Village of Lake Orion,
Oakland County, Michigan
CONSTRUCTION DOCUMENTS

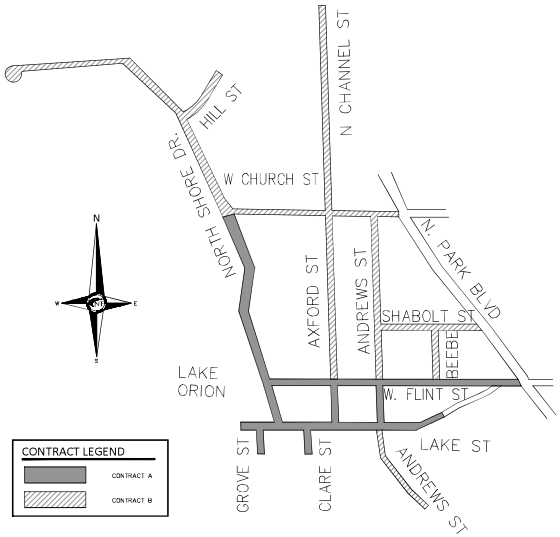
NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE, SUITE 200
SHELBY TWP., MI 48317
TEL (844) 416-3364
WWW.NFE-ENGR.COM

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LOCATION MAP

NOT TO SCALE

Project Name

2026 Lake Orion Street Improvement Program

APPROVALS	ADDRESS AND PHONE #:	APROVAL DATE	PERMIT #

REVISIONS:
07-07-08 ISSUED FOR CD REVIEW

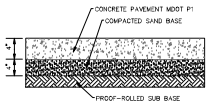
Know what's below Call before you dig. 811

N & F JOB P230

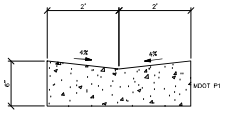
NF ENGINEERS
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LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL (844) 416-3364
FAX (248) 332-8257
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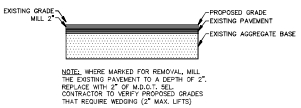
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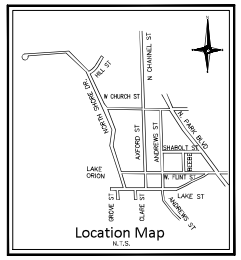
4" CONCRETE SIDEWALK SECTION
N.T.S.



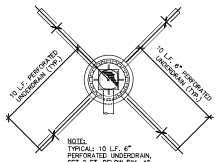
CONCRETE VALLEY GUTTER
N.T.S.



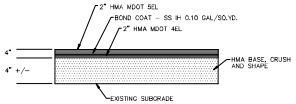
MILLING DETAIL
N.T.S.



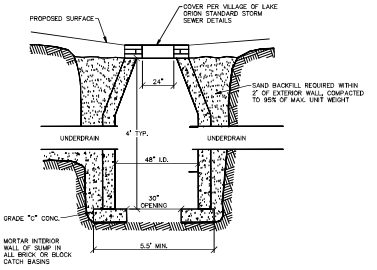
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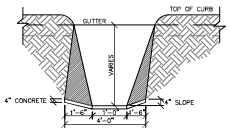
UNDERDRAIN DETAIL
N.T.S.



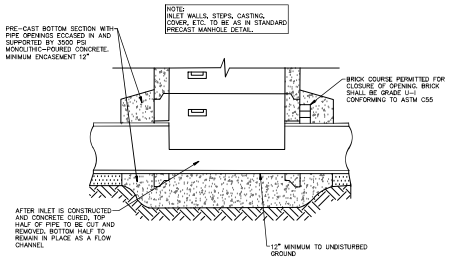
TYPICAL ASPHALT OVERLAY SECTION (CRUSH & SHAPE)
(RESURFACING)



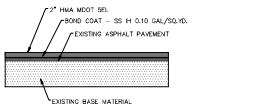
LEACHING BASIN
N.T.S.



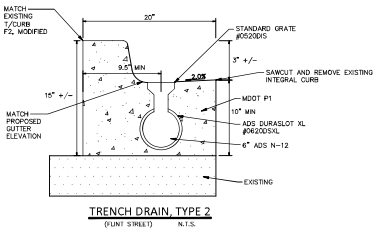
CONCRETE SPILLWAY DETAIL
N.T.S.



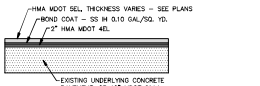
STORM INLET CONSTRUCTED OVER EXISTING SEWER
N.T.S.



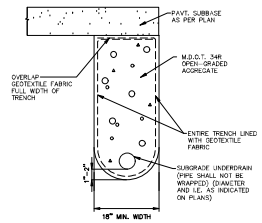
TYPICAL ASPHALT OVERLAY SECTION
(RESURFACING)
(CLARE STREET, AXFORD & ANDREWS between LAKE AND FLINT)



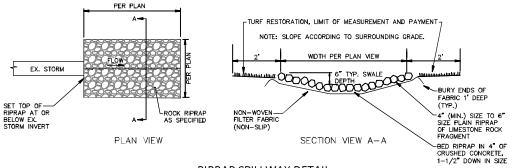
TRENCH DRAIN, TYPE 2
(FLINT STREET) N.T.S.



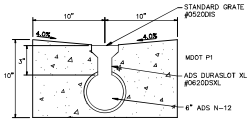
ASPHALT PAVEMENT SECTION (REMOVE & REPLACE)
(FLINT STREET)



UNDERDRAIN, SUBGRADE, OPEN-GRADED, 6 INCH
N.T.S.



RIPRAP SPILLWAY DETAIL
(N.T.S.)



TRENCH DRAIN, TYPE 1
N.T.S.

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Project Details

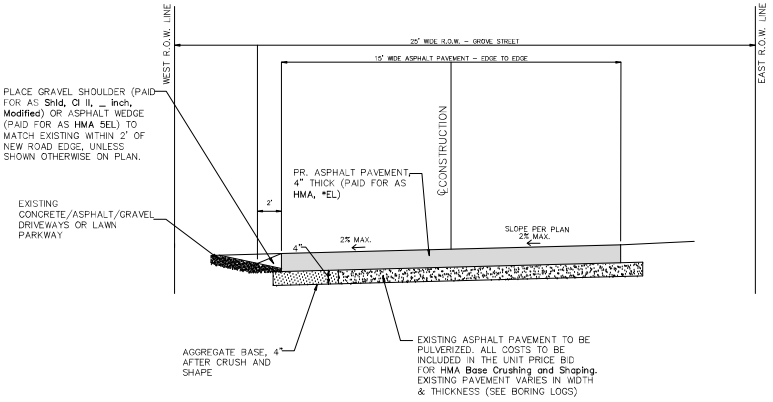
811 Know what's below Call before you dig.

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: N.T.S.

NFE JOB NO. P230
SHEET NO. 2

W:\E&SDocs\2026 Jobs\P230-1 (Lk Orion Streets Local Street)\PlotsConstruction Documents\P230_CDN.dwg, 12/7/2026 7:47:45 PM, AutoCAD PDF (Full) Quality Printing.ctb

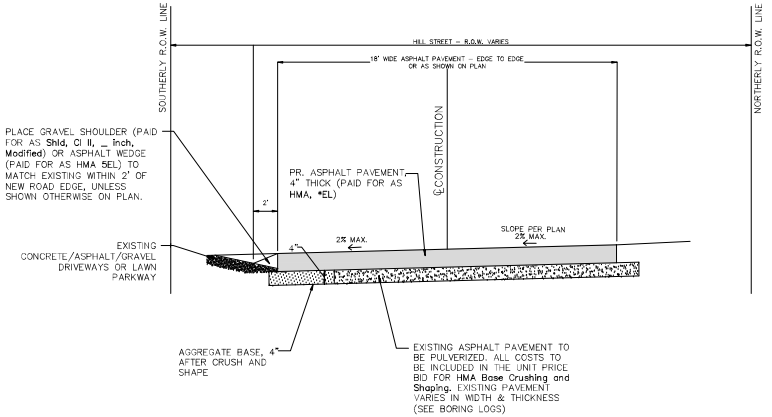


CRUSHING AND SHAPING 15' WIDE CROSS-SECTION

N.T.S.

(GROVE STREET)

CONTRACT A

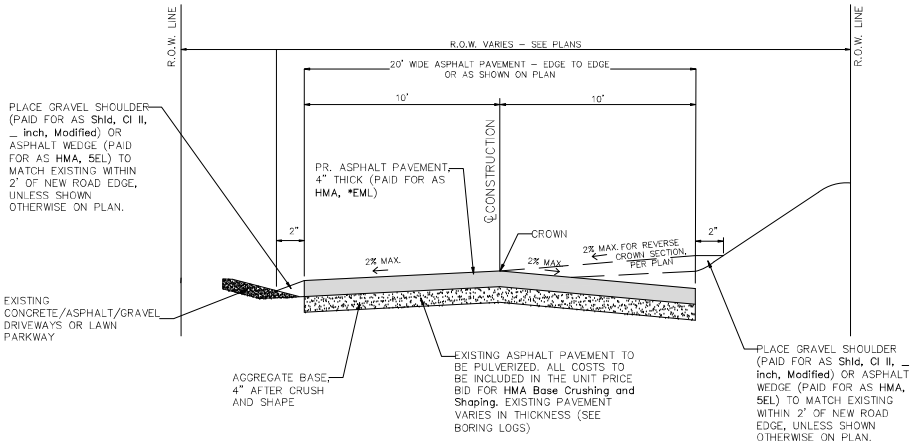


CRUSHING AND SHAPING 18' WIDE CROSS-SECTION

N.T.S.

(HILL STREET)

CONTRACT B

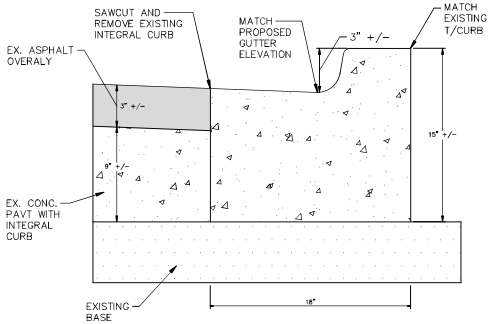


CRUSHING AND SHAPING 20' WIDE CROSS-SECTION

N.T.S.

CONTRACT A

AND CONTRACT B



CURB AND GUTTER, CONC, DET F2, MODIFIED

N.T.S.

CONTRACT A

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CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Project Cross Sections (1 of 2)

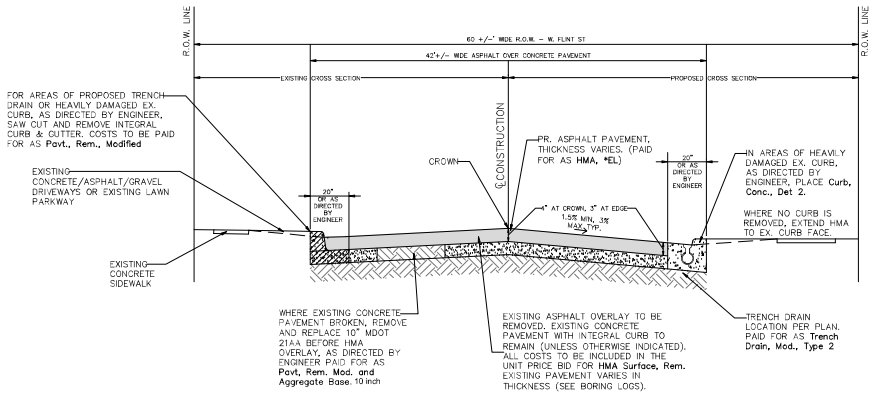
Know what's below Call before you dig.

DATE ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: N.T.S.

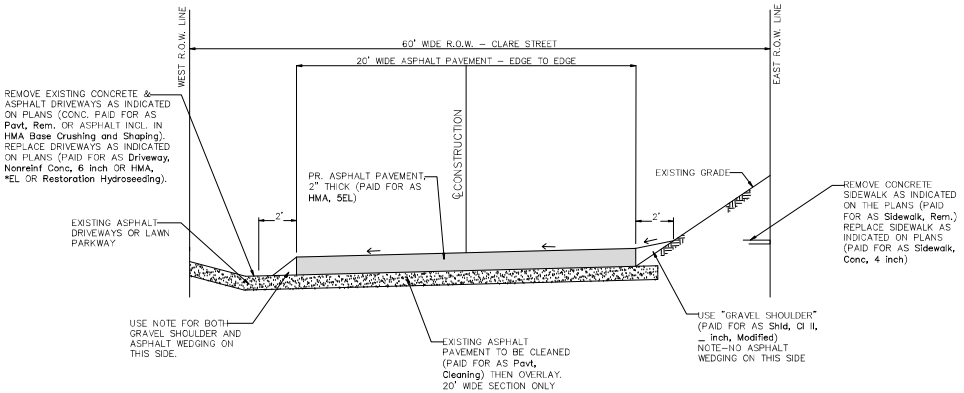
NFE JOB NO. P230
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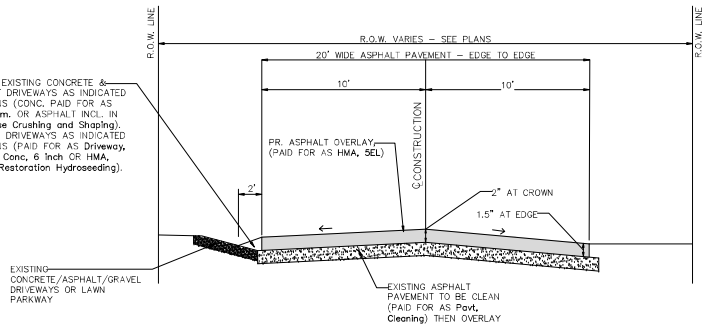
REMOVE & REPLACE CROSS-SECTION (W. FLINT ST)

N.T.S.
CONTRACT A



OVERLAY 20' WIDE CROSS-SECTION

N.T.S.
(CLARE STREET)
CONTRACT A



OVERLAY 20' WIDE CROSS-SECTION

N.T.S.
(AXFORD STREET AND ANDREWS STREET BETWEEN LAKE STREET AND FLINT STREET)
CONTRACT A

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CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
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PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
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SHEET
Project Cross Sections (2 of 2)

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DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: N.T.S.

NFE JOB NO. P230
SHEET NO. 3a

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MISCELLANEOUS QUANTITIES - CONTRACT A

DESCRIPTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
1507001	_ Mobilization, 5% Max	1	Lsum
8507060	_ Reimoursed Permit Fees	1	Dlr
8507051	_ Audio-Visual Record of the Construction Area	1	Lsum
8167011	_ Surface Restoration	1	Lsum
8127051	_ Traffic Control and Maintenance	1	Lsum
8027036	_ Curb and Gutter, Conc, Det F2, Modified (ESTIMATED ADDITONAL UNDER FLINT STREET EX. ASPH)	50	Ft
2060043	Subgrade Undercutting, Type IV, 21AA	82	Cyd
2017011	_ Pavt, Rem, Modified (ESTIMATED ADDITIONAL UNDER FLINT ST EX. ASPH)	100	Syd
3050010	Material Surplus and Unsuitable, Rem, LM	32	Cyd
3020026	Aggregate Base, 10 inch	100	Syd

MISCELLANEOUS QUANTITIES - CONTRACT B

DESCRIPTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
1507001	_ Mobilization, 5% Max	1	Lsum
8507060	_ Reimoursed Permit Fees	1	Dlr
8507051	_ Audio-Visual Record of the Construction Area	1	Lsum
8167011	_ Surface Restoration	1	Lsum
8127051	_ Traffic Control and Maintenance	1	Lsum
2250043	Subgrade Undercutting, Type IV, 21AA	82	Cyd
3050010	Material Surplus and Unsuitable, Rem, LM	88	Cyd

GENERAL PLAN NOTES

PROPERTY OWNERS
LINES DISPLAYING PROPERTY OWNERS LIMITS SHOWN ON THE PLANS ARE FOR INFORMATION ONLY, AND THEIR ACCURACY IS NOT GUARANTEED.

LANDSCAPING
OWNERS OF EXISTING LANDSCAPING WITHIN THE PROJECT AREA SHALL BE NOTIFIED TWO WEEKS IN ADVANCE OF ANY WORK TO BE DONE THAT WILL AFFECT THE LANDSCAPING. 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 PROPERTY OWNER'S PROPERTY FOR THE PROPERTY OWNER. ANY OTHER MODIFICATION TO THE LANDSCAPING IS THE RESPONSIBILITY OF THE OWNER AND NOT PART OF THIS CONTRACT.

PRIVATE LAWN IRRIGATION SYSTEMS
THE CONTRACTOR IS ADVISED THAT SOME PROPERTIES MAY CONTAIN LAWN IRRIGATION SYSTEMS BETWEEN THE EDGE OF STREET PAVEMENT AND THE RIGHT OF WAY LINE. PROPERTY OWNERS WILL BE NOTIFIED AT LEAST TWO WEEKS IN ADVANCE OF ANY WORK ON THE PROJECT AND REQUESTED TO RELOCATE ANY IRRIGATION SYSTEM TO AREAS OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.

IF THE PROPERTY OWNER FAILS TO RELOCATE ANY IRRIGATION SYSTEM LOCATED IN THE PUBLIC RIGHT-OF-WAY, THE CONTRACTOR WILL NOT BE HELD RESPONSIBLE FOR ANY DAMAGE TO SUCH SYSTEM. IF THE CONTRACTOR CUTS THE SYSTEM DURING CONSTRUCTION, CONTRACTOR SHALL CAP THE SYSTEM PIPE AND WITNESS THE LOCATION OF THE CAP WITH A WOODEN STAKE FOR THE PROPERTY OWNER'S USE AND PLACE ANY SALVAGED SPRINKLER HEADS ON THE PROPERTY OWNER'S PROPERTY. CAPPING AND MARKING SHALL BE INCIDENTAL TO THE WORK, AND AT NO ADDITIONAL COST TO THE VILLAGE.

MONUMENT BOXES AND WATER SERVICE VALVE BOXES
ALL GOVERNMENT CORNERS ON THIS PROJECT SHALL BE PRESERVED, WHETHER SHOWN OR NOT. IT MAY BE NECESSARY TO PLACE OR ADJUST MONUMENT BOXES AND WATER SERVICE VALVE BOXES, INCIDENTAL TO CONSTRUCTION.

SIDEWALK AND CURB RAMP GRADES
ALL SIDEWALK AND CURB RAMP GRADES SHALL BE "FORMED-UP" BY THE CONTRACTOR ACCORDING TO CURRENT MDOT STANDARD PLAN R-28 SERIES AND AS SHOWN ON THE PLANS.

SUBGRADE UNDERCUTTING
ESTIMATED QUANTITIES FOR EXCAVATION AND DISPOSAL OF UNSUITABLE SUBGRADE SOIL(S) HAVE BEEN PROVIDED AND ARE TO BE USED THROUGHOUT THE PROJECT, IF NECESSARY, AS DIRECTED BY THE ON-SITE ENGINEER.

AGGREGATE BASE
ALL AGGREGATE BASES SHALL BE 21AA AGGREGATE UNLESS OTHERWISE SPECIFIED.

DRAINAGE STRUCTURE COVERS
ALL DRAINAGE STRUCTURE COVERS OWNED BY THE VILLAGE OF LAKE ORION, WHICH REQUIRE REPLACEMENT AS PART OF THIS PROJECT, SHALL BE VILLAGE OF LAKE ORION STANDARD COVERS IN LIEU OF MDOT STANDARD PLAN COVERS. UNLESS OTHERWISE NOTED ON THE PLANS, OR SPECIFICALLY DIRECTED BY THE PROJECT ENGINEER, ALL NEW STRUCTURE FRAMES AND COVERS SHALL BE AS SPECIFIED IN THE VILLAGE OF LAKE ORION STANDARD DETAILS.

PAVEMENT REMOVAL QUANTITIES
PAVEMENT REMOVAL AS SHOWN ON THE PLANS WILL BE AT THE DISCRETION OF THE ON-SITE ENGINEER. IF IN HIS/HER JUDGMENT, AREAS OF PAVEMENT NEED TO BE ADDED TO PROVIDE PROPER TRANSITIONS TO THE MAINLINE SLAB, CHANGES WILL BE PAID ACCORDING TO THE UNIT PRICE FOR Pavt, Rem, OR Pavt, Rem, Modified.

CONCRETE TIES AND JOINTS
THE USE OF HOOK BOLTS IN LIEU OF EPOXY ANCHORED LANE TIES SHALL NOT BE PERMITTED ON THIS PROJECT.

SOIL BORINGS AND/OR PAVEMENT CORES
THE SOIL BORING LOGS AND/OR PAVEMENT CORES REPRESENT POINT INFORMATION. NO INFERENCE SHOULD BE MADE THAT SUBSURFACE OR PAVEMENT CONDITIONS ARE THE SAME AT OTHER LOCATIONS THROUGHOUT THE PROJECT.

EARTH DISTURBANCE & RESTORATION LIMITS
THE EARTH DISTURBANCE LIMIT FOR THIS PROJECT WILL BE AS INDICATED ON THE PLANS.

APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTH-DISTURBING ACTIVITIES. PLACE TURF ESTABLISHMENT 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 OR MULCH BLANKET AS DIRECTED BY THE ENGINEER.

SIGNS
ALL SIGNS SHALL BE INSTALLED, REMOVED AND/OR SALVAGED ACCORDING TO THE CURRENT EDITION OF "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND THE CURRENT EDITION OF MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) "STANDARD SPECIFICATIONS FOR CONSTRUCTION."

ALL SIGNS ON THE PLANS OR IN THE LOG THAT DO NOT HAVE A RECOMMENDATION ARE TO BE RETAINED.

EXISTING SIGN RELOCATION
ANY PERMANENT SIGNS REQUIRING RELOCATION DUE TO CONTRACTOR OPERATIONS SHALL BE SALVAGED AND REINSTALLED BY THE CONTRACTOR. SIGNS AND POSTS DAMAGED DURING THE REMOVAL AND STORAGE OPERATIONS SHALL BE REPLACED WITH NEW SIGNS AND POSTS. THE COST OF THIS WORK SHALL BE BORNE BY THE CONTRACTOR.

EXISTING STREET SIGNS
ALL TRAFFIC STREET SIGNS SUCH AS "NO PARKING", "NO STANDING", ETC. DISTURBED DURING CONSTRUCTION SHALL BE TRANSFERRED FROM OLD STD. OR POLE TO NEW STD. OR POLE AT SAME LOCATION OR IN CLOSE PROXIMITY BY THE CONTRACTOR.

STRUCTURE CLEANING
ALL STRUCTURES WITHIN THE PROJECT AREA MUST BE CLEANED BY THE CONTRACTOR OF ALL CONSTRUCTION RELATED DEBRIS, INCLUDING SAND AND SILT GENERATED DURING THE CONSTRUCTION OPERATIONS.

LEGEND

EXISTING SANITARY SEWER
EXISTING WATER MAIN
EXISTING STORM SEWER
EXISTING BURIED CABLES
EXISTING GAS MAIN
EXISTING OVERHEAD LINES
PR. SANITARY SEWER
EX. WATER MAIN ABANDON
PROPOSED WATER MAIN
PR. WATER MAIN OPEN CUT
PR. WATER MAIN PIPE BURST
PR. WATER MAIN DIRECTIONAL DRILLED
PROPOSED STORM SEWER
PR. SAND BACKFILL
UTILITY CROSSING
PR. TOP OF CURB ELEVATION
PROPOSED GUTTER ELEVATION
PR. TOP OF WALK ELEVATION
PR. TOP OF PAVEMENT ELEV.
PROPOSED FINISH GRADE
PROPOSED CONTOUR
PROPOSED SWALE
PR. DRAINAGE DIRECTION
PROPOSID INLET FILTER
DRAINAGE AREA LIMITS
PROPOSED SILT FENCE
LIMITS OF SOIL DISRUPTION
EXISTING ELEVATION
EXISTING FENCE
EXISTING GUARD RAIL
CONSTRUCTION/TREE PROTECTION FENCING
EXISTING UTILITY TO BE REMOVED
EXISTING UTILITY TO BE ABANDONED
EXISTING WATER SHUTOFF
SECTION CORNER FOUND
FOUND IRON
EXISTING GAS VALVE & GAS LINE MARKER
EXISTING TRANSFORMER & IRRIGATION VALVE
EXISTING TREE
SIGN
LIGHT POLE
SOIL BORING LOCATION
INDICATES EXISTING TREE TO BE REMOVED

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Notes & Legend

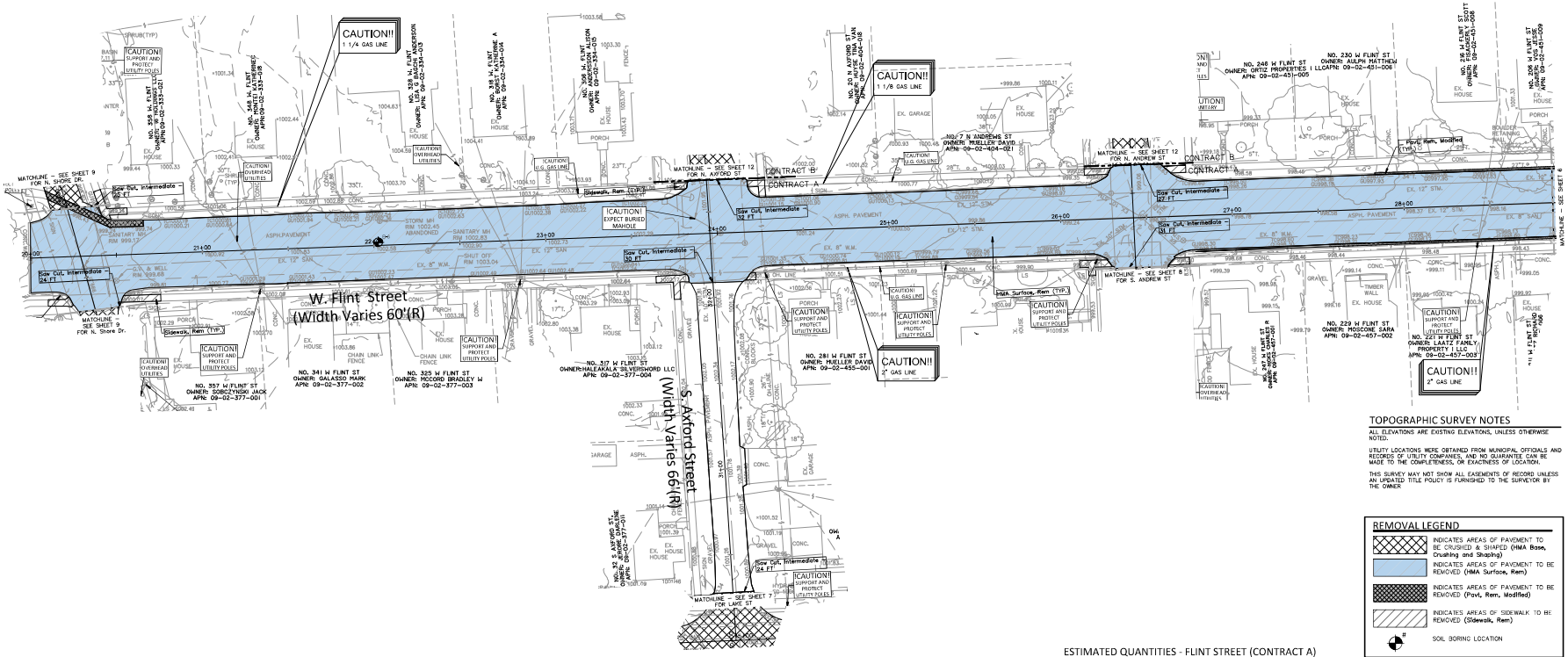
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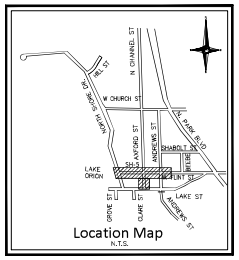
DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: N.T.S.

NFE JOB NO. P230
SHEET NO. 4

W:\E&S\2026\Jobs\P230-11\2026-11 Lake Orion Streets Local Street\Plan\Construction Documents\Plan\Cover.dwg, 12/10/2025 7:47:45 PM, AutoCAD PDF (High Quality Print).pc3





TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

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REMOVAL LEGEND

- INDICATES AREAS OF PAVEMENT TO BE CRUSHED & SHAPED (HMA Base, Crushing and Shaping)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (HMA Surface, Rem)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

ESTIMATED QUANTITIES - FLINT STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	Pavt, Rem, Modified	51	Syd
2040055	Sidewalk, Rem	70	Syd
5010005	HMA Surface, Rem	4151	Syd
6030090	Saw Cut, Intermediate	169	Ft

ESTIMATED QUANTITIES - S. AXFORD STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	4	Syd
5010003	Cold Milling HMA Surface	0	Syd
6030090	Saw Cut, Intermediate	24	Ft

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- 12" MAPLE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- INDICATES EXISTING TREE TO BE REMOVED

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
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WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - W. Flint & S. Axford (Contract A)

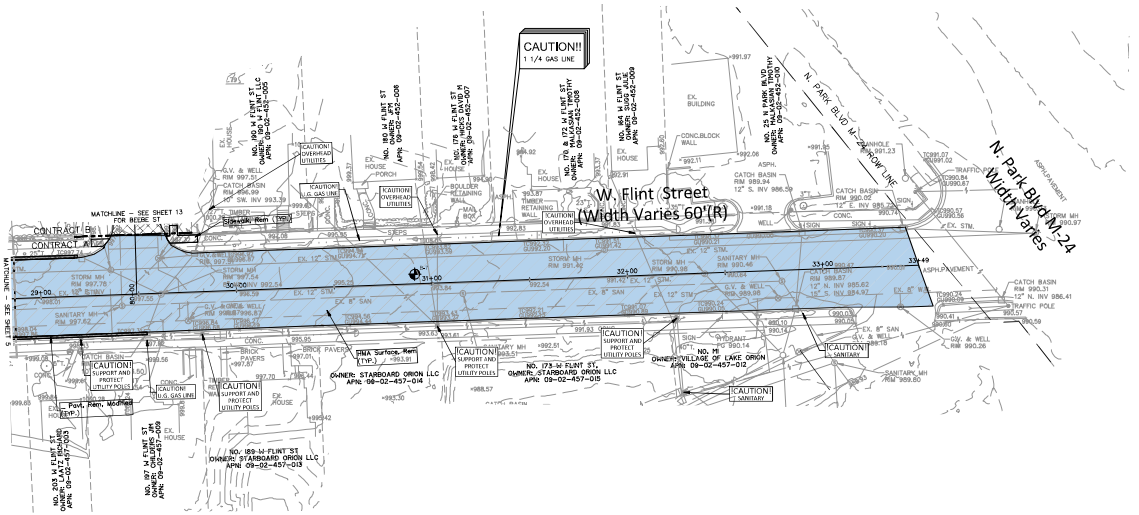
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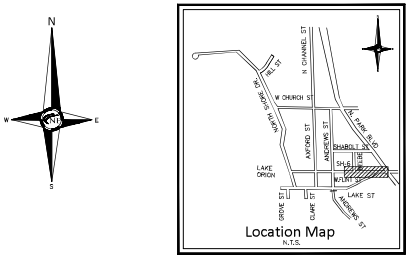
DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 5

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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - W. Flint (Contract A)

Know what's below Call before you dig.

DATE ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 6

TOPOGRAPHIC SURVEY NOTES

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REMOVAL LEGEND

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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pvmt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

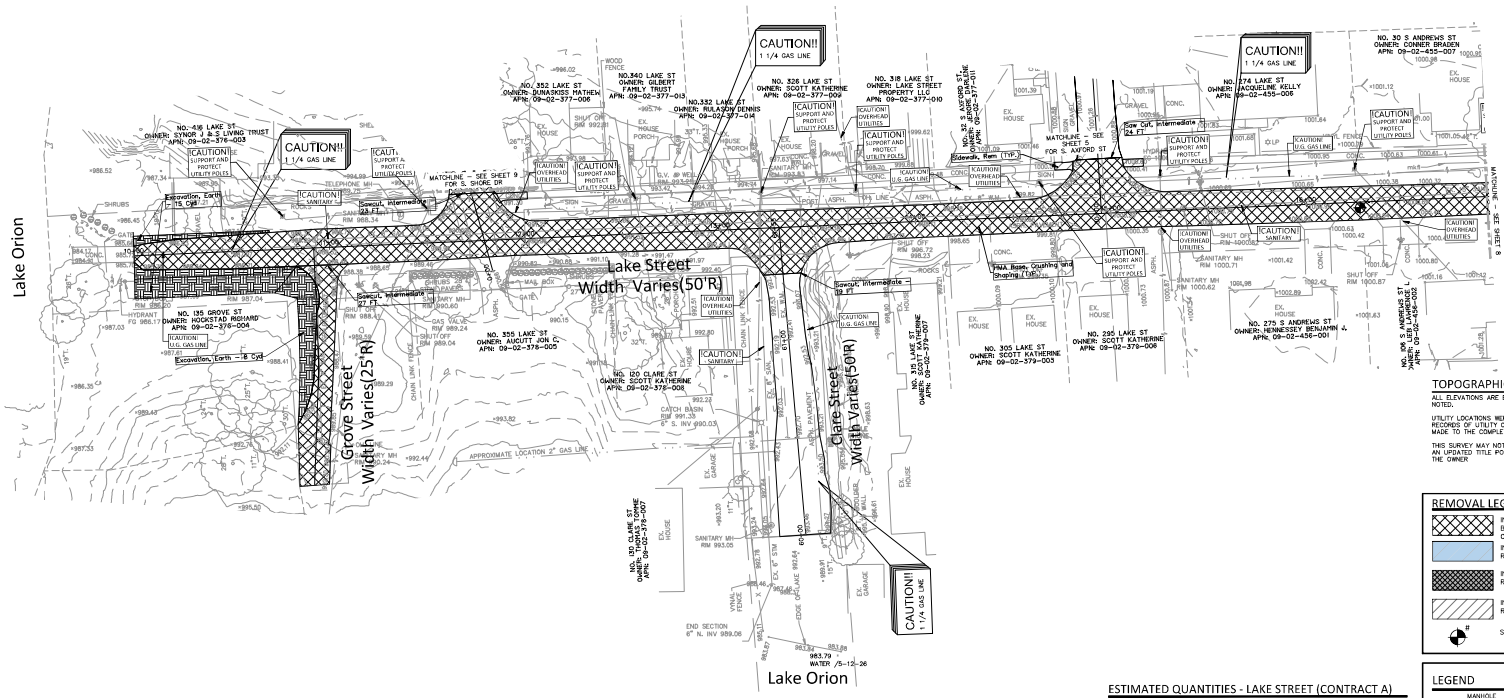
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- INDICATES EXISTING TREE TO BE REMOVED

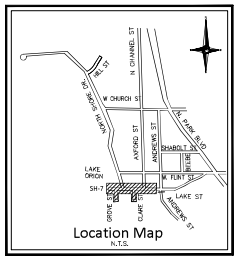
ESTIMATED QUANTITIES - W. FLINT STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	.. Pvmt, Rem, Modified	15	Syd
2040055	Sidewalk, Rem	10	Syd
5010005	HMA Surface, Rem	2077	Syd

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TOPOGRAPHIC SURVEY NOTES

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REMOVAL LEGEND

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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (HMA Surface, Rem)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- 12" MAPLE — INDICATES EXISTING TREE TO BE REMOVED

ESTIMATED QUANTITIES - LAKE STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	14	Syd
3050002	HMA Base Crushing and Shaping	1,511	Syd
6030090	Saw Cut, Intermediate	69	Ft
2050016	Excavation, Earth	15	Cyd

ESTIMATED QUANTITIES - GROVE STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	157	Syd
2050016	Excavation, Earth	8	Cyd

ESTIMATED QUANTITIES - CLARE STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
5010002	Cold Milling HMA Surface	0	Syd

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NOWAK & FRAUS ENGINEERS
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TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - Lake, Grove, & Clare (Contract A)

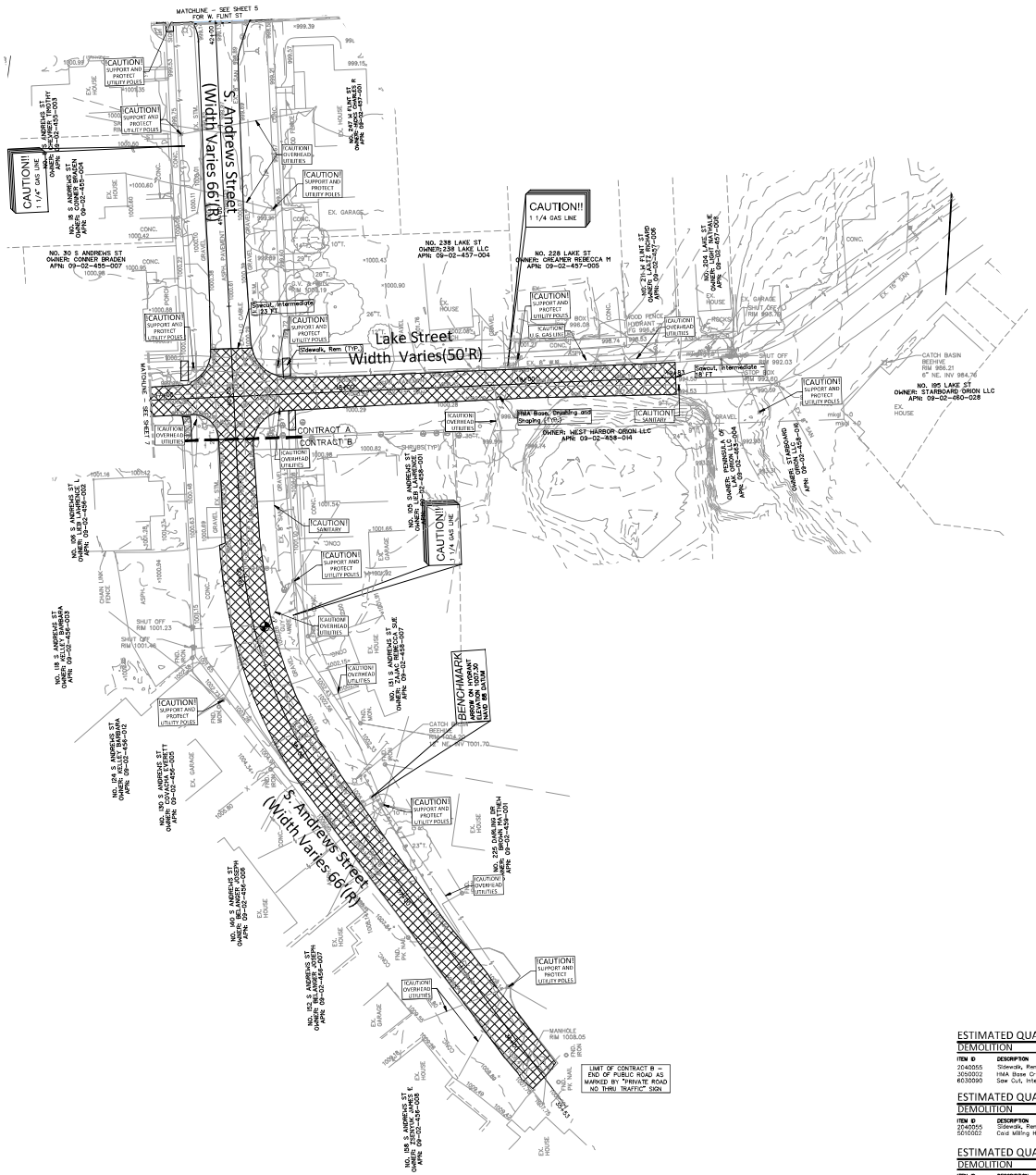
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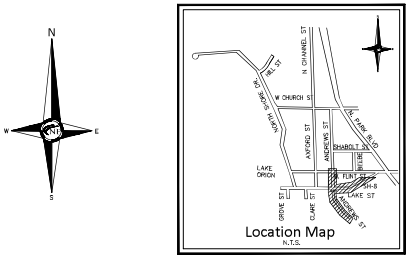
DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 00/00/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 7

W:\LOR\2026 Projects\P230 LO Lake Orion Streets.ide Cad\Office\Construction Documents\P230_QTMO.dwg, 2/27/2026 7:43:17 PM, AutoCAD PDF (High Quality Print).pc3





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LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - Lake St (Contract A) and Andrews St (Contract A & B)

Know what's below Call before you dig.

