SECTION 4
REQUIRED IMPROVEMENTS AND DESIGN STANDARDS

4-1 SUBMISSION FOR REVIEW AND APPROVAL.

Detailed engineering plans and specifications shall be prepared by a registered professional engineer in the State of Illinois for all improvements involved in the development of the subject tract of land. Said plans and specifications shall be of sufficient detail to adequately describe the proposed improvements and be submitted to the Director of Community Development for distribution to Village staff for review and comment. The Village Engineer shall recommend approval of the plans and specifications to the Village once all comments have been satisfactorily addressed.

4-2 ENGINEERING DOCUMENTS.

The engineering documents shall consist of, but shall not be limited to, the following:

1. Engineering plans and specifications signed and sealed by a registered professional engineer in the State of Illinois.
2. Drainage and surface water detention design and calculations.
3. Sanitary sewerage design and calculations.
4. Potable water facility design and calculations.
5. Mass grading and individual lot grading design.
6. Intersection pavement grading plans.
7. Existing wetland inventory and delineation.
8. Wetland mitigation plans.
9. Soil erosion and sedimentation control plans.
10. Landscaping plan.
11. Street pavement design.
12. Street lighting plan.

13. Street regulatory sign plan.

14. Engineers opinion of probable cost.

4-3 SANITARY SEWERAGE.

Sanitary sewerage design shall be in accordance with the Lake in the Hills Sanitary District rules and regulations, and those of the Illinois Environmental Protection Agency (IEPA) Division of Water Pollution Control (WPC).

4-4 POTABLE WATER.

Potable water facility design shall be designed in accordance with the Village ordinances and the rules and regulations of the IEPA - Division of Public Water Supplies. All water system improvements shall meet the requirements of the latest editions of the Standard Specifications for Water and Sewer Main Construction in Illinois, the American Water Works Association (AWWA), as well as specific requirements of the Village.

Watermain sizes shall be designed to adequately service the subdivision, including fireflow. All systems must be sized properly to allow for future expansion and may need to be oversized to provide sufficient regional flow.

The required materials and specific standards for watermain construction can be found in the following sections and in the appendices section of this document.

A. General: All developments shall include provisions for the construction of a water distribution system complete with valves, fire hydrants and other appurtenances and required by this Code. The water supply facility of any building located within the Village shall have said water supply facilities connected to the said water main line. All existing buildings presently within the Village that are being served by a private well are exempt from this Section until such time that an operational water main is located on any abutting easement or right of way, at which time they will be required to connect onto the Village water main within 90 days after date of official notice to do so. Any and all expenses to connect to the Village water main shall be solely at the owners expense. Any parcel and/or building located outside the Village shall be required to annex into the Village prior to connection onto the Village water supply and any and all expenses incurred to extend said water supply would be totally at the owner's expense.

B. Specifications: The water distribution system shall be designed in accordance with the grading schedule for Municipal Fire Protection, Insurance Services Office recommended fire flows; Illinois EPA Division of Public Water Supply Technical Policy statements and these Engineering Standards.

C. Design:

1. A complete water distribution system shall be designed to serve the entire development. The water mains shall be of adequate size to supply the required domestic consumption and fire flow demands throughout the system. The design engineer shall submit calculations showing flows in the system at various locations are adequate for domestic consumption and fire flow demand with a required minimum twenty-five psi residual pressure.

2. Design Flows: Domestic and Fire Protection: For purposes of water main design, maximum day flows shall be based on the following:

Location or Type	Domestic	Fire Flow
a. Residential		
Single family, detached	100 gpcd	1500 gpm
Single Family, attached (townhome) w/approved firewall	100 gpcd	2000 gpm
Multi-family	100 gpcd	3000 gpm
b. Office	50 gpcd	3000 gpm
c. Commercial	60 gal/employee/shift	6000 gpm
d. Industrial	75 gal/person/shift	6000 gpm

Flow shall be calculated using a ‘C’ factor of one hundred (100), ignoring fittings, and with a minimum residual pressure of twenty-five (25) psi.

3. Pipe Size: the minimum water main pipe size shall be eight inches (8”) diameter, unless otherwise approved by the Director of Public Works.

4. Fire Hydrants:

a. Hydrants shall be installed at all street intersections and at maximum three hundred foot (300’} spacing along the lengths of streets.

b. When a building to be occupied will be set back two hundred fifty feet (250') or more from a street or is located more than three hundred feet (300') from a hydrant, additional hydrants shall be installed such that one hydrant shall be located at the entrance to the building and hydrants shall be provided around the perimeter of the building at maximum two hundred fifty feet (250') spacing measured along access roads. Such hydrants shall be installed not more than fifty feet (50') nor less than twenty-five feet (25') from the building.

c. Fire hydrant spacing and location plans shall be submitted to the Building Inspector for review and approval.

d. Fire Hydrant spacing and location plans shall be submitted to the applicable fire department for review and approval.

