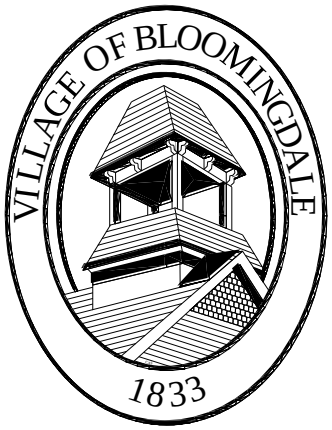
VILLAGE OF BLOOMINGDALE



"Growth with Pride"

CONSTRUCTION AND DESIGN STANDARDS

PUBLISHED 8-1-07

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APPENIX

CONSTRUCTION AND DESIGN STANDARDS

The developer responsible for construction of public improvements shall adhere to the procedures outlined as follows:

1. The Developer shall have prepared a topographic map showing the proposed layout, size and location of sanitary sewers, storm sewers and runoff storage facilities, water mains, landscaping, and roadways. This, along with a preliminary plan and an estimate of cost of the proposed improvements shall be submitted to the Village Board and the Village Engineer for review and any revisions.

2. After the aforesaid plans are reviewed and returned and upon gaining tentative approval of the Village Board, the Developer shall then have prepared under the supervision of a Professional Engineer registered in the State of Illinois and bearing his seal, seven (7) sets of complete engineering plans and specifications that shall be in accordance with the following:

   a. Village of Bloomingdale Subdivision Regulations, February 1961, revised February 1995.

   b. State of Illinois Department of Transportation Standard Specifications for Road and Bridge Construction in Illinois, Recurring Special Provisions and Supplemental Specifications Latest Edition.

   c. Standard Specifications for Water and Sewer Mains in Illinois, Adopted May 1996.

   d. Village Ordinances 92-4, as well as added amendments entitled "An Ordinance Petitioning for a Waiver and Adopting Various Provisions of the DuPage County Stormwater and Floodplain Ordinance Adopted by DuPage County on the 14th day of February 1992".

   e. The Zoning Ordinance of Bloomingdale as amended from time to time.

   f. The Offstreet Loading and Parking Ordinance, 90-59, as amended from time to time.

   In the case of conflict between specifications, the Village of Bloomingdale Subdivision and Zoning Ordinances shall prevail and the more stringent standard shall govern.

3. If in reading the Bloomingdale Subdivision Ordinance and the Zoning Ordinance, there seems to be a similarity in requirements or there is a repetition of requirements, this publication "Subdivision Regulations-Construction and Design Standards" will govern. It will be noted that these are the minimum requirements set forth by the Village of Bloomingdale.

   The policy set forth in this publication pertains to the construction of public improvements whether they may be in a new subdivision, part of a new subdivision, a planned unit development, special assessment project, or an improvement to a parcel of land.

ENGINEERING DESIGN STANDARDS

1. DRAWINGS

a. Topographic Map

A complete topography of the proposed subdivision showing all existing utilities, roadways, structures. etc., including the area extending one hundred feet (100') beyond the boundaries of the proposed project, and drawn to a minimum scale of one inch equal to one hundred feet (1"=100') and a maximum contour interval of two feet (2'). This shall be the standard and, unless specific conditions dictate changes, will be followed.

b. Construction Drawings

Drawings shall be on single or double plan and profile sheets with minimum scales of one inch equals five feet (1"=5') on the vertical and one inch equals fifty feet (1"=50') on the horizontal, and shall show all existing as well as proposed improvements.

c. Detail Sheet

A typical cross-section of the proposed street improvements showing the location of sidewalks, sanitary sewers, storm sewers, and water mains along with standards for valve vaults, manholes, catch basins, etc. will be included.

d. Measure

All measure (dimensions, elevations, etc.) shall be shown in English Units. The use of SI Unit measure shall conform to the Illinois Standard Specifications for Road and Bridge Construction.

2. GENERAL

a. Underground Improvements

Underground improvements shall be installed outside the limits of the pavement wherever possible. When improvements enter existing pavement, trenchless technologies should be used. When not feasible, open cutting may be considered, with written approval by Village Engineer. Backfill shall be flowable fill. Patching shall extend a minimum of one foot (1’) beyond edge of trench. Concrete patching shall extend to next tooled joint.

b. Elevations

All elevations used will be U.S.G.S. and tied to the Village of Bloomingdale Bench Mark System. The Bench Mark shall be clearly defined and noted on the Drawings.

c. Revisions

Revisions, changes, or deviations from the approved engineering plans by the Developer or Contractor, must be approved by the Village Engineer prior to construction.

d. "Record" Drawings

A completed set of "record" drawings shall be submitted to the Village of Bloomingdale upon completion of the utilities. "Record" drawings shall include, but are not limited to:

i. Plans must be submitted in paper, autocad and adobe formats;
ii. Rim and invert elevations for all sanitary sewer and storm sewer structures;
iii. Tie-down all structures (clean-outs, b-boxes, manholes, valves, etc.) with at least two (2) stationary points;
iv. Flow-line and center-line elevations along the roadway at a minimum of fifty foot (50) intervals and changes in alignment;
v. Top of foundation elevations;
vi. Routing of all underground utility lines;
vii. Topo detention basin and berms;
viii. Outlet control structure detail.

e. Soil Erosion & Sediment Control

Soil Erosion and sediment control measures shall be installed prior to any excavation measures shall include, as applicable:

i. Perimeter silt fence;
ii. Inlet protection;
iii. Ditch checks;
iv. Stabilized construction entrance;
v. Other as needed per stormwater ordinance.

f. Tree Protection

Tree Protection shall be installed per applicable Village ordinance.

I STORM SEWER

A. Design

For the purposes of design, a ten (10) year storm with a minimum time of concentration of thirty (30) minutes shall be used. Storm drainage computations using the rational formula Q=Cia shall be used. The co-efficient of runoff shall be as follows:

Impervious areas	0.95
Pervious areas	0.45

B. Mains

1. Storm Sewer Mains

Storm sewer mains shall have a minimum diameter of twelve inches (12"), and depending on location and depth, may be, concrete pipe or reinforced concrete pipe. In certain instances, such as small rear yard drains, P.V.C. pipe may be permitted upon approval by the Village Engineer.

