

# ***NYC DOT STREET LIGHTING DESIGN REQUIREMENTS***

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## Street Lighting Design Review Process:

### **Summary:**

- A coordination / kick-off meeting before or at scoping and processing design documents is required to discuss important aspect, such as:
  - Clarifying structural impact on all existing Street Lighting system (Lampposts, Conduits, Boxes, etc...)
  - Specific contract's Street Lighting scope and all applicable Street Lighting requirements.
  - Review turn-around time frames.
  - Construction shop drawings for material cut sheets.
  - Coordination with Electrical Inspection Unit ("EIU").
  - Submittals are all electronically, via email.
- Submittal of Lighting Calculations ("LC" / photometric analysis) to conform to NYC DOT Street Lighting and Vision Zero requirements.
- After having approved lighting calculations, submit Street Lighting plans package for review and approval.

NYC DOT Street Lighting Standard Drawings Book could be downloaded from NYC DOT web specification library at the following link:

<https://www1.nyc.gov/html/dot/downloads/pdf/nycdot-street-lighting-standard-drawings.pdf>

Designers/Contractors shall be aware of all applicable drawings to performed contract prior to start of work; any clarifications shall be sent immediately after BID.

### **SCOPE:**

The Developer/Owner/Agency shall conduct all Work necessary to provide all required street lighting and lighting components required for the Project. This includes design and build as per NYCDOT Street Lighting latest standards and specifications, fabrication and construction of all related permanent and temporary lighting.

The Developer/Owner/Agency shall perform the lighting work and be responsible for submitting to NYCDOT Street Lighting engineering all shop drawings and design plans needed for the scope of work. The review and approval process shall be in conformance with the latest NYCDOT Street Lighting Standards and Specifications.

### **General Requirements:**

The Developer/Owner/Agency shall be responsible for designing, submitting design plans for approvals, furnishing and installing all new components as conforms to design plans and applicable NYCDOT Street Lighting Standard Drawings and Specifications (from the utility company's power supply connection forward to luminaires) required for the implementation of the lighting system for the Project including new luminaires, photo controls, poles, mounting, cabinets, boxes, wiring, conduits, support hardware, etc. as necessary for delivering a complete, functional and acceptable lighting system. Existing lighting impacted by the Project shall be

replaced to meet current standards and the Project requirements, and temporary lighting shall be used as needed during construction.

The Developer/Owner/Agency shall prepare and submit all lighting calculations for all Temporary Lighting (for records only) and permanent lighting system (for review and approval) for the Project to City Department of Transportation Division of Street Lighting Engineering (NYCDOT-DSL). Lighting calculations shall be submitted for review and approval prior to the submittal of design plans. Exact Street Lighting Design Plans and details shall conform to Street Lighting Standards, review comments; and are subject to NYCDOT-DSL Engineering review and approval. The Developer/Owner/Agency shall assume that NYCDOT-DSL Engineering will require approximately at least four (4) to six (6) weeks for review of each of the lighting submittals. The street lighting design contact person for NYCDOT-DSL is Mr. Akmal Mikhail, 34-02 Queens Blvd., Long Island City, NY 11101; 212-839-3368 ([amikhail@dot.nyc.gov](mailto:amikhail@dot.nyc.gov)) and for Street Lighting Inspection Unit (EIU), contacts are Mr. John Palmer at 212-839-3310 ([jpalmer@dot.nyc.gov](mailto:jpalmer@dot.nyc.gov)) and, Mr. Peter Aro at 212-839-3806 ([paro@dot.nyc.gov](mailto:paro@dot.nyc.gov)).

All Lighting Calculations shall be submitted in a format compatible with either AGi32 or Visual along with PDF printouts.

Lampposts shall be mounted on concrete parapets or barriers where practical on highway and bridges. At-grade local street lampposts shall be 3' behind curb line. At-grade Highway lampposts shall be on barrier, 3' behind guiderail, or a minimum of 8' behind curb line. All exposed conduits shall be PVC coated rigid hot dipped galvanized steel (RGS). All light posts to be installed, including those on structural barrier, shall be on level foundations built as part of the structure or on separate foundation for installation. Use of leveling nuts and grout is not an acceptable method.

Submit Lighting Calculation that shall conform to NYCDOT Street Lighting requirements for review and approval. Exact values may vary to accommodate contract needs, after approval of NYCDOT DSL Engineering.

Submit voltage drop calculations & one-line wiring diagrams (including distances) that are related to the same Control Cabinet or Fuse Box (Inside and/or outside of contract limits) and as conforms to approved Lighting Calculation.

