

With Adopted Hydrology Section 6/13/16

CITY OF PRIOR LAKE PUBLIC WORKS DESIGN MANUAL



ADOPTED JULY 16, 2007

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EXHIBITS:

PERMITS:

- EXHIBIT A EXCAVATING AND GRADING PERMIT
- EXHIBIT B DRIVEWAY PERMIT
- EXHIBIT C RIGHT OF WAY / EASEMENTS / CITY PROPERTY WORK PERMIT

DEVELOPMENT/IMPROVEMENT DOCUMENTS:

- Exhibit D PUBLIC IMPROVEMENT PETITION
- Exhibit E PRE-CONSTRUCTION MEETING CHECKLIST
- Exhibit F PERMIT TO PROCEED
- Exhibit G POLICY FOR PRIVATE DEVELOPMENT PROJECTS

- | | |
|-----------|--|
| Exhibit H | SAMPLE STANDARD DEVELOPMENT CONTRACT / SAMPLE LETTER OF CREDIT / SAMPLE CERTIFICATE OF INSURANCE |
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- | | |
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PART I

GENERAL PROVISIONS AND ADMINISTRATIVE REQUIREMENTS

Since the City assumes perpetual ownership, maintenance and operation of the public infrastructure facilities referenced herein together with the inherent obligation and responsibility associated with the ownership thereof, it is necessary to ensure these facilities are designed and installed in a manner which minimizes the City's future financial and operational liabilities. The purpose of the **Public Works Design Manual** is to provide a standard for developers, builders, and their engineers, as well as City engineering and consulting engineering personnel, for use in design, construction, and connection to public infrastructure facilities within the City.

INDEX OF SECTIONS:

Section One	Administrative/Procedural Requirements
Section Two	Building Permits
Section Three	Sales Trailers and Model Homes
Section Four	Excavating and Grading
Section Five	Work within City Easements/Right-of-Way
Section Six	Grading/Drainage/Erosion and Sediment Control/Restoration
Section Seven	Conditional Requirements for Building Service Connections
Section Eight	Parking Lot Construction/Expansion
Section Nine	Easements
Section Ten	Security and Warranty Requirements
Section Eleven	Residential Standards

SECTION ONE:

ADMINISTRATIVE/PROCEDURAL REQUIREMENTS

1.1 PLATTING REQUIREMENTS: Refer to Chapter 1000 of the Prior Lake City Code Subdivision administrative/procedure for platting requirements associated with land development.

1.2 DESIGN AND INSTALLATION OF PUBLIC INFRASTRUCTURE IMPROVEMENTS (INCLUDING CITY-INITIATED IMPROVEMENTS): The developer has the option to request the City to install public infrastructure facilities necessary to serve the proposed development under a public improvement project or construct the facilities privately under the terms of a Development Contract. If the facilities necessary to serve a development are to be publicly funded, the City may choose to design and install the facilities as a public improvement project in accordance with M.S. 429.

1.2.1 Public Improvement Process: The following is a guide outlining steps in the Public Improvement process. Some of these steps may not be applicable for City-initiated improvements.

(A) Feasibility Report Phase:

1. Preliminary plat conditionally approved by the City Council, if applicable.



2. Petition requesting public infrastructure installation by the City presented to City Council for feasibility report preparation authorization (please refer to attached "EXHIBIT D").
3. City Council authorizes preparation of feasibility report or denies request.
4. Developer submits preliminary plat and grading plan for use in preparation of feasibility report, if applicable.
5. Present feasibility report to City Council for consideration and scheduling public hearing.
6. City Council schedules a public hearing or denies project.
7. City Council holds public hearing on project and approves or denies project.

(B) Plans & Specifications (P & S Phase):

1. City Council approves project at public hearing, orders plans and specifications.
2. Developer submits final plat, if applicable.
3. Developer submits final development grading plan, if applicable.
4. City, or its chosen consultant, prepares detailed plans and specifications.
5. City Council approves or rejects detailed plans and specifications.
6. City Council authorizes advertisement for solicitation of competitive bids and determines a bid date.
7. Bid amount is verified and compared to feasibility report cost estimate and engineer's cost estimate.
8. The bid amount comparison to feasibility report cost estimate and engineer's cost estimate is presented to City Council for consideration of contract award.
9. Final plat approved by City Council, if applicable.
10. Final plat recorded at Scott County, by Developer, if applicable.
11. All easements/rights of entry are properly executed.
12. City Council awards contract to lowest "responsible bidder" or rejects/cancels bids and re-advertises.



(C) Construction Phase:

1. All regulatory agency permits are obtained and received by City.
2. The contract documents are properly executed.
3. The Certificates of Insurance requirements as identified in the contract documents are provided with the City of Prior Lake listed as an additional insured.
4. Pre-construction conference is held at the City offices.
5. "Notice to Proceed" is issued to the contractor.
6. City's Engineering Division inspects erosion control measures prior to land disturbing activity.
7. Construction is inspected by the City's Engineering Division personnel or the City's consulting engineering personnel.
8. Contract final inspection/close-out.
9. Contract completion/final payment authorization by City Council.
10. City assumes perpetual maintenance responsibilities.
11. Warranty period begins.
12. Warranty inspection, 90 days prior to expiration.

(D) Final Assessments Phase:

1. Prepare Final Construction Contract Report of all final construction related costs and forward to Finance Department.
2. Engineering/Finance Department prepares final assessment rolls and presents to City Council. City Council schedules final assessment public hearing.
3. Review by special assessment committee, if applicable.
4. The City Council holds the Assessment Hearing. The City may schedule the assessment public hearing prior to award of the contract.
 - Prepare final assessment information sheet for City Council review (*i.e. number of years, average assessment, project number, etc.*)
 - Prepare detailed individual final assessment notices and mail to affected property owners.
5. Record pre-payments, if applicable.



6. Certify adjusted roll to County Auditor for collection.
 - When the assessment amount is certified to the County Auditor prior to November 30th ¹ of the current year, the amount of the assessment will be reflected on the tax statement due and payable the following year.
 - When the assessment amount is certified to the County Auditor after November 30th of the current year, the amount of the assessment will be reflected on the tax statement due and payable the year after the following year.

1.2.2 Developer Installed Improvements: The developer may elect to assume responsibility for the design and installation of public infrastructure facilities necessary to serve a proposed development. The developer is required to enter into a “Development Contract” with the City which ensures the City that the required public infrastructure facilities necessary to serve the development will be installed in a timely manner and in accordance with the standards and specification as set forth by the City Code.

As set forth in Chapter 1000 of the City Code, developers of property within the City of Prior Lake are required to submit detailed plans and specifications of proposed improvements for review and comment by the City. These plans and specifications are required to be prepared by professional engineers licensed to practice within the State of Minnesota. The engineer who designs, prepares and certifies plans does not lose his primary responsibility for the accuracy and adequacy of the plans when the plans are reviewed and approved by the owner.

Except those improvements designed and constructed by the City, it is the responsibility of the developer to determine and obtain all necessary approvals, permits and licenses from the City of Prior Lake, Minnesota Department of Transportation, Scott County Highway Department, appropriate watershed district or watershed management organization, utility companies, Minnesota Department of Natural Resources, Army Corps of Engineers, Minnesota Pollution Control Agency, Metropolitan Council, Minnesota Department of Health and any other regulatory or jurisdictional agency affected by or having jurisdiction over the improvements required for the proposed development. Any design requirements of any such agencies shall be determined and incorporated into plans and specifications. All costs incurred to obtain said approvals, permits and licenses and also all fines or penalties levied by an agency due to the failure of the developer to obtain or comply with conditions of such approvals, permits and licenses shall be the sole responsibility of the developer. The developer agrees to defend and hold the City harmless from any action initiated by a regulatory agency resulting from such failures of the developer.

When the Developer chooses to install required public improvements within his own development, the following is intended to outline the steps necessary for this process:

(A) Preliminary Plat Phase:



1. Developer submits preliminary plat application which includes grading and erosion control plans, general street and utility layout, copies of all hydrology calculations to the City for review and comment. These plans are to be prepared in accordance with current City Standards as outlined herein and the applicable sections of the City Code.
2. City staff reviews submission and provides comments to Developer.
3. Developer submits revisions to preliminary plat plans.
4. Preliminary plat general design is conditionally approved by the City Council.
5. Grading may commence with preliminary plat approval. Developer must apply for an Excavating and Grading Permit. As-built grading plans will be required prior to release of the grading security.

(B) Final Plat Phase:

1. Developer submits final plat application which includes detailed plans, specifications and copies of all design calculations to the City for review and comment. These plans are to be prepared in accordance with current City Standards as outlined herein and the applicable sections of the City Code.
2. City staff reviews submission and provides comments to Developer.
3. Developer submits revised plan submittal for staff review and comment together with any City "redline" copies and letter stating how each of the City comments has been addressed.
4. Developer submits a cost estimate or bid of the construction work to be done.
5. City prepares Development Contract. After completion of all required submittals, the City computes the Letter of Credit amount and the financial requirements in accordance with the City's most recent fee schedule.
6. After plans are complete or approved, the Development Contract and Final Plat are scheduled for Council approval. The Developer must sign the Development Contract before the City Council will consider the Final Plat approval.
7. After City Council approval of the Development Contract and Final Plat, the Developer will be required to submit a notice showing insurance coverage has been provided, along with a Letter of Credit and all fees outlined in the Development Contract. In addition, the Developer shall record the plat and Development Contracts prior to the construction phase.



(C) Construction Phase:

1. Once all of the items listed above have been completed and all permits are in place, the Contractor must organize a pre-construction conference for the project. The City then issues a "Notice to Proceed" for the project.
2. The City shall inspect the improvements and the Developer shall provide the remaining construction services as outlined in the Development Contract.
3. Letter of Credit Reductions
 - i. Requests for reduction of letters of credit shall be made in writing to the City. Reduction requests should be limited to no more than once per month.
 - ii. Completed improvements will be reduced to an amount not less than 25% of the original estimate until project has been accepted by the City.
4. Project Acceptance
 - i. Once the final wear course is in place, the property pins have been installed, the punch list is completed, a warranty bond has been submitted, lien waivers have been submitted, and as-builts have been approved, the City Council may accept the improvements.
 - ii. Once the landscaping has been completed, the Planning Department should be notified for an inspection. Upon successful inspection the warranty period may begin per City Code 1107.2106(5).
 - iii. The warranty period shall commence upon the date of the City Council resolution accepting the improvements. The warranty period shall be two years for public utilities and one year for street improvements.
 - iv. The Letter of Credit may be reduced to 5% of the original estimate and shall remain in place through the warranty period.
 - v. A warranty walkthrough will be performed 90 days prior to warranty period expiration. Developer will be responsible for any punch list items that are discovered during the warranty walkthrough.
 - vi. Once the warranty period has expired and any warranty walkthrough punch list items are completed, the City will release the Warranty Bond and the Letter of Credit for the development.

**SECTION TWO:
BUILDING PERMITS**

Chapter 400, Building Code, of the City Code references requirements for Building Permit issuance within the City. As part of all Building Permit applications, the requirements for public infrastructure improvements are reviewed by the City's Public Works Department. If public infrastructure is required, the applicant is responsible for ensuring that the required public facility is provided as a condition of the Building Permit issuance. This can be accomplished in two different ways:

1. The applicant can incorporate the required public facility as a part of the Building Permit application.



2. The applicant may petition the City to install the required public facility. In this case, the Council must order the improvement to be installed under public contract prior to the issuance of the Building Permit.

The Public Works Department reviews each Building Permit survey that is submitted to the City. Refer to "EXHIBIT L" for the Public Works Building Permit Checklist.

SECTION THREE: SALES TRAILERS AND MODEL HOMES

The following are requirements for sales trailers and model homes:

1. Final plat approval is necessary
2. Site Plan review approval is necessary
3. A Building Permit is required
4. Trailers/structures are not permitted within easements
5. Must meet structure setback requirements
6. For lots within the Shoreland District, maximum impervious surface cannot exceed 30% (an impervious surface worksheet is required)
7. Specify the location and number of parking spaces available (must have a hard surface)
8. Access point and roadway must be paved
9. A site plan review is necessary with the following information included:
 - Site plan reflecting property lines, and setbacks
 - Indicate roadway surface material at time of construction
 - Americans with Disabilities Act (ADA) accessibility
 - Hydrant locations
 - Landscaping
 - Façade/elevations
 - Signage
 - Floor plans
 - Domestic water and sanitary sewer lines
 - Existing and proposed contours

SECTION FOUR: EXCAVATING AND GRADING

Chapter 706, Excavating and Filling, of the City Code, references the shore impact zone requirements for Excavating and Grading Permit issuance within the City of Prior Lake. An Excavating and Grading Permit is required for any removal, storage or excavation of earth material or to fill or raise the existing surface grades within the City which exceed 500 S.F. or 50 C.Y. of material. The contractor is required to pay a permit fee as outlined in the current City fee schedule and to provide insurance and security in the amount of \$2,000 per acre of disturbed area or as outlined in the City fee schedule. Please refer to attached "EXHIBIT A" for a copy of the application for an Excavating and Grading Permit form.

A Developer may obtain an Excavating and Grading Permit after preliminary plat approval. The City will review the grading, drainage and erosion control plans prior to issuance of the Excavating and



Grading Permit. If grading is not a part of a preliminary plat and exceeds 400 cubic yards, a Conditional Use Permit is needed.

Property owner or grading contractor must apply for an NPDES Construction Site Permit in accordance with the Minnesota Pollution Control Agency.

Prior to any grading, a Pre-construction Conference shall be held between the Developer, the City, the Contractor, and all other parties involved. Prior to any clearing and grubbing or grading operations, down stream erosion control BMP, and tree preservation fence shall be installed by the Contractor and inspected by the City.

