

UTILITY COMPANY UTILITIES

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

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

COMCAST CABLE TV
 1070 TROWBRIDGE ROAD
 EAST LANSING, MI 48823
 517.332.1012

MERIDIAN CHARTER TOWNSHIP WATER MAINS
 5151 MARSH RD.
 OKEMOS, MI 48864
 517.853.4440

SANITARY SEWER
 PATHWAYS

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

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

INGHAM COUNTY ROAD DEPT PUBLIC ROADS AND
 301 BUSH ST. RIGHTS OF WAY
 MASON, MI 48854
 517.676.9722

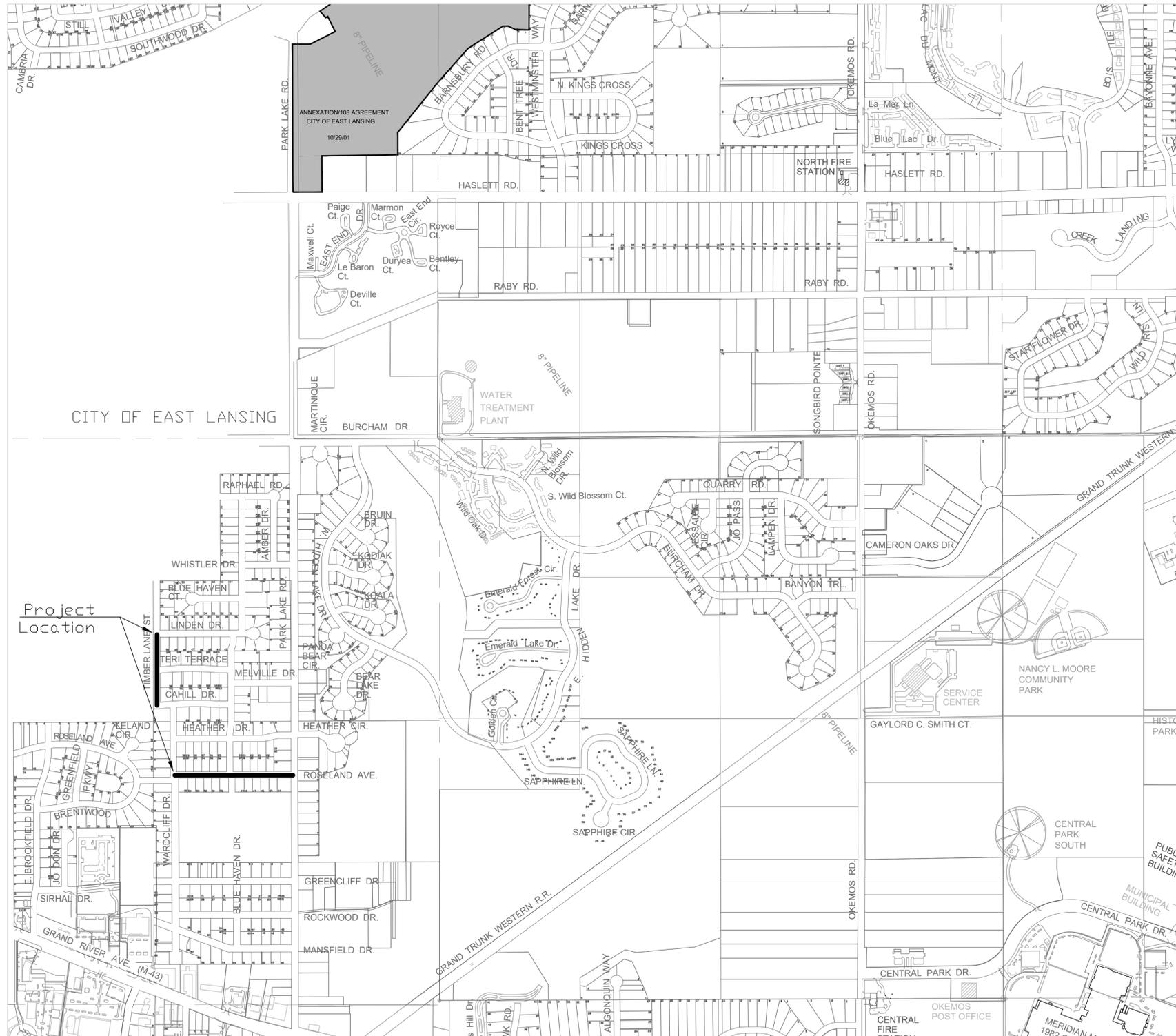
Timberlane and Roseland Watermain- 2026

CONSTRUCTION PLANS

FOR

MERIDIAN CHARTER TOWNSHIP

INGHAM COUNTY, MICHIGAN



PATHWAY AND SIDEWALK NOTES

1. Pathways and sidewalks shall be four (4) inch thick concrete except at driveways where they shall be six (6) inch (residential) or seven (7) inch (commercial) thick concrete.
2. Three (3) inches of compacted sand base shall be placed under all pathways and sidewalks.
3. All bituminous aprons shall be two and one-half (2½) inches thick, unless otherwise noted.
4. Property irons shall be maintained by the Contractor.
5. All existing concrete and bituminous to be removed shall be sawcut. All bituminous removal shall be considered incidental to construction.
6. All aggregate base material shall be four (4) inches of 22A.
7. All tree (less than 6") and shrub removal shall be considered part of subgrade preparation.
8. Location of new plant material shall be as directed by the Engineer, and shall be installed in accordance with guidelines established by the A.N.L.A.
9. All plant material not marked for removal shall be protected.
10. Bituminous drives shall be sawcut 18" on either side of proposed pathway.
11. The maximum longitudinal slope is 5% (up to an absolute maximum of 8% at the direction of the Engineer) and the maximum cross slope is 2%.
13. Expansion joints shall be placed at approximately 100' intervals and shall be ¾" thick. Contraction joints shall be sawcut to a depth of ¼ of the depth of the concrete.
14. All lumber to be pressure treated (Oscome 33 or equal) to 0.4 retention.
15. All items not covered under a specific pay item shall be considered incidental.

STANDARD CONSTRUCTION NOTES

1. 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.
2. 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.
3. 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.
4. 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.
5. The contractor shall notify "MISS DIG" 1-800-482-7171 at least 72 hours prior to the start of construction.
6. 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 therefrom from the money due the contractor.
7. 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.
8. 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.
9. 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.
10. Trees and shrubs are to be protected during construction and bored where necessary.
11. Existing fences shall be removed and restored to their original condition or better where in conflict with construction.
12. Driveways, culverts, ditches, drain tile, tile fields, drainage structures, etc., that are disturbed by the contractor's operations shall be immediately restored.
13. 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.
14. All ditch slopes shall have established vegetation and be protected from erosion.
15. All utility poles in close proximity to construction shall be supported in a manner satisfactory to the utility owner.
16. 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

1. Hydrant elevations and gate well tap elevations shall be set to existing ground elevations unless otherwise directed by the Township Engineer.
2. All water mains shall be constructed with 5 feet of cover below finish grade, unless otherwise indicated on the plans.
3. 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.
4. All valves shall be counter-clock wise open.
5. All fire hydrants shall be EJIW 5BR (54915) Traffic Type with breakaway flange or approved equal.
6. Hydrants shall be painted OSHA red.
7. Two brass wedges shall be installed at each joint on ductile iron pipe.
8. 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.
9. 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.
10. 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.
11. All manhole covers shall bear the legend "Meridian Water" with tree logo, where available.
12. 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.
13. All mechanical joints and fittings shall be restrained using MEGALUG® style restrainers, 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

1. Cover Sheet
2. SESC Plan
3. SESC Details
4. Site Plan - Timberlane
5. Site Plan - Roseland
6. Site Plan - Roseland
7. Water Standard Details
8. Pathway Standard Details

Call 811 before you dig.

Meridian Charter Township
 Ingham County, Michigan
 Watermain

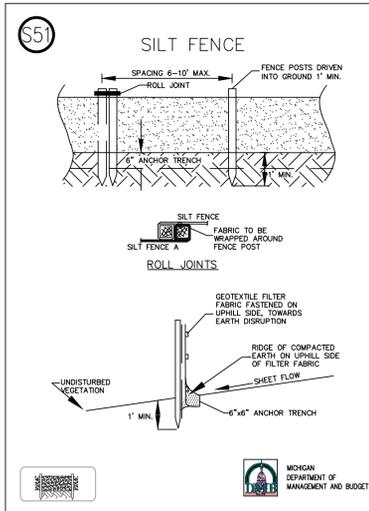
Timberlane and Roseland Watermain - 2026
 SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP,
 INGHAM COUNTY, MICHIGAN

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CHECKED BY: YI

REVISIONS:		
DATE	BY:	COMMENTS:

SHEET:
 1 - Cover Sheet



S51 SILT FENCE SPECIFICATIONS

When

- A temporary measure for preventing sediment movement.

Why

- Used to prevent sediment suspended in runoff from leaving an earth change area.