Submit Street Lighting plans package that shall include, but not limited to:

- Street Lighting Electrical Notes & Temporary Lighting Notes
- Street Lighting legends clarifying exist-to-remain, exist-to-be-removed, and Proposed Lighting.
- List of all applicable Street Lighting Standard Drawings & Specifications
- List of all applicable City and/or State Pay Item Numbers
- Existing/Removal Street Lighting Plans
- Proposed Street Lighting Plans
- Any Street Lighting related installation details
- One-line wiring diagram

After having an approved Street Lighting Design Plan, the Developer/Owner/Agency shall start submitting to NYC DOT Street Lighting Engineering all Street Lighting materials shop

drawings; as well as any special mounting details for review and approval before purchasing/installation. Standard 25' Aluminum lamppost foundations for bridge deck lighting shall conform to approved lamppost barrier foundation detail.

The Developer/Owner/Agency shall inspect all existing electrical cabinets and its distribution to determine their conditions, functionality and distribution extend. The Developer/Owner/Agency shall prepare and submit an Electric Cabinet Inspection Report for each Cabinet, along with recommended actions, to NYCDOT Street Lighting Engineering for review and records.

Lighting System within a Project limits shall be protected (including at grade system) and maintained by the Developer/Owner/Agency for the duration of the Project.

The Developer/Owner/Agency shall insure that existing installations are not disturbed. Any damage by the Developer/Owner/Agency to existing facilities or equipment shall be corrected by replacement or restoration by the Developer/Owner/Agency to the satisfaction of NYCDOT Street Lighting Electrical Inspection Unit at no extra cost to the State or City. The Developer/Owner/Agency shall replace any luminaire within the Project limits that is not functional. The Developer/Owner/Agency shall be responsible for any lighting system (inside and outside contract limit) that loses power due to the Project's Construction. The Developer/Owner/Agency shall restore and put back on service any lighting system lost to the satisfaction of NYCDOT Street Lighting Electrical Inspection.

#### **Removal of Existing Equipment:**

All wiring, cabinets, enclosures, and other electrical equipment shall be removed and disposed of by the Developer/Owner/Agency. All removed LED luminaires shall be carefully removed, neatly stored, and delivered to NYCDOT Street Lighting Store Yard. Coordination for delivery shall be done with NYCDOT Street Lighting Electrical Inspection Unit (EIU) . The Developer/Owner/Agency shall notify the NYC DOT Electrical Inspection Unit at 212-839-3285. Existing lampposts (except type 10) which are removed and not re-used in the finished work, shall be inspected by the NYC DOT Electrical Inspection Unit within 30 days after being contacted by the Developer/Owner/Agency. The NYCDOT Inspection Unit (EIU) will determine, in writing, whether the Developer/Owner/Agency should dispose of these items or deliver them to the NYC storage facility designated by NYCDOT. A minimum of two weeks advance notice shall be given to the storage facility prior to the delivery of any materials, and all appropriate forms are to be signed and completed.

NYCDOT Electrical Inspection Unit (EIU) personnel contacts as follows for the respective borough, copying the Deputy Directory of EIU:

- **EIU Deputy Director**
  - Peter Aro
    - [paro@dot.nyc.gov](mailto:paro@dot.nyc.gov)
    - (212) 839-3806
- **Manhattan**
  - Iaan Chin
    - [IChin@dot.nyc.gov](mailto:IChin@dot.nyc.gov)
    - (212) 839-3292

- **Brooklyn**
  - Patrick Kehinde
    - [pkehinde@dot.nyc.gov](mailto:pkehinde@dot.nyc.gov)
    - (212) 839-3303
- **Queens**
  - Albert Kong
    - [akong@dot.nyc.gov](mailto:akong@dot.nyc.gov)
    - (212) 839-3302
- **Bronx**
  - Wayne Archibald
    - [WArchibald@dot.nyc.gov](mailto:WArchibald@dot.nyc.gov)
    - (212) 839-3286
- **Staten Island**
  - Jamie Clarke
    - [jclarke@dot.nyc.gov](mailto:jclarke@dot.nyc.gov)
    - (212) 839-3295

## **Permanent Lighting System**

### **General:**

The Developer/Owner/Agency shall be responsible for ensuring that the permanent lighting system meets the following requirements:

- A) Lighting calculations provided for review and approval by NYCDOT Street Lighting Engineering prior to Design Plans.
- B) Provides lighting levels such that the road surface illumination meets or exceeds the recommended uniformity and the illuminance and/or luminance criteria during darkness listed below. Lighting level shall conform to Vision Zero Requirements and shall be reviewed and approved by NYCDOT Street Lighting Engineering.
  - Average illumination for expressways – 0.8 to 1.0 foot-candles (fc) with average to Min. Ratio of 4:1
  - Average illumination for local residential – 0.8 foot-candles (fc) with average to Min. Ratio of 4:1
  - Average illumination for local commercial streets - 0.8 to 1.0 foot-candles (fc) with average to Min. Ratio of 4:1
  - Average illumination for Street Intersections – 2.0 to 2.5 foot-candles (fc) with average to Min. Ratio of 4:1

- Average illumination for Highway Gore Areas – 1.2 fc with average to Min. Ratio of 4:1
- Average illumination for ramps – 1.2 fc with average to Min. Ratio of 4:1
- Average illumination for highway underdeck lighting – 4 fc with average to Min. Ratio of 4:1. Average illumination for local streets underdeck lighting – 3fc with average to Min. Ratio of 4:1
- Average illumination for pedestrian and sidewalk – 0.6 fc to 0.8 fc with average to Min. Ratio of 4:1
- Average illumination for shared bike lanes (no Vehicular interface) – 1.0 fc to 1.2 fc with average to Min. Ratio of 4:1
- Average illumination for Pedestrian Plaza – 2.0 foot-candles (fc) with average to Min. Ratio of 4:1

Correlated Color Temperature (CCT) of luminaire shall be 3000 Kelvin. Light Loss Factor (LLF) shall be 0.89.

All above values are general design concepts, exact design and values shall conform at review process of NYC DOT Engineering for each project location.

- C) Utilizes approved items that conform to latest NYCDOT Street Lighting Standard Specifications and Drawings.
- D) Can be fully and seamlessly integrated into the existing-to-remain lighting elements adjacent to the Project limits.
- E) Utilizes control Cabinet system that automatically controls lighting operation between dusk and dawn, control/fuse box, otherwise as per approved design plans.
- F) Existing Street Lighting distribution and conditions do not warrant replacement with same.
- G) New (Proposed, refurbished, or relocated) control cabinets and all associated distributions shall be designed to (reasonably, as per City DOT Street Lighting Engineering guidance) maximize the use of new Cabinets to control as many lights as possible adjacent to placement (i.e., SB & NB), subject to conformance with performed Voltage Drop Calculations (VDC). VDC shall account for all existing-to-remain and proposed lighting associated with the same control cabinet. Required VD by NYC DOT Street Lighting is 2.5%; this is for branch circuits and feeder combined.
- H) Utilizes lighting components that are readily available and not proprietary equipment; and
- I) Existing service point locations and control cabinet locations shall be provided in the “Street Lighting Electrical Cabinet Inspection Report” provided in the Reference Documents. The Developer/Owner/Agency shall replace all existing service point components and feeders and property line boxes consistent with approved NYCDOT-DSL plans. If additional service points are required, the Developer/Owner/Agency will request any service modification (i.e removal, new, or additions) from Con Edison. Con Edison initial case number and determination of request shall be added to street lighting notes and incorporated in street lighting plans
- J) All proposed boxes shall have a max of 4 knockouts.

- K) Any concrete roadway boxes at unpaved areas (at a park, local streets, or highways) shall have an RFID marker as per 3M ball markers No. 1428-XR/ID, For each box. Contractor shall add serial number of used marker ball to as-built plans. This is a condition that needs to be satisfied prior to proceeding to final walkthrough and inspection.
- L) All proposed conduits shall not exceed 9 live wires.
- M) All proposed standard roadway steel / aluminum lampposts shall be designed with standard 8' arm.
- N) All Proposed lampposts foundations (cast-in-place, or pre-cast) shall have full depth, same for roadway type boxes. If roadway does not have enough depth, then shallow or structural foundation shall be designed, reviewed, and signed by contract's (developer) structural engineer for review and approval by NYC-DOT Street Lighting Engineering.
- O) Any Median that is planned as a planter shall NOT be used for placement of Street Lighting infrastructure such as foundations, boxes, Conduits, etc.
- P) For all Highways, major/commercial roadways and, Underdecks/Viaducts shall be designed with High wattages LED luminaires and, residential streets shall be designed with low wattages luminaires.  
All street lighting calculations' designs shall be reviewed and approved by NYC DOT Street Lighting Engineering prior to purchase, and installation.
- Q) All Street Light Lampposts designed at intersections (signalized, or non-signalized), shall have M-2 Foundation, M-2 Shaft, corresponding Shaft Extension, arm, LED Luminaire, and PEC. Placement shall be 5' from existing old-designed curb, or 3' from new-designed / installed curb.
- R) Using hanging rods as a mounting detail for Type 5 Underdeck Luminaire is not acceptable.
- S) Temporary removal of Street Lighting items is not acceptable. All street Lighting items that are planned to be removed, shall be installed with new.
- T) Proposed lighting distribution system including conduits and boxes shall be installed in paved roadway or totally in cast-in-place barrier.
- U) Street Lighting Distribution system from box to box must have all distribution wiring (Phases, Neutral, Ground, and 24 Hrs.) all the way to the last box of the distribution. This applies to local, highway, or underdeck systems.
- V) All Control Cabinet distribution systems shall have a 24 Hr. wire in distribution.
- W) Bike lane shall be designed and coordinated with NYC DOT Street Lighting and Traffic Signal/Timing Units before releasing final design to coordinate buffers and required clearances for pole foundations/boxes.

