# CHAPTER 11

## Plan Standards

A. Introduction

The city requires uniform public improvement plans for ease of record keeping and understanding. The following standards govern most plan submittals to the city. Any specialized submittal requirements may be discussed with the city's development engineer. Copies of sample drawings are available for review.

B. General Plan Standards

1. General Drawings

a. All final engineering plans submitted shall be on 22” x 34” mylar as well as a computer CD-ROM in a compatible format to the city's current AutoCAD version.

b. Final specifications shall be submitted on a computer CD-ROM in a compatible format to the city's current Microsoft Word version.

c. All public improvement plans shall be prepared on reproducible double matte, 4 mil mylar, having a standard size of 22" x 34".

d. All plans must be clear, legible, and prepared in a professional manner.

e. All documents shall be drawn to scale, which will permit all necessary information to be plainly shown, legible, and easily understood. Utility plans shall be drawn to 1”=40’ horizontal and 1”=4’ vertical. Paving plans shall be drawn to 1”=20’ horizontal and 1”=2’ vertical. As an alternate the City Engineer may approve the use of 1’=40”, however intersection details should be drawn at 1”= 20’

f. All benchmarks shall be noted on the plans.

g. All proposed public improvement construction materials shall be indicated on the drawings.

h. All required drawings (sanitary, water main, storm, paving, grading, and street lighting) shall be bound and submitted in one set. The city will not review partial sets.

i. All elevations are to be based on the city datum (subtract 580.56 from the U.S.G.S. datum to convert to the city datum.)

j. All elevations shall be described to the nearest 1/100 of a foot unless otherwise noted.

k. All distances shall be described to the nearest 1/100 of a foot unless otherwise noted.

l. Slopes shall be indicated in percentages to the nearest 0.00%.

m. Stationing along the roadway centerline shall be shown at 100' intervals with tick marks at half-stations, including cul-de-sacs.

n. Stationing shall be referenced to a survey monument.

o. A symbol legend shall be shown.

p. Any revision made after the City Engineer has signed the plan set shall be clouded or otherwise indicated as a revision with the revision number indicated.

q. Revisions shall be numbered in the title block revision section.

r. The plan and profile sections shall be aligned vertically, with the profile at the top of the drawing.

s. Plan sheet size shall be 22" x 34", except for grading plans for review purposes only.

t. A proposed established street grade with the appropriate five-line profile will have to be created if one does not exist.

u. The design engineer's name, address, phone number, fax number, e-mail address, signature, and graphical company logo shall be placed just above the title block.

v. All text shall be read from the bottom or right side.

w. The computer file name and time of plot shall be printed up the left side of all plan sheets.

x. Identify all obstructions/appurtenances located within the project limits, including but not limited to trees, signs, utilities, fences, and light poles.

2. Title Block

a. A seal and signature of a Professional Engineer or Surveyor registered in the State of Wisconsin.

b. Scale the work is drawn in.

c. Placed in lower right corner and conform to city's standards.

d. Drawing date and any revisions in the lower portion of the engineer's seal block.

e. A sample is available on computer format, upon request.

3. Plan View

a. All easement locations, type, and size.

b. Subdivision boundary lines.

c. ROW lines and width.

d. All lot lines.

e. All underground utilities, proposed or existing, (sanitary, storm, water, gas, electric, telephone, and television cable.)

f. The design engineer shall certify in the title block, left side, that all utilities have been investigated and show them on the drawing.

g. Identify the following for all properties:

1) Owner's name

2) Address

3) Tax Key Number

4) Subdivision, block, and lot numbers

5) CSM number

6) Frontage distance

h. All curb flange and back or edge of pavement lines.

i. All adjoining and inclusive roadways and their names.

j. A north arrow.

k. An estimate of quantities.

l. Driveways and surface type

4. Profile View

a. Show proposed established street grade.

b. Show existing and proposed ground elevations over proposed facility.

c. Existing and proposed centerline grade shall be drawn and labeled.

d. All existing or proposed utility crossings such as sanitary, gas, and telephone shall be drawn with the name, diameter, elevation, and station indicated, including other than city public utilities.

C. Grading Plan

1. The erosion and sediment control plan shall be submitted on a separate sheet from the grading plan. These may be combined with the approval of the City Engineer.