Upon completion of the grading, the Developer shall provide an as-built grading plan to verify that the site was constructed as shown and to note all changes which may have occurred during the grading process. The as-built grading plan shall be reviewed by the City and become the record document for the proposed development. The Excavating and Grading Permit security deposit shall not be released until the “as-built” grading plan has been approved by the City.

In Summary, requirements for a permit are:

- Preliminary plat approval
- Approved grading plans
- Copy of NPDES and any other applicable permits
- Letter of Credit
- Permit Fees
- Certificate of Insurance

SECTION FIVE: WORK WITHIN CITY EASEMENTS/RIGHT-OF-WAY

In accordance with Section 701.700, Right of Way Management, the City requires a Right of Way/Easements/City Property Work Permit to be issued by the City for any excavation, opening or tunneling, across or upon a street or other public property within the City for the installation of private utilities of new subdivisions. Please refer to attached “EXHIBIT C” for a copy of the Right of Way/Easements/City Property Work Permit. Permit fees are in accordance with the current City fee schedule.

Any work within public right-of-way requires a traffic control plan and implementation in accordance with “Appendix B - Traffic Control for Short Term Street or Highway Work Zones - Minnesota Manual on Uniform Traffic Control Devices”.

SECTION SIX: GRADING/DRAINAGE/EROSION AND SEDIMENT CONTROL/RESTORATION

A grading, drainage, erosion and sediment control restoration plan prepared in accordance with the standards as outlined in the “Minnesota State Stormwater Manual”, or an equivalent set of standards is required for all construction activities within the City.



An as-built grading plan is required certifying that the grading conforms to the detailed development grading plan is required prior to Building Permit issuance.

The City may withhold issuance of Building Permits until the approved, certified grading plan is on file with the City and all erosion control measures are in place as determined by the City Engineer.

SECTION SEVEN: CONDITIONAL REQUIREMENTS FOR BUILDING SERVICE CONNECTIONS

New Construction: City code allows building service connection to the sanitary sewer and watermain prior to the completion of the street adjacent to the property after Class 5 is in place, all necessary testing and inspection have been performed on the utility systems and an authorization for utility system hookup has been completed.

Basement floors must be placed at a higher elevation than the sewer services to avoid use of sanitary sewer ejector pumps. In rare cases where this can not be accomplished the City Engineer must grant approval.

Existing Building Service Connection: When sanitary sewer and water service is readily available to an existing building which is currently not connected to the City services, a "Sewer and Water Permit" and "Right-of-Way/Easement/City Property Work Permit", if applicable, are required from the City. A review of the requested service connection is made and connection charges identified in accordance with the City's most recent "Fee Schedule".

Duplex Lot Split: When a duplex lot is currently serviced by a single water and sewer service and the duplex is proposed to be split into separate ownership, a separate sewer and water service connection is required for each unit as per Section 1101.501(5) of the Zoning Ordinance.

SECTION EIGHT: PARKING LOT CONSTRUCTION/EXPANSION

Section 1107 of the Zoning Ordinance of the Prior Lake City Code contains requirements for construction of off-street parking facilities within the City. Parking lot construction/expansion not associated with development or a Building Permit issuance requires an Excavating and Grading Permit in accordance with Section 706 of the City Code.

SECTION NINE: EASEMENTS

Chapter 1004, Subdivision Regulations (Platting) of the Prior Lake City Code contains requirements relating to protection of public infrastructure facilities within the City.

SECTION TEN: SECURITY AND WARRANTY REQUIREMENTS

See specifications or Development Contract for warranty requirements.



SECTION ELEVEN: RESIDENTIAL STANDARDS

Driveways: Residential driveways can not exceed 24 feet in width between the property line and the street. Residential driveways must be at least five feet from the property line. The minimum corner clearance from the street right-of-way shall be at least 30 feet to the edge of the driveway. The slope of the driveway must be designed with a slope of between 2% and 10%. Special circumstances may require approval from the City Engineer. Residential lots shall not have more than one driveway unless the criteria established below are met:

Criteria for a second driveway:

1. The lot width is at least 86 feet (100 feet in the shoreland district) for non-corner lots and 103 feet (120 feet in shoreland district) for corner lots. This applies to the lot line with the driveway.
2. The proposed second driveway on corner lots meets spacing requirements from the nearest intersection.
3. The proposed second driveway is at least 5 feet away from the property line.
4. The combined driveway opening width for both driveways does not exceed 24 feet in total width.
5. The second driveway can't reasonably be connected to the existing driveway.
6. A third stall does not exist or cannot be added to the existing garage.
7. The impervious surface requirements are not exceeded with the new driveway and garage.
8. If the additional garage was constructed at the time of house construction these rules do not apply and only one driveway is permitted.
9. Contractor is responsible for sawcutting and removing the curb and installing driveway curb cut, with minimal impact to existing bituminous street.
10. Second driveway will not be on a collector street.
11. Each case will be considered on its own merits and the City Engineer will make the final determination on whether a second driveway will be considered.

Right of Way and Easements: The placement of retaining walls, trees, landscaping, structures, fences, drainage alteration, or other activity within the right of way or drainage and utility easement is strictly prohibited unless the property owner secures a City License or Private Use of Public Right of Way Agreement. A Excavating and Grading Permit is needed for any grading within a drainage and utility easement. A Right of Way/Easements/City Property Work Permit and Excavating and Grading Permit is required for any grading within the right of way. Sprinkler systems may be installed within the right of way or drainage and utility easement at the property owner's risk. The City is not responsible for any damage to sprinkler systems within the right of way or drainage and utility easement and the City will not compensate for said damage.

Ownership of Utilities: The City owns and maintains all watermain in public right of way and dedicated easements. The private property owner maintains laterals, services, and appurtenances from the gate valve or curb stop of such line servicing private property. The property owner maintains all sanitary sewer services from the sanitary sewer main servicing private property.



Conservation and Wetland Buffers: Mowing, dumping, grading, landscaping, or other alteration to a conservation or wetland buffer is strictly prohibited.

Gopher State One Call Property owners must call 651-454-0002 prior to any excavating or digging.



PART II **DESIGN AND CONSTRUCTION STANDARDS**

The design and construction of public infrastructure facilities shall be performed in accordance with the most recent editions of the Minnesota Department of Transportation (MnDOT) “Standard Specifications for Highway Construction” and any amendments thereto, and the “Standard Utilities Specifications for Watermain and Service Line Installation and Sanitary Sewer and Storm Sewer Installation” as published by the City Engineers Association of Minnesota or as modified herein. All designs must incorporate the requirements identified in the City’s Comprehensive Plans in effect at the time of the infrastructure design and installation.

INDEX OF SECTIONS:

Section One	Construction Drawing – Format and Standards
Section Two	Grading/Erosion Control/Site Restoration
Section Three	Storm Sewer
Section Four	Sanitary Sewer
Section Five	Watermain
Section Six	Streets
Section Seven	County and State Right-of-Way
Section Eight	Street Lighting
Section Nine	Commerical and Industrial Standards
Section Ten	Record Plans

SECTION ONE:

CONSTRUCTION DRAWING - FORMAT AND STANDARDS

The City requires specific plan format and graphic standards for infrastructure improvements which are to be owned and maintained by the City. The following provides, in outline form, the City’s requirements for these plans:

1.1 Organize plan sheets generally in the following order:

- Title Sheet
- Survey Sheet
- Removal Plan (if necessary)
- Grading Plan
- Erosion Control Plan
- Sanitary Sewer and Watermain Plan & Profile Sheets
- Storm Sewer and Street Plan & Profile Sheets
- Typical Sections and Details Sheet
- Tree inventory with table
- Landscape Plan

1.2 All full size plan sheets shall be 22”x34”. Half size plans, 11”x17” shall also be provided.

Scale: Maximum Horizontal Scale 1” = 50’ (Half scale 1” = 100’)
Maximum Vertical Scale 1” = 10’ or approved scale by City Engineer



1.3 The following utilities shall be located in the approximate locations (See Plate #104):

Sanitary Sewer	On centerline of street right-of-way. No curvilinear design is permitted.
Watermain	Ten feet on either side of centerline and/or parallel to sanitary sewer.
Storm Sewer	Ten feet or greater as necessary on the opposite side of centerline as of watermain.
All Street surface structures (i.e. manhole, gate valve covers, etc.) shall be located as necessary to avoid being in the traveled wheel paths.	

1.4 All detailed drawings shall be on separate sheets or included in the specification manual.

1.5 The title sheet should include a Project Location Map (Scale 1" = 2000') showing the location and names of all major streets within one mile of proposed subdivision, all streets in the proposed project, all proposed or non-existing future streets and all other streets in the vicinity of the proposed project. The project area shall be indicated by circling.

1.6 Provide an Overall Plan with a maximum scale of 1" = 200' showing the proposed project area as well as adjacent property. Overall plan shall have the following information:

- Property lines - proposed in solid lines, existing in dashed lines.
- Easements – proposed in dashed lines.
- Street and street names.
- Schematics for proposed improvements of sanitary sewer, watermain, and storm sewer. Proposed manholes and appurtenances clearly shown. Existing piping and appurtenances information shall be shown and labeled.
- All property within plan shall be identified with lot number or appropriate title.
- Location and elevation of City or United States Geological Survey Benchmarks.

1.7 Show City of Prior Lake's project number in the lower right hand corner of the entire plan sheets.

1.8 The Developer must obtain all regulatory agency permits and approvals prior to construction, including but not limited to those from the Minnesota Pollution Control Agency for "General Storm Water Permit for Construction Activity", DNR, Army Corps of Engineers, Prior Lake / Spring Lake Watershed District, Minnesota Department of Transportation, Scott County, Minnesota Pollution Control Agency, Metropolitan Council, Minnesota Department of Health or any other permitting authority.

1.9 Title Block shall be located along the right side or right edge of bottom of each plan sheet and set in 1/2" from the edge. Information shall include name and address of engineering firm, sheet title name, sheet number, certification signature and registration number of registered professional engineer, project title, revision block, and City project number.



- 1.10 All parcels shall be properly labeled with lot and block numbers and plat name, or parcel number in unplatted areas. Developed parcels shall have their address shown on the plan.
- 1.11 All match-line breaks shall be clean with reference points and plan sheet numbers of continuation clearly marked. All plans which are broken by a match-line shall be on the same or consecutive sheets.
- 1.12 Approximate locations of existing utilities including: gas, electric, cable, telephone lines, pipelines, etc. must be shown on the construction drawings.
- 1.13 Right-of-way and pavement or curb and gutter alignment data shall be shown. All existing, proposed, or temporary easements shall be shown on drawings including sanitary sewer, watermain, and storm sewer.
- 1.14 All plans shall have properly placed north arrows and bar scales for each plan on the sheet. The north arrows and bar scales should be placed on the top and on the right side of the plan sheet. The direction north will be oriented either up or to the right on all plan sheets for utility and street plans.
- 1.15 Benchmarks shall be placed on all sheets. (Top nut of existing hydrant is a preferable benchmark). The Engineering Division can assist with benchmark location information.
- 1.16 Use of all typical engineering symbols is required. See Plate #100 for typical engineering symbols.
- 1.17 Existing utilities shall be shown and labeled as existing. When drafting utility and/or street plans, use a solid line for new utilities and a dashed line for existing utilities.
- 1.18 All plans should be drafted in computer aided drafting (CAD) format following the City of Prior Lake layer system as shown in the attached "EXHIBIT R". The drawings should be printed in grayscale.
- 1.19 Any revisions must be noted, initialed and signed on all affected sheets.
- 1.20 All easements, permanent and temporary, shall be shown and labeled.
- 1.21 All sewer and watermain shall be shown in profile with the appropriate information such as size, material, existing and proposed surface elevations, invert elevations, etc. Storm sewer plan should be on a separate sheet from sanitary sewer and water. Any utility crossings shall be shown on plan and profile. Indicate if possible conflict could exist.
- 1.22 The utility profile shall be directly below the plan with the stationing aligned as closely as practical. Stationing shall be shown on the plan view as well as the profile.
- 1.23 Provide digital copy of all the construction drawings in PDF or TIF format prior to construction.
- 1.24 All drawings shall use the Scott County coordinate system (feet).



- 1.25** Provide note on plans stating that working hours are from 7:00 A.M. – 7:00 P.M., Monday through Friday and 8:00 A.M. – 5:00 P.M., Saturday.

**SECTION TWO:
GRADING/EROSION CONTROL/SITE RESTORATION:**

This work shall be done in accordance with the most recent additions of the “MnDOT Standard Specifications for Highway Construction”. Design should follow the standards provided by the “Minnesota Stormwater Manual” prepared by the Minnesota Pollution Control Agency. Grading should be done in accordance with NPDES Construction Site Permit and Storm Water Pollution Prevention Plan (SWPPP).

The City requires the following for submittal of grading, erosion and sediment control plans:

- 2.1** Show adjacent plats, parcels, property lines, section lines, streets, existing storm drains and appurtenances, etc.
- 2.2** Show all existing and proposed grades. Required standard is 2' contours with existing contours shown as dashed and proposed contours shown as solid. Extend existing 2' contour lines a minimum of 200' beyond the property boundary or more as determined by the City Engineer to accurately depict the existing drainage patterns.
- 2.3** Show lot corner elevations and benchmark utilized.
- 2.4** Maximum 4:1 slopes are allowed in “maintained” areas except approved by the City Engineer. Maximum 3:1 slopes are allowed adjacent natural resources. Maximum 3:1 slopes are allowed for walkout lots.
- 2.5** Show the outlet elevation, HWL for ponds, and OHWL for water bodies based upon the hydrology of the site as analyzed following the requirements in “PART III” HYDROLOGY RULES.
- 2.6** Show garage floor, low floor, and rear pad elevations. Also show house style detail drawing.
- 2.7** Building elevations must follow the requirements of the Zoning Ordinance. Refer to Chapter 1104.308 for requirements in Shoreland Districts and Chapter 1105 Flood Plain Ordinance.
- 2.8** Retaining walls over four feet in height or have more than two tiers shall be designed by a Minnesota registered professional engineer, need a Building Permit, and have a fence constructed at the top of the wall. Retaining walls are to be located on private property. The construction of any retaining walls within the public right-of-way will need prior approval of the City Engineer. All retaining walls that need to be constructed in public right-of-way shall be a mortar less concrete block retaining wall system. These walls shall be non-deteriorating and virtually maintenance free. The retaining wall construction will require the submittal of detailed plans and specifications for a review by City staff. Show top and bottom elevations of the wall on the grading plan.