5. Valves and Vaults:

a. Valves shall be located on water mains so as to be able to isolate sections of main from the entire system with minimum disruption of service.

b. Valves shall be installed so that not over eight hundred feet (800') of water main, with services, will be shut off at any time. Transmission lines with no service connections shall have valves located so that not over twelve hundred feet (1200') of main will be shut off at any time. Valves on water mains servicing single family residential areas shall be installed so that no more than eight hundred feet (800') of water main and/or no more than twenty-five (25) units shall be affected when shutting off a section of main, or as approved by the Village.

c. Valves shall be located so that it will require no more than four (4) valves to be closed to isolate a section of water main.

d. Valve vaults are required on all valves two and one-half inches (2-1/2”) or larger. Valve vaults shall be sixty inch (60”) inside diameter or larger with concentric cones or as approved by the Village.

6. Thrust Blocks: Thrust blocks shall be required, along with tie roads and retaining glands (Megalugs), at all hydrant tees and bends. Thrust Blocks shall be pre-cast, except where poured concrete is detailed on the Engineering Details in Appendix I. Poured concrete shall be placed so as not to limit access to bolts, tie rods, or retaining glands.

7. Depth of Water Main: All water mains shall be constructed a minimum of 6 feet (6’0”) and a maximum of 8 feet (8’0”) below final grade unless otherwise approved by the Director of Public Works.

8. Separation of Water Mains and Sewers: Separation and protection of water mains from sewers shall comply with the Illinois EPA Division of Public Water Supplies Technical Policy Statements, latest edition.

9. Service Connections:
    a. All water service lines shall be designed with a minimum diameter necessary to provide adequate domestic and fire flow use.
    b. Water service line servicing single-family residences shall be a minimum of one-inch (1”) diameter.

D. Allowable Materials:

1. Water Main Pipe:
   a. All pipe and casings shall be Class 52 Ductile Iron Pipe, unless otherwise approved by the Director of Public Works, domestic only.
   b. All pipe shall have a minimum laying length of eighteen feet (18').
   c. Pipe joints shall be push-on joints or mechanical joints conforming to AWWA C-111 (ANSI 21.11).
   d. Any watermain in a sleeve must use field-lock gaskets.
   e. All pipes shall be cement-mortar lined in accordance with AWWA C-104 (ANSI A-21.4).
2. Water Main Fittings:
   a. All water main fittings shall be ductile iron fittings conforming to AWWA specification C-110 (ANSI 21.10), domestic only.
   b. Fittings shall be cement-lined in accordance with AWWA C-104 (ANSI A21.4).
   c. All mechanical joints or water main fittings shall use stainless steel T-bolts & nuts and Megalug restraining devices. No substitutions will be allowed.
3. Valves:
   a. All valves shall be Clow or Mueller resilient wedge valves, parallel set, non-rising stem gate valves conforming to AWWA C-500. Valves shall open counter clockwise. Joints shall be mechanical or push-on type conforming to AWWA C-111.
   b. Valves larger than eight inches (8") shall be ductile-iron body, rubber sealed, tight closure butterfly valves conforming to AWWA C-504. Valves shall be Class 150-8 and shall open counter clockwise and be operated by a two inch (2") square nut. Joints shall be flanged joints. Valves shall be Pratt-Groundhog Butterfly or Mueller Lineseal III. Other valves may be allowed upon review and approval of Public Works.
4. Valve Vaults:
   a. Valve vaults shall be a minimum of sixty-inch (60”) inside diameter and shall consist of precast reinforced concrete sections meeting ASTM C-478 and ASTM C-433 standards or as approved by the Village.
   b. Adjusting rings shall be precast concrete rings.
   c. Vault steps shall be Neenah R-1981-1 or approved equal.
   d. Frame and grates for valve vaults shall be Neenah or approved equal, embossed "Water" and have recessed pickhole.
   e. All Pipe openings shall have a lockjoint flexible manhole sleeve, conforming to ASTM-C, integrally cast into the barrel section.
5. Fire Hydrants:
   a. Fire hydrants shall be dry barrel type with breaktype flange and auxiliary gate valves and shall conform to AWWA C-502.

b. Hydrants shall have two (2), two and one-half inch (2-1/2") hose outlets and one four and one-half inch (4-1/2") national standard thread outlet.
c. Hydrants shall have a main valve opening of five and one-quarter inches (5-1/4") with a six-inch (6") auxiliary valve with mechanical joints. The auxiliary valve shall have a three (3)-piece valve box.
d. Hydrants shall be painted red.
e. Hydrants shall be Clow Medallion, F-2545 or Mueller Centurion A428.