### **Construction Requirements:**

The Developer/Owner/Agency shall provide permanent lighting materials that conform to latest NYCDOT Street Lighting applicable standard drawings and specifications to satisfy the Project requirements and applicable codes. In addition, the Developer/Owner/Agency shall:

- A) Ensure that all exposed conduits are made of PVC coated rigid galvanized steel (RGS). Short runs (no longer than 5 feet) of 3/4" dia. liquid-tight flexible metal conduit may only be used to make a final connection between the Box and Underdeck fixture; and
- B) Ensure that all outdoor attached parts shall be a minimum type 316 stainless steel.

### **Bollards Installation:**

- A) All Traffic Signal poles shall be installed 2'-8" from face of curb to center of the pole foundation and all street lighting poles shall be installed 36" from face of curb.
- B) All pole foundations should be separated from bollard foundations and should be maintain a minimum distance of 12 inches clearance between edges of the two foundations.
- C) Bollards adjacent to NYCDOT poles shall be removable for maintenance.
- D) APS must be located:
  - Between 3' and 5' from the pedestrian ramp.
  - Must be a minimum of 10' between APS installations at the same corner.
  - There shall be no vertical obstruction (i.e. Bollards) between the pedestrian ramp and the Accessible Pedestrian Unit.
  - Traffic Signals poles shall not be installed on APEX, unless directed otherwise by NYC DOT Traffic Signal Engineer.
  - All Traffic Signal or street lighting poles locations must be evaluated for the installation of APS with appropriate clearance provided per ADA requirements.
- E) All Traffic Signal and street lighting poles should have 360-degree clearance of 3' for maintenance purposes  
Deviations may be permitted on a case-by-case basis.
- F) Bollard foundation must avoid conflict with signal and street lightings elbow entrances to the foundation (foundations are typically accessed from the curb for maintenance purposes)
- G) Bollards on all sides of the Traffic Signal or street lighting pole must be removable to allow for minimum 3' clearance for maintenance operations.
- H) Traffic Signals and street lighting pole base access door must face Vehicular traffic and maintain 3' clear to nearest object.
- I) If bollards/Traffic Signal/Street Lighting foundations are integrated/married (NOT recommended by DOT), then it requires specific Revocable Consent language addressing emergency and non-emergency maintenance coordination.
  - Owner will be responsible for removing and reinstalling bollards as directed by DOT.
  - DOT have the right to remove bollard's setup without notification to owner when maintenance is required in emergency situations; Owner will be responsible for restoration of bollards removed by DOT under these conditions upon notification from DOT.

- J) At any corner(s) of the intersection where bollards are to be installed, it is required an additional foundation, conduit, and traffic pole be installed to accommodate future Accessible Pedestrian Signals (APS) equipment.
- K) There shall be no physical obstructions between the existing/proposed pole(s) and the pedestrian ramps.

**Temporary Street Lighting System:**

The Developer/Owner/Agency shall be aware that:

- A) During each construction stage, the Developer/Owner/Agency shall maintain temporary, existing, and proposed light standards used as temporary until the construction stage or construction is complete.
- B) Developer/Owner/Agency shall provide temporary street lighting power during each construction stage.
- C) Minimum cable clearance above roadway shall be maintained during construction. Maximum wire SAG shall not exceed 18 inches. Any additional supports or equipment used to satisfy this condition shall be included under the temporary wiring pay items.
- D) Add temporary support for overhead wiring every 65 feet. Provide poles for roadway crossing to provide a minimum clearance of 25’.
- E) Permanent lights used as temporary in each stage are to be connected to the new control cabinet, control box, or feed point when it is installed and operational, by disconnecting from the temporary network.
- F) NYCDOT does not supply equipment for temporary Lighting System.
- G) Developer/Owner/Agency is responsible for relocating temporary lighting poles at each stage, including all maintenance and energy cost during the duration of the project and other work and items related to temporary lighting system, inside and outside of the contract limits, not identified in any payment item; and
- H) Developer/Owner/Agency shall provide and maintain temporary lighting of an average illumination same criteria as proposed lighting levels.
- I) The Developer/Owner/Agency shall protect all temporary Conduit/Conductors used/required to maintain power to the connected load during various stages of construction.