- 2.9** Show construction limits.
- 2.10** Minimum grade for drainage swales and lot grading shall be 2% or greater.
- 2.11** Unless a part of a volume control BMP, maximum length for drainage swales shall be 300 feet or a total of eight lots draining to a point, or as approved by the City Engineer. Backyard drainage structures should be avoided. Rear yard drainage swales shall be final graded and sodded prior to the issuance of Building Permits. Once sodded these areas should be protected with erosion control measures and fencing.
- 2.12** Provide name of company, contact person, and emergency phone number for person responsible for erosion and sediment control plan preparation, implementation and maintenance.
- 2.13** Provide note on the plans specifying that perimeter / downstream sediment control best management practices should be installed by the Contractor and inspected by the City prior to any site work.
- 2.14** Slopes greater than or equal to 3:1 shall have approved erosion control best management practices installed immediately after finished grading.
- 2.15** Driveway grades shall be between 2% and 10% unless otherwise approved by the City Engineer.
- 2.16** A minimum of 10 feet beyond the house pad shall have a slope less than 10:1 unless otherwise approved by the City Engineer.
- 2.17** Site drainage must follow the City of Prior Lake rules outlined in "Part III: HYDROLOGY RULES" of the Public Works Design Manual.
- 2.18** Show wetland buffer, buffer signage, and tree preservation signage on the grading plan.
- 2.19** Show all emergency overflow high point and drainage arrows for low points and water bodies.
- 2.20** Show emergency overflow routes from all low points and show elevation of high point along emergency overflow route.
- 2.21** Drainage areas over 5 acres must have a temporary sediment basin.
- 2.22** All wetland areas and wetland buffers must be seeded to the specifications outlined in "PART III: HYDROLOGY RULES".
- 2.23** Prior to topsoil placement and final grading in designated park areas contact the Parks Maintenance Division at 952-440-9675.



- 2.24** All designated park areas must be seeded to the specifications outlined in the attached "EXHIBIT P".

SECTION THREE: STORM SEWER

This work shall be done in accordance with the most recent additions of the "MnDOT Standard Specifications for Highway Construction". Design should follow the standards provided by the "Minnesota Stormwater Manual" prepared by the Minnesota Pollution Control Agency.

The following are specific requirements related to the design of storm sewer:

- 3.1** The storm sewer alignment shall follow the sanitary sewer and watermain alignment where practical with a minimum of 10' of separation. Storm sewer placed along the curb alignment shall be along the curb opposite the watermain to maintain the 10' separation.
- 3.2** Catch basins shall be located on the tangent section of the curb at a point 3' from the point of curve. Mid-radius catch basins will not be allowed. Also, catch basins shall be designed to collect drainage on the upstream side of the intersection. As much as practicable, catch basins should be located at property lines.
- 3.3** The maximum spacing between manholes is 400 feet.
- 3.4** The slope must not have a slope less than 0.5% unless approved by the City Engineer.
- 3.5** Invert elevation of pipe outlets into ponds shall match the outlet elevation.
- 3.6** Any connections to existing manholes or catch basins shall be core drilled or the opening cut out with a concrete saw. No jack hammering or breaking the structure with a maul is permitted. Also, all connections to an existing system will require a manhole for access.
- 3.7** To the greatest extent possible, manholes shall be placed in paved surfaces outside of wheel paths, (3' and 9' off centerline) or other readily accessible areas.
- 3.8** Type of pipe within right-of-way shall be Reinforced Concrete Pipe (RCP). The class of pipe shall conform to the design standards for maximum allowable fill height for RCP pipe as shown on "EXHIBIT M". Type of pipe outside of right of way may be High Density polyethylene Pipe (HDPE).
- 3.9** Aprons or flared end sections shall be placed at all locations where the storm sewer outlets a ponding area. All inlet/outlet flared end sections shall be furnished with hot dipped galvanized trash guards (see Plate #305).
- 3.10** The last three pipe joints from the flared end section shall be tied together.
- 3.11** Riprap and filter blanket shall be placed at all outlet flared end sections. The riprap shall be hand placed. The minimum class of riprap shall be MnDOT 3601.2, Class III. Provide design



criteria justifying the size and amount of riprap. Outlets to lakes should use articulated concrete at all flared end sections.

- 3.12** Installation of Public Utilities or utilities to be maintained by the City including storm sewer on private property is prohibited. Should installation be required outside the right of way an outlet deeded to the City shall be provided with the utility pipe centered in the deeded outlet. The minimum outlet width shall be dictated by depth as indicated below:

Depth	Outlet Width
10 feet or less	20 feet
15 feet or less	30 feet
20 feet or less	40 feet
20 feet +	City Council approval

- 3.13** Junction manholes should be designed to limit the hydraulic head increase by matching hydraulic flow lines and by providing smooth transition angles.
- 3.14** Environmental manholes, 3 foot sumps, shall be constructed as the last structure which is road accessible prior to discharge to any water body.
- 3.15** The maximum spacing between manholes is 400'. All manholes shall be numbered and stationed in both plan and profile.
- 3.16** Pond outlets shall provide oil skimming for the 10 year event. A manhole with a baffle wall with orifice or notch is recommended to control rate. Outlet rate control manholes shall have a top mitered to conform to fill. A 66" minimum diameter outlet structure is required to provide access to both sides of the weir wall (see Plate #304).
- 3.17** All storm sewer pipes outside of roadway areas must have marking signs placed at the front and back of the property lines. Signs shall be green "Rhino Marking Posts" or approved equal and should be shown on the plans (see Plate #103).

SECTION FOUR: SANITARY SEWER:

All sanitary sewer and appurtenances shall be checked for conformance with the design criteria specified in the Recommended Standards for Waste Water Facilities - 1997 Edition of the Great Lakes - Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (10 State Standards) or latest revision and as modified herein this manual.

The following are specific requirements related to the design of sanitary sewer:

- 4.1** Determination of sanitary sewer services size and design shall be done in accordance with the Department of Health, Minnesota Plumbing Code, and Chapter 4715.
- 4.2** The Met Council Permit should consider 2.7 persons per household.



- 4.3 Manholes shall be placed on street centerline to the greatest extent possible, other locations outside the wheel paths (3' and 9' off centerline) may be allowed with City approval.
- 4.4 The maximum spacing between manholes is 400'.
- 4.5 Manholes are required at the terminus of all stubs if the line will be active.
- 4.6 Any connections to existing manholes shall be core drilled and attached to the manhole with a rubber boot, or as approved by the supplier.
- 4.7 If the pipe diameters of the existing and proposed pipes are the same, then the invert elevations shall drop 0.10 feet through the manhole. If the pipe diameters are different, the 8/10ths line of the two pipes shall match at the manhole.
- 4.8 Maintain a minimum of 10' of horizontal separation between sanitary sewer and watermain. If a situation dictates that the required 10' horizontal separation can not be met, the use of C-900 pipe will be required.
- 4.9 Sanitary sewer flow shall have a minimum of 2 feet per second. The minimum slopes for sanitary sewer shall be as follows:

Size of Pipe	Minimum Slope
8 inch	0.40%
10 inch	0.28%
12 inch	0.22%
15 inch	0.15%

- 4.10 Show the existing and proposed sanitary sewer in plan and profile view, along with other existing and proposed utilities in the construction zone.
- 4.11 Drop manholes are required when the pipe inverts are greater than 2 feet apart. Only outside drops are allowed. Inside drop manholes may be used in retrofit situations as determined by the City Engineer.
- 4.12 Installation of Public Utilities or utilities to be maintained by the City including sanitary sewer on private property is prohibited. Should installation be required outside the right of way an outlet deeded to the City shall be provided with the utility pipe centered in the deeded outlet. The minimum outlet width shall be dictated by depth as indicated below:

Depth	Outlet Width
10 feet or less	20 feet
15 feet or less	30 feet
20 feet or less	40 feet
20 feet +	City Council approval



- 4.13 Trunk sanitary sewers shall be designed to promote a laminar flow through the sewer system. Junction manholes should be designed to limit the hydraulic head increase by matching hydraulic flow lines and by providing smooth transition angles.
- 4.14 No manhole shall be located within a designated ponding/flowage easement without City approval. If such location is unavoidable, then the structure may be required to be built to a higher elevation to avoid flooding, constructed to tolerate frost action, and shall be made of water-tight materials. The City requires that manholes located in possible flooding areas will require an additional internal manhole chimney seal.
- 4.15 The following pipe types and class are identified in general with respect to depths with soil type verification and design criteria required to substantiate size and type of pipe used.

Size	Depth	Type & Class
8" to 10"	8' to 16'	PVC, SDR 35
8" to 10"	16' to 26'	PVC, SDR 26
8" to 10"	26' to 40'	DIP, Class 52
8" to 10"	Over 40'	DIP, Class 53

Pipe Materials for trunk sanitary sewer larger than 10" shall be constructed as directed by the City Engineer.

- 4.16 Deflection testing for all non-rigid pipes shall be conducted after the final backfill has been in place for 30 days.
- 4.17 Jacking or drilling methods must be approved by the City Engineer.
- 4.18 Televising of the sanitary sewer is required after testing. A copy of the televising report and tapes must be submitted to the Public Works Department.
- 4.19 All manholes shall be numbered and stationed in both plan and profile.
- 4.20 The size, type, and class of all sanitary sewer services shall be noted on the plans.
- 4.21 On combination sewer and water projects, services may be placed in the same trench with sanitary sewer services three feet downstream from water services.
- 4.22 Sanitary sewer services shall be having a minimum of 4 inches nominal inside diameter and be constructed with PVC SDR 26.
- 4.23 The maximum depth of the sanitary sewer service at the ROW line shall be 10' unless documented by a proposed house or building elevation that justifies a deeper service.
- 4.24 The sewer and water service shall be included in the pressure and leakage testing requirements for the main lines.
- 4.25 Minimum grade for sanitary service stubs shall be 1/4" per foot (2%).



- 4.26** When the sanitary sewer mainline is constructed with ductile iron pipe, the sanitary sewer services shall be constructed with Class 52 ductile iron pipe from main line sewer to the 45 degree bend.
- 4.27** Developers are responsible for constructing the services to 10' beyond the right of way line.
- 4.28** Cleanouts are required at 100' intervals including the riser on sanitary sewer services. All sanitary sewer cleanouts constructed in paved areas require the installation of a meter box and heavy duty cover for ease of access to the clean out.
- 4.29** Sewer services shall be connected to a wye on the main and shall not be constructed into manholes unless approved by the City. Approved connections to a manhole requires a KOR-N-SEAL connection or approved equal and must match the manhole invert.
- 4.30** The construction plans for water main and sanitary sewer shall include the lowest elevation of all houses or buildings to be served.
- 4.31** Provide 10 gauge tracer wires for the sanitary sewer services for locating purposes. The tracer wire should connect to a tracer wire access box at the easement (see Plate #401).
- 4.32** The sanitary sewer system must follow the requirements of the City's Comprehensive Plan. The City will pay for over sizing of sanitary sewer pipe over 8" unless it is determined that the development requires sanitary sewer pipe over 8". Commercial subdivisions must provide an analysis of the sanitary sewer piping size.
- 4.33** All sanitary sewer outside of roadway areas must have marking signs placed at the front and back of the property lines. Signs shall be green "Rhino Marking Posts" or approved equal and should be shown on the plans.

SECTION FIVE: WATERMAIN

All distribution system design for water works shall be checked for conformance with the design criteria specified in the Recommended Standards for Water Works by the Great Lakes - Upper Mississippi River Board of State Public Health and Environmental Managers - 1997 Edition (10 states standards) or latest edition and as modified herein this manual.

The following are specific requirements related to the design of watermain:

- 5.1** The size of the watermain should follow the City's Comprehensive Plan. The City will pay for the over sizing of watermain over 8" unless a larger watermain size is required to meet fire flow conditions of the development. Fire flow conditions must be analyzed for all commercial subdivisions. Fire flow conditions are defined as 1500 gpm for residential and 3500 gpm for commercial areas at 20 psi or as determined by the standards set forth in AWWA M31 "Distribution System Requirements for Fire Protection".