6. Service Connections:

a. One inch (1”) is the minimum size for a service line. One inch (1”) service lines shall be direct tapped.
b. Service lines greater than one inch (1”) and less than three inches (3”) shall be type K copper with approved service saddle & corporation stop.
c. Service lines three inches (3") and larger shall be ductile iron conforming to allowable water main material specifications and is subject to pressure testing and chlorination.
d. Corporation stops shall be Mueller H-15000 or A.Y. McDonald, flare, #4701.
e. Tapping Saddles for water services greater than one inch (1”) and less than three inches (3”) shall be Cascade CNS-2 or Smith Blair 317.
f. Each service less than three inches (3”) in diameter shall have a curb stop Mueller H-15154 or A.Y. McDonald, flare, #6107 and B-Box Mueller, H-10302 or A.Y. McDonald #5123. Services three inches (3") and larger shall have gate valves conforming to water main gate valve specifications.
g. Only Smith Blair 665, Cascade CST-EX tapping sleeves shall be allowed.
h. Repair sleeves shall be full circle, all stainless steel and shall be Smith Blair #261 or Cascade CR1.

7. Bedding and Trench Backfill: Aggregate for bedding when required and for trench backfill shall conform to requirements of article 704.01 of the "Standard Specifications for Road and Bridge Construction" State of Illinois and conform to gradation CA-6. No recycled concrete shall be allowed for use as bedding or trench backfill.

E. Construction:

1. Water Mains Water mains and appurtenances shall be installed in conformance with AWWA C-600, the material manufacturer's recommendations, the standard specifications for Water and Sewer Main construction in Illinois and this Chapter.
2. Trench Backfill: Trench backfill shall be required in all locations where the water main trench is under or within two feet (2') of existing or proposed pavements including but not limited to streets, sidewalks and driveway. The trench backfill shall be placed in lifts not exceeding eight inches (8") and shall be mechanically compacted to not less than ninety-five percent (95%) of the standard laboratory density. Backfill in water main trenches under existing or proposed streets shall consist of trench backfill as noted above except that the area from six inches (6") to one foot six inches (1'6") above the pipe shall be an impervious clay material compacted to ninety-five

percent (95%) standard laboratory density. Verification of density testing shall be provided to the Village.

3. Water in Trench: Where water is encountered in the trench, it shall be removed during pipe-laying and joint operations. Trench Water shall not be allowed to enter the pipe at any time.
4. Water System Connections: All connections to the existing water system shall be made under full water service pressure unless otherwise approved by the Village.
5. Butterfly Valves: All butterfly valves shall be attached to the water main with a MJ and flange connector to facilitate removal of the valve. The valve vault shall be of sufficient size to accommodate the valve and connector as approved by the Village.
6. Fire Hydrants:
    a. Fire hydrants shall have a minimum of seven cubic feet of one inch (1”) to one and one-half inch (1 ½”) washed river stone placed at the base of the hydrant to provide drainage at the barrel.
    b. The breakline flange of hydrants shall be not less than one inch (1") or more than three inches (3") above finished ground elevation. Hydrants in street rights of way shall be placed not less than three feet (3'), nor more than five feet (5') from the back of curb.
7. Miscellaneous:
    a. Water service lines shall have a minimum cover of seventy-two inches (72”).
    b. Copper service lines shall not have intermediate unions.
    c. Curb stops and curb boxes shall not be located in the rights of way. Such curb stops and boxes shall not be with in two (2) feet of any paved areas or other hard dust-free surface.

F. Pressure Test:

1. As part of the construction of development improvement, all water mains and water services three (3) inches or greater shall be pressure tested as described in this section. Pressure tests shall be scheduled with the Public Works Department, with a minimum of forty-eight (48) hours notice prior to the test. Only Public Works personnel will operate valves connected to the existing water system.
2. All newly laid pipe shall be pressure tested utilizing an oil-filled pressure gauge, in two (2) pound increments. The test shall of one hundred (100) pounds per square inch, with no loss or gain. Duration of each pressure test shall be for a period of not less than one hour. Each valved section of pipe shall be filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe. Before applying the specified test pressure, all air shall be expelled from the pipe. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced and the test repeated until satisfactory results are obtained.
3. All testing shall be done before the insulation of service lines.
4. All Valves, including Hydrant Auxiliary Valves, shall be open to include hydrants in the pressure test and chlorination.

5. All pressure tests, chlorination and bacteria samples shall be done in the presence of the Public Works Personnel.

G. Service Connections:
1. The Village must be in possession of the IEPA permit prior to installation of any service connections.
2. All plumbing shall be installed by a licensed plumber or plumbing apprentice as per Illinois Plumbing Code.

H. Preliminary Flushing: Prior to chlorination, the main shall be flushed as thoroughly as possible with the water pressure and outlets available. Flushing shall be done after the pressure test is made. It must be understood that such flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying. If no hydrant is installed at the end of the main, a tap should be provided large enough to affect a velocity in the main of at least 2.5 feet per second.

