

CHAPTER 3
STANDARDS OF DESIGN

STANDARDS OF DESIGN - STREETS

Scope

These standards define the minimum requirements for the design of streets and roadways.

Plans and Specifications

1. The plans and specifications shall be prepared by a professional engineer registered in the State of Michigan.
2. Plans shall consist of a cover sheet showing a location map and site plan of the proposed project, plan and profile sheets covering all the proposed street and roadway construction, and a standard detail sheet. Plan sheet size shall be 24 x 36. Plan scale shall be 1 inch = 40 feet horizontally and 1 inch = 5 feet vertically.
3. Plans shall be developed using AutoCad software; exceptions may be granted by the City.
4. Elevations shall be based upon U.S.G.S. datum. Elevations based upon assumed datum will not be approved.
5. Plan profiles shall indicate existing and proposed ground levels, U.S.G.S. elevations, and stationing.
6. Ten (10) sets of plans and specifications shall be submitted by the Developer to the City for preliminary approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the Developer for final corrections within thirty (30) days of receipt.
7. Six (6) sets of final plans and specifications shall be submitted by the Developer to the City for approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design.
8. The Developer shall be responsible for securing all State and local construction permits required for street and roadway construction.
9. One (1) set of reproducible "as-built" tracings, on mylar or polyester film, and one (1) disk in AutoCad format, shall be submitted to the City upon completion of the construction.

Standards of Design - Streets

1. Subsurface Soil Conditions - The Developer shall provide sufficient soil borings and other information to accurately describe the prevailing soil conditions under proposed streets and roadways. The minimum soil boring depth shall be 10 feet below the plan road grade, unless unstable soil conditions are encountered. If such conditions are found, the boring depth shall be extended until stable soil is encountered.
2. Curb and Gutter - All streets and roadways shall include concrete curb and gutter; bituminous curb will not be allowed. On local streets, the minimum street width shall be 31 feet back to back of curb. Concrete curb and gutter width on major streets shall conform to the "Uniform Criteria for Major Streets" as adopted by the Michigan Department of Transportation and the City's Master Plan. At all intersections, the minimum curb radius shall be 25 feet, unless otherwise approved. Concrete curb and gutter shall conform to MDOT F-4 or to a roll curb section approved by the City.
3. Sidewalk - Concrete sidewalks (where required) shall be 5 feet wide and shall be located 1 foot inside the right-of-way line. At all intersections of sidewalks and curb and gutter, appropriate pedestrian ramps shall be constructed. Unless otherwise approved, the ramps shall be MDOT Type 1.

The maximum allowable sidewalk grade shall be 7 percent and the minimum allowable grade shall be 0.50 percent. Sidewalks shall have a cross slope of 1/4 inch per foot away from the property line. Sidewalks shall project 1 inch above finished grade. In cut sections, the maximum sidewalk elevation shall be 1 foot above the street centerline elevation. In fill sections, the sidewalk elevation shall be no lower than 0.5 feet below the street centerline elevation. Sidewalks shall be 4 inches thick except across residential driveways, which shall be 6 inches thick, and across commercial driveways, which shall be 10 inches thick, unless otherwise approved by the Municipal Engineer.

4. Grade, Horizontal and Vertical Alignment - The minimum vertical grade on any street or roadway shall be 0.50 feet per 100 feet and the maximum grade on any street or roadway shall be 5 feet per 100 feet of length. In general, the length of a vertical curve will be determined by the design speed, per AASHTO's "A Policy on Geometric Design of Highways and Roads," 1990 edition, unless otherwise dictated by site topography. In general, all intersections of streets or roadways shall be made perpendicular to each other. However, intersections ranging from 75° to 90° from perpendicular may be approved. Additional information concerning street geometrics, right-of-way widths, block length requirements and other relevant requirements are available from the City.

5. Driveway Approaches - All driveway approaches between the curb and gutter and sidewalk shall be paved with concrete. Concrete driveway approaches for residential sections shall be 6 inches thick and 10 inches for commercial approaches. The maximum grade on driveway approaches shall be 10 percent. The width of the driveway curb cut shall conform to the standard detail contained in Chapter 6 of these standards.
6. Right-of-Way Width - The minimum width of street rights-of-way shall be 66 feet for local streets and 80 feet for arterial or section line streets.

