Article 6.12

General Subdivision Regulations

6.12.1. DESIGN AND CONSTRUCTION STANDARDS FOR STORM WATER MANAGEMENT FACILITIES.

The design and construction of the storm sewer system and storm water storage facilities within the jurisdiction of the City of Sycamore shall be in accordance with accepted engineering practice and shall conform to the most restrictive of the requirements contained in the latest edition of the following regulations, standards, and specifications:

1. The City's "Standard Details for Storm Sewer Construction."

2. "Standard Specifications for Water and Sewer Main Construction in Illinois."

3. "Standard Specifications for Road and Bridge Construction," Illinois Department of Transportation.

4. "Design and Environment Manual," Illinois Department of Transportation.

5. "Highway Standards," Illinois Department of Transportation.

6. "Drainage Manual," Illinois Department of Transportation.

7. "Culvert Manual," Illinois Department of Transportation.

8 Construction Manual Illinois Department of Transportation

9. Standards adopted by the Metropolitan Water Reclamation District of Greater Chicago (1988 Code *25.205).*

10. DeKalb County Storm Water Management Plan and Ordinance, as amended.

A. BASIS OF DESIGN FOR STORM SEWERS AND STORM WATER STORAGE

1. All storm sewers shall be designed using the rational method ($Q = CIA$) and shall be based on a 10-year storm frequency. The composite runoff coefficient shall be calculated but in no event shall a coefficient of less than 0.50 be used in the design.

2. The necessary volume of storm water storage shall be calculated on the basis of a 100-year storm frequency, using the criteria established by the Metropolitan Water Reclamation District of Greater Chicago. The volume required will be that necessary to handle the runoff of a 100-year storm for any and all durations, from the fully developed drainage area of the site tributary to the reservoir less that volume discharged during the same duration as the allowable release rate. No storm water storage will be required for off-site upstream areas unless otherwise provided herein. Flows from off-site tributary areas resulting from a 10-year storm frequency will be drained through the storm sewer system provided for the site. Off-site flow in excess of the 10-year storm frequency shall be bypassed through the site as overland flow and shall be calculated using the 100-year storm frequency. Rainfall for a 100-year storm shall be determined by using the Illinois State Water Survey Bulletin 70 criteria. (1988 Code §25.209; and Ordinance 96.47, *9-3-1996)*

   Note: Drainage systems and storm water storage facilities for projects larger than forty

(40) acres shall be designed using an approved hydrograph producing runoff calculation method including HEC-1, SCS TR-20 and SCS *TR-55* or other method approved by the City Engineer.

B. STORM SEWER CAPACITIES.

When storm water storage is required, provisions shall be made to transport storm water runoff from a 10-year storm frequency from the fully developed area of the site in a properly designed storm sewer system to the storm water storage area. The additional storm water runoff resulting from the design for a 100-year storm frequency may be transported overland to the storm water storage area over streets, parking areas, parks, playgrounds or other open spaces, including utility easements. The storm sewer system shall have adequate capacity to adequately drain all tributary drainage areas through the property and there shall be no compensation to the owner or developer by the City for the increased pipe sizes and construction costs, if any. In any subdivision, lot or parcel of land where it is determined by the City Engineer that the storm sewer would be larger than eighty four inches (84"), based on a 10-year storm frequency, then a ditch or drainage channel meeting the following standards may be used if the City Engineer so approves.

1. With grades to four percent (4%), ditch may have earth bottoms and sod banks.

2. With grades greater than four percent (4%), ditches must be paved.

3. All ditches shall have side slopes of not less than five to one (5:1).

4. Easements for all ditches shall be dedicated to the City, and there shall be provided in addition to the necessary width required for the ditch, a strip of land on each side of the ditch of a width of fifteen feet (15'), said distance to be measured perpendicular to trees, poles, structures and other obstructions. The slope of these side areas to the ditch shall not exceed five percent *(5%).* There shall be no trees, bushes or obstructions of any kind placed in this area.

5. Culverts or bridges shall be provided at all street crossings and shall be sized to eliminate flooding or ponding of water and shall have a minimum cover of twelve inches (12"). Culverts or bridges shall be reinforced concrete or pre-cast reinforced concrete pipes with necessary headwalls. Culverts or bridges shall extend a minimum of five feet *(5')* past each right-of-way line of the street and shall extend far enough to provide a minimum slope of five to one (5:1) from the right-of-way line down to the invert of the pipe.

6. All ditches, bridges and culverts shall be located and designed in accordance with City standards, as amended from time to time, and requirements of the City Engineer.

7. All culverts or bridges shall be provided with suitable railings and/or guard rails as required and approved by the City. (1988 Code §25.206; and 1994 Code).

C. DRAINAGE STRUCTURES

Manholes shall be provided at all changes in direction and at intermediate points not exceeding four hundred feet (400'). Catch basins with curb frames of proper size shall be provided along streets as required by the "Drainage Manual," Illinois Department of Transportation. Other catch basins and inlets for yards and other areas shall be provided as required by the City Engineer.

D. STORM SEWERS FOR IMPERVIOUS AREAS.

1. Definition: For the purpose of this subsection, areas such as, but not limited to, parking lots and driveways, patios, sidewalks, building roofs and tennis courts where water is unable to naturally penetrate or drain from, except as provided hereinabove, shall be deemed impervious surface areas.

