

# VILLAGE OF WINNETKA



## PUBLIC WORKS AND ENGINEERING DESIGN GUIDELINES

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**NOTES TO READER**

These Public Works and Engineering Design Guidelines have been written to set forth the technical aspects governing development/redevelopment of land within the jurisdiction of the Village of Winnetka.

Please consult the requirements for the Engineering Design Guidelines prior to submitting plans for review.

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# ENGINEERING DESIGN GUIDELINES

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## I. ENGINEERING PLAN REQUIREMENTS

The submittal for engineering review shall include, as a minimum, the following items:

### A. SUBMITTAL REQUIREMENTS

1. Four (4) sets of engineering drawings on 2' x 3' sheets, using the **North American Vertical Datum (NAVD) 1988 datum**, topographic survey, project specifications and any necessary calculations or supporting information.
2. The following permit applications and copies of approved permits, if applicable, must be received by the Public Works Department prior to final engineering approval of a proposed permit.
  - a. Cook County Highway Department (CCHD) for those projects contiguous to Locust Street south of Hill Road.
  - b. Illinois Department of Transportation (IDOT)
    - (1) Permit for all work within IDOT right-of-way, including Sheridan Road, Green Bay Road, Willow Road from Provident Avenue to West End, Tower Road at Green Bay Road, and Forest Way.
    - (2) Permit for all work within designated flood way from the Department of Natural Resources, Division of Water Resources.
  - c. Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) for new sanitary sewer installation or repair, commercial sanitary sewer service installation, and storm water detention for sites 5 acres and over.
  - d. Illinois Environmental Protection Agency (IEPA)
    - (1) Public Water Supply Construction Permit for public water main construction.
    - (2) Public Sanitary Sewer Construction Permit
    - (3) National Pollutant Discharge Elimination System (NPDES) Permit (Phase I or Phase II). All construction sites disturbing between 1 and 5 acres must obtain a Phase II permit.
  - e. Federal Emergency Management Agency for work within the Flood Plain requiring a Letter of Map Amendment or Letter of Map Revision.
  - f. North Cook County Soil and Water Conservation District (For Development of Parcels Over 2 Acres)
  - g. U.S. Army Corps of Engineers
    - (1) Wetlands
    - (2) Lake Michigan Shore Construction
  - h. Cook County Forest Preserve District for work within CCFP property or discharge of storm waters onto CCFP property.
  - i. Various Railway Authorities for work within Railway rights-of-way
  - j. Various miscellaneous authorities.

## B. ENGINEERING CERTIFICATION

Engineering plans, specifications and all calculations submitted for review must be sealed and signed by an Illinois Licensed Professional Engineer. Said attestation must include the expiration date of the Professional Engineer's License and the date the seal was affixed.

## C. DRAWING REQUIREMENTS

Complete drawings shall contain, at a minimum, the following information:

1. North arrow and scale.
2. Street names and property address.
3. Existing rights-of-way, pavement widths and easements.
4. An overall grading plan drawn to a minimum scale of one (1) inch = twenty (20) feet. The topographic survey of the site must show existing and proposed contours for the entire subject parcel and adjacent areas at an interval not less than one-foot (one-half foot if the average slope of the parcel in any direction is less than 2%) and not less than five (5) feet in ravine areas and in areas with grade differentials of more than 25%

This topographic survey is to be done using **NAVD 1988**, for those properties located west of Green Bay Road and east of Sheridan Road. Surveys shall extend at least thirty (30) feet off site in every direction, or to such further point or points as determined to be required by the Village Engineer. For all other areas, a relative datum is acceptable.

The original topographic survey shall be prepared and certified by an Illinois Licensed Professional Engineer or Land Surveyor.

The grading plan shall contain a statement reading as follows: "The proposed grade changes will not cause surface water runoff to be diverted onto or detained on abutting or nearby property, will not significantly alter existing drainage patterns and will not increase or concentrate storm water runoff onto abutting or nearby property." This statement shall be signed by the property owner or an Illinois Licensed Professional Engineer or Land Surveyor, where land grading is being performed in conjunction with building construction.

5. Existing and proposed top of foundation elevations, finished floor elevations and exact locations of all buildings on and adjacent to the site, within thirty (30) feet of the subject property.
6. Spot elevations along all property lines, all property corners and the existing/proposed finished grades adjacent to the foundation along the perimeter of the structure, and spot elevations throughout the site at an interval no greater 25'. A tighter survey grid may be required on small sites or sites with varied grade characteristics.
7. Location, elevation and slope of existing and proposed paved areas.
8. Location and elevation of all existing and proposed drainage courses, swales, catch basins or other drainage structures, pavement surfaces, patios, swimming pools, etc. on and within thirty (30) feet of the subject property.
9. Location, size, material and elevation of existing and proposed storm sewers, sanitary sewers and water mains, and all existing and proposed services to each.
10. Location of all downspout and sump pump discharge points on the subject property.
11. **A Storm Water Pollution Prevention Plan (SWPPP) must be submitted for review and approval as part of the engineering plan submittal requirements. See Section II.E for details.**
12. All existing vegetation to be retained/removed on site, including the public right-of-way. All existing vegetation that is to be retained and/or removed from the site must be reviewed, evaluated and approved by the Public Works Department's Village Forester. **Developments must comply with all applicable sections set forth in the Tree Enhancement and Preservation Ordinance, Chapter 15.28 of the Municipal Code, including the submittal of a Tree Preservation and Protection Plan.**

13. Location of existing structures, wells, septic tanks and field tiles. Water wells shall be plugged and certified according to the State of Illinois rules and regulations. If the well is to be kept for landscape maintenance, it must be brought into compliance with Illinois regulations. There shall be no connection between the Village water system and any private well.

Septic systems shall be abandoned. The septic tank and distribution boxes shall be removed. The piping for the seepage field shall be removed if they are of plastic pipe, or crushed, if clay tiles are used.

The Developer must submit to the Village, copies of all aforementioned certifications for well plugging and septic removal.

14. For proposed subdivisions, provide subdivision configuration with the proposed rights-of-way, the proposed lot layout with lot numbers and all proposed easements. All items shall be dimensioned in feet and decimal parts of a foot.
15. Provisions and a time schedule for restoration of grass and parkways, as well as any erosion control measures, such as silt fencing, that may be required by the Village Engineer.
16. Engineering plans shall be accompanied by a report containing any measurements, calculations, and assumptions used in determining plan compliance with the Village Code. This report shall be sealed by an Illinois Licensed Professional Engineer.
17. Note on the plans that Contractors shall conform to the rules and regulations of all applicable agencies.
18. All development within the 100-year flood plain must also be designed in accordance with the Village of Winnetka Flood Hazard Protection Ordinance, Chapter 15.68 of the Municipal Code.
19. A Hold Harmless and Indemnification Agreement will be required from all Developers and Contractors working within the Village of Winnetka. The developer and/or contractor shall, prior to the approval of the engineering plans, include on the engineering plans a hold harmless and indemnification agreement with the Village of Winnetka. A typical agreement is as follows:

“The Contractor/Developer hereby agrees to defend, indemnify and hold harmless the Village of Winnetka, their agents, officials and employees against all injuries, deaths, losses, damages, claims, suits, liabilities, judgement costs, and expenses, etc., which may accrue against the Village of Winnetka in consequence of granting permission to work within the Village of Winnetka. The developer/contractor shall at their own expense appear, defend and pay all attorney fees and all costs and other expenses arising therefore or incurred in connection therewith, and satisfy and discharge any judgement which shall be rendered against the Village of Winnetka, their agents, officials and employees.”

This agreement must be signed and dated by the developer on the approved engineering plans.