2. The grading plan shall show existing and proposed property topographic conditions based on the city datum.

3. A drawing scale of 1" = 40' and individual survey scale of 1" = 30' shall be used.

4. Existing and proposed contour lines at 1' intervals, extending 100' into adjacent properties, except when adjacent topography is critical to the development, then contour extends 200' into adjacent properties.

a. 2' contours may be used in certain cases, but only with the City Engineer's written authorization.

b. Existing contour lines shall be shaded and/or dashed.

c. Proposed contour lines shall be bold and solid.

5. All yard elevations shall be shown to 1/10 of a foot.

6. Proposed spot elevations at all proposed property corners, and breaks in alignment or grade, including high points, low points, and side and rear yard swales.

7. Typical sections and details shall be shown for all swales or ditches (side yard, rear yard, and drainage channel.)

8. Show all existing and proposed high points, low points, and other critical drainage elevations.

9. Elevations of all corners of paved parking areas.

10. Typical building pad locations for each lot that incorporate setbacks and offsets and show finished yard grade elevations to the nearest tenth of a foot.

11. Proposed yard grade at building shall be indicated at the building setback line.

12. Finished street centerline elevations shall be indicated at 100' stations, all intersections, cul-de-sac, and any change in slope.

13. All lots requiring walkouts, lookouts, or split level homes shall be indicated on the plans and recorded in the deed restrictions.

14. All obstructions within the project limits including but not limited to trees, landscaping, fences, structures, light poles, and manholes.

15. Proposed topsoil stockpile location.

16. Show storm water management facilities including location, size, required volume, provided volume, berm elevations, overflow location and elevation, and wet or dry bottom.

17. All existing and proposed culvert locations, inverts, sizes, and materials within the proposed development, and all existing within 200' of the development

18. Proposed and existing ditch elevations at grade breaks, property lines extended, or at spacings of 100' maximum.

19. Major and secondary (minor) flood routings through the site.

20. All existing and proposed storm sewer inlets and catch basins within the proposed development show rim and invert elevations and pipe sizes and flow directions.

21. Typical street cross section.

22. Culvert diameters for all lots having future individual driveways

23. Commercial developments shall have:

    a. A detail of driveway approaches, including elevations and dimensions.

    b. location, size, and material of roof drains outlets

    c. 3 copies of final site grading plan for City Engineer approval.

24. Grading plan certification shall be required for:

    a. subdivision/C.S.M. prior to final plat approval

    b. Building plats of survey prior to occupancy

D. Paving Plan

1. Plan View

    a. Storm sewer shall be shown on separate storm sewer plans, unless approved by the City Engineer.

    b. All surface structures related to underground utilities shall be shown with rim elevations (i.e. manholes, inlets, valve boxes, and hydrants).

    c. Catch basin and inlet locations and elevations shall be shown.

    d. Top of curb and centerline elevations at any non-standard cross sections and warped pavements at 25' intervals.

    e. Centerline of proposed ditches, if used, with proposed elevations at every even station.

    f. Lot line, numbers, and frontage distances.

    g. Name of each roadway and any adjoining roadways.

    h. All culvert locations, their sizes, and invert elevations.

    i. Radii of all intersections to edge of pavement or back of curb.

    j. All curb and gutter shall be dimensioned to the back of curb.

    k. Tabular curve data shall be shown for all roads proposed and existing.

    l. Typical roadway section and cul-de-sac section.

    m. Location of 4" underdrain outlets.

    n. Specific details of all existing roadways.

        1) Pavement type, thickness, and width.

        2) Shoulder type and width.

3) Ditch depth and location.

4) Curb type, size, and alignment with face and flange of curb.

5) Horizontal and vertical alignment, including cross slope.

o. All roadside ditch locations, slope, and flowline elevations as specified in the grading section.

p. The beginning and end of all radius points shall be labeled with a station, offset, and elevation.

q. The limits of any areas, which need special soil stabilization techniques, if known.

r. Slope intercepts shall be shown as a large dashed line.

s. A drawing scale of 1”=20’ horizontal and 1”=2’ vertical shall be used.

2. Profile View

a. Existing and proposed roadway profiles along the centerline of the roadway and cul-de-sac.

b. Stationing and proposed centerline grades at all stations and ½ stations, and at 25' for all vertical curves, and all horizontal and vertical P.C.'s, P.T.'s and P.I.'s.

c. All culverts with their size and inverts labeled.

d. Slope of the centerline between grade breaks.