2. Design Standards: All impervious surface areas of more than seven thousand five hundred (7,500)

square feet, as herein defined, shall be provided with storm sewers and catch basins when a public storm sewer is not greater than one hundred feet (100') from the nearest corner of property measured along a street, alley or easement of the public sewer system. One catch basin shall be provided for the first thirty thousand (30,000) square feet of said area and one additional catch basin shall be provided for every additional twenty five thousand (25,000) square feet of said area or portion thereof. All other impervious areas shall be so designed as to drain to a public street or an existing open watercourse; provided, that in no event shall water or other draining liquids be allowed to pass onto adjoining property or over public sidewalks unless at the point where a driveway intersects said sidewalk. (1988 Code §25.105; and 1994 Code)

E. STORM SEWER PIPE MATERIALS.

All storm sewers shall be reinforced concrete pipe of the class as required by IDOT's specifications, PVC SDR 26 pipe, ductile iron pipe, or other pipe approved by the City Engineer. A 4" PVC SDR 26 pipe shall be stubbed into each lot for the connection of the sump pump. Reinforced concrete storm sewers which are constructed along interior side lot lines shall have o-ring gasket joints.

F. BACKFILL MATERIALS FOR STORM SEWERS.

Where a storm sewer will be located beneath a proposed street or within two (2) feet of the edge of the street, the trench shall be backfilled with CA-7 granular material or other granular material approved by the City Engineer. As an alternate to providing the CA-7 granular material, the trench may be backfilled with the same material as excavated from the trench provided this material is mechanically compacted in maximum twelve (12) inch lifts to a minimum density of 85%. The compacted earth backfill for the trench area shall be tested and certified by a soil testing agency, approved by City Engineer and paid for by developer, at intervals as approved by City Engineer. In addition, when the compacted earth backfill alternate is used, the backfill material around all manholes and drainage structures in the street area and also at all crossings of other sewer and water trenches shall be CA-7 granular material. All compacted earth backfill trenches located beneath a proposed street shall also be jetted and flooded with water as required by City Engineer. The final bituminous surface shall not be completed until two complete winter seasons (November 1st to April 1st) have transpired.

G. DESIGN OF STORM WATER STORAGE AREAS.

The required volume of storm water storage may be provided in paved parking areas and in reservoirs with either a wet or dry bottom. Alternate types of storm water storage areas shall be approved by the City Engineer.

1. Parking Areas:

The storm water storage areas shall be designed so that the accumulation of water at any point in the parking lot during peak rainfall does not exceed one foot (1'). The parking lot shall be sloped to drain at a minimum of one percent (1%). The finished floor elevation of all buildings shall be set so that no damage would occur if a storm in excess of the 100-year storm frequency occurs or if the drainage outlet becomes plugged.

2. Dry Bottom Reservoirs:

a. A dry bottom type of reservoir may be designed to serve a secondary purpose for recreation, open space or other types of uses that will not be adversely affected by periodic flooding. A paved ditch with a slope of not less than five tenths percent (0.50%) will be required from the inlet pipe or structure to the outlet pipe or structure to prevent erosion of the bottom of the reservoir when the capacity of the inlet pipe exceeds five (5) cfs or when the inlet pipe has a constant flow, even during dry weather. In certain cases, dry bottom reservoirs shall have a pipe under drain system as required by the City Engineer. The paved ditch shall meet the requirements for paved ditches contained in the "Highway Standards", Illinois Department of

Transportation. However, the preferred design for transporting low flows and intermittent flows through the pond is by either piping the flow beneath or around the pond. The grassed bottom of the reservoir shall slope to drain to the outlet or paved ditch at a minimum two percent (2%) slope.

b. The side slopes on the earth berm around the reservoir shall not be steeper than five to one (5:1), and the earth berm at the top shall not be less than ten feet (10') wide. The inlet and outlet pipes or structures from the reservoir shall be self-operating and require very limited maintenance. An emergency overflow spillway shall be provided from the reservoir in the event a storm in excess of the 100-year storm frequency occurs. The inlet and outlet pipes or structures shall be provided with safety bars with maximum openings of six inches (6") to provide for the safety of children.

3. Wet Bottom Reservoirs: Wet bottom storage reservoirs shall be constructed to conform to the requirements shown on Exhibit "A" on file in the office of the City Engineer. The minimum depth from the normal water level to the bottom of the side slope shall be five feet (5'). A minimum of twenty five percent (25%) of the pond area shall be constructed to a minimum depth of ten feet (10') to provide for fish. Proper measures shall be provided by the developer to prevent the water from becoming stagnant. Where the soil in the bottom of the reservoir is too permeable to hold water, the bottom shall be sealed by an accepted method approved by the City Engineer. The inlet and outlet pipes or structures from the reservoir shall be self-operating and require very limited maintenance. An emergency overflow spillway shall be provided from the reservoir in the event a storm in excess of the 100-year storm frequency occurs. The inlet and outlet pipes or structures shall be provided with safety bars with maximum openings of six inches (6") to provide for the safety of children (1988 Code §25.2 12; and 1994 Code).

