DEVELOPMENT HANDBOOK

CITY OF WAUKESHA
DEPARTMENTS OF PUBLIC WORKS
AND
COMMUNITY DEVELOPMENT

2019 EDITION

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City of Waukesha

Department of Public Works

Design and Construction Manual

2019 Edition

Division 1

Development Handbook

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0 DEVELOPMENT HANDBOOK OVERVIEW

On behalf of the City of Waukesha, we would like to take this opportunity to thank you for your investment in the City of Waukesha with your proposed development. Our goal is to provide you with clear and understandable resources to get you going with your project as soon as possible.

The Engineering Division and Planning Department have created the ***Application for Development Review (D100)*** (found in the Attachments) to guide you through the Planning and Engineering review process for the City of Waukesha. This application serves as the application for all Plan Commission projects. All Private Development submittals are reviewed by multiple departments including: Planning and Community Development, the Engineering Division of the Department of Public Works, Fire Department, and Water Utility.

The Development Handbook consists of 6 Sections relating to Private Development. The goal of the Department is to provide clear and understandable resources to get you going with your project as soon as possible.

For complex development projects, we require you to schedule a review meeting with a conceptual plan with both the Community Development Department and the Engineering Division prior to submission of a full Plan Commission application. This meeting will be coordinated by the Planning Department. The comments you will receive from the concept review meeting will aid you in preparing your full plan set in a more efficient manner. A list of contacts for each City Department is included in this document as ***Attachment K***. While you may contact individual departments for guidance when preparing your plans, the formal drawings and application forms shall be submitted to the Planning Department for review and placement on a Plan Commission Agenda. A primary contact will be assigned to coordinate review between Community Development and the Engineering Division.

The City of Waukesha website at www.waukesha-wi.gov is also a resource for additional information from each City Department. The most recent version of the City of Waukesha Code Book and Standard Construction Specifications can be found on the City's website.

1 DEVELOPMENT REQUIREMENTS AND INFORMATION

Section 1 – Development Requirements and Information outlines the start of the application process of a Private Development. This Section addresses the Development Agreement, required Financial Guarantees and Plan Sheet Standards.

The Application for Development Review (D100) shall be completed and included with all plan submittals. Submittals that do not include the completed Application and

appropriate Forms and Attachments will be deemed incomplete and will not be reviewed. The Applicant will be notified if the Application if found to be incomplete.

Contacts:
Dave Buechl, Dbuechl@Waukesha-wi.gov 262-524-3600
See **Attachment K** for additional contact information.

The Private Development Process Flowchart (Chart A) illustrates the general process for Private Development, review and approval.

2 SANITARY SYSTEM

Section 2 – Sanitary System contains information for submittal and review of developments that require Sanitary Sewer connections or installations.

3 STORM SYSTEM

Section 3 Storm System contains information for submittal and review of developments that require Storm Sewer, stormwater collection or Stormwater Management systems or BMPs.

4 ROAD SYSTEM

Section 4 – Road System contains information for submittal and review of developments that have roadways that will be dedicated public rights-of-way or connect to a public right-of-way. Plan submittals from Developers shall follow AASHTO guidelines unless otherwise noted. Street designs shall be consistent with the City's adopted Comprehensive Plan and Ordinances. Private roads shall be designed in accordance with public road standards, even in PUD's. This Section explains when a TIA must be submitted, and explains the requirements.

5 STREET LIGHTING

Section 5 – Street Lighting contains information on when developments are required by the City to provide a continuation of an existing street light system or provide a new street lighting system within the right of way of public streets of a development. When this determination has been made, the Developer will follow this guide for the specifications, design, materials, construction, testing, and acceptance to the City of Waukesha. At no time may street lights be placed within the right of way of public streets in a development without written approval from the Engineering Division.

There are instances when a Developer will need to make modifications to an existing street light system. The Developer shall follow this Section only after modifications are approved by the Engineering Division.

6 PROJECT CLOSEOUT DOCUMENTS

Section 6 – Project Closeout Documents outlines post-construction or Project Close-out requirements and documentation. This includes a Construction Binder containing all construction-related information from the CSR and Contractor performing the work, Lien Waivers, Record Drawings, Easement documents if applicable, and public sewer and roadway acceptance forms.

7 CONSTRUCTION MANAGEMENT AND REVIEW

Section 7 – Construction Management and Review outlines the requirements for Construction Management Developer Deposit, Construction Site Representatives' requirements and their general responsibilities and duties for utility and roadway construction.

8 APPENDIX A – APPLICATION FORMS AND ATTACHMENTS

D100 – Application for Development Review
Chart A – Private Development Process Flowchart
Attachment A – Development Review Checklist
Attachment B – Engineering Plan Checklist
Attachment C – Site, Grading and Drainage Plan-Conditional Use Permit Checklist
Attachment D – Stormwater Management Plan
Attachment E – Certified Survey Map Checklist
Attachment F – Preliminary Plat Checklist
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1 DEVELOPMENT REQUIREMENTS & INFORMATION

1.1 DEVELOPMENT AGREEMENT

Projects that include public infrastructure shall be required to enter into a Development Agreement.

Development agreements are intended to provide the City with the public infrastructure and amenities necessary to serve the proposed land use (development) and that they will be provided for according to an agreed-upon schedule and at a level of quality consistent with current City standards adopted by the Board of Public Works. Public benefits arising from a development agreement may include, but are not limited to, provision of public facilities such as streets, sewerage, parks/open space, transportation, schools, drainage, stormwater facilities, and utility facilities.

1.1.1 Chart A – Private Development Process Flowchart

1.2 FINANCIAL GUARANTEES

Projects that include public infrastructure and storm water facilities shall be required to guarantee the construction of the improvements through financial securities. Developer shall submit appropriate Bonding, Cash Deposit or a Letter of Credit, for review and approval to Engineering to cover the construction costs and administrative review. The Financial Guarantee shall cover the following, but not limited to, items: record drawings, televising pipes, landscaping, all public infrastructure, storm water facilities, subdivision lot grading, street grading, asphalt surface course, sanitary sewer, storm sewer, concrete curb and gutter, concrete sidewalks and ramps, driveway approaches, street construction, signage, street lighting, traffic signals, pavement markings, transformer, pump station, etc.

Chapter 236 of the Wisconsin Statute will apply and will be released 14 months after all public improvements have been completed, satisfied and accepted by the City.

1.3 ENGINEER REVIEW AND PLAN STANDARDS

1.3.1 PLAN SUBMITTAL & GENERAL PROCEDURES

1.3.1.1 Plans shall be submitted electronically in Adobe PDF format. Hard copies may be requested on occasion by the Engineering Division.

1.3.1.2 The Application for Development Review (D100) and associated submittal forms and Attachment(s), shall be completed and included with all plan submittals. Submissions which do not include the completed Application (D100) and appropriate Form(s) and Attachment(s) will be deemed incomplete.

1.3.1.3 Once a submittal is received, the Engineering Division will conduct an initial review of the application to check for completeness and accuracy.

1.3.1.4 If the submittal is found to be incomplete, a letter of incompleteness will be sent to the applicant indicating additional items which need to be submitted prior to a plan review being initiated. If the additional items are not submitted within 30 calendar days from the date of the letter of incompleteness, the submittal will be considered null and void and discarded. A complete separate submittal will then need to be made by the applicant upon readiness.

1.3.1.5 If the submittal is found to be complete, the Engineering Division will conduct a review of the plans, specifications, and submitted materials and provide review comments or approval.

1.3.1.6 Review comments shall be addressed by the Engineer of Record for the project or Developer as applicable. Plans may be resubmitted only after all review comments have been addressed. Resubmittals shall include a cover letter addressing each review comment, item by item, and revised plans and requested material(s) or the resubmittal will be considered incomplete and a review will not be initiated.

1.3.1.7 Once a plan review has been initiated, the applicant will receive correspondence within 2-4 work weeks.

1.3.2 SUBMITTAL FORMAT AND GENERAL PLAN STANDARDS

1.3.2.1 Plans shall include the seal and signature of the Wisconsin licensed professional engineer responsible for the preparation of the construction plans on the cover sheet or on each sheet.

1.3.2.2 Storm water management plan(s) and construction specifications manual(s) shall be comb bound and include the seal and signature of the Wisconsin licensed professional engineer responsible for the preparation. Other reports shall include the seal and signature of the Wisconsin licensed professional responsible for the preparation.

1.3.2.3 Plans shall be prepared on sheets preferably measuring 11” high by 17” wide but may be as large as 24" high by 36" wide.

1.3.2.4 A complete set of plans and profile construction drawings shall be submitted and approved prior to the start of construction including sanitary sewer, watermain, storm sewer, site grading, erosion control, paving, landscaping improvements, details, and cross sections. Sanitary sewer and watermain may be shown together on the same plan. Grading and Erosion Control shall be on separate sheets. Other sheets as necessary shall be included such as signage, street lighting, traffic control and detours, and property or ALTA surveys.

1.3.2.5 Sanitary Sewer, watermain and storm sewer system plans for the entire development shall be included.

1.3.2.6 A profile view shall be located below the plan view on plan and profile sheets and both views shall be aligned by stationing whenever possible. In general, stationing shall be from left to right.

1.3.2.7 Plan and profile sheets shall start and terminate at match lines with minimum 25 feet overlap.

1.3.2.8 Upon approval of construction plans, provide complete PDF and CAD files on electronic media (no Blu-Ray discs), or via acceptable electronic document transfer methods, with CAD drawings in an AutoCAD format that is compatible with the version used by the City. One set of the PDF files shall be formatted so that the plan sheets fit on an 11” x 17” sheet.

1.3.3 ALL PLAN SHEETS

1.3.3.1 Plan views shall show the following:

- The assumed bearing base, control monuments and stationing reference line(s)
- Right-of-way limits and easement limits
- Flange, face and back of curb (urban section) or edge of pavement and gravel (rural section)
- Name of each existing, proposed, and future roadway and any intersecting roadways
- Lot lines, lot and block numbers and found lot corners
- Addresses for existing parcels
- All obstructions located within the project limits including, but not limited to: trees, signs, utilities, fences, light poles, structures, etc.
- Legend (relevant to each sheet) showing all special symbols, linetypes and hatch used
- A note warning that underground utilities must be located by “Diggers Hotline” prior to start of construction.

1.3.3.2 The title block shall include at a minimum, the following information:

- Name and address of engineering (design) firm and owner/developer
- Date of the drawing and last revision
- Scale
- Plan sheet number (# of #)
- Name and location description of development

1.3.3.3 North shall be to the top or right of the sheet and shall be shown by a north arrow, clearly shown without intrusion.

1.3.3.4 The scale of the plans shall be 1" = 40' horizontally and 1" = 8' vertically for 11” by 17” plan sheets and 1" = 20' horizontally and 1" = 4' vertically for 22” by 34” sheets. Partial site plans shall have a scale of 1" = 20' or larger. Overview sheets may have an alternate scale as appropriate to the information being displayed. The scale of details shall be such that the detail is clearly shown. The scale shall be shown with a line scale and text.

1.3.3.5 Existing surface improvements shall be indicated with screened lines and clearly labeled.

1.3.4 COVER SHEET

1.3.4.1 The cover sheet shall contain the following:

- Project title
- Location map (proximity to two main streets minimum)
- An index of all plan sheets
- For subdivisions, large, or phased developments, a key map showing layout and phases.
- Reference to a minimum of two (2) current SEWRPC reference benchmarks shall be required. Survey documentation of tie to NAD 1927 State Plane Wisconsin South coordinate system (horizontal) and City of Waukesha datum (vertical) shall be provided. Elevations shown shall be based on City of Waukesha datum which may be obtained by subtracting the conversion factor of 780.558 from National Geodetic Vertical Datum (NGVD) 1929 datum. Project or plan datum is not acceptable.
- All permanent benchmarks
- A description of the locations of the benchmarks; and the basis or origin of the vertical control network
- Date of preparation and applicable revision date(s)
- The following statement: “*All site improvements and construction shown on the plans shall conform to the current City of Waukesha Design and Construction Manual. Where the plans do not comply, it shall be the sole responsibility and expense of the Developer to make revisions to the plans and/or constructed infrastructure to comply.*”

1.3.5 SITE/GRADING AND SURVEYS FOR BUILDING PERMITS

1.3.5.1 Follow additional plan requirements in Municipal Code § 32, Storm Water Management and Erosion Control.

1.3.5.2 The plan shall show existing tree lines and any obstructions (fences, structures, power poles, etc.) within the project limits.

1.3.5.3 The site/grading plan and surveys for building permits shall show:

- All proposed lot lines and lot numbers or addresses
- Lot line dimensions and found or set lot corners

- Outline of buildable areas for each lot
- Typical setbacks of buildable area to front, side and back lot lines. Verify side setbacks for driveways.
- All existing and proposed roads with road names
- All existing buildings, structures and foundations
- All existing drainage channels and watercourses
- Emergency overflow routes
- Drainage clarified by flow arrows, high points, sags, ridges, and valley gutters
- Proposed retaining wall locations with top and bottom of wall elevations at key locations
- 100-year flood plain limit (both pre-project and post-project) and source information
- 100-year storm water surface elevation
- Wetlands with name of delineator, and date of delineation
- All environmental corridors, & or environmentally sensitive areas
- All existing and proposed easements
- Show proposed yard grade elevations, exposed rear and/or side yard elevations
- Indicate the highest seasonal high-water table elevation

1.3.5.4 Add the following notes to surveys for building permits:

1.3.5.4.1 Builder shall provide positive gravity sanitary sewer lateral flow to main.

1.3.5.4.2 Builder shall verify that the basement floor elevation is at least 1 foot above the highest seasonal high-water table elevation.

1.3.5.4.3 Builder shall follow approved grading plan. A grading certification is required.

1.3.5.4.4 Builder shall verify driveway slope does not exceed 10%.

1.3.5.5 Wetland limits shall be labeled with bearings and distances and be dimensioned to lot lines. Bearings and distances may be shown in tabulated format.

1.3.5.6 Existing topography of the site and all areas within 100 feet of the site shall be shown at a 1-foot contour interval using City of Waukesha datum. Existing contours shall be shown as thin, dashed screened or grey lines with a readily discernable heavier line used for the 5-foot contour intervals.

1.3.5.7 Proposed grading shall be shown at a 1-foot contour interval using City of Waukesha datum. Proposed contour lines shall be shown as solid medium lines, with a discernible heavier line used for the 5-foot contour intervals.

1.3.5.8 The yard grade and first floor elevation of any existing buildings located within 100 feet of the subdivision boundary shall be shown.

1.3.5.9 Show proposed road(s), curb and gutter, all storm sewer grates and storm sewer manholes (or cross-culverts for open ditches). Show any off-road storm inlets and discharge locations with surface entry elevations.

1.3.5.10 Spot grades shall be shown as necessary to ensure proper drainage and compliant ADA slopes and routing where applicable.

1.3.5.11 At front setback line show a typical house shell on each lot and the proposed yard grade to the nearest tenth of a foot (assumed to be 0.7' below the top of block) for each building. Show proposed finished elevations to the nearest tenth of a foot at all lot corners and at side lot lines adjacent to the front and back corners of the typical house. Show proposed finished elevations to the nearest tenth of a foot at high and low points along any side or back lot lines, and at high and low points if roads to demonstrate proposed drainage.

1.3.5.12 The grading plan for any house that will require special design due to topography shall clearly show separate grades for the garage and yard grade if extra steps are needed. Separate spot finish elevations shall be shown for rear or side exposure or walkout.

1.3.5.13 Verify basement floor elevation is at least 1 foot above the highest seasonal high-water table elevation. Grading Plan shall indicate seasonal high-water table elevation.

1.3.5.14 Indicate minimum finished floor elevations adjacent to floodplains, ponds, creeks/channels, etc.

1.3.5.15 The plan shall indicate if cuts and fills will be balanced on site.

1.3.5.16 Proposed storm inlets shall be shown on each grading plan. Each plan shall also include specific details on all applicable retention/detention basins, ponds, overflows, etc. Separate sheets or notes may be required.

1.3.5.17 Follow requirements in City Storm Water Management Ordinance.

1.3.5.18 The plan shall show any applicable Shoreland jurisdictional lines, boundaries, WDNR Chapter 30 lines or any other environmental determinations or restrictions.

1.3.5.19 Depending on the development phasing, interim and final master grading plans may be required by the Engineering Division.

1.3.6 EROSION CONTROL

1.3.6.1 On a separate plan sheet, show erosion and sediment control measures and details including:

- Existing topography of the site and all areas within 50 feet of the site shall be shown at a 1-foot contour interval using City of Waukesha datum. Existing

contours shall be shown as thin, dashed screened or grey lines with a readily discernable heavier line used for the 5-foot contour intervals.

- Proposed grading shall be shown at a 1-foot contour interval using City of Waukesha datum. Proposed contour lines shall be shown as solid medium lines, with a discernible heavier line use for the 5-foot contour intervals.
- List the total disturbed acreage including offsite areas
- Proposed limits of disturbance including proposed tree cutting areas
- Location and dimensions of all temporary topsoil and dirt stockpiles
- Location and dimensions of all appropriate best management practices (BMPs)
- Phasing of BMP's with the construction activities listed / described
- Construction sequence including schedule of anticipated starting and completion date of each land disturbing and land developing activity, including the installation of the BMP measures that are needed
- Location of all channels, pipes, basins or other conveyances proposed to carry runoff to the nearest adequate outlet, including applicable design assumptions and computations
- Areas to be sodded or seeded and mulched or otherwise stabilized with vegetation, describing the type of final vegetative cover
- Areas of permanent erosion control (other than vegetation)

1.3.6.2 Follow additional plan requirements in Municipal Code § 32, Storm Water Management and Erosion Control.

1.3.7 SANITARY SYSTEM

1.3.7.1 Proposed sewer shall be designed and located in accordance with City's Design and Construction Manual, current edition.

1.3.7.2 The plan view shall show the following:

- Screen existing utilities and lateral locations. Pipe size of existing utilities shall be labeled
- Proposed sewer and laterals with length, size, and material type clearly labeled
- Material and size of the existing sanitary sewer being connected to
- Stub-outs labeled with length, size, slope, and invert elevations (if not profiled)
- Dimensions showing offset from right-of-way to the sewer and separation distance between other utilities
- Type and size of encasement where needed
- Flow directions of all proposed mains
- Length of each sewer lateral and height of any lateral risers. Label proposed invert elevations at right-of-way lines.

- Distance from downstream manhole to each upstream sewer lateral
- Proposed manholes and cleanouts labeled with a design plan number. Existing manholes to be labeled with numbers obtained from City records.
- Rim and invert elevations at each manhole, based on City of Waukesha datum (for private sewer if not profiled)
- Show and label all easements

1.3.7.3 The profile view shall show the following:

- Stationing
- Existing and proposed surface profiles and elevations over the sewer
- All utility crossings. Label elevations if known.
- Pipe material / class, size, length, and percent grade to two (2) decimal places
- Material and size of the existing sanitary sewer being connected to
- Material, length, type and size of encasement as needed
- Proposed manholes. Indicate type and diameter.
- Label station, rim, and invert elevations, based on City of Waukesha datum, and design plan number for each manhole and cleanout. Existing manholes to be labeled with numbers obtained from City records.
- Limits of gravel, spoil and/or slurry backfill

1.3.8 STORM SYSTEM

1.3.8.1 Proposed storm sewer shall be designed and located in accordance with City's Design and Construction Manual, current edition.

1.3.8.2 The plan view shall show the following:

- Screen existing utilities and lateral locations. Pipe size of existing utilities shall be labeled.
- Proposed sewer and laterals with length, size, and material type clearly labeled
- Material and size of the existing storm sewer being connected to
- Stub-outs labeled with length, size, slope, and invert elevations (if not profiled)
- Dimensions showing offset from right-of-way to the sewer and separation distance between other utilities
- Type and size of encasement where needed
- Length of any sewer lateral. Label proposed invert elevations at right-of-way lines.
- Proposed inlets, manholes, and other drainage structures
- Proposed drainage structures labeled with a design plan number. Existing drainage structures to be labeled with numbers obtained from City records.
- Details of outfall or ditch inlet protection requirements such as rip-rap, end sections or headwalls as needed

- Details of detention facilities outfall, overflow and control structures as needed

1.3.8.3 The profile view shall show the following:

- Stationing
- Existing and proposed surface profiles and elevations over the sewer
- All utility crossings. Label elevations if known.
- Pipe material / class, size, length, and percent grade to two (2) decimal places
- Material and size of the existing storm sewer being connected to
- Material, length, type and size of encasement as needed
- Proposed inlets manholes, and other drainage structures. Label type and size.
- Label station, rim, and invert elevations, based on City of Waukesha datum, at each manhole, inlet, and detention control structure
- Proposed drainage structures labeled with a design plan number. Existing drainage structures to be labeled with numbers obtained from City records.
- Cross-section of open channels and detention facilities, including outfall, overflow, and control structures.
- Limits of gravel, spoil, and/or slurry backfill

1.3.9 ROADWAY

1.3.9.1 For all new streets, a site-specific geotechnical evaluation and pavement design shall be submitted with the plans.

1.3.9.2 A separate detail sheet shall be required for the roadway plans. This detail sheet shall show typical cross-sections for each roadway standard width and cul-de-sac if applicable.

1.3.9.3 Elevations shall be based on City of Waukesha datum.

1.3.9.4 The plan set of drawings shall include:

- Plan and profile views
- Intersection details
- Cross-sections at 25-foot intervals and at driveways shown on the plan

1.3.9.5 Each roadway plan sheet shall show the following:

- The assumed bearing base, control monuments and stationing reference line along the centerline of the roadway, including cul-de-sacs.
- At least one clearly labeled benchmark or control point with elevation.
- Width of pavement and median.
- Final grade elevations at 25’ intervals at the right-of-way including at the edge of pavement for rural sections or at the flange of curb for urban sections.

- Final grade elevations for cul-de-sacs at 25’ intervals at the right-of-way including at the edge of pavement for rural sections or at the flange of curb for urban sections.
- Label all PVC’s, PVT’s, and PC’s, PT’s for vertical and horizontal curves
- Potential driveway locations and/or driveway restrictions for all lots adjacent to storm inlets and intersections
- Sidewalks labeled and dimensioned.
- Existing, proposed, future streets and drives labeled and dimensioned
- All roadside ditch locations, flowline elevations (based on City of Waukesha datum) at 100’ intervals of the ditches.
- Slope intercepts.
- Limits of any areas which need special stabilization techniques
- Specific details of all existing connected roadways. Pavement, shoulders, ditches, curb alignment, and grades shall be shown as needed to adequately make the transition.

1.3.9.6 The profile view shall show the following:

- Stationing and final centerline grades at all 25, 50’ and 100’ stations and at grade breaks
- Existing and proposed roadway profiles along centerline of roadway and cul-de-sacs.
- Invert profile for 200’ downstream for any existing ditches receiving flow from a proposed road or street.
- Final grade elevations at 25’ intervals for pavement centerline including at edge of pavement for rural sections and at the flange of curb for urban sections.
- Final grade elevations for cul-de-sacs at 25’ intervals, including high points, edge of pavement for rural sections and at the flange of curb for urban sections.
- Vertical curve stationing and final centerline grades at PVC’s, PVI’s, PVT’s, POC’s at PVI’s, crest/sag location and elevation, curve length and K values.
- Slope of the roadway between each grade break.
- Street grades to nearest 0.01’. Maximum and minimum grades per Section 4 of the Development Handbook, current edition.
- Sizes and inverts for all existing and/or proposed culverts.
- Limits of any areas that need special stabilization techniques**.**

1.3.9.7 Intersection details shall show the following:

- Right-of-way lines and easements
- Existing and proposed lot corners
- Radii of all intersections (edge of pavement or back of curb, with note indicating which is referenced)
- Sidewalks and accessible ramps labeled and dimensioned
- Right of way corner clips and sight visibility easements

- Spot grades as necessary to ensure proper drainage and compliant ADA slopes
- Spot grades shall be shown at end of radius for all curb and gutter and the end radius for all back of sidewalk
- Drainage clarified by flow arrows, high points, sags, ridges, etc.
- Spot grades across entire intersection and sidewalks at the following including, but not limited to locations: centerline, flange, top of curb, face of sidewalk, back of sidewalk, radii, nearest street cross-section from drawings.

