Village of Menomonee Falls
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Menomonee Falls, WI 53051-3140
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Standards and Requirements for Development

I. GENERAL REQUIREMENTS

1. Complete set of plans and profile construction drawings (1" = 40') Preferred for sanitary sewer, water main, storm sewer, site grading, erosion control, paving, and landscape improvements. (Sanitary sewer and water main may be shown together on the same construction drawing. Grading and Erosion Control shall be on separate sheets.)

2. Provide a subdivision system plans for sanitary sewer, water main and storm sewer.

3. Provide detail drawings for intersections, pond outfall structures, or any structure such as bridges, nested culverts, etc… that may require special construction consideration.

4. Provide a subdivision cover sheet with the subdivision layout including all utilities, streets, lot and block numbers, easements, and adjacent land division if any. This cover sheet shall also indicate all project Bench Marks and a location lamp.

5. Developments shall be subject to the Stormwater Management Guidelines including on site detention, runoff, infiltration requirements, and water quality control provisions. (See attached Guidelines)

6. Sanitary sewer shall be located on the street centerline whenever possible with the water main parallel to it on the North or East side and the storm sewer on the South or West side.

7. All sanitary sewer, storm sewer and water mains shall be located within the roadway, except at locations deemed necessary by the Engineering or Utility Department. All utilities shall maintain a minimum distance of two feet from the curb flange except where utilities pass catch basins, the minimum distance shall be five feet from the curb flange. (There shall be no utilities beneath the curb & gutter.)

8. A subdivision grading plan shall be provided indicating the existing and proposed contours as well as the proposed finished yard grade for each lot.

9. When applicable, Wisconsin Department of Natural Resource wetland setbacks requirements must be indicated on the grading plans and plat. An approval letter by the Wisconsin Department of Natural Resources indicating concurrence with setback requirements must be submitted with the plans.

II. SANITARY SEWER (plan and profile)

1. Provide design sheets for each length of sanitary sewer main on Village forms or on forms approved by the Village. (see attached form)

2. Sanitary manholes shall have a maximum spacing of 400 feet.

3. 48 inch diameter manholes shall be used with Neenah R-1661 frames and self-sealing lids (non locking type) with no vent holes. Manholes in easements within floodplains will require bolt down covers.

4. The depth of sanitary sewers shall be adequate to serve all basements by gravity.

5. Provide an estimate of quantities on each construction drawing and indicate continuing sheets (See sheet No.).

6. All sanitary sewer manholes shall be numbered and begin with the Prefix "MH". Plan and profile views.

7. Show and label proposed and existing storm sewer and water main. (dashed)

8. Show lot lines, lot and block numbers, and frontage dimensions.

9. Show the size, class of pipe, and slope of all sewers and the distances between structures.

10. SDR35 pipe shall be used for sanitary sewer less than 16 feet deep.

11. C900 pressure pipe is required for sanitary sewer deeper than 16 feet.

12. Show station and offset for all sanitary sewer structures, including rim and all invert elevations.

13. Provide the following note on all applicable plan sheet: Backfill for all trenches shall be ¾" crushed limestone TB (Section 6.45.4 of the Village Specifications) unless other wise noted in the profile or in the project specification.

14. Show limits of gravel, spoil, or slurry backfill in the profile.

15. Show existing and proposed surface profiles over the sanitary sewer.

16. Dimensions showing offset from right-of-way to the sewer line and separation between the sanitary sewer, storm sewer, and water main. There shall be a minimum of 8’ horizontal clearance between the sanitary sewer, storm sewer, and water main.

17. All laterals connections shall be at the main. Lateral connections into manholes are not permitted.

18. Sanitary laterals are to be 10’-12’ below finished grade at the R/W line and at a depth adequate to service basement floor elevations.

19. In areas where sidewalk is proposed, the sanitary laterals shall be installed to extend 5 feet past the back of the proposed walk.

20. Indicate lateral size, length, elevation, and location from closest down stream sanitary sewer manhole. Plan and profile views.

21. Lateral risers shall indicate elevations at inverts on main sewer line and top of riser invert, height measured from top of main to invert of lateral. Plan and profile views

22. Any existing sewer laterals to be abandoned must be capped at the main.

23. Where the sanitary sewer main crosses any underground utility or structure, these crossings shall be shown in the profile.

24. The maximum deflection angle at manholes shall be 90 degrees.

25. 30 degree deflection angle or greater on sanitary sewer will require a minimum .25 ft. drop in the manhole, or greater drop if required by design computations.

26. Any angle less than 30 degrees on a sanitary sewer will require a minimum .10 ft. drop in the manhole, or greater drop if required by design computations.