20. **Upon completion of a project, prior to the issuance of a Certificate of Occupancy Permit, the Developer must submit 2 sets of “As-built” engineering plans and supporting calculations, for the site. All plans and calculations must be signed, sealed and dated, by the project’s design engineer. The “As-built” calculations shall include confirmation that the proposed volumes for storm water detention and compensatory storage have been provided, as required by the permit. The design engineer must also certify that the detention restrictor is the correct size and in the correct location. (See Section III. Project Inspection Procedures for further detail and other permit close-out requirements.)**

## II. DESIGN STANDARDS

### A. SANITARY SEWER SYSTEM

Sanitary sewer system shall be designed to meet MWRDGC's and other applicable agency requirements. Such design shall incorporate the more stringent requirements of the following items or agency requirements. All excavation within the public right-of-way must be permitted through the Village of Winnetka.

1. Each single family lot, and/or individually owned unit (i.e. condominium, townhouse...) in a multi-family or attached single family dwelling attached horizontally, or commercial unit in a similar arrangement, in other than a single family development, shall be served with a new separate sanitary sewer service. The minimum service size shall be six (6) inches using PVC SDR 26 pipe or four (4) inches using DIP Class 52, with a minimum slope of 1%. Where a larger capacity service is required, the design engineer shall submit to the Director of Public Works for review and approval, calculations certifying the required size increase. Sanitary service clean-outs, six (6) inches for domestic lines, must be provided within ten (10) feet from the outside face of a foundation wall and at every change in direction, and for lengths greater than eighty (80) feet, with a watertight, screw-down cap.
2. Each building shall be provided with a separate sewerage outlet for storm water and sanitary sewage. No sewer connections that will permit sanitary sewage to drain into any public storm water sewer shall be made. No storm or surface water from any building or property shall be permitted to drain into any public sanitary sewer. It will be the responsibility of the homeowner/contractor to dye test all connections to ensure that there are no illicit **sanitary** connections to the storm sewer **or storm connections to the sanitary sewer**. The results of the testing must be submitted to the Village of Winnetka.
3. Manholes are to be provided at each change in slope, direction of flow, change in pipe size and type of the building sewer between the building and public sewer.
4. Installation of sanitary services shall be done so as to avoid existing trees. If a sanitary service must be installed within the drip line of an existing tree, the service must be augered or pushed rather than open cutting a trench, or as directed by the Village Forester.
5. Sanitary manholes are to be pre-cast reinforced concrete eccentric type with a minimum 48" interior diameter. Cone sections shall have a 3" integrally cast pre-cast concrete collar. Pipe penetrations are to be sealed via the use of a flexible, synthetic rubber pipe sleeve that is to be fastened to the pipe with **double**, stainless steel bands. Barrel sections shall be sealed using a butyl rubber material strip and/or rubber gasket. Frames are to be sealed to the barrel sections of the manhole mechanically using synthetic rubber seals with stainless steel bands and "Cor-ten" bolts. Chimney seals, if required, are to be external type, manufactured by "Cretex" or approved equal. Steps shall be made of steel reinforced plastic, using an approved plastic meeting ASTM D4101, Type II, Grade 49108, over a #3 Grade 60, ASTM A615, reinforcing bar. A maximum of eight (8) inches of adjusting rings shall be used.

Manhole walls shall be 5" thick. Manhole base sections shall be 6" thick and be integrally cast into the lowest barrel section. Manholes shall rest on a minimum of 3" compacted sand cushion. The pipe invert elevation shall be 2" above the interior floor of the base, with a concrete bench extending to the spring line of the pipe.

6. Sanitary manholes and service clean-outs constructed in the flood plain must have a rim elevation twelve (12) inches above the base flood elevation or have a watertight, lock-down frame and cover, meeting the specifications of Neenah R-1916-C, or approved equal, for manholes.

7. Sanitary sewers and services shall be constructed of either PVC with a minimum SDR of 26 or DIP Class 52. Both pipe types shall be jointed by means of a flexible gasket. Gaskets for PVC pipe joints shall be in conformance with ASTM D3212. Gaskets for DIP shall be in conformance with ANSI A 21.11-79 (AWWA C111). Pipe shall be laid in approved bedding. In no case shall pipe be laid on loose fill or on soft, wet ground. The use of PVC or DIP shall be dependent upon depth of bury.
8. When connecting to an existing sewer main by means other than an existing wye, tee or existing manhole, one of the following methods shall be used:
  - a. Using a pipe cutter, neatly and accurately cut out the desired length of pipe for insertion of proper fitting. Use "band-seal" couplings or similar **double band**, non-shear mission band couplings, and shear rings and clamps to fasten the inserted fitting and hold it firmly in place. Non-shear, mission band couplings shall have the length of boot approximately equal to the pipe diameter. Follow manufacturer's recommendations for the installation.

No cut-in connections, made by breaking or cutting a hole in the main and inserting the spigot end of an ordinary sewer pipe shall be permitted.
  - b. Circular saw-cut of sewer main with proper tools ("Shewer-tap" machine or similar) and proper installation of a "Romac CB" Sewer Saddle, or approved equal, a hub-wye or hub-tee saddle containing a flexible boot, in accordance with manufacturer's recommendations. This method shall only be allowed for pipe sizes twelve inches (12") or greater in diameter.
9. Disconnection of existing services shall be by means of cutting out existing wye or tee sections and replacing with a straight piece of equal size pipe and making the final connection with non-shear, mission band couplings. Disconnection of all services must occur at the main. If the existing wye or tee is in good condition, it may be reused, pending approval of the Village of Winnetka.
10. When field conditions prohibit the installation of a new service to the site (sanitary or storm), the existing service may be rehabilitated and reused for the new construction, pending approval of the Village of Winnetka. The rehabilitation of an existing service lateral must employ a Cured in Place Pipe (CIPP) liner method.

A sewer service lateral may be lined, only if a videotape of the pipe shows that the following general conditions can be satisfied:

- a. The pipe has generally maintained its original shape;
- b. The existing service connection at the main is not a hammered tap (break-in tap);
- c. There shall be no significant sags in the service;
- d. The existing sewer service pipe must be a 6" inside diameter pipe;
- e. The CIPP will provide flow capacity equal to or greater than 100% of the original pipe's flow capacity when new.

The liner assembly shall be continuous in length and consist of one or more layers of absorbent textile material, i.e. needle punched felt, circular knit or circular braid that meets the requirements of ASTM F1216 and ASTM D5813, Sections 6 and 8. The textile tube and sheet is to be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to fit irregular pipe sections. The wet-out textile tube and sheet shall meet ASTM F1216, Section 7.2, as applicable, and shall have a uniform thickness, and 5% to 10% extra resin distribution that when compressed at installation pressures, will meet or exceed the design thickness after cure.



The outside layer of the textile tube (before inversion) and interior of the textile sheet shall be coated with an impermeable, translucent flexible membrane. The textile sheet, before insertion, shall be permanently marked as storm or sanitary service, correlating to the address of the building. The sheet and tube shall be surrounded by a second impermeable, flexible translucent membrane (translucent bladder) that will contain the resin and facilitate vacuum impregnation while monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

The resin/liner system shall conform to ASTM D5813 Section 8.2.2 – 10,000 hour test. The resin shall be corrosion resistant polyester, vinylester, epoxy or silicate resin with a catalyst system, that when properly cured, meets the requirements of ASTM F1216. The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.

The CIPP initial structural properties shall be as follows:

<u>Property</u>	<u>ASTM Test</u>	<u>Value (min.)</u>
Tensile Strength	D638-96	3,000 psi
Flexural Strength	D790	4,500 psi
Flexural Modulus	D790	250,000 psi

The installation procedures shall meet the following requirements:

- a. Access Safety: The contractor shall carry out his operations in strict accordance with OSHA and the manufacturer's safety requirements. Prior to entering access areas, such as manholes or excavation pits, to perform inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state or federal safety regulations.
- b. Cleaning and Inspection: Follow NASSCO Standards
- c. Sewage Bypass: When required, the main pipe flows will be bypassed. The pumping system will be sufficiently sized for normal to peak flow conditions. The upstream manhole will be monitored at all times and an emergency deflating system will be incorporated so that the plugs may be removed without requiring confined space entry.
- d. Inspection of the pipe: The existing service lateral shall be carefully inspected using closed circuit television to determine the location of any condition that shall prevent the proper installation of the liner such as roots, and collapsed or crushed pipe sections.
- e. Line Obstructions: The existing service lateral shall be cleared of obstructions that prevent the proper insertion and expansion of the lining system. Obstructions may include dropped or offset joints of no more than 20% of the inside pipe diameter. The Contractor must removal all debris from the right-of-way.
- f. Insertion and Curing: The Contractor must perform the insertion and curing process in accordance with the manufacturer's specifications. A copy of the manufacturer's recommended procedures and cure schedule shall be submitted to the Village of Winnetka.

