

CHAPTER 3

STANDARDS OF DESIGN

STANDARDS OF DESIGN – STREETS

SCOPE

These standards establish the minimum requirements for the design of streets in the Municipality.

PLANS AND SPECIFICATIONS

1. The plans and specifications shall be prepared by a professional engineer licensed 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 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 = 4 feet vertically.
3. Elevation shall be based upon U.S.G.S datum. Elevations based upon assumed datum will not be approved.
4. Plan profiles shall indicate existing and proposed ground levels and stationing.
5. Four (4) sets of plans and specifications shall be submitted by the Developer to the Municipality for preliminary approval. All plans submitted for approval shall be sealed by the licensed engineer in charge of design. Modifications required to meet the Municipal Standards, if any, will be noted on two (2) sets, with one such set returned to the Developer for final corrections with 90 days of receipt.
6. Six (6) sets of final plans shall be submitted by the Developer to the Municipality for approval. All plans and specifications submitted for approval shall be sealed by the licensed engineer in charge of design.
7. The Developer will be responsible for securing all State and local construction permits required for street construction.
8. Three (3) sets of Record blue-line prints and 1 set of clean reproducible “record drawings” on seia paper, and a computer generated 3 1/2 –inch floppy disc with the same, having each drawing saved as a separate file shall be submitted to the Municipality upon completion of the construction project. Utility information for as-built projects shall be provided in the following format:

CITY OF DEWITT
 AUTOCAD FILE INFORMATION

Version: AutoCad 14 or 2000
 File: single file showing all as-built sections
 Orientation: north up
 Units: AutoCad Engineering
 Layers:

<u>Information</u>	<u>Name</u>	<u>Line Type</u>	<u>Color</u>	<u>Text Height</u>
right-of-way	ROAD	continuous	3	
road name	ROADNAME	continuous	2	15' – 0"
water main	WM	hidden	9	
water main text	WMTEXT	continuous	4	20' – 0"
sewer main	SEWER	hidden	9	
sewer main text	SWRTEXT	continuous	4	20' – 0"
river banks	RIVER	continuous	5	
section	SECTION	center	8	

9. All required easements must be secured and recorded by the Developer. A copy must be filed with the Municipality.

STANDARDS OF DESIGN – STREETS AND ROADWAYS

1. Subsurface Soil Conditions – The Developer shall provide sufficient soil borings and other information to accurately describe the prevailing soil conditions under proposed streets. The minimum soil boring depth shall be five (5) 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 of the cross section indicated on the standard detail. In general, it is the intent that a rolled curb section be used in residential developments. Bituminous curb will not be allowed. On local streets, the minimum street width shall be 31 feet back to back of curb. Street width on major streets shall conform to the “Uniform Criteria for Major Streets” as adopted by the Michigan Department of Transportation. At all intersections, the minimum curb radius shall be 25 feet, unless otherwise approved.
3. Sidewalk – Concrete sidewalks shall be five feet wide and shall be located one foot inside right-of-way line. At all intersections of sidewalks and curb and gutter, appropriate pedestrian ramps shall be MDOT Type 1.

The maximum allowable sidewalk grade shall be five (5) percent. Sidewalk shall have a cross slope of ¼ inch per foot away from the property line. Sidewalks shall project one inch above finished grade. In cut sections, the maximum sidewalk elevation shall be one foot above the street centerline elevation. Sidewalk shall be 4 inches thick, except residential driveways shall be 7 inches and commercial driveways shall be 10 inches.

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 5.0 feet per 100 feet of length. In general, the minimum length of a vertical curve shall be 100 feet, unless otherwise dictated by site topography. Intersections of streets shall be made perpendicular to each other.
5. Driveway Approaches – All driveway approaches between the curb and gutter and sidewalk shall be concrete; residential sections shall be 7 inches thick and 10 inches for commercial approaches. The maximum grade on driveway approaches shall be twelve (12) percent. The width of the driveway curb cut shall conform to the standard detail.
6. Utility Locations Within Street Right-of-Way – Utility locations shall conform to the requirements outlined in Chapter 1 of these standards.
7. 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 (3 ½-inches) of MDOT bituminous material constructed in two lifts; 220 lbs/syd (2-inches) leveling and 165 lbs/syd (1 ½-inches) top course.