4. Allowable Release Rate: The allowable release rate of storm water runoff from the developed drainage area of the site shall not exceed the existing capacity of the downstream storm sewer system or drainage channel, but in no case shall the discharge be more than fifteen one-hundredths (0.15) cfs per acre measured at a maximum storage depth; except, that no outlet pipe of less than three inches (3") in diameter shall be used as an outlet pipe from any storm water storage facility. Outlet control facilities, other than pipes, shall be constructed of reinforced concrete. Outlet pipes from storage areas shall be either reinforced concrete pipe, Class III, or ductile iron pipe, Class 52. (1988 Code §25.110; amd. Ord. 96.48, 9-3-1996)

5. Bypass: The drainage systems which are provided for the site shall have adequate capacity to safely bypass through the development the flow resulting from a 100-year storm frequency from all upstream areas, assuming the land is in a fully developed state under present zoning or proposed zoning outlined in the Comprehensive Plan. The flow shall be calculated using a runoff coefficient of not less than fifty one-hundredths (0.50). An allowance shall be made for any upstream storm water storage which has actually been provided. The required bypass area for storm water in excess of the volume handled by the storm sewer system may consist of streets, parking areas, parks, playgrounds or other open spaces, including utility easements. There shall be no habitable structures located within this bypass area which is used as a floodway and this bypass area shall not be reshaped or restricted in any way to reduce its effective capacity. The design of the bypass area shall take into consideration the control of the storm water velocity to prevent erosion. The side slopes on any drainage swale shall not be steeper than five to one *(5:1)* (1988 Code *§25.211).*

6. Spillways. Each storm water storage area shall be provided with a properly designed spillway. For storm water storage areas with a total storage volume of twenty (20) acre-feet or less the spillway may be an earth spillway with proper vegetation to prevent erosion. For storm water storage areas with a total storage volume in excess of twenty (20*)* acre-feet the spillway shall be a reinforced concrete spillway approved by the City Engineer.

H. CONSTRUCTION AND POST-CONSTRUCTION SITE RUNOFF CONTROL REGULATIONS

1. Construction Site Runoff Control Regulations.

A storm water pollution prevention plan (SWPPP) shall be required for all developments and redevelopments that disturb a land area of one acre or more. The SWPPP shall meet or exceed the requirements of "Part IV - STORM WATER POLLUTION PREVENTION PLANS" of the current NPDES Permit No. ILR10.

2. Post Construction Site Runoff Control Regulations.

Post-construction storm water management shall be required for all developments and re-developments that have disturbed a land area of one acre or more and shall meet or exceed the requirements of "Part IV - STORM WATER POLLUTION PREVENTION PLANS" of the current NPDES Permit No. ILR10. These requirements shall be at least as restrictive as those identified in the Illinois Urban Manual, 2002, as amended from time to time.

I. EXCAVATIONS:

1. Permit Required. It shall be unlawful for any person to tunnel or make any excavation for constructing, repairing, or replacing a storm sewer in any existing street, sidewalk, driveway, alley, parking area or other public place without having obtained a permit therefore.

2. Street Opening Fees and Deposits. See the City Code, Title 7, for excavation fees and deposits.

3. Backfilling. All excavation in any existing street, sidewalk, driveway or alley shall be backfilled with CA-7 granular material and repaired in accordance with the city's standard details.

J. APPROVALS:

All work required to be done under this Section 6.12.1 by an applicant—be he the owner, subdivider or contractor—shall be periodically inspected by, and approved by, the City Engineer as the work progresses. When the work is completed, final approval shall be obtained from the City Engineer upon his final inspection.

6.12.2. SANITARY SEWER COLLECTION SYSTEM REQUIRED. A public sanitary sewer collection system shall be provided to serve all lots, parcels and tracts in the City in accordance with the following standards, specifications and requirements. Any person owning property within the corporate limits of the City, which is improved with one or more residences, buildings or structures used or intended to be used for human occupancy, employment or any other similar purpose, and which property abuts on any street, alley or right-of-way in which there is located a sewer within one hundred feet (100') from the nearest property line, shall install suitable toilet and waste disposal facilities therein and connect such facilities with the public sewer, in accordance with the terms and conditions of this Section 6.12.2, within ninety (90) days after such sewer is in service. **Exception:** Lots, parcels and tracts within the "R-4," Rural Residential District. On "R-4" parcels, dwelling units and permitted structures shall be served by private sewage disposal systems inspected and approved by the DeKalb County Health Department.

A. DESIGN AND CONSTRUCTION STANDARDS FOR SANITARY SEWER SYSTEM

The design and construction of the sanitary sewer system within the jurisdiction of the City shall be in accordance with accepted engineering practice and shall conform to the most restrictive of the requirements contained in the latest edition of the following regulations, standards, and specifications:

1. Sycamore's "Standard Details for Sanitary Sewer Construction."

2. "Standard Specifications for Water and Sewer Main Construction in Illinois."

3. “Recommended Standards for Sewage Works,” Great Lakes-Upper Mississippi River Board of State Sanitary Engineers (Ten State Standards), latest edition.

4. Rules and Regulations contained in the Environmental Protection Act.

5. Rules and Regulations of the Illinois Pollution Control Board.

B. SEPARATE SYSTEM

Sanitary sewers and storm sewers shall be kept separate. No combined sewers shall be permitted. Footing drain tiles, downspouts, etc. shall not discharge to the sanitary sewer system.

C. PIPE FOR SANITARY SEWERS

All pipe for sanitary sewers shall be PVC SDR 26 conforming to the requirements of ASTM D3034 or ASTM D2241. As an alternate, ductile iron pipe Class 50 conforming to ANSI/AWWA Cl 1 1/A2l.11 with a ceramic epoxy lining (Protecto 401) or Sewpercoat lining material.

