Street Lighting

Construction Standards and Specifications

General Provisions for Street Lighting

Street lighting shall be provided by the Owner, Subdivider or Developer throughout the subdivision or development to serve all properties within the subdivision, development or Planned Unit Development (PUD). Such improvements shall consist of light poles, luminaires, foundations, handholes, underground cable and conduit throughout the improved corridor, controllers, cabinets and all other miscellaneous work and equipment necessary for an integrated system of street lights.

All street lighting within the corporate limits or under the jurisdiction of the Village of Tinley Park shall be constructed in accordance with the latest editions of the provisions listed below and extend to serve each parcel within the development. Should there be any discrepancies between the codes listed below, the most stringent code shall apply.

The design of all roadway lighting systems shall meet the following codes and regulations unless otherwise noted herein.

- Current Federal and State Codes and Regulations
- Commonwealth Edison Company (ComEd)
- National Electrical Code (NEC)
- IDOT Standard Specifications for Road and Bridge Construction, Recurring Local Roads and Streets Special Provisions, latest edition
- Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code, latest edition
- Informational Guide for Roadway Lighting by the American Association of State Highway and Transportation Officials
- American National Standard Practice for Roadway Lighting, (Illuminating Engineering Society of North America RP-8, latest edition)
- Village of Tinley Park Subdivision and Development Regulations
- Village of Tinley Park of Design Standards and Village Code of Ordinances.

Design Requirements

The street lighting plan shall show the location and direction of the pole and mast and the proposed routing of the electric cable and duct. The pole size, bracket size, and catalog numbers are to be shown on the street light plans. The street lighting plan and equipment submittals must be approved by the Village Engineer prior to the installation of any part of the system.

The following General Notes shall be included in all lighting plan sets:

1. Contractor to verify location of all underground utilities before trenching or augering.
2. Before installing standards near overhead facilities, call Com Ed for approval or location.
3. For location of existing underground electrical cable, call JULIE
4. Size all conduit as specified on drawings.
5. All luminaries except at intersections and cul-de-sacs shall have Type III, 2-way distribution.
6. Intersection and cul-de-sacs shall have Type IV wide distribution.
7. Luminaries, except on major streets, intersections and cul-de-sacs, shall be grey or color improved.
8. Any tree trimming required as directed by the Village Engineer shall be performed by the Contractor, and the cost of this Work shall be considered Incidental to the Contract.
9. Contractor shall take all necessary measures to restore any specialized landscaping, (i.e. decorative rocks, shrubs, plants, etc.) or shall replace it, the cost of which shall be considered Incidental to the Contract.
10. Materials shall not be ordered or delivered to the job site until all pertinent submittals have been reviewed and approved by the Village Engineer. All materials shall be manufactured in the United States of America. A Letter of Certification shall be provided if requested by the Village.
11. All access handholes and cabinets shall provide full view of traffic.
12. Shimming shall be by means of stainless-steel shims supplied by pole manufacturer, if necessary. Shimming of more than 3/16" will not be permitted.

Material Requirements

- Lighting unit types shall be in accordance with Table 1 included herein and the Village of Tinley Park Standard Details.
- All cobra head luminaires shall be the GE Evolve Series LED luminaires.
- All lighting units shall feature a GE Light Grid Node, frequency A. A Gateway Access Point Modem shall be installed every 1500 feet. Each gateway can host up to 600 nodes (nodes shall be limited to 500 nodes per gateway, whenever possible)
- Composite ground handholes will be allowed for splicing on a case-by-case basis.
- Minimum conduit or duct size shall be one and a quarter (1-1/4") inches

- Internal pole electric cable:
  (1) Minimum cable size shall be No. 10 AWG and shall conform with NEMA WC70
  (2) All cables shall be copper
  (3) Cable shall be insulated with Thermoplastic, High Heat resistant, Nylon jacket (THHN) insulation
  (4) Shall be rated 600 volts and Underwriters Laboratories (UL) listed
  (5) Red or Black shall be hot; green ground and white neutral

Fuses

(1) Fuses shall be midget, ferrule type
(2) Fuse holders shall be Bussman Tron HEB Series breakaway with copper crimps (Hot and Neutral - Slug Built-In)

Underground cable

(1) Cable for residential developments shall be in duct and include a minimum of four (4) No. 6 AWG copper in duct
(2) Cable for commercial and industrial shall be determined based on electrical load and voltage drop calculations
(3) Shall be XLP Type-USE, extra abrasion resistance, 600 volts installed in Schedule 40 insulated conduit a minimum of thirty (30") inches below finished grade or approved equal.
(4) Direct bury cable is not allowed.
(5) Shall conform with NEMA WC-70