DATE ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 8

TOPOGRAPHIC SURVEY NOTES

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REMOVAL LEGEND

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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE GUY POLE
- GUY WIRE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
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- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- 12" MAPLE
- INDICATES EXISTING TREE TO BE REMOVED

ESTIMATED QUANTITIES - LAKE STREET (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	20	Syd
3050002	HMA Base Crushing and Shaping	654	Syd
4030090	Saw Cut, Intermediate	41	Ft

ESTIMATED QUANTITIES - S. ANDREWS STREET (CONTRACT A)

DEMOLITION

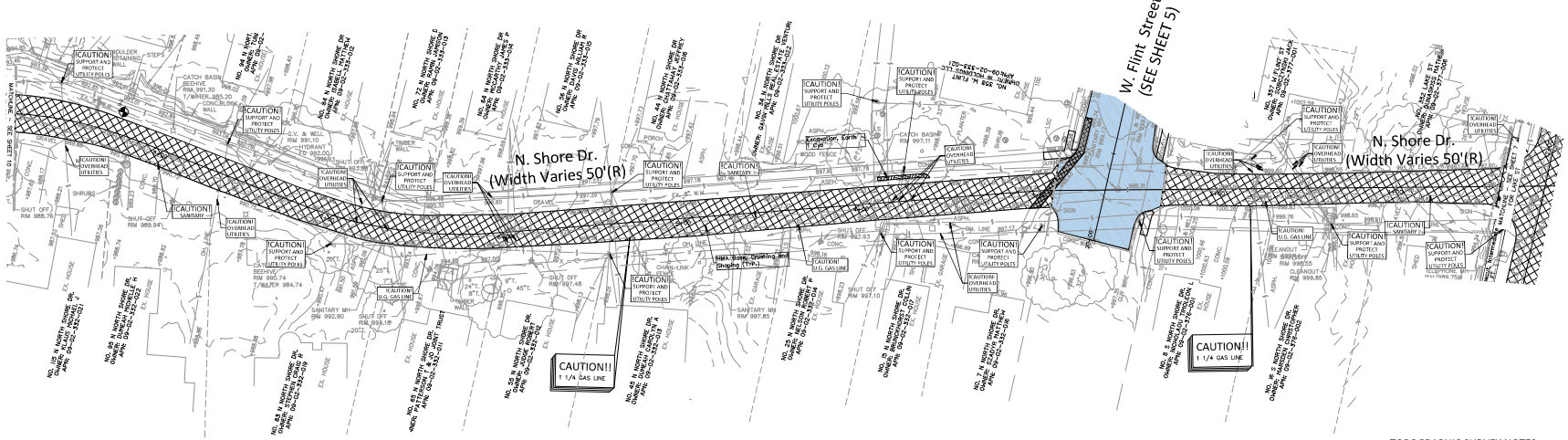
ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	2	Syd
5010002	Cold Milling HMA Surface	0	Syd

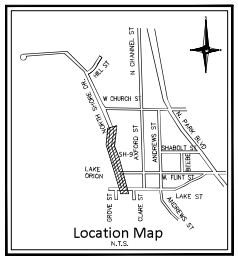
ESTIMATED QUANTITIES - S. ANDREWS STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	925	Syd

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TOPOGRAPHIC SURVEY NOTES

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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (HMA Surface, Rem)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- 12" MAPLE
- INDICATES EXISTING TREE TO BE REMOVED

ESTIMATED QUANTITIES - N. SHORE DRIVE (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	Pavt, Rem, Modified	8	Syd
2040055	Sidewalk, Rem	4	Syd
3060002	HMA Base Crushing and Shaping	1609	Syd
6030090	Sew Cut, Intermediate	17	Ft
2060016	Excavation, Earth	1	Cyd

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CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

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48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - N. Shore & S. Shore (Contract A)

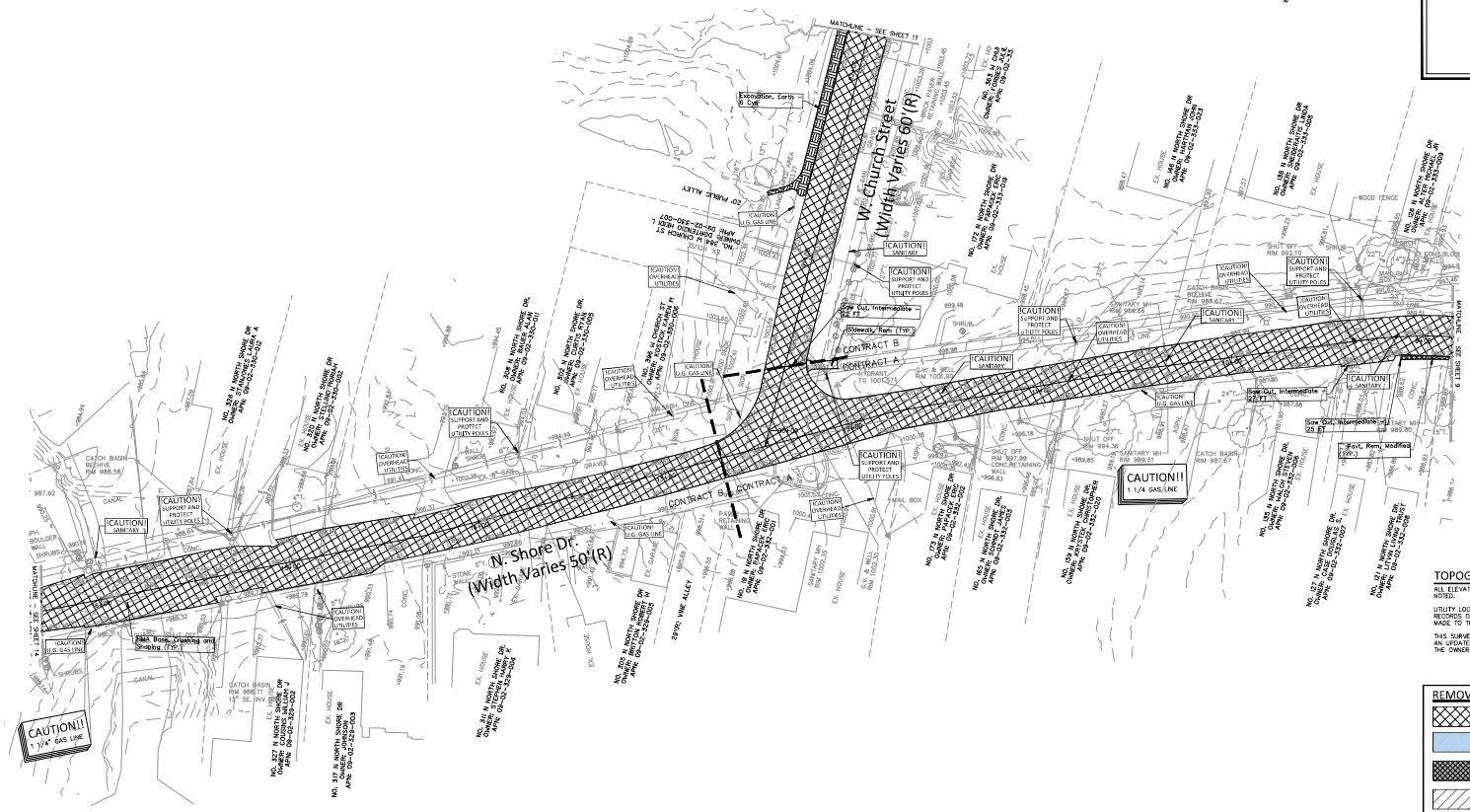
811 Know what's below Call before you dig.

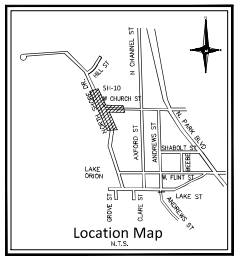
DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 9

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TOPOGRAPHIC SURVEY NOTES

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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- 12" MAPLE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
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- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- INDICATES EXISTING TREE TO BE REMOVED

ESTIMATED QUANTITIES - N. SHORE DRIVE (CONTRACT A)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	Pavt, Rem, Modified	5	Syd
2040055	Sidewalk, Rem	8	Syd
3050002	HMA Base Crushing and Shaping	970	Syd
6030090	Saw Cut, Intermediate	52	Ft

ESTIMATED QUANTITIES - N. SHORE DRIVE (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	915	Syd

ESTIMATED QUANTITIES - W. CHURCH STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	406	Syd
2050016	Excavation, Earth	6	Cyd

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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

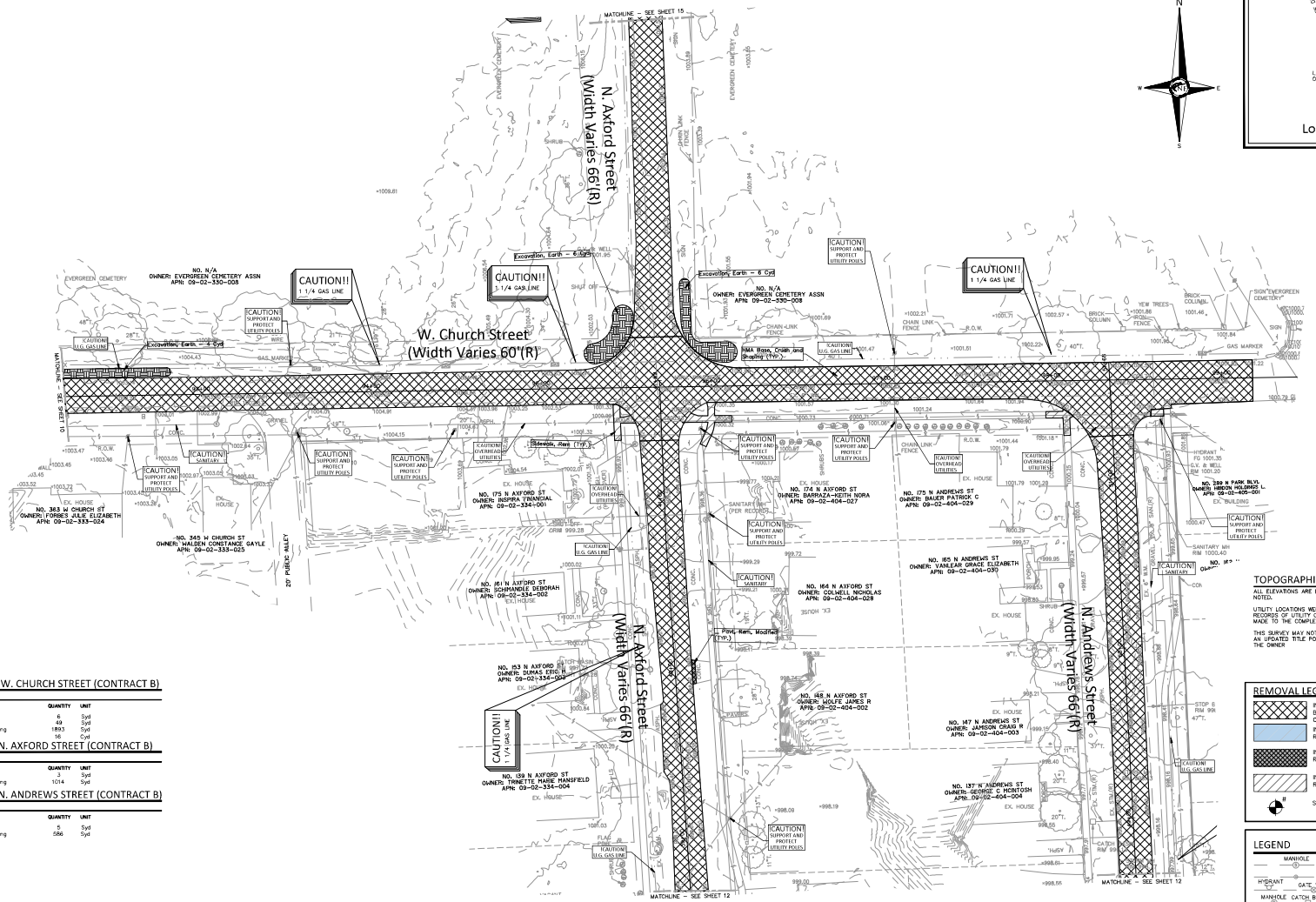
SHEET
Removal Plan - N. Shore & W. Church (Contract A&B)

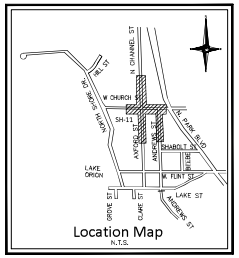
811 Know what's below Call before you dig.

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 10





ESTIMATED QUANTITIES - W. CHURCH STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	__ Pavt, Rem, Modified	6	Syd
2047055	Sidewalk, Rem	49	Syd
3050002	HMA Base Crushing and Shaping	1893	Syd
2050016	Excavation, Earth	16	Cyd

ESTIMATED QUANTITIES - N. AXFORD STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	__ Pavt, Rem, Modified	3	Syd
3050002	HMA Base Crushing and Shaping	1014	Syd

ESTIMATED QUANTITIES - N. ANDREWS STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	__ Pavt, Rem, Modified	5	Syd
3050002	HMA Base Crushing and Shaping	586	Syd

TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

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REMOVAL LEGEND

- INDICATES AREAS OF PAVEMENT TO BE CRUSHED & SHAPED (HMA Base, Crushing and Shaping)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (HMA Surface, Rem)
- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pavt, Rem, Modified)
- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- 12" MAPLE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- INDICATES EXISTING TREE TO BE REMOVED

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
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Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Removal Plan - W. Church, N. Axford, & N. Andrews (Contract B)

Know what's below Call before you dig.

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 11

ESTIMATED QUANTITIES - N. AXFORD STREET (CONTRACT B)

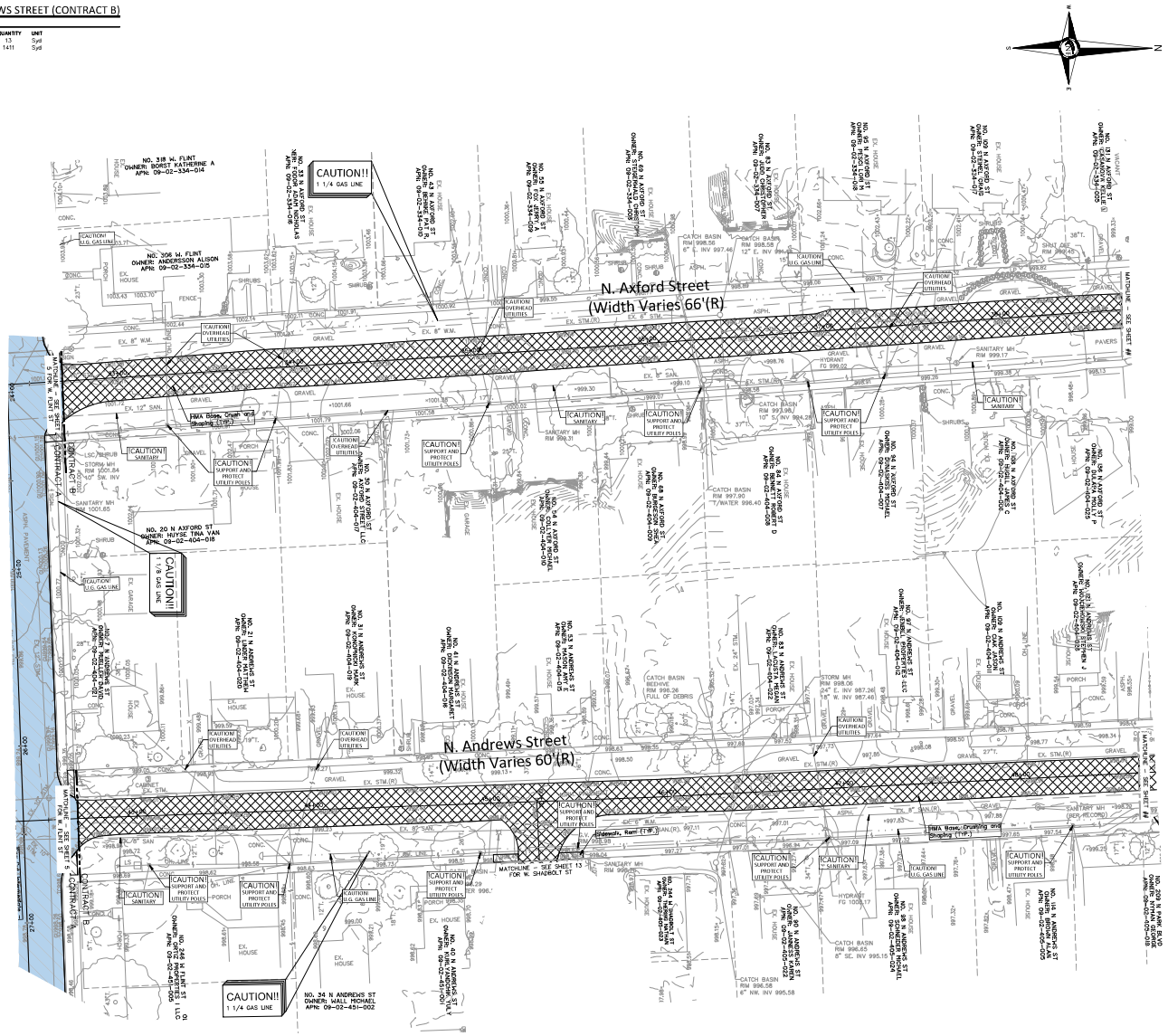
DEMOLITION

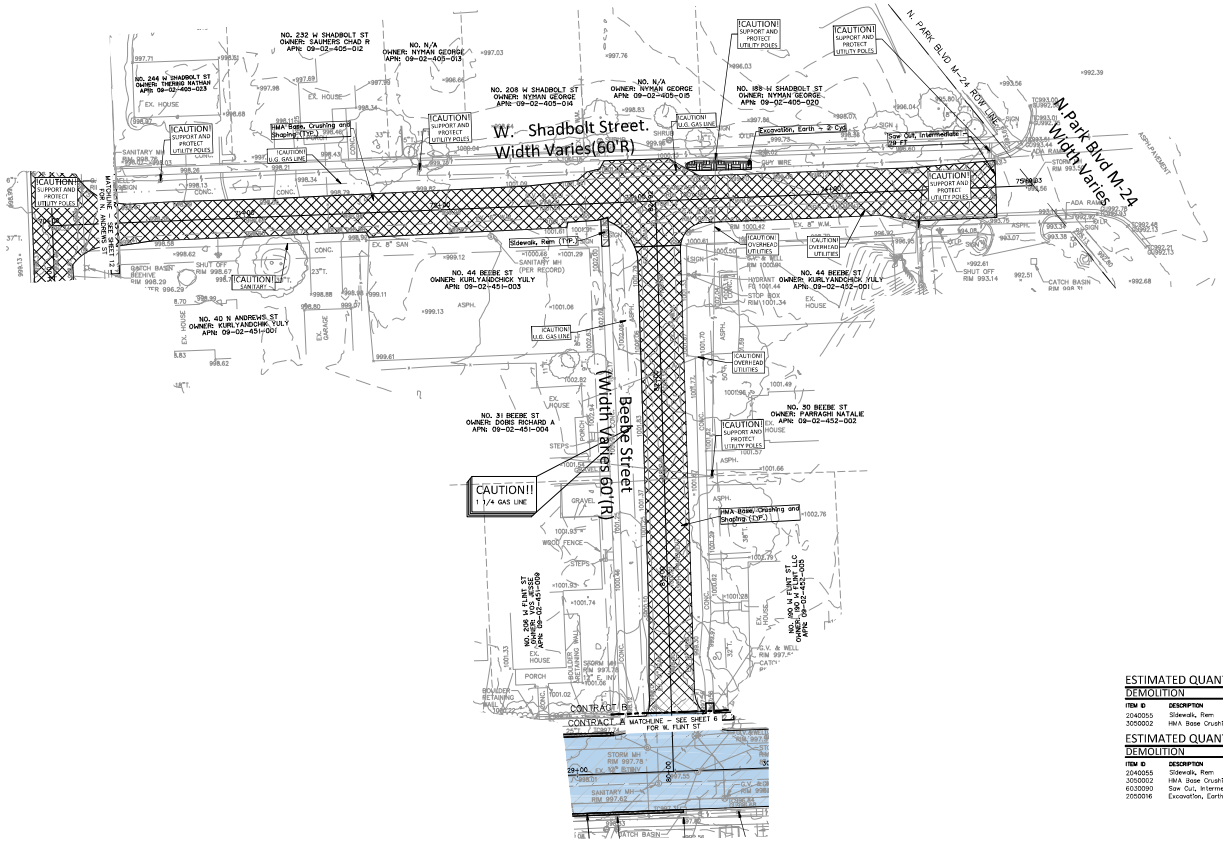
ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	1419	Syd

ESTIMATED QUANTITIES - N. ANDREWS STREET (CONTRACT B)

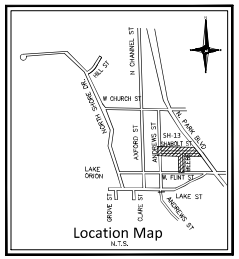
DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	13	Syd
3050002	HMA Base Crushing and Shaping	1411	Syd


N. Axford Street
(Width Varies 66'(R)
N. Andrews Street
(Width Varies 60'(R)
CAUTION!!
1 1/4 GAS LINE
CAUTION!
1 1/4 GAS LINE
CAUTION!!
1 1/4 GAS LINE
NO. 318 W. FLINT
OWNER: BORST KATHERINE A
APN: 09-02-334-014
NO. 306 W. FLINT
OWNER: ANDERSON ALISON
APN: 09-02-334-015
NO. 43 N AXFORD ST
OWNER: FOOR-CORTRIGHT JOAN
APN: 09-02-334-016
NO. 43 N AXFORD ST
OWNER: CLIFFORD JOHN CHRISTOPHER
APN: 09-02-334-010
NO. 35 N AXFORD ST
OWNER: SCHMIDT ROBERT
APN: 09-02-334-009
NO. 69 N AXFORD ST
OWNER: STEARNS-HALD CHRISTINE
APN: 09-02-326-003
NO. 83 N AXFORD ST
OWNER: CLIFFORD JOHN CHRISTOPHER
APN: 09-02-326-010
NO. 109 N AXFORD ST
OWNER: BOSCH LORI N
APN: 09-02-326-007
NO. 125 N AXFORD ST
OWNER: MCCLAIN ROBERT
APN: 09-02-326-004
NO. 20 N AXFORD ST
OWNER: HUYSE TINA VAN
APN: 09-02-404-018
NO. 30 N AXFORD ST
OWNER: 30 N AXFORD LLC
APN: 09-02-404-017
NO. 54 N AXFORD ST
OWNER: CLIFFORD JOHN
APN: 09-02-404-009
NO. 68 N AXFORD ST
OWNER: SPENCER-BENNETT ROBERT D
APN: 09-02-404-008
NO. 94 N AXFORD ST
OWNER: SPARKS MICHAEL
APN: 09-02-404-007
NO. 108 N AXFORD ST
OWNER: [illegible]
APN: 09-02-404-006
NO. 124 N AXFORD ST
OWNER: [illegible]
APN: 09-02-404-005
NO. 21 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-404-020
NO. 41 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-404-019
NO. 53 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-404-015
NO. 83 N ANDREWS ST
OWNER: LAUSCH MEGAN
APN: 09-02-404-011
NO. 101 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-404-010
NO. 121 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-404-009
NO. 34 N ANDREWS ST
OWNER: WALL MICHAEL
APN: 09-02-451-002
NO. 40 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-451-001
NO. 60 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-451-002
NO. 80 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-451-003
NO. 100 N ANDREWS ST
OWNER: [illegible]
APN: 09-02-451-004
NO.







ESTIMATED QUANTITIES - BEEBE STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	2	Syd
3050002	HMA Base Crushing and Shaping	590	Syd

ESTIMATED QUANTITIES - W. SHADBOLT STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2040055	Sidewalk, Rem	8	Syd
3050002	HMA Base Crushing and Shaping	1212	Syd
6030090	Saw Cut, Intermediate	29	Yd
2050016	Excavation, Earth	2	Cyd

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- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, GATE VALVE — EXISTING SAN. CLEAN OUT
- MANHOLE, CATCH BASIN — EXISTING WATER MAIN
- EXISTING STORM SEWER
- EX. R, Y, CATCH BASIN
- UTILITY POLE, GUY POLE, GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- 12" MAPLE — INDICATES EXISTING TREE TO BE REMOVED

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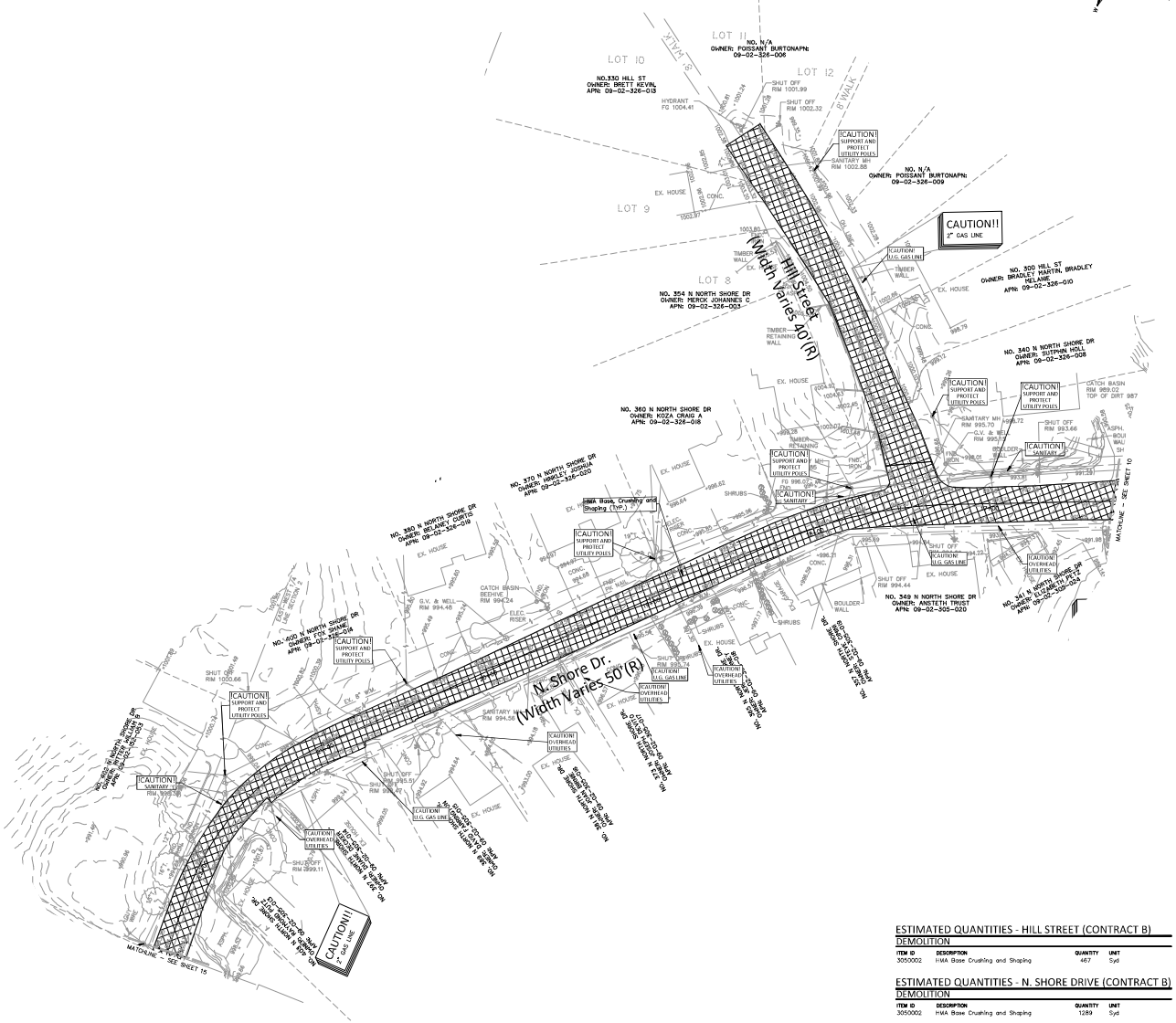
SHEET
Removal Plan - Shadbolt & Beebe (Contract B)

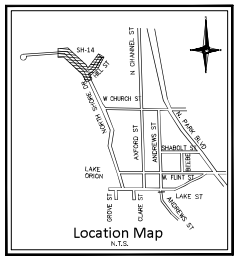
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DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 13





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- INDICATES AREAS OF SIDEWALK TO BE REMOVED (Sidewalk, Rem)
- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE GUY POLE
- GUY WIRE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
- EXISTING WATER MAIN
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- EX. R, Y, CATCH BASIN
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- OVERHEAD LINES
- LIGHT POLE
- TRAFFIC LIGHT
- SIGN
- EXISTING GAS MAIN
- EXISTING UTILITY TO BE REMOVED
- EXISTING UTILITY TO BE ABANDONED
- CONSTRUCTION/TREE PROTECTION FENCING
- 12" MAPLE
- INDICATES EXISTING TREE TO BE REMOVED

ESTIMATED QUANTITIES - HILL STREET (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	467	Syd

ESTIMATED QUANTITIES - N. SHORE DRIVE (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3050002	HMA Base Crushing and Shaping	1289	Syd

NF ENGINEERS
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SHEET
Removal Plan - N. Shore & Hill (Contract B)

811 Know what's below Call before you dig.

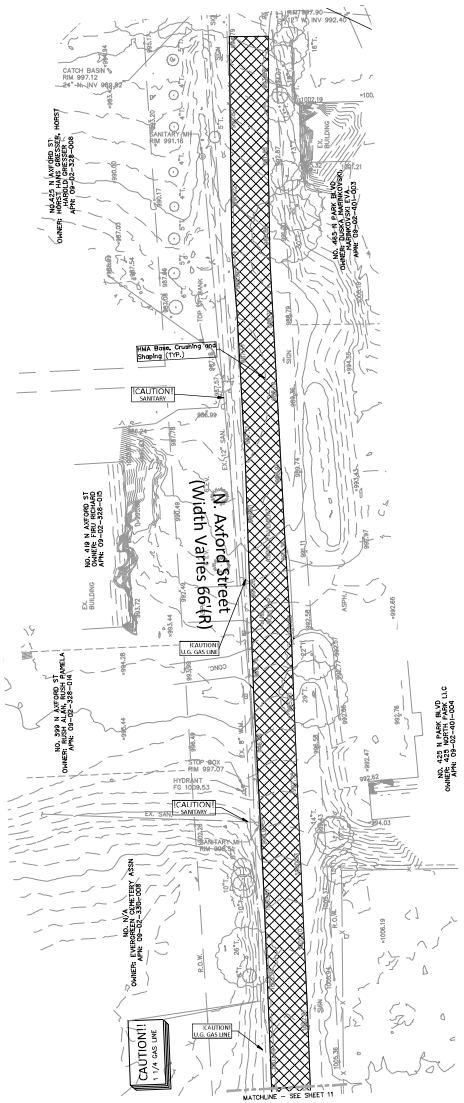
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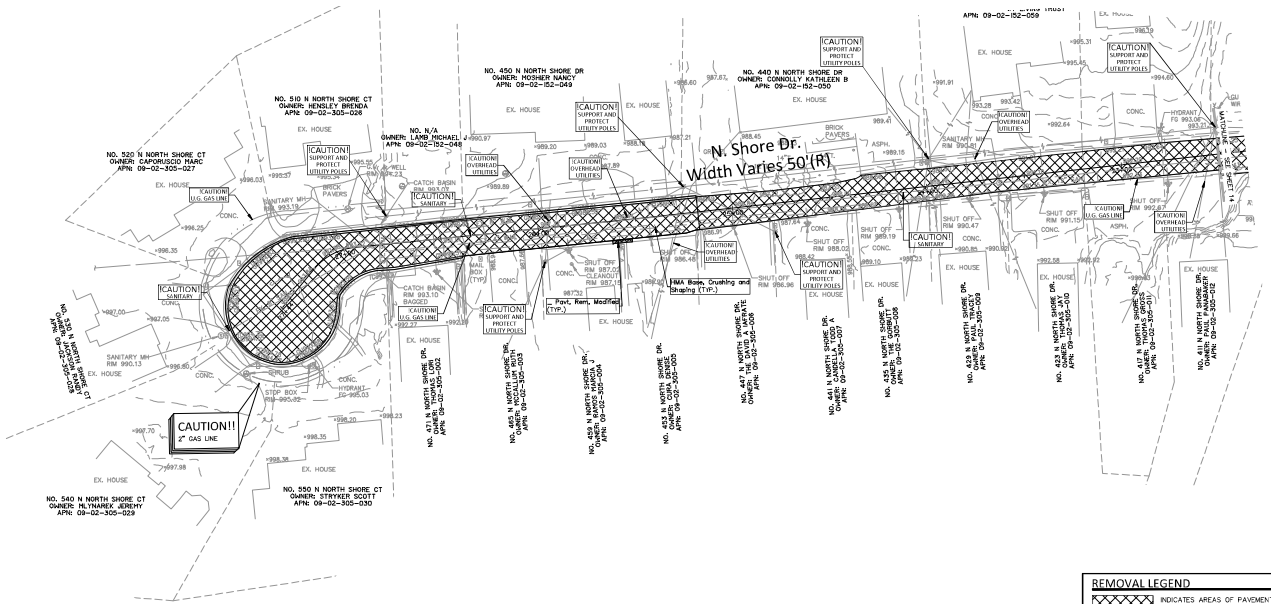
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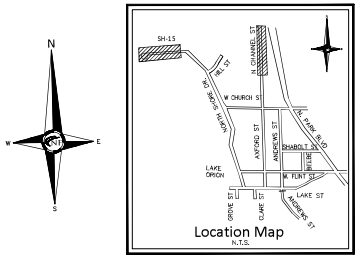
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NFE JOB NO. P230
SHEET NO. 14

W:\2026\2026 Projects\P230 Lake Orion Streets\de-Gen\Office\Construction Documents\P230_STMAP.dwg, 7/27/2026 7:48:39 PM, AutoCAD PDF (High Quality Print).pct3







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ESTIMATED QUANTITIES - N. SHORE DRIVE (CONTRACT B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2047050	__ Pvmt, Rem, Modified	3	Syd
3060002	HMA Base Crushing and Shaping	1185	Syd

ESTIMATED QUANTITIES - N. AXFORD DRIVE (Contract B)

DEMOLITION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3060002	HMA Base Crushing and Shaping	1157	Syd

REMOVAL LEGEND

- INDICATES AREAS OF PAVEMENT TO BE CRUSHED & SHAPED (HMA Base, Crushing and Shaping)
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- INDICATES AREAS OF PAVEMENT TO BE REMOVED (Pvmt, Rem, Modified)
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- SOIL BORING LOCATION

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE GUY POLE
- GUY WIRE
- EXISTING SANITARY SEWER
- EXISTING SAN. CLEAN OUT
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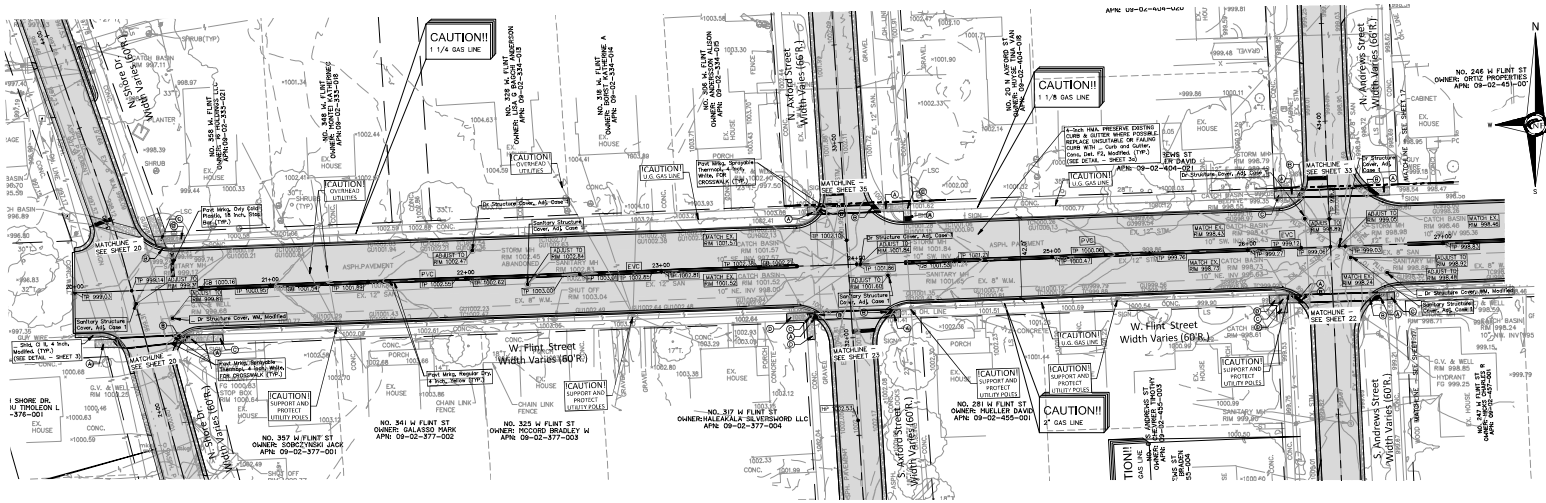
SHEET
Removal Plan - N. Axford & N. Shore (Contract B)