3. Detail Sheet

a. The detail sheet shall show all details, the standard cross section to be used, and any non-standard cross sections used on the project.

b. Curb section shall be shown with specific dimensions.

c. Details of any specialized items used on the project.

d. The detail sheet may include any other details required for the rest of the plan set.

e. Pavement cross section

E. Sanitary Plan (currently the Water and Sewer Utility are providing these as-builts. Therefore these requirements are incorporated for reference only).

1. Plan View

   a. Proposed and existing water and sanitary main and lateral locations.

   b. Proposed and existing water main, sanitary, and storm sewer and manhole locations, and rim and invert elevations, as applicable.

   c. Dimensions showing offset from ROW or centerline to the sewer line, and separation between the sanitary sewer and other utilities.

   d. Distance between manhole centers and between each sanitary sewer lateral.

   e. Length of each sanitary sewer lateral and length of any lateral risers.

   f. Size of proposed sanitary sewer.

   g. A note warning that underground utilities should be staked out by Diggers Hotline.

   h. All culvert locations (proposed and existing.)

   i. Numbered manholes.

   j. Proposed or existing storm sewer, water main, and appurtenances (dashed.)

   k. All required standard notes, MMSD notes, or other additional statements.

   l. All improvements are stationed.

   m. All obstructions/appurtenances located within the project limits including but not limited to trees, signs, utilities, fences, light poles, and structures.

   n. Existing sanitary sewer material, size, and location.

   o. Length, size, material, and slope of any sanitary sewer lines not shown in the profiles.

   p. A drawing scale of 1”=40’ horizontal and 1”=4’ vertical shall be used.

2. Profile View

   a. Sanitary sewer pipe to be drawn with two solid lines indicating arch and flow line of pipe.

b. Existing and proposed surface profiles over the sanitary sewer.

c. The proposed sanitary sewer and manholes.

d. Manhole numbers, rim, and invert elevations.

e. Material, class, slope, and size of sanitary sewer between each manhole.

f. The proposed water main or storm sewer and its size (dashed.)

g. Culverts and their inverts and sizes (proposed and existing.)

h. Limits of gravel, spoil, and/or slurry backfill.

i. Distance between manhole centerlines.

j. Material and size of any existing sewer to be tied into.

k. Material choices of new sanitary sewer, if appropriate.

l. Stationing.

F. Storm Sewer Plan

1. Plan View

a. Proposed and existing water and sanitary main, and lateral locations.

b. Proposed storm sewer, catch basin, inlet, and manhole locations and elevations.

c. Rim and invert elevations of inlets, catch basins, and manholes.

d. Dimensions from centerline or ROW.

e. Dimensions from proposed or existing sanitary and water mains.

f. Length, size, material, and slope of any storm sewer lines not shown in the profiles.

g. Existing storm sewer material, size, and location.

h. Rip-rap, or other end treatment cover, limits, and thickness.

i. Location of sump pump laterals.

j. A drawing scale of 1”=40’ horizontal and 1”=4’ vertical shall be used.

2. Profile View

    a. Storm sewer pipe to be drawn with two solid lines indicating arch and flow line of pipe.

    b. Length of each pipe from manhole center to center.

    c. Material, class, size, and slope of all storm sewer pipes.

    d. Rim and flow line elevations at manholes.

    e. Backfill types shall be shown on the top of the profile section.

    f. Existing and surface profiles over the storm sewer.

G. Water Main Plan (currently the Water and Sewer Utility are providing these as-builts. Therefore these requirements are incorporated for reference only).

1. Plan View

    a. Proposed or existing sanitary and storm sewer main and lateral locations.

    b. The location and elevation of all proposed water main and appurtenances.

    c. Dimensions showing offset from ROW or centerline to the water main, and separation between the water main and the sanitary sewer and other utilities.

    d. Labeled appurtenances (i.e., hydrants, gate valves, bends.)

    e. Length, size, and material of each water lateral.

    f. Size of water main.

    g. Size of proposed sanitary sewer.

    h. A note warning that underground utilities should be staked out by Diggers Hotline.

    i. All culvert locations.

    j. All areas to be insulated over water main.

    k. Material and size of any existing water main to be tied into.

    l. All required standard notes or other additional statements.

m. Pump house and well location.

n. All obstructions located within the project limits, including but not limited to trees, signs, utilities, fences, light poles, and structures.

o. A drawing scale of 1"=40' horizontal and 1"=4' vertical shall be used.

