CITY OF BLAINE

ENGINEERING DESIGN STANDARDS

These standards have been established to provide direction to the development community for plan and specification preparation. The City of Blaine's standard specifications and details shall be used on all projects. Standard specifications and details may be downloaded from the City's web site at www.ci.blaine.mn.us. Contact the Engineering Department at 763-785-6172 if you have any questions.

SANITARY SEWER

- Pipe
  - -Material……..PVC
  - -Minimum diameter for main line……..8"
  - -Class……SDR 35 (less than 20' depth)
  - -Class……SDR 26 (greater than 20', less than 28' depth)
  - -Class……Determined by designer for depths 28' to 35' (submit to City for verification)
  - -Location……Road centerline
  - -Minimum cover……..5'
  - -Maximum cover……...35'
- Manhole
  - -Type……..……..Precast
  - -Maximum inlet/outlet elevation difference……...2'
  - -Type of Casting……Neenah R-1733 w/ Platen Lid ……2 hole self cleaning & concealed pic holes
  - -Inside drop……..……...2'min.
    - -Drop Material……..Intra-Flow Drop System
    - -Pipe Material.....DIP from undisturbed soils into MH (minimum 20')
- Service Pipe
  - -Material……..PVC
  - -Class……SCH 40 (solvent weld joints)
  - -Minimum grade……...….1.0 %
  - -Riser Requirements……...see Standard Details
  - -Maximum depth for services……25'
- Service Cleanout
  - -Material……..PVC
  - -Class……...……...SCH 40
  - -Size……4" (residential) ……..6" (commercial/industrial)
  - -Maximum distance from main to structure w/o cleanout……..100'
- Flow Rates
  - -Residential……75 GPD/person
  - -Commercial/Industrial…….2,000 GPD/acre
  - -BOD (Residential)……..0.17 lbs/person/day
  - -BOD (Commercial/Industrial)……....3 lbs/acre/day

WATER MAIN

- Main Pipe
  - -Material……..DIP
    ……..PVC (tracer wire required)
  - -Class……..…Class 52 (<12” dia. DIP pipe)
    ……..…Class 50 (≥12” dia. DIP pipe)
    …….AWWA C900 PVC (4”-12” dia. pipe)
    …….AWWA C909, pressure class 150, PVC (4”-12” dia. pipe)
    …….....AWWA C905 PVC (14”-36” dia. pipe)
  - -Assumed system static pressure……..55 psi
  - -Minimum fire flow rate at dead ends……1,200gpm@20psi
  - -Minimum diameter……6”
  - -Air Release measures…….Hydrants
  - -Minimum Cover …….……7.5’
  - -Location…….……10’ from sanitary sewer
  - -Minimum pipe crossing clearance……..….18”

- Hydrant
  - -Type…….Waterous Pacer Model WB-67
  - -Depth……8’ Bury (Waterous definition)
  - -Spacing……...600’(low density residential)
    …….400’(medium density residential)
    …….300’(commercial/industrial)
- Valves
  - -Type……...(6”-12”) Resilient Seat Gate – AWWA C515
    …….(>12”) Resilient Seat Butterfly Valve – AWWA C504
  - -Maximum distance between valves on Trunk Mains……..……1,000’
  - -Maximum number of structures out of service…….……....35
- Service Pipe
  - -Service Material (residential)……see specifications
  - -Service Material (commercial/industrial)……..see specifications
  - -Type of Corporation Stop (saddles required on PVC mains)……..see specifications
  - -Type of Curb Stop …….……...see specifications
  - -Type of Curb Box ……...……..see specifications
  - -Driveway/Sidewalk Curb Stop Casting Type…….Ford Type A1

STORM SEWER

- Main Pipe
  - -Material……..RCP/HDPE
  - -RCP to be used from flared end to first structure…….(except mainline ditches)
  - -Depth ……2.0’ min cover for HDPE
  - -Minimum pipe diameter……..…12”
  - -Minimum culvert size…….……15”
  - -Culvert Material……...RCP/HDPE/CMP
  - -Trash Guard requirements……all sizes unless main line ditch
- Manhole
  - -Type…….…Precast/Block
  - -Type of Casting…….…Neenah R-1733 w/ Platen Lid
    …….2 hole self cleaning & concealed pic holes
- Catch Basin
  - -Type……..…Precast
  - -Type of Casting……...varies(see standard detail)