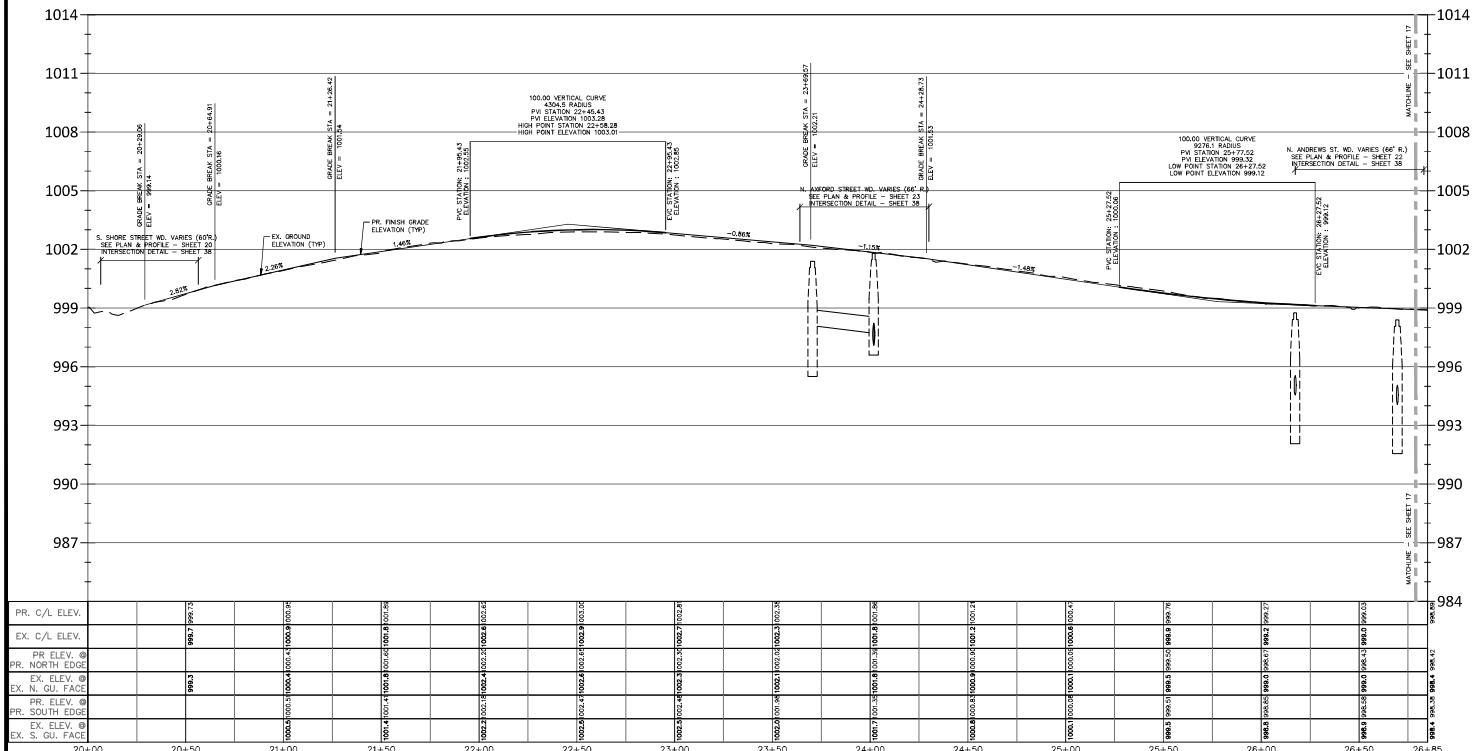
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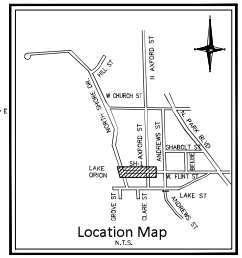
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 15







Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	_ SHd, Cl II, 4 Inch, Modified	10	Syd
4030306	Dr Structure, Top 6 Inch	0	Ea
4030065	Dr Structure Cover, Adj, Case 1	4	Ea
4047083	_ Sewer, CPE, 6 Inch, Tr Det 2	0	Ft
5012036	HMA, SCL	177	Ton
5012024	HMA, 4CL	177	Ton
8027060	_ Valley Gutter, Conc, Modified, Conc	0	Ft
8030010	Detectable Warning Surface	55	Ft
8030030	Curb Ramp Opening, Conc	60	Ft
8030044	Sidewalk, Conc, 4 Inch	687	Sft
8032002	Curb Ramp, Conc, 6 Inch	199	Sft
8110044	Pavt Mrkg, Dvly Cnkl Plastic, 18 Inch, Stop Bar	77	Ft
8110126	Pavt Mrkg, Regular Dry, 4 Inch, Yellow	998	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	328	Ft
4037060	_ Dr Structure Cover, MM, Modified	2	Ea
8352145	Sanitary Structure Cover, Adj, Case 1	4	Ea

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE — EXISTING SANITARY SEWER
SAN. CLEAN OUT
HYDRANT / GATE VALVE — EXISTING WATERMAIN
MANHOLE / CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
UTILITY POLE / GUY POLE / GUY WIRE — EXISTING BURIED CABLES
OVERHEAD LINES
LIGHT POLE
SIGN
C.O. MANHOLE — EXISTING GAS MAIN
HYDRANT / GATE VALVE — PR. SANITARY SEWER
INLET / C.B. / MANHOLE — PR. WATER MAIN
PR. STORM SEWER
PR. INFILTRATION BASIN
HP 600.00 / LP 600.00 — PROPOSED HIGH/LOW POINT
GB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00 / WB 600.00 — WALL TOP/BOTTOM ELEVATION

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SHEET
Construction Plans (1 of 22) (Contract A)

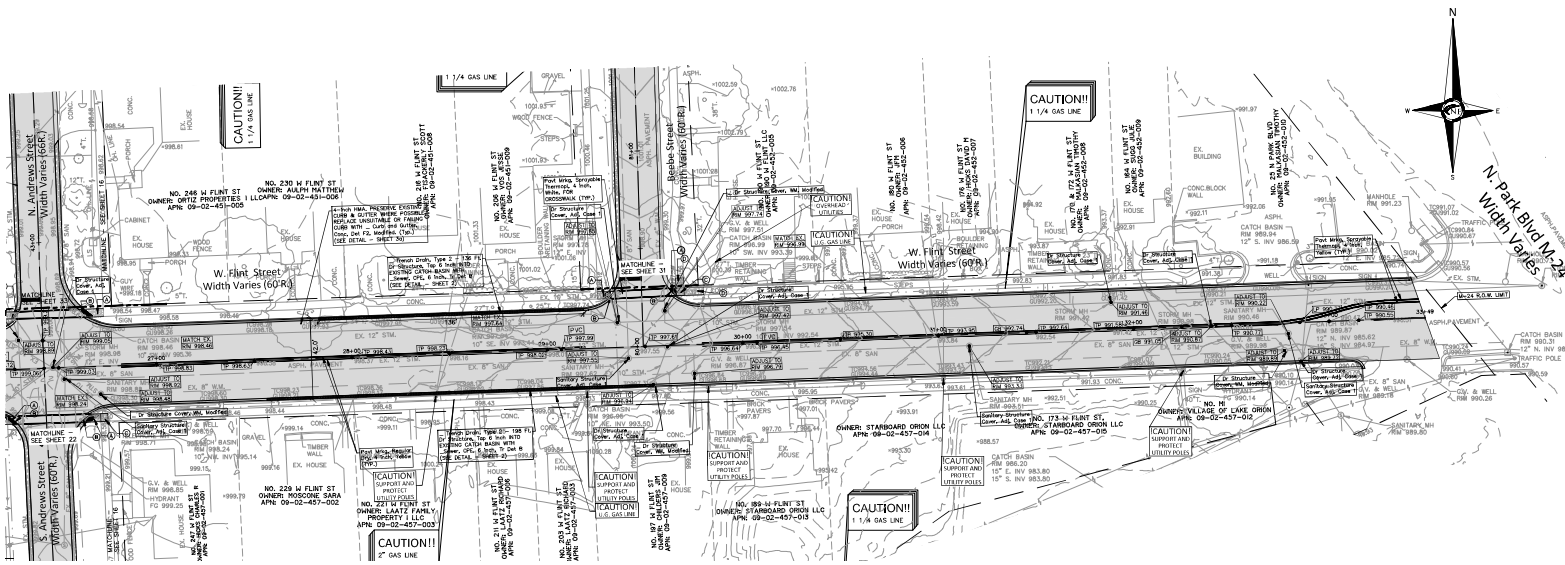
Know what's below Call before you dig.

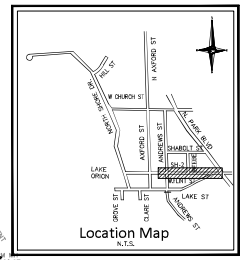
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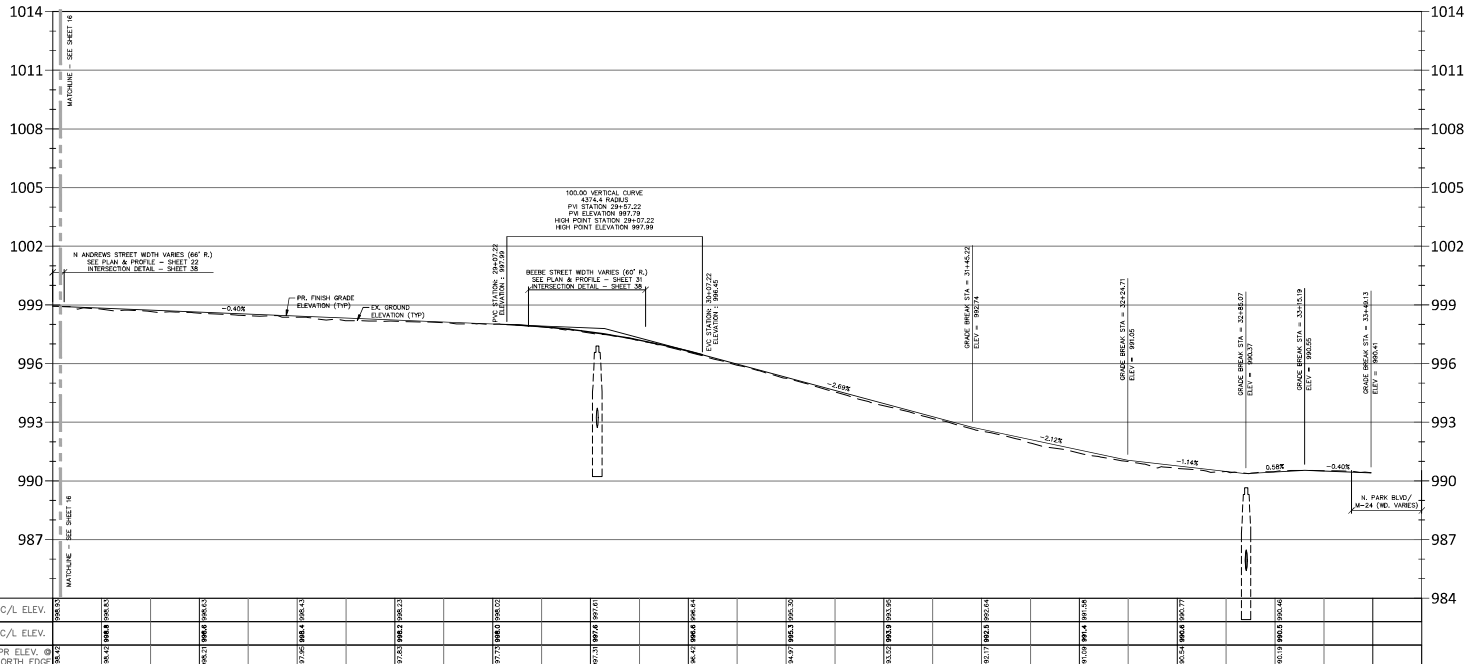
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 16

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Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
4033006	Dr Structure, Top 6 Inch	2	Ea
4033005	Dr Structure Cover, Adj, Case 1	5	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	20	Ft
5012036	HMA, SEL	325	Ton
5012036	HMA, 4EL	325	Ton
8030010	Detectable Warning Surface	10	Ft
8030030	Curb Ramp Opening, Conc	11	Ft
8030044	Sidewalk, Conc, 4 Inch	76	Sft
8032002	Curb Ramp, Conc, 6 Inch	36	Sft
8110044	Pavt Mrkg, Poly Conc Plastic, 18 Inch, Stop Bar	11	Ft
8110126	Pavt Mrkg, Regular Dry, 4 Inch, Yellow	973	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	63	Ft
4037050	Dr Structure Cover, MM, Modified	3	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	3	Ea
4027002	Trench Drain, Type 2	334	Ft

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE — EXISTING SANITARY SEWER
C.O. MANHOLE — SAN. CLEAN OUT
HYDRANT GATE VALVE — EXISTING WATERMAIN
MANHOLE CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
UTILITY POLE GUY POLE — OVERHEAD LINES
GUY WIRE
LIGHT POLE
SIGN
EXISTING GAS MAIN
PR. SANITARY SEWER
HYDRANT GATE VALVE — PR. WATER MAIN
INLET C.B. MANHOLE — PR. STORM SEWER
PR. INFILTRATION BASIN
HF 600.00 LP 600.00 — PROPOSED HIGH/LOW POINT
GB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00 WB 600.00 — WALL TOP/BOTTOM ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
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LAND PLANNERS
NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(2 of 22)
(Contract A)

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

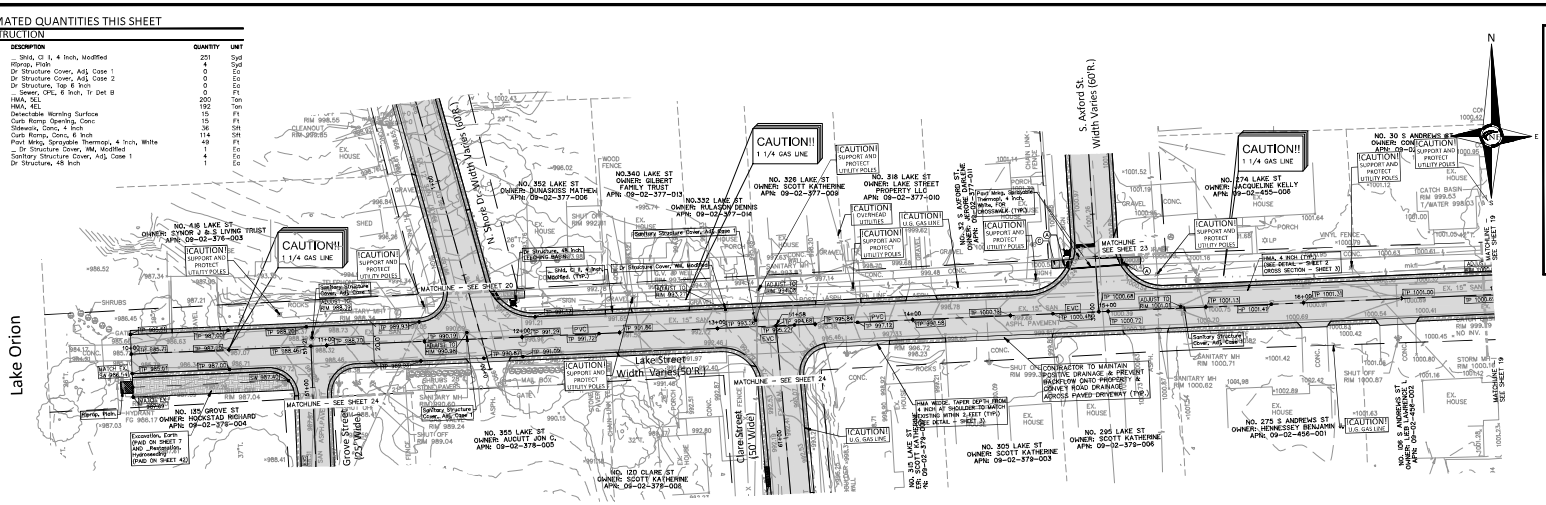
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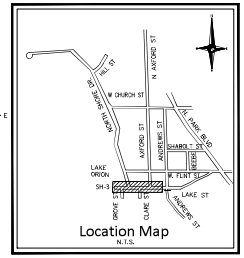
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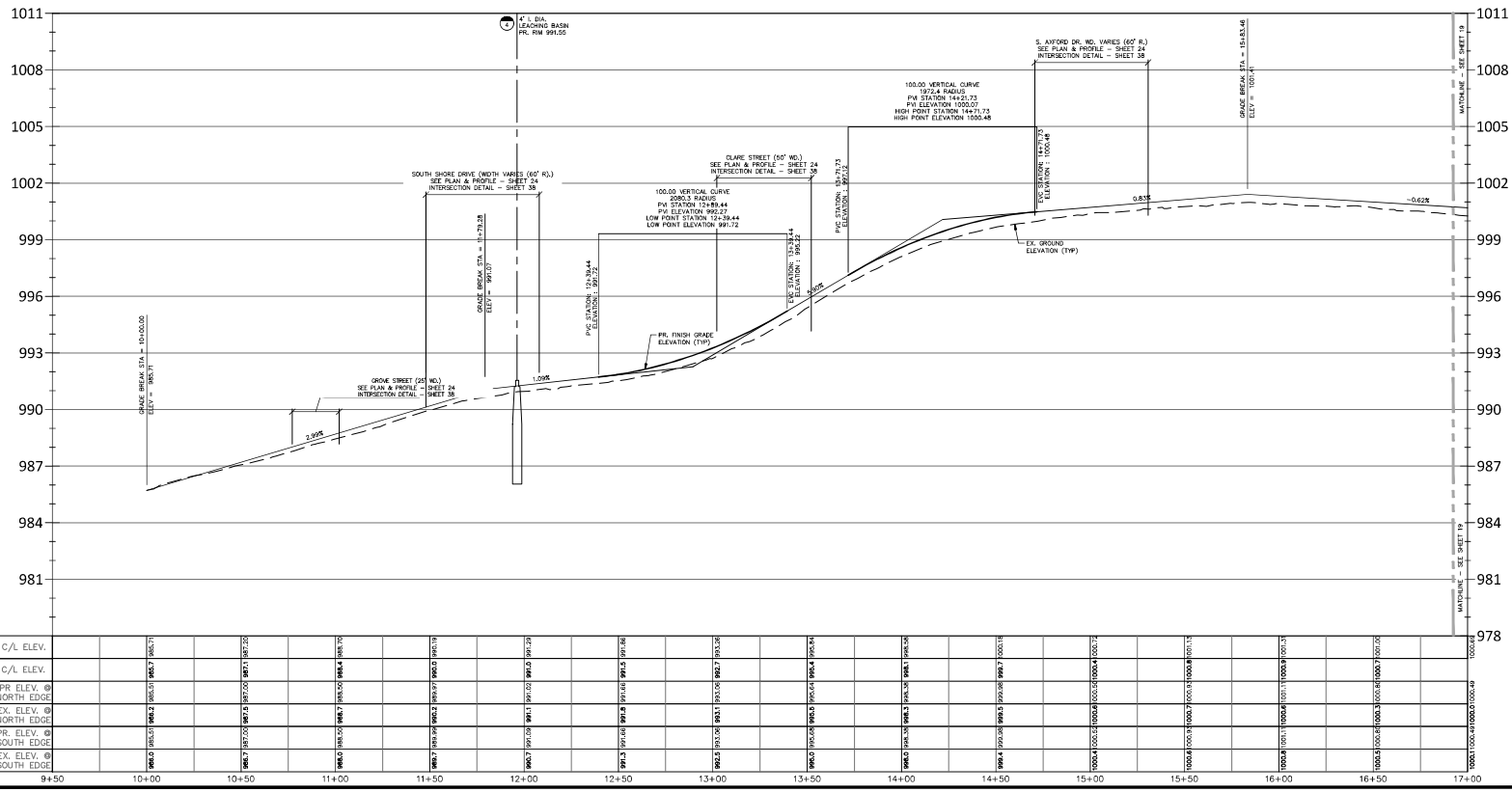
ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, Cl 1, 4 Inch, Modified	221	Syd
8130010	Riprap, Plain	4	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Top 6 Inch	0	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012036	HMA, 5EL	200	Ton
5012024	HMA, 4EL	192	Ton
8130010	Detectable Warning Surface	15	Ft
8530030	Curb Ramp Opening, Conc	15	Ft
8530044	Sidewalk, Conc, 4 Inch	36	Sft
8532002	Curb Ramp, Conc, 6 Inch	114	Sft
8110153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	49	Ft
4037050	Dr Structure Cover, RM, Modified	1	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	4	Ea
4030210	Dr Structure, 48 Inch	1	Ea







	9+50	10+00	10+50	11+00	11+50	12+00	12+50	13+00	13+50	14+00	14+50	15+00	15+50	16+00	16+50	17+00
PR. C/L ELEV.	985.71	987.20	988.70	990.19	991.69	993.36	995.84	998.58	1000.18	1000.72	1001.15	1001.35	1001.00			
EX. C/L ELEV.	986.7	987.1	988.4	990.0	991.5	992.7	993.3	994.4	996.7	1000.5	1000.8	1000.9	1001.0			
PR ELEV. @ PR. NORTH EDGE	985.51	987.00	988.50	989.99	991.49	993.16	995.64	998.38	1000.18	1000.55	1000.80	1000.90	1000.80			
EX. ELEV. @ PR. NORTH EDGE	986.2	987.5	988.7	990.3	991.8	993.1	993.7	994.5	996.5	1000.4	1000.7	1000.8	1000.7			
PR. ELEV. @ PR. SOUTH EDGE	985.91	987.39	988.89	990.38	991.88	993.56	995.95	998.78	1000.58	1000.55	1000.80	1000.90	1000.80			
EX. ELEV. @ PR. SOUTH EDGE	986.7	987.7	988.9	990.7	992.2	993.06	993.8	994.7	996.8	1000.4	1000.7	1000.8	1000.7			

Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE — EXISTING SANITARY SEWER
HYDRANT — GATE VALVE — SAN. CLEAN OUT
EXISTING WATERMAIN
MANHOLE — CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
UTILITY POLE — GUY POLE — EXISTING BURIED CABLES
GUY WIRE — OVERHEAD LINES
LIGHT POLE
SIGN
G.O. MANHOLE — EXISTING GAS MAIN
HYDRANT — GATE VALVE — PR. SANITARY SEWER
INLET — C.B. — MANHOLE — PR. WATER MAIN
PR. STORM SEWER
PR. INFILTRATION BASIN
FP 600.00 — LP 600.00 — PROPOSED HIGH/LOW POINT
BB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00 — WB 600.00 — WALL TOP/BOTTOM ELEVATION

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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(3 of 22)
(Contract A)

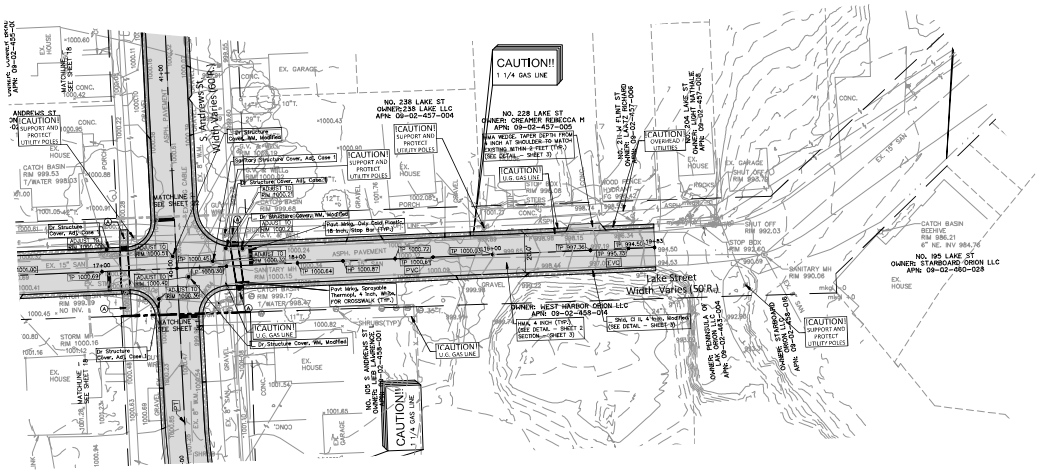
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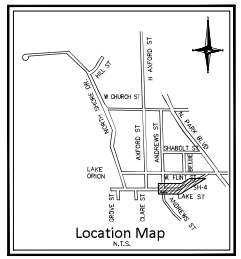
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

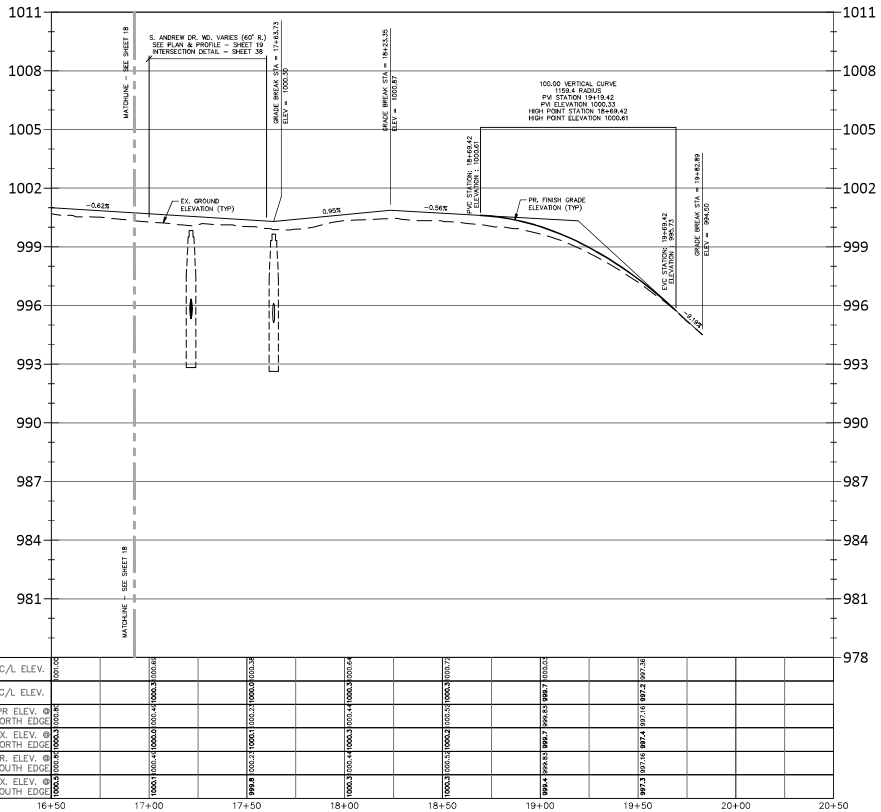
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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(4 of 22)
(Contract A)

Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, Cl II, 4 Inch, Modified	117	Syd
R-30010	Riprap, Plain	0	Syd
4330005	Dr Structure Cover, Adj, Case 1	3	Ea
4330006	Dr Structure Cover, Adj, Case 2	0	Ea
4330306	Dr Structure, Tap 6 Inch	0	Ea
4347083	Sewer, CIPP, 8 Inch, Tr Det B	0	Ft
5012036	HMA, SFL	82	Ton
5012224	HMA, HLL	81	Ton
8330010	Detectable Warning Surface	10	Ft
8330030	Curb Ramp Opening, Conc	16	Ft
8330044	Sidewalk, Conc, 4 Inch	16	Sft
8332002	Curb Ramp, Conc, 6 Inch	174	Sft
R-10044	Pvmt Mrkg, Only Cold Plastic, 18 Inch, Stop Bar	30	Ft
R-10153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	80	Ft
4370050	Dr Structure Cover, Wtr, Modified	3	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE — EXISTING SANITARY SEWER
SAN. CLEAN OUT
HYDRANT, GATE VALVE — EXISTING WATERMAIN
MANHOLE, CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
LIGHT POLE
SIGN
C.O., MANHOLE — EXISTING GAS MAIN
PR. SANITARY SEWER
HYDRANT, GATE VALVE — PR. WATER MAIN
INLET, C.B., MANHOLE — PR. STORM SEWER
PR. INFILTRATION BASIN
HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
GB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

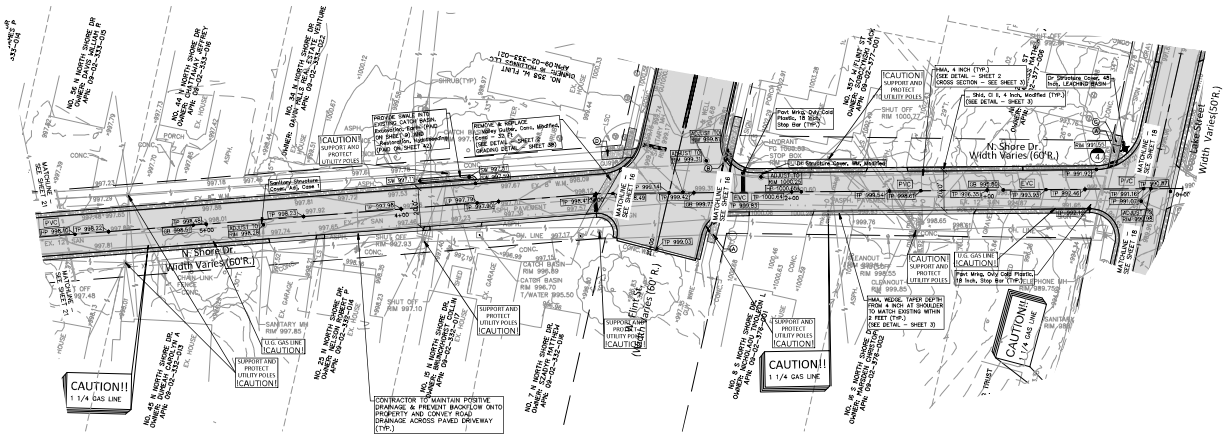
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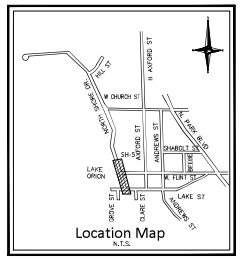
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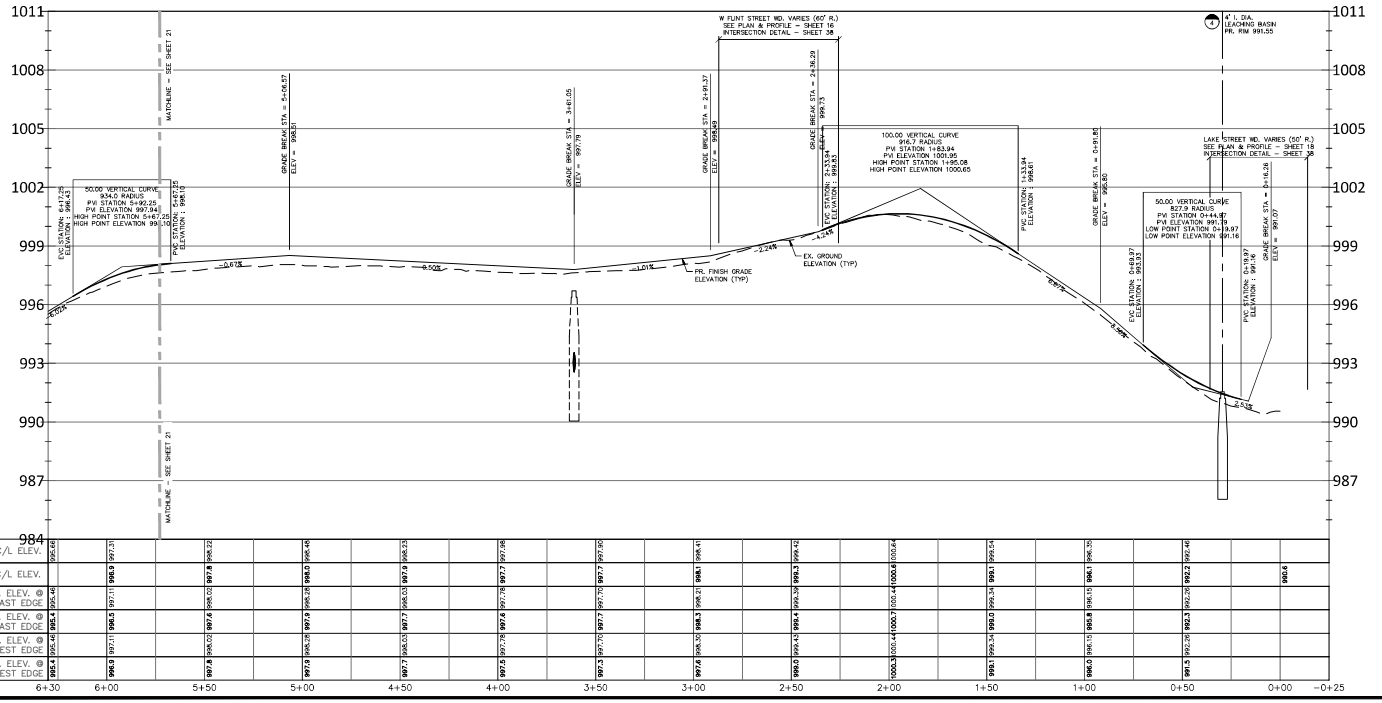
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 19

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Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	_ Shld, CI II, 4 Inch, Modified	144	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	_ Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012036	HMA, SEL	124	Ton
5012224	HMA, 4EL	114	Ton
8027060	Valley Gutter, Conc, Modified, Conc.	32	Ft
8030010	Detectable Warning Surface	0	Ft
8030530	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	46	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pavt Mrkg, Ovly Cold Plastic, 18 Inch, Stop Bar	20	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	_ Dr Structure Cover, WM, Modified	1	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea
4030210	Dr Structure, 48 Inch	1	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, G.T. GATE VALVE — SAN. CLEAN OUT
- MANHOLE, CATCH BASIN — EXISTING WATERMAIN
- EX. R. Y. CATCH BASIN — EXISTING STORM SEWER
- UTILITY POLE, GUY POLE, GUY WIRE — EXISTING BURIED CABLES
- LIGHT POLE — OVERHEAD LINES
- SIGN
- C.O. MANHOLE — EXISTING GAS MAIN
- HYDRANT, GATE VALVE — PR. SANITARY SEWER
- INLET, C.B., MANHOLE — PR. WATER MAIN
- PR. STORM SEWER
- PR. INFILTRATION BASIN
- HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
- GB 600.00 — PR. GRADE BREAK
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

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TEL (586) 739-0939
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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans (5 of 22) (Contract A)

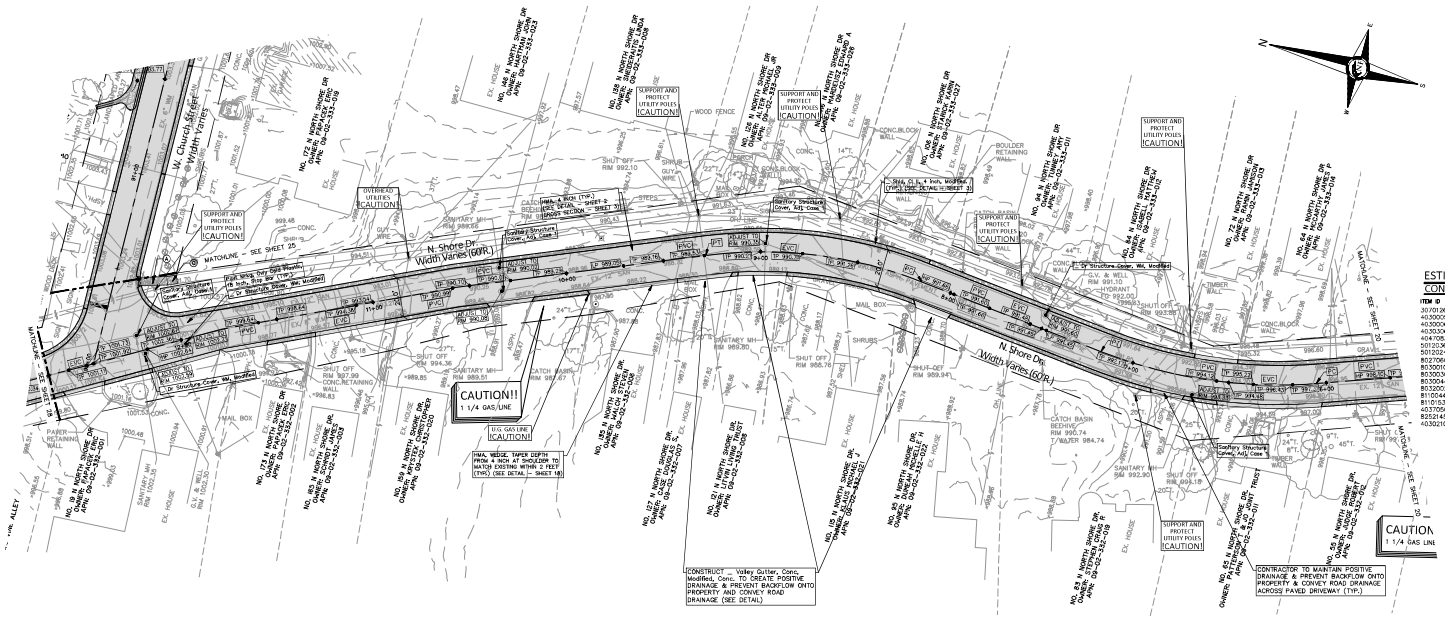
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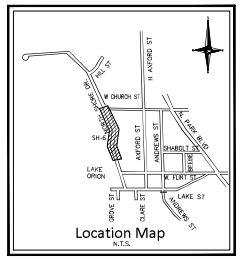
DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 20

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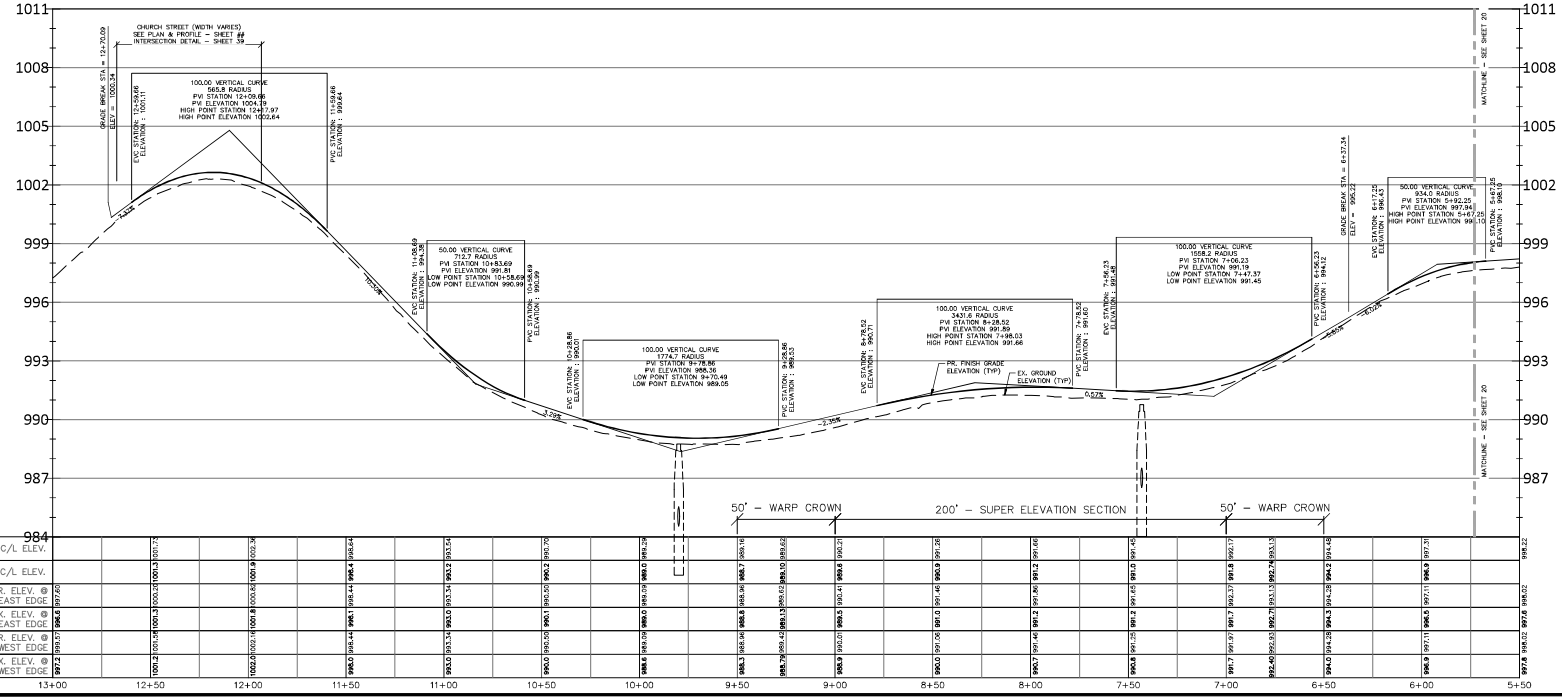




ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
20701026	_ Shld, C II, 4 Inch, Modified	233	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4041053	_ Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012036	HMA, SEL	197	Ton
5012124	HMA, 4E1	184	Ton
8027060	_ Valley Gutter, Conc, Modified, Conc.	71	Ft
8030010	Detectable Warning Surface	4	Ft
8030030	Curb Ramp Opening, Conc	5	Ft
8030044	Sidewalk, Conc, 4 Inch	22	SYd
8030052	Curb Ramp, Conc, 6 Inch	41	SYd
8110044	Pavt Mrkg, Ovly Cold Plastic, 18 Inch, Stop Bar	10	Ft
8110152	Pavt Mrkg, Sprayable Thermoso, 4 Inch, White	0	Ft
4037050	_ Dr Structure Cover, Wk, Modified	3	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	5	Ea
4030210	Dr Structure, 48 Inch	0	Ea



Sidewalk Paving Legend

PAVING

A		CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B		CURB RAMP OPENING, CONC.
C		CURB RAMP, CONC, 4 INCH
D		SIDEWALK, CONC, 4 INCH

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE	EXISTING SANITARY SEWER
C.O.	SAN. CLEAN OUT
HYDRANT / GATE VALVE	EXISTING WATERMAIN
MANHOLE / CATCH BASIN	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
UTILITY POLE / GUY POLE / GUY WIRE	EXISTING BURIED CABLES
	OVERHEAD LINES
	LIGHT POLE
	SIGN
MANHOLE	EXISTING GAS MAIN
C.O.	PR. SANITARY SEWER
HYDRANT / GATE VALVE	PR. WATER MAIN
INLET / C.B. / MANHOLE	PR. STORM SEWER
	PR. INFILTRATION BASIN
SP 600.00 / EP 600.00	PROPOSED HIGH/LOW POINT
GB 600.00	PR. GRADE BREAK
TC 600.00	PR. TOP OF CURB ELEVATION
GU 600.00	PR. GUTTER ELEVATION
TW 600.00	PR. TOP OF WALK ELEVATION
TP 600.00	PR. TOP OF PVMT. ELEVATION
NT 600.00 / NB 600.00	WALL TOP/BOTTOM ELEVATION

NOWAK & FRAUS ENGINEERS
46680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL. (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans (6 of 22) (Contract A)

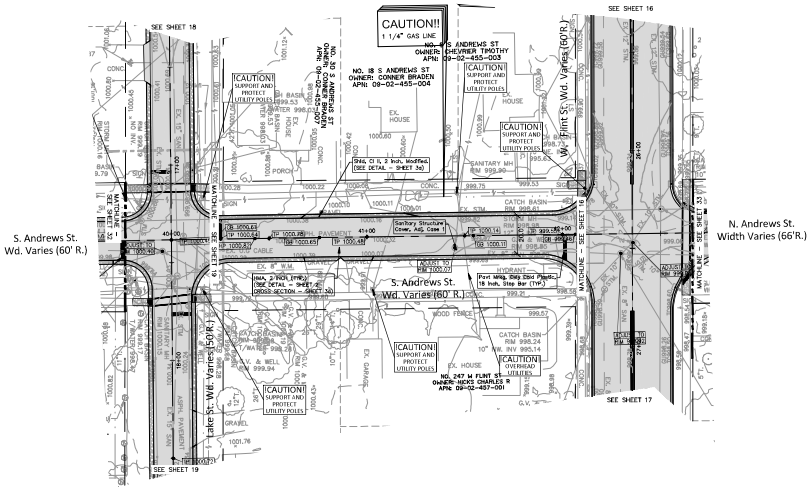
Know what's below Call before you dig.