2. Catch Basin Leads

Catch basin leads (storm manhole to catch basin) shall have a diameter of not less than twelve inches (12") and shall be reinforced concrete pipe, Class IV.

3. Inlet Leads

Inlet leads (catch basin to curb inlet) shall have a diameter of not less than ten inches (10"), and shall be reinforced concrete pipe, Class IV.

C. Manholes

1. Where the diameter of the sewer main is thirty-six inches (36") or less, manholes shall be four foot (4') inside diameter.

2. Where the main is thirty-six to forty-two inches (36"-42") in diameter, manholes shall be five feet (5') inside diameter.

3. Where the main is greater that forty-two inches (42") in diameter, a special reinforced manhole shall be used.

4. Manholes shall be four inch (4") minimum thick precast reinforced concrete placed on three inch (3") minimum CA-6 bedding.

5. Manholes shall have a minimum one (1) and maximum two (2) adjusting rings measuring a minimum of two inches (2") a maximum of eight inches (8").

6. Catch Basins shall be precast concrete, forty-eight inches (48") in diameter with a twenty-four inch (24") minimum sump. One (1) catch basin will be required for each inlet installed.

7. Inlet basins shall be precast reinforced concrete, twenty-four inches (24") in diameter.

8. 12"x12" garden inlets may be used with six inch (6") PVC in rear yards and shall be NDS1200 with green NDS1212 grate. Unused openings and pipe connections shall be sealed using manufacturers approved parts.

9. Catch basins and inlets shall be installed at sufficient intervals and in such a manner so that storm water will be properly collected by the storm sewer. They shall be installed at low points in the street, street intersections if necessary and at intervals not to exceed four hundred feet (400') until a point is reached and not to exceed six hundred feet (600') from the highpoint or crest on any street.

D. Manhole Frames and Lids

Frames and lids shall be Neenah Foundry Company R-1713 heavy duty, East Jordan Iron Works 1050Z1, or approved equal. The lid shall have the word "Storm" cast in.

E. Curb Frames and Grates

Inlet and catch basin frames and grates for mountable type curb (M3.12) shall be Neenah Foundry Company R-3501-D2A, East Jordan Iron Works 7171-M1 or approved equal; and for barrier type curb (B6.12), Neenah Foundry Company R-3281-A, East Jordan Iron Works 7210-M1, or approved equal. The grate on all models shall be a bicycle safe type.

F. Bedding and Initial Backfill

Pipe shall lay on four inch (4") minimum bedding. Concrete pipe shall be backfilled to spring line with CA-6. Plastic pipe shall be backfilled four (4) to twelve inches (12") above top of pipe with CA7/11 washed stone (no angular material).

G. Backfill

Granular CA-6 backfill shall be used for all storm sewer excavations that fall within two feet (2') of the limits of pavement. Backfill shall be mechanically compacted in one foot (1') lifts (no jetting). Flowable fill may be considered. Recycled materials will not be permitted.

H. Storm Water Detention/Retention

Storm water detention/retention facilities shall be designed according to applicable portions of the current Storm Water Management Ordinance. An additional storage volume of fifteen percent (15%) of the volume calculated shall be provided as a factor of safety. This additional storage volume may be provided by calculating the design High-Water-Level (H.W.L.) and required storage volume, and providing the overflow spillway at such elevation above the design H.W.L. that the additional volume for the factor of safety is at least fifteen percent (15%) of the required volume. In no case shall the difference in elevation between the overflow spillway and the design H.W.L. elevation be less than three-tenths of one foot (0.3'), and may be limited to not more than five-tenths of one foot(0.5') upon the approval of the Village Engineer.

I. Outlet Control Structure

Outlet Control Structures shall be seventy two inch (72") diameter precast reinforced concrete with nine inch (9") flat top, three-quarter inch (3/4") steel plate at center, scaled on both sides. Restrictor opening and overflow size/elevation to be determined by design engineer. Two (2) frames, one on either side shall be Neenah 1713 or EJIW 1050Z1, with the word "storm" cast in. The structure shall have steps on both sides.

J. Storm Water Discharge

Where applicable, discharge, or opposite flow, for storm sewers into lakes, ponds, rivers, or streams, or the ground, shall be through a concrete headwall. Use of flared end-sections shall be prohibited.

K. Backflow Preventor

Where needed backflow preventor shall be Tideflex TF-1 slip on.

L. Sump Pump Discharge Connection

Sump pump discharges shall be connected to a storm sewer structure or established service using four inch (4") to six inch (6") PVC with air gap at house connection. Opening shall be clearly cut. In line connections shall use rubber tapping boot or DFW saddle.

II SANITARY SEWERS

A. Mains

1. Sanitary sewer mains and services shall be Polyvinyl Chloride (P.V.C.) SDR-26, or Acrylonitrile-Butadiene-Styrene (ABS Truss) pipe, up to eighteen (18") inches, and beyond this size an approved equal.

2. Minimum diameter of eight inches (8").

3. Minimum design flow of two feet (2') per second.

4. Maximum design flow of eight feet (8') per second.

5. Force mains for sanitary sewers shall be P.V.C. pressure grade, ductile iron, or approved equal.

6. Minimum cover on sanitary sewer shall be three feet (3').

7. Sanitary sewer lift stations shall be permitted only by the Village Board upon recommendations of the Village Engineer.

B. Joints

Sanitary sewer joints shall be flexible elastomeric seals, conforming to ASTM D3212, or approved equal.

C. Wyes

Wyes shall be installed for all lots during construction. Wyes shall be tightly sealed with a cap or plug and gasket of the same materials as the pipe system.

D. Risers

1. Risers shall be installed at every wye location where the depth of the sewer is greater than twelve feet (12') below the finished grade.

2. Risers shall be constructed to within nine feet (9') of the finished grade.

3. CA-6 Granular backfill shall be compacted around the wye to prevent the weight of the riser from breaking or dislodging the wye.

E. Services

1. Sanitary sewer services shall have a minimum diameter of six inches (6") with flexible elastomeric seals, conforming to ASTM D3212.

2. Services shall have a minimum gradient of one-fourth inch (1/4") per foot and shall be stubbed out to the property line with the end tightly capped or plugged to prevent infiltration with same material as pipe and gasketed.

3. A four inch (4") post painted green shall be driven at the end of the service for purposes of locating the end of the stub.