Where

- Use adjacent to critical areas, wetlands, base of slopes, and watercourses.

How

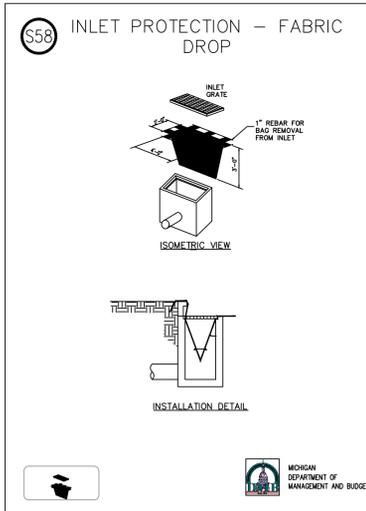
- Install parallel to a contour.
- The silt fence should be made of woven geotextile fabric.
- Silt fence should accommodate no more than 1/2 to 1 acre of drainage per 100' of fence and on slopes less than 10%.
- Place the silt fence along the area where the fence is to be placed.
- Place the silt fence bottom flap into the trench.
- Backfill the trench with soil and compact the soil on both sides. Create a small ridge on the up-slope side of the fence.
- Install wooden stakes 6 - 10' apart and drive into the ground a minimum of 12".
- Staple the geotextile fabric to the wooden stakes.
- Join sections of silt fence by wrapping ends together (See drawing).

Maintenance

- Inspect frequently and immediately after each storm event. Check several times during prolonged storm events. If necessary, repair immediately.
- If the sediment has reached 1/3 the height of the fence, the soil should be removed and disposed of in the trench. The silt fence should be re-installed if water is seeping underneath it or if the fence has become ineffective.
- Silt fence should be removed once vegetation is established and up-slope area has stabilized.

Limitations

- Silt fence may cause temporary ponding and could fail if too much water flows through the area.
- Do not use in areas with concentrated flows.
- Chance of failure increases if fence is installed incorrectly or if sediment accumulation is not removed.



S58 INLET PROTECTION - FABRIC DROP SPECIFICATIONS

When

- When sediment laden stormwater requires treatment before entering a stormwater drainage system.

Why

- To prevent sediment from entering stormwater systems.

Where

- Use in or at stormwater inlets, especially at construction sites or in streets.

How

- A filter fabric bag is hung inside the inlet, beneath the grate.
- Place grate, which will hold bag in place.
- Anchor filter bag with 1" rebar for removal from inlet.
- Flaps of bag that extend beyond the bag can be buried in soil in earth areas.

Maintenance

- Drop inlet filters should be inspected routinely and after each major rain event.
- Damaged filter bags should be replaced.
- Clean and/or replace filter bag when 1/2 full.
- Replace clogged fabric immediately.
- If needed, initiate repairs immediately upon inspection.
- Remove entire protective mechanism when upgradient areas are stabilized and streets have been swept.

Limitations

- Can only accommodate small flow quantities.
- Requires frequent maintenance.
- Ponding may occur around storm drains if filter is clogged.

E8 PERMANENT SEEDING SPECIFICATIONS

When

- To finalize stabilization of temporary seeding areas or when an area needs permanent stabilization following completion of construction. Also used when vegetative establishment can correct existing soil erosion or sedimentation problem.
- Within 5 days of final grade.
- To stabilize soil and prevent or reduce soil erosion/sedimentation problems from developing.

Why

- Used on construction and earth change sites which require permanent vegetative stabilization.

Where

How

- Review SESC plan and construction phasing to identify areas in need of permanent vegetative stabilization.
- Select perennial grass and ground cover for permanent seeding.
- Seeding mixes vary. However, they should contain native species.
- Seeding mixes should be selected through consultation with a certified seed provider and with consideration of soil type, light, moisture, use applications, and native species.
- Soil tests should be performed to determine the nutrient and pH levels in the soil. The pH may need to be adjusted to between 6.5 and 7.0.
- Prepare a 3-5" deep seedbed, with the top 3-4" consisting of topsoil.
- Slopes steeper than 1:3 should be roughened.
- Apply seed as soon as possible after seedbed preparation. Seed may be broadcast by hand, hydroseeding, or by using mechanical drills.
- Mulch immediately after seeding.
- Dormant seed mixes are for use after the growing season, using seed which lies dormant in the winter and begins growing as soon as site conditions become favorable.

E8 PERMANENT SEEDING SPECIFICATIONS (cont.)

How

- Protect seeded areas from pedestrian or vehicular traffic.
- Divert concentrated flows away from the seeded area until vegetation is established.

Maintenance

- Inspect weekly and within 24 hours following each rain event in the first few months following installation to be sure seed has germinated and permanent vegetative cover is being established.
- Add supplemental seed as necessary.

Limitations

- Seeds need adequate time to establish.
- May not be appropriate in areas with frequent traffic.
- Seeded areas may require irrigation during dry periods.
- Seeding success is site specific, consider mulching or sodding when necessary.

E8 PERMANENT SEEDING

Planting Zones:	Lower Peninsula (South of T20N) Zone 1	Lower Peninsula (North of T20N) Zone 2	Upper Peninsula Zone 3
Seeding Window	4/15 - 10/10	5/1 - 10/1	5/1 - 9/20
Seeding Window	11/15 - Freeze	11/01 - Freeze	11/01 - Freeze

Source: Adapted from MDOT Interim 2003 Standard Specifications for Construction

Seeding Date (with Irrigation or Mulch)	Zone 1 (South of U.S. 10)		Zone 2 (North of U.S. 10)		Zone 3 (Upper Peninsula)	
	4/1 - 8/1	5/1 - 9/20	5/1 - 9/20	5/1 - 9/10	5/1 - 6/15	8/1 - 9/20
Dormant Seeding Dates*	11/1 - Freeze	10/25 - Freeze	10/25 - Freeze	10/25 - Freeze		

Source: Adapted from USDA NRCS Technical Guide #342 (1999)

- * Dormant seeding is for use in the late fall after the soil temperature remains consistently below 50 F. prior to the ground freezing. This practice is appropriate if construction on a site is completed in the fall but the seed was not planted prior to recommended seeding dates. No seed germination will take place until spring. A cool season annual grass may be added in an attempt to have some fall growth.
- Mulch must be used with dormant seed.
- Do not seed when the ground is frozen or snow covered.
- Do not use a dormant seed mix on grassed waterways.

CONSTRUCTION SCHEDULE AND SEQUENCING

	START DATE	COMPLETE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS														
INSTALL WATERMAIN														
SITE RESTORATION														
FINAL INSPECTIONS & TEMPORARY EROSION REMOVAL														

- 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 5 days of completion of the final grading.

Call 811 before you dig.

WOLVERINE PIPE LINE COMPANY 219-844-9510

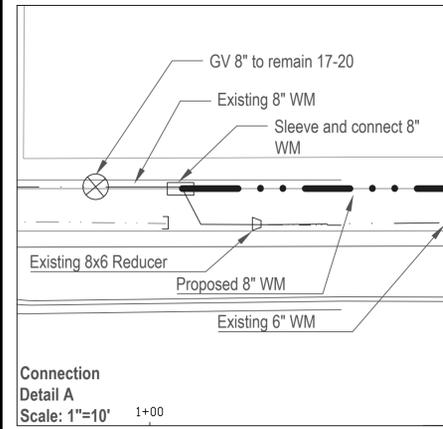
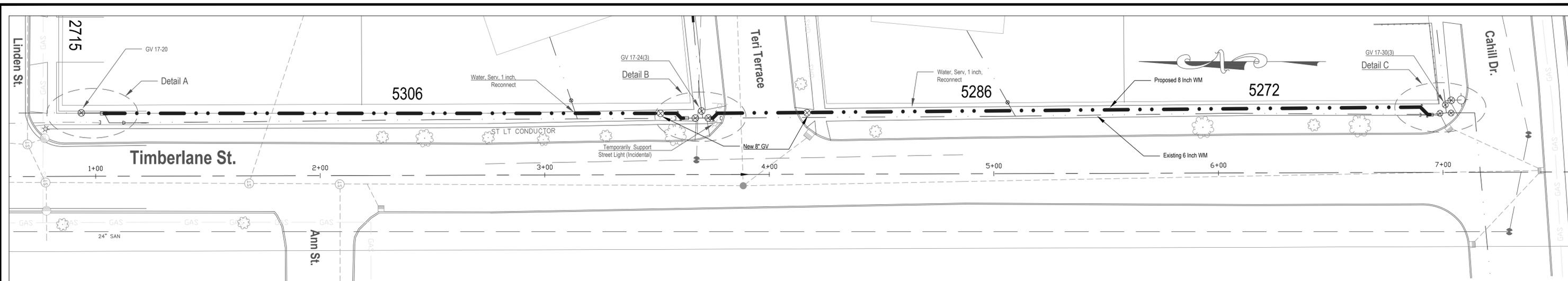
Meridian Charter Township
Ingham County, Michigan
Watermain