I. Disinfection:
1. The preferred point of application of the chlorinating agent shall be at the beginning of the pipeline extension of any valved section of it and through a corporation stop in the top of the newly laid pipe. The injector for delivering the chlorine-gas into the pipe should be supplied from a tap on the pipeline extension side of the gate valve controlling the flow into the pipeline extension.
2. Water from the existing distribution system or other source of supply shall be controlled to flow slowly into the newly laid pipeline during the application of chlorine-gas. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall be at least fifty ppm, or enough to meet the requirements during the retention period.
3. Valves shall be manipulated so that the strong chlorine solution in line being treated will not flow back into the line supplying the water.
4. Treated water shall be retained in the pipe at least twenty-four hours. After the chlorine-treated water has been retained for the required time, the chlorine residual at the pipe extremities and at other representative points should be at least ten (10) ppm.
5. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with chlorinating agent.
6. All water mains shall be disinfected and tested according to the requirements of the “Standards for Disinfection Water Mains”, AWWA C-601 and as required by this Chapter, shall be performed by an independent firm exhibiting experience in the methods and techniques of this operation, and shall be done in the presence of Public Works staff. Public Works shall be notified of the time of disinfection a minimum of forty-eight (48) hours prior to the disinfection.

J. Final Flushing and Testing:

1. An 8 ½”x11” site plan shall be submitted to the Water Superintendent and shall show any section of main being pressure tested, chlorinated, or tested for bacteria levels, and shall clearly show the sections of main being submitted for permit and shall clearly indicate the footage.

2. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipeline at its extremities until the replacement water, throughout its length shall, upon test, be approved as safe water by the Water Superintendent. This quality of water delivered by the new main should continue for a period of at least two (2) full days as demonstrated by laboratory examination of samples taken from a tap located and installed in such a way as to prevent outside contamination. Samples may not be taken from a fire hydrant. Two (2) samples, taken twenty-four (24) hours apart, shall pass the requirements of this Chapter. Upon final flushing, the chlorine residual in the new main shall not exceed normal chlorine residual in the existing main.
3. Samples shall be taken by the firm performing the disinfection of the main and in the presence of the Public Works personnel. The sample shall be taken to a laboratory approved by the Village for analysis.

4-5 DRAINAGE.

Drainage design shall be in accordance with the Lake in the Hills Municipal Code as follows:

1. Comprehensive Stormwater Management Ordinance, Chapter 49. Said Chapter is incorporated herein by reference.

In compliance with the provisions of the Illinois Environmental Protection Act, the IEPA has developed a general permit which addresses National Pollutant Discharge Elimination System (NPDES) requirements for storm water discharges from construction site activities. A Notice of Intent is required to be submitted to the IEPA Division of Water Pollution Control prior to Final Plat approval.

The required materials and specific standards for the construction of storm sewers and other stormwater drainage appurtenances can be found in the appendices section of this document.

4-6 SOIL EROSION AND SEDIMENT CONTROL.

Soil Erosion and Sediment Control shall be in accordance with Chapter 49, Comprehensive Stormwater Management Ordinance, of the Lake in the Hills Municipal Code, which Chapter is incorporated herein by reference.

Provision shall be made for an all-weather surface and staging area to clean all equipment, store vehicle equipment and materials to assure the public streets remain clean, the parking

regulations are adhered to and the construction going forward will have minimal affect on the surrounding properties.

4-7 STREETS AND ROADS.

4-7-1 PAVEMENT STRUCTURE.

The street pavement shall be designed in accordance with the Illinois Department of Transportation Flexible Pavement Design Procedures. The following structural numbers shall be attained for the given street classification:

Street Classification	Minimum Dt
Minor Residential	2.50
Collector	3.00
Business/Commercial	3.50
Industrial	4.00

The sub-grade shall have a minimum Illinois Bearing Ratio (IBR) value of 3.0. The minimum thickness for surface, binder, base and sub-base courses are as follows:

Pavement Course	Thickness (inches)
Bituminous Surface	1.5
Bituminous Binder	2.0
Bituminous Base	6.0
Aggregate Base	10.0
Aggregate Sub-Base	4.0

All materials shall conform with (and be subject to) construction testing as specified in the latest edition of the IDOT Standard Specifications for Road and Bridge Construction.

4-7-2 MINIMUM STANDARDS FOR STREET DESIGN.

STREET	ROW WIDTH	*MINIMUM PAVEMENT WIDTH	RADIUS OF HORIZONTAL CURVES	TANGENT BETWEEN LENGTH OF VERTICAL CURVES	HORIZONTAL REVERSE CURVES	MAXIMUM GRADIENT	MINIMUM GRADIENT	CLEAR SIGHT DISTANCE
MINOR RESIDENTIAL	60 FEET	30 FEET	150 FEET	100 FEET(b)	---	6%	.5%	200 FEET
COLLECTOR	100 FEET	36 FEET	500 FEET	200 FEET(a)	200 FEET	5%	.5%	500 FEET
MINOR COMMERCIAL/ INDUSTRIAL	80-100 FEET	30 FEET	500 FEET	200 FEET	200 FEET	2%	.5%	500 FEET
COMMERCIAL/ INDUSTRIAL-COLLECTOR	80-100 FEET	36 FEET	500 FEET	200 FEET	200 FEET	2%	.5%	500 FEET
CUL-DE-SAC CIRCLE	120 FOOT DIAMETER	88 FOOT DIAMETER (c)				6%	.5%	

NOTES:

* Pavement widths are measured edge to edge of pavement. Actual width may increase/decrease based on the proposed use and/or evaluation of a traffic impact study.