- g. Finish: The finished CIPP shall be continuous over the entire length of the rehabilitated service lateral and shall be free from visual defects such as material intrusions, pinholes, tears, bubbles, delamination, or other defects. Wall thickness at any point shall not be less than 87.5% of the specified design thickness. A clean-out must be installed at the upper end of the finished liner, on private property, adjacent to the property line. After the work is completed, the installer will provide the Village of Winnetka with video footage documenting the repair and the visual marking identifying the sewer lateral address as completed work. The finished product must provide an airtight/watertight verifiable non-leaking connection between the sewer main and sewer service lateral.
  - h. Cleanup and Restoration: Upon completion of all installation and testing, the Contractor shall clean and restore any damages to the public right-of-way to meet existing or better conditions.
11. Pipe penetrations into existing sanitary manholes shall be properly sized and cored and sealed with flexible watertight connections.
  12. All frames and covers which are to be publicly owned and/or publicly maintained, shall be Neenah Foundry R-1712-B, or approved equal, with concealed pick holes and sealed cover. Manhole covers must have "Sanitary" cast into the top of the cover. Frames and covers on privately owned and maintained structures must meet with the approval of the Village of Winnetka.
  13. All utility and service trenches under or within the zone of influence of paved surfaces shall be backfilled with trench backfill, using FA-1, 2 or 3 material or CA-7 materials, upon direction of the Director of Public Works. For trenches under existing public roadway, where an open cut of the pavement has been approved, backfill over conduit may be made with fine aggregate (FA-1, 2 or 3) or coarse aggregate (CA-13 or CA-7) to a point 12" inches above the conduit. The remaining backfill material to the sub-grade elevation shall be Controlled Low Strength Material (CLSM), Mix 1, otherwise known as "flowable fill", and shall be IDOT standards.
  14. Bedding for sanitary sewer and services and PVC pipe shall consist of a minimum of 4" of CA-11 material that extends to a minimum of 12" above the crown of the pipe.

#### II.4

## B. WATER MAIN SYSTEM

Water main systems shall be designed to meet the Illinois Environmental Protection Agency's and other applicable agency requirements. Such design shall incorporate the more stringent of the following or agency requirements:

1. All water mains shall be Ductile Iron Pipe (DIP) Class 55, **meeting AWWA C-151, the Class designed per AWWA C-150, with cement lining and tar coating meeting AWWA C-104, and with rubber-gasketed slip-on joints meeting the requirements of AWWA C-111.** Mechanical fittings supplied with "Corten" bolts, or rubber ring (Push-on) fittings. **Each length of pipe shall have its weight clearly painted upon it in white with the weight not to vary from the above standard by more than  $\pm 5\%$ .** All water main shall be encased in a high density polyethylene encasement with its material specifications and installation method in accordance with ANSI/AWWA C105/A21.5, ASTM A674, using "Method A" installation. A minimum of 4" of **FA-1, 2 or 3** bedding shall be placed under all water main pipe, and **FA-1, 2 or 3** material shall be placed to a minimum of 24" over the top of pipe.
2. In addition to any required thrust blocking, for all mechanical joints, bends over 10° and fire hydrants, "Megalug" restraints, or approved equal, must be installed.
3. Fittings (bends, tees, wyes and crosses) shall be DIP, CL 55, mechanical joints, cement lined, tar coated, conforming to the requirements of AWWA C-110, C-111, and C-104, respectively.
4. Water mains shall have a minimum bury depth of 5.0 feet, unless otherwise noted by a representative of the Village of Winnetka.
5. All valves shall be left-hand open (clockwise), resilient wedge gate valves at intervals not over 1000 feet, with stainless steel bolts.
6. Water tight valve vaults shall be provided for each valve. Barrel sections shall be sealed using a butyl rubber or rubber strip. Valve vaults shall have a minimum of 48" interior diameter, and have a maximum of eight inches (8") of adjusting rings. For water mains greater than 6" in diameter, use 60" interior diameter valve vault.
7. Fire hydrants shall have resilient wedge-gate valves and have a maximum spacing of 300 feet for single family residential and 150 feet in all other zoning districts.
8. Hydrants are to be breakaway type, and be painted with Rustoleum Oil Based Enamel Safety Yellow #7543, or approved equal, with stainless steel bolts.
9. Hydrants shall be single steamer with 2 – 2 ½" pumper nozzles, National Standard Thread. Hydrant lead bury depth shall be a minimum of 5.0 feet. Hydrants shall be flanged with 6" resilient wedge auxiliary valve, and have a main valve opening of 5 ¼". Auxiliary valves shall be Clow F5066, clockwise to open, flanged inlet, mechanical joint outlet with gaskets retainer ring and bolts. Auxiliary box adapters will not be permitted. Auxiliary box extensions will be permitted.
10. Acceptable hydrant manufacturer shall be Clow Medallion Fire Hydrant, F2545.
11. Hydrants shall be backfilled with CA-3 stone (½" - ¾", with no fines). The stone drain field shall have a minimum overall dimension of 2.5 feet by 2.5 feet, centered on the hydrant riser, and a depth of 2 feet below the main (½ cy, min.) and 2 feet above the main (½ cy, min.). Backfill stone will be covered by a 4-mil thick plastic sheet or geotextile fabric (Mirafi 140N). Concrete supports shall be placed under both the hydrant and auxiliary box. Lateral concrete support shall be placed along side of the hydrant and shall have a minimum width of 8". The depth of the concrete support under the hydrant shall be a minimum of 2 feet below the water main.
12. Hydrants shall be placed a minimum of 3' from the back of curb.

13. Connections to an existing water main shall be done by pressure connection only. The pressure connection and valve shall be located within the valve vault. No pressure connection shall be within 3 feet of an existing water main joint. If a pressure connection cannot be done, use a cut-in sleeve and tee connection. All fittings will be swabbed out with a chlorine solution of at least 50 mg/L. This solution must be tested by a Village Representative.
14. Connection to the end of an existing water main should be with a valve only. No new water main should be connected to the existing water main unless the new water main can be pressure tested separately.
15. Water services shall be a minimum of one-inch (1") diameter type "K" copper. Curb boxes, Curb stops, Corporation Stops and Water Services shall be furnished and installed by the Village of Winnetka.
16. The minimum water service for all zoning districts shall be a one inch (1") diameter service or equivalent flow capacity of a 1" service for each unit in a multi-family, multi-story dwelling. Water services shall be sized in accordance with the design criteria set forth in the "State of Illinois Plumbing Code", latest edition. Services must be sized prior to final permit approval.
17. All frames and covers for valve vaults shall be Neenah Foundry R-1712-B, or approved equal. Valve vault covers must have "WATER" cast into the top of the cover.
18. All utility and service trenches under or within the zone of influence of paved surfaces shall be backfilled with trench backfill, using FA-1, 2 or 3 material. For trenches under existing public roadway, where an open cut of the pavement has been approved, backfill over conduit may be made with fine aggregate (FA-1, 2 or 3) to a point **24"** inches above the conduit. The remaining backfill material to the sub-grade elevation shall be Controlled Low Strength Material (CLSM), Mix 1, otherwise known as "flowable fill", and shall be IDOT standards.
19. Bedding for water main and services shall consist of a minimum of 4" of FA-1, 2, 3 or 6 material, extending to a minimum of **24"** above the crown of the pipe.
20. For all water mains placed in casing pipe, the "PSI Casing Spacers and End Seals" must be included in the design.
21. For buildings supplied with fire and domestic water services, services shall be separated inside of the building with the proper sectionalizing valves and be hydraulically designed to provide the required water flows. Valving which occurs on private property must be easemented to the Village of Winnetka for purposes of access.
22. Reduced Pressure Zone (RPZ) valves shall be required on all lawn sprinkler systems, fire protection systems and for all other building uses as required by the Village of Winnetka Municipal Code and the "State of Illinois Plumbing Code", latest edition.
23. Private wells shall not be drilled within 200 feet of a potable water source.
24. Installation of water services shall be done so as to avoid existing trees. If a water service must be installed within the drip line of an existing tree, the service must be augered or pushed rather than open cutting a trench, or as directed by the Village Forester.