F. Manholes

Manholes shall be four foot (4') diameter, four inch (4") thick precast reinforced concrete with eccentric cones, conforming to ASTM C478, have a poured invert, and placed on three inch (3") minimum CA-6 bedding, sanitary manholes shall have a maximum spacing of four hundred feet (400'). The concrete manhole sections shall be joined with either cast-in-place rubber gaskets or bituminous mastic material. Manholes shall be provided with flexible watertight connectors, conforming to ASTM C923, for all pipe connections. Pipes shall be fastened to flexible watertight connectors with adjustable stainless steel bands. Manholes shall be equipped with cast iron or P.V.C. steps, placed sixteen inches (16") on-center.

Manholes shall have a minimum one (1) a maximum two (2) adjusting rings measuring a minimum two inches (2"), maximum eight inches (8"). The frame and lid shall be Neenah Foundry Company R-1713, East Jordan Iron Works 1050Z1, with self-sealing lid and concealed pick-holes, or approved equal. The lid shall have the word "Sanitary" cast in.

G. Bedding and Initial Backfill

Pipe shall lay on four inch (4") minimum bedding and be backfilled to twelve inches (12") above top of pipe with CA7/11 washed stone (no angular material).

H. Backfill

CA-6 Granular backfill will be used for all sanitary sewer excavations that fall within two feet (2') of the limits of pavement. Backfill shall be mechanically compacted in one foot (1') lifts. Flowable fill may be considered. Recycled materials will not be permitted.

I. Unstable Soil

When an unstable soil condition is encountered, the method of laying the pipe, the type and length of pipe to be used, shall be approved by the Village Engineer.

J. Testing

All pipes shall pass at least one of the following tests:

1. Exfiltration

Exfiltration leakage shall not exceed two hundred and forty (240) gallons per inch of pipe diameter per mile of pipe, including manholes.

2. Infiltration

Infiltration leakage shall not exceed two hundred (200) gallons per inch of pipe diameter per mile per day of pipe, including manholes.

3. Air Testing

Air leakage test results shall not be less than the time per inch of pipe diameter per length of pipe as specified in the table entitled "Air Test Table", as found in Division III, Section 31 of the Standard Specifications for Water and Sewer Main Construction in Illinois, dated May 1996.

K. Testing for Deflection Limits for Thermoplastic Pipes

Deflection of pipe shall be tested using a mandrel. Deflection of P.V.C. pipe shall not exceed five percent (5%) of the "Base I.D." of the pipe, as computed in Division III, Section 31 of the Standard Specifications for Water and Sewer Main Construction in Illinois, dated May 1996.

Deflection of ABS Truss pipe shall not exceed five percent (5%) of the average inside diameter of the pipe.

L. Failed Tests

If any section of pipe fails to meet any test, it shall be deemed a failed test. The failed pipe section shall be repaired and retested at the Contractors expense until it meets the minimum tolerances.

M. Closed Circuit Inspection

All public sanitary sewer main, or private sanitary sewer main, shall be inspected, by the developer, one year after acceptance of the construction by the Village by closed circuit television. The closed circuit television inspection shall include a written report summarizing the location of the inspection, manhole numbers, date, any defects discovered, length of the sewer main run between manholes, and wye locations. A copy of the closed circuit television tape shall be submitted in DVD format with the final report.

III WATER DISTRIBUTION SYSTEM

A. Mains

1. Water mains shall be ductile iron pipe Class 52, cement lined and tar coated. Upon written consent of the Village Engineer, C900 certa-lok may be considered for areas to be installed using trenchless technologies based on soil condition unsuitable for ductile iron.

2. Minimum diameter of water mains shall be eight inches (8"). Diameter of six inches (6") shall be permitted only for dead end runs in cul-de-sacs, with a low number of service connections.

3. Minimum cover of the water main shall be five and one half feet (5.5') as measured from the top of pipe to finished grade.

4. Water mains shall be wrapped in polyethylene wrap for corrosion protection.

5. Water mains shall be looped wherever possible.

B. Joints

Water main joints shall be mechanical or rubber ring (slip seal or push-on) conforming to AWWA C111 and C600.

C. Fittings

Fittings shall be restrained joint using Megalug series 1100 or equal. All bolts shall be stainless steel.

D. Valves

Valves for underground water mains shall be cast iron body, epoxy coated, bronze mounted, non-rising stem, one hundred and fifty (150) pound working pressure, three hundred (300) pound test, mechanical joint ends, East Jordon Flowmaster valve, C-515 or Watrous Series 515, and shall be connected with restrained joints using Megalug 1100 or equal with stainless steel bolts. Valves shall be located so that not more than one thousand feet (1,000') of main will be out of service during repairs and so that future extensions can be made without interrupting service. No more than three valves shall be required to be closed to isolate any segment of the water system.

E. Valve Boxes

Valve boxes shall be Tyler 6850-6645 placed on a concrete block and use a "valve box stabilizer" as manufactured by Valve Box Stabilizer, Inc. or an "Adaptor II" as manufactured by Adaptor, Inc. Valve boxes should be installed only on building services, auxiliary valves or upon approval of the Village Engineer after all other options are exhausted. Valve boxes will not be permitted on pressure connections.

F. Valve Vaults

Valve vaults shall be constructed for all water mains. The valve vault shall be made of four inch (4") minimum thick reinforced precast concrete with concentric cone, and shall be forty eight inches (48") inside diameter for valves up to twelve inches (12") in diameter, or sixty inches (60") inside diameter for valves greater than twelve inches (12") in diameter placed on eight inch (8") minimum CA-6 bedding, with a minimum one (1), a maximum two (2) adjusting rings measuring a minimum two inch (2"), a maximum eight inch (8"). Frame and lid shall be a Neenah 1713, East Jordan Iron Works 1050Z1, or approved equal, with self-sealing lid and concealed pick-holes. The lid shall have the word "Water" cast in. Valves shall align with frame opening.

G. Fire Hydrants

1. Fire hydrants shall be Watrous Pacer WB67-250 or East Jordan Iron Works 5BR250 with break away flange and epoxy coated foot. A six inch (6") diameter auxiliary valve shall be installed within two feet (2') of the hydrant with flanged joints to hydrant. The hydrant shall have a six inch (6") inlet, four and one-half inch (4-1/2") steamer nozzle, two (2) -two and one half inch (2 1/2") nozzles and have National Standard Hose Coupling Threads. The hydrant shall open "right handed". All bolts placed below grade shall be stainless steel.

