



PUBLIC STREETS

Minimum Street Widths, Measured from Face of Curb to Face of Curb (F-F)

Collector Street	36 to 40+ feet F-F (Varies by design)
Local Residential Streets	
High Density or Substantial Parking (<i>parking allowed on both sides</i>)	36 feet F-F
Standard (<i>parking allowed on both sides</i>)	32 feet F-F
One-Sided Parking (<i>when allowed by City</i>)	28 feet F-F
No Parking (<i>when allowed by City</i>)	24 feet F-F
Cul-de-Sac (<i>with center island</i>)	See Detail Plate 600-9

Minimum Right-of-Way Widths

Collector Street	80 feet to 100 feet
Commercial or Industrial Service Street	80 feet
Local Residential Streets	
High Density (<i>Parking allowed on both sides</i>).....	70 feet
Standard (<i>Parking allowed on both sides</i>)	66 feet
One-Sided Parking or No Parking (<i>when allowed by City</i>)	60 feet
Cul-de-Sac (<i>with center island</i>)	Stem 60 feet; Bulb 120 feet

Pavement Section Design

NOTE: *Pavement sections below are minimum allowed. Additional pavement section may be required based on Geotechnical Report of the subgrade soils.*

Pavement Section Property	Local Residential	Collector/Industrial
Design Tonnage	7-Ton	10-Ton
Bituminous Non-Wear Course Depth	2 inches	4 inches (2 lifts)
Bituminous Wear Course Depth	2 inches	2 inches
Minimum Class 5 Aggregate Base (Max 30% Recycle)	6 inches	8 inches
Subbase, Select Granular	In-place or as determined by Engineer	
Subsurface Drainage System (Drain Tile)	Only when recommended by Geotechnical Report	
Bituminous Non-Wear Course Mix	MnDOT 2360 Type SP 12.5 (3,C) SPNWB330C	
Bituminous Wear Course Mix	MnDOT 2360 Type SP 12.5 (3,C) SPWEB340C	
Joint Adhesive	To be installed between wear course and curb	

Geometric Design

Geometric Design Property	Local Residential	Collector/Industrial
Center Crown	2.5%	2.5%
Minimum Longitudinal Grade	0.5%	0.5%
Maximum Longitudinal Grade	8%	6%
Maximum Intersection Approach Grade, First 100 feet	2%	2%
Minimum Vertical Curve Length, Crest (including stop condition)	K=19	Per state aid
Minimum Vertical Curve Length, Sag (including stop condition)	K=37	Per state aid
Minimum Horizontal Curve Radius	100 feet	Per state aid
Intersection Angles	90 degrees	90 degrees
Tangent Length at Intersection from Curb, Local	50 feet	100 feet
Tangent Length at Intersection from Curb, Higher Class	100 feet	100 feet
Tangent Minimum between curves	50 feet	50 feet
Minimum Intersecting Street Offset, from Centerlines	125 feet	250 feet
Curb Radius, Minimum	15 feet	20 feet
Curb Radius, Minimum intersection with collector	20 feet	25 feet
Design Speed	30 MPH	30 MPH+
Dimensions for Cul-de-Sac	See Plate 600-9	N/A
Minimum Grade around Cul-de-Sac	1.0%	N/A
Maximum Cul-de-Sac Street Length	500 feet	N/A
Driveway Access, Residential	As Needed	Prohibited
Driveway Access, Commercial	N/A	Per Ordinance

Curb and Gutter

Material, All Purposes Concrete
 Concrete Mix Type, Hand Placed/Flatwork MnDOT 3F52
 Concrete Mix Type, Slipform Curb MnDOT 3F32
 Strength, Minimum Requirements 4,500 PSI
 Type: New Developments, Single Family Residential Surmountable or B618
 Type: Multifamily, Commercial, Collector Roads, Medians, Reconstruction B618