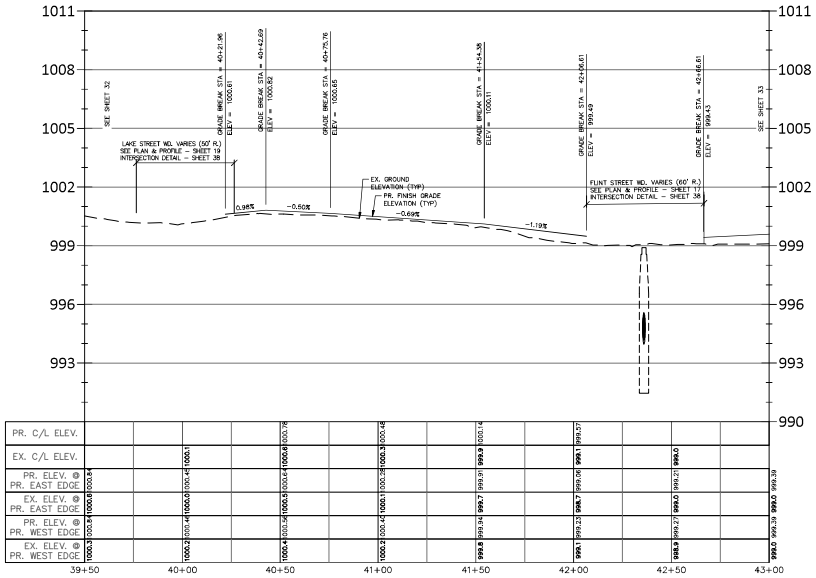
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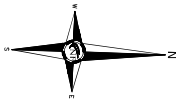
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

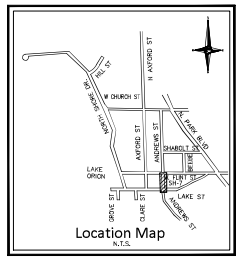
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SHEET NO. 21

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ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, Cl II, 2 Inch, Modified	80	Syd
4030336	Dr Structure, Top 6 Inch	0	Ea
4047083	Sewer, CPE, 8 Inch, Tr Det B	0	Ft
5012036	HMA, SEL	45	Ton
5012024	HMA, 4EL	0	Ton
8030044	Sidewalk, Conc, 4 Inch	16	SYS
8110044	Pavt Mrkg, Only Cold Plastic, 18 Inch, Stop Bar	0	Ft
8202145	Sanitary Structure Cover, Adj, Case 1	1	Ea

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- C.O. — SAN. CLEAN OUT
- HYDRANT, G.V. GATE VALVE — EXISTING WATERMAIN
- MANHOLE, C.B. CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- C.O. MANHOLE — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B. MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
- GB 600.00 — PR. GRADE BREAK
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
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- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

NF ENGINEERS
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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2
Town 4 North, Range 10 East,
Village of Lake Orion,
Oakland County, Michigan

SHEET
Construction Plans
(7 of 22)
(Contract A)

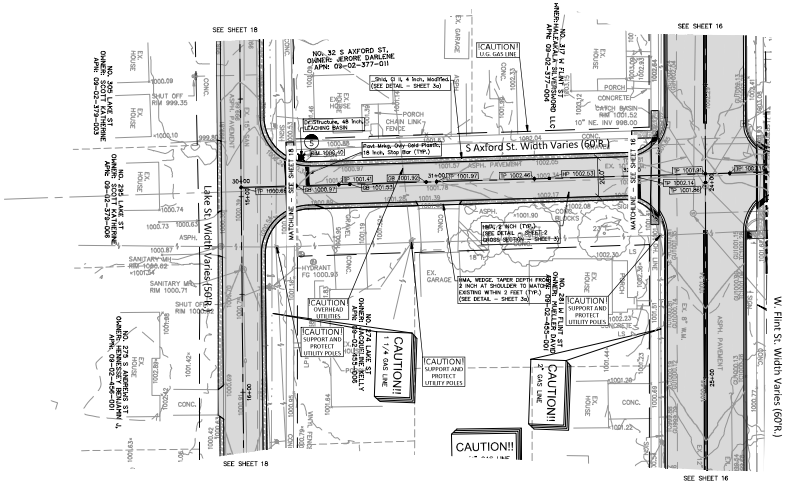
Know what's below Call before you dig.

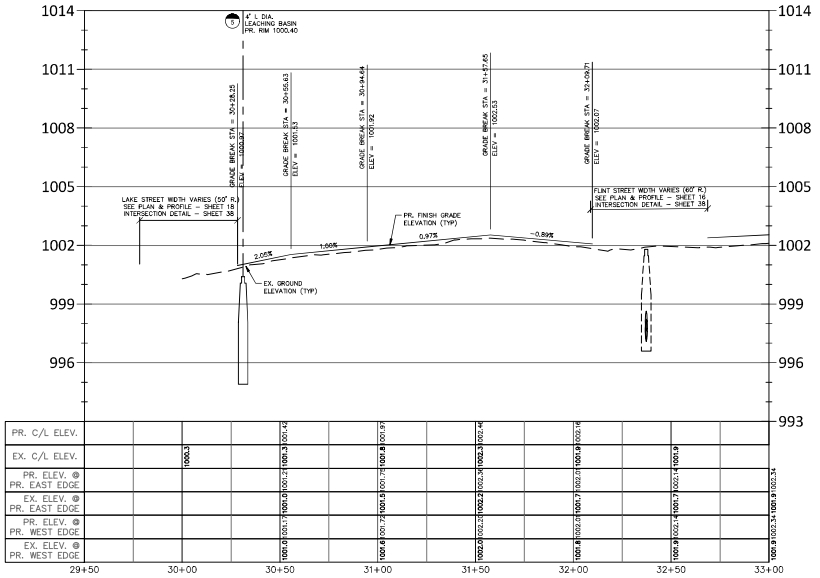
DATE	ISSUED/REVISED

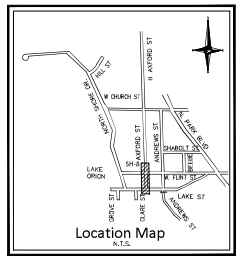
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 22

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Town 4 North, Range 10 East,
Village of Lake Orion,
Oakland County, Michigan

SHEET
Construction Plans
(8 of 22)
(Contract A)

811 Know what's below Call before you dig.

DATE ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 23

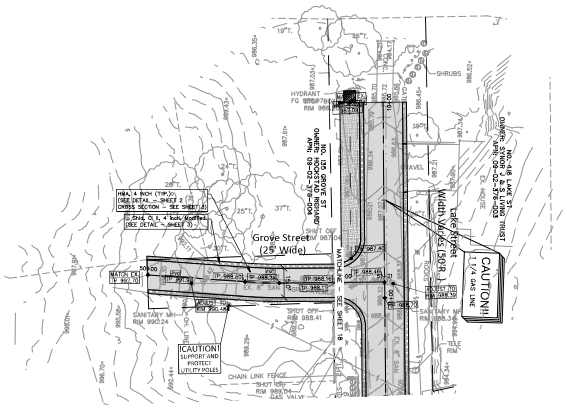
ESTIMATED QUANTITIES THIS SHEET
CONSTRUCTION

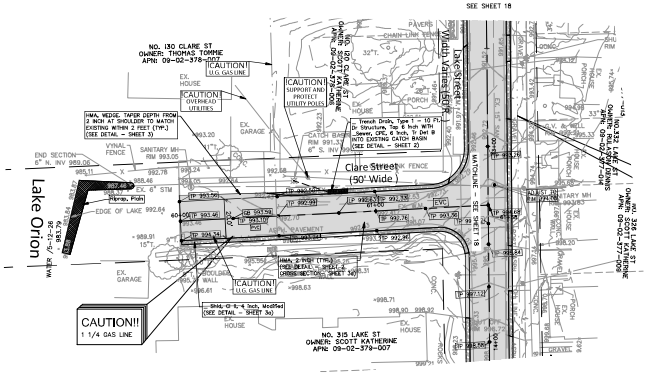
ITEM ID	DESCRIPTION	QUANTITY	UNIT
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4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012036	HMA, 5EL	42	Ton
5012224	HMA, 4EL	0	Ton
8030044	Sidewalk, Conc, 4 Inch	0	SY
8110044	Pavt Mrkg, Dvly Cold Plastic, 18 Inch, Stop Bar	10	Ft
4030210	Dr Structure, 48 Inch	1	Ea

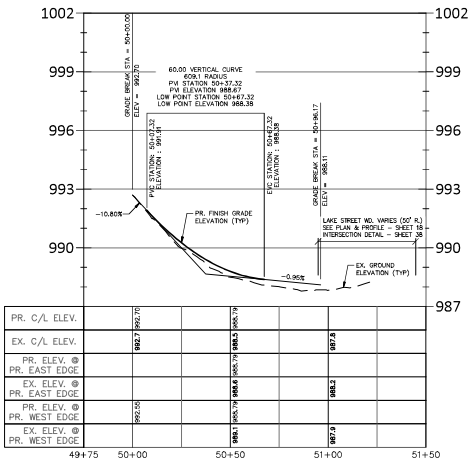
PAVING LEGEND
- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

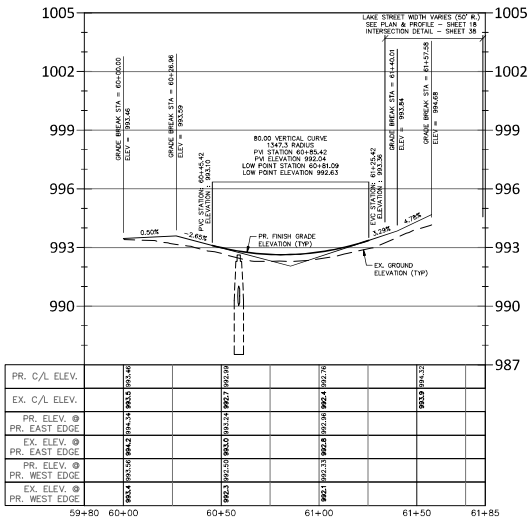
LEGEND
- MANHOLE — EXISTING SANITARY SEWER
- C.O. — SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE, GUY POLE — EXISTING BURIED CABLES
- GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- MANHOLE — EXISTING GAS MAIN
- C.O. — PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
- GB 600.00 — PR. GRADE BREAK
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- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

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ESTIMATED QUANTITIES THIS SHEET - GROVE ST

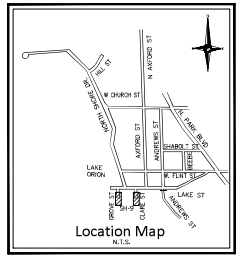
CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	_ Shld, Cl II, 4 Inch, Modified	52	Syd
5012036	HMA, 5EL	8	Ton
5012024	HMA, 4EL	8	Ton
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	_ Shld, Cl II, 4 Inch, Modified	56	Syd
8130010	Riprap, Plain	129	Syd
4030066	Dr Structure, Top 6 Inch	1	Ea
4047083	_ Sewer, CPE, 6 Inch, Tr Det B	18	Ft
5012036	HMA, 5LL	35	Ton
5012024	HMA, 4EL	0	Ton
4027091	_ Trench Drain, Type 1	10	Ft



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TEL: (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2
Town 4 North, Range 10 East,
Village of Lake Orion,
Oakland County, Michigan

SHEET
Construction Plans
(9 of 22)
(Contract A)

Know what's below Call before you dig.

DATE ISSUED/REVISED

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

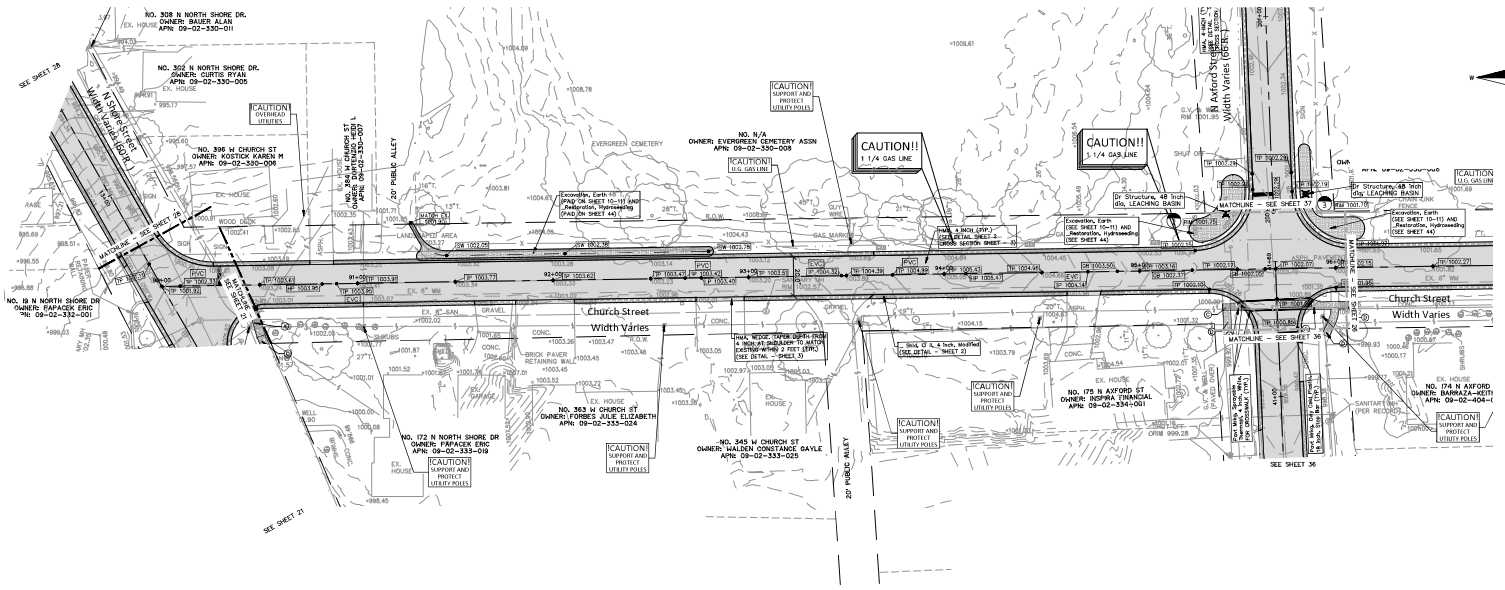
LEGEND

MANHOLE — EXISTING SANITARY SEWER
SAN. CLEAN OUT
HYDRANT — GATE VALVE — EXISTING WATERMAIN
MANHOLE CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
UTILITY POLE — GUY POLE — GUY WIRE — EXISTING BURIED CABLES
OVERHEAD LINES
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SIGN
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G.O. MANHOLE — PR. SANITARY SEWER
HYDRANT — GATE VALVE — PR. WATER MAIN
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PR. INFILTRATION BASIN
HP 600.00 LP 600.00 — PROPOSED HIGH/LOW POINT
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TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00 NB 600.00 — WALL TOP/BOTTOM ELEVATION

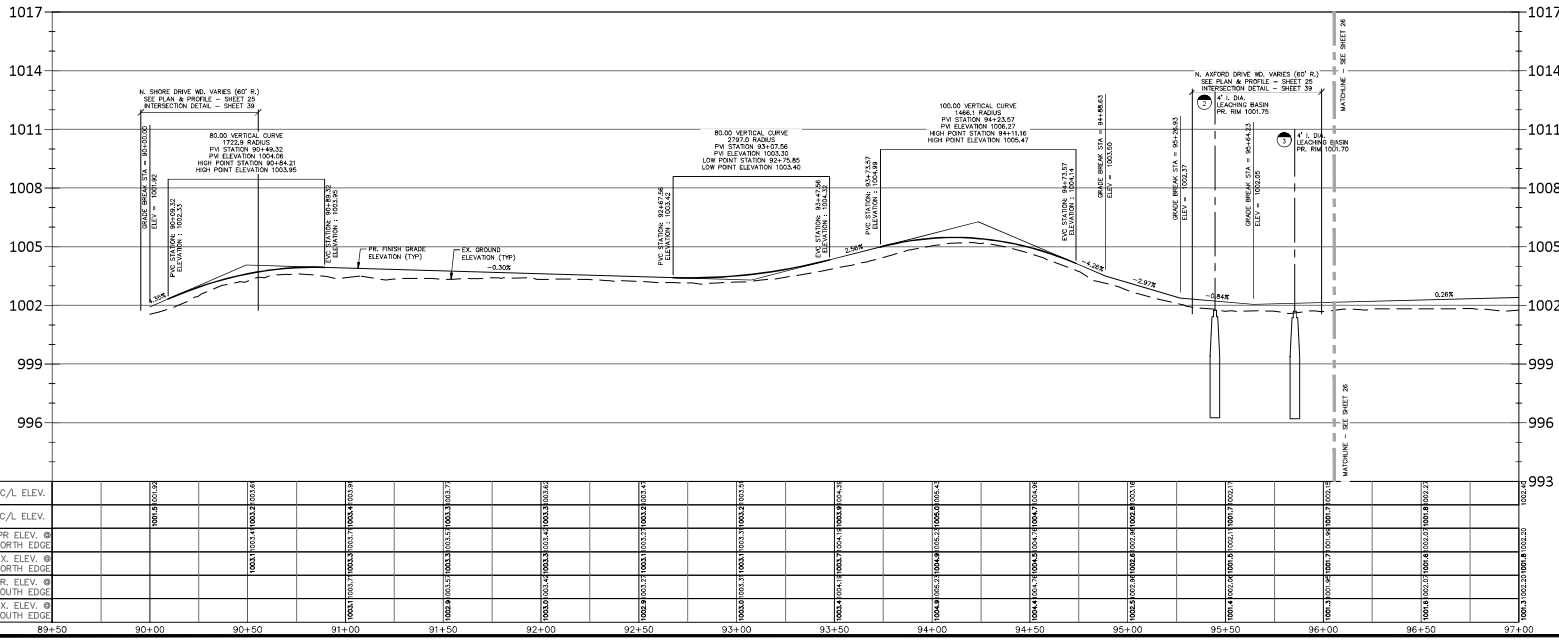
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'
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NFE JOB NO. P230
SHEET NO. 24

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	89+50	90+00	90+50	91+00	91+50	92+00	92+50	93+00	93+50	94+00	94+50	95+00	95+50	96+00	96+50	97+00
PR. C/L ELEV.		1001.92	1002.22	1002.49	1002.73	1002.89	1003.01	1003.09	1003.13	1003.14	1003.12	1003.07	1002.98	1002.85	1002.69	1002.49
EX. C/L ELEV.		1001.92	1003.22	1003.49	1003.73	1003.89	1003.97	1003.97	1003.93	1003.85	1003.73	1003.57	1003.37	1003.13	1002.85	1002.52
PR ELEV. @ PR. NORTH EDGE		1001.92	1003.22	1003.49	1003.73	1003.89	1003.97	1003.97	1003.93	1003.85	1003.73	1003.57	1003.37	1003.13	1002.85	1002.52
EX. ELEV. @ PR. NORTH EDGE		1001.92	1003.22	1003.49	1003.73	1003.89	1003.97	1003.97	1003.93	1003.85	1003.73	1003.57	1003.37	1003.13	1002.85	1002.52
PR. ELEV. @ PR. SOUTH EDGE		1001.92	1003.22	1003.49	1003.73	1003.89	1003.97	1003.97	1003.93	1003.85	1003.73	1003.57	1003.37	1003.13	1002.85	1002.52
EX. ELEV. @ PR. SOUTH EDGE		1001.92	1003.22	1003.49	1003.73	1003.89	1003.97	1003.97	1003.93	1003.85	1003.73	1003.57	1003.37	1003.13	1002.85	1002.52

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, CI II, 4 Inch	215	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	_ Sewer, CPE, 6 Inch, 7ft Dpt B	0	Ft
5012037	HMA, SEL	158	Ton
5012024	HMA, 4EL	155	Ton
8030010	Detectable Warning Surface	10	Ft
8030030	Curb Ramp Opening, Conc	13	Ft
8030044	Sidewalk, Conc, 4 Inch	126	Syft
8032002	Curb Ramp, Conc, 6 Inch	93	Syft
8110153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	61	Ft
4057050	_ Dr Structure Cover, MW, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea
4030210	Dr Structure, 48 Inch	1	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT, GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
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SHEET
Construction Plans
(10 of 22)
(Contract B)

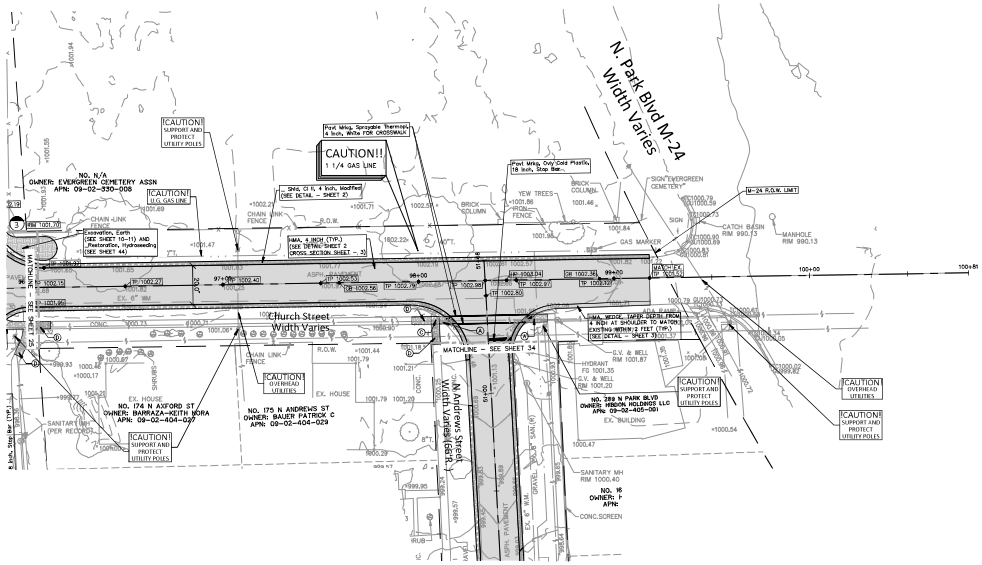
Know what's below Call before you dig.

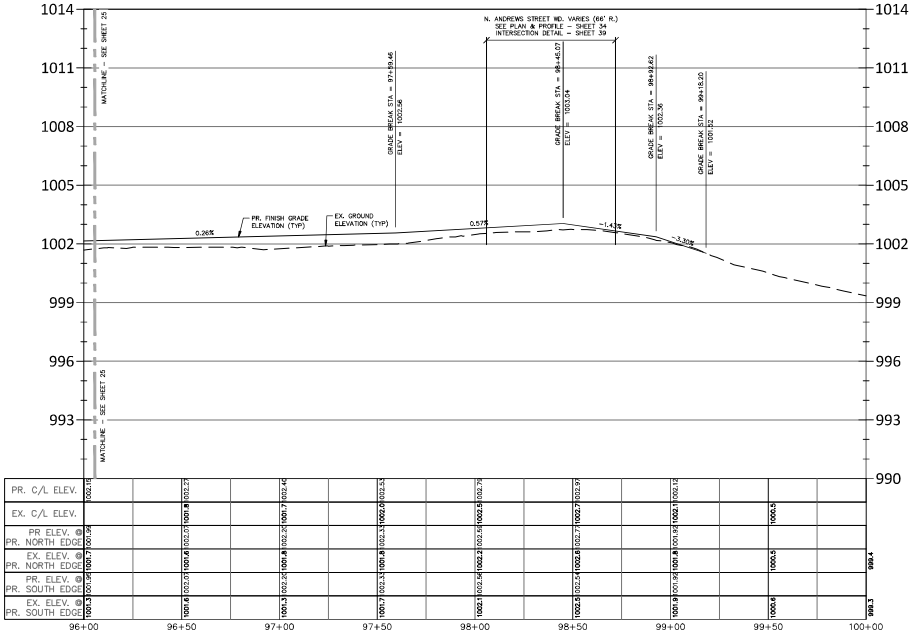
DATE ISSUED/REVISED

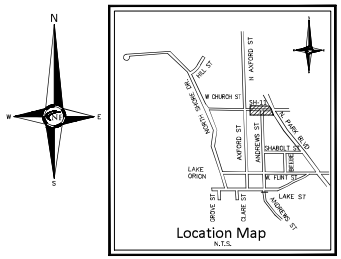
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 25

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SHEET
Construction Plans
(11 of 22)
(Contract B)

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DATE ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 26

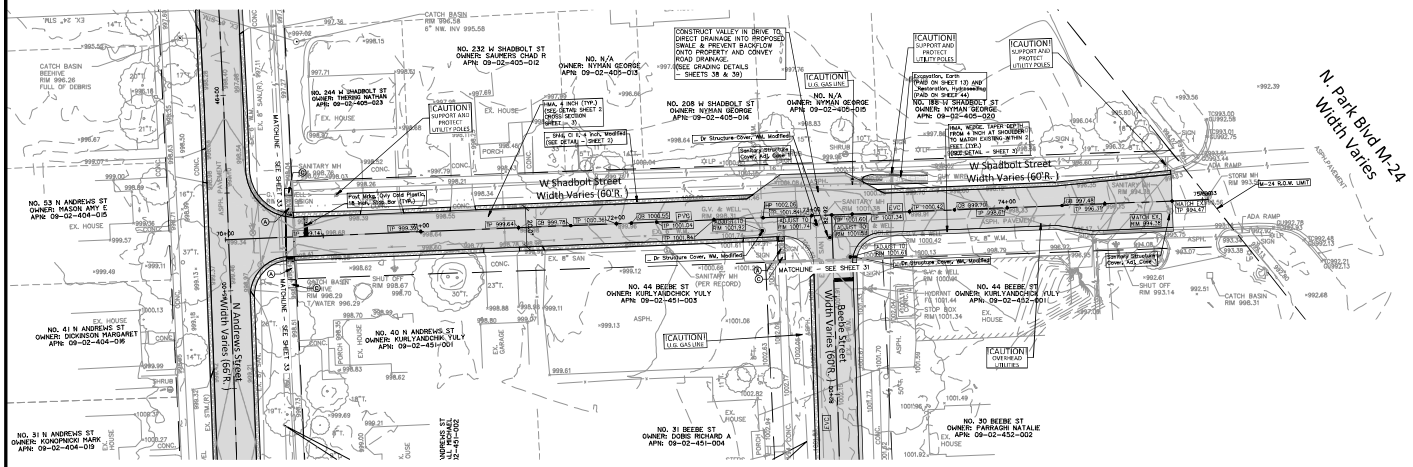
ESTIMATED QUANTITIES THIS SHEET
CONSTRUCTION

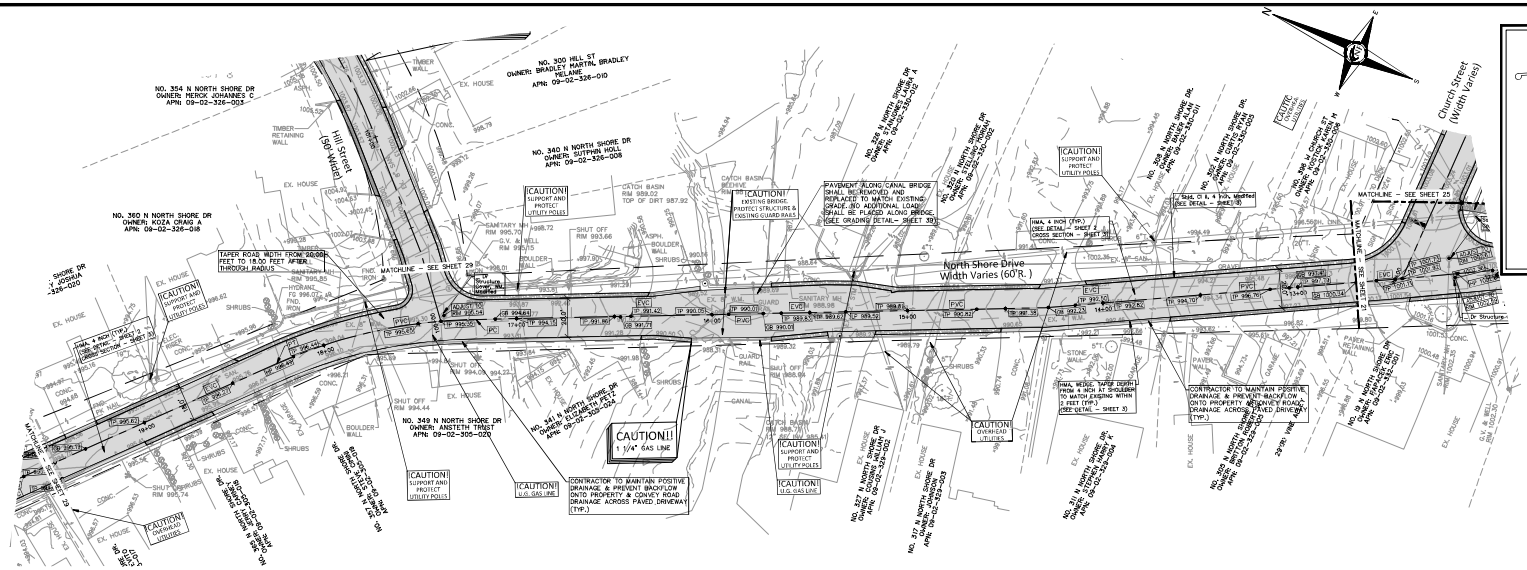
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4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Top 6 Inch	0	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, 5EL	90	Ton
5012024	HMA, 4EL	88	Ton
8030010	Detectable Warning Surface	10	Ft
8230030	Curb Ramp Opening, Conc	11	Ft
8230044	Sidewalk, Conc, 4 Inch	118	Syd
8232002	Curb Ramp, Conc, 6 Inch	78	Syd
8110044	Pvmt Mrkg, Poly Cold Plastic, 18 Inch, Stop Bar	12	Ft
8110153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	71	Ft
4037050	Dr Structure Cover, MH, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea

PAVING LEGEND
PROPOSED CONCRETE PAVEMENT
PROPOSED ASPHALT PAVEMENT

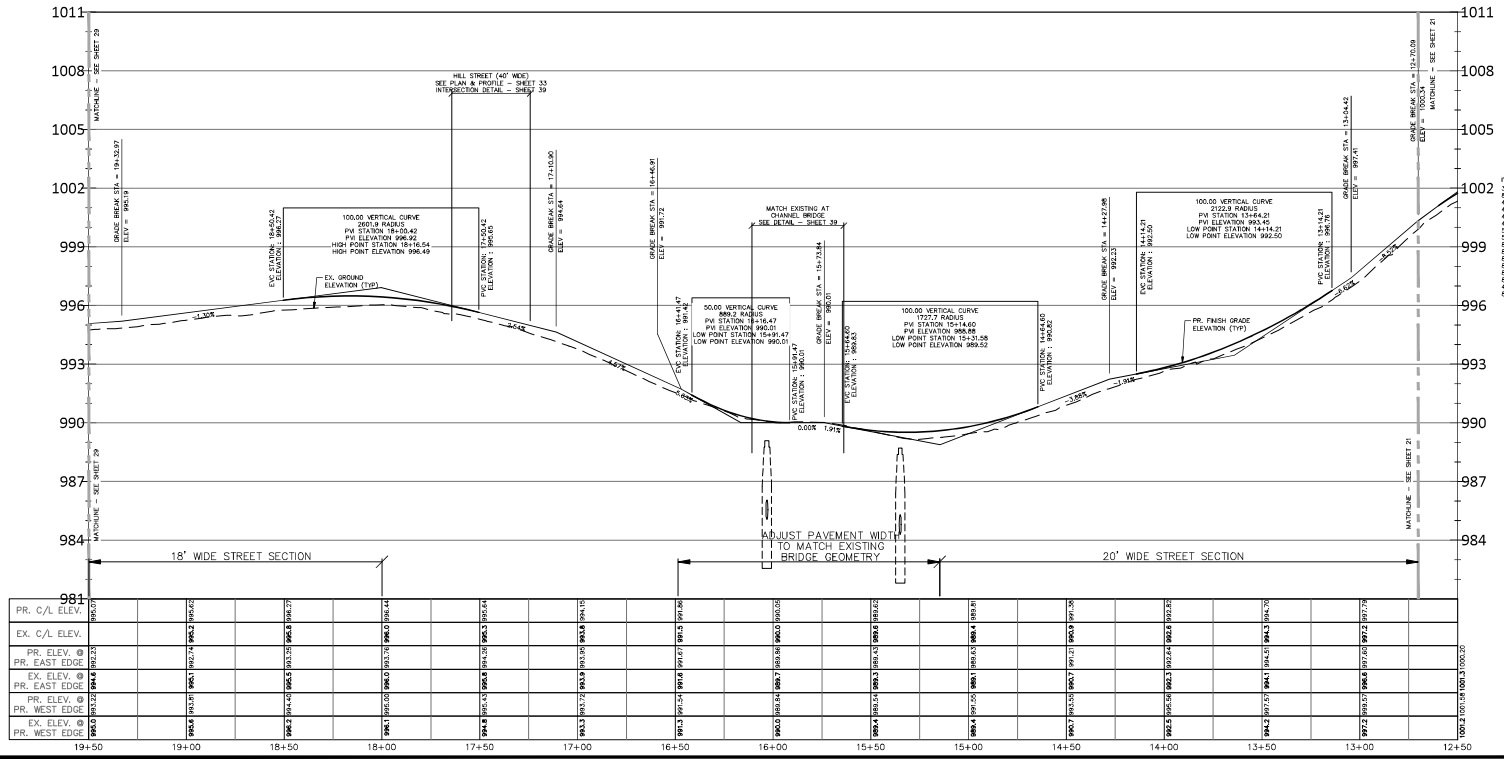
LEGEND
MANHOLE — EXISTING SANITARY SEWER
SAN. CLEAN OUT
HYDRANT, GATE VALVE — EXISTING WATERMAIN
MANHOLE, CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
LIGHT POLE
SIGN
C.O., MANHOLE — EXISTING GAS MAIN
PR. SANITARY SEWER
HYDRANT, GATE VALVE — PR. WATER MAIN
INLET, C.B., MANHOLE — PR. STORM SEWER
PR. INFILTRATION BASIN
HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
GB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
NT 600.00, NB 600.00 — WALL TOP/BOTTOM ELEVATION

W:\2026-2030 Projects\P230 Lake Orion Streets Ltr Sum\Office\Construction Documents\P230_2026Dwg 7/7/2026 7:50:18 PM AutoCAD PDF (High Quality Print).pct
N:\2026-2030 Projects\P230 Lake Orion Streets Ltr Sum\Office\Construction Documents\P230_Sht1.dwg 7/7/2026 7:50:18 PM AutoCAD PDF (High Quality Print).pct