**Deliverables:**

Deliverables shall be as stated below:

- Lighting System Design that is reviewed and approved by NYCDOT Street Lighting Engineering
- Lighting system installations conforming to approved Street Lighting Design Plans and passes final inspections by NYCDOT Street Lighting Electrical Inspection Unit and accepted for maintenance.



**Acceptance Protocol of Newly Constructed Traffic Signal, Street Lighting Design and Transfer of Maintenance Obligation:**

The Developer/ Owner/ Lead Agency constructing and/or installing any Traffic and streetlight pole(s) (the “Developer/ Owner/ Lead Agency”) in New York City (the “City”) must, at all times, comply with all applicable engineering standards, and City rules and regulations, including, but not limited to, standards established by NYCDOT.

Prior to the start of construction, the Developer/ Owner/ Lead Agency seeking to transfer the ownership and maintenance obligations of any newly constructed traffic signal/streetlight pole(s) to NYCDOT must first confirm, in writing and through the submission of drawings and catalog cuts, if available, that the equipment and material proposed for the installation satisfies current construction and maintenance standards, including, but not limited to, those standards established by NYCDOT’s engineering divisions upon the issuance of a work permit or at any point thereafter.

Once the Developer/ Owner/ Lead Agency begins work on the construction and installation of any traffic signal/streetlight poles, the Developer/ Owner/ Lead Agency must, at all times, have an approved set of drawings on site at all times and available for review by NYCDOT upon demand. Such drawings may include, but not limited to, design drawings, shop drawings, NYCDOT approved drawings and catalog cuts of the equipment being installed. If NYCDOT approves a drawing detailing the Developer/ Owner/ Lead Agency’s work at the site, that drawing must be on site at all times and available for review upon demand.

The Developer/ Owner/ Lead Agency, or its designee, must notify the NYCDOT Borough Chief, in writing, of the proposed start date for the construction and installation of the traffic signal/streetlight pole(s) and submit a proposed construction schedule. If there are any changes to this schedule, the Developer/ Owner/ Lead Agency, or its designee, must notify the NYCDOT Borough Chief two (2) business days prior to effective date of the change at issue.

At least three (3) business days prior to the completion of the work, the Developer/ Owner/ Lead Agency must submit a final inspection request to the NYCDOT Borough Chief in writing and schedule a final inspection by NYCDOT’s Electrical Inspection Unit. In its written request for final inspection, the Developer/ Owner/ Lead Agency must include shop drawings, as-built drawings and/or catalog cuts of the equipment, material and/or work associated with the construction and installation of the traffic signal/streetlight pole(s). The Developer/ Owner/ Lead

Agency must also designate a point of contact (the “Developer/ Owner/ Lead Agency Contact”), who will meet with the NYCDOT Electrical Inspection Unit representative at the site on the date of the final inspection and provide his or her contact information (name and number).

On the day of the final inspection, the Developer/ Owner/ Lead Agency Contact will meet the NYCDOT Electrical Inspection Unit representative at the site on the day and time set forth by NYCDOT. The Developer/ Owner/ Lead Agency Contact will deliver a copy of the PE stamped as-built drawings to the NYCDOT Electrical Inspection Unit representative.

Once NYCDOT completes its final inspection at the site, the Developer/ Owner/ Lead Agency shall submit an acceptance request package to NYCDOT’s Electrical Inspection Unit, which must include the following:

- A letter to NYCDOT requesting acceptance;
- Two (2) copies of the Certificate of Compliance completed by the Developer/ Owner/ Lead Agency or its designee with raised seal certifying that the work has been performed in accordance with applicable City and State standard, rules, and regulations; and
- Two (2) copies of 24” x 36” PE stamped as-built drawing, including AutoCAD files to be submitted to NYCDOT Traffic Signals.

NYCDOT will review all complete submissions and notify the Developer/ Owner/ Lead Agency in writing if any documents must be resubmitted.

NYCDOT will issue a written confirmation to the Developer/ Owner/ Lead Agency designating the date of acceptance.