

**PUBLIC UTILITIES**

AT&T  
337 N. ABBOTT, RM. 201  
EAST LANSING, MI 48823  
517.337.3660

**TELEPHONE**

CONSUMERS ENERGY  
530 W. WILLOW ST.  
P.O. BOX 30162  
LANSING, MI 48909  
517.373.6100

**GAS  
ELECTRIC**

COMCAST  
1070 TROWBRIDGE ROAD  
EAST LANSING, MI 48823  
517.332.1012

**CABLE TV**

MERIDIAN TOWNSHIP  
5151 MARSH DR.  
OKEMOS, MI 48864  
517.853.4440

**WATER MAINS  
SANITARY SEWER  
PATHWAYS**

WOLVERINE PIPE LINE  
8105 VALLEYWOOD LANE  
PORTAGE, MI 49024-5251  
231.323.2491

**PETROLEUM PIPELINE**

INGHAM COUNTY DRAIN  
COMMISSIONER  
707 BUHL ST.  
MASON, MI 48854  
517.676.8395

**DRAINS  
STORM SEWER**

INGHAM COUNTY ROAD DEPT  
301 BUSH ST.  
MASON, MI 48854  
517.676.9722

**PUBLIC ROADS AND  
RIGHTS OF WAY**

**SOIL EROSION & SEDIMENTATION CONTROL NOTES**

- All soil erosion and sediment control (SESC) work shall conform to the standards and specifications of the Ingham County Drain Commissioner's Office and Meridian Township.
- Daily inspections shall be made by the contractor for effectiveness of SESC measures. Any necessary repairs shall be performed without delay.
- Erosion of any sediment from work on the site shall be contained on-site and not allowed to collect on any off-site areas or in waterways. Waterways include both natural and man-made open ditches, streams, storm drains, lakes, ponds, and wetlands.
- The Contractor shall apply temporary SESC measures when required and as directed on these plans. The Contractor shall remove temporary measures as soon as permanent stabilization of slopes, ditches, and other changes have been established.
- Staging the work shall be done by the Contractor as directed in these plans and as required to ensure progressive stabilization of disturbed earth.
- Soil erosion control practice shall be established in the early stages of construction by the Contractor. Sedimentation control practices shall be applied as a perimeter defense against any transporting of soil off the site.
- The Contractor shall preserve natural vegetation as much as possible.
- Vegetative stabilization of all disturbed areas shall be established within 15 days of completion of the final grading.

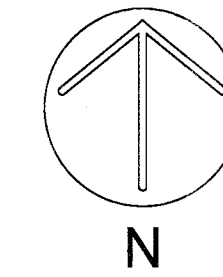
**SOILS:**

- UpA - URBAN LAND-CAPAC-COLWOOD COMPLEX (0-4% SLOPES)
- UtB - URBAN LAND-MARLETTE COMPLEX (2-12% SLOPES)

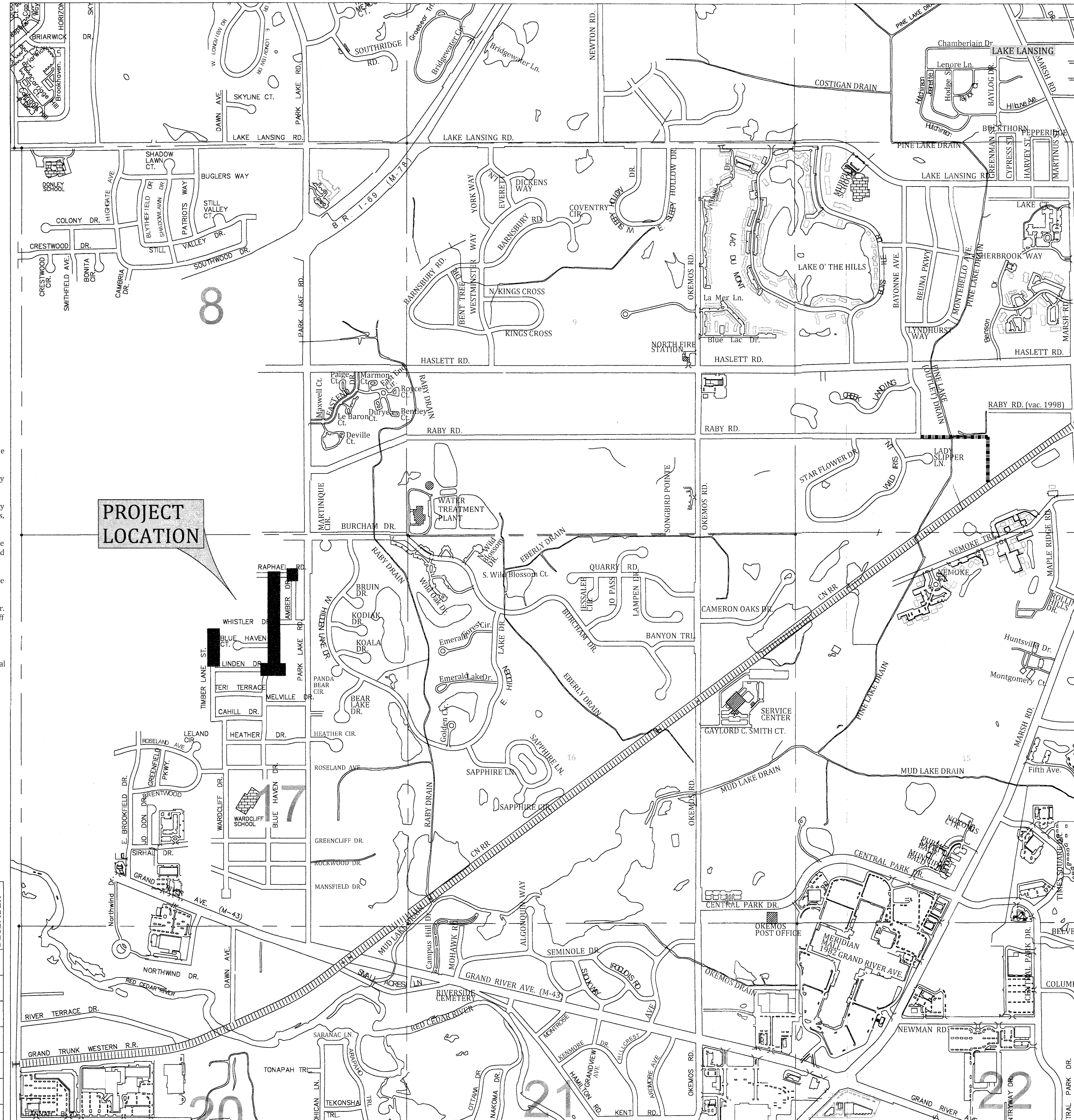
**RECOMMENDED CONSTRUCTION  
SCHEDULING & SEQUENCING**

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
INSTALL SESC MEASURES												
OPEN CUT TIMBERLANE												
OPEN CUT LINDEN												
OPEN CUT BLUE HAVEN CT & WHISTLER												
OPEN CUT RAPHAEL												
OPEN CUT AMBER												
HDD TIMBERLANE												
HDD BLUE HAVEN												
RESTORE												

**TIMBERLANE SUB WATER MAIN  
REPLACEMENT 2023  
CONSTRUCTION PLANS**  
for  
**MERIDIAN TOWNSHIP  
INGHAM COUNTY, MICHIGAN**



**Call 811 before you dig.**



**STANDARD CONSTRUCTION NOTES**

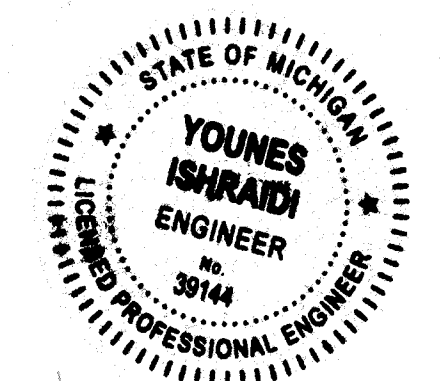
- The Contractor shall notify the Charter Township of Meridian, Department of Public Works, Office of Engineering 517-853-4440 a minimum of 72 hours prior to the start of construction of public utilities or of construction within the public right-of-way.
- All construction shall conform to the current standards and specifications of the Charter Township of Meridian which are included as part of these plans in effect at the time of construction.
- After the completion of construction of public utilities or construction within public right-of-way, the contractor must request a final inspection. Any punchlist items resulting from the final inspection must be resolved prior to final release and acceptance.
- The existing utilities indicated on the plans are in accordance with available information. It shall be the contractor's obligation to verify the exact location of all existing utilities, which might affect this job.
- The contractor shall notify "MISS DIG" 1-800-482-7171 at least 72 hours prior to the start of construction.
- The contractor shall at all times be aware of inconvenience caused to the abutting property owners and the general public. Where the contractor does not remedy undue inconveniences, the Charter Township of Meridian, upon four hours notice, reserves the right to perform the work and deduct the cost therefore from the money due the contractor.
- A Registered Land Surveyor provided by the contractor at the contractor's expense shall replace all property irons and monuments disturbed or destroyed by the contractor's operations.
- Contractor shall provide Owner and Township Engineer a copy of written permission to use private property for storage of equipment and materials or for his construction operations.
- Trench backfill under existing or proposed roadways, driveways, and parking areas, shall be sand or gravel, placed in 12" layers (maximum) and consolidated to 95% of maximum density as measured by modified proctor unless otherwise noted.
- Trees and shrubs are to be protected during construction and bored where necessary.
- Existing fences shall be removed and restored to their original condition or better where in conflict with construction.
- Driveways, culverts, ditches, drain tile, tile fields, drainage structures, etc., that are disturbed by the contractor's operations shall be immediately restored.
- All established lawn areas disturbed by the contractor's operations shall be resodded with matching sod. All other areas shall be seeded and mulched. Seeding and mulching shall be done in accordance with the General Specifications.
- All ditch slopes shall have established vegetation and be protected from erosion.
- All utility poles in close proximity to construction shall be supported in a manner satisfactory to the utility owner.
- Onsite parking and sanitary facilities shall be provided for construction workers. The facilities shall be constructed and operated (with minimal impact to the surrounding area) to the satisfaction of the Township.

**WATER MAIN NOTES**

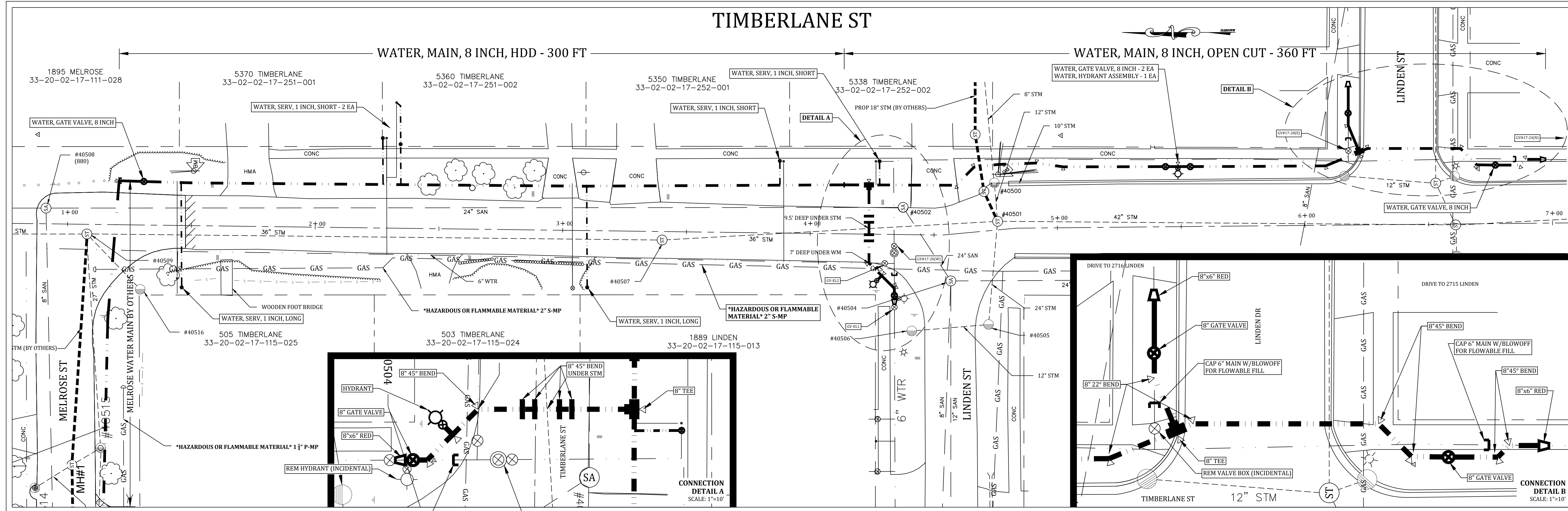
- Hydrant elevations and gate well tap elevations shall be set to existing ground elevations unless otherwise directed by the Township Engineer.
- All water mains shall be constructed with 5 feet of cover below finish grade, unless otherwise indicated on the plans.
- Connection to the existing water main shall not be made until after the successful completion of pressure and bacteriological tests. Pressure testing shall be performed in accordance with AWWA C600. Additionally, all corporation stops for proposed house services shall be installed prior to pressure testing. Disinfection and bacteriological testing shall be in accordance with the AWWA C651. Before the mains are chlorinated, they shall be thoroughly flushed. All mains shall be chlorinated for a period of at least twenty-four (24) hours. Chlorine shall be added in sufficient quantity to give a 50-ppm residual of free chlorine after a twenty-four (24) hour period. After completion of the chlorine procedure, the main shall be flushed. Then water samples shall be taken from the main for bacteriological tests. If the tests should result in unsafe conditions, the chlorinating shall be repeated by the Contractor. Two consecutive passing samples at least 24 hours apart must be obtained before the main can be connected to the existing water system.
- All valves shall be counter-clock wise open.
- All fire hydrants shall be EJIW 5BR (54915) Traffic Type with breakaway flange or approved equal.
- Hydrants shall be painted OSHA red.
- Two brass wedges shall be installed at each joint on ductile iron pipe.
- Polyethylene encasement of pipes will be required in all areas. The encasement shall be V-Bio® Enhanced Polyethylene Encasement, in accordance with ANSI/AWWA C105/A21.5, installed per the manufacturer's instructions.
- For existing lines: service taps, shut off valves, and service line extensions to the property shall be made by Township Department of Public Works personnel for connections 2" and smaller.
- Where water mains must dip to pass under a storm sewer or sanitary sewer, the sections which are deeper than normal shall be kept to a minimum length by the use of 45, 22½ or 11¼ degree bends properly restrained.
- All manhole covers shall bear the legend "Meridian Water" with tree logo, where available.
- Lead content requirements for all pipes, piping fittings, plumbing fittings, and fixtures that are used for potable water shall comply with NSF/ANSI 372 Standard.
- All mechanical joints and fittings shall be restrained using MEGALUG® style restraints, or approved equal. All exposed metal components of the restrained-joint system shall be treated with a corrosion resistant coating, including: the collar, breakaway bolts, wedges, and connecting nuts and bolts.