27. A minimum design slope of 0.60% is to be provided at end reaches of sanitary sewer.

28. Sanitary sewer will not be allowed in cul-de-sac outlots.

29. P.E. stamp of the Design Engineer.

30. Provide a warning note regarding underground utilities to located by “Diggers Hotline” on each design sheet

III Water Main (plan and profile)

1. Provide an estimate of quantities on each sheet.

2. All hydrants shall be numbered and begin with the Prefix "H". Plan and profile views.

3. Show station, offset, and elevation for all water main fittings. Locate gate valves at each intersection along the property lines extended.

3. All valves shall be numbered and begin with the Prefix "V". Plan and profile views.

4. Water main shall be designed with a depth of cover between 6.0' and 6.5' from top of pipe to finished surface grade. The water main may be deeper where it crosses under storm sewer to obtain the depth necessary to provide a minimum of 18" vertical clearance between pipes. Vertical offsets with bends shall be used to obtain the required depth at these crossings.

5. The minimum water main size shall be 8-inch diameter except for cul-de-sacs which service no more than one hydrant in which 6-inch diameter main will be allowed.

6. Compound bends and fittings will not be permitted. A minimum of 8 feet shall be provided between fittings such as tees, crosses, bends and valves. (Preferably10 feet).

7. 90° bends will not be permitted. Instead two 45° bends are to be used with a minimum of 8 feet between bends.

5. Show and label proposed and existing sanitary and storm sewers. (dashed)

6. Indicate water main size, class of pipe, slope and distance between fittings or grade breaks

7. Show lot lines, lot and block numbers, and frontage dimensions.

8. Indicate water lateral size, length, and location. (All residential water services shall be 1 ¼" polyethylene tubing. Two separate 1 ¼" services are to be provided on duplex lots).

9. Provide the following note on all applicable plan sheets: Backfill material for all trenches shall be ¾" crushed limestone TB (Section 6.45.4 of the Village Specifications unless otherwise noted in the profile or in the project specifications.

10. Dimensions showing offset from right-of-way to the water line and separation between the sanitary sewer, storm sewer, and water main. There shall be a minimum of 8’ horizontal clearance between the sanitary sewer, storm sewer, and water main

11. Show existing and proposed surface profiles over the water main.

12. Show the limits of gravel, spoil, or slurry backfill in the profile.

13. Where the water main crosses any underground utility or structure, these crossings shall be shown in the profile.

14. Hydrants shall be provided for air release at all dead ends including lines where the main will be extended in the future.

15. Hydrants should be located at the northeast corner of intersections. Hydrants not at intersections shall be placed at property lines extended. A 250 ft. radius of coverage shall be used for residential development. The radius of coverage shall provide full coverage of all building pads.

16. Water valves are located at the right-of-way lines extended, maximum spacing of 800 feet.

17. The number of mainline valves at intersections shall be one less than the number of legs of the intersection.

18. Mainline valves located mid-block should be located 10 feet off of a hydrant tee.

19. At the end of a line that will be extended in the future, the valve should be past the last set of service laterals and at least 40 feet from the temporary end of the water main. If a hydrant branch is located near the temporary dead end of the water main, the minimum length can be reduced to 20 feet.

20. Hydrants should be set 2 ft. behind the back of curb, with the nozzle elevation 20 inches above top of curb. Nozzle elevations must be shown on plan and profile views. Anchor tees shall be used for each hydrant branch.

21. Water main will not be allowed in cul-de-sac outlots.

22. P.E. stamp of the Design Engineer.

IV. STORM SEWER (plan and profile)

1. Provide storm sewer system design computations utilizing a 10 year storm event.

A. The computations must be based upon the *Point Rainfall Intensity-Duration-Frequency Equations for the Milwaukee Metropolitan Sewage District and Region.*

B. The computations shall include determination of the hydraulic grade line, which is to be contained within the storm sewer pipe. Include a map showing tributary areas with arrows for direction of flow.

C. The computations must use the appropriate composite C value which reflects actual conditions.

D. A drainage map indicating the area draining to each inlet must accompany the computations.

2. The storm sewer flow shall be supplemented by overland flow to accommodate a 100-year storm event to convey the runoff into the stormwater detention facilities in such a manner that it will not adversely affect property. In cases where the overland flow path does not drain to the stormwater detention facilities, the storm sewer shall be designed to accommodate the 100-year storm event.