### C. STORM SEWER SYSTEM

Storm sewer system shall be designed to meet MWRDGC's and other applicable agency requirements. Such design shall incorporate the more stringent requirements of the following items or agency requirements. All excavation within the public right-of-way must be permitted through the Village of Winnetka.

1. Each single family lot, and/or individually owned unit in a multi-family dwelling attached horizontally, or commercial unit in a similar arrangement, in other than a single family development, shall be served with a new separate storm sewer service. A minimum service size of six (6) inches using PVC SDR 26 pipe or four (4) inches using DIP Class 52, with a minimum slope of 1%. Where a larger capacity service is required, the design engineer shall submit to the Director of Public Works for review and approval, calculations certifying the required size increase.
2. Manholes are to be provided at each change in slope, direction of flow, change in pipe size of the building sewer between the building and public sewer.
3. Storm structures are to be pre-cast reinforced concrete concentric type. Storm manholes shall have a minimum 48" interior diameter, storm catch basins shall have a minimum 36" interior diameter and storm inlets shall have a minimum 24" interior diameter. Cone sections shall have a 3" integrally cast pre-cast concrete collar. Steps shall be made of steel reinforced plastic, using an approved plastic meeting ASTM D4101, Type II, Grade 49108, over a #3 Grade 60, ASTM A615, reinforcing bar. A maximum of eight (8) inches of adjusting rings shall be used. Manhole and catch basin barrel wall thickness shall be 5" and shall have a base thickness of 6" which is integrally cast with the lowest barrel section. Bases shall be set onto a minimum of 4" compacted sand cushion. Inlet wall thickness shall be 3" and shall have a base thickness of 4". Inlets shall be set onto a minimum of 3" compacted sand cushion.
4. Storm sewers and services shall be constructed of either PVC with a minimum SDR of 26 or DIP Class 52. PVC pipe shall have push-on gasket joints. Publicly owned storm sewer can also be constructed of pre-cast reinforced concrete pipe, with "O-ring" joints meeting ASTM C-361 standards. Pipe shall be laid in approved bedding. In no case shall pipe be laid on loose fill or on soft, wet ground. The use of pipe material shall be dependent upon depth of bury.
5. When connecting to an existing sewer main by means other than an existing wye, tee or existing manhole, one of the following methods shall be used:
  - a. Using a pipe cutter, neatly and accurately cut out the desired length of pipe for insertion of proper fitting. Use "band-seal" couplings or similar **double band**, non-shear, mission band couplings, and shear rings and clamps to fasten the inserted fitting and hold it firmly in place. Non-shear, mission couplings shall have the length of boot approximately equal to the pipe diameter. Follow manufacturer's recommendations for the installation.

No cut-in connections, made by breaking or cutting a hole in the main and inserting the spigot end of an ordinary sewer pipe shall be permitted.

- b. Circular saw-cut of sewer main with proper tools ("Shewer-tap" machine or similar) and proper installation of a "Romac CB" Sewer Saddle, or approved equal, a hub-wye or hub-tee saddle, in accordance with manufacturer's recommendations. This method shall only be allowed for pipe sizes twelve inches (12") or greater in diameter.

6. Disconnection of existing services shall be by means of cutting out existing wye or tee sections and replacing with a straight piece of equal size pipe and making the final connection with non-shear, mission band couplings. Disconnection of all services must occur at the main. If the existing wye or tee is in good condition, it may be reused, pending approval of the Village of Winnetka.
7. When field conditions prohibit the installation of a new service to the site (sanitary or storm), the existing service may be rehabilitated and reused for the new construction, pending approval of the Village of Winnetka. The rehabilitation of an existing service lateral must employ a Cured in Place Pipe (CIPP) liner method. (See Section II.A.10 for construction requirements)
8. All downspouts shall drain onto the ground unless doing so will result in an adverse affect on other private or public properties from such drainage. Such drainage shall be diverted toward an on-site drainage system, i.e., yard inlet, swale, prior to entering the public storm sewer system. A permit will need to be obtained to connect downspouts to a storm service line.
9. All sump pump discharge lines shall be provided with a minimum of a three-inch (3") air gap prior to entering the storm drainage system. When possible, such drainage shall be diverted toward an on-site drainage system, i.e., yard inlet, swale, prior to entering the public storm sewer system.
10. All frames and covers which are to be publicly owned and/or publicly maintained, shall be Neenah Foundry R-1712-B, or approved equal, with concealed pick holes and sealed cover. Manhole covers must have "Storm" cast into the top of the cover. Frames and covers on privately owned and maintained structures must meet with the approval of the Village of Winnetka.
11. All utility and service trenches under or within the zone of influence of paved surfaces shall be backfilled with trench backfill, using FA-1, 2 or 3 material or CA-7 materials, upon direction of the Director of Public Works. For trenches under existing public roadway, where an open cut of the pavement has been approved, backfill over conduit may be made with fine aggregate (FA-1, 2 or 3) or coarse aggregate (CA-13 or CA-7) to a point 12" inches above the conduit. The remaining backfill material to the sub-grade elevation shall be Controlled Low Strength Material (CLSM), Mix 1, otherwise known as "flowable fill", and shall be IDOT standards.
12. Bedding for concrete storm sewer shall consist of a minimum of 4" of CA-11 material that extends to the spring line of the pipe, in areas outside of the zone of influence of paved surfaces. For PVC storm sewer and services, the bedding material shall extend to a minimum of 12" above the crown of the pipe.
13. All storm sewer structures shall be protected from soil erosion, prior to final soil stabilization, by placing straw or hay bales around all sewer openings, or other approved methods.
14. For all two-way flow through open lid structures (structures below the design high water level or base flood elevation) shall have both the frames and grates locked/anchored to the drainage structure, unless otherwise directed by the Public Works Department.
15. All flared end sections greater than or equal to 12 inches that will receive or discharge storm water, shall have a removable grate system to prevent entry. This grate system shall be made from steel that is hot-dipped galvanized after fabrication.
16. Installation of storm services shall be done so as to avoid existing trees. If a storm service must be installed within the drip line of an existing tree, the service must be augered or pushed rather than open cutting a trench, or as directed by the Village Forester.

## 17. Storm Water Management

Developments required to provide storm water detention on site, include, but are not limited to multiple lot single family residential subdivisions, single family residential subdivisions of an individual lot, multi-family residential development and commercial developments.

New home construction on a previously developed lot shall provide storm water detention for the volume difference between using the runoff coefficient based upon the maximum impermeable lot coverage, per the Village of Winnetka's Zoning Code, and the runoff coefficient based upon the existing condition, for a 100-year storm event. The allowable release rate for both conditions will be determined by using a runoff coefficient of 0.15 and the rainfall intensity for a 3-year storm event. New home construction on a previously undeveloped site, or the redevelopment of a site for a different use (i.e. single family to multi-family, or commercial redevelopment) shall provide storm water detention for the total required detention volume based upon a 100-year storm event, using a runoff coefficient based upon the maximum impermeable lot coverage, and the allowable release rate using a runoff coefficient of 0.15 and a rainfall intensity for a 3-year storm event.