**SHEET INDEX**

SHT #	TITLE
1	COVER SHEET
2	TIMBERLANE ST
3	LINDEN ST
4	BLUE HAVEN DR (SOUTH)
5	BLUE HAVEN DR (NORTH)
6	RAPHAEL RD
7	WATER DETAIL SHEET



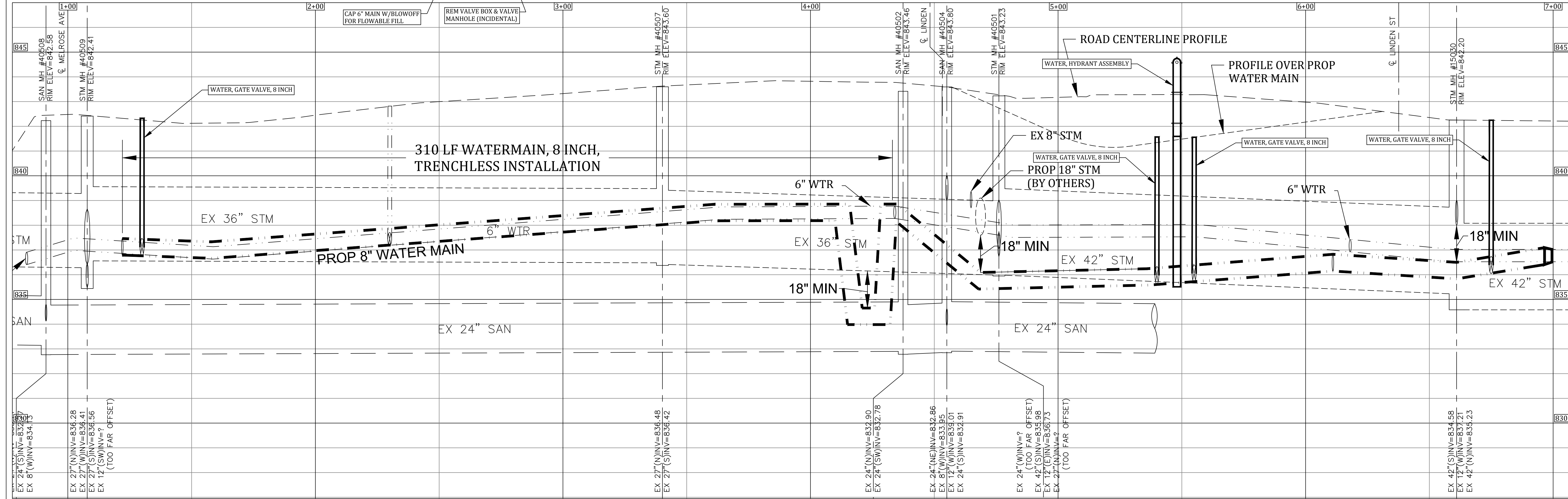
# TIMBERLANE ST



- SUGGESTED PROCEDURE:**
- Close GV-EL1, EL2, 17-20(W) & (E), 17-21, and 17-23(N).
  - Cut in at the NE corner of Linden (S).
    - Cap ex. 6" toward valve.
    - Connect 8"x6" reducer and build new 8" main to new 8" valve.
  - Turn on 17-21 and 17-23(N).
  - Build new 8" main from tee at 4+25 to new valve at 6+75.
  - Build new 8" main across Timberlane.
  - Cut and connect new 8" valve and 8"x6" reducer to the back side of ex. 6" valve (GV-EL1)
  - Pressure and bacteria test new main.
  - Bring new main live.
  - Cut 5338 Timberlane service to new main.
  - Close 17-24(N).
  - Cut in at 7+00.
    - Cap ex. 6" to north.
    - Connect 8"x6" reducer to new 8" main and existing 6" main.
  - Open 17-24(N).
  - Install new 8" main by HDD from Sta. 1+00 to 4+00.
  - Pressure and bacteria test new main.
  - Connect new mains at 4+00.
  - Bring new main live.
  - Connect services to new main.

**PAY ITEMS & QTS (THIS SHEET):**

6a. Water, Main, 6 inch, Abandon,	-	1	Ls
Timberlane	-	1	Ls
30a. Water, Main, 8 inch, Open Cut - 360 Ft	-	1	Ls
30b. Water, Main, 8 inch, HDD - 300 Ft	-	1	Ls
31b. Water, Bend, 45°	-	12	Ea
31c. Water, Bend, 22°	-	3	Ea
31d. Water, Bend, 11°	-	2	Ea
31e. Water, Union, 8 inch	-	6	Ea
31f. Water, Red, 8 inch by 6 inch	-	3	Ea
31g. Water, Tee, 8 inch	-	2	Ea
31h. Water, Tee, 8 inch by 6 inch	-	2	Ea
32. Water, Gate Valve, 8 inch	-	6	Ea
33. Water, Hydrant Assembly	-	2	Ea
35a. Water, Serv, 1 inch, Short	-	4	Ea
35b. Water, Serv, 1 inch, Long	-	2	Ea



<p>PINE</p> <p>DECID.</p> <p>BUSH</p> <p>STUMP</p> <p>SAN. MH</p> <p>F.H.</p>	<p>CATV BOX</p> <p>U.P. (W/GUY)</p> <p>TELE. MH</p> <p>STREET SIGN</p> <p>SIGN</p> <p>SAN. MH</p> <p>STM. MH</p> <p>TELE. BOX</p> <p>WTR. MH</p>	<p>CATV MH</p> <p>MAILBOX</p> <p>SITE BORING</p> <p>P.I.</p> <p>C.M.P.</p> <p>C.B.</p> <p>G.V.</p> <p>F.H.</p>	<p>CATV (COMCAST)</p> <p>C/L OF ROADS</p> <p>ELEC (CONSUMERS)</p> <p>GAS (CONSUMERS)</p> <p>TELE. (SBC)</p> <p>PROPERTY LINE</p> <p>ROW (ICRD, MDOT)</p>	<p>EX SAN MAIN</p> <p>EX STM (ICDC)</p> <p>EX WTR MAIN</p> <p>PROPOSED SAN</p> <p>PROPOSED STM</p> <p>PROPOSED WTR</p>	<p>LESS BOLD</p> <p>LESS BOLD</p> <p>LESS BOLD</p> <p>BOLD</p> <p>BOLD</p> <p>BOLD</p>	<p>0' 20' 40' 80'</p> <p><b>Call 811 before you dig.</b></p> <p>WOLVERINE PIPE LINE COMPANY 219-844-9510</p>
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Meridian Charter Township  
Ingham County, Michigan  
Water Main System

**TIMBERLANE STREET**  
MELROSE TO LINDEN (S)  
\*CoEL INTERCONNECT\*

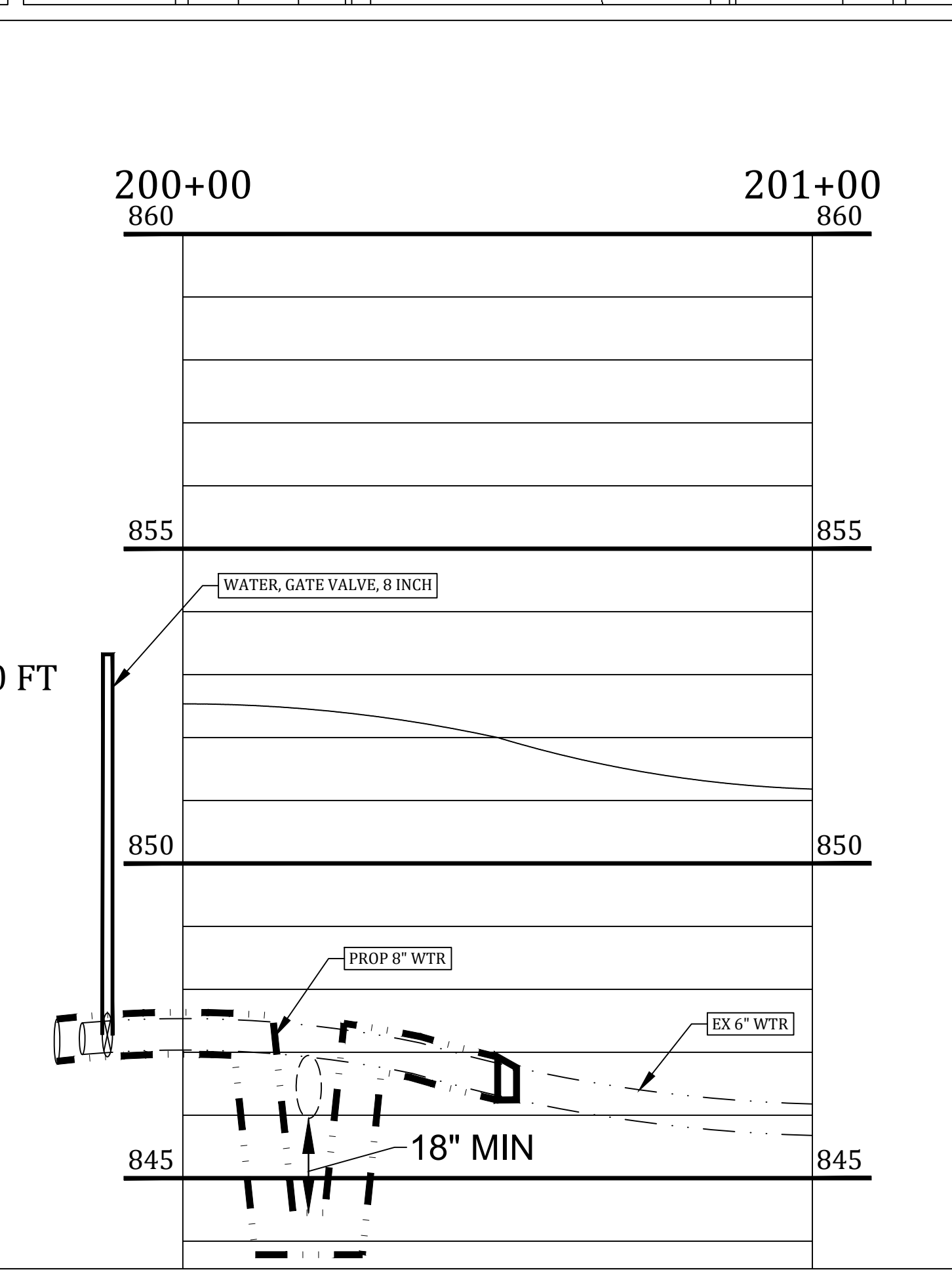
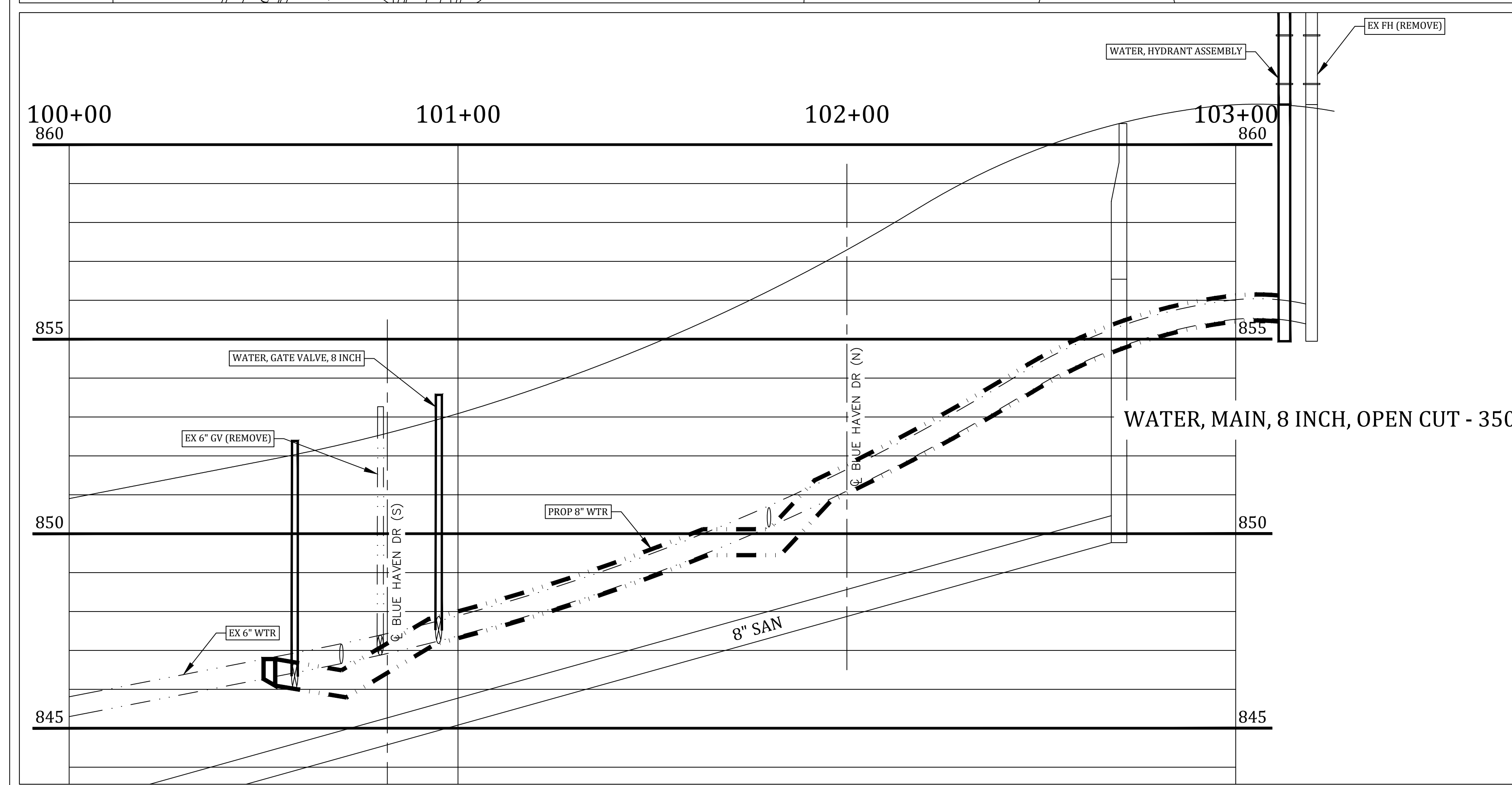
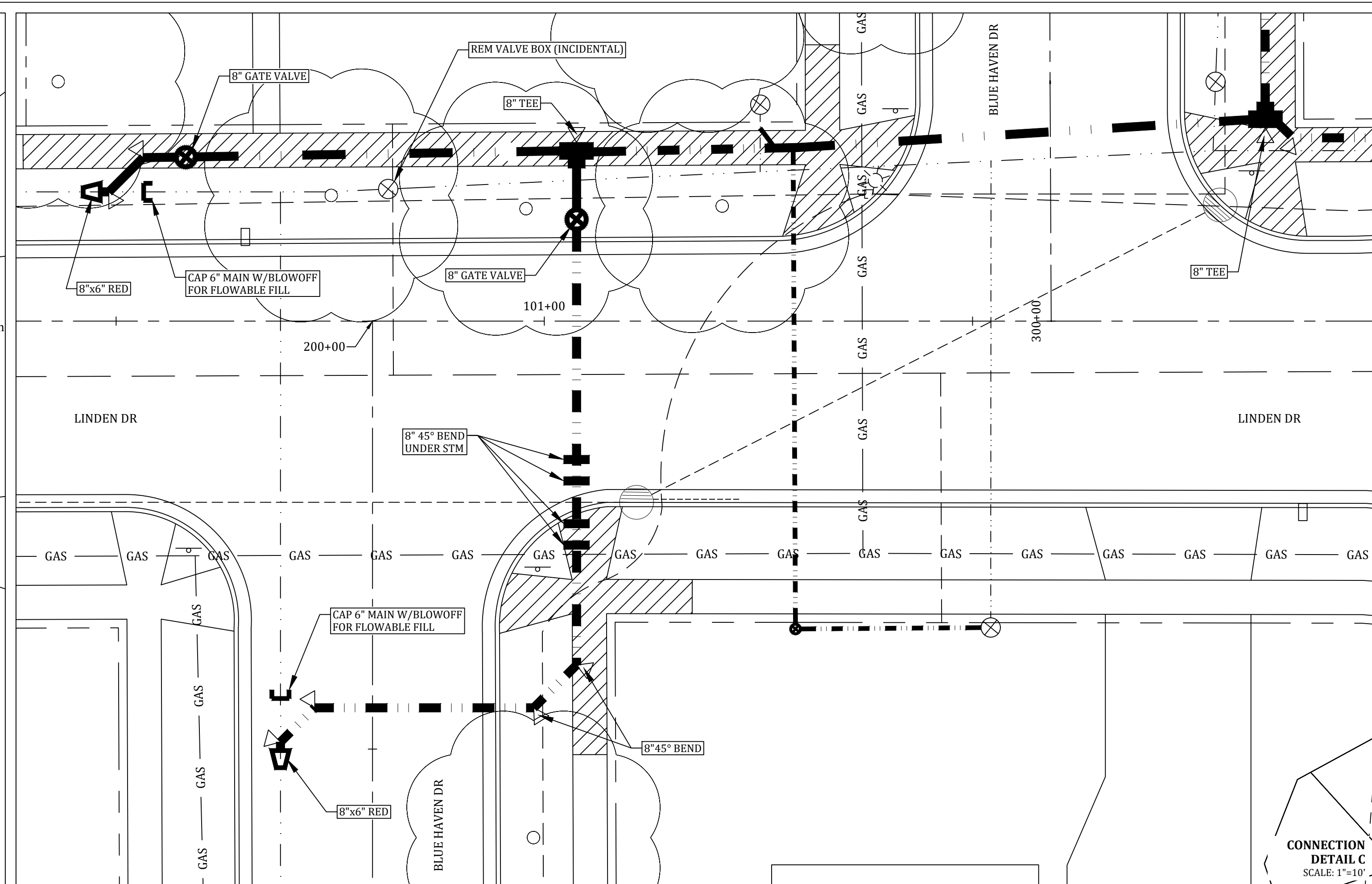
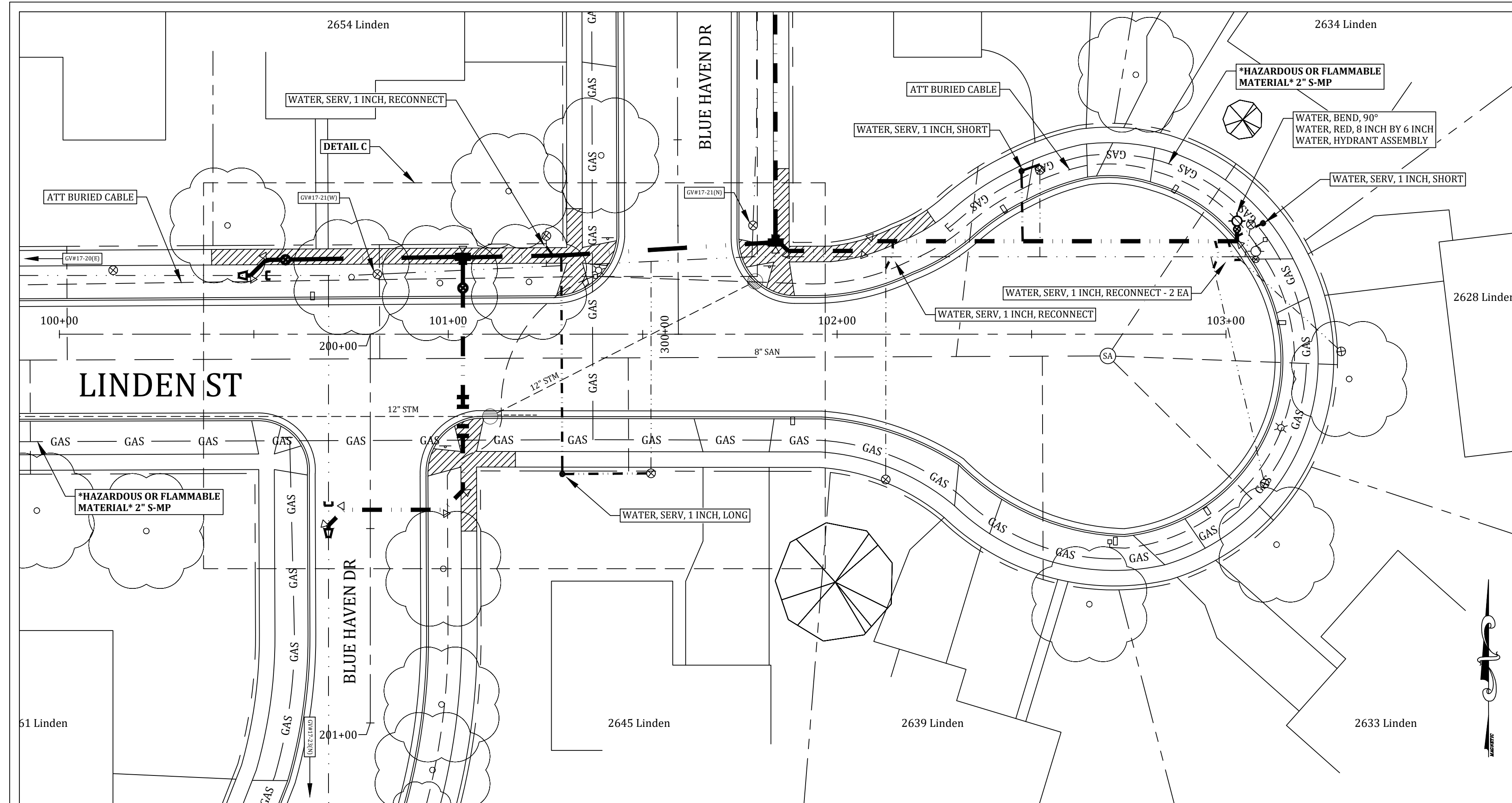
REVISIONS:	DATE:	BY:	COMMENTS:
	7/3/23	NN	Contract Plans