For new street rights-of-way, the Developer shall prepare legal descriptions, which the City will review and submit to MDOT.

7. Utility Locations Within Street Rights-of-Way – Utility locations shall conform to the requirements outlined in Chapter 1 of these standards.
8. Street Surface Materials and Pavement Thickness –
 - a. Pavement design for **major streets** shall reflect the increased traffic volume and higher axle loads and shall be subject to approval by the Municipality.
 - b. **Local streets** shall consist of 8 inches of compacted MDOT 22A gravel and 385 pounds per square yard of MDOT bituminous material constructed in two lifts; 220 lbs/syd leveling and 165 lbs/syd top course.

STANDARDS OF DESIGN – SANITARY SEWER SYSTEMS

Scope

These standards define the minimum requirements for the design of sanitary sewer systems.

Plans and Specifications

1. The plans and specifications shall be prepared by a professional engineer registered in the State of Michigan.
2. Plans shall consist of a cover sheet showing a location map and site plan of the proposed project, plan and profile sheets covering all the proposed sanitary sewer construction, and a standard detail sheet. Plan sheet size shall be 24 x 36. Plan scale shall be 1 inch = 40 feet and 1 inch = 5 feet vertically.
3. Plans shall be developed using AutoCad software; exceptions may be granted by the City.
4. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
5. Plan profiles shall indicate existing and proposed ground levels, U.S.G.S. elevations, and stationing.
6. Ten (10) sets of plans and specifications shall be submitted by the Developer to the City for preliminary approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the Developer for final corrections within thirty (30) days of receipt.
7. Six (6) sets of final plans and specifications shall be submitted by the Developer to the City for approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design and shall include a completed Permit Application for Wastewater System (Construction-Alteration-Addition or Improvement) as required by Part 41, Act 451, Public Act 1994 as amended.
8. The City shall secure the sanitary sewer construction permit from the MDEQ. The Developer shall be responsible for securing all other permits required for the sanitary sewer construction.

9. One (1) set of reproducible "as-built" tracings, on mylar or polyester film and one (1) disk in AutoCad format shall be submitted to the City upon completion of the utility construction. The location of all tees, manholes and the intersection of the service lateral and the respective property line shall be witnessed from at least two permanent topographic features.

Standards of Design - Sanitary Sewer Systems

1. Location - The location of the sanitary sewer within the street right-of-way shall be on the centerline of the street.
2. Minimum Grades and Velocities - Sanitary sewers shall be designed to maintain a minimum velocity of 2 feet per second; maximum velocity shall not exceed 10 feet per second. Suggested minimum grades for various size sanitary sewers are listed below:

6" (lateral)	1.00%
8"	0.40%
10"	0.28%
12"	0.22%
15"	0.15%
18"	0.12%
24"	0.10%

3. Minimum Diameter - The minimum diameter of collection sewers shall be 8 inches; the minimum diameter of the service laterals shall be 6 inches. If the City desires to increase the size of certain sewers over/above that which are required to service the development (i.e., betterment), the City shall pay for the difference in sewer pipe and manhole material costs. For example, if the development requires 8-inch sanitary sewers and the City desires to increase them to 12-inch, the City will pay for the difference in the (8-inch and 12-inch sewer pipe) material costs.
4. Manholes - Sanitary sewer manholes shall be constructed at all changes in grade, size and alignment of the sanitary sewer. The maximum run between manholes shall be 300 feet. Manholes shall be precast concrete; block or brick sanitary manholes will not be approved. Pipe openings shall be cast in the precast section or cored in the finished wall. Manhole pipe connections shall be furnished with an integrally cast seal system, "Kor-N-Seal" or equal.