3. Provide a warning note regarding underground utilities to be located by “Diggers Hotline” on each sheet.

4. Provide an estimate of quantities on each sheet.

5. Show the size, class of pipe, and slope of all sewers and the distances between structures. (All storm sewer pipe shall be gasketed RCP)

6. All storm manholes must be numbered and begin with the Prefix "ST". Plan and profile views.

7. All catch basins must be numbered and begin with the Prefix "CB". Plan and profile views.

8. The minimum depth of cover for storm sewer in roadway areas shall be 3.0’ from the top of pipe to finished pavement grade, except at catch basin leads where the depth of cover may be reduced to 2.5’ at the catch basin.

9. All catch basins shall be connected to storm sewer manholes and not other catch basins except at locations deemed necessary by the Engineering Department.

10. Show and label proposed and existing sanitary sewer and water main. (dashed)

11. Show lot lines, lot and block numbers, and frontage dimensions.

12. Locate all catch basins at the radius points on the curb at all intersections. When catch basins are required between intersections, they are to be located at or near property lines whenever possible. The maximum spacing of catch basins within streets shall be 300 feet from the crest of a hill or the next catch basin.

13. Storm inlets (no sump) shall be provided along backyard drainage swales such that the flow length in the swale does not exceed 350 feet before the drainage is captured by a storm inlet. Storm inlets located in rear lot areas are to be located on property lines where possible. Open pipe inlets are not to be used in backyard areas.

14. All catch basins within roads must flow into storm manholes except when a catch basin is outleting into a detention basin or located in easements.

15. Show station and offset for all storm sewer structures, including rim and all invert elevations.

16. Provide the following note on all applicable plan sheets: Backfill for all trenches shall be ¾" crushed limestone TB (Section 6.45.4 of the Village Specifications) unless other wise noted in the profile or in the project specification.

17. Show limits of gravel, spoil, or slurry backfill in the profile.

18. Show existing and proposed surface profiles over the storm sewer.

19. Dimensions showing offset from right-of-way to the sewer line and separation between the sanitary sewer, storm sewer, and water main.

20. 48 inch diameter pre-cast concrete manholes shall be used on storm sewer mains of 24" diameter or smaller with Neenah R-1661 frames and Neenah R-1660 -0003 covers with 6 vent holes. Storm manholes in easements shall use Neenah R-1661 frames with type C grates. All Storm Manhole sizes shall be indicated on plan and profile views.

21. At storm manholes with a 30° deflection angle or greater, a minimum drop of 0.25 feet shall be provided between inverts. A greater drop may be required per hydraulic design calculations.

22. At storm manholes with a deflection angle less than 30°, a minimum drop of 0.10 feet shall be provided between inverts. A greater drop may be required per hydraulic design calculations.

23. All catch basins in roadways shall be 2.5'x3' precast structures with 12" sumps and Neenah R-3246-A frames, grates and curb boxes. Type "L" vane grates shall be used where the street grade exceeds 4%. Backyard

storm inlets shall be 42” minimum diameter with no sumps and Neenah 2560-D8 beehive castings.

24. Swales must be constructed where necessary to direct surface water to the storm sewer system. Easements shall be obtained where required. All easement limits and widths shall be shown on the plans.

25. Storm sewer outfalls shall be ditched to the natural drainage area. If the ditch grade is too steep, velocity reducing measures may be required to minimize erosion. Headwalls shall be built around all open ends of the storm sewer.

26. Bar grates or trash guards are required on all inlet and discharge pipes in excess of 18” inches.

27. P.E. stamp of the Design Engineer.

V. STREET AND PAVING (plan and profile)

1. Show lot lines, lot and block numbers and frontage dimensions.

2. Indicate stationing along the centerline of the pavement including any cul-de-sacs. (All stationing and profiles in cul-de-sacs must continue to the back of curb.)

3. Show edge of pavement and either face or back of curb depending upon the curb section.

4. Show existing and proposed centerline profiles along the roadway, including any cul-de-sacs.

5. Show existing and proposed centerline grades at 50 ft. intervals, including any cul-de-sacs.

6. Cul-de-sacs shall have a maximum length of 500 feet.

7. Cul-de-sacs without interior islands shall have a radius of not less than 60 feet at the right-of-way line and a roadway radius of not less than 44 feet measured to the flange line of curb. Cul-de-sacs with interior islands shall have a radius of not less than 70 feet at the right-of-way line and a roadway radius of not less than 54 feet measured to the flange line of the outside curb and a radius of not less than 30 feet at the inside radius of the flange of curb.

8. Minimum design speed within the Village is typically 25 MPH (within new subdivisions). Speed requirements may vary with the Village and the design engineer must check design speed requirements for each project.