- Design
  - -Design frequency of storms……5 yr
  - -Minimum storm sewer design velocity…….….3.0 fps
  - -Design frequency for detention basins…….....5 & 100 yr
  - -Groundwater level below low floor elevations……..4'
  - -100-year flood elevation below lowest opening elevations…….……..2'
  - -Emergency overflow swale below building openings……...…1'
  - -Maximum basin side slope above water level……..4:1
  - -Basin safety bench slope starting at water level…….……....10:1
  - -Detention basin average depth……...…….4'-10'
  - -Minimum wetland buffer…….....20'
  - -Skimmer structure maximum 1-year storm event discharge rate…….….0.5 fps
  - -Minimum lot area above 100-year flood elevation……..8,000sf
- Grading
  - -Drainage away from homes……...0.5' drop within first 10'
  - -Drainage from house to property line……...min. 1% to high corner
  - -Drainage along property lines….……min. 1%
  - -Drainage first 20 feet behind structure……...5% slope

STREET

- Pavement
  - -Width (Public Streets)
    - -Standard urban two-lane….…….29' back to back
    - -Single lane w/ center median…….17' face to face
    - -Standard rural two-lane….……...24' edge to edge
  - -Width (Private Streets)
    - -Parking on both sides…….27' face to face
    - -Parking on one side……24' face to face
    - -No parking……..22' face to face
  - -Base……...…4" Agg. Base
  - -Wear Course…….……..1.0"
  - -Non Wear Course…….……..2.0"
- Boulevard
  - -Width (typ. for 60' ROW).……15.5'
  - -Typical slope.……..2%
  - -Treatment…….see details
  - -Topsoil……..….4"
  - -Minimum width for snow storage at back of curb…...……10'
- Sidewalks
  - -Width……..6'
  - -Concrete…….4"
  - -Cross slope……...2%
  - -Pedestrian Ramps……....truncated domes (charcoal gray or masabi black)
- Trails
  - -Width……...….8'
  - -Bituminous…….……2"
  - -Base…….…….4" Agg. Base
  - -Cross slope……...…2%

•Entrances

-Driveway – Residential

-Width…….12’-30’(see standard detail)

-Bituminous……..……..……..….2”

-Base……..….4” Agg. Base

-Concrete w/ 10-10 woven mesh or fibermesh……4”

-Concrete……..6”

-Minimum slope……...……..3.0 %

-Maximum slope……..10.0 %

-Driveway – Commercial

-Width……...16’-36’

-Bituminous…….…….3”

-Base……...6” Agg. Base

-Concrete……..6”

-Minimum radius……...……20’

•Curb

-Type – Concrete Curb & Gutter Design …….D312 (Residential)

Concrete Curb & Gutter Design ….…B618 (Commercial and MSA streets)

……..B612 (Medians and Commercial parking lots)

MISCELLANEOUS

-All plans shall be NGVD ’29 datum

-Crown (public streets)……...3.0%

-Minimum percent of grade……...….0.5%

-Maximum percent of grade for local streets……6.0%

-Maximum percent of grade for arterials and collectors……4.0%

-Diameter of Cul-de-sac……..91’ back to back

-Minimum % of grade around Cul-de-sac…….…....0.5%

-Minimum intersection radii for local and Arterial streets……....20’

-Minimum radius for Cul-de-sac……...……45.5’

-Right of Way Width Minimums

-Principal arterial (verify with governing agency)……....120’

-Arterial (verify with governing agency)…….…...80’

-Collector street……...70’

-Local street……60’

-Commercial/Industrial street……80’

-Service drive……..60’

-Cul-de-sac (from centerline)……..60’

-Drainage channel & natural waterways……..50’min.

-Minimum utility easement width (front and back yard)……..10’

-Minimum utility easement width (side yard)……5’

-Minimum drainage easement width……20’

-Minimum percent of grade at curb and gutter……...0.5%

-Minimum distance from property line for retaining walls……3’

-Maximum number of 0.2’ adjusting rings……...5

-Minimum number of 0.2’ adjusting rings……...…2

-Full depth soil corrections……...as directed by geotechnical engineer (fully corrected to back of sidewalk to 1’ off back of curb if no sidewalk)

-No clay or similar materials allowed in right-of-way.

-Extra Materials…….…..see specifications paragraph 2.1.2