CITY OF MILAN
CITY COUNCIL AGENDA
COUNCIL CHAMBERS

March 19, 2024 **REGULAR MEETING**
7:00 P.M. **MUNICIPAL BUILDING**

CALL TO ORDER:

PLEDGE OF ALLEGIANCE:

ROLL CALL OF COUNCIL MEMBERS: Mayor Edward Kolar __, Councilpersons Mary Kerkes __, Josh Kofflin__, Dave Snyder___, Matthew Stafford ___, Christian Thompson__, Shannon Dare Wayne __.

OTHER OFFICERS PRESENT: City Administrator Jim Lancaster ___, Clerk Lavonna Wenzel _ _, City Attorney Steven Mann ___, Police Chief Donald Tillery ___, City Treasurer Sarah Finch_____, Building Inspector Tom Toth, MIS & Communications Director Hanna Massouh ___, Community Engagement Director Jill Tewsley__, Fire Chief Robert Stevens___.

APPROVAL OF AGENDA: **March 19, 2024**

Motion by Councilperson_____, seconded by____

APPROVAL OF MINUTES: **March 5, 2024** **-** **Regular Meeting Minutes**

Motion by Councilperson ___, seconded by Councilperson ____ to approve the minutes.

CITIZENS MATTERS FROM THE FLOOR: (5-minute time limit per person)

A. **Residents:**
B. **Non-Residents:**

CONSENT AGENDA:

A. **Fundraiser, Parade, Solicitation and Special Event Request (2024 American Legion Memorial Day Ceremony and Parade – Monday – May 27, 2024 – from 8:30 am to 11:30 am).**
B. **Building Department and Code Enforcement Report for the month of February 2024.**
C. **Fundraiser, Parade, Solicitation and Special Event Request (S'Mac and Cheese Food Truck – Owl Event – Saturday – May 25, 2024 – from 4:00 pm to 9:00 pm – TCO Attached).**

Motion by Councilperson__, seconded by Councilperson__ to approve the Consent Agenda items A through C.

MATTERS FOR ACTION:

A. **Approve Resolution 2024-02 A RESOLUTION OF APPROVAL OF THE TRANSPORTATION ASSET MANAGEMENT PLAN**

Motion by Councilperson__, seconded by Councilperson__ to approve Resolution 2024-02.

B. Approve City of Milan Design Standards and Construction Specifications.

Motion by Councilperson__, seconded by Councilperson__ to approve the specifications.

ITEMS FOR DISCUSSION:

BILLS PAYABLE AND PAYROLL: **$372,925.61**

Motion by Councilperson___, seconded by Councilperson___ to approve the bills payable.

CITIZENS MATTERS FROM THE FLOOR: (3-minute time limit per person)

A. Residents:
B. Non-Residents:

MAYOR, COUNCIL & STAFF REPORTS AND/OR COMMENTS:

NEXT REGULAR MEETING:

Tuesday, April 2, 2024, (*Agenda Item Submission Deadline, March 27, 2024)*

ADJOURNMENT: Motion to adjourn meeting at __ P.M. by Councilperson____ seconded by Councilperson_____.

All matters to be presented to Milan City Council for their review, consideration and/or action, must be submitted in writing no later than 4:00 p.m., the Wednesday preceding the date of the meeting (normally the first and third Tuesdays of each month).

Special Notes:

The City of Milan will provide reasonable auxiliary aids and services, such as signers for the hearing impaired, and audiotapes of printed materials being considered at the meeting to individuals with disabilities upon one week's notice to the City of Milan. Individuals with disabilities requiring auxiliary aids or services should contact the City of Milan by writing or calling the following:

Lavonna Wenzel, City Clerk
7 Wabash, Milan, Michigan 48160
Equal Employment Opportunity

MINUTES OF A REGULAR MEETING OF THE MILAN CITY COUNCIL HELD
ON MARCH 5, 2024
147 WABASH ST. MILAN, MICHIGAN 48160

Mayor Kolar called the meeting to order at 7:00 p.m.

Pledge of Allegiance.

COUNCIL MEMBERS PRESENT: Mayor Kolar, Mayor Pro-Tem Wayne, Council Members, Kerkes, Kofflin, Snyder, Stafford, Thompson.

OTHER OFFICERS PRESENT: City Administrator Jim Lancaster, City Clerk Lavonna Wenzel, City Treasurer Sarah Finch-Excused, City Attorney Steve Mann, Police Chief Don Tillery, Mis/Communications Hanna Massouh, and Community Engagement Director Jill Tewsley.

OTHERS PRESENT: Stacey Burnette, George Bennett, Barb Bennett, Carrie Ritchie, Holly Forbis.

APPROVAL OF AGENDA: March 5, 2024

Motion to approve the agenda by Councilmember Wayne, seconded by Councilmember Stafford.
Motion carried unanimously.

APPROVAL OF MINUTES: February 20, 2024 - Regular Meeting Minutes

Motion by Councilmember Snyder, seconded by Councilmember Kerkes to approve the meeting minutes.
Motion carried unanimously.

CITIZENS MATTERS FROM THE FLOOR: (5-minute time limit per person)

A. **Residents:** Holy Forbis spoke on behalf of Moving Milan Forward.
B. **Non-Residents:** None

SPECIAL ITEM:

A presentation by the Police Department.

Chief Tillery presented former Lt. Jeremy Nieman as now Deputy Chief Nieman. Chief Tillery shared Deputy Chief Nieman's past accomplishments and how his time with the Milan Police Department has made a valuable impact on the community, the department, as well as Chief Tillery.

CONSENT AGENDA:

A. Guest Flag Request for the Pride Flag to be raised on June 1st by the ARC Milan Organization.
B. Fundraiser, Parade, Solicitation and Special Event Request (Request a 30-minute road closure for the 2024 Milan Pride Parade and Rally at Tolan Square – June 8, 2024 – from 4:00 pm to 5:00 pm).
C. Fundraiser, Parade, Solicitation and Special Event Request – (Knights of Columbus Tootsie Roll Drive on Palm Sunday weekend – March 22nd & 23rd – 8:am to 6:pm).
D. Fundraiser, Parade, Solicitation and Special Event Request (Milan Youth League Parade – Saturday, May 4, from 10:30am to 11:00am).
E. Fundraiser, Parade, Solicitation and Special Event Request (Hot Rods Motorcycle Suicide Prevention Annual Car Show – Saturday, September 7, - 7:am to 7:pm).

Motion by Councilmember Synder, seconded by Councilmember Kerkes to approve the Consent Agenda items A through E. Motion carried unanimously.

MATTERS FOR ACTION:

None.

ITEMS FOR DISCUSSION:

Recycling / Recycle Days

Councilmember Kofflin presented material (Attachment A) showing costs and possible grant funding to provide various recycle days to residents at an overall 5% increase in residents rubbish rates to offset cost of recycle days. City Administrator provided projected impacts (Attachment B) to the rubbish fund. Each councilmember shared their thoughts and concerns about the program.

BILLS PAYABLE AND PAYROLL: $304,343.47

Motion by Councilmember Stafford, seconded by Councilmember Kerkes to pay the bills as presented. Motion carried unanimously.

CITIZENS MATTERS FROM THE FLOOR: (3-minute time limit per person)

A. **Residents:** Stacy Burnet spoke.
B. **Non-Residents:** Carrie Ritchie spoke on behalf of the Milan Youth League. George Bennett spoke on behalf of Hotrod's Motorcycle & Suicide Prevention Foundation.

MAYOR, COUNCIL & STAFF REPORTS AND/OR COMMENTS:

Administrator Lancaster announced this year's road projects begun. He shared a Spark grant, and the wastewater treatment plant grant updates.
Clerk Wenzel thanked Election Inspectors and Election Specialist Sue Trudeau for a flawless day, and a special thank you to Mayor Kolar and Matt Barbour-Kier for signing on as the Early Voting Receiving Board team. She shared 73 voters participated in Early Voting and Election Day voter turnout was nearly 23%.
Chief Tillery congratulated Deputy Chief Nieman.
Mis/Director Massouh gave a brief update of the I.T. department take-over and transitions**.**
Councilmember Stafford thanked Moving Milan forward for putting all the recycle information together.
Councilmember Kofflin congratulated Deputy Chief Nieman on his promotion. He encourages all to see the Milan High School play, "Legally Blonde".
Mayor Pro-Tem Wayne congratulated Milan High School Girls Wrestling State Champ Angelina Penna, for all four years in a row. She also congratulated the boys and girls MHS Bowling teams, as both are state runners up this year. Dr. Wayne shared the dates for the Milan High School play. She thanked Councilmember Kofflin and Moving Milan Forward for their passion for recycling, and congratulated Deputy Chief Nieman.
Councilmember Snyder thanked the different organizations and groups for being involved and contributing to the community. He congratulated Deputy Chief Nieman. Mr. Snyder provided a Historic District Study Committee update, and announced the committee will begin meeting again soon.
Mayor Kolar announced that he received a very special phone call from Debbie Dingel. That Milan has received $360K for the Riverbank Center renovation. He shared that the Sons of American Legion donated $1000 for the Parks and Recreation annual "Easter Egg Hunt" and donated $1500 to Milan Cares. Mayor Kolar invited all out to participate in the "Milan Cares clean-up day" on Sunday April 7th.

NEXT REGULAR MEETING:

Tuesday, March 19, 2024 (*Agenda Item Submission Deadline, March 13, 2024)*

ADJOURNMENT: Motion to adjourn the regular meeting at 7:56 pm, by Councilmember Thompson, seconded by Councilmember Wayne. Motion carried unanimously.

_____ _____

Ed Kolar, Mayor Lavonna Wenzel, Clerk

C - A

CITY OF MILAN

FUNDRAISER, PARADE, SOLICITATION AND SPECIAL EVENT REQUEST FORM

NAME: Angela Jaworski

ORGANIZATION: American Legion Post 268

ADDRESS: 44 Wabash

CITY, STATE, ZIP Milan MI 48160

PHONE NUMBER: [redacted]

TYPE OF REQUEST: *FUNDRAISER **PARADE ***SOLICITATION ****SPECIAL EVENT

DESCRIPTION OF FUNDRAISER, PARADE ROUTE (include map) OR SPECIAL EVENT DETAILS:

Memorial Day Parade - from Cemetery to legion
Same as past years

** Dates of Event: May 27, 2024 ** Time of Event- From: 8:30 am To: 11:30 am

***(The City of Milan requires that all door-to-door solicitation end by 8:00p.m., unless otherwise specified)**

***(Solicitation without fundraising)

****(Attach map, event schedule, special needs)**

****PARADE PERMIT A*** "NOTHING SHALL BE PROJECTED INTO THE CROWD INCLUDING BUT NOT LIMITED TO WATER, CANDY, SILLY STRING, FOAM, CONFETTI, ETC.

REQUEST TO PUT ON CABLE: YES NO IF YES, REQUESTED DATES TO RUN: _____
(see attached policy- must fill out Acknowledgement of Operating Policy and Request Form)

SIGNATURE: Angela Jaworski (sorry broken finger)

OFFICE USE ONLY:

City Administrator Comments _____

APPROVED DENIED DATE _____

Police Chief Comments Chief Tillery

APPROVED X DENIED DATE 03/12/2024 Staffing needed, TCO Needed (attached)

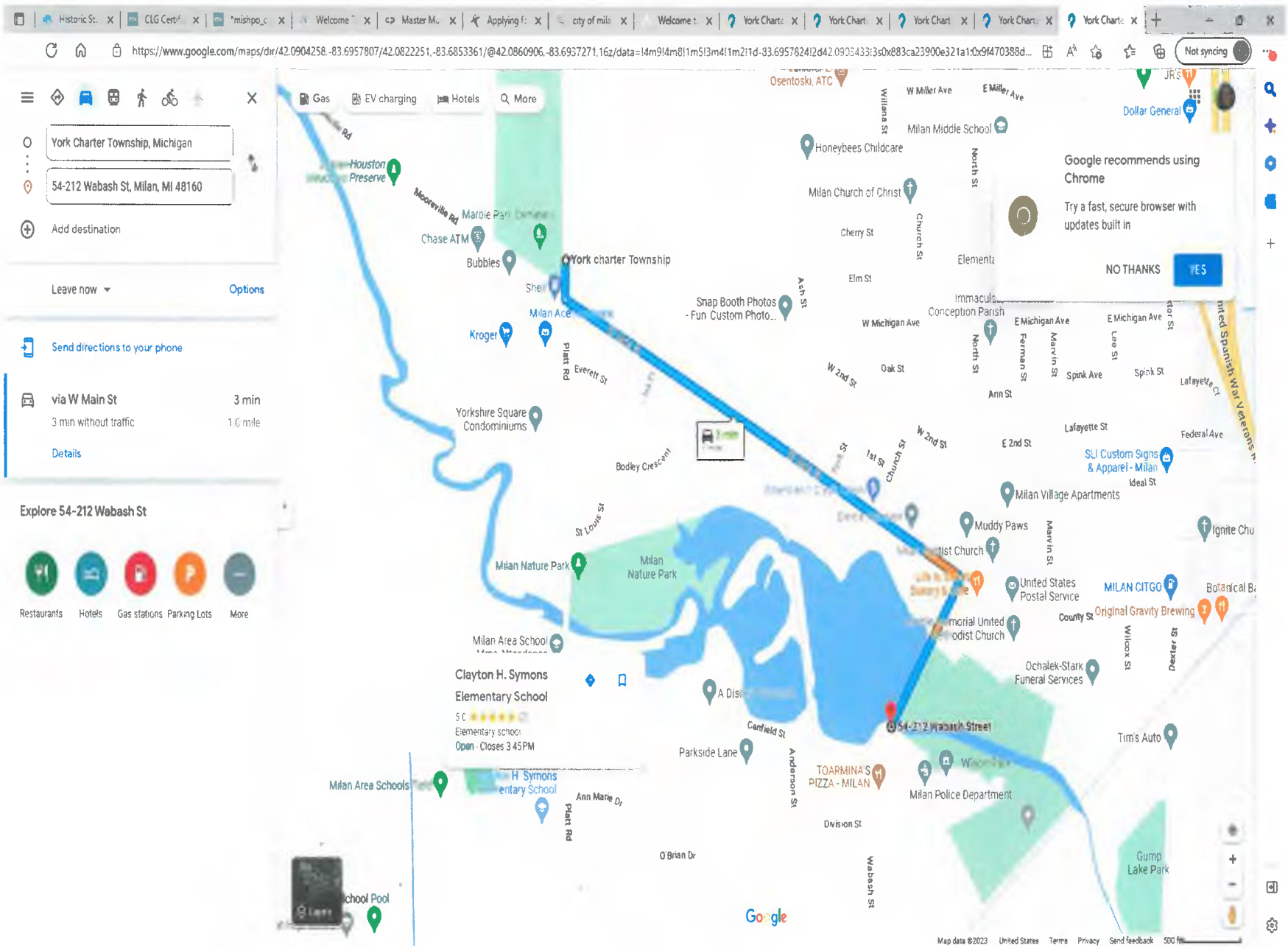
Other Comments _____

APPROVED DENIED DATE _____

Date of Council Meeting: _____

APPROVED DENIED DATE _____

RECEIVED
MAR 11 2024
CITY OF MILAN


York Charter Township, Michigan
54-212 Wabash St, Milan, MI 48160
Add destination
Leave now
Options
Send directions to your phone
via W Main St
3 min
3 min without traffic
1.0 mile
Details
Explore 54-212 Wabash St
Restaurants
Hotels
Gas stations
Parking Lots
More
Gas
EV charging
Hotels
More
Google recommends using Chrome
Try a fast, secure browser with updates built in
NO THANKS
YES
Clayton H. Symons Elementary School
Elementary school
Open · Closes 3:45 PM
York charter Township
Milan Nature Park
Milan Area Schools
Milan Middle School
Honeybees Childcare
Milan Church of Christ
Chase ATM
Bubbles
Kroger
Yorkshire Square Condominiums
Snap Booth Photos - Fun Custom Photo...
Immaculate Conception Parish
Milan Village Apartments
Muddy Paws
United States Postal Service
MILAN CITGO
Original Gravity Brewing
Ochalek-Stark Funeral Services
Milan Police Department
TOARMINA'S PIZZA - MILAN
Parkside Lane
Tim's Auto
Gump Lake Park
Dollar General
SLI Custom Signs & Apparel - Milan
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CITY OF MILAN

TEMPORARY TRAFFIC CONTROL ORDER

CONTROLLING VEHICULAR TRAFFIC AND PARKING ON CITY STREETS

TCO 2024-03-T

TRAFFIC CONTROL ORDER NUMBER: _____

Pursuant to 1949 PA 300 (MCL 257.606), as amended, for the regulation of streets or highways under jurisdiction of local authority within its City limits.

To facilitate the Memorial Day Parade on Monday May 27, 2024:

REGARDING: The temporary vehicular traffic and parking within the City of Milan, Counties of Washtenaw and Monroe, State of Michigan, it is so ordered:

It is so ordered:

West Main Street between the intersections of Wabash Street and North Platt Road shall be closed to vehicular traffic except: necessary department of public works, police, fire, and emergency medical services, beginning Monday May 27, 2024 at 9:30 A.M. and ending at 10:15 A.M. This includes the parking of motor vehicles on aforementioned roadway. Parking is prohibited.

Wabash St., between the intersections of E. Main St. & Neckel Ct. shall be closed to vehicular traffic except: necessary department of public works, police, fire, and emergency medical services, beginning Monday May 27, 2024 at 9:30 A.M. and ending at 10:15 A.M.

Parking of any and all vehicles on Wabash St. between the Bridge/Dam on the Saline River & the Northeastern most parking entrance to the Milan Area Fire Department shall be prohibited beginning on Monday May 27, 2024 at 8:00 A.M. and ending at 11:00 A.M.

Signs will be placed by the Department of Public Works 24 hours before the times as annotated in this order. Signs shall be removed at the conclusion of the Parade.

All vehicles impeding/blocking or inside the posted areas will be subject to applicable traffic violations and TOW-AWAY. 48 hours notices will not be utilized to move vehicles during this temporary order. Officers will attempt to locate the driver/owner before removal.

Approved by affirmative vote of the City of Milan Council on: _____
Date

_____ _____
Lavonna Wenzel Edward Kolar
City Clerk Mayor

Monthly Permit List - Last Month

Administrative

Permit #	Applicant	Address	Fee Total	Const. Value
PA2024-003	AABED, ASHRAF	13 W MAIN ST	$300.00	$0.00
PA2024-002	HEALY HOMES LLC	1410 EISENHOWER LN	$400.00	$0.00

Total Permits For Type: 2
Total Fees For Type: $700.00
Total Const. Value For Type: $0.00

Deck

Permit #	Applicant	Address	Fee Total	Const. Value
PB2024-0014	CUSTOM DECK CREATIONS LLC	710 JEFFERSON LN	$249.00	$13057.00

Total Permits For Type: 1
Total Fees For Type: $249.00
Total Const. Value For Type: $13057.00

DPW

Permit #	Applicant	Address	Fee Total	Const. Value
PW/S2024-002	26 WABASH LLC	26 WABASH ST	$525.00	$0.00
PW/S2024-001	EXCAVATORS	125 YORK ST	$660.00	$0.00

Total Permits For Type: 2
Total Fees For Type: $1185.00
Total Const. Value For Type: $0.00

Electrical

Permit #	Applicant	Address	Fee Total	Const. Value
PE2024-015	JOE RINGBLOOM	659 JEFFERSON LN	$145.00	$0.00
PE2024-014	DAILEY ELECTRIC CO	45 E LEWIS AVE	$145.00	$0.00
PE2024-013	RICHARD VALASCHO	575 YORKSHIRE SQ	$145.00	$0.00
PE2024-012	STATE ELECTRIC COMPANY C/O DUANE LOBBESTAEL	484 W MAIN ST	$85.00	$0.00
PE2024-001	SGI HEATING AND COOLING	34 W PHILLIPS AVE	$85.00	$0.00

Total Permits For Type: 5
Total Fees For Type: $605.00
Total Const. Value For Type: $0.00

Fence

Permit #	Applicant	Address	Fee Total	Const. Value
PFENCE2024-0	UNIQUE FENCE AND DECK AUSTIN GIBSON	120 MARVIN ST	$75.00	$8500.00
PFENCE2024-0	UNIQUE FENCE AND DECK AUSTIN GIBSON	288 IDEAL ST	$90.00	$8279.00
PFENCE2024-0	BEDFORD FENCE CO	100 E MICHIGAN AVE	$90.00	$7000.00

Total Permits For Type: 3
Total Fees For Type: $255.00
Total Const. Value For Type: $23779.00

Mechanical

Permit #	Applicant	Address	Fee Total	Const. Value
PM2024-075	STRAUB HEATING & A/C	601 YORK ST	$85.00	$0.00
PM2024-074	STRAUB HEATING & A/C	288 HURD ST	$85.00	$0.00
PM2024-073	BLISSFIELD HTG & PLBG INC	328 NORTH ST	$265.00	$0.00
PM2024-071	DON KEARNS	659 JEFFERSON LN	$160.00	$0.00
PM2024-070	BLISSFIELD HTG & PLBG INC	104 E SECOND ST	$85.00	$0.00
PM2024-069	Morris Heating & Cooling LLC KEVIN MORRIS	102 CHERRY LANE DR	$220.00	$0.00
PM2024-068	STRAUB HEATING & COOLING	45 E LEWIS AVE	$85.00	$0.00
PM2024-001	SGI HEATING AND COOLING	34 W PHILLIPS AVE	$85.00	$0.00

Total Permits For Type: 8
Total Fees For Type: $1070.00
Total Const. Value For Type: $0.00

Plumbing

Permit #	Applicant	Address	Fee Total	Const. Value
PP2024-024	SWEET, DAVID LEE	714 MARVIN ST	$85.00	$0.00
PP2024-023	SWEET, DAVID LEE	350 E BRAMAN AVE	$85.00	$0.00
PP2024-021	KLEVER FAMILY LIFE ESTATE	659 JEFFERSON LN	$145.00	$0.00
PP2024-020	DYNAMIC DRAINS LLC	250 E MAIN ST	$85.00	$0.00
PP2024-019	DYNAMIC DRAINS LLC	643 HONEYSUCKLE LN	$85.00	$0.00
PP2024-016	DAVID FOWLER	125 YORK ST	$85.00	$0.00

Total Permits For Type: 6
Total Fees For Type: $570.00
Total Const. Value For Type: $0.00

Res Alteration

Permit #	Applicant	Address	Fee Total	Const. Value
PB2024-0018	KLEVER FAMILY LIFE ESTATE	659 JEFFERSON LN	$555.00	$55000.00
PB2024-0016	No Limits Homes LLC CRAIG RODOSALEWICZ	64 FIRST ST	$810.00	$85000.00
PB2024-0015	Odds & Ends Handyman Services LLc LAURA RUSSEAU	575 YORKSHIRE SQ	$177.00	$3500.00

Total Permits For Type: 3
Total Fees For Type: $1542.00
Total Const. Value For Type: $143500.00

Roof

Permit #	Applicant	Address	Fee Total	Const. Value
PB2024-0019	SWEET, DAVID LEE	207 REDMAN RD	$104.00	$3000.00
PB2024-0017	SWEET, DAVID LEE	201 REDMAN RD	$104.00	$3000.00
PB2024-0012	SMOLYANOV HOME IMPROVEMENT LLC	590 HONEYSUCKLE LN	$280.00	$28000.00

Total Permits For Type: 3
Total Fees For Type: $488.00
Total Const. Value For Type: $34000.00

Temporary

Permit #	Applicant	Address	Fee Total	Const. Value
PT2024-002	CITY OF MILAN	W MAIN ST	$75.00	$0.00
PT2024-001	CITY OF MILAN	W MAIN ST	$75.00	$0.00

Total Permits For Type: 2
Total Fees For Type: $150.00
Total Const. Value For Type: $0.00

Windows/Doors

Permit #	Applicant	Address	Fee Total	Const. Value
PB2024-0013	WALLSIDE INC	22 W MICHIGAN AVE	$120.00	$5080.00
PB2024-0010	RIGHTWAY HOME RENOVATIONS LLC HAROLD KINZER III	217 ELM ST	$111.00	$2145.00

Total Permits For Type: 2
Total Fees For Type: $231.00
Total Const. Value For Type: $7225.00

Grand Total Fees: $7,045.00
Grand Total Permits: 37

Grand Total Const. Value:	$221561.00

Enforcement Category Totals - NEW

FEBRUARY 2024

BLIGHT ORDINANCE	**Total Entries: 2**
CODE ENFORCEMENT PROPERTY CHECK	**Total Entries: 1**
LITTER	**Total Entries: 1**
SIGNS & NOTICES	**Total Entries: 5**
SNOW REMOVAL	**Total Entries: 1**
VEHICLE- JUNK	**Total Entries: 5**
YARD- VEHICLES PARKED	**Total Entries: 3**
YARD WASTE IN PUBLIC RIGHT OF WAY	**Total Entries: 3**
ZONING VIOLATIONS	**Total Entries: 2**

TOTAL RECORD: 23

Monthly Code Enforcement Inspections FEBRUARY 2024

ENFORCEMENT #	Category	Inspection Type	Completed	Status
E2023-732	BLIGHT ORDINANCE	FOLLOW UP	2/5/2024	No Change
E2023-732	BLIGHT ORDINANCE	FOLLOW UP	2/28/2024	No Change
E2023-914	BLIGHT ORDINANCE	FOLLOW UP	2/1/2024	Partially Complied
E2023-914	BLIGHT ORDINANCE	FOLLOW UP	2/6/2024	Violations
E2023-914	BLIGHT ORDINANCE	FOLLOW UP	2/21/2024	Violations
E2023-915	LITTER	FOLLOW UP	2/1/2024	Partially Complied
E2023-915	LITTER	FOLLOW UP	2/5/2024	Complied
E2023-917	VEHICLE- JUNK	FOLLOW UP	2/1/2024	Complied
E2024-100	YARD WASTE IN PUBLIC RIGHT OF WAY	ORDINANCE	2/28/2024	Violations
E2024-101	ZONING VIOLATIONS	ORDINANCE	2/7/2024	Violations
E2024-101	ZONING VIOLATIONS	FOLLOW UP	2/8/2024	Complied
E2024-102	VEHICLE- JUNK	ORDINANCE	2/21/2024	Violations
E2024-102	VEHICLE- JUNK	FOLLOW UP	2/27/2024	No Change
E2024-103	YARD- VEHICLES PARKED	ORDINANCE	2/27/2024	Violations
E2024-104	YARD WASTE IN PUBLIC RIGHT OF WAY	ORDINANCE	2/27/2024	Violations
E2024-112	VEHICLE- JUNK	ORDINANCE	2/27/2024	Violations
E2024-113	SIGNS & NOTICES	ORDINANCE	2/20/2024	Violations
E2024-113	SIGNS & NOTICES	FOLLOW UP	2/27/2024	Complied
E2024-114	ZONING VIOLATIONS	ORDINANCE	2/20/2024	No Violation
E2024-114	ZONING VIOLATIONS	FOLLOW UP	2/27/2024	No Violation
E2024-115	CODE ENFORCEMENT PROPERTY CHECK	ORDINANCE	2/21/2024	No Violation
E2024-116	LITTER	ORDINANCE	2/26/2024	Violations
E2024-116	LITTER	FOLLOW UP	2/28/2024	No Change
E2024-117	SIGNS & NOTICES	ORDINANCE	2/26/2024	Violations
E2024-118	SIGNS & NOTICES	ORDINANCE	2/26/2024	Violations
E2024-119	SIGNS & NOTICES	ORDINANCE	2/26/2024	Violations
E2024-120	YARD WASTE IN PUBLIC RIGHT OF WAY	ORDINANCE	2/27/2024	Violations
E2024-120	YARD WASTE IN PUBLIC RIGHT OF WAY	FOLLOW UP	2/29/2024	Complied
E2024-121	SIGNS & NOTICES	ORDINANCE	2/28/2024	Violations
E2024-122	SIGNS & NOTICES	ORDINANCE	2/28/2024	Violations
E2024-123	SIGNS & NOTICES	ORDINANCE	2/28/2024	Violations
E2024-124	SIGNS & NOTICES	ORDINANCE	2/28/2024	Violations
E2024-925	YARD WASTE IN PUBLIC RIGHT OF WAY	FOLLOW UP	2/1/2024	Complied
E2024-932	BLIGHT ORDINANCE	FOLLOW UP	2/6/2024	Partially Complied
E2024-932	BLIGHT ORDINANCE	FOLLOW UP	2/14/2024	Partially Complied
E2024-932	BLIGHT ORDINANCE	FOLLOW UP	2/20/2024	Partially Complied
E2024-934	SIGNS & NOTICES	FOLLOW UP	2/1/2024	Complied
E2024-936	YARD WASTE IN PUBLIC RIGHT OF WAY	FOLLOW UP	2/1/2024	Complied
E2024-938	VEHICLE- ABANDONED	FOLLOW UP	2/8/2024	Complied
E2024-939	BLIGHT ORDINANCE	FOLLOW UP	2/21/2024	Complied
E2024-940	PROPERTY MAINT.	FOLLOW UP	2/1/2024	Complied
E2024-941	YARD WASTE IN PUBLIC RIGHT OF WAY	FOLLOW UP	2/1/2024	Complied
E2024-942	BLIGHT ORDINANCE	FOLLOW UP	2/21/2024	No Change
E2024-942	BLIGHT ORDINANCE	FOLLOW UP	2/27/2024	No Change
E2024-951	SNOW REMOVAL	FOLLOW UP	2/1/2024	No Change
E2024-951	SNOW REMOVAL	FOLLOW UP	2/5/2024	Violations
E2024-957	YARD WASTE IN PUBLIC RIGHT OF WAY	FOLLOW UP	2/8/2024	Complied

Monthly Code Enforcement Inspections FEBRUARY 2024

E2024-969	SNOW REMOVAL	FOLLOW UP	2/20/2024	Complied
E2024-970	SNOW REMOVAL	FOLLOW UP	2/20/2024	Complied
E2024-972	SNOW REMOVAL	FOLLOW UP	2/20/2024	Complied
E2024-982	SNOW REMOVAL	FOLLOW UP	2/1/2024	Complied
E2024-993	YARD- VEHICLES PARKED	ORDINANCE	2/7/2024	Violations
E2024-993	YARD- VEHICLES PARKED	FOLLOW UP	2/26/2024	No Change
E2024-993	YARD- VEHICLES PARKED	FOLLOW UP	2/27/2024	No Change
E2024-994	BLIGHT ORDINANCE	ORDINANCE	2/27/2024	Violations
E2024-995	YARD- VEHICLES PARKED	ORDINANCE	2/27/2024	Violations
E2024-996	VEHICLE- JUNK	ORDINANCE	2/7/2024	Violations
E2024-996	VEHICLE- JUNK	FOLLOW UP	2/28/2024	No Change
E2024-997	VEHICLE- JUNK	ORDINANCE	2/28/2024	Violations
E2024-998	VEHICLE- JUNK	ORDINANCE	2/28/2024	Violations
E2024-999	BLIGHT ORDINANCE	ORDINANCE	2/21/2024	Violations
E2024-999	BLIGHT ORDINANCE	FOLLOW UP	2/28/2024	No Change
	TOTAL # OF INSPECTIONS:62			

C - C

MILAN
Connect with what matters

CITY OF MILAN

FUNDRAISER, PARADE, SOLICITATION AND SPECIAL EVENT REQUEST FORM

NAME: Sara Bearman

ORGANIZATION: S'Mac and Cheese LLC

ADDRESS: 475 Canfield St

CITY, STATE, ZIP Milan MI 48160

PHONE NUMBER: [redacted]

TYPE OF REQUEST: *FUNDRAISER **PARADE ***SOLICITATION ****SPECIAL EVENT X

DESCRIPTION OF FUNDRAISER, PARADE ROUTE (**include map**) OR SPECIAL EVENT DETAILS:

I am requesting parking spaces 8, 9 & 10 on South side of Main St, West of Wabash to be blocked off on May 25, 2024 from 4pm-9pm. I would like to use the space for my food trailer for dinner - (map Attached)

** Dates of Event: 5/25/24 ** Time of Event- From: 4pm To: 9pm

***(The City of Milan requires that all door-to-door solicitation end by 8:00p.m., unless otherwise specified)**

***(Solicitation without fundraising)

******(Attach map, event schedule, special needs)**

******PARADE PERMIT** *** NOTHING SHALL BE PROJECTED INTO THE CROWD INCLUDING BUT NOT LIMITED TO WATER, CANDY, SILLY STRING, FOAM, CONFETTI, ETC.

REQUEST TO PUT ON CABLE: YES NO X IF YES, REQUESTED DATES TO RUN: _ _ _ _ _ _ _ _

(see attached policy- must fill out Acknowledgement of Operating Policy and Request Form)

SIGNATURE: Sara Bearman

OFFICE USE ONLY

City Administrator:_____

Approved:_____ **Denied:**_____ **Date:**_____

Chief of Police: Chief Tillery

Approved: X **Denied:**_____ **Date:** 3/14/2024 TCO needed (attached)

Indemnification-As a precondition to use of the public access channel, any person who submits material for broadcast must agree to defend, indemnify and hold harmless the City of Milan from and against any and all claims, demands, causes of action, liabilities, judgments, cost and expenses (including legal fees) arising out of the use of the access channel. Furthermore, the City of Milan will not assume responsibility for answering any complaints that may be received from the public as to the quality or contents of such programming. Any person submitting material for broadcast on the access channel will be expected to assume full and complete responsibility for and to answer any inquires which are received from any regulatory body, including the Federal Communications Commission, respecting such programming.

These guidelines shall be subject to periodic revision by the City of Milan.

I have read and understand the City of Milan Community Access television Channel Rules and Procedures and agree to comply with the requirements therein, including the acceptance of liability resulting from materials for broadcast that I have submitted.

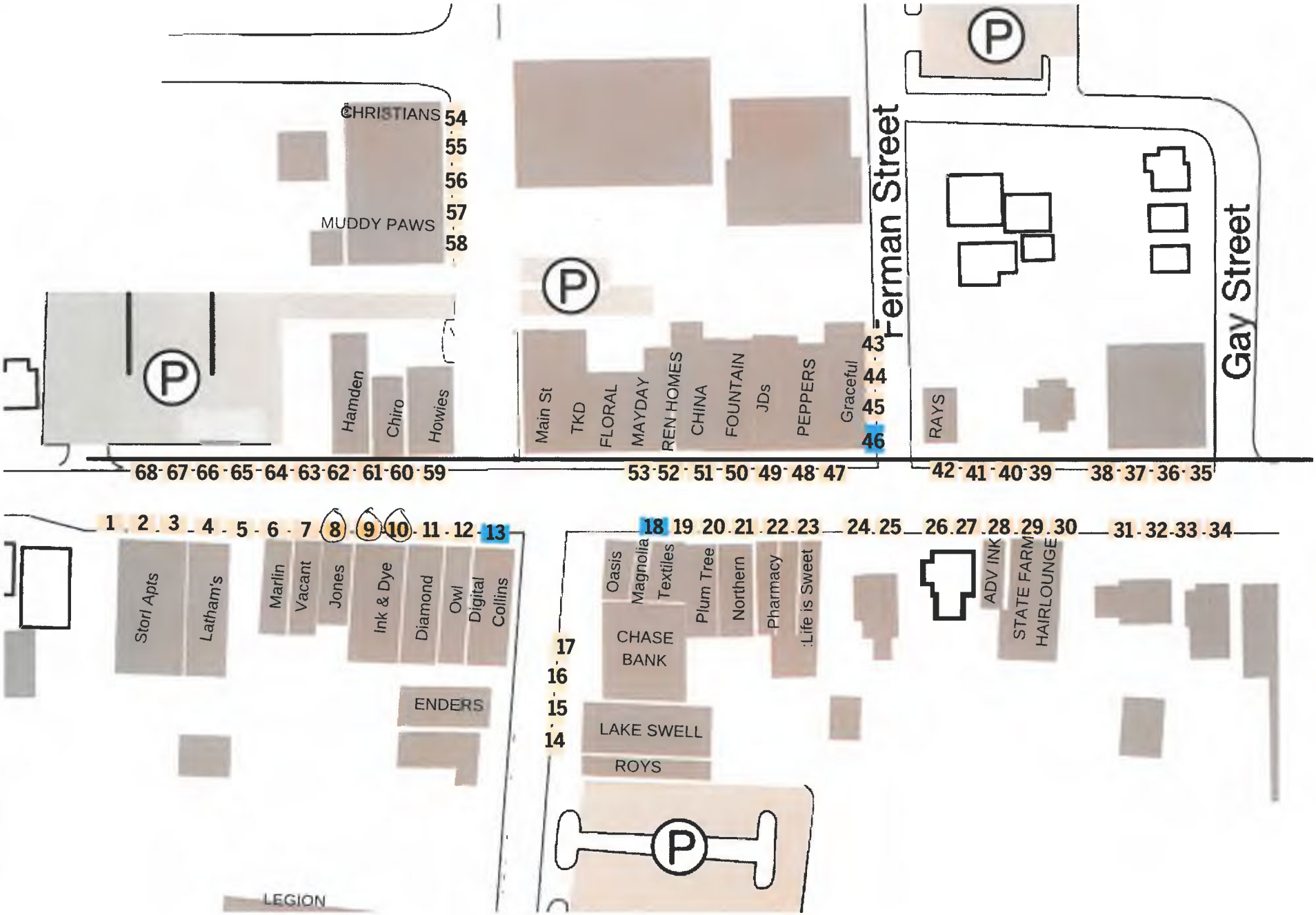
S'Mac and Cheese
Organization

Sara Boarman
Name of Individual Submitting Article/ Ad/Message

2-26-24
Date

734-604-0392
Telephone Number

Smac and cheese. trailer@gmail.com
E-Mail Address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CITY OF MILAN

TEMPORARY TRAFFIC CONTROL ORDER

CONTROLLING VEHICULAR TRAFFIC AND PARKING ON CITY STREETS

TCO 2024-5-T

TRAFFIC CONTROL ORDER NUMBER: _____

Pursuant to 1949 PA 300 (MCL 257.606), as amended, for the regulation of streets or highways under jurisdiction of local authority within its City limits, it is so ordered:

REGARDING: Road/Street closures and the parking of vehicles within the City of Milan, Counties of Washtenaw & Monroe, State of Michigan.

To facilitate a food truck on W. Main St., It is so ordered:

Beginning at 4:00 PM and ending at 9:00 PM on Saturday May 25, 2024.

The following restrictions are in place:

West Main Street Parallel Parking
W. Main St., the 00-100 block of W. Main St., on the South side of the road, beginning at the intersection of Wabash St. West, the 4th, 5th, and 6th parking spots, labeled #10, #9, & #8 in the attached parking map, are closed to general parking facilitate the parking of specialized food truck.

Signs will be placed by the Department of Public Works **48 hours** before the times as annotated in this order. Signs shall be removed at the conclusion of the event by DPW.

All vehicles impeding/blocking or inside the posted areas will be subject to applicable traffic violations and TOW-AWAY. 48 hours notices will not be utilized to move vehicles during this temporary order. Officers will attempt to locate the driver/owner before removal.

Enforcement of this order becomes effective when approved by affirmative vote of the City of Milan Council, filed with the City Clerk, and signs giving notice of the above have been erected.

Approved by affirmative vote of the City of Milan Council on: _____
Date

_____ _____
Lavonna Wenzel Edward Kolar
City Clerk Mayor

CITY OF MILAN
STAFF REPORT
MEETING DATE: March 19, 2024

TO: Mayor Kolar & City Council

FROM: Jim Lancaster, City Administrator

SUBJECT: Transportation Asset Management Plan Adoption

REASONS FOR COUNCIL CONSIDERATION:

In July of 2023 City Council approved Ohm to conduct a Transportation Asset Management Plan for the roads within the city. We were given a presentation by OHM at the February 6 work session outlining the results of the PASER study, capital improvement plan and the necessary funding to reach the level of service the city desires for its roadways. The next step in the process is to officially adopt the TAMP via a council resolution. Upon adoption we can then submit this plan to the State of Michigan for approval and it will give us more flexibility to move funds between major and local road funds to begin to accomplish the CIP that is within this document.

RECOMMENDED ACTION:

Approve and adopt the Transportation Asset Management Plan.

CITY OF MILAN
RESOLUTION NO. 2024-02

A RESOLUTION OF APPROVAL OF THE TRANSPORTATION ASSET MANAGEMENT PLAN

WHEREAS, the City of Milan is a Public Act 51 Local Road Agency responsible for approximately 27 centerline miles of roads; and

WHEREAS, the City of Milan developed a Transportation Asset Management Plan (TAMP) that was presented to City Council during a February 6, 2024, work session, and

WHEREAS, a resolution is required pursuant to Public Act 325 of 2018 and Public Act 338 of 2006 to provide proof of acceptance by the local road agency's governing body.

NOW, THEREFORE BE IT RESOLVED, that the City of Milan's Transportation Asset Management Plan is approved by the City Council.

Moved by Councilmember _____Supported by Councilmember_____ that the foregoing resolution be adopted

AYES:

NAYS:

ABSENT:

_____
Edward Kolar, Mayor

I, Lavonna Wenzel, Clerk of the City of Milan a Michigan Municipal Corporation, do hereby certify that the above-captioned Resolution No, 2024-02 was adopted by the City Council of the City of Milan at the regular meeting thereof on the 19 Day of March 2024. I further certify that Edward Kolar is the duly elected Mayor of the City of Milan, and Lavonna Wenzel is the duly appointed Clerk of the City of Milan.

_____
Lavonna Wenzel, Clerk

City of Milan
2024 Pavement
Asset Management Plan

A plan describing the City of Milan's Transportation Assets and Conditions

Prepared by: OHM Advisors
Author: Sarah Barrett
Author's Title: Engineer
Contact Information: OHM Advisors
34000 Plymouth Road, Livonia, MI 48150
Email: sarah.barrett@ohm-advisors.com
Phone: (734) 466-4540

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EXECUTIVE SUMMARY

As conduits for commerce and connections to vital services, roads are among the most important assets in any community along with other assets like bridges, culverts, traffic signs, traffic signals, and utilities that support and affect roads. The City of Milan's (the City) roads, other transportation assets, and support systems are also some of the most valuable and extensive public assets, all of which are paid for with taxes collected from ordinary citizens and businesses. The cost of building and maintaining roads, their importance to society, and the investment made by taxpayers all place a high level of responsibility on local agencies to plan, build, and maintain the road network in an efficient and effective manner. This asset management plan is intended to report on how the City is meeting its obligations to maintain the public assets for which it is responsible.

This plan overviews the City's road assets and condition, and explains how the City works to maintain and improve the overall condition of those assets. These explanations can help answer the following questions:

- What kinds of road assets the City has in its jurisdiction, who owns them, and the different options for maintaining these assets.
- What tools and processes the City uses to track and manage road assets and funds.
- What condition the City's road assets are in compared to statewide averages.
- Why some road assets are in better condition than others and the path to maintaining and improving road asset conditions through proper planning and maintenance.
- How agency transportation assets are funded and where those funds come from.
- How funds are used and the costs incurred during the City's road assets' normal life cycle.
- What condition the City can expect its road assets if those assets continue to be funded at the current funding levels
- How changes in funding levels can affect the overall condition of all of the City's road assets.

The City owns and/or manages 27.332 centerline of roads. This road network can be divided into the city major network, the city local network, the unpaved road network, and the National Highway System (NHS) network based on the different factors these roads have that influence asset management decisions. A summary of the City historical and current network conditions, projected trends, and goals for city major network and city local network can be seen in the two figures, below:

An asset management plan is required by Michigan Public Act 325 of 2018, and this document represents fulfillment of some of the City's obligations towards meeting these requirements. This asset management plan also helps demonstrate the City's responsible use of public funds by providing elected and appointed officials as well as the general public with inventory and condition information of the City's road assets, and gives taxpayers the information they need to make informed decisions about investing in its essential transportation infrastructure

1. INTRODUCTION

Asset management is defined by Public Act 325 of 2018 as “an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals”. In other words, asset management is a process that uses data to manage and track assets, like roads and bridges, in a cost-effective manner using a combination of engineering and business principles. This process is endorsed by leaders in municipal planning and transportation infrastructure, including the Michigan Municipal League, County Road Association of Michigan, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA). the City is supported in its use of asset management principles and processes by the Michigan Transportation Asset Management Council (TAMC), formed by the State of Michigan.

Asset management, in the context of this plan, ensures that public funds are spent as effectively as possible to maximize the condition of the road network. Asset management also provides a transparent decision-making process that allows the public to understand the technical and financial challenges of managing road infrastructure with a limited budget.

The City of Milan (the City) has adopted an “asset management” business process to overcome the challenges presented by having limited financial, staffing, and other resources while needing to meet road users’ expectations. The City is responsible for maintaining and operating over 27.332 centerline of roads.

This plan outlines how the City determines its strategy to maintain and upgrade road asset condition given agency goals, priorities of its road users, and resources provided. An updated plan is to be released approximately every two years to reflect changes in road conditions, finances, and priorities.

Questions regarding the use or content of this plan should be directed to Jim Lancaster at 147 Wabash, Milan, MI 48160 or at (734) 439-7089. Key terms used in this plan are defined in the City’s comprehensive transportation asset management plan (also known as the “compliance plan”) used for compliance with PA 325 or 2018.

Knowing the basic features of the asset classes themselves is a crucial starting point to understanding the rationale behind an asset management approach. The following primer provides an introduction to pavements.

Pavement Primer

Roads come in two basic forms—paved and unpaved. Paved roads have hard surfaces. These hard surfaces can be constructed from asphalt, concrete, composite (asphalt and concrete), sealcoat, and brick and block materials. On the other hand, unpaved roads have no hard surfaces. Examples of these surfaces are gravel and unimproved earth.

The decision to pave with a particular material as well as the decision to leave a road unpaved allows road-owning agencies to tailor a road to a particular purpose, environment, and budget. Thus, selecting a pavement type or leaving a road unpaved depends upon purpose, materials available, and budget. Each choice represents a trade-off between budget and costs for construction and maintenance.

Maintenance enables the road to fulfill its particular purpose. To achieve the maximum service for a pavement or an unpaved road, continual monitoring of a road's pavement condition is essential for choosing the right time to apply the right fix in the right place.

Here is a brief overview of the different types of pavements, how condition is assessed, and treatment options that can lengthen a road's service life.

Surfacing

Pavement type is influenced by several different factors, such as cost of construction, cost of maintenance, frequency of maintenance, and type of maintenance. These factors can have benefits affecting asset life and road user experience.

Paved Surfacing

Typical benefits and tradeoffs for hard surface types include:

- **Concrete pavement:** Concrete pavement, which is sometimes called a rigid pavement, is durable and lasts a long time when properly constructed and maintained. Concrete pavement can have longer service periods between maintenance activities, which can help reduce maintenance-related traffic disruptions. However, concrete pavements have a high initial cost and can be challenging to rehabilitate and maintain at the end of their service life. A typical concrete pavement design life will provide service for 30 years before major rehabilitation is necessary.
- **Hot-mix asphalt pavement (HMA):** HMA pavement, sometimes known as asphalt or flexible pavement, is currently less expensive to construct than concrete pavement (this is, in some part, due to the closer link between HMA material costs and oil prices that HMA pavements have in comparison with other pavement types). However, they require frequent maintenance activities to maximize their service life. A typical HMA pavement design life will provide service for 18 years before major rehabilitation is necessary. The vast majority of local-agency-owned pavements are HMA pavements.
- **Composite pavements:** Composite pavement is a combination of concrete and asphalt layers. Typically, composite pavements are old concrete pavements exhibiting ride-related issues that were overlaid by several inches of HMA in order to gain more service life from the pavement before it would need reconstruction. Converting a concrete pavement to a composite pavement is typically used as a "holding pattern" treatment to maintain the road in usable condition until reconstruction funds become available.
- **Sealcoat pavement:** Sealcoat pavement is a gravel road that have been sealed with a thin asphalt binder coating that has stone chips spread on top (not to be confused with a chip seal treatment over HMA pavement). This type of a pavement relies on the gravel layer to provide structure to

support traffic, and the asphalt binder coating and stone chips shed water and eliminate the need for maintenance grading. Nonetheless, sealcoat pavement does require additional maintenance steps that asphalt and gravel do not require and does not last as long as HMA pavement, but it provides a low-cost alternative for lightly-trafficked areas and competes with asphalt for ride quality when properly constructed and maintained. Sealcoat pavement can provide service for ten or more years before the surface layer deteriorates and needs to be replaced.

Unpaved Surfacing

Typical benefits and tradeoffs for non-hard surfacing include:

- **Gravel:** Gravel is a low-cost, easy-to-maintain road surface made from layers of soil and aggregate (gravel). However, there are several potential drawbacks such as dust, mud, and ride smoothness when maintenance is delayed or traffic volume exceeds design expectations. Gravel roads require frequent low-cost maintenance activities. Gravel can be very cost effective for lower-volume, lower-speed roads. In the right conditions, a properly constructed and maintained gravel road can provide a service life comparable to an HMA pavement and can be significantly less expensive than the other pavement types.

Pavement Condition

Besides traffic congestion, pavement condition is what road users typically notice most about the quality of the roads that they regularly use—the better the pavement condition, the more satisfied users are with the service provided by the roadwork performed by road-owning agencies. Pavement condition is also a major factor in determining the most cost-effective treatment—that is, routine maintenance, capital preventive maintenance, or structural improvement—for a given section of pavement. As pavements age, they transition between "windows" of opportunity when a specific type of treatment can be applied to gain an increase in quality and extension of service life. Routine maintenance is day-to-day, regularly-scheduled, low-cost activity applied to "good" roads to prevent water or debris intrusion. Capital preventive maintenance (CPM) is a planned set of cost-effective treatments for "fair" roads that corrects pavement defects, slows further deterioration, and maintains the functional condition without increasing structural capacity. The City uses pavement condition and age to anticipate when a specific section of pavement will be a potential candidate for preventive maintenance. More detail on this topic is included in the *Pavement Treatment* section of this primer.

Pavement condition data is also important because it allows road owners to evaluate the benefits of preventive maintenance projects. This data helps road owners to identify the most cost-effective use of road construction and maintenance dollars. Further, historic pavement condition data can enable road owners to predict future road conditions based on budget constraints and to determine if a road network's condition will improve, stay the same, or degrade at the current or planned investment level. This analysis can help determine how much additional funding is necessary to meet a network's condition improvement goals.

Paved Road Condition Rating System

The City is committed to monitoring the condition of its road network and using pavement condition data to drive cost-effective decision-making and preservation of valuable road assets. The City uses the

Pavement Surface Evaluation and Rating (PASER) system to assess its paved roads. PASER was developed by the University of Wisconsin Transportation Information Center to provide a simple, efficient, and consistent method for evaluating road condition through visual inspection. The widely-used PASER system has specific criteria for assessing asphalt, concrete, sealcoat, and brick and block pavements. Information regarding the PASER system and PASER manuals may be found on the TAMC website at: http://www.michigan.gov/tamc/0,7308,7-356-82158_82627---,00.html.

The TAMC has adopted the PASER system for measuring statewide pavement conditions in Michigan for asphalt, concrete, composite, sealcoat, and brick-and-block paved roads. Broad use of the PASER system means that data collected at the City is consistent with data collected statewide. PASER data is collected using trained inspectors in a slow-moving vehicle using GPS-enabled data collection software provided to road-owning agencies at no cost to them. The method does not require extensive training or specialized equipment, and data can be collected rapidly, which minimizes the expense for collecting and maintaining this data.

The PASER system rates surface condition using a 1-10 scale where 10 is a brand new road with no defects that can be treated with routine maintenance, 5 is a road with distresses but is structurally sound that can be treated with preventive maintenance, and 1 is a road with extensive surface and structural distresses that is in need of total reconstruction.