Sanitary sewer manholes shall have integral concrete manhole bottoms. A drop pipe shall be constructed for all sewers entering a manhole at a height of 24 inches or greater above the proposed manhole invert. The minimum inside diameter of a sanitary sewer manhole for sewers through 21 inches in diameter shall be 48 inches. For sanitary sewers 24 to 36 inches in diameter, the minimum inside diameter of the sanitary manholes shall be 60 inches. A minimum of 6 inches and a maximum of 12 inches of concrete adjusting rings shall be constructed on top of the precast cone section. The interior and exterior of the adjusting rings shall receive a 1/2 inch coat of plaster. The exterior of the adjusting rings shall be wrapped with a geotextile fabric, which shall extend from at least 6 inches below the bottom course of adjustment and lapping over the base flange of the manhole casting. (Fabric shall

be placed after mortar has hardened.) Manholes shall be provided with approved manhole steps.

5. Manhole Castings - The standard sanitary manhole casting shall have a 24-inch clear opening. Refer to the Table of Standard Materials on page 3-17 of these standards.
6. Service Laterals - Connection of the service laterals to the collection sewer shall be by means of a sewer pipe tee or wye. The service lateral shall be constructed to the property line of all lots and marked in accordance with the sanitary sewer standard of construction included herein. In addition, the Developer shall be required to furnish the City with a map indicating the precise location, including depth, of all sanitary sewer laterals at the property line intersection. The location shall be witnessed from two recoverable reference points.

For commercial or industrial connections, a sampling manhole shall be constructed at the property line. For service laterals of extended length, cleanouts shall be constructed at 50 foot intervals. A 6-inch cleanout shall also be installed at the property line. Where sanitary sewers are deeper than 12 feet, 6-inch diameter risers shall be constructed such that the service lateral is at least 10 feet below finished grade at the property line. All changes in direction, materials, or pipe size shall be completed with the proper fittings.

7. Check Valves - Refer to the Table of Standard Materials on page 3-17 of these standards.
8. Subsurface Soil Conditions - The Developer shall provide sufficient soil borings along the sanitary sewer route to accurately describe the prevailing soil conditions. The borings shall be constructed to a depth of 5 feet below the proposed invert elevation of the sanitary sewer.
8. Lift Stations - Sewage lift stations shall be one of the following types:
 - a. Wet pit-dry pit lift station with centrifugal pumps; structures shall be either steel shell, reinforced concrete section, or reinforced fiberglass.
 - b. Submersible pump lift station with concrete chamber and an exterior valve chamber.
 - c. Self-priming pump with enclosure.

The lift station should, to the extent possible, be of the same type and manufacturer as existing municipal lift stations. The lift station shall be equipped with duplex pumps.

Conventional wet pit-dry pit lift stations shall be equipped with a ventilation fan, sump pump and fire extinguisher in addition to the pumps, compressors, valves, ejectors and other associated components. Lift stations shall be equipped with a flowmeter with a recording chart on the pump discharge line.

Submersible pump lift stations shall be equipped with slide rails to facilitate the removal of the pumps for repair. Submersible pump lift stations shall be provided with intrinsically safe electrical control systems.

Lift stations shall be equipped with high and low level alarms, including visual (red light) and autodialer systems. Lift station design shall conform to the guidelines contained in the Recommend Standards for Sewage Works, Great Lakes-Upper Mississippi River Board of State Sanitary Engineers (Ten-States Standards) unless otherwise noted or approved. The electrical system shall have provisions for accepting portable electrical generator service. Lift station design shall be subject to the approval of the City.

9. Inverted Siphons - The use of inverted siphons shall not be approved unless specific conditions warrant their use.
10. Illegal Connections - The connections of footing drains, roof drains, sump pump discharge, or yard drains to the sanitary sewer are strictly prohibited.
11. Connection Elevations - Plans submitted for approval shall note the elevation of the sanitary sewer service lead at the building foundation line as well as the invert elevation of the service lead at the collection sewer. Minimum cover over the service lateral shall be 4 feet.
12. Trench Loading Design - All sanitary sewers shall be designed so as to resist all trench backfill and construction load or anticipated superimposed loadings utilizing a factor of safety of 2.0 of the pipe's resistance to failure.

STANDARDS OF DESIGN - STORM SEWER SYSTEMS

Scope

These standards define the minimum requirements for the design of storm sewer systems.