(a) 50 ft. for each one percent algebraic difference of grade but in no case less than 200 ft.

(b) 40 ft. for each one percent algebraic difference of grade but in no case less than 100 ft.

(c) Islands are not allowed in cul-de-sacs.
Non-aligning streets (jogs) shall be a minimum of 125 ft. (38m)

(d) Arterial design standards shall be based upon the total traffic volumes projected and the design speed of the roadway as determined by the Village Engineer.
Curb and gutter and storm sewer shall be designed for all roadways.

4-7-3 CURBS AND GUTTERS.

Curb and gutter will be required to be installed for all new developments. The required materials and specific standards for the construction of curb and gutter can be found in the appendices section of this document.

4-7-4 SIDEWALKS.

Sidewalks will be required to be installed for all new developments. The required materials and specific standards for the construction of sidewalks can be found in the appendices section of this document.

4-7-5 STREET LIGHTING.

Street Lighting will be required to be installed in all new developments. At a minimum, streetlights shall be installed at all intersections, at the ends of all cul-de-sacs that are 500-feet long or longer, and at mid-block locations where the distance between intersections is equal to or greater than 1,000-feet, as approved by the Village Engineer. Additional street lights may be required by the Village Engineer based upon street geometry. The required materials and standards for the construction of street lighting can be found in the appendices section of this document.

4-7-6 STREET SIGNS.

Street signs are required for street names and traffic regulations. The required materials and specific standards for the construction of street signs shall conform to the standards found in the Manual on Uniform Traffic Control Devices published by the Federal Highway Administration, as revised from time to time. In addition:

1. Street lights should be installed as close to intersections as possible to facilitate street name signage installation.

2. Stop signs shall be minimum 30" high intensity and shall be mounted on Tel-Spar poles. The minimum height to bottom of sign shall be 7 feet. The distance from the back of the curb to the pole shall be 3 feet, unless approved by the Director of Public Works.

3. Speed limit signs shall be minimum 18" X 24" engineer grade and shall be mounted on Tel-Spar poles. The minimum height to bottom of sign shall be 7 feet. The distance from the back of the curb to the pole shall be 3 feet, unless approved by the Director of Public Works.

4. Street ID signs shall be mounted on the street light pole, where applicable, and the distance from the final grade to the bottom of the sign shall be 14 feet. When it is not feasible to mount the street ID sign on a street light pole, street ID signs shall be mounted

on Tel-Spar poles and the minimum height to the lowest portion of sign assembly shall be 7 feet. The distance from the back of the curb to the pole shall be 3 feet. Signs shall be constructed from 1.20 gauge aluminum. Lettering shall be 9" high. Colors shall be green background with white lettering and border.

4-8 GRADING.

An overland and individual lot grading plan for each lot and area shall be submitted for review and approval by the Village Engineer. Grading shall include the existing topography, establishment of lot and area grades and building elevations which are consistent with the existing ground line, surrounding properties and affected public properties.

It is the purpose of the grading plan to develop a plan which does not adversely affect the surrounding properties and provides an individual lot grading which makes ample provision for surface water drainage between individual lots and areas.

The minimum grade shall be 2 percent and the maximum grade shall be 8 percent for pervious surfaces. Terraced slopes shall be no steeper than 4:1. Retaining walls shall be designed by a Licensed Structural Engineer and meet OSHA requirements.

4-9 HANDICAPPED FACILITIES.

Compliance is required with the Americans with Disabilities Act (ADA) for parking, ramps and sidewalks.

4-10 RECORD DRAWINGS.

PHASE 1

Upon completion of mass grading and installation of underground improvements and subsurface pavements; and before issuance of building permits, record drawings shall be submitted to the Village.

PHASE 2

Upon completion of all construction of a subdivision and acceptance by the Village, record drawings shall be submitted within 60 days to the Village.

The requirements for both phases are:

1. 3 sets of blue line prints. 24" x 36" maximum.
2. 1 set of reproducible mylar. 24" x 36" maximum.
3. 1 set of AutoCAD format (latest revision).

4-11 PARKS.

(See Section 6 herein)

4-12 LANDSCAPING.

4-12-1 LANDSCAPING PLAN.

A. A landscape plan shall be required with the application for all subdivision of lands, including subdivision of land between two or more lots, resubdivision of existing land, planned unit development approval, and annexation of land to the Village. The purpose of the landscaping requirements specified herein are intended to foster harmonious and aesthetically pleasing development which will protect and preserve the appearance, character, general health, safety, and welfare of the community. Specifically, they are intended to increase the compatibility of adjacent uses requiring a buffer or screen between uses and provide a landscaping standard for plantings, trees, shrubs, and ground coverings in all unpaved areas.

B. The content of the plans submitted for approval shall be to an engineering scale and contain or have attached thereto the following information:

1. The location and dimensions of all existing and proposed structures, parking lots and drives, roadways and right-of-ways, sidewalks, bicycle paths and parking areas, ground signs, refuse disposal areas, fences, free standing electrical equipment, utility easements, conservation easements, and ground lighting, tot lots and other recreational facilities and other freestanding structural features as determined necessary by the Director of Community Development.