W Shadbolt Street
Width Varies (60'R.)
N. Park Blvd M-24
Width Varies
N. ANDREWS STREET
Width Varies (66'R.)
BEEBE ST
Width Varies (60'R.)
NO. 53 N ANDREWS ST
OWNER: MASON AMY E
APN: 09-02-404-015
NO. 41 N ANDREWS ST
OWNER: DICKINSON MARGARET
APN: 09-02-404-016
NO. 31 N ANDREWS ST
OWNER: KONOPNICKI MARK
APN: 09-02-404-018
NO. 40 N ANDREWS ST
OWNER: KURLYANCHIK, YULY
APN: 09-02-451-001
NO. 232 W SHADBOLT ST
OWNERS: SAUMERS, CHAD R
APN: 09-02-405-012
NO. N/A
OWNER: NYMAN GEORGE
APN: 09-02-405-015
NO. 244 W SHADBOLT ST
OWNER: THRONG, NATHAN
APN: 09-02-405-023
NO. 208 W SHADBOLT ST
OWNER: NYMAN GEORGE
APN: 09-02-405-014
NO. 44 BEEBE ST
OWNER: KURLYANCHIK, YULY
APN: 09-02-451-003
NO. 31 BEEBE ST
OWNER: DOBIS, RICHARD A
APN: 09-02-451-004
NO. 44 BEEBE ST
OWNER: KURLYANCHIK, YULY
APN: 09-02-452-001
NO. 30 BEEBE ST
OWNER: PARKAGHI, NATALIE
APN: 09-02-452-002
CONSTRUCT VALLEY IN DRIVE TO DIRECT DRAINAGE INTO PROPOSED SWALE & PREVENT BACKFLOW ONTO PROPERTY AND CONVEY ROAD DRAINAGE. (SEE GRADING DETAILS - SHEETS 38 & 39)
CAUTION! UG GAS LINE
CAUTION! SUPPORT AND PROTECT UTILITY POLES
CAUTION! OVERHEAD UTILITIES
MATCHLINE - SEE SHEET 33
MATCHLINE - SEE SHEET 31
CATCH BASIN RIM 996.58 6" NW. INV 995.58
CATCH BASIN BEEHIVE RIM 996.26 FULL OF DEBRIS
HYDRANT RIM 998.29 / WATER 996.29
STORM MH RIM 995.76
SANITARY MH RIM 998.67
STOP BOX RIM 1001.34
STORM MH RIM 993.14
CATCH BASIN RIM 998.31
HYDRANT RIM 994.51
STORM MH RIM 994.33
SANITARY MH RIM 1000.05
SANITARY MH (PER RECORD)
EX. 8" W.M.
EX. 8" SAN
EX. 6" W.M.
EX. 12" W.M.
EX. 8" STORM
EX. 12" STORM
EX. 6" SAN
EX. 4" SAN
EX. 10" SAN
EX. 15" STORM
EX. 24" STORM
EX. 18" STORM
EX. 10" STORM
EX. 12" SAN
EX. 15" SAN
EX. 18" SAN
EX. 24" SAN
EX. 30" STORM
EX. 36" STORM
EX. 48" STORM
EX. 60" STORM
EX. 72" STORM
EX. 30" SAN
EX. 36" SAN
EX. 48" SAN
EX. 60" SAN
EX. 72" SAN
EX. 4" W.M.
EX. 6" GAS
EX. 8" GAS
EX. 12" GAS
EX. 4" GAS
EX. 6" UG ELEC
EX. 8" UG ELEC
EX. 12" UG ELEC
EX. 4" UG ELEC
EX. 6" UG TEL
EX. 8" UG TEL
EX. 12" UG TEL
EX. 4" UG TEL
EX. 6" UG CATV
EX. 8" UG CATV
EX. 12" UG CATV
EX. 4" UG CATV
EX. 6" UG COMB
EX. 8" UG COMB
EX. 12" UG COMB
EX. 4" UG COMB
EX. 6" UG FIBER
EX. 8" UG FIBER
EX. 12" UG FIBER
EX. 4" UG FIBER
EX. 6" UG UNKNOWN
EX. 8" UG UNKNOWN
EX. 12" UG UNKNOWN
EX. 4" UG UNKNOWN
EX. 6" UG WATER
EX. 8" UG WATER
EX. 12" UG WATER
EX. 4" UG WATER
EX. 6" UG SEWER
EX. 8" UG SEWER
EX. 12" UG SEWER
EX. 4" UG SEWER
EX. 6" UG STORM
EX. 8" UG STORM
EX. 12" UG STORM
EX. 4" UG STORM
EX. 6" UG GAS
EX. 8" UG GAS
EX. 12" UG GAS
EX. 4" UG







ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, CI IL 4 Inch, Modified	177	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, SEL	190	Ton
5012024	HMA, 4EL	172	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Syd
8032002	Curb Ramp, Conc, 6 Inch	0	Syd
8110044	Pavt Mrkg, Poly Cold Plastic, 18 Inch, Stop Bar	18	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	72	Ft
4037050	_ Dr Structure Cover, VM, Modified	1	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE
- HYDRANT
- GATE VALVE
- MANHOLE CATCH BASIN
- UTILITY POLE
- GUY POLE
- GUY WIRE
- MANHOLE
- HYDRANT
- GATE VALVE
- INLET
- C.B.
- MANHOLE
- EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- PR. SANITARY SEWER
- PR. WATER MAIN
- PR. STORM SEWER
- PR. INFILTRATION BASIN
- PROPOSED HIGH/LOW POINT
- PR. GRADE BREAK
- PR. TOP OF CURB ELEVATION
- PR. GUTTER ELEVATION
- PR. TOP OF WALK ELEVATION
- PR. TOP OF PVMT. ELEVATION
- WALL TOP/BOTTOM ELEVATION

FP 600.00 LP 600.00
GB 600.00
TC 600.00
GU 600.00
TW 600.00
TP 600.00
WT 600.00 WB 600.00

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
46860 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(13 of 22)
(Contract B)

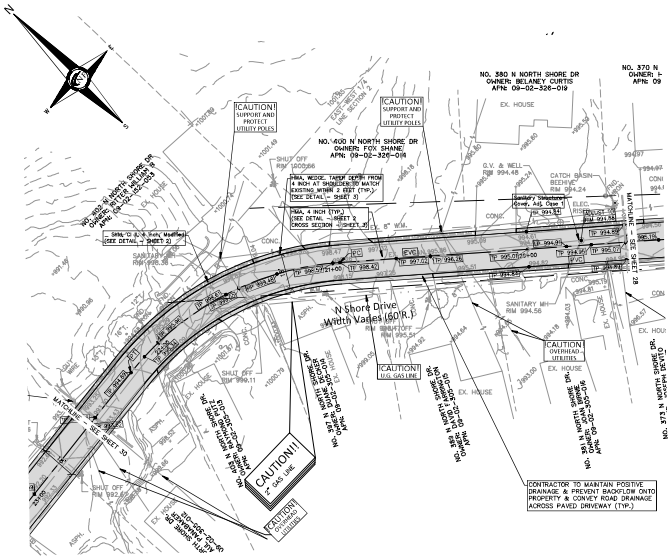
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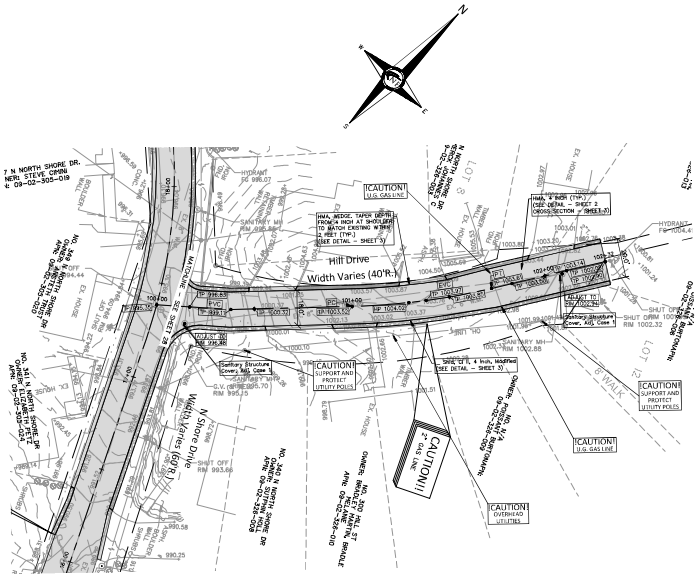
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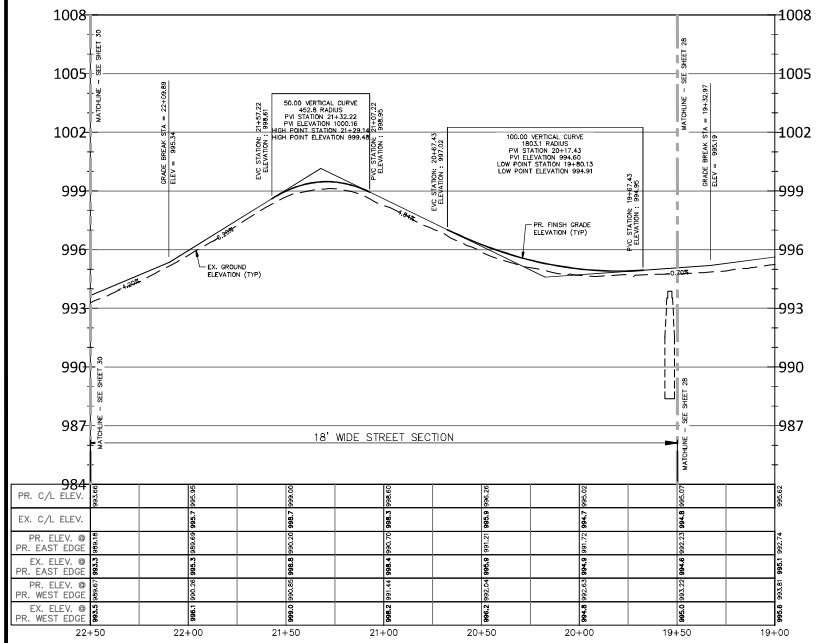
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

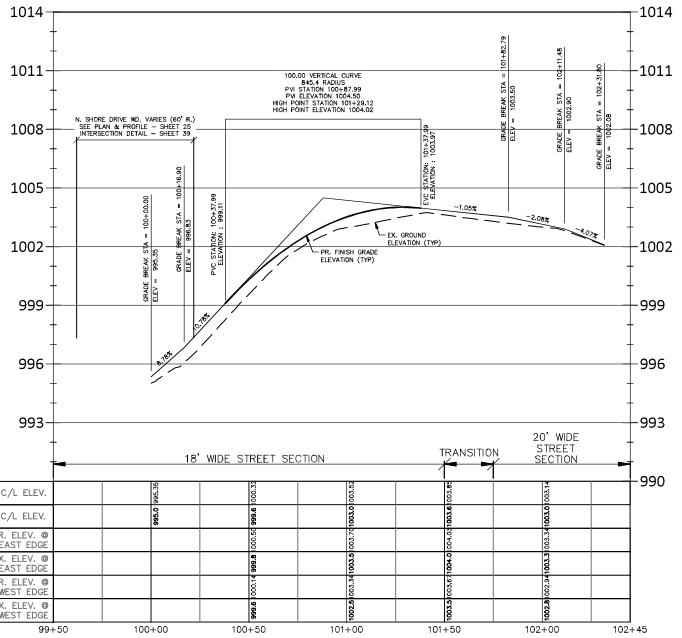
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SHEET NO. 28

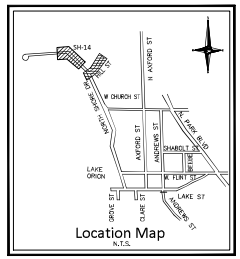
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ESTIMATED QUANTITIES THIS SHEET - N. Shore

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	__ Shld, Cl II, 4 Inch, Modified	74	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Top 6 Inch	0	Ea
4047083	__ Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, 5EL	77	Ton
5012024	HMA, 4EL	66	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Syd
8032002	Curb Ramp, Conc, 6 Inch	0	Syd
8110044	Pavt Mrkg, Ovly Cold Plastic, 18 Inch, Stop Bar	0	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	Dr Structure Cover, MH, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea
4030210	Dr Structure, 48 Inch	1	Ea

ESTIMATED QUANTITIES THIS SHEET - Hill

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	__ Shld, Cl II, 4 Inch, Modified	308	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Top 6 Inch	0	Ea
4047083	__ Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, 5EL	52	Ton
5012024	HMA, 4EL	48	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Syd
8032002	Curb Ramp, Conc, 6 Inch	0	Syd
8110044	Pavt Mrkg, Ovly Cold Plastic, 18 Inch, Stop Bar	0	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	Dr Structure Cover, MH, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	2	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- SAN. CLEAN OUT
- HYDRANT / GATE VALVE — EXISTING WATERMAIN
- MANHOLE / CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE / GUY POLE / GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- EXISTING GAS MAIN
- MANHOLE — PR. SANITARY SEWER
- HYDRANT / GATE VALVE — PR. WATER MAIN
- INLET / C.B. / MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- PROPOSED HIGH/LOW POINT
- PR. GRADE BREAK
- PR. TOP OF CURB ELEVATION
- PR. GUTTER ELEVATION
- PR. TOP OF WALK ELEVATION
- PR. TOP OF PVMT. ELEVATION
- WALL TOP/BOTTOM ELEVATION

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans (14 of 22) (Contract B)

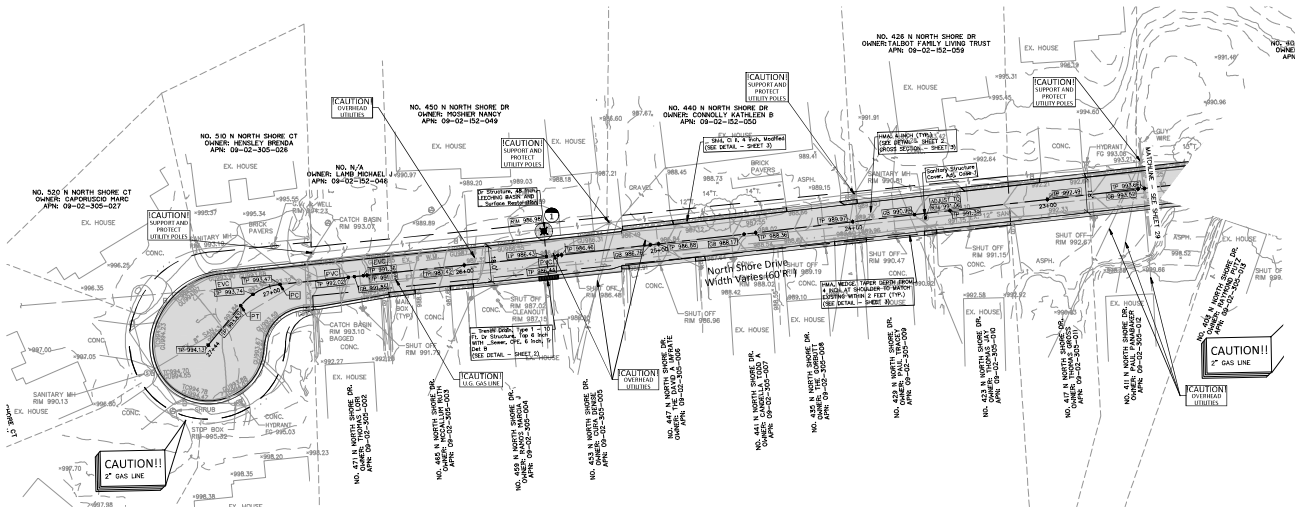
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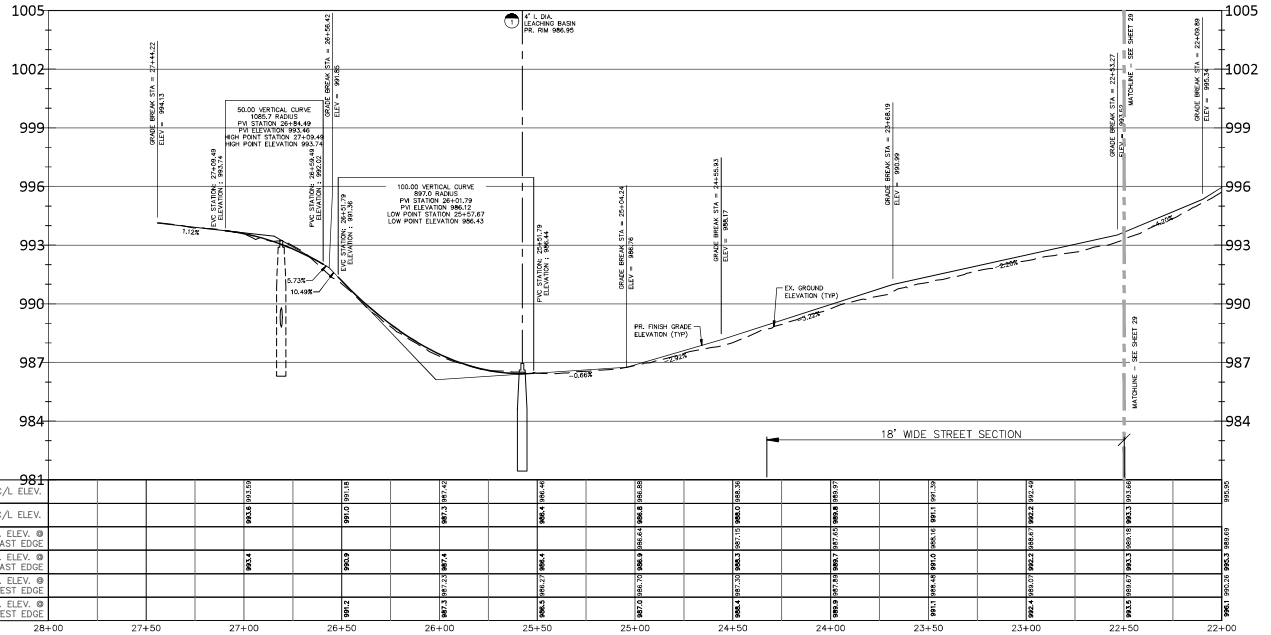
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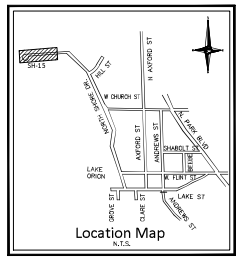
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 29

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ESTIMATED QUANTITIES THIS SHEET
CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	_ Shld, CI II, 4 Inch, Modified	49	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	1	Ea
4047083	_ Sewer, CPE, 6 Inch, Tr Det 2	23	Ft
5012027	HMA, SEL	157	Ton
5012024	HMA, 4EL	141	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pvmt Mrkg, Duty Cold Plastic, 18 Inch, Stop Bar	0	Ft
8110163	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	_ Dr Structure Cover, WA, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea
4037001	_ Trench Drain, Type 1	10	Ft

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE	EXISTING SANITARY SEWER
HYDRANT / GATE VALVE	SAN. CLEAN OUT
MANHOLE / CATCH BASIN	EXISTING WATERMAIN
	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
UTILITY POLE / GUY POLE / GUY WIRE	EXISTING BURIED CABLES
	OVERHEAD LINES
	LIGHT POLE
	SIGN
C.O. / MANHOLE	EXISTING GAS MAIN
HYDRANT / GATE VALVE	PR. SANITARY SEWER
INLET / C.B. / MANHOLE	PR. WATER MAIN
	PR. STORM SEWER
	PR. INFILTRATION BASIN
HP 600.00 / LP 600.00	PROPOSED HIGH/LOW POINT
GB 600.00	PR. GRADE BREAK
TC 600.00	PR. TOP OF CURB ELEVATION
GU 600.00	PR. GUTTER ELEVATION
TW 600.00	PR. TOP OF WALK ELEVATION
TP 600.00	PR. TOP OF PVMT. ELEVATION
WT 600.00 / WB 600.00	WALL TOP/BOTTOM ELEVATION

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SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(15 of 22)
(Contract B)

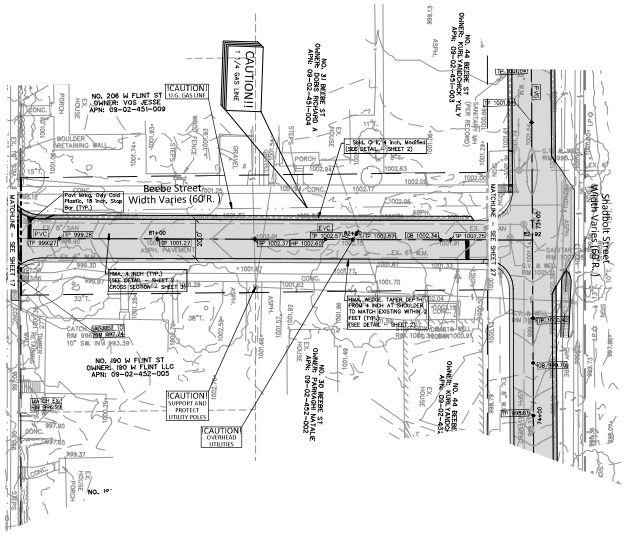
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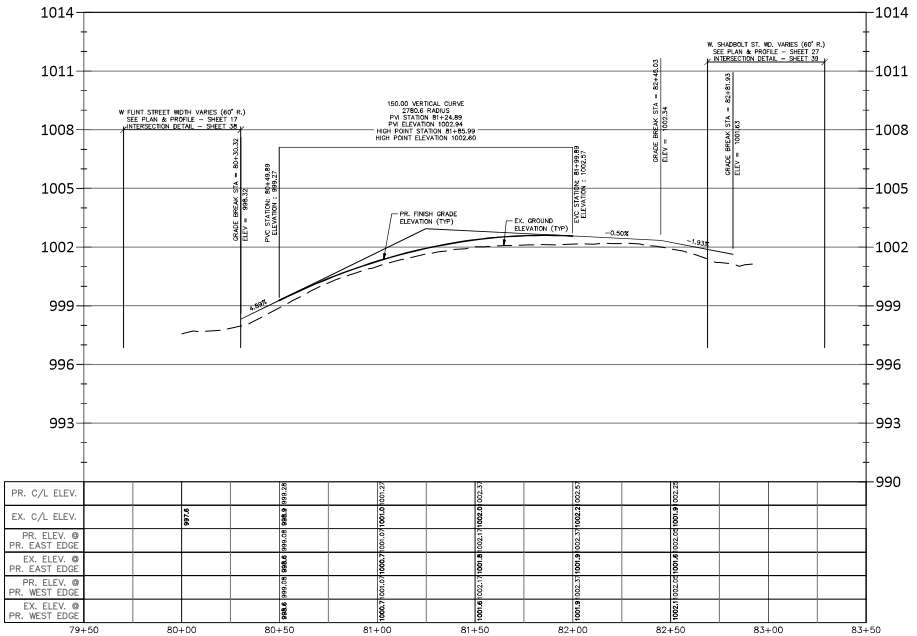
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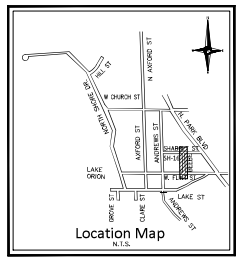
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 30

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ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	... Shld, CI IL 4 Inch, Modified	52	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Top 6 Inch	0	Ea
4041063	... Sewer, CPE, 6 Inch, Tr B	0	Ft
5012037	HMA, 5E,	126	Ton
5012024	HMA, 4E,	117	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pvmt Mrkg, Only Cold Plastic, 18 Inch, Stop Bar	21	Ft
8110153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037060	... Dr Structure Cover, Wtk, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT, GATE VALVE — SAN. CLEAN OUT
- GATE VALVE — EXISTING WATERMAIN
- MANHOLE, CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- EXISTING BURIED CABLES
- UTILITY POLE, GUY POLE, GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- G.O. MANHOLE — EXISTING GAS MAIN
- PR. SANITARY SEWER
- HYDRANT, GATE VALVE — PR. WATER MAIN
- INLET, C.B., MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- HP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
- GB 600.00 — PR. GRADE BREAK
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

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NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL: (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Construction Plans
(16 of 22)
(Contract B)

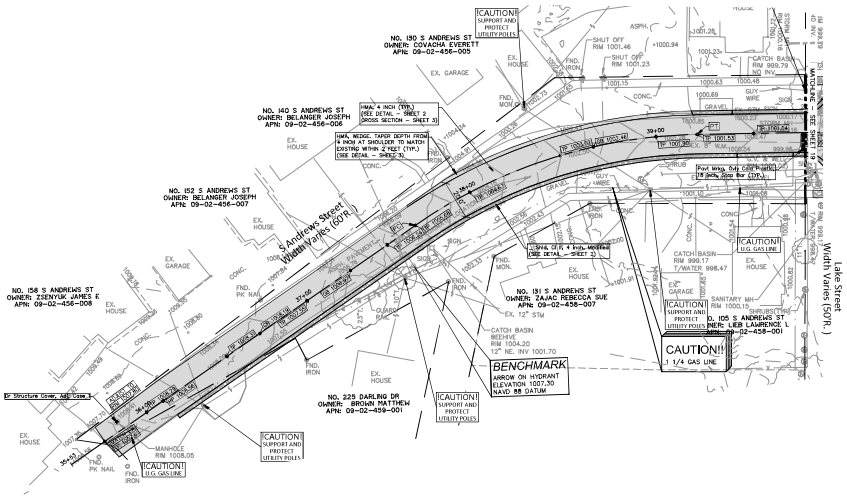
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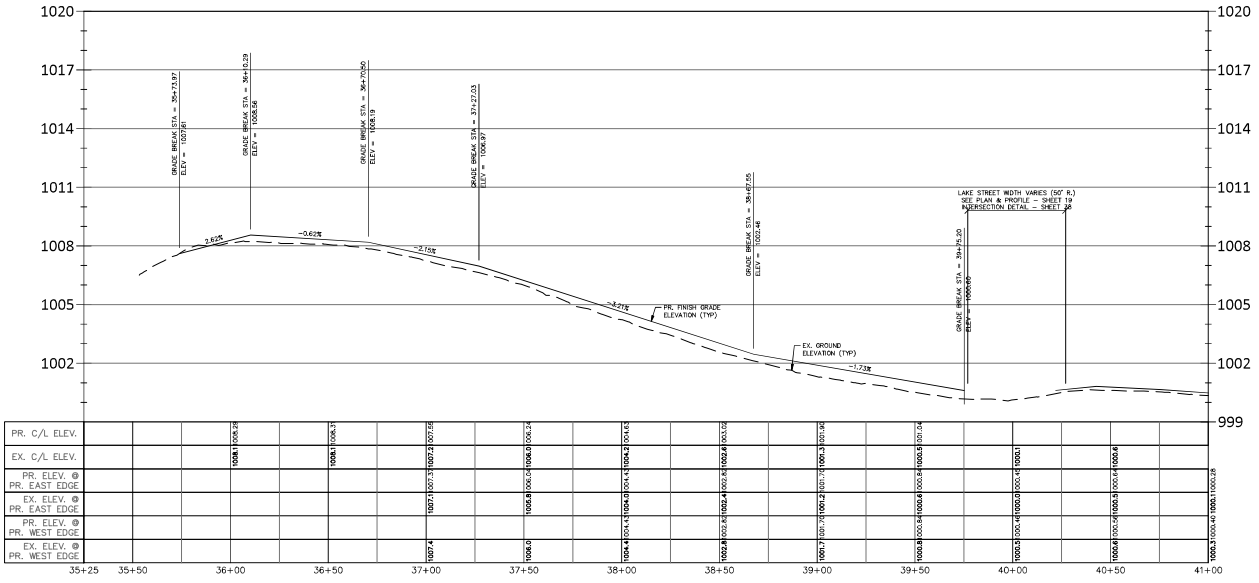
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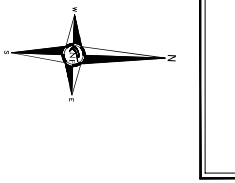
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 31

V:\P\P-2026\Plan\W\P230-P3\P3\P230 25-Lake Orion Street Improvement Program\Construction Documents\CAD\Sheets\Plan Sheets\P230_P3_Plan Sheets.dwg, 7/2/2026 3:35 PM, AutoCAD PDF (High Quality Print).pc3







ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	... Shld, CI A, 4 Inch, Modified	92	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	... Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, 5EL	104	Ton
5012024	HMA, 4EL	93	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pavt Mrkg, Duty Cold Plastic, 18 Inch, Stop Bar	0	Ft
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	... Dr Structure Cover, IRM, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT / GATE VALVE — EXISTING WATERMAIN
- MANHOLE / CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE / GUY POLE / GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- G.O. MANHOLE — EXISTING GAS MAIN
- PR. SANITARY SEWER
- HYDRANT / GATE VALVE — PR. WATER MAIN
- INLET / C.B. / MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- HP 600.00 / LP 600.00 — PROPOSED HIGH/LOW POINT
- GB 600.00 — PR. GRADE BREAK
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GJ 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
- WT 600.00 / WB 600.00 — WALL TOP/BOTTOM ELEVATION

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SHEET
Construction Plans
(17 of 22)
(Contract B)

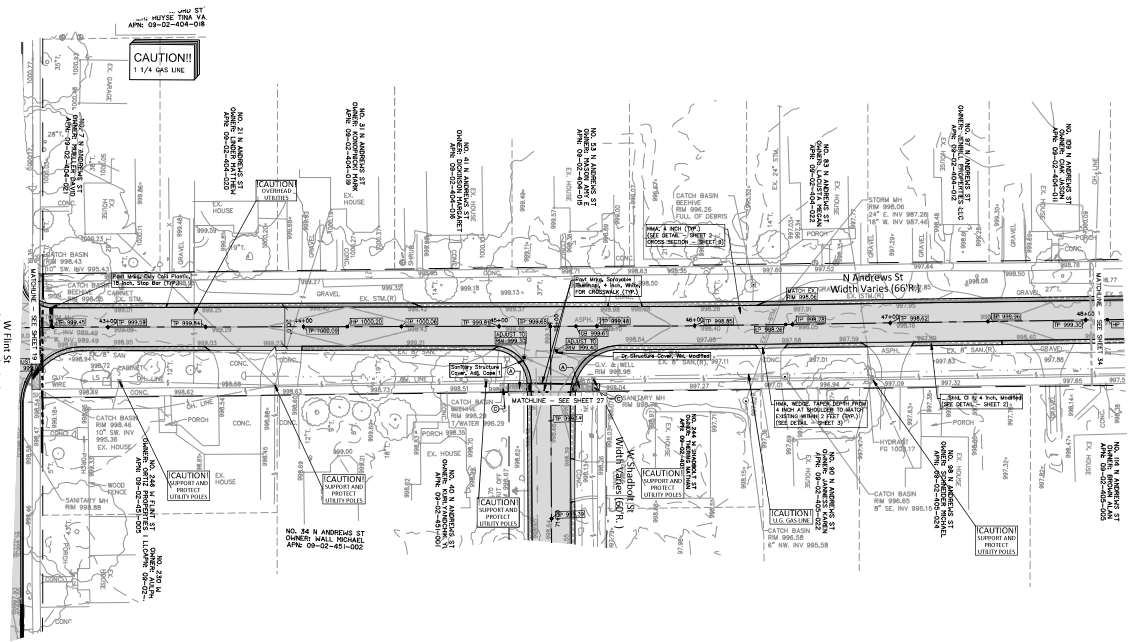
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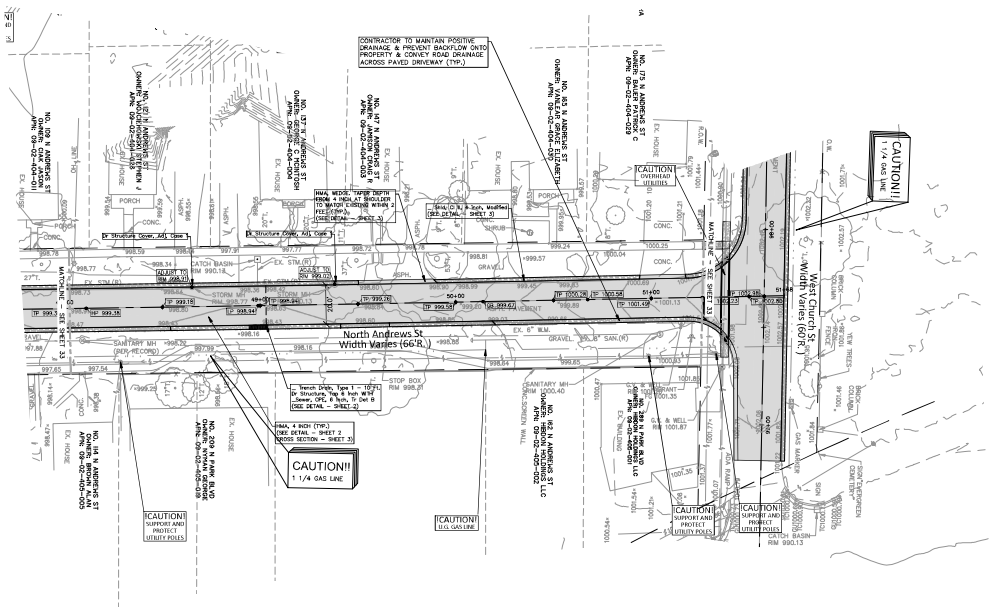
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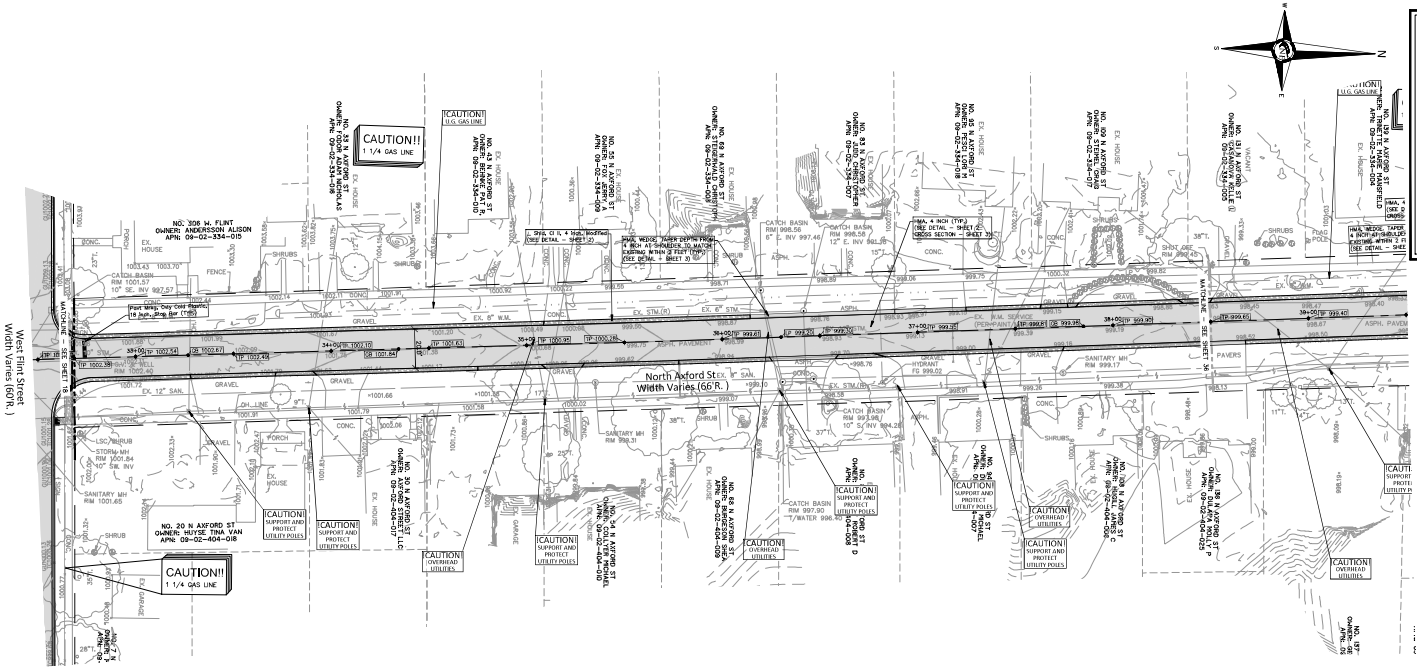
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

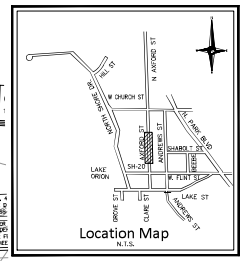
NFE JOB NO. P230
SHEET NO. 32

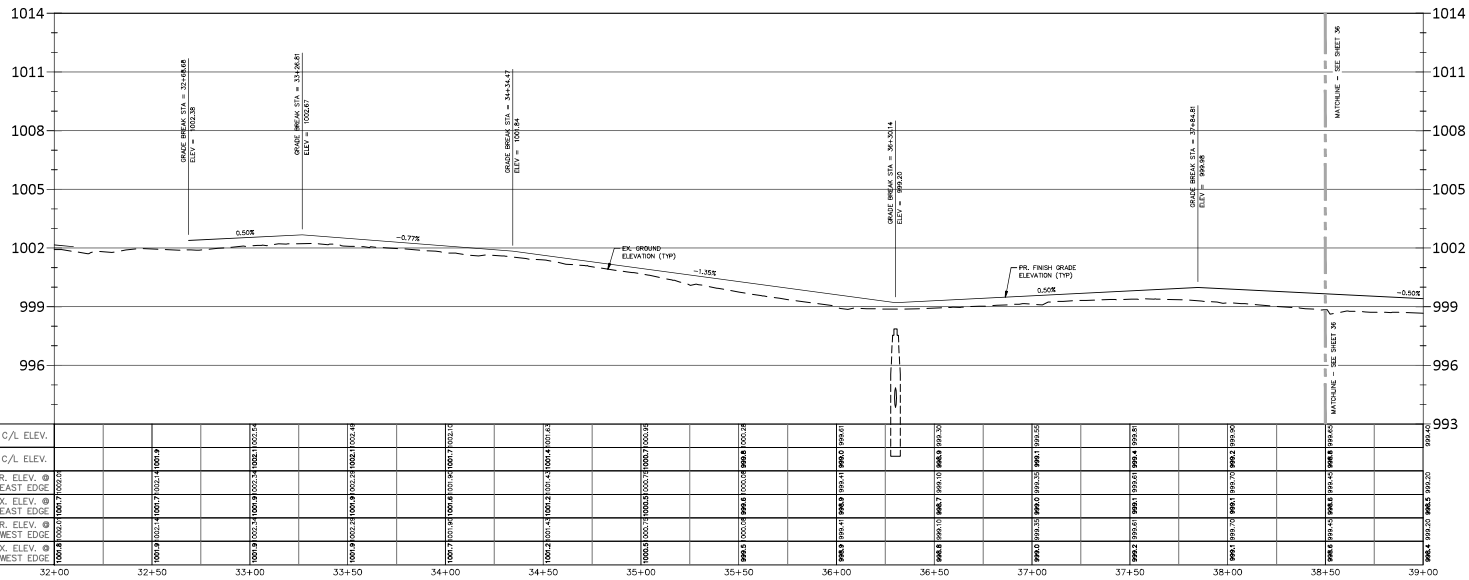
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CAUTION!!
1 1/4 GAS LINE
N Andrews St
Width Varies (66' R.)
W Flint St
(60' R.)
W Shadbolt St
Width Varies (50' R.)
CAUTION
OVERHEAD UTILITIES
CAUTION
SUPPORT AND PROTECT UTILITY POLES
MATCHLINE - SEE SHEET 27
MATCHLINE - SEE SHEET 29
NO. 34 N ANDREWS ST
OWNER: WALL MICHAEL
APN: 09-02-451-002
NO. 46 N ANDREWS ST
OWNER: SCHERER HERMAN SR
APN: 09-02-451-001
NO. 63 N ANDREWS ST
OWNER: SCHERER HERMAN SR
APN: 09-02-404-022
NO. 51 N ANDREWS ST
OWNER: NOWAK LEO V
APN: 09-02-404-016
NO. 59 N ANDREWS ST
OWNER: NOWAK LEO V
APN: 09-02-404-017
NO. 69 N ANDREWS ST
OWNER: NOWAK LEO V
APN: 09-02-404-018
NO. 249 W FLINT ST
OWNER: NOWAK LEO V
APN: 09-02-404-020
NO. 244 W SHADBOLT ST
OWNER: NOWAK LEO V
APN: 09-02-404-021
NO. 255 W FLINT ST
OWNER: NOWAK LEO V
APN: 09-02-404-015
Sanitary Structure Cover, Adj. Case 1
Dr Structure Cover, Adj, Case 1
Dr Structure Cover, WA, Modified
SANITARY MH
CATCH BASIN
HYDRANT
STORM MH
GUY WIRE
UTILITY POLE
CATCH BASIN RIM 998.43
10" SW. INV 995.43
CATCH BASIN RIM 998.46
10" SW. INV 995.36
CATCH BASIN RIM 996.26
FULL OF DEBRIS
CATCH BASIN RIM 996.65
8" SE. INV 995.15
CATCH BASIN RIM 996.58
6" NW. INV 995.58
STORM MH RIM 998.06
24" E. INV 987.28
18" W. INV 987.46
HYDRANT FG 1005.17
SANITARY MH RIM 998.88
SANITARY MH RIM 998.96
SANITARY MH RIM 999.26
SANITARY MH RIM 998.04
SANITARY MH RIM 998.54
SANITARY MH RIM 998.27
SANITARY MH RIM 998.54
SANITARY MH RIM 998.15


CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE & PREVENT BACKFLOW ONTO PROPERTY & CONVEY ROAD DRAINAGE ACROSS PAVED DRIVEWAY (TYP.)
North Andrews St
Width Varies (60 ft.)
West Church St
Width Varies (60 ft.)
CAUTION!! 1 1/4 GAS LINE
CAUTION! SUPPORT AND PROTECT UTILITY POLES
CAUTION! E.G. GAS LINE
CAUTION! OVERHEAD UTILITIES
CAUTION! SUPPORT AND PROTECT UTILITY POLES
CAUTION! SUPPORT AND PROTECT UTILITY POLES
CATCH BASIN RIM 990.13
Trench Drain, Type 1 - 10 Ft
Dr Structure, Top 6 Inch W/ 12 Inch Sump, Sewer, CPE, 6 Inch, Tr Det B
(SEE DETAIL - SHEET 2)
HMA, 4 INCH (TYP.)
(SEE DETAIL - SHEET 2)
(CROSS SECTION - SHEET 3)
Dr Structure Cover, Adj, Case 1
Dr Structure Cover, Adj, Case 2
STOP BOX RIM 998.87
SANITARY MH RIM 990.40
SANITARY MH (RDY-RECOND) RIM 997.88
SAN. & WELL RIM 1001.87
FIRE HYDRANT RIM 1001.35
TYP. HYDRANT
MATCHLINE - SEE SHEET 33
MATCHLINE - SEE SHEET 35
NO. 67 N ANDREWS ST
NO. 71 N ANDREWS ST
NO. 75 N ANDREWS ST
NO. 79 N ANDREWS ST
NO. 83 N ANDREWS ST
NO. 87 N ANDREWS ST
NO. 91 N ANDREWS ST
NO. 95 N ANDREWS ST
NO.







ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3070126	Shld, Cl II, 4 Inch, Modified	226	Syd
8130010	Riprap, Plain	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	0	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	0	Ft
5012037	HMA, SEL	290	Ton
5012024	HMA, 4EL	285	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Sft
8030052	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pavt Mrkg, Ovly Cold Plastic, 18 Inch, Stop Bar	10	Ft
8110163	Pavt Mrkg, Sprayable Thermop, 4 Inch, White	0	Ft
4032050	Dr Structure Cover, MW, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea

PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT / GATE VALVE — SAN. CLEAN OUT
- GATE VALVE — EXISTING WATERMAIN
- MANHOLE / CATCH BASIN — EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE / GUY POLE / GUY WIRE — EXISTING BURIED CABLES
- OVERHEAD LINES
- LIGHT POLE
- SIGN
- G.O. MANHOLE — EXISTING GAS MAIN
- PR. SANITARY SEWER
- HYDRANT / GATE VALVE — PR. WATER MAIN
- INLET / C.B. / MANHOLE — PR. STORM SEWER
- PR. INFILTRATION BASIN
- PROPOSED HIGH/LOW POINT
- PR. GRADE BREAK
- PR. TOP OF CURB ELEVATION
- PR. GUTTER ELEVATION
- PR. TOP OF WALK ELEVATION
- PR. TOP OF PVMT. ELEVATION
- WALL TOP/BOTTOM ELEVATION

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Part of West 1/2 of Section 2
Town 4 North, Range 10 East,
Village of Lake Orion,
Oakland County, Michigan

SHEET
Construction Plans
(20 of 22)
(Contract B)

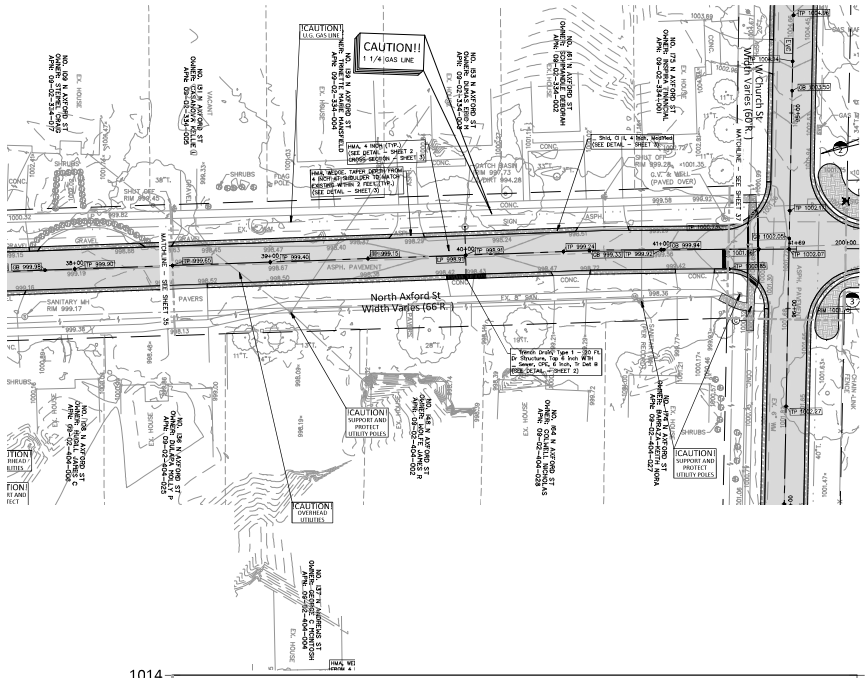
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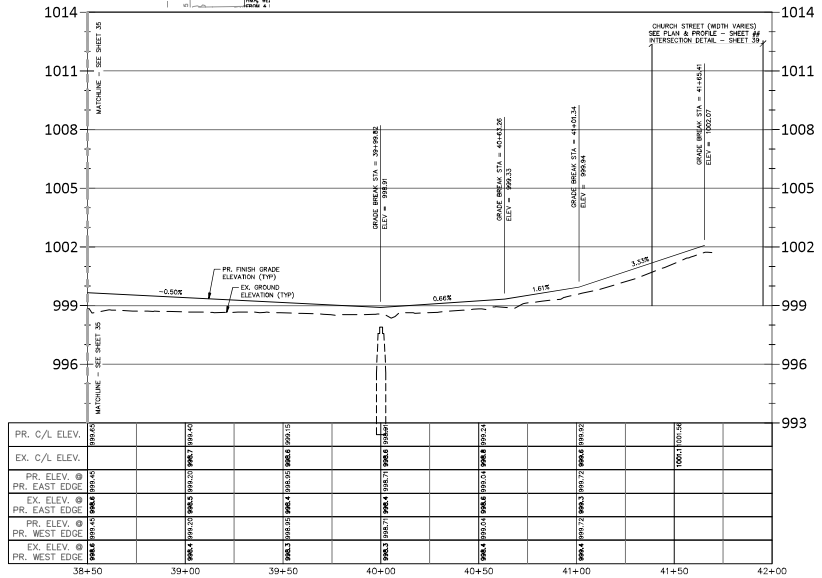
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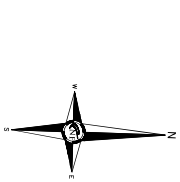
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 35

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Sidewalk Paving Legend

PAVING

A	CURB RAMP, CONC, 6 INCH WITH DETECTABLE WARNING SURFACE
B	CURB RAMP OPENING, CONC.
C	CURB RAMP, CONC, 4 INCH
D	SIDEWALK, CONC, 4 INCH

ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
3010126	Shld, Cl II, 4 Inch, Modified	100	Syd
8130010	Riprap, Plcin	0	Syd
4030005	Dr Structure Cover, Adj, Case 1	0	Ea
4030006	Dr Structure Cover, Adj, Case 2	0	Ea
4030306	Dr Structure, Tap 6 Inch	1	Ea
4047083	Sewer, CPE, 6 Inch, Tr Det B	25	Ft
5012037	HMA, 5E1	73	Ton
5012024	HMA, 4E1	70	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	15	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pvmt Mrkg, Only Cold Plastic, 18 Inch, Stop Bar	10	Ft
8110153	Pvmt Mrkg, Sprayable Thermopl, 4 Inch, White	0	Ft
4037050	Dr Structure Cover, Wtk, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	0	Ea
4027001	Trench Drain, Type 1	20	Ft

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE — EXISTING SANITARY SEWER
HYDRANT, GATE VALVE — SAN. CLEAN OUT
GATE VALVE — EXISTING WATERMAIN
MANHOLE, CATCH BASIN — EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
UTILITY POLE, GUY POLE — OVERHEAD LINES
GUY WIRE
LIGHT POLE
SIGN
EXISTING GAS MAIN
G.O. MANHOLE — PR. SANITARY SEWER
HYDRANT, GATE VALVE — PR. WATER MAIN
INLET, C.B. MANHOLE — PR. STORM SEWER
PR. INFILTRATION BASIN
EP 600.00, LP 600.00 — PROPOSED HIGH/LOW POINT
BB 600.00 — PR. GRADE BREAK
TC 600.00 — PR. TOP OF CURB ELEVATION
GU 600.00 — PR. GUTTER ELEVATION
TW 600.00 — PR. TOP OF WALK ELEVATION
TP 600.00 — PR. TOP OF PVMT. ELEVATION
WT 600.00, WB 600.00 — WALL TOP/BOTTOM ELEVATION

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SHEET
Construction Plans
(21 of 22)
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
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SCALE: 1" = 30'

NFE JOB NO. P230
SHEET NO. 36

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PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE, HYDRANT, GATE VALVE, MANHOLE CATCH BASIN, UTILITY POLE, GUY POLE, GUY WIRE, OVERHEAD LINES, LIGHT POLE

EXISTING SANITARY SEWER, SAN. CLEAN OUT, EXISTING WATERMAIN, EXISTING STORM SEWER, EX. R. Y. CATCH BASIN, EXISTING BURIED CABLES

C.O., HYDRANT, GATE VALVE, INLET, C.B., MANHOLE

SIGN, EXISTING GAS MAIN, PR. SANITARY SEWER, PR. WATER MAIN, PR. STORM SEWER, PR. R. Y. CATCH BASIN, PROPOSED LIGHT POLE

TC 600.00 PR. TOP OF CURB ELEVATION

GU 600.00 PR. GUTTER ELEVATION

TW 600.00 PR. TOP OF WALK ELEVATION

TP 600.00 PR. TOP OF PVMT. ELEVATION

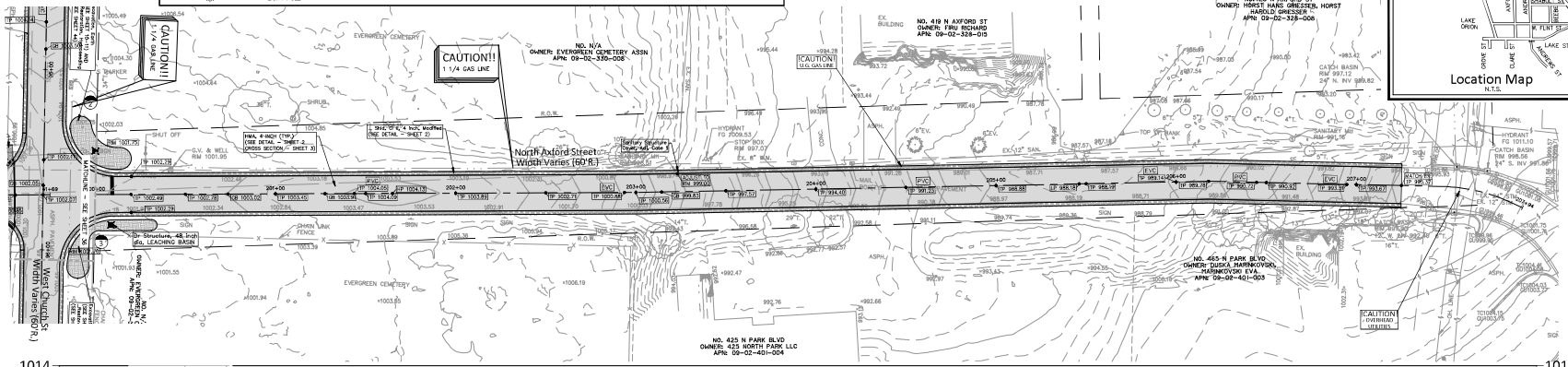
FG 600.00 FINISH GRADE ELEVATION

WT 600.00 WB 600.00 WALL TOP/BOTTOM ELEVATION

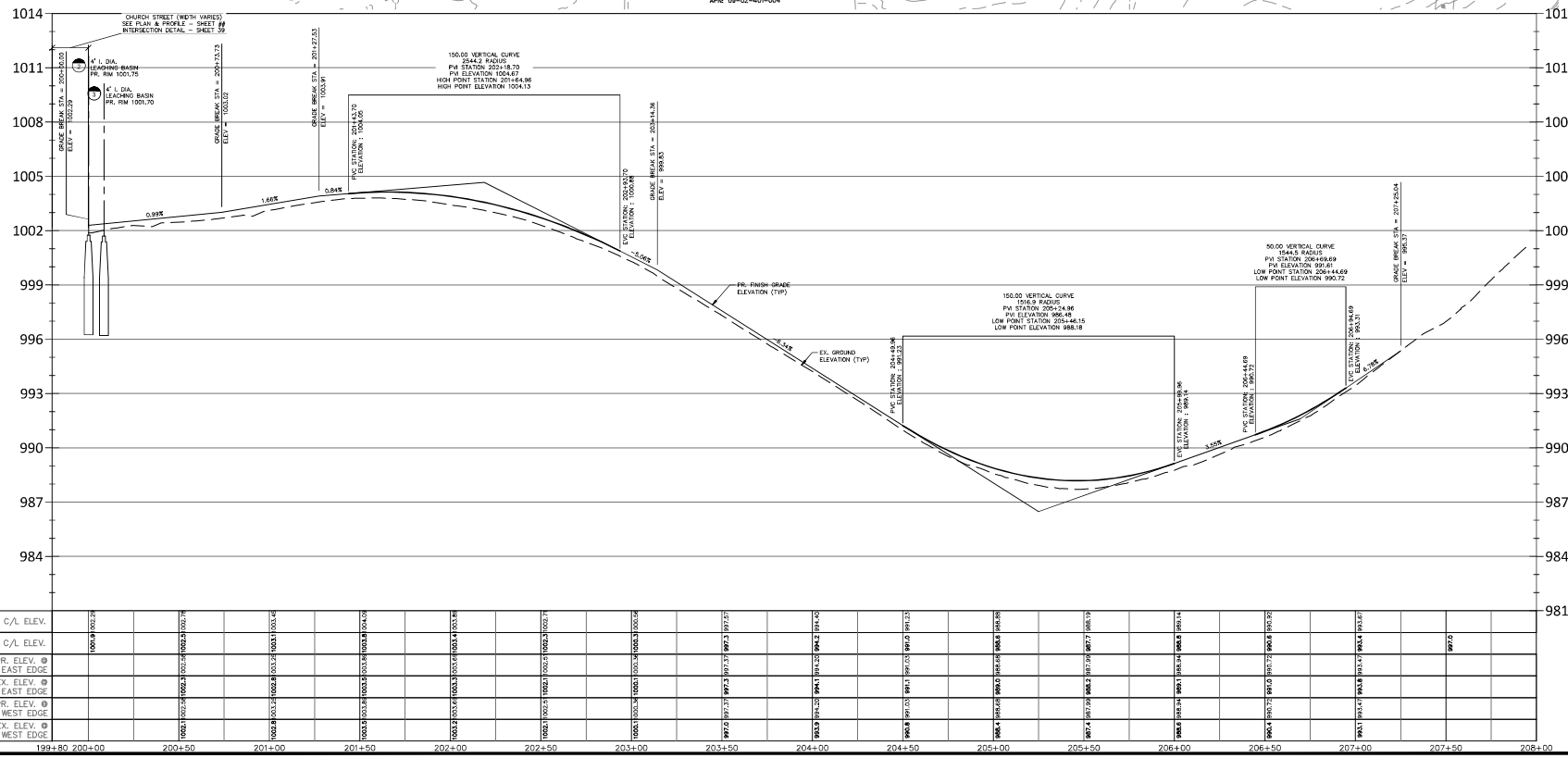
ESTIMATED QUANTITIES THIS SHEET

CONSTRUCTION

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3070126	_ Shld, Cl II, 4 Inch, Modified	322	Syd
4030065	Dr Structure Cover, Adj, Case 1	0	Ea
4030066	Dr Structure Cover, Adj, Case 2	0	Ea
5012037	HMA, 5EL	177	Ton
5012024	HMA, 4EL	177	Ton
8030010	Detectable Warning Surface	0	Ft
8030030	Curb Ramp Opening, Conc	0	Ft
8030044	Sidewalk, Conc, 4 Inch	0	Sft
8032002	Curb Ramp, Conc, 6 Inch	0	Sft
8110044	Pavt Wrkg, Only Cold Plastic, 18 Inch, Stop Bar	10	Ft
8110153	Pavt Wrkg, Sprayable Thermopl, 4 Inch, White	72	Ft
4037050	_ Dr Structure Cover, Wtl, Modified	0	Ea
8252145	Sanitary Structure Cover, Adj, Case 1	1	Ea
4030210	Dr Structure, 48 Inch	1	Ea



Location Map
N.T.S.



	199+80	200+00	200+50	201+00	201+50	202+00	202+50	203+00	203+50	204+00	204+50	205+00	205+50	206+00	206+50	207+00	207+50	208+00
PR. C/L ELEV.	1001.9	1002.28	1002.5	1002.76	1003.1	1003.45	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	
EX. C/L ELEV.		1002.39	1002.5	1002.73	1003.1	1003.49	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	
PR. ELEV. @ PR. EAST EDGE		1002.3	1002.5	1002.76	1003.1	1003.45	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	
EX. ELEV. @ PR. EAST EDGE		1002.39	1002.5	1002.73	1003.1	1003.49	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	
PR. ELEV. @ PR. WEST EDGE		1002.3	1002.5	1002.76	1003.1	1003.45	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	
EX. ELEV. @ PR. WEST EDGE		1002.39	1002.5	1002.73	1003.1	1003.49	1003.8	1004.09	1003.8	1003.86	1003.4	1002.71	1002.3	1001.54	1000.3	1000.04	997.0	

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Construction Plans
(22 of 22)
(Contract B)

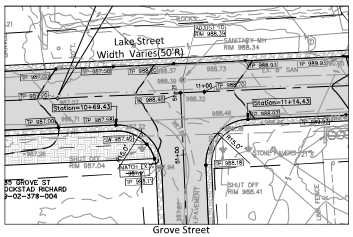
Know what's below Call before you dig.

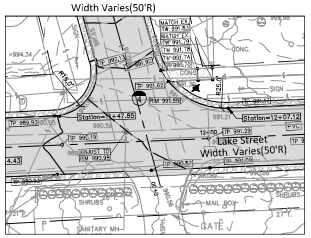
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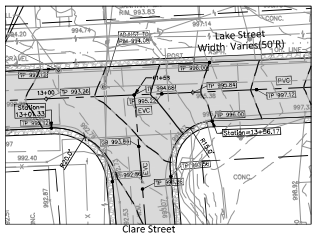
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 30'

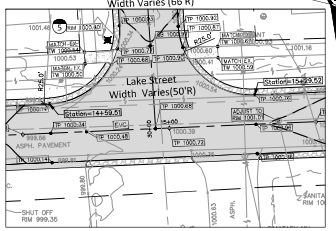
NFE JOB NO. P230
SHEET NO. 37

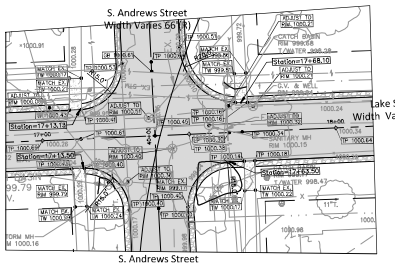
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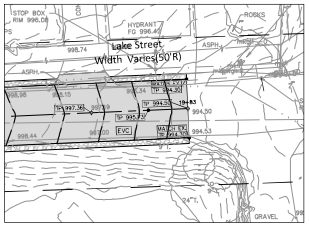


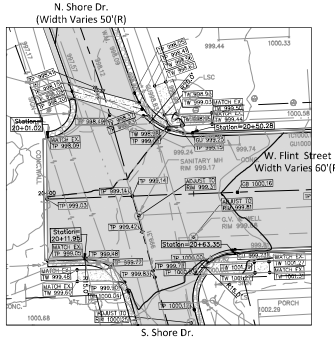


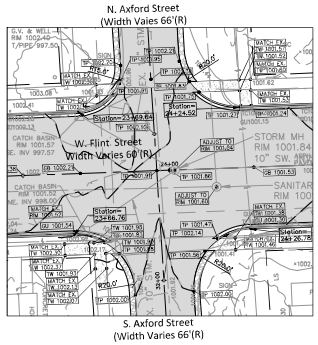


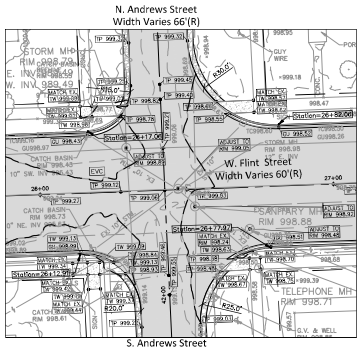


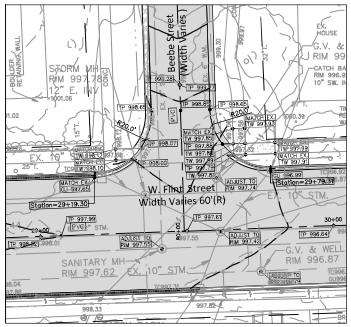


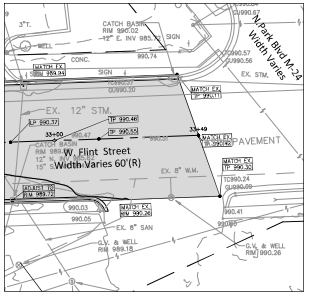


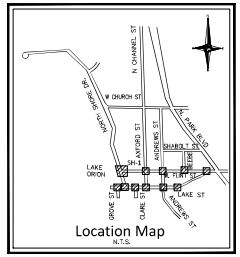












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NOWAK & FRAUS ENGINEERS
46860 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL. (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2
Town 4 North, Range 10 East,
Village of Lake Orion,
Oakland County, Michigan

SHEET
Interection Geometrics & Curb Ramp Schematics (1 of 2)

Know what's below Call before you dig.

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED ASPHALT PAVEMENT

LEGEND

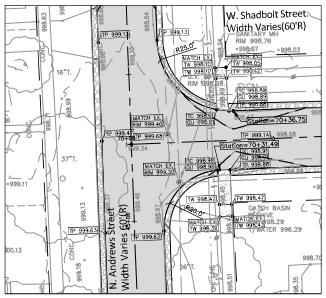
MANHOLE	EXISTING SANITARY SEWER
HYDRANT / GATE VALVE	SAN. CLEAN OUT
MANHOLE / CATCH BASIN	EXISTING WATERMAIN
	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
UTILITY POLE / GUY POLE	EXISTING BURIED CABLES
GUY WIRE	OVERHEAD LINES
	LIGHT POLE
	SIGN
C.O. / MANHOLE	EXISTING GAS MAIN
	PR. SANITARY SEWER
HYDRANT / GATE VALVE	PR. WATER MAIN
INLET / C.B. / MANHOLE	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	PROPOSED LIGHT POLE
TC 600.00	PR. TOP OF CURB ELEVATION
GU 600.00	PR. GUTTER ELEVATION
TW 600.00	PR. TOP OF WALK ELEVATION
TP 600.00	PR. TOP OF PVMT. ELEVATION
FG 600.00	FINISH GRADE ELEVATION
WT 600.00 / WB 600.00	WALL TOP/BOTTOM ELEVATION

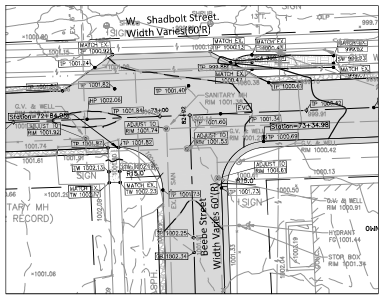
DATE	ISSUED/REVISED

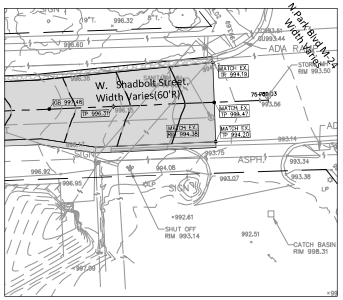
DRAWN BY: A. Filar
DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 20'

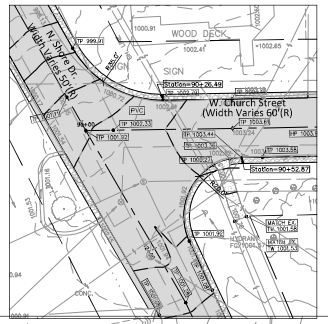
NFE JOB NO. P230
SHEET NO. 38

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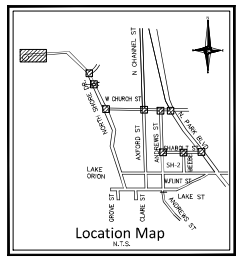




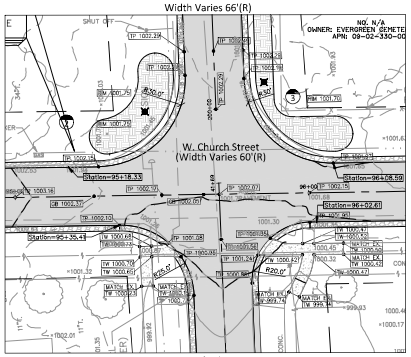




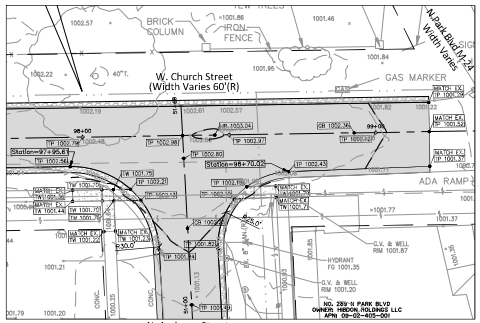




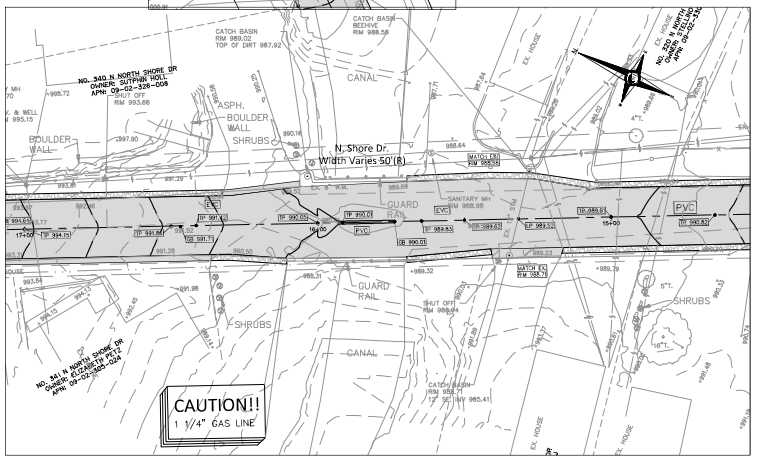
N. Axford Street
Width Varies 66'(R)

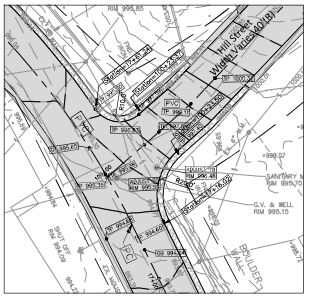


N. Axford Street
Width Varies 66'(R)

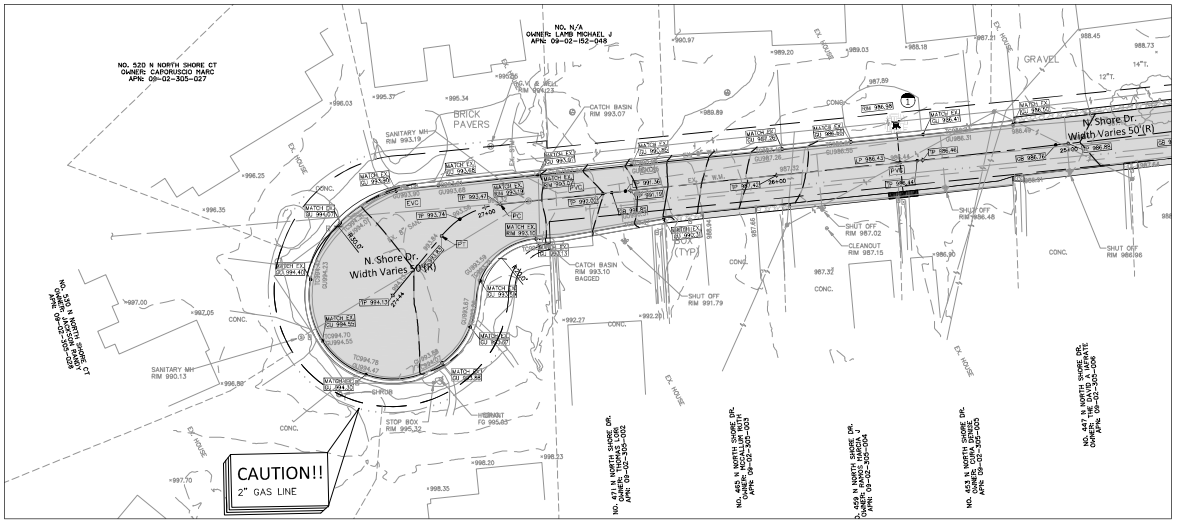


N. Andrews Street
(Width Varies 60'(R)





N. Shore Dr.
Width Varies 50'(R)



PAVING LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT / GATE VALVE — SAN. CLEAN OUT
- MANHOLE / CATCH BASIN — EXISTING WATERMAIN
- EXISTING STORM SEWER
- EX. R. Y. CATCH BASIN
- UTILITY POLE / GUY POLE — EXISTING BURIED CABLES
- GUY WIRE — OVERHEAD LINES
- LIGHT POLE
- SIGN
- C.O. / MANHOLE — EXISTING GAS MAIN
- HYDRANT / GATE VALVE — PR. SANITARY SEWER
- INLET / C.B. / MANHOLE — PR. WATER MAIN
- PR. STORM SEWER
- PR. R. Y. CATCH BASIN
- PROPOSED LIGHT POLE
- TC 600.00 — PR. TOP OF CURB ELEVATION
- GU 600.00 — PR. GUTTER ELEVATION
- TW 600.00 — PR. TOP OF WALK ELEVATION
- TP 600.00 — PR. TOP OF PVMT. ELEVATION
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LAND SURVEYORS
LAND PLANNERS

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48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL. (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Interection Geometrics & Curb Ramp Schematics (2 of 2)

Know what's below Call before you dig.

DATE	ISSUED/REVISED

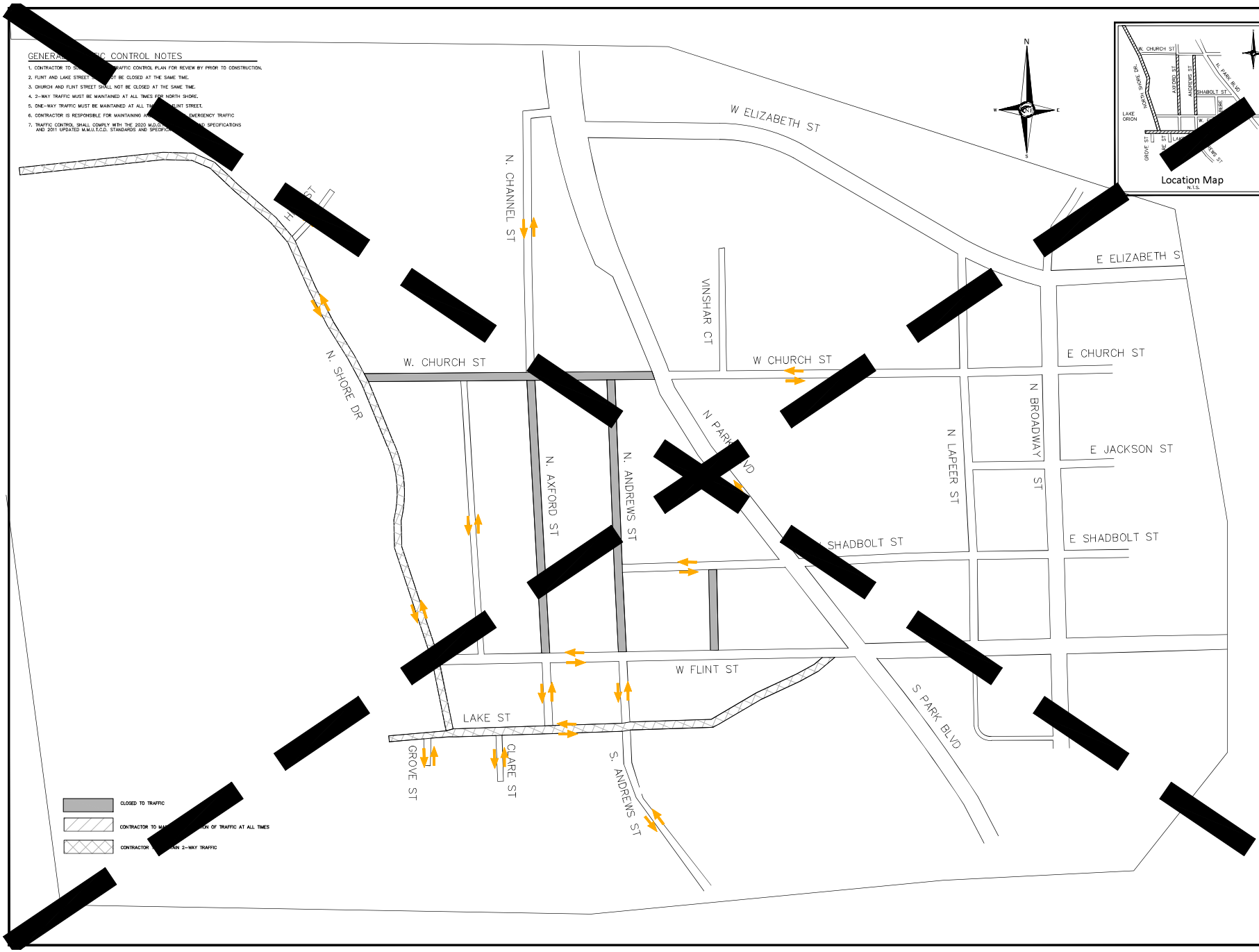
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DESIGNED BY: A. Filar
APPROVED BY: W. Spence
DATE: 06/06/2026
SCALE: 1" = 20'

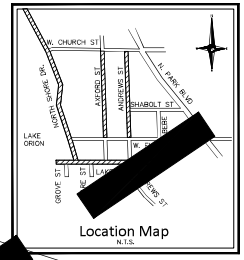
NFE JOB NO. P230
SHEET NO. 39

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GENERAL TRAFFIC CONTROL NOTES

1. CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN FOR REVIEW BY PRIOR TO CONSTRUCTION.
2. FLINT AND LAKE STREET SHALL NOT BE CLOSED AT THE SAME TIME.
3. CHURCH AND FLINT STREET SHALL NOT BE CLOSED AT THE SAME TIME.
4. 2-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES FOR NORTH SHORE.
5. ONE-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES ON FLINT STREET.
6. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ACCESS FOR EMERGENCY TRAFFIC
7. TRAFFIC CONTROL SHALL COMPLY WITH THE 2020 M.D.O.T. STANDARD SPECIFICATIONS AND 2011 UPDATED M.M.U.T.C.D. STANDARDS AND SPECIFICATIONS





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SHELBY TOWNSHIP, MI 48317
TEL: (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Maintaining Traffic - Phase 1

811 Know what's below Call before you dig.

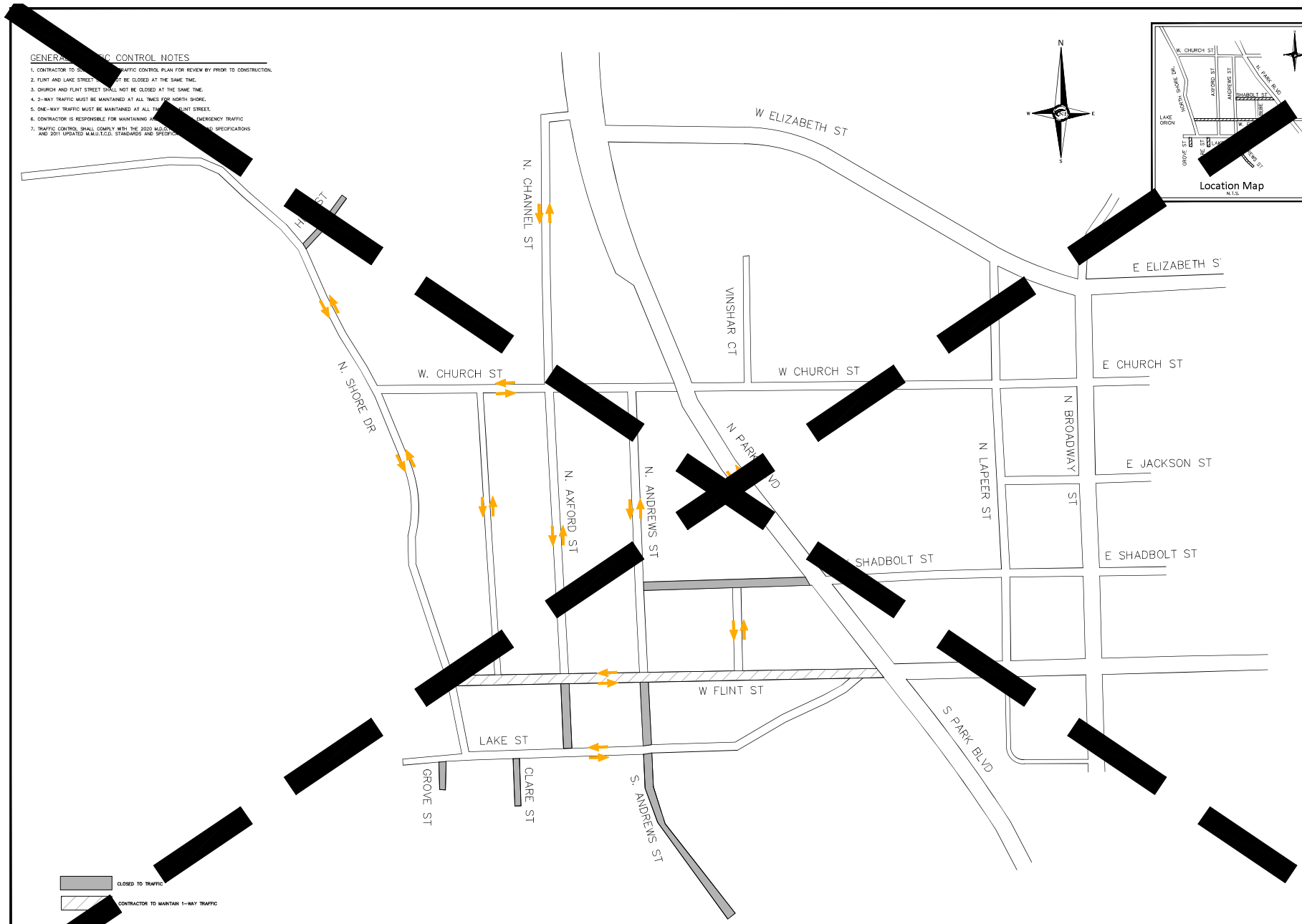
DATE	ISSUED/REVISED

DRAWN BY: A. Suchoski
DESIGNED BY: A. Suchoski
APPROVED BY: W. Spence
DATE:
SCALE:

NFE JOB NO.
P230

GENERAL TRAFFIC CONTROL NOTES

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7. TRAFFIC CONTROL SHALL COMPLY WITH THE 2020 M.D.O.T. AND 2011 UPDATED M.M.U.T.C.D. STANDARDS AND SPECIFICATIONS



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46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (844) 416-3364
FAX. (248) 332-8257
WWW.NFE-ENGR.COM

SEAL

PROJECT
?????