Driveways

Maximum Driveway Width at Right-of-Way 30' Residential, 32' Commercial
 Driveway Spacing from Property Edge 3' Minimum
 Maximum Driveway Slope 10%
 Bituminous Driveway Minimum Thickness, Section 3" Bituminous, 6" Class 5
 Concrete Driveway Minimum Thickness, Section 6" Concrete, 6" Class 5
 Commercial Concrete Driveway Minimum Thickness, Section 8" Concrete, 6" Class 5

Dead End Streets

Termination, Permanent or Temporary.....	Cul-de-sac, 60' Min Diameter if temp allowed
Maximum Length of Dead-end Street	500 feet

Boulevard

Slope - Typical Range and Maximum	2% to 4% (typ.) and 4:1 Max.
Topsoil Minimum	6 inch
Tree Location	See Landscaping and Trees Section
Signpost Location	3 feet from back of curb

Sidewalks

Collector Street	Required on both sides, or on one side with trail on other
Local Residential Street.....	Required on one side
Width	5 feet
Clear Zone, each side	2 feet
Maximum Running and Cross Slope	Per ADA Standards
Pedestrian Ramps	Per Current ADA and MnDOT Standards
Pavement Section Standard.....	4 inch Concrete; 4 inch Class 5
Pavement Section through Residential Driveways.....	6 inch Concrete; 6 inch Class 5
Pavement Section through Commercial Driveways	8 inch Concrete; 6 inch Class 5

Trails

Locations	Per City trail plan and as directed
Width, Local Trail	8 feet minimum, 10 feet preferred
Width, Regional Trails	10-12 feet
Pavement Section	3 inch Bituminous; 6 inch minimum Class 5
Maximum Longitudinal Grade	5%

SANITARY SEWER

Gravity Main

Minimum Diameter.....	8 inch
Material.....	PVC or DIP
Class, up to 16 feet in depth	SDR 35 PVC
Class, 16-30 feet in depth	SDR 26 PVC
Class and Material, over 30 feet in depth.....	Class 52 DIP or Project Specific
First 20 lineal feet from vertical drop	Class 52 DIP
Minimum Cover Over Pipe.....	5.5 feet
Minimum/Maximum Slope.....	Ten State Standards
Location of Main in Street.....	Centerline, 10' separation from Watermain

Force Main

Material.....	PVC, HDPE, or DIP Class 52
PVC, 2 inch–24 inch.....	C900/C905
HDPE Class, 1 inch.....	SDR 9
HDPE Class, 2 inch–24 inch.....	SDR 11
Minimum Cover	7.5 Feet
Location of Main in Street.....	Project Specific
Air Relief Valve and Manhole Locations	All High Points
Clean Outs.....	All Low Points and Bends

Service Pipe

Material and Class.....	PVC SCHEDULE 40 or SDR 26
Minimum Diameter	
Residential.....	4 inch
Commercial/Multi Unit Residential	6 inch
Minimum Slope.....	Comply with MN Plumbing Code
Minimum Cover Over Pipe.....	6 Feet
Maximum Depth	12 Feet, risers to be used at Wye location to minimize depth
Cleanout.....	If Service exceeds 100 ft or requires multiple bends

Tracer Wire (Force Main and Service Pipe)

Tracer Wire Material.....	12 AWG solid, PRO TRACE HF CCS PE45
Drive In Magnesium Grounding Anode Rod	Copperhead Part # ANO 1005 (1.5lb)
Tracer Wire at Grade Access Box.....	Snake Pit Light Duty

Sanitary Sewer Manholes

Type.....	Precast Concrete
Steps.....	Standard on all structures, place on downstream side
Maximum Inlet/Outlet Elevation Difference	2 feet
Minimum Depth of Manhole	6 feet
Type of Casting.....	R 1642 B
Joints and Assembly.....	Per City Details
Location.....	Street Centerline
Maximum Spacing.....	400 feet
Adjustment Rings	HDPE, Minimum of 2, Maximum of 6 (1 foot)
Elevation Drop Across Standard Manholes (Non-Trunk Lines).....	0.1 feet
Connections to Existing Manholes.....	Core Drill with Boot, doghouse inside
Outside Drop Minimum	2 feet
Outside Drop Material	DIP Class 52
Infiltration Protection	Infishield or I&I Barrier