Timberlane and Roseland Watermain - 2026
SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP,
INGHAM COUNTY, MICHIGAN

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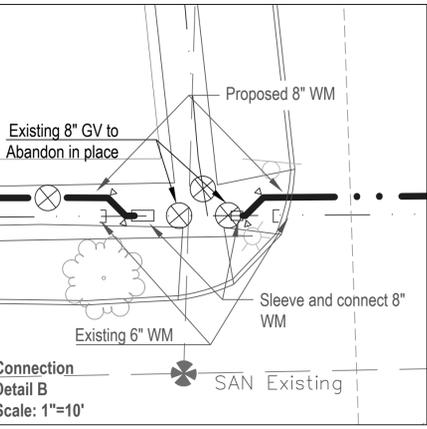
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SHEET: 3 - SESC Details



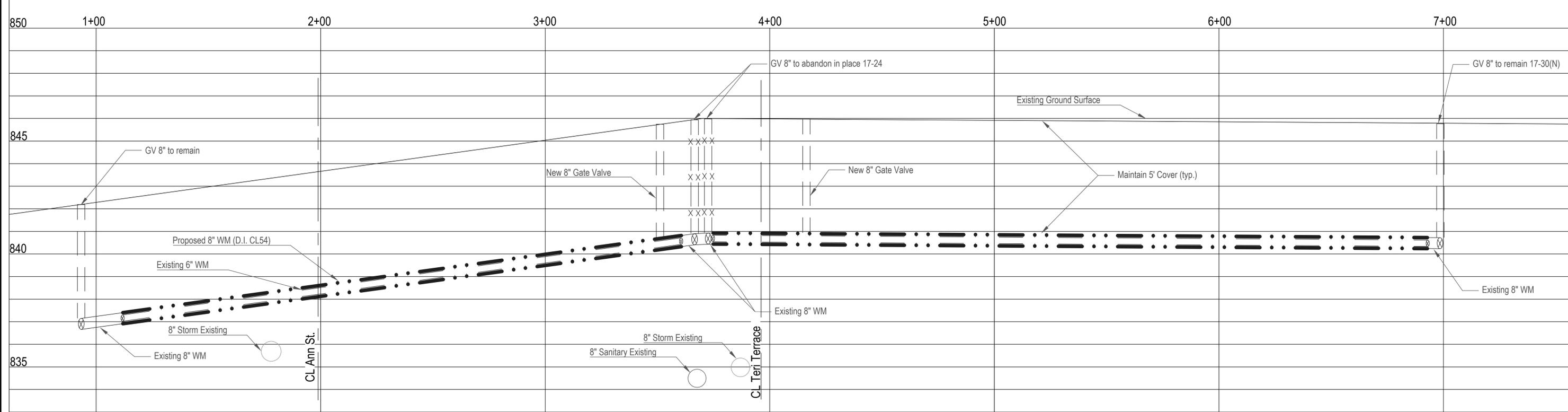
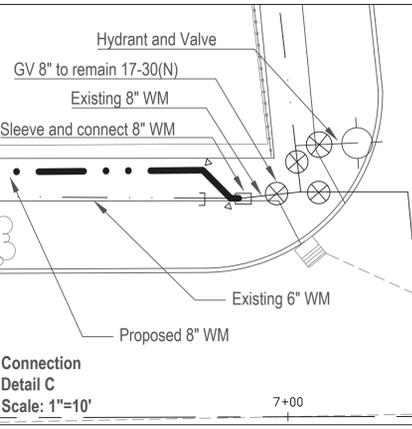
- SUGGESTED PROCEDURE Timberlane:**
1. Close existing GV 17-20 and 17-24(N)
 2. Cut and cap existing 6" WM South of Linden St. and install a temporary thrust block
 3. Open existing GV 17-24(N)
 4. Install proposed 8" WM from Linden to Teri Terrace including proposed 8" GV 17-24(N) and 45 degree bends
 5. Pressure and bacteria test proposed 8" main
 6. Close existing GV 17-24(E,S)
 7. Connect proposed 8" WM to existing 8" WM North of Teri Terrace and abandon existing GV 17-24 (N) open
 8. Transfer water service at 5306 Timberlane
 9. Open existing GV 17-20 and new GV 17-24 (N)
 10. Abandon existing 6" WM from Linden St. to Teri Terrace

9. Close existing GV 17-24(S) and 17-30(N)
10. Cut and cap existing 6" WM North of Cahill Dr. and install a temporary thrust block
11. Open existing GV 17-24(S)
12. Install proposed 8" WM from Cahill to Teri Terrace including proposed 8" GV 17-24 (S) and 45 degree bends
13. Pressure and bacteria test proposed 8" main
14. Close existing GV 17-24(E) and newly placed GV 17-24(N)
15. Connect proposed 8" WM to existing 8" WM North of Teri Terrace and abandon existing GV 17-24(S) open
16. Transfer water service at 5286 Timberlane
17. Open existing GV 17-30(N) and 17-24(E,N)
18. Abandon existing 6" WM from Cahill Dr. to Teri Terrace



PAY ITEMS & QTS (THIS SHEET):

1. Pavt, Rem, Concrete	2815	SF
2. Pavt, Rem, Asphalt	350	SF
7. Water, Main, 6 inch, Abandon	1	LS
8. Water, Main, 8 inch, Install	580	FT
9. Water, Sleeve, 8 inch	4	EA
10. Water, 45 degree bend, 8 inch	6	EA
11. Water, Gate Valve, 8 inch	2	EA
12. Water Serv, 1 Inch, Reconnect	2	EA
13. Concrete, 4 Inch	2665	SF
14. Sidewalk Ramp, ADA	150	SF
15. Detectable Warning Surface	40	SF
16. HMA, 13A	10	TN
17. Curb and Gutter, Rem	35	FT
18. Curb and Gutter, Inst	35	FT



Legend:

- CATV BOX
- TELE. MH
- U.P. W/ GUY WIRE
- STREET SIGN
- SAN. MH
- STM. MH
- TELE. BOX
- WTR. MH
- CATV MH
- LIGHT
- SOIL BORING
- MAILBOX
- P.I.
- C.M.P.
- C.B.
- G.V.
- F.H.
- CATV (COMCAST)
- OF ROADS
- ELEC. ABOVE GROUND
- ELEC. UNDERGROUND
- GAS (CONSUMERS)
- TELE. (COMM)
- PROPERTY LINE
- R.O.W. (I.C.R.C., MDDT)
- EX. SAN. MAIN
- EX. STM. (I.C.D.C.)
- EX. WTR. MAIN
- PROPOSED SAN.
- PROPOSED STM.
- PROPOSED WTR.
- PROPOSED 7' PATHWAY

Benchmark
#1. IRON PIN, 40103, NORTHEAST 1/4 SECTION CORNER, SECTION 17, T4N-R1W, MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN. ELEVATION = 842.18

SCALE: 1" = 20'

Call 811 before you dig.