Improvements to an existing home and/or lot, causing an increase in impermeable lot coverage greater or equal to 25%, shall provide storm water detention for the difference between the proposed and existing condition, for a 100-year storm event and an allowable release rate based upon a 3-year storm event and a runoff coefficient of 0.15. The actual proposed lot coverage may be used to calculate the proposed runoff coefficient.

The storm water detention facilities shall be designed in accordance with the MWRDGC's requirements for storm water detention as modified by the rainfall frequencies set forth in Bulletin 70 "Frequency Distribution and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois" prepared by the Illinois State Water Survey, 1989. Design high water level (HWL) will consist of the elevation of the storm water in a 100-year storm event (plus six (6) inches for redevelopments.)

This system must meet the following additional requirements, unless otherwise approved:

### a. Dry Basin Storage System

- (1) Minimum bottom flow line slope = 1%.
- (2) Design HWL must equal the storm water elevation in a 100-year storm event plus six (6) inches.
- (3) Maximum water depth for parking lot surface detention is ten (10) inches.
- (4) In residential developments, the finished grade elevation at the building foundation shall be a minimum of one (1) foot above the design HWL. In commercial developments, the finished grade elevation at the building foundation shall be a minimum of nine (9) inches above the design HWL.
- (5) Vertical walls in detention basins will not be permitted adjacent to a property line. Vertical walls elsewhere on site will not be permitted without a proper, permanent, fixed physical barrier.

### b. Wet Basin Storage System

- (1) Maximum side slope of 5:1 to two (2) feet below normal water level. These side slopes shall be stabilized with rip-rap, retaining walls, or other permanent method of stabilization. Stabilization design plans, including any necessary circulation systems, must be submitted to the Village of Winnetka for review and approval by the Village's Health Department.

- (2) Five (5) foot ledge at two (2) foot below normal water level, pitched toward shore;
- (3) A five (5) foot ledge, 12" to 18" above normal water level shall also be provided;
- (4) Maximum side slope of 4:1 below the five (5) foot ledge below normal water level.
- (5) Design HWL must equal the storm water elevation in a 100-year storm event plus six (6) inches.
- (6) A minimum of twenty-five (25) percent of the basin shall be at least ten (10) feet deep at normal water level. The remaining lake area should be an average depth of at least five (5) feet.
- (6) In residential developments, the finished grade elevation at the building foundation shall be a minimum of one (1) foot above the design HWL. In commercial developments, the finished grade elevation at the building foundation shall be a minimum of nine (9) inches above the design HWL.

c. Underground Storage System

- (1) Underground chambers must be large enough to allow the chamber to be manually cleaned.
- (2) Access points for ingress and ventilation purposes are to be provided in the chamber at a maximum spacing of one hundred (100) feet and at the ends of the chamber.
- (3) Underground storage chambers are to be clearly labeled on the engineering plans as "private storm water storage facility". These chambers are to be maintained by the Developer until a homeowner's association has been established.
- (4) Poured in place reinforced concrete chamber designs must be signed and sealed by an Illinois Licensed Structural Engineer.
- (5) A catch basin shall be placed at the downstream end of the chamber (located immediately in front of the storm water outlet orifice and restrictor).
- (6) All reinforcement steel shall be epoxy coated and all concrete shall be treated with a protective concrete coating, on the interior and exterior of the chamber.
- (7) For pre-cast concrete construction, geotextile fabric must be placed over the top of the structure, and all joints must be grouted.
- (8) All structural steel members used shall be "Cor-ten" or hot-dipped galvanized. All connectors shall have like treatment.
- (9) A minimum of six (6) inches of top soil plus sod must be placed to cover the underground storage facility when constructed under pervious surfaces.

18. Runoff coefficients to be used in design are as follows:

Existing surface, pre-development	0.15
Proposed grass or landscaped area	0.25
Proposed hard or impervious surface	0.95
Permanent water surface	1.00



Adherence to the Village of Winnetka's lot coverage standards for maximum impermeable lot coverage area must be used to determine the runoff coefficient for the site for new home construction. Improvements to an existing home and/or lot may use the actual proposed lot coverage in determining the required storm water detention volume.

19. Storm water detention outflow shall be controlled by means of a restrictor. The restrictor shall consist of a two (2) foot long section of pipe, properly sized, with a minimum three (3) inch diameter. The restrictor shall be placed in a structure located outside of the detention facility, with the rim elevation above the design high water level, on the upstream side of the manhole. Restrictors shall be sized according to the allowable release rate based upon Bulletin 70, "Frequency Distribution and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois" for a 3-year storm.
20. All emergency overland flow routes shall be designed to meet the 100-year storm event, and should be routed along roadways, if possible. There must be at least one (1) foot above the 100-year hydraulic point on the flow line to the lowest accessible point on a structure's foundation, including window wells, where overland flow routes run adjacent to the structures.
21. All detention basins along a right-of-way shall have a permanent, fixed physical barrier provided for safety. Basins along any roadway shall have a permanent, fixed physical barrier.
22. All detention basins shall be located such that the design high water level is a minimum of ten (10) feet from the property line, ten (10) feet from structures and ten (10) feet from the right-of-way.
23. The first structure upstream from the restrictor manhole must be a catch basin with a three (3) foot sump below the invert of the pipe.
24. Storm water detention facilities shall be constructed during the initial phases of construction of a development.
25. Storm water detention facilities should be designed to minimize impact on existing trees. Proper location of detention areas should be away from trees, when possible. The location of the storm water detention facility will require the review and approval of the Village Forester.

#### D. DRAINAGE AND GRADING

1. All site development shall manage its storm water drainage on-site. Any proposed development or proposed grade changes to a site must not adversely affect adjacent public and/or private properties. All new construction shall diminish or remove any adverse impact of surface water drainage and run-off onto an adjacent property, during and following construction of any such improvement. The rate of storm water run-off from a newly developed site or a site under construction shall not be at a rate greater than the water run-off immediately prior to such construction. Connection to available storm sewers or other means, in the form of drainage swales, detention facilities or other such form of water control, shall be used to limit such storm water run-off and provide for the proper control and drainage of surface water.
2. Existing grades along all property lines must be maintained.
3. All storm and surface waters shall drain into a storm drainage system, as required for the site and as approved by the Director of Public Works. In every case, effort shall be made to increase the time of concentration of storm water runoff prior to entering the public storm sewer system, unless it can be demonstrated that by doing so would adversely affect other private and public properties.
4. Drainage from downspouts or sump pumps shall be diverted toward a storm drainage system on-site, and shall not be directed toward or drain onto adjacent properties.
5. Roof downspouts shall drain onto the ground toward a storm drainage system, unless the owner of the property first obtains a permit from the Director of Public Works to connect into the storm sewer service for the site. A permit will not be approved unless the Director of Public Works finds that there will be significant adverse effect on other private or public property from such drainage.
6. Sump pumps shall drain into a storm drainage system. When possible, sump pumps shall discharge at grade and drain toward a storm drainage facility prior to discharging into the public storm sewer system. However, if it can be shown that such drainage would adversely affect adjacent private or public properties, the sump pump may be connected directly into the site's storm sewer service.
7. No storm or surface water from any building or property shall be permitted to drain into any public sanitary sewer. The homeowner/contractor will be required to perform a dye test on all existing/proposed storm water connections to ensure that they are not illicitly connected to the sanitary sewer system.
8. Drainage swales must have sufficient depth and width to direct storm water runoff toward a storm drainage system. Swales must be at least six (6) inches deep and two (2) feet wide at the bottom of the swale. The side slopes of the swale must not exceed a 4:1 slope. The top of the swale must meet the existing grades at the property lines, with the flow line of the swale below the existing grades at the property line. Damming or displacing water onto adjacent properties is not allowed.
9. When compensatory storage or storm water detention is required to be provided on site, the required storage area or detention basin shall not be constructed with the use of retaining walls along the sides of the basin nearest to the property line.
10. No grade changes will be permitted within the drip line of existing trees without the review and approval of the Village Forester.