Roads with lower PASER scores generally require costlier treatments to restore their quality than roads with higher PASER scores. The cost effectiveness of treatments generally decreases the as the PASER number decreases. In other words, as a road deteriorates, it costs more dollars per mile to fix it, and the dollars spent are less efficient in increasing the road's service life. Nationwide experience and asset management principles tell us that a road that has deteriorated to a PASER 4 or less will cost more to improve and the dollars spent are less efficient. Understanding this cost principle helps to draw meaning from the current PASER condition assessment.

The TAMC has developed statewide definitions of road condition by creating three simplified condition categories—"good", "fair", and "poor"—that represent bin ranges of PASER scores having similar contexts with regard to maintenance and/or reconstruction. The definitions of these rating conditions are:

- "Good" roads, according to the TAMC, have PASER scores of 8, 9, or 10. Roads in this category have very few, if any, defects and only require minimal maintenance; they may be kept in this category longer using PPM. These roads may include those that have been recently seal coated or newly constructed. Figure 1 illustrates an example of a road in this category.
- "Fair" roads, according to the TAMC, have PASER scores of 5, 6, or 7. Roads in this category still show good structural support, but their surface is starting to deteriorate. Figure 1 illustrates two road examples in this category. CPM can be cost effective for maintaining the road's "fair" condition or even raising it to "good" condition before the structural integrity of the pavement has been severely impacted. CPM treatments can be likened to shingles on a roof of a house: while the shingles add no structural value, they protect the house from structural damage by maintaining the protective function of a roof covering.
- "Poor" roads, according to the TAMC, have PASER scores of 1, 2, 3, or 4. These roads exhibit evidence that the underlying structure is failing, such as alligator cracking and rutting. These roads must be rehabilitated with treatments like a heavy overlay, crush and shape, or total reconstruction. Figure 1 illustrates a road in this category.

Figure 1: *Top image, right*– PASER 8 road that is considered "good" by the TAMC exhibit only minor defects. *Second image, right*– PASER 5 road that is considered "fair" by the TAMC. Exhibiting structural soundness but could benefit from CPM. *Third image, right*– PASER 6 road that is considered "fair" by the TAMC. *Bottom image, right*– PASER 2 road that is considered "poor" by the TAMC exhibiting significant structural distress.

The TAMC's good, fair, and poor categories are based solely on the definitions, above. Therefore, caution should be exercised when comparing other condition assessments with these categories because other

condition assessments may have “good”, “fair”, or “poor” designations similar to the TAMC condition categories but may not share the same definition. Often, other condition assessment systems define the “good”, “fair”, and “poor” categories differently, thus rendering the data of little use for cross-system comparison. The TAMC’s definitions provide a statewide standard for all of Michigan’s road-owning agencies to use for comparison purposes.

PASER data is collected 100 percent every two years on all federal-aid-eligible roads in Michigan. The TAMC dictates and funds the required training and the format for this collection, and it shares the data regionally and statewide. In addition, the City collects 100 percent of its paved non-federal-aid-eligible network using its own staff and resources.

Unpaved Road Condition Rating System (IBR System™)

The condition of unpaved roads can be rapidly changing, which makes it difficult to obtain a consistent surface condition rating over the course of weeks or even days. The PASER system works well on most paved roads, which have a relatively-stable surface condition over several months, but it is difficult to adapt to unpaved roads. To address the need for a reliable condition assessment system for unpaved roads, the TAMC adopted the Inventory Based Rating (IBR) System™, and the City also uses the IBR System™ for rating its unpaved roads. Information about the IBR System™ can be found at http://ctt.mtu.edu/inventory-based-rating-system.

Figure 2: *Top*– Road with IBR number of 1 road that has poor surface width, poor drainage adequacy, and poor structural adequacy. *Middle*– Road IBR number of 7 that has fair surface width, fair drainage adequacy, and fair structural adequacy. *Bottom*– Road with IBR number of 9 road that has good surface width, good drainage adequacy, and good structural adequacy.

The IBR System™ gathers reliable condition assessment data for unpaved road by evaluating three features—surface width, drainage adequacy, and structural adequacy—in comparison to a baseline, or generally considered “good”, road. These three assessments come together to generate an overall 1-10 IBR number. A high IBR number reflects a road with wide surface width, good drainage, and a well-designed and well-constructed base, whereas a low IBR number reflects a narrow road with no ditches and little gravel. A good, fair, or poor assessment of each feature is not an endorsement or indictment of a road’s suitability for use but simply provides context on how these road elements compare to a baseline condition.

Figure 2 illustrates the range over which features may be assessed. The top example in Figure 2 shows an unpaved road with a narrow surface width, little or no drainage, and very little gravel thickness. Using the IBR System™, these assessments would yield an IBR number of “1” for this road. The middle example in Figure 2 shows a road with fair surface width, fair drainage adequacy, and fair

structural adequacy. These assessments would yield an IBR number of "7" for this road. The bottom example in Figure 2 shows a road with good surface width, good drainage adequacy, and good structural adequacy. These assessments would yield an IBR number of "9" for this road.

Unpaved roads are constructed and used differently throughout Michigan. A narrow, unpaved road with no ditches and very little gravel (low IBR number) may be perfectly acceptable in a short, terminal end of the road network, for example, on a road segment that ends at a lake or serves a limited number of unoccupied private properties. However, high-volume unpaved roads that serve agricultural or other industrial activities with heavy trucks and equipment will require wide surface width, good drainage, and a well-designed and well-constructed base structure (high IBR number). Where the unpaved road is and how it is used determines how the road must be constructed and maintained: just because a road has a low IBR number does not necessarily mean that it needs to be upgraded. The IBR number are not an endorsement or indictment of the road's suitability for use but rather, an indication of a road's capabilities to support different traffic volumes and types in all weather.

Pavement Treatments

Selection of repair treatments for roads aims to balance costs, benefits, and road life expectancy. All pavements are damaged by water, traffic weight, freeze/thaw cycles, and sunlight. Each of the following treatments and strategies—reconstruction, structural improvements, capital preventive maintenance, and others used by the City—counters at least one of these pavement-damaging forces. The cost of pavement treatments include engineering services, survey, and construction costs.

Reconstruction

Pavement reconstruction treats failing or failed pavements by completely removing the old pavement and base and constructing an entirely new road (Figure 3). Every pavement has to eventually be reconstructed and it is usually done as a last resort after more cost-effective treatments are done, or if the road requires significant changes to road geometry, base, or buried utilities. Compared to the other treatments, which are all improvements of the existing road, reconstruction is the most extensive rehabilitation of the roadway and therefore, also the most expensive per mile and most disruptive to regular traffic patterns. Reconstructed pavement will subsequently require one or more of the previous maintenance treatments to maximize service life and performance. A reconstructed road lasts approximately 20 years and costs $545,000 per lane mile for local roads and $680,000 per lane mile for major roads.

Figure 3: Examples of reconstruction treatments—(left) reconstructing a road and (right) road prepared for full-depth repair.

Structural Improvement

Roads requiring structural improvements exhibit alligator cracking and rutting and rated poor in the TAMC scale. Road rutting is evidence that the underlying structure is beginning to fail and it must be either rehabilitated with a structural treatment. Examples of structural improvement treatments include HMA overlay with or without milling, and crush and shape (Figure 4). The following descriptions outline the main structural improvement treatments used by the City.

Figure 4: Examples of structural improvement treatments—(from left) HMA overlay on an unmilled pavement, milling asphalt pavement, and pulverization of a road during a crush-and-shape project.

Hot-mix Asphalt (HMA) Overlay with/without Milling

An HMA overlay is a layer of new asphalt (liquid asphalt and stones) placed on an existing pavement (Figure 4). Depending on the overlay thickness, this treatment can add significant structural strength. This treatment also creates a new wearing surface for traffic and seals the pavement from water, debris, and sunlight damage. An HMA overlay lasts approximately five to twelve years and costs $305,000 to $545,000 per lane mile. The top layer of severely damaged pavement can be removed by the milling, a technique that helps prevent structural problems from being quickly reflected up to the new surface. Milling is also done to keep roads at the same height of curb and gutter that is not being raised or reinstalled in the project.

Pulverize and Reshape

During a crush and shape treatment, the existing pavement and base are pulverized and then the road surface is reshaped to correct imperfections in the road's profile (Figure 4). An additional layer of gravel is often added along with a new wearing surface such as an HMA overlay or chip seal. Additional gravel and an HMA overlay give an increase in the pavements structural capacity. This treatment is usually done on rural roads with severe structural distress; Adding gravel and a wearing surface makes it more prohibitive for urban roads if the curb and gutter is not raised up. Pulverize and reshape treatments last approximately 15 years and cost $484,000 per lane mile.

Capital Preventive Maintenance

Capital preventive maintenance (CPM) addresses pavement problems of fair-rated roads before the structural integrity of the pavement has been severely impacted. CPM is a planned set of cost-effective treatments applied to an existing roadway that slows further deterioration and that maintains or improves the functional condition of the system without significantly increasing the structural capacity. Examples of such treatments include crack seal, fog seal, chip seal, slurry seal, and microsurface (Figure 5). The purpose of the following CPM treatments is to protect the pavement structure, slow the rate of deterioration, and/or correct pavement surface deficiencies. The following descriptions outline the main CPM treatments used by the City.

Figure 5: Examples of capital preventive maintenance treatments—(from left) crack seal, fog seal, chip seal, and slurry seal/microsurface.

Overband and Crack Seal

Water that infiltrates the pavement surface softens the pavement structure and allows traffic loads to cause more damage to the pavement than in normal dry conditions. Crack sealing helps prevent water infiltration by sealing cracks in the pavement with asphalt sealant (Figure 5). The City seals pavement cracks early in the life of the pavement to keep it functioning as strong as it can and for as long as it can. Crack sealing lasts approximately two years and costs $7,000 per lane mile. Even though it does not last very long compared to other treatments, it does not cost very much compared to other treatments. This makes it a very cost effective treatment when the City looks at what crack filling costs per year of the treatment's life.

Cape Seal

A cape seal consists of a chip seal treatment covered by a slurry seal or microsurfacing treatment. Cape seals are best applied to pavements that are not exhibiting problems with strength, and their purpose is to help preserve that strength. It is designed to extend the life of pavements in fair to good condition, providing benefits of both chip seal and slurry seal or microsurfacing. These treatments last approximately seven years and cost $67,000 per lane mile.

Chip Seal

A chip seal, also known as a sealcoat, is a two-part treatment that starts with liquid asphalt sprayed onto the old pavement surface followed by a single layer of small stone chips spread onto the wet liquid asphalt layer (Figure 5). The liquid asphalt seals the pavement from water and debris and holds the stone chips in place, providing a new wearing surface for traffic that can correct friction problems and helping

to prevent further surface deterioration. Chip seals are best applied to pavements that are not exhibiting problems with strength, and their purpose is to help preserve that strength. These treatments last approximately five years and cost $46,000 per lane mile.

Slurry Seal/Microsurface

A slurry seal or microsurface's purpose is to protect existing pavement from being damaged by water and sunlight. The primary ingredients are liquid asphalt (slurry seal) or modified liquid asphalt (microsurface), small stones, water and portland cement applied in a very thin (less than a half an inch) layer (Figure 5). The main difference between a slurry seal and a microsurface is the modified liquid asphalt used in microsurfacing provides different curing and durability properties, which allows microsurfacing to be used for filling pavement ruts. Since the application is very thin, these treatments do not add any strength to the pavement and only serves to protect the pavement's existing strength by sealing the pavement from sunlight and water damage. These treatments work best when applied before cracks are too wide and too numerous. A slurry seal treatment lasts approximately seven years and costs $46,000 per lane mile, while a microsurface treatment tends to last for ten years and costs $46,000 per lane mile.

Figure 6: Examples of capital preventive maintenance treatments, cont'd—(from left) concrete road prepared for partial-depth repair, gravel road undergoing maintenance grading, and gravel road receiving dust control application (dust control photo courtesy of Weld County, Colorado, weldgov.com).

Maintenance

Maintenance is the most cost-effective strategy for managing road infrastructure and prevents good and fair roads from reaching the poor category, which require costly rehabilitation and reconstruction treatments to create a year of service life. It is most effective to spend money on routine maintenance and CPM treatments, first; then, when all maintenance project candidates are treated, reconstruction and rehabilitation can be performed as money is available. This strategy is called a "mix-of-fixes" approach to managing pavements.

1. PAVEMENT ASSETS

Building a mile of new road can cost over $1 million due to the large volume of materials and equipment that are necessary. The high cost of constructing road assets underlines the critical nature of properly managing and maintaining the investments made in this vital infrastructure. The specific needs of every mile of road within an agency's overall road network is a complex assessment, especially when considering rapidly changing conditions and the varying requisites of road users; understanding each road-mile's needs is an essential duty of the road-owning agency.

In Michigan, many different governmental units (or agencies) own and maintain roads, so it can be difficult for the public to understand who is responsible for items such as planning and funding construction projects, [patching] repairs, traffic control, safety, and winter maintenance for any given road. MDOT is responsible for state trunkline roads, which are typically named with "M", "I", or "US" designations regardless of their geographic location in Michigan. Cities and villages are typically responsible for all public roads within their geographic boundary with the exception of the previously mentioned state trunkline roads managed by MDOT. County road commissions (or departments) are typically responsible for all public roads within the county's geographic boundary, with the exception of those managed by cities, villages, and MDOT.

In cases where non-trunkline roads fall along jurisdictional borders, local and intergovernmental agreements dictate ownership and maintenance responsibility. Quite frequently, roads owned by one agency may be maintained by another agency because of geographic features that make it more cost effective for a neighboring agency to maintain the road instead of the actual road owner. Other times, road-owning agencies may mutually agree to coordinate maintenance activities in order to create economies of scale and take advantage of those efficiencies.

The City is responsible for a total of 27.332 centerline of public roads, as shown in Figure 7.

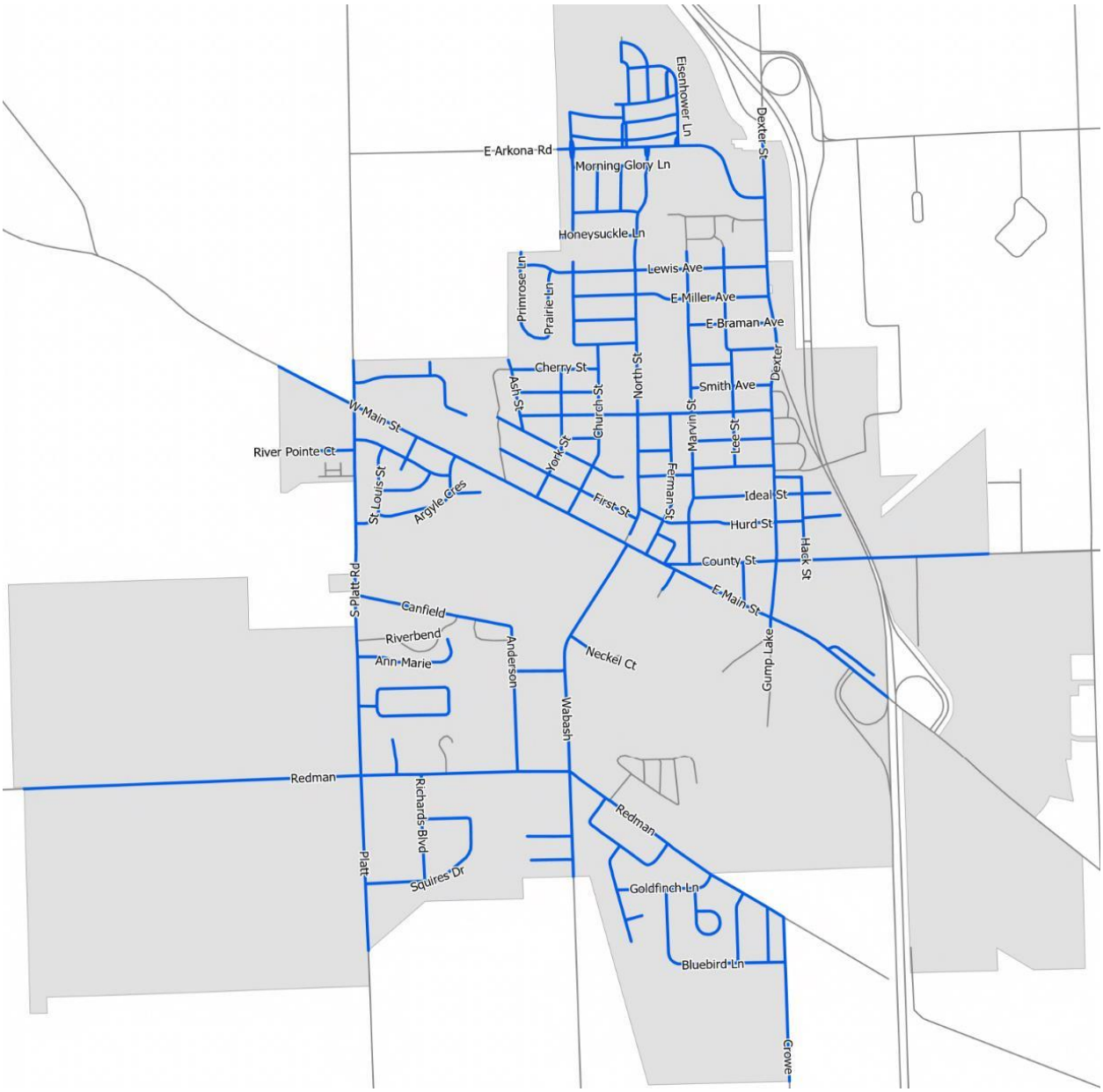


Figure 7: Map showing location of the City's paved roads (i.e., those managed by City).

Inventory

Michigan Public Act 51 of 1951 (PA 51), which defines how funds from the Michigan Transportation Fund (MTF) are distributed to and spent by road-owning agencies, classifies roads owned by the City as either city major or city local roads. State statute prioritizes expenditures on the city major road network.

Of the 27.332 centerline of public roads owned and managed by the City, approximately 35% of all City Major roads are classified as federal aid eligible, which allows them to receive federal funding for their maintenance and construction.

Figure 8 illustrates the percentage of roads owned by the City that are classified as city major and city local roads.

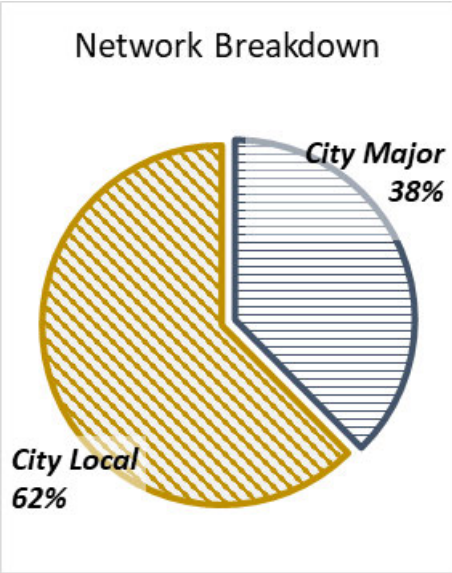


Figure 8: Percentage of city major and city local roads for the City.

Types

The City has multiple types of pavements in its jurisdiction, including: asphalt, concrete; it also has unpaved roads (i.e., gravel and/or earth). Factors influencing pavement type include cost of construction, cost of maintenance, frequency of maintenance, type of maintenance, asset life, and road user experience. More information on pavement types is available in the Introduction's Pavement Primer.

The City consists of nearly 100% of asphalt roads with one road 0.016 miles of concrete.

Condition

The road characteristic that road users most readily notice is pavement condition. Pavement condition is a major factor in determining the most cost-effective treatment—that is, routine maintenance, capital preventive maintenance, or structural improvement—for a given section of pavement. The City uses pavement condition and age to anticipate when a specific section of pavement will be a potential candidate for preventive maintenance. Pavement condition data enables the City to evaluate the benefits of preventive maintenance projects and to identify the most cost-effective use of road construction and maintenance dollars. Historic pavement condition data can be used to predict future road conditions based on budget constraints and to determine if a road network's condition will improve, stay the same, or degrade at the current or planned investment level. This analysis helps to determine how much additional funding is necessary to meet a network's condition improvement goals. More detail on this topic is included in the Introduction's *Pavement Primer*.

Paved Roads

The City is committed to monitoring the condition of its road network and using pavement condition data to drive cost-effective decision-making and preservation of valuable road assets. The City uses the Pavement Surface Evaluation and Rating (PASER) system, which has been adopted by the TAMC for measuring statewide pavement conditions, to assess its paved roads. The PASER system provides a simple, efficient, and consistent method for evaluating road condition through visual inspection. More information regarding the PASER system can be found in the Introduction's Pavement Primer.

The City has been collecting 100 percent of its PASER data every two years on average on all federal-aid-eligible roads and non-federal-aid-eligible roads.

Historically, the overall quality of the City's paved city major and city local roads have been decreasing, as can be observed in Figures 9 and 10.

Comparing the City's paved city major road condition trends illustrated in Figure 9 with overall statewide condition trends for similarly-classified roads, which are illustrated in Figure 11, shows a different trend locally as in the rest of the state.

Comparing the City's paved city local road condition trends illustrated in Figure 10 with overall statewide condition trends for all paved city local roads illustrated in Figure 12 indicates a different trend locally as in the rest of the state. The year-to-year variation in the paved city local road network is likely due to the fact that only a portion of the network is collected each year, both locally and statewide. This variation is likely a result of reporting bias since a representative sample of roads is not collected each year.

The statewide condition of federal-aid roadways has remained steady the last 5 years while the City's road conditions have improved from 2015 to 2019.

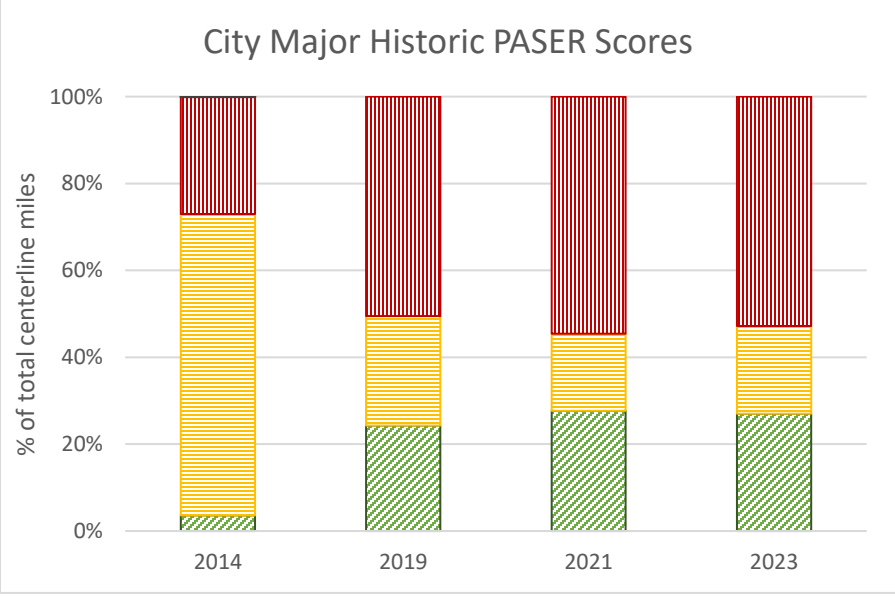


Figure 9: Historical City paved city major road network condition trend

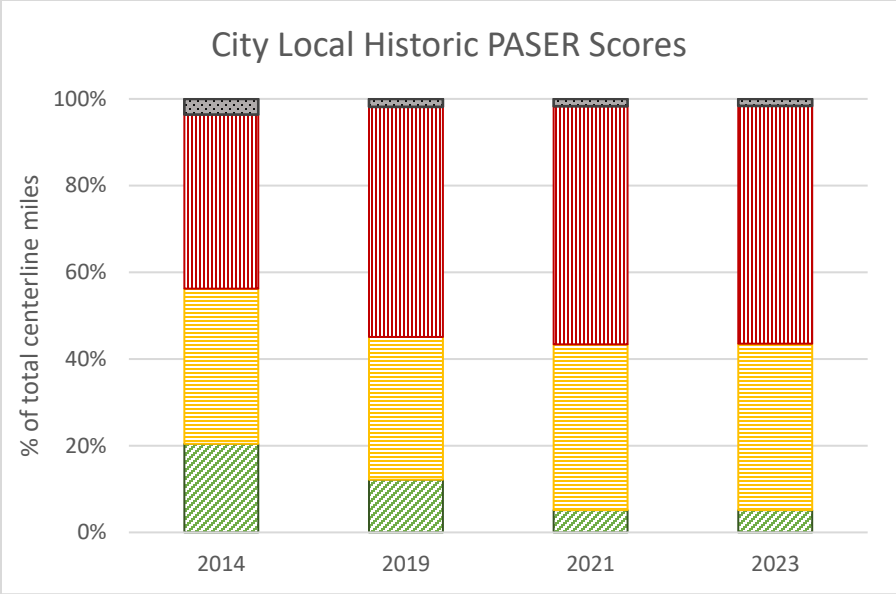


Figure 10: Historical City paved city local road network condition trend

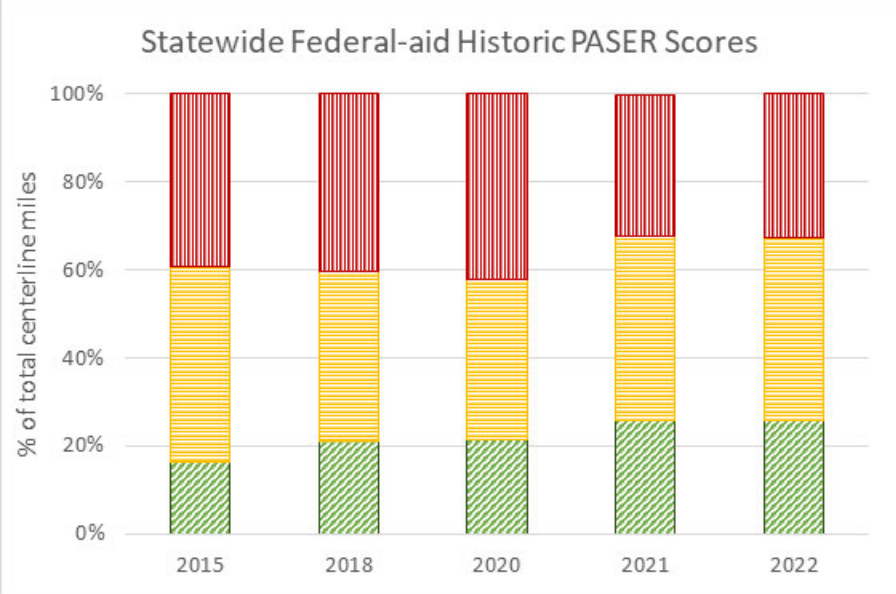


Figure 11: Historical statewide city major road network condition trend

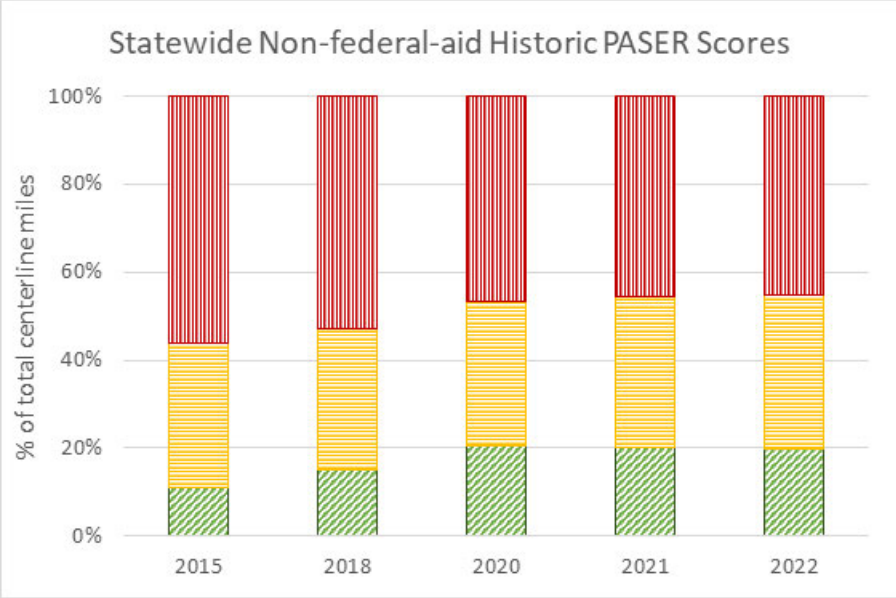


Figure 12: Historical statewide paved city local road network condition trend

The City's 2023 paved city major road network has 27 percent of roads in the TAMC good condition category, 53 percent in fair, and 20 percent in poor (Figure 13A). The paved city local road network has 5 percent in good, 39 percent in fair, and 56 percent in poor (Figure 13B).

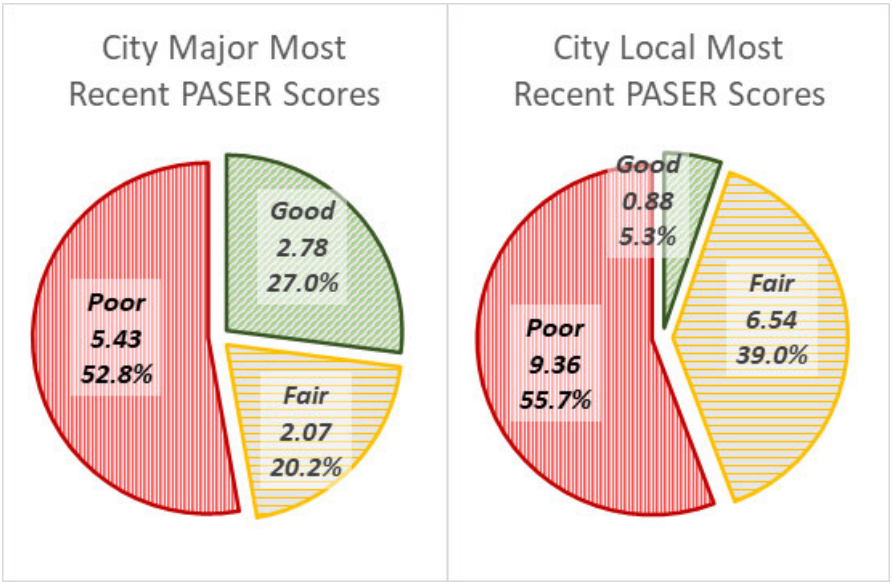


Figure 13: (A) Left: City paved city major road network conditions by percentage of good, fair, or poor, and (B) Right: paved city local road network conditions by percentage of good, fair, or poor

In comparison, the statewide paved city major road network has 26 percent of roads in the TAMC good condition category, 42 percent in fair, and 32 percent in poor (Figure 14A). The statewide paved city local road network has 20 percent in good, 35 percent in fair, and 45 percent in poor (Figure 14B). Comparing Figure 13A and Figure 14A shows that the City's paved city major road network is worse than similarly-classified roads in the rest of the state, while Figure 13B and Figure 14B show that the City's paved city local road network is worse than similarly-classified roads in the rest of the state. Other road condition graphs can be viewed on the TAMC pavement condition dashboard at: http://www.mcgi.state.mi.us/mitrp/Data/PaserDashboard.aspx.

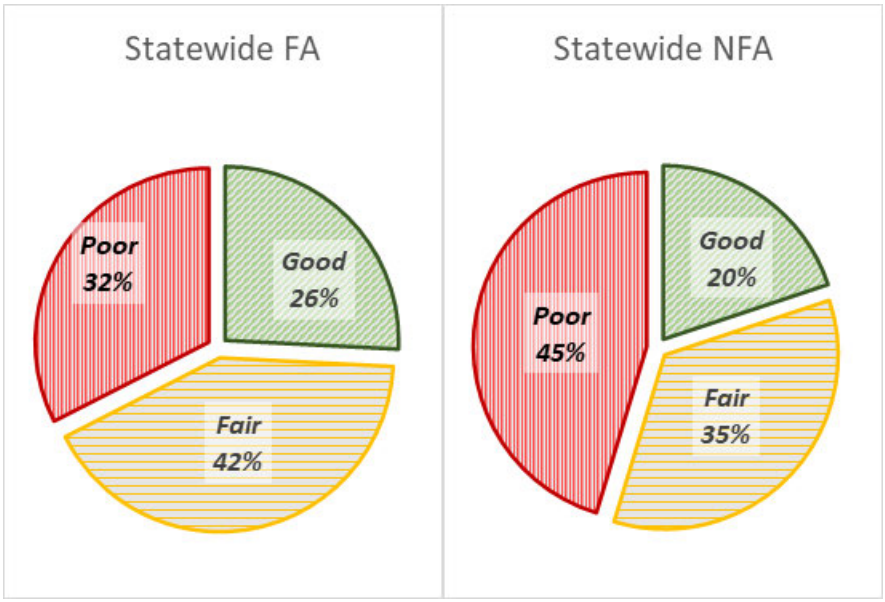


Figure 14: (A) Left: Statewide paved city major road network conditions by percentage of good, fair, or poor, and (B) Right: paved city local road network conditions by percentage of good, fair, or poor

Figure 15 and Figure 16 show the number of miles for the City's roads with PASER scores expressed in TAMC definition categories for the paved city major road network (Figure 15) and the paved city local road network (Figure 16). The City considers road miles on the transition line between good and fair (PASER 8) and the transition line between fair and poor (PASER 5) as representing parts of the road network where there is a risk of losing the opportunity to apply less expensive treatments that gain significant improvements in service life.

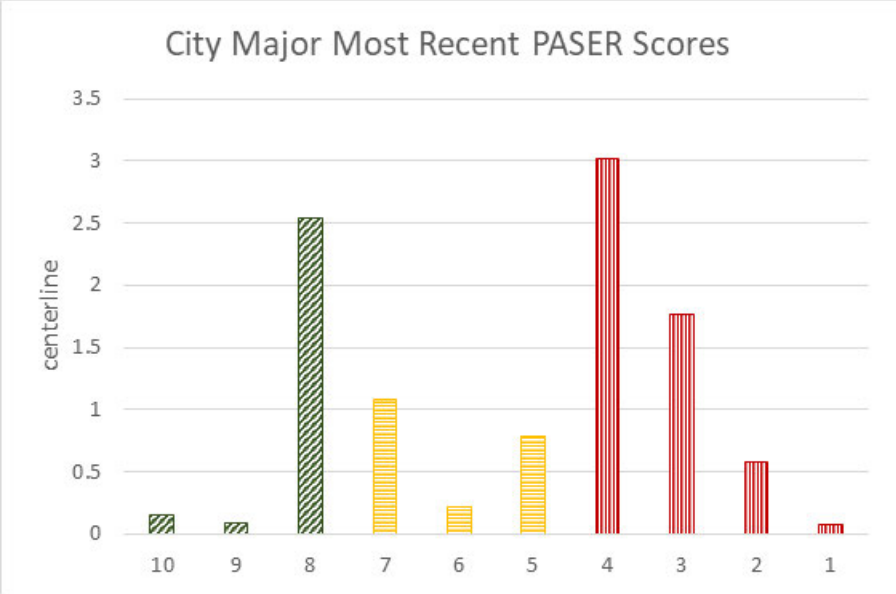


Figure 15: The City paved city major road network conditions. Bar graph colors correspond to good/fair/poor TAMC designations.

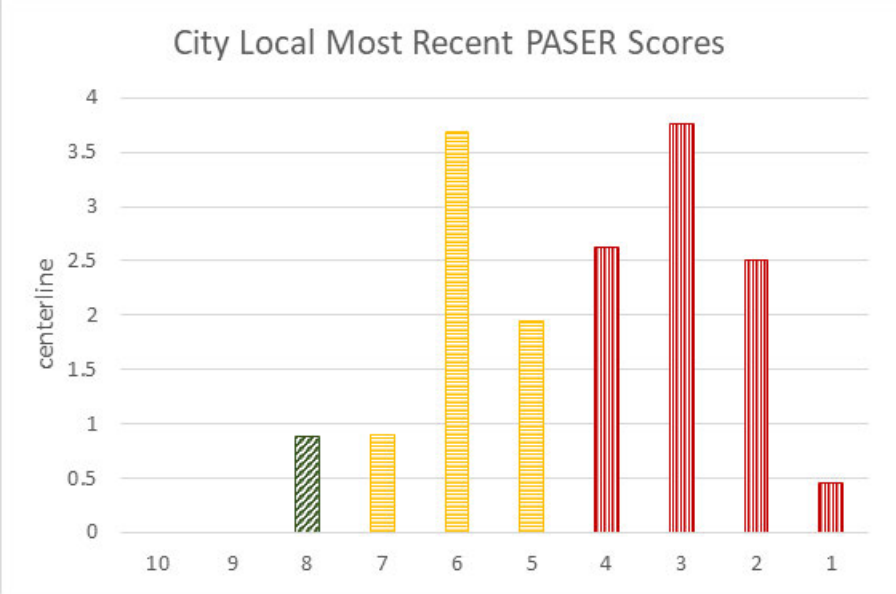


Figure 16: The City paved city local network condition by PASER rating. Bar graph colors correspond to good/fair/poor TAMC designations.

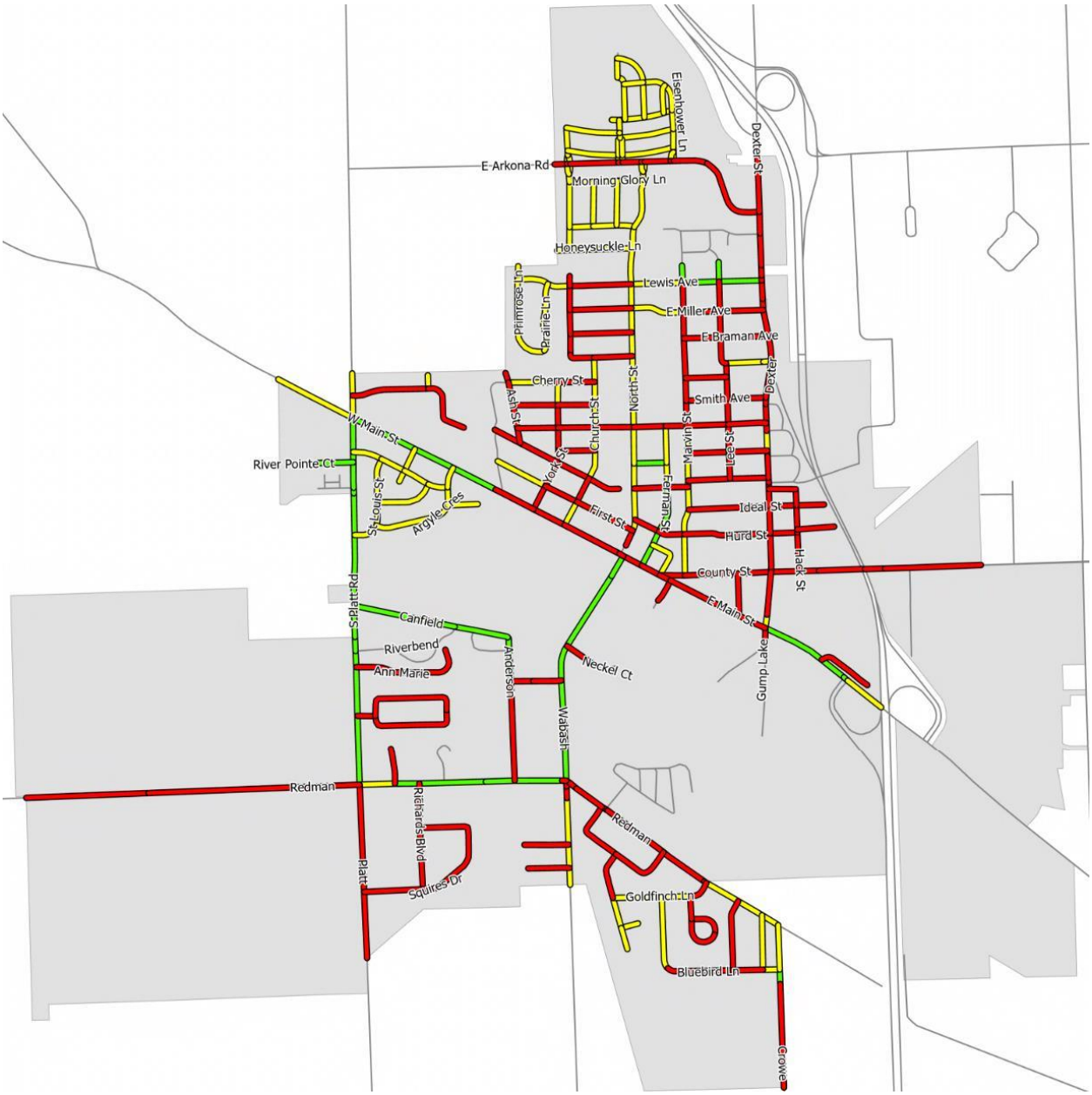


Figure 17: Map of the current paved road condition in good (PASER 10, 9, 8) shown in green, fair (PASER 7, 6, 5) shown in yellow, and poor (PASER 4, 3, 2, 1) shown in red. Only Roads owned by the City are shown.

Goals

Goals help set expectations to how pavement conditions will change in the future. Pavement condition changes are influenced by water infiltration, soil conditions, sunlight exposure, traffic loading, and repair work performed. the City is not able to control any of these factors fully due to seasonal weather changes, traffic pattern changes, and its limited budget. In spite of the uncontrollable variables, it is still important to set realistic network condition goals that efficiently use budget resources to build and maintain roads meeting taxpayer expectations. An assessment of the progress toward these goals is provided in the *1. Pavement Assets*: *Gap Analysis* section of this plan.

Goals for Paved City Major Roads

The overall goal for the City's paved city major road network is to maintain or improve road conditions network-wide at 2023 levels. The baseline condition for this goal is illustrated in Figure 18.

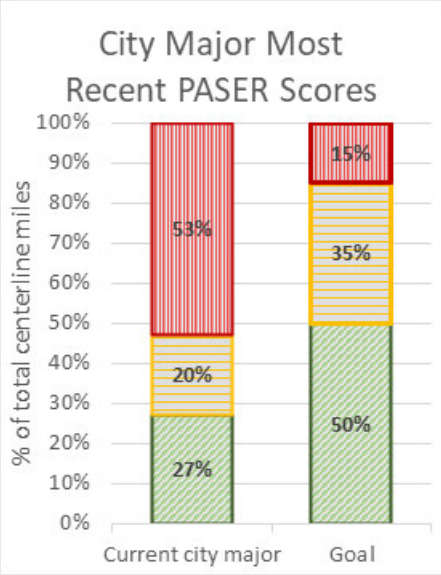


Figure 18: The City's 2023 city major road network condition by percentage of good/fair/poor

The City's network-level pavement condition strategy for paved city major roads is:

1. Prevent its good and fair (PASER 10 - 5) paved city major from becoming poor (PASER 4 - 1).
2. Move 38 percent of paved city major roads out of the poor category.
3. Have no more than 15% of roads in poor condition.

Goals for Paved City Local Roads

The overall goal for the City's paved city local road network is to maintain or improve road conditions network-wide at 2023 levels. The baseline condition for this goal is illustrated in Figure 19.

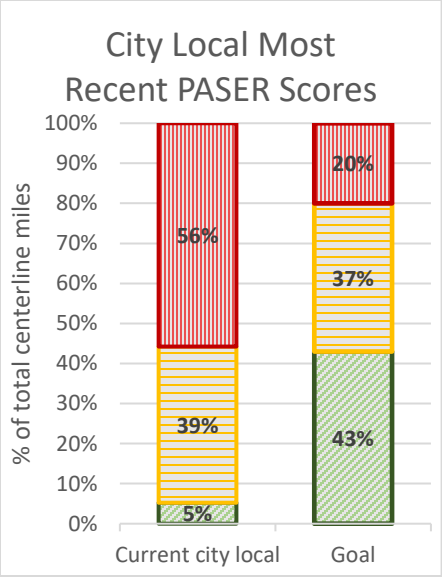


Figure 19: the City 2023 paved city local road network condition by percentage of good/fair/poor

The City's network-level pavement condition strategy for paved city local roads is:

1. Prevent its good and fair (PASER 10 - 5) paved city local roads from becoming poor (PASER 4 - 1).
2. Move 36 percent of paved city local roads out of the poor category.
3. Have no more than 20% of roads in poor condition.

Modelled Trends

Roads age and deteriorate just like any other asset. All pavements are damaged by water, traffic weight, freeze/thaw cycles, sunlight, and traffic weight. To offset natural deterioration and normal wear-and-tear on the road, the City must complete treatment projects that either protect and/or add life to its pavements. The year-end condition of the whole network depends upon changes or preservation of individual road section condition that preservation treatments have affected.

the City uses many types of repair treatments for its roads, each selected to balance costs, benefits, and road life expectancy. When agency trends are modelled, any gap between goals and accomplishable work becomes evident. Financial resources influence how much work can be accomplished across the network within agency budget and what treatments and strategies can be afforded; a full discussion of the City's financial resources can be found in the *5. Financial Resources* section.

Treatments and strategies that counter pavement-damaging forces include reconstruction, structural improvement, capital preventive maintenance, innovative treatments, and maintenance. For a complete discussion on the pavement treatment tools, refer to the *1. Introduction*'s *Pavement Primer*.

Correlating with each PASER score are specific types of treatments best performed either to protect the pavement (CPM) or to add strength back into the pavement (structural improvement) (Table 1). MDOT provides guidance regarding when a specific pavement may be a candidate for a particular treatment. These identified PASER scores “trigger” the timing of projects appropriately to direct the right pavement fix at the right time, thereby providing the best chance for a successful project. The information provided in Table 1 is a guide for identifying potential projects; however, this table should not be the sole criteria for pavement treatment selection. Other information such as future development, traffic volume, utility projects, and budget play a role in project selection. This table should not be a substitute for engineering judgement. selection of road improvement projects may be affected by available funding, proximity to concurrent projects, and/or impact to overall quality of transportation system.

Table 1: Service Life Extension (in Years) for Pavement Types Gained by Fix Type[1]

Fix Type	Life Extension (in years)*			PASER
	Flexible	Composite	Rigid	
HMA crack treatment	1-3	1-3	N/A	6-7
Overband crack filling	1-2	1-2	N/A	6-7
One course non-structural HMA overlay	5-7	4-7	N/A	4-5****
Mill and one course non-structural HMA overlay	5-7	4-7	N/A	3-5
Single course chip seal	3-6	N/A	N/A	5-7†
Double chip seal	4-7	3-6	N/A	5-7†
Single course microsurface	3-5	**	N/A	5-6
Multiple course microsurface	4-6	**	N/A	4-6****
Ultra-thin HMA overlay	3-6	3-6	N/A	4-6****
Paver placed surface seal	4-6	**	N/A	5-7
Full-depth concrete repair	N/A	N/A	3-10	4-5***
Concrete joint resealing	N/A	N/A	1-3	5-8
Concrete spall repair	N/A	N/A	1-3	5-7
Concrete crack sealing	N/A	N/A	1-3	4-7
Diamond grinding	N/A	N/A	3-5	4-6
Dowel bar retrofit	N/A	N/A	2-3	3-5***
Longitudinal HMA wedge/scratch coat with surface treatment	3-7	N/A	N/A	3-5****
Flexible patching	**	**	N/A	N/A
Mastic joint repair	1-3	1-3	N/A	4-7
Cape seal	4-7	4-7	N/A	4-7
Flexible interlayer “A”	4-7	4-7	N/A	4-7
Flexible interlayer “B” (SAMI)	4-7	4-7	N/A	3-7
Flexible interlayer “C”	4-7	4-7	N/A	3-7
Fiber reinforced flexible membrane	4-7	4-7	N/A	3-7
Fog seal	**	**	N/A	7-10
GSB 88	**	**	N/A	7-10
Mastic surface treatment	**	**	N/A	7-10
Scrub seal	**	**	N/A	4-8

* The time range is the expected life extending benefit given to the pavement, not the anticipated longevity of the treatment.

** Data is not available to quantify the life extension.

*** The concrete slabs must be in fair to good condition.

**** Can be used on a pavement with a PASER equal to 3 when the sole reason for rating is rutting or severe raveling of the surface asphalt layer.

† For PASER 4 or less providing structural soundness exists and that additional pre-treatment will be required for example, wedging, bar seals, spot double chip seals, injection spray patching or other pre-treatments.

[1] Part of Appendix D-1 from *MDOT Local Agency Programs Guidelines for Geometrics on Local Agency Projects* 2017 Edition Approved Preventive Maintenance Treatments

Roadsoft Pavement Condition Forecast to Forecast Future Trends

The City uses Roadsoft, an asset management software suite, to manage road- and bridge-related infrastructure. Roadsoft is developed by Michigan Technological University and is available for Michigan local agencies at no cost to them. Roadsoft uses pavement condition data to drive network-level deterioration models that forecast future road conditions based on planned construction and maintenance work. A screenshot of Roadsoft's pavement condition model and the associated output is shown in Figure 20.

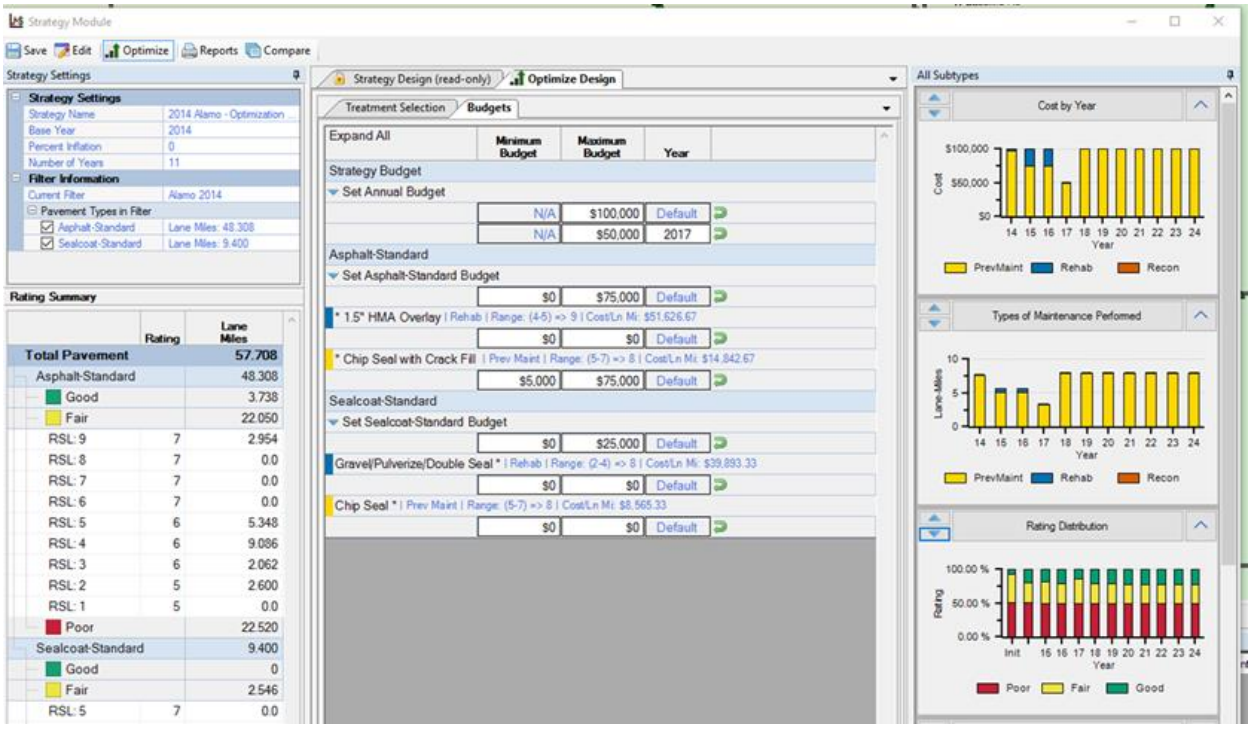


Figure 20: Pavement condition forecast model in the software program Roadsoft.