2. Profile View

a. Water main pipe to be drawn with two solid lines indicating arch and flow line of pipe.

b. Existing and proposed surface profiles over the water main.

c. The proposed water main and appurtenances.

d. Labels and elevations of appurtenances.

e. Distances between appurtenances.

f. Slope of water main and elevations at break points.

g. The proposed sanitary or storm sewer and its size (dashed.)

h. Culverts and their inverts and sizes.

i. Limits of gravel, spoil, and/or slurry backfill.

j. Material and size of any existing water main to be tied into.

k. Stationing of any areas to be insulated.

l. Hydrant nozzle and hydrant tee elevations.

m. Material choices of new water main, if appropriate.

H. Street Lighting Plan

Plan View

1. Location of:

- street light poles and transcloser
- location and nominal length of buried cable-in-duct

- pull box locations
- location and sizes of conduit crossings of pavements

2. Details showing street lights and luminaries, types, sizes, and specifications.

3. Streetlighting plans may be combined with the paving plans with the approval of the City Engineer.

I. Storm Water Management Plan

1. Report

a. The report shall be bound in a single document. A professional engineer registered in the State of Wisconsin shall stamp the cover.

b. The report shall contain the following components:

1) Introduction

2) Undeveloped conditions

3) Developed conditions

4) Explanation of routing

5) Outlet structure analysis and details

6) Summary of peak flows, allowable flows, required storage, provided storage and peak water surface elevations for the 1-year, 2-year and 100-year events.

7) Explanation of water quality performance standards including suspended solids reduction, infiltration, protective areas and fueling and vehicle maintenance areas.

8) Appendices containing all supporting documentation including input and output data, hydrographs, routing calculations and stage-storage-discharge tables.

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2. Plan

a. Drainage basin map showing pre and post-development watersheds in acres. Label basin using letters, and cross-reference report.

b. Show all spillway/outfall structures, size, materials, and construction methods.

c. Flood stage of 100-year, 24-hour storm event.

d. Show time of concentration flow path with each flow component type (sheet, shallow concentrated, or channel).

e. Show each type of land use.

f. Show facility overflow routes.

g. Show pre- and post-development peak flows in cubic feet per second at each storm water exit point

J. Erosion Control Plan

The erosion control plan shall include:

1. Site boundaries and adjacent lands.

2. Existing site topography of the proposed site and adjacent lands, within 200'.

3. Existing vegetative cover and soil type.

4. Limits of 100-year flood plain, wetlands, environmental corridor, and water courses.

5. Location and dimensions of storm water drainage systems.

6. Location and dimensions of existing ponds, utilities, structures, and lot lines.

7. Proposed plan items shall include:

a. Location and dimensions of all proposed land-disturbing activities.

b. Location and dimensions of all temporary soil stockpiles.

c. Location and dimensions of all Best Management Practices, including but not limited to:

- Filter fabric used in curb & field inlets
- Erosion control mat
- Ditch checks
- Silt fence
- Tracking mats
- Seeding used for erosion control

d. Phasing plan for Best Management Practices.

e. Maintenance provisions.

f. Haul road locations.

K. Preliminary Plat

Two copies of the approved preliminary plat shall be submitted with the required engineering plans.

L. Final Plat

1. Final plat shall be submitted to the city only after the City Engineer has certified all improvements that are required by the development agreement are complete.

2. One full size and one 200-scale reduction shall be submitted on 4 mil, double matte mylar. All copies shall be black line mylar.

3. Final plat shall be submitted in the city's current AutoCAD version, or ASCII text file on a CD-ROM.

M. As-Built Record Drawings

1. General

a. Sanitary sewer record drawings shall be done in accordance with MMSD rules and regulations.

b. Construction site inspector shall create a red-lined "as-built" copy of the construction plan.