SCALE: 1" = 20' HOR  
1" = 2' VERT

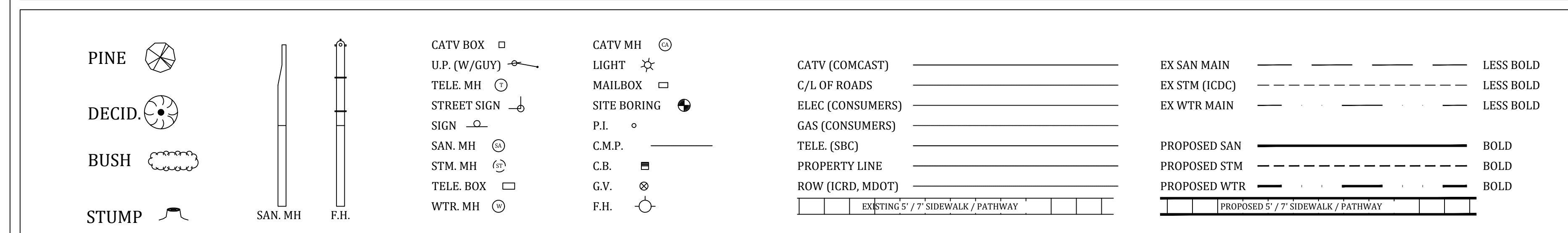
PAGE: 2 OF 7

FILE:

DRAWN BY: NN 06/09/23 CHECKED BY: YI 07/05/23



- SUGGESTED PROCEDURE:**
- Close 17-20(E), 17-21(W), and 17-23(N).
  - Cut in at Sta. 100+50.
    - Cap ex. 6" toward east.
    - Connect 8"x6" reducer and build new 8" main to new 8" valve.
  - Turn on 17-20(E) and 17-23(N).
    - Leave 17-21(W) closed.
  - Build new 8" main from 100+50 to 103+00, and 200+00 to 200+50.
    - Cap new main shy of ex. 6" main at 200+50.
  - Pressure and bacteria test new main.
  - Close 17-23(N).
    - Cut in at Sta. 200+50.
      - Cap ex. 6" toward north.
      - Connect 8"x6" reducer to ex. 6" main and to new 8" main.
  - Open 17-23(N).
  - Bring new main live.
  - Cut Linden services to new main.
- PAY ITEMS & QTS (THIS SHEET):**
- |  |      |    |
|--|------|----|
| 6a. Water, Main, 6 inch, Abandon, Blue Haven | - 1  | Ls |
| 30a. Water, Main, 8 inch, Open Cut - 350 Ft  | - 1  | Ls |
| 31a. Water, Bend, 90°                        | - 1  | Ea |
| 31b. Water, Bend, 45°                        | - 14 | Ea |
| 31e. Water, Union, 8 inch                    | - 2  | Ea |
| 31f. Water, Red, 8 inch by 6 inch            | - 3  | Ea |
| 31g. Water, Tee, 8 inch                      | - 2  | Ea |
| 32. Water, Gate Valve, 8 inch                | - 2  | Ea |
| 33. Water, Hydrant Assembly                  | - 1  | Ea |
| 35a. Water, Serv, 1 inch, Short              | - 2  | Ea |
| 35b. Water, Serv, 1 inch, Long               | - 1  | Ea |
| 35c. Water, Serv, 1 inch, Reconnect          | - 4  | Ea |



Meridian Charter Township  
Ingham County, Michigan  
Water Main System

**LINDEN STREET**  
BLUE HAVEN DR TO CUL-DE-SAC

REVISIONS:

DATE:	BY:	COMMENTS:
7/3/23	NN	Contract Plans

SCALE: 1" = 20' HOR, 1" = 2' VERT

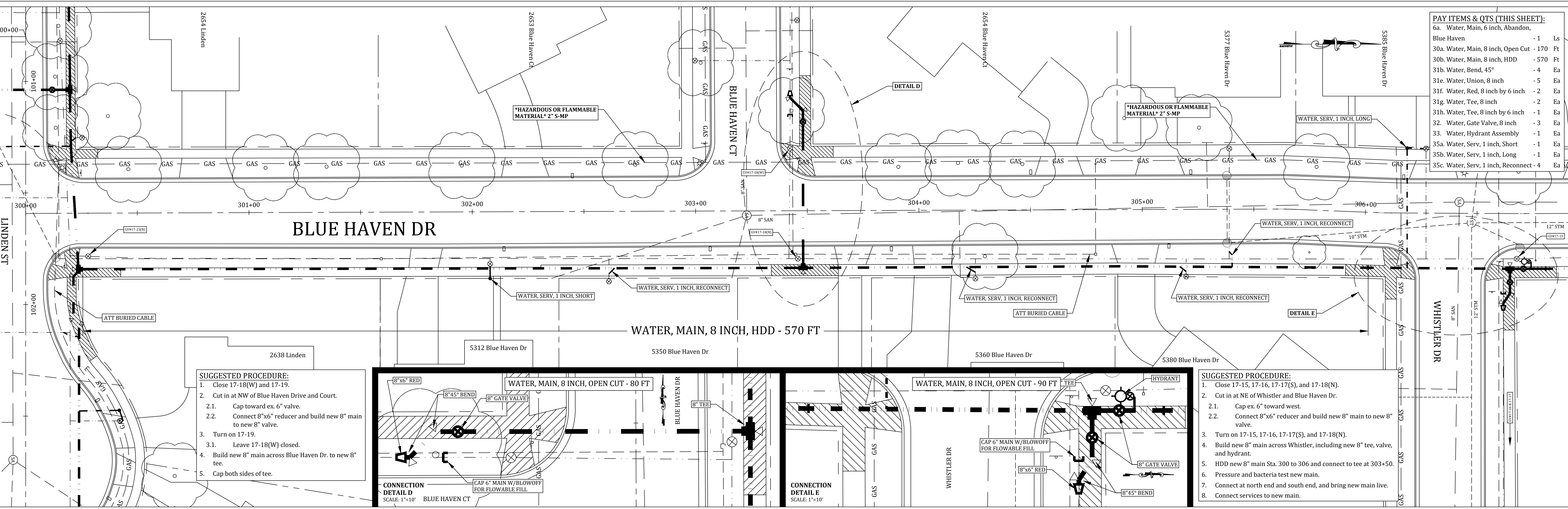
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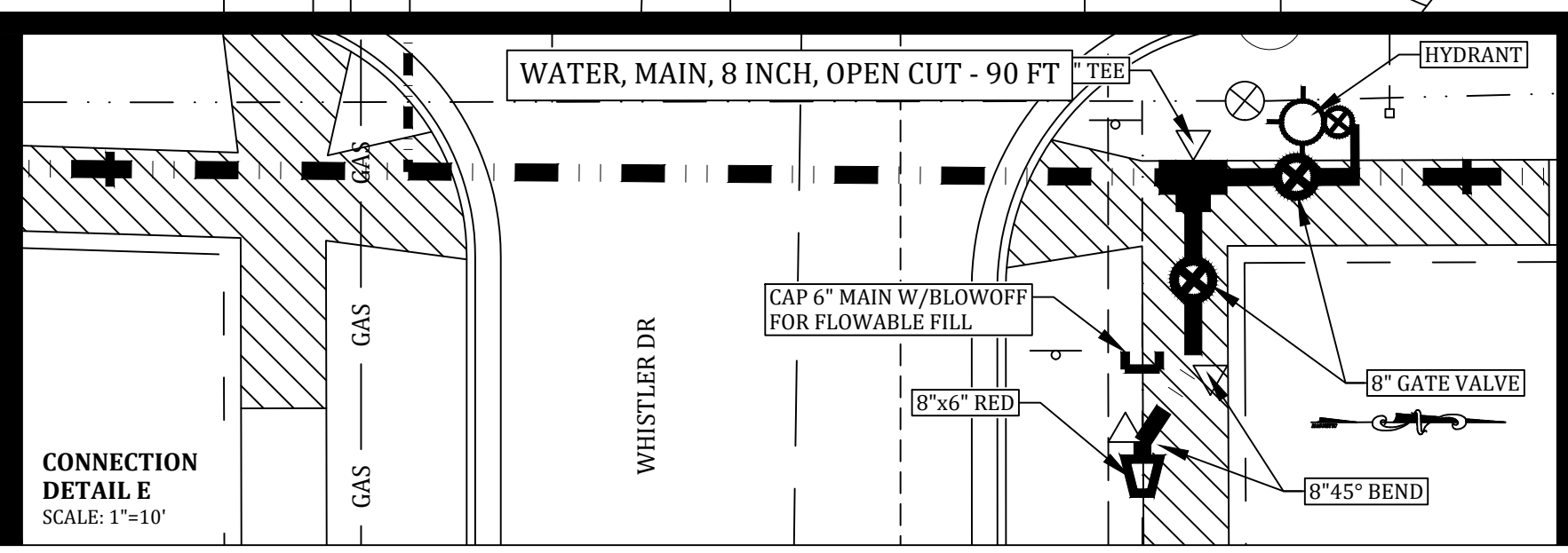
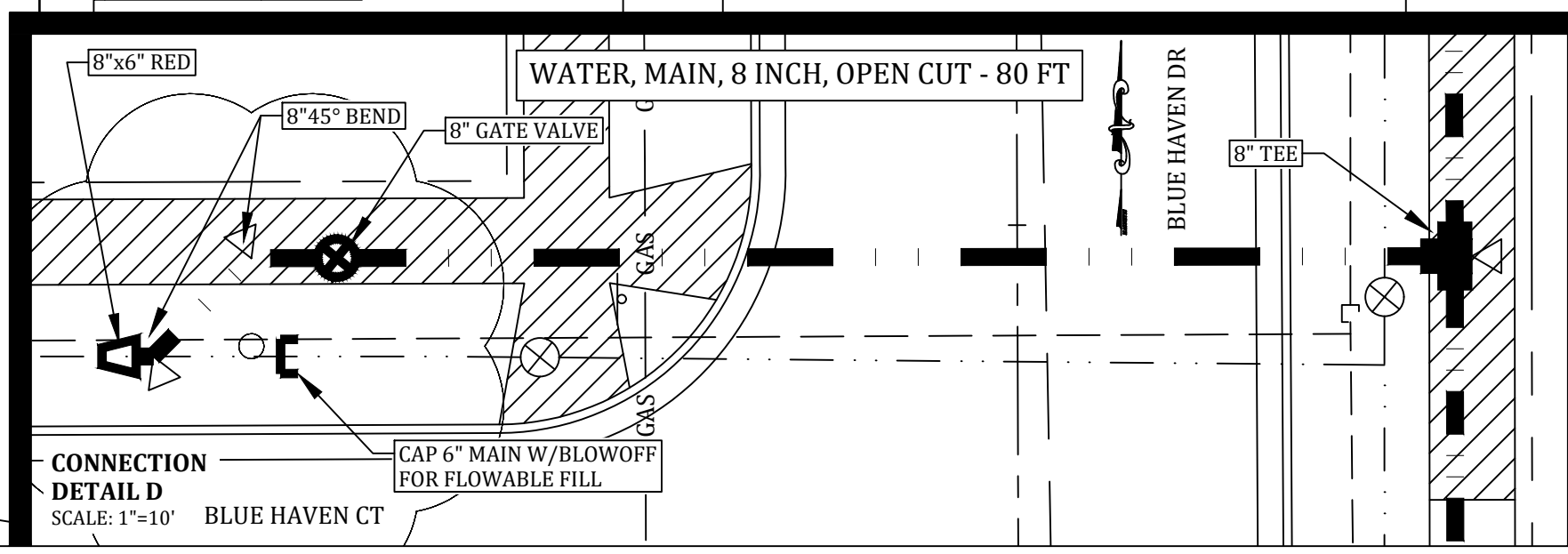
**PAY ITEMS & QTS (THIS SHEET):**