D. SIZE OF SANITARY SEWERS

All sanitary sewers, except services, shall be a minimum of eight (8) inches in diameter. Services shall be a minimum of six (6) inches in diameter and shall be extended a minimum of five (5) feet beyond the street R.O.W. line.

E. SANITARY SEWER DEPTH

Sanitary sewer shall be constructed to a sufficient depth to serve the adjoining properties by gravity, where possible, and should not be less than five *(5)* feet from finished grade to the top of pipe.

F. MANHOLES

Manholes shall be installed at the end of each line; at all changes in grade, size, or alignment; and at intermediate intervals no greater than four hundred (400) feet, except for sanitary sewers twenty-four (24) inches and larger, in which the manhole spacing can be up to five hundred (500) feet.

G. SANITARY SEWER EXTENSIONS

Reimbursement: Any sanitary sewer which is to be constructed shall extend from across the entire width of the lot to be served and, in the case of a corner lot, the sanitary sewer shall also be extended along the side of the lot. When sanitary sewer has been constructed at the expense of the City, the City shall be reimbursed at the rate of nine dollars ($9.00) per front foot of property by the applicant or owner before any service connection is made to said sanitary sewer. Unless otherwise determined by the City, all sanitary sewers, except service and private lines, shall become the property of the City. The City shall have the right to extend or upsize lines to serve others without obligation to the developer across whose property the extension may run.

H. OVERSIZE DESIGN

When the City requires any sewer main to be larger than necessary to serve future connections, an agreement may be made to repay the owner or subdivider the construction cost resulting from the increased design, for the cost of the pipe only. Differences in required pipe sizes shall be determined by the City Engineer. No pipe less than eight (8) inches in diameter shall be laid by the owner or subdivider. No bids shall be taken or work commenced until such agreement is reached, in writing, with the City.

I. SANITARY SEWER TESTING

All sanitary sewers shall be tested as follows and any defects corrected before being approved by the City:

1. Air Test. All sanitary sewers shall be air tested for tightness after at least thirty (30) days following completion in accordance with the requirements outlined in the Illinois Water-Sewer Specifications except that the maximum pressure drop in the specified time shall not be greater than five-tenths (0.50) pound.

2. Deflection Test. All flexible pipes eight (8) inches and larger shall be tested for deflection after at least thirty (30) days following completion using a mandrel of the proper diameter.

3. Television inspection. All sanitary sewer eight (8) inches and larger shall be televised after at least thirty (30) days following completion and the City shall be furnished with a written report and cassette of this inspection.

4. Manhole Testing. All sanitary sewer manholes shall be vacuum tested in accordance with ASTM C1244.

J. BACKFILL MATERIALS FOR SANITARY SEWERS

Where a sanitary sewer will be located beneath a proposed street or within two (2) feet of the edge of the street, the trench shall be backfilled with CA-7 granular material or other granular material approved by the City Engineer. As an alternate to providing the CA-7 granular material, the trench may be backfilled with the same material as excavated from the trench provided this material is mechanically compacted in maximum twelve (12) inch lifts to a minimum density of 85%. The compacted earth backfill for the trench area shall be tested and certified by a soil testing agency, approved by City Engineer and paid for by developer, at intervals as approved by City Engineer. In addition, when the compacted earth backfill alternate is used, the backfill material around all manholes in the street area and also at all crossings of other sewer and water trenches shall be CA-7 granular material. All compacted earth backfill trenches located beneath a proposed street shall also be jetted and flooded with water as required by City Engineer. The final bituminous surface shall not be completed until two complete winter seasons (November 1st to April 1st) have transpired.

K. EXCAVATIONS

1. Permit Required. It shall be unlawful for any person to tunnel or make any excavation for constructing, repairing, or replacing a sanitary sewer in any existing street, sidewalk, driveway, alley, parking, or other public place without having obtained a permit therefore.

2. Street Opening Fees and Deposits. See the City Code, Title 7, for excavation fees and deposits.

3. Backfilling. All excavation in any existing street, sidewalk, driveway or alley shall be backfilled with CA-7 granular material and repaired in accordance with the City's standard details.

L. APPROVAL

All work required to be done under this Section 6.12.2 by an applicant, whether the owner, subdivider, or contractor, shall be periodically inspected by, and approved by, the City Engineer as the work progresses. When the work is completed, final approval shall be obtained from the City Engineer upon his final inspection.

6.12.3. WATER DISTRIBUTION SYSTEM REQUIRED. Water mains and fire hydrants shall be provided to serve all lots, parcels, and tracts in the city in accordance with the standards, specifications and requirements elaborated below, unless varied by the City Engineer. Except for (a) dwelling units and permitted structures within the "R-4," Rural Residential District, or (b) uses or methods in existence on or before July 2, 2001, the

private use or attempted use of ground water from within the corporate limits of the City as a potable water supply by the installation or drilling of wells or by any other method is hereby prohibited. Properties that are legally served only by a private well under the aforementioned circumstances may continue to be served by that well as long as the water is certified as potable at least every two (2) years without modifications to the well. When the public water system extends across the frontage street and is located within two hundred fifty feet (250') of the nearest point of the property, the existing well shall be capped and the public water system shall be extended to the property.

A. DESIGN AND CONSTRUCTION STANDARDS

The design and construction of a water distribution system within the jurisdiction of the City of Sycamore shall be in accordance with accepted engineering practice and shall conform to the most restrictive of the requirements contained in the latest edition of the following regulations, standards, and specifications:

1. Sycamore's "Standard Details for Water Main Construction."

2. "Standard Specifications for Water and Sewer Main Construction in Illinois."