2. Water Main Record Drawings

a. Shall indicate ties to all above-ground improvements, including valves, hydrants, and stop boxes.

b. Main type and size.

c. Lateral type and size.

d. Hydrant type and size.

e. Fitting type and size.

f. Lateral lengths and location.

g. Name of contractor and date construction was complete.

h. Subdivision lot numbers, consistent with final plat.

i. Street names.

j. Edge of pavement and ROW.

k. Existing sanitary sewer, dashed.

l. Existing storm sewer, dashed.

m. Inspector's name and firm.

n. Adjoining file numbers.

o. Location of mainline off of ROW, centerline, or another utility.

p. Show all easements and widths.

3. Storm Sewer Record Drawings

a. Main type, size, and length including catch basin leads.

b. Catch basins, manholes, and type of construction.

c. Rim elevations and invert elevations of all manholes/catch basins.

d. Subdivision lot numbers consistent with final plat.

e. Edge of pavement and ROW.

f. Street name.

g. Name of contractor and date construction was complete.

h. Name of inspector and firm.

i. Storm sewer easements and widths.

j. All dimensions to laterals, type, size, and depth.

k. Location of main line.

l. Location of existing sanitary sewer and water main.

4. Grading and Drainage Record Drawings

After finish grading is complete, a grading record drawing shall be submitted to verify conformance with the approved grading plan. The drawings shall consist of the following:

a. Use approved grading plan as the base sheet. Denote "record drawing" in bold letters at the top and specify the firm conducting the certification. Cross out the name of the design firm on the plan if different from the firm doing record drawing.

b. Spot elevations in the center of all lot pads to the nearest tenth of a foot.

c. Spot elevations at all property corners to nearest tenth of a foot.

d. Spot elevations at all property line midpoints to the nearest tenth of a foot.

e. Culvert invert elevations to the nearest hundredth of a foot.

f. Centerline ditch grades for roadside ditches at every even station or if in an easement, at 100' intervals to the nearest tenth of a foot.

g. Elevations at top of bank and toe of slope of berms, to the nearest tenth of a foot.

h. Spot elevations at all critical break points and drainage swales to the nearest tenth of a foot.

i. Verify topographic lines as directed by the City Engineer.

j. Elevations at all detention basins, including outfall structures, emergency outfalls, basin contours and certification of pond capacity.

k. Tolerances

1. All spot elevations shall be within +0.10’ and –0.30’ of plan grade to be acceptable.

2. Building pad areas may be left low to accommodate less hauling off of basement spoils as long as positive drainage is maintained.

N. Building Permit Plat of Survey

1. A Wisconsin registered land surveyor shall prepare all building permit plats.

2. Two original building permit plans must be submitted, each with an original surveyor's seal and signature.

3. The building permit plat shall show the following:

   a. Address and phone number of the surveyor

   b. Date of the survey

   c. Approved yard grade from the master grading plan, CSM grading plan, site grading plan, or proposed established street grade drawing

   d. Indicate which of the above were used

   e. Property address

   f. Lot lines with dimensions

   g. Building set back, ROW, curb or edge of pavement lines

   h. Building foot print with dimensions

   i Legal description of the land survey

   j. Name of abutting streets

   k. Drawing scale and north arrow

   l. Proposed and existing 1' contours extending 20' onto adjacent property

   m. The proposed contours should be a heavy weight line

   n. Proposed spot elevations, using the city datum, at the following locations:

      1) Lot corners

      2) Swale high points

      3) Swale low points

      4) Garage floor at the middle of the front

      5) At the back of walk, if existing or proposed

      6) At back of curb or center of the ditch at the property lines extended

7) Ditch elevations each end of the driveway culvert

8) Any controlling elevations from the master grading plan

9) Adjacent yard grades per the master grading plan

o. Existing spot elevations, using the city datum, at the following locations:

1) Lot corners

2) Existing swale high points

3) Existing swale low points

4) At the back of curb or existing edge of pavement (indicate if the final surface has or has not been placed)

1) Existing yard grades of adjacent homes if they exist

p. The proposed elevation should be boxed to distinguish them from existing elevations

q. Additional elevations needed to define specialized grading features

r. Proposed or existing

1) Sidewalk

2) Street lights

3) Street trees

4) Hydrants

5) Manholes

6) Valve boxes

7) Drainage or water courses

8) Other buildings

9) Driveway location and slope

10) Easement locations, size and type

11) Erosion control devices location and type

12) Floodplain and/or floodway boundaries

s. Indication if the lot will use any specialized grading features such as walkout, lookout, split level, drop garage floor, exposed foundation, berms, or retaining wall systems