CLIENT
?????

PROJECT LOCATION
Part of the _ ¼
of Section _
T. , R.
City of _,
_, Michigan

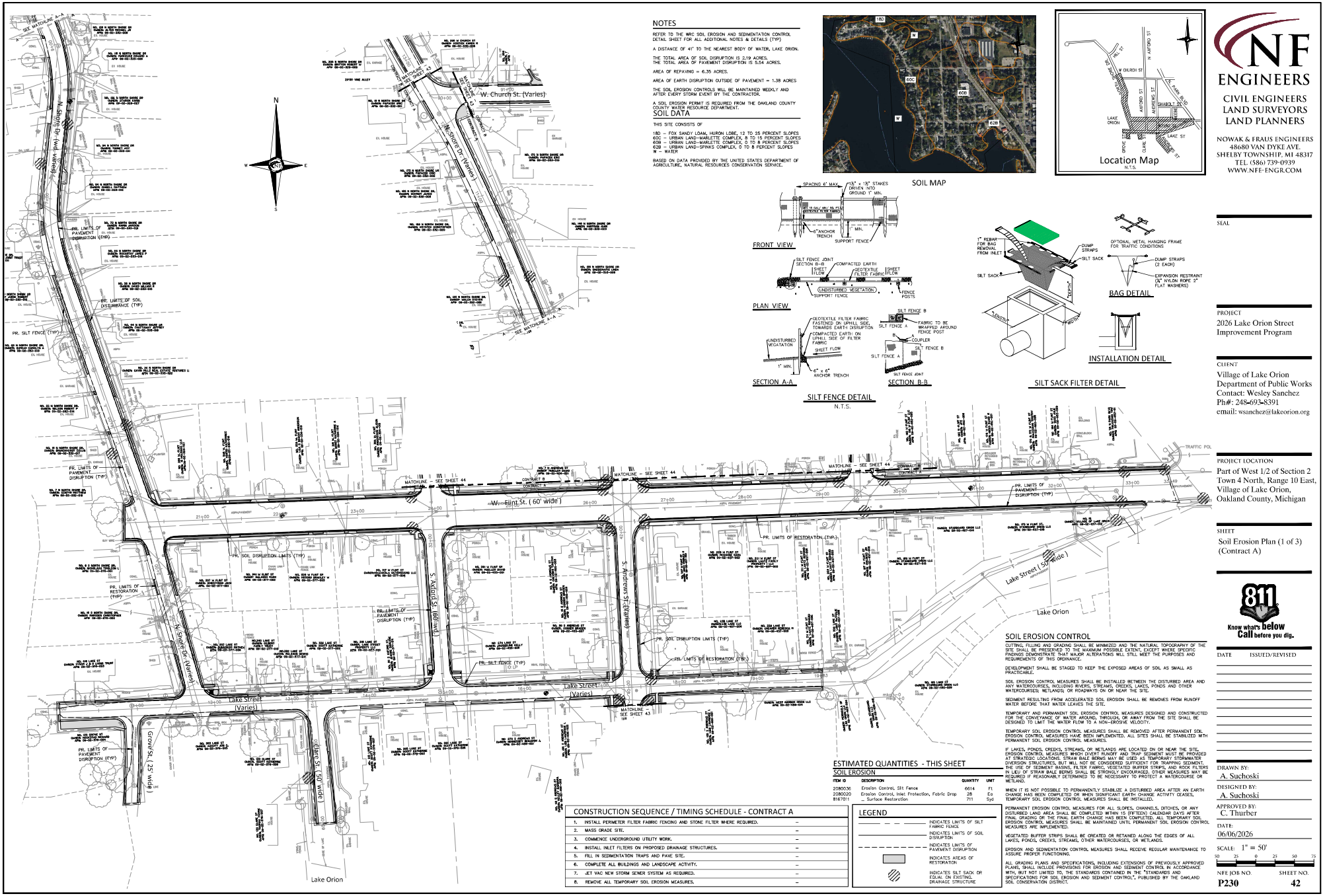
SHEET
Paving & Grading Plan

811 Know what's below Call before you dig.

DATE	ISSUED/REVISED
00/00/00	REVISED PER

DRAWN BY:
A. Suchoski
DESIGNED BY:
A. Suchoski
APPROVED BY:
W. Spence
DATE
SCALE
NFE JOB NO.
-

W:\[redacted]\Plan\NFE~1\[redacted]\Create Orion Streets Lidar Survey\Plan\Construction Documents\Plan_Set\Traffic Control Plan 10/7/2020 7:13:46 PM AutoCAD PDF (High Quality Print).pc3



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48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

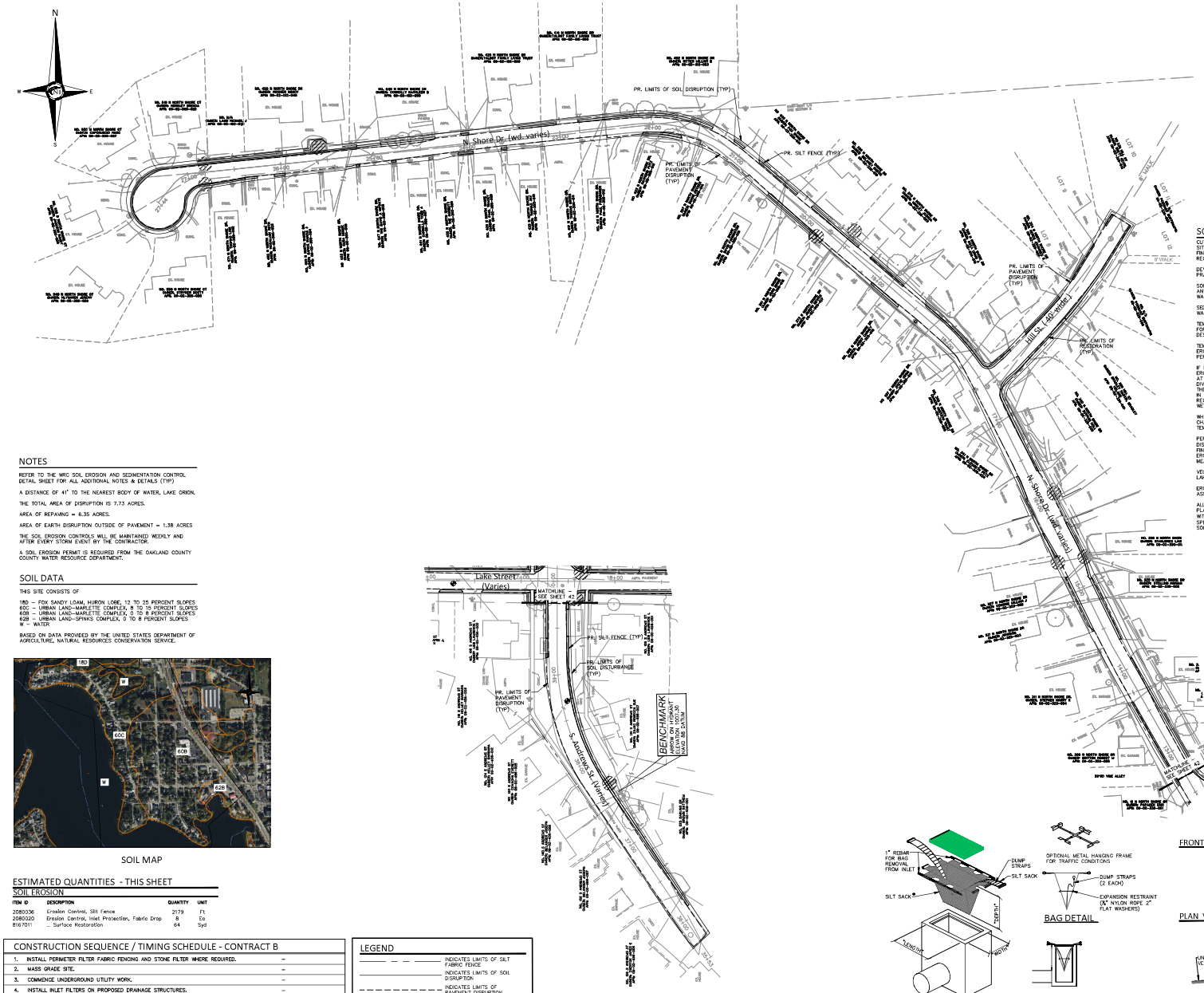
SHEET
Soil Erosion Plan (1 of 3) (Contract A)

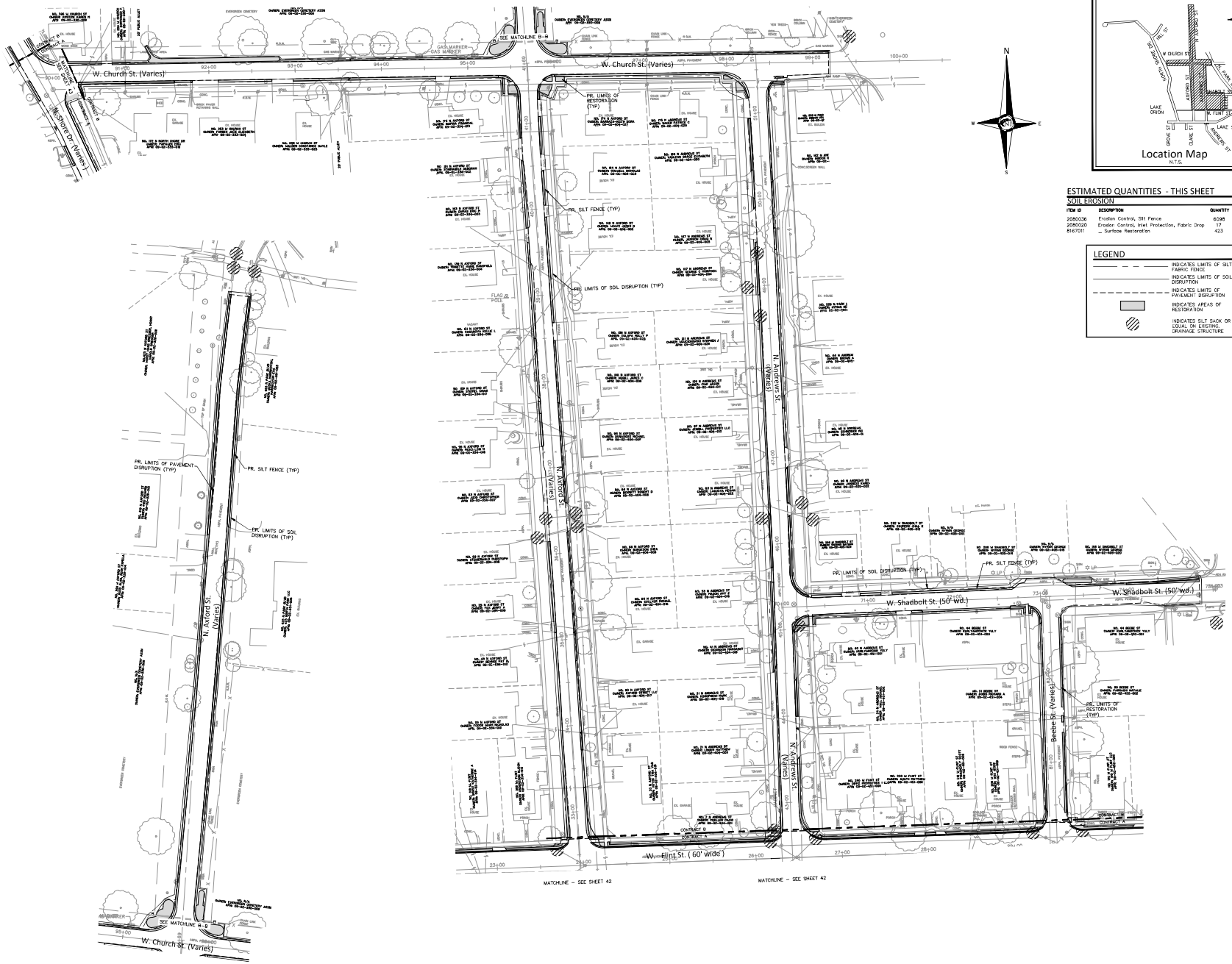
Know what's below Call before you dig.

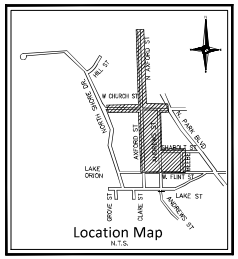
DATE ISSUED/REVISED

DRAWN BY: A. Suchoski
DESIGNED BY: A. Suchoski
APPROVED BY: C. Thurber
DATE: 06/06/2026
SCALE: 1" = 50'

NFE JOB NO. P230
SHEET NO. 42


N
S
E
W
N. Shore Dr. (wd. varies)
PR. LIMITS OF SOIL DISRUPTION (TYP)
PR. SILT FENCE (TYP)
PR. LIMITS OF PAVEMENT DISRUPTION (TYP)
PR. LIMITS OF RESTORATION (TYP)
LOT 9
LOT 10
LOT 11
LOT 12
8' WALK
1101 S.A. (460 MORE)
1176
1178
1180
1182
1184
1186
1188
1190
1192
1194
1196
1198
1200
1202
1204
1206
1208
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1230
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1234
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1242
1244
1246
1248
1250
1252
1254





ESTIMATED QUANTITIES - THIS SHEET

SOIL EROSION

ITEM ID	DESCRIPTION	QUANTITY	UNIT
2080036	Erosion Control, Silt Fence	6098	Ft
2080020	Erosion Control, Inlet Protection, Fabric Drop	17	Ea
8167011	_ Surface Restoration	423	Syd

LEGEND

- INDICATES LIMITS OF SILT FABRIC FENCE
- INDICATES LIMITS OF SOIL DISRUPTION
- INDICATES LIMITS OF PAVEMENT DISRUPTION
- INDICATES AREAS OF RESTORATION
- INDICATES SILT SACK OR EQUAL ON EXISTING DRAINAGE STRUCTURE

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
48680 VAN DYKE AVE.
SHELBY TOWNSHIP, MI 48317
TEL (586) 739-0939
WWW.NFE-ENGR.COM

SEAL

PROJECT
2026 Lake Orion Street Improvement Program

CLIENT
Village of Lake Orion
Department of Public Works
Contact: Wesley Sanchez
Ph#: 248-693-8391
email: wsanchez@lakeorion.org

PROJECT LOCATION
Part of West 1/2 of Section 2 Town 4 North, Range 10 East, Village of Lake Orion, Oakland County, Michigan

SHEET
Soil Erosion Plan (3 of 3) (Contract B)

811 Know what's below Call before you dig.

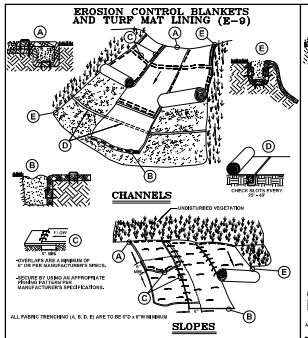
DATE	ISSUED/REVISED

DRAWN BY: A. Suchoski
DESIGNED BY: A. Suchoski
APPROVED BY: C. Thurber
DATE: 06/06/2026
SCALE: 1" = 50'

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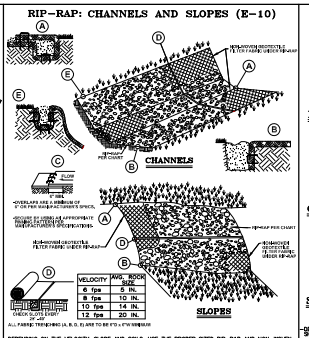
NFE JOB NO. P230
SHEET NO. 44

EROSION CONTROL BLANKETS AND TURF MAT LINING (E-9)



DEPENDING ON THE VELOCITY, SLOPE, SOILS, USE PROPER BLANKET OR TURF MAT LINING PER MANUFACTURER'S SPECIFICATIONS TO HANDLE THE SHEER STRESSES OF THE SLOPE/CHANNEL.

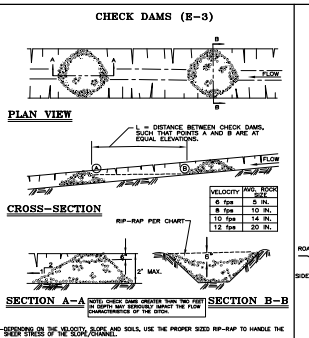
RIP-RAP: CHANNELS AND SLOPES (E-10)



VELOCITY	AVG. ROCK SIZE
6 fps	8 IN.
8 fps	10 IN.
10 fps	14 IN.
12 fps	20 IN.

DEPENDING ON THE VELOCITY, SLOPE AND SOILS, USE THE PROPER SIZED RIP-RAP AND NON-WOVEN GEOTEXTILE FABRIC TO HANDLE THE SHEER STRESS OF THE SLOPE/CHANNEL.

CHECK DAMS (E-3)



VELOCITY	AVG. ROCK SIZE
6 fps	8 IN.
8 fps	10 IN.
10 fps	14 IN.
12 fps	20 IN.

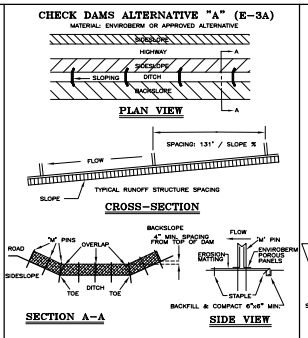
NOTE: CHECK DAMS GREATER THAN TWO FEET IN DEPTH MAY REQUIRE ALTERING THE FLOW CHARACTERISTICS OF THE DITCH.

DEPENDING ON THE VELOCITY, SLOPE AND SOILS, USE THE PROPER SIZED RIP-RAP TO HANDLE THE SHEER STRESS OF THE FLOW CHANNEL.

FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

CHECK DAMS ALTERNATIVE "A" (E-3A)

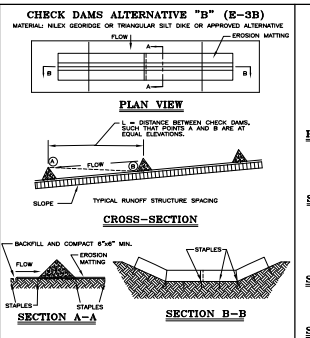
MATERIAL: ENVIROBERM OR APPROVED ALTERNATIVE



FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

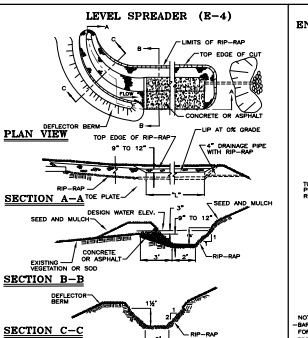
CHECK DAMS ALTERNATIVE "B" (E-3B)

MATERIAL: NILEX GEORIDGE OR TRIANGULAR SILT DIKE OR APPROVED ALTERNATIVE

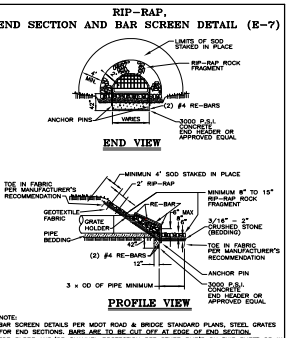


FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

LEVEL SPREADER (E-4)



RIP-RAP, END SECTION AND BAR SCREEN DETAIL (E-7)

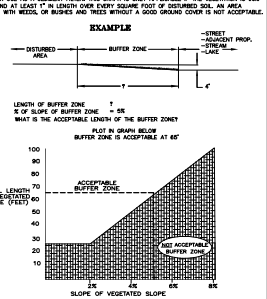


NOTE:
-BAR SCREEN DETAILS PER MDOT ROAD & BRIDGE STANDARD PLANS, STEEL GRATES FOR END SECTIONS. BARS ARE TO BE CUT OFF AT EDGE OF END SECTION.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

VEGETATIVE BUFFER ZONE (SP-1)

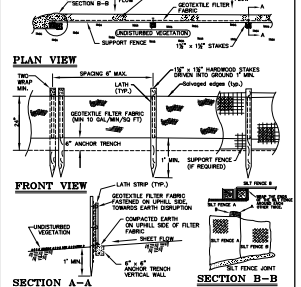
THE GRAPH SHOWN BELOW IS USED TO DETERMINE THE ADEQUACY OF AN EXISTING VEGETATIVE BUFFER ZONE FOR USE AS A SEDIMENT FILTER. THIS GRAPH IS ONLY APPLICABLE IF THE VEGETATION IS SOD DENSE AND AT LEAST 1" IN LENGTH OVER EVERY SQUARE FOOT OF DISTURBED SOIL. AN AREA COVERED WITH WEEDS, OR BUSHES AND TREES WITHOUT A GOOD GROUND COVER IS NOT ACCEPTABLE.

EXAMPLE



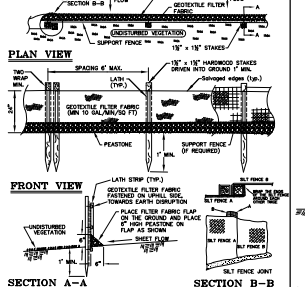
SILT FENCE (SP-2)

(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)



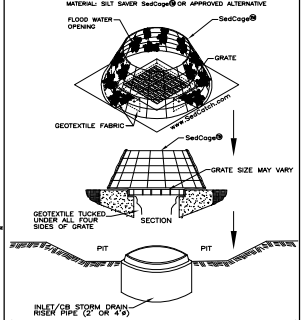
WINTER/FROZEN GROUND SILT FENCE (SP-2W)

(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)



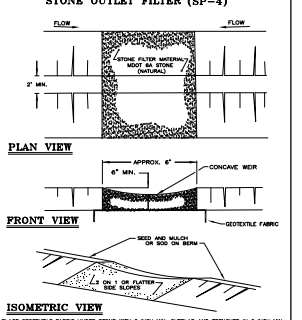
RYCB INLET FILTER ALTERNATIVE "B" (SI-3B)

MATERIAL: SILT SAVER SedCage® OR APPROVED ALTERNATIVE

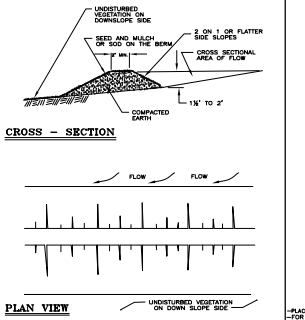


(NOTE: NO PIT REQUIRED WHEN FRAME AND COVER OR GRATE AND COVER ARE IN PLACE.)

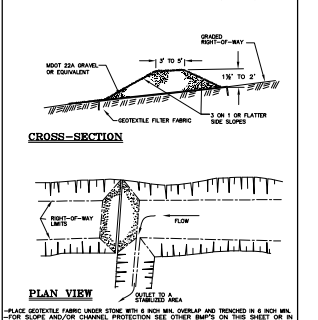
EARTH DIVERSION BERM WITH STONE OUTLET FILTER (SP-4)



EARTH DIVERSION BERM (E-2)



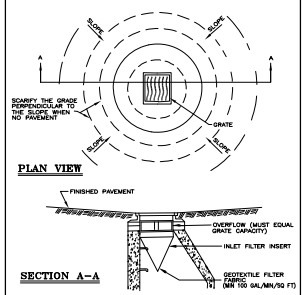
GRAVEL INTERCEPTOR DIKE (SP-6)



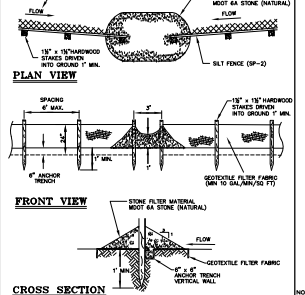
-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

LOW POINT INLET FILTER ALT. "A" (SI-2A)

MATERIAL: CATCH-ALL, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE

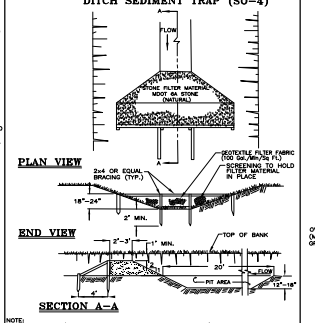


SILT FENCE GRAVEL FILTER (SP-3)



-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.

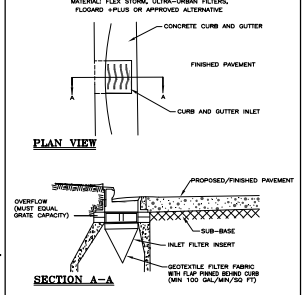
DITCH SEDIMENT TRAP (SO-4)



NOTE:
FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THE SHEET OR IN THE WRC SOIL EROSION MANUAL.

CURB AND GUTTER INLET FILTER ALTERNATIVE "A" (SI-4A)

(BEFORE AND AFTER PAVING)
MATERIAL: FLEX STORM, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE

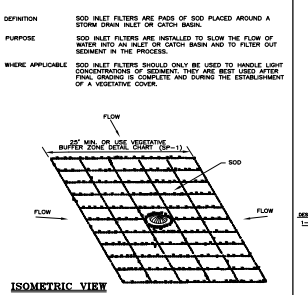


SOD INLET FILTER (SI-1)

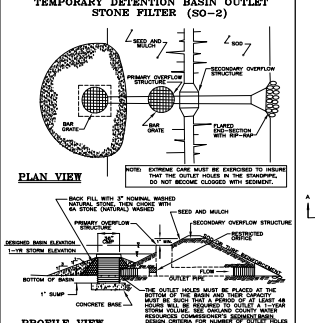
DEFINITION: SOD INLET FILTERS ARE PADS OF SOD PLACED AROUND A STORM DRAIN INLET OR CATCH BASIN.

PURPOSE: SOD INLET FILTERS ARE INSTALLED TO SLOW THE FLOW OF WATER INTO AN INLET OR CATCH BASIN AND TO FILTER OUT SEDIMENT IN THE PROCESS.

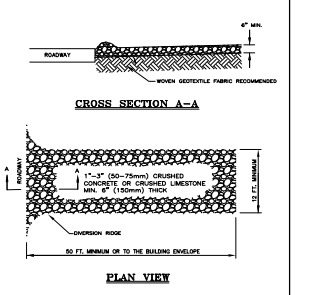
WHERE APPLICABLE: SOD INLET FILTERS SHOULD ONLY BE USED TO HANDLE LIGHT CONCENTRATIONS OF SEDIMENT. THEY ARE BEST USED AFTER FINAL GRADING IS COMPLETE AND DURING THE ESTABLISHMENT OF A VEGETATIVE COVER.



TEMPORARY DETENTION BASIN OUTLET STONE FILTER (SO-2)

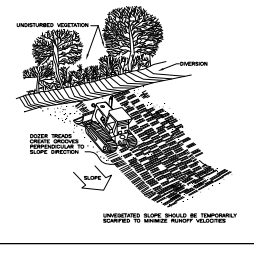


TEMPORARY STONE ACCESS DRIVE (SP-9)

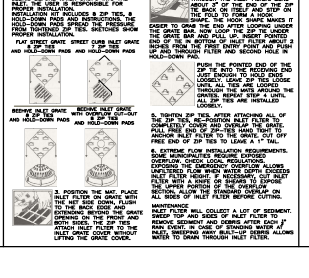


SURFACE ROUGHENING AND SCARIFICATION (E-8)

THIS IS AN EASY AND ECONOMICAL WAY TO REDUCE SOIL EROSION. IT IS SIMPLY THE PLACING OF HORIZONTAL GROOVES IN A SLOPE PERPENDICULAR TO THE FLOW OF RUNOFF. THIS CAN BE DONE BY EITHER DISC HARROWING, BLADE BLADING OR JUST RUNNING THE TREADS OF A CRAWLER TRACTOR PERPENDICULAR TO THE SLOPE AS SHOWN BELOW.



INLET FILTER
INLET PROTECTION DEVICE (IF-1)
INSTALLATION AND MAINTENANCE GUIDE



NOTE:
The Oakland County Water Resources Soil Erosion and Sedimentation Control standard details cannot be modified, reduced, edited, or changed in any way. Any deviation from these standard details must be approved in writing by the Oakland County Water Resources Commissioner. Changes otherwise made are in violation of Part 91 of Act 451 of 1994, the Natural Resources and Environmental Protection Act.

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

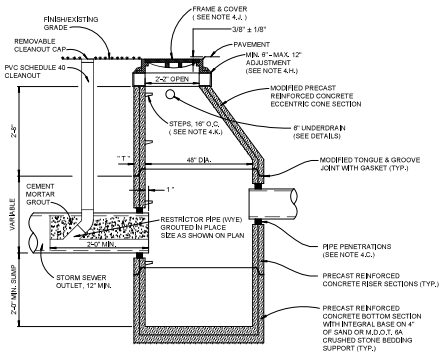
REVISIONS BLOCK			
New Symbol / Revised Item			No.
No.	By	Date	Description
1			
2			
3			
4			
5			

ORIG. DATE:	01/01/01
SCALE:	NONE
DESIGNED BY:	WRC
DRAWN BY:	Modeling

WRC WATER RESOURCES COMMISSIONER — Jim Nash

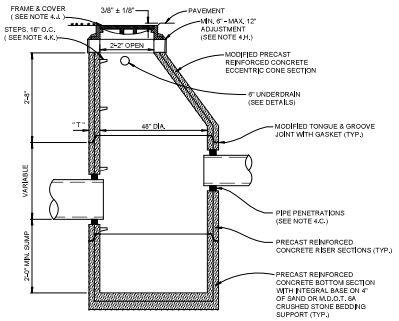
ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MI 48328-1907

SHEET NO.: 1 of 1

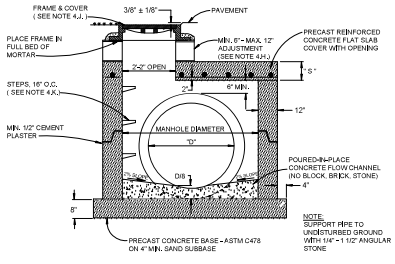


WALL THICKNESS "T"	
DEPTH	PRECAST
0'-10'	6"
10'-16'	8"

4 FT. DIAMETER CATCH BASIN WITH SUMP AND RESTRICTOR CLEANOUT



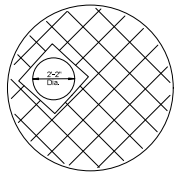
4 FT. DIAMETER CATCH BASIN WITH SUMP



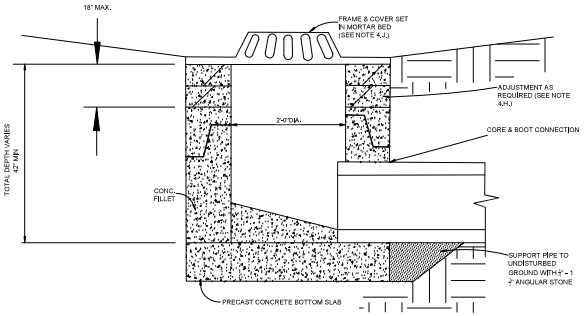
OUTLET "D"	M.H. I.D.*	TOP SLAB "S"	REINFORCING STEEL
36" OR LESS	4'	8"	3#4" @ 9" EA. WAY
42"	5'	10"	3#4" @ 9" EA. WAY
48"- 54"	6'	11"	7#5" @ 9" EA. WAY
60" OR MORE	7'	12"	1" @ 9" EA. WAY
	8'	12"	1" @ 9" EA. WAY

*DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWERS

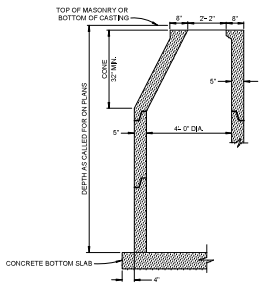
PRE-CAST LOW HEAD MANHOLE



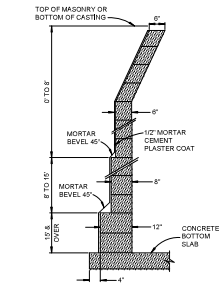
TOP SLAB PLAN VIEW



PRE-CAST INLET DETAIL



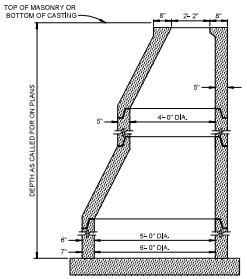
TYPICAL PRECAST CONCRETE SECTION



TYPICAL CONCRETE BLOCK SECTION

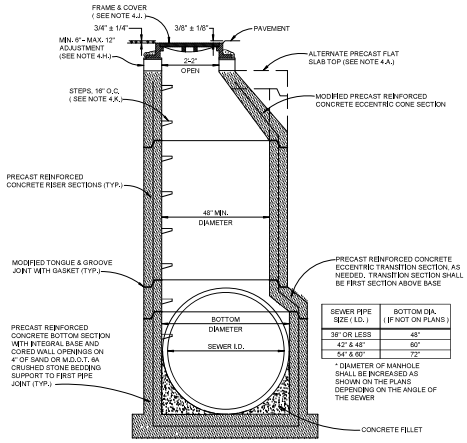
REQUIRES PRIOR WRITTEN APPROVAL OF VILLAGE D.P.W.

TYPICAL WALL SECTION FOR 4'-0" DIAMETER DRAINAGE STRUCTURE



TYPICAL PRECAST CONCRETE SECTION

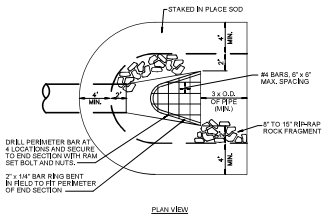
TYPICAL WALL SECTION FOR LARGER THAN 4'-0" DIAMETER DRAINAGE STRUCTURE



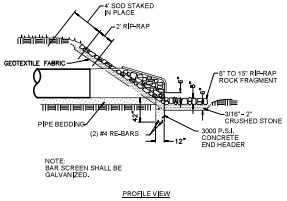
SEWER PIPE SIZE (I.D.)	BOTTOM DIA. (IF NOT ON PLANS)
39" OR LESS	48"
42" & 48"	60"
54" & 60"	72"

* DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWER

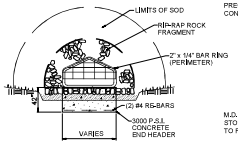
STORM SEWER MANHOLE



PLAN VIEW

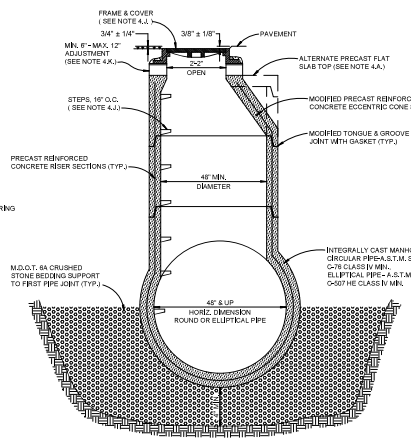


PROFILE VIEW



END VIEW

END SECTION AND BAR SCREEN DETAIL



STORM SEWER TEE MANHOLE

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
46680 VAN DYKE, SUITE 200
TEL (586) 739-0939
WWW.NOWAKFRAUS.COM

SEAL

STATE OF MICHIGAN
CAROL P. THURBER
ENGINEER
NO. 37685
LICENSED PROFESSIONAL ENGINEER

VILLAGE OF LAKE ORION
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: DIRECTOR OF PUBLIC WORKS
DATE: JUNE 1, 2024

SHEET
STORM SEWER STANDARD DETAILS (1 OF 2)

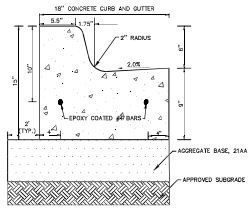
Village of Lake Orion EST 1859

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: C. Thurber
APPROVED BY: C. Thurber
DATE: 10-31-2023
SCALE: N.T.S.

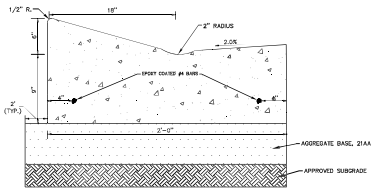
NFE JOB NO. N885
SHEET NO. 1 OF 2

W:\2020-2029 Projects\2023-PROJECTS\N885 (Village Standard Details)\Standard Details.dwg, 10/27/2023 5:14 PM



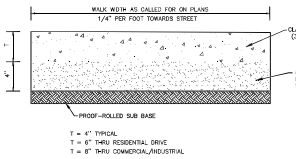
STANDARD CURB & GUTTER

N.T.S.



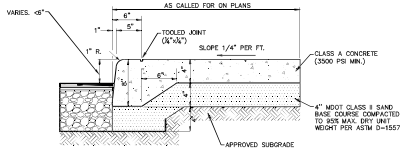
4" MOUNTABLE CURB AND GUTTER

N.T.S.



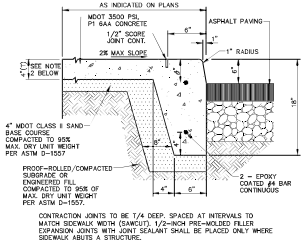
CONCRETE SIDEWALK SECTION

N.T.S.



SIDEWALK, CONC, 4" w/ THICKENED EDGE

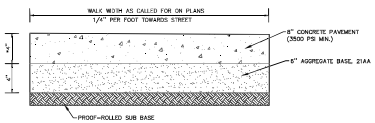
N.T.S.



CONTRACTION JOINTS TO BE 1/4 DEEP. SPACED AT INTERVALS TO MATCH SIDEWALK WIDTH (SAWCUT). 1/2-INCH PRE-MOLDED FILLER EXPANSION JOINTS WITH JOINT SEALANT SHALL BE PLACED ONLY WHERE SIDEWALK ABUTS A STRUCTURE.

INTEGRAL CURB & SIDEWALK

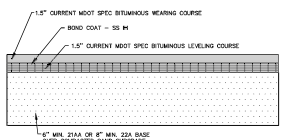
N.T.S.



CONCRETE PAVEMENT SECTION

DUMPSTER PADS

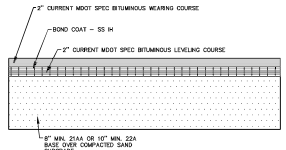
N.T.S.



STANDARD ASPHALT PAVEMENT SECTION

(RESIDENTIAL DRIVEWAY, PRIVATE PARKING SPACES, PATHS)

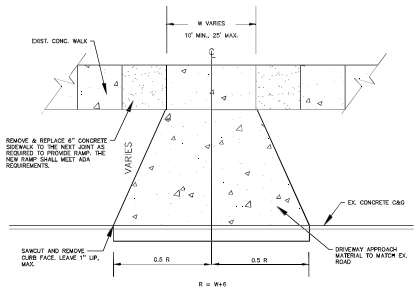
N.T.S.



HEAVY ASPHALT PAVEMENT SECTION

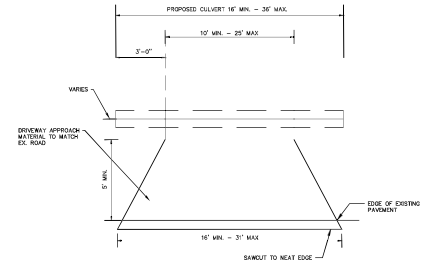
COMMERCIAL/ INDUSTRIAL DRIVEWAY, FIRE LANE, ROADWAY (SEE NOTE 5.C)

N.T.S.



RESIDENTIAL DRIVEWAY TO CURB & GUTTER

N.T.S.