E. SOIL EROSION AND SEDIMENTATION CONTROL

**A Storm Water Pollution Prevention Plan (SWPPP) shall be submitted as part of the permit requirements for engineering.** Soil erosion and sedimentation control shall be provided, as required, to prevent off-site damage due to sedimentation of drainage ditches, storm sewers, ponds, lakes, streets, or other property, both public and private; and to prevent erosion of adjoining land due to the change in the land use or rerouting of surface water. No person, firm or corporation may develop, landscape, or disturb land until its **SWPPP** has been approved and a building permit issued.

1. The **SWPPP**, including soil erosion and sedimentation control shall be prepared by the Developer and shall outline the measures to be taken to ensure that soil and sediment are contained on the development site.
2. The **SWPPP** shall indicate the proposed phasing of the project to include clearing, rough grading, construction, final grading and landscaping. Phasing identifies the date clearing will begin, how long cleared areas will be exposed and the sequence of clearing, installing sediment control measures, installing storm drainage, paving, and establishing vegetative cover.
3. The **SWPPP** shall be at a scale no smaller than 1" = 20' showing proposed excavation, grading, or filling. The plans shall also include the following:
  - a. The property owner's name, address and telephone number;
  - b. Location of proposed and existing utilities;
  - c. Existing and proposed contours, as previously noted;
  - d. Details of temporary/permanent drainage plan;
  - e. Details of soil erosion and sedimentation control measures to be used on the site;
  - f. Details of final stabilization measures to be used on the site;
  - g. Delineation of the 100-year flood plain boundary;
  - h. Clearing limits;
  - i. Temporary access location to the site.
4. The Village of Winnetka, as deemed necessary may impose additional soil erosion and sedimentation control measures.
5. Slope changes shall be designed to keep slope lengths and gradients to a minimum. All slopes shall be stabilized with either vegetative or non-vegetative material.
6. **SWPPP** shall provide for the appropriate control measures as outlined in the IEPA's *Standard and Specification for Soil Sediment Control and Procedures and Standards for Urban Soil Erosion and Sediment Control in Illinois (Urban Manual)*.
7. Temporary access shall be provided for all construction sites prior to any land disturbance, to minimize curb damage and mud deposits on the streets. Unless an existing paved access exists on site, temporary access shall be constructed with a minimum of 6 inches of gravel (1.5" to 3" stone) with a stabilization fabric. The access drive shall have a minimum width of 12 feet, and should not be pitched to drain onto adjacent properties. All deliveries of material to the construction site shall be required to use the temporary driveway. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. When necessary, wheels shall be cleaned prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone that will drain into protected inlet structures. The use of asphalt concrete grindings will not be permitted.
8. Where natural vegetation is removed during grading, soil erosion and sediment control shall be initiated and vegetation shall be promptly re-established within 30 days in sufficient density to provide effective erosion control as determined by the Director of Public Works/Village Engineer. Permanent vegetation shall be established as soon as possible after grading has been completed.
9. When grading operations are completed or suspended for 30 days, permanent vegetation must be established at sufficient density to provide effective erosion control. Between permanent vegetation period (grass seeding), temporary cover shall be provided.

10. Increased runoff caused by changed soil and surface conditions during and after grading must be accommodated. The use of rip-rap, check dams, filter berms, grass channels, mulching, or other appropriate measures shall be implemented to reduce the increased velocity of run-off from the site due to the development.
11. Sites shall be laid out to provide positive drainage. Drainage shall be away from buildings and designed to prevent storm water run-off from flowing onto adjacent properties.
12. No storm water run-off shall drain directly or indirectly into a sanitary sewer.
13. Ground adjoining development sites shall be protected from accelerated and increased surface water, silt and other affects of erosion.
14. Whenever possible, the site development plan should incorporate storm water management and storm water quality design practices that will minimize storm water runoff from the site and improve the water quality of the storm water that will leave the site.
15. When earthwork is required and the natural vegetation removed, the disturbed area must be kept to a minimum. Every effort shall be made to protect permanent vegetation from harm during the construction process.
16. Stockpiles shall be for foundation backfill only. All other excavated materials must be removed from the site immediately. Stockpiles of soil that will remain for a period greater than 7-days must be stabilized and provided with the appropriate soil erosion and sedimentation control measures. No stockpile shall be placed in a flood prone area or flood plain. No stockpile shall be placed within 25 feet to a roadway or drainage channel.
17. Dust control measures should be used, when applicable, to minimize the spread of airborne particles.
18. Building materials and other construction site wastes must be properly managed and disposed of to reduce the risk of pollution.
19. All storm inlets onsite and those receiving inlets offsite must be protected from sedimentation by an appropriate protective measure, i.e., staked hay bales, filter fabric over the inlet, or other engineered inlet protection devices, as approved by the Village of Winnetka.
20. All soil erosion and sedimentation control measures must be maintained throughout the entire construction process.
21. All temporary soil erosion and sedimentation control measures shall be disposed of within 30 days after final site stabilization or after the temporary measures are no longer needed. All trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures should be permanently stabilized to prevent further erosion and sedimentation.
22. Occupancy permits will not be issued until final grading has been completed and the site has been vegetated and stabilized. When conditions prevent ground cover from being established, an occupancy permit may be issued by submitting an escrow deposit sufficient to guarantee completion.
23. All streets, alleys, sidewalks, curbs and gutters and other public rights-of-way shall be kept free from deposited dirt or foreign material. Trucks and other construction equipment should be cleaned on site to prevent mud from being deposited on the public right-of-way. Concrete trucks shall not wash out on the public/private right-of-way. If mud, material or debris is deposited on a public or private street, the Contractor, representative, firm or corporation responsible for the development site will be notified and shall abate the violation within 4 hours of notification by the Village of Winnetka.

## F. STREETS AND PUBLIC RIGHTS-OF-WAY

### PUBLIC RIGHT-OF-WAY EXCAVATION:

No sewer, water pipe, or other public or private utility, nor any street or alley, pavement, sidewalk or other like improvement shall be placed, laid or maintained in, under or upon any proposed or existing public street, alley or other public place within the Village of Winnetka or in any proposed addition, subdivision or dedication of any lands within the boundaries of the Village, without approval by the Director of Public Works.

1. All construction operations shall be conducted in a manner to ensure minimum hindrance to traffic using the roadway.
2. No street detours, lane closures or shoulder usages are allowed unless authorized by the Director of Public Works.
3. All barricades, lights, etc., shall be furnished, erected and maintained and removed by the developer. When necessary, flaggers shall be provided for the protection and safe accommodation of traffic on the roadway affected by the proposed work.
4. All necessary traffic control devices shall be in compliance with the State of Illinois Manual of Uniform Traffic Control Devices and the appropriate Illinois Department of Transportation State Standard Specifications, which are minimum requirements.
5. No public roadway, alley, sidewalk or other public right-of-way shall be blocked by loading, backfilling or hauling equipment. When excavations are made in the public pavement, not more than one lane of pavement nor more than one-third of the pavement width shall be closed to traffic
6. Throughout the entire construction process, all streets, alleys, sidewalks, curbs and gutter and other public rights-of-way shall be kept free from deposited dirt or foreign material. Proper drainage within the right-of-way shall be maintained at all times. Any ice build up within the gutter shall be cleared so as to allow water to pass freely at all times.
7. All pavement excavations must be completed and backfilled in one day unless either steel plates have been adequately anchored in place over the excavation, or properly controlled traffic diversion is authorized by the Village Engineer. Steel plates must be properly marked and shall not remain over one week on the site. **Street Opening Permits will not be issued between December 15<sup>th</sup> and March 15<sup>th</sup>, unless there is an emergency situation. If an emergency situation arises during the winter months, plates must be inset into the pavement and secured, such that the finished elevation of the plate is level with the pavement, for snow plowing safety.**
8. All excavation under paved surfaces, sidewalks, curbs and gutter within the public right-of way must be saw-cut for the full depth of the material using a concrete saw.
9. Openings made in Portland Cement Concrete pavement, sidewalk or curb and gutter shall be made at existing construction joints wherever possible. All deteriorated concrete or concrete cracked as part of the ongoing work shall be removed to a point where solid concrete exists.
10. Whenever a pavement opening in a Portland Cement Concrete pavement is made less than 3 feet from a pavement edge, construction joint, crack, etc., the pavement opening will be enlarged to meet the edge, joint or crack so that the entire area will be repaired as one patch.
11. All excavated material shall be removed and properly disposed of off-site.
12. Tunneling shall be defined as the use of any means other than an auger to remove soil or other material from underneath any existing pavement, curb or sidewalk, and shall not be permitted. Augering shall be permitted provided that the diameter of the augered opening shall not be more than four inches greater than the diameter of the pipe to be placed therein.
13. No construction materials of any kind shall be stored on the public right-of-way.