2. Hydrants shall be installed at the same time the water main is being installed and will be placed no further than three hundred feet (300') apart. In commercial and multi-unit dwellings, two (2) hydrants shall be within three hundred feet (300') of fire suppression connection, with one (1) hydrant being located within one hundred feet (100') of fire suppression connection.

3. Hydrants shall have two foot (2') square blocks placed under them and sufficient gravel shall be placed under and around the hydrant base to facilitate complete draining.

4. Hydrants shall be adjusted such that the center port height is a minimum eighteen inches (18") a maximum twenty-four inches (24") above grade and the breakaway flange is a maximum four inches (4") above grade, but not buried.

6. Hydrants shall be painted DTM Latex Safety Red #0434521 as manufactured by M.A. Bruder & Son, and have the chains and chain collars removed.

H. Corporation Stops

Corporation stops shall be Mueller (CC) Thread Type Inlet H15008 for three-quarter inch (3/4”) to one inch (1”), H15013 for one and one-half inch (1 1/2") to two inch (2”) or approved equal.

I. Thrust Blocking

All plugs, caps, tees, and bends deflecting eleven and one quarter (11-1/4) degrees or over on any water mains six inches (6") diameter or more shall be provided with concrete thrust blocks one foot (1') square. The thrust block shall rest upon undisturbed earth on sufficient bearing to resist the forces from the water main under normal operating pressure.

J. Separation

Separation of water and sewer mains and services shall be governed by Division IV, Section 4-2.01 of the Standard Specifications for Water and Sewer Main Construction in Illinois, and by the Illinois Environmental Protection Agency criteria.

K. Casings

Where needed, crossings shall be protected with watermain quality ductile iron or plastic pipe. Casing shall have stainless steel or plastic spacer’s, pea gravel blown in, ends bulkheaded or sealed with other approved device.

L. Water Services

1. Water service for a single-family dwelling shall be minimum one inch (1") diameter type K copper. For a large dwellings, apartment buildings, hospitals, industrial buildings, etc., the size of the service shall be determined by the design engineer or architect and be approved by the plumbing inspector. Any service two inches (2") or less shall also be type K copper.

2. Curb stops shall be Mueller 825155, or approved equal and shall be placed on a precast concrete support base.

3. Curb Stop Extension service box or valve stop box shall be Tyler 95E, or approved equal, and use a threaded plastic B-box stabilizer. Curb boxes shall be located in the right-of-way within one foot (1') of the property line at a set distance throughout the subdivision. A four inch (4") post painted blue shall be driven at the service box for purposes of locating the water service.

M. Miscellaneous

1. Any connection to an existing main shall be tapped under pressure, using a pressure connection or line stop. Tapping sleeves shall be stainless steel.

2. Service connections shall be installed for all present and future dwellings to be serviced by water mains.

3. Water service pipe shall lay in the trench with sufficient weaving to allow not less than one foot (1') extra length in its entire length and shall be stubbed out to the property line or easement line.

N. Bedding & Initial Backfill

Pipe shall lay on a four inch (4") bedding and be backfilled to twelve inches (12") above top of pipe with CA7/11 washed stone (no limestone).

O. Backfilling

CA-6 Granular backfill shall be used for all watermain excavations that fall under or within two feet (2') of the limits of pavement. Backfill shall be mechanically compacted in one foot (1') lifts. Flowable fill may be considered. Recycled material will not be permitted.

P. Placing Mains in Service

Before water mains are placed in service, they should be thoroughly flushed, pressure-tested and disinfected with chlorine gas. These operations must be witnessed by the Village Engineer or his representative. The following procedure shall be followed:

1. Pressure Test

   Pressure tests shall be performed after initial flushing to remove any air in the water main and brought to one hundred fifty (150) pounds per square inch (psi) and held at that pressure for two (2) hours. If there is any drop in pressure, a recovery test shall be performed. If the recovery test fails, the cause shall be determined and any necessary repairs shall be made by the contractor, and the pressure/recovery test repeated until a passing test is achieved, as noted in the Standard Specifications for Water and Sewer Main Construction in Illinois. The pressure gauge shall be an analog type, with increments of five (5) psi or less.

2. Flushing

   The mains shall be flushed by discharging through each of the hydrants on the system until the water runs clear.

3. Chlorination

   Chlorination of mains shall be performed by an accredited chlorination specialist and at the Contractor's expense.

4. Sampling

Twenty four (24) hour samples shall be collected and sampled by an accredited lab. Collection shall be witnessed by the Village's Water Systems Operator. The Village reserves the right to require second day samples.

5. Use of Water

Mains shall not be put in service until satisfactory results are received by the Village Engineer on bacteriological samples submitted to the laboratory. Mains must be put in service within two (2) weeks of approval of samples. While minor water usage is expected for items relating to flushing, testing and chlorinating new water mains, unauthorized, unmetered use of water shall be prohibited. Use of water for construction shall be coordinated with the Village's Utilities Division.

IV SIDEWALKS

A. Description

Except where there is an existing sidewalk, in which case the width would correspond to the widest existing part, sidewalks shall be constructed at a uniform five foot (5') width. They shall slope one-quarter inch (1/4") per foot toward the street and shall be at least six inches (6") above the top of the curb on the top surface next to the property line. The edge of the new sidewalks shall be located one foot (1') from the property line.

B. Subgrade

The subgrade shall be prepared by cutting or filling to a depth of seven inches (7") below the sidewalk grade. All organic and unsuitable material shall be removed and backfilled with compacted granular material. All trench crossings shall be mechanically compacted.

C. Materials

1. Forming

Forms of wood or metal, straight and free from warp shall be securely staked, braced and held firmly to the required line and grade. They shall be of sufficient strength to resist springing during the process of depositing concrete against them and of a depth equal to the depth of the sidewalk and be so designed as to permit secure fastening together at the top. On curves of a radius of less than one hundred fifty feet (150'), flexible forms shall be used, and in all cases, shall be cleaned and oiled before concrete is placed. Forms shall extend to the base of concrete pour.