WATERMAIN

Main Pipe

Material..... DIP CL 52 (<12”), DIP CL 51 (>12”) or PVC C-900, PVC C-905
Minimum Diameter..... 8 inch (6 inch as allowed by City Engineer)
Minimum Cover 7½ feet
Location..... 10’ Minimum Separation from Sanitary/Storm, within street area
Minimum Vertical Separation at Utility Crossings 18 inches, See Plate 300-12
Maximum Length of Dead Ends 1,000 feet
Material Source..... All components (pipe, valve, fittings, etc.) American Made
Bolts Fluoropolymer Coated (Core-Blu)

Service Pipe

Service Size and Material

Residential..... 1” Type “K” Copper
Irrigation 2” HDPE CTS SDR-9
Commercial/Multi Unit Residential 4 to 8 inch PVC or DIP (Project Specific)

Corporation Stop..... Ballcorp Corporation Stop (Ford or McDonald)
Curb Stop Ball Valve Curb Stop – Minneapolis Pattern (Ford or McDonald)
Curb Box..... A.Y. McDonald 5614 w/rod & Mpls. Top
Service Saddle Material Stainless Steel

Hydrants

Type..... Waterous Pacer WB 67-250, 22-inch barrel
Hydrant Leads 6 inch DIP Class 52
Placement On Lot lines 5’ behind curb, intersections, or Cul-de-Sacs
Depth of Bury 7½ feet
Maximum Coverage Radius 250 feet
Gate valve on Hydrant leads Yes, 2 feet behind curb
Hydrant Nozzles Template 70424, Pumper Nozzle 4.75”x7 TPI, 2.5” NST Hose Nozzles 7 TPI
Temporary dead end lines Stubbed to plat boundary, hydrant required at end

Water Valves

Resilient Seat Gate Valve, for 12 inch pipe & smaller..... American Flow Control 2500 Series
Butterfly Valve, for pipe over 12 inch Mueller Linesal III
Valve Box..... Tyler G Box6860 Screw Type, Cast Iron 3-piece
Maximum area isolated by valving 20 services
Maximum distance between valves on Trunk Mains 800 feet

Tracer Wire

Tracer Wire (*Main, services, & hydrants*) 12 AWG solid, PRO TRACE HF CCS PE45
Tracer Wire Hydrant Terminal Cobra T2 Access Box
Tracer Wire at Grade Access Box..... Snake Pit Light Duty
Drive In Magnesium Grounding Anode Rod Copperhead Part # ANO 1005 (1.5lb)

STORM SEWER

Pipe Design

Design Frequency for Storm Sewer Pipes.....	10 year
Minimum storm sewer design velocity.....	3 fps
Maximum storm sewer design velocity.....	15 fps
Maximum storm sewer outlet velocity.....	5 fps
Minimum Outfall Pipe Slope.....	Verify positive grade at completion (no reverse grade)
Outfall Pipe Invert End.....	Match NWL of pond
Storm Sewer Pipe Material.....	RCP (Class per Concrete Pipe Association fill tables)
Minimum Cover Depth.....	3 feet
Minimum Pipe Diameter.....	15 inch (12" may be accepted for CB leads)
Maximum Spacing Between Structures.....	400 feet
Alignment.....	10' Separation from Sanitary and Watermain

Culvert pipe

Culvert Material, urban road or crossing public road.....	RCP
Culvert Material, rural road private driveway.....	CMP or Dual Wall HDPE
Minimum Culvert Size.....	15 inch
Apron and Trash Guard Required.....	Yes

Manholes

Type.....	Precast Concrete
Steps.....	Standard on all structures, place on downstream side
Location.....	Outside of standard wheel path
Sump Depth and Location.....	4 feet, located at street prior to discharge point
Minimum Structure Depth.....	4 feet
Casting.....	R 1642 B
Adjustment Rings.....	HDPE, Minimum of 2, Maximum of 6 (1 foot)
Infiltration Protection.....	Infishield or I&I Barrier