1.3.9.8 Road cross sections shall show the following:

- Right of way limits
- Slope intercepts clearly labeled
- Elevations to the nearest 0.01’
- Offset distance (left or right) from the reference line
- Final grade elevations at back of walk, face of walk, top of curb, flange elevation (edge of pavement for rural section), and the centerline of the street or roadway
- Cross-slope of sidewalk, terrace area, and roadway
- Invert elevation of ditches (for rural section)

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2 SANITARY SYSTEM

All labor and material shall be governed by the latest edition and all amendments thereto of the Standard Specifications for Sewer and Water Construction in Wisconsin (SWS), and Wisconsin Department of Natural Resources (WDNR) Regulations, unless otherwise specified in these Specifications, whichever is more restrictive.

When starting an installation, the farthest downstream location of the new sanitary sewer system shall have a plug installed and maintained by the utility Contractor. That plug shall not be removed until the infrastructure field verification process and a walkthrough has been completed and the City is ready to accept the system.

2.1 STANDARDS

2.1.1 SANITARY SEWER MAIN

2.1.1.1 MATERIALS

2.1.1.1.1 All pipe used for sanitary and private main interceptor sewers shall be:

- *PVC (solid wall) SWS Section 8.10.0, ASTM D-3034, SDR-35 where final cover over the pipe is 15 feet or less*
- *PVC (solid wall) SWS Section 8.10.0, ASTM D-3034, SDR- 26 where final cover over the pipe exceeds 15 feet*
- *PVC (solid wall, green in color for in-ground identification) SWS Section 8.20.0, AWWA C-900*

2.1.1.2 DESIGN

2.1.1.2.1 Design flow as determined by the City Engineer, subject to the following:

2.1.1.2.1.1 Residential/Multi-Family: gpcd = gallons per capita per day

Base Sanitary Flow	*100 gpcd*
Peaking Factor	*2.5 – 4.0*
Residential population equivalent:	
Efficiency or Studio Apartment:	*1*
1 Bedroom Apartment:	*1.5*
2 Bedroom Apartment:	*3*
3 *Bedroom Apartment:*	*3*
Single Family Home:	*3.5*
Mobile Home:	2.25

2.1.1.2.1.2 Commercial, Industrial & Institutional Areas:

- If actual water use records exist from a similar development already operating in the City of Waukesha, the past water usages for the previous four quarters or more can be obtained from the Waukesha Water Utility (WWU). The four quarters of water usage or more can be added to determine the total annual water usage and averaged with previous annual water usages to obtain an annual average water usage for the development. Another option is to provide equivalent water usage records

as previously described above from an equivalent development in another municipality for review.

- If actual water usages do not exist, then acceptable engineering references can be used to estimate annual water usages for a particular type of property. Acceptable water usage references include, but are not limited to:
  a) 'Estimated Indoor Use, Table 510-1 and 510-2'; *Utah Water Usage Reference*
  b) *U.S. Department of Energy Federal Water Use Indices*; 11-08-2005;
  c) 'C-2.5 Equivalent Dwelling Unit Schedule'*, Prince William County, VA*.; 08/23/84
  d) 'Section 370 Appendix B, Table 2-Commonly Used Quantities of Sewage Flows from Miscellaneous Type Facilities', *Environmental Protection Agency 06/05*
  e) *Water Usage Estimating Charts for Culligan Water Conditioning Equipment*
  f) 'Table 1-Average Flow Rate on Specific Developments'; *City of Oakland, CA; Sanitary sewer design guidelines; Rev. 08-18-05*

2.1.1.2.2 Design flows and peaking factors are as determined by the Engineering Division. Design objectives shall result in elimination, to the greatest extent possible, of all infiltration and inflow.

2.1.1.2.3 Minimum Main sizes:

Residential:	*8"*
Industrial / Commercial / Multi-Family & PUD:	*8"*
Shall accommodate future tributary areas as directed by the City Engineer.	

2.1.1.2.4 Minimum slopes.

2.1.1.2.4.1 Pipes slopes shall achieve self-cleansing velocities for peak design flows as directed by the City Engineer. Generally, minimum velocity of 2.0 fps shall be met at half-full conditions.

Pipe Size (I.D)	*Minimum Slope*
8"	*0.45 % (Dead end reach 0.70%)*
10"	*0.28 %*
12"	*0.22 %*
15"	*0.15 %*
18"	*0.12 %*
21"	*0.10 %*
Other sizes	*Per Engineering Division.*

2.1.1.2.5 Complete sewer design calculations and sewer system plans are required with construction plan submittals.

2.1.1.2.6 Conceptual sewer system plans are required for proposed developments located within the Ultimate Service Area even if sanitary sewer currently is not available. A determination is needed at the conceptual stage that future gravity sewer systems will work when needed.

2.1.1.2.7 Center of manhole shall coincide with street centerline where possible and shall be located outside of the wheel path of vehicles.

2.1.1.2.8 Invert shall not be less than:

Distance below the centerline grade of the street	*Road ROW Width*
11.0 feet	*60/66-ft*
12.0 feet	*80-ft*
13.0 feet	*>80-ft and cul-de-sacs*

2.1.1.2.9 Minimum sewer depth shall be 8 feet from finished grade to top of pipe under exceptional circumstances and shall require approval of the Engineer.

2.1.2 SANITARY SEWER LATERALS (From main to lot line)

2.1.2.1 MATERIALS

2.1.2.1.1 All pipe used for sanitary laterals shall be:

- *PVC (solid wall) SWS 8.10.0, ASTM D-3034, SDR-35 or 26. Laterals shall have the same dimensional ratio as the sewer main.*
- *PVC (solid wall) SWS, Section 8.20.0, AWWA C-900*
- *HDPE (iron pipe sizing) SWS, Section 8.51.3, ASTM F-714, DR 17 for laterals installed by pipe bursting.*

2.1.2.1.2 Risers shall be as required by the plans in accordance with these standards or as pre-approved by the Engineer.

2.1.2.1.3 Risers: Minimum depth below road centerline shall be per Section 2.1.1.2.8, or 5 feet below basement, whichever is greater. Sewer depth to be greater than 14 feet for riser. (Per SWS File Nos: 10A, 10B, 10C, 10D, & 10E).

2.1.2.2 DESIGN

2.1.2.2.1 Sites are allowed one (1) sanitary lateral connection. In special circumstances, additional laterals may be allowed with the written permission of the City Engineer.

2.1.2.2.2 Minimum size shall be 4” diameter.

2.1.2.2.3 Slope at 2.00%. Under exceptional conditions, the Engineer may permit minimum slope = 1.00% in ROW/easement.

2.1.2.2.4 All connections to mains and manholes shall be in accordance with Section 2.1.3.

2.1.2.2.5 Existing laterals not used in a development shall be abandoned at the main when a development, land division or building razing occurs. See Section 2.2.

2.1.2.2.6 Each habitable building shall have a separate lateral connection to the sewer main.

2.1.2.3 REUSE OF EXISTING LATERALS

2.1.2.3.1 For all development projects requiring either Plan Commission approval and/or a Building Permit, the Developer shall provide a video of the sewer lateral to the Engineering Division for review and approval prior to the reuse of an existing lateral. Video format shall be determined by the Engineering Division.

2.1.2.3.2 In special circumstances, the City may permit the Developer to provide a $5,000 letter of credit, cash escrow or Bond in lieu of submitting a sewer lateral video prior to issuance of a Building Permit. Once the video is received and accepted, the letter of credit, cash or Bond may be released.

2.1.3 LATERAL CONNECTIONS

2.1.3.1 Connection of new laterals to new sanitary main shall be constructed using a wye fitting.

2.1.3.2 Existing lateral reconnections to new sanitary main shall be constructed using a wye fitting.

2.1.3.3 Connection of new sanitary laterals to existing sanitary mains shall be as follows based on existing main material:

2.1.3.3.1 ABS - Truss Pipe

- *Location - not closer than 36” to an existing joint or fitting or closer than 48” to an existing lateral.*
- *Hole - Core drill or saw-cut with appropriate cutting tools.*
- *Connection Device – Inserta Tee.*

2.1.3.3.2 Concrete Pipe

- *Location - not closer than 24” to an existing joint or fitting or closer than 48” to an existing lateral.*
- *Hole - Core with appropriate cutting tools.*
- *Connection Device – Inserta Tee.*

2.1.3.3.3 PVC Pipe

- *Location - Not closer than 36” to an existing joint or fitting or closer than 48” to an existing lateral.*

- *Hole - Core drill or saw-cut with appropriate cutting tools.*
- *Connection Device – Inserta Tee.*

2.1.3.3.4 Vitrified Clay Pipe

- *Location - not closer than 24" to an existing joint or fitting or closer than 48" to an existing lateral.*
- *Hole - Core with appropriate cutting tools.*
- *Connection Device – Inserta Tee.*

2.1.3.4 Connection of sanitary laterals to sanitary manholes will only be allowed on a case-by-case basis and when pre-approved by the Engineering Division.

2.1.4 SANITARY FORCE MAIN

2.1.4.1 MATERIALS

2.1.4.1.1 All pipe used for sanitary force (pressure) mains shall be:

- *PVC (solid wall) SWS 8.51.2, AWWA C-900*
- *HDPE Force Main Pipe SWS 8.51.3, ASTM F-714*

2.1.4.1.2 All pipe shall conform to Ductile Iron Pipe OD.

2.1.4.1.3 Consult with Engineering Division for valve requirements.

2.1.4.2 DESIGN

2.1.4.2.1 Consult with Engineering Division for valve spacing.

2.1.4.2.2 Minimum design depth shall have 8 feet of cover from final grade.

2.1.4.2.3 Buried tracer location wire is required above the force main.

2.1.4.2.4 Velocity/Size:

- *Hazen-Williams formula "C" value of 120.*
- *Velocity 2.0 – 6.0 fps for lowest energy pumping cost, as approved by the City.*

2.1.4.2.5 High/Low Points:

- *Air relief valve sizing calculations shall be submitted with Plans.*
- *4-ft. minimum diameter manhole enclosures shall be installed.*

2.1.5 SANITARY MANHOLES

2.1.5.1 MATERIALS

See City of Waukesha Design and Construction Manual – Division 3 - Standard Construction Specifications – latest Edition for additional information.

2.1.5.1.1 All sanitary manholes shall be pre-cast concrete with integral base, with cone top section, Comply with ASTM C-478; 4,000 psi concrete.

2.1.5.1.1.1 Reinforced concrete flat slab as optional, with pre-approval required by the City and as shown on the Plans.

2.1.5.1.2 The manholes shall be sized as follows:

Downstream Pipe Size	Minimum Manhole I.D.
24” or less	48”
> 27”	Special Design requiring City Engineer Approval
Sampling Manhole	48”

2.1.5.1.3 All sanitary manhole cone sections shall have a minimum 3” internal vertical surface at the bottom and 2” outside vertical surface at the top.

2.1.5.1.4 All pre-cast manhole barrel joints shall be sealed with preformed butyl rubber gasket material (e.g. ‘EZ-Stik’ or equal).

2.1.5.1.5 All barrel & cone section lifting holes which penetrate through the structure shall be sealed with a cementitious grout with a struck joint. Grout shall be premixed, non-metallic, high-strength, non-shrink, Pennegrout® by IPA Systems, or approved equal, which meets requirements of ASTM C-1-91 and C-827 as well as CRD C-588 and C-621. When mixed to a mortar or “plastic” consistency, the grout shall have a minimum 1-day and 28-day compressive strength of 6,000 and 9,000 psi, respectively.

2.1.5.1.6 A frame/chimney internal rubber seal shall be installed in all manholes that conforms to SWS 8.42.0 and the following:

- *Cretex 26” LSS 0-6 Internal Chimney Seal*

2.1.5.1.7 An external sealing wrap shall be placed at all joints between pre-cast manhole sections. The external sealing wrap shall meet, or exceed, the requirements of ASTM C-877, Type II. External joint seals shall be Cretex Wrap External Manhole Joint Seals, as manufactured by Cretex Specialties Products, or pre-approved equal.

2.1.5.1.8 All manhole steps shall comply with SWS, Section 8.40.0 A.

2.1.5.1.9 All sanitary manhole lids (except for monitoring manholes) shall be solid, gasketed lids (self-sealing) with “T” gasket, Neenah R-1660 type C platen. Frame shall be Neenah R-1661.

2.1.5.1.10 All new and rehabilitated manholes located in floodplains shall have Neenah R-1916-C water tight frames, gasket, and bolt down covers.

2.1.5.1.11 All manhole lids installed on manholes in public sanitary systems shall have the words “City of Waukesha” “D.P.W.” in 1-inch letters stamped on the top surface. Reference Neenah 1660 – 5262. Frame shall be Neenah R-1661.

2.1.5.1.11.1 Monitoring manholes are described in Section 2.1.6.

2.1.5.2 DESIGN

2.1.5.2.1 Maximum distance between manholes, per Administrative Code NR-110.

2.1.5.2.2 Slope through manhole:

Angle (degrees)	Drop (feet)
0 to 10	0.10-ft. drop
>10 and <30	0.15-ft. drop
≥30 degrees	0.25-ft. drop

2.1.5.2.3 Finished frame grade:

- Finished frame grade: Adjust frame grades in accordance with Division 3 - Standard Construction Specifications, Section 5.3.4

2.1.5.2.4 Frame/Lid: All sanitary manholes shall have a heavy-duty frame with solid, gasketed self-sealing lid (T-Gasket) with concealed pick holes. Sealed bolted-down lids/frames shall be required in areas in floodplains.

2.1.5.2.5 Frame/Chimney Seals: Internal rubber seal to be installed in new manholes and when rehabilitating existing manholes.

2.1.5.2.6 Manhole chimney height: 4” minimum and 8” maximum for manholes.

2.1.5.2.7 Monitoring manholes and exterior grease tanks shall be required as directed by the City. See Monitoring Manholes - Section 2.1.6.

2.1.5.2.8 All pre-cast manhole barrel sections shall be rotated to align all manhole steps vertically in the manhole.

2.1.5.2.9 Outside drop connections shall be provided in accordance with SWS. Inside drop connections for mains or laterals will not be permitted unless approved by the City.

2.1.5.2.10 As subsequent improvements are made to any existing manhole, chimney heights shall be reconstructed to meet the requirements of this section.

2.1.6 MONITORING MANHOLES

Users shall submit to the Engineering Division the plans and specifications for the construction or modification of monitoring manholes at least 30 days before the proposed commencement of construction or modification.

2.1.6.1 MATERIALS

2.1.6.1.1 Manholes shall be 60” I.D. pre-cast concrete with integral base, with cone top section as standard and reinforced concrete flat slab as optional, with pre-approval required by the City.

2.1.6.1.2 Manholes shall be installed with Neenah R-1661 frame and lids and internal chimney seals.

2.1.6.1.3 An external sealing wrap shall be placed at all joints between pre-cast manhole sections. The external sealing wrap shall meet, or exceed, the requirements of ASTM C-877, Type II. External joint seals shall be Cretex Wrap External Manhole Joint Seals, as manufactured by Cretex Specialties Products, or pre-approved equal.

2.1.6.2 DESIGN

2.1.6.2.1 The approach section of pipe approaching the primary gauging device shall be straight for a distance of at least 20 pipe diameters with no connections, drops, or bends.

2.1.6.2.2 The slope of the approach distance shall be no more than 1%.

2.1.6.2.3 When installing a primary gauging device, the slope of the downstream outlet pipe should not be less than the upstream pipe slope. Free fall conditions should exist.

2.1.6.2.4 There should be no grade changes, angle points, or connections at the structure.

2.1.6.2.5 The sides of the channel shall be plumb and straight throughout the manhole.

2.1.6.2.6 All manhole steps shall comply with SWS, Section 8.40.0 A. The top step shall be set at a height that does not interfere with passage of sampling equipment in or out of the manhole.

2.1.7 ADJUSTMENT RINGS

2.1.7.1 MATERIALS

2.1.7.1.1 All frame/casting adjusting rings shall be manufactured from ARPRO® Expanded Polypropylene (EPP), black 5000 series meeting ASTM D3575 and ASTM D4819-13; B6D7G4L3M24S2T17W7 having a 27” I.D. The rings shall be manufactured using a high compression molding process to produce a finished density of 120 g/l ((7.5 pcf). Material shall be Pro-Ring as manufactured by Cretex Specialty Products. Paving rings are not permitted.

2.1.7.1.1.1 "Grade" adjustment rings may contain either an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside with a flat top.

2.1.7.1.1.2 "Finish" or "Flat" rings may either have a keyway (groove) on the underside for vertical alignment and/or an adhesive trench with a flat upper surface. These rings shall be available in heights (thicknesses) which will allow final adjustment of the frame and cover or grate to within ¼" (one quarter inch) to ½" (one half inch) of the specified final elevation. "Finish" rings may also have a keyway on the upper surface of the inner diameter to facilitate installation of an "Angle" ring.

2.1.7.1.1.3 "Angle" rings may either have an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside. When required, the "Angle" ring or rings shall allow final adjustment of the frame and cover or grate to within ¼" (one quarter inch) to ½" (one half inch) of the specified final elevation.

2.1.7.1.1.4 For new manholes, the minimum height of adjusting rings for a chimney section above the cone as measured from the top of the cone or slab top shall be 4" with the maximum height of 8". If more than 8" of adjusting rings are needed to set the casting to finished grade, then an additional barrel section shall be installed on the manhole.

2.1.7.1.2 Any adhesive or sealant used for watertight installation of the grade adjustment rings shall be M-1 Structural Adhesive/Sealant or equal meeting the following specifications:

- ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O
- Federal Specification TT-S-00230-C Type II, Class A.
- Corps of Engineers CRD-C-541, Type II, Class A

2.1.7.1.3 Repair mortar shall be a one component, quick set, high strength, non-shrink; polymer modified cementitious patching mortar, which has been formulated for vertical or overhead use meeting the requirements of ASTM C-109 for Compressive Strength, C-348 and C-78 for Flexural Strength and C-882 for Slant Shear Bond Strength. Repair mortar shall not contain any chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents nor shall it promote the corrosion of any steel that it may come in contact with. Material shall be Octocrete as manufactured by IPA Systems, Inc. or approved equivalent.

2.1.7.1.4 Cementitious grout shall be a premixed, non-metallic, high strength, non-shrink grout which meets the requirements of ASTM C-191 and C-827 as well as CRD-C-588 and C-621. When mixed to a mortar or "plastic" consistency, it shall have minimum one day and 28-day compressive strength of 6,000 and 9,000 psi, respectively. Material shall be Ipatop-Penngrout as manufactured by IPA Systems, Inc. or approved equal.

2.1.8 GREASE INTERCEPTORS

All buildings with food service preparation on-site (now or at any future time) shall be required to install, maintain and operate an exterior or interior grease interceptor tank sized in accordance with the Department of Safety and Professional Services (DSPS). State plumbing reviews by the DSPS shall be completed before a plumbing permit will be issued. Construction of the grease interceptor shall, in addition to requirements of the Plumbing Code, conform to the following standards. These standards are intended to minimize the potential for groundwater infiltration and inflow or rainwater from entering the sanitary sewer system via this system component.

2.1.8.1 MATERIALS

2.1.8.1.1 INTERIOR GREASE INTERCEPTOR

2.1.8.1.1.1 Interior grease interceptors shall be constructed in a watertight manner of one of the following materials

- Precast reinforced concrete
- Reinforced monolithic concrete
- Cast iron
- Coated 12-gauge steel
- Vitrified Clay
- Fiberglass
- Plastic
- Other approved materials

2.1.8.1.2 EXTERIOR GREASE INTERCEPTOR

2.1.8.1.2.1 Exterior grease interceptors shall be pre-cast concrete with integral base when required by the City Engineer and shown on the plans.

2.1.8.1.2.2 Exterior grease interceptors shall be equipped with water-tight locking frame and lids.

2.1.8.1.2.3 All barrel joints shall have a mastic or gasket type joint seal. The exterior shall be wrapped with an additional joint seal that meets requirements of ASTM C-877, Type II, such as Cretex Wrap External Manhole Joint Seals, as manufactured by Cretex Specialties Products, or pre-approved equal.

2.1.8.1.2.4 The access or inspection chimney(s) shall have an internal chimney seal installed after construction is inspected. The internal chimney seal shall be Cretex or approved equal.

2.1.8.2 DESIGN

2.1.8.2.1 The approach section of pipe approaching the tank shall be straight for a distance of at least 20 pipe diameters with no connections, drops, or bends.

2.1.8.2.2 There should be no grade changes, angle points, or connections at the structure.

2.1.8.2.3 When practicable, grade earth at 5H:1V slope around manhole openings. In paved areas, slope drainage away from the manhole openings.

2.1.8.2.4 Because inlet and outlet pipe slopes are critical, the location of the exterior grease trap tank shall require prior approval of the City Engineer for location and grades. For projects requiring prior Site Plan Approval requirements, this site element shall be included on the Site Plan Submittal(s).

2.1.9 LIFT STATIONS

Consult with Engineering Division for design requirements.

2.1.10 TRACER WIRE

2.1.10.1 MATERIALS

2.1.10.1.1 Solid copper #10 AWG, with solid PVC insulation, SWS Section 2.11.0

2.1.10.2 DESIGN

2.1.10.2.1 Tracer wire on sanitary sewer shall be installed as required by the Engineering Division.

2.1.10.2.2 Tracer wire shall be required on all force mains. Tracer wire shall be brought to the surface in a section of PVC conduit placed vertically above the force main. A valve box top section level with the surface shall be used for access to the tracer wire. The 5¼" lid shall be of a stay-put design and embossed with the word "SEWER". A minimum of 18" of excess wire shall be brought into each valve box. Contact the Engineering Division for box location requirements.

2.1.11 BEDDING/COVER/BACKFILL

2.1.11.1 MATERIALS

2.1.11.1.1 Pipe Bedding and Cover Materials: Materials as required in Chapter 3.2.0 of the SWS for the application, unless otherwise permitted by the City.

2.1.11.1.2 Trench Backfill:

2.1.11.1.2.1 Under existing or proposed pavement: Granular Backfill meeting the requirements of SWS, Section 8.43.7, Table 39. No excavated material will be allowed for reuse as trench backfill unless otherwise permitted by the City.

2.1.11.1.2.2 In non-pavement areas: Previously excavated materials meeting the requirements of SWS, Section 8.43.5 unless otherwise permitted by the City.

2.1.11.1.3 Slurry Backfill: Aggregate slurry in accordance with SWS, Section 8.43.8 and requirements of City, or in accordance with the Excavation within the Public Right-of-Way permit, when issued.

2.1.12 CASING PIPE

Consult with Engineering Division for design requirements.

2.1.13 INSULATION

2.1.13.1 MATERIALS

2.1.13.1.1 Polystyrene board, SWS 8.50.2

2.1.13.2 DESIGN

2.1.13.2.1 All sanitary sewer pipes (mains, force mains & laterals), having less than 5.0 ft. of cover material, shall be insulated.

2.2 CONSTRUCTION

Follow construction requirements in Division 3, Standard Construction Specifications, current edition.

2.3 ABANDONMENT

2.3.1 GENERAL

2.3.1.1 All existing sanitary sewer mains and service lines, that will not be used in new or re-used in reconstruction of existing building sites, shall be abandoned at the main by:

- Excavation of the roadway and capping at the main.
- Grouting the lateral at the main

2.3.1.2 Abandonment shall be witnessed by a Construction Site Representative (CSR), a City Engineering Project Manager or the City Engineering Tech Supervisor.

2.3.1.3 Main and/or service abandonment at the street main shall be a condition of any site demolition permit(s) issued or in the case of duplication, service lines that will remain unused on new construction.

2.3.1.4 All excavations within the public rights-of-way shall require a City Excavation within the Public Right-of-Way (P103) permit.

2.3.1.5 Sanitary or other special manholes or structures that are part of an abandoned system shall also be abandoned in accordance with SWS Section 3.2.24 except manholes shall be removed to a depth of 3-feet below the surface or to the bottom of the cone, whichever is deeper. Structures and sewers 15 inches and larger shall be completely filled with controlled lower-strength material (CLSM / flowable fill).

2.3.1.6 The property owner shall be responsible for proper disposal of all manhole components removed. All waste materials shall be removed from pipelines and structures before abandonment.