- 5.2** Minimum watermain size shall be 8" for residential developments. Minimum watermain size shall be 12" for Commercial or Industrial developments or as required to meet fire flow conditions. The watermain size should be 6" for dead end watermain in cul-de-sacs under 500 feet in length.
- 5.3** For all watermains the depth of cover shall be a minimum of 8' to top of pipe and maximum of 10' of cover. Also 10' of horizontal separation shall be provided from other parallel utility alignments.
- 5.4** Materials shall be ductile iron pipe Class 52 watermain. Materials for fittings shall be ductile iron. Use Class 51 for watermain over 16".
- 5.5** Hydrant spacing is 450' maximum for Residential developments and 300' maximum for Commercial developments.
- 5.6** Locate hydrants at all intersections, if practical. Hydrants not located at an intersection shall be located at a property line.
- 5.7** If sizing is not consistent with the City's Comprehensive Plan, design calculations for sizing of all watermains shall be submitted with preliminary plans.
- 5.8** Locate gate valves within street surface where possible and at the extended right-of-way line approximately 25 feet from intersection centerline. When intersection spacing exceeds 1000', then a mid-block gate valve will be required.
- 5.9** Show on plans the existing and proposed watermain in plan and profile view along with other existing and proposed utilities in the construction zone.
- 5.10** Provide a minimum of 18" vertical separation for all watermain crossings with sanitary and storm sewer. Also, other utilities that cross the watermain shall cross at a 90 degree angle, if possible, with the minimum requirement of a 45 degree angle for the crossing. Provide insulation for all storm sewer crossings or as determined by the City Engineer.
- 5.11** Activation of the watermain system shall be performed by City personnel only.
- 5.12** All valves and curb stops shall be resilient seal gate valves.
- 5.13** Dead-end lines shall be minimized by looping of all mains wherever practical. Where dead-end mains occur a hydrant shall be installed at or near the end of the main for flushing purposes. In commercial and industrial developments, watermain over 500 feet in length must be looped. The hydrant shall be located behind the curb on stub streets to allow the City's snow plow crews to pile snow on the end of the stub street. All temporary and permanent dead-ends shall be secured with a gate valve at least 40' from the plugged end. Automatic flushing units may be required.
- 5.14** Installation of Public Utilities or utilities to be maintained by the City including watermain on private property is prohibited. Should installation be required outside the right of way an outlet



deeded to the City shall be provided with the utility pipe centered in the deeded outlot. The minimum outlot width shall be dictated by depth as indicated below:

Depth	Outlot Width
10 feet or less	20 feet
15 feet or less	30 feet
20 feet or less	40 feet
20 feet +	City Council Approval

- 5.15** The City will maintain all watermain in public right of way and dedicated easements. The private property owner maintains laterals, services, and appurtenances from the gate valve or curb stop of such line servicing private property unless noted in the Developers Contract.
- 5.16** Hydrant flags are required (see Plate #500). The Developer shall furnish and install hydrafinder high-visibility locating device. Rodon, Inc., or approved equal on each hydrant to be included in the contract price bid for hydrant. Contractor shall also supply an extra hydrafinder per hydrant and one extra gate valve key, curb box key and hydrant wrench per development be delivered to the Public Works Department.
- 5.17** Watermains, laterals, and/or services shall not be located within any defined or designated ponding easement.
- 5.18** All watermain gate valves and curb stops shall have adjustable gate valve extension stems.
- 5.19** Whenever possible avoid the use of 90 degree bends.
- 5.20** Developers are responsible for constructing the services to the easement line which is approximately 10' beyond the right of way line.
- 5.21** All water fittings should be labeled as to size and type such as bends, tees, plugs, etc.
- 5.22** The size, type, and class of all water services shall be noted on the plans.
- 5.23** Water services shall be a minimum of one inch nominal inside diameter.
- 5.24** The sewer and water service shall be included in the pressure and leakage testing requirements for the main lines.
- 5.25** All watermain outside of roadway areas must have marking signs placed at the front and back of the property lines. Signs shall be blue "Rhino Marking Posts" or approved equal and should be shown on the plans.



**SECTION SIX:
STREETS**

The design and construction of public infrastructure facilities shall be performed in accordance with the most recent editions of the Minnesota Department of Transportation (MnDOT) “Standard Specifications for Highway Construction” and any amendments thereto.

The following are specific requirements related to the design of streets:

6.1 Roadway widths from back of curb to back of curb and right of way widths should be determined as follows:

Classification	Road Width	ROW Width	Curb Style
Local Street	32 feet*	50 feet**	Surmountable
Commercial Street	36 feet	60 feet	B618
Collector Street	36 feet	66 feet	B618
Arterial Street	44 feet	80 feet	B618

* 28 foot wide streets in environmentally sensitive areas as determined by the City Engineer.

**Sidewalk on one side 55 feet, Sidewalk and trail 60 feet.

6.2 The minimum street and right-of-way width shall be determined by the City Engineer for streets approaching County and State roadway intersections.

6.3 Street connections should be reviewed against the Comprehensive Plan.

6.4 Streets shall be laid out so as to intersect as nearly as possible at right angles, except where topography or other conditions justify variations. The minimum angle of intersection of streets shall be eighty (80) degrees. Local street intersections must have a centerline offset of at least 280 feet. Local streets intersecting with a collector or higher order street must have a centerline offset of at least 660 feet unless topographic or other conditions render the requirements of this provision unreasonable.

6.5 Street alignment for local streets, both vertical and horizontal, shall be designed for 30 MPH design speed based on the MNDOT State Aid Manual unless otherwise approved by the City Engineer. Horizontal curves shall have a minimum 250' centerline radius. Vertical and horizontal curves on major and minor collector streets must be designed in accordance with MNDOT State Aid standards.

6.6 Vertical curves shall be designed using the following formula:

Sag vertical curves: $L=KA$
L = minimum length of vertical curve in feet
K = 36 (30 MPH Design Speed)
A = Algebraic difference in grade

Crest Vertical Curves $L=KA$



K= 30 (30 MPH Design Speed)

- 6.7** The design speeds of commercial streets, collector streets, and arterial streets must be approved by the City Engineer. Refer to the MNDOT State Aid Manual for more information.
- 6.8** Plan and profile sheets are required for all new subdivision streets. The plan and profile sheets should include centerline stationing and the typical section for the street shown. The street construction plans shall include a grading plan and/or cross sections.
- 6.9** The horizontal and vertical curve data must be shown on the street plans and should include: curve lengths, radius lengths, tangent lengths, stationing, delta, algebraic differences, and K values.
- 6.10** Regardless of soil type, the minimum bituminous thickness for street sections shall be 4". The base course shall be 2 1/2" thick after compaction. The wear course shall be 1 1/2" thick after compaction and placed the next construction season after base course placement. A minimum of 6" of Class 5 (crushed limestone) and 2' subcut with granular borrow is also required. Soil borings, pavement design calculations, and/or special design considerations are required to verify design. Provide drain tile at all low points across roadway along both sides of the storm sewer pipe and twenty-five feet along curbline in each direction of the low point catch basins.
- 6.11** Flexible pavement design shall be based on design procedures set forth by the Minnesota Department of Transportation. Arterial, commercial, or collector streets shall be designed for a minimum nine (9) ton pavement design. Local streets shall be designed for a minimum seven (7) ton pavement design.
- 6.12** Minimum street grade shall be 1.00%. The design maximum shall be 8.00%. At intersections, the street grade shall not exceed 2.00% for the first 100' approaching said intersection. The 100' is measured from the curb line of the intersected street. In cul-de-sacs, the gutter grade shall not be less than 0.80%.
- 6.13** A minimum 0.5' crown or 2% cross-slope grade, whichever is greater, is required of all street cross-sections. The minimum curb return radius shall be 25'. The minimum grade around curb returns shall be 0.50%.
- 6.14** Opposing street intersections and commercial driveway intersections shall match at the centerlines. If the streets or driveways cannot be aligned to match, then the intersections shall be offset as approved by the City Engineer.
- 6.15** Temporary "dead-end" situations associated with providing access for future extension to and through adjacent undeveloped property require a cul-de-sac with concrete curb and gutter installation and a sign reading "Possible Future Roadway Connection". Cul-de-sac design should follow the requirements of Plate #605. Temporary "dead-end" situations associated with phased development do not require concrete curb and gutter along the radius of the cul-de-sac.
- 6.16** A cul-de-sac is not needed if the "dead-end" street is less than 200 feet in length. However, a sign reading "Possible Future Roadway Connection" and barricades in accordance with the



Minnesota Manual on Uniform Traffic Control Devices shall be placed at the end of these “dead-end” streets. (See Plate #613.)

- 6.17 The design and construction of sidewalks and trail shall be in accordance with the City’s Standard Plates and City ordinances. Sidewalks shall be 5’ wide concrete and trail shall be a minimum of 8’ wide bituminous. The cross slope of the sidewalk or trail shall not exceed 2% and must follow the requirements of the American Disabilities Act. The boulevard between the street and the sidewalk or trail must be between 3% - 5%. At low points, the boulevard should be between 5% - 10%.
- 6.18 Pedestrian curb ramps shall meet the latest MNDOT specification.
- 6.19 Provide conceptual layout for adjacent areas which have not been developed. The roadway grade and location should be reviewed for adjacent properties.
- 6.20 Street signage should be placed on the street plans and should follow the requirements of Plates #105, #611, #612, and #613.
- 6.21 Pavement markings must follow the requirements of MNDOT. Add note to the plans stating that the Contractor must give the City Public Works Department at least 48 hours notice prior to pavement marking. The City must have time to review the layout.
- 6.22 If the gutter lines are different from the centerline, separate profiles need to be shown.
- 6.23 The City will reimburse the Developer for “oversizing” of public streets based on the following criteria: If the street right-of-way is above 66 feet, if the design strength of the roadway is above 7 ton (if the minimum street section meets the roadway design, no oversizing will be paid), or if the roadway width is above 36 feet (back of curb to back of curb). No reimbursement will be made if the traffic generated by the development requires “oversizing”.
- 6.24 Provide note on the plans stating that the final date for paving of the bituminous base course and curb placement is November 1st, and final date for paving the bituminous wear course is September 30th and that no paving shall commence prior to removal of seasonal road restrictions.

SECTION SEVEN: COUNTY AND STATE RIGHT-OF-WAY

The design and construction of public infrastructure facilities shall be performed in accordance with the most recent editions of the Minnesota Department of Transportation (MnDOT) “Standard Specifications for Highway Construction” and any amendments hereto and the requirements outlined in the Scott County Permit.

The following are specific requirements related to the design within County or State right of way:



- 7.1 Work within the Scott County or State of Minnesota right of way will require a permit from the governing agency.
- 7.2 Any modification to Scott County or State of Minnesota roadways requires plan sheets and cross sections every 50 feet.
- 7.3 Any replacement of the pavement section should receive prior approval from the governing agency.
- 7.4 Any modifications to the left turn lanes or right turn lanes require plan sheets and details that match the latest governing standard. Plans should include milling and sawcutting limits and cross sections every 50 feet.
- 7.5 Street signage off of Scott County or State of Minnesota roadways must be 9" signage with 6" lettering and a 6" City of Prior Lake logo.
- 7.6 Trails along Scott County or State of Minnesota roadways must be located at least 8 feet from the edge of roadway and be 10 feet in width.
- 7.7 Access from Scott County or State of Minnesota right of way shall be limited to those areas detailed in the permit.
- 7.8 Plantings, monument signage, or other structures shall not be placed within the Scott County or State of Minnesota right of way.
- 7.9 Any work or modification to traffic signals must be coordinated through Scott County or the State of Minnesota.
- 7.10 The County and State of Minnesota require at least 48 hour notice for placement of striping targets. The striping plans must be approved prior to placement of the striping.

SECTION EIGHT: STREET LIGHTING

- 8.1 Residential street lighting shall conform to the City Residential Street Lighting Policy. See "EXHIBIT I" for a copy of the City's Residential Street Lighting Policy.
- 8.2 All street lights and all street lighting plans require approval of the City Engineer. Only three standard lights shall be installed in the City of Prior Lake. They are "Traditional" style, "Decorative" style, and "Shoebox" style (See Plate #106).
- 8.3 In new subdivisions developers shall:
 - Pay the full capital cost of every light to be installed.
 - Pay operation and maintenance for the project's street lighting system until the City accepts the project.
 - Follow design standards as outlined in the Street Lighting Policy.



SECTION NINE: COMMERCIAL AND INDUSTRIAL STANDARDS

Commercial and Industrial improvements require civil engineering plans signed by a Registered Professional Engineer. The requirements outlined herein are intended to provide minimum design requirements. The Engineer of record should provide additional detailed information on the plans as necessary.

- 9.1** Civil plans should include: title sheet, survey of existing site conditions, site plan, grading/erosion control plan, utility site plan, and detail sheet. The survey shall be shown on a separate sheet. All other sheets can be combined if approved by the City Engineer.
- Plan sheets shall be on 22"x34".
 - The maximum scale must be 1" = 30 feet. Grading plan may have up to 50 scale if needed to show entire site on one sheet.
 - Plan sheets should include a north arrow in the upper right corner of each page.
 - Plans are to include the following: legend, City project number, benchmark.
 - Plans should use typical engineering symbols as shown in Plate # 100.
 - All plans should be drafted in computer aided drafting (CAD) format following the City of Prior Lake layer system as shown in the attached "EXHIBIT R". The drawings should be printed in grayscale.
 - All plan sheets shall be "screened" to feature the proposed improvements. For example, on the utility sheet, the proposed utilities should be shown in a darker font than the streets, driveways, etc.
- 9.2** Title page should include a Location Map (Scale 1" = 2000') showing the location and names of major streets within one mile of proposed site, all streets in the proposed project, all proposed or non-existing future streets and all other streets in the vicinity of the proposed project. The project area shall be circled.

Title sheet shall also include the Engineer contact information, project information, sheet index, City project number, and benchmark. The existing and proposed legends can also be placed on the title page.