3. "Recommended Standards for Sewage Works," Great Lakes-Upper Mississippi River Board of State Sanitary Engineers.

4. Rules and Regulations contained in the Environmental Protection Act.

5. Rules and Regulations of the Illinois Pollution Control Board.

B. PIPE FOR WATER MAINS

All pipe for water mains shall be ductile iron pipe class 52 with a push-on compression gasket joint. The pipe shall conform to ANSI A2 1.51 (AWWA C- 151).

C. SIZE OF PIPE FOR WATER MAIN

No pipe less than six (6) inch diameter will be permitted for water main construction. The water distribution system shall be properly looped to form a tight grid system and dead-end mains shall be avoided where possible.

D. PIPE FITTINGS

All pipe fittings shall be mechanical joint ductile iron fittings conforming to ANSI A2l-10 (AWWA C-110) and ANSI 21.11 (AWWA C-111).

E. DEPTH OF PIPE COVER

All water mains shall be constructed so that the distance measured vertically from the finished grade to the top of the pipe is not less than five and five-tenths (5.5) feet.

F. VALVES

Valves shall typically be installed at such intervals to isolate not more than one block of watermain and so that a main break or other failure will not affect more than five hundred (500) feet of mains in commercial/industrial districts or more than seven hundred (700) feet in other districts. No more than four valves shall be required to isolate any section of water main. All valves and valve manholes shall conform to the requirements of the City's standard details.

G. HYDRANTS

A sufficient number of hydrants shall be provided in order that no portion of any building is more than three hundred (300) feet from a fire hydrant. All hydrants shall be provided with an auxiliary valve and shall conform to the requirements of the City's standard details.

H. WATER MAIN EXTENSIONS

Any water main which is to be constructed shall extend from the existing water main across the entire width of the lot to be served, and, in the case of a corner lot, the water main shall also be extended along the side of the lot. When water main has been constructed at the expense of the City, the City shall be reimbursed at the rate of nine dollars ($9.00) per front foot of property by the applicant or owner before any service connection is made to said water main. Unless otherwise decided by the City, all water mains, except service and private lines for fire protection, shall become the property of the City. The City shall have the right to extend lines to serve others without obligation to the developer across whose property the main may run.

I. OVERSIZE DESIGN

In order to provide for future connections and overall planning, the City may require larger water mains than would be necessary to adequately serve the immediate property and may enter into an agreement to repay the owner or subdivider the difference in the cost of the materials only for the larger pipes, valves, and fittings resulting from the oversize design. No pipe less than six (6) inches in diameter shall be constructed by the owner or the subdivider. No bids shall be taken or work commenced until such agreement is arrived at, in writing, with the City.

J. PRESSURE TESTING AND BACTERIOLOGICAL TESTING OF WATER MAINS

After proper installation, all water mains and services shall be subjected to a hydrostatic pressure test of one hundred fifty (150) psi for one hour with the allowable leakage being in accordance with the requirements set forth in the "Standard Specifications for Water and Sewer Main Construction in Illinois". In addition, all water mains shall be properly disinfected and flushed and samples shall be obtained on two (2) consecutive days producing satisfactory bacteriological results. The owner, subdivider, or contractor shall conduct and pay all expenses associated with said testing.

K. BACKFILL MATERIALS FOR WATER MAINS

Where a water main will be located beneath a proposed street or within two (2) feet of the edge of the street, the trench shall be backfilled with CA-7 granular material or other granular material approved by the City Engineer. As an alternate to providing the CA-7 granular material, the trench may be backfilled with the same material as excavated from the trench provided this material is mechanically compacted in maximum twelve (12) inch lifts to a minimum density of 85%. The compacted earth backfill for the trench area shall be tested and certified by a soil testing agency, approved by City Engineer and paid for by developer, at intervals as approved by City Engineer. In addition when the compacted earth backfill alternate is used, the backfill material around all valve vaults in the street area and also at all crossings of other sewer and water trenches shall be CA-7 granular material. All compacted earth backfill trenches located beneath a proposed street shall also be jetted and flooded with water as required by City Engineer. The final bituminous surface shall not be completed until two complete winter seasons (November 1st to April 1st) have transpired.

L. EXCAVATIONS

1. Permit Required. It shall be unlawful for any person to tunnel or make any excavation for constructing, repairing, or replacing a water main in any existing street, sidewalk, driveway, alley, parking, or other public place without having obtained a permit therefore.

2. Street Opening Fees and Deposits. See the City Code, Title 7, for excavation fees and deposits.

3. Backfilling. All excavation in any existing street, sidewalk, driveway or alley shall be backfilled with select granular material and repaired in accordance with the City's standard details.

M. APPROVAL

All work required to be done under this Section 6.12.3 by an applicant – be he the owner, subdivider, or contractor - shall be periodically inspected by, and approved by, the City Engineer as the work progresses. When the work is completed, final approval shall be obtained from the City Engineer upon his final inspection.

6.12.4. **STREETS REQUIRED**. A public street or streets shall provide access to all lots, parcels, and tracts of land in the City.