A slip forming machine may be used to pour and form the concrete curb. The machine shall not cause aggregation separation. The concrete mix shall be of a sufficient stiffness to prevent the curb and gutter from slumping and deforming before hardening. The line and grade control shall be established twenty four (24) hours prior to the pouring of the concrete curb by machine method for proper inspection by the Village Engineer and Inspector.

2. Concrete

Sidewalk shall be five inches (5") thick, and placed on a two inch (2") thick aggregate base. Class SI concrete mix shall be used. Where the sidewalk crosses a driveway, the sidewalk shall be six inches (6") in thickness. During cold weather construction, proper precautions shall be taken to prevent freezing of the concrete. Calcium chloride shall not be added to the mix at the job-site. Liquid calcium chloride may be added, at the time of batching mix, at an amount not to exceed two percent (2%). All freshly poured concrete shall be properly cured. A protective coat shall be applied to all new concrete in accordance with the Illinois Standard Specifications for Road and Bridge Construction.

3. Fill

Fill material consisting of layers of sand, crushed stone or gravel containing no organic matter shall be used for subbase and backfilling; recycled material will not be permitted. Subbase shall be a minimum thickness of two inches (2").

4. Expansion Joints

Bituminous filler one-half inch (1/2") thick shall be used in sidewalk expansion joints at fifty foot (50') intervals.

5. Expansion Joint Material

Expansion joint material may be bituminous premolded joint filler of bituminous premolded fiber joint filler of the dimensions and thickness indicated.

D. Construction Methods

1. Finishing

Concrete shall be floated, troweled and given a light brooming.

2. Joints

Control joints at five foot (5') intervals shall be grooved into the surface of the sidewalk, expansion joints shall be constructed at intervals of fifty feet (50') and at crosswalks. All joints shall conform to Section 424 of the Illinois Standard Specifications for Road and Bridge Construction.

3. Backfill

Sufficient backfill shall be placed on both sides of the sidewalk as soon as possible after construction to prevent scouring and undercutting by storm waters.

4. Curing and Protection

Membrane curing compound shall be applied to the concrete in accordance with Section 720.13a of the Illinois Standard Specifications for Road and Bridge Construction.

Protective coat shall be applied, regardless of time of year, in accordance with Section 420.21 of the Illinois Standard Specifications for Road and Bridge Construction.

E. Handicap Accessibility

All sidewalk crossings of driveway, streets or other barriers and obstacles shall be made with a Handicap Accessible Ramp sidewalk, with properly depressed concrete curbing. Ramps shall be colored red throughout and contain truncated dome pattern to within six inches (6") of edges, regardless of shape or size. Red colored ramps should not exceed thirty six inches (36") in length as measured from back of curb. Joints falling within ramp shall be tooled prior to pattern installation or sawed in to eliminate floated finish adjacent to joint.

V ROAD SUB-BASE

A. Subgrade Preparation

Excavation shall be to the required depth below the finished surface in accordance with the type of road to be built. All soft and yielding spots and unsuitable materials shall be removed and replaced with granular fill. The subgrade shall be compacted and finished to a firm smooth surface.

Where the existing surface is below the curb and gutter subgrade elevation, it shall be raised to that elevation with approved material, thoroughly compacted.

B. Proof Roll

Prior to placement of aggregate base, sub-base shall pass a proof-roll performed by an accredited geo-technical specialist. Unsuitable areas shall be remedied in accordance with recommendations. Additional proof-rolls may be required to insure compaction is achieved.

VI CURB AND GUTTER

A. Type

Curb and gutter shall be type M3.12 or B6.12, per the Illinois Standard Specifications for Road and Bridge Construction, Section 606. Depressed curb is required at all sidewalk crossings of the curb or curb and gutter. Depressions should also be placed at driveway entrances when possible.

B. Forming of Curb and Gutter Section

Forms of wood or metal, straight and free from warp shall be securely staked, braced and held firmly to the required line and grade. They shall be of sufficient strength to resist springing during the process of depositing concrete against them and of a depth equal to the depth of the curb and be so designed as to permit secure fastening together at the top. On curves of a radius of less than one hundred fifty feet (150'), flexible forms shall be used, and in all cases, shall be cleaned and oiled

before concrete is placed. Forms shall extend to the base of the concrete pour.
A slip forming machine may be used to pour and form the concrete curb. The machine shall not cause aggregation separation. The concrete mix shall be of a sufficient stiffness to prevent the curb and gutter from slumping and deforming before hardening. The line and grade control shall be established twenty four (24) hours prior to the pouring of the concrete curb by machine method for proper inspection by the Village Engineer and Inspector.

D. Expansion Joints

Dowel bars of three-quarters inch (3/4") smooth cold-rolled steel and two feet (2') in length shall be placed every one hundred feet (100'). A three-quarter inch (3/4") thick expansion joint filler shall be cut to the curb cross-section and shall be installed, with the dowel bars, every one hundred foot (100') interval and five feet (5') to either side of storm structures placed in curb.

E. Expansion Joint Material

Expansion joint material may be bituminous premolded joint filler or bituminous premolded fiber joint filler of the dimensions and thickness indicated.

F. Control Joints

Curb and gutter may be divided into sections not more than twenty (20') feet in length with joints formed by tooling or sawing to a depth of not less than two inches (2") and a thickness of not less than one-eighth inch (1/8"). Sawing shall be completed within twenty-four (24) hours.

G. Mixing and Placing Concrete

Where a redi-mix truck is used, concrete shall not remain in the drum for a period of more than sixty (60) minutes. Water added at the job site shall be noted on the truck ticket and these tickets shall be available to the Village Engineer and Inspector.

Following subgrade and forms approval by the Village Engineer, the concrete shall be placed on a moist subgrade, deposited to the proper depth and tamped and spaded sufficiently to bring the mortar to the surface and prevent honeycombing. It shall be checked with a ten foot (10') straight edge and all irregularities eliminated before finishing.

H. Finishing

Exposed surfaces shall be finished while the concrete is green with a wood float and fine brush and the edges shall be rounded with a finishing tool of one-half inch (1/2") radius. The forms shall be removed within twenty-four (24) hours after the concrete has been placed. Any minor defects shall be filled with mortar composed of one (1) part cement and two (2) parts sand.

I. Curing and Protection

Membrane curing compound shall be applied to the concrete in accordance with Section 720.13a of the Illinois Standard Specifications for Road and Bridge Construction.

