SUFFICIENT PROTECTION FOR BOTH MOTORISTS AND WORKERS THROUGHOUT WORKSITE SO AS TO ALLOW SAFE PASSAGE AROUND WORK AREAS - AS DIRECTED BY THE ENGINEER



VERTICAL SCALE
0 2 4

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2018 STREET PROGRAM
E. HOWARD STREET
ROAD PLAN AND PROFILE

MARCH, 2018
PROJECT NO. 832190

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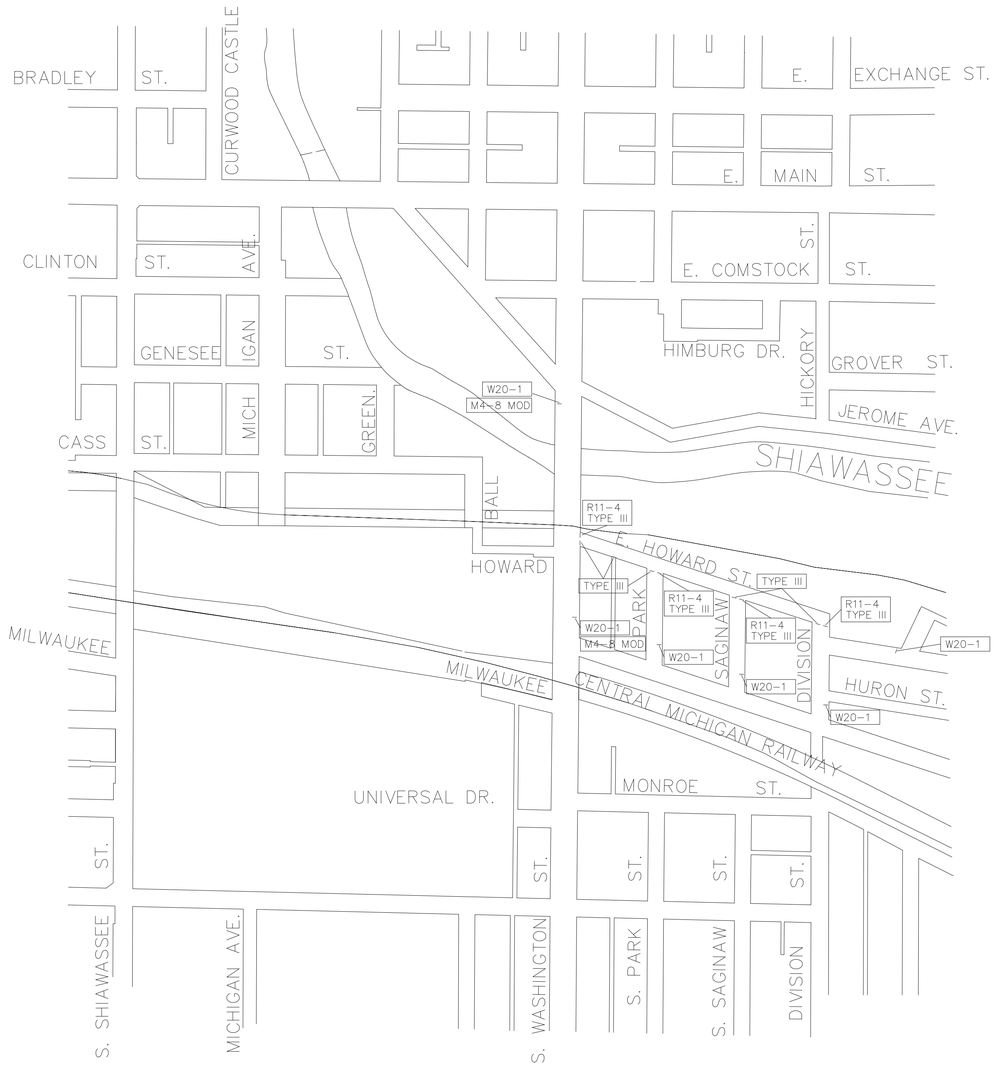
HO4



SCALE BAR

1000 0 1000

QUANTITIES FOR THIS SHEET :

BARRICADE, TYPE III, HIGH INTENSITY, FURN__	9	EACH
BARRICADE, TYPE III, HIGH INTENSITY, OPER__	9	EACH
PLASTIC DRUM, HIGH INTENSITY, FURN_____	30	EACH
PLASTIC DRUM, HIGH INTENSITY, OPER_____	30	EACH
SIGN TYPE B, TEMP, FURN_____	150	SFT
SIGN TYPE B, TEMP, OPER_____	150	SFT

	CODE	SIZE	SFT.	QUAN.	TOTAL SFT.
ROAD CLOSED TO THRU TRAFFIC	R11-4	5 x 2.5	12.5	4	50
ROAD WORK AHEAD	W20-1	4 x 4	16	6	96
HOWARD ST	M4-8 (MOD)	2.5 x 0.67	1.7	2	4
					150 TOTAL

GENERAL BARRICADING NOTES

1. The contractor shall provide lighted barricades and shall erect, maintain, light and remove such temporary barricades and temporary signs as specified on plans, or as directed by the engineer, all in accordance with the provisions of Section 8.12 of the 2003 Standard Specifications and the 2005 "Michigan Manual Of Uniform Traffic Control Devices".
2. All locations for the project's signing and barricading, as shown on the BARRICADING MAP, will be staked by the engineer prior to the placement by the contractor.
3. All signs shall be mounted on portable stands. The portable stands shall be kept in place by the means of sandbags. The minimum number of sandbags per portable mount is four. Additional sandbags required to keep the portable mount in place shall be placed by the contractor at no extra cost to the project.
4. Local traffic along the construction shall be maintained by the contractor as directed by the engineer. Access to driveways shall be maintained until curbs are poured.
5. No signs can be attach to the Type III barricade.

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E. HOWARD STREET
DETOUR PLAN

MARCH, 2018
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HO5