The Certificate of Survey should include the following:

- Parcel address and lot and block number
- Plat name or parcel number
- Datum
- Legal description
- Topographical features
- Wells
- Trees
- Spot elevations
- Existing contours in one foot increments



- Existing streets
- Property lines and corner monuments
- Existing easements
- Utilities, public and private
- Wetlands and ponds
- Driveways
- Benchmark

9.3 The Site Plan should include the following:

- Property and easement lines
- Site dimensions
- Site conditions and existing development on the subject property and immediately adjacent property
- The proposed use of all areas on the site
- Proposed location of all buildings
- All public streets, entrance and exit drives and walkway locations
- All parking areas, pavement type and pavement striping
- Fire lane and parking stall dimensions
- Concrete curb and gutter, shown as three separate lines
- Sidewalk and pedestrian ramps
- All ponding facilities
- All retaining walls
- All surface utilities
- Trash enclosures
- Outdoor mechanical equipment
- Proposed fencing
- Construction limits
- Construction notes
- Street light locations
- Entrance, paving, curb and gutter, and sprinkler system details

9.4 The Grading and Erosion Control Plan should include the following:

- Existing and proposed contours shown in one foot increments
- Existing spot elevations
- Existing significant tree locations
- Proposed topographical features (building, parking lot, etc.)
- Door locations showing finished floor elevations
- Roof scupper locations
- Existing topographic features
- Proposed spot elevations as necessary
- Proposed handicapped access parking locations
- Catchbasin and manhole locations
- Proposed storm sewer pipe locations
- Proposed storm sewer rim and invert elevations
- Proposed drainage and utility easements
- Proposed watermain valve and hydrant locations
- PIV location



- Erosion control features
 - Property lines and easements
 - Sanitary manhole locations
 - Retaining wall locations with top and bottom of wall elevations noted
 - Pedestrian ramp locations
 - Spot elevations for handicapped parking areas
 - Tree protection fencing
 - Emergency overflow locations and elevations
 - Erosion control details
- 9.5** The Utility Plan should include the following:
- General site features (building, parking lot, curb and gutter)
 - Existing and proposed utility locations
 - Material size, type and class
 - Existing topographic features
 - Slope of sanitary sewer
 - Catchbasin and manhole locations with rim and invert elevations
 - Invert elevations for utilities at a point 5 feet from the building
 - Hydrant, tees, cross, bend, PIV, sprinkler connection, and valve locations
 - Label watermain bends and service locations
 - Service inverts
 - PIV
 - Irrigation service
 - Property and easement lines
 - Pipe length and slopes
 - Drain tile location
 - Utility connection notes
 - Utility details
- 9.6** All plans should have a legend showing all line types used on the plan sheet, a bar scale, and a north arrow.
- 9.7** All plans should provide notes detailing construction activities (ie. sawcutting, utility connections, removals, salvaging, etc.).
- 9.8** Curb radii shall be a minimum 25' for entrances off of a public street.
- 9.9** Unless approved by the City Engineer, street intersections and commercial driveway intersections shall match at the centerlines. If the streets or driveways cannot be aligned to match, then the intersections shall be offset as approved by the City Engineer.
- 9.10** Hydrant spacing should be 300' maximum.
- 9.11** A manhole is required at the property line/easement line in Commercial/Industrial areas where service connection to the City system is made. These manholes will serve as an inspection or monitoring manhole.



- 9.12** Commercial buildings must have a separate domestic service line with a curb stop and a fire flow service line with a shutoff valve. Curb stops and shutoff valves must be located within the right-of-way or easement.
- 9.13** If a separate domestic water line is included in the design, the connection to the watermain must be separate from water line for fire protection.
- 9.14** Commercial entrances must be at least 25 feet wide with a maximum width of 36 feet per standard Plate # 607.
- 9.15** All sidewalks and handicapped parking areas must meet ADA requirements.
- 9.16** Commercial buildings must follow the requirements of the grading erosion control section and hydrology part of this manual.
- 9.17** Design and maintenance of Off-street parking areas must follow section 1107 of the Zoning Ordinance.
- 9.18** A 6-inch, poured in place, concrete curb shall be provided around the periphery of all parking lots for 6 cars or more unless it is demonstrated by a drainage plan that a 6-inch curb will impede the planned overland drainage. In that case other pavement edge treatment may be approved if it restricts vehicle parking to the designated parking area, protects the pavement edge and protects vegetation. A 6-inch poured in place concrete curb or other pavement edge treatment is required along all internal access roads. Curbs or other means shall be provided to prevent parked vehicles from overhanging property lines or damaging plant materials.
- 9.19** The watermain entering the building should be sized to meet fire flow requirements.
- 9.20** The sanitary sewer shall be sized to meet the demands of the commercial building.
- 9.21** Plans should have note to contact Gopher State One Call for location of utilities.
- 9.22** Plans must demonstrate that the intended vehicles be able to make turning radius movements.
- 9.23** Place note on the plans that the Contractor shall contact the Engineering Division at 951-447-9830 to coordinate inspections for utility installation. City inspection requires a minimum of 48 hours notice.
- 9.24** The City requires 48 hours notice for any watermain shutoff. Watermain shutoff shall be performed by City personnel only.
- 9.25** The developer shall obtain all regulatory agency permits and approvals necessary for the proposed construction including but not limited to: Minnesota Department of Natural Resources, Army Corp. of Engineers, the Minnesota Department of Health, Minnesota Pollution Control Agency, Metropolitan Council, and Prior Lake/Spring Lake Watershed District, etc.



- 9.26** Grades within parking lots should be between 2% - 5% except as required for ADA accessible areas.
- 9.27** Heavy duty concrete aprons shall be constructed for all commercial / industrial entrances from the roadway to the property line as shown on Plate #607. The thickness of the concrete section shall be a minimum of 8". Entrances shall have a maximum slope of 10%.
- 9.28** Design and maintenance of off-street parking areas shall follow the provisions of section 1107.204 of the City of Prior Lake Zoning Code.
- 9.29** Minimum watermain size shall be 6" DIP within commercial / industrial site served with fire hydrants.
- 9.30** Pre-construction meeting is required before construction.
- 9.31** After construction an as-built record plan shall be submitted. The as-built plan shall follow the requirements of Section 10 of the Public Works Design Manual prior to issuance of any certificate of occupancy.
- 9.32** Storm sewer must be RCP or other material approved by the City Engineer.

SECTION TEN: RECORD PLANS

Record plans are required for all residential subdivisions, commercial subdivisions, commercial building sites, and public improvement projects. The record plans must follow the requirements below:

- 10.1** All as-built record plans shall be provided in 22"x34" mylar, 22"x34" paper, 11"x17" paper plots, digital format (PDF or TIF – including Engineer's signature), and CAD format.
- 10.2** Distances, lengths and ties on as-built plans shall be lettered in italics. All tie measurements to gate valves and service stubs shall be to the nearest foot.
- 10.3** All curb stop boxes and sanitary sewer lines shall be tied at the property line with at least two ties using the following priority:
- The served structure with address noted
 - Neighboring structures with address noted
 - Fire hydrants
 - Manholes
 - Catch basins (if curb and gutter are in place)
 - Other permanent structures (telephone pedestals, transformers, bridges, etc.)
 - Power poles, trees, other semi-permanent items
 - Stationing from hydrants, manholes, catch basins. These may be used with back-of-curb distance
 - Adjacent services
 - All ties should be less than 100 feet. All ties should be shown in table format.



10.4 All gate valves shall be tied with at least two ties using the following priority:

- Fire hydrants
- Manholes
- Catch basins (if curb and gutter are in place)
- Buildings with address noted
- Other permanent structures (telephone pedestals, transformers, bridges, etc.)
- Power poles, trees, other semi-permanent items.
- Stationing from hydrants, manholes, catch basins. These may be used with back-to-curb distance
- Adjacent services
- All ties should be less than 100 feet. All ties should be shown in table format.

10.5 Final quantity tabulations shall be submitted for the following:

- Sanitary sewer by footage and size
- Watermain by footage and size
- Number of hydrants, gate valves, manholes, catch basins, etc.
- Storm sewer by footage and size
- Streets by linear footage and square yards
- Sidewalks by linear footage and square yards
- Trails by linear footage and square yards

10.6 At the bottom of each as-built sheet indicate the following:

- Contractor's name
- City Project number
- "Record Plan" and date completed

10.7 Digital CAD format of record plan data ("base plan") shall meet the following criteria:

- Base Plan drawings shall be in Autodesk AutoCAD (DWG or DXF) format, compatible with the City's current software version.
- Base Plan drawings shall be in the Scott County coordinate system (feet) or a system approved by the City Engineer.
- Base Plan shall be drawn using the City of Prior Lake layer system as shown in the attached "EXHIBIT R".
- Base Plan shall have all lines representing pipes drawn continuous between fittings, bends, structures, etc. Pipe lines shall meet end to end.
- Base Plan shall have all lines representing gravity pipes drafted in the direction of flow.
- Insertion point of all blocks representing structures shall be placed at the end point of lines.



PART III **HYDROLOGY RULES**

Site hydrology must follow the rules specified herein. These rules are based on the policies set forth in the City of Prior Lake Local Surface Water Management Plan (LSWMP), the Water Resource Management Plan of the Prior Lake-Spring Lake Watershed District (PLSLWD), and the Comprehensive Water Resource Management Plan and Rules of the Scott Water Management Organization (Scott WMO).

By enforcing the rules of this Part, the City of Prior Lake is fulfilling the requirements of State Statute Chapters 103B and 103D and Minnesota Rules Chapter 8410. The City of Prior Lake enforces these rules under the terms of a Memorandum of Understanding or Memorandum of Agreement (MOU or MOA) with both the PLSLWD and Scott WMO.

In the future, when major amendments are needed in this Part, the Scott WMO and the PLSLWD must be consulted and must grant approval for said amendments as required by Scott WMO, PLSLWD, State Statute, and Minnesota Rules.

Index of Sections

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SECTION ONE: DEFINITIONS

Best Management Practices (BMPs): Practices to prevent or reduce the pollution of the waters of the state, including schedules of activities, prohibition of practices, management practices, treatment, requirements, and operating procedures and practices to control plant site runoff, spillage or leaks, sludge, or waste disposal or drainage from raw material storage. BMPs include practices documented in the Minnesota Stormwater Manual (MPCA), Protecting Water Quality in Urban Areas (MPCA, 2000), and other MPCA manuals, all as amended.

Buffer: An area of natural, non-invasive, permanently undisturbed, vegetated ground cover adjoining and surrounding a wetland measured from the delineated edge of the wetland.

Buffer Averaging: Varying the width of a buffer while maintaining compliance with all buffer requirements outlined in Section Six, Wetlands. A buffer around a wetland may have variable width as long as any minimum buffer width requirements are met. The overall buffer area must be equal in area to a corresponding fixed width buffer around the same wetland, set at the average width.



Common Plan of Development or Sale: A contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land disturbing activities may occur.

Construction Activity: A disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff, leading to soil erosion and movement of sediment into surface waters or drainage systems. Examples of construction activity may include clearing, grading, filling, and excavating.

EOF: Emergency Overflow.

Expandable Ponding: Ponds built in low areas common to multiple developments that can be easily expanded when neighboring areas develop.

HWL: High water level of a pond or basin resulting from the 100-year, 24-hour storm.

Landlocked Basin: Any depression with a contributing drainage area greater than 1 acre that does not have a natural surface outflow below the level of the 100-year, 24-hour storm, or below its OHW.

LSWMP: Local Surface Water Management Plan.

Maintained Area: Turf grass or landscaped area that receives regular maintenance such as mowing or mulching.

MS4 Permit: MPCA General Permit authorizing the discharge of stormwater associated with small Municipal Separate Storm Sewer Systems (MS4) under the NPDES/SDS permit program; Permit No. MNR040000.

Net Acre: Total land area minus any wetland, lake, or bluff acreage.

New Development: All construction activity that is not defined as redevelopment.

No-grade zone: An area around a wetland where no change in grade is allowed.

NPDES Construction Stormwater Permit: MPCA General Permit authorizing the discharge of stormwater associated with construction activity under the NPDES/SDS Program; Permit No. MNR100001.

NWL: Normal water level, the elevation of the permanent wet pool of for a pond or basin.

OE: Outlet Elevation, the primary outlet elevation of a pond or basin.

OHW: Ordinary High Water level.



Qualifying Small Sites: Sites where development, redevelopment, or change in use creates more than 3,500 square feet of new impervious area and disturbs more than 10,000 square feet of land, but where coverage under the NPDES Construction Stormwater Permit is not required.

Redevelopment: Any construction activity where, prior to the start of construction, the areas to be disturbed have 15 percent or more of impervious surface(s).

Reduce: Reduce to the Maximum Extent Practicable (MEP) unless otherwise defined in the context in which it is used.

Regional ponding: Permanent stormwater facility used to provide rate control and water quality treatment for an area that encompasses two or more entities (including but not limited to developments, subdivisions, building additions, and conditional uses).

Stormwater: Stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Management Overlay District: An area within the City that has a separate set of standards, generally defined by a tributary feature (Example: Any area draining to the Prior Lake Outlet Channel).

Structural Stormwater BMP: A stationary and permanent BMP that is designed, constructed, and operated to prevent or reduce the discharge of pollutants in stormwater.

Swale: A wide, shallow, vegetated depression in the ground designed to channel drainage of water.

Tributary Area: Total land area that drains into a pond, wetland, ditch, stream, reach, or other point of interest on site in the existing condition, prior to any drainage alterations or landlocked basin connections.

Volume Management: Limiting volume and rate of stormwater by impounding water for extended durations within a tributary area.

Volume Storage: Volume set aside for holding stormwater below a natural or created outfall that during hydrologic variation mitigates effects of increased stormwater volume.

SECTION TWO: FORMAT AND STANDARDS

2.1 Construction Drawings

Show the OE and HWL for ponds and the OHW for water bodies on the plans.

Show garage floor, low floor, and rear pad elevations and housing style for each unit on the grading plan. Include a schematic describing each housing style and typical grading.

Show limits of clearing and limits of grading on grading plan and tree preservation plan. Show removal of all trees and brush that will occur below the NWL of existing and newly created ponding areas.



Show emergency overflow routes using arrows from all low points and show elevation of high point along emergency overflow route. All emergency overflow routes shall be graded and the easement area sodded prior to Building Permit issuance.

Show or define access routes for maintenance purposes to all stormwater infrastructure and ponding areas (maximum of 8% grade, maximum of 2% cross slope, and minimum of 10' wide). Drainage and utility easements shall be dedicated at the time of final platting to provide this access.