Paved City Major Roads

Table 2 illustrates the network-level model inputs for Roadsoft on the paved city major road network. Other pavement types in this network were neglected due to their small numbers relative to HMA pavements. The treatments outlined in Table 2 are the average treatment volume of planned projects scheduled to be completed in 2024-2028. Specific project selections will be identified in the City's CIP.

Table 2: Roadsoft Modelled Trends, Planned Projects, and Gap Analysis for 's Road Assets—Modelled Trends: Roadsoft Annual Work Program for the Paved City Major Road Network Forecast

Treatment Name	Annual Miles of Treatment	Years of Life	Trigger-Reset
Overband Crack Seal	2	2	6-7, 7
Cape Seal	0	7	5-6, 8
Microsurfacing	0	10	5-6, 8
Slurry Seal	0	7	5-6, 8
Mill & Overlay - 1.5"	1	5	4-5, 9
Mill & Overlay - 4"	1	12	1-3, 10
Pulverize and Reshape w/ 4.5" Overlay	1	15	2-4, 9
Reconstruction w/ or w/o Open Ditch to Curb Conversion	0	20	1-3, 10

Results from the Roadsoft network condition model for the city major roads are shown in Figure 21. The Roadsoft network analysis of the City's planned projects from its currently-available budget does not allow the City to reach its pavement condition goals given the projects planned for the next three years. The model results presented below represent the allocation of an additional $800,000 per year of investment.

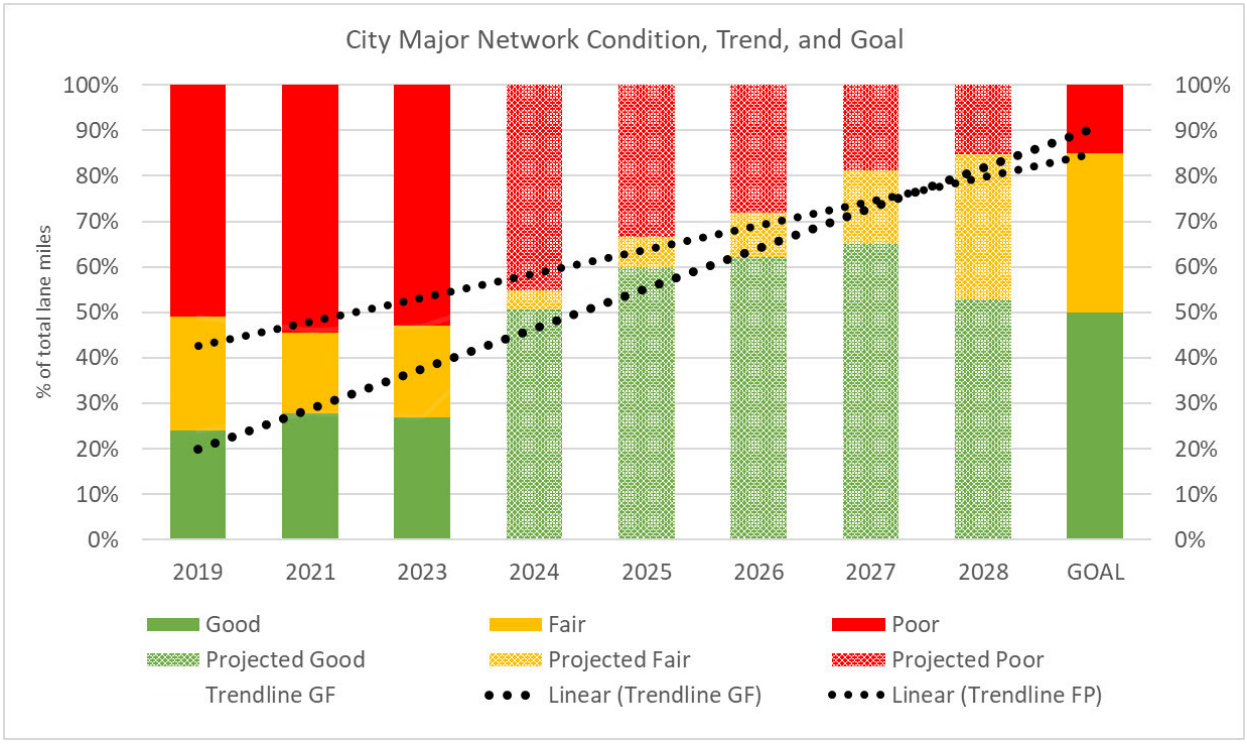


Figure 21: Forecast good/fair/poor changes to the City network condition from planned projects on the city major road network using Scenario 3.

Paved City Local ***Road***

A screenshot of Roadsoft's pavement condition model and the associated output is shown in Figure 22.

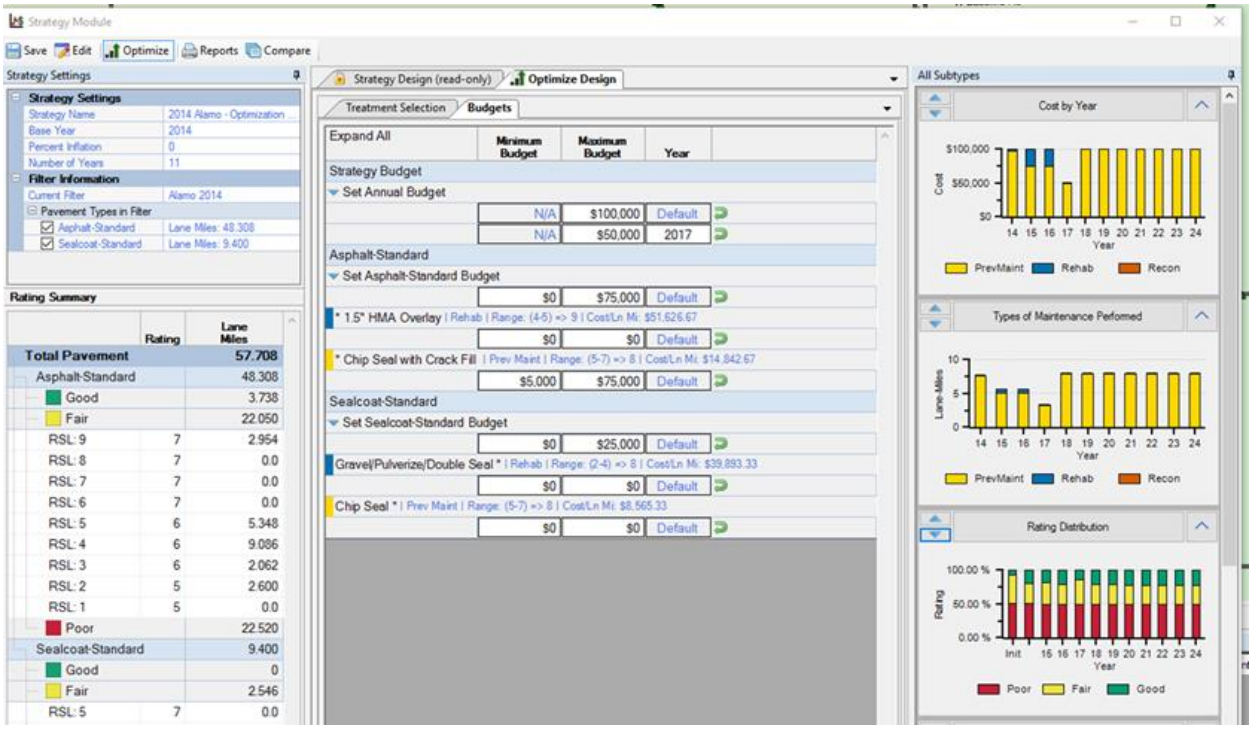


Figure 22: Pavement condition forecast model in the software program Roadsoft.

Table 3 illustrates the network-level model inputs for Roadsoft on the paved city local road network. Other pavement types in this network were neglected due to their small numbers relative to HMA pavements. The treatments outlined in Table 3 are the average treatment volume of planned projects scheduled to be completed in 2024-2026.

Table 3: Roadsoft Modelled Trends, Planned Projects, and Gap Analysis for 's Road Assets—Modelled Trends: Roadsoft Annual Work Program for the Paved City Local Road Network Forecast

Treatment Name	Annual Miles of Treatment	Years of Life	Trigger-Reset
Overband Crack Seal	2	2	6-7, 7
Cape Seal	0	7	5-6, 8
Microsurfacing	0	10	5-6, 8
Slurry Seal	0	7	5-6, 8
Mill & Overlay - 1.5"	1	5	4-5, 9
Mill & Overlay - 4"	1	12	1-3, 10
Pulverize and Reshape w/ 4.5" Overlay	1	15	2-4, 9
Reconstruction w/ or w/o Open Ditch to Curb Conversion	0	20	1-3, 10

Results from the Roadsoft network condition model for the paved city local roads are shown in Figure 23. The analysis includes the current available budget with the addition of $800,000 of funding per year. Results from the Roadsoft network condition model for the paved city local roads are shown in Figure 23.

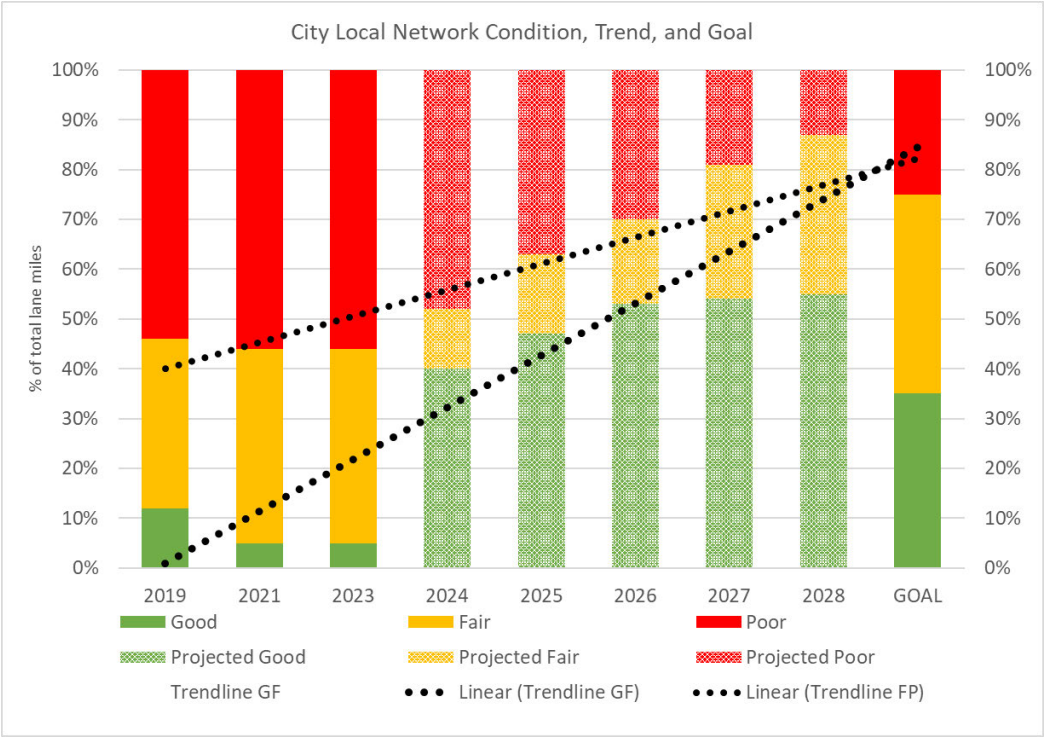


Figure 23: Forecast good/fair/poor changes to the City network condition from planned projects on the paved city local road network using Scenario 3.

Summary of Models

As seen in Figure 24 below, if the City spends $8,000,000 over the next ten years the average PASER rating of the network by 2033 will be 3.9. If the City spends $11,800,000 over ten years, the average PASER rating of the network by 2033 will be 4.6. If the City spends $15,800,000 over ten years, the average PASER rating of the network by 2033 will be 5.6. This is the investment level recommend to maintain and improve the road network condition.

It is important to note that, if the City spends $11,800,000 and only funds reconstruction projects, the average PASER rating of the network by 2033 will be 3.4. This scenario illustrates the importance of a balanced approached that focuses on maintenance and preserving roads in good/fair condition. Breakdowns of Scenario 1, Scenario 2, Scenario 3 and Scenario 4 can be found in Figure 25.

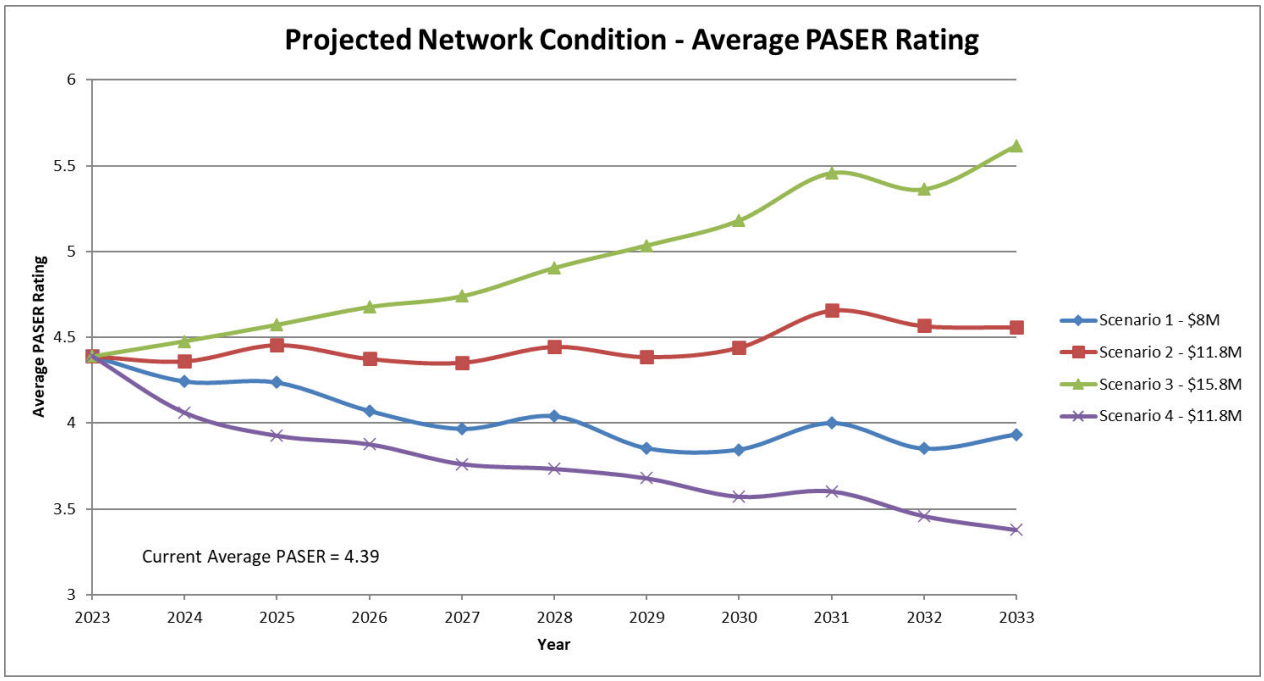


Figure 24: Forecast average PASER rating changes to the City network condition from planned projects on the paved city local road network.

City of Milan				
Modeled Budget Scenarios				
Scenario 1: Projected Revenues				
FY 23/24	FY 24/25	FY 25/26	FY 26/27	FY 27/28
$1,380,000	$880,000	$495,000	$880,000	$495,000
Scenario 2: Projected Revenues with Additional $400,000 Dedicated to Capital Road Improvements				
FY 24	FY 25	FY 26	FY 27	FY 28
$1,780,000	$1,280,000	$895,000	$1,280,000	$895,000
Scenario 3: Projected Revenues with Additional $800,000 Dedicated to Capital Road Improvements				
FY 24	FY 25	FY 26	FY 27	FY 28
$2,180,000	$1,680,000	$1,295,000	$1,680,000	$1,295,000
Scenario 4: Same as Scenario 2 Funding Levels. Road Reconstruction Projects Only (No PM)				
FY 24	FY 25	FY 26	FY 27	FY 28
$1,780,000	$1,280,000	$895,000	$1,280,000	$895,000

Figure 25: Projected Network Conditions Budget Scenarios (budgets based off assumptions).

Planned Projects

The City plans construction and maintenance projects several years in advance. A multi-year planning threshold is required due to the time necessary to plan, design, and finance construction and maintenance projects on the paved city major road network. This includes planning and programming requirements from state and federal agencies that must be met prior to starting a project and can include studies on environmental and archeological impacts, review of construction and design documents and plans, documentation of rights-of-way ownership, planning and permitting for storm water discharges, and other regulatory and administrative requirements.

Per PA 499 of 2002 (later amended by PA 199 of 2007), road projects for the upcoming three years are required to be reported annually to the TAMC. Planned projects represent the best estimate of future activity; however, changes in design, funding, and permitting may require the City to alter initial plans. Project planning information is used to predict the future condition of the road networks that the City maintains. The *1. Pavement Assets*: *Modelled Trends* section of this plan provides a detailed analysis of the impact of the proposed projects on their respective road networks.

Specific project and street selections will be identified in the City's Capital Improvement Program (CIP). In order to achieve the projected results, the City will need to make project selections based on the recommended maintenance activity distribution.

2. FINANCIAL RESOURCES

Public entities must balance the quality and extent of services they can provide with the tax resources provided by citizens and businesses, all while maximizing how efficiently funds are used. the City will overview its general expenditures and financial resources currently devoted to pavement maintenance and construction. This financial information is not intended to be a full financial disclosure or a formal report. Michigan agencies are required to submit an Act 51 Report to the Michigan Department of Transportation each year; this is a full financial report that outlines revenues and expenditures. This report can be obtained by request submitted to our agency contact (listed in this plan).

The City has a total budget for pavement asset management of $7,800,000 for 2024 to 2028, assuming no additional millages form the County or the City.

City Major and Local Network

The City has historically spent $500,000 to $1,400,000 annually on pavement-related projects. Federal-aid major road projects occur every two to three years on average, the balance of work includes major and local roads. Over the next three years, the City plans to spend $2,800,000 on city major-network projects consisting of, but not limited to, reconstruction, overlay, culvert replacement, and preventive maintenance. Spending on projects depends on revenue from Michigan Transportation Fund (MTF), millages, township contributions, and federal/state programs Many local agencies in Michigan use local tax millages to supplement their road-funding budget. These taxes can provide for additional construction and maintenance for new or existing roads that are also funded using MTF or MDOT funds. The City has local tax millages in its road-funding budget. Road millage for dedicated use of road preventitive maintenance and reconstruction.

3. RISK OF FAILURE ANALYSIS

Transportation infrastructure is designed to be resilient. The system of interconnecting roads and bridges maintained by the City provides road users with multiple alternate options in the event of an unplanned disruption of one part of the system. There are, however, key links in the transportation system that may cause significant inconvenience to users if they are unexpectedly closed to traffic. Figure 26 illustrates the key transportation links in the City's road network, including those that meet the following types of situations:

- **Geographic divides:** Areas where a geographic feature (river, lake, mountain or limited access road) limits crossing points of the feature
- **Emergency alternate routes for high-volume roads:** Roads which are routinely used as alternate routes for high volume roads or roads that are included in an emergency response plan
- **Limited access areas:** Roads that serve remote or limited access areas that result in long detours if closed
- **Main access to key commercial districts:** Areas where large number or large size business will be significantly impacted if a road is unavailable.

Our road network includes the following critical assets: Platt Road, Main Street, Gump Lake Road, Wabash Road, North Street, Michigan Avenue, Redman Road, and Allen Road (see Figure 26).

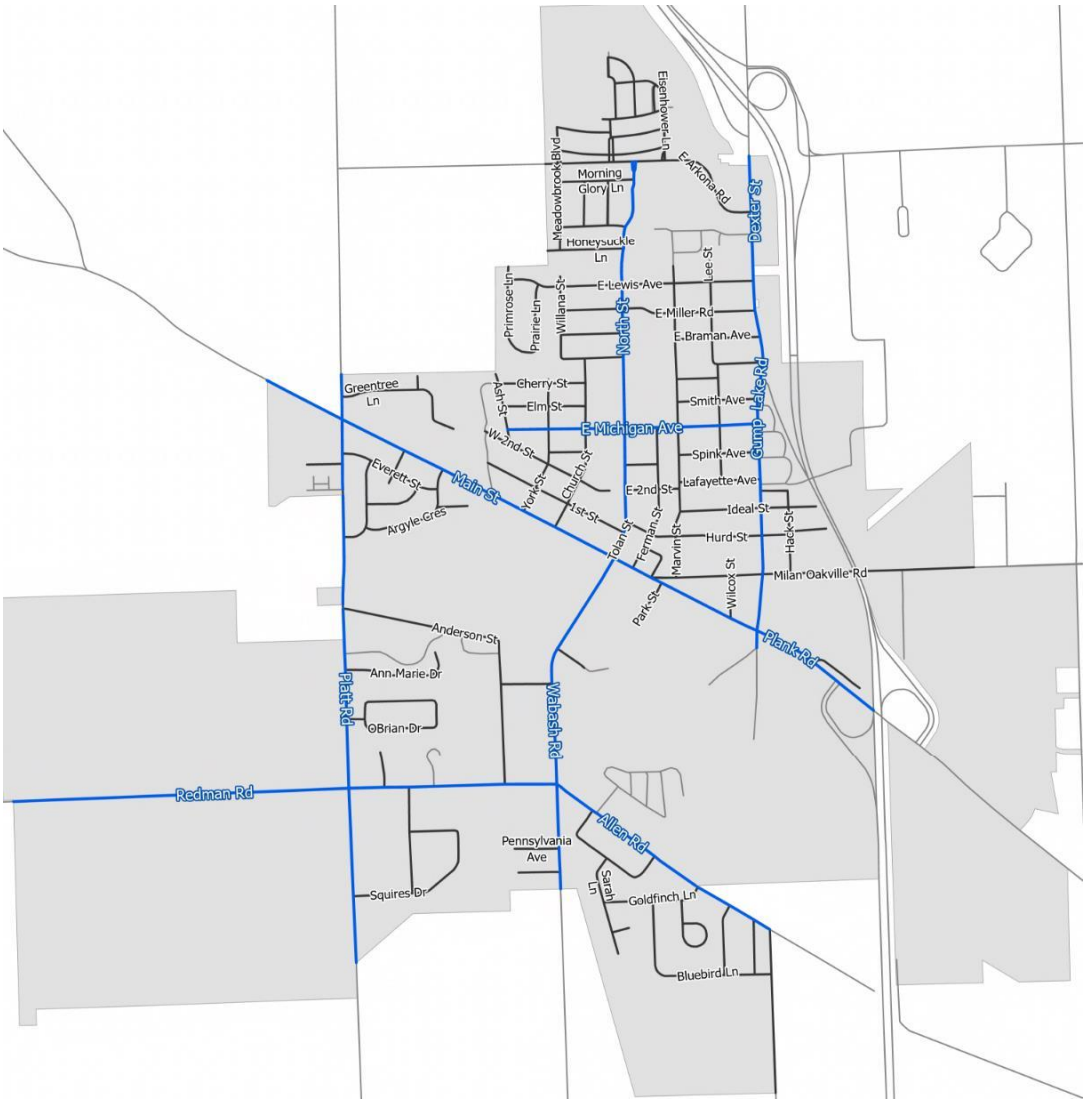


Figure 26: Key transportation links in the City's road network

4. COORDINATION WITH OTHER ENTITIES

An asset management plan provides a significant value for infrastructure owners because it serves as a platform to engage other infrastructure owners using the same shared right of way space. the City communicates with both public and private infrastructure owners to coordinate work in the following ways:

PUBLIC UTILITY COORDINATED PLANNING

The City maintains drinking water, sanitary sewer, and storm sewer assets in addition to transportation assets. The City follows an asset management process for its assets by coordinating the upgrade, maintenance, and operation of all major assets.

Improvements to the drinking water, sanitary sewer, or storm sewer systems are coordinated with the transportation infrastructure plans to maximize value and minimize service disruptions and cost to the public.

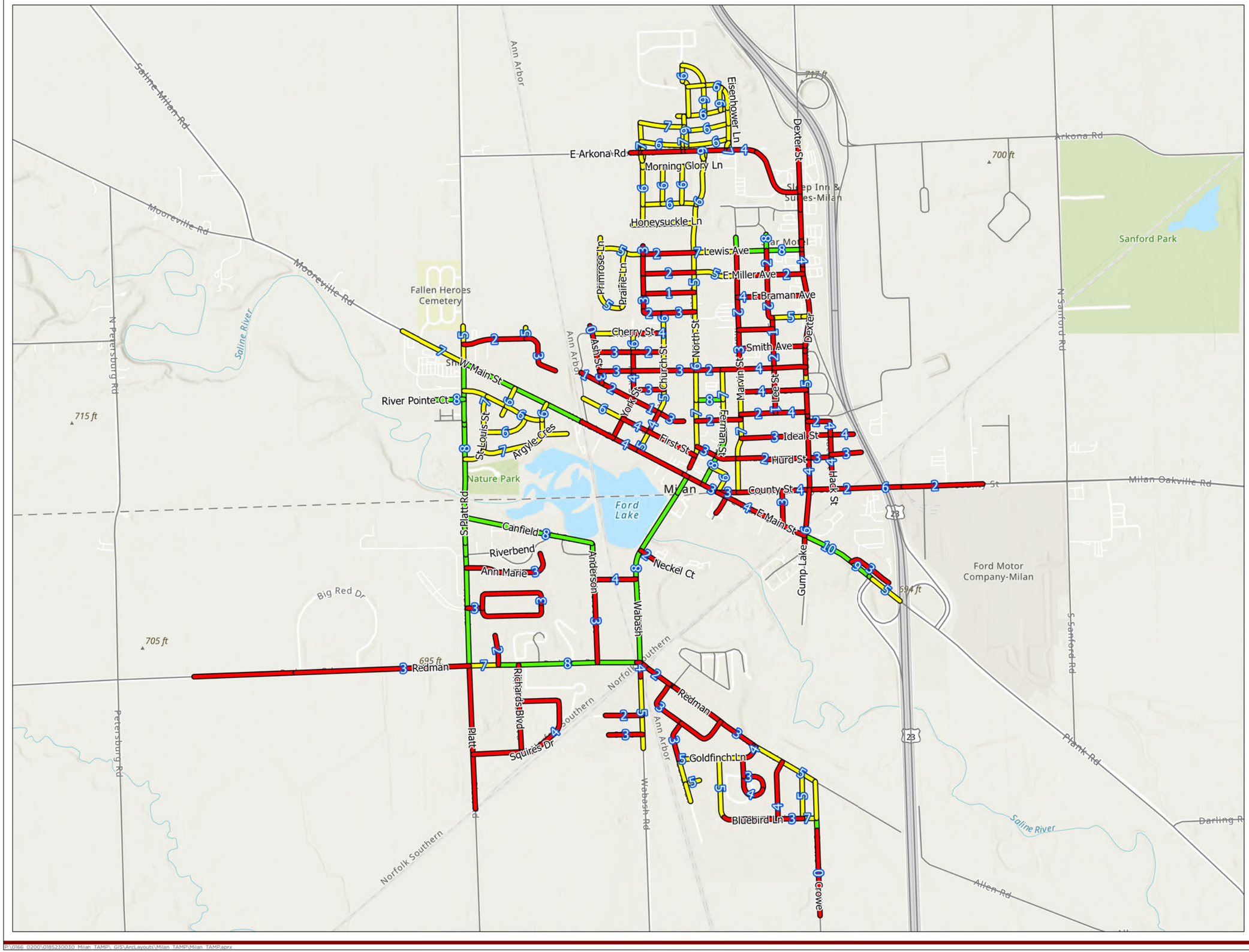
The City takes advantage of coordinated infrastructure work to reduce cost and maximize value using the following policies:

1. Typically, roads which are in poor condition that have a subsurface infrastructure project planned, which will destroy more than half the lane width, will be rehabilitated or reconstructed full width using transportation funds to repair the balance of the road width.
2. Subsurface infrastructure projects which will cause damage to pavements in good condition will be delayed to the extent possible or will consider methods that do not require damage to the pavement.
3. Every attempt is made to coordinate under pavement assets to be upgraded when a roadway is reconstructed, regardless of ownership of assets. The City typically sends an annual list of upcoming roadway reconstruction projects to franchised utility companies.
4. Road reconstruction projects will be coordinated to be completed with sub surface utilities upgrades.

APPENDIX A: CURRENT CITY STREETS PASER RATINGS

City of Milan
Current Road Conditions

MILAN
Connect with what matters



- Good (PASER 8-10)
- Fair (PASER 5-7)
- Poor (PASER 1-4)
- County Roads

N

0 1,400 2,800

Feet

1" = 1,400'

Source: Data provided by City of Milan, ESRI and OHM Advisors. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 2011 StatePlane Michigan South FIPS 2113 Ft Intl

Map Published: December 21, 2023

OHM

APPENDIX B: CURRENT PASER RATINGS BY STREET

Small Urban

Milan (CityVillage)

Report Module: Road Surface Management Analysis

Today's Date: 12/21/2023

Grouped By: Road Name

Report Filter(s)

Field Name	Operator	Value(s)
City/Twp	=	Milan
Legal System	=	4-City Major or 5-City Local

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1447301	1st St																	
		1st St	Dead End or Start	York St	0.000	0.130	0.130	Milan	Local	City Local	Asphalt-Standard	0	2023	6	4	82		
		1st St	York St	Church St	0.130	0.215	0.085	Milan	Local	City Local	Asphalt-Standard	0	2023	4	1	87		
		1st St	Church St	North St & Tolan St	0.215	0.366	0.151	Milan	Local	City Major	Asphalt-Standard	0	2023	4	-1	91		
1440004	E 2nd St																	
		E 2nd St	North St	Ferman St	0.000	0.080	0.080	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-12	91		
		E 2nd St	Ferman St	Marvin St	0.080	0.130	0.050	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-11	91		
4603159	W 2nd St																	
		W 2nd St	Church St	York St	0.000	0.085	0.085	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-13	94		
		W 2nd St	York St	Ash St	0.085	0.186	0.101	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
		W 2nd St	Ash St	Cherry Lane Dr	0.186	0.255	0.069	Milan	Local	City Major	Asphalt-Standard	0	2023	1	-23	96		
4604006	W 2nd St																	
		W 2nd St	Church St	Dead End or Start	0.000	0.079	0.079	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	91		
1239204	Allen Rd																	
		Allen Rd	Wabash Rd & Redman Rd	Norfolk Southern Railway	0.000	0.010	0.010	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-3	93		
		Allen Rd	Norfolk Southern Railway	Norfolk Southern Railway	0.010	0.031	0.021	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-6	95		
		Allen Rd	Norfolk Southern Railway	Asher Pass	0.031	0.107	0.076	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-5	92		
		Allen Rd	Asher Pass	Reed Way	0.107	0.123	0.016	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-4	95		
		Allen Rd	Reed Way	Asher Pass	0.123	0.291	0.168	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-4	95		
		Allen Rd	Asher Pass	Goldfinch Ln	0.291	0.411	0.120	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-3	93		
		Allen Rd	Asher Pass	Goldfinch Ln	0.411	0.418	0.007	Milan	Local	City Local	Asphalt-Standard	0	2023	4	0	90		
		Allen Rd	Goldfinch Ln	Bobwhite Ln	0.418	0.507	0.089	Milan	Local	City Local	Asphalt-Standard	0	2023	5	0	89		
		Allen Rd	Bobwhite Ln	King Fisher Ln	0.507	0.573	0.066	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		
		Allen Rd	King Fisher Ln	Crowe Rd	0.573	0.618	0.045	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1239108	Anderson St																	
		Anderson St	Redman Rd	Division St	0.000	0.242	0.242	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-12	82		
		Anderson St	Division St	Riverbend Dr & Canfield St	0.242	0.348	0.106	Milan	Local	City Local	Asphalt-Standard	2019	2023	8	7	97		
		Canfield St	Division St	Riverbend Dr & Canfield St	0.348	0.479	0.131	Milan	Local	City Local	Asphalt-Standard	2019	2023	8	7	97		
		Canfield St	Riverbend Dr	Platt Rd	0.479	0.727	0.248	Milan	Local	City Local	Asphalt-Standard	2019	2023	8	7	97		
4302124	Ann Marie Dr																	
		Ann Marie Dr	Platt Rd	Dead End or Start	0.000	0.271	0.271	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
1447307	Ann St																	
		Ann St	North St	Ferman St	0.000	0.078	0.078	Milan	Local	City Local	Asphalt-Standard	0	2023	8	14	59		
1432802	Argyle Cres																	
		Argyle Cres	Saint Louis St	Argyle Ct	0.000	0.188	0.188	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	97		
		Argyle Cres	Argyle Ct	Everett St	0.188	0.232	0.044	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
		Argyle Cres	Everett St	Main St	0.232	0.281	0.049	Milan	Local	City Local	Asphalt-Standard	0	2023	6	7	98		
1447405	Argyle Ct																	
		Argyle Ct	Argyle Cres	Dead End or Start	0.000	0.073	0.073	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
1439605	E Arkona Rd																	
		E Arkona Rd	City/Twp Line	Meadowbrook Blvd & Pierce Ln	0.497	0.527	0.030	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-5	88		
		E Arkona Rd	City/Twp Line	Meadowbrook Blvd & Pierce Ln	0.527	0.535	0.008	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-5	88		
		E Arkona Rd	Meadowbrook Blvd & Pierce Ln	Kennedy Ln	0.535	0.651	0.116	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Arkona Rd	Meadowbrook Blvd & Pierce Ln	Kennedy Ln	0.651	0.661	0.010	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Arkona Rd	Kennedy Ln	North St	0.661	0.706	0.045	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Arkona Rd	Kennedy Ln	North St	0.706	0.714	0.008	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Arkona Rd	North St	Eisenhower Ln	0.714	0.777	0.063	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Arkona Rd	North St	Eisenhower Ln	0.777	0.785	0.008	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		

Small Urban

Federal Aid Eligible Roads

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1439605	E Arkona Rd																	
		E Arkona Rd	Eisenhower Ln		0.785	0.866	0.081	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
4603257	E Arkona Rd																	
		E Arkona Rd		Dexter St	0.000	0.194	0.194	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	94		
1447303	Ash St																	
		Ash St	Dead End or Start	Cherry St	0.000	0.024	0.024	Milan	Local	City Local	Unimproved Earth	0	0	4	-2	89		
		Ash St	Cherry St & Cherry Lane Dr	Elm St	0.024	0.079	0.055	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
		Ash St	Elm St	W Michigan Ave	0.079	0.136	0.057	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
		Ash St	W Michigan Ave	W 2nd St	0.136	0.172	0.036	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-8	96		
4302320	Asher Pass																	
		Asher Pass	Allen Rd	Sarah Ln	0.000	0.161	0.161	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		
		Asher Pass	Sarah Ln	Allen Rd	0.161	0.314	0.153	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		
4302325	Barnswallow Ln																	
		Barnswallow Ln	Bluebird Ln	Goldfinch Ln	0.000	0.175	0.175	Milan	Local	City Local	Asphalt-Standard	0	2023	5	1	87	9	2021
4604988	Beavertail Ln																	
		Beavertail Ln	Poppy Ln	Morning Glory Ln	0.000	0.108	0.108	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	95		
4302327	Bluebird Ln																	
		Bluebird Ln	Barnswallow Ln	Bobwhite Ln	0.000	0.159	0.159	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-4	92	9	2021
		Bluebird Ln	Bobwhite Ln	King Fisher Ln	0.159	0.231	0.072	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-5	98	9	2021
		Bluebird Ln	King Fisher Ln	Crowe Rd	0.231	0.272	0.041	Milan	Local	City Local	Asphalt-Standard	0	2023	7	2	73	9	2021
4302326	Bobwhite Ln																	
		Bobwhite Ln	Bluebird Ln	Allen Rd	0.000	0.171	0.171	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-1	91		
1447404	Bodley Cres																	
		Bodley Cres	Saint Louis St	Everett St	0.000	0.143	0.143	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1431206	E Braman Ave																	
		E Braman Ave	Marvin St	Lee St	0.000	0.088	0.088	Milan	Local	City Local	Asphalt-Standard	0	2023	4	1	87		
		E Braman Ave	Lee St	Dexter St	0.088	0.204	0.116	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	85		
1447402	W Braman Ave																	
		W Braman Ave	Willana St	North St	0.000	0.148	0.148	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-17	95		
1447305	Cherry St																	
		Cherry St	Cherry Lane Dr & Ash St	York St	0.000	0.119	0.119	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-3	84		
		Cherry St	York St	Church St	0.119	0.208	0.089	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-4	89		
1439909	Church St																	
		Church St	Main St	1st St	0.000	0.063	0.063	Milan	Local	City Major	Asphalt-Standard	0	2023	5	0	89		
		Church St	1st St	W 2nd St	0.063	0.127	0.064	Milan	Local	City Major	Asphalt-Standard	0	2023	4	-1	91		
		Church St	W 2nd St	Oak St	0.127	0.197	0.070	Milan	Local	City Major	Asphalt-Standard	0	2023	5	3	94		
		Church St	Oak St	W Michigan Ave	0.197	0.253	0.056	Milan	Local	City Major	Asphalt-Standard	0	2023	5	3	94		
		Church St	W Michigan Ave	Elm St	0.253	0.306	0.053	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	94		
		Church St	Elm St	Cherry St	0.306	0.362	0.056	Milan	Local	City Local	Asphalt-Standard	0	2023	6	6	88		
		Church St	Cherry St	W Phillips Ave	0.362	0.420	0.058	Milan	Local	City Local	Asphalt-Standard	0	2023	6	6	88		
1239207	Crowe Rd																	
		Crowe Rd	City/Twp Line	pavement change	2.388	2.637	0.249	Milan	Local	City Local	Gravel-Standard	0	0	8	-1	51	9	2021
		Crowe Rd	pavement change	Bluebird Ln	2.637	2.672	0.035	Milan	Local	City Local	Asphalt-Standard	0	2023	8	7	86	9	2021
		Crowe Rd	Bluebird Ln	Allen Rd	2.672	2.779	0.107	Milan	Local	City Local	Asphalt-Standard	0	2023	5	4	97		
4604987	Daisy Ln																	
		Daisy Ln	Poppy Ln	Morning Glory Ln	0.000	0.107	0.107	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	93		
1431609	Dexter St																	
		Dexter St	County St	Hurd St	0.000	0.092	0.092	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1431609	Dexter St																	
		Dexter St	Hurd St	Ideal St	0.092	0.158	0.066	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Dexter St	Ideal St	Federal Ave	0.158	0.199	0.041	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Dexter St	Federal Ave	Case Dr	0.199	0.215	0.016	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	Case Dr	Lafayette Ave	0.215	0.226	0.011	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	Lafayette Ave	Lafayette Ct	0.226	0.278	0.052	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	1	91		
		Dexter St	Lafayette Ct	Spink Ave	0.278	0.292	0.014	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	5	4	92		
		Dexter St	Spink Ave	Spink Ct	0.292	0.339	0.047	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	5	4	92		
		Dexter St	Spink Ct	E Michigan Ave	0.339	0.358	0.019	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	1	91		
		Dexter St	E Michigan Ave	Lafayette Ct	0.358	0.403	0.045	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Dexter St	Lafayette Ct	Smith Ave	0.403	0.419	0.016	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Dexter St	Smith Ave	Carpenter/S US 12 RAMP	0.419	0.462	0.043	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	Carpenter/S US 12 RAMP	Phillips Ave	0.462	0.507	0.045	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	Phillips Ave	E Braman Ave	0.507	0.568	0.061	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Braman Ave	E Miller Rd	0.568	0.632	0.064	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Miller Rd	E Lewis Ave	0.632	0.639	0.007	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Miller Rd	E Lewis Ave	0.639	0.658	0.019	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Miller Rd	E Lewis Ave	0.658	0.703	0.045	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Lewis Ave	Kay St	0.703	0.715	0.012	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Lewis Ave	Kay St	0.715	0.740	0.025	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Lewis Ave	Kay St	0.740	0.819	0.079	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	Kay St	E Arkona Rd	0.819	0.871	0.052	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		Dexter St	E Arkona Rd	City/Twp Line	0.871	0.983	0.112	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1431609	Dexter St																	
		Dexter St	E Arkona Rd	City/Twp Line	0.983	1.005	0.022	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
1239205	Division St																	
		Division St	Anderson St	Ann Arbor Railroad	0.000	0.054	0.054	Milan	Local	City Local	Asphalt-Standard	0	2023	4	2	95		
		Division St	Ann Arbor Railroad	Wabash Rd	0.054	0.122	0.068	Milan	Local	City Local	Asphalt-Standard	0	2023	4	2	95		
1447403	Dolores Dr																	
		Dolores Dr	Greentree Ln	Dead End or Start	0.000	0.032	0.032	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-3	77		
4302988	Eagles Nest Ct																	
		Eagles Nest Ct	Sarah Ln	Dead End or Start	0.000	0.042	0.042	Milan	Local	City Local	Asphalt-Standard	0	2023	5	4	92		
4604968	Eisenhower Ln																	
		Eisenhower Ln	E Arkona Rd	Reagan Ln	0.000	0.021	0.021	Milan	Local	City Local	Asphalt-Standard	0	2023	7	14	96		
		Eisenhower Ln	E Arkona Rd	Reagan Ln	0.021	0.032	0.011	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Eisenhower Ln	Reagan Ln	Jefferson Ln	0.032	0.076	0.044	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Eisenhower Ln	Jefferson Ln	Jackson Ln	0.076	0.122	0.046	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Eisenhower Ln	Jackson Ln	McKinley Ln	0.122	0.187	0.065	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Eisenhower Ln	McKinley Ln	E Roosevelt Ln	0.187	0.241	0.054	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Eisenhower Ln	E Roosevelt Ln	Truman Loop	0.241	0.287	0.046	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
5490689	Eisenhower Ln																	
		Eisenhower Ln	E Arkona Rd	Eisenhower Ln	0.000	0.023	0.023	Milan	Local	City Local	Asphalt-Standard	0	2023	7	6	91		
1447306	Elm St																	
		Elm St	Ash St	York St	0.000	0.108	0.108	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
		Elm St	York St	Church St	0.108	0.197	0.089	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-9	93		
1439609	Everett St																	
		Everett St	Platt St	Saint Louis St	0.000	0.071	0.071	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		

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1439609	Everett St																	
		Everett St	Saint Louis St	Iva St	0.071	0.133	0.062	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
		Everett St	Iva St	Bodley Cres	0.133	0.200	0.067	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
		Everett St	Bodley Cres	Argyle Cres	0.200	0.247	0.047	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
4302323	Faith Ct																	
		Faith Ct			0.000	0.106	0.106	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-4	89		
		Faith Ct		Goldfinch Ln	0.106	0.161	0.055	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		
4302324	Faith Ct																	
		Faith Ct			0.000	0.084	0.084	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		
1439804	Federal Ave																	
		Federal Ave	Dexter St	Hack St	0.000	0.065	0.065	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-8	93		
1440002	Ferman St																	
		Ferman St	Main St	Gay St	0.000	0.056	0.056	Milan	Local	City Major	Asphalt-Standard	2019	2023	8	7	97		
		Ferman St	Gay St	Hurd St	0.056	0.092	0.036	Milan	Local	City Major	Asphalt-Standard	2019	2023	8	7	97		
		Ferman St	Hurd St	E 2nd St	0.092	0.204	0.112	Milan	Local	City Local	Asphalt-Standard	2019	2023	8	7	93		
		Ferman St	E 2nd St	Ann St	0.204	0.263	0.059	Milan	Local	City Local	Asphalt-Standard	0	2023	7	4	37		
		Ferman St	Ann St	E Michigan Ave	0.263	0.351	0.088	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	43		
1440003	Gay St																	
		Gay St	Ferman St	E Main St & County St & Main St	0.000	0.105	0.105	Milan	Local	City Local	Asphalt-Standard	0	2023	6	7	58		
4302322	Goldfinch Ln																	
		Goldfinch Ln	Barnswallow Ln	Faith Ct	0.000	0.069	0.069	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		
		Goldfinch Ln	Faith Ct	Allen Rd	0.069	0.123	0.054	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-1	91		
4302984	Goldfinch Ln																	
		Goldfinch Ln	Barnswallow Ln		0.000	0.039	0.039	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		

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4302987	Goldfinch Ln																	
		Goldfinch Ln	Sarah Ln		0.000	0.079	0.079	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	94		
1439701	Greentree Ln																	
		Greentree Ln	Platt Rd	Dolores Dr	0.000	0.184	0.184	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-9	93		
		Greentree Ln	Dolores Dr	Dead End or Start	0.184	0.334	0.150	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
1239405	Gump Lake Rd																	
		Gump Lake Rd	Unknown	E Main St & Dexter St	0.219	0.260	0.041	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-8	86		
		Dexter St	Gump Lake Rd & E Main St	Norfolk Southern Railway	0.260	0.292	0.032	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	6	4	83		
		Dexter St	Norfolk Southern Railway	County St	0.292	0.395	0.103	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
1440007	Hack St																	
		Hack St	County St	Hurd St	0.000	0.093	0.093	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		
		Hack St	Hurd St	Hurd St	0.093	0.100	0.007	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-3	95		
		Hack St	Hurd St	Ideal St	0.100	0.158	0.058	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		
		Hack St	Ideal St	Federal Ave	0.158	0.197	0.039	Milan	Local	City Local	Asphalt-Standard	0	2023	4	1	87		
4604983	Honeysuckle Ln																	
		Honeysuckle Ln	North St	Meadowbrook Blvd	0.000	0.153	0.153	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Honeysuckle Ln	Meadowbrook Blvd	Dead End or Start	0.153	0.182	0.029	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
1439802	Hurd St																	
		Hurd St	North St	Ferman St	0.000	0.064	0.064	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-5	90		
		Hurd St	Ferman St	Marvin St	0.064	0.127	0.063	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-8	96		
		Hurd St	Marvin St	Dexter St	0.127	0.335	0.208	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-9	97		
		Hurd St	Dexter St	Hack St	0.335	0.400	0.065	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-5	92		
4602714	Hurd St																	
		Hurd St	Hack St	Dead End or Start	0.000	0.089	0.089	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		

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1439803	Ideal St																	
		Ideal St	Marvin St	Dexter St	0.000	0.194	0.194	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-7	85		
		Ideal St	Dexter St	Hack St	0.194	0.259	0.065	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-4	89		
		Ideal St	Hack St	Dead End or Start	0.259	0.326	0.067	Milan	Local	City Local	Asphalt-Standard	0	2023	4	3	94		
1439620	Iva St																	
		Iva St	Main St	Everett St	0.000	0.058	0.058	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
		Iva St	Everett St	Dead End or Start	0.058	0.086	0.028	Milan	Local	City Local	Asphalt-Standard	0	2023	6	5	95		
5499063	Jackson Ln																	
		Jackson Ln	McKinley Ln	Eisenhower Ln	0.000	0.021	0.021	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Jackson Ln	E Roosevelt Ln	McKinley Ln	0.021	0.069	0.048	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Jackson Ln	Truman Loop	E Roosevelt Ln	0.069	0.116	0.047	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Jackson Ln	Kennedy Ln	Truman Loop	0.116	0.130	0.014	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Jackson Ln	Truman Loop	Kennedy Ln	0.130	0.148	0.018	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
4604972	Jefferson Ln																	
		Jefferson Ln	Pierce Ln	Kennedy Ln	0.000	0.128	0.128	Milan	Local	City Local	Asphalt-Standard	0	2023	7	13	89		
		Jefferson Ln		Kennedy Ln	0.128	0.129	0.001	Milan	Local	City Local	Asphalt-Standard	0	2023	7	7	96		
5490696	Jefferson Ln																	
		Jefferson Ln	Kennedy Ln	Eisenhower Ln	0.000	0.130	0.130	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
4604967	Kennedy Ln																	
		Kennedy Ln	E Arkona Rd	Reagan Ln	0.000	0.017	0.017	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Kennedy Ln	Reagan Ln	Jefferson Ln	0.017	0.061	0.044	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Kennedy Ln	Jefferson Ln	Jefferson Ln	0.061	0.073	0.012	Milan	Local	City Local	Asphalt-Standard	0	2023	6	6	98		
		Kennedy Ln	Jefferson Ln	Jackson Ln	0.073	0.104	0.031	Milan	Local	City Local	Asphalt-Standard	0	2023	7	8	98		

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5490698	Kennedy Ln																	
		Kennedy Ln	E Arkona Rd	Reagan Ln	0.000	0.018	0.018	Milan	Local	City Local	Asphalt-Standard	0	2023	6	10	92		
		Kennedy Ln	Reagan Ln	Jefferson Ln	0.018	0.061	0.043	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	89		
4302983	King Fisher Ln																	
		King Fisher Ln	Bluebird Ln	Allen Rd	0.000	0.131	0.131	Milan	Local	City Local	Asphalt-Standard	0	2023	5	0	89	9	2021
1439805	Lafayette Ave																	
		Lafayette Ave	Marvin St	Lee St	0.000	0.101	0.101	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-9	93		
		Lafayette Ave	Lee St	Dexter St	0.101	0.194	0.093	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-5	90		
1447308	Lee St																	
		Lee St	Lafayette Ave	Spink Ave	0.000	0.064	0.064	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-17	95		
		Lee St	Spink Ave	E Michigan Ave	0.064	0.131	0.067	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-17	95		
		Lee St	E Michigan Ave	Smith Ave	0.131	0.192	0.061	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
		Lee St	Smith Ave	Welch St	0.192	0.245	0.053	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-20	93		
		Lee St	Welch St	Phillips Ave	0.245	0.277	0.032	Milan	Local	City Local	Asphalt-Standard	0	2023	1	-17	95		
		Lee St	Phillips Ave	E Braman Ave	0.277	0.347	0.070	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		
		Lee St	E Braman Ave	E Miller Rd	0.347	0.410	0.063	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		
		Lee St	E Miller Rd	E Lewis Ave	0.410	0.481	0.071	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		
		Lee St	E Lewis Ave	Attribute Change	0.481	0.528	0.047	Milan	Local	City Local	Asphalt-Standard	0	2023	8	19	30		
4604992	E Lewis Ave																	
		W Lewis Ave	Primrose Ln	Prairie Ln	0.000	0.076	0.076	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	95		
		W Lewis Ave	Prairie Ln	Willana St	0.076	0.130	0.054	Milan	Local	City Local	Asphalt-Standard	0	2023	5	2	91		
		W Lewis Ave	Willana St	E Lewis Ave & North St	0.130	0.278	0.148	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
		E Lewis Ave	W Lewis Ave & North St	Marvin St	0.278	0.402	0.124	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	13	51		
		E Lewis Ave	Marvin St	Lee St	0.402	0.490	0.088	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	39		