WOLVERINE PIPE LINE COMPANY 219-844-9510

Meridian Charter Township
Ingham County, Michigan
Watermain

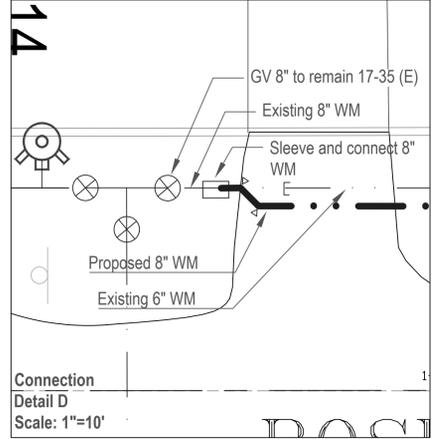
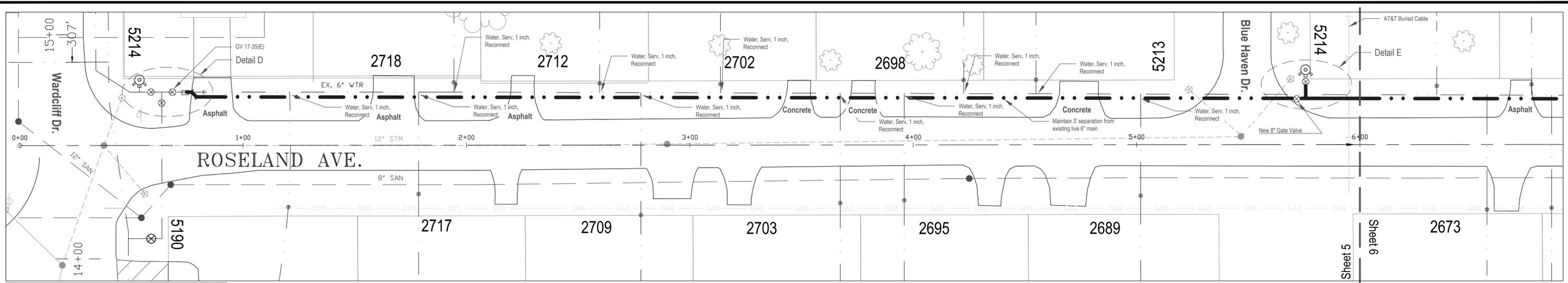
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SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP,
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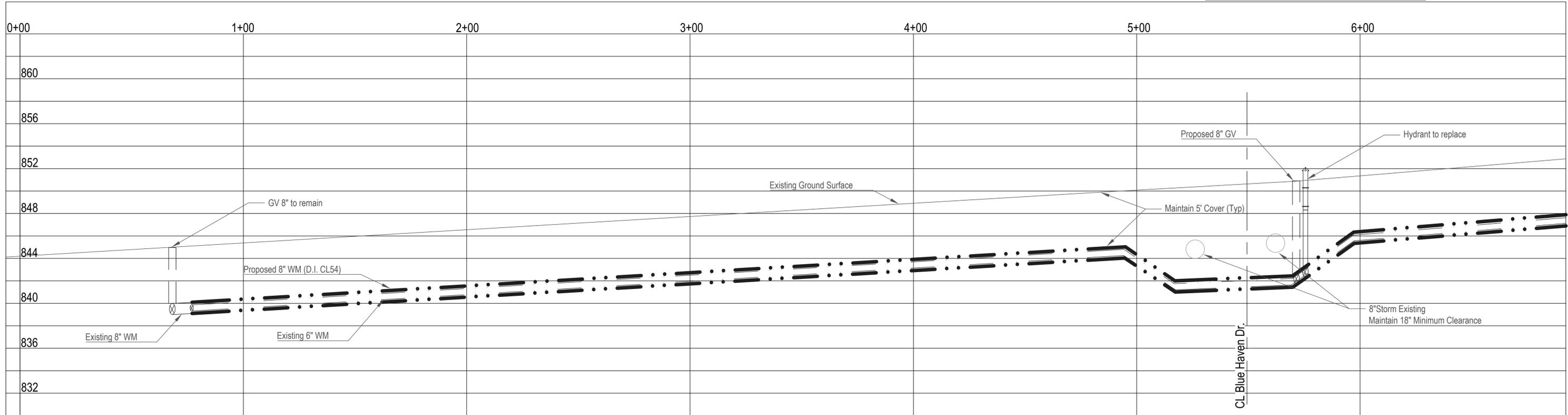
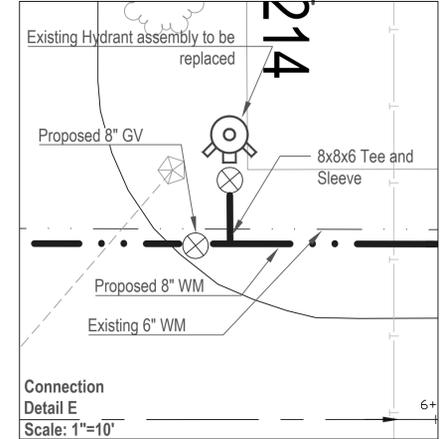
SHEET:
4 - Site Plan - Timberlane



- SUGGESTED PROCEDURE Roseland:**
1. Live tap existing 20" main at Park Lake Rd. (See Sheet 6)
 2. Install new 8" main from Park Lake Rd. to Wardcliff Dr. including bends, proposed 8" valve, and hydrant assemblies (Adjust depth of proposed 8" WM to avoid long side water services)
 3. Pressure and Bacteria test new main
 4. Close GV 17-35(E) and 17-34(E)
 5. Connect new 8" WM to existing 8" WM East of Wardcliff Dr.
 6. Reconnect water services
 7. Open GV 17-35(E) and tapping valve at Park Lake Rd.
 8. Coordinate with township staff to close existing GV 17-33(A,B), 17-53(E), and 17-XX (New valve between Rockwood and Greenciff),
 9. Remove existing 6" GV 17-34(E) and plug existing tee
 10. Open existing GV 17-33(A,B), 17-53(E), and 17-XX (New Valve)
 11. Abandon existing 6" WM

PAY ITEMS & QTS (THIS SHEET):

1. Pavt, Rem, Concrete	220	SF
2. Pavt, Rem, Asphalt	385	SF
7. Water, Main, 6 inch, Abandon	1	LS
8. Water, Main, 8 inch, Install	526	FT
9. Water, Sleeve, 8 inch	1	EA
10. Water, 45 degree bend, 8 inch	2	EA
11. Water, Gate Valve, 8 inch	1	EA
12. Water, Hydrant Assembly	1	EA
13. Water Serv, 1 Inch, Reconnect	11	EA
14. Concrete, 6 Inch	220	SF
15. HMA, 13A	21	TN



Legend:

- CATV BOX
- TELE. MH
- UP. W/ GUY WIRE
- STREET SIGN
- SAN. MH
- STM. MH
- TELE. BOX
- WTR. MH
- CATV MH
- LIGHT
- SDIL BORING
- MAILBOX
- P.I.
- C.M.P.
- C.B.
- G.V.
- F.H.
- EX. SAN. MAIN
- EX. STM. (I.C.D.C.)
- EX. WTR. MAIN
- PROPOSED SAN.
- PROPOSED STM.
- PROPOSED WTR.
- PROPOSED 7' PATHWAY
- ELEC. ABOVE GROUND
- ELEC. UNDERGROUND
- GAS (CONSUMERS)
- TELE. (COMM)
- PROPERTY LINE
- R.D.W. (I.C.R.C., MDDT)

Benchmark
#1. IRON PIN, 40103, NORTHEAST 1/4 SECTION CORNER,
SECTION 17, T4N-R1W, MERIDIAN TOWNSHIP, INGHAM
COUNTY, MICHIGAN. ELEVATION = 842.18

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WOLVERINE PIPE LINE COMPANY 219-844-9510

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Watermain

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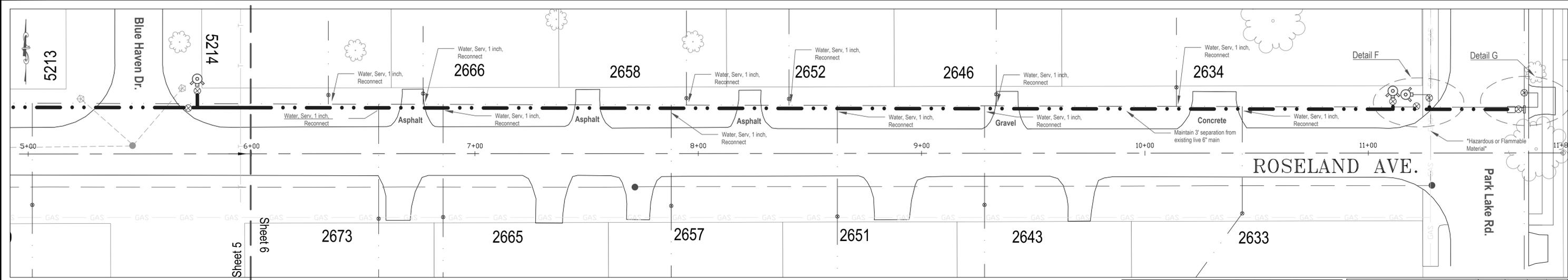
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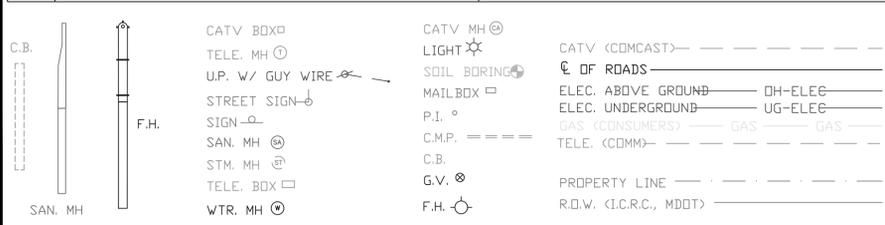
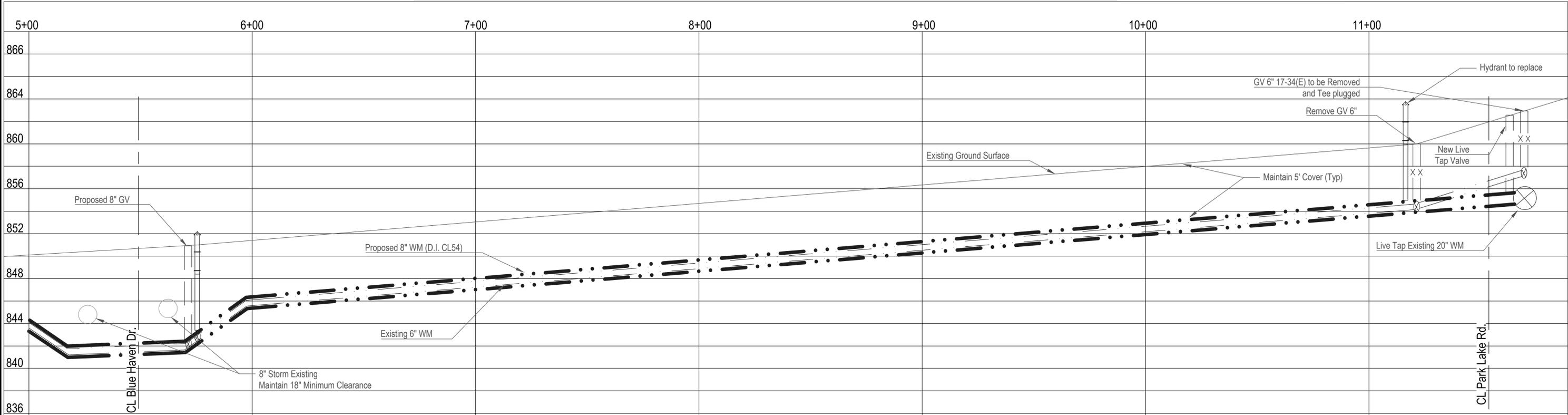
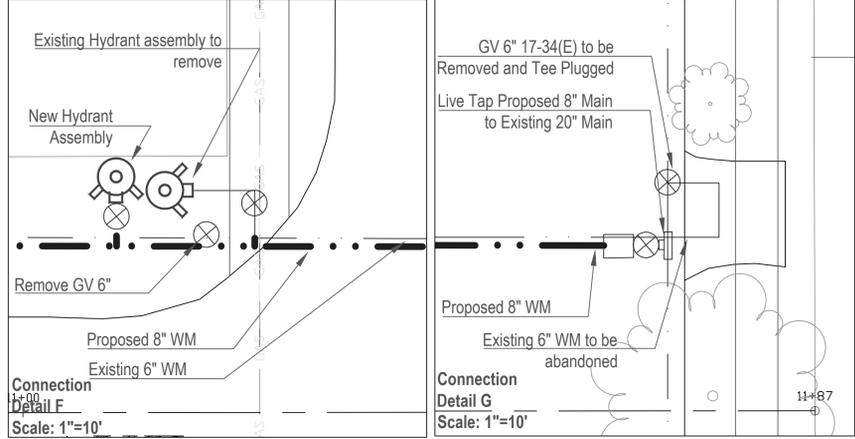
5 - Site Plan - Roseland