2.3.2 SANITARY SEWER

2.3.2.1 All sanitary lines shall be abandoned at the street main fitting by:

- Excavation of the roadway and capping at the main
- Grouting the lateral at the main

2.3.2.2 Sanitary or other special manholes or structures that are part of an abandoned system shall also be abandoned in accordance with SWS Section 3.2.24 except manholes shall be removed to a depth of 3-feet below the surface or to the bottom of the cone, whichever is deeper. Structures and sewers 15 inches and larger shall be completely filled with controlled lower-strength material (CLSM / flowable fill).

2.3.3 SUBMITTALS AND SAMPLES

2.3.3.1.1 All submittals shall be in accordance with Division 3, Standard Construction Specifications, Section 5.1.3

2.3.4 ACCEPTANCE TESTING

2.3.4.1 General

2.3.4.1.1 Sewers shall be deflection and low-pressure air tested in accordance with Division 3, Standard Construction Specifications, Section 5.1.4

2.3.4.1.2 All sewers, leads, and laterals shall be televised within the project and/or disturbed area limits by an independent televising inspection service. Televising shall be in accordance with Division 3, Standard Construction Specifications, Section 5.3.10

END OF SECTION

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3 STORM SYSTEM

3.1 STANDARDS

All labor and material provided under this contract shall be governed by the latest edition and all amendments thereto of the Standard Specifications for Sewer and Water Construction in Wisconsin (SWS) and State of Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, unless otherwise specified in these standards, whichever is more restrictive. THESE STANDARDS SHALL APPLY TO ALL PUBLIC STORM SEWERS. Any and all modifications to these standards shall be approved by the Engineer.

3.1.1 STORM SEWER PIPE

3.1.1.1 MATERIALS

3.1.1.1.1 Storm sewers shall be constructed with reinforced concrete pipe per SWS, Section 8.6.0.

- *Class V for 12-inch diameter pipe*
- *Class IV for 15-inch diameter pipe*
- *Class III for 18-inch diameter pipe and larger*
- *Reinforced Concrete Pipe – ASTM C76*
- *Horizontal Elliptical Reinforced Concrete Pipe – ASTM C507.*
- *Joints for concrete storm sewer pipe shall have rubber gaskets conforming to SWS, Section 8.41.2*
- *ADS N-12 or PVC pipe shall not be used without prior approval by the City.*

3.1.1.1.2 Where permitted by the City, PVC storm sewer shall be PVC (solid wall) SWS Section 8.10.0, ASTM D-3034, SDR-35.

3.1.1.2 DESIGN

3.1.1.2.1 Minimum size: 12-inch diameter.

3.1.1.2.2 Pipe cover:

- *3 feet minimum from finish design grade to outside top of storm sewer, or as approved by the City.*

3.1.1.2.3 Reinforced concrete flared end sections shall be used at the outfall of the storm sewer. Storm sewers with diameters of 24” or greater equivalent, daylighting in ditches, shall have safety grates meeting design standards installed at the upstream and downstream ends.

3.1.1.2.4 Mainline and conveyance storm sewer design storm: Minimum 10-year storm event; Storm sewers may not be surcharged in a 10-year or less design storm condition. Surcharge condition is defined as to the crown of pipe (full pipe flow - no pressure).

3.1.1.2.5 Minimum slope shall be that which achieves a minimum velocity of 2.0 feet per second (fps) when pipe is flowing full. City may limit maximum velocities.

3.1.1.2.6 Complete sewer design calculations are required with submittals, including drainage area maps and time of concentration calculations. Use Rational Method or TR-55 Method. Site specific conditions may necessitate the need to calculate the hydraulic grade line. Headwater or tailwater conditions may affect the storm water computations and shall be considered as warranted.

3.1.1.2.7 Existing field tiles shall be connected to a storm sewer or have a positive outfall provided.

3.1.2 STORM LATERALS (From main to lot line)

3.1.2.1 MATERIALS

3.1.2.1.1 Unless otherwise specified, all pipe used for storm laterals shall be:

- *Class III concrete sewer pipe; or*
- *PVC (solid wall) SWS Section 8.10.0, ASTM D-3034, SDR-35.*
- *ADS N-12 pipe shall not be used without prior approval by the City.*

3.1.2.2 DESIGN

3.1.2.2.1 Minimum size in ROW / Easement areas shall be 6” diameter.

3.1.2.2.2 The minimum slope on laterals shall be 1.00%.

3.1.2.2.3 The maximum slope on laterals shall be 4.00%.

3.1.2.2.4 Minimum cover for storm sewer laterals in paved areas shall be 12” as measured from the top of the pipe to the top of the subgrade.

3.1.2.2.5 Connection of laterals to storm sewer shall be subject to following:

- *Hole - Core drill only.*
- *Connection Device - Kor-N-Seal boot, or pre-approved equal with stainless steel snap-in ring.*
- *Any lateral that is connected into a manhole shall have a smooth concrete bench/channel placed to convey lateral flow into the storm sewer.*

3.1.2.2.6 Storm sewer lateral lines should be designed to receive the storm water runoff from window wells, footing drains and sump pumps.

3.1.2.2.7 In areas with storm sewer where high ground water is known to exist, the City may require a storm sewer lateral be provided for each lot or building.

3.1.2.2.8 Covers installed on lateral cleanouts shall not be bolted to the cleanout pipe.

3.1.2.2.9 A temporary 2” x 6” stake shall be placed at the end of each storm lateral.

3.1.3 CULVERTS

3.1.3.1 MATERIALS

3.1.3.1.1 Culverts shall be manufactured and installed in accordance with the requirements of the WisDOT Standard Specifications.

3.1.3.1.2 Damaged or rusted culvert pipes shall not be reused.

3.1.3.2 DESIGN

3.1.3.2.1 Culverts located in a minor storm water management system shall be designed to safely convey surface water runoff from a 25-year storm event. Culverts may not be surcharged in a 25-year or less design storm condition. Surcharge condition is defined as to the crown of pipe (full pipe flow – no pressure). In some cases, culverts may need to be designed for a 100-year storm event.

3.1.3.2.2 Minimum size shall be 12” diameter for driveways and 15” for roadway cross culverts.

3.1.3.2.3 All crossroad culverts shall be designed to provide a minimum of 18” of cover as measured from the top of the pipe to top of subgrade at the edge of the finished pavement of the road.

3.1.4 FLARED END SECTIONS

3.1.4.1 MATERIALS

3.1.4.1.1 The end sections shall be in accordance with the requirements of the WisDOT Standard Specifications.

3.1.4.2 DESIGN

3.1.4.2.1 In areas with greater than 35 miles per hour, flared end sections shall be required to be installed on the ends of any driveway culvert.

3.1.5 DITCHES

3.1.5.1 DESIGN

3.1.5.1.1 Slopes.

- *1½% minimum*
- *4% maximum*

Alternative methods upon approval of the City.

3.1.5.1.2 Foreslope: 4H:1V maximum.

3.1.5.1.3 Backslope: 4H:1V preferred, 3H:1V maximum.

3.1.5.1.4 The minimum ditch depth shall be 12” below the shoulder point at roadway high points. Other ditch locations shall have a minimum depth of 20” below the shoulder point and be graded to accommodate a properly sized driveway culvert.

3.1.5.1.5 See Section 2 – Erosion Control, Stormwater Management and Water Resources in the Standard Construction Specifications for erosion control requirements. See Section 14 – Site Improvements and Restoration for restoration, seed and sod requirements. Sod placement shall be required on longitudinal slopes greater than 4%.

3.1.5.1.6 If the back slope of a ditch extends beyond the right-of-way, drainage easements shall be required adjacent to the street right-of-way at a uniform distance from the road centerline, as approved by the City Engineer.

3.1.5.1.7 Turf reinforcement may be used as in ditches with slopes between 4% - 5%. City shall pre-approve turf reinforcement type.

3.1.6 STORM MANHOLE

3.1.6.1 MATERIALS

3.1.6.1.1 All storm manholes shall be pre-cast concrete with integral base and offset cone.

3.1.6.1.2 The manholes shall be sized as follows:

Downstream Pipe O.D.*	Minimum Manhole I.D.
30” or less	48”
31” – 36”	60”
37” – 42”	72”
> 42”	Special Design Requiring Engineer Approval
*O.D. is the largest horizontal outside pipe dimension	

3.1.6.1.3 Confirm design manhole sizing with Cretex Manhole Calculator or similar.

3.1.6.1.4 Where field conditions do not permit an offset cone, the manhole shall be constructed with a flattop (slab or deck) with an appropriately configured opening for the casting.

3.1.6.1.5 All lifting holes which penetrate through the structure shall be sealed with a cementitious grout with a struck joint. Grout shall be premixed, non-metallic, high-strength, non-shrink, Pennegrout® by IPA Systems, or approved equal, which meets requirements of ASTM C-1-91 and C-827 as well as CRD C-588 and C-621. When mixed to a mortar or "plastic" consistency, the grout shall have a minimum 1-day and 28-day compressive strength of 6,000 and 9,000 psi, respectively. Dry stacking of flat decks shall not be permitted.

3.1.6.1.6 Steps shall not be installed in manholes.

3.1.7 INLETS

3.1.7.1 MATERIALS

3.1.7.1.1 Shall consist of pre-cast concrete. All inlets shall be designed and constructed to allow easy access for maintenance and cleaning.

3.1.7.1.2 Size (minimum).

- *Rectangular 24" x 36" (Internal Dimensions).*
- *Round 48" ID*

3.1.7.1.3 All inlets shall have a 2-foot deep sump below the outlet pipe invert elevation.

3.1.7.1.4 Steps shall not be installed in inlets.

3.1.7.1.5 Where directed by the City, a continuous 4" diameter perforated, corrugated polyethylene drain pipe shall be installed under the curb and gutters and extend 50 feet in either direction from storm water inlets located at low points. For inlets in other locations, the 50-ft length of drainage pipe shall be connected only to the upstream side.

3.1.7.1.6 Where underdrain pipe is specified, a 4" diameter hole shall be cored in opposite sides of each inlet located at low points to allow the connection of 4" diameter perforated, corrugated polyethylene underdrain pipe. Inlets located in other locations shall have a 4" diameter hole cored in the upstream side to allow the connection of 4" diameter underdrain pipe. The holes shall be cored at an elevation that is below the subgrade elevation to allow for positive drainage and proper placement of the underdrain. See 3.1.9.2 for underdrain Materials requirements.

3.1.7.1.7 All lifting holes which penetrate through the structure shall be sealed with a cementitious grout bed with a struck joint. Grout shall be premixed, non-metallic, high-strength, non-shrink, Pennegrout® by IPA Systems, or approved equal, which meets requirements of ASTM C-1-91 and C-827 as well as CRD C-588 and C-621. When mixed to a mortar or "plastic" consistency, the grout shall have a minimum 1-day and 28-day compressive strength of 6,000 and 9,000 psi, respectively.

3.1.7.2 DESIGN

3.1.7.2.1 Inlet capacity design storm: Minimum 10-year storm event. In a 100-year storm event, the maximum spread of ponded storm water shall be 10 feet as measured from the face of curb on a residential street and 3 feet as measured from the face of curb on a major street.

3.1.7.2.2 Inlet capacity design storm: 100-year storm event for areas with no overland flow relief.

3.1.7.2.3 Where only front yard drainage flows to the curb, maximum separation or run to an inlet is 300 feet unless, in the opinion of the City, a lesser distance is required. Where the collective drainage from more than one lot discharges over the curb at a single point, an inlet shall be required at the lot line extended.

3.1.8 FIELD INLETS

3.1.8.1 MATERIALS

3.1.8.1.1 Shall consist of pre-cast concrete construction.

3.1.8.1.2 Inlets shall be designed and constructed to allow easy access for maintenance and cleaning.

3.1.8.1.3 Steps shall not be installed in inlets.

3.1.8.1.4 All lifting holes which penetrate through the structure shall be sealed with a cementitious grout bed with a struck joint. Grout shall be premixed, non-metallic, high-strength, non-shrink, Pennegrout® by IPA Systems, or approved equal, which meets requirements of ASTM C-1-91 and C-827 as well as CRD C-588 and C-621. When mixed to a mortar or “plastic” consistency, the grout shall have a minimum 1-day and 28-day compressive strength of 6,000 and 9,000 psi, respectively.

3.1.8.2 DESIGN

3.1.8.2.1 Inlet capacity design storm: In a 100-year storm event, the maximum spread of ponded storm water shall be 10 feet.

3.1.8.2.2 Inlet capacity design storm: 100-year storm event for areas with no overland flow relief.

3.1.9 ROAD UNDERDRAINS

3.1.9.1 GENERAL

3.1.9.1.1 Underdrain systems shall be installed under curb and gutters to collect water and convey it to inlets. The required site specific geotechnical evaluation and pavement design report submitted by the Developer shall address any recommendation to install underdrains. The City will make the final determination if road underdrains are to be included in the design including extents and locations.

3.1.9.2 MATERIALS

3.1.9.2.1 The underdrain system shall be constructed with:

- *4" diameter perforated, corrugated polyethylene drainage pipe meeting the requirements of AASHTO Designation: M-252.*
- *Pipe perforations may be holes or slots and may be in 3 or 4 lines spaced around the circumference of the pipe at 120° or 90° respectively.*

3.1.9.2.2 The trench shall be backfilled with open graded ¾" crushed stone.

3.1.9.2.3 Geotextile fabric, as specified in Section 612.2.8 of the WisDOT Standard Specifications, shall be used to line the underdrain trench before the drainage pipe is installed and backfilled. Enough fabric shall be provided as to cover the sides and bottom of the trench and overlap across the top of the trench by a minimum of 4 inches.

3.1.9.3 DESIGN

3.1.9.3.1 The 4" drainage pipe shall be laid in an 8" deep by 8" wide trench with flat bottom with square sides. The trench, constructed at an elevation lower than the base course, shall extend 50 feet in either direction from a storm water inlet located at the low point of the road, aligned with the proposed centerline of the flange of the curb and gutter. For inlets in other locations, the 50' drainage pipe shall be connected only to the upstream side.

3.1.9.3.2 The drainage pipe shall be connected to inlets in cored holes and grouted in-place in the cored holes. The end of drainage pipe opposite the inlet shall be capped with a cap suitable for installing on the drainage pipe.

3.1.10 BEHIND CURB COLLECTORS

3.1.10.1 MATERIALS

3.1.10.1.1 Where required by the City, all behind the curb collector systems shall be constructed with minimum 6" diameter PVC (SDR 35) pipe.

3.1.10.2 DESIGN

3.1.10.2.1 Connected to sump pump drainage lines in lieu of storm sewer.

- *36" from flow line to surface.*
- *1 % minimum grade.*
- *300-ft. maximum run to outlet.*
- *Maximum run of 250 feet in curvilinear street.*
- *Maximum of 4 lots contributing area.*

3.1.10.2.2 Behind the curb collector systems shall be installed 2' behind the curb at cul-de-sacs and hill crests where storm sewers are not located.

3.1.10.2.3 The collector pipe shall be connected to the nearest inlet.

3.1.10.2.4 A clean out shall be installed at the upstream end of the collector system.

3.1.10.2.5 Sump lines for lots not served by the storm sewer shall be connected to the PVC collector pipe by a wye or tee fitting.

3.1.10.2.6 Tracer wire installation is required on all behind the curb collector pipe.

3.1.11 FRAMES, GRATES AND LIDS

3.1.11.1 MATERIALS

3.1.11.1.1 Vertical curb inlet frames and grates shall be Neenah R-3290.

3.1.11.1.2 Depressed curb inlet frames and grates shall be Neenah R-3290-A for driveway curb head reductions.

3.1.11.1.3 Field inlet beehive grates shall be Neenah R-2560-E.

3.1.11.1.4 Manhole frames and grates in inlet applications shall be Neenah R-2467.

3.1.11.1.5 Manhole frames and lids in non-inlet applications shall be Neenah R-1661. Covers shall have machined bearing surface and shall have eight (8) vent holes.

3.1.11.1.6 Manhole lids installed on manholes in public storm systems shall have the words “City of Waukesha” “D.P.W.” in 1-inch letters stamped on the top surface. Reference Neenah 1660 – 5262. Frame shall be Neenah R-1661.

3.1.11.1.7 A pipe grate shall be installed on all flared end sections with sewer diameters 24” or greater equivalent.

3.1.12 ADJUSTMENT RINGS

3.1.12.1 MATERIALS

3.1.12.1.1 All frame/casting adjusting rings shall be manufactured from ARPRO® Expanded Polypropylene (EPP), black 5000 series meeting ASTM D3575 and ASTM D4819-13; B6D7G4L3M24S2T17W7. The rings shall be manufactured using a high compression molding process to produce a finished density of 120 g/l ((7.5 pcf). Material shall be Pro-Ring as manufactured by Cretex Specialty Products.

3.1.12.1.1.1 Paving rings are not permitted.

3.1.12.1.1.2 “Grade” adjustment rings may contain either an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside with a flat top.

3.1.12.1.1.3 "Finish" or "Flat" rings may either have a keyway (groove) on the underside for vertical alignment and/or an adhesive trench with a flat upper surface. These rings shall be available in heights (thicknesses) which will allow final adjustment of the frame and cover or grate to within ¼" (one quarter inch) to ½" (one half inch) of the specified final elevation. "Finish" rings may also have a keyway on the upper surface of the inner diameter to facilitate installation of an "Angle" ring.

3.1.12.1.1.4 "Angle" rings may either have an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside. When required, the "Angle" ring or rings shall allow final adjustment of the frame and cover or grate to within ¼" (one quarter inch) to ½" (one half inch) of the specified final elevation.

3.1.12.1.1.5 For new manholes, the minimum height of adjusting rings for a chimney section above the cone as measured from the top of the cone or slab top shall be 4" with the maximum height of 8". If more than 8" of adjusting rings are needed to set the casting to finished grade, then an additional barrel section shall be installed on the manhole.

3.1.12.1.2 Any adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall be M-1 Structural Adhesive/Sealant or equal meeting the following specifications:

- *ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O*
- *Federal Specification TT-S-00230-C Type II, Class A.*
- *Corps of Engineers CRD-C-541, Type II, Class A*

3.1.12.1.3 Repair mortar shall be a one component, quick set, high strength, non-shrink; polymer modified cementitious patching mortar, which has been formulated for vertical or overhead use meeting the requirements of ASTM C-109 for Compressive Strength, C-348 and C-78 for Flexural Strength and C-882 for Slant Shear Bond Strength. Repair mortar shall not contain any chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents nor shall it promote the corrosion of any steel that it may come in contact with. Material shall be Octocrete as manufactured by IPA Systems, Inc. or approved equivalent.

3.1.12.1.4 Cementitious grout shall be a premixed, non-metallic, high strength, non-shrink grout which meets the requirements of ASTM C-191 and C-827 as well as CRD-C-588 and C-621. When mixed to a mortar or "plastic" consistency, it shall have minimum one day and 28-day compressive strength of 6,000 and 9,000 psi, respectively. Material shall be Ipatop-Penngrout as manufactured by IPA Systems, Inc. or approved equal.

3.1.13 SUMP PUMPS, DOWN SPOUTS, AND ROOF DRAINS

3.1.13.1 DESIGN

3.1.13.1.1 The City may require sump pumps to be connected to a storm sewer system if one exists adjacent to the lot.

3.1.13.1.2 Down spouts and roof drains may be connected to the storm sewer or behind the curb collector pipe. Connections shall be in accordance with the applicable building code.

3.1.13.1.3 When sump pumps, down spouts and roof drains discharge on the ground, they shall do so in such a matter that:

- *Adjoining properties are not adversely affected.*
- *If no drainage easement exists along a side or rear lot line, the discharge point within the site, shall be at least 10' from the lot line.*
- *If a public open drainage easement exists adjacent to any lot, the discharge point for down spouts and/or roof drains may be discharged directly into the easement.*

3.1.14 BEDDING/COVER/BACKFILL

3.1.14.1 MATERIALS

3.1.14.1.1 Pipe Bedding and Cover Materials: Materials as required in Chapter 3.2.0 of the SWS for the application, unless otherwise permitted by the City.

3.1.14.1.2 Trench Backfill:

3.1.14.1.2.1 Under existing or proposed pavement: Granular Backfill meeting the requirements of SWS, Section 8.43.7, Table 39. No excavated material will be allowed for reuse as trench backfill, unless otherwise permitted by the City.

3.1.14.1.2.2 In non-pavement areas: Previously excavated materials meeting the requirements of SWS, Section 8.43.5 unless otherwise permitted by the City.

3.1.14.1.3 Slurry Backfill: Aggregate slurry in accordance with SWS, Section 8.43.8 and requirements of City, or in accordance with Excavation within the Public Right-of-Way permit, when issued.

3.2 CONSTRUCTION

3.2.1 GENERAL

3.2.1.1 Construction shall be in accordance with the Design and Construction Manual, Division 3 - Standard Construction Specifications, latest Edition.

3.2.2 SUBMITTALS AND SAMPLES

3.2.2.1 All submittals shall be in accordance with the Design and Construction Manual, Division 3 - Standard Construction Specifications, latest Edition.

3.2.3 ACCEPTANCE TESTING

3.2.3.1 General

3.2.3.1.1 All sewers, leads, and laterals shall be televised within the project and/or disturbed area limits by an independent televising inspection service. Televising shall be in accordance with the Design and Construction Manual, Division 3 - Standard Construction Specifications, latest Edition, Section 5.3.10.

3.3 FLOODPLAIN

3.3.1 GENERAL

3.3.1.1 Follow City Floodplain Zoning Ordinances and FEMA requirements. Provide 1:1 ratio compensatory volume for filled floodplain areas.

END OF SECTION

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4 ROAD SYSTEM

Follow AASHTO guidelines unless otherwise noted. Street designs shall be consistent with the City's adopted Comprehensive Plan. Private roads shall be designed in accordance with public road standards, even in PUD's.

4.1 GEOMETRICS

4.1.1 RIGHT-OF-WAY WIDTHS

4.1.1.1 Right-of-way widths shall be in accordance with Municipal Code § 23.06(3).

4.1.2 PAVEMENT WIDTHS

4.1.2.1 Pavement widths shall be in accordance with Municipal Code § 23.06(4).

4.1.3 CUL-DE-SACS

4.1.3.1 The use of cul-de-sacs is discouraged. Cul-de-sacs may only be implemented with approval of the Engineer.

4.1.4 STREET GRADES

4.1.4.1 Street grades shall be in accordance with Municipal Code § 23.06(5)

4.1.5 CROSS SLOPE

4.1.5.1 All typical roadway sections shall have a crown, with a cross slope of 2% from the pavement centerline to the edge of pavement (flange of the curb and gutter).

4.1.6 HORIZONTAL CURVES

4.1.6.1 Horizontal curve requirements shall be in accordance with Municipal Code § 23.06(5).

4.1.7 VERTICAL CURVES

4.1.7.1.1 Minimum horizontal curve requirements shall be in accordance with Municipal Code § 23.06(5).

4.1.7.1.2 Maintain "K" Values per AASHTO Geometric Design of Highways and Streets, current edition including all updates.

4.1.8 SIGHT DISTANCE

4.1.8.1 For minimum sight distance requirements at intersections and driveways, refer to AASHTO Geometric Design of Highways and Streets, current edition including all updates.

4.1.9 CORNER RADII

4.1.9.1 Radii shall be in accordance with Municipal Code § 23.06(6).

4.1.9.2 Corner radii at intersections to external roadways, shall be as approved by the City.

4.1.10 ACCELERATION / DECELERATION / BYPASS LANES

4.1.10.1 Any roadway intersecting with any roadway projected to have more than 100 ADT shall require Acceleration/Decelerations/Bypass Lanes per WisDOT SDD 9A1.

4.1.11 TRANSITIONS

4.1.11.1 Transitions areas, such as lane additions, bypass lanes, traffic shifting lanes, and areas between existing pavement and new pavement sections with varying widths, shall be transitioned at a ratio of 15:1 (widen 1 foot in 15 feet).

4.2 STANDARDS

These standards shall apply to all public and private roadways. All modifications shall be approved by the Engineering Division.

4.2.1 SUBGRADE

4.2.1.1 DESIGN

4.2.1.1.1 Soil borings to a minimum depth of 10 feet below finish grade shall be taken every 500 feet measured along the proposed centerline of the roadway, or as required by City Engineering. A site map showing the actual location of the borings along with laboratory soils classifications for each boring shall be submitted to the City once the borings have been completed.