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4604992	E Lewis Ave																	
		E Lewis Ave	Lee St	Dexter St	0.490	0.593	0.103	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	49		
1239502	E Main St																	
		E Main St		Dead End or Start	0.000	0.134	0.134	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	91		
1432907	Main St																	
		Mooreville Rd	City/Twp Line	Main St & Platt St & Platt Rd	6.652	6.854	0.202	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	7	14	59		
		Main St	Mooreville Rd & Platt St & Platt Rd	Iva St	6.854	7.021	0.167	Milan	Minor Arterial	City Major	Asphalt-Standard	2019	2023	8	7	97		
		Main St	Iva St	Argyle Cres	7.021	7.124	0.103	Milan	Minor Arterial	City Major	Asphalt-Standard	2019	2023	8	7	97		
		Main St	Argyle Cres	Ann Arbor Railroad	7.124	7.239	0.115	Milan	Minor Arterial	City Major	Asphalt-Standard	2019	2023	8	7	97		
		Main St	Ann Arbor Railroad	York St	7.239	7.342	0.103	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Main St	York St	Church St	7.342	7.426	0.084	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	91		
		Main St	Church St	Tolan St	7.426	7.575	0.149	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Main St	Tolan St	Wabash St	7.575	7.586	0.011	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	0	98		
		Main St	Wabash St	Ferman St	7.586	7.636	0.050	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	3	-5	98		
		Main St	Ferman St	E Main St & Gay St & County St	7.636	7.685	0.049	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	3	-4	95		
1440006	Marvin St																	
		Marvin St	County St	Hurd St	0.000	0.099	0.099	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	13	94		
		Marvin St	Hurd St	Ideal St	0.099	0.160	0.061	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	13	94		
		Marvin St	Ideal St	E 2nd St	0.160	0.214	0.054	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	12	97		
		Marvin St	E 2nd St	Lafayette Ave	0.214	0.230	0.016	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	13	94		
		Marvin St	Lafayette Ave	Spink Ave	0.230	0.295	0.065	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	12	97		
		Marvin St	Spink Ave	E Michigan Ave	0.295	0.362	0.067	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	12	97		
		Marvin St	E Michigan Ave	Smith Ave	0.362	0.422	0.060	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	3	-8	96		

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1440006	Marvin St																	
		Marvin St	Smith Ave	Welch St	0.422	0.476	0.054	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	3	-8	96		
		Marvin St	Welch St	E Braman Ave	0.476	0.572	0.096	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	2	-9	97		
		Marvin St	E Braman Ave	E Miller Rd	0.572	0.634	0.062	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	2	-9	97		
		Marvin St	E Miller Rd	E Lewis Ave	0.634	0.705	0.071	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	2	-13	97		
		Marvin St	E Lewis Ave	Attribute Change	0.705	0.746	0.041	Milan	Local	City Local	Asphalt-Standard	0	2023	8	14	49		
4604981	McKinley Ln																	
		McKinley Ln	Jackson Ln	Eisenhower Ln	0.000	0.068	0.068	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
4604984	Meadowbrook Blvd																	
		Meadowbrook Blvd	Honeysuckle Ln	Poppy Ln	0.000	0.057	0.057	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Meadowbrook Blvd	Poppy Ln	Morning Glory Ln	0.057	0.166	0.109	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Meadowbrook Blvd	Morning Glory Ln	E Arkona Rd & Pierce Ln	0.166	0.185	0.019	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Meadowbrook Blvd	Morning Glory Ln	E Arkona Rd & Pierce Ln	0.185	0.210	0.025	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
5490692	Meadowbrook Blvd																	
		Meadowbrook Blvd	Meadowbrook Blvd	Pierce Ln & E Arkona Rd	0.000	0.025	0.025	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
1439807	E Michigan Ave																	
		W Michigan Ave	Ash St	York St	0.000	0.098	0.098	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-6	95		
		W Michigan Ave	York St	Church St	0.098	0.187	0.089	Milan	Local	City Major	Asphalt-Standard	0	2023	4	-7	85		
		W Michigan Ave	Church St	North St & E Michigan Ave	0.187	0.280	0.093	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-5	92		
		E Michigan Ave	North St & W Michigan Ave	Ferman St	0.280	0.358	0.078	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	2	-7	96		
		E Michigan Ave	Ferman St	Marvin St	0.358	0.408	0.050	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-4	89		
		E Michigan Ave	Marvin St	Lee St	0.408	0.509	0.101	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-4	89		
		E Michigan Ave	Lee St	Dexter St	0.509	0.600	0.091	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-5	90		

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1223905	Milan Oakville Rd																	
		County St	E Main St & Gay St & Main St	Marvin St	0.000	0.061	0.061	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	3	-4	95		
		County St	Marvin St	Wilcox St	0.061	0.182	0.121	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-1	91		
		County St	Wilcox St	Wilcox St	0.182	0.189	0.007	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-1	91		
		County St	Wilcox St	Dexter St	0.189	0.268	0.079	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-1	91		
		County St	Dexter St	Hack St	0.268	0.335	0.067	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	2	-11	95		
		County St	Hack St	Norfolk Southern Railway	0.335	0.384	0.049	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	2	-11	95		
		County St	Norfolk Southern Railway	Milan Oakville Rd & S US 23	0.384	0.487	0.103	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	2	-12	91		
		Milan Oakville Rd	S US 23 & County St	N US 23	0.487	0.495	0.008	Milan	Minor Arterial	City Major	Concrete-Standard	0	2023	6	10	98		
		Milan Oakville Rd	N US 23	Norfolk Southern Railway	0.495	0.543	0.048	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	2	-12	97		
		Milan Oakville Rd	Norfolk Southern Railway	City/Twp Line	0.543	0.775	0.232	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	2	-12	97		
1439810	E Miller Rd																	
		W Miller Rd	Willana St	E Miller Rd & North St	0.000	0.149	0.149	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
		E Miller Rd	North St & W Miller Rd	Marvin St	0.149	0.277	0.128	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		
		E Miller Rd	Marvin St	Lee St	0.277	0.365	0.088	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
		E Miller Rd	Lee St	Dexter St	0.365	0.469	0.104	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
4604985	Morning Glory Ln																	
		Morning Glory Ln	Meadowbrook Blvd	Beavertail Ln	0.000	0.059	0.059	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	93		
		Morning Glory Ln	Beavertail Ln	Daisy Ln	0.059	0.115	0.056	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	93		
		Morning Glory Ln	Daisy Ln	North St	0.115	0.177	0.062	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	93		
1239206	Neckel Ct																	
		Neckel Ct	Wabash Rd	Attribute Change	0.000	0.080	0.080	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-9	93		
4604989	North St																	
		North St	1st St & Tolan St	Hurd St	0.000	0.027	0.027	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	17	60		

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PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
4604989	North St																	
		North St	Hurd St	E 2nd St	0.027	0.102	0.075	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	5	47		
		North St	E 2nd St	Ann St	0.102	0.162	0.060	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	4	58		
		North St	Ann St	E Michigan Ave & W Michigan Ave	0.162	0.249	0.087	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	4	51		
		North St	E Michigan Ave & W Michigan Ave	W Phillips Ave	0.249	0.420	0.171	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	6	3	84		
		North St	W Phillips Ave	W Braman Ave	0.420	0.477	0.057	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	1	89		
		North St	W Braman Ave	E Miller Rd & W Miller Rd	0.477	0.535	0.058	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	3	86		
		North St	E Miller Rd & W Miller Rd	E Lewis Ave & W Lewis Ave	0.535	0.593	0.058	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	3	94		
		North St	E Lewis Ave & W Lewis Ave	Honeysuckle Ln	0.593	0.679	0.086	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	9	95		
		North St	Honeysuckle Ln	Poppy Ln	0.679	0.734	0.055	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	13	93		
		North St	Poppy Ln	Morning Glory Ln	0.734	0.853	0.119	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	13	93		
		North St	Morning Glory Ln	E Arkona Rd	0.853	0.872	0.019	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	9	95		
		North St	Morning Glory Ln	E Arkona Rd	0.872	0.897	0.025	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	9	95		
5490690	NORTH ST																	
		NORTH St	NORTH St	E Arkona Rd	0.000	0.025	0.025	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	6	3	90		
1447304	Oak St																	
		Oak St	York St	Church St	0.000	0.089	0.089	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	91		
4301974	OBrian Dr																	
		OBrian Dr	Platt Rd	N OBrian Dr	0.000	0.043	0.043	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-7	88		
		OBrian Dr	N OBrian Dr	N OBrian Dr	0.043	0.263	0.220	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
4302286	N OBrian Dr																	
		N OBrian Dr	OBrian Dr	OBrian Dr	0.000	0.236	0.236	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
1239120	Ohio																	
		Ohio	Wabash Rd	Dead End or Start	0.000	0.100	0.100	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	90		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1239420	Park St																	
		Park St	E Main St	Attribute Change	0.000	0.057	0.057	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-5	93		
4301714	Pennsylvania Ave																	
		Pennsylvania Ave	Wabash Rd	Dead End or Start	0.000	0.107	0.107	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-10	91		
1439809	Phillips Ave																	
		Phillips Ave	Lee St	Dexter St	0.000	0.090	0.090	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		
		Phillips Ave	Dexter St	Dexter St	0.090	0.108	0.018	Milan	Local	City Local	Asphalt-Standard	0	2023	5	-2	85		
1447310	W Phillips Ave																	
		W Phillips Ave	Willana St	Church St	0.000	0.062	0.062	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-12	91		
		W Phillips Ave	Church St	North St	0.062	0.154	0.092	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-11	91		
4604976	Pierce Ln																	
		Pierce Ln	Meadowbrook Blvd & E Arkona Rd	Reagan Ln	0.000	0.022	0.022	Milan	Local	City Local	Asphalt-Standard	0	2023	7	14	96		
		Pierce Ln	Meadowbrook Blvd & E Arkona Rd	Reagan Ln	0.022	0.033	0.011	Milan	Local	City Local	Asphalt-Standard	0	2023	7	14	96		
		Pierce Ln	Reagan Ln	Jefferson Ln	0.033	0.088	0.055	Milan	Local	City Local	Asphalt-Standard	0	2023	6	11	91		
5490693	Pierce Ln																	
		Pierce Ln	E Arkona Rd & Meadowbrook Blvd	Pierce Ln	0.000	0.021	0.021	Milan	Local	City Local	Asphalt-Standard	0	2023	7	6	91		
1226001	Plank Rd																	
		E Main St	Gay St & County St & Main St	Park St	0.000	0.029	0.029	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	3	-5	93		
		E Main St	Park St	Wilcox St	0.029	0.215	0.186	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Main St	Wilcox St	Norfolk Southern Railway	0.215	0.260	0.045	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-2	94		
		E Main St	Norfolk Southern Railway	Gump Lake Rd & Dexter St	0.260	0.284	0.024	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	4	-4	89		
		E Main St	Gump Lake Rd & Dexter St		0.284	0.440	0.156	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	10	14	92		
		E Main St		Main/S US 23 RAMP	0.440	0.509	0.069	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	9	3	55		
		E Main St	Main/S US 23 RAMP	S US 23/Main RAMP	0.509	0.521	0.012	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	9	11	69		

Small Urban

PRNo	Road Name	Segment Name	From Description	To Description	P.O.B	P.O.E	Length	City/Twp	NFC	Legal System	Surface Subtype	Last Resurf	Last Eval	Current Rating	RSL	RSL Conf	IBR Rtg	IBR Year
1226001	Plank Rd																	
		E Main St	S US 23/Main RAMP	S US 23 & Plank Rd	0.521	0.624	0.103	Milan	Minor Arterial	City Major	Asphalt-Standard	0	2023	5	4	92		
1233604	Platt Rd																	
		Platt Rd	Norfolk Southern Railway	Squires Dr	5.112	5.271	0.159	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-6	95		
		Platt Rd	Squires Dr	Redman Rd	5.271	5.529	0.258	Milan	Local	City Major	Asphalt-Standard	0	2023	3	-6	95		
		Platt Rd	Redman Rd	OBrian Dr	5.529	5.698	0.169	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	79		
		Platt Rd	OBrian Dr	Ann Marie Dr	5.698	5.815	0.117	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	79		
		Platt Rd	Ann Marie Dr	Riverbend Dr	5.815	5.853	0.038	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	79		
		Platt Rd	Riverbend Dr	Canfield St	5.853	5.887	0.034	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	79		
		Platt Rd	Riverbend Dr	Canfield St	5.887	5.961	0.074	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	79		
4302160	Platt Rd																	
		Platt Rd	Canfield St	Platt St & Saint Louis St	0.000	0.010	0.010	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	70		
		Platt Rd	Canfield St	Platt St & Saint Louis St	0.010	0.051	0.041	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	70		
		Platt St	Canfield St	Platt St & Saint Louis St	0.051	0.171	0.120	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	19	77		
		Platt St	Saint Louis St	Yorkshire Sq	0.171	0.271	0.100	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	12	72		
		Platt St	Saint Louis St	Yorkshire Sq	0.271	0.284	0.013	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	12	72		
		Platt St	Yorkshire Sq	River Pointe Ct	0.284	0.346	0.062	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	12	72		
		Platt St	River Pointe Ct	Everett St	0.346	0.370	0.024	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	19	77		
		Platt St	Everett St	Mooreville Rd & Main St & Platt Rd	0.370	0.452	0.082	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	19	77		
		Platt Rd	Mooreville Rd & Main St & Platt St	Greentree Ln	0.452	0.506	0.054	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	5	47		
		Platt Rd	Greentree Ln	City/Twp Line	0.506	0.559	0.053	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	2	56		
4604986	Poppy Ln																	
		Poppy Ln	Meadowbrook Blvd	Beavertail Ln	0.000	0.057	0.057	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	95		

Small Urban

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4604986	Poppy Ln																	
		Poppy Ln	Beavertail Ln	Daisy Ln	0.057	0.114	0.057	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	95		
		Poppy Ln	Daisy Ln	North St	0.114	0.156	0.042	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	93		
4604990	Prairie Ln																	
		Prairie Ln	Primrose Ln	W Lewis Ave	0.000	0.163	0.163	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	95		
4604991	Primrose Ln																	
		Primrose Ln	Prairie Ln	W Lewis Ave	0.000	0.217	0.217	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	95		
		Primrose Ln	W Lewis Ave	Dead End or Start	0.217	0.249	0.032	Milan	Local	City Local	Asphalt-Standard	0	2023	5	3	95		
4604971	Reagan Ln																	
		Reagan Ln	Pierce Ln	Kennedy Ln	0.000	0.123	0.123	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Reagan Ln	Pierce Ln	Kennedy Ln	0.123	0.133	0.010	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		Reagan Ln	Kennedy Ln	Eisenhower Ln	0.133	0.257	0.124	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
1233610	Redman Rd																	
		Redman Rd	City/Twp Line	Platt Rd	3.214	3.509	0.295	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	3	-5	93		
		Redman Rd	City/Twp Line	Platt Rd	3.509	4.018	0.509	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	3	-5	93		
		Redman Rd	Platt Rd	Stonehaven Ct	4.018	4.103	0.085	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	7	17	60		
		Redman Rd	Stonehaven Ct	Silver Fox Dr & Richards Blvd	4.103	4.162	0.059	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	59		
		Redman Rd	Silver Fox Dr & Richards Blvd	Lauff Dr	4.162	4.322	0.160	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	59		
		Redman Rd	Lauff Dr	Anderson St	4.322	4.392	0.070	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	69		
		Redman Rd	Anderson St	Ann Arbor Railroad	4.392	4.506	0.114	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	14	69		
		Redman Rd	Ann Arbor Railroad	Allen Rd & Wabash Rd	4.506	4.516	0.010	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	2	86		
4302003	Richards Blvd																	
		Richards Blvd	Squires Dr	Squires Dr	0.000	0.147	0.147	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		
		Richards Blvd	Squires Dr	Redman Rd & Silver Fox Dr	0.147	0.254	0.107	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		

Small Urban

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4605896	River Pointe Ct																	
		River Pointe Ct	Platt St	Dead End or Start	0.000	0.085	0.085	Milan	Local	City Local	Asphalt-Standard	0	2023	8	1	54		
4604969	E Roosevelt Ln																	
		E Roosevelt Ln	Jackson Ln	Eisenhower Ln	0.000	0.084	0.084	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
		E Roosevelt Ln	Eisenhower Ln	Wilson Ln & W Roosevelt Ln	0.084	0.179	0.095	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
1439608	Saint Louis St																	
		Saint Louis St	Platt St	Argyle Cres	0.000	0.062	0.062	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	97		
		Saint Louis St	Argyle Cres	Bodley Cres	0.062	0.118	0.056	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	97		
		Saint Louis St	Bodley Cres	Everett St	0.118	0.224	0.106	Milan	Local	City Local	Asphalt-Standard	0	2023	7	12	97		
4302319	Sarah Ln																	
		Sarah Ln	Asher Pass	Goldfinch Ln	0.000	0.115	0.115	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-6	95		
		Sarah Ln	Goldfinch Ln	Eagles Nest Ct	0.115	0.190	0.075	Milan	Local	City Local	Asphalt-Standard	0	2023	5	4	92		
		Sarah Ln	Eagles Nest Ct	Dead End or Start	0.190	0.243	0.053	Milan	Local	City Local	Asphalt-Standard	0	2023	5	4	92		
1439808	Smith Ave																	
		Smith Ave	Marvin St	Lee St	0.000	0.100	0.100	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	87		
		Smith Ave	Lee St	Dexter St	0.100	0.193	0.093	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-9	87		
1439806	Spink Ave																	
		Spink Ave	Marvin St	Lee St	0.000	0.100	0.100	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		
		Spink Ave	Lee St	Dexter St	0.100	0.192	0.092	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-1	91		
4302033	Squires Dr																	
		Squires Dr	Platt Rd	Richards Blvd	0.000	0.142	0.142	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-4	89		
		Squires Dr	Richards Blvd	Richards Blvd	0.142	0.471	0.329	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-2	94		
4302043	Stonehaven Ct																	
		Stonehaven Ct	Redman Rd	Dead End or Start	0.000	0.087	0.087	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-10	95		

Small Urban

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5503640	Tolan St																	
		Tolan St	Main St	1st St & North St	0.000	0.039	0.039	Milan	Major Collector	City Local	Asphalt-Standard	0	2023	4	-2	84		
5499060	Truman Loop																	
		Truman Loop	Wilson Ln	Eisenhower Ln	0.000	0.025	0.025	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
		Truman Loop	Eisenhower Ln	Jackson Ln	0.025	0.110	0.085	Milan	Local	City Local	Asphalt-Standard	0	2023	6	13	96		
1239109	Wabash Rd																	
		Wabash Rd	City/Twp Line	Ohio	2.762	2.802	0.040	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	2	46		
		Wabash Rd	Ohio	Pennsylvania Ave	2.802	2.858	0.056	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	2	46		
		Wabash Rd	Pennsylvania Ave	Ann Arbor Railroad	2.858	2.970	0.112	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	5	0	71		
		Wabash Rd	Ann Arbor Railroad	Norfolk Southern Railway	2.970	2.998	0.028	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-4	59		
		Wabash Rd	Norfolk Southern Railway	Redman Rd & Allen Rd	2.998	3.012	0.014	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	4	-2	57		
		Wabash Rd	Redman Rd & Allen Rd	Division St	3.012	3.256	0.244	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	97		
		Wabash Rd	Division St	Neckel Ct	3.256	3.342	0.086	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	97		
4302161	Wabash Rd																	
		Wabash Rd	Neckel Ct	County Line	0.000	0.199	0.199	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	97		
		Wabash St	County Line	Main St	0.199	0.255	0.056	Milan	Major Collector	City Major	Asphalt-Standard	0	2023	8	13	97		
1447309	Welch St																	
		Welch St	Marvin St	Lee St	0.000	0.099	0.099	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-13	97		
1239404	Wilcox St																	
		Wilcox St	E Main St	County St	0.000	0.102	0.102	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-8	96		
1447401	Willana St																	
		Willana St	W Phillips Ave	W Braman Ave	0.000	0.050	0.050	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-13	88		
		Willana St	W Braman Ave	W Miller Rd	0.050	0.108	0.058	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		
		Willana St	W Miller Rd	W Lewis Ave	0.108	0.166	0.058	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		

Small Urban

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1447401	Willana St																	
		Willana St	W Lewis Ave	Dead End or Start	0.166	0.189	0.023	Milan	Local	City Local	Asphalt-Standard	0	2023	3	-13	88		
4604982	Wilson Ln																	
		Wilson Ln	Truman Loop	E Roosevelt Ln & W Roosevelt Ln	0.000	0.046	0.046	Milan	Local	City Local	Asphalt-Standard	0	2023	6	9	97		
1439908	York St																	
		York St	Main St	1st St	0.000	0.062	0.062	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-5	88		
		York St	1st St	W 2nd St	0.062	0.126	0.064	Milan	Local	City Local	Asphalt-Standard	0	2023	4	0	81		
		York St	W 2nd St	Oak St	0.126	0.155	0.029	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-5	90		
		York St	Oak St	W Michigan Ave	0.155	0.210	0.055	Milan	Local	City Local	Asphalt-Standard	0	2023	4	-5	88		
		York St	W Michigan Ave	Elm St	0.210	0.264	0.054	Milan	Local	City Local	Asphalt-Standard	0	2023	2	-16	95		
		York St	Elm St	Cherry St	0.264	0.319	0.055	Milan	Local	City Local	Asphalt-Standard	0	2023	6	-9	65		

Total Centerline Mileage for all Roads: 27.332

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CITY OF MILAN
STAFF REPORT
MEETING DATE: March 19,2024

TO: Mayor Kolar & City Council

FROM: Jim Lancaster, City Administrator

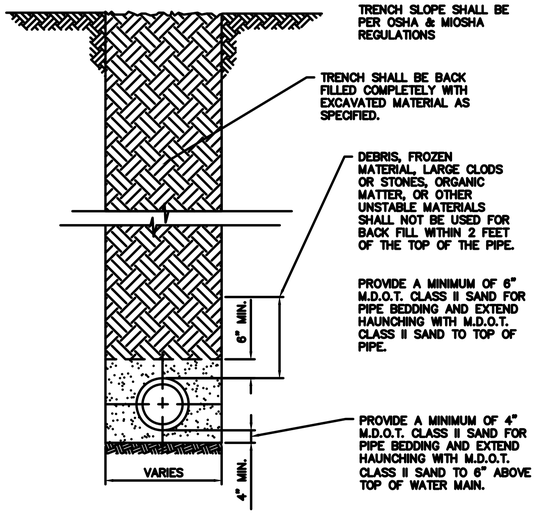
SUBJECT: Engineering Standards

FACTS:

A few months back City council approved a proposal from OHM to put together and update the cities engineering standards. City staff and staff from OHM collaborated to put together this document to help contactors and homeowners know and understand our standards to aid in the development process. These standards will make sure that all construction projects align with our staff's desires and the most up to date materials to ensure these projects adhere to the level of construction that the city desires.

RECOMMENDED ACTION:

Approve the engineering standards for the City of Milan.

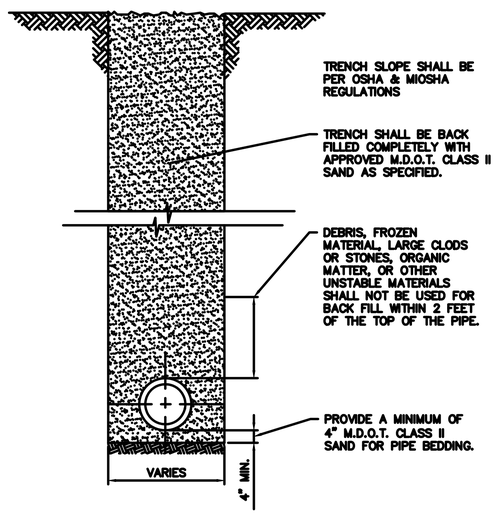


The following are maximum trench widths.

I.D. PIPE (Inches)	6	8	10	12	16	20	24	30	36	42	48
(W) TRENCH WIDTH (Inches)	24	25	28	30	34	38	42	48	55	61	67

DUCTILE IRON WATER MAIN TRENCH DETAIL F

SCALE: NONE



The following are maximum trench widths.

I.D. PIPE (Inches)	6	8	10	12	16	20	24	30	36	42	48
(W) TRENCH WIDTH (Inches)	24	25	28	30	34	38	42	48	55	61	67

DUCTILE IRON WATER MAIN TRENCH DETAIL G

SCALE: NONE

MINIMUM PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES [1]							
LENGTH (IN FEET) OF RESTRAINT REQUIRED [2]							
DEFLECTION ANGLE	22 1/2"	33 1/4"	45°	56 1/2"	67 1/2"	78 1/4"	90° TEE OR DEAD END
PIPE							
6"	3	6	11	16	23	29	37
8"	4	8	15	22	31	41	50
10"	5	11	18	28	38	49	61
12"	6	13	22	33	45	59	73
14"	7	14	25	37	52	68	84
16"	8	16	28	42	59	77	95
18"	8	18	31	47	66	86	107
20"	9	20	35	53	73	95	118
24"	11	23	40	61	85	111	138
30"	13	29	50	75	105	136	170
36"	15	34	59	88	123	160	199
42"	17	39	67	101	141	184	228
48"	19	43	75	113	157	206	255

NOTES:
1. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE + WATER HAMMER). FOR OTHER TEST PROCEDURES, ALL VALUES ARE TO BE INCREASED OR DECREASED PROPORTIONALLY.

2. IN EACH DIRECTION FROM POINT OF DEFLECTION OR TERMINATION EXCEPT FOR A TEE AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE TEE STEM.

3. IF TIE RODS ARE APPROVED BY ENGINEER, THEY MUST BE STAINLESS STEEL GRADE 316 RODS & NUTS. PLACE (2) RODS 5/8 INCH DIAMETER MINIMUM FOR WATER MAIN 6 INCH TO 10 INCH, AND (4) RODS 5/8 INCH DIAMETER MINIMUM FOR 12 INCH AND LARGER.

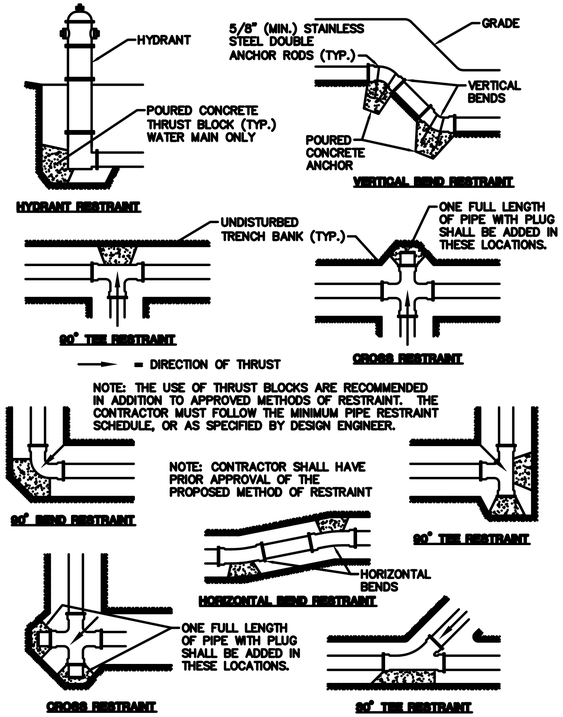
4. CONTRACTOR SHALL USE CITY OF MILAN APPROVED RESTRAINED JOINTS.

5. IN-LINE VALVES SHALL BE CONSIDERED DEAD ENDS IN BOTH DIRECTIONS.

6. THIS TABLE IS PLACED HERE AS A MINIMUM REQUIREMENT FOR THRUST RESTRAINT OF GROUND BURIED PRESSURE PIPES AND NOT DOES ALLEVIATE THE DESIGN ENGINEER OF THE RESPONSIBILITY TO DESIGN PROPER THRUST RESTRAINT SPECIFIC TO THE PROPOSED PROJECT. IN THE CASE OF DUCTILE IRON PIPE, THE DESIGN ENGINEER SHALL FOLLOW THE APPLICABLE STANDARD AS SET FORTH IN THE LATEST EDITION FOR THRUST RESTRAINT DESIGN FROM THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA).

MINIMUM PIPE RESTRAINT DETAIL

SCALE: NONE

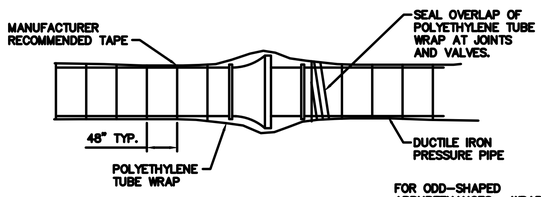


LOCATION OF THRUST BLOCK RESTRAINT

SCALE: NONE

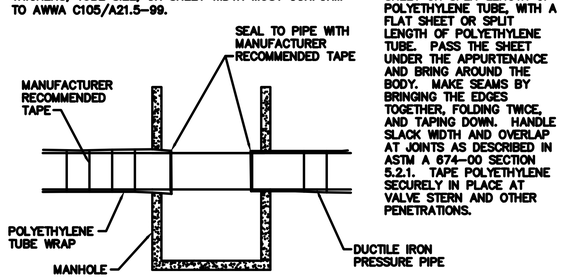
1. ALL PIPE SHALL BE WRAPPED, EXCEPT IN MANHOLES.

2. CIRCUMFERENTIAL WRAPS OF MANUFACTURER RECOMMENDED TAPE SHALL BE PLACED AT NO GREATER THAN FOUR FOOT INTERVALS ALONG THE BARREL OF THE PIPE WITH THE EXCESS FOLDED OVER THE TOP TO TAKE OUT EXCESS SLACK HELPING TO MINIMIZE THE SPACE BETWEEN THE POLYETHYLENE AND THE PIPE. COMPLETE THE INSTALLATION BY OVERLAPPING THE POLYETHYLENE TUBE WRAP AT EACH END AND SEAL ENDS PER AWWA C105/A21.5-99.



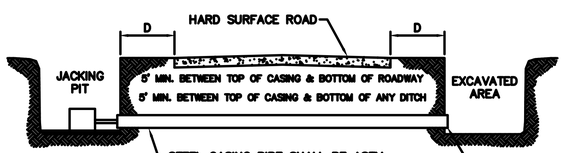
POLYETHYLENE WRAP: CROSS-LAMINATED HIGH DENSITY AND MANUFACTURED OF VIRGIN POLYETHYLENE MATERIAL CONFORMING TO THE REQUIREMENTS OF ASTM D-4976. RAW MATERIALS USED FOR THE FILM, ITS STRENGTH, THICKENS, TUBE SIZE, OR SHEET WIDTH MUST CONFORM TO AWWA C105/A21.5-99.

FOR ODD-SHAPED APPURTENANCES: WRAP VALVES, TEES, CROSSES, AND OTHER ODD-SHAPED PIECES WHICH CANNOT BE PRACTICALLY BE WRAPPED IN A TUBE, WITH A FLAT SHEET OR SPLIT LENGTH OF POLYETHYLENE TUBE. WITH A FLAT SHEET OR SPLIT LENGTH OF POLYETHYLENE TUBE. PASS THE SHEET UNDER THE APPURTENANCE AND BRING AROUND THE BODY. MAKE SEAMS BY BRINGING THE EDGES TOGETHER, FOLDING TWICE, AND TAPING DOWN. HANDLE SLACK WIDTH AND OVERLAP AT JOINTS AS DESCRIBED IN ASTM A 674-00 SECTION 5.2.1. TAPE POLYETHYLENE SECURELY IN PLACE AT VALVE STERN AND OTHER PENETRATIONS.



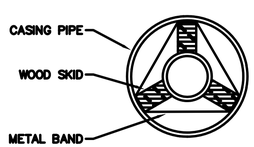
POLYETHYLENE TUBE WRAP FOR DUCTILE IRON PIPE

SCALE: NONE



MDOT
D=30' FOR TRAFFIC OVER 45 MPH
D=20' FOR TRAFFIC UNDER 45 MPH

COUNTY
D=10' FOR ROADS WITH SHOULDER/DITCH
D=5' FOR ROADS WITH CURB AND GUTTER



BORE AND JACK CONSTRUCTION ON ALL ROADS AND RAILROADS

SCALE: NONE

SIZE AND MATERIAL	MIN. CASING DIA. O.D. INCHES	MIN. WALL THICKNESS INCHES
8" P.V.C. PRESSURE PIPE OR SMALLER	12.75	0.375
6" SANITARY SEWER V.C.P. OR P.V.C.		
10"-12" P.V.C. PRESSURE	20.00	0.375
8"-10" SANITARY SEWER		
16" P.V.C. PRESSURE PIPE	24.00	0.375
12"-15" SANITARY SEWER		
18"-24" P.V.C. PRESSURE	30.00	0.406
18" SANITARY SEWER CONCRETE		
21"-24" SANITARY SEWER CONCRETE	36.00	0.469

NOTES:

1. ALL BORE AND JACK OPERATIONS WITHIN THE ROAD R.O.W. WILL REQUIRE A PERMIT FROM THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS. ALL BORE AND JACK OPERATIONS WITHIN RAILROAD R.O.W. WILL REQUIRE A PERMIT FROM THE AGENCY HAVING AUTHORITY OVER THE RAILROADS.

2. THE CONTRACTOR SHALL ABIDE BY ALL SAFETY PRECAUTIONS INCLUDING THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 6 AS REQUIRED BY THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS AND RAILROADS.

3. THE CONTRACTOR SHALL PROTECT AND RESTORE ALL PROPERTY.

4. THE CONTRACTOR SHALL NAME THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS AS AN ADDITIONAL NAMED INSURED FOR CONTINGENT LIABILITY FOR THE PROPOSED CONSTRUCTION.

5. THE CONTRACTOR SHALL ABIDE BY ALL REQUIREMENTS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS AND RAILROADS.

6. THE SHEETING OF THE FRONT FACE OF THE BORE PIT WILL BE REQUIRED IF UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.

7. THE AUGER MUST ALWAYS PROCEED THE CASING PIPE HEAD.

8. THE CONTRACTOR SHALL NOTIFY THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS AND RAILROADS A MINIMUM OF 72 HOURS PRIOR TO BEGINNING CONSTRUCTION.

9. WOOD SKIDS AND STAINLESS STEEL METAL BANDS MUST BE INSTALLED FOR ALL BORES TO KEEP THE CARRIER PIPE ON LINE AND GRADE. THE MAXIMUM DISTANCE FROM THE I.D. OF THE CASING PIPE TO THE OUTSIDE EDGE OF THE SKID SHALL BE 1".

10. THE ENDS OF THE CASING PIPE SHALL BE BULK HEADED WITH AN 8" WATER TIGHT MASONRY BULKHEAD.

BORE AND JACK CONSTRUCTION ON ALL ROADS AND RAILROADS

SCALE: NONE

MILAN
Connect with what matters

ISSUED FOR:	#####
REVISION	DESCRIPTION
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DATE

PROJECT NUMBER	PM	DISCIPLINE LEAD	CLIENT PROJ NO
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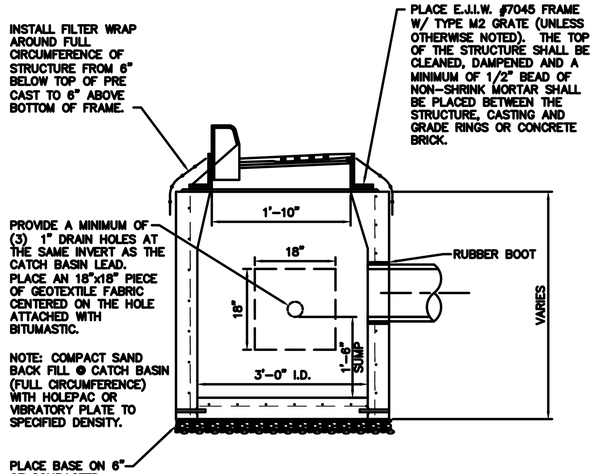
CITY OF MILAN

WATER MAIN STANDARD DETAILS

1 of 2

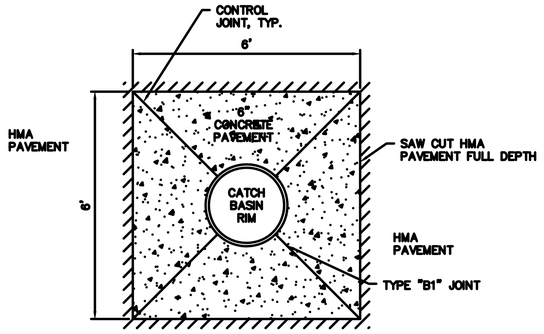
DRAWING PATH: P:\0166_0200\0166230020_engineering_standards\Drawings\Civil\Details\002020ET.dwg Mar 13, 2024 - 2:32pm



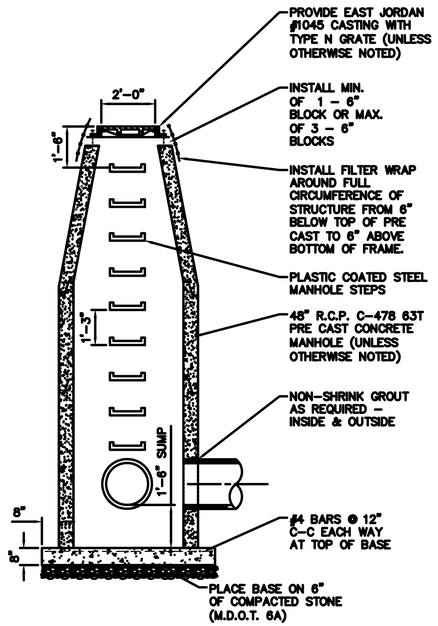
NOTE: PROVIDE CORRECT SIZE OPENING FOR 10" CATCH BASIN LEAD TO MAIN LINE STORM SEWER MANHOLE (UNLESS SPECIFIED OTHERWISE.) ALL OPENINGS SHALL BE CUT AT THE PLANT UNLESS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL INSTALL FERNCO (C.M.A.) TO CATCH BASIN LEAD PRIOR TO INSTALLATION.

3' DIAMETER CATCH BASIN (CONCRETE)

SCALE: NONE

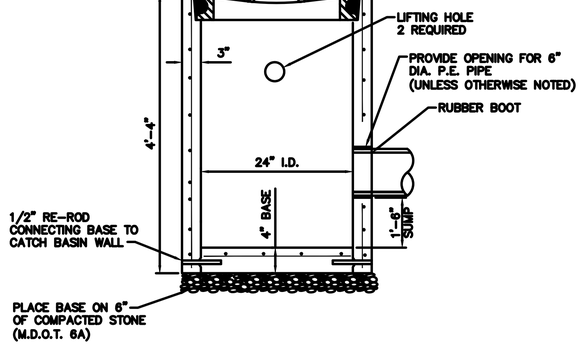


NOTE: ALL MANHOLE CASTINGS AND OTHER STRUCTURES WITHIN THE PAVEMENT SHALL BE BOXED OUT AS SHOWN.



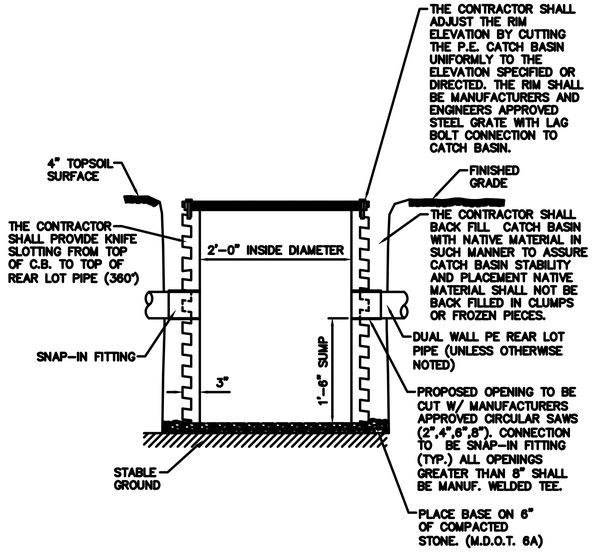
STORM SEWER MANHOLE / WITH SUMP

SCALE: NONE



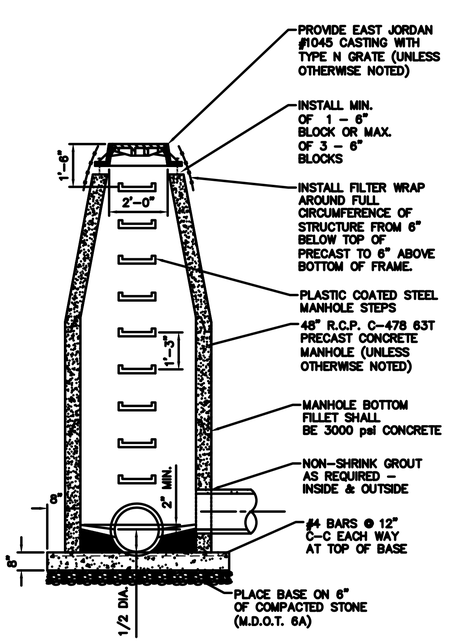
2' DIAMETER CATCH BASIN

SCALE: NONE



2' DIAMETER D.W.P.E. REARLOT CATCH BASIN

SCALE: NONE



STORM SEWER MANHOLE

SCALE: NONE

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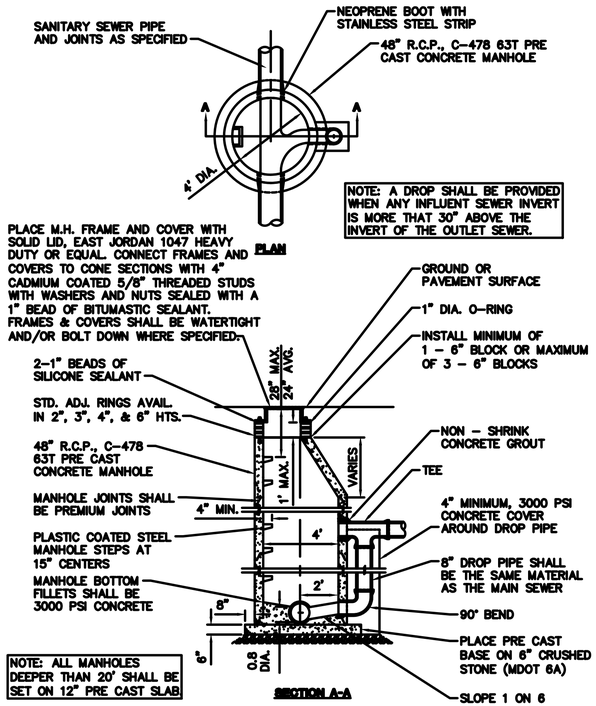
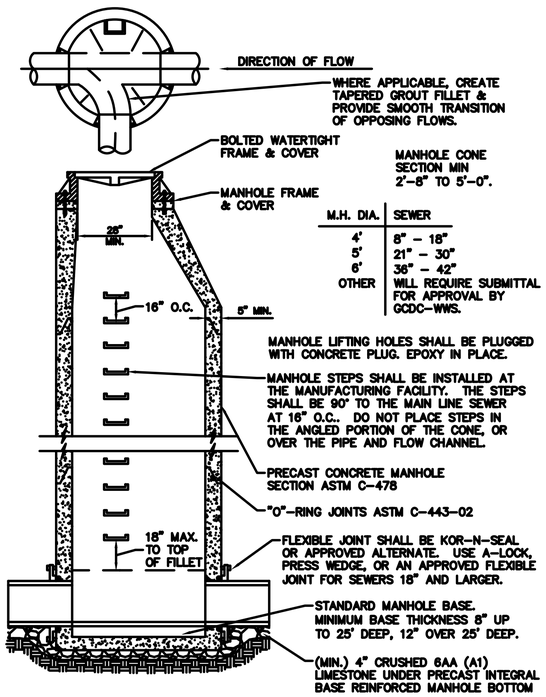
CITY OF MILAN

STORM SEWER STANDARD DETAILS



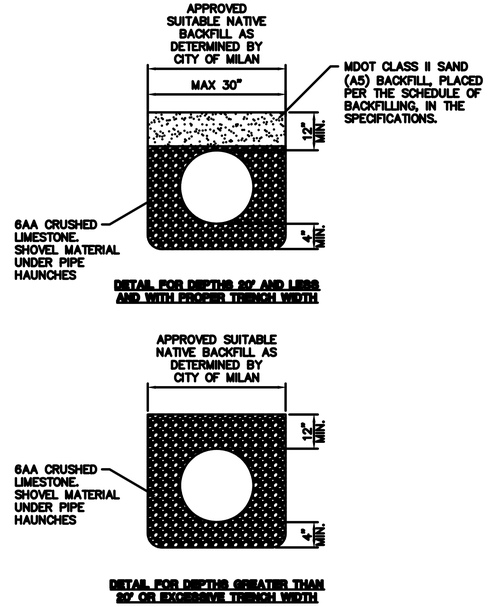
SANITARY DROP MANHOLE DETAIL

SCALE: NONE



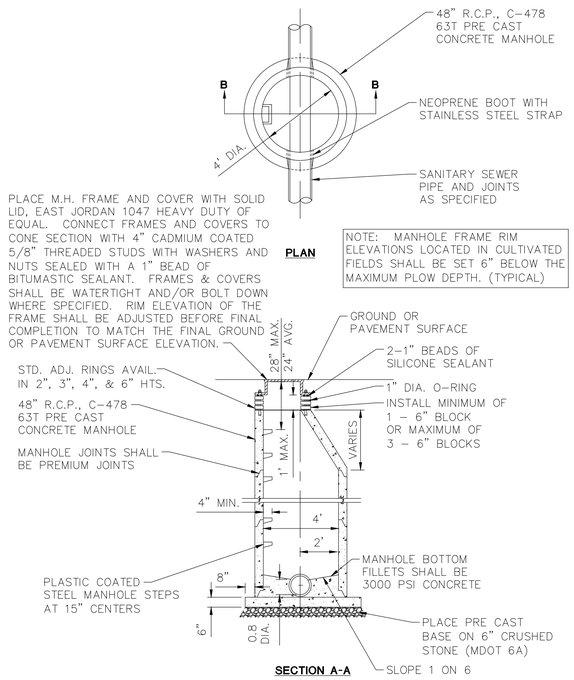
PRECAST FLEXIBLE JOINT MANHOLE

SCALE: NONE



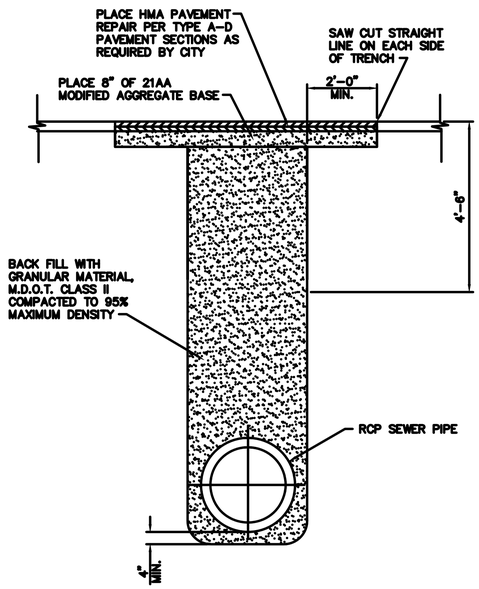
SANITARY BEDDING AND TRENCH DETAILS

SCALE: NONE



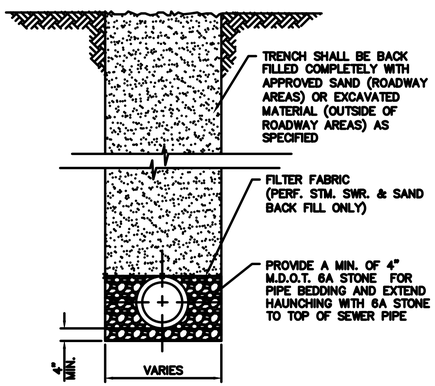
SANITARY MANHOLE DETAIL

SCALE: NONE



OPEN CUT TRENCH DETAIL

SCALE: NONE



TRENCH DETAIL, SLCPP SEWER

SCALE: NONE

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DATE

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CITY OF MILAN

SANITARY SEWER STANDARD DETAILS

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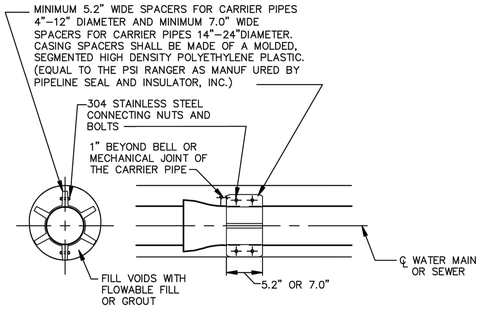
TYPICAL BORE AND JACK CASTING NOTES

1. REFER TO CITY OF SALINE STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. BORING SHALL BE PERFORMED BY ACCEPTED AND RECOGNIZED METHODS WHICH WILL PROVIDE ADEQUATE SAFETY AND PROTECTION AT ALL TIMES TO WORKMEN, INSPECTORS, AND ALL OTHERS INVOLVED IN THE CONSTRUCTION.
3. THE SHEETING OF BORING PITS ALONG ANY ROAD WILL BE REQUIRED IF THE LEADING EDGE OF ALL WORK PITS WILL BE CLOSER TO THE PAVEMENT EDGE THAN THE SHOULDER POINT OR TEN (10) FT, WHICH EVER DISTANCE IS GREATER, OR ON CURB AND GUTTER SECTIONS, AT LEAST FIVE (5) FT FROM BACK OF CURB.
4. STEEL ENCASING PIPE FOR BORING AND JACKING SHALL CONFORM TO THE REQUIREMENTS OF EITHER ASTM A53, TYPE E OR S, GRADE B OR ASTM A139, GRADE B. CASING PIPE WALL THICKNESS SHALL BE MINIMUM 0.50 INCHES.
5. THE INSIDE DIAMETER OF CASING PIPE SHALL BE AT LEAST 4 INCHES GREATER THAN THE LARGEST OUTSIDE DIAMETER OF THE CARRIER PIPE JOINTS FOR CARRIER PIPE 6 INCHES AND OVER IN DIAMETER.
6. CASING PIPE JOINTS SHALL BE WELDED TO FORM A LEAK PROOF CONTINUOUS CASING.
7. EACH CASING SPACER SHALL HAVE AT LEAST SIX INTEGRALLY MOLDED SKIDS. CASING SPACERS SHALL BE PLACED A MAXIMUM OF SEVEN (7) FEET APART ALONG THE LENGTH OF THE CARRIER PIPE WITH ONE CASING SPACER WITHIN 1 FOOT OF EACH SIDE OF A PIPE JOINT AND THE REST EVENLY SPACED.
8. THE STEEL CASING PIPE SHALL BE OF SMOOTH INTERIOR AND SHALL BE PLACED ACCURATELY TO LINE AND GRADE, ALLOWING FOR THE ENCASED PIPE THICKNESS AND SUPPORTS UNDER EACH LENGTH OF ENCASED PIPE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE CITY OF SALINE 48 HOURS PRIOR TO BEGINNING BORING.
10. AFTER TESTING SATISFACTORILY, THE REMAINING SPACE BETWEEN THE CARRIER PIPE AND ENCASING PIPE SHALL BE PRESSURE GROUTED OR OTHERWISE FILLED WITH CONCRETE. THE CARRIER PIPE SHALL BE ADEQUATELY BRACED TO PREVENT MOVEMENT OF THE PIPE.