Catch Basins

Type.....	Precast Concrete
Minimum Structure Depth.....	4 feet
Maximum run to Catch Basin.....	350 feet
Casting, Curb & Gutter, B Style Curb.....	R 3067V
Casting, Curb & Gutter, Surmountable Style Curb.....	R 3501 TB
Casting, Area Drain.....	R 4342
Location at Intersections.....	End Radius (Not mid radius)
Infiltration Protection.....	Infishield or I&I Barrier

STORMWATER MANAGEMENT

Note: Stormwater facilities shall be in accordance with the requirements listed herein; in accordance with the latest approved requirements of the Vermillion River watershed district; and in accordance with the Minnesota Pollution Control Agency NPDES Construction Storm Water Permit. In addition, all “Recommended” and “Highly Recommended” provisions of the Minnesota Stormwater Manual should be considered requirements by the City of Hastings unless approved otherwise by the City Engineer. **See City Stormwater Ordinance 152 for Complete list of Stormwater Requirements. The City of Hastings is the permitting authority.**

Site Design

Facility locations.....	Ponds/Basins Located in Outlots or Easements
Facility Location and Size	Ponds/Basins contained within 100 year HWL
Rate Control	Not to exceed existing runoff for 1 yr-24 hr, 10 yr-24 hr, or 100 yr-24 hr
Rate Control Discharging Directly to Vermillion River	100 yr – 4 day
Volume Control/Water Quality (infiltration preferred) - Must Meet the Greater of:	
o Not to exceed 2 yr-24 hr existing runoff or	
o 1” x sum of new and fully reconstructed impervious area	
Building Lowest Opening above 100 year HWL.....	2 feet
Building Lowest Opening above EOF	1 foot, 2 feet preferred
Minimum access route width to permanent storm facilities	20-foot easement
Maximum grade for maintenance access route	10%
Setback from building foundations.....	35 feet
Flood Protection	Overland Emergency Overflows Required (No landlocked basins)

Ponds (Detention Basins)

Minimum Basin Depth to HWL	3 feet
Maximum Pond Depth to HWL.....	10 feet
Average Permanent Pool Depth	4 feet to 10 feet
Permanent Pool Length to Width Ratio.....	3:1 or greater
Maintenance Bench Maximum side slope, first ten feet above Permanent Pool.....	10:1
Aquatic Bench Maximum side slope, first ten feet into Permanent Pool	10:1
Maximum side slope, beyond first ten feet.....	4:1
Minimum vegetated buffer strip	City Ordinance 152.08.C
Required freeboard.....	2 feet above HWL
Pond Liner	Clay lined
Developer Maintenance Responsibility	Until project is accepted by City (LOC released)

Infiltration Facilities (Bioretention Areas and Rain Gardens)

Maintenance Agreement	Required
Maintenance Access Easement	Required
Minimum distance from public or private well	Outside of 1-year capture zone
Minimum depth to Bedrock.....	3 feet
Minimum depth to Seasonally High Water Table.....	5 feet
Infiltration Limitations	City Ordinance 152.08.B.5.b.2
Infiltration Alternatives due to limitations	City Ordinance 152.08.B.5.C
Soil infiltration rates.....	Soil Borings or Double Ring Infiltrometer
Maximum side slope	4:1
Maximum drain dry time	48 hours (visual required)
Soil medium	MnDOT 3877 D Rooting Topsoil Borrow
Seeding.....	MnDOT 3876 Specifications with Type 33 261
Plantings.....	Planted in conformance with City approved landscape plan

*** Soil borings are required to verify infiltration rates. Borings must be taken to a depth of 5 feet below proposed infiltration basin elevation.**

- Minimum 1 boring per facility < 1,000 SF of infiltration area.
- Minimum 2 borings per facility between 1,000 and 5,000 SF of infiltration area.
- Minimum 3 borings per facility between 5,000 and 10,000 SF of infiltration area.
- Minimum 4 borings per facility > 10,000 SF of infiltration area.
- Additional boring required for every additional 2,500 SF of infiltration area above 15,000 SF