2. The plan shall include and indicate the quantity and species, both botanical and common names, of all existing and proposed plant materials, the specification of the type, quantity, boundaries, size, spacing, designation, location, and spacing of proposed ground cover.

3. The plan shall indicate all proposed grading including final grading and all proposed berming indicating the contour and percent of slope, elevations of all fences, bridges, retaining walls or other similar details proposed for location on site and elevations, the total square feet of the lot or parcel to be developed, the landscaped area between right-of-ways, buildings and any public or private street and the total area landscaped, cross sections and other details as determined by the Director of Community Development.

4. Chapter 6 of the Lake in the Hills Municipal Code contains a list of permitted trees, shrubs, and ground covers for public properties, including size and spacing requirements.

4-12-2 OTHER LANDSCAPING REQUIREMENTS.

A. Landscape improvements should serve to integrate the project to the site, with particular sensitivity to the natural topography, water courses, and the existing vegetation. Preservation of the existing landscape materials and land forms should be taken into account, particularly where mature trees are a part of the site. This is of particular importance where specimen tree groves, or tree lines, or tree lined watercourses are present.

B. Grass seeding or sod is required in all unpaved areas within street right-of-way and shall be seeded or sodded with Kentucky Bluegrass mixture or with such other grass mixture approved by the Public Works Director. There shall be a minimum of 6 inches of top soil upon which the seed or sod shall be placed. Before the release of the 2 year maintenance letter of credit can be recommended by the Village Engineer, all unpaved areas between the edge of the road pavement and the right-of-way line must support an adequate mat of grass. Provisions, by the developer, shall be made to insure the growth of all landscaping.

C. Wood chips or similar ground cover material shall not be used in areas designed to detain storm runoff waters, in areas less than 15 inches above the bottom of local depression, or in areas less than 15 inches above the bottom of a swale serving more than one acre or serving more than two lots.

D. Protective screen planting (in addition to any required fencing) may be required to secure a reasonably effective physical barrier between development use, right-of-ways, and multiple- family buildings. Protective screening shall include earthen berms and existing topography and should, whenever practical, be incorporated into the landscape treatment of a site. Bermed areas should be designed to resemble natural land forms whenever possible. The maximum permissible slope is 3:1. Seeding and sodding requirements for earthen berms shall be at the discretion of the Director of Community Development or his/ her designee.

E. When fencing is used, provide landscaping which involves a variety of plant material with height, color, and texture variation to soften or minimize long expanses of fencing.

F. Landscaping shall be required around the perimeter of all retention and detention basins. Such landscaping shall consist of trees, shrubs, and emergent plantings in an amount and arrangement that will create an aesthetically pleasing environment.

Retention and detention basins should be designed to resemble land forms whenever possible. Trees, shrubs, and turf should be located above the high water line and emergent plantings should be located below the high water line.

G. During the development stages and until final acceptance of said development by the Village, the owner of the property, or subsequent owners, shall be jointly and generally responsible for the maintenance, mowing, manicuring, and replacement of all landscape materials. Any and all plant materials such as trees, shrubs, and ground covers which die as a result of construction, neglect, or natural cause shall be replaced in compliance with the approved landscape plan.

4-13 TREE PRESERVATION - PROTECTION OF EXISTING TREES.

A. TREE PRESERVATION.

Trees and surface vegetation provide a natural means of sedimentation and erosion control. Species of trees identified as undesirable may be considered for preservation if deemed warranted by the Planning and Zoning Commission and Board of Trustees. Actions in accordance with the principles of good forestry practices for the continued survival of a forested area or the conduct of agricultural extraction are not affected hereby.

1. A Tree Preservation Plan is required for all subdivision of lands, including subdivision of land between two or more lots, resubdivision of existing land, planned unit development approval, and annexation of land to the Village. The plan shall indicate the location of those trees to be removed or preserved, the reasoning for such decision, and the methods which are to be used to preserve such trees. This Tree Preservation Plan shall specify the following techniques for preservation:

    a. All grading and construction equipment shall be forbidden from encroaching within the root zone (see definition) of a tree. No excess soil, additional fill, liquids or construction debris shall be placed within the root zone of any tree that is required to be preserved.

    b. Crushed limestone hydrocarbons and other materials detrimental to trees shall not be dumped within the root zone of any tree nor at any higher location where drainage toward the tree could conceivably effect the health of the tree.

    c. Appropriate protective fencing shall be temporarily installed for protection of preserved trees and is to be shown on the submitted map at the periphery of the tree's root zone. A separate fence must be

shown to completely surround any conservancy areas on the site.

d. All required protective fencing must be in place and inspected by the Village before a building permit will be issued. The fencing must remain in place during the entire construction period. All fencing must be secured to metal posts driven into the ground spaced no further than 6 feet apart.

e. No attachments, fences or wires, other than approved materials for bracing, guying or wrapping shall be attached to any vegetation during the construction period.

f. Other measures such as construction pruning and root pruning of trees directly impacted by construction must also be indicated on the plan or on an accompanying sheet.

g. During construction, all reasonable steps necessary to prevent the destruction or damaging of trees (other than those specified to be removed) shall be taken. Trees destroyed or receiving major damage, as determined by the Village, shall be replaced per sub-section 3.

h. No soil is to be removed from within the root zone of any tree that is to remain.