- SUGGESTED PROCEDURE Roseland:**
1. Live tap existing 20" main at Park Lake Rd.
 2. Install new 8" main from Park Lake Rd. to Wardcliff Dr. including bends, proposed 8" valve, and hydrant assemblies (Adjust depth of proposed 8" WM to avoid long side water services)
 3. Pressure and Bacteria test new main
 4. Close GV 17-35(E) and 17-34(E)
 5. Connect new 8" WM to existing 8" WM East of Wardcliff Dr.
 6. Reconnect water services
 7. Open GV 17-35(E) and tapping valve at Park Lake Rd.
 8. Coordinate with township staff to close existing GV 17-33(A,B), 17-53(E), and 17-XX (New valve between Rockwood and Greenclyff),
 9. Remove existing 6" GV 17-34(E) and plug existing tee
 10. Open existing GV 17-33(A,B), 17-53(E), and 17-XX (New Valve)
 11. Abandon existing 6" WM

PAY ITEMS & QTS (THIS SHEET):

1. Pavt, Rem, Concrete	360	SF	18. HMA, 13A	21	TN
2. Pavt, Rem, Asphalt	385	SF	19. Curb and Gutter, Rem	43	FT
7. Water, Main, 6 inch, Abandon	1	LS	20. Curb and Gutter, Inst	43	FT
8. Water, Main, 8 inch, Install	578	FT			
9. Water, Sleeve, 8 inch	1	EA			
10. Water, Gate Valve, 8 inch	1	EA			
11. Water, Gave Valve, 6 inch, Abandon	1	EA			
12. Water, Live Tap 8 x 20 inch	1	EA			
13. Water, Hydrant Assembly	1	EA			
14. Water Serv, 1 Inch, Reconnect	12	EA			
15. Concrete, 6 Inch	320	SF			
16. Sidewalk Ramp, ADA	40	SF			
17. Detectable Warning Surface	24	SF			



Benchmark
 #1. IRON PIN, 40103, NORTHEAST 1/4 SECTION CORNER,
 SECTION 17, T4N-R1W, MERIDIAN TOWNSHIP, INGHAM
 COUNTY, MICHIGAN. ELEVATION = 842.18

SCALE: 1" = 20'

Call 811 before you dig.

WOLVERINE PIPE LINE COMPANY 219-844-9510

Meridian Charter Township
 Ingham County, Michigan
 Watermain

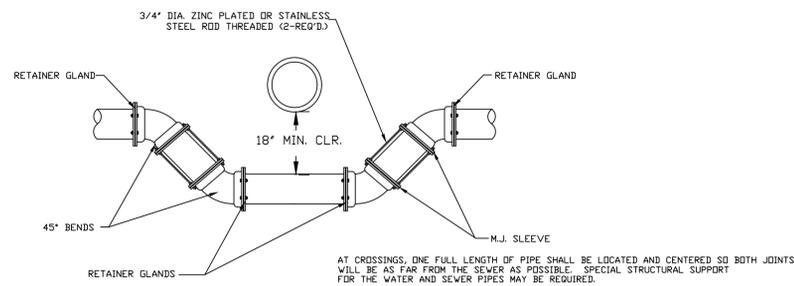
Timberlane and Roseland Watermain - 2026
 SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP,
 INGHAM COUNTY, MICHIGAN

DRAWN BY: TH CHECKED BY: YI

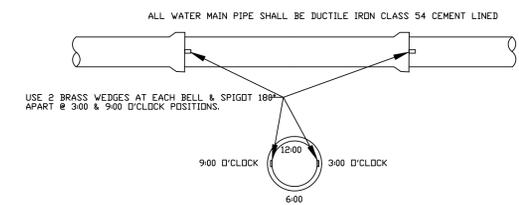
REVISIONS:

DATE	BY:	COMMENTS:

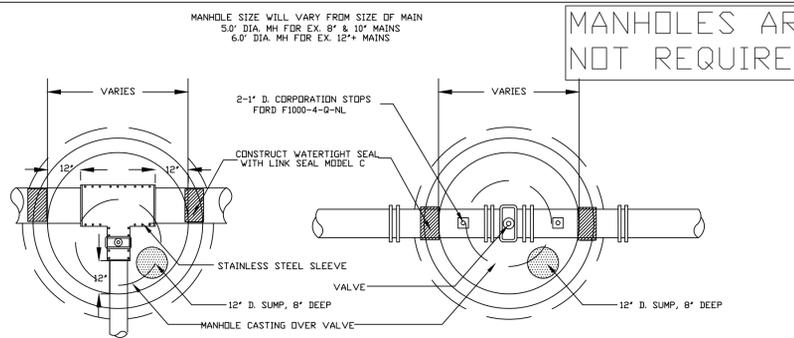
SHEET:
6 - Site Plan - Roseland



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



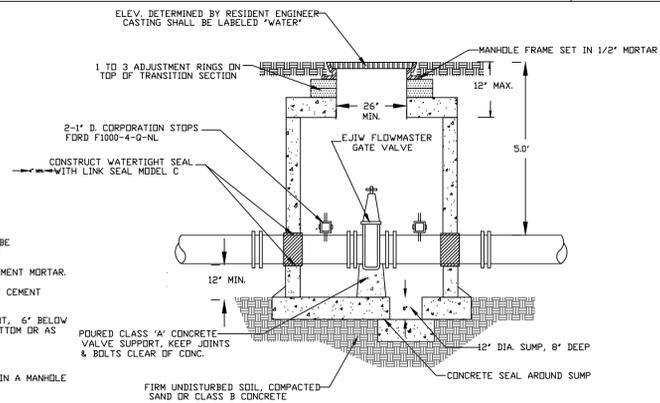
WATER MAIN JOINT DETAILS



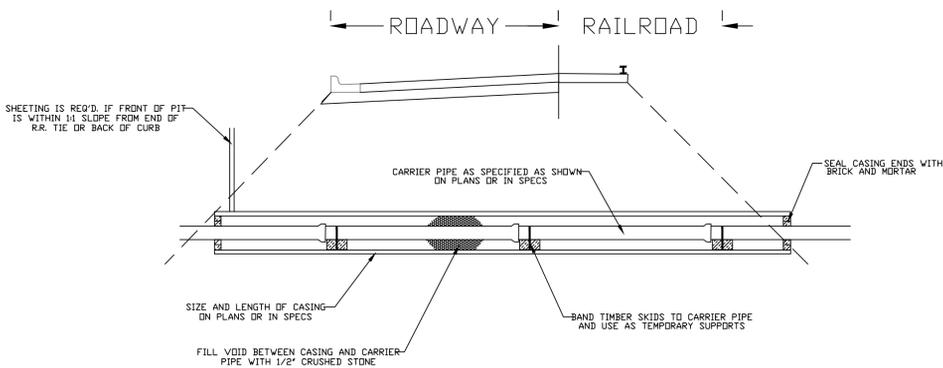
MANHOLES ARE NOT REQUIRED

TAPPING VALVE PLAN VIEW TYPICAL IN-LINE VALVE PLAN VIEW

MANHOLES ARE NOT REQUIRED



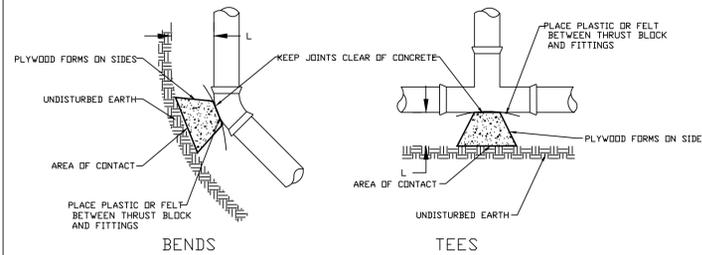
TYPICAL IN-LINE VALVE MANHOLE CROSS SECTION