A. DESIGN AND CONSTRUCTION STANDARDS FOR STREETS AND SIDEWALKS

The design and construction of streets and sidewalks within the jurisdiction of the City shall conform to the most restrictive of the requirements contained in the latest edition of the following regulations, manuals, standards, and specifications, three (3) copies of which shall be on file in the City Clerk's Office:

1. Sycamore's "Standard Details for Street and Sidewalk Construction."

2. "Construction Manual," Illinois Department of Transportation.

3. "Design and Environment Manual," Illinois Department of Transportation.

4. "Highway Standards," State of Illinois, Department of Public Works and Buildings, Division of Highways, Bureau of Design.

5. "Manual on Uniform Traffic Control Devices," Illinois Department of Transportation.

6. "Standard Specifications for Road and Bridge Construction," Illinois Department of Transportation.

B. GENERAL DESIGN CRITERIA

1. All streets shall be located in relation to existing and planned streets, to topographical conditions, to public convenience and safety and to the proposed uses of the land to be served by such streets. If the Comprehensive Plan or Land Use Map makes no provision therefore, the arrangements of streets shall either provide for the continuation of appropriate projection of existing streets in the surrounding area, or conform to a plan for the adjacent area adopted to meet a particular situation where topographical or other conditions make continuance or conformance to existing street impracticable.

2. Half-streets are not permitted. When any parcel or part of a parcel is adjacent to only one side of an existing right-of-way, which is less than the required width required by this Ordinance or the Official Map, the subdivider/developer shall take the necessary measures to dedicate additional right-of-way to meet the specifications of this Section.

3. Permanent dead-end streets will not be allowed.

4. All streets shall be laid out to provide multiple routes within and between neighborhoods in the City, and shall accommodate motor vehicles, bicyclists, and

pedestrians.

5. Where a parcel abuts or contains an existing or proposed limited access street, the Plan Commission may require alternative lot and street configurations to avoid creating double frontage lots.

6. Proposed streets shall extend to existing adjoining streets, unless the City Engineer determines such extension would be impractical.

7. GRADES.

a. MAXIMUM STREET GRADE. The maximum longitudinal grade for streets shall be five percent (5%).

b. MINIMUM STREET GRADE. In order to provide adequate gutter drainage, the minimum longitudinal grade shall be five-tenths of one-percent (0.5%).

c. PARKWAY CROSS-SLOPE GRADE. The area between the sidewalk and curb shall slope at a minimum rate of two percent (2%), and a maximum rate of six percent (6%), from the sidewalk toward the curb.

8. CURB AND GUTTER. Curb and gutter shall be provided on both sides of all public streets and or private streets unless otherwise determined by the City. The location of all sanitary sewer services, water services, and storm services, where applicable, shall be imprinted on the face of the new concrete curb and gutter with an "S," "W," or "~."

9. PAVEMENT CROSS-SECTION. The cross-slope for all pavements shall be two-percent (2%).

10. SIDE CLEARANCE. No obstructions of any type, including traffic control devices, shall be located closer than two (2) feet from the back edge of the curb.

11. CUL-DE-SAC STREETS. A cul-de-sac street shall be avoided where possible. When approved, the length shall not exceed five hundred feet (500') measured along its centerline from the point of origin to the end of the right of way, and the minimum turn-around radius at the end shall be fifty (50) feet from the center to the back of curb.

12. STREET OFFSETS. Street offsets shall not be less than one hundred fifty feet (150'), measured from centerline to centerline.

13. STREET INTERSECTIONS. All streets shall intersect each other as close to right angles as topography and other limiting factors of good design permit. An intersection of more than two (2) streets shall not be permitted. Any type of partial cloverleaf intersection (eyebrow) or other similar configuration will not be permitted, except upon the recommendation of the City Engineer.

14. MINOR STREET ALIGNMENT. All minor streets shall be so aligned that their use by through traffic will be discouraged.

15. CURB CUTS. The number of curb cuts shall be restricted to provide for traffic safety with the maximum width of a curb cut being thirty feet (30') with a minimum of fourteen feet (14').

16. TELEPHONE, TELEVISION, CABLE AND ELECTRIC DISTRIBUTION LINES. All utilities shall be placed underground in new subdivisions. Such conduits or cables shall be placed within easements or dedicated rights-of-way in a manner that will not conflict

with other underground services.

17. STREET NAME SIGNS. The subdivider or developer shall provide at each intersection permanent street name signs meeting City specifications.

18. RIGHT-OF-WAY WIDTHS: The right-of-way widths for streets shall conform to the following minimum dimensions:

a.	Primary streets	100 feet
b.	Secondary streets	80 feet
c.	Collector streets	66 feet
d.	Minor streets	66 feet
e.	Cul-de-sac streets	66 feet with 131 foot diameter at turnaround

19. STREET ALIGNMENT. For curvilinear streets the centerline radii shall conform to the requirements of IDOT's "Design and Environment Manual" except that minor residential streets shall have a minimum centerline radii of not less than one hundred sixty (160) feet and a collector residential street shall have a minimum centerline radii of not less than two hundred fifty (250) feet.

20. SOIL SURVEY. A soil survey shall be performed prior to the design of the pavement when the City Engineer has reason to believe the sub-grade materials may be unsatisfactory or remedial underground drainage might be needed. A copy of the soil survey shall be submitted to the City Engineer with the detailed plans and specifications.