Protective coat shall be applied, regardless of time of year, in

accordance with Section 420.21 of the Illinois Standard Specifications for Road and Bridge Construction.

J. Backfill

Sufficient backfill shall be placed next to the curb as soon as possible after construction to prevent scouring and undercutting by storm water runoff.

K. Testing

The Developer will be required to take test cylinders, entrained air content and slump testing at no expense to the Village. The number of samples and test cylinder breaking dates will be determined by the Village Engineer.

VII ROAD DESIGN

A. Description

Except where pavements in a commercial or industrial subdivision may be of a greater width if required by the Plan Commission, the width of pavement shall be in accordance with the Standard Subdivision Regulations as follows:

Collector	36 feet
Minor Street	27-34 feet
Cul-de-sac	80 feet in diameter (between back of curbs)
Half street	18 feet (where permitted)

B. Grades

1. The minimum grade on streets shall be 0.40%.

2. For collector streets, the maximum grade shall be 5.0%.

3. For minor streets, the maximum grade shall be 7.0%.

C. Curves

1. Vertical curves shall be used wherever the algebraic difference in grade exceeds 1.25%.

2. Where there is a ten (10) degree or more deflection in horizontal center lines within a given block at any point, a curve shall be inserted with a radius of not less than:

300 feet - Collector streets
150 feet - Minor streets

D. Tangents

Between reverse horizontal curves, tangents of at least fifty feet (50') in length shall be introduced.

E. Radius

A minimum curb radius of twenty-five feet (25') shall be used on all intersecting streets.

VIII BASE AND PAVEMENT DESIGN

A. Base Course

1. Commercial or Industrial

Base course shall be constructed of either of the following conforming to applicable portions of Sections 311, 312, 351,

and 355, of the Illinois Standard Specifications for Road and Bridge Construction:

a. Aggregate Base Course, Type B, CA-6, twelve inches (12") in thickness;

b. Aggregate Base Course, Type B, CA-6, four inches (4") in thickness and Bituminous Aggregate Mixture (B.A.M.), six inches (6") in thickness.

2. Residential

Base course shall be constructed of Aggregate Base Course, Type B, CA-6, twelve inches (12") in thickness, conforming to Section 351 of the Illinois Standard Specifications for Road and Bridge Construction.

3. Recycled materials will not be permitted.

B. Bituminous Prime Coat

Following the construction of the base course and approval by the Village Engineer, the base shall be primed with MC-30 at a rate of 0.25-0.5 gallons per square yard for aggregate bases, or primed with AC 5-10-20 at a rate of 0.25-0.5 gallons per square yard for bituminous bases.

C. Bituminous Binder Course

Hot Mix Asphalt binder course, mix "C", N50, shall be used for construction of the binder course and shall conform to Section 406 of the Illinois Standard Specifications for Road and Bridge Construction. The minimum thickness shall be one and one-half inches (1-1/2").

D. Bituminous Surface Course

Hot Mix Asphalt surface course, 16-19.0 N50, shall be used for construction of the surface course and shall conform to Section 406 of the Illinois Standard Specifications for Road and Bridge Construction. The minimum thickness shall be one and one-half inches (1-1/2").

Prior to placement, curb, gutter and binder course shall be inspected for deficiencies. All repairs shall be made prior to placement of surface course.

IX STREET SIGNS

A. Materials and Construction Methods

At each intersection, street signs consisting of a metal post and metal sign with raised letters shall be erected.

Street name blanks shall be flat aluminum, nine inches (9”) in height and of sufficient length for the street name, with one and one-half inch (1 1/2”) radius corners. Sign backing shall be green retro reflective, DG-3 material as manufactured by 3M, with one-half inch (1/2”) white border and Series "C" white lettering. On streets with established speed limits less than 30 miles per hour, letters for street name shall be five inches (5") high, three inches (3") high letters for Ln., Ave., St., etc. On streets with established speed limits 30 miles per hour or more, letters for street name shall be six inches (6”) high.

Regulatory stripping and signs, such as snow route parking regulations, speed limits, stop, yield, (school) crossing, or other signs determined to be necessary by the Village Engineer will be required to be provided and installed by the Developer in accordance with the MUTCD. Such signage shall be constructed on sign DG-3 sign backing as manufactured by 3M.

Signs shall be installed at a height of not less than seven feet (7') and shall be mounted to a street light with stainless steel adjustable straps or a break-away pole. Poles shall be 12 gauge carbon steel, two inch (2") square tubing with three-eighths inch (3/8") diameter knockouts on one inch (1") centers, full length on all sides.

X PUBLIC UTILITIES

A. Requirements

All utility distribution lines (electric, telephone, gas, cable TV) in the subdivision shall be placed underground in compliance with applicable orders and Rules and Regulations of the Illinois Commerce Commission now, or hereafter effective and with an approved right-of-way permit.

The subdivider shall be responsible for such compliance with rules and regulations hereafter effective and filed with said Commission pursuant to the Illinois Public Utilities Act, of any public utility whose services will be required for the Subdivision with respect to the provision of such underground facilities.

B. Placement

Underground telephone, electric, cable television, and gas services shall be placed within easements or dedicated public ways in a manner which will not conflict with other underground service. Transformer boxes and/or service pedestals shall be located within rear yard easements, so as not to be unsightly or hazardous to the public. Transformer boxes and service pedestals located in residential districts or public rights-of-way may be required to be screened.

XI STREET LIGHTING SYSTEM DESIGN

Prior to the approval of any street lighting layout, the Village Engineer shall make his recommendations as to the lighting intensity and distribution for each area to be developed. Although various types and styles of lighting standards and luminaries may be utilized, the following minimum standards shall be adhered to:

1. Maximum light standard height shall be twenty-five feet (25') as measured from finished grade to the top of the luminaire.

2. Minimum concrete foundation or embedded depth of standard shall be five feet (5').

3. All light standards shall be equipped with hand-holes located eighteen inches (18") above finished grade and two hundred and seventy (270) degrees measured counter-clockwise from the fixture. Minimum hand-hole opening shall be two and one-quarter inches by seven inches (2-1/4" x 7").