- NOTES
1. WORK IN ROADS AND IN RAILROAD RIGHT-OF-WAYS SHALL BE IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AGENCY'S REQUIREMENTS.
 2. CASING PIPE SHALL BE ASTM 139, GRADE B OR ASTM A-53, GRADE B OR API 5-L, GRADE B OR API GRADE B WITH 0.375" MINIMUM WALL THICKNESS.

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



THRUST BLOCK PLAN VIEWS

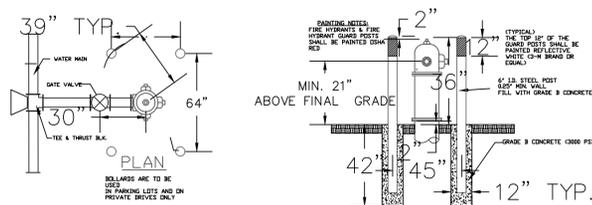
PIPE SIZE	THRUST FORCE (LBS)				SOIL	SAFE BEARING LOAD (LBS/SQ. FT.)
	TEE OR PLUG	90 BEND	45 BEND	22 1/2 BEND		
4"	1,900	2,700	1,500	740	MUCK, PEAT & ETC...	0
6"	4,250	6,000	3,250	1,660	SOFT CLAY	1,000
8"	7,540	10,670	5,770	2,940	SAND	2,000
10"	12,000	16,750	9,100	4,650	SAND AND GRAVEL	3,000
12"	16,970	23,990	12,980	6,620	SAND AND GRAVEL CEMENTED W/CLAY	4,000
16"	30,100	42,600	23,100	11,800	HARD COMPACTED CLAY	5,000

NOTES

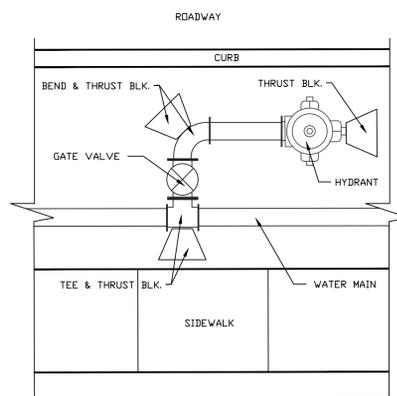
1. A THRUST BLOCK SHALL BE 3000 PSI TRANSIT MIX CONCRETE
2. THRUST BLOCKS SHALL BE BUILT WITH PLYWOOD FORMS FOR THE SIDES

PIPE DIAMETER IN INCHES	'L' IN FEET
4 & 6	2.0
8, 10 & 12	2.5
16	3.0
20	4.0

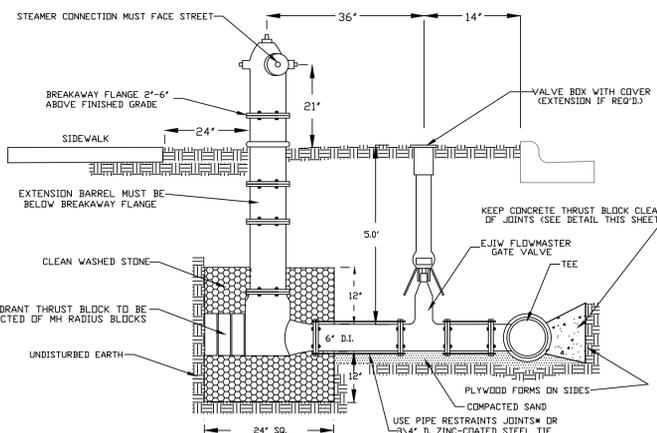
EXAMPLE: TYPICAL REQUIRED CALCULATION FOR A THRUST BLOCK 6" - 90° BEND IN SAND
THRUST FORCE (LBS) = 6,000 LBS
SAFE BEARING LOADS = 2,000 LBS/SQ. FT. = 3 SQ. FT.



BOLLARDS AROUND FIRE HYDRANT



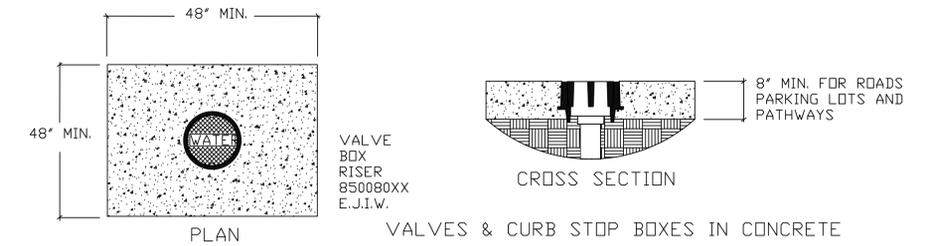
ALTERNATE LAYOUT FOR CONFINED AREAS



- NOTES
1. HYDRANT TO BE E.I.W. SBR250 (CODE 54915) WITH "HARRINGTON INTEGRAL HYDRANT STORZ" NOZZLE
 2. HYDRANT DRAIN SHALL BE PLUGGED
 3. STONE SHALL NOT BE PLACED AROUND THE HYDRANT VALVE.
 4. GATE VALVES SHALL BE E.I.W. FLOWMASTER

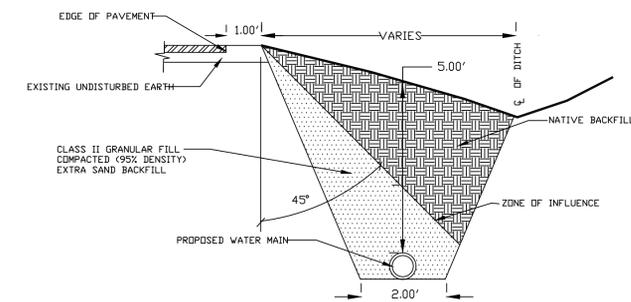
TYPICAL HYDRANT ASSEMBLY DETAIL

ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED



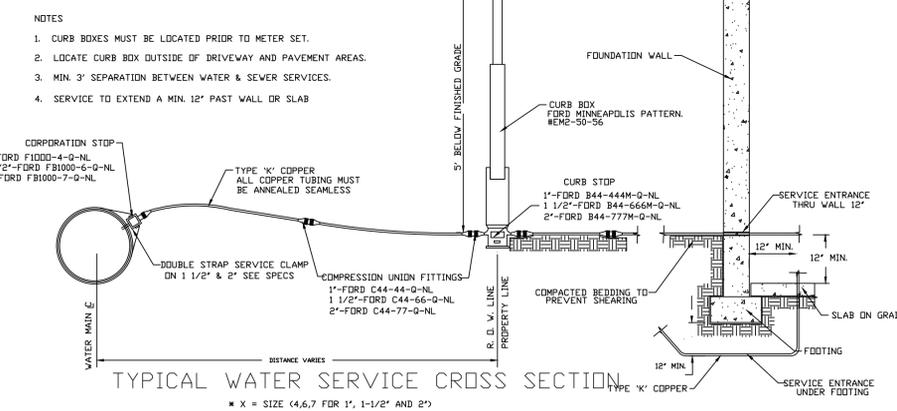
VALVE BOX RISER 850080XX E.J.I.W.