21. LOTS AND BLOCKS.

a. Size of lots. The size of lots shall conform to the relevant zoning classifications.

b. Access to lots. Each lot within a subdivision must have access to a public street or private street.

c. Corner lots. All corner lots shall have adequate width and depth to permit proper building setbacks from both streets.

d. Configuration of blocks. The shape of blocks shall be determined by existing and proposed street patterns, existing and projected traffic patterns, lot depths, and topographical depths.

e. Width. Blocks shall typically have sufficient width to provide for two (2) tiers of lots of the appropriate depths.

f. Length. The maximum length of blocks shall be one thousand eight hundred feet (1,800'). The use of crosswalks will be specified by the Plan Commission. Pedestrian crosswalks shall have a right of way width of ten feet (10') and a paved sidewalk width of not less than four feet (4').

22. STREET LIGHTING.

a. Subdivision Street Lighting: In new subdivisions, adequate street lighting shall be provided at all intersections and at intermediate intervals not exceeding three hundred fifty feet (350'). The developer shall be responsible for furnishing and installing all street lighting facilities, including, but not limited to, poles, underground or overhead cables, trenching and backfilling for a completely workable system ī. As an alternate to the developer furnishing and installing the street lighting facilities, the developer shall cause the utility company providing such service to furnish and install said facilities with the developer reimbursing said company for this work. No approval of a final plat of subdivision will be made until the foregoing improvements as required by the plan commission are made or until the plan commission has been provided proper guarantee of performance. (Ordinance 98.80, 4-5-1999)

b. Alternative Street Lighting: Upon the approval of the City Manager or designee, light poles other than the concrete poles and appurtenances typically used in the city may be installed at the developer's expense. Such fixtures shall provide the minimum illumination specified by the city engineer at all intersections and at intermediate intervals. Further, such poles and appurtenances shall conform to the alternative models specified by Commonwealth Edison or any other electric utility company providing such service. If the operation, maintenance, and replacement costs of such streetlights create an expense in excess of the average cost of the city's standard lighting, the city council shall establish an operational special service area to finance any extraordinary maintenance costs. Prior to the approval of any alternate system of lighting, a joint developer/city agreement shall be approved by the City Council. (Ordinance 98.80, 4-5-1999; and. Ordinance 2002.95, 4-21-2003)

C. PAVEMENT DESIGN.

The pavement design for all streets shall be in accordance with IDOT's "Design and Environment Manual" with the minimum requirements as defined in TABLE 1, MINIMUM STREET STANDARDS, below. For the use of this table the various street classifications are defined as follows:

1. Collector Street: A street of considerable continuity which carries traffic from minor streets to secondary or primary streets in eluding the principal entrance streets of residential developments and the principal circulating streets within such a development.
2. Minor Street: A street of limited continuity used primarily for access to abutting properties and the local needs of the neighborhood.
3. Primary Street: A street that will provide for heavy traffic of considerable continuity that is, or that will be, used as a connection between various districts of the City and adjoining communities.
4. Secondary Street: A street which carries traffic from such facilities as schools, churches, shopping areas, and employment centers to high population densities and to primary streets.

D. HANDICAPPED RAMPS

1. Sidewalk ramps for the handicapped shall be provided at all street intersections and at designated crosswalks. The sidewalk ramps shall meet the requirements outlined in "Highway Standards," published by the Illinois Department of Transportation.
2. Where sidewalks are constructed or replaced at intersections and other crosswalks adjacent to barrier, mountable, or roll type curbing, a sidewalk ramp for the handicapped shall be provided in accordance with the requirements outlined in "Highway Standards," published by the Illinois Department of Transportation. Where the replacement of existing public sidewalk or the installation of new public sidewalk that is eligible for City reimbursement requires an alteration of the curb to accommodate the handicapped ramp, appropriate fees (cf. City Code, Title 9) shall be paid to the City.

E. BACKFILL MATERIALS FOR UNDERGROUND UTILITIES AND OTHER IMPROVEMENTS.

Where underground utilities will be located beneath a proposed street or within two (2) feet of the edge of the street, the trench shall be backfilled with CA-7 granular material or other granular material approved by the City Engineer. As an alternate to providing the CA-7 granular material, the trench may be backfilled with the same material as excavated from the trench provided this material is mechanically compacted in maximum twelve (12) inch lifts to a minimum density of 85%. The compacted earth backfill for the trench area shall be tested and certified by a soil testing agency, approved by City Engineer and paid for by developer, at intervals as approved by City Engineer. In addition when the compacted earth backfill alternate is used, the backfill material around all structures in the street area and also at all crossings of other utility trenches shall be CA-7 granular material. All compacted earth backfill trenches located beneath a

proposed street shall also be jetted and flooded with water as required by City Engineer. The final bituminous surface shall not be completed until two complete winter seasons (November 1st to April 1st) have transpired.

F. COMPACTION TESTS

When compaction tests are required by the City Engineer for the embankment or subgrade, said tests shall be conducted by a certified testing agency and all costs associated with this testing shall be paid by the owner.

G. WIDENING STREETS

When land is subdivided or developed adjacent to an existing street without curb and gutter, the street shall be provided with curb and gutter to the proper width and the street shall be reconstructed, widened or surfaced as required by the City Engineer and Table 1, Section 6.12.4.

H. IMPROVEMENTS REQUIRED.

A properly designed street system complete with curb and gutter and sidewalks on both sides shall be provided at the expense of the owner or developer of a subdivision to serve each lot within said subdivision. All streets, curb and gutter, and sidewalks shall extend across the entire width of the lot to be served and, in the case of a corner lot, said improvements shall also be provided along the corner side yard. Variations from this standard, as for instance the widening of a sidewalk to ten feet (10') on one side of a street to accommodate bicyclists and pedestrians, may be permitted, but only with the recommendation of the City Engineer and Plan Commission and the approval of the City Council.

