CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

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STREET LIGHTING, ROUNDABOUT, AND INTERSECTION DESIGN AND SUBMITTAL REQUIREMENTS

EFFECTIVE DATE: FEBRUARY 10, 2022

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1 SUBDIVISION STREET LIGHTING DESIGN REQUIREMENTS

There is not a design or submittal requirement when standard components are selected. When non-standard lighting components are used, then details, as noted in Section 1.1.5 of this document, must be submitted to Grand Island Utilities for approval prior to installation.

1.1 DESIGN CRITERIA

1.1.1 ROADWAY CLASSIFICATION

Roadways should be classified in accordance with ANSI/IES RP-8-18, Section 11.3.1.

1.1.2 PEDESTRIAN CLASSIFICATION

Pedestrian Activity should be classified according to ANSI/IES RP-8-18, Section 11.3.3.

1.1.3 LUMINAIRE COLOR / TEMPERATURE

A luminaire color of 3000 Kelvin should be used where the street location is adjacent to property where existing zoning allows for a single or multifamily residential unit to be built. For all other areas either 3000 or 4000 Kelvin luminaires can be used.

1.1.4 STANDARD LIGHTING

Denoted below are the standard items that the Utility will furnish and install at no cost with each development. Standard layout includes luminaires placed at cul-de-sacs, intersections, and mid-block depending on the distance between intersections. Standard installation details can be found on the Utilities website here: (https://www.giud.com/engineers-contractors/engineering-standards/streetlight-standards).

Residential Subdivision Streets and Intersections

- Fixed Output Luminaires
  - 3K Roadway - VERD-S-CA1-40-730-U-T2-AP-10MSP-PR7-U124000
  - 3K Intersection - VERD-S-CA1-40-730-U-T3-AP-10MSP-PR7-U124001
- Poles
  - Wood Poles (30’ Mounting Height)
- Pole Attachment Arms
  - 12’
- Other
  - Pull Boxes (if necessary)
  - Conduit (2” Schedule 80 HDPE if bored and 2” Schedule 40 PVC if trenched)

Commercial Subdivision Streets and Intersections

- Adj. Output Luminaires (29W/55W/64W/74W/86W/91W/97W/103W/108W/114W)
  - 4k Intersection - VERD-CA2-110-740-U-T3-AP-10MSP-4B-FADC-U123970
  - 3k Intersection - VERD-CA2-110-730-U-T3-AP-10MSP-4B-FADC-U123971
  - 4k Roadway - VERD-CA2-110-740-U-T2-AP-10MSP-4B-FADC-U123972
  - 3k Roadway - VERD-CA2-110-730-U-T2-AP-10MSP-4B-FADC-U123973

- Fixed Output Luminaires
    - 3K Roadway - VERD-S-CA1-40-730-U-T2-AP-10MSP-PR7-U124000
    - 3K Intersection - VERD-S-CA1-40-730-U-T3-AP-10MSP-PR7-U124001
- Poles
    - Aluminum Poles (30’ or 40’ Mounting Height)
- Pole Attachment Arms
    - 12’
- Other
    - Pull Boxes
    - Conduit (2” Schedule 80 HDPE if bored and 2” Schedule 40 PVC if trenched)

1.1.5 NON-STANDARD LIGHTING

In the event a developer desires to utilize streetlighting components that are not noted in Section 1.1.4 of this document, or requests non-standard spacing of streetlights, then the developer shall be responsible for the following:

1) Submit anticipated luminaire, pole height, mount height, and arm length for each non-standard arraignment. Grand Island Utilities must give approval on materials being used prior to installation.
2) Supply of 10% spare hardware.
3) Cost of labor and installation materials in excess of a standard installation.

2 ROUNDABOUT, MAJOR INTERSECTION, AND THROUGH STREET LIGHTING DESIGN REQUIREMENTS

When not modifying the geometry of the roadway, or the location of the existing light poles, luminaires can be replaced without going through the design and submittal process as long as the replacement lamps equal or exceed the output of the lamps being removed.

When the geometry of the roadway is modified, or the layout of the existing light poles is changed, then the new lighting layout will be subject to the full requirements of Section 2 and Section 6 of this document.

2.1 DESIGN CRITERIA

2.1.1 ROADWAY CLASSIFICATION

Intersecting roadways should be classified according to the maximum average daily traffic count (using the maximum value leg) in accordance with ANSI/IES RP-8-18, Section 12.1.2.

2.1.2 PEDESTRIAN CLASSIFICATION

Pedestrian Activity should be classified according to ANSI/IES RP-8-18, Section 12.1.3.

2.1.3 LUMINAIRE COLOR / TEMPERATURE

A luminaire color of 3000 Kelvin should be used where roundabout or street location is adjacent to property where existing zoning allows for a single or multifamily residential unit to be built. For all other areas either 3000 or 4000 Kelvin luminaires can be used.

2.1.4 STANDARD LIGHTING

Denoted below are the standard items that the Utility will furnish and install at no cost. Note that the Contractor must furnish and install all conduit runs in addition to being responsible for all staking required. Development and submittal of a lighting design as detailed in Section 6 of this document is required for all standard and non-standard lighting installations. Standard installation details can be found on the Utilities website here: (https://www.giud.com/engineers-contractors/engineering-standards/streetlight-standards).