VALVES & CURB STOP BOXES IN CONCRETE



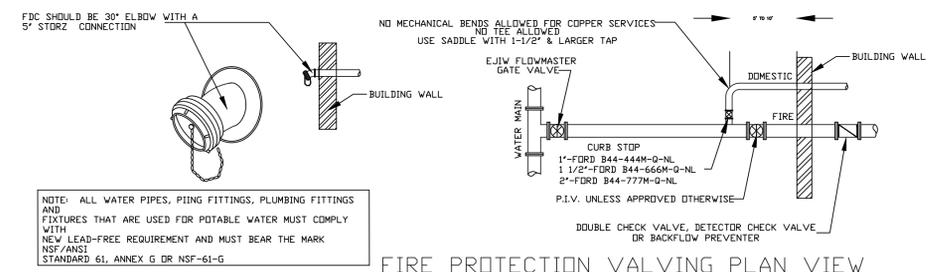
TYPE-1 TRENCH CROSS SECTION

ALL WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CEMENT LINED



TYPICAL WATER SERVICE CROSS SECTION

* X = SIZE (4, 6, 7) FOR 1", 1-1/2" AND 2"



- NOTE: ALL WATER PIPES, PIPING FITTINGS, PLUMBING FITTINGS AND FIXTURES THAT ARE USED FOR POTABLE WATER MUST COMPLY WITH NEW LEAD-FREE REQUIREMENT AND MUST BEAR THE MARK NSF-61 (ANSI STANDARD 61, ANNEX G OR NSF-61-G)

FIRE PROTECTION VALVING PLAN VIEW



Meridian Charter Township
Ingham County, Michigan
Watermain

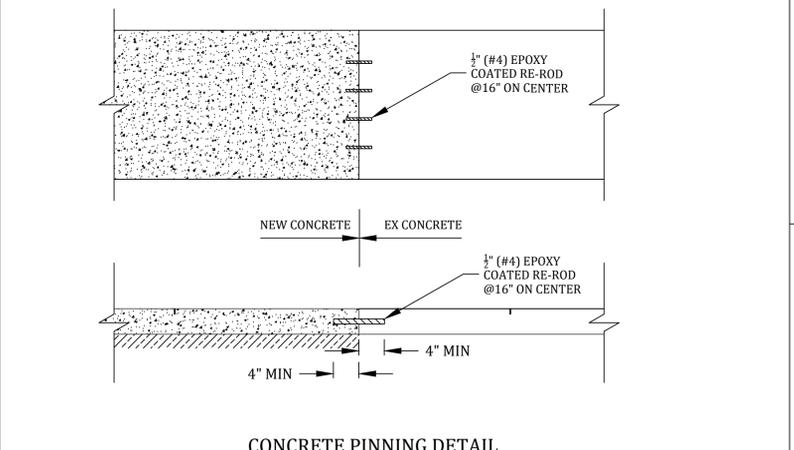
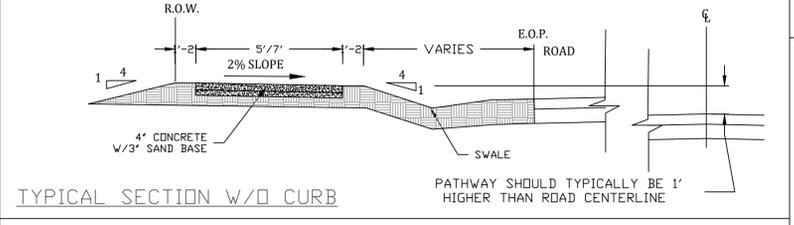
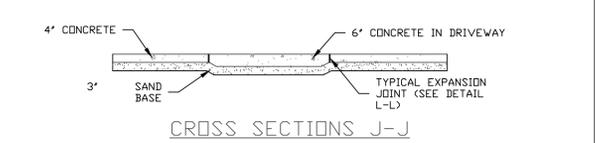
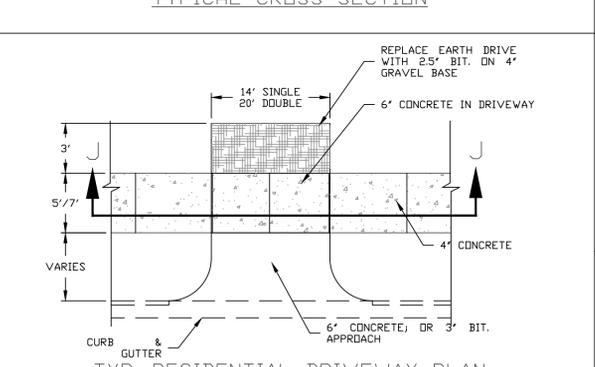
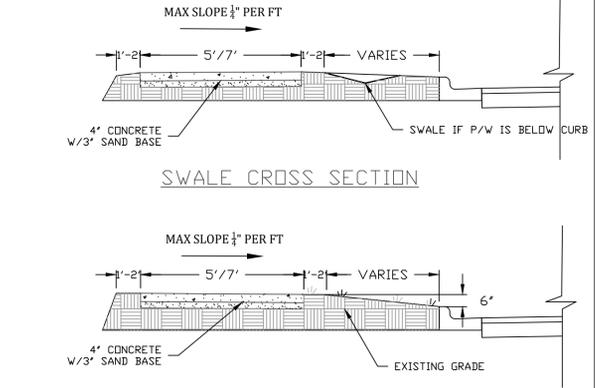
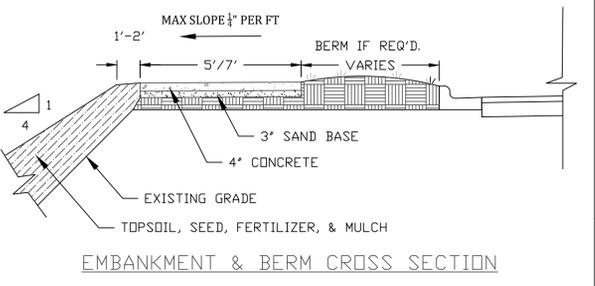
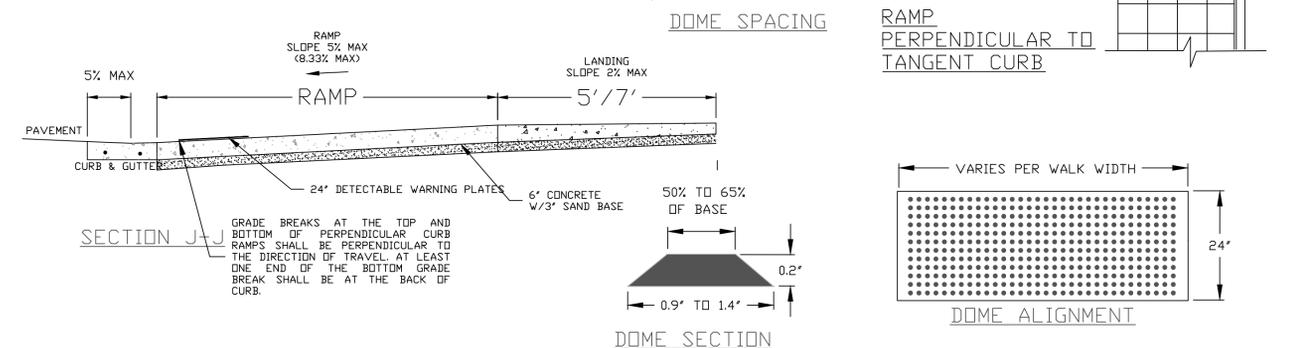
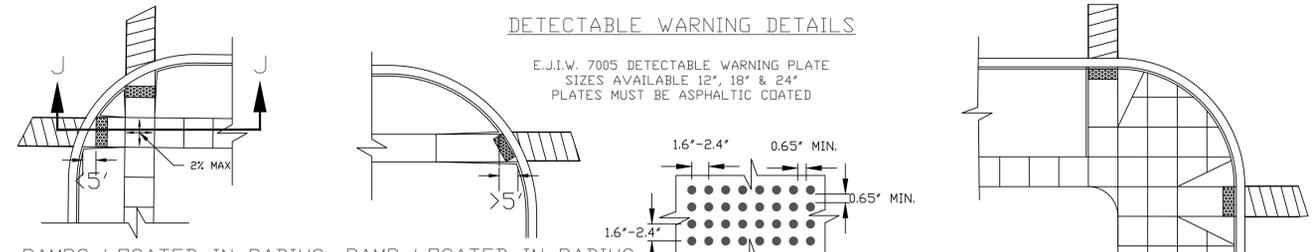
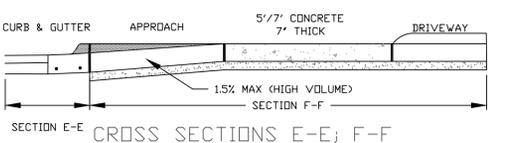
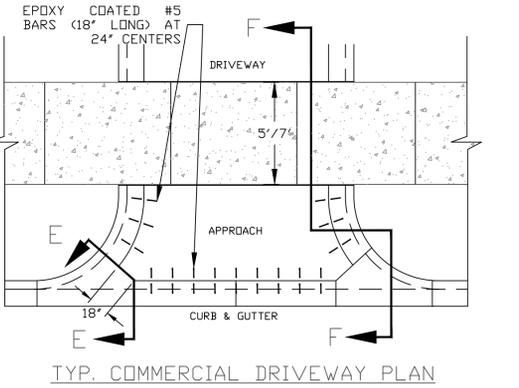
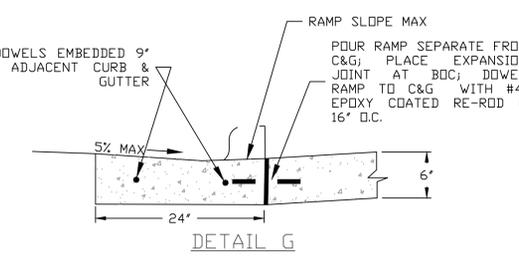
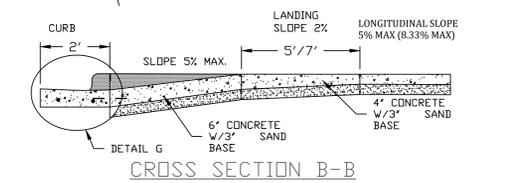
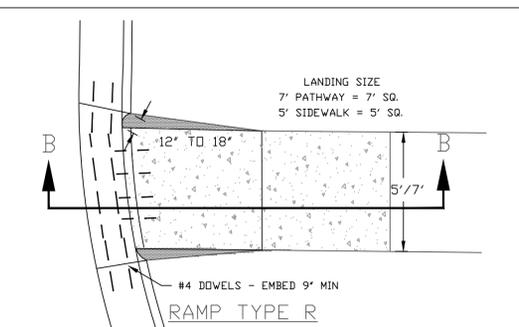
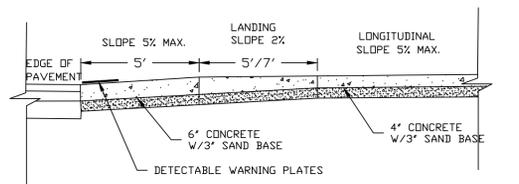
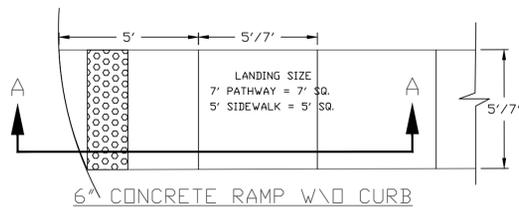
Timberlane and Roseland Watermain - 2026
SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP,
INGHAM COUNTY, MICHIGAN