TYPICAL BORE AND JACK CASING DETAILS

NOT TO SCALE

DIA. OF WATER MAIN	MIN. (I.D.) "A"	ROAD CROSSING	RAILROAD* CROSSING
		MIN. "B"	MIN. "B"
6"	14"	.250"	.250"
8"	16"	.250"	.281"
12"	20"	.250"	.344"
16"	24"	.375"	.375"

NOTES:
1. MAINTAIN MIN OF 5'6" OF COVER BETWEEN GROUND ELEVATION & TOP OF CASING FOR WATER MAIN.
2. THE ENDS OF THE CASING SHALL BE BULKHEADED AND ANNULAR SPACE FILLED WITH CEMENT GROUT.
3. WHITE OAK SKIDS WITH STRAPPING MAY BE USED WITH CITY APPROVAL.
4. END SEALS REQUIRED

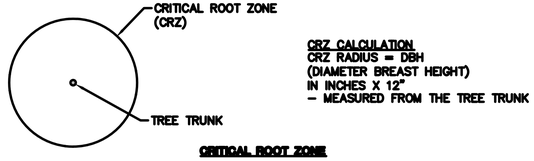
* UNCOATED AND UNPROTECTED

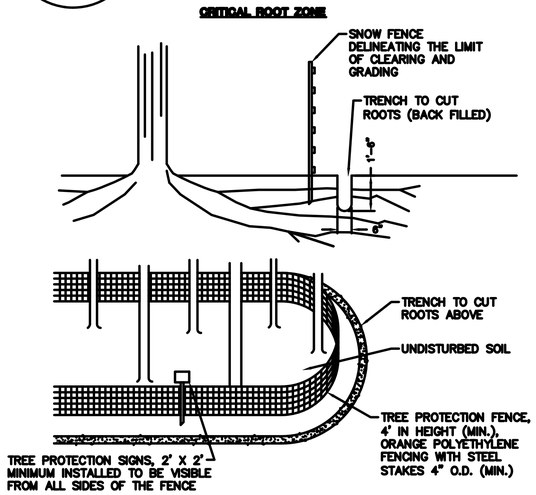
ALL STRUCTURE COVERS SHALL BE MANUFACTURED BY EJ OR CITY ENGINEER APPROVED EQUAL; EJ COVER NUMBERS AND ILLUSTRATIONS ARE SHOWN AND ANY SUBSTITUTIONS SHALL MEET THE DIMENSIONAL REQUIREMENTS AS SET FORTH. ADDITIONAL INFORMATION CAN BE FOUND IN THE EJ PRODUCT CATALOG.

STRUCTURE COVERS SHALL BE UTILIZED AS FOLLOWS:

FRAME	COVER	SPECIAL LETTERING	APPLICATION
1040Z	A	SANITARY SEWER	SANITARY MANHOLES
1040Z	B	STORM	STORM MANHOLES
1040Z	C	DEPT OF WATER SUPPLY	GATE WELLS
1040Z			STORM INLETS
	M1, M2	NONE	PAVEMENT AREAS
	N, 02	NONE	LAWN AREAS
5100Z	M1	NONE	GUTTER INLET
7045Z	M2–T1	DUMP NO WASTE–	CURB INLET
		DRAINS TO WATERWAY	
		FISH LOGO	
1564Z	1564A	SEWER	SEWER CLEANOUT
2960Z	2960A	NONE	CURB STOP
8550	6800	WATER	VALVE BOX

UTILITY STRUCTURE COVERS

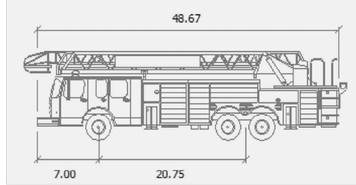




TRENCHING / FENCING SECTION

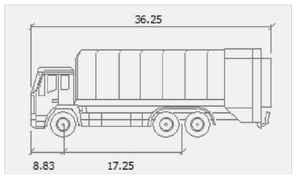
TREE PROTECTION OF CRITICAL ROOT ZONE, FENCING, AND SIGNAGE

SCALE: NONE



WIDTH: 10'
TRACK: 8'
LOCK to LOCK TIME: 6.0 SEC
STEERING ANGLE: 29.1 DEG

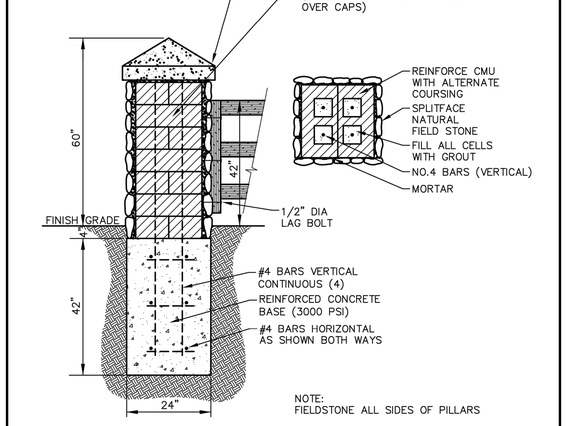
FIRE TRUCK DETAIL



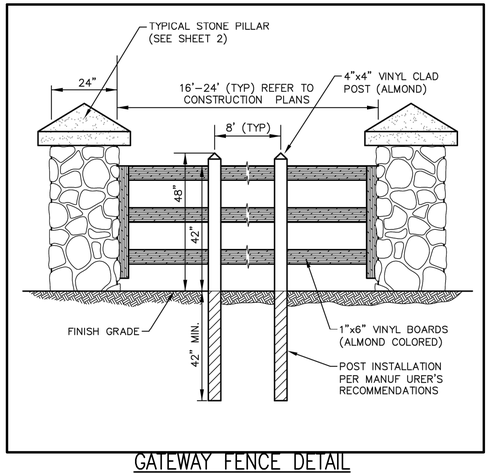
WIDTH: 8.42'
TRACK: 8'
LOCK to LOCK TIME: 6.0 SEC
STEERING ANGLE: 31.8 DEG

REFUSE TRUCK DETAIL

TYPICAL TRUCK TURNING TEMPLATE DETAILS



GATEWAY FENCE DETAIL
TYPICAL FENCE AND PILLAR



GATEWAY FENCE DETAIL
TYPICAL STONE PILLAR

NOT TO SCALE

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MILAN
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REVISION	DESCRIPTION	
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PROJECT NUMBER	PM	DISCIPLINE LEAD	CLIENT PROJ NO
---	Value	##	####

CITY OF MILAN

MISCELLANEOUS STANDARD DETAILS

PROJECT NUMBER	PM	DISCIPLINE LEAD	CLIENT PROJ NO
----	Value	##	####

CITY OF MILAN

STANDARD DETAILS

ISSUED FOR:	#####	##########
REVISION	DESCRIPTION	DATE
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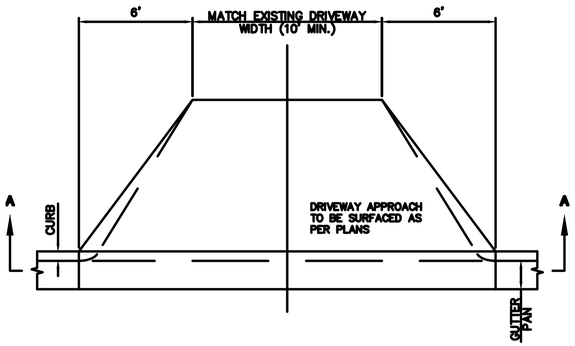
connect with what matters

MILAN

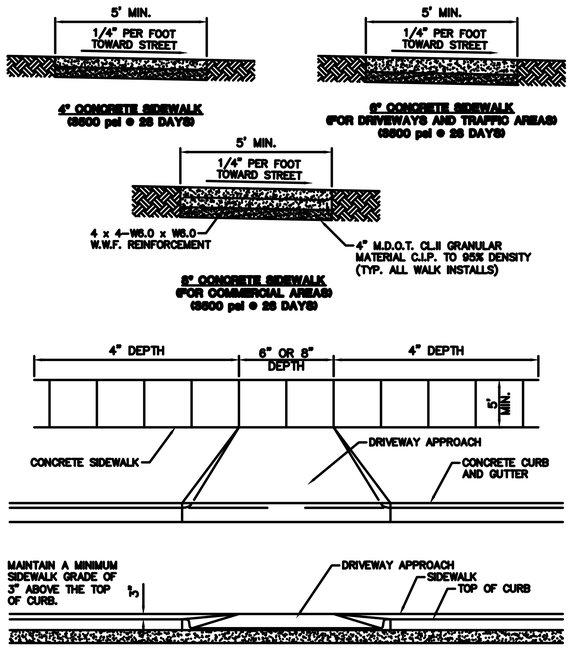


DRIVEWAY APPROACH PLAN

SECTION A-A

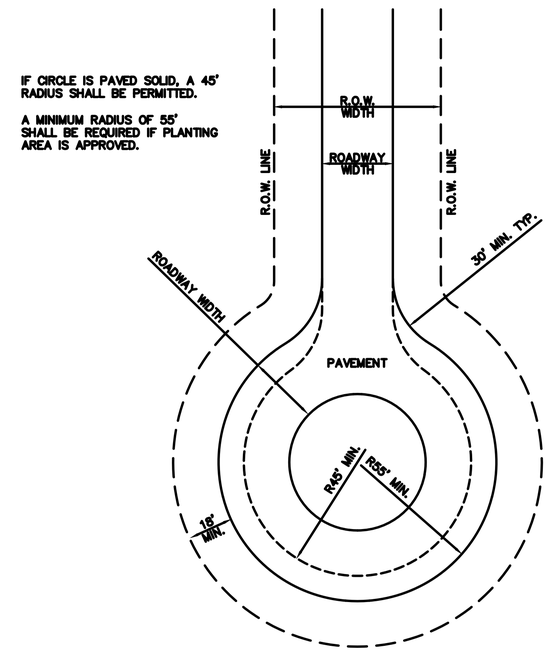
RESIDENTIAL DRIVEWAY DETAIL

SCALE: NONE



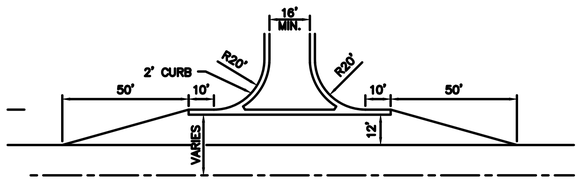
SIDEWALK DETAIL

SCALE: NONE



CUL-DE-SAC DETAIL FOR DEAD END STREETS

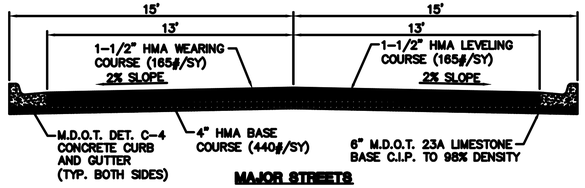
SCALE: NONE



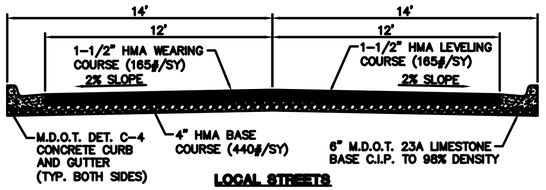
COMMERCIAL DRIVEWAY DETAIL TYPE 'M' OPENING ON UNCURBED ROAD

SCALE: NONE

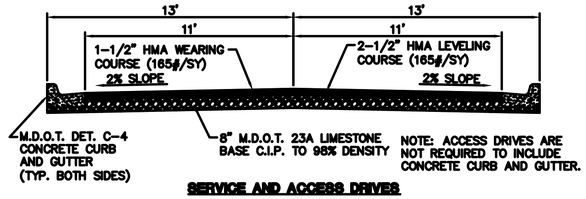
NOTE: FULL DEPTH 9" ASPHALT PAVEMENT MAY BE SUBSTITUTED. PLANNING COMMISSION MAY ADJUST ROAD WIDTH TO ALLOW LANE WIDTH TO BE LESS THAN 13'–0".



MAJOR STREETS



LOCAL STREETS



SERVICE AND ACCESS DRIVES

TYPICAL ROAD CROSS SECTIONS

SCALE: NONE

MILAN
Connect with what matters

ISSUED FOR:	#####	#
REVISION	DESCRIPTION	DATE
---	---	----

PROJECT NUMBER	PM	DISCIPLINE LEAD	CLIENT PROJ NO
---	Value	##	####

CITY OF MILAN

PAVEMENT STANDARD DETAILS

CITY OF MILAN

DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS

MARCH 2024

Table of Contents

1.0 Definitions

The following is a list of words and phrases defined for the purpose of their use in interpretation of the Design Standards and Construction Specifications Manual. These definitions shall apply in the interpretation, administration and enforcement of the Design Standards and Construction Specifications Manual. Words and phrases not specifically defined shall rely on their definition in the City of Milan's Zoning Ordinance, Land Division Control Ordinance, Condominium Regulations or its common or standard definition.

City – The City of Milan, Michigan, and its officers, employees and agents, including, but not limited to the City Council, City Planning Commission, City Staff, City Attorney, City Engineer, etc.

Contractor/Developer – The Contractor and/or the Developer is the person, partnership, corporation responsible for performing the work required by the City of Milan in accordance with the City of Milan's Design Standards and Construction Specifications Manual.

Design Standards – The applicable standards relevant to the planning, design and construction of Infrastructure improvements within the City as adopted and contained in the City of Milan's Design Standards and Specifications Manual.

Engineer – The City of Milan's City Engineer, or other City officer, employee or agent acting on behalf of the City of Milan in the administration of the City's Design Standards and Specifications Manual.

HMA – Hot Mix Asphalt or Bituminous material used to create an asphalt surface for roads, parking lots, driveways or pathways.

Monuments – Any object defining the location of a property corner, street location, section line, fractional section line, right-of-way marker, or any other delineation of land ownership or division.

Project Drawings/Plans – Include Site Plans, Plats, Condominium Site Plans, Project drawings and plans, etc. detailing the construction plans, requirements and specifications applicable to the City of Milan's Design Standards and Specifications Manual.

2.0 Title, Purpose, Interpretation and Application

Section 2.01 Title

This document establishes a comprehensive improvement standards and specifications for the City of Milan, Michigan. This document shall be known and may be cited as "The Design Standards and Construction Specifications for the City of Milan, Michigan."

Section 2.02 Purpose

It is the purpose of these Standards to establish minimum standards and specifications for the design, materials, and construction of commercial, industrial, residential developments, site plan improvements, utility systems, and other developments proposed for the City of Milan, Michigan (City) in order to ensure sound, safe, reliable and appropriate construction.

Section 2.03 Interpretation and Application

In interpreting and applying the provisions of these Standards they shall be held to be the minimum requirements for the promotion of the public safety, health, convenience, comforts, morals, propensity and general welfare and for the promotion of sound, safe, reliable and appropriate construction. It is not intended by this document to repeal, abrogate, annul or interfere with any ordinance or any rule, regulations, agreements, or permits adopted or issued and not in conflict with this document, however that where this document imposes greater standards, specifications or restrictions than are imposed or required by existing ordinances, regulations, rules or agreements, the provisions of this document shall govern.

3.0 General Requirements

Section 3.01 Procedures and Requirements

Unless otherwise specified, all construction shall be in compliance with the procedural and substantive requirements of the City of Milan Code, as amended, Building Regulations, as amended, and all other regulations, statues, and ordinances, in addition to the requirements contained in these Design Standards and Construction Specifications (Document) of the City of Milan, Michigan.

In addition to the requirements set forth in this Document, the developer shall enter into a Municipal Improvements Agreement with the City, substantially meeting the requirements of this Document, or a similar agreement as approved by the City, setting forth required improvements that shall be made in connection with the development of the developer's property.

Engineering drawings for proposed developments, improvements, utility and other construction shall be approved by all applicable jurisdictional agencies and the City prior to the beginning of any construction.

Permits will not be issued until all permit requirements are met and required approvals and permits are secured for all applicable sources including but not limited to Federal, State and County agencies.

Section 3.02 Locations for Proposed Utilities

In general, utilities shall be located outside the paved areas except where not feasible as determined by the City, or as necessary to connect with an existing utility line.

Section 3.03 Information on Subsurface Utilities

The location and size of existing sewers, drains, culverts, gas and water mains, and other underground conduits and structures shall be shown on the drawings submitted to the City for approval. This information can be obtained, in part, from field surveys, and from records of the City or other available records. The City does not guarantee the size, location, quantity, or number of underground utilities, where such information was obtained from the City's records. The City's records are based on the best available data but should not be regarded as conclusive. The contractor shall notify all owners of public utilities in accordance with the requirements of Act No. 53 Public Acts of 1974 of the State of Michigan. The contractor shall be responsible for contracting the appropriate utility companies to verify the location of all underground utilities.

Section 3.04 Drawing Submittals

Engineering drawings shall comply with the following and shall include information necessary for the completion of the City's Preliminary Site Plan List, Final Site Plan Checklist, Washtenaw and/or Monroe County Soil Erosion Control Permit Application, and any other information required by the Building Department and Planning Commission to complete their review process. An engineering site plan review checklist is supplied within the Appendix.

1. Engineering drawings shall consist of a title sheet and plan view of the complete project, site plan, profile sheets and standard detail sheets.
2. A location map at a scale of 1" =2,000' shall be provided. Engineering drawings shall be presented on 24" x 36" sheets unless otherwise approved by the City prior to submittal.
3. Plan sheets shall be drawn to scale at a scale not smaller than 1" =100'. Profile sheets shall be drawn to a scale of 1" =40' horizontally and 1" =5' vertically.
4. A north arrow, scale bar and legend shall be provided for on each sheet.
5. Plans shall be dated, with each revision date noted with explanation of change.
6. Elevations shall be on USGS datum. Benchmarks shall be shown at least every 1,200'. At least two benchmarks shall be noted on each sheet.
7. The plans shall expressly state that all construction shall conform to the "Construction Standards and Specifications of the City of Milan."
8. Existing and proposed topography including all existing and proposed utilities, shall be shown extending 100' past the site boundaries. Topography shall include elevation contours at a minimum of 2' intervals at a USGS datum.

9. The drawings shall show street names and widths, subdivision names, lot numbers and sizes, easement type, locations, and widths, as well as other necessary survey information.
10. The drawings shall indicate the limits of any special soil conditions or backfill requirements.
11. Profile drawings shall be shown over the vertical centerline of the proposed pipeline and shall show elevations of existing and finished grades, pavement grades, pavement surfaces, existing and proposed utilities, and any other installation affecting pipeline construction. Existing surface elevations shall be obtained from actual field or aerial surveys. Elevations from aerial surveys shall be adequately field checked.
12. Profile drawings shall generally be located on the same sheet as the corresponding plan drawings and shall be projected vertically.
13. Detail sheets shall be provided for all appurtenances and structures to be included with underground construction and special or unusual construction requirements. Scales used for special details shall be selected to clearly portray intended construction, components, or equipment arrangement. Scales shall be clearly identified.
14. Exact location of all water, sanitary, and storm leads from the main to the structure will be provided by the developer in a form approved by the City.
15. The drawing shall show all the pipe that is to be bored, jacked-in-place or installed in casing pipe. Casing pipe material, length, size, class and/or wall thickness shall be indicated on the drawings.
16. Upon completion of construction, 2 sets of as-built drawings will be provided to the City electronically. The drawings shall be identified as “As Built Drawings” in the title block of each drawing and shall be signed and dated by the proprietor, and shall bear the seal of a registered engineer verifying the work and placement. The drawings shall show all the work as actually installed and as field verified.

Section 3.05 Sanitary Sewer Drawing Requirements

In addition to the above mentioned guidelines, the Sanitary Sewer Drawings shall also conform to the following:

1. For sanitary sewer construction requiring permits from the Michigan Department of Environment, Great Lakes, and Energy, the petitioner shall submit a completed Part 41 permit application, prepared for the signature of the City Administrator.
2. The drawings shall show an overall layout of the sewer system with manhole numbers and direction of flow arrows, and district limits of sewer.
3. The drawings shall show the locations of all the sewer mains, manholes, special structures and other sewer appurtenances. Location shall be given by dimensions from property lines, right-of- ways, buildings or other monuments.

4. The drawings shall provide the length, size, and direction of flow for each section of sewer between manholes. The length, size, invert elevations, and type of service lead connection shall be shown on the plans.
5. The drawings shall depict, by station and lot number, all building sewers, wye branches, and tee inlets that are to be installed during the sewer construction. The drawings shall indicate the lowest floor elevation that is to be served by the sanitary sewer.
6. The drawings shall show the location of all monitoring manholes for industrial connections in accordance with the City's Industrial Pretreatment Program (IPP) Ordinance.
7. All sanitary mains shall be shown in profiles.
8. The drawings shall show all pipe diameters and the wall and/or class thickness for the various types of pipe.

Section 3.06 Storm Sewer Drawing Requirements

In addition to the Drawing Submittal guidelines, the Sanitary Sewer Drawings shall also conform to the following:

1. The petitioner shall submit storm sewer design calculations for a 10-year design storm, including areas tributary to damage structures, calculations of runoff coefficients and resulting flow rates as calculated by the rational method.
2. When required to limit storm water discharge rates, detention systems shall be shown on the drawings. Detention volume, proposed grading and details of the inlet and outlet designs shall be provided.
3. The drawings shall show the locations of all the sewer mains, manholes, special structures and other sewer appurtenances. Location shall be given by dimensions from property lines, right-of- ways, buildings or other monuments.
4. The drawings shall provide the length, size, and direction of flow for each section of sewer between manholes. The length, size, invert elevations, and type of service lead connection shall also be shown on the plans.
5. The drawings shall depict, by station and lot number, sump pump leads, wye branches, and tee inlets that are to be installed during the sewer construction.
6. The drawings shall include a drainage plan delineating the total area tributary to the proposed sewer system and an overall layout of the sewer system with manhole numbers and direction of flow arrows.
7. All sanitary mains shall be shown in profiles.
8. Profiles shall show the hydraulic grade line for a 10 year and 100 year design storm where required.

Section 3.07 Water Main Drawing Requirements

In addition to the Drawing Submittal guidelines, the Water Main Drawings shall also conform to the following:

1. The drawings shall show the locations of all the sewer mains, manholes, special structures and other sewer appurtenances. Location shall be given by dimensions from property lines, right-of- ways, buildings or other monuments.
2. Finish grades shall be provided at hydrants and valve walls.
3. Service line location and diameter shall be shown to all buildings including location of curb stop box.
4. The drawings shall include a drainage plan delineating the total area tributary to the proposed sewer system and an overall layout of the sewer system with manhole numbers and direction of flow arrows.
5. The drawings shall detail all proposed joint restraints, showing the type and locations.
6. Where required, a hydrant assembly consisting of a hydrant, a 6” valve, a cast iron valve box, and all piping necessary for a complete job shall be shown on the drawings.

Section 3.08 Site Improvement Drawing Requirements

In addition to the Drawing Submittal guidelines, the Site Improvement Drawings shall also conform to the following:

1. An overall plan of the proposed project shall be provided that will depict the full extent of proposed site improvements.
2. Drawings shall provide existing elevations at 50’ horizontal intervals along all site boundary lines. The drawings shall provide proposed grade elevations to one hundredth of a foot at each lot corner.
3. The drawings shall depict the proposed elevations for pavement, sidewalks, top of curb, parking islands and any other deemed necessary by the City. Top of curb or shoulder elevations to one hundredth of a foot shall be provided adjacent to each lot corner.
4. The drawings shall provide finish grade elevations to one hundredth of a foot at all building lines and structures. Buildings and structures shall be accurately located on the drawings and drawn to scale. Elevations of first floor shall also be provided.
5. The drawings shall provide the stationing at the centerline of street pavements, pavement elevations at 50’ intervals and at all high and low point elevations.
6. The drawings shall include all existing and proposed storm drainage structures. Rim elevations and end section finished grades shall be noted. Any drainage that flows onto, through, or off the site shall be noted.

7. Drainage flows arrows shall be shown to indicate the direction of surface water flow on the open space lots and pavements.
8. When swales for lot drainage are proposed, swale elevations shall be provided. General flow direction of swales shall be shown with arrows.
9. Where street pavement is proposed, the drawings shall include typical sections that note the existing soil conditions, material and thickness for proposed pavement, slopes of finished pavement surfaces and curb or shoulder dimensions.
10. The drawings shall include a standard detail sheet fully setting forth miscellaneous construction details.

Section 3.09 Phased Construction

Where construction is to proceed in phases, a separate plan sheet shall be included in the submittal package, which details the scope of work for each phase. Site approval must be obtained for each phase of construction. With the exception of tap fees, applicable permits expire 1 year from the date of issue.

Section 3.10 Sealing of Drawings

All submitted construction drawings for City review and Approval shall bear the seal and signature of a State of Michigan licensed engineer, architect or landscape architect, as deemed applicable by the City.

Section 3.11 Codes, Ordinances, Laws and Regulations

The contractor and subcontractors shall observe and comply with all applicable federal, state and local codes, ordinances, laws and regulations. The contractor shall pay for and obtain all building permits, licenses, inspection tests, and shall file the construction documents with the jurisdictional inspection department.

Section 3.12 Bonds and Insurance

Performance, payment, maintenance bonds and insurance certificates will be provided by the contractor, in types and amounts approved by the City, special language may be required by the City. The City will be named as an additional insured and not a certificate holder. The City will be named as bond holder on all projects as determined by the City.

Section 3.13 Protection of Work Property

The contractor shall continuously protect all public and private property from damage resulting from the contractor's work. The contractor shall make good on any such damages without delay and cost to the City, and hold the City, and its employees and agents harmless. Protection of the work, including property and persons within the county and public right-of-ways, shall be in accordance with the current edition of the State Manual of Uniform Traffic Control Devices.

Section 3.14 Responsibility for Adjoining Structures

The contractor and subcontractors shall assume full responsibility for the protection of utilities above and below ground, pavement, curbs, mailboxes, signs, poles, vegetation and other surface structures. The contractor shall make good on any such damages without delay and cost to the City, and hold the City, and its employees and agents harmless.

Section 3.15 Vegetation Protection

No woody vegetation located within the right-of-way shall be removed or destroyed without written permission from the City. The contractor will protect adjoining vegetation by surrounding it with fences prior to construction, and any vegetation on private property needing protection will require permission from the property owner prior to the installation of the fencing. Vegetation that is planned for temporary removal will be removed, stored and replanted in a manner acceptable to the City.

Section 3.16 Easements and Right-of-Ways

The developer must provide the City with the necessary easements and rights-of-way for publicly owned, operated, or maintained site improvements that are proposed for privately owned property. Easements and rights-of-way shall be a minimum 20’ in width unless there is prior approval from the City. The City shall have final approval of proposed easements and rights-of-way, and all parties having legal interest in the property must execute and grant the easement or right-of-way.

Section 3.17 Staking

All property corners, lots, buildings, site improvements and underground utility lines with grades shall be properly staked for location and elevation under the supervision of a State of Michigan licensed Land Surveyor.

Section 3.18 Monuments

The contractor, prior to construction, shall erect protective barricades around all ascertained monuments that are in or adjacent to the construction area. Any other monuments uncovered or located during the construction process shall be protected from damage and loss, and the City shall be notified in writing to the exact location. Any monuments lost or destroyed during construction shall be replaced at the cost to the contractor under the direct supervision of a State of Michigan licensed surveyor.

During the normal course of construction, monuments requiring removal shall have a State of Michigan licensed surveyor set 4 iron pipe stakes, 2’ long as reference points for the resetting of such monument. Reference stakes shall be located in such positions and barricaded so that they will not be disturbed by any construction operations.

Section 3.19 Inspection

Prior to construction, the contractor will notify the City of the proposed construction inspection plan in order to obtain mutual consensuses. The City can provide inspection personnel; however, the contractor shall pay all applicable inspection fees as established by the City. Fees will be assessed at the beginning of the project, and adjusted as necessary during the project, or upon completion. Construction inspection provided by the City during non-office hours will be scheduled with the City and based on inspector availability. Costs for afterhours inspection will be additional and based on actual time per the City's official fee schedule.

Section 3.20 Time and Sequence of Work

The contractor shall have control over the sequence of the work and over the method of accomplishing the required result, except as some particular sequence or method is required by the City.

Section 3.21 Sunday and Night Work

Sunday and night work shall not be permitted unless in the case of emergency.

Section 3.22 Reference Specification

Where reference is made in these Standards to specifications or standards of any technical society, organization, association, governmental agency, such specification or standards shall be part of these Standards as though fully stated herein. Such references shall meet the latest standard code, specification, or tentative specification adopted and published, unless specially stated otherwise.

4.0 Soil Erosion and Sedimentation Control

Soil erosion and sedimentation control shall be dictated by the County. Permits shall be pulled from Washtenaw County Drain Commission and/or Monroe County Drain Commission.

5.0 Storm Water Management

Section 5.01 Description/Permits

1. All work related to the construction of storm sewer, manholes, service leads and related items in the City of Milan shall be constructed in accordance with these standard specifications, the current edition of MDOT Standard Specifications for Construction, Division 4, and together with any supplemental specifications, special provision, standard details, and the plans, as approved by the City of Milan.
2. No storm sewer or related items shall be installed without the contractor first obtaining approval of the plans and materials from the City Engineer and/or a permit from the governing agency have jurisdiction over a particular drainage course (county, state,

federal).

Section 5.02 Submittals

1. Prior to the start of construction, the Contractor shall submit to the City Engineer for approval the following items. The City Engineer shall provide written approval of the submittals and work shall be constructed prior to said approval.
2. Shop drawings or data sheets for all pipe, drainage structures, underground detention systems, stormwater treatment units, structure covers, miscellaneous drainage pipe (i.e., underdrain, trench drain, service lead) and backfill materials to be used during storm sewer and storm sewer lead construction.
3. Shop drawings for all manhole structures shall include pipe size, pipe invert and pipe direction.

Section 5.03 Computational Requirements for Stormwater Management Systems

1. The City desires to manage stormwater for both new development and re-development sites. Increases in impervious surfaces on a site increase both the rate and volume of stormwater runoff. By using a combination of standard detention systems and infiltration Best Management Practices (BMPs) within a stormwater management system, both the surface water runoff rate and the runoff quality can be effectively managed. Additional information on the requirements can be found in Section 6.0.

Section 5.04 Materials

1. Pipe and Fittings
    a. All public storm sewer pipe and fittings shall be Reinforced Concrete Pipe (RCP). The use of Polyvinyl Chloride (PVC) pipe shall only be used for service leads/lead connection, base underdrain, and where permitted by the City Engineer. The use of ADS N12 HDPE pipe may be used for private storm sewer and rear yard drains as permitted by the City Engineer. The use of Corrugated Metal Pipe (CMP) may only be used where permitted by the City Engineer.
2. Storm Sewer Main Pipe
    a. All public storm sewer pipes shall be a minimum of 12 inches in diameter and shall be the class of pipe specified on the plans and shall meet the requirements of ASTM C76.
    b. Concrete pipe shall have tongue and groove, gasketed premium joints.
    c. Concrete pipe joints shall be made of a resilient material conforming to the latest revision of ASTM Designation C443. Proper lubricant shall be furnished by the joint manufacturer.
    d. Concrete pipe for use with rubber joints shall be smooth and precisely formed to provide a uniform annular space for joint materials.

3. Non-Main Storm Sewer Pipe
    a. Storm service leads shall be SDR-35 pipe conforming to ASTM D 3034 or SCHD 40 pipe conforming to ASTM D 2665.
    b. Non-residential storm service lead pipes shall have a minimum diameter of 4 inch. Any pipe larger than 8 inches in diameter shall follow the requirements of storm sewer mains.
    c. Residential storm service lead collector pipes shall be SDR-35 pipe conforming to ASTM D 3034.
    d. Flexible underdrain pipe shall be of the size specified in the City Standard Details, shall be perforated and wrapped with a non-woven geotextile.
    e. Fittings for PVC pipe shall be made of similar PVC material as the adjacent pipe with a wall thickness no thinner than that of the pipe.
    f. PVC wye fittings shall be used when connecting PVC pipes.
    g. Any couplings, fittings, solvents and/or lubricants used for joining of pipes shall meet the requirements of the pipe or fitting manufacturer.
    h. When connecting between new and existing sewer pipe, use flexible transition couplings. Couplings shall be watertight by use of a manufactured flexible transition coupling designed for such purpose. Provide flexible transition couplings in accordance with ASTM D 5926 and ASTM C 1173. Acceptable manufacturers are Fernco, Inc., Cascade Flex-Seal, or equivalent approved by the City Engineer.
4. Storm Manholes and Catch Basins
    a. Storm manholes and catch basins shall be constructed of precast concrete as shown in the City Standard Details, following these specifications and in conformance with the latest revision of ASTM C478. Precast section joints shall be rubber gasketed and conform to ASTM C990-96. All structures larger than two (2) feet in diameter shall have eccentric cones. Structures shall not be constructed of block/brick masonry unless specifically approved by the City Engineer.
    b. All storm manholes and catch basins shall have precast, integral base sections, except when constructed over an existing sewer where a doghouse shall be set onto a precast cookie and secured with mortar.
    c. If approved by the City Engineer, storm manholes or catch basins constructed of concrete block/brick masonry shall meet the following requirements:
        i. Concrete block masonry units shall be constructed in conformance with ASTM C135. Brick units shall be constructed in conformance with ASTM C32.
        ii. Concrete block masonry units shall be curved blocks with a curved radius necessary to match the proposed structure diameter. Blocks shall have a tongue and groove or approved type of joint at the ends so that units

interlock to form a rigid structure.

iii. Concrete block masonry units shall not exceed 18 inches in length or 8 inches in height. No block shall be less than 6 inches thick. All blocks used in a single structure shall be of the same height dimension. The block dimensions shall be chosen so that the proposed structure contains only full or half-length blocks to form a single course.

iv. The entire interior and exterior of block/brick structure shall be plastered with a minimum 1/2-inch-thick coat. The interior coat of plaster shall be applied in a smooth, neat, workmanlike manner.

v. Mortar for plastering of storm manholes and catch basins shall be one part Portland Cement to two parts of sand. Mortar materials and mixing shall correspond, in general, to those used for concrete.

d. Storm manhole and catch basin steps shall be reinforced polypropylene coated steel. They shall be M.A. Industries models PS1-PF or PS1-B, or City approved equal.

e. All storm manhole and catch basin frames and covers shall be manufactured by EJ with the frame and cover type in accordance with City Standard Detail "Utility Structure Covers". All frames and covers shall be coated at the point of manufacture with coal tar pitch varnish or other approved asphalts coating.

5. Bedding and Backfill Material

a. Pipe Bedding shall consist of and as specified on the City Standard Details:

i. MDOT Class II Granular Material

ii. MDOT 6A Aggregate

b. Trench Backfill shall consist of and as specified on the City Standard Details:

i. MDOT Class II Granular Material

ii. Native soils void of soft clay, topsoil, mulch, vegetation, boulders, trash or other non-compactable material.

6. End Section Grates

a. Bar grates shall be made of minimum 3/4-inch diameter steel bars and may be plain or deformed bars. Bars shall be welded together in the configuration shown in the City Standard Details.

b. Alternative materials may be used in lieu of steel if approved by the City Engineer.

Section 5.05 Construction

1. Excavation and Preparation of Trench
    a. The storm sewer trench shall be excavated to the required alignment and depth as called for on the plans. Trenches should not be opened too far in advance of the pipe laying. All trenches five (5) feet deep or greater should be shored unless cut back at an appropriate angle. Excavated materials should be stored a safe distance from the trench.
    b. The trench width at the surface will depend on type of soil encountered and trench depth. The minimum bottom trench width should be 18 inches from the centerline of the pipe or one (1) foot greater than the outside diameter of the barrel whichever is greater.
    c. The pipe should be laid on stable soil. If stable soil conditions are not encountered an additional depth should be excavated and backfilled with crushed stone or other suitable material.
    d. Water should be kept out of the trench to make for safer working conditions and to keep the pipe clean as possible when installing. Any water pumped from the trench shall be discharged through a filter bag into the nearest drainage course (overland swale or catch basin).
2. Storm Sewer Pipe Installation
    a. Installation of RCP with pipe shall be in conformance with the appropriate City Standard Detail(s). Pipe bedding shall be in conformance with the dimensions and material type shown in the City Standard Details and shall be placed in maximum 6-inch lifts. Trench backfill shall be placed in maximum 12 inch lifts. Backfill material shall be mechanically compacted to the required density.
    b. Any pipe damaged in transport or handling shall be rejected and removed from the site to prevent accidental installation. All pipe should be inspected for damage and defects before being lowered into the trench.
    c. All pipe shall be laid true to the required lines and grades. All trenches shall be kept dry while pipe laying is in progress; and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.
    d. All joints shall be made up in accordance with the manufacturer's instructions using materials and equipment specially prepared for the type of joint to be used.
    e. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by levels, laser or other tools which shall be furnished by the Contractor at their expense. Each pipe shall be laid accurately to the line and grade as shown on the plans and in such a manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description.

Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.

f. The location of the piping shall be determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground, and other underground mains, services, utilities, or structures. Any change in location of alignment of piping which may be found more feasible or practicable as the work progresses shall be made by the Contractor, and the Engineer may direct. The Engineer should be notified of any changes made when Engineer is not present to observe.

g. All pipe and fittings shall be carefully lowered and moved into position in the trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessing amount of scratching on the surface of the pipe will be considered cause for rejection.

h. All cutting of the pipe shall be done in a neat workman-like manner with the least amount of waste and without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool may be used to cut PVC pipe. Cuts must be square, and the edge must be beveled. Ragged edges shall be removed with a cutting tool or file.

i. Breaks in the pipe or joints shall be repaired to the satisfaction of the Engineer and at the expense of the Contractor.

j. All storm sewer pipe including service leads and underdrain, shall be connected to a storm manhole, catch basin or designated roadside collector pipe, and shall not be tapped into storm sewer pipes. City Engineer may approve pipe taps on a per case basis if situations would lessen impact on other City infrastructure.

3. Storm Manhole/Catch Basin Installation

a. Storm manholes and catch basins shall be installed where shown on the construction plans.

b. Storm manholes and catch basins shall be installed in accordance with the City Standard Details. Final frame and cover adjustment to be performed in conformance with the applicable section of Division 7 of these Standard Specifications.

c. If a storm manhole or catch basin is permitted to be constructed from block or brick, proposed storm sewer pipes connecting to structure shall be placed at same time as structure construction with blocks adjusted to fit tightly with exterior of pipe. Coring of structure for pipe installation after block construction is complete is not allowed and may require the structure to be reconstructed.

d. When placed over an existing sewer pipe, all openings in a storm manhole/catch basin shall be closed with brick and mortar in a manner that will make them watertight. Both interior and exterior of brick work shall be plastered with a minimum 1/2-inch-thick coat.

4. Connections to Manholes, Sewers, and Other Rigid Structures

    a. When a storm sewer or storm service lead is connected to an existing manhole/catch basin, a hole adequate to receive the new pipe shall be cut into the manhole/catch basin.

    b. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and plastered with a minimum 1/2-inch-thick mortar coat on the inside and outside surface.

    c. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. All reinforcing steel shall be removed only as necessary to allow pipe installation. Reinforcement shall be integrated into the patching of the structure.

    d. To connect proposed storm sewer main pipe or non-main pipe to a proposed manhole, openings shall be precast into the proposed storm manhole/catch basin at the required elevation and orientation. Any required field adjustments to add openings or adjust opening location shall be made in a manner similar to that described above.

    e. After pipe installation, any remaining void space between the new pipe and existing or proposed manhole/catch basin shall be closed with brick and mortar in a manner that will make them watertight. Both interior and exterior of work shall be plastered with a minimum 1/2-inch-thick coat.

5. End Section Grates

    a. End section bar grates shall be fastened securely to the concrete end section.

    b. Bar grates shall not be installed until after the storm sewer system has been cleaned, inspected and approved by the City.

Section 5.06 Testing

1. General

    a. The Contractor shall furnish all equipment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of a City Representative. No acceptance tests shall be conducted until the entire sewer system is constructed and has been installed for not less than 30 days.

    b. Prior to testing, all sewer lines and manholes shall be cleaned of all debris. All sewer lines shall be videotaped to check for alignment and installation conditions. A copy of the video showing the completed and cleaned sewer(s) and manhole(s) shall be provided to the City prior to acceptance by the City in conformance with the applicable section of Division 1 and Division 7 of these Standard Specifications.

c. All manholes shall be tested for leakage. All gravity flow PVC lines shall be tested for deflection.

d. Should the results of any test fail to meet the criteria established in this Specification, the contractor shall, at their own expense, locate and repair rejected section and retest until it is within specified allowance.

2. Test for Manhole Leakage

    a. Manhole Leakage Test requirement may be waived by the City Engineer on per project basis.

3. Test for Alignment

    a. All sewers shall be laid accurately to the line and grade as shown on the construction plans. The sewers will be tested for alignment by shinning a light through the pipe at a manhole and view the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the Engineer to pass this test.

4. Test for Deflection of PVC Pipe

    a. Deflection tests shall be performed on all flexible pipes. The tests shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system.

    b. No pipe shall exceed a deflection of 5 percent of the inside diameter. If deflection exceeds 5 percent, the pipe shall be excavated. Replacement or correction shall be accomplished in accordance with the requirements in the approved specifications.

    c. The rigid ball or mandrel used for the deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on which is specified in the ASTM Specification, including the appendix, to which the pipe is manufactured. The tests shall be performed without mechanical pulling devices.

5. Trench Backfill Tests

    a. The Contractor shall have trench backfill tested to confirm that required material densities have been reached. The results of the density tests shall be provided to the City for review as part of the Inspector's Daily Report. Any trench backfill within the influence of pavement shall have the density results reviewed and approved by the City Engineer prior to the installation of pavement surface.

6.0 Storm Water Management Practices

Part A. Purpose and Introduction

The City desires to manage stormwater for both new development and re-development sites. Increases in impervious surfaces on a site increase both the rate and volume of stormwater runoff. By using a combination of standard detention systems and infiltration Best Management Practices (BMPs) within a stormwater management system, both the surface water runoff rate and the runoff quality can be effectively managed.

Part B. Storm Water Management Requirements

To manage water quality, volume, rate and quantity, stormwater management methods for each development/re-development site must be designed to treat the following:

- First flush volume:
    - The runoff from the first inch of rain as determined by the Rational Method.
    - A minimum of 80 percent removal of TSS.
- Bankfull volume:
    - The 2-year/24-hour storm event, as determined by the NRCS Method.

If redevelopment is proposed on any existing site, the stormwater management system(s) must be brought up to the current standard for the redeveloped or newly constructed portion of the site. The following must be addressed:

- If 50% or more of the site is proposed for redevelopment, the entire site will be subject to all the requirements herein.
- All portions of the site that are proposed to be redeveloped will be subject to all the requirements herein.
- It is highly recommended that previously developed portions of the site not proposed for redevelopment will have retrofits made to the existing drainage system to provide quality treatment of runoff prior to leaving the site. This may be completed by traditional methods or the addition of mechanical treatment devices.
- Pavement reconstruction in regard to the proposed redevelopment will be considered new construction.
- Further development of the site (within 10 years from plan approval) that in combination results in redevelopment of 50% or more of the site will trigger the entire site as subject to all of the requirements outlined herein.

Detention/ Retention System Considerations

Design of detention/retention basins must accommodate goals of controlling large storm events to prevent flooding, as well as smaller, more frequent events to mitigate water quality impacts and channel erosion.

Best Management Practices (BMPs)

Extensive literature is available on specific design concepts and alternatives. For additional information on BMP planning, design, and implementation, refer to the SEMCOG Low Impact Development Manual for Michigan: A Reference Guide for Implementers and Reviewers. Specific examples and example calculations have been included herein.

Discharge Volume

In no event will the maximum design rate for discharge volume be allowed exceed the maximum capacity of the downstream outlet. In the event that an as-constructed stormwater system fails to comply with this requirement, it is the petitioner's responsibility to design and construct any necessary additional or alternative stormwater management system(s) at the petitioner's expense. Any such additional and/or alternative stormwater management facilities will be subject to the City of Milan's review and approval. All associated review and/or permitting fees shall be the petitioner's responsibility.

The allowable release rate from a flood control storage facility will not exceed 0.15 cfs per acre.

A description of the stormwater outlet drainage course and calculations that it is adequate for the proposed discharge shall be provided. It is noted that controlling discharge flow the pre-development rate may not be adequate and additional reductions in outlet discharge rate may be required. An Engineer's Certificate of Outlet must be provided and must be signed and sealed by a professional engineer registered in the State of Michigan. The professional engineering will be responsible for determining adequacy of the discharge rate.

Part C. Hydrological Soil Groups

Soil properties must be considered in methods of runoff estimation as they greatly influence the amount of runoff generated by a specific site.

The hydrologic soil groups, as defined by NRCS soil scientists, are:

Group A

Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B

Soils having moderate infiltration rates when thoroughly wetted and consisting of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C

Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes the downward movement of water or soils with moderately fine to fine texture. These soils have a slow rate of water infiltration.

Group D

Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

For a full description on soil type see the EGLE document, Computing Flood Discharges for Small Ungauged Watersheds by Richard Sorrell. For a list of acceptable curve numbers adapted from TR-55 see Table 4.

Surface runoff is based on soil class survey unless field testing and/or observations indicate otherwise.

Part D. Land Cover Types

In the NRCS method of runoff estimation, the effects of the surface conditions of a watershed are evaluated by means of land cover and land treatment classes.

Commonly Used Curve Numbers	**Cover Description**	**Curve Numbers for Hydrologic Soil Group**			
	Cover Type and Hydrologic Condition	A	B	C	D
	Fully developed urban areas (vegetation established) Open space (lawns, parks, golf course, cemeteries, etc.):				
	Poor condition (grass cover <50%)	68	79	86	89
	Fair conditions (grass cover 50% to 75%)	49	69	79	84
	Fair conditions (grass cover 50% to 75%)	39	61	74	80
	Impervious areas:				
	Paved parking lots, roofs, driveways, etc. (excluding right-of-ways)	98	98	98	98
	Streets and Roads:				
	Paved; curbs and storm sewers (excluding right-of-way)	98	98	98	98
	Paved; open ditches (including right-of-way)	83	89	92	93
	Gravel (including right-of-way)	76	85	89	91
	Pasture, grassland or range - continuous forage for grazing				
	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
	Meadow**- continuous grass, protected from grazing and generally mowed for hay	30	58	71	78
	Brush - brush-weed-grass mixture with brush the major element				
	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30	48	65	73

	Woods - grass combination (orchard or tree farm)				
	Poor	57	73	82	86
	Fair	43	65	76	82
	Good**	32	58	72	79
	Woods				
	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
	Farmsteads- buildings, lanes, driveways and surrounding lots	59	74	82	86
	Wetlands				
	No standing water that contributes to runoff	78	78	78	78
	With standing water	98	98	98	98

Commonly Used Runoff Coefficients	Type of Surface	Runoff Coefficient		
	Water Surfaces	1.0		
	Roofs	0.95		
	Asphalt or concrete pavements	0.95		
	Gravel, brick or macadam surfaces	0.85		
	Semi-pervious: lawns, parks, playgrounds	Slope <4%	Slope 4-8%	Slope >8%
	Hydrologic Soil Group A	0.15	0.20	0.25
	Hydrologic Soil Group B	0.25	0.30	0.35
	Hydrologic Soil Group C	0.30	0.35	0.40
	Hydrologic Soil Group D	0.45	0.50	0.55

Part E. Standard METHOD STORMWATER VOLUME Runoff Volume CALCULATONS

Total Site Area = _____ac

Pre-Development C-Factor/Curve Number Calculations

Rational Method Variables[B]	Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (c)	(C)(Area)

Total - Σ(C)(Area) = _____

Area Total - Σac or Σsf = _____

Weighted C - Σ(C)(area)/Σac or Σsf = _____

NRCS Variables[C]	Pervious Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (c)	(C)(Area)

Total - Σ(C)(Area) = _____

Area Total - Σac or Σsf = _____

Weighted C - Σ(C)(area)/Σac or Σsf = _____

Post-Development C-Factor Calculations

Rational Method Variables[B]	Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (c)	(C)(Area)

Total - Σ(C)(Area) = _____

Area Total - Σac or Σsf = _____

Weighted C - Σ(C)(area)/Σac or Σsf = _____

Post-Development Curve Number Calculations

NRCS Variables[C]	Pervious Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (c)	(C)(Area)

Total - Σ(C)(Area) = _____

Area Total - Σac or Σsf = _____

Weighted C - Σ(C)(area)/Σac or Σsf = _____

NRCS Variables[C]	Impervious Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (c)	(C)(Area)

Total - Σ(C)(Area) = _____

Area Total - Σac or Σsf = _____

Weighted C - Σ(C)(area)/Σac or Σsf = _____

Standard Method Runoff Volume Calculations

First Flush Runoff Calculations (V_{ff})

$$V_{ff} = (1")(\frac{1'}{12"})(\frac{43560ft^2}{1ac})AC$$

$$V_{ff} = (1")(\frac{1'}{12"})(\frac{43560ft^2}{1ac})(\quad)(\quad)$$

$$V_{ff} = \_\_\_\_\_ft^3$$

Pre-development Bankfull Runoff Calculations ($V_{bf\text{-}pre}$)

2 year/24 hour storm event: $P = 2.35in$

Pre-development Curve number as calculated above: _____

$$S = \frac{1000}{CN} - 10$$

$$\boldsymbol{S} = \_\_\_\_\_\boldsymbol{in}$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$\boldsymbol{Q} = \_\_\_\_\_\boldsymbol{in}$$

Total Site Area = _____sf

$$V_{bf-pre} = Q\left(\frac{1}{12}\right) Area$$

$$\boldsymbol{V_{bf-pre}} = \_\_\_\_\_\boldsymbol{ft^3}$$

Pervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-}per\text{-}post}$)

2 year/24 hour storm event $P = 2.35in$

Pervious Cover CN (calculated above): CN = _____

$$S = \frac{1000}{CN} - 10$$

$$\boldsymbol{S} = \_\_\_\_\_\boldsymbol{in}$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$\boldsymbol{Q} = \_\_\_\_\_\boldsymbol{in}$$

Pervious Cover Area = _____sf

$$V_{bf-pre-post} = Q\left(\frac{1}{12}\right) Area$$

$$\boldsymbol{V_{bf-pre-post}} = \_\_\_\_\_\boldsymbol{ft^3}$$

Impervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-}imp\text{-}post}$)

2 year/24 hour storm event $P = 2.35in$

Impervious Cover CN (calculated above) CN = _____

$$S = \frac{1000}{CN} - 10$$

$$\boldsymbol{S = \_\_\_\_\_in}$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$\boldsymbol{Q = \_\_\_\_\_in}$$

Impervious Cover Area = _____sf

$$V_{bf-imp-post} = Q\left(\frac{1}{12}\right)Area$$

$$\boldsymbol{V_{bf-imp-post} = \_\_\_\_\_ft^3}$$

Pervious Cover Post-Development 100-year Storm Runoff Calculations ($V_{100\text{-}per\text{-}post}$)

100 Year Storm Event $P = 5.11in$

Pervious Cover CN (calculated above): CN = _____

$$S = \frac{1000}{CN} - 10$$

$$\boldsymbol{S = \_\_\_\_\_in}$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$\boldsymbol{Q = \_\_\_\_\_in}$$

Pervious Cover Area = _____sf

$$V_{100-pre-post} = Q\left(\frac{1}{12}\right)Area$$

$$\boldsymbol{V_{100-pre-post} = \_\_\_\_\_ft^3}$$

Impervious Cover Post-Development 100-year Storm Runoff Calculations ($V_{100\text{-}imp\text{-}post}$)

100-year storm event $P = 5.11in$

Impervious Cover CN (calculated above) CN = _____

$$S = \frac{1000}{CN} - 10$$

$$\boldsymbol{S = \_\_\_\_\_ in}$$

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$\boldsymbol{Q = \_\_\_\_\_ in}$$

Impervious Cover Area = _____sf

$$V_{100-imp-post} = Q\left(\frac{1}{12}\right) Area$$

$$\boldsymbol{V_{100-imp-post} = \_\_\_\_\_ ft^3}$$

Determine Time of Concentration for Applicable Flow Types ($T_{c\text{-}hrs}$)

Flow Type	K	Change in Elevation	Length (L)	Slope % (S*100%)	$S^{0.5}$	$V=K*S^{0.5}$	$T_c=L/(V*3600)$
Sheet Flow*	0.48						
Waterway	1.2						
Small Tributary	2.1						

*Sheet flow cannot exceed 300 ft. Anything beyond this is considered waterway.