RESIDENTIAL DRIVEWAY TO ASPHALT ROAD

N.T.S.

PAVING GENERAL NOTES

1. **STANDARDS AND SPECIFICATIONS**

A. ALL PAVING AND MATERIALS SHALL MEET ALL APPLICABLE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT), AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) AND AMERICAN ASSOCIATION OF HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARDS OUTLINED IN THESE CONSTRUCTION STANDARDS AND SHOWN ON THE VILLAGE OF LAKE ORION PAVING STANDARD DETAILS. ALL MATERIALS TO BE INSTALLED WITHIN PUBLIC RIGHT-OF-WAY ARE SUBJECT TO INSPECTIONS AND TESTS BY THE OWNER, OR AUTHORIZED REPRESENTATIVE. MATERIAL CERTIFICATES IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THESE CONSTRUCTION SPECIFICATIONS SHALL BE PROVIDED TO THE VILLAGE ENGINEER OR VILLAGE'S REPRESENTATIVE.

B. ALL STREET AND PAVING CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS, ROAD COMMISSION FOR OAKLAND COUNTY (RCOC), AND/OR MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) AS APPLICABLE.

C. PAVEMENT AND CURB & GUTTER SECTIONS SHOWN IN THESE DETAILS ARE TO BE CONSIDERED A MINIMUM ACCEPTABLE DESIGN. SECTIONS WITH GREATER STRENGTH CHARACTERISTICS MAY BE REQUIRED BASED ON SITE-SPECIFIC CONDITIONS, WHICH SHALL BE THE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO CONFIRM.

C. ALTERNATE PAVEMENT SECTIONS WILL BE CONSIDERED ON A CASE BY CASE BASIS, PROVIDED ADEQUATE ENGINEERING DATA IS MADE AVAILABLE FOR REVIEW AND DEMONSTRATES EQUAL OR GREATER STRUCTURAL STABILITY AND LONGEVITY COMPARED TO THE STANDARD DETAILS. ALL PROPOSED PAVEMENT SECTIONS ARE SUBJECT TO REVIEW AND APPROVAL BY THE VILLAGE.

2. **PRECONSTRUCTION REQUIREMENTS**

A. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRECONSTRUCTION MEETING AT A TIME AND PLACE AS ARRANGED BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. THE PROJECT OWNER SHALL NOTIFY AFFECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE PRECONSTRUCTION MEETING. THE OWNER'S ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES TEN (10) DAYS PRIOR TO PRECONSTRUCTION MEETING. CONSTRUCTION SHALL START WITHIN TWO (2) WEEKS OF MEETING UNLESS WAIVED BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS.

B. THE CONTRACTOR SHALL NOTIFY:

- MISS DIG 800-482-7171
- THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS 248-693-8321
- NOWAK AND FRAUS ENGINEERS 586-739-0939

AT LEAST THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION.

THE CONTRACTOR SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH ARE NOT PARTICIPANTS OF THE MISS DIG SYSTEM.

C. A ROAD COMMISSION FOR OAKLAND COUNTY AND/OR MICHIGAN DEPARTMENT OF TRANSPORTATION PERMIT IS REQUIRED FOR ALL CONSTRUCTION WITHIN THEIR ROAD RIGHTS-OF-WAY AND/OR EASEMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND BONDS PRIOR TO CONSTRUCTION, OR TO ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.

D. ALL PUBLIC PAVEMENT CONSTRUCTION SHALL HAVE COMPETENT FULL TIME CONSTRUCTION OBSERVATION PROVIDED BY, OR CAUSED TO BE PROVIDED BY, THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. ALL COSTS FOR LOCATING, SUPPORTING, REMOVING AND REPLACING, RELOCATING OR REPAIRING THESE UTILITIES SHALL BE BORNE BY THE CONTRACTOR.

3. **CONSTRUCTION**

A. EXISTING TOPSOIL, VEGETATION AND ORGANIC MATERIALS, AND UNSUITABLE SOILS INCLUDING PEAT, MUCK AND MARL SHALL BE STRIPPED AND REMOVED FROM PROPOSED PAVEMENT AREAS PRIOR TO PLACEMENT OF BASE MATERIALS. TREE ROOTS SHALL BE COMPLETELY REMOVED.

B. PRIOR TO PLACEMENT OF BASE MATERIALS OR PAVEMENT, CONTRACTOR SHALL PROOFROLL SUBGRADE AND REMOVE ANY UNSUITABLE MATERIAL OBSERVED. SUBGRADE SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY (MODIFIED PROCTOR).

C. FILL AREAS SHALL BE MACHINE COMPACTED IN UNIFORM LIFTS TO 95% MAXIMUM DRY DENSITY (MODIFIED PROCTOR). ALL AGGREGATE BASE MATERIAL SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY (MODIFIED PROCTOR) AND EXTEND A MINIMUM OF TWO (2') FEET BEYOND THE BACK OF CURB OR PAVED EDGE.

D. SIX (6") INCH UNDERDRAIN IN GEOTEXTILE SHALL BE INSTALLED ALONG BOTH SIDES OF PUBLIC ROADWAYS UNLESS OMISSION IS PERMITTED BY THE VILLAGE BASED ON EXISTING SOIL DRAINAGE CHARACTERISTICS.

E. FOR RESIDENTIAL DEVELOPMENTS, THE OWNER SHALL RETAIN THE SERVICES OF A GEOTECHNICAL ENGINEERING AND TESTING FIRM. ALL FILL MATERIAL AND BASE MATERIAL SHALL BE TESTED, AND ITS COMPACTION AND SUITABILITY FOR ACCEPTANCE SHALL BE CERTIFIED BY THE TESTING FIRM. OWNER SHALL SUPPLY COPIES OF TEST RESULTS AND CERTIFICATIONS TO THE VILLAGE.

F. IF THE INSPECTOR OR TESTING ENGINEER DETERMINES THAT FIELD CONDITIONS WARRANT ADDITIONAL TESTING, OWNER/CONTRACTOR SHALL ARRANGE FOR AND PAY THE COST OF ALL ADDITIONAL TESTING.

G. CONCRETE AND ASPHALT TESTING IS REQUIRED FOR ALL PUBLIC SIDEWALKS, PATHS AND ROADWAYS, AND FOR ALL RESIDENTIAL DEVELOPMENTS. COPIES OF TEST RESULTS SHALL BE PROVIDED TO THE VILLAGE.

4. **CONCRETE PAVEMENT**

A. CONCRETE SHALL CONSIST OF:

- PORTLAND CEMENT TYPE 1A (AIR-ENTRAINED) CONFORMING TO ASTM C-150.
- FINE AGGREGATE SHALL BE NATURAL SAND AND SHALL CONFORM TO THE CURRENT MDOT STANDARD SPECIFICATION 2NS.
- COARSE AGGREGATE SHALL BE CRUSHED STONE, ROCK, OR GRAVEL CONFORMING TO CURRENT MDOT SPECIFICATION 6A.

B. CONCRETE SHALL ATTAIN A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI WITH A SLUMP OF 1 ½" TO 3".

C. ALL CONCRETE PAVEMENT, SIDEWALKS, DRIVEWAYS, CURB AND GUTTER SHALL BE SPRAY CURED WITH A WHITE MEMBRANE CURING COMPOUND IMMEDIATELY FOLLOWING FINISHING OPERATION.

D. FORMS SHALL NOT BE REMOVED FROM FRESHLY PLACED CONCRETE UNTIL IT HAS SET FOR 12 HOURS UNLESS SLIPFORM IS USED. FORMS SHALL BE REMOVED CAREFULLY TO AVOID DAMAGE TO THE PAVEMENT.

E. ALL JOINTS SHALL BE CONSTRUCTED TRUE TO LINE WITH THEIR FACES PERPENDICULAR TO THE SURFACE OF THE PAVEMENT. GAPS OR JOINTS IN CONCRETE SIDEWALKS SHALL NOT BE WIDER THAN ONE-HALF OF AN INCH (1/2") AND MUST RUN PERPENDICULAR TO THE TRAVELED PATH.

F. SEALING OF JOINTS SHALL BE COMPLETED BEFORE THE PAVEMENT IS OPENED TO TRAFFIC AND AS SOON AFTER COMPLETION OF THE CURING PERIOD AS IS FEASIBLE. JUST BEFORE SEALING, EACH JOINT SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATERIAL, INCLUDING MEMBRANE CURING COMPOUND, AND THE JOINT FACES SHALL BE CLEANED BY MEANS OF SAND BLASTING AND THOROUGHLY BLOWN OUT WITH A STREAM OF COMPRESSED AIR AND SURFACE-DRY WHEN THE SEAL IS APPLIED.

G. AFTER CONCRETE PAVEMENT OR CURB HAS SUFFICIENTLY CURED, IT SHALL BE BACKFILLED TO THE REQUIRED ELEVATION WITH APPROVED MATERIAL, COMPACTED, AND LEFT IN A NEAT AND WORKMANLIKE CONDITION.

H. NO CONCRETE PAVING SHALL BE ALLOWED PRIOR TO MAY 1 OR AFTER NOVEMBER 1 UNLESS APPROVED BY THE VILLAGE DPW.

I. CONTRACTOR MAY NOT PLACE CONCRETE WHEN PRECIPITATION IS IMMINENT OR WHEN MOISTURE ON THE EXISTING SURFACE WOULD PREVENT SATISFACTORY CURING. UNLESS OTHERWISE APPROVED BY THE VILLAGE IN WRITING, TEMPERATURE AND SEASONAL REQUIREMENTS FOR CONCRETE PLACEMENT WILL BE IN ACCORDANCE WITH CURRENT MDOT SPECIFICATIONS. PAVING WILL NOT BE ALLOWED WHEN FROST IS IN OR ON THE EXISTING SURFACE.

J. CONTRACTOR SHALL EMPLOY WHATEVER MEASURES ARE NECESSARY TO PREVENT DAMAGE TO THE WORK AND SHALL BE RESPONSIBLE FOR ANY CONCRETE PLACED DURING COLD WEATHER. FOR PUBLIC PROJECTS, ANY CONCRETE INJURED BY FROST ACTION, IN THE OPINION OF THE VILLAGE ENGINEER, SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

5. **BITUMINOUS PAVEMENT**

A. ALL MATERIALS AND METHODS OF HMA PLACEMENT SHALL CONFORM TO CURRENT MDOT STANDARD SPECIFICATION.

B. IN AREAS WHERE EXISTING SUBGRADE IS COMPRISED OF CLAY, A MINIMUM FOUR (4") INCHES OF MDOT CLASS II SAND SUBBASE OR FOUR (4") INCHES OF ADDITIONAL AGGREGATE BASE MATERIAL SHALL BE PROVIDED IN ADDITION TO THE MATERIALS SHOWN IN THE PAVEMENT SECTION DETAILS.

C. HEAVY DUTY ASPHALT SECTION OR APPROVED EQUIVALENT SHALL BE PROVIDED AT ALL ACCESS DRIVES, INTERNAL DRIVE AISLES, LOADING AREAS, EQUIPMENT STORAGE AREAS, AND ANY OTHER AREAS SUBJECT TO TRAFFIC LOADING BY NON-PASSENGER VEHICLES.

D. ALL BITUMINOUS MATERIAL SHALL BE COMPACTED TO NOT LESS THAN 97% OF THE FIELD CONTROL DENSITY AS DETERMINED BY THE MARSHALL METHOD. COPIES OF TEST RESULTS SHALL BE PROVIDED TO THE VILLAGE.

E. A BOND COAT OF SS-1H EMULSION IS REQUIRED BETWEEN ALL COURSES OF ASPHALT IMMEDIATELY PRIOR TO PLACEMENT OF NEXT COURSE OF PAVEMENT. THE BOND COAT SHALL BE APPLIED UNIFORMLY OVER THE SURFACE AT A RATE OF 0.10 GALLONS PER SQUARE YARD BETWEEN LEVELING COURSES AND 0.05 GALLONS PER SQUARE YARD BETWEEN LEVELING COURSE AND WEARING COURSE.

F. CONTRACTOR MAY NOT PLACE HMA OR APPLY BOND COAT WHEN PRECIPITATION IS IMMINENT OR WHEN MOISTURE ON EXISTING SURFACE WOULD PREVENT SATISFACTORY CURING. UNLESS OTHERWISE APPROVED BY THE VILLAGE IN WRITING, TEMPERATURE AND SEASONAL REQUIREMENTS FOR HMA PLACEMENT WILL BE IN ACCORDANCE WITH CURRENT MDOT SPECIFICATIONS. PAVING WILL NOT BE ALLOWED WHEN FROST IS IN OR ON THE EXISTING SURFACE.

6. **AGGREGATE SHOULDER**

A. SUBGRADE FOR THE SHOULDERS SHALL BE GRADED TO AN ELEVATION BELOW THE FINISHED SURFACE THAT WILL PERMIT THE PLACING OF THE SPECIFIED THICKNESS OF SHOULDER MATERIAL.

B. AGGREGATE SHALL BE PLACED ON THE PREPARED SUBGRADE TO SUCH A DEPTH THAT THE COMPACTED LAYER WILL BE NO MORE THAN FIVE (5") INCHES THICK. WHERE THE COMPLETED SHOULDER IS TO BE MORE THAN FIVE (5") INCHES THICK, IT SHALL BE CONSTRUCTED IN TWO OR MORE COURSES.

C. AGGREGATE SHALL BE DEPOSITED ON THE SHOULDERS BY MEANS OF AN APPROVED MECHANICAL SPREADER. ON IRREGULAR AREAS WHERE THE USE OF A MECHANICAL SPREADER IS NOT PRACTICAL, THE USE OF HAND TOOLS OR POWER GRADING EQUIPMENT WILL BE PERMITTED. DUMPING AGGREGATE ON THE ROAD AND GRADING IT ONTO THE SHOULDER WILL NOT BE PERMITTED.

D. AGGREGATE SHALL BE COMPACTED TO NOT LESS THAN 100 PERCENT OF THE MAXIMUM UNIT WEIGHT, BY THE USE OF PNEUMATIC-TIRED COMPACTION EQUIPMENT OR VIBRATOR COMPACTORS.

E. THE ROLLING AND COMPACTING OPERATION SHALL BE PERFORMED IMMEDIATELY AFTER THE SHOULDER MATERIAL HAS BEEN SPREAD. WATER SHALL BE APPLIED AS NEEDED, TO AID IN THE COMPACTION AND SHAPING OF THE SURFACE. WATER SHALL BE APPLIED BY MEANS OF APPROVED SPRINKLER EQUIPMENT.

7. **FINAL ACCEPTANCE**

A. BEFORE FINAL ACCEPTANCE, ALL OF THE FOLLOWING ARE REQUIRED:

- A FINAL REVIEW MUST BE MADE BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS AND THE VILLAGE ENGINEER.
- ALL EASEMENTS AND/OR RIGHTS-OF-WAY MUST BE RECORDED AND ACCEPTED BY THE VILLAGE.
- ALL "AS-BUILT" RECORD DRAWINGS FOR PUBLIC ROADWAYS MUST BE ACCEPTED AND APPROVED BY THE LAKE ORION DEPARTMENT OF PUBLIC WORKS.
- MAINTENANCE AND GUARANTEE BOND PER NOTE 8.

8. **MAINTENANCE AND GUARANTEE BOND**

A. FOR ALL PUBLIC ROADWAYS AND SIDEWALKS THE CONTRACTOR SHALL PROVIDE A TWO (2) YEAR MAINTENANCE AND GUARANTEE BOND TO THE VILLAGE OF LAKE ORION FROM A SURETY LICENSED IN THE STATE OF MICHIGAN, DATED FROM THE TIME OF FINAL ACCEPTANCE BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS, FOR 100% OF THE CONSTRUCTION COSTS.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
48680 VAN DYKE, SUITE 200
TEL (586) 739-0939
WWW.NOWAKFRAUS.COM

SEAL



VILLAGE OF LAKE ORION
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: DIRECTOR OF PUBLIC WORKS
DATE: MARCH 26, 2025

SHEET
PAVING STANDARD DETAILS
(1 OF 1)

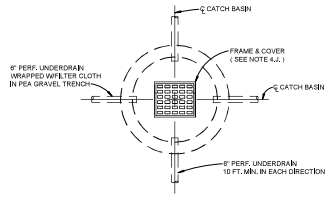
Village of Lake Orion EST 1859

DATE	ISSUED/REVISED

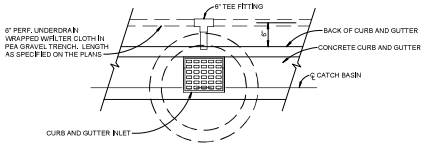
DRAWN BY: A. Suchoski
DESIGNED BY: C. Thurber
APPROVED BY: C. Thurber
DATE: 01-02-2025
SCALE: N.T.S.

NFE JOB NO. N885
SHEET NO. 1 OF 1

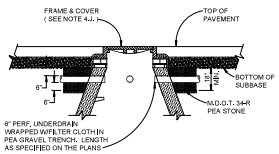
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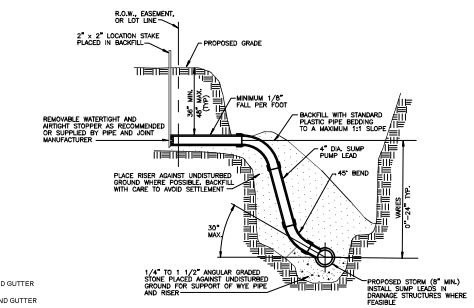
CATCH BASIN UNDERDRAIN LOCATION IN PARKING LOT



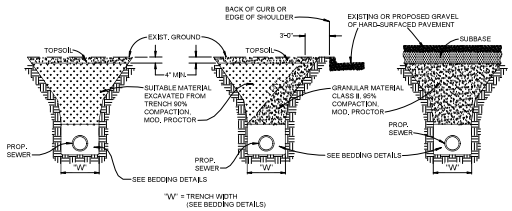
CATCH BASIN UNDERDRAIN LOCATION AT CURB



UNDERDRAIN DETAIL



HOUSE LEAD DETAIL FOR 4" DIA. PLASTIC SUMP PUMP LEADS



PROPOSED STORM SEWER NOT UNDER PAVEMENT

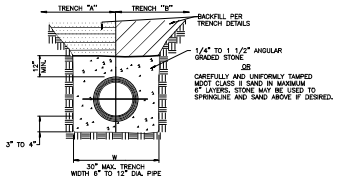
TRENCH DETAIL "B"

PROPOSED STORM SEWER UNDER PAVEMENT OR WITHIN INFLUENCE OF PAVEMENT

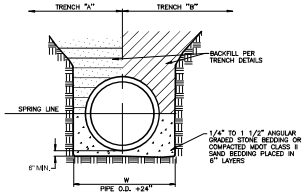
TRENCH DETAIL "A"

NOTE:
MATERIAL SPECIFICATIONS SHALL COMPLY WITH M.D.O.T. STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.

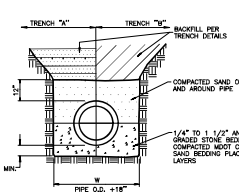
TRENCH DETAILS



ABS (TRUSS AND SOLID WALL), PVC (TRUSS, SOLID WALL, A2000), ADS N-12 WT PIPE BEDDING DETAIL

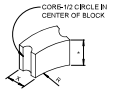


BEDDING DETAIL FOR 27" DIAMETER AND LARGER CONCRETE PIPE



BEDDING DETAIL FOR 24" DIAMETER AND SMALLER CONCRETE PIPE

NOTE:
WHERE ALLOWABLE TRENCH WIDTHS ARE EXCEEDED STANDARD PIPE BEDDING SHOWN SHALL BE PROVIDED TO THE FULL WIDTH BETWEEN UNDISTURBED TRENCH WALLS OR AT LEAST 2.5 PIPE DIAMETERS ON BOTH SIDES OF THE PIPE. NO CONCRETE CRADLES.



CONCRETE BLOCK FOR VARIOUS DIAMETER DRAINAGE STRUCTURES

* HEIGHT OF BLOCKS MAY VARY FROM 6" TO 7 5/8"

STRUCTURE DIAMETER	R	X
2'-0"	1'-0"	6"
3'-0"	1'-6"	6" OR 8"
4'-0"	2'-0"	8", 8" OR 12"

CONCRETE BLOCKS

STORM SEWER GENERAL NOTES

1. STANDARDS AND SPECIFICATIONS

A. ALL STORM SEWER AND STORM DRAINAGE SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS, THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER, THE ROAD COMMISSION FOR OAKLAND COUNTY AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AS APPLICABLE. CONSTRUCTION AND MATERIALS SHALL ALSO CONFORM TO THE APPLICABLE CURRENT ASTM STANDARD SPECIFICATION OR PRACTICE, WHEN REFERENCED.

B. ANY MATERIALS OTHER THAN THOSE LISTED ON THE STANDARD DETAIL SHEETS MUST BE APPROVED IN WRITING BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. CONTRACTOR MUST SUBMIT THREE COPIES OF SHOP DRAWINGS AND SPECIFICATIONS FOR PROPOSED ALTERNATE MATERIAL TO THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS FOR REVIEW AS AN APPROVED EQUAL. DETERMINATION OF ACCEPTANCE BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS SHALL BE CONSIDERED FINAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REVIEW OF THE PROPOSED ALTERNATE MATERIALS AS AN APPROVED EQUAL.

2. PRECONSTRUCTION REQUIREMENTS

A. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRECONSTRUCTION MEETING AT A TIME AND PLACE AS ARRANGED BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. THE PROJECT OWNER SHALL NOTIFY APPECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE PRECONSTRUCTION MEETING. THE OWNER'S ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF TEN (10) DAYS PRIOR TO PRECONSTRUCTION MEETING.

B. THE CONTRACTOR SHALL NOTIFY:

- MISS DIG 800-482-7171
- THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS 248-693-8321
- NOWAK & FRAUS ENGINEERS 586-739-0939

AT LEAST THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION.

THE CONTRACTOR SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH ARE NOT PARTICIPANTS OF THE MISS DIG SYSTEM.

C. A ROAD COMMISSION FOR OAKLAND COUNTY AND/OR MICHIGAN DEPARTMENT OF TRANSPORTATION PERMIT IS REQUIRED FOR ALL CONSTRUCTION WITHIN THEIR ROAD AND/OR DRAIN RIGHTS-OF-WAY AND/OR EASEMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.

D. ALL STORM SEWER AND STORM DRAINAGE SYSTEM CONSTRUCTION SHALL HAVE COMPETENT FULL TIME CONSTRUCTION OBSERVATION PROVIDED BY, OR CAUSED TO BE PROVIDED BY, THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. ALL COSTS FOR LOCATING, SUPPORTING, REMOVING AND REPLACING, RELOCATING OR REPAIRING THESE UTILITIES SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES BEFORE ANY WORK IS STARTED. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY HAND DIGGING.

3. PIPE MATERIAL

A. ONLY NEW UNDAMAGED STORM SEWER PIPE SHALL BE USED. THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS SHALL HAVE THE RIGHT TO REJECT ANY OR ALL PIPE.

B. REINFORCED CONCRETE CIRCULAR SEWER PIPE SHALL HAVE MINIMUM WALL THICKNESS B (ASTM C76). SIZE AND CLASS OF PIPE SHALL BE AS INDICATED ON THE PLANS. ALL REINFORCED CONCRETE SEWER PIPE SHALL BE CAST WITH REINFORCING STEEL EXTENDING INTO THE BELL. ALL JOINTS SHALL BE MODIFIED TONGUE AND GROOVE WITH GASKET (ASTM C361). GASKETS SHALL BE SYNTHETIC RUBBER. NATURAL RUBBER GASKETS ARE NOT ACCEPTABLE.

C. FOR INSTALLATION ON PRIVATE PROPERTY, THE FOLLOWING PLASTIC PIPE MAY BE SPECIFIED BY THE DESIGN ENGINEER. FOR INSTALLATION WITHIN VILLAGE-OWNED PROPERTY AND PUBLIC RIGHTS-OF-WAY, THE FOLLOWING PLASTIC PIPE MAY ONLY BE USED WITH THE WRITTEN AUTHORIZATION OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS AND WHEN THE PIPE WILL NOT BE SUBJECT TO CRUSHING LOADS FROM CONSTRUCTION EQUIPMENT AND PROPERTY MAINTENANCE AND A MINIMUM THREE FEET (3') OF COVER CAN BE MAINTAINED:

COMPOSITE (PVC TRUSS) PIPE: POLYVINYL CHLORIDE (PVC) COMPOSITE (TRUSS) SEWER PIPE (ASTM D2680) WITH GASKETED JOINTS (ASTM D3212).

PVC SOLID WALL PIPE: PVC TYPE PS-115 PLASTIC GRAVITY FLOW SEWER PIPE (ASTM F789), PVC SOLID PLASTIC PIPE, SCHEDULE 40 (ASTM D1785), OR PVC SOLID PLASTIC PIPE, SDR 26 (ASTM D3034) WITH GASKETED JOINTS (ASTM D3212).

CORRUGATED PVC: CORRUGATED PVC SEWER PIPE WITH A SMOOTH INTERIOR SURFACE (ASTM F949) WITH GASKETED PUSH-ON JOINTS (ASTM D3212). GASKET SHALL BE A DOUBLE SEALING GASKET THAT INDEXES TWO (2) CORRUGATIONS. CORRUGATED PVC SEWER PIPE SHALL BE INSTALLED WITH CRUSHED STONE ENCASEMENT BEDDING.

PVC CLOSED PROFILE: PVC CLOSED PROFILE GRAVITY SEWER PIPE (ASTM F1803) WITH BELL AND SPIGOT TYPE JOINTS WITH ELASTOMERIC SEALS (ASTM D3212). PVC CLOSED PROFILE GRAVITY PIPE SHALL BE INSTALLED WITH CRUSHED STONE ENCASEMENT BEDDING.

CORRUGATED POLYETHYLENE: CORRUGATED POLYETHYLENE (PE) PIPE WITH A SMOOTH INTERIOR (ASTM F2306). WATERTIGHT PIPE JOINTS SHALL MEET A 10.8 PSI LABORATORY TEST PER ASTM D3212 AND UTILIZE A BELL AND SPIGOT DESIGN WITH A GASKET MEETING ASTM 477. BELL SHALL SPAN OVER THREE (3) SPIGOT CORRUGATIONS. ONLY TWELVE INCH (12") THROUGH TWENTY-FOUR INCH (24") PIPE WILL BE CONSIDERED.

CORRUGATED POLYPROPYLENE: CORRUGATED POLYPROPYLENE (PP) PIPE WITH A SMOOTH INTERIOR (ASTM F2881). WATERTIGHT PIPE JOINTS SHALL MEET A 10.8 PSI LABORATORY TEST PER ASTM D3212 AND UTILIZE A BELL AND SPIGOT DESIGN WITH A GASKET MEETING ASTM 477.

ALL PIPE SHALL HAVE CLASS, LOT NUMBER, AND DATE OF MANUFACTURE CONSPICUOUSLY MARKED ON EACH LENGTH BY THE MANUFACTURER.

D. ALL PIPE SHALL BE CERTIFIED BY THE MANUFACTURER TO MEET THE APPLICABLE ASTM SPECIFICATION REQUIREMENTS. CERTIFICATION FORMS, TOGETHER WITH A REPORT OF THE TEST RESULTS, SHALL BE PROVIDED THE CONSTRUCTION INSPECTOR WITH PIPE DELIVERIES AND COPIES SHALL BE FORWARDED TO THE ENGINEER OR THE OWNER. CERTIFICATION FORMS SHALL INCLUDE PROJECT NAME, LOCATION, CONTRACTOR, AND TEST LOT NUMBER. LOT SIZES SHALL BE ACCEPTABLE TO THE VILLAGE ENGINEER AND DEPARTMENT OF PUBLIC WORKS.

4. DRAINAGE STRUCTURES

A. ALL NEW MANHOLES SHALL BE PRECAST REINFORCED CONCRETE, FLEXIBLE-JOINT TYPE (ASTM C478). THE TOP SECTION SHALL BE A MODIFIED ECCENTRIC CONE SECTION. ALTERNATELY, THE MANHOLE MAY BE CONSTRUCTED WITH A REINFORCED CONCRETE FLAT SLAB COVER (ASTM C478). THE BASE SECTION FOR EIGHT INCH (8") TO SIXTY INCH (60") DIAMETER SEWERS SHALL BE A PRECAST RISER SECTION WITH AN INTEGRAL BASE. JOINTS AND GASKETS SHALL BE MODIFIED TONGUE AND GROOVE (ASTM C443). ALL LIFTING HOLES SHALL BE FILLED WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR. ALTERNATELY, THE BASE SECTION FOR SEWERS FORTY-EIGHT INCHES (48") IN DIAMETER AND LARGER MAY BE A MANHOLE TEE (ASTM C76, CLASS IV MINIMUM).

ALL NEW CATCH BASINS SHALL BE FORTY-EIGHT INCH (48") DIAMETER (MINIMUM) PRECAST REINFORCED CONCRETE, FLEXIBLE-JOINT TYPE (ASTM C478). THE TOP SECTION SHALL BE A MODIFIED ECCENTRIC CONE SECTION. THE BASE SECTION SHALL BE A PRECAST RISER SECTION WITH AN INTEGRAL BASE. JOINTS AND GASKETS SHALL BE MODIFIED TONGUE AND GROOVE (ASTM C478). ALL LIFTING HOLES SHALL BE FILLED WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR. ALL CATCH BASINS SHALL BE CONSTRUCTED WITH A TWO FOOT (2') SUMP (MINIMUM). PIPE PENETRATION JOINTS FOR NEW PRECAST REINFORCED DRAINAGE STRUCTURES SHALL BE A FLEXIBLE WATER-TIGHT JOINT, "KOR-N-SEAL" FOR SEWERS SIX INCH (6") THROUGH THIRTY INCH (30") IN DIAMETER AND "A-LOK" FOR SEWERS THIRTY-SIX INCH (36") IN DIAMETER AND LARGER. HOLES FOR PIPES SHALL BE CAST IN THE RISER SECTION SO AS TO PROVIDE A MINIMUM CLEARANCE OF TWO INCHES (2") BETWEEN THE INSIDE BOTTOM OF THE BASE SECTION AND THE OUTSIDE WALL OF THE PIPE. PIPE SHALL NOT EXTEND INTO A MANHOLE BEYOND THE INTERIOR FACE OF THE MANHOLE WALL.

B. EXISTING PRECAST DRAINAGE STRUCTURES SHALL BE TAPPED WITH THE "KOR-N-SEAL" METHOD, WITH A WATER-TIGHT RUBBER BOOT FOR SEWERS SIX INCH (6") THROUGH FIFTEEN INCH (15") IN DIAMETER. EXISTING BRICK DRAINAGE STRUCTURES, AND TAPS FOR SEWERS EIGHTEEN INCH (18") IN DIAMETER AND LARGER, SHALL HAVE HOLES DRILLED AT FOUR INCHES (4") CENTER TO CENTER AROUND THE PERIPHERY OF THE OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING OUT THE SECTION. NON-SHRINK GROUT, PRECO OR SEKA SET, SHALL BE USED TO SEAL THE OPENING. A CONCRETE COLLAR SHALL BE POURED TWELVE INCHES (12") AROUND THE PIPE AND EXTEND TWELVE INCHES (12") EXTERIOR TO THE DRAINAGE STRUCTURE.

C. CONCRETE LEACHING BASINS SHALL BE IN ACCORDANCE WITH MDOT STANDARD PLANS OR AS APPROVED BY VILLAGE. MATERIALS FOR PLASTIC LEACHING BASIN DRAINAGE STRUCTURE SHALL BE IN ACCORDANCE WITH ALL APPLICABLE ASTM STANDARDS AND AS SPECIFIED ON THE PLANS. THE COVER FOR THE LEACHING BASIN DRAINAGE STRUCTURES SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND AS SPECIFIED ON THE PLANS.

D. THE CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT ANY DRAINAGE STRUCTURE THAT IS DAMAGED WHILE BEING TAPPED.

E. FIELD TAPS SHALL NOT BE ALLOWED TO THE PIPE SECTION OF MANHOLE TEES. TAPPING OF RISER SECTIONS IS PERMITTED WITH THE WRITTEN AUTHORIZATION OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS.

F. THE CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT ANY DRAINAGE STRUCTURE THAT IS DAMAGED WHILE BEING TAPPED.

G. FIELD TAPS SHALL NOT BE ALLOWED TO THE PIPE SECTION OF MANHOLE TEES. TAPPING OF RISER SECTIONS IS PERMITTED WITH THE WRITTEN AUTHORIZATION OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS.

H. GRADE ADJUSTMENTS SHALL BE MADE USING PRECAST ADJUSTMENT RINGS (ASTM C478 4,000 PSI 28-DAY COMPRESSIVE STRENGTH) WITH RUBBER GASKETS (ASTM C443). LIGHTWEIGHT POLYMER COMPOSITE GRADE, FINISH AND RESTORATION RINGS MANUFACTURED BY UNDERGROUND TECHNOLOGIES ARE AN APPROVED ALTERNATE FOR USE IN GREENBELTS AND MAY BE USED IN PAVEMENT WITH THE WRITTEN APPROVAL OF THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. MINIMUM ADJUSTMENT SHALL BE THREE INCHES (3") AND MAXIMUM ADJUSTMENT SHALL BE TWELVE INCHES (12"). ADJUSTMENT RINGS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. NO BRICK OR BLOCK SHALL BE ALLOWED FOR ADJUSTMENT COURSES UNLESS APPROVED IN WRITING BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. ADJUSTMENT RINGS SHALL NOT OVERHANG BEYOND THE TOP OF THE RISER OR BASE OF THE COVER.

I. CONCRETE AND RADIAL BLOCK SHALL CONFORM TO ASTM 139 AND SHALL BE GRADE N-1. MORTAR FOR LAYING BLOCK, POINTING OF JOINTS, AND PLASTERING OUTSIDE OF STRUCTURES SHALL BE COMPOSED OF ONE (1) PART TYPE II MASONRY CEMENT AND TWO AND ONE-HALF (2-1/2) PARTS MASONRY SAND.

J. DRAINAGE STRUCTURE FRAMES AND COVERS SHALL BE AS FOLLOWS:

MANHOLE:	EJW 1040 WITH TYPE B COVER WITH "STORM SEWER" IN RAISED LETTERS OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (NO CURB & GUTTER)	EJW 5100Z WITH TYPE M1 5105 GRATE OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (STRAIGHT FACE CURB & GUTTER)	EJW 7045 WITH TYPE M1 GRATE AND 7050 T1 BACK OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (MOUNTABLE CURB & GUTTER)	EJW 7065 WITH 7043 TYPE M1 GRATE AND 7060 T1 BACK OR APPROVED EQUAL
CATCH BASIN (YARD TYPE):	EJW 1040 WITH TYPE M1, M2 OR TYPE N GRATE OR APPROVED EQUAL
CATCH BASIN (DITCH TYPE):	EJW 1040 WITH TYPE N GRATE OR APPROVED EQUAL

K. STEPS SHALL BE M.A. INDUSTRIES P.S.I. POLYPROPYLENE OR MSU #360 ALU POLY MANHOLE STEPS AND INSTALLED AT SIXTEEN INCHES (16") CENTER TO CENTER SPACING. STEPS SHALL HAVE FOOT RECESS AND BE SUITABLY SCORED TO PROVIDE A NONSLIP SURFACE. BOTTOM STEP SHALL BE TWENTY-FOUR INCHES (24") MAXIMUM ABOVE FLOOR. TOP STEP SHALL BE THIRTY INCHES (30") MAXIMUM BELOW RIM. STEPS SHALL NORMALLY BE PROVIDED ON A BACK WALL OF THE DRAINAGE STRUCTURE FURTHEST FROM TRAFFIC. IF A DRAINAGE STRUCTURE IS INSTALLED AT A LOCATION WITHIN EXISTING TRAFFIC FLOW, STEPS SHALL BE PROVIDED SUCH THAT PERSONNEL WILL FACE ONCOMING TRAFFIC.

5. CONSTRUCTION

A. NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.

B. A MINIMUM VERTICAL CLEARANCE OF ONE AND ONE-HALF FEET (1-1/2') MUST BE MAINTAINED BETWEEN THE STORM SEWER AND ANY UTILITIES.

C. ALL SEWER PIPE SHALL BE LAID USING A LASER TO MAINTAIN GRADE AND ALIGNMENT.

D. ALL SEWER PIPES AND APPURTENANCES SHALL BE STAKED UNDER THE SUPERVISION OF A LICENSED LAND SURVEYOR OR A LICENSED ENGINEER. CUT SHEETS SHALL BE PROVIDED TO THE VILLAGE ENGINEER AND THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS. NO SEWER SHALL BE LAID WITHOUT STAKES.

6. TESTING AND ACCEPTANCE

A. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIALS, EQUIPMENT AND PERSONNEL TO CONDUCT REQUIRED TESTING.

B. ALL CORRUGATED PVC SEWER PIPE (ASTM F949), PVC CLOSED PROFILE GRAVITY SEWER PIPE (ASTM F1803) AND CORRUGATED PE SEWER PIPE (ASTM 2306) FOR STORM SEWER INSTALLATIONS SHALL BE SUBJECT TO DEFLECTION TESTING, NO EARLIER THAN THIRTY (30) DAYS AFTER CONSTRUCTION, WITH A NINE (9) SIDED MANDREL. A PROVING RING, PROVIDED BY THE CONTRACTOR, SHALL BE AVAILABLE FOR ALL DEFLECTION TESTS. THE HORIZONTAL AND VERTICAL DEFLECTION AT THE TIME OF INITIAL TESTING SHALL NOT EXCEED FIVE PERCENT (5%). ANY SEWER FOUND EXCEEDING THESE LIMITS SHALL BE REPLACED BY AND AT THE CONTRACTOR'S EXPENSE.

C. BEFORE FINAL ACCEPTANCE, ALL OF THE FOLLOWING ARE REQUIRED:

- A FINAL REVIEW MUST BE MADE BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS AND THE VILLAGE ENGINEER.
- ANY REQUIRED EASEMENTS AND/OR RIGHTS-OF-WAY MUST BE RECORDED AND ACCEPTED BY THE VILLAGE.
- A STORMWATER MAINTENANCE PLAN AND SIGNED AGREEMENT MUST BE ACCEPTED AND ON FILE AT THE VILLAGE.
- ALL "AS-BUILT" RECORD DRAWINGS MUST BE ACCEPTED AND APPROVED BY THE LAKE ORION DEPARTMENT OF PUBLIC WORKS.
- MAINTENANCE AND GUARANTEE BOND PER NOTE 7.

7. MAINTENANCE AND GUARANTEE BOND

A. FOR ALL PUBLIC STORM SEWER THE CONTRACTOR SHALL PROVIDE A TWO (2) YEAR MAINTENANCE AND GUARANTEE BOND TO THE VILLAGE OF LAKE ORION FROM A SURETY LICENSED IN THE STATE OF MICHIGAN, DATED FROM THE TIME OF ACCEPTANCE BY THE VILLAGE OF LAKE ORION DEPARTMENT OF PUBLIC WORKS, FOR 100% OF THE CONSTRUCTION COSTS.

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
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SEAL

STATE OF MICHIGAN
CAROL P. THURBER
ENGINEER
NO. 37685
LICENSED PROFESSIONAL ENGINEER

VILLAGE OF LAKE ORION
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: DIRECTOR OF PUBLIC WORKS
DATE: JUNE 1, 2024

SHEET
STORM SEWER STANDARD DETAILS (2 OF 2)

Village of Lake Orion EST 1859

DATE	ISSUED/REVISED

DRAWN BY: A. Filar
DESIGNED BY: C. Thurber
APPROVED BY: C. Thurber
DATE: 10-31-2023
SCALE: N.T.S.
NFE JOB NO. N885
SHEET NO. 2 OF 2

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