I. PERMIT REQUIRED.

1. Application for Permit. No person shall connect to or extend any street or sidewalk in the City without first submitting an application for a permit to the City Engineer.

2. Plans and Specifications. The application forms for a permit shall be accompanied by three (3) sets of plans and specifications for review, prepared by a registered professional engineer of Illinois. When said plans and specifications are approved and a permit has been issued, the applicant shall furnish the City with an additional three (3) sets of plans and specifications.

3. Notice of Construction. The City shall be given an advance notice of forty-eight (48) hours before any construction begins.

J. APPROVAL

All work required under this Chapter shall be periodically inspected by the City Engineer and his approval is necessary before work can progress. Before final approval can be obtained, the City Engineer shall inspect all work and see that the same has been completed in accordance with the approved plans and specifications.

TABLE 1: MINIMUM STREET STANDARDS

Street Classification	Minimum R.O.W. (feet)	Minimum Street Width (feet) Measured Back to Back of Curb	Minimum Structural Number* (Dt)	Minimum Pavement Construction**
Residential				
Minor	66	35	2.90	10" compacted limestone base consisting of 6" of 1" to 4" crushed limestone with limited fines and 4" of CA-6 crushed limestone plus 4" of hot mix asphalt surface course IL-

				9.5L, N30 installed in two lifts.
Cul-de-sac	Same as for Minor street but with 131 foot diameter at end	Same as for Minor street but with 100 foot diameter at end	2.90	10" compacted limestone base consisting of 6" of 1" to 4" crushed limestone with limited fines and 4" of hot mix asphalt surface course IL-9.5L, N30 installed in two lifts.
Collector Projected ADT: 1,000-3,000	66	35	3.16	12" compacted limestone base consisting of 8" of 1" to 4" crushed limestone with limited fines and 4" of CA-6 crushed limestone plus 4" of hot mix asphalt surface course IL-9.5L, N30 installed in two lifts.
Collector Projected ADT: 3,000 and over	66	35	3.95	15" compacted limestone base consisting of 10" of 1" to 4" crushed limestone with limited fines and 5" of CA-6 crushed limestone plus 5" of hot mix asphalt surface course IL-9.5L, N30 installed in two lifts.
Rural Residential				
Minor	66 (Includes 24 foot road surface, with 3 foot earth shoulders)	24 (Ditches shall have 4:1 maximum slope with 2' wide flowline)	2.50	10" compacted base consisting of 6" of 1" to 4" crushed limestone with limited fines and 4" of CA-6 crushed limestone plus 3" of hot mix asphalt surface course IL 9.5L, N30 (placed in two lifts)
Commercial				
Minor	66	35	3.16	12" compacted limestone base consisting of 8" of 1" to 4" crushed limestone with limited fines and 4" of CA-6 crushed limestone plus 4" of hot mix asphalt surface course IL-9.5L, N30 installed in two lifts.
Collector	66	35	3.95	15" compacted limestone base consisting of 10" of 1" to 4" crushed limestone and 5" of CA-6 crushed limestone plus 5" of hot mix asphalt surface course IL-9.5, N50 installed in two lifts.
Institutional***				
	66	35	3.16	12" compacted crushed limestone base consisting of 8" of 1" to 4" crushed limestone and 4" of CA-6 crushed limestone plus 4" of hot mix asphalt surface IL-9.5L, N30 installed in two lifts.
Industrial				
Minor	66	35	3.68	16" compacted crushed limestone base consisting of 10" of 1" to 4" crushed limestone with limited fines and 6" of CA-6 crushed limestone plus 4" of hot mix asphalt surface course IL-9.5, N50 installed in two lifts.
Collector	66	35	4.34	12 oz. non-woven geotechnical fabric with an 18" compacted stone base consisting of 12" of 1" to 4" crushed

				limestone with limited fines and 6" of CA-6 crushed limestone plus 5" of hot mix asphalt surface course IL-9.5, N50 installed in three lifts.
Secondary	80	49	4.34	12 oz. non-woven geotechnical fabric with an 18" compacted stone base consisting of 12" of 1" to 4" crushed limestone with limited fines and 6" of CA-6 crushed limestone plus 5" of hot mix asphalt surface course IL-9.5, N50 installed in three lifts.
Primary	100	55	6.18	12 oz. non-woven geotechnical fabric with 8" compacted CA-6 crushed limestone subbase, 10" bituminous concrete base course IL-19.0 N50 with 5" of hot mix asphalt surface course IL-9.5, N50 installed in three lifts.

*As defined in the "Design and Environment Manual," State of Illinois, Department of Transportation.
**Various combinations of pavement types and thicknesses that produce the required structural number may be used if approved by the City Engineer. Properly designed Portland cement concrete pavement may be used if approved by the City Engineer.
***Minor streets providing access to churches, schools, hospitals, etc.
Note: All N30 Bituminous mixes shall have 58-28 asphalt cement.

K. BITUMINOUS PAVING EQUIPMENT.

All paving equipment shall conform to IDOT's "Standard Specification for Road and Bridge Construction" and the finishing machine shall be capable of a paving width up to nineteen (19) feet in one pass.