Plans and Specifications

1. The plans and specifications shall be prepared by a professional engineer registered in the State of Michigan.
2. Plans shall consist of a cover sheet showing a location map and a site plan of the proposed project, plan and profile sheets covering all the proposed storm sewer construction, and a standard detail sheet. Plan sheet size shall be 24 x 36. Plan scale shall be 1 inch = 40 feet horizontally and 1 inch = 5 feet vertically.
3. Plans shall be developed using AutoCad software; exceptions may be granted by the City.
4. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
5. Plan profiles shall indicate existing and proposed ground levels, U.S.G.S. elevations, and stationing.
6. Ten (10) sets of plans and specifications shall be submitted by the Developer to the City for preliminary approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the Developer for final corrections within thirty (30) days of receipt.
7. Six (6) sets of final plans and specifications shall be submitted by the Developer to the City for approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design.
8. The Developer shall be responsible for securing all State and local construction permits for storm sewer construction.
9. One (1) set of reproducible "as-built" tracings, on mylar or polyester film, and one (1) disk in AutoCad format, shall be submitted to the City upon completion of the utility construction. The location of all tees, manholes and catch basins, shall be witnessed from at least two permanent topographic features.

Standards of Design - Storm Sewer Systems

1. Location - The location of the storm sewer shall be within the street right-of-way 8 feet from the centerline of the right-of-way.
2. Minimum and Maximum Velocity - All storm sewers shall be designed to provide a minimum velocity of 3 feet per second and a maximum velocity of 10 feet per second when the pipe is flowing full.
3. Minimum Diameter - The minimum diameter for all storm sewers, including catch basin leads, shall be 12 inches. If the City desires to increase the size of certain sewers over/above that which are required to service the development (i.e., betterment), the City shall pay for the difference in sewer pipe and manhole structure material costs. For example, if the development requires 21-inch storm sewers and the City desires to increase them to 36-inch, the City will pay for the difference in the (21-inch and 36-inch sewer pipe and the 48-inch and 60-inch manhole structure) material costs.
4. Manhole - Storm sewer manholes shall be constructed at all changes in grade, size, and alignment of the storm sewer. The maximum run between storm sewer manholes shall be 500 feet. Manholes shall be precast concrete. The minimum inside manhole diameter for storm sewers through 21 inches in diameter shall be 48 inches. For storm sewers from 24 to 36 inches in diameter, the minimum storm manhole diameter shall be 60 inches. For storm sewers 42 inches and larger, "tee" manhole riser sections shall be used. Should a change in grade, size, or alignment of the pipe occur in a manhole where one or more of the sewers are 42 inches in diameter or larger, the manhole section shall have a minimum inside diameter of the largest pipe diameter plus 2 feet. A minimum of 6 inches and a maximum of 12 inches of concrete adjusting rings shall be constructed on top of the precast cone section. The interior and exterior of the adjusting rings shall receive a ½ inch coat of plaster. The exterior of the adjusting rings shall be wrapped with geotextile fabric, which shall extend from at least 6 inches below the bottom course of adjustment and lapping over the base flange of the manhole casting. (Fabric shall be placed after mortar has hardened.) Manholes shall be provided with approved manhole steps.
5. Storm Sewer Design - Storm sewers which discharge to a county drain shall meet the requirements of the Eaton County Drain Commissioner. Where applicable, the one hundred (100) year flood plain limits and flood plain elevation shall be noted on the plans.
6. Catch Basins - Storm sewer catch basins shall have a minimum inside diameter of 48 inches and shall provide a minimum sump depth of 24 inches below the lowest pipe invert elevation. Catch basins shall be constructed at all low points in the curb and gutter and shall be located so as to limit storm water travel in the gutter section to a maximum distance of 250 feet.

7. Standard Castings - Refer to the Table of Standard Materials on page 3-17 of these standards.
8. Trench Loading Design - All storm sewers shall be designed so as to resist all trench backfill and construction load or anticipated superimposed loadings utilizing a factor of safety of 2.0 of the pipe's resistance to failure.
9. Storm Water Detention/Retention - The City may require the construction of storm water detention/retention facilities. If required, the facilities shall meet the requirements of the standards of the Eaton County Drain Commissioner.
10. Storm Sewer Leads – Storm sewer leads shall be installed for each lot or parcel, extending from the main line storm sewer to the property line. Leads shall be 6-inch SDR 35 pipe, connected to the main line storm sewer via a cored hole and Kor-N-Seal or equivalent boot.