4.2.2 GEOTEXTILE FABRIC

4.2.2.1 MATERIALS

4.2.2.1.1 Material shall be in accordance with the Design and Construction Manual, Division 3 - Standard Construction Specifications, latest edition, Section 4.

4.2.3 BASE COURSE

4.2.3.1 MATERIALS

4.2.3.1.1 The crushed aggregate base course for the roadway shall consist of dense graded base conforming to Wisconsin Department of Transportation (WisDOT) Standard Specification Section 305. See also Design and Construction Manual, Division 3, Standard Construction Specifications, latest edition, Section 4.

4.2.3.2 **DESIGN**

4.2.3.2.1 The minimum base course thickness shall be:

	Asphalt Pavement	Concrete Pavement
Residential streets	12”	8”
Commercial and industrial	14.5”	10”

4.2.4 SHOULDERS

4.2.4.1 **MATERIALS**

4.2.4.1.1 The aggregate for shoulder shall consist of crushed stone conforming to WisDOT Standard Specification Section 305 for 3/4-inch dense graded base. See also Design and Construction Manual, Division 3, Standard Construction Specifications, Section 4.

4.2.4.1.2 Recycled asphalt is not an acceptable material.

4.2.5 ASPHALT PAVEMENT

4.2.5.1 **MATERIALS**

4.2.5.1.1 Asphalt pavement materials shall be in accordance with the requirements of Division 3, Standard Construction Specifications, latest edition, Section 8.

4.2.5.1.2 The Contractor shall submit the mix design for approval by the City two weeks prior the preconstruction conference. The following applies:

<table>
<tr><td></td><td colspan="2">Binder</td><td colspan="2">Surface</td></tr>
<tr><td></td><td>Mix Design</td><td>Min. Thickness</td><td>Mix Design</td><td>Min. Thickness</td></tr>
<tr><td>Residential streets</td><td>Type 3 LT 58-28 H</td><td>3”
(one lift)</td><td>Type 5 LT 58-28 H</td><td>2”</td></tr>
<tr><td rowspan="2">Commercial and Industrial</td><td>Type 4 LT* 58-28 H</td><td>2”
(Upper)</td><td rowspan="2">Type 5 LT* 58-28 H</td><td rowspan="2">1.5”</td></tr>
<tr><td>Type 3 LT* 58-28 H</td><td>2.5”
(Lower)</td></tr>
</table>

**MT mix may be required as directed by the City Engineering Division.*

4.2.5.1.2.1 Mix designs for all other classifications shall be as approved by the City Engineering Division.

4.2.6 CONCRETE PAVEMENT

4.2.6.1 MATERIALS

4.2.6.1.1 Portland Cement used in all concrete mixes shall be in accordance with the requirements in Division 3, Standard Construction Specifications, latest edition, Section 6.

4.2.6.2 DESIGN

Residential streets	Non-Reinforced	8”
Commercial and Industrial	Doweled	9”

4.2.6.2.1.1 Alternative designs shall be as approved by the City Engineering Division.

4.2.7 CURB AND GUTTER

4.2.7.1 MATERIALS

4.2.7.1.1 Portland Cement used in all concrete mixes shall be in accordance with the requirements of Division 3, Standard Construction Specifications, latest edition, Section 6.

4.2.7.1.2 Concrete Curb and Gutter shall be a standard 6” vertical face curb and gutter type that is 30” wide (6” top curb and 24” flange) unless otherwise approved. See the Design and Construction Manual, Division 4 - Standard Details.

4.2.7.2 DESIGN

4.2.7.2.1 Minimum curb grade: 0.5 % (along the gutter flowline).

4.2.8 PEDESTRIAN RAMPS

4.2.8.1 MATERIALS

4.2.8.1.1 Portland Cement used in all concrete mixes shall be in accordance with the requirements of Division 3, Standard Construction Specifications, latest edition, Section 6.

4.2.8.1.2 Detectable Warning Fields shall be in accordance with the requirements of Division 3, Standard Construction Specifications, latest edition, Section 7.

4.2.8.2 DESIGN

4.2.8.2.1 Design of pedestrian ramps shall be in accordance with ADA standards, and shall be a Type 2 where geometrically possible.

4.2.9 ROAD UNDERDRAIN PIPE

4.2.9.1 MATERIALS

4.2.9.1.1 See Section 3.1.9.

4.2.10 DRIVEWAYS

4.2.10.1 DESIGN

4.2.10.1.1 Driveway approaches are to be constructed by removing existing curb and gutter and installing poured in-place concrete. This activity requires a Construction Permit issued by the City.

4.2.10.1.2 Driveway slopes shall not exceed 10%.

4.2.10.1.3 Driveway slopes shall not exceed 5% in all areas within 25 feet of a building.

4.2.10.1.4 For commercial, industrial and multi-family buildings, if the initial 25 feet of driveway is deemed to be an accessible passenger loading zone, the American Disabilities Act (ADA) requires accessibility routes with longitudinal slopes of not greater than 5% and cross slopes of 2% to be connected to the loading zone and the accessible building entrance.

4.2.10.1.5 AASHTO Sight Distance requirements shall be required at all driveway locations.

4.2.10.1.6 Driveways shall be in accordance with Municipal Code § 6.13

4.2.10.2 RESIDENTIAL DRIVEWAYS

4.2.10.2.1 Only one driveway is allowed per parcel for residential developments.

4.2.10.2.2 For multi-family developments, the Plan Commission may grant one or more additional access points, based on the size of the development.

4.2.10.3 COMMERCIAL DRIVEWAYS

4.2.10.3.1 The number of commercial driveways shall be the minimum necessary to provide reasonable access for regular traffic and emergency vehicles, while preserving operations and safety along the public roadway. Unless a Traffic Impact Analysis (TIA) shows that a single driveway cannot provide this, only one driveway access will be permitted unless one or more of the following conditions are met.

- *The continuous frontage of the parcel is over 300 feet long, in which case an additional driveway per each 300 feet or frontage may be granted by the Plan Commission.*

- *Two one-way driveways may be permitted along frontage of at least 150 feet provided the driveways do not interfere with operations at other driveways or along the street.*
- *The Plan Commission may determine additional driveways are justified due to the amount of traffic generated by the use without compromising traffic operations along the public street.*
- *All commercial driveways along roadways with vertical face curb and gutter shall be constructed with a minimum of a driveway apron. Certain locations with heavy amounts of traffic will need to use a street type entrance as directed by the City.*

4.2.11 PARKING LOTS

4.2.11.1 Off street parking lots shall be designed to accommodate traffic volumes and pedestrian circulation based on the land use served.

4.2.11.2 The internal circulation pattern shall be designed with 24-foot wide driving aisles (measured from edge of pavement marking to edge of pavement marking) for two-way traffic to allow users to maneuver in an efficient & safe manner.

4.2.11.3 The use of landscaped islands & medians shall be used to provide positive guidance to motorist and establish proper driving patterns.

4.2.11.4 Sidewalks adjacent to parking stalls shall be 8 feet wide. Smaller sidewalks may be allowed with prior City approval. Appeals may be made to the Plan Commission.

4.2.11.5 Turning radii for a single unit truck (SU Design Vehicle) shall be provided as a minimum to all portions of the lot.

4.2.11.6 Pavement:

- *General parking areas are recommended to have at least a minimum of 8-inches of crushed aggregate base course and 4-inches of LT Asphaltic Concrete.*
- *Areas of heavy traffic, such as loading docks, shall have at least a minimum of 10-inches of crushed aggregate base course and 6-inches of LT Asphaltic Concrete.*

4.2.11.7 Refer to Municipal Code § 22.53 for additional parking lot requirements.

4.2.12 SIDEWALK

4.2.12.1 MATERIALS

4.2.12.1.1 Sidewalk materials shall be in accordance with the requirements of Division 3, Standard Construction Specifications, Section 6, latest edition, and Municipal Code § 6.08.

4.2.12.2 **DESIGN**

4.2.12.2.1 Sidewalk is to be constructed of a minimum thickness of 4-inches of concrete over a 4-inch crushed aggregate base course.

4.2.12.2.2 Residential driveway crossings shall be 6-inches of concrete over a 4-inch crushed aggregate base course.

4.2.12.2.3 Commercial driveway crossings shall be 7-inches of concrete over a 4-inch crushed aggregate base course.

4.2.12.2.4 Sidewalk shall be placed with a slope perpendicular and toward the centerline of the road of 1.5%.

4.2.12.2.5 The maximum allowed longitudinal grade shall be 5%. This grade shall not be exceeded unless the road grade is of a steeper grade, in which case the longitudinal sidewalk grade shall not exceed the road grade.

4.2.12.2.6 The outside edge of sidewalks shall be located 6-inches from the right-of-way line or as directed by the City except at intersection crossings. At intersection crossing, the proper placement shall be determined by the location of the crosswalk and or as directed by the City.

4.2.12.2.7 Sidewalk are typically installed fronting on all City properties. If sidewalks are not installed as part of the project, the terrace area shall be graded for future sidewalk installation.

4.3 CONSTRUCTION

4.3.1 GENERAL

4.3.1.1 Construction shall be in accordance with the requirements of Division 3, Standard Construction Specifications, latest edition.

4.4 TRAFFIC IMPACT ANALYSIS

These guidelines were developed to assist City staff and prospective developers in determining whether a traffic impact analysis (TIA) should be required of a Developer. These guidelines follow the practice recommended by the Institute of Transportation Engineers (ITE) and expanded on by WisDOT.

4.4.1 WHEN A TRAFFIC IMPACT ANALYSIS IS REQUIRED

4.4.1.1 A TIA is required if the development meets or exceeds any of the following requirements:

- *All big box retail (any single user exceeding 50,000 SF), gas station, grocery store, drive-thru pharmacy and fast food restaurant developments;*
- *Sit-down Restaurant development: 8,000-square feet;*
- *Commercial/retail development: 15,000-square feet;*
- *Residential development: 100 houses, 125 apartment units or condominiums/town houses;*
- *Warehouse development: 210,000-square feet;*
- *Industrial development: 55,000-square feet;*
- *Office development: 40,000-square feet;*
- *Dental/medical office development: 20,000-square feet;*
- *Hotels: 100 rooms.*

4.4.1.2 In some cases, as determined by the City, an abbreviated traffic study may be required instead of a full TIA. An abbreviated TIA can be a technical memorandum which could include following:

- *Site layout / proposed access*
- *Adjacent roadways and intersections*
- *trip generation*
- *trip assignment*
- *opening day capacity analysis*

4.4.1.3 The city reserves the right to require a TIA if the development does not fall within one of the listed criteria, or due to existing known traffic and/or safety issues, or if it was determined by the City that the proposed development may create unsafe conditions or traffic congestion.

4.4.1.4 The City may waive the TIA requirement altogether depending on the type of development and expected traffic impacts**.**

4.4.2 TIA PREPARATION

4.4.2.1 Preparing a TIA and all costs associated with it will be the responsibility of the developer.

4.4.2.2 All TIAs shall include an existing conditions analysis, initial build conditions analysis, and total build conditions analysis (for multi-phase developments). It is the City's discretion whether a +10-year future analysis should be included in the TIA (depending on development location and level of intensity of the development). Typically, a +10-year future analysis will be required if the development is expected to generate 500 or more peak hour trips.

4.4.2.3 Analysis Peak Periods to be studied (additional analysis hours may be added depending on development location and details of development or at the discretion of the city traffic engineer):

- *Big Box Retail – weekday AM (6-9), weekday PM (3-6) & SAT (10-2)*
- *Restaurants – weekday midday (11-1) & weekday PM (3-6) (if fast food, also include weekday AM (6-9))*
- *Commercial/Mixed Use Commercial/Grocery – weekday PM (3-6) & SAT (10-2)*
- *Residential - weekday AM (6-9) & weekday PM (3-6)*
- *Warehouse – weekday AM (6-9) & weekday PM (3-6)*
- *Industrial, Office - weekday AM (6-9) & weekday PM (3-6)*
- *Dental/Medical Office – weekday PM (3-6) and possibility weekday AM (6-9) depending on hours of operation and location.*
- *Hotel – weekday AM (6-9) & weekday PM (3-6) & potentially Friday night or Saturday night if the Hotel includes banquet rooms/conference center.*
- *Institutional (School, hospitals, gov't) – weekday AM (6-9) & weekday PM (2-6, depending on dismissal hours)*

4.4.2.4 If a TIA is deemed to be required, the TIA shall be prepared per the general requirements of the most recent WisDOT TIA guidelines. Specifically, the following shall be included in the submittal:

- *Development Description and Site Location*
- *Proposed Site Plan, Land Use & Intensity*
- *Development Phasing & Timing*
- *Proposed access locations*
- *Potential Off-site development (as identified by the City)*
- *Study Area, including description of existing transportation system*
- *Traffic Volumes (turning movement counts required within past 3 years)*
- *Trip Generation, Trip Distribution & Trip Assignment*
- *Capacity/Level of Service & Queuing Analysis*
- *Recommendations to achieve LOS C or D*
- *Traffic Signal Warrants and Sight Distance Analysis may also be required depending on the specific situation*
- *A signal progression analysis may be required if traffic signal timing/phasing is proposed to be modified and the subject intersection is part of a signal system.*
- *The capacity analysis software used for the analysis shall follow HCS (Highway Capacity Analysis) standards. Consult with the City traffic engineer on acceptable programs.*
- *The appendix of the report shall include all traffic count data and traffic analysis computer outputs and other calculations utilized to develop recommendations.*

4.4.2.5 When a TIA is completed and accepted by the City, it will be valid for that development only and has a sunset period of 5 years from acceptance. If the development is phased for a period of years, the City may require an updated TIA past the 5-year period.

4.4.3 OTHER CONSIDERATIONS

4.4.3.1 For any developments that are directly adjacent to, or impacting a state trunk highway by means of a new access point, or impacting an intersection with a state trunk highway, the developer shall prepare the TIA in accordance with and under the direction of WisDOT.

4.4.3.2 For any developments that are directly adjacent to, or impacting a county trunk highway by means of a new access point, or impacting an intersection with a county trunk highway, the developer shall prepare the TIA in accordance with and under the direction of Waukesha County.

4.4.3.3 If the TIA is prepared for WisDOT or Waukesha County, the developer shall submit the TIA to these agencies for review and send a copy of the same TIA for the City to review at the same time. Required development improvements for state or county highways will be directed by the state or county and the City will determine the level improvement for City streets.

4.4.3.4 Other considerations may be included in the TIA as required by the City. Such considerations may include:

- *Crash Rates: Locations identified by the City or Police Department as being high crash rate intersections.*
- *Neighborhood traffic impacts: Areas where the potential exists to increase average daily traffic volumes on city streets that may cause hardship to existing residents on those streets. Mitigation efforts may be required.*
- *Congestion: Areas of high traffic congestion that may be worsened by the development.*
- *Multimodal assessment and accommodations (pedestrians, transit, bikes)*

4.4.4 REVIEW OF TIA

4.4.4.1 The review of TIAs submitted to the City will be performed under the supervision of the Director of Public Works. Facts, comments, and recommendations will be discussed with the Planning Department in preparation for reporting to the City Plan Commission. The City and Developer will work together to review and agree upon any infrastructure improvements needed to facilitate the development and to fully mitigate all traffic impacts.

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5 STREET LIGHTING

5.1 SCOPE

There are instances when developments are required by the City to provide a continuation of an existing street light system or provide a new street lighting system within the right of way of public streets of a development. When this determination has been made, the Developer will follow this guide for the specifications, design, materials, construction, testing, and acceptance by the City. At no time may street lights be placed within the right of way of public streets in a development without written approval from the City Engineering Division.

There are instances when a Developer will need to make modifications to an existing street light system. The Developer shall follow this guide only after modifications are approved by the Engineering Division.

5.2 STANDARDS

All street light systems shall be designed to meet the requirements of the current edition of the American Standard Practice for Roadway Lighting, unless otherwise specified in the Standard Construction Specifications or by the Engineering Division. All street light systems shall be constructed to meet the requirements of the State of Wisconsin Department of Transportation Standard Specifications, unless otherwise specified in the City of Waukesha's Design and Construction Manual, Division 3 - Standard Construction Specifications, Section 11, latest edition.

Specified City requirements may be found within this document and within the Standard Construction Specifications.

5.2.1 DESIGN

5.2.1.1 All street lighting systems are designed for the purpose of keeping the public safe. This includes but is not limited to:

- Signalized intersections
- Non-signalized intersections
- Pedestrian crossings
- Roads with dangerous hills and curves
- Major roadways
- Collector roadways

Intersection "Beacon" lighting may be required for intersections of Local, Collector, and Major streets. Contact the Engineering Division for proper determination.

5.2.2 MATERIALS

5.2.2.1 Conduit shall be Schedule 40, HDPE, Black or Black with a Red stripe.

5.2.2.2 Conduit couplings shall be Shure-Lok 2. No other substitutions will be allowed.

5.2.2.3 Pull box shall be round, PVC, 15-Inch diameter, with a cast steel, heavy duty frame and lid.

5.2.2.4 Wire shall be #4, XLP, USE, for ungrounded and grounded conductors, and a #6, XLP, USE, green for grounding conductors.

5.2.2.5 Type 5 poles will be Flagpoles Inc. #FPSLS84530B-1-8 for single arm poles and Flagpoles Inc. #FPSLS84530B-2-8 for twin arm poles. Contact the Engineering Division for proper color and finish. Equals are allowed when approved by the Engineering Division.

5.2.2.6 Post Top decorative poles shall be HADCO -P1791-11'-8"-A. Pole shall be black in color. No equals will be allowed.

5.2.2.7 Cobra head fixtures shall be Cooper/Lumarc #LDRC-T3-E03-E-AP. Light fixture shall match pole in color. No equals will be allowed.

5.2.2.8 Post Top fixtures shall be Philips Hadco #TX0364BA2A3NWANS – MOD. Light fixture shall match the pole. No equals will be allowed.

5.2.3 CONSTRUCTION

5.2.3.1 Construction shall be in accordance with Division 3, the Standard Construction Specifications, latest edition.

5.2.4 INSPECTION AND PERMITS

5.2.4.1 All materials, installation, and testing of systems, are subject to inspection from the proper Authority Having Jurisdiction. For electrical service inspections, contact the Building Department, Electrical Inspector. For all other inspections within the right of way, contact the Engineering Division.

5.2.4.2 All necessary permits shall be applied for, paid for, and managed by the Developer.

5.2.4.3 Three business day notice is required for any inspections from the Engineering Division.

5.2.4.4 All submittals of materials and installation practices shall be submitted to the Engineering Division for review prior to construction. The Engineering Division reserves the right to reject any submittals that do not meet the standards as specified in this document.

5.2.5 ENERGY PROVIDER POWER AND LIGHTING

5.2.5.1 When required to provide Energy Provider street lighting, submit type of pole, type of fixture, design location and height to the Engineering Division for approval.

5.2.5.2 The Developer shall be responsible for all installation costs of Energy Provider lighting.

5.2.5.3 The Developer shall be responsible for all coordination and cost of a new or relocated electrical service for a street lighting cabinet or Energy Provider street lighting equipment.

5.2.6 PRIVATE ROADS

5.2.6.1 At no time, without proper authorization of the governing boards and/or City Council, shall public street lighting be installed on private roadways. This includes where a private roadway intersects with a public roadway. Private roadways may be lit with street lighting, but will be privately paid for within the development.

5.2.7 CITY PARTICIPATION

5.2.7.1 The City may make the determination to opt into participation of a new development for the purpose of constructing street lighting. This is at the sole discretion of the City and will only be done with proper authorization. The Engineering Division will contact the Developer for coordination if proper determination has been made and funds are allocated.

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6 PROJECT CLOSE-OUT DOCUMENTS

6.1 CONSTRUCTION BINDER

6.1.1.1 Construction Site Representative (CSR) (see Section 7 of Division 1 - Development Handbook) shall provide the City with a Construction Binder including the following documents:

- Material submittals
- Daily reports and photographs
- Test results/reports
- Marked up field set of construction plans

6.2 LIEN WAIVERS

Developer shall provide the City with all lien waivers pertaining to the public infrastructure prior to final acceptance by the City.

6.3 RECORD DRAWINGS

6.3.1 GENERAL

6.3.1.1 Plans shall include the seal and signature of the Wisconsin licensed professional engineer responsible for the preparation of the record drawings on the cover sheet or on each sheet.

6.3.1.2 Plans shall be prepared on sheets measuring 11" high by 17" wide.

6.3.1.3 A profile view shall be located below the plan view on plan and profile sheets and both views shall be aligned by stationing whenever possible. In general, stationing shall be from left to right.

6.3.1.4 Plan and profile sheets shall start and terminate at match lines with minimum 25 feet overlap.

6.3.1.5 Plan views shall show the following:

- All right-of-way, easement, lot, and property lines
- Edge of pavement or face and back of curb
- Addresses if available, lot and block numbers, and subdivision or development name. Unplatted lands, the address of the property and the name(s) of the property owner(s).
- All street names

6.3.1.6 The title block shall include at a minimum, the following information:

- Name and address of engineering (design) firm and owner/developer
- Name of Contractor
- Date of the drawing and last revision
- Date of construction
- Scale

- Plan sheet number (# of #)
- Name and location description of development

6.3.1.7 North shall be to the top or right of the sheet and shall be shown by a north arrow, clearly shown without intrusion.

6.3.1.8 The scale of the record drawings shall be 1"=40'. This shall be shown with a line scale and text.

6.3.1.9 Screen any existing surface improvements.

6.3.1.10 Two SEWRPC reference benchmarks shall be shown on each sheet.

6.3.1.11 Elevations shown shall be based on City of Waukesha datum which may be obtained by subtracting the conversion factor of **780.558** from **National Geodetic Vertical Datum (NGVD) 1929** datum. Project or plan datum is not acceptable.

6.3.1.12 Screen existing sanitary sewer, storm sewer and watermain and service locations.

6.3.1.13 Concurrent with the hard copy submittal:

6.3.1.13.1 Provide complete set of drawings in PDF format.

6.3.1.13.2 Provide complete set of drawings in AutoCAD (.DWG) format on electronic media tied to the NAD 1927 State Plane Wisconsin South coordinate system. Elevations shown shall be based on City of Waukesha datum which may be obtained by subtracting the conversion factor of 780.558 from National Geodetic Vertical Datum (NGVD) 1929 datum.

6.3.1.13.3 Provide digital files in Shapefile or Geodatabase format including the above coordinate system. This will facilitate direct insertion of the subject into the City's Geographic Information System (GIS).

6.3.1.13.4 Provide separate Excel or CSV (Comma Separated Values) format file for sanitary manholes indicating survey coordinates showing northing, easting, and elevation of the center of the manhole cover. Coordinate system shall be **NAD 1927 State Plane Wisconsin - South**. Elevations shown shall be City of Waukesha datum. Each type of manhole information shall be in a separate column.

6.3.1.13.5 Provide separate Excel or CSV (Comma Separated Values) format file for all storm manholes, inlets, and flared end sections indicating survey coordinates showing northing, easting, and elevation Coordinate system shall be NAD 1927 State Plane Wisconsin South. Elevations shown shall be City of Waukesha datum. Each type of information shall be in a separate column.

6.3.1.14 The cost of archiving the Record Drawings and insertion of the data into the City's GIS System shall be the sole responsibility of the Developer. Cooperation and submission of the aforementioned data will keep costs to a minimum.

6.3.2 SANITARY SYSTEM

6.3.2.1 Each sheet shall show all sewer and laterals with length, size, class, and material type clearly labeled.

6.3.2.2 The percent grade to two (2) decimal places and direction of flow of sanitary sewer.

6.3.2.3 Length of each sewer lateral and height of any lateral risers. Label invert elevations at right-of-way or easement lines. The ends of the laterals shall be marked with a mapleheart board and field located using survey methods.

6.3.2.4 Distance from downstream manhole to each upstream sewer lateral.

6.3.2.5 Type and size of encasement if used.

6.3.2.6 Manholes and cleanouts to be labeled with a design plan number and Waukesha system number. Obtain Waukesha system numbers to use from Engineering Division.