4. Each standard shall be equipped with an internal lug for the purpose of attaching a ground connector.

5. All standards shall be in accordance with AASHTO standard specification for structural supports. Minimum design wind velocity of eighty (80) miles per hour with a gust velocity of one hundred and four (104) miles per hour.

6. Luminaries shall be two hundred and fifty watts (250W) at intersections and end of cul-de-sacs, and one hundred and seventy-five watts (175W) at mid-block locations. Luminaries at intersections and cul-de-sacs shall be furnished with forward throw protectors.

7. Luminaries shall be Underwriter's Laboratory Listed.

8. Removal of the ballast shall be accomplished without removal of the lamps.

9. Lamps shall be metal halide.

10. Minimum lamp characteristics:

Wattage	Initial Lumines	Mean Lumines	Rated Life (hours)
175	8,600	7,200	24,000
250	12,100	9,800	24,000

11. All electrical conductors shall be installed in a minimum one and one-quarter inch (1-1/4") diameter unit-duct conduit. Two inch (2") diameter galvanized steel conduit shall be installed under all pavement crossings. Conduit shall be buried a minimum of twenty-four inches (24").

12. All conductors shall be minimum #6 AWG THHN stranded copper, with 600 volt insulation complying with ASTM B8, Class B.

13. Each luminaire shall be independently grounded using a bare #6 stranded copper connected to the hand-hole lug, luminaire, the neutral and by driving a three-quarter inch by ten foot (3/4" x 10') copperweld ground rod.

14. Each street light shall be individually serviced ("single drop") to rear yard electric pedestal. Service shall be established at such points as are found feasible by Commonwealth Edison and the Engineer. Service drops shall be protected by platted easements. Each luminaire shall be separately activated using separate photo cells.

15. Luminaries shall operate via 120/240 VAC, 60HZ.
16. All luminaries shall be individually fused. Fuses shall be 5 amp HEP-AA TRON, or equal; fuse holders shall be Bussman, or equal.

17. Street lighting system shall be installed in accordance with the latest edition of the National Electrical Code.

18. Conductors inside the standard to the luminaire shall be minimum #10 AWG THHN stranded copper.

19. Each light standard shall be erected plumb. The contractor shall verify that the centerline of each pole is within 0.2% of true vertical in all directions, with arm and luminaire in place.

20. Backfill around embedded standards shall be granular aggregate compacted in six inch to eight inch (6"-8") lifts with a mechanical compactor.

21. Testing of the street lighting system shall be performed by the Village's electrical maintenance contractor at the owner's expense.

22. All materials and construction methods shall be approved by the Village Engineer prior to commencement of work.

XII LOT GRADING

1. All lots shall be finished graded with a minimum eight inches (8") of topsoil to the elevations on the approved grading plan.

2. All lots shall be graded to provide positive drainage away from structures and into the storm water collection system.

3. Side-yard and rear-yard drainage swales shall have a minimum two percent (2%) slope and a maximum side-yard slope from the structure of 1:4.

4. In areas where the maximum slope cannot be obtained, retaining walls may be installed with approval from the Village Engineer. Walls shall be constructed of interlocking blocks such as Unilock or Keystone or an approved equal. Walls in excess of four feet (4') in height shall be sealed by a licensed structural engineer.

XIII STREET TREES

1. Trees shall be planted along all streets where trees do not exist. Trees shall have a trunk diameter, measured six inches (6") above the ground, of not less than three inches (3"), and shall be spaced not more than forty feet (40') apart. Plants shall be of the size and type specified, and shall be true to their name as specified. A listing of Permitted, Non-permitted, and Limited Use trees is maintained by the Village Forester. Limited Use trees may only be planted with the approval of the Village Engineer.

2. Plants shall be balled and burlapped. Balls are to be no less in width and depth than sizes generally accepted as standard for the trunk diameter and the species root system. Balls are to be firm, properly tied, and in the best possible condition.

3. The diameter of the planting hole shall be no less than TWO FEET (2') greater than the diameter of the tree ball. The depth of the planting hole shall be equal to the depth of the tree ball.

4. Trees shall have a single trunk, unless otherwise approved, free from scars, wounds and borers. Trees shall have single leaders, be well branched and shall be free of branches to a minimum of five feet (5') but not higher than one half (1/2) the total height of the tree. All deciduous trees shall have their central leader intact. Species, which have other characteristics of growth and crown, shall exhibit the true form and growth characteristics of the species.

5. In wet clay soils and in other areas of poor drainage, the tree balls shall be set two inches (2") higher than ground level.

6. The plant, with the burlap around the root ball, shall be placed in the hole in a plumb position. Backfill the bottom one-third (1/3) of the hole, firmly working the soil around and under the root ball to give it support. The backfill shall be selected excavated soil in a loose and friable condition. Heavy clay soils may be amended by the addition of course sand. If the root ball is in a wire basket, the top tier of the wire basket shall be removed. The lacing shall be loosened and removed. The burlap shall be rolled off the top and down the sides of the ball. The burlap shall be cut and removed above the backfill. Backfilling shall be completed around the root system in such a manner as to eliminate air pockets.

7. A berm of backfill material shall be constructed around the perimeter of the planting hole; and then, a thorough watering shall be completed to saturate the backfill. This watering shall be performed during the same day of planting. After the backfill settles, as a result of the watering, additional backfill shall be placed to match the level of the finished grade.

8. A four inch (4") layer of mulch shall be placed over the planting hole following initial watering, completion of backfill after settlement and installation of trunk protection. Mulch shall be shredded hardwood bark or coarse peat moss.

9. Bracing will not be required; however, the tree shall be maintained in a plumb position until final acceptance.

10. All bracing and lines not constructed of thin gauge natural twine and bracing shall be removed prior to acceptance.

XIV REVIEW OF PLANS AND INSPECTION FEES

Review of plans and inspection during the course of construction by the Village Engineer shall be paid by the developer. Fees are calculated at rates as specified in Ordinance Number 93-17.

XVI NOTICE TO ENGINEER

The Village Engineer shall be notified at least twenty-four (24) hours

prior to any construction or inspection requests. Additional notice will not be required when the work continues from day to day, but will be required following any shut down.

XV INSPECTION

A thorough inspection upon completion of the underground improvements shall be made the Village Engineer, the Contractor, and the Developer's Engineer. All defects will be noted and upon their correction, there will be initial acceptance of the work and will limit the Contractor's responsibility to defects in workmanship.