STANDARDS OF DESIGN - WATER DISTRIBUTION SYSTEMS

Scope

These standards define the minimum requirements for the design of water distribution systems.

Plans and Specifications

1. The plans and specifications shall be prepared by a professional engineer registered in the State of Michigan.
2. Plans shall consist of a cover sheet showing a location map and site plan of the proposed project, plan and profile sheets covering all the proposed water main construction, and a standard detail sheet. Plan sheet size shall be 24 x 36. Plan scale shall be 1 inch = 40 feet horizontally and 1 inch = 5 feet vertically.
3. Plans shall be developed using AutoCad software; exceptions may be granted by the City.
4. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
5. Plan profiles shall indicate existing and proposed ground levels, U.S.G.S. elevations, and stationing.
6. Ten (10) sets of plans and specifications shall be submitted by the Developer to the City for preliminary approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the Developer for final corrections within thirty (30) days of receipt.
7. Six (6) sets of final plans and specifications shall be submitted by the Developer to the City for approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design.
8. The City shall secure the water main construction permit from the MDEQ, Drinking Water and Radiological Protection Division. The Developer shall be responsible for securing all other permits required for the water distribution system construction.
9. One (1) set of reproducible "as-built" tracings, on mylar or polyester film and one (1) disk in AutoCad format, shall be submitted to the City upon completion of the utility construction. The location of all valves and curb shutoffs shall be witnessed from at least two permanent topographic features.

Standards of Design - Water Distribution Systems

1. Location - The location of the water main within the street right-of-way shall be 23 feet from the centerline of the right-of-way. In no case shall a water main be constructed within 10 feet (measured horizontally) from a sanitary sewer.
2. Minimum Size - The minimum size of water main shall be 8 inches in diameter. If the City desires to increase the size of certain mains over/above that which are required to service the development (i.e., betterment), the City shall pay for the difference in water main and valve material costs. For example, if the development requires 8-inch water mains and the City desires to increase them to 12-inch, the City will pay for the difference in the (8-inch and 12-inch water main pipe and valve) material costs.
3. Valves - AWWA approved gate or butterfly valves shall be placed throughout the distribution system in accordance with the following regulations:
 - a. On straight runs, valve shall be spaced at maximum intervals of 500 feet.
 - b. At tees, a minimum of two valves are required.
 - c. At crosses, a minimum of three valves are required.
 - d. At the end of dead end mains, valves and two full lengths of water main shall be constructed to facilitate future connections.
 - e. A valve shall be installed at the intersection of water mains and easement lines; the City intends to maintain water main within legal easements.

Refer to the Table of Standard Materials on page 3-17 of these standards.

4. Valve Boxes and Manholes - Valves shall be provided with adjustable screw type valve boxes. In some cases, valve manholes may be required in State Highway rights-of-way, paved surfaces, berms, sidewalks, and any other location where re-excavation may be difficult. Refer to the Table of Standard Materials on page 3-17 of these standards.
5. Water Mains - Shall be constructed of PC350 ductile iron with a minimum cover of 6 feet. In general, water mains shall be designed in a network with sufficient looping to eliminate "dead end" runs. Continuity wedges shall be installed at each joint.
6. Hydrants - Hydrants shall be spaced along the water main network such that all residential and commercial establishments are within 300 feet of a hydrant (measured along the street right-of-way). The hydrants shall have plugged drains, unless otherwise directed by the City. The pumper connection shall face the street.

Hydrants shall be constructed at all dead end mains. Hydrants shall be constructed from the main by use of a standard tee and gate valve; the use of Lucas tees shall not be permitted. Concrete thrust blocks of sufficient area shall be constructed to resist the thrust. Refer to the Table of Standard Materials on page 3-17 of these standards and the Standard Hydrant Assembly Detail on page 6-14 of these standards.