6a. Water, Main, 6 inch, Abandon, Blue Haven	- 1	LS
30a. Water, Main, 8 inch, Open Cut - 170 Ft	- 170	Ft
30b. Water, Main, 8 inch, HDD - 570 Ft	- 570	Ft
31b. Water, Bend, 45°	- 4	Ea
31e. Water, Union, 8 inch	- 5	Ea
31f. Water, Red, 8 inch by 6 inch	- 2	Ea
31g. Water, Tee, 8 inch	- 2	Ea
31h. Water, Tee, 8 inch by 6 inch	- 1	Ea
32. Water, Gate Valve, 8 inch	- 3	Ea
33. Water, Hydrant Assembly	- 1	Ea
35a. Water, Serv, 1 inch, Short	- 1	Ea
35b. Water, Serv, 1 inch, Long	- 1	Ea
35c. Water, Serv, 1 inch, Reconnect	- 4	Ea

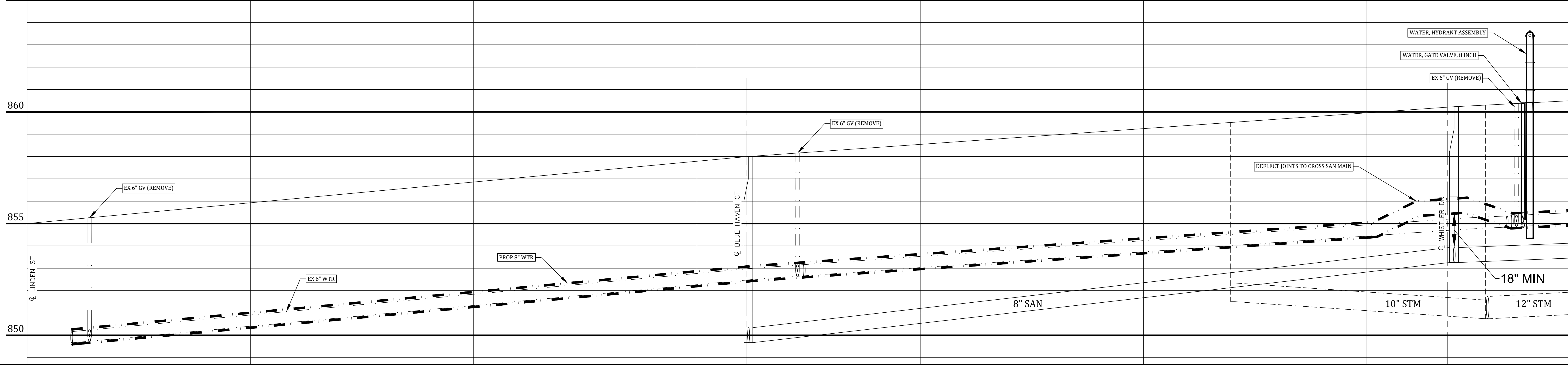


- SUGGESTED PROCEDURE:**
1. Close 17-18(W) and 17-19.
  2. Cut in at NW of Blue Haven Drive and Court.
    - 2.1. Cap toward ex. 6" valve.
    - 2.2. Connect 8"x6" reducer and build new 8" main to new 8" valve.
  3. Turn on 17-19.
    - 3.1. Leave 17-18(W) closed.
  4. Build new 8" main across Blue Haven Dr. to new 8" tee.
  5. Cap both sides of tee.

- SUGGESTED PROCEDURE:**
1. Close 17-15, 17-16, 17-17(S), and 17-18(N).
  2. Cut in at NE of Whistler and Blue Haven Dr.
    - 2.1. Cap ex. 6" toward west.
    - 2.2. Connect 8"x6" reducer and build new 8" main to new 8" valve.
  3. Turn on 17-15, 17-16, 17-17(S), and 17-18(N).
  4. Build new 8" main across Whistler, including new 8" tee, valve, and hydrant.
  5. HDD new 8" main Sta. 300 to 306 and connect to tee at 303+50.
  6. Pressure and bacteria test new main.
  7. Connect at north end and south end, and bring new main live.
  8. Connect services to new main.



300+00 301+00 302+00 303+00 304+00 305+00 306+00



PINE	DECID.	BUSH	STUMP	CATV BOX	U.P. (W/GUY)	TELE. MH	STREET SIGN	SIGN	SAN. MH	STM. MH	TELE. BOX	WTR. MH	CATV MH	LIGHT	MAILBOX	SITE BORING	P.I.	C.M.P.	C.B.	G.V.	F.H.	CATV (COMCAST)	C/L OF ROADS	ELEC (CONSUMERS)	GAS (CONSUMERS)	TELE. (SBC)	PROPERTY LINE	ROW (ICRD, MDOT)	EXISTING 5' / 7' SIDEWALK / PATHWAY	EX SAN MAIN	EX STM (ICDC)	EX WTR MAIN	PROPOSED SAN	PROPOSED STM	PROPOSED WTR	LESS BOLD	LESS BOLD	LESS BOLD	BOLD	BOLD	BOLD
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0' 20' 40' 80'

**Call 811 before you dig.**

WOLVERINE PIPE LINE COMPANY 219-844-9510

Meridian Charter Township  
Ingham County, Michigan  
Water Main System

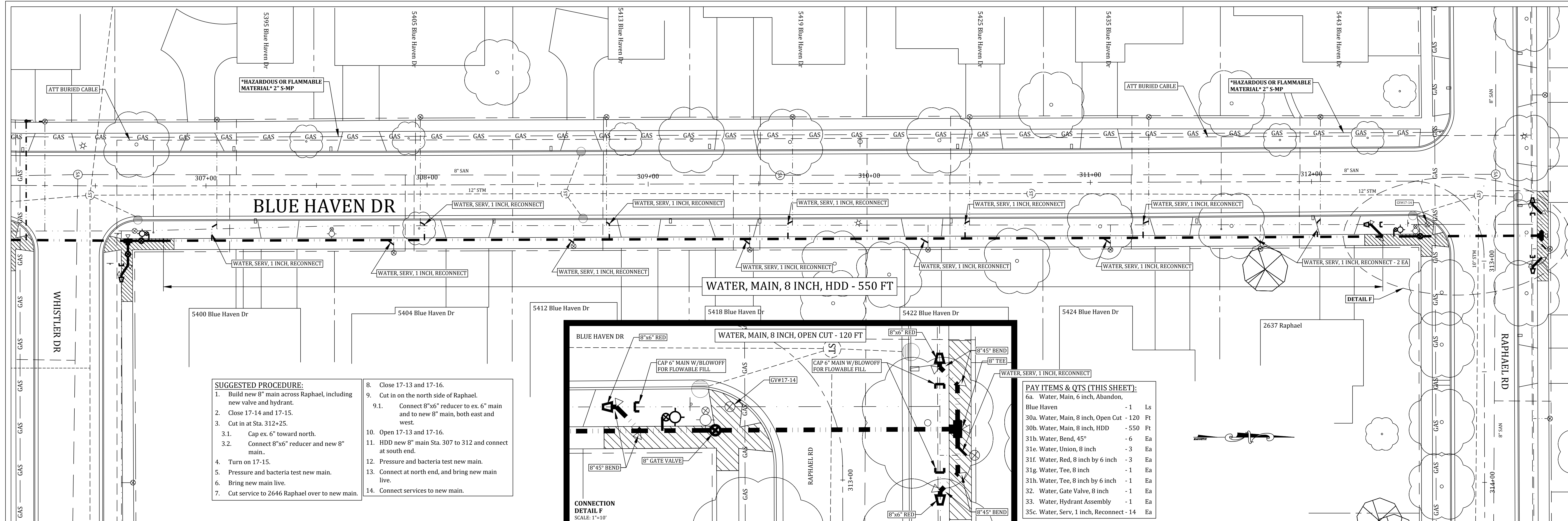
**BLUE HAVEN DRIVE**  
LINDEN ST TO WHISTLER DR

REVISIONS:  
DATE: 7/3/23 BY: NN COMMENTS: Contract Plans

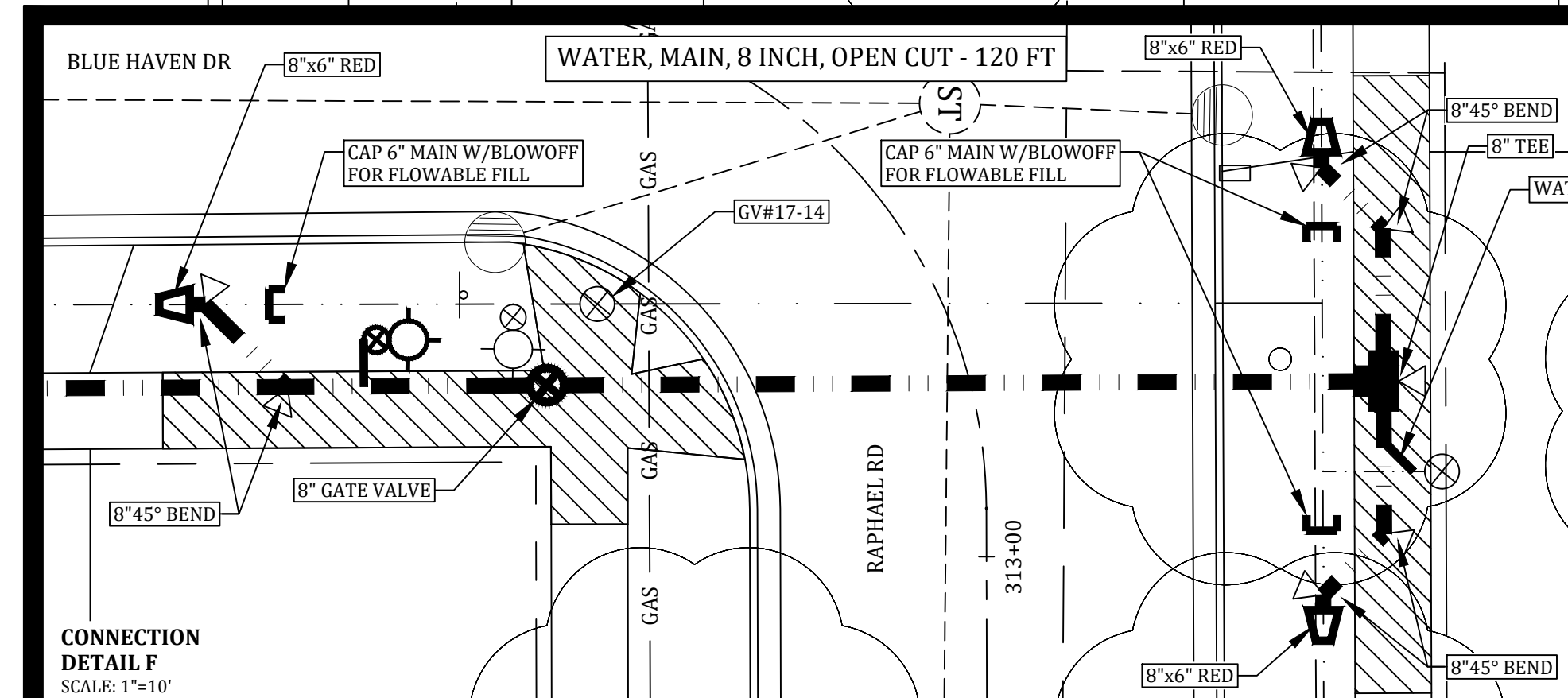
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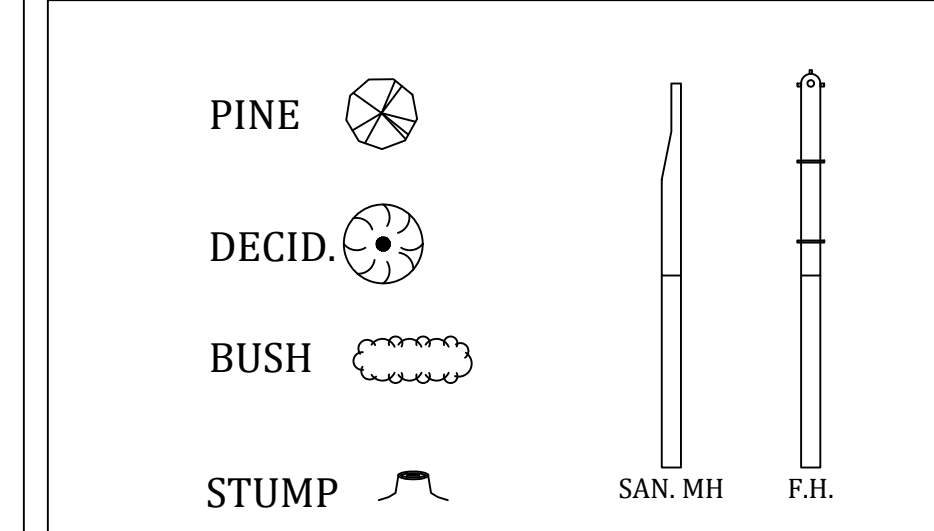
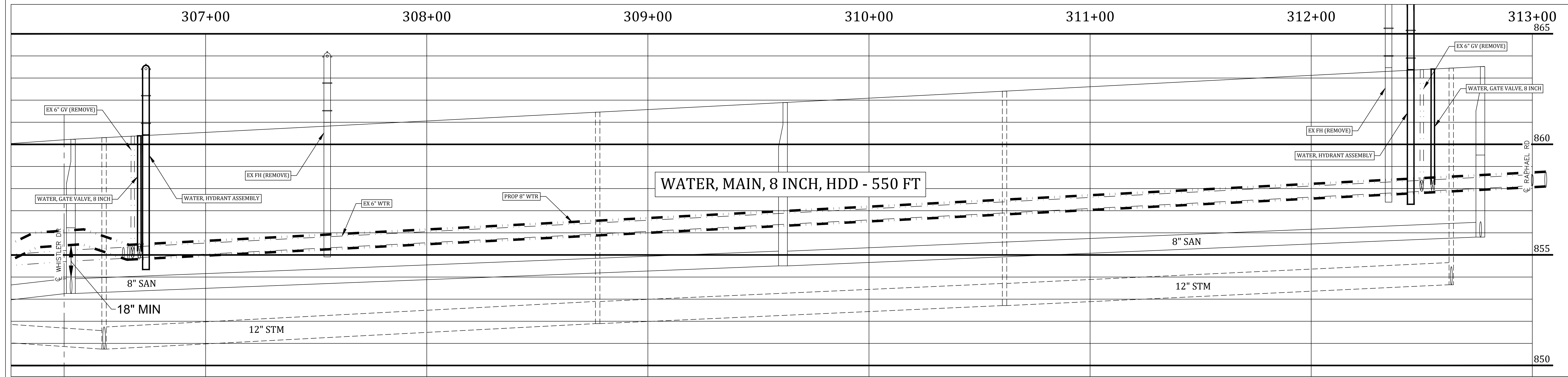