2.2 Stormwater Management Report

Calculations shall be submitted showing proposed design elements that meet requirements of this Part. A narrative describing the proposed system shall accompany this collection of calculations. The stormwater narrative shall be a brief and clear description of the stormwater system that summarizes and reference figures, tables and plan sheets. The following are the minimum summary/narrative elements:

- Narrative describing the proposed system, referencing requirements in this Part
- Summary of existing and proposed offsite runoff rates and volumes
- Summary of volume control requirements and curve number reductions claimed
- Narrative describing volume control method and why it was chosen
- Summary of volume control system showing that it meets requirements
- Existing and proposed drainage maps
- Walker method calculations

SECTION THREE: GRADING, EROSION AND SEDIMENT CONTROL

Site erosion and sediment control described here is in addition to the Stormwater Pollution Prevention Plan (SWPPP) as required by the NPDES Construction Stormwater Permit. All sites must comply with the NPDES Construction Stormwater Permit regardless of whether the builder/developer is party to the Permit.

3.1 Grading Standards

Maximum 4:1 slopes are allowed in "maintained" areas except approved by the City. Maximum 3:1 slopes are allowed for road fill sections adjacent to water bodies, buffers, or other areas permanently protected by easements or City ownership.

Minimum grade for swales and lot grading shall be 2% or greater. Drainage swales shall have a maximum length of the greater of: (i) 300 feet; (ii) a total of eight lots draining to a point; or (iii) as approved by the City. Backyard drainage structures should be avoided. Drainage swales shall be graded and stabilized (drainage blanket, seed and mulch, or sod) prior to the issuance of Building Permits.

A minimum of 15 feet beyond the house pad shall have a slope less than 10:1.

Verify locations and design of all overland drainage routes for capacity and erosion potential. All low points in streets must have E.O.F's designed for the 100 year storm event.



3.2 Erosion and Sediment Control / SWPPP Standards.

All construction activity that results in land disturbance of equal to or greater than 1 acre or a common plan of development or sale that disturbs greater than 1 acre must comply with the requirements of the NPDES Construction Stormwater Permit. The SWPPP must be reviewed and approved by the City before an Excavating and Grading Permit is issued.

An SWPPP that meets the requirements of the NPDES Construction Stormwater Permit must be prepared for all construction activity that results in land disturbance of equal to or greater than 10,000 square feet in a shoreland zone. The SWPPP must be reviewed and approved by the City before an Excavating and Grading Permit is issued.

All provisions of the NPDES Construction Stormwater Permit & SWPPP must be adhered to for the duration of the City grading permit.

Provide name of company, contact person, and phone number for person responsible for SWPPP preparation, implementation, and maintenance.

Provide a note on the plans specifying that all down gradient sediment control BMPs shall be installed prior to any land disturbance. The City must inspect and approve these BMPs before land disturbance may occur.

Slopes greater than or equal to 4:1 shall have erosion control blanket installed immediately after finished grading.

Areas coming out of agricultural production must be seeded with a cover crop prior to development.

SECTION FOUR: SITE HYDROLOGY, STORMWATER AND VOLUME MANAGEMENT

4.1 General Standards

A hydrologic method, based on sound hydrologic theory must be used to analyze runoff for the design of stormwater conveyance systems and permanent stormwater facilities. Curve numbers shall follow recommendations of SCS Technical Release 55, Second Edition (TR-55, 1986).

Rate and volume control will be required for all development, redevelopment, or change in use that creates more than 3,500 square feet of new impervious area and disturbs more than 10,000 square feet of land. Sites exceeding these thresholds that do not require coverage under the NPDES Construction Stormwater Permit are termed Qualifying Small Sites.

4.2 Rate Control

NOAA Atlas 14 precipitation depths resulting from the 2-, 10- and 100-year, 24-hour storm events (NRCS MSE3 rainfall distribution) shall be modeled for existing and proposed conditions. NOAA Atlas 14 precipitation depths for Prior Lake are 2.84", 4.22" and 7.39" for the 2-, 10- and 100-year, 24-hour storm events, respectively.



Rate Control Standard:

Discharge rates for the 2-, 10-, and 100-year, 24-hour storm events existing before the proposed development, redevelopment, or change in use shall not be increased.

Stormwater Management Overlay District #1 – Prior Lake Outlet Channel: (Figure 1)

Rate control for tributary areas to the Prior Lake Outlet Channel shall hold total offsite peak runoff at or below the following schedule:

- 2-year, 24-hour event: 0.25 cfs per *net acre*
- 10-year, 24-hour event: 0.25 cfs per *net acre*
- 100-year, 24-hour event: 0.25 cfs per *net acre*

Alternate Rate Control Standard for Wetlands Utilized for Volume Management:

A portion of the 10- and 100-year, 24-hour storm events from a development may utilize wetlands for stormwater rate control. The wetland must be eligible based on the requirements of Section Six, Wetlands. The following schedule shall apply to the rate control a wetland provides.

The Alternate Standard for Wetlands shall hold discharge out of a utilized wetland at or below the following rate schedule:

- 2 year: 0.05 cfs per *tributary acre*
- 10 year: 0.15 cfs per *tributary acre* *
- 100 year: Existing peak flow *

* May be overridden by a stormwater management overlay district.

* In the case that the wetland cannot provide the volume for active storage in the 10- and 100-year storms, the upstream stormwater system must be sized such that the system meets this requirement.

Any proposed improvements utilizing wetlands for portions of the 10- or 100-year event storage must consider the build out condition of the watershed draining to that wetland. Developments will be allowed to utilize a wetland proportional to their share of the tributary area. Rate control must be constructed to serve the build-out condition of the entire subwatershed based on current zoning.

Information on the utilization of wetlands for *volume storage* can be found in Section 6 of this Part. Wetlands may not be eligible for utilization if land ownership or easements for stormwater uses cannot be obtained.

Additional requirements for rate control may be set by the City. The utilization of wetlands for active storage or volume storage is subject to the approval of the City.

4.3 Volume Control

Volume Control Standard 1 – Qualifying Small Sites:

Applies to qualifying small sites as defined in this Section. Site runoff volume for qualifying small sites shall be reduced from pre-project conditions by a volume equal to or greater than 0.5 inch over all new impervious surfaces, unless that standard is modified by a Stormwater Management Overlay District.



Volume Control Standard 2 – NPDES Permit Sites:

Applies to new development and redevelopment projects with land disturbance of greater than or equal to 1 acre, including projects less than 1 acre that are part of a larger common plan of development or sale and that discharge to the Prior Lake MS4.

For new development projects, site runoff shall have no net increase from pre-project conditions (on an annual average basis) of:

- Stormwater discharge volume (unless precluded by stormwater management limitations listed in this Section)
- Stormwater discharge of Total Suspended Solids (TSS)
- Stormwater discharge of Total Phosphorus (TP)

For redevelopment projects, site runoff shall have a net reduction from pre-project conditions (on an annual average basis) of:

- Stormwater discharge volume (unless precluded by stormwater management limitations listed in this Section)
- Stormwater discharge of Total Suspended Solids (TSS)
- Stormwater discharge of Total Phosphorus (TP)

Methods for Volume Control:

CN Reduction Credits:

All sites shall consider the use of curve number (CN) reduction credits as a portion of the volume control requirement. These methods include tree plantings, native grass buffers, porous pavements, impervious disconnections, green roofs, constructed wetlands, and soil amendments.

Credit for each method is given on an area basis at the following depths:

- tree plantings 0.05 inch
- native grass buffers 0.05 inch
- natural area preservation 0.05 inch
- soil amendments 0.05 inch
- impervious disconnection 0.10 inch
- porous pavements 0.50 inch + not counted in impervious calculation
- green roofs 1.00 inch + not counted in impervious calculation

An example of the credit reduction can be found in Section Nine, Miscellaneous and CN Reductions. Each CN reduction method has additional requirements described in Section 9. Additional CN reduction techniques may be proposed. Approval of such techniques and assignment of credits will be at the discretion of the City.

Greywater/Stormwater Recycling:

For many applications, the use of pond water for irrigation can be a very cost effective method of volume control. Since these systems do not directly function on a storm by storm basis an applicant must work with the City to determine the amount of volume control credit to be applied.

Infiltration:

If infiltration is used the following is required:



1. Requirements and recommendations laid out in the Minnesota Stormwater Manual shall be followed.
2. Infiltration tests shall be used to provide a base infiltration rate of surrounding soils. The base rate shall be reduced to a conservative rate for the design. The infiltration tests shall be conducted at the location and elevation of the proposed infiltration system.

Bioretention:

If bioretention is used the following is required:

1. Requirements and recommendations laid out in the Minnesota Stormwater Manual shall be followed.
2. Infiltration tests shall be used to provide a base infiltration rate of surrounding soils. The base rate shall be reduced to a conservative rate for the design.

Stormwater Wetlands/Constructed Wetlands:

Constructed wetlands may be utilized to abstract volume. Since these systems do not directly function on a storm by storm basis an applicant must work with the City to determine the amount of volume control credit to be applied.

1. Requirements and recommendations laid out in the Minnesota Stormwater Manual shall be followed.

Offsite Stormwater Management:

For Qualifying Small Sites, any of the above credits can be used at an offsite location to meet the volume control requirement with the approval of the City. The offsite location must be within the same watershed. Offsite BMPs must be permanently protected through an easement, development agreement and/or maintenance agreement, to ensure the volume reduction feature continues to function as designed.

For NPDES Permit Sites, offsite stormwater management may be allowed for meeting TSS and/or TP reduction requirements [MS4 Permit, Part III.D.5.a(4)].

Stormwater Management Overlay District #2 – All Landlocked Basins

If a development is in a tributary area to a landlocked basin, the following restricted volume control is required for that tributary area:

- Volume shall be reduced in the proposed condition by a volume equal to or greater than 1.0 inches over all new impervious surfaces.
- Extended duration detention is required such that volume discharging offsite in the proposed condition not exceed the volume discharging offsite in the existing conditions in the 24 hour period following the peak of the 100-year, 24 hour rainfall event (NRCS MSE3 rainfall distribution).

Provision of an outlet or emergency overflow does not reduce the amount of Volume Control required.



Stormwater Management Limitations and Exceptions:

Infiltration techniques to achieve volume control requirements are prohibited when infiltration BMPs will receive discharges from, or are constructed in areas:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA
- Where vehicle fueling and maintenance occur
- With less than 3 feet of separation distance from the bottom of the infiltration system to the elevation of seasonally saturated soils or the top of bedrock
- Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater

Infiltration techniques to achieve volume control requirements, (without higher engineering review and City approval) sufficient to provide a functioning treatment system and prevent adverse impacts to groundwater, are restricted when the infiltration BMPs will be constructed in areas:

- With predominately Hydrologic Soil Group D (clay) soils
- Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features
- Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13
- Where soil infiltration rates are more than 8.3 inches per hour

For linear projects where the lack of right-of-way precludes the installation of volume control practices that meet the volume control requirements, and a reasonable attempt has been made to obtain right-of-way during the project planning process, exceptions for stormwater discharge volume under the following circumstances:

- The owner and/or operator of a construction activity is precluded from infiltrating stormwater through a designed system due to any of the infiltration-related limitations described above, and;
- The owner and/or operator of the construction activity implements, to the maximum extent practicable, volume reduction techniques other than infiltration on the site of the original construction activity that reduces stormwater discharge volume, but may not meet the volume control requirements.

Wellhead protection area:

- Soil infiltration features must comply with requirements and limitations of wellhead protection plans.

Stormwater Mitigation Provisions

Stormwater mitigation provisions shall apply to all NPDES Permit Sites, as defined in this section. Stormwater mitigation shall comply with the MS4 Permit, Part III.D.5.a(4), Mitigation Provisions (page 17 of 38).



Long-Term Maintenance of Structural Stormwater BMPs

Structural stormwater BMPs not owned or operated by the City of Prior Lake that were implemented to meet the conditions for post-construction stormwater management in the MS4 Permit, Part III.D.5.a(2) shall comply with the MS4 Permit, Part III.D.5.a(5).

4.4 Low Floor / Low Opening Elevations

Low Floor Elevations and Low Opening Elevations are to be designed to the following standards:

Low floor elevations shall be at least:

- 3' Above OHW or Highest Known (whichever is greater)
- 2' Above HWL

Low opening elevations shall be at least:

- 2' Above EOF

In the case of a landlocked basin, low floor elevations shall be at least:

- 3' above the basin overflow elevation or 3' above back to back 100-year, 24-hour rainfall events (NRCS MSE3 rainfall distribution).

4.5 Additional Requirements

For development or redevelopment projects, the developer and/or property owner is responsible for the removal of all significant vegetation (trees, stumps, brush, debris, etc.) from any and all areas which would be inundated by the designated controlled outlet elevation of any required ponding areas as well as the removal of all dead trees, vegetation, etc., to the high water level of the pond.

Upon the completion of the construction of a Structural Stormwater BMP, the developer is required to submit an as-built record plan of the ponding area certifying that the Structural Stormwater BMP constructed meets all design parameters. The developer may over-excavate the bottom of stormwater ponds to compensate for erosion that will occur. The developer will be responsible for verifying, at the end of the warranty period, that the ponds are providing the required volume.

4.6 Water Quality

The water quality treatment standard for new stormwater ponds is a 60% reduction in Total Phosphorus (TP) and 90% reduction in Total Suspended Solids (TSS) from the proposed developed area draining to a stormwater pond. Section Seven, Stormwater Pond Design Criteria, details standard wet pool detention pond design criteria.

Alternatives to stormwater ponds may be proposed but must meet water quality treatment standards. If alternatives are proposed, documentation must be submitted by the applicant based on literature values or independent laboratory work to demonstrate the performance of the alternative being proposed.