2. The methods which are to be used to preserve those trees shall be clearly specified. If, in the opinion of the Village, the necessary precautions as specified in the tree preservation plan were not undertaken before or maintained during construction, the building permit for the parcel shall not be issued or, if previously issued, shall be revoked until such time as these precautions have been complied with.

3. In the event that a tree designated for preservation is destroyed or removed during the construction process, such tree shall be replaced, at a minimum, with a new tree in accordance with the following:

Diameter at 48 inch Height (in inches)	Number of Replacement Trees
30 or greater	5
13-29	4
3-12	3

a. For the measurements above, if a fraction is less than 1/2 inch, the

lower full number of replacement trees shall be used. If a fraction is 1/2 inch or greater, the higher number shall be used.

b. All replacement trees shall have a minimum caliper of 4 inches (four feet (4') from the ground).

c. Replacement trees shall be approved by the Village. The Village, at its option, may require a cash payment in lieu of the required replacement trees. The cash payment shall include both the cost of the replacement tree and installation of the tree.

d. Removal of trees designated for preservation shall be allowed only by amending the Tree Preservation Plan and shall require the approval of the Board of Trustees. The amended Tree Preservation Plan shall indicate the location, specie, and size of all replacement trees. The request for an amended Tree Preservation Plan shall be accompanied by:

    1. A written statement indicating the reason for removal of the tree or trees.

    2. A general description of the tree or trees to be removed.

    3. A copy of the tree preservation plan.

    4. A report from a Certified Arborist if requested by the Village.

e. Approval for a request involving tree removal activity shall be granted only if the Village finds that all reasonable efforts have been undertaken in the architectural layout and design of the proposed development to preserve existing trees and to otherwise enhance the aesthetic appearance of the development by incorporation of trees in the design process.

f. The Village shall approve a request for an amended Tree Preservation Plan if one or more of the following conditions is present:

    1. It is necessary to remove a tree or trees which poses a safety hazard to pedestrian or vehicular traffic or threatens to cause disruption of public safety.

2. It is necessary to remove a tree or trees which poses a safety hazard to structures.

3. It is necessary to remove a tree or trees which is diseased or has been weakened by age, storm, fire or other natural cause.

4. It is necessary to observe good forestry practice. A Certified Arborist report may be required.

B. ENFORCEMENT.

This Code shall be a minimum standard and shall be enforced by the Village.

Compliance with the approved landscape plan shall be confirmed by site inspection. An occupancy permit shall not be issued prior to satisfactory completion of the landscape plan installation. In the event that installation cannot be completed prior to occupancy, due to seasonal considerations, etc., a deposit of 125 percent of the cost of specified landscape materials remaining to be installed or replaced (including labor costs) shall be held by the Village. This may be in the form of a Letter of Credit or cash bond.

Dead, dying or diseased plant materials shall be replaced within 1 year or by the next growing season. Replacements shall be of "like kind" according to the approved plan or existing materials.

The landscape planting shall be subject to inspections by the Village to verify compliance with the approved plan.

4-14 FENCING.

Perimeter fencing may be required in accordance with the Lake in the Hills Zoning Ordinance.

4-15 PARTIAL SUBDIVISION OF LARGER PROPERTIES.

No non-residential subdivision shall be reviewed by the Village, which would allow for the initial development of the property on an arterial, collector or minor street, into lot(s) representing less than forty percent (40%) of the total property, or representing more than twenty percent (20%) of the property frontage, unless a Tentative Plat is presented by the petitioner and reviewed by the Village for the entire property.

4-16 ENGINEERING DOCUMENTS: DEVELOPMENT AND APPROVAL.

Before a Final Plat may be approved by the Planning and Zoning Commission, the following procedure must be completed:

A. Complete engineering documents, prepared by a Registered Professional Engineer, shall be submitted. The engineering plans shall show sufficient data to insure compliance with the above requirements for roads and roadside drainage facilities, and must meet the minimum requirements set forth herein.

B. A complete and detailed estimate of cost, prepared by a Registered Professional Engineer, shall be submitted. The cost estimate shall set forth all items of work to be performed and the estimated cost thereof.

C. The engineering documents and cost estimates shall be reviewed and approved by the Village Engineer. Plans that appear unworkable and estimates that appear inadequate will not be approved.

D. When the engineering documents and cost estimates have been approved, the owner shall obtain good and sufficient security to insure that the construction will be completed and maintained until accepted. The security furnished shall meet the requirements as stated herein.

4-17 CONSTRUCTION, MAINTENANCE, AND ACCEPTANCE BY VILLAGE.