- Each reinforced concrete foundation shall have a minimum of two raceways

Electrical Requirements

- Electric service shall be 120/240 V, single phase, 60 Hz, as provided by ComEd
- Lighting systems shall feature alternating red/black -120V/+120V circuits
- All lighting systems shall have metered control cabinets
- Voltage drop from the electric service to the last pole in each circuit shall be limited to 6%.
- All wiring shall be installed in HDPE unit duct or preassembled cable in coilable, non-metallic conduit.
- Duct shall be installed within rigid galvanized steel conduit underneath all roadway and commercial driveway crossings, impervious surfaces, sidewalks, paths, and inaccessible areas. Rigid galvanized steel shall extend a minimum of two (2') feet beyond the back of curb or edge of pavement. Ends shall be capped. Maximum length shall be two hundred (200') feet.
- Wiring shall be continuous from source to pole or from pole to pole. No underground splices will be allowed.
- Minimum installation depth for underground cable shall be thirty inches (30”)

Fusing

(1) A fused disconnect splice shall be installed for each non-grounded conductor in the poles.
(2) The fuse shall be completely enclosed by the splice connector and protected from water and weather damage.
(3) The contacts shall be spring loaded to exert contact on the fuse and fuse holder. Terminals of the splice connector shall be crimped onto the line connectors.
(4) Conductors shall be crimped, copper-sleeved, insulated and made weatherproof with closed end connectors. Wire nuts are not allowed.

Grounding

(1) All poles and feed points shall be grounded
(2) Ground rod shall be 5/8" x 10' copper weld rod
(3) Ground rod installed to height equal to pole handhole as shown on the Standard Details

Layout – Residential Developments

- Decorative lighting will be considered on a case-by-case basis, and must be approved by the Village Electrical Department
- Type 2 conventional lights shall be installed at all mid-block locations. Spacing shall not exceed 300'. All lights shall be installed at lot lines to avoid conflicts with utility service lines, service walks, and driveways.
- Type 4 conventional lights shall be installed at al intersections, curves, knuckles, eye-brows, and at the end of all cul-de-sacs.
- Lights shall not be located in areas in which it is likely they would be struck by a vehicle, such as on the straight side of tee intersections.

Layout – Major Roadways, Commercial and Industrial Developments

Street lighting shall be designed in accordance with the Illuminating Engineering Society (IES) RP-8, latest edition. Calculations shall be performed using photometric software such as AGi32 produced by Lighting Analysts, Inc. All calculations shall consider an R3 pavement type and a light depreciation factor of 0.7.

The levels defined in IES RP 8 are minimum acceptable levels and the design approach shall be to achieve but not significantly exceed these levels. Calculated lighting levels shall not exceed the values for the next higher roadway classification for the respective combination land use / pedestrian area. For example, if a roadway is determined to have a classification of Local/Low, the maximum levels for this roadway shall not exceed the classification of Collector/Low."

Straight line calculations shall be performed using the luminance method and shall include veiling luminance calculations per RP-8. The calculation submittals shall include all typical pavement widths and lane configurations.

Intersection calculations shall use the actual project CADD geometry to produce calculation printouts in accordance with RP-8. The illuminance method shall be used.

Poles shall be located at all intersections and spaced per calculations performed in accordance with RP-8. The developer shall consult with the Village Engineer to assist with determining roadway and area classifications. Poles shall also be located at the ends of cul-de-sacs and at curves in roadway as required by the Village Engineer. Poles shall be set in the parkway a minimum of two (2) feet from the back of curb. Where the distance between the sidewalk and the curb is such that this location is impractical or where the sidewalk adjacent to the curb, the Village Engineer shall review and approve alternate locations for the pole. Under no circumstances may the pole be installed within a sidewalk.

In no cases shall light pole spacing exceed three hundred feet (300')

Lighting on IDOT routes shall be designed and permitted in accordance with the District 1 General Guidelines for Lighting Design, November 2011.

Submittal Requirements

Submittals shall be submitted to the Village Engineer and Village Electrical Department to allow for review two (2) weeks prior to construction. Any initial review requirements by the Village Engineer shall be submitted allowing sufficient time for comments, revisions, and final completion.

Contractor is to conduct the research into the timely availability of the equipment and to ensure that all materials/equipment are in strict conformance with the contract documents and delivery schedules are compatible with the project time constraints.

Submittals shall include but not be limited to the following:

- Design Plans, signed and sealed by a Professional Engineer registered in the State of Illinois
- Plats of Subdivision
- Permits
- Easement Requests
- Licensing Agreements
- Soil boring reports justifying foundation depth
- A complete set of Shop Drawings including: pole, arm, luminaire, lighting controller, unit duct, conduit, handholes, cable, ground rod, fuse kits, concrete mix design, rebar, foundation raceways, anchor bolts, etc. Shop drawings shall be in electronic PDF format.
- Voltage drop calculations
- Photometric calculations for industrial or commercial developments.

Construction

All street lighting work by the Contractor shall be coordinated with the State, County, and/or Railroad along with the Village Engineer, Public Works Director, and Electrical Department as required. Service connections to the required power source shall be made with ComEd and follow the necessary rules and regulations.