9. Minimum stopping sight distance shall meet all AASHTO guidelines.

10. Show the slope at each grade break and all vertical and horizontal curve data.

    - The minimum radius allowed for horizontal curves, measured at the center line within roadways, is 150 feet.
    - The minimum "K" value for vertical curves must meet minimum design requirements per AASHTO. The minimum "K" value for residential subdivision streets shall be 18.5 except at sag locations, near intersections where there will be stop signs, in which a smaller “K” value will be permitted.
    - The maximum “K” value for crest and sag vertical curves in residential subdivision streets shall not exceed 35.

11. Provide an estimate of quantities on each sheet, and indicate continuing sheets (See Sheet No. __)

12. Dimension the pavement, the curb lawn (parkway), and right-of-way.

13. Provide intersection details at 1:20 scale. Dimension radii of all intersections and provide curb grades at all intersections including pavement grades at the flange lines extended where required to maintain proper drainage.

14. Minimum radii of all intersections are 30 feet measured at the flange.

15. The maximum grade for all streets shall be 6%, except cul-de-sacs which are 8%. The minimum grade for all streets shall be 0.6%.

16. Show limits of any areas that require special soil stabilization fabric or undercutting.

17. Show specific details of all existing streets to be connected to. This topography data shall include all pavement, shoulders, ditches, curbs, culverts, and driveways within 100 ft. +/- of the proposed development.

18. Provide typical street cross-sections, curb cross-sections, and other required details.

19. Provide a warning note regarding underground utilities to be located by “Diggers Hotline” on each design sheet.

20. P.E. stamp of Design Engineer.

VI. GRADING PLAN AND EROSION CONTROL

1. Show subdivision boundary lines including street right-of-way and lot and block numbers.

2. Show all existing and proposed streets as well as the existing and proposed storm sewer system. All rim elevations must also be shown.

3. Show existing and proposed contour lines at 1 ft. intervals. These contour lines shall extend at least 100 ft. into all adjacent parcels. When the adjacent topography is critical to the development, the contour lines shall extend as far as necessary into adjacent parcels in order to assess the potential impact of the proposed development on existing homes or businesses.

4. Show proposed grades to the nearest tenth of a foot at all property corners.

5. Show any retaining walls required. All retaining shall not exceed four feet in height unless it has been designed and its construction supervised by a professional engineer. A retaining wall shall be stepped to achieve a greater height. Each step of the wall shall be no more than four feet in height and shall be set back a minimum of three feet from the previous step.

6. Show building pad locations for each lot incorporating all required setbacks. Show finished yard grades (garage floor) to the nearest tenth of a foot for each lot. Yard grades (garage floor) shall have a maximum elevation allowing the driveway to have a grade of less than 10% at the high side of the lot.

7. Building pads with full exposures shall have the exposure set at 8.3’ to accommodate 9-foot basements.

8. Show all swales and ditches required for drainage, as well as all required drainage easements. Provide drainage swales, centered along lot lines, whenever possible. All drainage swales shall have a minimum of 1% slope.

9. All permanent diversion berms necessary for stormwater management shall have a minimum height of 2 feet with a top of berm width of at least 3 feet.

10. Show all areas of Floodway, Flood Fringe, or Wetland designation.

11. Show location of topsoil stockpile if required.

12. Provide a separate Erosion Control plan conforming to the Menomonee Falls Erosion Control Ordinance.

13. Provide notes to properly sequence the construction activities in order to manage the storm water runoff.

14. Provide specific details on all retention/detention basins, ponds, overflows, etc. See separate Storm Water Management Guidelines enclosed.

15. All basement exposure elevations and yard grades shall be a minimum of 2 feet above any potential standing water. The highest level of potential ponding water shall be assumed to be at the elevation in which there is an overland relief path. Basement floor elevations shall be a minimum of:
    A. 2 feet above the 100-yr flood elevation of a mapped floodplain.
    B. 2 feet above the normal water surface elevation of any adjacent detention pond or natural area of standing water.
    C. 3 feet above the highest anticipated seasonal groundwater elevation (to be determined by a licensed professional soils engineer).

16. All finish yard grades (garage floor) shall be a minimum 1.6 ft. above the top of curb in line with the house at the high side of the lot and a minimum of 1.0 ft. higher than the finish grade elevation of the highest lot corner.

17. Provide at least 0.5’ drop in elevation from the yard grade to the side lot lines.

18. In areas with sidewalk, terrace areas located in the right-of-way between the curb and front of sidewalk shall be graded so that the elevation from the back of curb increases at a 3% slope to the front of sidewalk.

19. In areas without sidewalk, the terrace areas shall be graded to a 2.3% slope from the back of curb to the right-of-way line.

20. For areas where catch basins are located in yards, the maximum depth of potential ponding water shall be no more than 1’ before it reaches an overland relief path.

21. P.E. stamp of the Design Engineer.