STANDARDS OF DESIGN – STORM SEWERS

SCOPE

These standards establish the minimum requirements for the design of storm sewers in the Municipality.

PLANS AND SPECIFICATIONS

1. The plans and specifications shall be prepared by a professional engineer licensed 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 either 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically.
3. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
4. Plan profiles shall indicate existing and proposed ground levels and stationing.
5. Four (4) sets of plans and specifications shall be submitted by the Developer to the Municipality for preliminary approval. All plans and specifications submitted for approval shall be sealed by the licensed 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 90 days of receipt.
6. Six (6) sets of final plans and specifications shall be submitted by the Developer to the Municipality for approval. All plans and specifications submitted for approval shall be sealed by the licensed engineer in charge of design.
7. The Developer will be responsible for securing all State and local construction permits for storm sewer construction.
8. Three (3) sets of Record blue-line prints and 1 set of clean reproducible "record drawings" on seoi-a paper, and a computer generated 3 1/2 -inch floppy disc with the same, having each drawing saved as a separate file shall be submitted to the Municipality upon completion of the construction project. Utility information for as-built projects shall be provided in the following format:

CITY OF DEWITT
AUTOCAD FILE INFORMATION

Version: AutoCad 14 or 2000
File: single file showing all as-built sections
Orientation: north up
Units: AutoCad Engineering
Layers:

<u>Information</u>	<u>Name</u>	<u>Line Type</u>	<u>Color</u>	<u>Text Height</u>
right-of-way	ROAD	continuous	3	
road name	ROADNAME	continuous	2	15' – 0"
water main	WM	hidden	9	
water main text	WMTEXT	continuous	4	20' – 0"
sewer main	SEWER	hidden	9	
sewer main text	SWRTEXT	continuous	4	20' – 0"
river banks	RIVER	continuous	5	
section	SECTION	center	8	

Standards of Design – Storm Sewers

1. Location – Shall be located within the street right-of-way as indicated in Chapter 1 of these standards.
2. Minimum and Maximum Velocity – All storm sewers shall be designed to provide a minimum velocity of three feet per second and a maximum velocity of ten feet per second when the pipe is flowing full.
3. Minimum Diameter – The minimum diameter for all storm sewer, including catch basin leads, shall be 12 inches. The Municipality may desire to increase the size of certain sewers and in some instances may pay the difference in costs between what is required to service the development and what the City desires to see constructed.
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. 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 two feet. All manholes shall be provided with approved manhole steps.

5. Storm Sewer Design – Storm sewer design shall conform to the standards of the Clinton County Drain Commissioner. Where applicable, the flood plain and flood 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 sewer water travel in the gutter section to a maximum distance of 250 feet.
7. Standard Castings – Refer to the table of standard castings for the Municipality's standard castings.
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 – Storm water detention and retention may be required for new developments and shall comply with the standards of the Clinton 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 – SITE GRADING

SCOPE

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

PLANS AND SPECIFICATIONS

1. The plans and specifications shall be prepared by a professional engineer licensed 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 or 22 x 34. Plan scale shall be either 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically.
3. Elevations shall be based upon U.S.G.S. datum. Elevations based upon an assumed datum will not be approved.
4. The site plan for street and lot layout shall indicate both existing and proposed contours at a 2 foot contour interval. Individual lot drainage patterns shall be indicated on the plan.
5. Four (4) sets of plans and specifications shall be submitted by the developer to the Municipality for preliminary approval. All plans and specifications submitted for approval shall be sealed by the licensed engineer in charge of design. Modifications required to meet the Municipal Standards, if any, will be noted on 2 sets, with 1 such set returned to the developer for final corrections within 90 days of receipt.
6. Six (6) sets of final plans and specifications shall be submitted by the developer to the Municipality for approval. All plans and specifications submitted for approval shall be sealed by the licensed engineer in charge of design.
7. The developer will be responsible for securing all State and local construction permits.

Standards of Design – 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 runoff 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 runoff. 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 shall be provided to minimize erosion. The maximum allowable slope shall be 3.5 horizontal to 1 vertical. Site grading shall conform to the applicable sections of the Soil Erosion and Sedimentation Control Act.

TABLE OF STANDARD MATERIALS

STORM SEWER SYSTEM

Storm Manhole Castings

EJIW 1040B

Catch Basin Castings

EJIW 7045 Curb

EJIW 6517 Ditch