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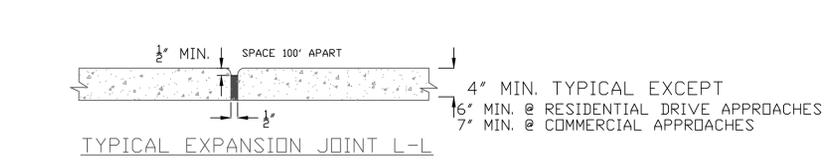
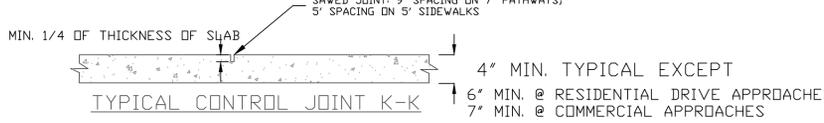
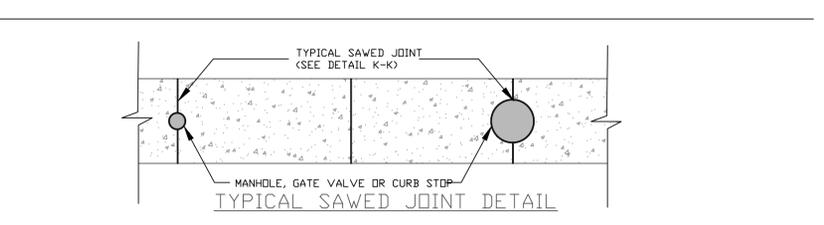
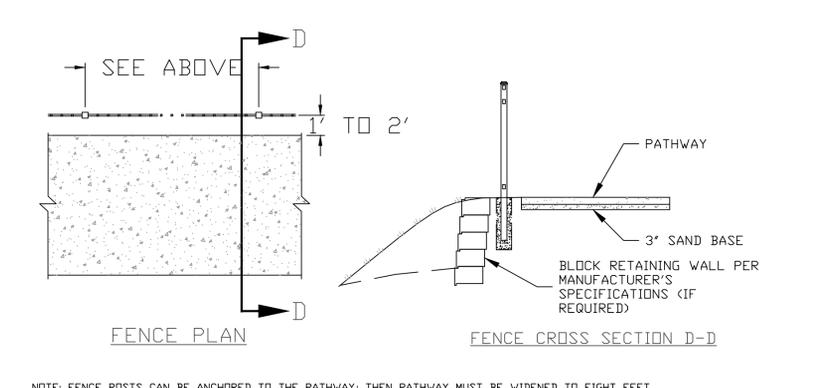
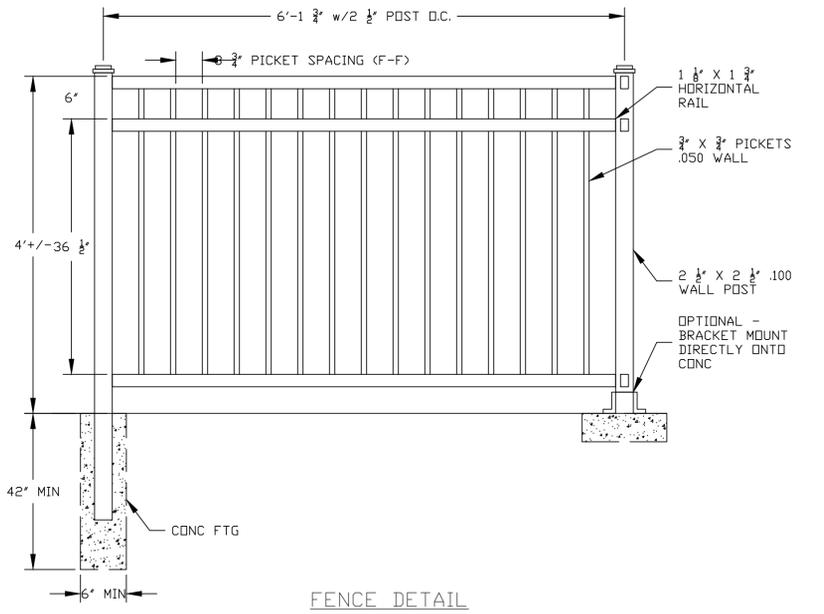
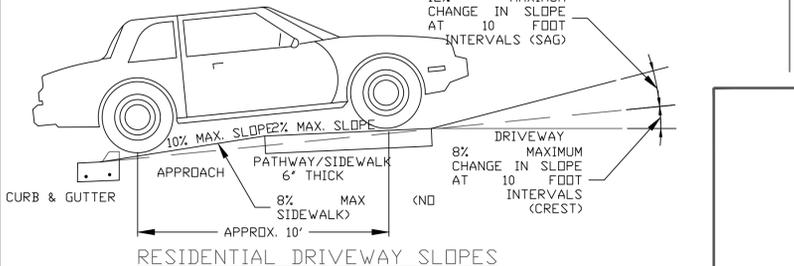
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REVISIONS:		
DATE	BY:	COMMENTS:

SHEET:
7 - Water Standard Details



- GENERAL NOTES
1. SIDEWALKS/PATHWAYS SHALL BE 4" THICK CONCRETE EXCEPT AT DRIVEWAYS.
 2. SIDEWALKS/PATHWAYS THRU DRIVES SHALL BE: 6" (RESIDENTIAL); 7" (MULTI-RESIDENTIAL & COMMERCIAL)
 3. 3" OF COMPACTED SAND BASE SHALL BE PLACED UNDER ALL SIDEWALKS/PATHWAYS.
 4. ALL BITUMINOUS APRONS SHALL BE 2 1/2" THICK, UNLESS NOTED OTHERWISE
 5. PROPERTY IRONS SHALL BE MAINTAINED BY THE CONTRACTOR.
 6. ALL EXISTING CONCRETE AND BITUMINOUS TO BE REMOVED SHALL BE SAWCUT. ALL CONCRETE AND BITUMINOUS REMOVAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
 7. ALL AGGREGATE BASE SHALL BE 22A, 4" THICK.
 8. ALL TREE AND BUSH REMOVAL SHALL BE CONSIDERED PART OF SUB-GRADE PREPARATION.
 9. LOCATION OF NEW PLANT MATERIAL SHALL BE AS DIRECTED BY THE ENGINEER, AND SHALL BE INSTALLED IN ACCORDANCE WITH GUIDELINES ESTABLISHED BY THE A.A.D.N.
 10. ALL PLANT MATERIAL NOT MARKED FOR REMOVAL SHALL BE PROTECTED.
 11. BITUMINOUS DRIVES SHALL BE SAWCUT 18" ON EITHER SIDE OF PROPOSED PATHWAY.



Meridian Charter Township Ingham County, Michigan Watermain		REVISIONS:	
		DATE	BY: COMMENTS:
Timberlane and Roseland Watermain - 2026 SECTION 17, T4N, R1W, MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN		SHEET: 8 - Pathway and Sidewalk	
		Standard Details	
DRAWN BY: TH	CHECKED BY: Y1		