6.3.2.7 The following information shall be shown for each manhole:

- Elevation of the center of the manhole cover
- Invert elevation of each sewer
- Pipe size of each sewer
- Type of frame to chimney seal

6.3.2.8 Label backfill types and locations.

6.3.3 STORM SYSTEM

6.3.3.1 Each sheet shall show all sewer and any laterals with length, size, class, and material type clearly labeled.

6.3.3.2 The percent grade to two (2) decimal places and direction of flow of storm sewer.

6.3.3.3 Length of any sewer lateral. Label invert elevations at right-of-way or easement lines. The ends of laterals shall be marked with a mapleheart board and field located using survey methods.

6.3.3.4 Distance from downstream manhole to any upstream sewer lateral.

6.3.3.5 Type and size of encasement if used.

6.3.3.6 Drainage structures (e.g. manholes, inlets, flared end sections, etc.) to be labeled with a design plan number and Waukesha system number. Obtain Waukesha system numbers from Engineering Division.

6.3.3.7 Elevations of all manholes, inlets, and flared end sections shall be given. Elevations shall be to the center of the cover for manholes and the grate at the flowline for curb inlets. Invert elevations and pipe sizes shall be given for inlets and manholes.

6.3.3.8 Label backfill types and locations.

6.3.4 GRADING CERTIFICATION PLAN

6.3.4.1 In preparing a Certification Plan, the Developer's Grading Plan shall be shown as screened background.

6.3.4.2 Record grades shown on lot lines shall be no less than 0.30 ft. lower than final grades shown on approved grading plan or higher than 0.10 ft. above the final grades shown on approved grading plan. The Developer shall establish final grades within 5 feet of side lot lines, rear lot lines and the front right-of-way area between the front lot line and the back of curb. These areas shall be described as a "no-touch zone". All grades within the "no-touch zones" shall be certified by Developer's Engineer. Developer shall typically show spot grades along the side lot line, at front curb, front property corners, front setback, back of house extended, any high points, and rear property corners.

6.3.4.3 Grades along the side lot lines are required even in wooded, ungraded areas.

6.3.4.4 Existing house pad grade (elevation taken at the center and each corner of a typical house, except for lots designed for rear exposure house show existing grade at front and back of typical house). House pads are to be left 1.75' below finish yard grade with a +/- 0.25' tolerance.

6.3.4.5 Elevations every 50 feet along Developer graded swales and ditches.

6.3.4.6 Elevations every 100-ft station along the road alignment. Locations shall include:

- Pavement centerline
- Edge of pavement for rural sections and at the flange for urban sections
- Right-of-way
- Ditch flowline for rural sections
- Top of embankment on the backslope of the ditches for rural sections

6.3.4.7 Elevations around curb and gutter radii at intersections. At sidewalk ramps, include shots at the following minimum locations: gutter, top of ramp, back of landing.

6.3.4.8 After analyzing certified grades, Developer shall identify on plan those areas not within above tolerance. Show areas to be regraded, or areas where it may be desirable to revise the proposed grades in the Grading Plan.

6.3.5 STORM WATER BMP CERTIFICATION PLAN

6.3.5.1 Elevations (minimum of every 50')

- Top of berm

- Top of slope
- Toe of slope
- Safety shelf edges
- Bottom of BMP
- Spillway-top of slope & toe of slope (detailing length, width and height)
- Critical design locations

6.3.5.2 Structure Locations and Elevations

- Outfall (invert elevation and size)
- Overflow structures (corners of opening) and piping (invert elevation and size)
- Inlet structures (center of manhole) and piping (invert elevation and size)
- Outlet structures (center of manhole) and piping (invert elevation and size)
- Weirs (invert elevation and size)
- Orifice (invert elevation and size)
- Inlet/Outlet (invert elevation and size)
- Below ground storm water quality devices

6.3.6 BUILDING AND SITE CONSTRUCTION CERTIFICATIONS

6.3.6.1 For individual lots, Builder shall verify that the lot grading and home construction elevations match the approved master grading plan or approved individual grading plan. If the grades and elevations do not match the approved elevations, the Builder shall revise the work to match the approved drawings.

6.3.6.2 Builder shall provide a stamped topographical survey by Professional Land Surveyor showing and certifying that record spot grades match the proposed grading contours on approved grading plan prior to occupancy or shall post a $5,000 letter of credit.

6.3.6.3 Items to show on survey include:

- First floor elevation(s)
- Top of foundation wall elevation
- Basement floor elevation
- Garage floor elevation
- Yard grade elevations
- Driveway sidewalk elevation
- Distance from driveway sidewalk to garage floor
- Driveway slope(s)
- Driveway sideyard setbacks
- Address

6.3.6.4 The surveyor shall include the following written certification on the stamped topographical survey: The final lot elevations match the approved master grading plan within a tolerance of 0.1 feet.

6.3.6.5 Televising of installation of new sanitary sewer lateral connections to main:

6.3.6.5.1 Builder to provide a post construction sewer lateral video to City for review and approval. Video format to be determined by the Engineering Division.

6.3.6.5.2 In special circumstances, the City Engineering Division may permit the Builder to provide a $5,000 letter of credit or cash escrow in lieu of submitting a sewer lateral video prior to issuance of occupancy.

6.4 EASEMENTS

6.4.1 GENERAL

6.4.1.1 The Developer shall prepare formal written easement documents, including graphics and written legal description attachments for each easement and record the same with the Waukesha County Register of Deeds after review and approval by the City for each utility easement shown on the subdivision plat (or CSM) as a condition of Final Plat (CSM) approval.

6.4.1.2 No encroachment by structures, berms, trees, shrubs, paved surfaces or changes in grade greater than 6” are allowed in easement areas without approval of the City Engineering Division.

6.4.1.3 30-feet wide minimum width for a single utility. The utility shall be located in the center of the final easement. Easement width may be increased to 50 feet based on pipe size and depth.

6.4.1.4 Easements with multiple utilities, the minimum separation from outside of the utility to the easement line shall not be less than 15 feet subject to approval by the Engineering Division. Add not less than 10 feet per additional utility in the easement.

6.4.1.5 Maximum ground slope along easements:

- transverse: 25%
- longitudinal: 10%.

6.4.2 STORM SYSTEM

6.4.2.1 The City requires public storm sewer and/or drainage easements for any storm water conveyance system that drains public ROW areas or neighboring off-site areas.

6.4.2.2 A storm sewer running along the rear lot lines within a subdivision, specifically to drain backyards, does not warrant a public easement. The City considers this to be a private system built for the lot owners of the subdivision and owned/maintained by the property owners.

6.5 PUBLIC SANITARY SEWER ACCEPTANCE

6.5.1 INFRASTRUCTURE FIELD VERIFICATION

6.5.1.1 Once sanitary infrastructure construction has been completed, the Contractor shall contact the Engineering Division to request a field verification walkthrough. The field verification walkthrough shall be conducted with the Contractor and a City Engineering representative. Items to be verified include:

- *City standard covers installed*
- *Chimney seals installed*
- *Chimney ProRings acceptably installed*
- *Manholes free of debris*
- *No leaks in piping / structures*
- *Manhole pipe connections suitably mortared around entire pipe circumference*
- *All temporary plugs have been removed and the system is ready to accept sewage*
- *Pump station operational (if applicable)*

6.5.1.2 Following the field verification walkthrough, the contractor shall complete Sanitary Infrastructure Field Verification – Form A (C117) and forward to the City for review and signature.

6.5.2 INFRASTRUCTURE ACCEPTANCE REQUEST

6.5.2.1 Once the City has received and countersigned the Sanitary Infrastructure Field Verification – Form A (form C117), the developer shall complete and submit Sanitary Infrastructure Acceptance Request – Form B (form C118) to obtain final acceptance of the sanitary infrastructure by the City. See Division 1 – Project Administration, Section 2 – Construction Administration for Forms C117 and C118. The follow items shall be addressed prior to acceptance:

- *Sewer televising documents submitted and approved*
- *Record drawings submitted and approved*
- *All punch list items completed*
- *All temporary plugs have been removed the system is ready to accept sewage*
- *Easements or plat recorded*
- *Work is free from all liens*
- *Review and inspection fees paid to City*
- *Development agreement conditions satisfied*

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7 CONSTRUCTION MANAGEMENT AND REVIEW

7.1 CONSTRUCTION MANAGEMENT DEVELOPER DEPOSIT

Projects that include public infrastructure shall be required to provide a Construction Management Developer Deposit of 120% of the estimated costs to cover any of the following applicable public infrastructure costs: as-built and easement preparation, review services for roadway, sanitary system, storm system and all associated apparatus and appurtenances, and updates to the City Geographic Information System.

7.2 CONSTRUCTION SITE REPRESENTATIVE (CSR) REQUIREMENTS

A construction site representative (CSR) shall be required for all projects that contain public infrastructure. A CSR is required to observe that the public infrastructure is in accordance with City standards. The CSR is not responsible for supervision or directing of the work. The CSR is in addition to, and not a replacement of, construction oversight by a Developer and their contractors, and at no time replaces the Developer's or the contractor's responsibilities of construction management and oversight of their work.

For private development projects, the CSR review of public infrastructure shall be performed by a consultant selected by the Developer from a pre-approved and contracted list of consultants supplied by the City, at the sole cost of the Developer. The City will make final determination of when a CSR is required to be on-site, but shall be on-site during all sanitary sewer and storm sewer construction, roadway undercutting (EBS), concrete curb and gutter and paving operations. Other construction review may be determined by the City.

City statues referencing City requirements are listed below as of November 29, 2017:

23.07(3)(b) Prior to starting any of the work covered by the plans approved as above, arrangements shall be made to provide for inspection of the work sufficient, in the opinion of the Director of Public Works, to insure compliance with the plans and specifications as approved, and written approval obtained from the City to start the work.

23.07(3)(c) (Cr. #36-71) Irrespective of any other provisions herein or in §§22.50 or 22.52 of this Code, the developers of P.U.D. or Community Development projects shall pay to the City for the review of sanitary sewer, as such review is furnished by the City-approved Construction Site Representatives.

7.2.1 GENERAL CONSTRUCTION MANAGEMENT

7.2.1.1 The CSR shall be responsible for observing all construction work performed on-site relative to completing the project for intended use and purpose.

7.2.1.1.1 Provide full-time on-site construction observation services for the installation of all project elements, as appropriate for the nature and type of project element being constructed.

7.2.1.1.1.1 The City shall provide a list of pre-approved Consultants to the Developer. Consultant shall be contracted through the City with hourly rates of CSRs made available for the Developer's information. CSRs that will be on site shall be pre-approved by the Engineering Division or the Engineering Tech Supervisor.

7.2.1.1.1.2 The Developer shall coordinate and schedule with the Consultant and CSRs that will be on site. Once the Developer selects a Consultant, the Developer shall complete the project with the selected Consultant unless approved by the Director of Public Works.

7.2.1.1.2 Prepare daily progress reports describing work completed, trades involved, and any issues that occurred at the site.

7.2.1.1.3 Maintain an ongoing and current record of changes to the Plans or Specifications that occur on the project. The marked-up plan-set shall be submitted with the final record drawings.

7.2.1.1.4 Review all materials delivered to the site to ensure that they meet the Standard Construction Specifications.

7.2.1.1.5 Maintain daily logs and records, submitting an original copy to the City at no less often than weekly during the project construction period.

7.2.1.1.6 At the close of the project, the Consultant shall provide the City with a Construction Binder including the following documents:

- Material Submittals
- Daily Construction Progress Reports
- Test Results/Reports
- Change Orders / Substitutions
- Final Mark up or red-line set / record set of construction plans

7.2.2 GENERAL RESPONSIBILITIES

7.2.2.1 The CSR shall have a thorough understanding of construction and experience with the construction of sanitary systems, water systems, storm systems, roadway systems, and all associated construction requirements.

7.2.2.2 Review project plans, specifications and special provisions. At all times have a set of Approved Construction Documents and a copy of the City of Waukesha Design and Construction Manual available for use at the Project Site.

7.2.2.3 City to meet with any new CSRs prior to the start of the designated Project.

7.2.2.4 Notify the City of any meetings that are scheduled.

7.2.2.5 Attend the pre-construction meeting.

7.2.2.6 Complete a Daily Report that includes monitoring erosion control devices to ensure that they are functioning at the beginning and end of the workday. Note the status of erosion control.

7.2.2.7 Review all construction materials delivered to the project. Mark all defective material and have the Contractor remove it from the site in a prompt manner. Record manufacturer, class and type of material being used on both the Daily Report and in the CSR's set of field plans.

7.2.2.8 Review the project location and become familiar with marked underground utility locations. Be alert for underground utilities when the Contractor is excavating.

7.2.2.9 During project, and after the project is substantially complete, prepare a punchlist of corrective work and provide copies to the Contractor, City and project file. Perform follow-up to assure completion of the Punch List work items, as directed by the City.

7.2.2.10 During final review, determine that all areas disturbed by the Contractor have been cleaned up, graded and properly restored.

7.2.2.11 When corrective work has been completed, compile all tests, forms and reports and submit to the City.

7.2.2.12 Upon project completion, provide certification that project was completed according to approved plans and specifications.

7.2.2.13 Maintain one (1) record set of "as-built" drawings at the Project Site, marked up to show all field changes, locations of buried utilities around and contiguous to the building(s), and other significant items. This information shall be turned over to the City Engineer at the conclusion of the Project. Preparation of the Utility line as-builts shall be consistent with City standards.

7.2.2.14 If requested, review all progress and final payment requests by the Contractor(s).

7.2.2.15 Identify any liquidated damages that may become due, basis for the charges against the Contractor(s) and document in writing to the City. Track any possible causes that justify the granting of a time extension to the Contract. Review and recommend any requests by the Contractor for changes in compensation differing from the amount(s) bid. Document these issues on the Daily Report form.

7.2.2.16 Review, document and recommend payment of all Contractor proposals and requests for Change Order using appropriate forms. Document any verbal requests for Change Order work on the Daily Report. Compile all Change Order request documentation and submit to the City with recommendation.

7.2.2.17 The Project Designer shall be responsible for resolving any conflict between the Plans, the Specifications and the site conditions that are encountered in the Construction Phase with due notice to the City. The Designer shall be responsible for review and approval of all Shop Drawings for the Project.

7.2.3 GENERAL UTILITY CONSTRUCTION

7.2.3.1 As grade staking is completed for various sections of the project, verify stakes for offsets and note all locations for structures, hydrants, valves and fittings. Confirm that the line and grade of the grade stakes corresponds with the approved construction plans and survey cut sheets.

7.2.3.2 Verify that the surface upon which the pipe is to be laid is true to grade, firm and thoroughly compacted. Never allow pipe to be laid upon a trench bottom which is soft, yielding, mucky or under water. Any undercutting not provided for in the contract should be cleared with the City Engineer. Measure all undercutting to depth, width and location to provide proper documentation and payment.

7.2.3.3 Confirm that the pipe is properly bedded the entire length.

7.2.3.4 Verify the line and grade of the pipe as it is being set by the Contractor.

7.2.3.5 Verify that the pipe is clean, joint components and contact surfaces are free of defects. Make sure that the pipe is driven “home” to the full depth of the socket according to manufacturer’s requirements and instructions.

7.2.3.6 Obtain an accurate measurement of all piping installed and record the measurements on the Daily Report and CSR’s field plans.

7.2.3.7 Confirm that the Contractor is using a pipe plug or “cookie” in the last installed pipe prior to excavation of the next length of pipe to prevent debris from entering the pipe. Also insist that the Contractor installs the pipe plug in the last pipe installed each day to prevent dirt, water or animals from entering the pipe.

- Observe removal of the pipe plug or “cookie”.

7.2.3.8 Observe the backfilling work to assure that only proper material is placed into the trench (no clay lumps, broken concrete, frozen chunks, etc.).

7.2.3.9 Verify that the pipe is properly protected against subsequent damage during backfilling operations.

7.2.3.10 Observe that backfilling around the pipe is done to one foot above the top of pipe. Observe that subsequent backfill is completed in uniform lifts and compacted per the specifications.

7.2.3.11 Observe staking and record ties and invert and top of pipe elevations for all main line stubs which are installed for future connections.

7.2.3.12 Observe that all services, including those to vacant properties and buildings, have been properly staked by the survey crew. Verify the staked service locations and elevations against the approved construction plans.

- Record the actual location of services on the CSR’s field plans.
- Confirm that all services are marked by a wooden lateral marker.

- Accurately record the location, size, depth (or invert elevation) and length of all sanitary services on the CSRs field plans.

7.2.3.13 Confirm bedding and cover stone, and backfill meets specifications. 1.5.3.15 Verify benches poured in manholes and inlet manholes. Verify “no wood shims” are used in manhole, inlet or catch basin construction. Verify chimneys are properly completed prior to internal seals being installed.

7.2.4 SANITARY SEWER CONSTRUCTION

7.2.4.1 All precast and cast-in-place manhole components should be checked for configuration, dimensions, thickness, damage, and defects as they are delivered or constructed.

7.2.4.2 When the manhole base is installed, confirm the base is level and at proper grade.

7.2.4.3 Prior to backfilling, verify that the manholes are completely finished. Check for plumbness, dimensions, proper inverts, proper patching and leakage. All manholes must be free of dirt and debris.

7.2.4.4 Prior to completion, confirm that all manhole inverts have been finished off, in accordance with the plans and specifications. Check the floor and flow line, castings, adjusting rings, and steps for compliance with Contract Documents.

7.2.4.5 Schedule and observe low pressure air tests, and mandrel tests. Coordinate the scheduling with the Engineering Division. Confirm that the Contractor removed all plugs in existing lines.

7.2.4.6 Verify that the Contractor cleaned and televised the sewer.

7.2.5 STORM SEWER CONSTRUCTION

7.2.5.1 Verify that inlets are set to match the proposed curb and gutter for both line and grade.

7.2.5.2 When the Contractor is installing storm sewer directly below curb and gutter, check the elevation difference between the top of storm sewer and the bottom of the curb and gutter. Proactively check that manholes, catch basins, and inlets will be buildable as construction progresses.

7.2.5.3 If a storm sewer line is laid close to a watermain, determine the separation distance between the storm sewer and watermain, and consult with Tech Supervisor about the need for insulation. Wisconsin DNR requirements shall be followed.

7.2.5.4 Verify that all manholes and inlets are completely finished. Verify that the floor and flow line are in compliance with the plans and that the casting and Pro-rings are correctly positioned in place.

7.2.5.5 Verify that the Contractor cleaned and televised the storm sewer.

7.2.6 ROADWAY CONSTRUCTION

7.2.6.1 Before the start of construction, develop an understanding of the grading requirements.

7.2.6.2 Observe the grading for curb to verify that the Contractor is not undercutting the grades. If undercutting occurs, require the Contractor to bring the subgrade up with suitable granular material, at the Contractor's expense. Verify that the granular material meets the compaction requirements in the Contract Documents.

7.2.6.3 Determine that the pavement and the curb areas of the roadway are properly proof rolled, then monitor the repair of any substandard areas.

7.2.6.4 Utilize forms and/or string lines to check line and grade of curb and gutter and sidewalk. The forms or string lines should be checked at every grade stake with a carpenter's level. Visually check the string line or form line to assure uniform grade.

7.2.6.5 Inquire which technique will be employed by the Contractor to construct curbs (forms or curb machine). If forms are used, they should be clean, sprayed with form oil, and well braced.

7.2.6.6 Check curb immediately after the curb machine starts, for conformance to standard details. Continue to check for proper alignment, grade and pitch while the machine is in operation.

7.2.6.7 Verify that the curb is backfilled prior to when paving operations begins.

7.2.6.8 Before paving begins, verify that the job mix formula has been received and approved. As paving is conducted, sample and test in accordance with the testing program for the project.

7.2.6.9 Check temperatures of the bituminous mixtures from the truck box and the paver hopper.

7.2.6.10 Observe the pavement mixture as it is dumped from the truck to the paver. No lumps, clumps or non-coated aggregates are allowed.

7.2.6.11 Determine that all joints and areas around castings or obstacles are properly raked to ensure a uniform pavement after compaction.

7.2.6.12 Check for uniform shaping of the boulevards and backslopes. If grading beyond the plan limits is required, through no fault of the Contractor, measure and record the additional grading in the Daily Report and Item Record Accounts.

7.2.6.13 Check the project to ensure that all structures are clean, plumb and functional.

7.2.7 CONSTRUCTION SITE REPRESENTATIVE REQUIREMENTS – CITY PROJECTS

In addition to those requirements noted above, the CSR on City projects shall:

7.2.7.1 Monitor the schedule of individual phases of the project elements to ensure a timely completion. Verify that all necessary Permits are obtained by the Contractor(s).

7.2.7.2 Make recommendations for adjusting the work to accommodate changing and unforeseen conditions, as applicable and appropriate. Daily Reports when required, reflecting the effect on each Contractor or Subcontractor and the overall project schedule.

7.2.7.3 Receive and forward required Shop Drawings to the Designer for review. The Designer shall be responsible to distribute the reviewed Shop Drawings to the appropriate parties. Document correspondence via Memorandum or email.

7.2.7.4 Assist the City with such other services as may be required in execution of the Contract Documents to complete the project.

7.2.7.5 Assist the City in implementing the project completion consistent with the project schedule and the Contract Documents.

END OF SECTION

Appendix A

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City of Waukesha
Application for Development Review

Last Revision Date: 6/18/2018

City of Waukesha Community Development Department - 201 Delafield Street, Suite 200, Waukesha, WI 53188 262-524-3750
City of Waukesha Department of Public Works Engineering Division—130 Delafield Street, Waukesha, WI 53188 262-524-3600
www.waukesha-wi.gov

APPLICANT INFORMATION

Applicant Name: _____

Applicant Company Name: _____

Address: _____

City, State: _____ Zip: _____

Phone: _____

E-Mail: _____

PROPERTY OWNER INFORMATION

Applicant Name: _____

Applicant Company Name: _____

Address: _____

City, State: _____ Zip: _____

Phone: _____

E-Mail: _____

ARCHITECT/ENGINEER/SURVEYOR INFORMATION

Name: _____

Company Name: _____

Address: _____

City, State: _____ Zip: _____

Phone: _____

E-Mail: _____

PROJECT & PROPERTY INFORMATION

Project Name: _____

Property Address _____

Tax Key Number(s): _____

Zoning: _____

Total Acreage: _____ Existing Building Square Footage _____

Proposed Building/Addition Square Footage: _____

Current Use of Property: _____

PROJECT SUMMARY (please provide a brief project description)

_____

_____

_____

_____

All submittals require a complete scaled set of digital plans (Adobe PDF) and shall include a project location map showing a 1/2 mile radius, a COLOR landscape plan, COLOR building elevation plans, and exterior lighting photometric maps and cut sheets. A pre-application meeting is required prior to submittal of any applications for Subdivisions, Planned Unit Developments, and Site and Architectural Plan Review. **The deadline for all applications requiring Plan Commission Reviews is at 4:00 P.M, 30 days prior to the meeting date. The Plan Commission meets the Second and Fourth Wednesday of each month.**

APPLICATION ACKNOWLEDGEMENT AND SIGNATURES

I hereby certify that I have reviewed the City of Waukesha Development Handbook, City Ordinances, Submittal Requirements and Checklists and have provided one PDF of all required information. Any missing or incomplete information may result in a delay of the review of your application. By signing this I also authorize The City of Waukesha or its agents to enter upon the property for the purpose of reviewing this application.

Applicant Signature _____

Applicant Name (Please Print) _____

Date: _____

For Internal Use Only:

Amount Due (total from page 2): _____ Amount Paid: _____ Check #:_____

Trakit ID(s) _____ Date Paid: _____

City of Waukesha Application for Development Review

TYPE OF APPLICATION & FEES (CHECK ALL THAT APPLY) **Fees**

Please note that each application type has different submittal requirements. Detailed submittal checklists can be found in Appendix A of the Development Handbook.