SECTION FIVE: DRAINAGE ALTERATIONS AND FLOODPLAIN MANAGEMENT

5.1 Landlocked Basins

If a landlocked basin (tributary area < 25 acres) is proposed to be connected to a downstream system the following is required:

- If the landlocked basin contains a wetland, the rate of outflow from that wetland must follow provisions for the “Alternate Rate Control Standard for Wetlands utilized for Volume Management” detailed in Section 4.
- If the landlocked basin contains a wetland, Stormwater Utilization must occur to the maximum extent allowable under provisions for wetlands detailed in Section 6.
- If the landlocked basin does not contain a wetland, or the wetland is legally proposed to be filled under the Wetland Conservation act, the volume storage lost to connection must be mitigated by increasing volume storage of a pond or wetland equal to the lost volume of the landlocked basin utilized in the 100 year storm event.
- All Provisions described in Section 5, Drainage Alterations must be followed.

If a landlocked basin (tributary area > 25 acres) is proposed to be connected to a downstream system the following is required.

- All requirements listed above apply.
- The PLSLWD or Scott WMO must review the proposed connection. All conditions of Scott WMO or PLSLWD approval must be met.

5.2 Drainage Alterations

If the applicant proposes to artificially drain, connect a landlocked basin, obstruct, or redirect the natural flow of runoff the following is required:

Drainage alteration (tributary area < 5 acres) requirements:

Demonstrate:

- That overall change in flow volumes to each subwatershed do not burden downstream infrastructure.

Requirements:

- Considered a minor alteration provided applicant demonstrates that downstream burdens do not exist.
- If there is evidence to suggest there is or will be a flooding problem immediately downstream of the proposed alteration, the requirements for drainage alteration of between 5 and 25 acres shall apply.

Drainage alteration (tributary area > 5 and < 25 acres):

- All requirements listed above apply.

Demonstrate:

- There is a necessity for such a change.
- Reasonable care has been taken to avoid impact to upstream or downstream land.
- Efforts have been taken to mitigate changes in downstream volume and rates.

Requirements:

- City approval of drainage alterations is required.



- Peak rate to the gaining subwatershed of the drainage alteration must be held to rate control standard per tributary acre included in the development.

Drainage alteration (tributary area > 25 acres) requirements:

- All requirements listed above apply.
- The PLSLWD or Scott WMO must approve the proposed alteration. All conditions of Scott WMO or PLSLWD approval must be met.

5.3 Floodplain Alterations

If grading takes place within the floodplain (below the predicted 100-year flood elevation for a public water) no net decrease in flood storage is allowed.

SECTION SIX: WETLANDS

6.1 Procedure

The following procedure is dependent on the location of the wetland(s). Some requirements, common to both Scott WMO and PLSLWD are listed under “both.” To determine which watershed requirements apply to a project, applicants should contact the City early in the planning process.

Stormwater susceptibility is determined from the results of a wetland functional assessment (Minnesota Routine Assessment, or MnRAM) to determine if a wetland is eligible for stormwater utilization.

Both:

The applicant must submit a wetland delineation and a MnRAM wetland functional assessment; these documents are then reviewed by the City.

If impacts are proposed to any wetland, the procedure follows the requirements of the Wetland Conservation Act and these rules.

A wetland is given a functional classification dependent on the value for vegetative diversity determined by MnRAM. Rankings are: Exceptional, High, Medium, and Low.

6.2 Requirements

PLSLWD:

Wetland replacement for impacts occurring within the PLSLWD must take place within the District at a rate of 0.5:1 (New Wetland Credit per acre impacted.)

Both:

The City must review and approve of the wetland delineation and MnRAM results.

Any drainage, fill, excavation or other alteration of a public waters or wetlands is regulated by the Wetland Conservation Act (WCA), State Statutes 103G.245 and regulations adopted hereunder. The City is the Local Governing Unit (LGU) under these rules.



A conservation easement is required over all buffers. Conservation easements shall be dedicated to the PLSLWD in District areas or to the City in WMO areas.

6.3 Stormwater Susceptibility

Both:

Highly Susceptible: A wetland is considered highly susceptible if:

- Forty percent or more of the wetland complex has highly susceptible wetland communities as shown in Table 6.1 and;
- Highly susceptible wetland communities have medium to exceptional floral diversity/integrity.

Moderately Susceptible: A wetland is considered moderately susceptible if:

- Forty percent or more of the wetland complex has a moderately susceptible wetland communities shown in Table 6.1 and;
- Moderately susceptible wetland communities have medium to exceptional floral diversity/integrity.

Least Susceptible: Wetlands with low floral diversity, as determined by MnRAM, were considered to be least susceptible wetlands.

Slightly Susceptible: Wetlands that do not fall under the high, moderate or least susceptible categories are considered slightly susceptible.

Table 6.1

Wetland Community Susceptibility to Stormwater Impacts

Highly Susceptible Wetland Communities*		Moderately Susceptible Wetland Communities*
Sedge Meadow	Low Prairies	Shrub-Carrs
Bogs	Coniferous Swamps	Alder Thickets
Coniferous Bogs	Hardwood Swamps	Fresh (wet) Meadows
Open Bogs	Seasonally Flooded Basins	Shallow Marsh
Calcareous Fens		Deep Marsh

- Wetland communities determined using key provided in MnRAM.



6.4 Stormwater Utilization

Table 6.2
Stormwater Utilization

Hydroperiod Standard	Highly Susceptible	Moderately Susceptible	Slightly Susceptible	Least Susceptible
100-year Storm Bounce	Existing	Existing + 0.5 ft	Existing + 1.0 ft	No Limit
Discharge Rate	Existing	Section 4: Wetland Standard (1)	Section 4: Wetland Standard (1)	Section 4: Wetland Standard (1)
1 & 2 year NRCS event Inundation	Existing	Existing + 1 Day	Existing + 2 Days	Existing + 7 Days
10 yr NRCS event Inundation	Existing	Existing + 7 Days	Existing + 14 Days	Existing + 21 Days
(2) Outlet Control Elevation	None: Note OE/HWL on Map	None: Note OE/HWL on Map	0 – 2 ft additional storage	0 – 4 ft additional storage

- (1) Rates shall be held to the rate control requirements of Section 4, alternate rate control standard for wetlands, unless obtaining these rates is prevented by inundation period requirement.
- (2) Outlet Control Elevation changes can be made to mitigate *volume storage* as required in Section 5.

6.5 Buffer & No-Grade Zone Requirements

PLSLWD:

The following are the buffer and minimum no-grade zone requirements for each functional classification. The tiered buffer requirement is based on a functional classification of; exceptional, high, medium or low, and can be found using the results of the MnRAM vegetation assessment as described above

Table 6.3
PLSLWD Buffer, Setback and No-Grade Matrix

Buffer Requirement	Exceptional	High	Medium	Low
Average Buffer Width (ft)	30	30	30	30
Minimum Buffer Width (ft)	20	20	20	20
Minimum No-Grade Zone (ft)	10	10	10	10
Foundation setback from <i>Buffer</i>	20	20	20	20



Scott WMO:

The following are the buffer and minimum no-grade zone requirements for each functional classification. The tiered buffer requirement is based on a functional classification of; exceptional, high, medium or low, and can be found using the results of the MnRAM vegetation assessment as described above.

Table 6.4
Scott WMO Buffer, Setback and No-Grade Matrix

Buffer Requirement	Exceptional	High	Medium	Low
Average Buffer Width (ft)	65	50	30	25
Minimum Buffer Width (ft)	25	25	25	25
Minimum No-Grade Zone (ft)	25	25	25	25
Foundation setback from <i>wetland</i>	35	35	35	35

Both:

Grade changes or other disturbances are not allowed in no-grade zones with the following exceptions: Pipe outlets and associated riprap, reseeding or soil amendments, embankment and impacts associated with an approved CIP transportation corridor, grade changes adjacent to approved WCA impacts to wetlands, approved wetland or flood storage mitigation areas and temporary impacts associated with utility installation.

A buffer width may vary using “Buffer Averaging.” Buffer width may be reduced to the minimum buffer width, but the overall buffer area must be equal in area to a hypothetical fixed width average buffer around the same wetland.

6.6 Buffer Vegetation Requirements:

Both:

Buffer must be seeded with a native mix with forbs. A two year maintenance period is required as part of the developers agreement or other City agreement. If at the end of the two year maintenance period the seed has not established, there is a prevalence of invasive species, or there are other encroachments, over-seeding or reseeding may be required.

Land use within a buffer shall be subject to the following restrictions: Buffer vegetation shall not be cropped, cultivated, hayed, mowed, fertilized, or subject to the placement of mulch or yard waste or otherwise disturbed, except for the periodic cutting or burning that promotes the vegetative health of the buffer or as needed to address invasive or noxious species. Buffers may be temporarily disturbed when permitted by the City. No new structure or hard cover may be placed within a buffer area. No fill, debris, or other material may be excavated from or placed in a buffer area.



Buffer strips shall be required whether or not the wetland is on the same parcel as the proposed development or on an adjacent parcel. Wetlands on adjacent parcels need not be delineated, but an estimation using aerial photos or other methods will be required.

If acceptable vegetation is in place, reseeding is not required. Acceptable natural vegetation has the following characteristics: A continuous dense layer of perennial grass uncultivated or unbroken for 5 years or has an overstory of trees or shrubs uncultivated or unbroken for 5 years.

6.7 Buffer Monuments and Easement:

Both:

Buffer strips shall be identified within each parcel by permanent monuments. A monument shall be required at each parcel line where it crosses a buffer strip and shall have a maximum spacing of 200 feet along the edge of the buffer strip. An additional monument shall be placed at the midpoint of each lot and/or as necessary to accurately define the edge of the buffer strip (considering curvature). A monument shall consist of a post and a buffer strip sign. The signs shall comply with City Plate #203, Wetland Boundary Signs. The signs shall be installed prior to the issuance of a Building Permit and should be shown on the approved plans. Buffer strip signs must be purchased from the City at a cost shown on the latest fee schedule.

All buffer strips must be covered by drainage and utility easement and conservation easements.

Drainage and utility easement shall be granted to the City of Prior Lake. Conservation easements shall be dedicated to the PLSLWD in District areas or to the City in WMO areas.

SECTION SEVEN: STORMWATER POND DESIGN CRITERIA

Water Quality Volume

The permanent pool volume for stormwater ponds shall be calculated using the Design Calculations for Wet Detention Ponds by Dr. William W. Walker (1987) presented below.

A_w = Total Watershed area (acres)

A_i = Area of impervious surfaces draining to stormwater conveyors (acres)

F_i = Impervious Fraction = $\frac{A_i}{A_w}$

CN = area weighted mean NRCS curve number for pervious portion of watershed (Based on soil type and land cover)

P = Design storm size = 2.5 (inches)

$S = \left(\frac{1000}{CN} \right) - 10$ = Maximum soil retention (inches)



$$R = P \times F_i + \frac{(P - 0.2 \times S)^2}{P + 0.8 \times S} \times (1 - F_i) = \text{Runoff for design storm (inches)}$$

$$V = \frac{R \times A_w}{12} = \text{Volume of permanent pool (acre-feet)}$$

Rate Control Volume

The active volume (between the OE and the HWL) shall be sized to meet the rate control requirements outlined in Section 4, Rate Control, using a maximum slope at 4:1 (H:V).

Additional Design Criteria

The use of regional ponding, stormwater wetlands, or expandable ponding is encouraged by the City.

A 10' wide aquatic vegetation bench is required below the OE of the pond, with the maximum slope of 10:1.

The invert elevations of pond inlet flared end sections shall match the OE of the pond. Submerged outlets will only be allowed at the discretion of the City.

Outlet control structures from ponding areas are required as directed by the City. Location and appearance of outlet structures shall be subject to City approval and may require landscape screening.

The EOF of a pond should be at least 1 foot higher than the HWL. The top of dike elevation should be at least 2 feet higher than the HWL.

Dikes used to create rate control ponds must at maximum use 4:1 slopes and measure 10' wide at top. At minimum, a clay core should be designed in consideration of groundwater flow. If head difference between OE of pond and downstream land exceeds 3', soils data will be required in the area and dike design must address maintenance of pond water level and dike stability. Outlet pipes through engineered dikes with head differences greater than 6' should be designed with anti-seep collars. Sand bedding shall not be used through dike section.

Pond outlets shall provide floatable debris skimming for the 10-year, 24-hour rainfall event (NRCS MSE3 rainfall distribution). A manhole with a baffle wall with orifice or notch is recommended to control rate. Outlet rate control manholes shall have a top mitered to conform to fill. A 66" minimum diameter is required to provide access to both sides of the weir wall.



**SECTION EIGHT:
STORM SEWER DESIGN CRITERIA**

Storm sewer facilities shall use design criteria utilizing a rational or hydrograph method based on sound hydrologic theory to analyze the storm water runoff and proposed development. (Such as the Soil Conservation Service TR-55 Urban Hydrology for Small Watersheds)

Storm sewer facilities shall be designed for a 10-year, 24-hour rainfall event (NRCS MSE3 rainfall distribution) for local pipe design and a 100-year, 24-hour rainfall event (NRCS MSE3 rainfall distribution) for ponding detention basin design and trunk facilities. Pipe size and grade shall be greater than 15" ID and 0.5% slope. Pipe class shall conform to design standards as shown in "EXHIBIT M".

Drainage calculations shall be submitted to show the sizing of pipe, ponds, emergency overflow spillways, and catch basin interception analysis. Assuming catch basins can receive a maximum of 3 cfs, multiple catch basins may be required at low points.

Provide for overflow routes to drain all street and backyard low points.

**SECTION NINE:
MISCELLANEOUS AND CN REDUCTIONS**

Section 4 detailed a credit system used for volume management; the following is additional information on that credit system.

The following calculation is an example of volume control met entirely through the use of CN reductions. This will not be suitable for most sites but serves as an example on how to use a variety of methods to meet the requirement.