14. All utility and service trenches under or within the zone of influence of paved surfaces shall be backfilled with trench backfill, using FA-1, 2 or 3 material or CA-7 materials, upon direction of the Director of Public Works. For trenches under existing public roadway, backfill over conduit may be made with fine aggregate (FA-1, 2 or 3) or coarse aggregate (CA-13 or CA-7) to a point 12" inches **(24" for water main/service)** above the conduit. The remaining backfill material to the sub-grade elevation shall be Controlled Low Strength Material (CLSM), Mix 1, otherwise known as "flowable fill", and shall be IDOT standards.
15. Temporary pavement replacement is the responsibility of the developer, and shall consist of properly placed and inspected backfill material with 2" of bituminous cold mix (compacted), as measured from the existing pavement surface, down 2". The temporary pavement shall be placed the same day backfilling is completed to the satisfaction of the Director of Public Works.
16. Permanent flexible pavement replacement shall be made by the Village of Winnetka.
17. Permanent rigid pavement replacement shall be made by the developer, and shall be made in compliance with applicable sections of the Illinois Department of Transportation's "Standard Specifications for Road and Bridge Construction", latest edition, except that the concrete mixture shall either be a high-early strength Portland Cement Concrete mix or a 7-bag mix of regular Portland Cement Concrete. Replacement of full width openings shall be done one-half at a time allowing the first half to adequately cure prior to placing the remaining half.
18. All excavation made in grassed parkways shall be replaced with sod surface. In other areas, the top 4" of excavation shall be replaced with 4" of pulverized topsoil and the entire disturbed area is to be seeded.

**SIDEWALKS, CURB AND GUTTER:**

19. All newly constructed public sidewalks must bear the stamp of the builder of that sidewalk. The stamp must include the company name and year of construction, and must be stamped at each end of each piece of walk placed. The letters and figures of such impressions shall be at least one-half inch high and three-sixteenths of an inch in depth.
20. Public sidewalks and curb and gutter are to be constructed with the following minimum specifications:
 

a. Cement	6.1 bags of Type I per cubic yard
b. Aggregate	1.5 " maximum
c. Slump	4 " maximum
d. Air Entrainment	5% to 8%
e. Curing Time	72 hours with securely anchored polyethylene.
f. Strength	3500 psi in 14 days
g. Sidewalk Thickness	5" minimum, 6" minimum across driveways
h. Curb & Gutter Flag Thickness	9", M-4.12 mountable curb is standard
i. Backfill Material	8" layers of CA-7, mechanically compacted, in-place.
21. Sidewalks constructed over utility trenches shall have three equally spaced, epoxy coated #4 rebars centered in the sidewalk over the trench.
22. Sidewalks shall be constructed continuously through driveways.

23. Sidewalks shall have a 1" expansion joint provided at 50' intervals, and contraction joints at 5' intervals.
24. Ramping and sloping of sidewalks at all intersections shall be in accordance with the specifications and standards set forth by the Illinois Department of Transportation.
25. Curb and gutter constructed over utility trenches shall have two equally spaced, epoxy coated #4 rebars centered in the flag over the trench.
26. Curb and gutter shall have a 1" expansion joint placed at 60' intervals, and contraction joints at 15' intervals and all points of curvature.
27. All Portland Cement Concrete shall be treated with a protective coat application.

DRIVEWAY CONSTRUCTION:

28. Driveways shall be constructed of either Portland Cement Concrete, bituminous concrete or other approved permanent paving surface for that portion of the driveway extending from a distance of 24" behind the property line or 5' behind the sidewalk to the street.
29. The maximum width of a driveway where it meets the public sidewalk or property line is 16 feet in single-family residential zones, and 22 feet in all other zones.
30. Driveways may not be paved over public sidewalks.
31. No driveway may be constructed so that storm water runoff is directed toward the adjacent property.
32. Driveways may not be constructed so as to dam water on adjacent properties.
33. Driveways constructed along a property line must be sloped a minimum of 1/4" per foot away from the property line and toward the subject property to avoid discharging storm water runoff onto the adjacent property.
34. The use of metal edging, or edging of any material, in the construction, reconstruction, repair or resurfacing of any portion of a driveway located on public right-of-way, and on any portion of a driveway within 24" of any public street, sidewalk or public right-of-way is prohibited.
35. The grade of that portion of the driveway that crosses a public sidewalk must maintain, as nearly as possible, the same grade as the sidewalk.
36. All curb and gutter and/or public sidewalk damaged or disturbed as part of the construction of a driveway shall be restored as prescribed by the Director of Public Works.
37. No driveway shall be constructed so as to interfere with the drainage of the adjoining street.
38. The construction of circular driveways must be approved by the Director of Public Works. Circular driveways will only be approved on lots with a minimum lot width of 75'. The distance between the edge of the proposed driveway and the property line on a corner lot must be a minimum of 25' from the property line, or 50' to the back of curb.
39. The Village Council must approve driveway proposals of three or more curb cuts.
40. The construction of circular driveways will not be permitted if substantial damage to existing parkway and/or private trees may occur, as determined by the Village Forester.

TREE PRESERVATION AND PLANTING:

41. No tree with a diameter of eight (8) inches or greater as measured 4.5 feet above ground level may be cut, broken, injured or destroyed, or subject to any procedure resulting in the death or substantial destruction of the tree without written permission from the Director of Public Works.
42. Approved removal of trees with diameters of eight (8) inches or greater as measured 4.5 feet above ground level may be required to be replaced with a minimum of a three inch caliper trees. The Village Forester shall determine the total replacement tree inches.
43. As part of the subdivision and building permit process for new construction or improvements increasing the existing gross floor area by more than fifty percent, parkway tree planting may be required, as determined by the Director of Public Works.
44. Tree preservation plans shall be submitted with all proposed building plans.
45. Tree preservation plans shall include the location of all proposed utility installations, highlighting all proposed augering of utilities within the drip line of trees. The plan shall also include the accurate location of all public and private trees measuring 8" in diameter, or greater.
46. Grade changes within the drip line of a tree will not be permitted without the approval of the Village Forester.
47. Tree preservation areas shall be those areas of a lot or parcel of land and public right-of-way within which all trees, eight inches or larger in diameter as measured 4.5 feet above ground, and their root systems are protected and preserved.
48. Building activity areas shall be the smallest area possible to minimize the adverse affects on protected trees.
49. No construction activity, movement or placement of equipment or material, stockpiling or spoils storage shall be permitted within the tree preservation area, including trees located within the public right-of-way. No digging, stockpiling or storage of other materials may occur within ten (10) feet of any parkway tree without the approval of the Village Forester.
50. Tree preservations areas shall be designated by the placement of temporary fencing in accordance with the conditions of the building permit. This fencing is usually installed around the entire perimeter of the drip line of the tree to be protected, and/or as prescribed by the Village Forester.
51. Construction activities on a lot or parcel shall not commence unless and until adequate fencing has been constructed and erected around the tree preservation areas. Tree fencing must be inspected and approved by the Village Forestry Inspector prior to construction.
52. Private planting at public street intersections must be reviewed and approved by the Director of Public Works. Private shrubbery plantings within public property must not exceed twenty-four (24) inches in height. No planting is permitted within two (2) feet of the back of curb or roadway. Private shrubbery plantings on private property, at street intersections, must not exceed twenty-four (24) inches in height within twenty-five (25) feet of the property corner adjacent to the intersection. Tall shrubs or trees planted at these locations must be thinned to a height of seven feet above grade.