☐Plan Commission Consultation **$200** _____

☐Traffic Impact Analysis _____

- ☐Commercial, Industrial, Institutional, and Other Non-Residential **$480**
- ☐Residential Subdivision or Multi-Family **$480**
- ☐Resubmittal (3rd and all subsequent submittals **$480**

☐Preliminary Site Plan Review _____

- ☐Level 1: Buildings/additions less than 10,000 sq.ft. or sites less than 1 acre **$2,200**
- ☐Level 2: Buildings/additions between 10,001-50,000 sq.ft. or sites between 1.01 and 10 acres **$2,320**
- ☐Level 3: Buildings/additions between 50,001-100,000 sq.ft. or sites between10.01 and 25 acres **$2,440**
- ☐Level 4: Buildings/additions over 100,001sq.ft. or sites greater than 25.01 acres. **$2,560**
- ☐Resubmittal Fees (after 2 permitted reviews) **$750**

☐Final Site Plan Review _____

- ☐Level 1: Buildings/additions less than 10,000 sq.ft. or sites less than 1 acre **$1,320**
- ☐Level 2: Buildings/additions between 10,001-50,000 sq.ft. or sites between 1.01 and 10 acres **$1,440**
- ☐Level 3: Buildings/additions between 50,001-100,000 sq.ft. or sites between10.01 and 25 acres **$1,560**
- ☐Level 4: Buildings/additions over 100,001sq.ft. or sites greater than 25.01 acres. **$1,680**
- ☐Resubmittal Fees (3rd and all subsequent submittals) **$750**

☐Minor Site or Architectural Plans _____

- ☐Projects that do not require site development plans **$330**
- ☐Resubmittal Fees (3rd and all subsequent submittals) **$330**

☐Certified Survey Map (CSM) _____

- ☐1-3 Lots **$500**
- ☐4 lots or more **$560**
- ☐Resubmittal (3rd and all subsequent submittals) **$180**
- ☐Extra-territorial CSM **$260**

☐Preliminary Subdivision Plat _____

- ☐Up to 12 lots **$1,270**
- ☐13 to 32 lots **$1,390**
- ☐36 lots or more **$1,510**
- ☐Resubmittal (3rd and all subsequent submittals) **$630**

☐Final Subdivision Plat _____

- ☐Up to 12 lots **$660**
- ☐13 to 32 lots **$780**
- ☐36 lots or more **$900**
- ☐Resubmittal (3rd and all subsequent submittals) **$480**
- ☐Extra-territorial Plat **$540**

☐Rezoning and/or Land Use Plan Amendment _____

- ☐Rezoning **$630**
- ☐Land Use Plan Amendment: **$630**

☐Conditional Use Permit

- ☐Conditional Use Permit with no site plan changes **$480**
- ☐Conditional Use Permit with site plan changes **$480** plus applicable preliminary and final site plan fees above _____

☐Planned Unit Development or Developer's Agreement (Site Plan Review is also required) _____

- ☐New Planned Unit Development or Developer's Agreement **$1,760**
- ☐Planned Unit Development or Developer's Agreement Amendment **$610**

TOTAL APPLICATION FEES: ☐

City of Waukesha
Development Review Submittal Requirements

PLAN COMMISSION CONSULTATION SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

A Plan Commission Consultation my be submitted for review and comment for the owner/developer to ascertain the feasibility of a proposed project. A consultation is not required but may be submitted in advance of an actual submittal for a preliminary plat, CSM, Planned Unit Development, rezoning, conditional use or site plan. The Plan Commission will only provide feedback, no approvals will be given. Prior to applying for a Plan Commission Consultation you must discuss your project with the Planning Division to determine if a Plan Commission Consultation is recommended.

Review Time: Approximately 30 days

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission (optional)

In addition to this application and corresponding application fee you will also need:

☐One (1) digital (PDF) copy of the plans you want conceptual review of

☐Attachment A: Development Review Checklist . You should also review all other corresponding checklists that relate to the project that you are seeking conceptual review of and include as much information as possible.

☐ Cover letter outlining project details.

TRAFFIC IMPACT ANALYSIS SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

A Traffic Impact Analysis is required for projects that meet certain criteria. Please refer to the Developer's Handbook Section 4.4 to determine if your project requires a Traffic Impact Analysis

Review Time: Approximately 30 days

Reviewing Departments: Public Works Engineering Division

Reviewing Boards: None, however the Plan Commission may require a copy as part of site plan review process.

In addition to this application and corresponding application fee you will also need:

☐One (1) digital (PDF) copy of the Traffic Impact Analysis

PRELIMINARY SITE AND ARCHITECTURAL PLAN SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

Preliminary site and architectural plans are required for any new residential development with 4 or more units and all non-residential developments. Preliminary site plan approval is also required for additions or modifications to existing developments and projects where a stormwater management plan is needed. Preliminary approval is required unless it is determined by City staff in the Pre-Application meeting that the project only needs Final Site and Architectural Review.

Review Time: Approximately 30 days (45 if Common Council review is needed)

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Cover letter outlining project details.
- ☐ Color architectural elevations of all sides of the building and color perspective renderings
- ☐ Conceptual Landscape Plan
- ☐ Attachment A: Development Review Checklist
- ☐ Site Plan (see Attachment B: Engineering Plan Checklist)
- ☐ Grading Plan (see Attachment C: Site Grading and Drainage Plan Checklist)
- ☐ Stormwater Management Plan (see Attachment D: Stormwater Management Plan Checklist)
- ☐ Utility Plans (see Attachment H: Sewer Plan Review Checklist)
- ☐ Any other attachments as applicable.

FINAL SITE AND ARCHITECTURAL PLAN SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

Final site and architectural plans are submitted only after the Plan Commission has approved Preliminary Site Plans for any new residential development with 4 or more units and all non-residential developments, including modifications to existing developments. Some projects may bypass Preliminary approval but only if it is determined by City staff in the Pre-Application meeting.

Review Time: Approximately 30 days (45 if Common Council review is needed)

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Cover letter outlining project details.
- ☐ Color architectural elevations of all sides of the building and color perspective renderings
- ☐ Landscape Plan (see Attachment I: Landscape Plan Checklist)
- ☐ Attachment A: Development Review Checklist
- ☐ Site Plan (see Attachment B: Engineering Plan Checklist)
- ☐ Grading Plan (see Attachment C: Site Grading and Drainage Plan Checklist)
- ☐ Stormwater Management Plan (see Attachment D: Stormwater Management Plan Checklist)
- ☐ Utility Plans (see Attachment H: Sewer Plan Review Checklist)

MINOR SITE AND ARCHITECTURAL PLAN SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

Minor Site and Architectural review is intended for projects that may not need the extensive submittal requirements for Preliminary and Final Site Plan approval. Projects that qualify for Minor Site Plan submittal may include landscape, façade and building changes or minor site modifications that don't result in the addition of impervious surface.

Review Time: Approximately 30 days (45 if Common Council review is needed)

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Cover letter outlining project details.
- ☐ Architectural elevations of all sides of the building being modified

☐ In addition, depending on the type of project, you may also need the following items:

- ☐ Site Plan (see Attachment B: Engineering Plan Checklist)
- ☐ Landscape Plan (see Attachment I: Landscape Plan Checklist)

CERTIFIED SURVEY MAP SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

A Certified Survey Map may be used to divide up to eight (8) lots in Commercial, Industrial, and Mixed Use zoning districts and up to four (4) lots in all other zoning districts.

Review Time: Approximately 45-60 days. An extension letter will be required if the approval process will take more than 90 days.

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Attachment E: Certified Survey Map Checklist
- ☐ Attachment A: Development Review Checklist and other attachments as applicable.

**Please note If any exterior architectural, landscape, or site plan changes are required you must also go through Site Plan Review and meet all of those submittal requirements.*

PRELIMINARY PLAT SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

A Preliminary Plat shall be used to subdivide land in the City. The applicant is responsible for submitting the Preliminary Plat to Waukesha County and the State of Wisconsin for review.

Review Time: Approximately 45-60 days. An extension letter will be required if the approval process will take more than 90 days.

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Attachment F: Preliminary Plat Checklist
- ☐ Cover letter outlining project details.
- ☐ Attachment A: Development Review Checklist and other attachments as applicable
- ☐ Stormwater Management Plan (see Attachment D: Stormwater Management Plan Checklist)

FINAL PLAT SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

A Final plat shall be used to subdivide land in the City. The applicant is responsible for submitting the Final Plat to Waukesha County and the State of Wisconsin for review.

Review Time: Approximately 45-60 days. An extension letter will be required if the approval process will take more than 90 days.

Reviewing Departments: Community Development Planning Division, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission. Common Council and Board of Public Works review may be required for certain projects.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Attachment G: Final Plat Checklist
- ☐ Cover letter outlining project details.
- ☐ Attachment A: Development Review Checklist and other attachments as applicable.
- ☐ Stormwater Management Plan (see Attachment D: Stormwater Management Plan Checklist)

REZONING & COMPREHENSIVE PLAN AMENDMENT SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

This review is for any requests to rezone land or amend the City's Comprehensive Master Plan. For rezonings all property owners within 300 feet of the property will be notified of your request.

Review Time: 45-60 Days

Reviewing Departments: Community Development Planning & Building Inspection Divisions, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission, Common Council

Additional Information: Rezonings must be done in accordance with the Comprehensive Plan. Please consult with Planning staff to determine if a Comprehensive Plan Amendment is also required prior to submitting a rezoning application.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Cover letter outlining project details and rationale for rezoning
- ☐ Rezoning Form including legal description and notarized owner(s) signatures (rezoning applications only)
- ☐ Conceptual Plan (if applicable)

**Please note this application fee only covers the rezoning and/or Comprehensive Plan Amendment. If you are proposing site plan changes or are subdividing land you will also need to meet the applicable submittal requirements for those proposals.*

CONDITIONAL USE PERMIT SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

Any use listed as a Conditional Use in Chapter 22 (Zoning Code) requires a Public Hearing in front of the Plan Commission prior to building or occupancy permits being issued. All property owners within 300 feet of the property will be notified of your request.

Review Time: 30-45 days

Reviewing Departments: Community Development Planning & Building Inspection Divisions, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Conditional Use Permit Application

**Please note If any exterior architectural, landscape, or site plan changes are required you must also go through Site Plan Review and meet all of those submittal requirements.*

PLANNED UNIT DEVELOPMENT OR DEVELOPER'S AGREEMENT SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

The PUD Overlay District is intended to permit development that will, over a period of time, be enhanced by coordinated area site planning, diversified location of structures, diversified building heights and types, and/or mixing of compatible uses. The PUD Overlay District under this Chapter will allow for flexibility of overall development design with benefits from such design flexibility intended to be derived by both the developer and the community, while at the same time maintaining insofar as possible the standards or use requirements set forth in the underlying basic zoning district.

Developer's Agreements are used for any project that require public infrastructure improvements (sewer, storm sewer, sidewalks, etc) and other off-site improvements such as median openings, traffic signals, street widening, etc..

Review Time: 45-60 days

Reviewing Departments: Community Development Planning & Building Inspection Divisions, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission, Common Council. Some projects will also require Board of Public Works review.

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Cover letter/statement that outlining project details and all of the required information set forth in the Zoning Ordinance Section 22.52 (4)(a)
- ☐ Rezoning Form including legal description and notarized owner(s) signatures (rezoning applications only)
- ☐ General Development Plan
- ☐ Proposed Supplemental Design Elements (required for all PUDs under the minimum required acreage)

**Please note in addition to the PUD submittal requirements your project will also need additional application fees and submittal materials based on the project type. This may include Preliminary and Final Plats, Preliminary and Final Site and Architectural Plans, Certified Survey Maps, Traffic Impact Analysis. Staff will inform you of any additional submittal requirements at the Pre-Application meeting, which is required prior to submitting your application.*

ANNEXATION SUBMITTAL REQUIREMENTS AND ADDITIONAL INFORMATION

Requests for annexation as permitted under Section 66.0217 Wisconsin Statutes.

Review Time: 45-60 days

Reviewing Departments: Community Development Planning & Building Inspection Divisions, Public Works Engineering Division, Fire Department, Water Utility.

Reviewing Boards: Plan Commission, Common Council

In addition to this application and corresponding application fee you will also need:

☐ One (1) digital (PDF) that includes of items listed below

- ☐ Copy of your State of Wisconsin Request for Annexation Review Application
- ☐ Signed City of Waukesha Direct Annexation Petition
- ☐ Map of property of property to be annexed.
- ☐ A boundary description (legal description of property to be annexed)
- ☐ Any additional information on the annexation.

Attachment A - Application for Development Review Checklist

Project Name: _____

Engineering Design Firm: _____

Checklist Items	CSM	Preliminary Plat	Final Plat	Property Survey for Bldg Permit	Storm Water Plan	Erosion Control Plan	Site, Grading, Drainage Plan	Street Plan	Utility Plan	Landscape Plan	Traffic Control Plan	Traffic Impact Analysis	Conditional Use or Home Indus.	PUD or Developer's Ag.	Minor site or Arch. Change	Conditional Use	Rezoning & Comp. Plan Change
Followed Construction Drawing Sheet Layout standards in Development Handbook																	
Followed Development Handbook and Storm Water Ordinance standards for Erosion control plans																	
Obtained geotechnical evaluation for storm water and pavement design																	
Followed Development Handbook standards, and Wisconsin Administrative Code for Property Survey																	
Verified proposed basement floor elevation is at least 1 foot above the highest seasonal high water table elevation																	
Followed Development Handbook standards and Ordinance for Preliminary Plat																	
Followed Site, Grading, and Drainage Plan design standards in Development Handbook and Storm Water Ordinance																	
Followed Traffic impact analysis standards in Development Handbook																	
Specifications conform to current City Standard Specifications																	
Followed Lighting Plan standards in Development Handbook																	
Development site contains Contaminated Waste																	
Followed storm water management requirements in Development Handbook, and Ordinance																	
Site contains mapped FEMA floodplain or a local 100-year storm event high water limits																	
Site contains wetlands or Natural Resource limits (ie. Primary, Secondary, Isolated , shoreland limits)																	
CSM follows standards in Development Handbook, City Ordinance, and State Statutes																	
Followed Development Handbook standards for Street plans and profiles																	
Followed Development Handbook standards for utility plans and profiles																	
Existing sanitary sewer lateral has been televised																	

Checklist Items	CSM	Preliminary Plat	Final Plat	Property Survey for Bldg Permit	Storm Water Plan	Erosion Control Plan	Site, Grading, Drainage Plan	Street Plan	Utility Plan	Landscape Plan	Traffic Control Plan	Traffic Impact Analysis	Conditional Use or Home Indus.	PUD or Developer's Ag.	Minor site or Arch. Change	Conditional Use	Rezoning & Comp. Plan Change
Development Agreement needed for Public Infrastructure																	
Followed Development Handbook standards for Landscape plans																	
Followed Development Handbook standards, State Statures and Ordinance for Final Plat																	
A-E 2.02(4): Each sheet of plans, drawings, documents, specifications and reports for architectural, landscape architectural, professional engineering, design or land surveying practice should be signed, sealed, and dated by the																	
32.10(e)(12.)H. A cover sheet stamped and signed by a professional engineer registered in the State of Wisconsin indicating that all plans and supporting documentation have been reviewed and approved by the engineer and certifying that they have read																	
City, DNR, County or State Permits are needed																	
Complete and submit Plan Sheet and Submittal Specific checklists in Development Handbook																	
Proposed easements needed are shown.																	
All Existing easements are shown																	

PLANNING

PERMITTING

CONSTRUCTION

PRE-APPLICATION MEETING

APPLICATION AND FEE SUBMITTAL

PRELIMINARY APPLICATION COMPLETE

NO

WORK WITH DEVELOPER UNTIL SATISFACTORY

YES

PLAN REVIEW BY STAFF

PLANNING COMMISSION MEETING

DENIED

APPROVED

APPROVED WITH CONDITIONS

COMMON COUNCIL (IF NECESSARY)

COMMUNITY DEVELOPMENT & FIRE DEPT

BUILDING DEPT ENTERS DATA FOR PLAN REVIEW

PLAN REVISION AND REVIEW

PLAN APPROVAL

WAUKESHA WATER UTILITY

INFRASTRUCTURE PLAN REVISION & REVIEW

FEE, BOND & LOC SUBMITTAL

WATER UTILITY AGREEMENT (IF NECESSARY)

PLAN APPROVAL

ENGINEERING

INFRASTRUCTURE PLAN REVISION & REVIEW

FEE, BOND & LOC SUBMITTAL

PLAN APPROVAL

DEVELOPER'S AGREEMENT (IF NECESSARY)

APPLICATION FOR BUILDING PERMITS

NOT APPROVED

APPROVED

BUILDING INSPECTION ISSUES PERMITS

CONSTRUCTION REVIEW

CONSTRUCTION

OCCUPANCY PERMIT ISSUED

PUBLIC INFRASTRUCTURE ACCEPTANCE

PROJECT CLOSE-OUT

LEGEND

DEVELOPER'S ACTION ITEM

PUBLIC MEETINGS

CITY'S ACTION ITEM

CITY PLANNING / COMMUNITY DEVELOPMENT

CITY FIRE DEPT

CITY ENGINEERING

WAUKESHA WATER UTILITY

REVISED 12/18

FILE NAME : O:±Standard Construction Specifications - 2018 Edition±2019 Updates and Revisions - Staff Mark-ups±Division 1 - Development Handbook±PRIVATE DEVELOPMENT PROCESS FLOW CHART.dwg

City of Waukesha
Department of Public Works
130 Delafield Street
Waukesha, WI 53188
Waukesha-wi.gov

Engineering Plan Checklist

Attachment B
(Rev 12/18)

Project Name: _____

Engineering & Design Firm: _____

General Information

Plans shall include the seal and signature of the Wisconsin licensed professional engineer responsible for the preparation of the construction plans on the cover sheet or on each sheet

YES	NO	N/A	
☐	☐	☐	Provide a copy of the WisDOT permit for any work in the State of Wisconsin right of way.
☐	☐	☐	Provide a copy of the Waukesha County Department of Public Works permit for any work in right of way of Waukesha County.
☐	☐	☐	Provide a copy of Wisconsin Department of Natural Resources Water Resources Application for Project Permits (WRAPP) for all sites greater than one acre.
☐	☐	☐	Provide a copy of US Army Corps of Engineers 404 permit.
☐	☐	☐	Provide cross access agreements for use of entrances.
☐	☐	☐	Provide off-site utility easements.
☐	☐	☐	Provide hydraulic gradeline calculations for all storm sewer pipes signed and sealed by a professional engineer licensed in the State of Wisconsin.
☐	☐	☐	Provide a storm water management plan and calculations signed and sealed by a professional engineer licensed in the State of Wisconsin.

All Plan Sheets

YES	NO	N/A	
☐	☐	☐	Plans prepared on sheets measuring 11” high by 17” wide or no larger than 24" high by 36" wide.
☐	☐	☐	Sanitary Sewer, watermain and storm sewer system plans for the entire development are included.
☐	☐	☐	A profile view is located below a plan view on plan and profile sheets and both views are aligned by stationing whenever possible. In general, stationing is from left to right.
☐	☐	☐	Plan and profile sheets start and terminate at match lines.
☐	☐	☐	The assumed bearing base, control monuments and stationing reference line(s)
☐	☐	☐	Right-of-way limits and easement limits
☐	☐	☐	Edge of pavement or flange, face and back of curb
☐	☐	☐	Name of each existing, proposed, and future roadway and any intersecting roadways
☐	☐	☐	Lot lines, lot and block numbers
☐	☐	☐	Addresses and names of Owners for existing parcels

☐	☐	☐	All obstructions located within the project limits including, but not limited to: trees, signs, utilities, fences, light poles, structures, etc.
☐	☐	☐	A note warning that underground utilities must be located by “Diggers Hotline” prior to start of construction
☐	☐	☐	Legend (relevant to each sheet) showing all special symbols, line types and hatch used
☐	☐	☐	Title block includes at a minimum, the following information: Name and address of engineering (design) firm and owner/developer Date of the drawing and last revision Scale Plan sheet number (# of #) Name and location description of development
☐	☐	☐	North to the top or right of the sheet and shown by a north arrow, clearly shown without intrusion.
☐	☐	☐	Scale of the plans 1" = 40' horizontally and 1" = 8' vertically for 11” by 17” plan sheets and 1" = 20' horizontally and 1" = 4' vertically for 22” by 34” sheets. Partial site plans have a scale of 1" = 20' or larger. The scale of details is such that the detail is clearly shown. The scale is shown with a line scale and text.
☐	☐	☐	Existing surface objects indicated with screened lines and clearly labeled.

Cover Sheet

YES	NO	N/A	
☐	☐	☐	Project title.
☐	☐	☐	Location Map (Proximity to two main streets minimum).
☐	☐	☐	Index of all plan sheets
☐	☐	☐	For large or phased subdivisions, a key map of layout and phases.
☐	☐	☐	A minimum of two (2) current SEWRPC reference benchmarks. Survey documentation of tie to Wisconsin State Plane Coordinate System, South Zone (horizontal) and City of Waukesha datum (vertical) provided. Elevations shown based on City of Waukesha datum.
☐	☐	☐	All permanent or temporary benchmarks and elevations.
☐	☐	☐	A description of the locations of the benchmarks; and the basis or origin of the vertical control network.
☐	☐	☐	Date of plan preparation and applicable revision date(s)
☐	☐	☐	The following statement: “*All site improvements and construction shown on the plans shall conform to the City of Waukesha Development Handbook & Infrastructure Specifications. Where the plans do not comply, it shall be the sole responsibility and expense of the Developer to make revisions to the plans and/or constructed infrastructure to comply.*”

Roadway

YES	NO	N/A	
☐	☐	☐	For all new streets, a site specific geotechnical evaluation and pavement design submitted with the plans.
☐	☐	☐	A separate detail sheet showing typical cross-sections for each roadway standard width and cul-de-sac if applicable.

Plan View

YES	NO	N/A	
☐	☐	☐	The assumed bearing base, control monuments and stationing reference line along the centerline of the roadway, including cul-de-sacs.
☐	☐	☐	At least one clearly labeled benchmark or control point per sheet.
☐	☐	☐	Pavement and median dimensions.
☐	☐	☐	Final grade elevations at 25’ intervals at the right-of-way including at the edge of pavement for rural sections or at the flange of curb for urban sections.
☐	☐	☐	Final grade elevations for cul-de-sacs at 25’ intervals at the right-of-way including at the edge of pavement for rural sections or at the flange of curb for urban sections.
☐	☐	☐	Label all PVC’s, PVT’s, and PC’s, PT’s for vertical and horizontal curves. Radii of all intersections (edge of pavement or flange of curb, with note indicating which is referenced).
☐	☐	☐	Driveways for all lots adjacent to storm inlets and intersections.
☐	☐	☐	Sidewalks labeled and dimensioned.
☐	☐	☐	Existing, proposed, future streets and drives labeled and dimensioned.
☐	☐	☐	All roadside ditch locations, flowline elevations at 50’ intervals of the ditches.
☐	☐	☐	Slope intercepts.
☐	☐	☐	Invert profile for 200’ downstream for any existing ditches receiving flow from a proposed road or street.
☐	☐	☐	Limits of any areas which need special stabilization techniques.
☐	☐	☐	Specific details of all existing connected roadways. Pavement, shoulders, ditches, curb alignment, and grades shall be shown as needed to adequately make the transition.

Intersection Details

YES	NO	N/A	
☐	☐	☐	Radii of all intersections (edge of pavement or flange of curb, with note indicating which is referenced).
☐	☐	☐	Sidewalks and accessible ramps labeled and dimensioned.
☐	☐	☐	Right of way corner clips and sight visibility easements.
☐	☐	☐	Spot grades as necessary to ensure proper drainage and compliant ADA slopes.
☐	☐	☐	Spot grades shall be shown at end of radius for all curb and gutter and the end radius for all back of sidewalk.
☐	☐	☐	Drainage clarified by flow arrows, high points, sags, ridges, etc. Slope intercepts shall be clearly labeled by station, elevation to the nearest 0.1’, and offset distance (left or right) from the reference line.
☐	☐	☐	Invert elevation of ditches (for rural roadway).
☐	☐	☐	Final subgrade elevation at the centerline of the street or roadway.