50 acre site with 20% impervious surfaces, = 10 acres new impervious (actual calculation required)
 10 acres impervious x 0.5in volume control requirement = 5ac-in or 18150cf volume.

(see next page for sample calculation)

Volume Credits Claimed:

CN Reduction Category	Area (acres)	Area basis depth (in)	Credit (ac-in)
Native grass buffers	5	0.05	0.25
Pervious pavers	1	0.50	0.50
Pervious paver area no longer counted in impervious calculation	1	0.50	0.50
Tree plantings	5	0.05	0.25
Soil amendments	30	0.05	1.50
Impervious area disconnection	5	0.10	0.50
Green roof	1	1.00	1.00
Green roof area no longer counted in impervious calculation	1	0.50	0.50
Total Volume Credits:			5.00 ac-in



Additional Requirements for CN Reduction

Tree plantings:

Area determinations for tree plantings shall be assumed at 500sf per tree. *(Based on an conservative average water use of 1cf per day per tree at 7 years in an open canopy condition, less average tree mortality, 3days water use per storm $0.7*(1/(.05/12))*3$ the beneficial effects of canopy intercept are ignored).* This reduction can be used in combination with the native grass buffer (ex. Oak prairie restoration could count as tree planting, native grass and soil amendment reduction).

Native grass buffers:

Area determination shall only include buffers currently, or proposed to be, established in a native species. Area must be included in a permanent conservation easement dedicated to the City or PLSLWD.

Natural area preservation:

Upland wooded or prairie areas proposed include only those areas not already prohibited from development (buffers, bluffs, etc.) and must be kept in their natural state through outlot dedication and/or conservation easements. No grading is allowed in preservation areas. Preservation area must be denoted through the use of decorative fencing, informational signing, or other methods approved by the City.

Soil amendments:

Soil amendments must take place after building construction is complete to avoid compaction during the construction process.

Soil amendment shall be designed to mitigate the effects of compaction due to mass grading by returning the soil to a loose, friable state able to transmit water.

All soil amendments must be designed by a licensed professional engineer or professional soil scientist. Soil design must promote deep loosening of the mass-graded soils strata, and improvement of infiltration and moisture retention characteristics of the topsoil. (Example: 18" deep ripping or tilling of base soils and compost mix after mass grading, followed by the application of a designed mix of compost, peat, sand, and topsoil and spread at 6" depth).

Impervious disconnection:

Area determination for impervious disconnections will be that roof area or select pavement area that is disconnected from the drainage system and allowed to flow over natural grounds that are designed to promote infiltration and transpiration. Design shall not cause wet lawn conditions, basement seepage, or other nuisances. Design must discourage reconnection to impervious surfaces by providing a minimum of a 75' pervious flow path.

Porous pavements:

Area determination for porous pavements will be only that area meeting the following requirements: Porous pavement systems must use permeable base material and promote infiltration. Porous pavements must be designed by a licensed professional engineer and approved by the City.



Green roofs:

Area determination for green roofs will be only that area meeting the following requirements: Design must be must be designed by a professional architect and meet Building Code. The design must be approved by the City.

More information on these and other CN reductions and site design measures can be found in the MPCA stormwater manual.



PART IV **INSPECTIONS, TESTING AND OTHER REQUIREMENTS**

The purpose of this part of the Public Works Design Manual is to provide guidance on the pre-construction meeting, subdivision monumentation, construction staking, construction testing, and inspection. Work quality, project progression, and minimizing inconveniences are primary goals of the City during public infrastructure construction.

Index of Sections

Section One	Pre-Construction Conference
Section Two	Subdivision Monumentation
Section Three	Construction Staking Requirements
Section Four	Construction Inspection and Testing Requirements
Section Five	Schedule of Required Tests
Section Six	Schedule of Required Final Inspections

SECTION ONE: **PRE-CONSTRUCTION CONFERENCE**

Prior to any construction activity relating to grading and/or public infrastructure installation within the City, whether public or private, a pre-construction conference is required. Please refer to attached "EXHIBIT E" for a sample format to conduct the Pre-construction Meeting. The following pre-construction conference requirements are identified.

- 1.1 Include pre-construction conference requirement in the contract specifications.
- 1.2 Construction specifications require the Contractor and all primary subcontractors to attend the pre-construction conference.
- 1.3 The pre-construction conference is scheduled by the Project Manager and coordinated through a City designated representative.
- 1.4 Pre-construction conference is held at the Prior Lake City Offices.
- 1.5 The following parties are required to attend the pre-construction conference: Prime contractor, all primary subcontractors, and a representative from all utility companies, developer and/or designated representative, and affected regulatory agency representatives.
- 1.6 Submittals required prior to the pre-construction conference:
 - Bar chart schedule.
 - Subcontractor and supplier list.
 - Manhole and catch basin shop drawings.
 - Concrete mix design.
 - Bituminous mix design.
 - Aggregate base source and testing results.
 - MnDOT certified testing personnel to be used.



1.7 The following pre-construction format will generally be adhered to:

- General introduction and sign-up sheet.
- Verify contract status/requirements.
- Identify project management team.
- Contractor's authorized representative (including Superintendent, Foreman and Emergency Phone Numbers).
- Engineer's description of project. (including Contract Start Date, Working Days, *Contract Completion Date as specified in the development agreement, and Special scheduling, if any*).
- Extra sets of plans and specifications.
- Contractor's proposed written schedule and bar sheet required (including Start Date, Days and Hours of Work - identifying City Code restrictions, Work Force and Equipment, and Subcontractors).
- Utility companies and locations (including gas, telephone, electric, cable and City).
- Traffic (including Barriers and Enclosures, Access Roads, Provide and Maintain Proper Warning Control Devices, Notification to City's designated representative in addition to Police, Fire, School District, Ambulance Service, designated public transit service and street department of road closure 48 hours in advance, and permit requirements of jurisdictional agency for open cutting public streets).
- Temporary removal and reinstallation of existing street signs and mailboxes. **[Do not remove street signs that are the property of the City. Notify City Street Department 48 hours in advance to remove appropriate City street signs.]**
- Use of City water system. (including Compliance with regulations of the MN Dept. of Health) **[Valve isolation and hydrant use for obtaining water is prohibited. Contact the Public Works Department for locations of water loading stations or for valve isolation requests.]**
- Permit To Proceed. **[Prior to any construction activities, a Permit to Proceed must be issued by the City]** (Please refer to attached "EXHIBIT F")

SECTION TWO: SUBDIVISION MONUMENTATION

The Developer shall install all subdivision monumentation within one (1) year from the date of recording the plat, or monumentation shall be installed on a per lot basis at the time the Building Permit is issued, whichever occurs first. At the end of the one (1) year period from recording of the plat, the Developer shall submit to the City Engineer written verification by a registered land surveyor that the required monuments have been installed.

SECTION THREE: CONSTRUCTION STAKING REQUIREMENTS

3.1 SANITARY SEWER:

- Line and grade stakes shall be set every 25' for the first 100' out of the downstream manhole, and every 50' thereafter to the next manhole.
- A line reference stake shall be set for each manhole.
- Wye locations, stationed from the downstream manhole, shall be staked and the



stationing shown on the cut sheets.

- Proposed elevations of service inverts at the 45 degree bend for the end riser shall be staked and shown on the cut sheets.
- Proposed structure top elevation and upstream and downstream invert elevations shall be shown on the cut sheets (manhole castings shall be set $\frac{1}{4}$ " to $\frac{1}{2}$ " below finished street grade).

3.2 WATERMAIN:

- Line and grade stakes shall be set every 50' (top of watermain shall be staked 8.0 below finished elevation).
- Fitting locations shall be staked and the stationing shown on the cut sheets.
- Line and grade stakes shall be set at hydrant break-off for all hydrants.
- Line and grade stakes shall be set for all valves
- Proposed elevations of the tops of curb boxes shall be staked and shown on the cut sheets. Line reference stakes shall be set for curb box locations.

3.3 STORM SEWER

- Line and grade stakes shall be set every 25' for the first 100' out of the downstream manhole, and every 50' thereafter to the next manhole or catch basin.
- An offset hub and line reference stake to back of curb shall be set for all catch basins and catch basin manholes.
- Catch basin top and invert elevations and manhole top elevation and upstream and downstream invert elevations shall be shown on the cut sheets.

3.4 STREETS

- When centerline stakes are set for grading subgrade, cut sheets shall be provided, Blue Top every 50' for final aggregate base tolerancing.
- Line and grade stakes shall be set every 25' and for all begin, mid and end radius points of the curb at street intersections.
- Cut sheets shall be provided for all curb and gutter construction.

NOTE: ALL CUT SHEETS MUST IDENTIFY BENCH MARKS USED, BENCH MARK ELEVATIONS, ACTUAL HUB ELEVATIONS, PROPOSED ELEVATIONS, AND CUTS OR FILLS FOR ALL ENTRIES.

It is also imperative that the contractor and project inspector for the City have cut sheets in hand prior to construction. The City will order Contractor to cease working whenever this requirement is not met.

SECTION FOUR: CONSTRUCTION INSPECTION AND TESTING REQUIREMENTS

It is the policy of the City of Prior Lake that any construction activity within the City be monitored/inspected by the City staff personnel or a designated representative on behalf of the City. Refer to "EXHIBIT G" for a description of the City's policy for construction inspections and testing for private development projects.



All City construction designated project representatives are required to complete daily a "Construction Project Status Report" which is submitted weekly to the City.

All public infrastructure facilities will be tested in accordance with the appropriate sections of the City of Prior Lake Specifications, this manual, and witnessed by the City designated project representative.

SECTION FIVE: SCHEDULE OF REQUIRED TESTS

5.1 WATERMAIN PRESSURE TEST

- Follows installation of all main line pipe, services and hydrants, and pre-testing by Contractor.
- Requires 48 hours notice be given to Project Representative by Contractor prior to record test.
- Witnessed by Project Representative and follow City of Prior Lake specification section 02611.3 G
- Pressure drop shall not exceed 1 psi in a 2 hour period at 150 psi.

5.2 ELECTRICAL CONDUCTIVITY TEST

- Performed on all iron pipe water mains within 7 days of satisfactory completion of the pressure test.
- Requires 48 hours notice to be given to Project Representative by Contractor prior to test.
- Witnessed by Project Representative and representative of City Public Works Department and follow City of Prior Lake specification section 02611.3 H.
- Electrical conductivity shall be 350 amps for 3 minutes then 400 amps for 1 additional minute.

5.3 WATERMAIN BACTERIOLOGIC QUALITY TEST

- Performed on the completed watermain after final flushing and before being placed in service.
- Samples taken by an approved testing laboratory.
- Follow City of Prior Lake specification section 02611.3 E
- After final flushing, one test shall be taken for every 1000 feet of pipe.

5.4 SANITARY SEWER AIR TEST

- Follows completion of all main line pipe, service pipe and manhole installations.
- Requires 48 hours notice to be given to Project Representative by Contractor prior to test.
- Witnessed by Project Representative and follow City of Prior Lake specification section 02621.3 F1.

5.5 SANITARY SEWER MANDREL TEST

- Follows completion of all main line pipe installations by a minimum of 30 days.
- Requires 48 hours notice be given to Project Representative by Contractor to test.
- Witnessed by Project Representative and follow City of Prior Lake specification section 02621.3 G.



5.6 SANITARY SEWER FORCEMAIN PRESSURE TEST

- Follows completion of all main line pipe installations by a minimum of 30 days.
- Requires 48 hours notice be given to Project Representative by Contractor to test.
- Witnessed by Project Representative and follow City of Prior Lake specification section 02621.3 F5.

5.7 SANITARY SEWER TELEVISION

- Follows successful mandrel test and completion of punchlist.
- Report and video submitted to the City of Public Works Department.

5.8 STREET CONSTRUCTION TESTING

- Witnessed by Project Representative and follow City of Prior Lake specification section 1603.

SECTION SIX: SCHEDULE OF REQUIRED FINAL INSPECTIONS

6.1 SANITARY SEWER

Final Inspection of Sanitary Sewer

- Performed after completion of final manhole casting adjustments and construction of first lift of bituminous, and prior to any building Certificate of Occupancy Permit by designated City Project Manager.
- Punch list of any required corrective work is given to designated City Project Engineer.
- After completion of all punch list items is certified by contractor, corrective work is re-inspected by designated City Project Manager.

6.2 WATERMAIN

Final Inspection of Main Line Valves

- Performed after construction of first lift of bituminous by designated City Project Manager.
- Punch list of any required corrective work is given to designated City Project Manager.
- After completion of all punch list items is certified by contractor, corrective work is re-inspected by designated City Project Manager.

Final Inspection of Hydrants, Hydrant Valves and Curb Boxes

- Performed after completion of all street construction, including final boulevard grading and restoration, by designated City Project Manager.
- Punch list of any required corrective work is given to designated City Project Manager.
- After completion of all punch list items is certified by contractor, corrective work is re-inspected by designated City Project Manager.



6.3 LAMPING AND FINAL INSPECTION OF STORM SEWER

- Performed after completion of all street construction, including final grading and restoration of boulevards, ponding areas and drainage swales, by designated City Project Manager.
- Punch list of any required corrective work is given to designated City Project Manager.
- After completion of all punch list items is certified by contractor, corrective work is re-inspected by a designated City Project Manager.

6.4 FINAL INSPECTION

- Performed after completion of all street construction, including final grading and restoration of boulevards, ponding areas and drainage swales by a designated City Project Manager.
- Punch list of any required corrective work is given to designated City Project Manager.
- After completion of all punch list items is certified by contractor, corrective work is re-inspected by a City designated Project Manager.

6.5 WARRANTY INSPECTION

- Performed 90 days prior to expiration of the warranty period.
- Refer to the Development Contract for warranty terms.