- SUGGESTED PROCEDURE:**
- Build new 8" main across Raphael, including new valve and hydrant.
  - Close 17-14 and 17-15.
  - Cut in at Sta. 312+25.
    - Cap ex. 6" toward north.
    - Connect 8"x6" reducer and new 8" main.
  - Turn on 17-15.
  - Pressure and bacteria test new main.
  - Bring new main live.
  - Cut service to 2646 Raphael over to new main.
  - Close 17-13 and 17-16.
  - Cut in on the north side of Raphael.
    - Connect 8"x6" reducer to ex. 6" main and to new 8" main, both east and west.
  - Open 17-13 and 17-16.
  - HDD new 8" main Sta. 307 to 312 and connect at south end.
  - Pressure and bacteria test new main.
  - Connect at north end, and bring new main live.
  - Connect services to new main.



**PAY ITEMS & QTS (THIS SHEET):**

6a. Water, Main, 6 inch, Abandon, Blue Haven	- 1	Ls
30a. Water, Main, 8 inch, Open Cut - 120 Ft		
30b. Water, Main, 8 inch, HDD - 550 Ft		
31b. Water, Bend, 45°	- 6	Ea
31e. Water, Union, 8 inch	- 3	Ea
31f. Water, Red, 8 inch by 6 inch	- 3	Ea
31g. Water, Tee, 8 inch	- 1	Ea
31h. Water, Tee, 8 inch by 6 inch	- 1	Ea
32. Water, Gate Valve, 8 inch	- 1	Ea
33. Water, Hydrant Assembly	- 1	Ea
35c. Water, Serv, 1 inch, Reconnect - 14		



CATV BOX	□	CATV MH	⊙
U.P. (W/GUY)	—	LIGHT	☆
TELE. MH	⊙	MAILBOX	□
STREET SIGN	⊙	SITE BORING	⊙
SIGN	⊙	P.I.	⊙
SAN. MH	⊙	C.M.P.	—
STM. MH	⊙	C.B.	⊙
TELE. BOX	□	G.V.	⊙
WTR. MH	⊙	F.H.	⊙

CATV (COMCAST)	—	LESS BOLD
C/L OF ROADS	—	LESS BOLD
ELEC (CONSUMERS)	—	LESS BOLD
GAS (CONSUMERS)	—	LESS BOLD
TELE. (SBC)	—	BOLD
PROPERTY LINE	—	BOLD
ROW (ICRD, MDOT)	—	BOLD
EXISTING 5' / 7' SIDEWALK / PATHWAY	—	
PROPOSED SAN	—	BOLD
PROPOSED STM	—	BOLD
PROPOSED WTR	—	BOLD
EX SAN MAIN	—	LESS BOLD
EX STM (ICDC)	—	LESS BOLD
EX WTR MAIN	—	LESS BOLD

0' 20' 40' 80'

**Call 811 before you dig.**

WOLVERINE PIPE LINE COMPANY 219-844-9510

Meridian Charter Township  
Ingham County, Michigan  
Water Main System

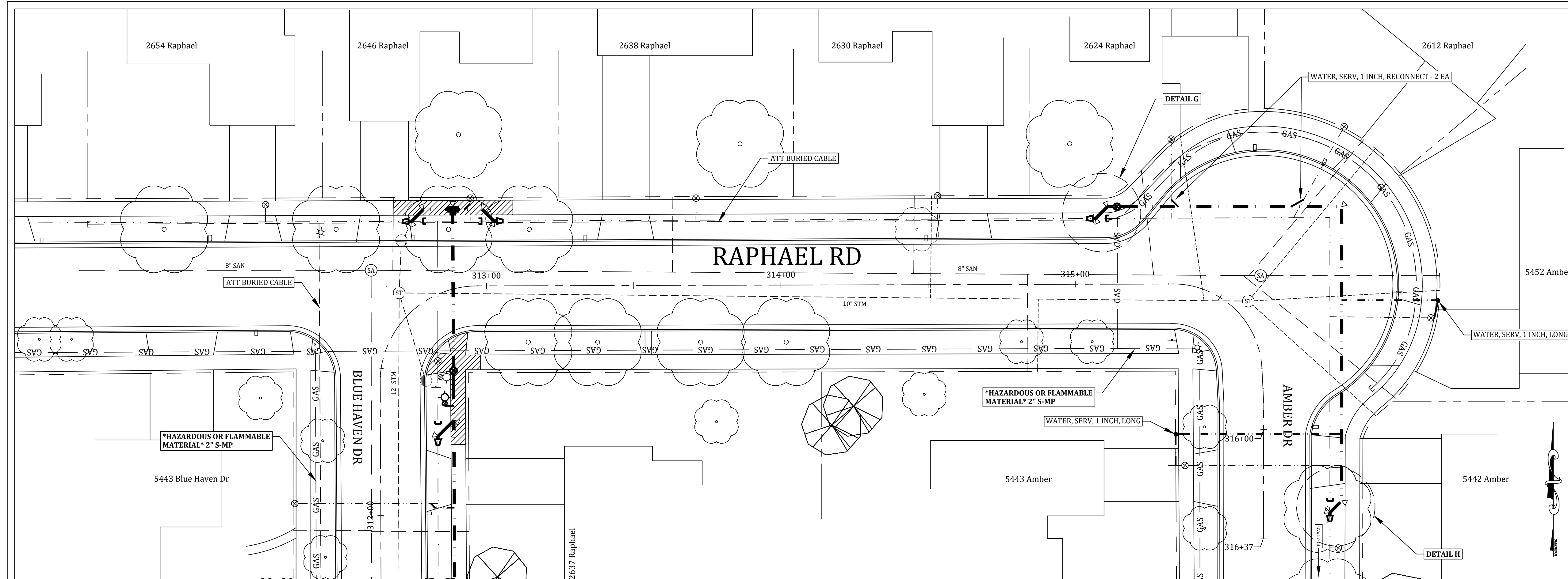
**BLUE HAVEN DRIVE**  
WHISTLER DR TO RAPHAEL RD

REVISIONS:  
DATE: 7/3/23 BY: NN COMMENTS: Contract Plans

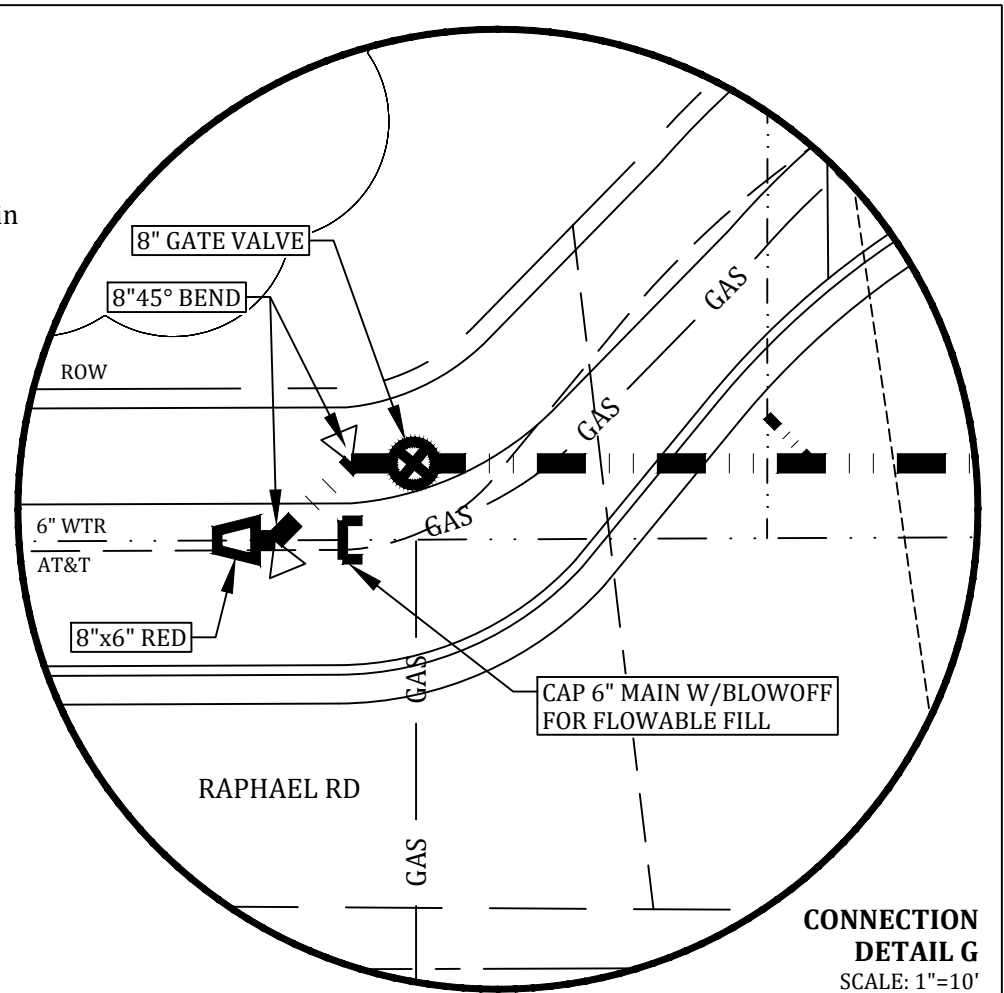
SCALE:  
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1" = 2' VERT

PAGE: 5 OF 7 FILE:

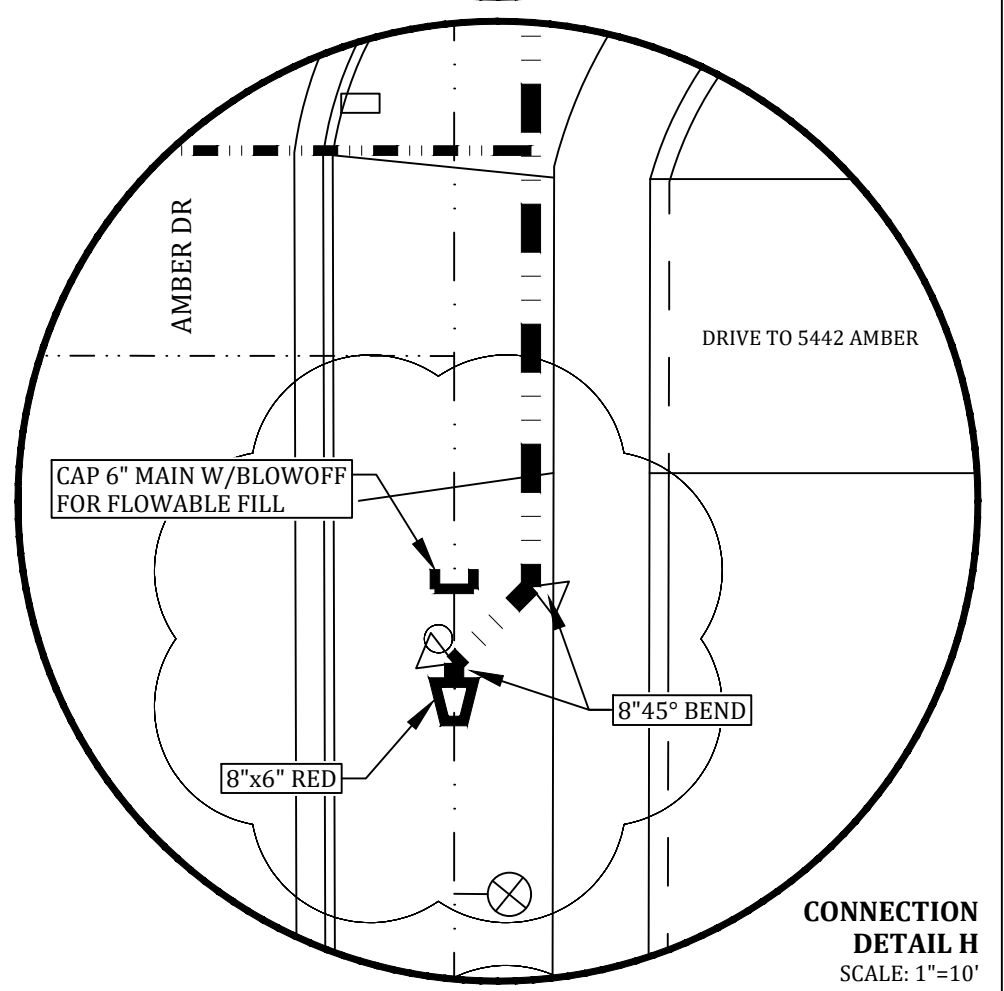
DRAWN BY: NN 06/09/23 CHECKED BY: YI 07/05/23