Cross Sections

YES	NO	N/A	
☐	☐	☐	Right of way limits.
☐	☐	☐	Slope intercepts clearly labeled.
☐	☐	☐	Elevations to the nearest 0.01'.
☐	☐	☐	Offset distance (left or right) from the reference line.
☐	☐	☐	Final grade elevations at back of walk, face of walk, top of curb, flange elevation (edge of pavement for rural section), and the centerline of the street or roadway.
☐	☐	☐	Cross slope of sidewalk, terrace area, and roadway.
☐	☐	☐	Invert elevation of ditches (for rural section)

City of Waukesha

Department of Public Works
130 Delafield Street
Waukesha, WI 53188
Waukesha-wi.gov

Site, Grading and Drainage Plan
Conditional Use Permit Checklist

Attachment C
(Rev 12/18)

Project Name: _____

Engineering & Design Firm: _____

General Requirements

YES	NO	N/A	
☐	☐	☐	Applicant's name
☐	☐	☐	Name and location of development
☐	☐	☐	Scale and north arrow
☐	☐	☐	Date of original and revisions noted
☐	☐	☐	License number and professional seal
☐	☐	☐	Digital Drawings in AutoCAD format of the site layout & building plan layout
☐	☐	☐	Pay impact fees

Building Plans

YES	NO	N/A	
☐	☐	☐	Contact Community Development Department

Site Plans

YES	NO	N/A	
☐	☐	☐	Dimensions of development site
☐	☐	☐	Location, footprint, and outside dimensions
☐	☐	☐	Existing and proposed pedestrian access points
☐	☐	☐	Existing and proposed vehicular access points
☐	☐	☐	Parking lots, driveways shown
☐	☐	☐	Front, side and rear yard setbacks shown and labeled
☐	☐	☐	Location, identification and dimensions of all existing or planned easements
☐	☐	☐	Identification of all land to be dedicated
☐	☐	☐	Location, elevation, and dimensions of walls and fences
☐	☐	☐	Location of outdoor lighting with lighting design plan and calculations
☐	☐	☐	Sign complies with City Code Book
☐	☐	☐	Location of existing and proposed signs

Site Access

YES	NO	N/A	
☐	☐	☐	Legal description or certified survey of property
☐	☐	☐	Development compatible with its zoning district
☐	☐	☐	Sidewalks to be shown
☐	☐	☐	Site entrance drive dimensions
☐	☐	☐	Individual development vehicular entrances at least 125 feet apart
☐	☐	☐	Adjacent development share driveway where possible
☐	☐	☐	At least one vehicular and pedestrian access point to each adjoining site granted by cross easements
☐	☐	☐	Cross access to be provided with minimum paved width of 24 feet
☐	☐	☐	Design detail for all new public streets

Parking/Traffic

YES	NO	N/A	
☐	☐	☐	5-foot wide (min) paved walkway to building entrance
☐	☐	☐	7-foot parking separation from front of building
☐	☐	☐	Minimum parking spaces provided
☐	☐	☐	Service truck parking in designated service areas
☐	☐	☐	Parking spaces and layout dimensioned
☐	☐	☐	Lot paved with HMA or concrete
☐	☐	☐	Handicap parking provided
☐	☐	☐	Minimum required stacking distance
☐	☐	☐	Concrete curb and gutter around parking lot

Grading and Drainage Plans

YES	NO	N/A	
☐	☐	☐	Show existing tree lines and any obstructions (fences, structures, power poles, etc.) within the project limits.
☐	☐	☐	All proposed lot lines and lot numbers or addresses
☐	☐	☐	Lot line dimensions
☐	☐	☐	Outline of buildable areas for each lot
☐	☐	☐	Typical setbacks of buildable area to front, side and back lot lines
☐	☐	☐	All existing buildings, structures and foundations
☐	☐	☐	All existing drainage channels and watercourses
☐	☐	☐	Emergency overflow routes
☐	☐	☐	Drainage clarified by flow arrows, high points, sags, ridges, and valley gutters
☐	☐	☐	Proposed retaining wall locations with top and bottom of wall elevations at key locations
☐	☐	☐	100-year flood plain limit (both pre-and post-project)
☐	☐	☐	100-year storm water surface elevation
☐	☐	☐	Wetlands. Wetland limits labeled with bearings and distances and dimensioned to lot lines. Bearings and distances may be shown in tabulated format.

☐	☐	☐	All environmental corridors, & or environmentally sensitive areas as required by DNR
☐	☐	☐	All existing and proposed easements.
☐	☐	☐	Existing topography of the site and all areas within 50 feet of the site shown at a one foot contour interval using City of Waukesha datum. Existing contours shown as thin, dashed screened or grey lines with a readily discernable heavier line used for the 5-foot contour intervals.
☐	☐	☐	Proposed grading shown at a contour interval of 1 foot using City of Waukesha datum. Proposed contour lines shown as solid medium lines, with a discernible heavier line use for the 5-foot contour intervals.
☐	☐	☐	The yard grade and first floor elevation of proposed building and any existing buildings located within 150 feet of the parcel boundary.
☐	☐	☐	Proposed road(s), curb and gutter, all storm sewer grates and storm sewer manholes (or cross-culverts for open ditches). Show any off-road storm inlets and discharge locations with surface entry elevations.
☐	☐	☐	Spot grades as necessary to ensure proper drainage and compliant ADA slopes and routing where applicable.
☐	☐	☐	At front setback line show a typical house shell on each lot and the proposed yard grade to the nearest tenth of a foot (assumed to be 0.7' below the top of block) for each building. Show proposed finished elevations to the nearest tenth of a foot at all lot corners and alongside lot lines adjacent to the front and back corners of the typical house. Show proposed finished elevations to the nearest tenth of a foot at high and low points along any side or back lot lines, and at high and low points if roads to demonstrate proposed drainage.
☐	☐	☐	The grading plan for any house that will require special design due to topography, clearly show separate grades for the garage and yard grade if extra steps are needed. Separate spot finish elevations shown for rear or side exposure or walkout.
☐	☐	☐	Indicate minimum finished floor elevations adjacent to floodplains, ponds, creeks/channels, etc.
☐	☐	☐	Proposed storm inlets shown on each grading plan. Each plan also includes specific details on all applicable retention/detention basins, ponds, overflows, etc. Separate sheets or notes as required.
☐	☐	☐	Locations of existing and proposed streets, drives, alleys, easements, right-of-way, parking as required, vehicular and pedestrian access points, and sidewalks
☐	☐	☐	Outline of any development stages
☐	☐	☐	Location and details on any required emergency access roads
☐	☐	☐	Soil characteristics
☐	☐	☐	Existing and proposed topography shown for the site and or adjacent properties
☐	☐	☐	Floodplain, shore land, environmental and wetlands shown
☐	☐	☐	Location and dimensions of on-site storm water drainage facilities
☐	☐	☐	Location and footprint of all existing buildings
☐	☐	☐	Locations and species of existing trees
☐	☐	☐	Berm detail
☐	☐	☐	Lot grades and swales shown
☐	☐	☐	Drainage calculations provided

Erosion Control

YES	NO	N/A	
☐	☐	☐	Location Map
☐	☐	☐	Soils Survey Map
☐	☐	☐	Existing Land Use Mapping
☐	☐	☐	Predeveloped Site Conditions
☐	☐	☐	• Existing contours
☐	☐	☐	• Property lines
☐	☐	☐	• Existing flow paths and direction
☐	☐	☐	• Outlet locations
☐	☐	☐	• Drainage basin divides and subdivides
☐	☐	☐	• Existing drainage structures on and adjacent to the site
☐	☐	☐	• Nearby watercourses
☐	☐	☐	• Lakes, streams, wetlands, channels, ditches, etc.
☐	☐	☐	• Limits of the 100-year floodplain
☐	☐	☐	Practice location/layout/cross sections
☐	☐	☐	Construction Details
☐	☐	☐	Name of receiving waters
☐	☐	☐	Site description/Nature of construction activity
☐	☐	☐	Sequence of construction
☐	☐	☐	Estimate of site area and disturbance area
☐	☐	☐	Pre- and post-developed runoff coefficients
☐	☐	☐	Description of proposed controls, including
☐	☐	☐	• Interim and permanent stabilization practices
☐	☐	☐	• Practices to divert flow from exposed soils
☐	☐	☐	• Practices to store flows or trap sediment
☐	☐	☐	• Any other practices proposed to meet ordinance
☐	☐	☐	Existing topography of the site and all areas within 50 feet of the site shown at a one foot contour interval using City of Waukesha datum. Existing contours shown as thin, dashed screened or grey lines with a readily discernable heavier line used for the 5-foot contour intervals.
☐	☐	☐	Proposed grading shown at a contour interval of 1 foot using City of Waukesha datum. Proposed contour lines shown as solid medium lines, with a discernible heavier line use for the 5-foot contour intervals.
☐	☐	☐	List the total disturbed acreage including offsite areas.
☐	☐	☐	Provide free survey in accordance with City Erosion Control Ordinance
☐	☐	☐	Proposed limits of disturbance including proposed tree cutting areas.
☐	☐	☐	Location and dimensions of all temporary topsoil and dirt stockpiles.
☐	☐	☐	Location and dimensions of all appropriate best management practices (BMP).
☐	☐	☐	Phasing of BMP's with the construction activities listed / described.
☐	☐	☐	Schedule of anticipated starting and completion date of each land disturbing and land developing activity, including the installation of the BMP measures that are needed.
☐	☐	☐	Location of all channels, pipes, basins or other conveyances proposed to carry runoff to the nearest adequate outlet, including applicable design assumptions and computations.

☐	☐	☐	Areas to be sodded or seeded and mulched or otherwise stabilized with vegetation, describing the type of final vegetative cover.
☐	☐	☐	Areas of permanent erosion control (other than vegetation).
☐	☐	☐	Boundaries of the construction site
☐	☐	☐	Drainage patterns/slopes after grading activities
☐	☐	☐	Areas of land disturbance
☐	☐	☐	Locations of structural and nonstructural controls
☐	☐	☐	Drainage basin delineations and outfall locations

Optional Submittals as Determined by Review Authority

YES	NO	N/A	
☐	☐	☐	Traffic impact analysis
☐	☐	☐	Environmental impact statement
☐	☐	☐	Soil and Site Evaluation Report per DNR Technical Standard 1002
☐	☐	☐	Plot of effect of exterior illumination on site and adjacent properties
☐	☐	☐	Description of any unusual characteristics
☐	☐	☐	Street perspectives showing view corridors
☐	☐	☐	Historic site
☐	☐	☐	Economic feasibility study
☐	☐	☐	Contaminated Waste Site

I hereby certify that I have reviewed the City ordinances and provided one (1) full-sized set of all required information along with all the required reduced copies of plans.

Applicant's Signature: _____

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City of Waukesha
Department of Public Works
130 Delafield Street
Waukesha, WI 53188
Waukesha-wi.gov

Stormwater Management Plan

Attachment D
(Rev 12/18)

Project Name: _____

Engineer & Design Firm: _____

STORM WATER MANAGEMENT PLAN WORKSHEET			
The City of Waukesha requires a Stormwater Management Plan to be submitted with the proposed development plans for site plan review. A Stormwater Management Plan is a document describing the storm water management practices constructed and implemented within the proposed development to ensure compliance with the storm water management criteria, as set forth by the City of Waukesha. The purpose of a Stormwater Management Plan is to protect the safety and health of the public, property and aquatic environment from the threats due to storm water from land development activity. The worksheet will provide a basis to the information that shall be provided when preparing a Stormwater Management Plan for a proposed development. This Plan shall include a set of complete plans and calculations, stamped by a registered professional engineer. Stormwater Management Plans are required as listed in City Code Book Chapter 32.06(b)			
Exemptions for Design and Plan Requirements			
YES	**NO**	**N/A**	
☐	☐	☐	Site is associated with agricultural or sylvicultural activities
Design Requirements: Total Suspended Solids			
YES	**NO**	**N/A**	
☐	☐	☐	Site is a New Development – 80% Reduction must be met
☐	☐	☐	Site is an Infill Development – 80% Reduction must be met
☐	☐	☐	Site is a Redevelopment – 40% Reduction must be met
☐	☐	☐	Site has areas of New Development and Redevelopment
☐	☐	☐	Calculations for % Reduction are included in the plan (WinSLAMM input and output)
☐	☐	☐	Storm water Management Facilities to address TSS removal are designed according to Chapter 32 of the City Code Book and DNR Technical Standards – Check all that apply: ☐ Wet Detention Basin ☐ Bio Retention Basin ☐ Swales ☐ Proprietary Devices ☐ Other (specify): _____
Design Requirements: Peak Discharge			
YES	**NO**	**N/A**	
☐	☐	☐	Storm water Management Facilities to address Peak Discharge are designed according to Chapter 32 of City Code Book and DNR Technical Standards – Check all that apply: ☐ Wet Detention Basin ☐ Bio Retention Basin ☐ Swales ☐ Other (specify): _____
☐	☐	☐	Downstream Capacity for 2-year, 10-year and 100-year, 24-hour design storms are met
☐	☐	☐	Calculations of available capacity, proportional share, and proposed utilized capacity under all design storms are included in plan
☐	☐	☐	Calculations of Peak Discharge are included in the plan

Design Requirements: Infiltration			
YES	**NO**	**N/A**	
☐	☐	☐	Hydraulic Soil Type: ☐ Soil Type A – Proceed ☐ Soil Type B – Proceed ☐ Exemption or Exclusion – Provide documentation
☐	☐	☐	Site and Soil Evaluation Report per DNR Technical Standard 1002
☐	☐	☐	Low Imperviousness. Ex: low density residential parks, cemeteries Post-Development Infiltration Performance Standards: ☐ Up to 40% Connected Impervious Surface ☐ 90% of Pre-Development Infiltration volume met ☐ 1% of site – Maximum Effective Infiltration Area
☐	☐	☐	Medium Imperviousness. Ex: Medium and high density residential, multi-family, industrial, institutional, office park. Post-Development Infiltration Performance Standards: ☐ 40%-80% Connected Impervious Surface ☐ 75% of Pre-Development Infiltration volume met ☐ 2% of site – Maximum Effective Infiltration Area
☐	☐	☐	High Imperviousness. Ex: commercial strip malls, shopping centers, commercial downtowns Post-Development Infiltration Performance Standards: ☐ Greater than 80% Connected Impervious Surface ☐ 60% of Pre-Development Infiltration volume met ☐ 2% of site – Maximum Effective Infiltration Area
☐	☐	☐	Site has parking lots and new road construction: ☐ Pretreatment included ☐ 10% Infiltration of the runoff from the tow-year, 24-hour design storm with Type II Distribution
☐	☐	☐	Calculations of Infiltration Volumes are included in the plan and model input and output (WinSLAMM)
☐	☐	☐	Exclusions for Infiltration: ☐ Tier 1 Industrial Facility ☐ Storage and Loading Areas of Tier 2 Industrial Facility ☐ Fueling and Vehicle Maintenance Facility ☐ Areas within 1,000 feet up gradient of Karst Features ☐ Areas within 100 feet downgradient of Karst Features ☐ Areas with < 3 feet of separation from bottom of Infiltration System to seasonal high groundwater or top of bedrock (does not prohibit roof runoff) ☐ Areas with runoff from industrial, commercial and institutional parking lots and roads with < 5 feet separation from bottom of infiltration system to elevation of seasonal high groundwater or top of bedrock ☐ Areas within 400 feet of community water system well ☐ Areas within 100 feet of private well ☐ Areas where contaminants of concern (defined by NR720.03(2) are present in the soil through which infiltration will occur) ☐ Area where soil does not meet any of the following characteristics between bottom of infiltration system and seasonal high groundwater and top of bedrock: ☐ *At least 3-foot soil layer with 20% fines or greater* ☐ *At least 5-foot soil layer with 10% fines or greater*

YES	NO	N/A	
☐	☐	☐	Exemptions for Infiltration: ☐ Areas where infiltration rate < 0.6 inches/hour ☐ Parking Areas and Access Roads less than 5,000 square feet for commercial and industrial ☐ Redevelopment Post-Construction Sites ☐ Infill Development < 5 acres ☐ Infiltration during periods when soil on the site is frozen ☐ Roads in commercial, industrial and institutional land uses ☐ Arterial Roads in Residential land uses
☐	☐	☐	Storm water Management Facilities to address Infiltration are designed according to Chapter 32 of the City Code Book and DNR Technical Standards – Check all that apply: ☐ Bioretention Basin (1004) ☐ Infiltration Basin (1003) ☐ Infiltration Trench (1007) ☐ Permeable Pavement (1008) ☐ Rain Garden (1000) ☐ Other (specify): _____
Design Requirements: Protective Areas			
YES	**NO**	**N/A**	
☐	☐	☐	Impervious areas are outside protective area. If not, provide a written explanation.
☐	☐	☐	Land disturbing activities are within a protective area. If **Yes**, check all that apply: ☐ If no impervious area is within protective area, adequate sod or self-sustaining vegetative cover of 70% or greater shall be established. ☐ Adequate sod or self-sustaining vegetative cover is sufficient for bank stability, maintenance of fish habitat and filtering of pollutants from upslope overland flow areas under sheet flow conditions. ☐ Non-Vegetative materials are employed on the bank as necessary to prevent erosion (steep slopes, high velocity areas).
☐	☐	☐	Best Management Practices are located within the protective area – Check all that apply: ☐ Filter Strips ☐ Swales ☐ Wet Detention Basins ☐ Other (specify): _____
☐	☐	☐	Non-Applicable Areas Apply: ☐ Structures that cross or access surface water (boat landing, bridge, culvert) ☐ Structures constructed in accordance with Section 59.692(1v) Wisconsin Statutes: ☐ Post-Construction Runoff does not enter surface water except to the extent that vegetative groundcover necessary for bank stability
Design Requirements: Fuel and Maintenance Facilities			
YES	**NO**	**N/A**	
☐	☐	☐	Are Fuel and Maintenance Facilities on the Site?
☐	☐	☐	Are Best Management Practices designed to reduce petroleum within runoff (no visible sheen)?

Design Requirements: Swale Treatment for Transportation Facilities			
YES	**NO**	**N/A**	
☐	☐	☐	Does the site use swales for runoff conveyance and pollutant removal for transportation facilities? If **Yes**, must have the following: *Groundcover:* ☐ Vegetated ☐ Non-Vegetated where appropriate to prevent erosion or provide runoff treatment (riprap, check dams) *Swale Velocity Control:* ☐ Swale is 200 feet or more in length with a velocity no greater than 1.5 feet per second for the two-year, 24-hour design storm or two-year storm with duration equal to time of concentration ☐ Swale is 200 feet or more in length with velocity > 1.5 feet per second then velocity is reduced to maximum extent practicable. Written explanation stating why requirement of > 1.5 feet per second cannot be met
☐	☐	☐	Exemptions Apply: Average Daily Vehicles > 2,500 and initial surface water of the state that runoff directly enters is any of the following: ☐ An outstanding resource of water (ORW) ☐ An exceptional resource water (ERW) ☐ Water is listed in Section 303(d) of the Federal Clean Water Act and is identified as impaired in whole or in part due to non-point source impacts ☐ Water where targeted performance standards are developed under NR 151.004 of the Wisconsin Administrative Code to meet water quality standards
Plan Requirements			
YES	**NO**	**N/A**	
☐	☐	☐	Provide permit application form, including contact information (name, address, telephone number) for the landowner, developer, land operator, certified project engineering, responsible party for installation of storm water management practices, responsible party for long-term maintenance of the storm water management practices.
☐	☐	☐	Legal Description of proposed development.
☐	☐	☐	Narrative describing the proposed development.
☐	☐	☐	Brief summary of Design Criteria and methods used for development of Storm Water Management Practices.
☐	☐	☐	Storm Water Management Maintenance Agreement shall be included with the Storm Water Management Plan (see Storm Water Management Maintenance Agreement template for additional information required).
☐	☐	☐	Certification by a Wisconsin registered professional engineer.
☐	☐	☐	Financial Guarantee.

Description and Site Characteristics for Pre/Post Development conditions shall be delineated by one (1) or more site maps at a scale of not less than one (1") inch equals two hundred (200') feet. The map(s) shall include, at minimum, the following information:			
YES	**NO**	**N/A**	
☐	☐	☐	Site Location and Legal Description.
☐	☐	☐	Pre-developed and revised topography by contours related to USGS survey datum or other datum approved by City. The topographic contours of the site shall not exceed 2 feet. The topography shall extend at minimum 100 feet outside the site boundaries to show runoff patterns onto, through and from the site.
☐	☐	☐	One hundred (100) year Floodplain boundary, shore land, environmental corridors, and wetland boundaries shall be delineated if applicable
☐	☐	☐	All lakes, streams, and other water bodies illustrated on map shall be named as defined on a USGS 7.5 minute topographic map.
☐	☐	☐	Predominant Soil Types and Hydraulic Soil Group Classifications per NRCS
☐	☐	☐	Coordinates of all manhole and inlets with reference to two nearest reference point monuments which shall be Section or ¼ Section corners.
☐	☐	☐	Location, capacity, and dimensions/details of on-site Pre-developed and Post-developed storm water management facilities such as, but not limited to, the following: manholes, pipes, curbs, gutters, curb inlets, filter strips, swales, detention basins, curb cuts, and drainage gates.
☐	☐	☐	Location, extent, detailed drawings, typical cross sections and slope ratios of all pre-developed and post-developed storm water retention and detention areas and drainage ways – list inlet/outlet elevations, permanent water surface elevation, high water surface elevation, and emergency spillway elevation, if applicable.
☐	☐	☐	Location and Elevations at top and bottom of pre-developed and post-developed buildings and structures.
☐	☐	☐	Locations and names of pre-developed and post-developed streets and intersections and the location of parking lots, sidewalks, bike paths and impervious surfaces (excluding single family residences). Map(s) shall clearly differentiate pre-developed and post-developed surfaces.
☐	☐	☐	Delineation and dimensions of all pre-developed and post-developed property boundaries, easements, right-of-way, building setbacks, maintenance easements, and other restrictions.
☐	☐	☐	Pre-developed and post-developed land use boundaries, including cover type and condition.
☐	☐	☐	Post-developed land use cover totals for Impervious and Pervious areas as well as permanent water surface area of all storm water management facilities.
☐	☐	☐	Delineation of pre-developed and post-developed watershed and sub-watershed boundaries used in determination of Peak flow discharges and discharge volumes from the site. (If the watershed extends beyond the site boundaries, a separate watershed map can be supplied).
☐	☐	☐	Location of the pre-developed and post-developed discharge points.
☐	☐	☐	Pre/Post developed directional Flow Paths used to calculate existing/proposed time of concentrations.
☐	☐	☐	Location of the Emergency Overland Flow.
☐	☐	☐	Location of any Regional Treatment Options (if applicable).
☐	☐	☐	Identify all pre-developed land cover features, such as, natural swales, natural depressions, native soil infiltrating capacity and natural groundwater recharge areas.
☐	☐	☐	Location of any protective areas within the site.
☐	☐	☐	Location of wells located within 1,200 feet of pre-developed and post-developed Storm Water Detention Basins, Infiltration Basins, or Infiltration Trenches.
☐	☐	☐	Delineation of Wellhead protection areas defined under NR 811.16

Supportive Information and Calculation summaries shall be supplied for all storm water management requirements as dictated in the checklist under Design Requirements:			
YES	**NO**	**N/A**	
☐	☐	☐	Pre-developed and post-developed watershed, sub-watersheds, and land use areas (acres, watershed shall be delineated by property lines).
☐	☐	☐	Pre-developed and post-developed impervious areas (acres).
☐	☐	☐	Pre-developed and post-developed Runoff Curve Numbers.
☐	☐	☐	Pre-developed and post-developed Time of Concentration.
☐	☐	☐	Pre-developed and post-developed peak flows for the 2-year, 10-year and 100-year, 24-hour storm events for each discharge point.
☐	☐	☐	Total suspended solids removal computations to show compliance.
☐	☐	☐	Design computations for the runoff volume of the pre-developed and post-developed conditions to show compliance with the infiltration requirements.
☐	☐	☐	Design computations for all storm water drainage facilities such as, but not limited to, inflow/outflow rates, hydrographs, water surface elevations, outlet design computations, runoff discharge volume, velocities, and stage/storage data.
☐	☐	☐	Design computations for the 10-year Rational Method flows for all proposed storm conveyance systems.
☐	☐	☐	Computation of the available downstream capacity flowing full, overflow level of ditches and the top of the upstream end of the pipe for any culverts.
☐	☐	☐	Computation of the downstream capacity using the 5-year rational storm.
☐	☐	☐	Tail water analysis included in storm water design for 2-year, 10-year and 100-year storm events.
☐	☐	☐	Design computations to illustrate compliance with pollutant loading criteria (Storm Water Quality Management practices) with pre- and post-storm water management facilities.
☐	☐	☐	Narrative describing all assumptions that were deemed appropriate for design.
☐	☐	☐	Explanation of provisions to preserve and use natural topography and land cover features.
☐	☐	☐	Explanation of restrictions on Storm Water Management practices by wellhead protection plans (if applicable).
☐	☐	☐	Results of investigations of soil and groundwater required for installation of Storm Water Management practices.
☐	☐	☐	Impact assessment results on Wetland Functional Values (if applicable).
☐	☐	☐	Storm Water Management practices installation schedule.
☐	☐	☐	Cost estimate for the construction, operation and maintenance of each Storm Water Management practice.
☐	☐	☐	Any additional information that the City, or designee, may need to evaluate the impacts of the storm water discharge quality and quantity on the existing area and existing utilities.