Drainage Swales

Maximum side slopes on Swales	4:1
Minimum longitudinal Swale grade	2%
Maximum length of drainage swale	300 LF or 8 Lots Draining to 1 point
Minimum Swale depth within Right of Way.....	18 inches
Minimum Bottom Width.....	4 feet

Emergency Overflows

Minimum bottom.....	3' flat bottom with 4:1 side slopes
Separation from Inhabited Structures	15 feet

Retaining Walls

Location.....	Not in R.O.W. without signed approval
Walls 4' tall or greater.....	Signed by Professional Engineer, City Permit Needed

LANDSCAPING AND TREES

Tree Planting Guidelines

- Secure permission from the City by contacting the City Forester at 651-480-6177.
- For boulevard trees, tree location should be minimum 5' behind back of curb and centered between sidewalk and curb. In case of no sidewalk, trees shall be placed halfway between the curb and right-of-way.
- Proposed tree location minimum required separations:
 - 5 feet from any driveway or sidewalk
 - 10 feet from underground sewer or water lines
 - 10 feet from an alleyway
 - 15 feet from streetlights and fire hydrants
 - 20 feet from any existing tree or other proposed trees
 - 50 feet from any intersection
- Proposed boulevard trees should be spaced a maximum of every 50 feet along newly constructed streets
- No trees should be located within the following areas dedicated to permanent stormwater management:
 - 100-year HWL
 - Drainage and Utility Easement
 - 20' maintenance access route

Approved Tree Species

Large Species

- Elm, Hybrid (Disease Resistant)
- Ginkgo
- Hackberry
- Honeylocust
- Ironwood
- Kentucky Coffee Tree
- Linden, American or Little Leaf
- Northern Catalpa
- Oaks - Bur, Swamp White, Red, or Northern Pin

Ornamental Species

- Amur Chokecherry
- Flowering Crab
- Thornless Hawthorn
- American Hornbeam
- Japanese Tree Lilac
- Magnolia
- Pagoda Dogwood

MISCELLANEOUS

Street Lighting

Maximum Spacing Between Lights 500 Feet, and at all intersections
Residential Street Lights18-foot Dark Bronze Pole, Traditional LED, 3000 Lumens
Commercial/Industrial Light Pole 30 Foot Cobra LED
Wattage..... 100W (Residential), 150W (Commercial)

Mailboxes

Single Box Placement.....42" Above Top of Curb, Aligned with Back. Standard Detail 600-8
Multiple Mailbox Units To be installed with all new developments

Private Utilities

Joint Trench.....To be used on all new developments
 Location..... Within dedicated Right-of-Way limits
 Installation Depth36-48 inches
 Extra Conduit1 empty conduit to be installed in all joint trenches
 Utility Conduit Type PVC Schedule 40
 Conduit Crossings.....Perpendicular to Street and minimum 1 foot below Street Subgrade

Signing and Striping

Design StandardsFollow MMUTCD
 Sign Panels Type IX Diamond Grade DG3
 Sign Posts 2 inch round/channel
 Lane Striping Material..... Latex unless otherwise noted
 Thermoplastic (ground in) Pavement messages, stop bars, crosswalks
 Typical Widths:
 ▪ Fog Lines and Road Centerlines 4 inches
 ▪ Crosswalk 12 inches
 ▪ Stop Bar..... 24 inches

Easements

- **Sanitary sewer and watermain pipe require minimum 30-foot wide easements and storm sewer pipes require a minimum 20-foot wide (greater width may be required dependent on pipe depth).** Easements shall be centered over the pipe/structure if not located within the public right of way. Additional easement width may be required as determined by the City Engineer and Public Works Director. Easements must be dedicated to the City and be provided in the City’s standard form of easement agreement.

DETAIL PLATE NUMBERS

Category	Detail Plates
Watermain	300-1 to 300-17
Sanitary and Storm Sewer	400-1 to 400-28
Street Construction	600-1 to 600-14
Paving	700-1 to 700-2
Erosion Control	1500-1 to 1500-10
Lighting	1600-1