Total Time of Concentration ($T_{c\text{-}hrs}$) = _____

Runoff & Onsite Infiltration Summary

A. Runoff Summary (previously calculated)

First Flush Volume (V_{ff})	_____ft^3
Pre-Development Bankfull Runoff ($V_{bf\text{-}pre}$)	_____ft^3
Pervious Cover Post-Development Bankfull Volume ($V_{bf\text{-}per\text{-}post}$)	_____ft^3
Impervious Cover Post-Development Bankfull Volume ($V_{bf\text{-}per\text{-}post}$)	_____ft^3
TOTAL Bankfull Volume (Pervious/Impervious)	**_____ft^3**

Detention/Retention Requirement

Detention

$Q_p = 238.6{T_c}^{-0.82}$ Peak of the Unit Hydrograph $\boldsymbol{Q_p} =$ _____$\boldsymbol{cfs/(in - mi^2)}$

Total Site Area (ac) **Area =** _____**ac**

$Q_{100} = Q_{100-per} + Q_{100-imp}$ $\boldsymbol{Q_{100}} =$ _____$\boldsymbol{in}$

$Peak\ Flow\ (PF) = \frac{Q_p\left(\frac{cfs}{in-mi^2}\right)Q_{100}(in)Area(ac)}{640}$ $\boldsymbol{PF} =$ _____$\boldsymbol{cfs}$

$\Delta = PF(cfs) - 0.15Area(ac)$ $\boldsymbol{\Delta} =$ _____$\boldsymbol{cfs}$

$V_{det} = \frac{\Delta\,(cfs)}{PF\,(cfs)} V_{100}(ft^3)$

V_{det} = Calculated Detention (ft^3), <u>not</u> including volume reduction credit for infiltration

$$\boldsymbol{V_{det}} = \text{\_\_\_\_\_}\boldsymbol{ft^3}$$

Retention

$V_{ret} = 2(V_{100})$ $\boldsymbol{V_{ret}} =$ _____$\boldsymbol{ft^3}$

Determine Applicable BMPs and Associated Volume Credits

Proposed BMP	Area (ft^2)	Storage Volume[A] (ft^3)		Ave. Design Infiltration Rate (in/hr)	Infiltration Volume During Storm[B] (ft^3)	Total Volume Reduction[C] (ft^3)
		Surface & Soil				
Bioretention Basins						
Rain Gardens						
Pervious Pavement						
Infiltration Basins/Trenches/Subsurface Beds						

Runoff Volume Credit (ft^3) = _____

[A] Storage volume as defined in individual BMP write-ups (see Part F).

[B] Approximated as the average design infiltration rate over 6 hours multiplied by the BMP area:

Infiltration Rate x 6 hours x BMP Area x Unit Conversions = Infiltration Volume (ft3)

[C] Total Volume Reduction Credit is the sum of the Storage Volume and the Infiltration Volume During Storm

Summary

Site Summary of Infiltration & Detention

Designed/Provided Infiltration Volume _____ft^3

Total Calculated Detention Volume, V_{det} _____ft^3

Net Required Detention Volume

(V_{det} – Designed/Provided Infiltration Volume) _____ft^3

Part F. BEST MANAGEMENT PRACTICE CALCULATIONS

BIORETENTION BASINS & RAIN GARDENS

Infiltration Area Calculation

The Infiltration Area is the bottom area of a Bioretention Basin/Rain Garden defined as:

$$\frac{Area\ at\ Ponding\ Depth + Area\ at\ Bottom}{2} = Average\ Infiltration\ Area$$

Volume Reduction Calculations

The storage volume of a Bioretention Basin or Rain Garden is defined as the sum total of the surface and subsurface void volumes beneath the level of discharge invert.

Inter-media void volumes may vary considerably based on design variations.

The volume of a Bioretention Basin or Rain Garden has three components:

$$Surface\ Storage\ Volume\ (ft^3) = Bed\ Area\ (ft^2) * Maximum\ Waer\ Depth\ (ft)$$

$$\begin{aligned} &Soil\ Storage\ Volume\ (ft^3) \\ &\quad = Length\ (ft) * Width\ (ft) * Depth\ (ft) \\ &\quad * Void\ Ratio\ of\ Storage\ Material\ (\%) \end{aligned}$$

$$Infiltration\ Volume\ (ft^3): using\ 6\ hours\ for\ infiltration\ credit$$

Total volume is the sum of the above three components:

$$\begin{aligned} &Total\ Volume(ft^3) \\ &\quad = Surface\ Storage\ Volume + Soil\ Storage\ Volume + Infiltration\ Volume \end{aligned}$$

PERVIOUS PAVEMENTS

Infiltration Area Calculations

The minimum infiltration area must be based on the following equation:

$$Minimum\ Surface\ Area = \frac{Contributing\ impervious\ area}{8}$$

Volume Reduction Calculations

$$Runoff\ Volume\ (ft^3) = Depth\ (ft) * Area\ (ft^2) * Void\ Space$$

*Example Void Space = 0.30 for aggregate

INFILTRATION BASINS-TRENCHES-BEDS

Infiltration Area Calculations

The minimum infiltration area must be based on the following equation:

$$Minimum\ Surface\ Area = \frac{Contributing\ impervious\ area}{8}$$

Volume Reduction Calculations

The following equation can be used to determine the approximate storage volume of an Infiltration Basin:

$$Storage\ Volume\ (ft^3) = Average\ bed\ area\ (ft^2) * Maximum\ design\ water\ depth\ (ft)$$

$$Subsurface\ storage\ or\ infiltration\ \ bed\ volume\ (ft^3) = Infiltration\ Area\ (ft^2) * Depth\ of\ Underdrain\ Material\ (ft) * Void\ Ratio\ of\ Storage\ Material\ Used\ (\%)$$

** Depth is the depth of the water stored during a storm event, depending on the drainage area, conveyance to the bed, and outlet control.*

$$Infiltration\ Volume\ (ft^3) = Bed\ Bottom\ Area\ (ft^2) * \left(Infiltration\ design\ rate\ \left(\frac{in}{hr}\right) * Infiltration\ Period * 6\ hours\right) * \frac{1\ ft}{12}\ in)$$

Part G. Computational Requirements – Conveyance Systems

Flow Determination

Acceptable methods of determining the flow rate required to size storm piping systems, open channels and culverts are listed below. The proprietor's engineer may use any of the methods listed or another if approved by the City of Milan:

- Rational method (max drainage area of 120 acres)
- USDA NRCS Curve Number Method
- The EGLE Computing Flood Discharges at Small Ungauged Watersheds method

The rational method of calculating stormwater runoff is generally acceptable for highly impervious sites less than 120 acres in size. However, it may not be considered an adequate design tool for sizing large drainage systems. The Rational Formula is outlined as follows:

Where:

Qp= peak runoff rate (cfs)

C= the runoff coefficient of the area

I = the average rainfall intensity (in/hr) for a storm with a

duration equal to the time of concentration of the area

A = the size of the drainage area (acres)

Type of Surface	Runoff Coefficient		
Water Surfaces	1.0		
Roofs	0.95		
Asphalt or concrete pavements	0.95		
Gravel, brick or macadam surfaces	0.85		
Semi-pervious: lawns, parks, playgrounds	Slope <4%	Slope 4-8%	Slope >8%
Hydrologic Soil Group A	0.15	0.20	0.25
Hydrologic Soil Group B	0.25	0.30	0.35
Hydrologic Soil Group C	0.30	0.35	0.40
Hydrologic Soil Group D	0.45	0.50	0.55

All composite runoff coefficients must be based on the values shown. The slopes listed for the semi-pervious surfaces are the proposed finished slope of the tributary area.

Intensity Formulas (24 hours)

Recurrence Interval	Rainfall Intensity
1 yr	72/(T+25)
5 yr	145/(T+25)
10 yr	175/(T+25)
25 yr	215/(T+25)
50 yr	245/(T+25)
100 yr	275/(T+25)

Hydraulics

Manning's formula shall be used to size the open channel or pipe system in most cases. In situations where a backwater condition exists, the Standard Backwater procedure or other method acceptable to the City must be used. Manning's formula is outlined as follows:

$$Q = \frac{1.486}{n} A * R^{\frac{2}{3}} * S^{1/2}$$

A minimum "n" of 0.035 will be used for the roughness coefficient for open channels. See below for roughness coefficients or contact the City about unusual situations.

Boundary Material	n value	Boundary Material	n value
HDPE pipe, smooth lined	0.011	Brick	0.016
Concrete pipe	0.013	Riveted steel	0.018
Vitrified clay pipe	0.014	Rubble	0.025
HDPE pipe, unlined	0.015	Gravel	0.029
Cast iron pipe	0.018	Riprap	0.033
Finished concrete	0.012	Natural channels with stones & weeds	0.035
Planed wood	0.012	Natural channels in poor condition	0.060
Unplaned wood	0.013	Natural channels with heavy bush	0.100
Unfinished concrete	0.014		

Open Channels

Open channels such as streams, drains, etc. shall be designed to endure all events up to the 10-year flow without an increase in erosion, siltation, or deposition.

- Projects with a direct outlet to a County Drain will be required to meet design, review and permitting expectations of the Washtenaw County Water Resources Commissioner's Office.
- Modifications to an Inland Lake or Stream, as defined by the EGLE, will require a permit from the EGLE and must be designed and constructed as per EGLE requirements.

Specific requirements for the sizing of open channel conveyance systems (swales, ditches, drains) are as follows:

- The minimum acceptable average channel velocity for the design storm will be 2.0 ft/sec, and the maximum acceptable velocity will be 6.0 ft/sec.
- Sheer stress on the channel bed and banks shall be considered.
- Vegetation establishment with locally adapted plants are required and native plants are preferred.
- Riprap shall be used where necessary and shall be designed to be stable for the 10-year flow rate.

Traditional Piping Systems

Traditional stormwater piping systems shall be designed for the 10-year flow. Specific requirements for the sizing of these systems are as follows:

- Enclosed storm drain piping systems will be sized to accommodate the 10-year flow, with the hydraulic gradient maintained below the top of the pipe.
- In a situation where the piping system outlets to a detention or retention facility, the 2-year recurrence interval pond water surface elevation must be used for the starting water surface elevation in the 10-year recurrence interval pipe capacity computations.
- Catch basin or inlet covers must be designed to accept the 10-year design storm while maintaining spread to the curb gutter section, or as required by the agency regulating the roadway (MDOT, WCRC, etc.) All private sump and/or roof drainage lines must connect to a catch basin structure to further prevent surface ponding of water during storm events.
- Pipe full flowing velocity will be greater than 3 ft/sec and less than 10 ft/sec.
- Pipe inverts will be such that all selections drain completely during dry weather.
- All structure rims must be above the 100-year storm elevation.
- Minimum pipe diameter of 12 inches.
- There should be a minimum of 42 inches from the proposed ground surface elevation to the spring line of all pipes within the pipe network.
- A drop of a minimum of 0.1 feet should be incorporated where inflow and outflow pipes of the same diameter meet at a manhole structure.
- When inflow and outflow pipes of different diameters meet at a manhole structure, the invert of the smaller pipe must be raised to maintain the energy gradient line such that the 8/10ths depth point of both pipes are at the same elevation.

Culvert Sizing

Under Michigan State Law, Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, crossroad culverts draining areas of two square miles or greater must be reviewed and approved by the EGLE.

Culverts draining an area of two (2) square miles or greater of upstream watershed will be sized by the proprietor's engineer and approved by the EGLE, Washtenaw County Road Commission (if applicable) and Washtenaw County Water Resources Commissioner (if applicable).

Specific requirements for the sizing of culverts are as follows:

1. At a minimum, culverts will be designed to convey the peak 10-year storm flow with velocity not exceeding 8 ft/sec.
2. The 100-year recurrence interval storm must pass the embankment with no adverse increase in water elevation occurring off of the site or flooding of structures within the proposed development. A minimum of one (1) foot of freeboard is required.
3. The discharge velocity from culverts should consider the effect of high velocities, eddies, or other turbulence on the natural channel, downstream property and roadway embankment.
4. The culvert exit velocity shall not cause downstream channel erosion or scour.
5. Sizing of culvert crossings will consider entrance and exit losses as well as tailwater conditions on the culvert. Once the design flow is determined, the required size of the culvert will be determined by one of the following methods, as applicable to the situation:
    a. "Mannings" formula
    b. Inlet headwater control/outlet tailwater control nomographs (FHWA, Hydraulic Design of Highway Culverts (Hydraulic Design Series No. 5))

Requirements – EGLE

For sites that impact streams with upstream watersheds equal to or greater than two (2) square miles, approval by EGLE is required, pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

7.0 Culverts

Cross culverts shall be required at all drive locations that cross drainage and roadside ditches. Crest drives are the only exception.

Culverts shall be placed to provide positive drainage. No culvert shall be placed flat or with backfall.

Culverts shall be sized according to the size of the existing ditches. Proper analysis and supporting calculations shall be provided for all culvert designs greater than 15 inches in diameter. Minimum culvert size shall be 12 inches. All culvert sizes shall be subject to review by the City. Culvert material shall be in accordance with the Culvert section of the Construction Specifications elsewhere in this document.

Section 7.01 Culvert Materials

All culvert materials used shall comply with the following standards and requirements:

1. Corrugated Metal Pipe (CMPC). All metal pipe used shall be equal to the standard specifications of AASHTO for corrugated metal pipe culverts. Pipe shall be galvanized. Unless otherwise required by an applicable regulatory agency, the minimum gauge for corrugated metal pipe shall be:

Roadway

Pipe Diameter	Gauge
12”-18”	16
24”-36”	14
42”-48”	12
54” or larger	10

Railway

Pipe Diameter	Gauge
12”-15”	14
18”-21”	12
24”-30”	10
36” or larger	8

   a. Joints. Pipe joints shall be corrugated coupling type with all materials galvanized.

   b. End Sections. End sections shall have all materials galvanized and coated as the culvert pipe. End sections shall be complete including coupling and necessary bolts. Corrugated metal end sections shall meet the requirements of the Michigan Department of transportation.

      i. Concrete. All concrete pipe used shall meet the requirements of the American Society for Testing Materials.

         1. Joints. Pipe joints shall be corrugated coupling type with all materials galvanized.

2. End Sections. Concrete end sections shall meet the requirements of the Michigan Department of Transportation Standard Plans. Unless otherwise specified, included with each have all materials galvanized and coated as the culvert pipe. End sections shall be complete including coupling and necessary bolts. Corrugated metal end sections shall meet the requirements of the Michigan Department of transportation.

8.0 Universal Access

Section 8.01 Application

1. All areas of newly designed or newly constructed buildings and facilities and altered portions of existing buildings and facilities shall comply with the City of Milan Universal Access Standards, unless otherwise provided in this section or as modified in a special application section.
2. When a building or facility contains more than one use covered by a special application section, each portion shall comply with the requirements for that use.
3. Areas Used Only by Employees as Work Areas. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas. These guidelines do not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.
4. These guidelines cover temporary buildings or facilities as well as permanent facilities. Temporary buildings and facilities are not of permanent construction but are extensively used or are essential for public use for a period of time. Examples of temporary buildings or facilities covered by these standards include, but are not limited to reviewing stands, temporary classrooms, bleacher areas, exhibit areas, temporary banking facilities, temporary health screening services, or temporary safe pedestrian passageways around a construction site. Structures, sites and equipment directly associated with the actual processes of construction, such as scaffolding, bridging, materials hoists, or construction trailers are not included.

Section 8.02 Accessible Sites and Exterior Facilities: New Construction

An Accessible site shall meet the following minimum requirements:

1. At least one accessible route complying with the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) Section 4.3 shall be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones if provided, and public streets or sidewalks, to an accessible building entrance.
2. At least one accessible route complying with the ADAAG Section 4.3 shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.
3. Court Sports: An accessible route complying with the ADAAG Section 4.3 shall directly connect both sides of the court in court sports.
4. All objects that protrude from surfaces or posts into circulation paths shall comply with ADAAG Section 4.3 with the exception to areas of sport activity.
5. Ground surfaces along accessible routes and in accessible spaces shall comply with ADAAG Section 4.5 with the exception to areas of sport activity, or animal containment areas designed and constructed for public use shall not be required to provide stable, firm, and slip resistant ground and floor surfaces and shall not be required to comply.

6. If parking spaces are provided for self-parking by employees or visitors, or both, then accessible spaces complying with ADAAG Section 4.6 shall be provided in each such parking area in conformance with the table below. Spaces required by the table need not be provided in the particular lot. They may be provided in a different location if equivalent or greater accessibility, in terms of distance from an accessible entrance, cost and convenience is ensured.

Type	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus 1 for each 100 over 1000

7. In new construction, the developer is not required to meet fully the requirements of these guidelines if they can demonstrate that it is structurally impracticable to do so. Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. If full compliance with the requirements of these guidelines is structurally impracticable, a person or entity shall comply with the requirements to the extent it is not structurally impracticable. Any portion of the building or facility which can be made accessible shall comply to the extent that it is not structurally impracticable.

9.0 Streets and Right-of-Ways

Section 9.01 Definitions

1. Major streets - Streets meeting one or more of the following:
    a. Streets that provide extensions to State trunk lines or County primary roads in facilitating through traffic.
    b. Streets that provide an integral network to service the traffic demands created by industrial, commercial, educational, or other traffic generating centers.
    c. Streets that provide for the circulation of traffic and around the central business district.
    d. Streets that are designated truck routes.
    e. Streets that collect traffic from an area served by an extensive network of local streets.
2. Local streets - streets not meeting any of the criteria for major streets.

Section 9.02 General

1. Street Widths and Cross Sections
   Streets Shall be designed to meet or exceed the following width guidelines:

Type	Minimum Width (feet)	Minimum Lane Width (feet)
Major Street	26	13
Local Street*	24	12
Service Drive	22	11
Access Drive	22-no curb	11

   Note: For streets with parallel parking an additional 8 feet per side shall be added.

   * Planning Commission may adjust road width to allow minimum lane width to be less than requirements shown.

   If reconstructing an existing street, City may allow the reconstruction to take place without the addition of concrete curb and gutter.

   Curb and gutter streets are required for development serving commercial property. Curb and gutter streets are preferred for residential development with final determination of warrant by the City of Milan.

   Street cross sections shall include curb and gutter in accordance with concrete curb and gutter specification provided elsewhere in this document.

   Street cross sections shall meet or exceed the details shown in Appendix B. All cross sections shall be subject to approval by the City.

   Phased development shall use the same cross section throughout the entire project.

Concrete cross sections will be allowed, with thickness required to be determined by the City Engineer.

2. Boulevards and Islands

   All islands shall be curbed in the same manner and in accordance with the same detail for curb and gutter used elsewhere.

   Medians and islands shall have a minimum width of 10 feet from back of curb to back of curb. Hourglass and other odd shaped medians are not acceptable.

   Material placed between the curbs shall be sodded earth, crushed limestone, or other materials approved by the City.

3. Cul-de-Sacs and Other Turnarounds

   Minimum radius for a cul-de-sac shall be 45 feet without an island and 55 feet with an island. See details in Appendix A.

   Temporary cul-de-sac turnarounds shall have a minimum base of 8 inches crushed limestone.

4. Turning Radii at Intersections

   Curb and gutter radii at intersections shall be as follows unless otherwise approved by the city:

Type	Radius - Back of Curb (inches)
Major Street	40
Local Street	30
Commercial and Industrial Street	50

5. Turn Lanes/By-pass Lanes

   Left turn lanes and bypass lanes should be considered on streets where traffic volumes are high enough or safety considerations are sufficient to warrant them. Such usage shall be determined on a case by case basis at the City's discretion.

6. Right-of Way Requirements

   All street of roads shall have the following right-of-way widths:

Type	Minimum ROW Widths (inches)
Major Street	80
Local Street	66

Cul-de-sacs shall have a minimum right-of-way width of 18 feet beyond back of curb.

7. Sidewalks

   Sidewalks shall have a minimum width of 5 feet. Sidewalk is mandatory on commercial zoned properties. Sidewalk is not required for residential use, except in high density development and the City of Milan will make the final determination whether sidewalk is required.

   Sidewalk shall match adjoining or existing sidewalk where possible. Sidewalks shall typically be placed 1 foot inside the ROW but not less than 3 feet from the back of curb.

   Sidewalks shall "jog" around natural features (i.e., trees, etc.) Integrated curb and sidewalk shall not be used.

   Sidewalks shall have the following thickness:

Type	Thickness (inches)
Thru Commercial Drive	8
Thru Residential Drive	6
Sidewalk Ramp	6
All others	4

   Sidewalk transverse slopes shall not exceed 1/48 inch per foot. A minimum cross slope shall be provided to maintain positive drainage of water off the sidewalk. Longitudinal grades shall not exceed 1 inch per foot.

   Sidewalk ramps shall be used at intersections where the sidewalk intersects a curb.

   Ramps shall not be steeper than one inch per foot. Ramps shall meet the requirements of the Americans with Disabilities Act (ADA) and the Michigan Department of Transportation (MDOT).

   Sidewalk ramps shall contain a change in texture and color per ADA requirements. Ramp details with truncated domes will be required as shown in the sidewalk details within this section.

8. Curb and Gutter

   All curbing shall be concrete. No bituminous curbing shall be permitted.

   Concrete curbing shall be standard MDOT detail F4 unless otherwise approved by the City. Concrete curbing for major streets shall be F4 only.

   All curbing shall drain to catch basins in the curb. Curbing shall be sloped using grades no less than 0.4% and a maximum grade of 6%. Catch basins shall be spaced as specified elsewhere in this document. The City of Milan may allow variances of these requirements on a case-by-case basis.

9. Suggested location for utilities
    a. North and South Street

East Side

Storm Sewer	15’-0” to 23’-0” from centerline
Water Main:	20'-0" to 25'-0" from centerline
Utility Poles*:	27'-0" from centerline
5 foot Sidewalk:	27'-0" to 32'-0" from centerline
Utility Conduit:	30'-0" from centerline

West Side

Gas Main:	19'-0" from centerline
Water Main:	23'-0" to 25'-0" from centerline
Utility Poles*:	27'-0" fromcenterline
5 foot Sidewalk:	27'-0" to 32'-0" from centerline
Utility Conduit:	30'-0" from centerline

    b. East and West Street

South Side

Storm Sewer	15’-0” to 23’-0” from centerline
Water Main:	20'-0" to 25'-0" from centerline
Utility Poles*:	27'-0" from centerline
5 foot Sidewalk:	27'-0" to 32'-0" from centerline
Utility Conduit:	30'-0" from centerline
Gas Main:	19'-0" from centerline
Water Main:	23'-0" to 25'-0" from centerline
Utility Poles*:	27'-0" fromcenterline
5 foot Sidewalk:	27'-0" to 32'-0" from centerline
Utility Conduit:	30'-0" from centerline

** Location also applicable if underground electric and telephone lines are used instead of overhead lines.*

10.0 Street Lighting

Section 10.01 General

It is the intent of this document to provide general guidelines for street lighting for all Major and Local Streets within the City of Milan. Street lighting shall be designed to provide illumination for the highest level of safety for vehicular and pedestrian traffic with minimal intrusion into neighboring residences.

All street lighting should be designed by a qualified professional engineer or private utility owner. All lighting designs, fixtures, etc. shall be reviewed and approved by the City.

Section 10.02 Intensity

All streetlights within the City of Milan shall have a minimum Luminaire Rating of 8500 Lumens and provide a minimum intensity averaging 0.5 foot candles measured at the surface of the street along the entire length of street. The City requires a photometric plan (lighting grid) to determine the appropriateness of the proposed lighting layout and intensity. The City may differ from this requirement, requiring a higher or lower standard (Lumen Ratings and/or intensity) along Major Streets, Collector Streets and other areas deemed appropriate by the City due to traffic (vehicular and pedestrian), safety concerns, neighborhood character, etc.

Section 10.03 Lighting Source

Streetlight lamps shall be High-Pressure Sodium, Metal Halide, or LED.

Section 10.04 Fixture Heights/Poles

Street lighting fixtures shall have a minimum height of 12 feet and a maximum height of 20 feet, unless approved by the City. A fixture height of 14 feet is preferred.

Section 10.05 Fixtures

All street lighting fixtures shall be reviewed by the City. Street lighting fixtures should complement the City's existing street lighting system and historic character. Contemporary lighting fixtures shall not be permitted. Decorative or Traditional Street lighting fixtures offered by private utility owner or other comparable fixtures may be approved by the City.

Streetlights along Major Streets and any other location deemed appropriate by the City, shall be fitted with a bracket and electric outlet for hanging street decorations. A ground mounted electric outlet which may be properly secured shall also be provided.

Section 10.06 Spacing

Streetlights shall be placed at every street intersection to provide maximum illumination. Streetlights on Boulevard Streets or entrances shall be placed on the outside of each lane at the intersection. Streetlights shall be staggered or on one side of a street utilizing, with staggered lighting on alternating sides of the street preferred. Streetlights shall be spaced in such a manner that the separation between lighting patterns ("dark spots") does not exceed 10 feet. Utilizing streetlights at each street intersection as the end points, streetlights shall be spaced equally, as much as possible, between the end points; however, in no instance shall the spacing between lights exceed 105 feet on Local Streets and 80 feet on Major Streets. However, spacing may be reduced to increase lighting intensity and overlapping lighting patterns, along Major Streets, Collector Streets and other areas deemed appropriate by the City due to traffic (vehicular and pedestrian) safety concerns, neighborhood character, etc.

Section 10.07 General Restrictions

All wiring shall be UL Listed for wet locations. No wiring shall be exposed. All streetlights shall have underground wiring within an enclosed conduit system. No overhead fixtures. All illumination shall be constant, not flashing, moving or intermittent.

11.0 Driveways

Section 11.01 Residential

Residential driveway shall have a minimum width of 10 feet or match the existing drive. No residential driveway shall be wider than 30 feet unless approved in writing by the City.

Requirements for residential curb cuts shall be as follows:

Requirements	Local Streets (feet)	Collector Streets (feet)	Arterial Streets (feet)
Intersection to first curb cut from intersection corner radii	20	40	40
Minimum length of tangent curb between drives	4	4	4
Minimum curb cut	14	14	20
Maximum curb cut	26	30	50
Minimum width of drive at property line	10	10	10
Maximum width of drive at property line	20	24	30

Section 11.02 Commercial

All commercial driveways within the road right-of-way shall be concrete with a minimum thickness of 8 inches and reinforced with 6"x6"x10" steel mesh. Commercial drives shall be of a width approved by the City.

Section 11.03 Industrial

Heavily traveled industrial drives shall be designed by a qualified professional engineer and approved by the City. Industrial drive widths shall be approved by the City.

Section 11.04 Approaches

Approaches shall have adequate flares to provide a safe turning radius. Minimum flaring shall be 6 feet on the right side and 4 feet on the left. Flaring length shall be a minimum of 10 feet. Flarings details are provided in Appendix B. If a residential driveway is wider than 20 feet, the flaring widths shall be adjusted to provide a maximum drive opening of 30 feet.

Commercial and industrial approaches shall be MDOT Type “M” openings when attached to an existing curbed street. (See details in Appendix B).

Commercial and industrial driveways shall be constructed according to the Concrete Drive Construction Specification.

Driveways shall be sloped to direct drainage to the street. Drive slopes shall not exceed 0.10 feet vertical to 1 foot horizontal.

Section 11.05 Curb Removal

For residential approaches constructed on an existing curbed street, the curb and gutter shall be entirely removed or cut horizontally to the satisfaction of the City.

When an MDOT Type "M" approach is constructed on an existing curbed street, the curb and gutter must be entirely removed. The extent of the removal shall extend to the nearest joint past the spring line of the new curb.

12.0 Parking Lots

Section 12.01 General

Parking lot design considerations will vary due to use considerations. The following design criteria are meant as a minimum guideline only. Parking lots will also need to follow requirements of current City zoning ordinances which pertain to parking.

Curbing is required for all newly constructed parking lots. City may require curbing placed on the reconstruction of existing parking lots.

Section 12.02 Classifications

Parking lots can be grouped as follows:

1. Class "A" - Light duty driveways, school yards, playgrounds and small parking lots with less than 40 stalls. This cross section is not suitable for heavy refuse truck pick-up or delivery service. In areas where this service is used, the commercial/industrial cross section should be used for routing to and from the service area.
2. Class "B" - Parking lots containing more than 40 stalls, medium to heavy truck traffic, some commercial lots.
3. Class "C" - Industrial lots, heavy truck uses, some commercial lots, bus routes.
4. Class "D" - Parking areas where extremely heavy truck traffic is encountered should be designed on a per case basis by a qualified professional engineer.

Cross sections for the above mentioned groupings are provided in Appendix B.

Section 12.03 Service Drives

Service drives should utilize the Class "C" cross section. Design alternatives should be considered where extremely high volumes of truck traffic will be encountered.

Section 12.04 Alternate Cross Sections

Alternate cross sections designed by a qualified, licensed engineer and accompanied by supporting data will be considered.

Section 12.05 Curb

Concrete curb details are provided in the Streets and Roadways specification located in Appendix B. Bituminous curbing will not be permitted. Curbing is required in all commercial situations.

13.0 Water lines

Section 13.01 General

Water main shall be sized to provide the volumes required by the proposed developments. Design shall include ample research to verify that the required volumes and pressures are available. No water main smaller than 8 inches in diameter shall be permitted.

For commercial developments, the minimum water main size is 12 inches in diameter.

Water main shall be looped whenever feasible in order to increase reliability. The City shall review all water main layouts for adequate looping. The City will require water main extensions to the limits of the property.

Developer will be responsible to submit construction documents to the EGLE. The more stringent requirements will be required to be followed for an acceptable project.

Water mains shall be designed to provide adequate volumes for firefighting purposes. ISO standards shall be used as a minimum guideline to provide 1000 GPM for emergency use. Depending on the development, larger flow rates may be required.

All tees, plugs, bends, hydrants and similar fittings shall be braced to undisturbed ground by use of concrete thrust blocks or restrained joints.

Whenever possible, water main shall be located on the south side of an east-west street and on the west side of a north-south street.

Water main materials shall be as specified in the Water Main section of the Construction Specifications.

Water main shall have a minimum of 5 feet 6 inches of cover in all cases. Compacted sand backfill to 95% maximum density shall be used where the water main is within the influence of a paved surface.

Connection of existing mains to the new mains will be done only after the new mains are shown to be health compliant by the results of the bacteriological analysis.

Section 13.02 Service Leads

Service leads shall be type “K”, soft temper copper with a minimum size of 1 inch in diameter, ASTM B88, water tube with compression joints for underground services. Service leads shall be sized according to volume and pressure requirements of the development. DR9 plastic service leads are allowed for 1 ½” and 2” service leads.

All services shall include corporation at the main and curb stop inside of right-of-way. Curb stops shall be placed 1 foot inside right-of-way.

Service leads shall be installed as shown in the Water Main section of the Construction Specifications.

Section 13.03 Valves

Valves shall be located at strategic points along the water main to provide adequate isolation.

Valves shall be located near tees and other looping measures. Spacing shall be a maximum of 1,000 feet.

Valves shall be placed at all tees and connections. Valve locations shall be reviewed by the City. All valves 8 inches and smaller and outside of pavement shall be designed as direct bury valves and include the proper cast iron valve box and stand. Valves that fall within the pavement shall be within a manhole. Valves larger than 12 inches shall be provided with a 5 foot diameter manhole. Larger manholes may be required depending on the size of the valve. Valves to be installed in manholes shall be furnished with flange connections. Flanges shall be faced and drilled to 125 lbs. standard. Two (2) complete sets of joint accessories shall be furnished with each valve.

All pressure tapping valves shall be enclosed within a 5 foot diameter manhole. (Larger manholes maybe required for larger valves.)

Valves shall open counterclockwise unless otherwise specified by the City.

Gate valves shall be designed for 150 psi working pressure and meet the requirements of the American Water Works Association.

Please see City of Milan Special Provision for Water Main Installation within the Appendix for further details and descriptions of materials and installation.

Section 13.04 Hydrants

Hydrants shall be spaced to provide a maximum service radius of 250 feet. Hydrants should be positioned as close to lot lines as possible. Locations shall be approved by the City.

A hydrant assembly consisting of a hydrant, a 6’ valve, a cast iron valve box, and all piping necessary for a complete job shall be installed. Valves shall be located approximately 3’ from the hydrant.

Hydrants shall be factory painted in accordance with AWWA C502 and color to meet City of Milan.

Hydrants shall be obtained from East Jordan Iron Works, model number EJIW 5BR or approved equal by the City and shall be made to open in the counterclockwise direction. Self-drain openings shall be plugged. The developer shall provide one repair kit for each 5 hydrants or portion thereof.

The hydrant assembly must be tested by the developer using approved City methods.

Please see City of Milan Special Provision for Water Main Installation and the fire hydrant assembly detail within the Appendix for further details and descriptions of materials and installation.

14.0 Sanitary Sewer

Section 14.01 General

All sanitary sewer shall be designed to the latest Milan City standards and state standards, whichever is more stringent. The developer shall undertake sufficient research to determine if the sewer has adequate capacity to handle the anticipated volumes. Such research will be provided to the City at the City's request.

A EGLE Sanitary Sewer Permit shall be required on all sanitary sewer construction and if the EGLE requirements are found to be more stringent, then the more stringent requirements shall apply.

Sanitary sewer shall, whenever possible, be installed on the north side of an east-west street and on the east side of a north-south street. Sanitary sewers shall be designed with adequate slope to produce self- cleaning velocities and to provide capacity for future expansion.

Plans shall be sealed by a licensed professional engineer.

Designs shall incorporate the use of materials and sizes as specified in the Sanitary Sewer section of the Construction Specifications.

Section 14.02 State Requirements

State requirements and limitations on discharges shall apply in any case where they are more stringent than both federal requirements and limitations and those in this article.

Section 14.03 Specific Pollutant Limitations

1. *Toxic* pollutants. The following pollutant limits are established to protect against pass through and interference. No person shall discharge wastewater containing in excess of the following:

    0.360 mg/l arsenic
    0.110 mg/l cadmium
    2.77 mg/l chromium
    0.390 mg/l copper
    0.280 mg/l cyanides
    0.690 mg/l lead
    0.0002 mg/l mercury*
    0.130 mg/l molybdenum
    1.600 mg/l nickel
    0.300 mg/l nickel
    0.300 mg/l silver
    0.960 mg/l zinc
    1.000 total phenols**

    *Mercury shall not be discharged above levels of detection. The analytical method shall be EPA 245.1, and the reported detection level shall not exceed 0.0002 mg/l unless appropriate based on demonstrated sample matrix interference.

    **The limit for total phenols is based on analytical testing via EPA Method 420.1 and discharge of any or all of the following compounds: 2 chlorphenol, 4-chlorophenal, 2, 4-dichlorphenol, and methylphenol (also referred as ocresol). Discharge of other phenolic compounds is prohibited, except as specifically authorized by the City. If a discharge exceeds the total phenols local limit, the affected user may petition for an alternative mass-based limit. Included with this petition shall be a phenol characterization plan, which shall aim to identify and quantify the specific phenolic compounds present in the discharge. If the superintendent deems a plan approvable and concurs with the results of the subsequent study, alternative mass-based limits may be granted based on appropriate allocations of the following maximum headwork's loading for the POTW:

    0.798 lb/day 2-chlorophenol
    0.798 lb/day 4-chlorophenol
    2.29 lb/day 2, 4-chlorophenol
    3.29 lb/day 2-methylphenol

2. Compatible *pollutants.* The following limits for pollutants compatible with the POTW treatment system are established to protect against pass through and interference. Subject to the conditions of section 24-163 herein, no person shall discharge wastewater containing in excess of the following:

   510 mg/l 5-day BOD
   1,100 mg/l chemical oxygen demand (COD), where the superintendent determines COD to be an accurate and appropriate alternative to 5-day BOD.
   1,800 mg/l total suspended solids (TSS)
   18 mg/l total phosphorus (as P)
   64 mg/l ammonia nitrogen (as N)
   50 mg/l fats, oil and grease

3. *Concentrations.* Concentrations apply at the point where the industrial waste is discharged to the POTW. All concentration for metallic substances is for "total metal" unless otherwise indicated. The superintendent may impose mass limitations in addition to or in place of the concentration based limitation above.

Section 14.04 Service Leads

All service leads within the right-of-way shall be a minimum of 6 inches in diameter SDR 35 for less than 10 ft deep and SDR 26 for depths greater than 10 ft.. Service leads shall be installed as shown on the Sanitary Sewer details in Appendix B of the Construction Specifications. Service leads shall have a minimum slope of 1%. Wyes for service leads shall be installed as shown on the Sanitary Sewer details in Appendix B of the Construction Specifications. For service leads beyond the right-of-way, cleanouts shall be provided every 90 feet or at any bend 45º or greater.

Section 14.05 Sewer Capacity

For all developments, the City will determine existing capacity of sanitary sewer during plan review process. The developer may be required to provide capacity analysis data with City reviewing data to verify capacity. Any upgrades to existing sanitary sewer or existing pump stations required by the increased capacity will require developer to be responsible for all design and construction costs.

15.0 Site Grading

In general, developments should follow the existing contours of the land. Any changes which alter the established drainage patterns need to be addressed by the Developer. Grading information shall be provided for the entire site and a distance of 40 feet outside of all property lines.

Grading plans shall be provided for all projects. Individual lot grading plans may be necessary prior to the issuance of building permits.

Rear yard drainage may be required for developments. If required by the City Engineer, an acceptable drainage system within an easement shall be provided on the lot line to intercept drainage from both off- site flows and that of the proposed development.

Existing and proposed contours and drainage patterns shall be provided by the developer. Sufficient off- site topography must be shown to determine the extent of contributing runoff. Provisions must be made to accommodate the off-site contributing flow.

Proposed grading of a site should not adversely impact drainage from adjacent projects.

16.0 Traffic Control/Safety Standards

A detailed plan for traffic control shall be provided on projects as determined necessary by the City of Milan. The Current Michigan Manual of Uniform Traffic Control Devices shall be referenced for all traffic control plans.

All traffic control plans shall be reviewed by the City as well as any governing authorities having jurisdiction in the construction area.

The intent of all traffic control is to limit the duration of any closure to the minimum time required to complete construction as well as to provide as much advance warning as possible while creating minimal confusion.

Any traffic control devices left in place overnight shall be lighted and maintained on a regular basis. All excavations and hazardous areas shall be protected by barricades or snow fencing.

The City shall review and approve all detour plans prior to construction.

The City shall be notified of any road closures or traffic alterations a minimum of 3 business days in advance.

The City may require a developer to provide a Traffic Impact Analysis as part of the approval process. This determination will be at the discretion of the City and the Engineer.

17.0 City Inspection Requirements for Land Improvements and Utility Installation

Section 17.01 Definitions

The following definitions apply to the respective terms as they are used in this section.

1. Land Improvements
   Any paving, grading or filling of land or changing of surface drainage of land and the construction or installation of sanitary sewer, storm sewer, water main or storm water detention basin systems.
2. Grading
   Any change or alteration of existing ground surface elevations by excavation or filling.
3. Surface Drainage
   Any storm water collecting on or flowing over the surface of the ground.

Section 17.02 City Authorization Required

No person shall commence land improvements on any parcel of land without having first applied for and received authorization from the City of Milan in accordance with this section.

Section 17.03 Application for Land Improvement Permit

1. Application
   Prior to the construction or installation of land improvements on any parcel of land, the owner of such land or an agent having the written authorization of the owner, shall submit an application for a land improvement permit with the department. The application shall include design drawings, sealed by a licensed engineer in the State of Michigan, the estimated cost of the land improvements, estimated time schedule for construction (number of estimated construction days required), the appropriate plan review fee and plans and specifications.

2. Plans and Specifications
   The plans and specifications shall be prepared by, and signed and sealed by, a professional engineer. Plans detailing parcel surveys must be signed and sealed by a licensed land surveyor. Plans shall be prepared on 24"x36" size sheets and shall generally be drawn to scale of not more than 50 feet to the inch. The drawings shall contain sufficient detail to properly show the proposed locations and methods of construction or grading. The City Engineer may require the plans to be drawn to a scale of 20 feet to the inch when deemed necessary for proper review.

   Three (3) complete sets of plans and specifications shall be submitted with the permit application.

   After completion of the project, as-built plans, in an electronic format and acceptable to the City, must be submitted showing the exact location of all land improvements prior to final approval of the project by the City. These plans must be prepared and certified by

the owner's engineer.

Section 17.04 Duties of the City

Upon receipt of the permit application, plans and specifications, cost estimate and plan review fee, the Department shall transmit copies to the appropriate departments for their review.

Section 17.05 Review

The City engineer shall review the plans and specifications and approve the same if they comply with the City's design and construction standards and meet all site plan review approval requirements. In the event any item does not comply with said standards, the plans shall be returned to the landowner or agent, with notations as to any deficiency. The land developer or owner shall resubmit the required number of copies of corrected plans directly to the city engineer. Upon approval of the plans and specifications, the City engineer shall notify the owner or agent of such approval.

Section 17.06 Issuance of Permit

Following approval of the plans and specifications, land development authorization will be issued upon receipt of the following:

1. Inspection fees, as required herein.
2. Performance Bond
3. All approvals and/or permits from other governmental agencies having jurisdiction if applicable.

Section 17.07 Inspection

No land improvements shall be undertaken without City inspection. Any facilities installed without inspection may be required to be removed and reinstalled at the owner's expense, with proper City inspection.

Section 17.08 Inspection Fees

Inspection fees shall be deposited with the City to cover the inspection costs. Deposit shall be based on estimated construction schedule provided by applicant. A set hourly rate will be provided to the applicant in relation to inspection costs.

In the event the developer exceeds the estimated time, the developer shall deposit additional funds to the City to cover additional inspection time. This deposit must occur prior to the developer continuing with construction.

Any unused portion of the fee shall be returned to the applicant at the completion of the project.

Section 17.09 Performance Bond

The owner or contractor shall post a performance bond in the name of the City and guaranteeing completion of land improvements. The amount of the bond shall be equal to the construction cost.

18.0 Hot Mix Asphalt Paving Specification

Section 18.01 Materials

1. Bituminous Mixtures

   Materials shall meet the requirements of the latest Michigan Department of Transportation Standard Specifications for Construction.

   Bituminous mixtures and application rates shall be as shown on the plans.

2. Aggregate

   Aggregate for base under a proposed bituminous pavement shall meet the requirements for 21AA aggregate, as specified in the latest Michigan Department of Transportation Standard Specifications for Construction, unless noted otherwise on the plans or in the proposal.

Section 18.02 Construction of Bituminous Pavements

1. Equipment

   Equipment shall meet the requirements of the latest Michigan Department of Transportation Standard Specifications for Construction.

2. Preparation of Aggregate Base (for pavements constructed on an aggregate base)

   An aggregate base, of the thickness shown on the plans, shall be constructed on a prepared subgrade. The subgrade shall be free of unstable or yielding soils or organic material and shall be compacted to at least 98% of its maximum density as determined by ASTM D1557. Unstable, yielding, and organic soils shall be excavated and replaced with suitable soil.

   The aggregate base shall be constructed of aggregate meeting the requirements of Series 21AA aggregate as specified in the latest MDOT Standard Specifications for Construction, unless another aggregate is called for on the plans in the project specifications or directed by the City.

   The aggregate shall be placed in lifts not less than 3 inches nor more than 6 inches and compacted to at least 98% of its maximum density as determined by the One Point Michigan Cone Test, as described in the MDOT Density Control Handbook. The finish grade of the aggregate shall be graded and shaped to the dimensions and elevations required within a tolerance of 3/4 inches.

3. Preparation of Existing Pavement (for overlays)

   Catch basins, manhole covers, valve boxes, and water shutoffs shall be adjusted before placement of the surface course.

   The existing pavement surface shall be thoroughly cleaned of all dirt and debris. Joints and cracks in the existing pavement shall be cleaned of all dirt and debris. The Contractor shall not place any pavement courses until the existing surface has been inspected and approved by the City.

   Existing bituminous patches with a high bituminous content which may cause bleeding or instability, as determined by the City, shall be removed. Holes, depressions, cracks, and removed patches shall be patched with bituminous material, flush with the existing pavement. A bituminous bond coat shall be uniformly applied in advance of paving using a pressure distributor.

   The rate of application shall be as specified by the City; the rate will be between 0.05 and 0.10 gallons per square yard.

   Paving shall not be placed until the bond coat has cured.

   All joints to be tacked regardless of temperature.

4. Transportation of Mixtures

   Transportation of mixtures shall meet the requirements of the latest edition of the Michigan Department of Transportation Standard Specifications for Construction.

5. Placing Bituminous Pavement

   Construction procedures shall meet the requirements of the latest edition of the Michigan Department of Transportation Specifications for Construction.

6. Weather and Seasonal Limitations

   Neither bituminous mixtures nor bond coats are to be placed when rain is threatening nor when the moisture on the surface would prevent satisfactory bonding.

   Bituminous pavements shall not be constructed before May 5 nor after November 15 unless otherwise approved by the City. The temperatures shall meet the requirements of the latest edition of the Michigan Department of Transportation Standard Specifications for Construction.

7. Wearing Course

   Developers shall provide bond for final bituminous wearing course to allow majority of construction to be completed prior to placing wearing course. Final wearing course shall be placed within 2 years after leveling course is applied.

19.0 Cleanup and Restoration Specification

Section 19.01 General

Slope Restoration, Modified shall consist of but not be limited to roadside seeding (seed mixture "THM" @ 220 Lbs/Acre), fertilizer, chemical nutrient, class A (240 Lbs/Acre), mulch (2 Tons/Acre) and topsoil surface, 3 inches to be placed on areas disturbed by Contractor's operations as directed by the Engineer.

The item of Slope Restoration, Modified shall be in accordance with Section 816 of the Michigan Department of Transportation current edition Standard Specifications for Construction as stated herein.

Section 19.02 Construction Methods

Section 816.03A.2 of the Michigan Department of Transportation (MDOT) Current Edition for Construction shall be deleted and the following substituted:

Placing Topsoil: All areas which are to be seeded or sodded shall be covered with topsoil, except those areas within the street right-of-way not disturbed by construction. Where slopes exist of topsoil, muck or peat, topsoil surface will not be required, (or as directed by engineer).

The topsoil shall be spread on the prepared areas to a depth of not less than 3 inches. After spreading, any large clods and lumps shall be broken with a pulverizer or by other effective means, and all stones, and rocks over 2 inches in diameter, roots, litter or any foreign matter shall be raked up and disposed of by the contractor. The topsoil surface shall be in reasonably close conformity to the lines, grade and cross sections shown on the plans.

Topsoil surface, 3 inches shall be placed on all fore slopes and at other areas where directed by the Engineer. In established lawn areas, seed mixture THM (220 Lbs/Acre) fertilizer, screened topsoil and anchoring mulch shall be used on both the front slope and back slope. Topsoil shall pass through a screen having squares no larger than ½ inch x ½ inch.

Substitution of hydro-seeding will be allowed as approved by the Engineer.

If there is an excess of topsoil from salvaging and stockpiling topsoil, the stockpiles of surplus topsoil shall be trimmed to be safe and have an aesthetically pleasing appearance, as directed by the Engineer.

20.0 Concrete Curb and Gutter Specification

Section 20.01 General

1. Work Included

   This work includes all preparation, forming, concrete production and placement, finishing, jointing, reinforcing, curing, protection, and restoration for the construction of concrete curb and gutter.

   The concrete curb and gutter shall be constructed substantially in accordance with the cross section provided on the City approved plans.

   Curb and gutter may be constructed either by slip-forming or using fixed forms.

Section 20.02 Products

1. Materials
   a. Portland cement shall meet the requirements of ASTM C150.
   b. Coarse aggregate shall meet the requirements of Class 6A aggregate as described in the latest Michigan Department of Transportation Specification for Construction.
   c. Reinforcing steel shall be grade 60 steel bars meeting the requirements ASTM A615, A616, or A617.
   d. White membrane curing compound shall conform to ASTM C309, Type 2, Class B vehicle.
   e. Fiber joint filler shall meet the requirements of ASTM D1751.
2. Mixtures
   a. Concrete for driveways, curb and gutter, sidewalks, and miscellaneous pavements shall be transit mixed concrete in accordance with ASTM C94.
   b. Air content shall be 5.5-8%, slump shall be 1-4 inches, and compressive strength shall be at least 3500 psi after 28 days.

Section 20.03 Execution

1. Removal of Existing Curb and Gutter

   Where the proposed curb and gutter is to replace existing curb and gutter, the existing curb and gutter shall be removed in accordance with the requirements for pavement removal, included elsewhere in these documents.

2. Preparation

   The base shall be excavated, filled, and shaped as required to construct the proposed curb and gutter at the elevations and alignment required. The base shall be compacted to at least 95% of its maximum unit weight as determined by ASTM D1557. Soft and yielding material shall be excavated and replaced with suitable soils.

   Forms, if used, shall extend the full depth of the concrete. Face forms for the exposed curb face are not required. Forms shall be of sufficient strength and staked to prevent springing or yielding after placement of concrete. Flexible forms capable of making a smooth arc shall be used for curved sections.

   Steel reinforcement shall be placed as shown on the plans. Reinforcing shall be spliced and held in place in a manner approved by the City. Splices shall be overlapped by 10 inches.

3. Placing Concrete

   Concrete shall not be placed until the forms or the prepared grade (if slip forming) have been inspected by the City. Concrete shall be deposited to the full depths and spaded or vibrated to ensure proper consolidation.

   Joints shall be constructed perpendicular to the surfaces and shall not vary more than 1/4 inch from their designated position. Contraction joints shall be spaced at 50 foot intervals and shall be at least 1/4 the thickness of the section. Steel reinforcing shall not extend through contraction joints. Expansion joints shall be constructed at spring points, at intervals not exceeding 400 feet, and 10 to 50 feet each side of a drainage structure. Expansion joints shall be 1 inch thick and extend through the full cross section of the curb and gutter. Plane-of-weakness joints shall be provided at uniform spacing, not exceeding 10 feet. Plane-of-weakness joints shall extend through at least 1/4 the thickness of the section.

   The edges of the gutter, the back of the top edge of curb, and all transverse joints shall be rounded with a finishing tool having a radius of 1/4 inch. The face of the curb, at the top and bottom, shall be shaped with suitable tools to provide the required radius. Any material required to fill low spots shall be obtained from the mixture used in the work.

   Exposed surfaces shall be finished smooth and even by means of a moistened wood float, followed by light brushing.

   The gutter and top of curb shall not vary more than 3/16 inch in 10 feet when using a 10 foot straight edge. Other surfaces shall not vary more than 3/8 inch in 10 feet.

   Water shall not be added as an aid to finishing.

   Exposed concrete surfaces shall be cured using white membrane curing compound applied uniformly at a rate of 200 square feet per gallon. Curing compound shall be applied regardless of temperature or humidity conditions.

4. Protection

   Concrete shall not be placed until the air away from artificial heat is at least 25°F and rising. Concrete shall be protected from damage by freezing or precipitation. The Contractor shall provide barricading and security as necessary to protect fresh concrete from accidental damage or vandalism. Damaged concrete shall be removed to a joint and replaced at the Contractors expense.

5. Cleanup and Restoration

   Forms shall be removed when the concrete has attained sufficient strength. After removal of forms, the curb and gutter shall be backfilled.

   Areas to be restored with turf shall be backfilled with suitable soil, compacted, and surfaced with 3 inches of topsoil such that the topsoil surface is flush with the top of curb. Areas to be surfaced with pavement or sidewalk shall be backfilled with sand to the bottom of the proposed pavement, sidewalk, or base, and compacted.