City of Waukesha
Department of Public Works
130 Delafield Street
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Waukesha-wi.gov

Certified Survey Map Checklist

Attachment E
(Rev 12/18)

Project Name: _____

Engineer & Design Firm: _____

Surveyor: _____

Checklist to be completed and signed:			
YES	**NO**	**N/A**	
☐	☐	☐	Scale and north arrow
☐	☐	☐	Scale of plans less than or equal to 1" = 100'
☐	☐	☐	Date of original and revisions noted
☐	☐	☐	Certification from surveyor that Plat complies with State Statute 236
☐	☐	☐	Digital PDF submitted
☐	☐	☐	Location of all existing structures and first floor elevations
☐	☐	☐	Location of utility and drainage easements
☐	☐	☐	Exact length and bearing of the centerline of all streets
☐	☐	☐	Exact street width along the line of any obliquely intersecting street
☐	☐	☐	Railway rights-of way within and abutting the plat
☐	☐	☐	Location and size of all lands to be dedicated for public use (when required)
☐	☐	☐	Comprehensive site grading drainage plan
☐	☐	☐	Special restrictions relating to access control, planting strips, restrictive yard requirements, etc. (when required)
☐	☐	☐	Map shows entirety of all parcels in proposed certified survey map
☐	☐	☐	Major street setback or WisDOT setbacks (if applicable)
☐	☐	☐	Floodplain limits of the 100-year recurrence interval flood
☐	☐	☐	Location of any wetlands, shore land, or other environmental areas (if applicable)
Plans to be submitted (when applicable):			
YES	**NO**	**N/A**	
☐	☐	☐	Street plans and profiles
☐	☐	☐	Sanitary sewer plans and profiles
☐	☐	☐	Storm sewer plans
☐	☐	☐	Grading and drainage plans
☐	☐	☐	Water main plans and profiles
☐	☐	☐	Erosion control plans
☐	☐	☐	Landscape plans

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City of Waukesha
Department of Public Works
130 Delafield Street
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Preliminary Plat Checklist

Attachment F
(Rev 12/18)

Project Name: _____

Engineer & Design Firm: _____

Surveyor: _____

Plans to include:

- ☐ Subdivision Plat
- ☐ Legal Description
- ☐ Street Construction and Profile Plans
- ☐ Site, Grading, and Drainage Plans
- ☐ Sanitary Sewer and Water Main Plans
- ☐ Street Lighting Plans
- ☐ Landscape Plan
- ☐ Home Owner's Association (if applicable)
- ☐ The following ***City*** signature blocks shall be used on all subdivision plats which are regulated by Chapter 23 of the City Code Book:

I, being the duly appointed, qualified and acting treasurer of the City of Waukesha, do hereby certify that the records in my office show no unredeemed tax sales and no unpaid taxes or special assessments as of _____ affecting the lands included in the plat of _____.

CITY TREASURER: _____
GINA KOZLIK

RESOLVED, that the plat of _____ in the City of Waukesha,_____ , owners, is hereby approved by the Common Council of the City of Waukesha.

APPROVED: _____
MAYOR SHAWN REILLY

I hereby certify that the foregoing is a copy of resolution number _____ adopted by the Common Council of the City of Waukesha.

CITY CLERK: _____
GINA KOZLIK

YES	NO	N/A	
☐	☐	☐	Scale and north arrow
☐	☐	☐	Scale of plans less than or equal to 1" = 100'
☐	☐	☐	Date of original and revisions noted
☐	☐	☐	Certification from surveyor that Plat complies with Chapter 17
☐	☐	☐	Reproducible paper less than 36" in width
☐	☐	☐	Title under which subdivision to be recorded

☐	☐	☐	Location of subdivision by government lot, ¼ section, section, township, range, county and state
☐	☐	☐	Location and names of any adjacent subdivisions, parks and cemeteries
☐	☐	☐	Location of any wetlands, shore land or other environmental areas (if applicable)
☐	☐	☐	Location of all existing and proposed public ways
☐	☐	☐	Right-of-way widths of proposed streets
☐	☐	☐	Names of proposed streets
☐	☐	☐	Location of any easements, railways and utility rights-of-way
☐	☐	☐	Location of proposed subdivision in the US Public Land Survey section
☐	☐	☐	Phasing plan
☐	☐	☐	Map showing entire area owned by applicant that is contiguous to proposed subdivision
☐	☐	☐	Exact length and bearing of exterior boundaries
☐	☐	☐	Existing contours at intervals not more than 2 feet
☐	☐	☐	Water elevations of adjoining lakes and streams
☐	☐	☐	Floodplain limits of the 100-year recurrence interval flood
☐	☐	☐	Location and approximate size of any areas to be reserved or dedicated to the City
☐	☐	☐	Approximate radii of all curves
☐	☐	☐	Existing zoning of land within and adjacent to subdivisions
☐	☐	☐	Location of any proposed riparian lake and stream access
☐	☐	☐	Proposed lake and stream improvements or relocations
☐	☐	☐	Plat shows entirety of all parcels in proposed subdivision
☐	☐	☐	Street plans and profiles (when required)
☐	☐	☐	Traffic impact study (when required)
☐	☐	☐	Type, width and elevation of any existing and proposed street pavements
☐	☐	☐	Approximate dimensions of all lots
☐	☐	☐	Location of all existing water and gas mains
☐	☐	☐	Location of all existing property boundary lines, structures and first floor elevations thereof
☐	☐	☐	Location and elevations of any existing sanitary and storm sewers, culverts and drain pipes, manholes, catch basins and hydrants
Plans to be submitted (when applicable):			
YES	**NO**	**N/A**	
☐	☐	☐	Street plans and profiles
☐	☐	☐	Sanitary and sewer plans and profiles
☐	☐	☐	Storm sewer pans
☐	☐	☐	Grading/drainage plans
☐	☐	☐	Water main plans and profiles
☐	☐	☐	Erosion control plans
☐	☐	☐	Landscape plans

City of Waukesha
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130 Delafield Street
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Final Plat Checklist

Attachment G
(Rev 12/18)

Project Name: _____

Engineer & Design Firm: _____

Surveyor: _____

Plans to include:

- ☐ Subdivision Plat
- ☐ Legal Description
- ☐ Street Construction and Profile Plans
- ☐ Site, Grading, and Drainage Plans
- ☐ Sanitary Sewer and Water Main Plans
- ☐ Street Lighting Plans
- ☐ Landscape Plan
- ☐ Home Owner's Association (if applicable)
- ☐ The following ***City*** signature blocks shall be used on all subdivision plats which are regulated by Chapter 23 of the City Code Book:

I, being the duly appointed, qualified and acting treasurer of the City of Waukesha, do hereby certify that the records in my office show no unredeemed tax sales and no unpaid taxes or special assessments as of _____ affecting the lands included in the plat of _____.

CITY TREASURER: _____
GINA KOZLIK

RESOLVED, that the plat of _____ in the City of Waukesha, _____, owners, is hereby approved by the Common Council of the City of Waukesha.

APPROVED: _____
MAYOR SHAWN REILLY

I hereby certify that the foregoing is a copy of resolution number _____ adopted by the Common Council of the City of Waukesha.

CITY TREASURER: _____
GINA KOZLIK

Checklist to be submitted:

YES	NO	N/A	
☐	☐	☐	Scale and north arrow
☐	☐	☐	Scale of plans less than or equal to 1" = 100'
☐	☐	☐	Date of original and revisions noted
☐	☐	☐	Certification from surveyor that Plat complies with Chapter 23
☐	☐	☐	Reproducible paper less than 36" in width
☐	☐	☐	Title under which subdivision to be recorded
☐	☐	☐	Comprehensive drainage
☐	☐	☐	Location of subdivision by government lot, ¼ section, section, township, range, county and state

☐	☐	☐	Map showing entire area owned by applicant that is contiguous to proposed subdivision
☐	☐	☐	Location and names of any adjacent subdivisions, parks and cemeteries
☐	☐	☐	Special restrictions relating to access control, planting strips, restrictive yard requirements, etc. (when required)
☐	☐	☐	Plat shows entirety of all parcels in proposed subdivision
☐	☐	☐	Sheet size of final plat is 22” x 30”
☐	☐	☐	Railway rights-of-way within and abutting the plat
☐	☐	☐	Location of utility and drainage easements
☐	☐	☐	Locations of all lands reserved for the common use of the property owners within plat
☐	☐	☐	Basin ownership and maintenance to be fractionally assisted to all lots and assigned to homeowner’s association
☐	☐	☐	Exact length and bearing of exterior boundaries
☐	☐	☐	Exact length and bearing of the centerline of all streets
☐	☐	☐	Floodplain limits of the 100-year recurrence interval flood
☐	☐	☐	Easements and notes
☐	☐	☐	Location of any wetlands, shore land or other environmental areas (if applicable)
☐	☐	☐	Exact street width along the line of any obliquely intersecting street
☐	☐	☐	Existing zoning of land within and adjacent to subdivision
Plans to be submitted (when applicable):			
YES	**NO**	**N/A**	
☐	☐	☐	Street plans and profiles
☐	☐	☐	Sanitary sewer plans and profiles
☐	☐	☐	Storm sewer plans
☐	☐	☐	Grading/drainage plans
☐	☐	☐	Water main plans and profiles
☐	☐	☐	Erosion control plans
☐	☐	☐	Landscape plans
The land division will be reviewed for compliance with Chapters 4, 23 and 32 of the City Code Book, Development Handbook, Chapter 236 of the Wisconsin State Statutes, and general development considerations.			

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Sewer Plan Review Checklist

Attachment H
(Rev 12/18)

Project Name: _____

Engineering & Design Firm: _____

Sanitary System

YES	NO	N/A	
☐	☐	☐	Minimum 4" sanitary sewer lateral from the main to the property line, PVC SDR 26 or 35 conforming to ASTM standards D 3034 with rubber gasket joints
☐	☐	☐	Sanitary sewer laterals shall have a green #12 locater wire installed along the entire length. Locater wire shall be brought to the surface at the edge of the building and enclosed in a curb box with "sewer" on the cover.
☐	☐	☐	Sampling manhole required for all food service developments (or developments with the potential to become food service) and industrial/manufacturing facilities.
☐	☐	☐	Industrial facilities must complete an industrial discharge form.
☐	☐	☐	Outside drop manhole connection required where drop is greater than 24 inches.
Sanitary Plan View			
YES	**NO**	**N/A**	
☐	☐	☐	Ghost existing utilities and lateral locations in screened format. Label the pipe size of existing utilities.
☐	☐	☐	Label the proposed sewer and laterals with length, size, and material type
☐	☐	☐	Material and size of the existing sanitary sewer being connected to.
☐	☐	☐	Label the stub-outs with length, size, slope, and invert elevations (if not profiled).
☐	☐	☐	Dimensions showing offset from right-of-way to the sewer and separation distance between other utilities.
☐	☐	☐	Show type and size of encasement where needed
☐	☐	☐	Show flow directions of all proposed mains.
☐	☐	☐	Length of each sewer lateral and height of any lateral risers. Label proposed invert elevations at right-of-way lines.
☐	☐	☐	Distance from downstream manhole to each upstream sewer lateral.
☐	☐	☐	Proposed manholes and cleanouts labeled with a design plan number. Existing manholes labeled with numbers obtained from City records.
☐	☐	☐	Rim and invert elevations at each manhole, based on City of Waukesha datum (for private sewer if not profiled)
☐	☐	☐	Show and label all easements
Sanitary Profile View			
YES	**NO**	**N/A**	
☐	☐	☐	Stationing.
☐	☐	☐	Existing and proposed surface profiles and elevations over the sewer.
☐	☐	☐	All utility crossings. Label elevations if known.

☐	☐	☐	Pipe material / class, size, length, and percent grade to two (2) decimal places.
☐	☐	☐	Material and size of the existing sanitary sewer being connected to.
☐	☐	☐	Length, type, and size of encasement as needed.
☐	☐	☐	Proposed manholes. Indicate type and diameter.
☐	☐	☐	Label station, rim, and invert elevations, based on City of Waukesha datum, and design plan number for each manhole and cleanout. Existing manholes to be labeled with numbers obtained from City records.
☐	☐	☐	Limits of gravel and/or slurry backfill.
Sanitary for Subdivisions/Large Developments			
(Complete copies of City specifications for sanitary sewer are available upon request.)			
YES	**NO**	**N/A**	
☐	☐	☐	Each parcel should have a separate sanitary sewer lateral.
☐	☐	☐	Sanitary sewer – 8 ft. horizontal separation from water main per DNR requirements. 8" diameter minimum size, PVC SDR 26 for depths up to 25 ft.
☐	☐	☐	Sanitary sewer manhole at every change of direction and a maximum distance of 400 ft.
☐	☐	☐	A chimney seal shall be required on all manholes.
☐	☐	☐	Provide copies of all approved WDNR/WDOC submittals, including sewer sizing calculation worksheet and the area served.

Storm System

Storm Plan View			
YES	**NO**	**N/A**	
☐	☐	☐	Ghost existing utilities and lateral locations in screened format. Pipe size of existing utilities labeled.
☐	☐	☐	Proposed sewer and laterals with length, size, and material type clearly labeled.
☐	☐	☐	Material and size of the existing storm sewer being connected to.
☐	☐	☐	Stub-outs labeled with length, size, slope, and invert elevations (if not profiled).
☐	☐	☐	Dimensions showing offset from right-of-way to the sewer and separation distance between other utilities.
☐	☐	☐	Type and size of encasement where needed
☐	☐	☐	Length of any sewer lateral. Label proposed invert elevations at right-of-way lines.
☐	☐	☐	Proposed inlets, manholes, and other drainage structures.
☐	☐	☐	Proposed drainage structures labeled with a design plan number. Existing drainage structures labeled with numbers obtained from City records.
☐	☐	☐	Details of outfall or ditch inlet protection requirements such as rip-rap, end sections or headwalls as needed.
☐	☐	☐	Details of detention facilities, outfall, overflow and control structures as needed.
Storm Profile View			
YES	**NO**	**N/A**	
☐	☐	☐	Stationing.
☐	☐	☐	Existing and proposed surface profiles and elevations over the sewer.
☐	☐	☐	All utility crossings. Label elevations if known.
☐	☐	☐	Pipe material / class, size, length, and percent grade to two (2) decimal places.
☐	☐	☐	Material and size of the existing storm sewer being connected to
☐	☐	☐	Length, type, and size of encasement as needed.
☐	☐	☐	Proposed inlets, manholes, and other drainage structures. Label type and size.
☐	☐	☐	Label station, rim, and invert elevations, based on City of Waukesha datum, at each manhole, catch basin, inlet, and detention control structure.

☐	☐	☐	Proposed drainage structures labeled with a design plan number. Existing drainage structures to be labeled with numbers obtained from City records.
☐	☐	☐	Cross-section of open channels and detention facilities, including outfall, overflow, and control structures.
☐	☐	☐	Limits of gravel and/or slurry backfill.

General System

YES	NO	N/A	
☐	☐	☐	Show all easements, public or private.
☐	☐	☐	No structures allowed within a public easement.
☐	☐	☐	Plantings or signs within public easements, if permitted by City, shall be at least 5 feet from the utilities.
General for Subdivisions/Large Developments			
YES	**NO**	**N/A**	
☐	☐	☐	Provide plans sealed by Registered Professional Engineer
☐	☐	☐	Show benchmark, north arrow and scale.
☐	☐	☐	Show existing/proposed sewer and water utilities.
☐	☐	☐	All sewer to be installed by the developer under the terms of a Development Agreement.
Utility Plans			
YES	**NO**	**N/A**	
☐	☐	☐	Location of all utilities: storm and sanitary sewers, water mains, fire hydrants, electrical, natural gas, and communication (cable television, telephone, etc.) lines
☐	☐	☐	Exterior lighting for parking and other outdoor areas, outdoor signs, and building exteriors.
☐	☐	☐	Location of waste and trash collection, and indicate plans for snow removal.
☐	☐	☐	Location and footprint of any and all buildings
☐	☐	☐	Location and names of existing and proposed streets
☐	☐	☐	Location and size of existing and proposed storm sewer, sanitary sewer, and water utility systems shown
☐	☐	☐	Electric, gas, telephone, and cable lines shown
☐	☐	☐	All new utilities are underground
☐	☐	☐	Exterior lighting detail provided
☐	☐	☐	Location of all utility and private fire hydrants
☐	☐	☐	Sampling manhole shown (if applicable)
☐	☐	☐	Grease interceptor shown (if applicable)
☐	☐	☐	Location and size of existing and proposed water meters
Include the following notes on the Utility Plan:			
YES	**NO**	**N/A**	
☐	☐	☐	All sanitary sewer to be installed in accordance with City of Waukesha standards.
☐	☐	☐	All applications and fees for sanitary sewer must be completed and paid prior to connection to sewer systems.
☐	☐	☐	Any utility work in the right-of-way and all sanitary sewer connections to be inspected by City. Notify City 72 hours in advance of connecting to sewer.
The above list contains items that are commonly missed on Utility Plans. For subdivisions or other large or complex projects, a complete plan review includes many more checks too numerous to list here. Please call (262) 524-3600 for additional information. City typical sewer details can be provided upon request.			
Note: For water main, contact Waukesha Water Utility at (262) 521-5272			

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City of Waukesha
Department of Public Works
130 Delafield Street
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Landscape Plan Checklist

Attachment I
(Rev 12/18)

Project Name: _____

Engineering & Design Firm: _____

☐ Contact Community Development Department for Requirements

Listed below are general design considerations only:

YES	NO	N/A	
☐	☐	☐	Show easements
☐	☐	☐	Location and footprint of any and all buildings
☐	☐	☐	Dimensions of development site along property line
☐	☐	☐	Existing and proposed streets
☐	☐	☐	Pedestrian and vehicular access points
☐	☐	☐	Location and dimensions of parking lots, etc.
☐	☐	☐	Location and dimensions of all existing or planned easements
☐	☐	☐	Location and dimensions of snow removal and storage areas
☐	☐	☐	Location and dimensions of outdoor lighting fixtures
☐	☐	☐	Interior parkway provided
☐	☐	☐	Parkway provided
☐	☐	☐	Buffer strip provided
☐	☐	☐	Dumpster enclosure details
☐	☐	☐	Parking lot landscaping
☐	☐	☐	Utility/mechanical equipment screened
☐	☐	☐	Service area screened
☐	☐	☐	Location of freestanding signs
☐	☐	☐	Walls and fences shown
☐	☐	☐	Location of utilities
☐	☐	☐	Existing and proposed contours and grades, including berm elevations
☐	☐	☐	Location, name and size of proposed plant materials
☐	☐	☐	Specifications of all types of all proposed ground cover, i.e., seed, sod, etc.
☐	☐	☐	Location, species, and size of existing trees
☐	☐	☐	Clear identification of trees to be removed
☐	☐	☐	Square footage of parking lot area
☐	☐	☐	Tree protection plan

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City of Waukesha

Department of Public Works
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Property Survey for Building Permit Checklist

Attachment J
(Rev 12/18)

Project Name: _____

Engineer & Design Firm: _____

Surveyor: _____

Plans to include:			
YES	**NO**	**N/A**	
☐	☐	☐	Survey
☐	☐	☐	Legal Description
☐	☐	☐	Site, Grading and Drainage Plan
Checklist to be completed:			
YES	**NO**	**N/A**	
☐	☐	☐	Scale and north arrow
☐	☐	☐	Scale of plans less than or equal to 1" = 100'
☐	☐	☐	Date of original and revisions noted
☐	☐	☐	Certification from surveyor that Plat complies with Wisconsin Administrative Code A-E7
☐	☐	☐	Digital PDF
☐	☐	☐	Location of all existing structures, fences, driveways and encroachments
☐	☐	☐	Legal description of existing parcel
☐	☐	☐	Setbacks of all existing structures
☐	☐	☐	Monumentation of boundaries in accordance with Section 236.15 Wisconsin Statutes
☐	☐	☐	Major street setback or WisDOT setbacks (if applicable)
☐	☐	☐	Requirements in Development Handbook for Grading – Attachment D
☐	☐	☐	In accordance with Wisconsin Administrative Code A-E 2.02(4): Each sheet of plans, drawings, documents, specifications and reports for architectural, landscape architectural, professional engineering, design or land surveying practice should be signed, sealed, and dated by the registrant or permit holder who prepared, or directed and controlled preparation of, the written material
☐	☐	☐	Pay impact fees
☐	☐	☐	Landscape letter of credit
☐	☐	☐	Provide positive gravity sanitary sewer lateral flow to main
☐	☐	☐	Verify basement floor elevation is at least 1 foot above the highest seasonal high water table elevation
☐	☐	☐	The 1st floor elevation(s), yard grade elevations, top of foundation wall elevation, basement floor elevation, garage floor elevation, driveway sidewalk elevation, distance from driveway sidewalk to garage floor, address, driveway slope(s), and driveway setbacks should be listed
☐	☐	☐	Follow applicable easement rights and conditions
☐	☐	☐	Follow applicable notes on Final Plat or CSM
☐	☐	☐	Follow notes on approved subdivision construction drawings

☐	☐	☐	Verify driveway side setback to be 5 feet
☐	☐	☐	Applicable Isolated Natural Resource Area restrictions
☐	☐	☐	Tree replanting plan
☐	☐	☐	Verify driveway slope does not exceed 10%
☐	☐	☐	Provide gravity drainage for drain tile to rear yard
☐	☐	☐	Install roof drains to connect to private main per specifications and plan design
☐	☐	☐	Set two 4-inch diameter/6-foot-long cedar posts to mark 75-foot non-disturbance limit at east and west lot line/wetlands/and Isolated Natural Resource limits
☐	☐	☐	Verify exposed basement floor elevation shall be at least 2 feet above the 100-year high water elevation of the pond
☐	☐	☐	If an existing sanitary sewer lateral is proposed to be reused, provide a pre-construction sewer lateral video to City for review and approval. Contact the City Engineering Department for the video format. If lateral maintenance is needed, then the lateral improvements may need to be included as part of this project. The lateral pipe and connection to the main may need to be lined or relayed to reduce infiltration into the City's sanitary sewer system or improve the structural integrity. In lieu of submitting the video at this time, a $5,000 letter of credit or cash escrow can be submitted to Engineering to guarantee that the work be performed
☐	☐	☐	As-built Survey Prior to occupancy: Provide certificate stating: Lot grading substantially matches the master grading plan, and no drainage issues are created with adjoining lots or buildings.

City of Waukesha
Department of Public Works
130 Delafield Street
Waukesha, WI 53188
Waukesha-wi.gov

Reviewing Departments

Attachment K
(Rev 12/18)

Department	*Contact Person*	*Areas of Review*
Community Development – Planning	Maria Pandazi, City Planner ➢ **(262)-524-3530**	Planning requirements
Community Development	Jennifer Andrews, Development Director ➢ **(262)-524-3750**	General information
Fire Department	Brian Charlesworth, Fire Marshall ➢ **(262)-524-3651**	Fire safety and protection
Waukesha Water Utility	Chris Walter, P.E., Technical Services Manager ➢ **(262)-901-5886**	Water requirements
Community Development – Building Inspections	Kristin Stone, Chief Building Inspector ➢ **(262)-524-3530**	Building requirements
Parks Department	Dave Rauterberg, City Forester ➢ **(262)-650-2545**	Tree protection and landscaping
Public Works Engineering	David Buechl. ➢ **(262)-524-3600**	City Engineering
Transit	Brian Engelking, Transit Manager ➢ **(262)-524-3636**	Public transportation

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