- Adj. Output Luminaires (29W/55W/64W/74W/86W/91W/97W/103W/108W/114W)
  - 4k Intersection - VERD-CA2-110-740-U-T3-AP-10MSP-PR7-FADC-U123970
  - 3k Intersection - VERD-CA2-110-730-U-T3-AP-10MSP- PR7-FADC-U123971
  - 4k Roadway - VERD-CA2-110-740-U-T2-AP-10MSP- PR7-FADC-U123972
  - 3k Roadway - VERD-CA2-110-730-U-T2-AP-10MSP- PR7-FADC-U123973
- Fixed Output Luminaires
  - 3K Roadway - VERD-S-CA1-40-730-U-T2-AP-10MSP-PR7-U124000
  - 3K Intersection - VERD-S-CA1-40-730-U-T3-AP-10MSP-PR7-U124001
- Poles
  - Aluminum Poles (30’ or 40’ Mounting Height)
- Pole Attachment Arms
  - 12’
- Other
  - Pull Boxes

2.1.5 NON-STANDARD LIGHTING

In the event it is desired to utilize streetlighting components that is not noted in Section 2.1.4 of this document, the developer shall be responsible for the following:

1) Supply of 10% spare hardware.
2) Cost of labor and installation materials in excess of a standard installation.

2.2 HORIZONTAL ILLUMINATION

2.2.1 LIGHT LOSS FACTOR (LLF)

A LLF of 0.9 should be used on all luminaires.

2.2.2 MODELING

A horizontal calculation grid should be placed with spacing between points being no greater than 6.6 feet apart as per ANSI/IES RP-8-18, Section 12.4.6.2.

2.2.3 ILLUMINANCE AND UNIFORMITY RATIO (Eavg / Emin)

The Roadway and Pedestrian classification should be used in correspondence with ANSI/IES RP-8-18, Table 12-4 to establish minimum illuminance and uniformity ratio levels.

2.3 VERTICAL ILLUMINATION AT CROSSWALKS

2.3.1 LIGHT LOSS FACTOR (LLF)

A LLF of 1.0 should be used on all luminaires.

2.3.2 MODELING

A series of points shall be modeled at the center of each crosswalk, 5 feet off the pavement, and spaced 1.65 feet apart as per ANSI/IES RP-8-18, Section 12.4.5.4.

2.3.3 ILLUMINANCE AND UNIFORMITY RATIO (Eavg / Emin)

The Roadway and Pedestrian classification should be used in correspondence with ANSI/IES RP-8-18, Table 12-4 to establish minimum illuminance and uniformity ratio levels. The illuminance required shall be equal to that required on the horizontal plane.

2.4 OBTRUSIVE ILLUMINATION THRESHOLDS

2.4.1 LIGHT LOSS FACTOR (LLF)

A LLF of 1.0 should be used on all luminaires.

2.4.2 RESIDENTIAL PROPERTY LINES – VERTICAL ILLUMINATION

A 5 ft x 5 ft vertical point grid should be modeled at each property line. This grid should extend, horizontally, the entire length of all property lines adjacent to the street. The grid should also extend vertically from a plane equivalent to the base of the pole to a height equivalent to the elevation of the highest luminaire being modeled. At no point shall vertical illumination exceed 0.2 foot-candles on any property where existing zoning allows for a single or multifamily residential unit to be built.

2.4.3 FACE OF RESIDENTIAL STRUCTURES – VERTICAL ILLUMINATION

A 5 ft x 5 ft vertical point grid should be modeled along the face of each residential structure located on properties adjacent to the street. This grid should extend, horizontally, the entire face of each structure (only sides facing the street). The grid should also extend vertically from a plane equivalent to the base of the pole to a height equivalent to the elevation of the highest luminaire being modeled. At no point shall vertical illumination exceed 0.1 foot-candle on the face of any single or multifamily residential structure.

3 ROUNDABOUT, MAJOR INTERSECTION, AND THROUGH STREET LIGHTING DESIGN SUBMITTAL REQUIREMENTS

3.1.1 DESIGN CRITERIA

The following criteria should be noted with all submittals:

- Luminaires Used (Wattage / Distribution Type / Light Color or Temperature)
- Pole Type (Aluminum / Wood / Fiberglass / Steel / Concrete)
- Luminaire Heights
- Any luminaire shielding/tilting/rolling/spinning being modeled

3.1.2 PLAN VIEW

A plan view shall be submitted to the Utility for review. This view should show the following details:

- Horizontal illuminance, in foot-candles, on a grid spaced per the requirements of this document
- Footprint (approximate) of all adjacent building structures
- Property line locations
- Proposed Roadway, Curbs, and Sidewalks
- Proposed Streetlight locations

3.1.3 CROSSWALKS

The data below should be submitted for each of the driving lanes that intersects a crosswalk. Calculations should be performed at the centerline of the crosswalk and based on the oncoming direction of traffic for each given lane.

- Maximum Vertical Illuminance
- Minimum Vertical Illuminance
- Average Vertical Illuminance
- Average/Minimum Vertical Illuminance

3.1.4 PROPERTY LINES

For each property adjacent to the roundabout or intersection, the following criteria should be provided for review.

- Maximum Vertical Illuminance
- Maximum Horizontal Illuminance

3.1.5 ADJACENT RESIDENTIAL STRUCTURES

For the face of each residential structure adjacent to the roundabout or intersection, the following criteria should be provided for review.

- Maximum Vertical Illuminance