7. Service Connections - Connection to the existing main shall be made with a corporation stop with a minimum diameter of 1 inch. Service lead shall be type K annealed seamless copper water tubing with compression type fittings. Service lead shall be constructed to within 6 inches of the property line and shall be terminated with a curb valve and adjustable curb box. The open end shall be capped and protected during backfill operations. The size of the water service connection shall be approved by the City. Each service connection shall be provided with a minimum of 6 feet of cover. Refer to the Table of Standard Materials on page 3-17 of these standards for acceptable manufacturers and model numbers.
8. Water Meters – The City shall provide a standard household 5/8" x 3/4" meter and yoke per service. If a larger meter is required, the Owner is responsible to pay for the difference in cost. All water meters installed must be compatible with the City's meter reading system. The meter and appurtenances shall remain the property of the City and shall be maintained by the City in accordance with the City Water Ordinance.
9. Backflow Preventers – If a backflow preventer is required for a service connection to the City water distribution system, it must be an approved backflow preventer, per the Michigan Plumbing Code. Water service will not be activated until the backflow preventer installation has been certified by a licensed plumber.

STANDARDS OF DESIGN - SITE GRADING

Scope

These standards define the minimum requirements for the design of site grading.

Plans and Specifications

1. The plans and specifications shall be prepared by a professional engineer registered in the State of Michigan.
2. Plans shall consist of a cover sheet showing a location map and site plan of the proposed project, a plan sheet showing the street and lot drainage, and a standard detail sheet. Plan sheet size shall be 24 x 36. Plan scale shall be 1 inch = 40 feet horizontally and 1 inch = 5 feet vertically.
3. Plans shall be developed using AutoCad software; exceptions may be granted by the City.
4. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
5. The site plan for street and lot layout shall indicate both existing and proposed contours at a two foot contour interval. Individual lot drainage patterns shall be indicated on the plan.
6. Ten (10) sets of plans and specifications shall be submitted by the Developer to the City for preliminary approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the Developer for final corrections within thirty (30) days of receipt.
7. Six (6) sets of final plans and specifications shall be submitted by the Developer to the City for approval. All plans and specifications submitted for approval shall be sealed by the registered engineer in charge of design.

Standards for Design – Site Grading

Site grading shall be designed to allow for drainage of storm water away from residential or commercial buildings. Grades shall be such as to minimize earth settlement problems, avoid concentrating run-off onto adjacent properties, prevent creation of water pockets or pools of standing water and to minimize erosion. The grading design shall incorporate natural drainage courses where possible.

In areas where natural drainage is not present, surface (ditches) or subsurface (storm sewers) drainage shall be provided for collection and disposal of storm run-off. It is the intent of these regulations that the grading design minimize the need for banks, retaining walls or terracing.

Minimum grade away from structures shall be 2 percent. On slopes of 3.5 horizontal to 1 vertical or greater, Class A sodding with pegs must be provided to minimize erosion. The maximum allowable slope shall be 4.0 horizontal to 1 vertical. Site grading shall conform to the applicable sections of the Soil Erosion and Sedimentation Control Act. Where mulch is required, a mulch adhesive shall be used.

Grading plans for parking lot and sidewalk construction shall conform to the requirements of the Americans with Disabilities Act and the Michigan Barrier Free codes.

TABLE OF STANDARD MATERIALS

Sanitary/Storm Sewer System

Sanitary Manhole Castings	EJIW 1040A
Storm Manhole Castings	EJIW 1040B
Storm Catch Basin Castings	
Curb Type	EJIW 7045
Ditch Type	EJIW 6508
Gutter Type	EJIW 7065
Alleys	EJIW 5105
Parking Lots	EJIW 1490, Type M
Check Valve	Canplas 3285 – 4” Canplas 3286 – 6”

Water Distribution System

Valves

Gate	Waterous, Clow or equal; Open Left
Valve Box	Ford, Mueller or equal; two piece
Tapping Valve	Stainless Steel Saddle with cast flange residual valve. Clow

Services

Service Lead	Type K annealed seamless copper
Corporation Stop	Mueller H-15050 or equal Mueller H-15013 1 ½” – 2” Corporation Sizes exceeding the maximum for 3 full threads shall use a service clamp.
Service Clamp (Saddles)	Mueller H-10526 through H-10537 or equal
Curb Valve or Stop	Mueller H-15204 Compression Type
Curb Box	Mueller H-10350, Ford or equal; two piece