A. No construction work shall be started until a Final Plat has been approved by the Board of Trustees and recorded. Prior to starting construction, the subdivider must provide approved engineering plans and specifications to the following Village authorities: Public Works Department, Village Engineer, and Community Development Department. The subdivider must also schedule a pre-construction meeting with the Public Works Department, Village Engineer, and Community Development Department.

B. The owner/developer shall employ a Registered Professional Engineer who shall be responsible for establishing the proper lines and grades and shall exercise general supervision as construction progresses. For the purpose of this section, general supervision shall mean sufficient overseeing of the project to assure that construction of the engineering improvements is accomplished substantially in accordance with the approved plans and specifications. The owner/developer shall submit, to the Village Engineer, the Certificate of Owner/Developer Approval and Acceptance of Design and Construction of Subdivision Improvements prior to acceptance. Please refer to Appendix J. The Owner/Developer shall submit a Title Insurance Policy to

the Village, indicating that the improvements have been completed, are ready for acceptance by the Village, and are free and clear of any and all liens and encumbrances.

C. All construction items, except the bituminous surface and seeding, shall be completed within one year after approval of the Final Plat. All items shall be completed by the development completion date indicated at the time of the preconstruction meeting. Stabilization of the soil will be in accordance with Chapter 49 of the Municipal Code. Only under extreme conditions may a letter of credit be extended. Any extension must first be approved by the Board of Trustees. It shall be the obligation of the developer to request such an extension in a timely manner.

D. The owner/developer shall be responsible for maintaining all public improvements in the subdivision until such roads have been accepted by the Village onto the two-year maintenance period. Maintenance, which shall include snow plowing, shall be adequate to insure ingress and egress to all lots that have been sold.

E. Public improvements will not be accepted by the Board of Trustees until all construction detailed in the plans has been completed. No public improvements will be accepted by the Village for maintenance during the period of November 15 to April 30. It shall be the responsibility of the subdivider to consult with the Village Engineer before the work has begun to afford the Village Engineer an opportunity to inspect the work as construction progresses. Prior to acceptance of the improvements, the following conditions shall be met by the subdivider:

1. Completion of the construction detailed on the approved engineering plans, as determined by the Village Engineer.
2. Completion of any punchlist items, as determined by the Village Engineer, with assistance from Public Works. Videotaping all storm sewers will be required, prior to the placement of the final road surface, as part of the punchlist.
3. Filing of electronic and mylar format record drawings to the following Village authorities:
    a. Village Engineer: One electronic version of the record drawings on compact disc in AutoCAD format (Version 14 or higher), one electronic version of the record drawings on compact disc in Adobe Acrobat PDF format and one bond copy.
    b. Public Works Department: Two bond copies and one mylar copy.
    c. Community Development Department: One bond copy.

Upon completion of the above referenced requirements, the Village Engineer shall prepare a written recommendation to the Board of Trustees to accept the public improvements for a two-year maintenance period.

Prior to the end of the two-year maintenance period, the Village Engineer and the Public Works Department will review the condition of the public improvements. The Village Engineer will prepare a punchlist of any required repairs to be submitted to the subdivider. Videotaping all storm sewer will be a part of the punchlist. Upon resolution of the punchlist items, the Village Engineer will prepare a written recommendation for the final acceptance of the public improvements by the Board of Trustees. Prior to recommending final acceptance of the public improvements, the Village Engineer will review the record drawings to ensure that no additional changes to the infrastructure have occurred as a result of any punchlist items. If changes are required to the record drawings, the subdivider shall be required to re-submit record drawings pursuant to this section 4.17E

F. Adequate precautions shall be taken to ensure against erosion and siltation until protective vegetation has been established, and overflow provisions shall be provided. The physical precautions (e.g. silt fencing) taken to ensure against erosion and siltation shall be removed prior to acceptance onto the two-year maintenance period and only with the prior approval of the Village Engineer.

G. The owner/developer shall be solely responsible for all energy charges from ComEd or a subsequent power provider for operation of all streetlights within a development at all times unless and until such streetlights, and the streets they serve, have been approved by the Village and dedicated to and accepted by the Village.

4-18 UNDERGROUND UTILITIES.

A. It is recommended that the developer keep all utility and CATV companies appraised of progress on the subdivision, and coordinate construction activities with those of the utility and CATV companies.

B. If underground utility installation cannot be completed prior to final grading and seeding, it shall be the responsibility of the developer to restore the turf following installation of underground utilities.

C. Utility companies shall not dig trenches across any roads after placement of the aggregate surface course.

D. All utility lines shall be placed underground in easements along rear lot lines of the subdivision or as otherwise allowed by the Board of Trustees. Conduits and/or cables shall be placed within the easements or dedicated public ways in a manner which will not conflict with other underground services. All transformer boxes shall be located so as not to be unsightly or hazardous to the public.

4-19 STANDARD DETAILS.

Please refer to Appendix I regarding specifications and details for public improvements.

Amended August 8, 2019