Initial acceptance does not mean that the Village accepts the responsibility for maintaining these improvements.

XVII INSURANCE REQUIREMENTS FOR DEVELOPERS

A. PURPOSE

The Subdivider and/or Developer shall procure and maintain, for the duration of the project, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of any work by the Subdivider/Developer, his agents, representatives, employees, contractors, subcontractors, the Village, and the Engineer which may arise from subdividing and improving the property, either directly or indirectly. All such insurance shall be secured from an insurance company authorized to write casualty insurance in the State of Illinois. All such insurance shall include an indemnity hold harmless provision. The subdivider shall not commence work until he has obtained all insurance required under this section and shall have filed a certificate of insurance or the certified copy of the insurance policy with the Village. Each insurance policy shall contain a clause providing that it shall not be canceled by the insurance company without thirty (30) days written notice to the Village of intention to cancel. The amount of the insurance shall not be less than required herein.

B. POLICY

1. Minimum Scope of Insurance

Coverage shall be at least as broad as:

a. Insurance Services Office Commercial General Liability occurrence form CG 0001 (Ed. 11/85) and/or Owners and Contractors Protective Liability policy with the municipality stated as named insured; and

b. Insurance Services Office form number CA 0001 (Ed. 1/87) covering Automobile Liability, code 1 "any auto" and endorsement CA 0029 (Ed. 12/88) changes in Business Auto and Truckers coverage forms-Insured Contract; and

c. Worker' Compensation as required by the Labor Code of the State of Illinois and Employers' Liability insurance.

2. Minimum Limits of Insurance

Subdivider/Developer shall maintain limits no less than:

a. Commercial General Liability: $1,000,000 combined single limit per occurrence for bodily injury and property damage. The general aggregate shall be twice the required occurrence limit. Minimum General Aggregate shall be no less than $2,000,000.

b. Automobile Liability: $1,000,000 combined single limit per accident for bodily injury and property damage.

c. Workers' Compensation and Employers' Liability: Workers' Compensation limits as required by the Labor Code of the State of Illinois and Employers' Liability limits of $1,000,000 per accident.

d. Builder's Risk: Shall insure against "All Risk" of physical damage, including water damage (Acts of God such as flood and hydrostatic excluded), on a completed value basis.

3. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the municipality. At the option of the municipality, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the municipality, its officials and employees; or the Subdivider/Developer shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

4. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

a. General Liability and Automobile Liability Coverage’s

(1) The municipality, its officials, employees and volunteers are to be covered as insured’s as respects: liability arising out of activities performed by or on behalf of the Subdivider/Developer; products and completed operations of the Subdivider/Developer; premises owned, leased, or used by the Subdivider/Developer; or automobiles owned, leased, hired, or borrowed by the Subdivider/Developer. The coverage shall contain no special limitations on the scope of protection afforded to the municipality, its agents, employees, or volunteers.

(2) The Subdivider/Developer's insurance coverage shall be primary as respects the municipality, its officials,

employees, and volunteers. Any insurance or self-insurance maintained by the municipality, its officials, agents, employees, and volunteers shall be excess of Subdivider/Developer's insurance and shall not contribute with it.

(3) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the municipality, its officials, employees, and volunteers.

(4) Coverage shall state that the Subdivider/Developer's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

b. Workers' Compensation and Employers' Liability Coverage's

The insurer shall agree to waive all rights of subrogation against the municipality, its officials, agents, employees, and volunteers for losses arising from work performed by Subdivider/Developer within and for the municipality.

c. Professional Liability
Professional Liability Insurance that provides indemnification and defense for the architect, engineer, or surveyor for injury or damage arising out of acts, errors, or omissions in providing the following professional services, but not limited to the following:

(1) Preparing, approving or failure to prepare or approve maps, drawings, opinions, reports, surveys, change orders, designs, or specifications;

(2) Providing direction, instruction, supervision, inspection, engineering services, or failing to provide them, if that is the primary cause of injury or damage.

d. All Coverage's

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits except after thirty (30) days written notice by certified mail, return receipt requested, has been given to the municipality.

5. Acceptability of Insurers

Insurance is to be placed with insurers with a Best's rating of no less than B+.

6. Verification of Coverage

Subdivider/Developer shall furnish the municipality with certificates of insurance naming the municipality, its officials,

agents, employees, and volunteers as additional insured's, and with original endorsements affecting coverage required by this section. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements may be on forms provided by the municipality and are to be received and approved by the municipality before any work commences. The municipality reserves the right to request full certified copies of the insurance policies.

7. Contractors/Subcontractors

Subdivider/Developer shall include all contractors and/or subcontractors as insured's under its policies or shall furnish separate certificates and endorsements for each contractor and/or subcontractor. All coverage's for contractors/subcontractors shall be subject to all of the requirements stated herein.

C. Indemnity Hold Harmless Provision

To the fullest extent permitted by law, the Subdivider/Developer hereby agrees to defend, indemnify and hold harmless the municipality, its officials, agents, and employees against all injuries, deaths, loss, damages, claims, patent claims, suits, liabilities, judgements, cost and expenses, which may in anywise accrue against the municipality, its officials, agents, and employees, arising in whole or in part of in consequence of the performance of this work by the Subdivider/Developer, its employees, contractors, or subcontractors, or which may in anywise result therefore, except that arising out of the sole legal cause of the municipality, its agents, or employees, the Subdivider/Developer shall, at its own expense, appear, defend, and pay all charges of attorneys and all cost and other expenses arising therefore incurred in connections therewith, and, if any judgement shall be rendered against the municipality, its officials, agents, and employees, in any such action, the Subdivider/Developer shall, at its own expense, satisfy and discharge the same.

The Subdivider/Developer expressly understands and agrees that any performance bond or insurance policies required by the subdividing and improving of land, shall in no way limit the responsibility to indemnify, keep and save harmless and defend the municipality, its officials, agents, and employees as herein provided.

The Subdivider/Developer further agrees that to the extent that money posted by the Subdivider/Developer, whether a performance bond or letter of credit by virtue of subdividing and improving land shall be considered necessary in the judgement of the municipality, may be retained by the municipality to protect itself against said loss until such claims, suits, or judgements shall have been settled or discharged and/or evidence to that effect shall have been furnished to the satisfaction of the municipality.