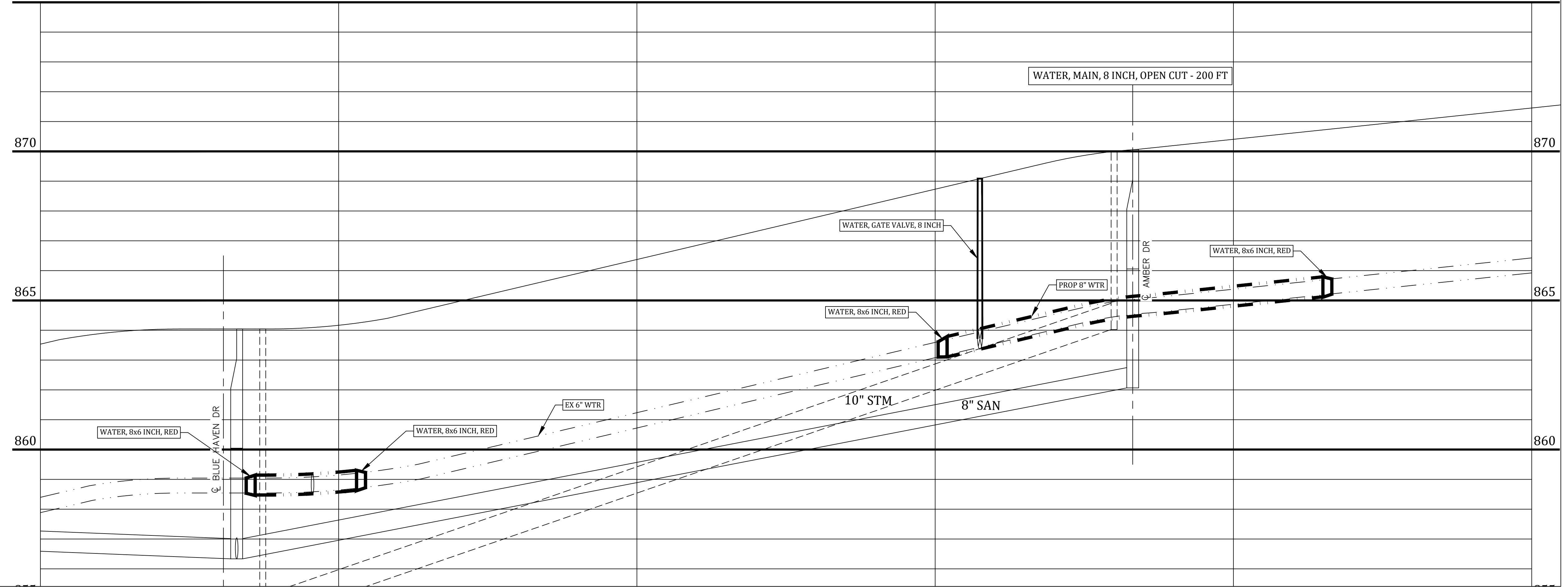
- SUGGESTED PROCEDURE:**
1. Close 17-13, 17-14, and 17-16.
  2. Cut in at Sta. 315+00.
    - 2.1. Cap ex. 6" toward east.
    - 2.2. Connect 8"x6" reducer and build new 8" main to new 8" valve.
  3. Open 17-13, 17-14, and 17-16.
  4. Build new 8" main from new valve 316+25.
    - 4.1. Cap new main shy of ex. 6" main at 316+25.
  5. Pressure and bacteria test new main.
  6. Bring new main live.
  7. Cut Amber & Raphael services to new main.
  8. Close 17-13 and 17-16.
  9. Cut in at Sta. 316+25.
    - 9.1. Cap ex. 6" toward north.
    - 9.2. Connect 8"x6" reducer to ex. 6" main and to new 8" main.
  10. Open 17-13 and 17-16.



- PAY ITEMS & QTS (THIS SHEET):**
- |   |            |    |    |
|---|------------|----|----|
| 6a. Water, Main, 6 inch, Abandon,           | Blue Haven | -1 | Ls |
| 30a. Water, Main, 8 inch, Open Cut - 200 Ft |            |    |    |
| 31a. Water, Bend, 90°                       |            | -1 | Ea |
| 31b. Water, Bend, 45°                       |            | -4 | Ea |
| 31e. Water, Union, 8 inch                   |            | -1 | Ea |
| 31f. Water, Red, 8 inch by 6 inch           |            | -2 | Ea |
| 32. Water, Gate Valve, 8 inch               |            | -1 | Ea |
| 35b. Water, Serv, 1 inch, Long              |            | -2 | Ea |
| 35c. Water, Serv, 1 inch, Reconnect         |            | -2 | Ea |



312+00 875      313+00      314+00      315+00      316+00      317+00 875



<p>PINE </p> <p>DECID. </p> <p>BUSH </p> <p>STUMP </p> <p>SAN. MH </p> <p>F.H. </p>	<p>CATV BOX </p> <p>U.P. (W/GUY) </p> <p>TELE. MH </p> <p>STREET SIGN </p> <p>SIGN </p> <p>SAN. MH </p> <p>STM. MH </p> <p>TELE. BOX </p> <p>WTR. MH </p>	<p>CATV MH </p> <p>LIGHT </p> <p>MAILBOX </p> <p>SITE BORING </p> <p>P.I. </p> <p>C.M.P. </p> <p>C.B. </p> <p>G.V. </p> <p>F.H. </p>	<p>CATV (COMCAST) </p> <p>C/L OF ROADS </p> <p>ELEC (CONSUMERS) </p> <p>GAS (CONSUMERS) </p> <p>TELE. (SBC) </p> <p>PROPERTY LINE </p> <p>ROW (ICRD, MDOT) </p>	<p>EX SAN MAIN </p> <p>EX STM (ICDC) </p> <p>EX WTR MAIN </p> <p>PROPOSED SAN </p> <p>PROPOSED STM </p> <p>PROPOSED WTR </p>	<p>LESS BOLD</p> <p>LESS BOLD</p> <p>LESS BOLD</p> <p>BOLD</p> <p>BOLD</p> <p>BOLD</p>	<p>0'      20'      40'      80'</p> <p><b>Call 811 before you dig.</b></p> <p>WOLVERINE PIPE LINE COMPANY 219-844-9510</p>
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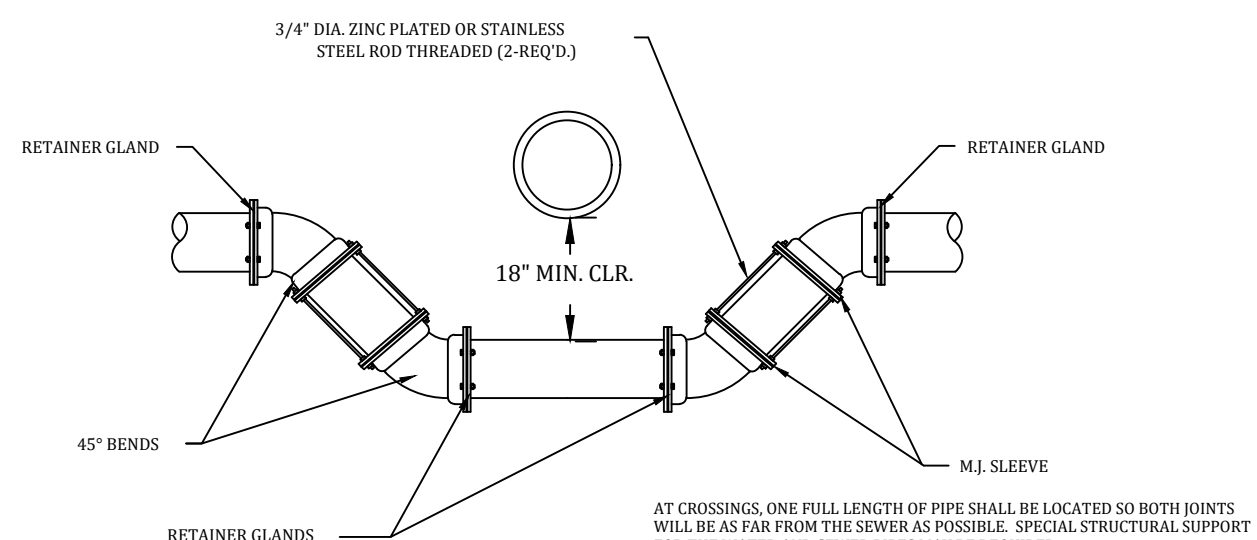
Meridian Charter Township  
Ingham County, Michigan  
**Water Main System**

**RAPHAEL ROAD**  
BLUE HAVEN DR TO AMBER DR

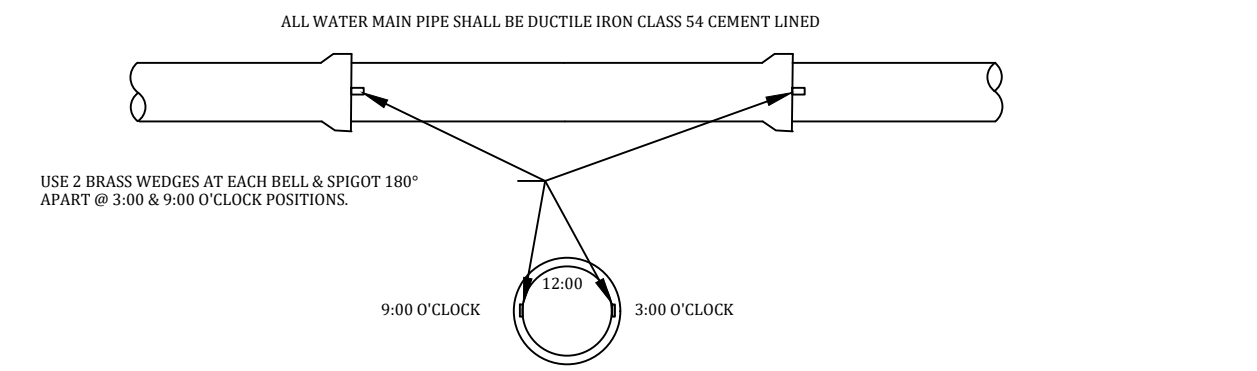
REVISIONS:		
DATE:	BY:	COMMENTS:
7/3/23	NN	Contract Plans

SCALE: 1" = 20' HOR 1" = 2' VERT      PAGE: 6 OF 7      FILE:

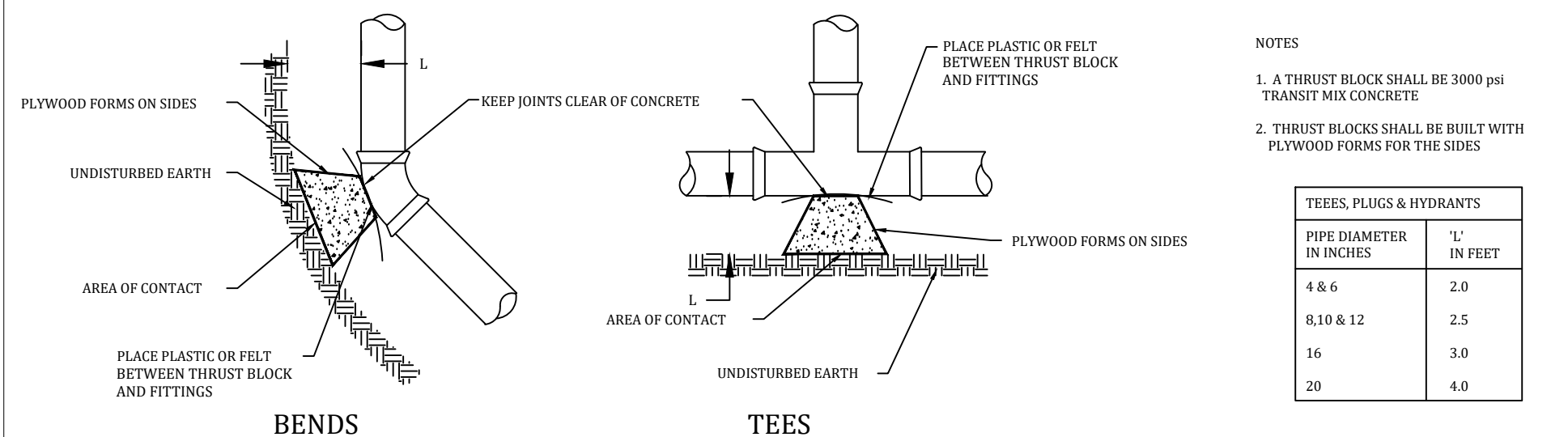
DRAWN BY: NN 06/09/23      CHECKED BY: YI 07/05/23



**LOWERING WATER MAIN CROSS SECTION**  
ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED



**WATER MAIN JOINT DETAILS**



**THRUST BLOCK PLAN VIEWS**

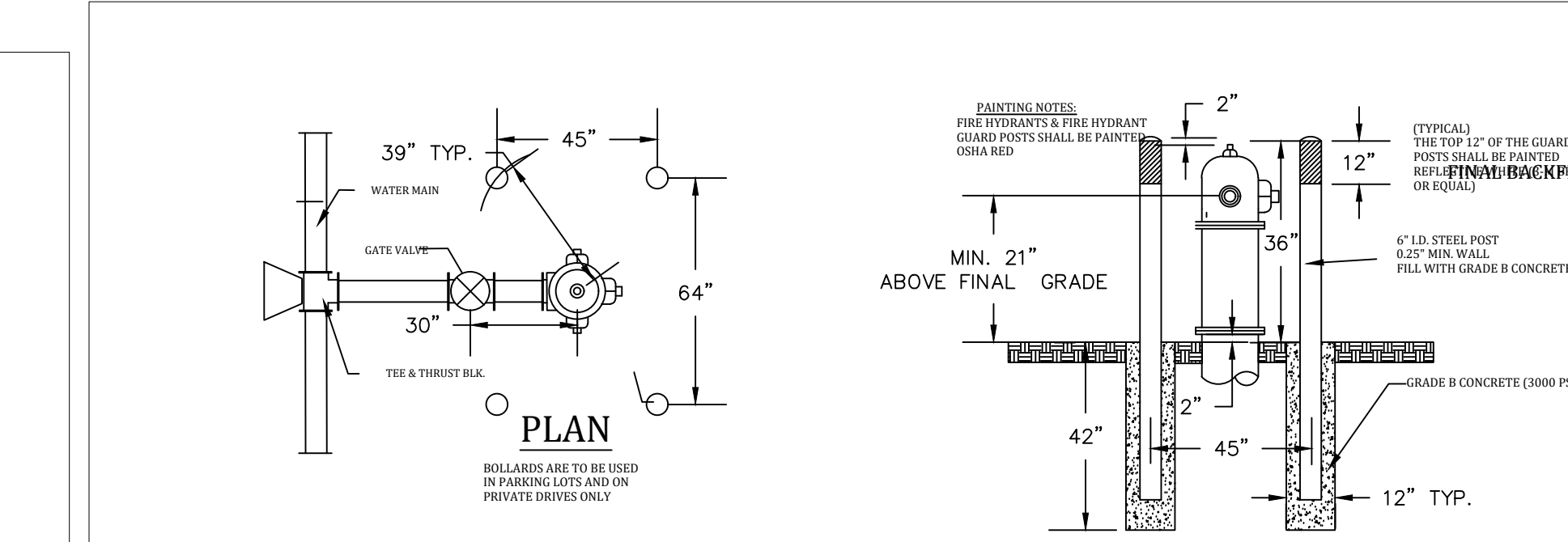
THRUST FORCE (LBS)

PIPE SIZE	TEE OR PLUG	90 BEND	45 BEND	22 1/2 BEND
4"	1,900	2,700	1,500	740
6"	4,250	6,000	3,250	1,660
8"	7,540	10,670	5,770	2,940
10"	12,000	16,750	9,100	4,650
12"	16,970	23,990	12,980	6,620
16"	30,100	42,600	23,100	11,800

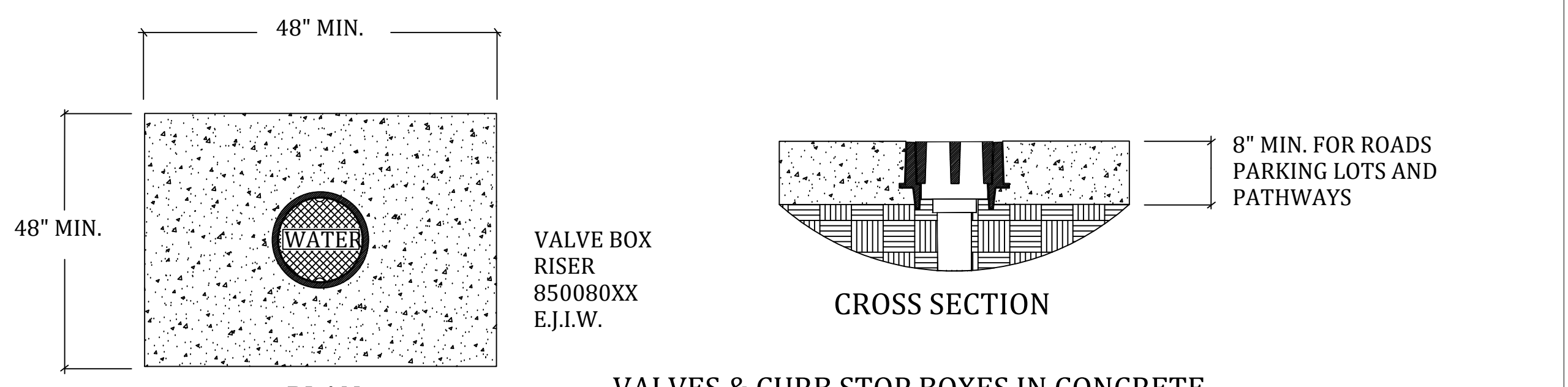
  

SAFE BEARING LOAD (LBS/SQ. FT.)