   Where curb and gutter is constructed adjacent to an existing pavement, the void between the curb and gutter and the pavement shall be filled full depth with material in kind as the existing pavement.

21.0 Concrete Drives and Miscellaneous Concrete Pavement Specification

Section 21.01 General

1. Work Included

   This work includes all preparation, forming, concrete production and placement, finishing, jointing, reinforcing, curing, protection, and restoration for the construction of concrete driveways and miscellaneous concrete pavement.

2. Minimum Driveway Cross Sections

   Driveways shall be constructed of concrete to the following minimum cross sections, unless otherwise directed.

Type	Thickness (inches)
Commercial/Industrial	8
Residential	6

Section 21.02 Products

1. Materials
    a. Portland cement shall meet the requirements of ASTM C150.
    b. Coarse aggregate shall meet the requirements of Class 6A aggregate as described in the latest Michigan Department of Transportation Specifications for Construction.
    c. Reinforcing steel shall be grade 60 steel bars meeting the requirements of ASTM A615, A616, or A617.
    d. White membrane curing compound shall conform to ASTM C309, Type 2, Class B vehicle.
    e. Fiber joint filler shall meet the requirements of ASTM D1751.
2. Mixtures

    Concrete for driveways and miscellaneous pavements shall be transit mixed concrete in accordance with ASTM C94. Air content shall be 5.5-8%, slump shall be 1-4 inches, and compressive strength shall be at least 3500 psi after 28 days. Concrete shall contain at least 5.6 sacks of cement per cubic yard of concrete.

Section 21.03 Execution

1. Coordination of Traffic

    Hazardous areas shall be barricaded to protect pedestrian and vehicular traffic.

    Work shall be scheduled so that access is maintained to driveways and entrances through the project area to the extent possible. Where a driveway or entrance must be closed for a period, the property owner or occupant shall be notified in advance of the closing.

2. Preparation

    The base shall be excavated, filled, and shaped as required to construct pavement of the required thickness at the proposed grades and alignment. The base shall be compacted to at least 95% of its maximum unit weight as determined by ASTM D1557. Soft and yielding soils shall be excavated and replaced with suitable soils.

    Forms shall extend the full depth of the concrete. Forms shall be of sufficient strength and staked to prevent springing or yielding after placement of concrete. Driveway grades shall not exceed 1 foot per 10 feet. Where steel reinforcement is used, it shall be spliced and held in place in a manner approved by the Engineer. Splices shall be overlapped by ten inches.

3. Placement of Concrete

   Concrete shall not be placed until the forms have been inspected by the City. Concrete shall be deposited to the proper depth and spaded or vibrated to ensure proper consolidation.

   Joints shall be constructed perpendicular to surfaces and shall not vary more than 1/4 inch from their designated position. Transverse plane-of-weakness joints shall be placed at intervals not exceeding 10 feet. In irregularly shaped areas, joints shall be perpendicular as much as possible.

   Expansion joints shall be constructed using 1/2 inch fiber joint filler as follows:

   a. At intervals not exceeding 50 feet.
   b. At fixed objects such as curbs, sidewalks, and building.
   c. At intersections and changes in direction.

   Any material required to fill low spots shall be obtained from the mixture used in the work.

   Exposed surfaces of the concrete slab shall be finished smooth and even by means of a moistened wood float, followed by a light brushing perpendicular to sidewalk. Water shall not be added to the concrete surface as an aid to finishing. The top edges of the slab and all transverse joints shall be rounded with a finishing tool having a radius of 1/4 inch. Pavement surfaces shall not vary more than 3/8 inch from the alignment and typical cross section.

   Exposed concrete surfaces shall be cured using white membrane curing compound applied uniformly at a rate of 200 square feet per gallon. Curing compound shall be applied regardless of temperature or humidity conditions.

4. Protection

   Concrete shall not be placed unless the temperature of the air away from artificial heat is at least 25° F and rising. Concrete shall be protected from damage caused by freezing or rain. The Developer shall provide sufficient barricading and security to protect fresh concrete from accidental damage or vandalism. Damaged concrete shall be removed to a joint and replaced at the Developer's expense.

5. Cleanup

   After the concrete has attained sufficient strength, the forms shall be removed.

22.0 Concrete Sidewalks Specification

Section 22.01 General

1. Work Included

   This work includes all preparation, forming, concrete production and placement, finishing, jointing, reinforcing, curing, protection, and restoration for the construction of concrete sidewalks.

2. Minimum Sidewalk Cross Sections

   Sidewalk shall be constructed to the following minimum cross sections, unless otherwise directed.

Type	Thickness (inches)
Thru Commercial/Industrial driveways (subject to heavy truck traffic)	8
Thru other driveways	6
Sidewalk Ramp	6
All others	4

Section 22.02 Products

1. Materials

   a. Portland cement shall meet the requirements of ASTM C150.

   b. Coarse aggregate shall meet the requirements of Class 6A aggregate as described in the latest Michigan Department of Transportation Specifications for Construction.

   c. Reinforcing steel shall meet the requirements of ASTM D1751. Steel shall be grade 60.

   d. White membrane curing compound shall conform to ASTM C309, Type 2, Class B vehicle.

2. Mixtures

   Concrete for sidewalks shall be transit mixed concrete in accordance with ASTM C94. Air content shall be 5.5-8%, slump shall be 1-4 inches, and compressive strength shall be at least 3500 psi after 28 days. Concrete shall contain at least 5.6 sacks of cement per cubic yard of concrete.

Section 22.03 Construction Requirements

1. Coordination of Traffic

   Hazardous areas shall be barricaded to protect pedestrian and vehicular traffic.

   Work shall be scheduled so that access is maintained to driveways and entrances through the project area to the extent possible. Where a driveway or entrance must be closed for a period, the property owner or occupant shall be notified in advance of the closing.

2. Preparation

   The base shall be excavated, filled, and shaped as required to construct pavement of the required thickness at the proposed grades and alignment. The base shall be compacted to at least 95% of its maximum unit weight as determined by ASTM D1557. Soft and yielding soils shall be excavated and replaced with suitable soils. Forms shall extend the full depth of the concrete.

   Forms shall be of sufficient strength and staked to prevent springing or yielding after placement of concrete. Sidewalk transverse slopes shall not exceed 1/2 inch per foot. Transverse slopes less than 1/4 inch per foot shall not be used unless longitudinal drainage is provided. Longitudinal grades shall not exceed 1 inch per foot. Sidewalk ramps shall be constructed at intersections where the sidewalk intersects a curb and where otherwise directed. Ramps shall not be steeper than 1 inch per foot. Where steel reinforcement is used, it shall be spliced and held in place in a manner approved by the City. Splices shall be overlapped by 10 inches.

3. Placement of Concrete

   Concrete shall not be placed until the forms have been inspected by the City. Concrete shall be deposited to the proper depth and spaded or vibrated to ensure proper consolidation.

   Joints shall be constructed perpendicular to surfaces and shall not vary more than 1/4 inch from their designated position. Transverse plane-of-weakness joints shall be placed at intervals equal to the width of the sidewalk, except as follows.

   a. Where the sidewalk abuts an existing sidewalk, joints shall coincide.
   b. Joint spacing shall not exceed 6 feet.
   c. In irregularly shaped areas, joints shall be perpendicular as much as possible.
   d. Individual slab size shall be between 16 square feet and 36 square feet, as much as possible.

   Expansion joints shall be constructed using ½ inch fiber joint filler as follows:

   a. At intervals not exceeding 50 feet.
   b. At fixed objects such as poles, stairs, manholes, drain inlets, curbs, and buildings.
   c. At intersections and changes in direction.

Any material required to fill low spots shall be obtained from the mixture used in the work.

Exposed surfaces of the concrete slab shall be finished smooth and even by means of a moistened wood float, followed by a light brushing perpendicular to sidewalk. Water shall not be added to the concrete surface as an aid to finishing. The top edges of the slab and all transverse joints shall be rounded with a finishing tool having a radius of 1/4 inch. Pavement surfaces shall not vary more than 3/8 inch from the alignment and typical cross section.

Exposed concrete surfaces shall be cured using white membrane curing compound applied uniformly at a rate of 200 square feet per gallon. Curing compound shall be applied regardless of temperature or humidity conditions.

4. Protection

   Concrete shall not be placed when the air temperature is less than 25° F. Concrete shall be protected from damage caused by freezing or rain.

   The Contractor shall provide sufficient barricading and security to protect fresh concrete from accidental damage or vandalism. Damaged concrete shall be removed to a joint and replaced at the Contractor's expense.

5. Cleanup

   After the concrete has attained sufficient strength, the forms shall be removed.

6. Standard Details

   See attached Standards in Appendix A for typical sidewalk details.

7. Construction Completion

   Developer shall submit bond for sidewalk construction to require sidewalk to be installed within 2 years after completion of infrastructure. Allow sidewalk to be constructed as homes are constructed; however, if homes are not complete within a 2 year period, all remaining sidewalk shall be constructed as required in approved construction plans.

23.0 Sanitary Sewer Specification

Section 23.01 General

1. Work Included

   The Developer shall supply all labor, material and equipment required for the installation and testing of all gravity sanitary sewers and appurtenances in compliance with these general specifications, project specifications and the contract drawings.

   The Developer shall do all ditching, pumping, well pointing and bailing, build all drains and do all other work necessary to keep the excavation clear of groundwater, sewage or storm water during the progress of the work, and until the finished work is inspected and ready for backfill.

2. Shop Drawings

   The Developer shall submit shop drawings to the City prior to construction for the following items:

   a. Pipe, fittings and joint material.

   b. Full details of all castings

3. Standards

   Where materials or methods of construction are listed as being in conformance with local Water/Sewer Authority and Ten States Standard, it shall refer to the latest edition of the standard specification or any interim revision.

Section 23.02 Products

1. Materials

   All material or equipment supplied shall be new and shall be of first class ingredients and construction, designed and guaranteed to perform the service required.

   a. Concrete Pipe

      All reinforced concrete pipe shall conform to ASTM C-76 with circular reinforcement, wall thickness B and concrete with a minimum cement content of 6.5 sacks per cubic yard of concrete. Minimum Pipe class shall be Class IV unless heavier loadings require otherwise. Use of concrete pipe for sanitary sewer requires City approval.

   b. PVC Pipe

      All PVC pipe shall be ASTM gasketed sewer pipe with a SDR 26. City Engineer may require SDR 23.5 or SDR 21 in areas of deep excavation.

   c. Ductile Iron Pipe

      All ductile iron pipe for gravity sanitary sewer lines shall be Class 53. Cement lining in accordance with ASA A 21.4 is required on the interior of all ductile iron pipe. Use of ductile iron pipe for sanitary sewer requires City approval.

2. Material Testing

   All materials to be incorporated in the construction of gravity sewers and appurtenances shall be subject to inspection and tests as specified by ASTM, ASA or AWWA regulations. The City requires TV inspection and air infiltration tests to be completed prior to final acceptance. The City reserves the right to subject any material supplied for a particular project to an independent testing laboratory. Such tests if scheduled shall be paid for by the Developer. The results of such tests shall govern in material acceptance. The Developer will be required to supply the City with a certificate of testing or actual

test results stating that the material to be used is in conformance with the specifications prior to using material for construction.

Section 23.03 Execution

1. Excavations

   The Contractor shall call MISS DIG (1-800-482-7171) to arrange for staking of underground utilities in advance of performing any excavation.

   Excavation shall include clearing the site of the work, loosening, loading, removing, transporting and disposing of all materials, wet or dry, necessary to be removed to construct all sewers and appurtenances to the lines, grades and locations shown on the project drawings. The Developer must assume the risk of completing the work and shall be responsible for the cost of removal of quicksand, hardpan, boulders, clay, rubbish, unforeseen obstacles, underground conduits, gas pipe, drain tile, telephone ducts, tree roots, water mains, masonry structures, railroad tracks, pavements and sidewalks and the delay or damage occasioned by the same, whether these obstacles are shown on the project drawings or not.

   The location of sewers, conduits and structures, as shown on the project drawings, shall be selected to provide the least possible interference with or the crossing of existing utilities. The City reserves the right to make minor variations in the location of these items during the construction to meet any changed conditions discovered during the construction.

   The location of existing piping and underground utilities, such as gas mains, water mains, electric duct lines, telephone conduits, etc., as shown on the project drawings, are to have been determined from the best available information by actual surveys or furnished and taken from the records of the parent utility companies and drawings of the existing facilities. However, the City does not assume responsibility for the possibility that during construction, utilities other than those shown may be encountered, or that actual location of those shown may be different from the locations designated on the project drawings.

   At the locations wherein detailed positions of these facilities become necessary to the new construction, the Developer shall at his own expense, furnish all labor and tools to either verify and substantiate the record drawing location, or definitely establish the position of the facilities.

   Unless otherwise specified on the project drawings, all concrete and asphalt surfaced pavements shall be sawed before removal.

   Necessary arrangements shall be made by the Developer with all persons, firms, corporations owning or using any poles, pipes, tracks, or conduits, etc., affected by the construction of the project, to maintain and protect such facilities during construction with the cost of any such protection paid by the Developer. In the event that any existing gas pipes, water pipes, conduits, sewers, tile drains or poles are blocked or interfered with by the excavation required on this project, the Developer shall maintain them in continuous operation, and restore them to the same condition as they were prior to the

start of this project.

Excavated material shall not be placed on grass plots unless there is no other suitable place to put it. Excavated material shall be placed on pavements or sidewalks only on the written approval of the City.

Sidewalks and pavements must in no case be blocked or obstructed by excavated material, except on the authorization of the City, and then only when adequate provisions have been made for a satisfactory temporary passage of pedestrians and vehicles. Adequate bridging and planked crossings must be provided and maintained across all open trenches for pedestrians and vehicles.

Barriers, lights, flares and watchmen shall be provided and maintained by the Developer at all trenches, excavations and embankments.

The Developer shall be responsible for the furnishing and installation of all temporary sheeting, dewatering, shoring, timbering and bracing required to maintain the excavation in a condition to furnish safe working conditions and to permit the safe and efficient installation of all items of work.

The Developer shall further, at his own expense, shore up, or otherwise protect all fences, shrubs, buildings, walls, walks, curbs or other property adjacent to any excavation which might be disturbed during the progress of the work. The Developer will be held liable for any damage which may result to neighboring property from excavation or construction operations. Lumber used for sheeting may consist of any species which will satisfactorily stand driving. It shall be sawn or hewn with square corners, and shall be free from worm holes, loose knots, wind shakes, decayed or unsound portions, or other defects which might impair its strength or tightness.

Minimum thickness shall be 2 inch nominal. Lumber for bracing shall be No. 2 common yard lumber or timber in less than 6 inch sizes, and common structural grade on timbers 6 inches and over in thickness.

The sheeting and bracing shall be removed as the work progresses in such a manner as to prevent the caving in of the excavations, or any damage to the masonry. While being drawn, all vacancies left by the sheeting and bracing shall be carefully filled with fine sand and rammed by special tools, or puddles as directed by the City.

Sheeting, shoring, timbering and bracing for open trenches and excavations may be ordered left in place by the City when in its opinion such is necessary for the protection of the work, the public or the adjacent property.

The Developer shall supply all temporary supports and braces that may be necessary to secure a safe prosecution of the work until the permanent structure is complete, at his own expense or concurrently with the completion of the permanent structure.

The Developer shall do all ditching, pumping, well pointing and bailing, build all drains and do all other work necessary to keep the excavation clear of groundwater, sewage or storm water during the progress of the work, and until the finished work is safe from injury. Where the excavation is wet sand, and suitable construction conditions cannot be

obtained by other methods, the Developer shall install and operate a pumping system connected with well points, so as to drain the same effectually. No masonry or pipe shall be laid in water and water shall not be allowed to rise over masonry until concrete or mortar has set at least 48 hours. All water pumped or drained from the work shall be disposed of in a manner satisfactory to the City and all entities having jurisdiction without damage to adjacent property or to other work under construction.

Necessary precautions shall be taken to protect all construction against flooding.

The Developer shall supply water to homeowners if wells go dry due to construction. Whenever the excavation is carried beyond the lines and grades shown on the project drawings, or given by the City, the Developer shall at his own expense, refill all such excavated space with sand material and in such a manner as may be directed. Beneath and around concrete structures, space excavated without authority shall be thoroughly compacted when refilling, or if deemed necessary by the City, shall be refilled with concrete at the Developer's expense. If the materials encountered on any excavation are not suitable for structural foundations, or if it is necessary to go an additional depth or width from that designated on the project drawings to provide proper bearing for pipe or masonry, or to construct pile or plank foundations, the Developer shall make such additional excavations outside the regular limits of the work as may be directed by the City. The cost of such additional excavation shall be the Developer's responsibility.

Excavated material shall be deposited so as to interfere as little as possible with the excavation of the whole work or its several parts, and in such a manner that for each purpose the most suitable material may be placed in its final position but not in a manner to interfere with the satisfactory carrying out of the work. Such material as cannot be placed in its final position in fills and embankments shall be removed to a temporary spoil bank, from which it shall later be taken and placed in embankment or fills.

Unsuitable and surplus excavated material not incorporated in the improvement shall be disposed of by the Developer at his own expense unless otherwise designated.

If private land is used by the Developer as a spoil site, the Developer shall obtain written permission from the owner or agent of the land agreeing to its use for this purpose and provide the project City with a certified copy of such agreement.

2. Trench Excavation

The ground shall be excavated in open trenches, of sufficient width and depth to provide ample room within the limits of the excavation, or lines of sheeting and bracing, for the proper construction of the sanitary sewer and its appurtenances as shown on the contract drawings and for removing any material which the City may deem unsuitable for foundation. The excavation of the trench shall not advance more than 200 feet ahead of the completed masonry and pipe work, except where in the opinion of the City, it is necessary to drain wet ground.

When trench excavation is carried ahead of contemplated masonry and pipe work, the elevation of the bottom of the trench shall be continually checked to the satisfaction of the City.

Excavation made below that necessary for the proper installation of the sewers, masonry

and appurtenances shall be refilled only with sand or fine gravel, or properly graded crushed rock, thoroughly compacted, all at the Developer's expense.

In clay excavation, the bottom of the trench shall be excavated to a minimum depth of 4 inches below the bottom of the pipe barrel and this space refilled with clean low void sand or other non- compressible fine low void material satisfactory to the City. Refill shall be slightly rounded to provide as much bearing area as possible for the lower 1/4 of the pipe. Clay shall be interpreted to mean all soils other than rock, sand or gravel. In sand and gravel excavation, the bottom of the excavation shall be slightly rounded to provide as much bearing area as possible for the lower 1/4 of the pipe.

When excessive ground water is encountered in the bottom of the non-dewatered system trench, the trench shall be excavated to a depth of 6 inches below the bottom of the pipe barrel and this space refilled with a graded stone material satisfactory to the City. Refill shall be slightly rounded to provide as much bearing area as possible for the lower quarter of the pipe. Any excavation that requires well pointing shall have the pipe bedding stone.

All sanitary sewer or pipe of the bell and spigot type is to be installed in the trench with bell holes of sufficient depth dug across the bottom of the trench to accommodate the bell.

The following construction methods shall be strictly adhered to concerning trench width and backfill requirements:

a. Trench widths shall be according to MIOSHA standard details.

b. For depth of excavation 8-13 feet - the pipe shall be placed on a 4 inch cushion of sand that has been shaped to fit the lower 1/4 of the pipe and the bell holes dug out. The sand shall extend 8 inches over the top of the barrel of the pipe.

c. For depth of excavation 14-19 feet - the pipe shall be placed on a 4 inch cushion of graded stone that has been shaped to fit the lower 1/4 of the pipe and the bell holes dug out. The graded stone shall extend to the springline of the pipe. The area from the springline to 8 inches over the barrel of the pipe shall be backfilled with sand or graded stone.

d. For depths of excavation greater than 19 feet - the placing and backfill shall be the same as for 14-19 foot depths. Modifications to the above noted on the plan sheets shall supersede these requirements.

e. For large size pipes - the trench width shall be 8 inches greater than the outside diameter of the pipe. Any deviations to the above trench widths must be approved in writing by the City.

3. Tunnel Construction – Bore and Jack

Excavation in casings made beneath existing structures, across railroad right-of-way, existing pavements and sidewalks for the installation of sanitary sewer pipe or force main shall be of sufficient size to permit the installation of the pipe and shall have a minimum diameter as shown on the following table.

The outer steel casing shall be of sufficient strength to meet the loading conditions of H-

20 loading for pavements and Cooper E-72 loading for railroad tunnels. The casing shall also have a minimum wall thickness according to the following table.

Inside Pipe Diameter (inches)	Minimum Casing Diameter (inches)	Minimum Required Thickness (inches)
6	12 O.D.	.375
8	20 O.D.	.375
10	20 O.D.	.375
12	24 O.D.	.375
15	30 O.D.	.406
18	36 O.D.	.469
21	36 O.D.	.469
24	42 O.D.	.500
27	48 O.D.	.500

All work performed beneath existing structures, across railroad right-of-ways, and under pavements shall be performed in accordance with the requirements of the parties of agencies having jurisdiction over these locations. The Developer shall contact the parties or agencies prior to starting work and shall meet all requirements of the parties or to be taken in performing the tunnel work. All costs involved in meeting these requirements shall be paid for by the Developer.

A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to provide sufficient working room. Guide timbers or rails for keeping the casing on line and grade shall be installed in the bottom of the trench, and heavy timber backstop supports installed at the rear of the trench bearing or "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. Excavation shall not exceed 6 inches ahead of the lead pipe. Excavation at the top and sides may be approximately 1 inch greater than the outside periphery of the pipe. Bottom excavation shall be accurately cut to line and grade.

Adjoining sections of steel pipe shall be welded with a continuous weld. Pipe shall be jacked upgrade where possible. Any undercutting at bore pit shall be stone filled. Casing shall begin a minimum of 5 feet from the back of curb on all city streets and local roads, a minimum of 10 feet from edge of pavement on all open ditch sections, measured at right angles to the pavement.

The junction of 2 or more sewers shall be made in strict conformance with the project drawings.

New sewer connections with old existing sewers shall be made within a manhole. All construction shall begin at an infiltration test manhole with no connection to the existing sewer until the proposed sewer has been inspected by the City.

Where no old manhole exists at the point of connection, a new manhole shall be constructed of the size and type shown on the project drawings.

When connections are made with sewers carrying sewage or water, special care must be taken that no part of the work is built under water, a flume or dam must be installed, and pumping.

maintained if necessary to keep the new work in the dry until completed and concrete or mortar has set up.

Openings provided in manholes for future sewer extensions shall consist of 1 bell end pipe of the size required extending to the outside wall of manhole with a watertight tile stopper.

4. Pipe Laying

Each pipe shall be laid on an even, firm bed, so that no uneven strain will come to any part of the pipe. Particular care shall be exercised to prevent the pipes bearing on the sockets. Bell holes for bell and spigot pipe shall be dug at each point as specified before. Each pipe shall be laid in conformity with the line and grade stakes and in the presence of the inspector. The bell end of the pipe shall be laid up-grade.

The interior of the sewer shall, as the work progresses, be cleaned of all dirt, jointing material and superfluous materials of every description.

All pipe shall be completely shoved home. On pipe of the tongue and groove type, 30 inch diameter and larger, pressure must be applied to the center of each pipe as it is laid by a winch and cable or other mechanical means properly set and operated to ensure that the spigot is all the way home in the socket, and that the sewer joint is of uniform size throughout the circumference of the pipe.

Laying holes in pipe if used shall be tapered and shall be plugged before backfilling with a tapered concrete plug set in mortar or mastic.

Pipes laid in tunnel or casing pipe shall be supported on suitable blocks cut or grouted into position to place the invert of the sewer or drain at the slope and to the elevations indicated on the project drawings.

5. Pipe Joints

In all jointing operations the trench must be dewatered when joints are made and kept dewatered until sufficient time has elapsed to assure efficient hardening of the jointing material. Bell and spigot, or tongue and groove ends of the pipe shall first be wiped clean before actual jointing operations are started. The type of joint to be installed shall be as specifically designated in the project Drawings.

Joints between consecutive bell and spigot or tongue and groove pipe shall be made with a rubber gasket. The gasket shall be fitted over the tongue or spigot of each pipe, as recommended by the manufacturer, and the pipe entered into the bell or groove and shoved home. The remainder of the joint space for pipes in excess of 36 inches shall be pointed up with mortar.

   a. Ductile Iron Pipe Joints

Before any joints are made or the spigot of pipes placed in the bells, the spigots, bells, gaskets and glands shall be thoroughly cleaned, and all foreign materials removed from their surfaces.

Joining mechanical joint pipe and fittings, the gland, followed by the gasket shall be placed over the plain end of the pipe, the gasket and socket brushed with soapy water and the pipe inserted into the bell. The gasket and socket shall then be pushed into position so that it is evenly seated in the bell and the gland moved into position against the face of the gasket.

The bolts shall be inserted and made finger tight. The bolts shall then be tightened up with a torque wrench to complete the joint.

In joining gasket type pipe and fittings, the gasket shall be seated evenly around the inside of the bell in the groove or recess provided and the inside of the gasket lubricated with lubricant furnished by the joint manufacturer. The spigot of the next pipe shall then be aligned with the bell and started into the bell until it contacts the gasket. The joint shall then be completed by forcing the spigot past the gasket until it makes contact with the base of the socket.

Pressure to force the spigot home shall be applied by means of a bar, a special lever or a mechanical jack-type assembly tool.

b. Factory-Fabricated Resilient Material Joints for Clay Pipe

In joining clay pipe with a factory-fabricated resilient material joints, the bell and the spigot of the pipes shall be thoroughly cleaned, the joint material assembled on the spigot if it is made up of more than one part, the joint material for both bell and spigot coated with lubricant or adhesive, furnished by the joint manufacturer, the spigot entered into the bell and the pipe forced home by means of a bar or mechanical pipe puller.

c. Concrete Pipe Joints

In joining concrete pipe, the bell and spigot of the pipes shall be thoroughly cleaned. Joints shall be mastic type. All joints shall be thoroughly sealed.

6. Connections for Service Pipes

Service connections for house sewer shall be provided in the main sewers as shown on the project drawings. The exact location shall be as indicated on the approved plans.

All sewer connection openings on bell and spigot pipe shall be "Y" branches with the outlet being 6 inches in internal diameter. All sewer connection openings on concrete pipe of the tongue and groove type shall be cast in place with the shape, size and dimension of the opening corresponding to the bell end of a standard sewer pipe 6 inches in internal diameter. "Y" branches are acceptable for service connections. The installation of house services shall follow the installation of the main line by not more than 30 days unless written authorization is received from the City to delay the installation of these house services for a period greater than 30 days after the sewer is installed. It shall be the Developer’s responsibility to install service leads at a sufficient depth to service house basements if the main line sewer is sufficiently deep.

The Developer shall place a hardwood stake on the property line directly opposite each opening left in the sewer. The hardwood stake shall be 8 feet long and a minimum size of 2"x4". The Developer shall locate and keep a record in tabular form of all manhole and sewer opening locations by measurement to the nearest downstream opening. All manhole locations shall be witnessed by at least 2 ties to existing topographic features. This record shall be delivered to the City monthly during the progress of the work. When constructing sanitary sewer connections in wet ground, place a 45° bend at the property end of the connection and install enough house lead to bring the connection above the natural ground water level.

For service connections where the main line is less than 10 feet deep the Developer need not supply a riser connection for the service lead. The service connection shall be left at a depth of 8 to 10 feet below the ground at the property line. The Developer has the option of installing the house lead at an incline or using a riser section for sewers less than 10 feet deep.

When the invert of the sanitary sewer is in excess of 10 feet a riser section shall be used to raise the service connection to a point approximately 10 feet below the surface of the ground. All service connections shall be installed in accordance with the standard details.

Riser pipes and joints shall be SDR 26. All openings shall be plugged with an airtight stopper. A sewer lead on an existing sewer system shall be connected by an existing “y” branch. When a “y” branch location is not available, a “Y” branch with an outlet with a 6 inch internal diameter will be installed into existing sewer main. If conditions do not allow a “y” branch to be installed, a flexible saddle with stainless steel bands will be used to create a circular cut on the sewer main.

Service leads on easements or adjacent to property lines shall extend a minimum of 1 pipe length from the main line sewer. All service leads shall be a minimum of 6 inch diameter pipe to the property line.

7. Structures and Appurtenances

All special structures or manholes shall be constructed at the locations and to the details shown on the contract drawings. Manholes shall be constructed of monolithic concrete or precast concrete rings. The use of precast flexible joint sanitary sewer manholes is approved.

Concrete and reinforcing steel shall be installed to the details shown on the project drawings.

Precast concrete rings shall be laid with "O" ring joint and with full mortar on all joints inside and outside.

Additional inlet pipes, placed through manhole sidewalls, shall extend through the walls a sufficient distance to allow connection on the outside. Such pipes shall be struck smooth on the inside in line with the inside wall of the manhole. The manhole masonry shall be carefully constructed around all pipes, so as to prevent leakage along the outer surfaces.

The manhole frame and cover shall be as specified in the project specifications. Manhole covers shall be labeled “Sanitary Sewer”.

8. Backfill

   Unless otherwise directed, all trenches and excavation shall be backfilled as soon as joints have acquired a suitable degree of hardness and the work shall be prosecuted expeditiously after it has commenced. No sewers shall be backfilled above the top of the pipe until the sewer elevations, gradient, alignment, and the pipe joints have been checked, inspected and approved by the construction observer. All pipe shall be held in place by cable and winch or other suitable method satisfactory to the construction observer during backfill operations so that there will be no movement in the pipe joints. Excavations for structures shall be backfilled as soon as they have developed sufficient strength to resist backfilling loads and forces.

   The trench shall be backfilled to 8 inches over the barrel of the pipe with clean low void sand or other non-compressible fine low void material, satisfactory to the City. The backfill within the trench area shall be placed as noted under construction methods, trench excavation.

   The remainder of the trench shall be backfilled by using the material originally excavated from the ditch to a height slightly above the original elevation of the ground or as hereinafter specified. Rocks, debris, trees, stumps or other rubbish shall not be used as backfill material.

9. Infiltration Testing – Sanitary Sewers

   The amount of infiltration into the sanitary sewer construction under this project shall be measured by use of an infiltration manhole where called for on the plans or by a V-notched sharp crested weir, for sewers equal to or greater than 24 inch in diameter. The weir shall be furnished and installed by the Contractor as directed by the City. Maximum allowable infiltration shall be 100 gallons per mile per inch diameter of sewer per 24 hour day at any time. The joint shall be tight and visible leakage in the joints or excess of the specified amount shall be repaired at the Contractor's expense by any means found to be necessary.

   All sewers 24 inches or greater shall be subjected to the above infiltration test prior to being accepted by the City. All sewers shall also be televised with tape logs and DVD’s submitted to the City for acceptance.

   All sewers less than 24 inches in diameter shall be subjected to an air test for infiltration testing, including televised with tape logs and DVD’s to the City for acceptance.

   The Contractor shall be required to furnish the City with acceptable air test results for each 1,000 foot segment prior to further construction.

   If a sewer fails to pass any of the previously described tests, the Contractor shall determine the location of the leaks, repair them and retest the sewer. The tests shall be repeated until satisfactory results are obtained.

   Method of testing and measurement shall be approved by the Owner, including required test times for a pressure drop of 1 psi over a 100 foot segment. The Contractor shall provide the necessary equipment and labor for making tests, and the cost of same.

   Chemical or cement grouting will not be considered an acceptable method of repairing

leaking pipe, joints or structural failures, except where specifically approved by the City. In this regard the decision of the City shall be final.

24.0 Storm Sewer Specification

Section 24.01 General

This work includes construction of pipe storm sewers, drainage structures, and appurtenances. Drainage structures include catch basins, inlets, manholes, and manhole tees.

Section 24.02 Materials

1. Reinforced Concrete Pipe

   Pipe shall meet ASTM C76. PVC and Smooth Lined Corrugated Plastic Pipe (SLCPP) pipe materials may also be used and follow manufacturer's recommendations for backfill. Joints shall be mastic type.

   Reinforced concrete pipe is identified on the plans and on the proposal by the designation C76 and a roman numeral indicating the pipe class. Reinforced concrete pipe to be installed by jacking shall be Class V and shall be provided with full circular reinforcement. Pipe joints shall be butt type.

2. End Sections

   End sections shall be flared and beveled to conform with ditch slopes. Concrete end sections shall be constructed of precast concrete and reinforcement conforming to the requirements of AASHTO M 170 (ASTM C76), Class II. Connection of end section to concrete pipe shall be made by tongue and groove joints.

3. Drainage Structures

   Drainage structures shall be precast concrete units meeting the requirements of ASTM C478. Drainage structures shall be 4 feet in diameter, unless shown otherwise on the plans approved by the City. Precast concrete grade rings, meeting ASTM C 478 shall be used to adjust the top of the structure to the final grade. At least 6 inches, but not more than 18 inches of vertical adjustment shall be provided with grade rings. Manhole steps shall be provided in drainage structures where shown on the plans. Manhole steps shall be copolymer polypropylene plastic, equal to M.A. Industries PS-IPF with a 12 inch overall dimension and 1/2 inch grade 60 steel reinforcement.

4. Castings

   Castings shall conform to the requirements of AASHTO M 105. All exposed surfaces of castings shall be completely coated with coal tar pitch varnish to which sufficient oil has been added to make a smooth coating which shall be tough and tenacious when cold, and shall not be tacky or brittle, nor have any tendency to scale off. Castings shall be Class 30 grey iron.

Section 24.03 Execution

1. Open Cut Construction of Storm Sewers

   Trench excavation shall begin at the outlet end of the system and proceed toward the upper end, unless otherwise directed. The trench shall be excavated in reasonably close conformity with the lines and grades of the flow line shown on the plans or established by the City. The trench shall be of sufficient width to provide free working space and to permit ramming and compacting the backfill around the pipe. The bottom of the trench shall be shaped so that the pipe will be uniformly supported and recesses shall be excavated to receive the bells. The trench shall be excavated at least 4 inches below the elevation established for the bottom of the pipe. Any excavation below the grade for the bottom of the pipe shall be replaced with sand, thoroughly compacted.

   The Developer shall furnish, install, and operate pumps well points, wells, discharge piping and other equipment necessary to provide a dry excavation and work are. All water pumped from the project shall be disposed of in a manner acceptable to the City. Where unstable soil conditions, or obstructions other than rock, require excavation of the sewer trench below the elevation shown on the approved plans, such excavation shall be made to the dimensions authorized by the City. Unstable soil removed by undercutting shall be replaced with stone meeting the gradation of MDOT, Class 6A.

   Sections of sewer pipe shall be carefully laid in the prepared trench, bell ends upgrade, with the spigot end fully entered in the adjacent bell. Each section shall have firm bearing throughout its length and shall be substantially true to the line and grade required. The use of blocks to bring sections to grade will not be permitted.

   Circular concrete pipe with lift holes shall be installed with the lift holes on top of the pipe. Holes shall be plugged with suitable concrete plugs before backfilling.

   Existing live sewers that are to remain shall be carefully protected during construction of the new sewers. If they are damaged in any way, they shall be immediately repaired or replaced, as directed by the City.

   All junctions with house or building leads shall be made in a manner acceptable to the City.

   Flexible watertight joints shall be installed in accordance with the Manufacturer's recommendations.

   Connections to sewers owned by other agencies shall be done in accordance with their requirements.

   Connections to existing sewers having a plug or bulkhead shall be made with a watertight joint.

   The plug or bulkhead shall be removed without damage to the sewer, and the plug material shall be removed from the sewer and properly disposed of.

   If there are no openings in the existing pipe or structures at the point of connection, an

opening shall be cut or chipped in concrete pipe or the structure sufficiently large to permit 3 inches of mortar to be packed around the entering pipe and the mortar pointed up smooth and flush with the inner wall. Pipe passing through pipe or structure walls shall be cut at the end to conform with the shape of the inside of the wall and to be flush therewith. On the outside of the pipe or structure, the entering pipe shall be encased with sufficient mortar to provide bearing under the pipe. Any existing pipe broken or cracked while making the connection shall be replaced at the Developer's expense.

When replacing an existing sewer, connections to the original sewer or drain that are encountered shall be reconnected to the new sewer.

Backfill shall be placed only after the pipe has been inspected and approved by the City.

Backfill shall be placed in layers not to exceed 12 inches in thickness. Backfill within the 1 on 1 influence of a roadbed or structure shall be sand, compacted to not less than 95% of its maximum unit weight (ASTM D1557).

Backfill for sewers outside the limits of the roadbed or structures shall be suitable material excavated from the trench. Backfill placed within 12 inches of the pipe shall not contain stones larger than 2 inches. Sound earth, free from large stones and lumps, shall be carefully placed under and around the pipe in layers. Each layer shall be thoroughly compacted without displacing the sections, until the sewer is completely covered to a depth of at least 1 foot. The balance of the backfill shall be placed in layers, each layer shall be thoroughly compacted by hand tamping or approved mechanical methods.

Sewers shall be reasonably free of accumulation of silt debris and other foreign matter at the time of final acceptance.

2. Sewer Installation by Jacking

   Sewers shall be installed by jacking where shown on the approved plans and as approved by the applicable regulatory agency. Installation procedures shall be such that the roadbed or railroad above the sewer is not disturbed.

   The pipe shall be jacked into place according to the required line and grade, shown on the approved plans.

   The excavation ahead of the pipe shall be approximately 1 inch larger than the outside diameter of the pipe at the top and taper off towards the invert. The excavation shall not be carried ahead of the pipe far enough to cause caving of the earth. A steel cutting edge or shield may be attached to the front section of pipe to form and to cut the required opening for the pipe. The approach trench shall be large enough to accommodate at least one section of pipe, jacks, and blocking.

   Two rails or sills shall be laid in the bottom of the trench to keep the pipe at the established line and grade.

   Voids between the excavation and the pipe shall be filled using filler materials and placing methods, as approved by the City.

   Concrete pipe joints shall be protected from crushing due to jacking pressures. Upon completion of the jacking operations, joints shall be filled with mortar, wiped, and finished smooth. The joints shall be thoroughly wet before the mortar is placed.

3. End Sections

   End sections shall be attached to the ends of pipe culverts, where directed. Metal end sections shall be used on metal culverts and on smooth lined plastic pipe culverts. Concrete end sections shall be used on concrete pipe culverts. End sections shall be installed on firm ground. The slope adjacent to the end section shall be graded and shaped to meet the geometry of the end section.

4. Drainage Structures

   The Developer shall excavate to the depths and widths required for construction of drainage structures. Unsound material at the proposed structure bottom shall be excavated to the dimensions directed by the City and replaced with stone meeting the gradation of MDOT Class 6AA.

   Precast concrete units shall be placed on a 6 inch sand base or 6AA aggregate, leveled and thoroughly compacted. Joints shall be sealed with mortar. Joints shall be thoroughly wetted prior to sealing. The joints inside the structure shall be flush with the walls. Joints shall be completely filled with mortar.

   Pipe or tile connections to concrete drainage structures shall extend through the structure wall and be cut flush with the inside surface. The opening around the pipe shall be neatly filled with mortar to prevent leakage.

   The excavation for drainage structures shall be backfilled in layers not more than 12 inches in thickness. Backfill within the 1 on 1 influence of a roadbed or structure shall be backfilled with sand and compacted to at least 95% of its maximum unit weight (ASTM D1557).

   Drainage structure covers shall be new and adjusted to the finish elevation using precast concrete grade rings. Covers shall be of the types shown at the end of Section 1.1. Covers and grade rings shall be set in full mortar beds. Structure cones shall be either concentric or eccentric.

   Cover elevations given on the plans are for information only. The final elevation will be determined in the field, based on as-constructed conditions. All final elevations shall be approved by the City.

   Drainage structures shall be maintained reasonably free of accumulations of silt, debris, and other foreign matter at the time of final acceptance.

25.0 Water Main Specification

Section 25.01 General

The Contractor shall replace water mains and appurtenances in accordance with the plans and this special provision.

The Contractor shall protect existing utilities during construction, whether the existing utilities are shown on the plans or not. Utilities damaged by construction shall be repaired in a manner satisfactory to the Engineer and at the Contractor's expense. The Contractor shall call Miss Dig, 1-800-482-7171, for staking and locating the existing utilities.

The City of Milan Water Department will assist the Contractor in locating existing water service leads and mains.

The Contractor shall contact the City of Milan to schedule work that may interfere with existing water service. Approval of temporary shut off shall be obtained from the City of Milan.

Section 25.02 Materials

All materials supplied by the Contractor shall be new, meeting the specifications contained herein.

1. Pipe

   Water main shall be constructed of ductile iron pipe. Ductile iron pipe shall conform to ANSI/AWWA C151-17/A21.51. Ductile iron pipe shall be cement lined in accordance with ANSI/AWWA C150/A21.50.21 and pipe shall be Pressure Class 54, meeting NSF Standard 61, with mechanical joint, bell-and plan-spigot end.

   Pipe manufacturer, pipe weight, class, and year of casting shall be marked on each length of pipe.

   Joints shall be either push-on or mechanical type in accordance with ANSI/AWWA C111-17/A21.11, with working pressure rating of 350 psi. Provisions shall be made at each joint for electrical conductivity.

2. Fittings

   Fittings shall be ductile iron mechanical joints and shall be in accordance with ANSI/AWWA C110/A21.10 and ANSI/AWWA C111-17/A21.11. Fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4. Joints shall be provided with an electrical conductivity device. Glands, Gaskets and Bolts: AWWA C111, ductile iron glands, rubber gaskets, and ASTM A242- 81 “cor-ten” steel bolts and nuts.

   Restraint: All fittings and valves shall be mechanical joint restrained with Series 1100 “Megalug” by EBBA Iron, Series 1400 Wedge type restraints by Uni-Flange or Romac Industries. Thrust restraint length for fittings for ductile iron pipe shall follow DIPRA, and restraint may be accomplished with lock gasket slip joint pipe such as American Lok-Ring or Flex Ring and US Pipe Field-Lok or TR-Flex, or equal.

3. Fire Hydrants

   This item shall include the fire hydrant, an auxiliary valve (placed 3 feet from hydrant), valve box, all 6” water main, connector pieces and the hydrant tee. These items shall be installed in accordance with the standard construction practices and the standard fire hydrant detail.

   All fire hydrants shall be manufactured in accordance with standard AWWA C502 specifications and in accordance with the latest revised edition. Hydrants shall be provided as outlined in the details within the construction plans.

   Hydrants shall open to the left or "counterclockwise" with a five sided operating nut. Hydrant color shall be red.

   Hydrants shall be EJ or Mueller, meeting the City of Milan’s requirements. Contractor shall provide one repair kit.

4. Gate Valves & Boxes

   Gate valves shall be iron body, non-rising stem, resilient wedge seat type design. Gate valves shall meet or exceed AWWA C-509, latest revision. Gate valves shall have a vertical, non-rising stem.

   Gate valves shall be direct buried, with a two-inch operating nut, and open to the left.

   The stem shall be sealed by two "O" rings; one located above the thrust collar, the other located below. The area between the "O" rings shall be filled with a lubricant for providing proper lubrication to all working parts.

   The disc shall have an integrally cast ASTM B-621 Bronze Stem Nut. Loose or otherwise non- integral stem nuts or guides are not acceptable. The valve shall have a maximum of two moving parts.

   The seat ring shall seat into a fully machined seat and be made of natural rubber. Contractor shall provide one repair kit for every five (5) valves installed or portion thereof.

   Internal ferrous metal surfaces shall be fully coated to a minimum of 4 mil thickness, with a two- part thermosetting epoxy.

   Valves shall have full opening flow ways, of the same diameter as the adjacent piping.

   Valve shall be furnished with slip joints. Mechanical joints shall not be used unless permission is first obtained by the City of Milan.

   Valves shall be tested in accordance with AWWA C-509.

   Gate valves shall be EJ, Mueller, or approved equal. Each gate valve shall be furnished with a valve box.

   Valve boxes shall be cast iron. Cast iron lids shall be furnished with valve boxes and shall be marked “WATER” in raised letters. Cast iron boxes shall be of the three piece adjustable type. A number six base shall be furnished with all valves. Cast iron material shall meet requirements of ASTM A-126-B.

5. Tracing Wire

   Tracing wire shall be required for all pipe. For open cut the wire shall be 16 gauge blue with 30 mil coating with break load of 144 lb. For directional drilling wire shall be blue 12 awg, 45 mil coating and break load 1150 minimum.

6. Copper Pipe

   Water service leads shall be copper water tube, Type K, soft temper, for underground service, in accordance with ASTM B-88 **with compression joints (NO Flange Fittings Allowed)**. The pipe shall be marked with the manufacturer's name or trademark and a mark indicative of the type of pipe. The outside diameter of the pipe and minimum weight per foot of the pipe shall not be less than the listed in ASTM B-251, Table II. Copper pipe installed from the water main to the service box shall be 1 inch diameter, unless otherwise noted. Blue C9201 DR-9 IPS CTS SIDR 250 psi is allowed as an alternative to Copper for 1 ½" and 2" water services.

7. Curb Stops

   Curb stops shall be located at the street face of walks, or if no walk, at the property line. Curb stops shall conform to AWWA C800 and shall be Minneapolis pattern, Mueller H-15150, Clow F-4544, Ford B44-444M-NL for 1", B44-555M-NL for 1 ¼", B44-666M-NL for 1 ½", and B44-777M-NL for 2", or equal, stop and drain, with ¾ inch inlet and outlet and 2 inch Minneapolis Thread. Curb boxes shall be Mueller H-10300, 1-1/4 inch diameter for 1-inch stop of suitable length complete with lid No. 87590, Clow F-4580 with lid F-4586, Ford EM2-55-56/57/67, or equal. Cast iron material shall meet requirements of ASTM A-126-B. Bolt material shall meet requirements of ASTM B-316 and B-253.

Section 25.03 Construction Methods

All materials supplied by the Contractor shall be new, meeting the specifications contained herein.

1. Pipe

   Water main shall be constructed of ductile iron pipe. Ductile iron pipe shall conform to ANSI/AWWA C151-17/A21.51. Ductile iron pipe shall be cement lined in accordance with ANSI/AWWA C150/A21.50.21 and pipe shall be Pressure Class 54, meeting NSF Standard 61, with mechanical joint, bell-and plan-spigot end.

   Pipe manufacturer, pipe weight, class, and year of casting shall be marked on each length of pipe.

   Joints shall be either push-on or mechanical type in accordance with ANSI/AWWA C111-17/A21.11, with working pressure rating of 350 psi. Provisions shall be made at each joint for electrical conductivity.

2. Fittings

   Fittings shall be ductile iron mechanical joints and shall be in accordance with ANSI/AWWA C110/A21.10 and ANSI/AWWA C111-17/A21.11. Fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4. Joints shall be provided with an electrical conductivity device. Glands, Gaskets and Bolts: AWWA C111, ductile iron glands, rubber gaskets, and ASTM A242- 81 “cor-ten” steel bolts and nuts.

   Restraint: All fittings and valves shall be mechanical joint restrained with Series 1100 “Megalug” by EBBA Iron, Series 1400 Wedge type restraints by Uni-Flange or Romac Industries. Thrust restraint length for fittings for ductile iron pipe shall follow DIPRA, and

   restraint may be accomplished with lock gasket slip joint pipe such as American Lok-Ring or Flex Ring and US Pipe Field-Lok or TR-Flex, or equal.

3. Fire Hydrants

   This item shall include the fire hydrant, an auxiliary valve (placed 3 feet from hydrant), valve box, all 6” water main, connector pieces and the hydrant tee. These items shall be installed in accordance with the standard construction practices and the standard fire hydrant detail.

   All fire hydrants shall be manufactured in accordance with standard AWWA C502 specifications and in accordance with the latest revised edition. Hydrants shall be provided as outlined in the details within the construction plans.

   Hydrants shall open to the left or "counterclockwise" with a five sided operating nut. Hydrant color shall be red.

   Hydrants shall be EJ or Mueller, meeting the City of Milan’s requirements. Contractor shall provide one repair kit.

4. Gate Valves & Boxes

   Gate valves shall be iron body, non-rising stem, resilient wedge seat type design. Gate valves shall meet or exceed AWWA C-509, latest revision. Gate valves shall have a vertical, non-rising stem.

   Gate valves shall be direct buried, with a two-inch operating nut, and open to the left.

   The stem shall be sealed by two "O" rings; one located above the thrust collar, the other located below. The area between the "O" rings shall be filled with a lubricant for providing proper lubrication to all working parts.

   The disc shall have an integrally cast ASTM B-621 Bronze Stem Nut. Loose or otherwise non- integral stem nuts or guides are not acceptable. The valve shall have a maximum of two moving parts.

   The seat ring shall seat into a fully machined seat and be made of natural rubber. Contractor shall provide one repair kit for every five (5) valves installed or portion thereof.

   Internal ferrous metal surfaces shall be fully coated to a minimum of 4 mil thickness,

with a two- part thermosetting epoxy.

Valves shall have full opening flow ways, of the same diameter as the adjacent piping.

Valve shall be furnished with slip joints. Mechanical joints shall not be used unless permission is first obtained by the City of Milan.

Valves shall be tested in accordance with AWWA C-509.

Gate valves shall be EJ, Mueller, or approved equal. Each gate valve shall be furnished with a valve box.

Valve boxes shall be cast iron. Cast iron lids shall be furnished with valve boxes and shall be marked "WATER" in raised letters. Cast iron boxes shall be of the three piece adjustable type. A number six base shall be furnished with all valves. Cast iron material shall meet requirements of ASTM A-126-B.

5. Tracing Wire

   Tracing wire shall be required for all pipe. For open cut the wire shall be 16 gauge blue with 30 mil coating with break load of 144 lb. For directional drilling wire shall be blue 12 awg, 45 mil coating and break load 1150 minimum.

6. Copper Wire

   Water service leads shall be copper water tube, Type K, soft temper, for underground service, in accordance with ASTM B-88 **with compression joints (NO Flange Fittings Allowed)**. The pipe shall be marked with the manufacturer's name or trademark and a mark indicative of the type of pipe. The outside diameter of the pipe and minimum weight per foot of the pipe shall not be less than the listed in ASTM B-251, Table II. Copper pipe installed from the water main to the service box shall be 1 inch diameter, unless otherwise noted. Blue C9201 DR-9 IPS CTS SIDR 250 psi is allowed as an alternative to Copper for 1 ½" and 2" water services.

7. Curb Stops

   Curb stops shall be located at the street face of walks, or if no walk, at the property line. Curb stops shall conform to AWWA C800 and shall be Minneapolis pattern, Mueller H-15150, Clow F-4544, Ford B44-444M-NL for 1", B44-555M-NL for 1 ¼", B44-666M-NL for 1 ½", and B44-777M-NL for 2", or equal, stop and drain, with ¾ inch inlet and outlet and 2 inch Minneapolis Thread. Curb boxes shall be Mueller H-10300, 1-1/4 inch diameter for 1-inch stop of suitable length complete with lid No. 87590, Clow F-4580 with lid F-4586, Ford EM2-55-56/57/67, or equal. Cast iron material shall meet requirements of ASTM A-126-B. Bolt material shall meet requirements of ASTM B-316 and B-253.

Section 25.03 Construction Methods

1. Excavation

   The Contractor shall excavate all material to the depths necessary to construct the water main as shown on the plans. Excavation shall include the removal of rock, dirt, abandoned pipelines, old foundations, stumps and roots and similar materials encountered. Excavation, of whatever material encountered, shall be included in the contract unit prices for water main installation and will not be paid for separately. Pavement removal and restoration will be paid for at the contract unit prices for the appropriate item in accordance with the Standard Specifications and Supplemental Specifications.