Contractors shall be IDOT Pre-Qualified for any work within IDOT Rights of Way.

Street lights shall be installed and in good working order immediately upon completion of the roadway base course, sanitary sewer, water mains, storm sewer, AT&T, ComEd and Nicor installations. The developer shall arrange with the ComEd to energize the street light system as soon as possible. The developer shall be responsible for all connection fees.

The Village shall be billed for energy usage. Maintenance of the street light network within the development shall be the developer's responsibility until Village Board formally accepts subdivision improvements. The Village Board will not formally accept the street light network until they have operated for twelve (12) months, receipt of as- built drawings and final approval by the Village Engineer. Reports of outages made to the Village in the interim will be addressed by the Village Public Works Department at the expense of the developer.

The developer or contractor shall be responsible for all work and costs associated with commissioning the new Light Grid nodes into the Village's system.

Developer is responsible for contacting the Village Building Department/Inspector and Public Works Electrical Department to complete a pre-inspection, service connection/meter inspection and final inspection. After the Building Department Inspector approves the pre-inspection, Developer must request a field inspection from ComEd for service connection/meter installation. Developer must then request a final inspection with the Public Works Electrical Department twenty-four (24) hours in advance to arrange for a jobsite visit to turn on the lights.

Inspections of street lights shall be required for the following:

- Pre-pour Inspection (Request a minimum of 24 hours before the pour through Public Works Department)
- Prior to pouring foundations once hardware is installed
- Trench Inspection
- Final Inspection

Post Construction

Upon completion of the projects(s), Electrical Contractor or Developer shall provide three (3) sets of Record Drawings (11"x17") to the Village Engineer, Building Commissioner and Public Works Director for review. As-built information shall include but not be limited to the following:

- Number and Location of Poles/Luminaires, Wiring and Control Boxes.
- Red-line plans clearly noting any deviation from the approved design plans.
- Voltage
- Lamp Wattage
- Electrical Load
- Wire Size(s)

Any violations with Com Ed standards are the responsibility of the Developer or Electrical Contractor. Any and all violation and corrections are the Developer's responsibility.

Developer and/or contractor shall perform electrical testing in the presence of Village Staff to confirm all work had been completed in accordance with all rules and polices listed above. Upon completion of the electrical testing and approval of the Record Drawings, a zip drive with the approved plan sets and the Record Drawings (both .PDF and .DWG) shall be provided to the Village Engineer.

Ownership and maintenance of the lighting system shall remain with the developer/contractor until the Village issues a formal letter accepting ownership and maintenance.

Table 1: Lighting Unit Types, Applications, and Components

Lighting Type	Description	Luminaire Type	IES Distribution Type	Arm Length	Lumen Output	Voltage	Pole	Mounting Height	Arm	Max. Spacing	Foundation
1	Residential/Local Street Decorative/Black	Sternberg A850SRLED "Old Town" SSP20370-PT-A850SRLED-5P-16L27T3-MDL014-A/BK	III	N/A	5,665	120	Sternberg 5" Dia. Fluted Pole 2227/1112FP5-.250/2-HH/1-GFI/LPIUC/BK	15'	None	150'	20" Diameter w/12" Diameter bolt circle, no reinforcement cage
2	Residential/Local Street Conventional/Silver Midblock locations	GE Evolve Series	II	8'	12,000	120	Conventional brushed aluminum	25'	Valmont Aluminum Tapered Elliptical, 8'	300'	24' Reinforced Concrete Foundation
3	Residential/Local Street Conventional/Silver Refer to diagram	GE Evolve Series	IV	6 ft	15,000	120	Conventional brushed aluminum	27'	Valmont Aluminum Tapered Elliptical, 8'	150'	24' Reinforced Concrete Foundation
4	Commercial and Industrial Conventional/Black	GE Evolve Series	Determine via photometric calculations	12'	Determine via photometric calculations	120 (240 to be accepted on a case-by-case basis if needed.	Conventional with textured black factory powder-coat finish	40'	Valmont Aluminum Alloy Truss, 12'	300'	24' Reinforced Concrete Foundation
5	Commercial and Industrial Decorative (Black)	GE Evolve Series	Determine via photometric calculations	---	Determine via photometric calculations	120 (240 to be accepted on a case-by-case basis if needed.	Conventional with textured black factory powder-coat finish	40'	Valmont Aluminum Alloy, Davit, 12'	150'	24' Reinforced Concrete Foundation
6	Downtown Decorative/Black	Sternberg PT-6130CLED-MOD-4ARC22T3-MDL03-SV1-SRR7-SC-5AFUSE/BKT	III	---	7,000	120	Sternberg 5" Dia. Fluted Pole 2227/1112FP5-.250/2-HH/1-GFI/LPIUC/1-FH/BK	15'	None	150'	20" Diameter w/12" Diameter bolt circle, no reinforcement cage

Note:

1. All light sources shall be LED
2. All luminaires shall have a minimum 5 year factory warranty