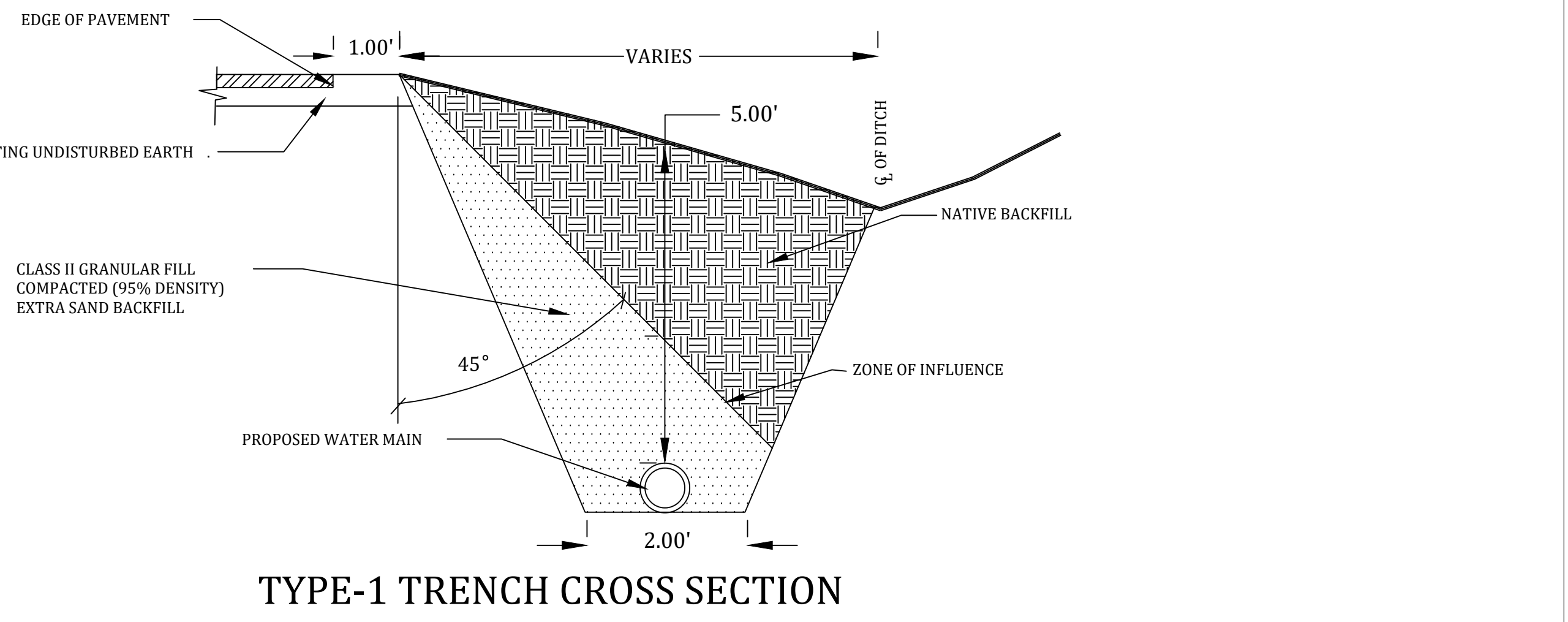
SOIL	SAFE BEARING LOAD (LBS/SQ. FT.)
MUCK, PEAT & ETC.	0
SOFT CLAY	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED W/CLAY	4,000
HARD COMPACTED CLAY	5,000