PUBLIC RIGHT-OF-WAY OBSTRUCTIONS:

53. Stones, boulders, rocks, railroad ties or other physical obstructions, including underground sprinkler systems shall not be permitted within the public right-of-way.
54. Combination concrete curb and gutter, integral concrete curb or barrier concrete curb shall be considered standard for use adjacent to public streets. Other types of edging material will not be permitted.
55. Providing appropriate street edging such as high curbs or small retaining walls adjacent to parkway areas with severe grade differentials or where reasonable sloping of the parkway is not feasible shall be the responsibility of the Village of Winnetka, only. Driveway approaches across such parkways shall be the responsibility of the property owner, and materials and methods used shall be consistent with those used at the street edge.

LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

56. The Contractor/Developer shall at all times observe and comply with all Federal and State laws, local laws, ordinances, and regulations which in any manner affect the conduct of work. The Contractor/Developer shall indemnify and hold harmless the Village of Winnetka and all of its officers, agents, employees, and servants against any claim or liability arising from or based on the violation of such law, ordinance, regulation, order or enactment, whether by the Contractor/Developer or anyone subject to the control of the Contractor/Developer, which may accrue against the Village of Winnetka in consequence of granting permission to work within the Village of Winnetka. (See also Item I.C.18 for Hold Harmless and Indemnification Agreement language)

G. DESIGN REFERENCES

All work shall be designed and constructed in accordance with the following references as they apply:

1. "Standard Specifications for Road and Bridge Construction", Illinois Department of Transportation, latest edition.
2. "Manual for Structural Design of Portland Cement Concrete Pavement", Illinois Department of Transportation, latest edition.
3. "Manual of Instructions for the Structural Design of Flexible Pavements on Projects involving MFT, FAS and FAUS Funds", Illinois Department of Transportation, latest edition.
4. "Design Manual", Illinois Department of Transportation, latest edition.
5. Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition.
6. MWRDGC Manual of Procedures, latest edition.
7. IEPA Illinois Urban Manual, latest edition.

### III. PROJECT INSPECTION PROCEDURES

Inspection of the installation of a project's infrastructure and grading is done to ensure conformance with the approved Engineering plans and specifications as approved by the Village of Winnetka.

#### A. UNDERGROUND UTILITIES

1. Where utility or service trenches cross through existing paved surfaces, the Contractor shall backfill the trench with Flowable Fill which meets the IDOT standards of Controlled Low Strength Material (CLSM) Mixture 1.
2. No sewer service connection or sewer main installation shall be backfilled prior to inspection and approval by a representative of the Village of Winnetka's Public Works Department.
3. No water service connection or water main installation shall be backfilled prior to inspection and approval by a representative of the Village of Winnetka's Water and Electric Department.
4. **Contractors will not be permitted to open and close fire hydrants or water main valves. Only Village personnel are permitted to operate hydrants or valves.**
5. The Contractor shall, after installation of a water main system or parts thereof, pressure test and chlorinate the new system. A two hour pre-test must be made and passed by the Contractor before scheduling the pressure test with the Village of Winnetka. The main shall then be pressure tested at 150 psi for a duration of not less than one hour in the presence of a Village of Winnetka Water and Electric Department. After a successful pressure test, the main shall be chlorinated by gas injection method, only, by a qualified technician. Samples shall be taken on 2 consecutive work days, Monday through Friday, 24 hours after chlorination, and after the main has been flushed. Water quality samples will be taken and tested by the Village of Winnetka in accordance with the IEPA requirements.
6. All trench backfilling within the public right-of-way must be inspected and approved by a representative of the Village of Winnetka's Public Works Department.
7. Sanitary, storm and water service locations shall be imprinted on the curb/sidewalk with an "S", "ST" or "W", respectively, when possible.

#### B. SITE GRADING

All site grading, including swales, detention areas and compensatory storage shall be done in accordance with the approved engineering plans. Certified "As-built" engineering plans must be submitted to the Village of Winnetka prior to final grading inspection and approval by the Village of Winnetka. The design engineer must certify all "As-built" plans and calculations. The "As-built" calculations shall include confirmation that the proposed volumes for storm water detention and compensatory storage have been provided, as required by the permit. The design engineer must also certify that the detention restrictor is the correct size and in the correct location. "As-built" plans and calculations shall be submitted in hardcopy form. The Village of Winnetka must approve any changes in site grading prior to any of those changes being done. No part of site grading can be assigned from developers to individual homeowners. A Certificate of Occupancy will not be issued until the final grading has been inspected and approved by the Village of Winnetka.

### C. GENERAL CONDITIONS

1. The Contractor shall notify the Village of Winnetka at least 24 hours prior to inspection of work. Inspections and open cuts within the public right-of-way are permitted during regular weekday work hours only.
2. The Contractor shall be responsible for the installation and maintenance of adequate signs, traffic control devices, and warning devices to inform and protect the public during all phases of construction.
3. The IDOT "Standard Specifications for Road and Bridge Construction", latest edition, and the Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition, shall govern construction of proposed improvements, unless superceded by special provisions included in this Engineering Guide.
4. A copy of the Village approved stamped plans and specifications and other agencies' permits, i.e. IDOT, County, MWRD, IEPA, etc., must be kept on the job site during construction of the proposed work.
5. Revisions to the project's approved engineering plans must be re-approved by the Village of Winnetka.
6. Where conflict exists between plans and specifications, the Contractor shall notify the Director of Public Works/Village Engineer who will decide which will govern.
7. Upon completion of the project, the Contractor shall submit "as-built" drawings of the completed project. The drawings shall contain all field changes, additions, omissions, elevations and location of all improvements. "As-built" plans shall be submitted in hardcopy format.

**BULLETIN 70**  
**RAINFALL INTENSITY SCHEDULE**

<b>TIME OF CONCENTRATION</b>	<b>3-YEAR STORM I (IN./HR)</b>	<b>10-YEAR STORM I (IN./HR)</b>	<b>100-YEAR STORM I (IN./HR)</b>
5 MIN.	4.92	6.48	10.92
10 MIN.	4.44	5.88	10.02
15 MIN.	3.64	4.84	8.20
20 MIN.	3.30	4.20	7.50
30 MIN.	2.60	3.30	5.60
40 MIN.	2.10	2.85	4.50
50 MIN.	1.82	2.40	4.08
1 HR.	1.60	2.10	3.56
1.5 HRS.	1.24	1.60	2.76
2.0 HRS.	1.00	1.32	2.24
3.0 HRS.	0.73	0.94	1.60
4.0 HRS.	0.59	0.76	1.30
5.0 HRS.	0.50	0.65	1.10
6.0 HRS.	0.43	0.57	0.97
7.0 HRS.	0.38	0.51	0.86
8.0 HRS.	0.33	0.45	0.78
9.0 HRS.	0.30	0.40	0.71
10.0 HRS.	0.28	0.37	0.65
11.0 HRS.	0.26	0.35	0.60
12.0 HRS.	0.25	0.33	0.56
13.0 HRS.	0.23	0.29	0.55
14.0 HRS.	0.22	0.27	0.53
15.0 HRS.	0.21	0.26	0.49
16.0 HRS.	0.20	0.25	0.44
17.0 HRS.	0.19	0.24	0.42
18.0 HRS.	0.18	0.23	0.39
19.0 HRS.	0.17	0.22	0.38
20.0 HRS.	0.17	0.21	0.36
21.0 HRS.	0.16	0.20	0.35
22.0 HRS.	0.16	0.20	0.34
23.0 HRS.	0.15	0.19	0.33
24.0 HRS.	0.15	0.19	0.32

Note: The above table has been extrapolated from Bulletin 70 "Frequency Distribution and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois" published by the Illinois Water Survey 1989, Appendix "A". Rainfall intensity shown is the average of the Northeast Section data.