   Excavated material that is suitable for backfill material shall be neatly piled adjacent to the excavation so as to prevent cave-ins of the excavation and damage to adjacent trees, shrubs, fences, and other property.

   The excavated area shall be kept free of water at all times. Sheeting and shoring shall be provided if necessary for the protection of the workers.

   Excavated material that is not to be used as backfill shall be disposed of by the Contractor.

   Backfilling shall follow immediately behind trench excavation and pipe laying operations. In no case shall more than 100 ft. of trench excavation be open at any one time. Any excavation left open and unattended shall be protected with lighted Type II barricades and a "snow fence" constructed around the perimeter of the excavation.

   The Contractor shall excavate to the depths required to construct the water main and appurtenances as described on the plans. For water main construction, trench excavation shall be to a depth sufficient to provide at least 5' cover over the top of the pipe and a four-inch sand cushion below the pipe. Over excavation will be at the Contractor's expense. The trench width at a level of twelve inches above the pipe shall be no greater than 32 inches in width.

   In areas where the proposed construction may interfere with existing utilities, additional excavation may be required to determine the exact location of said existing utilities. This work will be included within the water main pay items and no additional compensation will be due to the Contractor for this work.

   In some cases, the plans call for removing an existing water main or sewer in order to construct a new water main. The Contractor shall remove said existing pipelines and dispose of them at his expense.

   Open ends of an abandoned pipeline that is to be left in the ground shall be capped with a metallic cap and bulkheaded with one course of brick and mortar. Removal, disposal, and bulkheading of pipelines to be abandoned is included in cut and cap existing Water Main pay item.

2. Pipe Handling

   Pipe shall be handled in such a manner as to prevent the ends from splitting, damages to the protective coatings, and other undesirable conditions. Pipe shall not be dropped, skidded, or rolled into other conditions. Repairs to damaged pipe must be approved by the Engineer.

3. Pipe Cutting

   Pipe cutting shall be done in a neat and workmanlike manner without damage to the pipe or lining and as to leave a smooth end at right angles to the axis of the pipe. Cutting shall be done by an approved mechanical saw or cutter. Hydraulic squeeze cutters are not acceptable.

4. Pipelaying

   Pipe located inside structures shall be rigidly supported.

   Pipe laid underground shall be uniformly supported through its entire length on a four-inch cushion of sand. A depression shall be carved out of the sand cushion to accommodate the pipe bells.

   Pipe shall be inspected for defects, debris, or dirt while suspended in a sling prior to lowering it into the trench. Defective pipe shall be removed from the project site immediately. Lumps, blisters, and excess coal tar coating shall be removed from inside the bell and outside the spigot.

   These areas shall be wire brushed and wiped clean with a dry oil-free rag. No debris, tools, clothing, or other materials shall be allowed in the pipe.

   Pipe shall be laid in a dry trench with bell ends facing in the direction of laying. After placing a length of pipe in the trench, and after installing the gasket and applying the gasket lubricant, the spigot end shall be centered in the bell and the pipe pushed home and brought to the correct line and grade. The pipe shall be secured in place by tamping granular material Class II around it. Precautions shall be taken to prevent dirt from entering the joint space. A watertight plug shall be inserted in the open end(s) of the pipe to prevent water, dirt, animals, or other foreign matter from entering the pipe.

   When it is necessary to deflect pipe from a straight line, either horizontally or vertically, the deflection shall not exceed the following values:

Mechanical Joint	
Nominal Pipe Size (In.)	Maximum Deflection (In./18 ft. length)
6	19
8	19
12	19

5. Jointing

   Mechanical joints shall be installed in accordance with the joint manufacturer's recommendations. Copies of such recommendations shall be furnished to the Engineer prior to the start of construction.

6. Backfilling

   Backfilling shall be in accordance with the trench detail called for on the plans or as directed by the Engineer in accordance with the following:

   Trench detail G shall be used when part of the trench is within the 1 on 1 influence area of an existing or proposed roadway, sidewalk, building, or similar structure. The trench shall be backfilled with granular material Class II, in lifts of ten inches, and mechanically tamped to 95% of maximum unit weight.

   Trench detail F shall be used when the trench is not within the 1 on 1 influence area of a road or structure. The trench shall be backfilled with granular material Class II to a level of six inches above the top of the pipe and compacted to not less than 95% of maximum weight. The remaining portion of the trench shall be backfilled in twelve-inch lifts with suitable excavated material and compacted to at least 90% of maximum unit weight. Suitable excavated material used for backfill shall be free of rocks, debris, trees, stumps, broken concrete, and organic material. Backfill material shall not be saturated with water.

   Where the proposed water main crosses under an existing utility, the proposed water main shall be deflected above or below the existing utility in accordance with the following:

   a. Maintain 5'6" cover over top of proposed water main.
   b. Maintain at least 18” of vertical separation between the outside of the proposed water main and the outside of a sewer, drain pipe, or catch basin lead.
   c. Maintain at least one foot of vertical separation between the outside of the proposed water main and the outside of an existing utility other than a sewer, drain, or catch basin lead.
   d. When crossing an existing sewer, drain pipe, or catch basin lead, construct the proposed water main so that its joints are equidistant from the utility being crossed.

7. Valves

   a. General

      Valves shall be located as shown on the plans or as otherwise directed by the Engineer. Failure by the Contractor to locate said valves as called for will require that the Contractor correct the error at his own expense.

   b. Setting Valves

      Valves shall be examined by the Contractor prior to lowering in the trench. Check all nuts and bolts to assure tightness.

      Valves shall be installed with the valve closed, supported on two 2" x 6" x 18"

hardwood blocks, and vertically plumb. The valve box shall be set plumb and its axis shall be in line with the stem. Valve boxes shall have the ability for future adjustments of up to 6 inches, above or below grade.

c. Reaction Backing

All tees, bends, and other fittings that may be subjected to unequal thrust shall be restrained using mechanical joint fittings with retainer glands.

8. New Services and Reconnections

Water services shall be constructed where shown on the plans or where directed by the Engineer.

Water services shall be constructed after the main has been tested, chlorinated, and approved by the Engineer.

Each water service pipe shall be connected to the water main through a brass corporation stop. The water main shall be drilled and tapped under pressure by use of a tapping machine with a combination drill and tap of the appropriate size for the connection being installed.

After tapping the main and installing the corporation stop, the tap shall be tested by turning the corporation on and off. Any leakage detected visually shall be corrected by the Contractor.

The service lead shall be constructed of Type K, copper pipe. Service leads shall be 3/4 inch diameter unless otherwise called for on the plans or directed by the Engineer. The copper pipe shall be laid such that there is at least 18 inches of slack in the service line at the main. In other words, the first three feet of trench adjacent to the main shall have at least 4 1/2 feet of copper pipe laid in it.

All joints of copper pipe shall be flanged joints. After the copper pipe is in place and connected to the curb stop, the line shall be visually checked for leaks by closing the curb stop and opening the corporation stop.

The Contractor shall leave the corporation stop in the open position and close the curb stop unless directed otherwise by the Engineer. The curb box shall be installed on the curb stop such that its height is adjustable at least six inches above and below grade.

Where an existing service lead is to be reconnected to a new main, new copper pipe shall be placed to the right-of-way line or to the point directed by the Engineer. At this point, a suitable connection shall be made from the new copper to the existing lead, of whatever size and material that may be encountered. The cost of the connection to the existing material shall be incidental to the project. The new copper pipe shall be no less than the size of the existing lead; 1 inch diameter shall be a minimum.

The excavation resulting from water service construction or reconnections shall be backfilled by the Contractor with granular material Class II, compacted to not less than 95% of maximum unit weight.

Where the excavated area is not within the 1 on 1 influence of an existing or proposed roadway or suitable excavated material may be used as backfill, compacted to not less

than 90% of maximum unit weight.

Services to be installed by boring shall be installed in a manner approved by the Engineer. Over excavation of the borehole will not be allowed.

9. Water Service Abandonments

   Where called for on the plans or directed by the Engineer, existing water services shall be disconnected from the existing main. The Contractor shall excavate as necessary to locate the point at which the service connects to the existing main. At that point, the Contractor shall disconnect the service and close the corporation. The excavated area shall be backfilled by the Contractor with granular material Class II, compacted to not less than 95% of maximum unit weight.

   Where the excavated area is not within the 1 on 1 influence of an existing or proposed roadway or railroad track and at least 6 inches above the main, suitable excavated material may be used as backfill compacted to not less than 90% of maximum unit weight.

   The City Water Department will assist the Contractor in locating existing water services.

10. Hydostatic Pressure Test

    All new construction shall be subjected to a hydrostatic pressure test. Testing should be performed as soon as possible after construction on a section is complete.

    The Contractor shall provide all equipment, materials, and labor necessary to perform the tests, including pumps, gauges, plugs, corporations, excavation and backfill, water, miscellaneous piping and fittings, and a means of measuring the volume of water lost.

    The Contractor shall fill the main with water through hydrants or corporations. Air shall be bled off at the ends and at highpoints through corporations or hydrants. The Contractor shall plug all taps made solely for the pressure test by inserting brass plugs.

    Water shall be added until the hydrostatic pressure at the highest point of the main is at least 150 psig.

    The Engineer shall be notified two hours prior to testing and shall witness the test and determine the leakage over a two hour period.

    Water shall be added as necessary throughout the two hour test period to maintain a uniform pressure of 150 psi, plus or minus 5 psi.

    At the end of the two hour period, the total volume of water added to maintain the required test pressure will be determined and will be the actual leakage in a two hour period.

    The allowable leakage rate will be determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

Where:

L = Testing allowance (makeup water) (gph)
S = Length of pipe tested (ft)
D = Nominal diameter of the pipe (inches)
P = Average test pressure during the hydrostatic test (psi [gauge])

If the actual leakage rate exceeds the allowable leakage rate, the Contractor at his own expense, shall locate and repair the leak(s). The test process shall be repeated until satisfactory results are obtained.

Section 25.04 Sterilization

1. General

    a. All pipe and fittings connected to and forming a part of a potable water supply shall be sterilized in accordance with the AWWA Standard C651-14.

    b. Generally, sampling taps shall be provided on the water main every five hundred (500) feet, in order to afford representative water testing and sample collection. When long transmission mains are constructed, without side connections, the distance between each tap may, at the discretion of the Engineer, be increased. In all instances, however, sampling taps shall be provided to collect a source sample and enough representative water samples for laboratory examination.

2. Preliminary Flushing

    The main shall be flushed prior to sterilization as thoroughly as possible with water pressure and outlets available. The main shall be flushed from the north gate valve first with the south gate valve closed, the north valve shall then be closed and the south valve opened. After the flushing is completed the plug for the 8 inch tee shall be installed. The minimum velocity in the main shall be 2.5 fps. The flushing operation shall be done after the pressure test has been made.

3. Disinfecting

    a. Before being placed in service, all mains and existing piping disturbed in any manner by the work shall be disinfected in accordance with the AWWA Standard C651-14. Drawing the water from existing piping or even lowering the water pressure more than one-half will constitute disturbances of the piping.

    b. The disinfecting of water mains, valves and other appurtenances incorporated into the main construction shall be done in accordance with the AWWA Standard 651-14.

    c. During the disinfecting operation, valves, hydrants and other mechanical devices controlling the water shall be operated to permit full effectiveness of the disinfectant. Valves shall be manipulated so that the strong solution within the main being sterilized will not flow back into the supply line nor flow into mains already in service.

4. Final Flushing and Tests
    a. After the required period of retention has elapsed, the heavily chlorinated water shall be flushed out completely discharged to the sediment basin by the Contractor until the replacement water throughout the length of the main shall, upon test, be proven comparable in quality to the water supply source.
    b. When the water in the treated main shall have been proven comparable to that of the source, at least 2 safe bacteriological samples collected at least 24 hours apart must be obtained from every 500 feet sections of WM, must be obtained before placing each section WM section in service. Samples shall be taken in the presence of the City. Under no circumstances shall such samples be collected from hydrants or unsterilized hose connections. Should the results of the bacteriological examination prove satisfactory, the main shall be placed in service. Should the initial disinfecting fail to result in approval, the disinfecting procedure shall be repeated until satisfactory results are obtained.
    c. Bacteriological samples must be picked up by the Contractor and run by a commercial other laboratory, approved by the Engineer, employed and paid by the Contractor.
5. Disinfection

    The Developer shall flush the water main with potable water until discharge from the main runs clear. The main shall be chlorinated in accordance with AWWA C651. After the chlorination procedure is completed, the water main shall be flushed again until the chlorine content is equal to that of the water being supplied. Sixteen hours or longer after the flushing, the Developer may begin collecting samples for bacteriological analysis. Samples shall be collected at 24 hour intervals until 2 consecutive satisfactory results are obtained. Samples shall be collected at the end opposite the chlorine injection, except that in long lines or where contamination is suspected, the City may require other sampling points. Where satisfactory results are not obtained, the main shall be re-flushed, disinfected, and retested until satisfactory results are obtained.

26.0 Landscape Specification

Please provide all details and specifications, as noted below, when submitting plans for review and approval. Specifications are to be included in note form on the landscape plans unless the item(s) does (do) not apply to your project.

Section 26.01 General Requirements

1. Landscape plans are to be prepared by a registered landscape architect for all projects.
2. Provide name, address and signed seal with registration number on plans. Irrigation plans shall be prepared by a qualified irrigation designer. Recommendations are available upon request.

3. Existing and proposed structures/utilities on the project site and existing

structures/utilities within 100' of the project site are to be located on the landscape plan. This includes all buildings, overhead utilities, exact location of existing trees on site within 25' of project site on adjacent properties.

4. Minimum plant material sizes are as follows:
    a. Shade/Canopy Trees 2" caliper
    b. Ornamental/Flowering Trees 2" caliper
    c. Evergreen Trees 6 – 7' ht.
    d. Flowering Shrubs 18 – 36" ht. (depends on species)
    e. Evergreen Shrubs 18 – 24" ht./spread (depends on species)
    f. All plant material to be nursery grade #1.
5. Provide all applicable details on the plan including canopy tree, flowering tree, evergreen tree, shrub and ground cover planting details, berm and planter details and any other deemed necessary to property construct the landscape job.
6. Provide detailed cross-sections of earth berms, raised planters and post installations. Berm cross- sections are to show proposed heights, slope dimensions and fill/topsoil depths. Planters, posts and walls should be constructed with stone, brick, concrete or wolmanized timbers 6' x 8" dimensions (specify treatment) and with proper detailed footings.

Section 26.02 Specifications to be Noted on Plans

Exceptions to the following specifications will be considered if acceptable alternates are discussed with the City of Milan prior to landscape installation. Additional specifications are to be added by the landscape architect as needed.

1. Prior to any land clearing or construction, tree protection fencing is to be installed by the contractor and inspected by the City, see Appendix D for drawing. This fencing shall be installed at the drip line of all trees and shrubs, in accordance with the City's Tree Protection Detail, and must be maintained as approved for the duration of the project. No cutting, filling or trespassing shall occur inside the fenced areas without prior approval from the City.
2. Trees to be transplanted on the site shall be so marked in the field by the contractor, approved by the City of Milan and transplanted using only the appropriate size tree spade, per the American Association of Nurserymen and City of Milan Standards. Transplants are to be watered immediately following planting.
3. Trees shown on the plan to save or transplant that are removed or damaged shall be replaced with one (1) 2"-3" caliper tree for each tree removed under 6" diameter. Trees over 6" diameter shall be replaced with one (1) 2"-3" caliper tree for each 6" in diameter removed. Type of replacement and location shall be determined by the project landscape architect or the City of Milan.

4. Plant trees and shrubs no closer than the following minimum distances from sidewalks, curbs and parking stalls:
    a. Shade/Canopy Trees, 5 feet
    b. Ornamental/Flowering Trees, 10 feet
    c. Evergreen Trees, 10 feet
    d. Evergreen/Flowering Shrubs, 4 feet
5. Dig shrub pits a minimum of 1' larger than shrub root balls and tree pits 2' larger than root balls. Backfill with one part topsoil and one part soil from the excavated planting hole. Plant trees and shrubs at the same grade level at which they were planted at the nursery. If clay soils are evident, and water is standing, plant trees and shrubs higher.
6. Remove all twine, wire and burlap from the top 1/3 of tree and shrub earth balls and from tree trunks. Remove all non-biodegradable material such as plastic or nylon completely.
7. Lawn trees are to be mulched with a minimum of 6' wide by 3" deep shredded bark rings or approved design for trunk protection. Only natural-colored shredded hardwood bark mulch will be accepted.
8. Shrub beds are to be mulched with shredded bark mulch to a minimum depth of 3". Only natural- colored shredded hardwood bark mulch will be accepted.
9. Sod is to be provided for all existing lawn areas that the owner intends to save and areas that are damaged during construction. The sod must be inspected by the City to determine viability. If the existing lawn is found to be level, healthy, dense and free from weeds, lawn may not require replacement or renovation. If renovation is required or is part of the approved plan, then the following requirements will apply:
    a. Existing lawn found to be in poor condition must first be sprayed with Round-Up (or equal) to kill the existing lawn and weed areas. Wait for a minimum period of seven (7) days for the herbicide to take effect, then remove all dead sod and weeds to a minimum depth of two (2) inches. Add a minimum of four (4) to six (6) inches of new topsoil to all lawn areas. Back fill and compact topsoil to the top of all curbs and walks prior to sodding. Re-grade to eliminate all bumps and depressions and re-sod all areas.
    b. Existing lawn found to be generally in good condition but with bare, sparse or weedy areas must be renovated by filling in low areas, raking, over seeding and top dressing all sparse and bare spots and by initiating a weed and feed program.
10. The contractor shall backfill directly behind all curbs and along sidewalks and compact to the top of curb or walk to support vehicle and pedestrian weight without settling. All landscape areas, especially parking lot islands and landscape beds next to buildings shall be excavated of all building materials and poor soils to a depth of 12"– 18" and backfilled with good, medium textured planting soil (loam or light yellow clay). Add 4"– 6" of topsoil over fill material and crown a minimum of 6" above top of curbs and/or walks after earth settling unless otherwise noted on the landscape plan.

11. In natural areas the following procedures shall be followed:
    a. Remove any trees and brush per City of Milan direction only.
    b. Remove trash and perform surface grading (if any) only to fill in the worst low spots. Do not cut or fill around trees.
    c. Rake, hydroseed and mulch bare ground areas with proper seed mix (shade or sunny mix).
    d. Let area revert to trees and shrubs. Mow very minimally, if necessary.
12. Landscape berms are to be constructed of light yellow clay or loam soils and are to be free of construction materials and debris. Use of heavy clays for berm construction must be approved by the City of Milan prior to installation. Slopes are to be no steeper than 1:3 unless otherwise specified on the landscape plan.
13. Conversion of all asphalt and gravel areas to landscape shall be done in the following manner:
    a. The contractor shall remove all asphalt, gravel and compacted earth to a depth of 6 – 18”; depending on the depth of the subbase and dispose of offsite for an inspection prior to backfilling.
    b. Replace excavated material with good, medium textured planting soil (loam or light yellow clay) to a minimum of 2” above top of curb and sidewalk, add 4–6” of topsoil and crown to a minimum of 6” above adjacent curb and walk after earth settling, unless otherwise noted on the landscape plan.
14. All existing trees on site and in the right-of-way shall be pruned as directed by the City to remove dead, dying and hazardous limbs or to remove limbs which impede construction, driveways and sidewalks. Pruning and deep-root fertilizing is to be done only by a qualified, licensed tree service company.
15. The construction of detention basins should be made with the following goals in mind:
    a. Natural, with free form appearing grades
    b. Slopes of 1:4 or flatter
    c. No fencing
    d. No water levels to be retained
    e. Mow slopes and let bottom of basin revert to natural vegetation
16. Provide continuous curbing around all landscape areas on site. Alternate landscape area protection such as decorative fences, retaining walls, etc., may be acceptable in lieu of curbing or may be required in addition to curbing to protect the landscape areas and properly deflect vehicular and pedestrian traffic.

27.0 Administration and Enforcement

Section 27.01 Enforcement

The provisions of this Ordinance shall be administered and enforced by the Director of Public Works or by such deputies of his department as the Director of Public Works.

Section 27.02 Violations and Penalties

Except as expressly stated otherwise in this document, any person, persons, firm or corporation, or anyone acting in behalf of said person, persons, firm or corporation violating any of the provisions of this document shall be guilty of a misdemeanor, and upon conviction thereof, shall be subject to a fine of not more than $5,000 and the cost of prosecution, or by both such fine and imprisonment at the discretion of the court. Each day that a violation is permitted to exist shall constitute a separate offense. The imposition of any sentence shall not exempt the offender from compliance with the requirements of this document.

Section 27.03 Cumulative Rights and Remedies

The rights and remedies provided herein are cumulative and in addition to any other remedies provided by law.

Appendix A – Site Design Review Checklist

City of Milan

Checklist for Site Plans

The following checklist is intended to serve as a guide for designers to review prior to submitting plans to the City for review. While this checklist covers all major areas that will be reviewed by the City and/or their chosen consulting engineer, this list is not all-inclusive, and the City Engineer may comment on items not listed herein.

General Information

Development Team information including Petitioner's/Owner's names, addresses, telephone numbers, and email addresses.

Title block with the name, address, telephone number and email address of the site plan preparer as well as project name and date, as well as revision dates.

A location map drawn at a scale of not greater than 1" =20' nor less than 1" =200'. A north arrow shall be indicated on all pages.

A brief project description shall be provided on the plans.

Topography

A complete topographical survey is required for all proposed projects. A metes and bounds legal description of the project site shall be provided on the plans. General description of any deed restrictions, if any, shall be included. Property lines shall be indicated by bearing and distance in the plan view. All existing easements shall also be shown on the plan view of the existing conditions.

A minimum of two (2) benchmarks are required. All benchmarks shall be clearly indicated on the plans. All benchmark elevations shall be to North American Vertical Datum 1988 (NAVD '88).

Existing offsite elevations must be given at a minimum of 50 feet and 100 feet abutting the entire perimeter of the site. Grades will be indicated at all property corners and along all property lines. Onsite, intermittent elevations and/or defined contours (minimum contour interval of 2 feet), are required to establish the existing site drainage.

Existing features shall be located and shown within 100 feet of the project. Existing features to be shown shall include, but may not necessarily be limited to the following items:

Ditches
Culverts
Water supply systems, stormwater management, and/or sanitary sewer facilities, including inverts and casting elevations at all structures.
Gas, telephone, electric, and cable television lines, including manholes and/or utility poles.
Pedestrian facilities
Trees and other landmark vegetation.
All streams, lakes, and/or county drains with names shown.

Existing adjacent roads and existing right-of-way or easement lines shall be shown on the plans and shall extend across the entire site with grades shown on both sides of the road for:

Right-of-way or easement line.
Ditch centerline.
Top of bank.
Edge of shoulder.

Existing adjacent roads and existing right-of-way or easement lines shall be shown on the plans and shall extend across the entire site with grades shown on both sides of the road for:

Right-of-way or easement line.
Ditch centerline.
Top of bank.
Edge of shoulder.
Edge of pavement or top of curb.
Crown or centerline.

Water Supply System

Water infrastructure improvements specified in the City of Milan Water Reliability Study (latest version) may be required as part of the project. The applicant shall contact the City Engineer to determine if any improvements called for in the City Water Reliability Study will be necessary.

The minimum size water main allowed for use in the distribution system shall be 8" diameter. Water mains shall be looped. Where dead ends are unavoidable, the following must be met: all mains must end with a gate valve followed by a hydrant. Maximum allowable dead-end main lengths are:

60' for 6" diameter fire hydrant service pipe. If hydrant leads exceed 40', 8" diameter water main shall be used and reduced to 6" prior to attaching the hydrant.
600' for 8" diameter water distribution mains (residential areas only).
1,000' for 12" diameter and larger water distribution mains.

Show water service and size; no private services allowed from 6" hydrant lead or water mains larger than 16" diameter.

Where required, a dedicated easement must be shown on the plans. These easements shall be either twice the depth of bury, plus the diameter of the pipe, plus 2-feet (rounded up to the nearest whole foot) or 20', whichever is greater.

Where the water main is adjacent to and parallel to the right-of-way, a water main easement must be extended across the entire frontage of the property.

A 10-foot horizontal separation must be maintained between the water main and the sanitary/storm sewers.

Valve spacing:

Three (3) valves can be closed to isolate any section of water main, four (4) maximum.
No more than 800 feet of main out of service for 8" water mains, not more than ¼ mile of water main out of service for mains 12" and larger.
No more than two (2) hydrants out of service.
No more than 24 single-family units or 30 multiple-family units out of service.

For major commercial and industrial developments, building services must be maintained from a looped system with valves located on either side of the building service.

Fire hydrants shall be located to provide 250-foot radial coverage of all existing and proposed permanent structures.

No parking within ten (10) feet of a hydrant.

Sanitary Sewers

Sanitary sewer infrastructure improvements specified in the City of Milan SRF Project Plan may be required as part of the project. The applicant shall contact the City Engineer to determine if any improvements called for in the City SRF Project Plan will be necessary.

Preliminary basis of design calculations shall be provided on the plans.

Where required, a dedicated easement must be shown on the plans. These easements shall be either twice the depth of bury, plus the diameter of the pipe, plus 2-feet (rounded up to the nearest whole foot) or 25', whichever is greater.

Show building lead size and location as well as other proposed sewers.

Stormwater Management Systems

Preliminary design calculations prepared in accordance with these standards shall be provided on the plans.

Restricted discharge rates and/or improvements to downstream drainage courses may be required as determined by the City. The applicant shall contact the City Engineer to determine what design criteria will apply to the proposed project.

Proposed collection points, system layout, sizes, and outlets must be shown on the site plan. Preliminary invert elevations and top of casting elevations must also be shown.

Where required, a minimum 12-foot wide easement for open rear or side yard drainage, a minimum 20-foot wide easement for enclosed storm drains, and a minimum 30-foot wide easement for open cross lot drainage swales shall be shown on the plans.

Paving Improvements

All roads must conform to these standards as specified herein.

Onsite paving requirements:

Pavement cross-section must be shown in accordance with the City requirements.
Bituminous pavements shall have a minimum slope of 1.0% and a maximum slope of 6.0%
Concrete pavements shall have a minimum slope of 0.5% and a maximum slope of 6.0%.
Minimum drive widths and parking lot dimensions per City Standards.

Sidewalks are required along the frontage of all existing and proposed roads. The following requirements shall be met for proposed sidewalks:

Sidewalks shall be located one (1) foot inside the ultimate right-of-way (ROW) line.

Barrier free ramps shall be noted.

All structures, hydrants, poles, etc., noted and moved or adjusted, as necessary.

Bike paths may be required in lieu of sidewalks along the frontage of major roads.

Site Grading and Earthwork

Sufficient proposed grades indicated to ensure that:

Drainage is adequately discharged offsite with proper detention.

No upstream drainage is restricted.

The site, in general, drains without standing water.

Elevation representing the finished grade (F.G.) and the first floor (F.F.) grade must be indicated. Each elevation shall be clearly labeled as either finished grade (F.G.) or first floor (F.F.) grade.

Proposed grading shall meet abutting property line elevations. A maximum slope of 1 vertical to 4 horizontal (1:4) may be employed to meet existing grades at property lines.

Easement(s) from adjacent property owner(s) will be required for any grading necessary on offsite property. All offsite easements required to complete the work shall be obtained prior to the start of construction.

CITY OF MILAN
BILLS PAYABLE & PAYROLL
19-Mar-24

PAYROLL:

03/12/2024 Special Payroll: On Call #1030	$	19,192.25
03/15/2024 Regular & Elections Payroll # 1031	$	116,913.29
TOTAL PAYROLL		**$136,105.54**

ACCOUNTS PAYABLE:

03/19/2024 Accounts Payable	$235,925.61
TOTAL PAYABLES	**$235,925.61**
GRAND TOTAL	**$372,031.15**

INVOICE DISTRIBUTION REPORT FOR CITY OF MILAN

EXP CHECK RUN DATES 03/07/2024 - 03/20/2024
POSTED AND UNPOSTED
OPEN AND PAID

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 101 GENERAL FUND					
Department: 172 ADMINISTRATIVE					
101-172-831.000	MML RENEWAL FEES-LANCASTER	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	425.00	313
101-172-860.000	MICH MUNICIPAL EXECUTIVES	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	300.00	313
101-172-860.000	MME CONF LODGING	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	181.53	313
101-172-860.000	MME CONF PARKING	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	30.00	313
101-172-860.000	MME CONF LODGING	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	181.53	313
			Total Department 172 ADMINISTRATIVE	1,118.06	
Department: 210 CITY HALL					
101-210-727.000	CITY HALL WORKSTATION	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	116.99	309
101-210-727.000	OFFICE /BLDG SUPPLIES FOR	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	22.76	309
101-210-727.000	COFFEE PODS FOR	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-WENZEL	15.96	310
101-210-727.000	OFFICE SUPPLIES-BINDERS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	30.91	313
101-210-727.000	OFFICE SUPPLIES-MASTER	STAPLES BUSINESS CREDIT	POST ITS/LEGAL PADS/COPY PAPER/LABELS	386.56	None
101-210-728.000	POSTAGE	QUADIENT FINANCE USA, INC	POSTAGE MACHINE - POSTAGE RELOAD	4,730.78	None
101-210-775.000	PLASTIC FILE FOLDERS-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	9.99	309
101-210-803.000	AUDIT FEES/ ACCOUNTING	GABRIDGE & COMPANY, PLC	FISCAL YEAR 2023 AUDIT	15,025.29	None
101-210-818.000	OUTFRONT MEDIA-BILLBOARD	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	420.00	309
101-210-818.000	CONTRACTUAL SERVICES	COMCAST	CABLE SERVICE FOR CITY HALL-3/15-	128.31	None
101-210-900.000	PRINTING & PUBLISHING	MLIVE MEDIA GROUP	PUBLISHING OF PUBLIC NOTICES-FEB 2024	640.25	None
101-210-900.000	PRINTING & PUBLISHING	BEDFORD TOWNSHIP	2/27/2024 ELECTION PUBLICATIONS	58.11	None
101-210-941.000	OFFICE MACHINE LEASES-CITY	KONICA MINOLTA PREMIER	OFFICE MACHINE LEASES-COPIERS-2/16-	401.83	None
			Total Department 210 CITY HALL	21,987.74	
Department: 215 CLERK/ELECTIONS					
101-215-860.000	TRANSPORTATION &	LAVONNA WENZEL	MILEAGE REIMBURSEMENT 11/7/23-2/27/24	252.18	None
101-215-860.000	TRANSPORTATION &	STACY CLEGGET	MILEAGE REIMBURSEMENT-FEB 2024	64.32	None
101-215-958.000	QVF ELECTION SCANNER	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	50.00	309
101-215-958.400	PASSPORT FACILITY EXP-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-WENZEL	107.75	310
			Total Department 215 CLERK/ELECTIONS	474.25	
Department: 228 INFORMATION TECHNOLOGY					
101-228-740.000	OPERATING SUPPLIES-IT	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	901.99	316
101-228-740.000	BUBBLE WRAP FOR PACKAGES	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	16.99	316
101-228-740.000	IT SERVICES LAPTOP MEMORY	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	69.34	316
101-228-850.000	DUO SECURITY-MFA MTHLY	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	60.00	312
101-228-850.000	CITY ZOOM ACCOUNT	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	84.69	312
101-228-850.000	COMMUNICATION	VERIZON WIRELESS	CITY WIDE CELL SERVICE-1/24-2/23/24	1,422.88	None
101-228-852.000	CLOUD EMAIL EXPENSES	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	189.54	312
101-228-852.000	CLOUD EMAIL EXPENSES	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	18.00	312
			Total Department 228 INFORMATION TECHNOLOGY	2,763.43	
Department: 253 TREASURER/FINANCE					
101-253-860.000	MMTA CONFERENCE-FINCH	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	599.00	309
			Total Department 253 TREASURER/FINANCE	599.00	
Department: 265 BUILDING MAINTENANCE					
101-265-921.301	ELECTRICITY-POLICE STATION	DTE	0 BOBWHITE/GOLDFINCH-SIREN-ELECT-	32.92	None
101-265-921.301	ELECTRICITY-POLICE STATION	DTE	35 NECKEL CT-GAS & ELECT-2/6-3/6/24	1,079.51	None
101-265-921.441	ELECTRICITYDPW BLDGS	DTE	50 NECKEL CT-ELECT-2/6-3/6/24	280.95	None
101-265-923.301	HEAT EXPENSES-POLICE	DTE	35 NECKEL CT-GAS & ELECT-2/6-3/6/24	353.17	None
101-265-936.000	TV HARDWARE	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	4.36	311

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 101 GENERAL FUND					
Department: 265 BUILDING MAINTENANCE					
101-265-936.000	PURCHASE OF TV	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	379.99	311
101-265-936.210	COMMERCIAL VACUUM FOR CITY	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	145.59	309
101-265-936.210	CITY HALL WORKSTATION	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	221.99	309
101-265-936.301	SEWER REPAIR AT THE PD-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	525.00	313
101-265-936.301	REPAIR & MAINTENANCE	ARAMARK	BLANKETS/MATS/MOPS FOR THE POLICE	771.64	None
101-265-936.441	REPAIR & MAINTENANCE DPW	ARAMARK	APRONS/MATS/MOPS/ROLL & SHOP	400.19	None
101-265-936.672	RETURN OF ICE MACHING	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	(23.99)	317
101-265-936.672	REPAIR & MAINT-THE CENTER-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	17.00	317
101-265-936.672	REPAIR & MAINTENANCE-THE	ARAMARK	MATS/MOPS FOR THE CENTER	501.29	None
			Total Department 265 BUILDING MAINTENANCE	4,689.61	
Department: 301 POLICE					
101-301-710.000	UNIFORM REPLACEMENT	ON DUTY GEAR, LLC	DC BADGE	105.00	None
101-301-710.000	UNIFORM REPLACEMENT	ON DUTY GEAR, LLC	FLEX BADGES	117.00	None
101-301-710.000	UNIFORM REPLACEMENT	ON DUTY GEAR, LLC	OFC EVANT PANTS	194.98	None
101-301-710.000	UNIFORM REPLACEMENT	ON DUTY GEAR, LLC	BADGE	90.00	None
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	33.71	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	29.70	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	19.58	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	31.57	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	12.46	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	19.35	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	12.68	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	14.99	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	21.96	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	21.72	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	16.33	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	30.20	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	27.13	314
101-301-760.300	FUEL COSTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-POLICE DEPT	32.22	314
101-301-775.000	ANTIBACTERIAL WIPES	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	43.95	311
101-301-775.000	ANTIBACTERIAL SOAP	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	77.54	311
101-301-775.000	ID CARD PRINTER RIBBON	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	199.17	311
101-301-775.410	CAMERAL UPLOAD	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	15.00	311
101-301-775.410	OTHER SUPPLIES-JOINT	DTE	13551 N SANFORD RD-ELECT-1/31-3/1/24	274.75	None
101-301-810.000	LIVESCAN FINGERPRINTING	MICHIGAN STATE POLICE	LIVESCAN FEES	216.25	None
101-301-818.000	CLOUD BADGING YRLY	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	239.88	311
101-301-818.000	CONTRACTUAL SERVICES	TRANSUNION RISK &	CONTRACTUAL SERVICES	140.00	None
101-301-818.000	CONTRACTUAL SERVICES	WASHTENAW COUNTY TREASURER	MAR24 DISPATCH SERVICES	5,994.67	None
101-301-818.000	CONTRACTUAL SERVICES	COMCAST	CABLE SERVICE FOR THE POLICE DEPT-	288.68	None
101-301-930.000	NUC COMPUTER	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	485.00	311
101-301-930.000	LED HEADLIGHT BULBS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	49.99	311
101-301-930.000	MDC CABLE	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-IT SERVICES	9.99	316
101-301-930.000	REPAIR & MAINTENANCE	MULLINS AUTO SUPPLY	CAR 3-18 4 TIRES MOUNT AND BALANCE	80.00	None
101-301-941.000	OFFICE MACHINE LEASES-	KONICA MINOLTA PREMIER	OFFICE MACHINE LEASES-COPIERS-2/16-	401.83	None
101-301-960.000	SGT ARCHER WEIGHT TRAINER	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	674.00	311
101-301-960.100	IN-SERVICE TRAINING-SGT	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	350.00	311
			Total Department 301 POLICE	10,371.28	
Department: 336 FIRE					

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 101 GENERAL FUND					
Department: 336 FIRE					
101-336-705.001	FIRE RUNS	MILAN AREA FIRE DEPARTMENT	JULY 2023 INCIDENT RUNS	4,021.21	None
101-336-932.000	VALVE REPLC AT FIRE DEPT-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	442.62	313
			Total Department 336 FIRE	4,463.83	
Department: 371 BUILDING DEPARTMENT					
101-371-818.000	CONTRACTUAL SERVICES	DAVID TUBBS	ELECTRICAL INSPECTIONS-FEB 2024	540.00	None
101-371-818.000	CONTRACTUAL SERVICES	JEFFREY FELDKAMP	PLUMBING/MECHANICAL INSPECTIONS-FEB	450.00	None
101-371-818.000	CONTRACTUAL SERVICES	YORK TOWNSHIP	BLDG DEPT SERVICES-FEB 2024	2,115.00	None
101-371-818.000	CONTRACTUAL SERVICES	WARREN M WISNER	PLUMBING/MECHANICAL INSPECTIONS-FEB	1,080.00	None
			Total Department 371 BUILDING DEPARTMENT	4,185.00	
Department: 372 RENTAL INSPECTION					
101-372-818.000	CONTRACTUAL SERVICES	CARLISLE WORTMAN	ADMIN WORK FOR RENTAL PROGRAM-FOIA	60.00	None
101-372-818.000	CONTRACTUAL SERVICES	CARLISLE WORTMAN	RENTAL INSP PRGM-DEC 2023 INSPECTIONS	12,220.00	None
101-372-818.000	CONTRACTUAL SERVICES	CARLISLE WORTMAN	RENTAL INSP PRGM-MISC SERVICES-FEB	170.00	None
101-372-818.000	CONTRACTUAL SERVICES	CARLISLE WORTMAN	RENTAL INSPECTIONS-FEB 24	5,450.00	None
101-372-818.000	CONTRACTUAL SERVICES	CARLISLE WORTMAN	RENTAL INSPECTION-CONSULT SERV-FEB 24	62.50	None
			Total Department 372 RENTAL INSPECTION	17,962.50	
Department: 441 DEPARTMENT OF PUBLIC WORKS					
101-441-818.000	CONTRACTUAL SERVICES	ARAMARK	APRONS/MATS/MOPS/ROLL & SHOP	37.53	None
101-441-818.000	CONTRACTUAL SERVICES	ARAMARK	UNIFORMS FOR THE DPW	48.03	None
101-441-818.000	OFFICE MACHINE LEASES-DPW	KONICA MINOLTA PREMIER	OFFICE MACHINE LEASES-COPIERS-2/16-	401.83	None
101-441-821.000	CONTRACTUAL SERV.-	ORCHARD, HILTZ &	TACO BELL ENGINEERING REVIEW	513.50	None
101-441-886.100	BEAUTIFICATION COMM.	DENISE KOLAR	TO REIMB FOR PURCH OF FALL PLANTING	50.88	None
101-441-921.000	ELECTRICITY	DTE	STREET LIGHTING/TRAFFIC SIGNALS-FEB	8,840.54	None
101-441-921.000	ELECTRICITY	DTE	3 E MAIN REAR-ELECT-1/24-2/22/24	17.63	None
101-441-921.000	ELECTRICITY	DTE	62 PARK LN-ELECT-2/8-3/6/24	17.63	None
101-441-922.100	STREET LIGHTING	DTE	896 DEXTER ST-ELECT-1/26-2/26/24	111.59	None
101-441-922.100	STREET LIGHTING	DTE	898 DEXTER ST-ELECT-1/26-2/26/24	75.51	None
101-441-922.100	STREET LIGHTING	DTE	1104 DEXTER ST-ELECT-1/26-2/26/24	86.30	None
101-441-922.100	STREET LIGHTING	DTE	1102 DEXTER ST-ELECT-1/26-2/26/24	85.51	None
101-441-922.100	STREET LIGHTING	DTE	202 COUNTY -ELECT-1/26-2/26/24	107.50	None
101-441-922.100	STREET LIGHTING	DTE	340 LAFYAETTE AVE+ELECT-1/26-2/26/24	96.07	None
101-441-922.100	STREET LIGHTING	DTE	26 W MAIN ST-ELECT-1/25-2/23/24	232.88	None
101-441-922.100	STREET LIGHTING	DTE	120 PARK LN-ELECT-1/25-2/23/24	46.48	None
101-441-922.100	STREET LIGHTING	DTE	24 TOLAN-ELECT-1/25-2/23/24	184.49	None
101-441-922.100	STREET LIGHTING	DTE	41 WABASH-ELECT-1/25-2/23/24	93.17	None
101-441-922.100	STREET LIGHTING	DTE	52 WABASH-ELECT 1/25-2/23/24	140.01	None
101-441-922.100	STREET LIGHTING	DTE	120 PARK LN BLDG R-ELECT-2/6-3/6/24	32.19	None
101-441-930.000	DUMP TRAILER CONTROLLER	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	25.99	313
101-441-930.000	DPW EQUIP MAINT-HYD PUMP	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	26.99	313
101-441-930.000	REPAIR & MAINTENANCE	MILAN ACE HARDWARE	DPW -SUPPLIES-DUCT TAPE/9X3 PEARE	21.98	None
101-441-930.000	REPAIR & MAINTENANCE	LLOYDS REPAIR SERVICE	TOOLS/EQUIP MAINT-WEED WHIP	48.00	None
101-441-930.000	REPAIR & MAINTENANCE	MULLINS AUTO SUPPLY	DPW TRUCK #411 VEHICLE MAINTENANCE	104.47	None
101-441-930.000	REPAIR & MAINTENANCE	MILAN ACE HARDWARE	DPW SHOP SUPPLIES-	90.52	None
101-441-935.000	REPAIR & MAINT.-STREET	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-LANCASTER	189.90	313
101-441-984.000	DPW SAFETY EQUIP	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-FINCH	793.71	309
			Total Department 441 DEPARTMENT OF PUBLIC WORKS	12,520.83	
Department: 674 SENIOR CITIZENS					

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 101 GENERAL FUND					
Department: 674 SENIOR CITIZENS					
101-674-818.000	CONTRACTUAL SERVICES	MILAN SENIORS FOR HEALTHY	FY24 4TH QRT PMT PER CONTRACT	19,500.00	None
			Total Department 674 SENIOR CITIZENS	19,500.00	
Department: 751 PARKS & RECREATION					
101-751-667.002	SR/COMM CENTER RENTAL	LAURA RUSSEAU	DAMAGE DEP REFUND FOR CANCELLED	200.00	None
101-751-740.000	OPERATING SUPPLIES-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	23.98	317
101-751-931.000	REPAIR & MAINTENANCE-PARKS	DUNDEE LUMBER, INC.	METAL ROOF FOR OLD PAVILLION AT	2,678.40	None
			Total Department 751 PARKS & RECREATION	2,902.38	
Department: 752 COMMUNITY ENGAGEMENT					
101-752-831.000	DUES-MI RECREATION PARK	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	835.00	317
101-752-831.000	CANVA PRO SUBSCRIPTION	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	26.93	317
101-752-831.000	DUES & SUBSCRIPTIONS-	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	39.25	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	421.70	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	9.99	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	26.37	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	27.71	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	204.69	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	524.46	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	155.59	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	6.00	317
101-752-890.100	SUPPLIES FOR THE 2024	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	138.52	317
101-752-890.100	SUPPLIES FOR THE FAMILY	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TEWSLEY	8.45	317
			Total Department 752 COMMUNITY ENGAGEMENT	2,424.66	
			Total Fund 101 GENERAL FUND	105,962.57	
Fund: 202 MAJOR STREET FUND					
Department: 174					
202-174-803.000	AUDIT FEES/ ACCOUNTING	GABRIDGE & COMPANY, PLC	FISCAL YEAR 2023 AUDIT	762.15	None
			Total Department 174	762.15	
Department: 463 ROUTINE MAINTENANCE					
202-463-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-1160 NORTH	539.54	None
			Total Department 463 ROUTINE MAINTENANCE	539.54	
Department: 474 TRAFFIC SERVICES					
202-474-921.000	ELECTRICITY	DTE	STREET LIGHTING/TRAFFIC SIGNALS-FEB	707.99	None
			Total Department 474 TRAFFIC SERVICES	707.99	
			Total Fund 202 MAJOR STREET FUND	2,009.68	
Fund: 203 LOCAL STREET FUND					
Department: 174					
203-174-803.000	AUDIT FEES/ ACCOUNTING	GABRIDGE & COMPANY, PLC	FISCAL YEAR 2023 AUDIT	1,088.79	None
			Total Department 174	1,088.79	
			Total Fund 203 LOCAL STREET FUND	1,088.79	
Fund: 226 RUBBISH COLLECTION					
Department: 521 SANITATION/COMPOST/RECYCLE					
226-521-818.000	CONTRACTUAL SERVICES	STEVENS DISPOSAL &	DUMPSTER SERVICES FOR MAR 2024	9,273.23	None
226-521-818.000	CONTRACTUAL SERVICES	STEVENS DISPOSAL &	CONTRACTUAL SERVICES FOR MAR 2024	40,707.25	None

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 226 RUBBISH COLLECTION					
Department: 521 SANITATION/COMPOST/RECYCLE					
			Total Department 521 SANITATION/COMPOST/RECYCLE	49,980.48	
			Total Fund 226 RUBBISH COLLECTION	49,980.48	
Fund: 272 VOLUNTEERS IN POLICE SERVICES FUND					
Department: 325 POLICE DISPATCH					
272-325-758.400	POLICE RESERVE MISC-RETURN	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	(152.51)	311
272-325-758.400	POLICE RESERVE MISC-LIGHTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	236.77	311
272-325-758.400	POLICE RESERVE MISC-PAINT	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	174.54	311
272-325-758.400	POLICE RESERVE MISC-LIGHTS	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	159.36	311
272-325-758.400	POLICE RESERVE MISC-PAINT	FIRST MERCHANTS BANK	FEB 2024 VISA STMT-TILLERY	76.68	311
			Total Department 325 POLICE DISPATCH	494.84	
			Total Fund 272 VOLUNTEERS IN POLICE SERVICES FUND	494.84	
Fund: 592 WATER/SEWER FUND					
Department: 000 UNALLOCATED ACTIVITY					
592-000-204.001	DEPOSITS PAYABLE	FONSON COMPANY INC.	UB REFUND FOR ACCOUNT: 0014-000147-	2,595.94	None
			Total Department 000 UNALLOCATED ACTIVITY	2,595.94	
Department: 556 WATER - PRODUCTION					
592-556-775.000	OTHER SUPPLIES	MUNICIPAL SUPPLY CO	WTR DEPT SUPPLIES-REPAIR CLAMPS	277.50	None
592-556-803.000	AUDIT FEES/ ACCOUNTING	GABRIDGE & COMPANY, PLC	FISCAL YEAR 2023 AUDIT	3,701.88	None
592-556-818.000	CONTRACTUAL SERVICES	ARAMARK	APRONS/MATS/MOPS/ROLL & SHOP	37.52	None
592-556-818.000	CONTRACTUAL SERVICES	F&V OPERATIONS & RESOURCE	WTP/WWTP OPERATION SERVICES-MAR 2024	12,196.53	None
592-556-818.000	CONTRACTUAL SERVICES	ARAMARK	UNIFORMS FOR THE DPW	48.03	None
592-556-818.000	CONTRACTUAL SERVICES	QUADIENT INC	FOLDING MACHINE MAINTENANCE-4/1-	660.35	None
592-556-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-100 NECKEL-	1,292.53	None
592-556-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	WTR PLANT GENERATOR REPAIR	344.73	None
592-556-821.000	CONTRACTUAL SERV.-	ORCHARD, HILTZ &	TMF GRANT WATER (LSL GRANT)	511.50	None
592-556-821.000	CONTRACTUAL SERV.-	ORCHARD, HILTZ &	TACO BELL ENGINEERING REVIEW	513.50	None
592-556-922.000	LIBRARY/NURSERY UTILITIES	DTE	25 PARK LN-GAS-1/25-2/23/24	225.06	None
592-556-922.000	LIBRARY/NURSERY UTILITIES	DTE	25 PARK LN-ELECT-1/25-2/23/24	73.06	None
			Total Department 556 WATER - PRODUCTION	19,882.19	
Department: 557					
592-557-803.000	AUDIT FEES/ ACCOUNTING	GABRIDGE & COMPANY, PLC	FISCAL YEAR 2023 AUDIT	3,701.89	None
592-557-818.000	CONTRACTUAL SERVICES	F&V OPERATIONS & RESOURCE	MAINTENANCE OVERAGE-JAN 2024	3,181.65	None
592-557-818.000	CONTRACTUAL SERVICES	F&V OPERATIONS & RESOURCE	WTP/WWTP OPERATION SERVICES-MAR 2024	34,713.19	None
592-557-818.000	CONTRACTUAL SERVICES	F&V OPERATIONS & RESOURCE	MAINTENANCE OVERAGE-FEB 2024	1,818.03	None
592-557-818.000	CONTRACTUAL SERVICES	AT&T	NETWORK REDUNDANCY-75 GUMP LK RD-FEB	194.96	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-NECKEL LIFT	549.76	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-588 ASHER	549.76	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-WWTP	1,672.60	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-W MAIN	549.76	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-BODLEY	549.76	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-CHERRY LIFT	547.69	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	WWTP PORTABLE GENERATOR MAINT	554.00	None
592-557-818.000	CONTRACTUAL SERVICES	COMCAST	CABLE SERVICE FOR THE WWTP-3/16-	217.20	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-PLANK RD	554.00	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	WWTP GENERATOR REPAIR	305.98	None

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
Fund: 592 WATER/SEWER FUND					
Department: 557					
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	GENERATOR REPAIR-INTERNAL FAILURE-	554.49	None
592-557-818.000	CONTRACTUAL SERVICES	CUMMINS SALES & SERVICE	YR 3 OF 5-GENERATOR MAINT-1161 MARVIN	535.30	None
592-557-818.000	CONTRACTUAL SERVICES	AT&T	NETWORK REDUNDANCY-WWTP-MARCH 2024	389.92	None
592-557-921.000	ELECTRICITY	DTE	322 ANN MARIE # GEN BOX-ELECT-1/27-	107.80	None
592-557-921.000	ELECTRICITY	DTE	44 NECKEL CT-GAS & ELECT-2/6-3/6/24	71.04	None
592-557-923.000	HEAT EXPENSES	DTE	322 ANN MARIE # GEN BOX-GAS-2/1-	62.23	None
592-557-923.000	HEAT EXPENSES	DTE	308 W MAIN-GAS-2/8-3/6/24	62.23	None
592-557-923.000	HEAT EXPENSES	DTE	44 NECKEL CT-GAS & ELECT-2/6-3/6/24	62.23	None
592-557-923.000	HEAT EXPENSES	DTE	75 GUMP LK RD-GAS-2/6-3/5-24	2,405.65	None
			Total Department 557	53,911.12	
			Total Fund 592 WATER/SEWER FUND	76,389.25	

GL Number	Invoice Line Desc	Vendor Name	Invoice Description	Amount	Check Number
--- TOTALS BY FUND ---					
		101	GENERAL FUND	105,962.57	
		202	MAJOR STREET FUND	2,009.68	
		203	LOCAL STREET FUND	1,088.79	
		226	RUBBISH COLLECTION	49,980.48	
		272	VOLUNTEERS IN POLICE SERVICES FUND	494.84	
		592	WATER/SEWER FUND	76,389.25	
		Total For All Funds:		235,925.61	