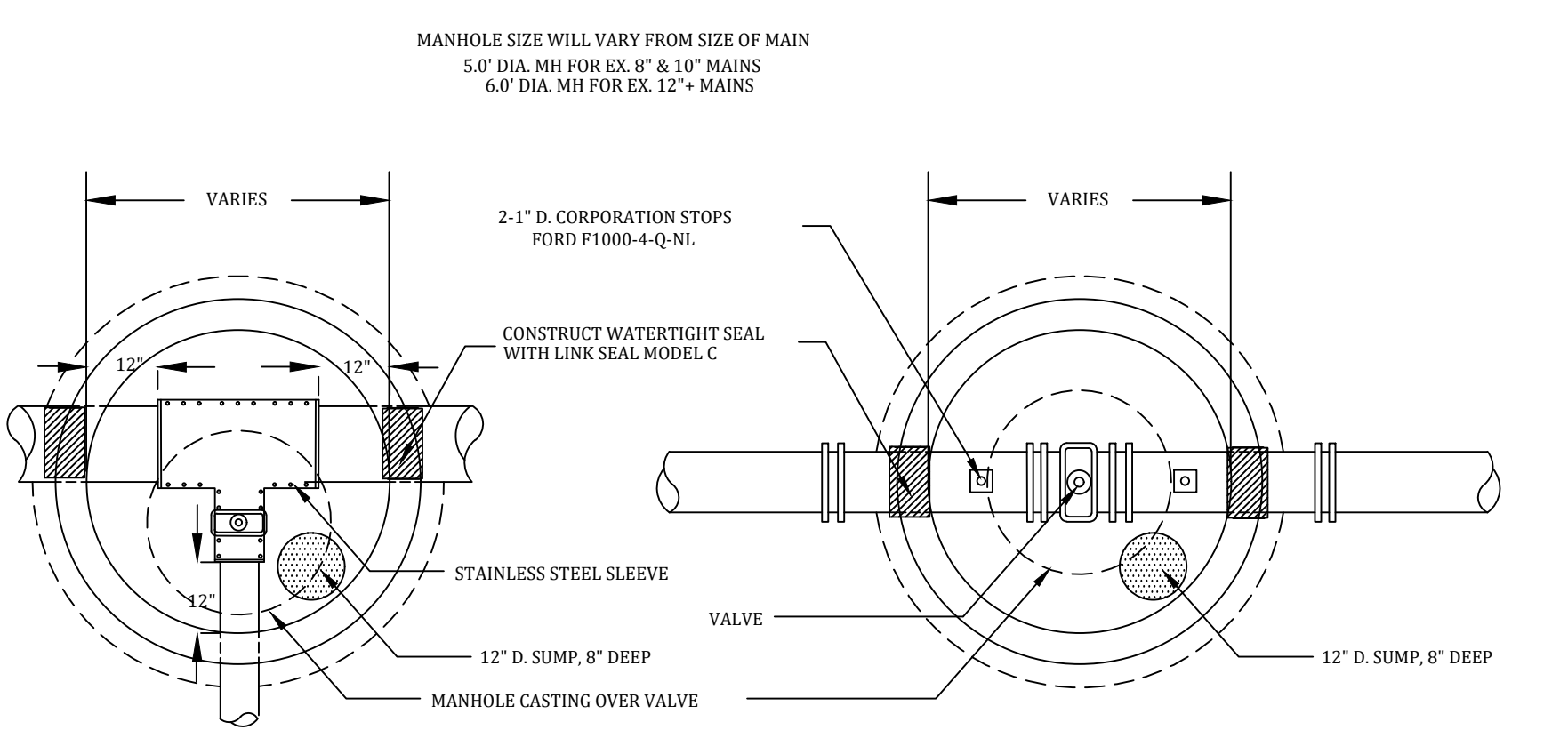
**BOLLARDS AROUND FIRE HYDRANT**



**VALVES & CURB STOP BOXES IN CONCRETE**

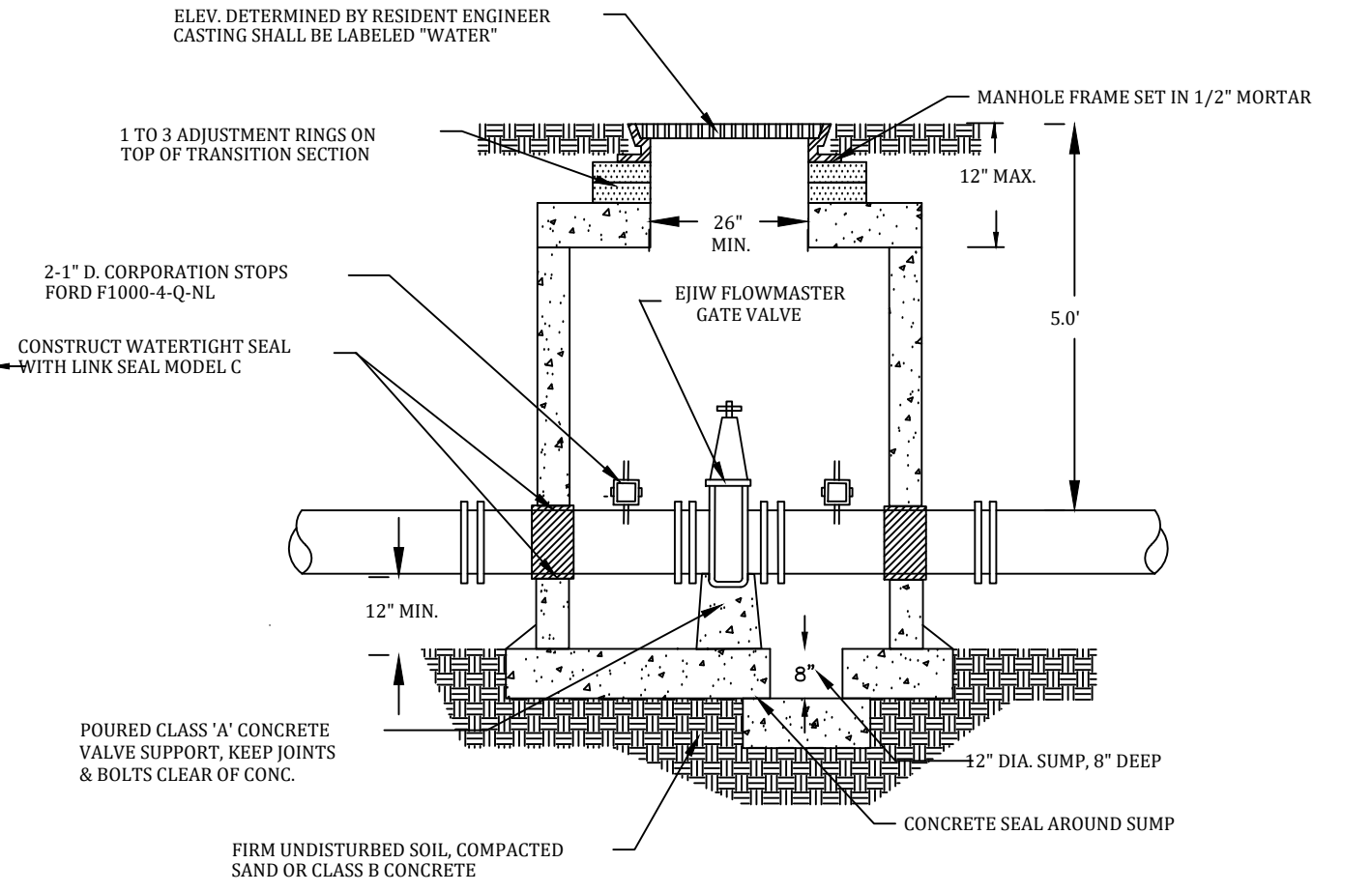


**TYPE-1 TRENCH CROSS SECTION**  
ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED

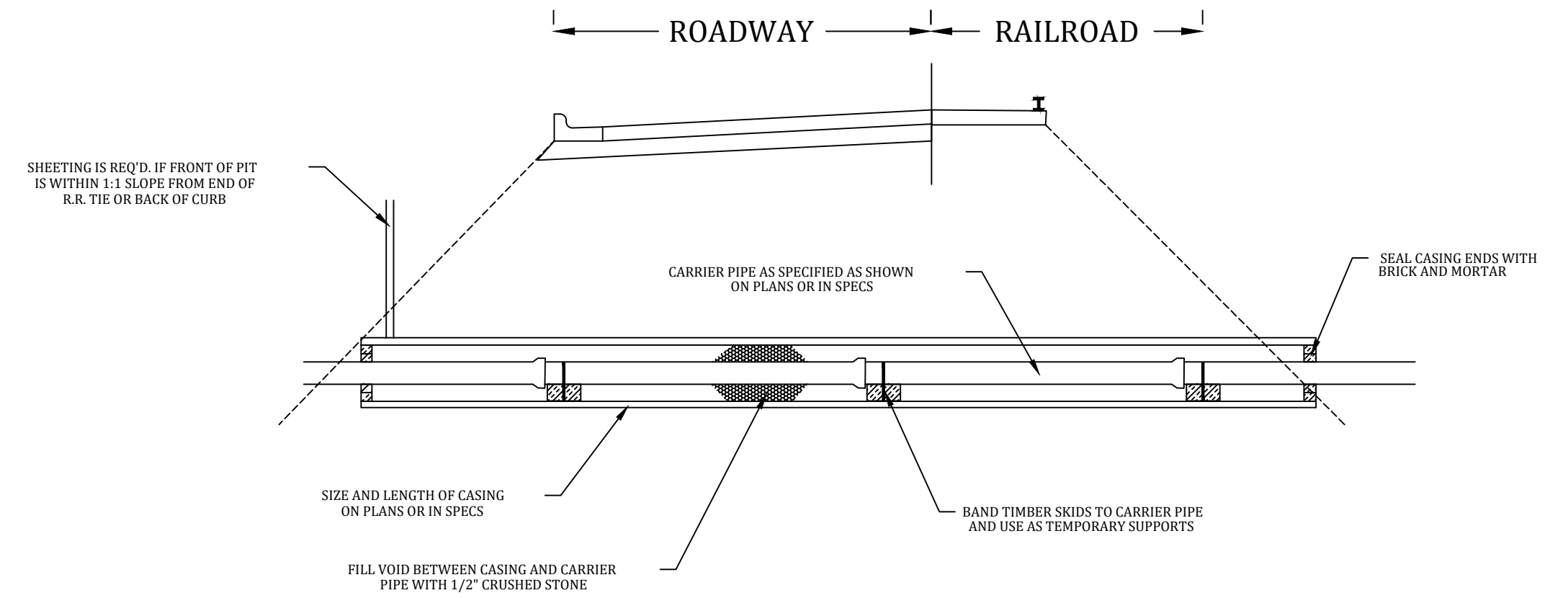


**TAPPING VALVE PLAN VIEW**      **TYPICAL IN-LINE VALVE PLAN VIEW**

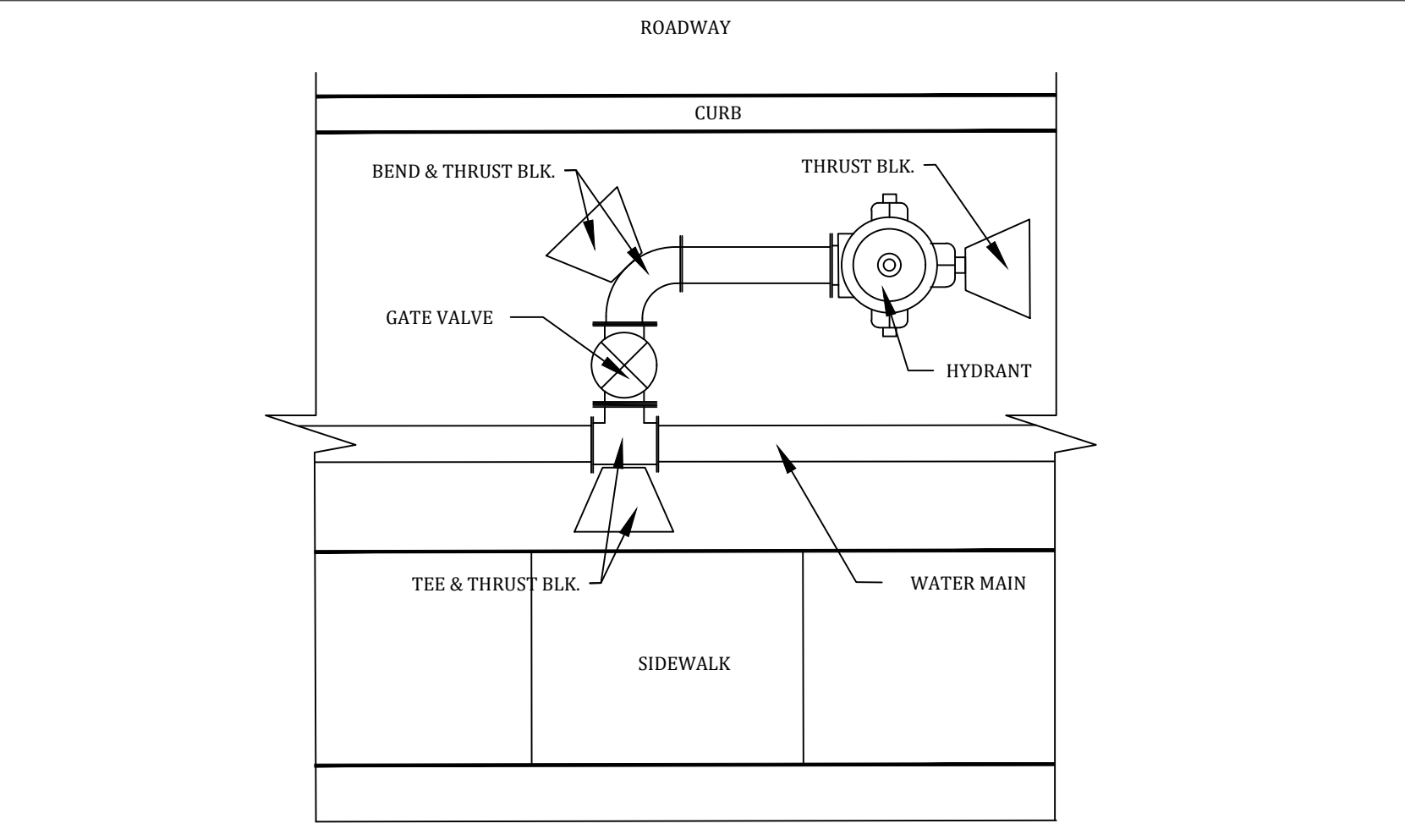
**\* ALL GATE VALVES SHALL BE EJIW FLOWMASTER**



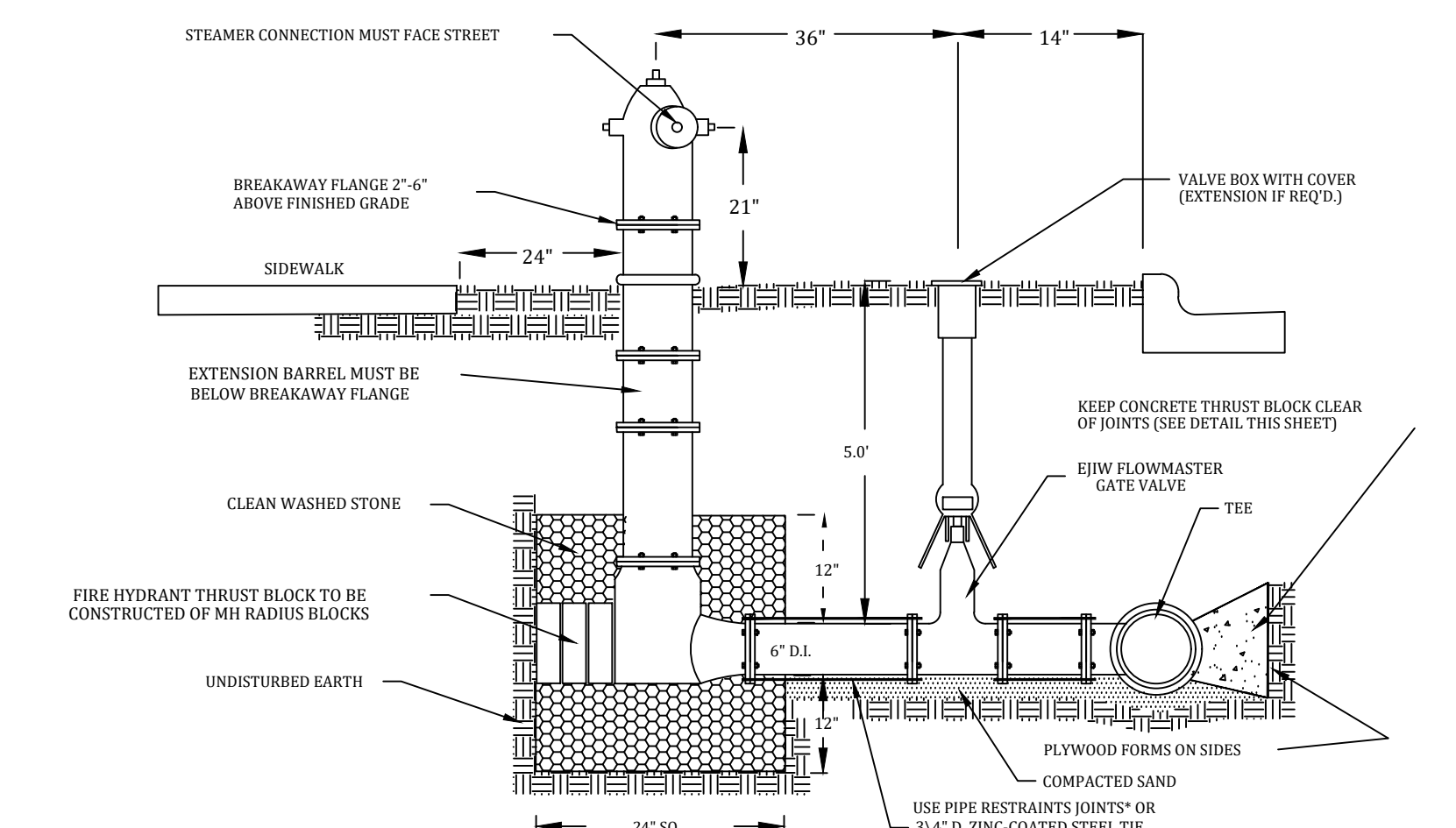
**TYPICAL IN-LINE VALVE MANHOLE CROSS SECTION**



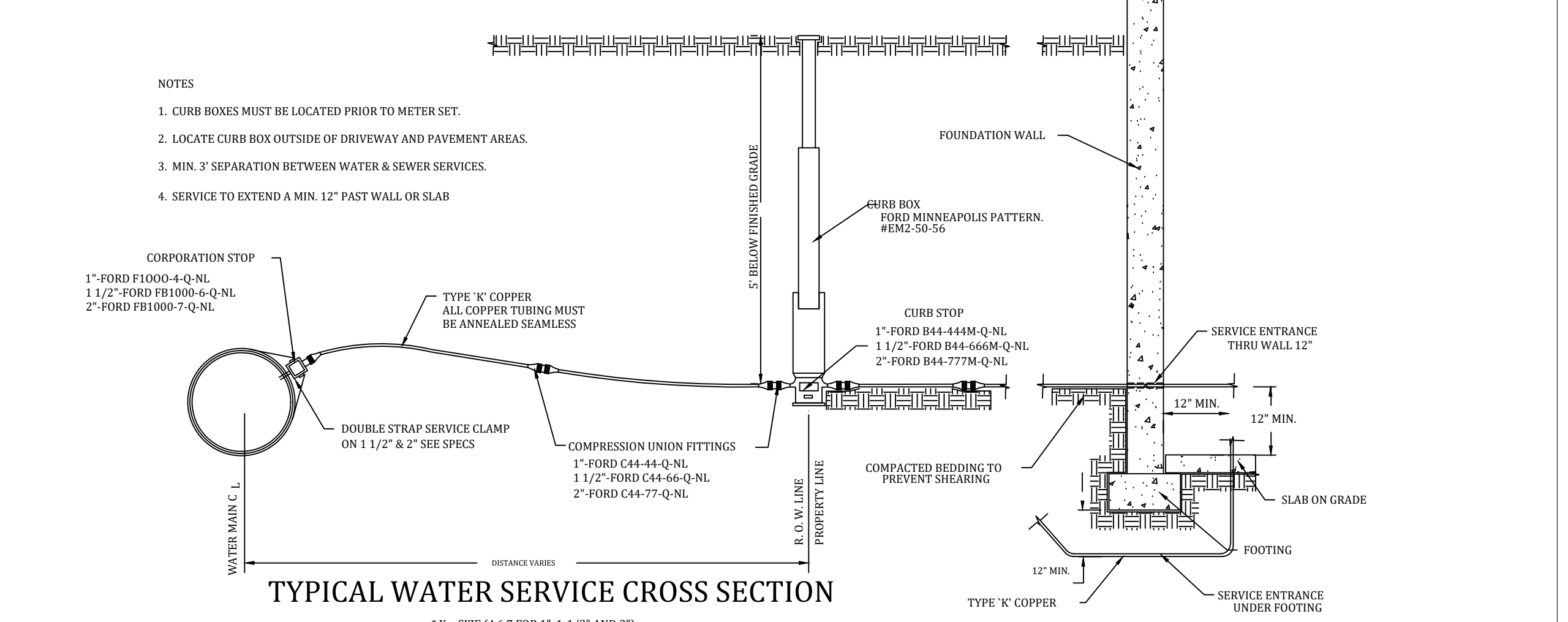
**CASING INSTALLATION DETAIL FOR ROADS & RAILROADS**  
CASING AND CARRIER PIPE TO BE INSTALLED BY METHOD OTHER THAN OPEN CUT  
ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED



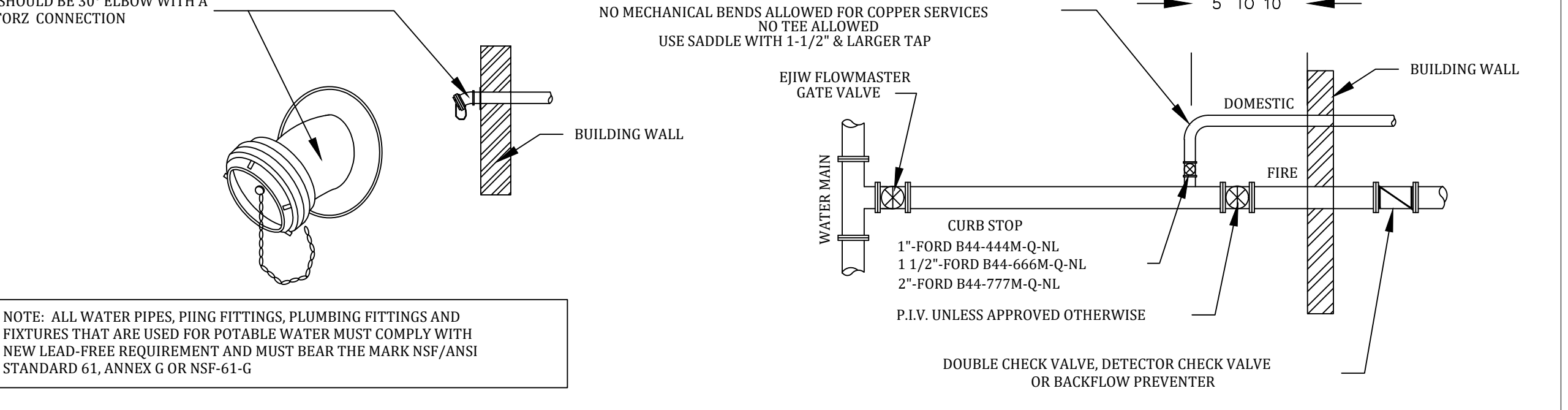
**ALTERNATE LAYOUT FOR CONFINED AREAS**



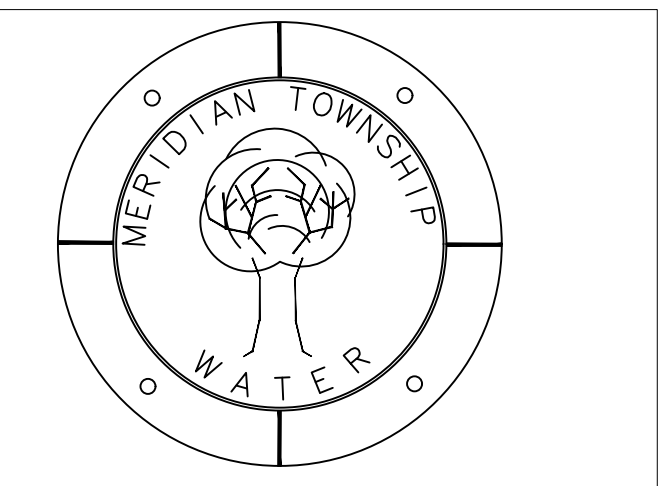
**TYPICAL HYDRANT ASSEMBLY DETAIL**  
ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED



**TYPICAL WATER SERVICE CROSS SECTION**



**FIRE PROTECTION VALVING PLAN VIEW**



Meridian Charter Township  
Ingham County, Michigan  
PUBLIC WORKS DEPARTMENT

**STANDARD DETAILS FOR WATER SYSTEM**

REVISIONS:

REVISIONS:	BY:	COMMENTS:
3/31/09	JG	CLARIFY CURB STOP MODELS
1/12/10	JG	P.I.V. CLARIFICATION
10/22/12	JG	WATER SERVICE SIZE & MAKE CLARIFICATIONS
6/13/14	JG	CURB BOX MANUFACTURER AND MODEL TYPE
10/13/17	JG	WATER CROSSING NOTE - FULL LENGTH PIPE
4/2/21	JG	ADD 30° ELBOW AND STORZ TO FDC
6/11/21	JG	ALL GATE VALVES SHALL BE EJIW FLOWMASTER NOTE

SCALE: 1" = 40' HOR.

SHEET 7 of 7

DRAWN BY:      CHECKED BY: