



Streets and Utilities Committee

MEETING AGENDA

Berryville-Clarke County Government Center

101 Chalmers Court, Second Floor

Main Meeting Room

Regular Session

December 19, 2023

3:00 PM

Item

Page

1. **Call to Order--Diane Harrison, Chair**
2. **Approval of Agenda**
3. **Construction Standards Update--Christy Dunkle**
4. **Proposed Truck Route--Jean Petti**
5. **Other**
6. **Closed Session**
7. **Adjourn**

WATER DISTRIBUTION SYSTEM * April 2015 (Listed in order of preference)

Updated December, 2023

Items for Water Distribution	Manufacturer	Model #	ANSI/AWWA spec.* or other Requirement
Water lines	Griffin Atlantic States JM Eagle		C151/A121.5 AWWA C151 C0909
Fire Hydrants	Mueller Centurion American Flow Control	Super Centurion 200 B62B.4' D.O.B.	AWWA C502
Gate Valves R.S. Ductile Iron	Mueller American Flow Control	A2361 AFC 2500	AWWA C502
Swing Check Valves	Mueller American Flow Control	A 2600-6 AFC 2100	AWWA C508
Combination Air Release & Air Vacuum Valves	Valmatic Apco	VM 201 C & VM 202 C 143C & 145C	ASTM A126 Class B
Valves Boxes	Tyler Union Pipe Bingham and Taylor	564S BT 22	AWWA C110 ASTM A438-62
Valve Box Adapter	Adapter, Inc.	Valve Box Adapter II (VBAll)	N/A
Bolts and Gasket Kits	Stewart Carson	S-FBK-FF-1/8 C-FBK-FF-1/8	
Mechanical Joint Fittings	Tyler Union Pipe Star	Compact	AWWA C153
Mech. Joint Restraints Mega Lug Glands	EBAA Iron Mega Lugs Ford Meter Box Co.	1100 Series 1400 Series	ASTM A536-80
Wall pipe/Sleeve/Flg Spools – Ductile Iron Pipe and Flanges	Higgins Eng. Davis K Clow		AWWA C115
Service Line Fittings	Ford Meter Box Co. Mueller	C44 Series 110 Series	compression AWWA C800
Service Tubing	Mueller Howell	HDPE	CTS 200 PSI
Threaded Fittings	Trenton Lee Brass	Red Brass Red Brass	ANSI B16.15

(Continued)

*Must meet the requirements of the ANSI/AWWA and/or ASTM standards as described.

WATER DISTRIBUTION SYSTEM * April 2015 (Listed in order of preference)

Updated December, 2023

Items for Water Distribution	Manufacturer	Model #	ANSI/AWWA spec.* or other Requirement
Service Saddles	Ford Meter Box Co. FS 202 Mueller	Double Strap H10500	Stainless Steel Bands
Ball Corporation Stops	Ford Meter Box Co. Mueller	FB 1000 Series 300 Series	AWWA C800
Coppersettors			
Single Service 1 ¹ / ₂ "	Ford Meter Box Co.	VBHH76-15C11-66NL	AWWA C800
Single Service 5/8"	Ford Meter Box Co.	VBHC172-12WW443NL	W/ dual bypass
Single Service 1"	Ford Meter Box Co.	VBHC174-15W444NL	check valve
Double Service 5/8"	Ford Meter Box Co.	VBHC172-12W1433NL	
Single Service 2"	Ford Meter Box Co.	VBHH77-15BHC 11-77NL	
Dual Cartridge Style Check	Ford Meter Box Co.	HHC Series	AWWA C800
Meter Box			
Single Service 5/8"	Mid-States Plastics Bingham & Taylor	18" x 30"	ASTM-D1505 High density plastic
Single Service 1"	Mid-States Plastics Bingham & Taylor	24" x 30"	High density plastic
Double Service 5/8"	Mid-States Plastics	36" x 36"	Polyethylene
Meter Box Insulation Pads	Mid-States Plastics	TP-18, -24, -36 Series	Polyethylene
Meter Box Frame and Cover			
5/8" to 2"	Ford Meter Box Co.	Style M32C PW REC	Cast Iron
5/8" to 2"		MC36 or M36	
Single service 5/8"	AY McDonald	Style 74M32CRG	Cast Iron
Single service 5/8"	Bingham & Taylor	Style #180-18-C	Cast Iron
Meter Box Cover	Ford Meter Box Co.	NO#1	Extensions
Extension Rings	MBC	NO 18-24	Cast Iron
Cold Water Meters	Neptune	T-10	AWWA C700
Blow-off Hydrants	Kupferle Foundary	#77	
Sampling Stations	Kupferle Foundary	NO88-WC (Eclipse)	
Mechanical Joint Connections	Infact Corporation	Foster Adaptor	
Backflow Assemblies Low Hazard	Ames Watts	3000 SS 709 DCA	ASSE 1048
Backflow Assemblies High Hazard	Ames Watts	5000 SS 909 RPDA	ASSE 1047

*Must meet the requirements of the ANSI/AWWA and/or ASTM standards as described

SEWER COLLECTION SYSTEM * April 2015 (Listed in order of preference)

Items for Sewer Collection	Manufacturer	Model #	ANSI/AWWA spec.* or other Requirement
Gravity Sewer Mains PVC	J.M. Eagle	C909/905	AWWA C909 ASTM F1483
Gravity Sewer laterals 4" through 6"	National NAPCO	DR25 PVC	ASTM D3139
Force Main (PVC) 6" through 12"	J.M. Eagle	C909	AWWA C909
Force Main PVC Pressure Pipe 1½" through 4"	J.M. Eagle	C900	AWWA C900
Sewer Main Fittings Gravity	HARCO	C900 Fittings	PVC ASTM D 1784
Mechanical Joint Fittings 3" through 12"	Tyler Union Pipe Star	Compact	AWWA C153
Ball Curb Stops 2"	Ford Meter Box, Inc. Mueller	B11 Series	AWWA C800
Manhole Frames And Cover 24" diameter	Neenah	Watertight R1916-F Standard R1642	ASTM-A-48 Class 35B Gray Iron

(Continued)

*Must meet the requirements of the ANSI/AWWA and/or ASTM standards as described.

SEWER COLLECTION SYSTEM * April 2015 (Listed in order of preference)

Items for Sewer Collection	Manufacturer	Model #	ANSI/AWWA spec.* or other
Hour Meters	Cramer		
Flow Meters	Polysonics		
Pumps	Gorman-Rupp		
Ball Valve	Geneco	EST ST-3.0	ASTM A-36
Extension Stems	Trumble		84A
Gate Valves R5	AFC 2500	250 PSI R. S.	AWWA C515
Ductile Iron	Mueller A 2361	Ductile Iron	
Air Release and Air Vacuum Valve	Valmatic APCO	801 BW, 802 BW	ASTM A126 Class B
Valve Boxes	Tyler Union Bingham & Taylor	24" x 36" 36" x 48"	Cast Iron
Gate Valve	Geneco	EST ST-3.0	ASTM A-36-84A
Extension Stems	Trumble		
Clean Out Adapters and Plug	Jones Manufacturing	C.I. Clean Out Adapter	Cast Iron
Clean Out Wye Fabricated	HARCO	SDR 21 Long Sweed T-Wye	ASTMD-1784
Clean Out Frame and Cover	Capital Foundaries	Lamp Pole Frame and Cover	Cast Iron
Manhole Internal And External Chimney Seals	N.P.C., Inc. Cretex Wrapid		

*Must meet the requirements of the ANSI/AWWA and/or ASTM standards as described.

STREET SIGNAGE * November 2019

Items for Street Signage	Manufacturer	Model #	Specifications
Standard public street name sign	N/A	N/A	MUTCD D3-1 3M Green background, white letters white rounded corners
Standard private street name sign	N/A	N/A	MUTCD D3-1 3M3430EGP3430 brown background, white letters white rounded corners
Perforated traffic post	Trinity Highway	SQR-LOC	2" square 14 gauge Aluminum, FHWA approved breakaway support
Enforcement and warning sign posts	N/A	N/A	2" square 14 gauge galvanized yellow post
Sign slot hardware	N/A	N/A	Standard sign 5.6" sign slot
Sign T slot hardware	N/A	N/A	5.6" t slot

DESIGN CRITERIA FOR STREET LIGHTING

- A. **SCOPE.** These criteria shall be adhered to for the design of all street lighting systems to be installed in the public street right-of-way. Continuous street lighting systems shall consist of one or more service enclosures, distribution systems, poles, luminaires, and other appurtenances required to provide a complete, operable lighting system. The City Engineer shall be responsible for determining the scope of a street lighting system.
- B. **LOCAL STREET LIGHTING.** City policy is not to continuously light local streets, therefore lighting along local streets does not provide specific maintained light averages and uniformity ratios. The purpose of local street lighting is to provide enough light on the street to enhance the safety of the street users but to avoid over lighting the area. All streetlights on local streets will be installed in conformance with the following basic guidelines.

At Intersections:

In order to provide lighting within the intersection area of two local streets, a light pole will be installed on one corner of an intersection or opposite the intersection in the case of a T-intersection.

Within Cul-de-Sac Bulbs:

A light pole will be installed within the cul-de-sac bulb when the cul-de-sac street is longer than 200 feet measured from the intersection of the intersecting streets to the center of the cul-de-sac bulb.

Mid-block Streetlights:

A minimum number of mid-block streetlights will be installed in order to achieve a desired pole spacing of approximately 250 feet. The maximum spacing between lights should not exceed 300 feet and the minimum spacing between lights should not be less than 200 feet unless otherwise approved by the City Engineer. Lights should desirably be located on or near a property line and not in front of residences, if avoidable.

At this time, lighting on local streets is installed and maintained by the electrical utility company. For all new developments, the developer shall indicate the location of streetlights on the roadway plans for all local streets. The City Engineer will review the location of streetlights and authorize the electrical utility company to install the streetlights when the street is constructed and accepted for maintenance.

- C. **CONTINUOUS LIGHTING DESIGN.** These criteria are established to provide uniform procedures to aid the Design Engineer in preparing improvement plans. These criteria are not to be a rigid set of rules that would restrict the Design Engineer from utilizing creative or original design; however these criteria may be modified only with prior authorization by the City Engineer.

The *AASHTO Roadway Lighting Design Guide* permits either the illuminance method or the luminance method to be used in the design of highway lighting. The luminance method requires a complex design process and knowledge of the reflective characteristics of the pavement surface used. These reflective characteristics change as the pavement ages and with variations in weather conditions. It is for these reasons that the luminance method is not allowed by the City.

Photometric analysis shall be utilized to calculate the theoretical spacing of street lights to meet the illumination criteria based on the street classification. The City Engineer should be consulted to determine the appropriate street classification. The minimum illumination criteria should be as shown in the table on the following page.

Street Classification	Minimum Maintained Average Illumination	Average-to-Minimum Uniformity Ratio
Arterial	1.3 foot-candles	3:1
Commercial Collector	0.9 foot-candles	4:1
Residential Collector	0.6 foot-candles	4:1

The street pavement surface is assumed to be the R3 reflective classification. The lighting loss factor shall be 1.0 for all photometric analysis. Only luminaires listed in the City's Approved Materials List shall be utilized for photometric analysis.

- D. PLACEMENT OF STREET LIGHT POLES. The actual spacing of street light poles should be the possible spacing nearest to the calculated theoretical spacing. At locations where additional lighting may be beneficial, such as around curves, at intersections, and at crosswalks, pole spacing may be reduced to increase lighting levels.

Street light poles shall have a minimum setback of three feet, measured from the back of curb to the center of the pole foundation. The minimum setback for a non-curbed street shall be six feet, measured from the edge of pavement to the center of the pole foundation. Poles may be located in medians where the minimum setback requirements can be satisfied. In medians, poles shall be installed as close as possible to the center of the median. All poles in medians shall be a minimum of 15 feet behind the median nose.

Poles located at the intersection of residential streets should desirably be placed so the light pole can be used to mount stop and street name signs. That means the pole should be installed as near to the location where a vehicle should stop while maintaining the minimum setback of three feet from the back of curb.

All poles installed in residential areas should ideally be located on or near property lines whenever possible. In the case of larger lots, poles cannot always be located on the property line. In these cases, in order not to exceed the maximum desired pole spacing, poles can be located within the lot. The designer should take care not to locate the pole in front of large windows of houses. Any pole located near a residential drive entrance should be located a minimum of five feet from the edge of the drive or concrete wing.

The Design Engineer should also coordinate the location of all poles with existing trees, such that the fixture does not extend into the tree canopy or such that the tree canopy does not block the light output from the fixture.

Street light poles should be located to have a minimum clearance of 10 feet from all overhead electrical utilities. Specific clearance requirements shall be determined by the utility company and/or *National Electric Safety Code*. A minimum clearance of three feet shall be maintained from any non-electric lines such as cable TV lines, aerial fiber lines, etc. The Design Engineer shall be responsible to determine if adequate clearance can be achieved and make adjustments to the pole locations or coordinate utility relocation if necessary.

- E. STREET LIGHT POLES. Street light pole types, differentiated by mounting height and bracket arm length, are illustrated in the Standard Drawings. Equipment to be utilized should be selected based on the following criteria.

Luminaires should be installed at a maximum mounting height of 40 feet above the roadway. Poles mounted on structures, such as bridges and retaining walls, may require special pole lengths as not to exceed the maximum mounting height.

Bracket arms should be selected to position the luminaire over the traveled way for greatest utilization of available light. The bracket arms should be oriented 90-degrees, or perpendicular, to the traveled way. Bracket arm lengths should be selected in order to position the luminaires in a relatively straight line when looking down the roadway.

Decorative street light poles are not allowed unless approved by the City Engineer.

- F. STREET LIGHT POLE FOUNDATIONS Screw-in anchor foundations are assumed to be used for all poles wherever possible. If a screw-in anchor cannot be installed for any reason, such as encountering rock, then a concrete foundation shall be installed. Screw-in anchor foundations are not to be installed in soils that have been disturbed or filled to a depth of 3 feet or more.
- G. LUMINAIRES. In general cobrahead style LED luminaires are rated as Class A through Class E depending on their ability to light a particular type of roadway and cross section. Recent advances in LED technology allow for fixtures with greater lumen output, which are rated as Class Z. Typically, the lowest class of LED luminaire should be used in the design that satisfies the given lighting criteria. An approximate comparison between the different classes of LED luminaires and high pressure sodium (HPS) luminaires is as follows:

Class Z LED – greater than 400 W HPS

Class A LED – approximately equivalent to a 400W HPS

Class B LED – approximately equivalent to a 310W HPS

Class C LED – approximately equivalent to a 250W HPS

Class D LED – approximately equivalent to a 150W HPS

Class E LED – approximately equivalent to a 100W HPS

The City uses only two LED luminaire models with field adjustable light outputs to achieve the different classes of lumen output. The Design Engineer should refer to the City's Approved Products List for the models of luminaires, light loss factors, and the photometric files that should be used for photometric analysis.

- H. CONDUIT. The distribution system shall be underground in 2-inch conduit. Conduit for street lighting systems shall be either Schedule 40 polyvinyl chloride (PVC) conduit or SDR 11 high density polyethylene (HDPE) conduit. Cable-in-duct may be installed for projects in mostly unpaved areas. If conduit is to be installed on a structure, rigid metal conduit (RMC) conduit should be used per the requirements of the Missouri Department of Transportation. In new concrete structures, PVC conduits can be embedded when structures are constructed.

Except where it crosses under a street, the conduit shall be behind the back of curb or outside the edge of pavement. The conduit should be installed at a constant offset from the back of curb or edge of pavement preferably at the same distance as the pole setback, unless a common trench is being used. The minimum setback from the street to the center of the conduit should be the same as that specified for street light poles except in medians, where conduit setback may be closer to the back of curb to avoid landscaping. The setbacks may have to be adjusted in places to avoid storm sewers, utility conflicts, or other obstructions.

In unpaved areas, conduit can be trenched or plowed. Conduit shall be bored under all sidewalks, drives, and streets unless otherwise approved by the City Engineer. Boring under streets shall be perpendicular to the roadway or the shortest possible crossing distance.

The length of conduit is calculated by adding the center to center distances between equipment. All of the center to center distances should be subtotaled and multiplied by 102% to allow for bending of conduit to avoid obstructions. The method of conduit installation is not quantified.

- I. JUNCTION AND PULL BOXES. Junction or pull boxes shall be installed at each location where splices in the distribution cable are required outside the pole base or where 90-degree bends in conduit runs are required. The distance between boxes and/or street light poles shall not exceed 300 feet to facilitate the pulling of cable. Boxes must be installed at least 10 feet away from street light poles to allow for conduit sweeps. The minimum setback from the street to the center of boxes should be the same as specified for street light poles. The installation of boxes in streets, driveways and curb ramps is unacceptable. In addition, the City prefers that boxes not be installed in the sidewalk. Boxes should be located on level ground, clear of ditches.

Type 1 junction boxes shall be used if one or two conduits enter/exit the box. Type 2 junction boxes shall be used where three or four conduits enter/exit the box. A Class 1 pull box shall be located adjacent to each service enclosure, or where five or more conduits enter/exit the box.

- J. SERVICE ENCLOSURE. The Design Engineer shall coordinate and verify the location of the service enclosure with the electric utility company to ensure availability of service. Secondary service for street lighting shall be three-wire 120/240 Volt single phase. Service enclosures are typically located behind the sidewalk, or at least 10 feet from the back of the curb (or edge of pavement where there is no curb). Service enclosures should be generally located on level ground, clear of ditches, and clear of sight lines for right-turning traffic at intersections. Each service enclosure shall contain a photoelectric cell, to be oriented to the north or east. Four-circuit service enclosures are typically used for street lighting systems, unless otherwise approved by the City Engineer.

A 3-inch Schedule 40 PVC conduit with power cables shall be installed from the service enclosure to the foundation of the secondary service point (utility pole, secondary pedestal, or pad-mount transformer) as designated by the electrical utility company. The conduit should be installed in a straight horizontal line in accordance with the Standard Drawings, and should be 100 feet or less in length. Junction or pull boxes are not permitted in the conduit run between the service enclosure and secondary service point unless authorized by the electrical utility company. Power cables shall be three #2 cables. The electrical utility company will supply the meter and connect the power cables to the transformer.

- K. CIRCUITS. All street lighting circuits shall be two-wire 240 volt (hot to hot) system with a ground wire. Distribution cable shall be sized so that the voltage drop does not exceed 5% at any point in the system. The Design Engineer is required to submit voltage drop calculations for verification. Distribution cables shall be no larger than #4 and no smaller than #8. Voltage drop calculations shall be prepared using the full input wattage of the luminaire, even if the light output is designed to be adjusted in the field.

Each street lighting circuit shall be contained in a separate conduit, except for the conduit raceway between a service enclosure and the adjacent class 1 pull box. For that raceway, two conduits will be required. The distribution cable for each of the lighting circuits shall be routed

through one of these two conduits into the class 1 pull box, and then routed to the first pole for each circuit through separate conduits.

Splices in the distribution cable should be minimized. Circuits shall not be spliced between the service enclosure and the first street light pole on each circuit. Splices in distribution cable should be made using insulated multi-cable connector kits. Splicing of distribution cable is only allowed in pole bases, pull boxes, or junction boxes.

The length of distribution cable is calculated by adding the center to center distances between all equipment on a circuit. The length of all cable should be subtotaled and multiplied by 102% to allow for bending. Five feet of slack should be added at each light pole base or power supply. Slack should also be added for junction and pull boxes; two feet at each Type 1 junction box, three feet at each Type 2 junction box, and six feet at each Class 1 pull box.

- L. POLE WIRING. Pole and bracket cable consists of a 3-conductor cable run inside the street light pole. Poles with dual luminaires will require two 3-conductor pole and bracket cables. The distribution cables are spliced to the pole and bracket conductors in the pole base using multiple tap connectors. Break-away disconnects are also installed on each pole and bracket conductor in the pole base. Fused disconnects should be used for each of the phase conductors, and a non-fused disconnect should be used for the ground conductor as shown in the Standard Drawings.

The length of 3-conductor pole and bracket cable at each street light pole is calculated by adding the nominal pole height, the length of the bracket arm, and five feet of slack. This quantity is multiplied by the number of luminaires on the pole.

- M. GROUNDING. All street light poles shall be bonded together to form a continuous system. Ground rod shall be installed adjacent to each concrete street light pole foundation and each service enclosure. Ground rods are not required to be installed with to screw-in anchor foundations. The grounding conductor shall be bonded to each ground rod.

- N. POLE NUMBERING. Street light poles shall be numbered using the service enclosure identification number followed by the circuit number and pole number. For example the first pole on circuit number 1, from service enclosure number 2F03 should be labeled as 2F03-1-1. The second pole on the circuit shall be labeled 2F03-1-2.

PLAN REQUIREMENTS

The street lighting plans shall include all information necessary to build and check the design of a street lighting system. Street lighting plans shall meet all public improvement project plan preparation requirements for the City of Liberty in addition to the requirements listed in this section.

Street Lighting plans shall consist of the following sheets:

- Title Sheet
- General Notes and Quantities Sheet
- Street Lighting Plan Sheet(s)
- Wiring Diagram
- Standard Detail Sheets

Title Sheet: Title sheet is only required for stand-alone lighting projects. If street lighting plans are part of a larger plan set, a title sheet is not necessary. The title sheet shall meet the City's plan requirements for public improvement projects.

General Notes and Quantities Sheet: This sheet should contain the following:

- A. List of general notes to the Contractor
- B. Any project specific notes
- C. Legend of symbols that apply to all sheets
- D. Lighting design calculations and illumination criteria
- E. Recapitulation of quantities table

Street Lighting Plan Sheet(s): The plan sheet(s) shall include the following information:

- A. One or more plan sheets adequately showing the street lighting system in relation to the streets and adjacent properties, with a north arrow, and a bar scale at a minimum scale of 1 inch equals 50 feet.
- B. All existing and proposed utilities such as power, gas, water, telephone, cable, sanitary sewer, storm sewer, and other items shall be accurately shown according to the best available information in the records of the owner of the facility, or field location, and shall be identified as to type, size, material, etc., as may be applicable. Existing utilities should be shown in gray.
- C. All existing and known proposed improvements within 50 feet each side of the right-of-way and 100 feet beyond the project limits shall be shown at their proper locations unless otherwise approved or required by the City Engineer. These improvements shall include items such as street pavement, curbs and gutters, sidewalks and driveways, storm and sanitary sewers, water mains and fire hydrants, utility poles and pedestals, trees and shrubs, fences and walls, buildings, and similar items, and shall be identified as to type, size, material, etc., as may be applicable. Irrelevant items may be omitted for new developments. Existing items should be shown in gray. New non-lighting items may be shown with a thin black line. Future non-lighting items may be shown with a thin dashed line.
- D. Typically, street lighting equipment does not need to be identified by station and offset unless stationing is available. If the street lighting is part of an improvement project for which stationing and controls have been developed, street centerline stations should be shown and marked at 100-foot intervals for consistency between the signal and improvement plans. If station and offset are not indicated, the locations of proposed street lighting equipment should be referenced from existing features that appear on the base plans, such as the back of curb, edge of pavement, utility poles, etc.
- E. Each item to be constructed or installed for the project should be legibly noted. Each power supply should be labeled with the identification number assigned by the City Engineer. Street light poles should also be labeled with the power supply identification number, circuit number and pole number as previously described.
- F. There should be a table listing the pole number, station, offset, and bracket arm length, and luminaire type for all proposed poles. There should also be a table listing the box number, station, offset and type of box for all proposed junction and pull boxes. All proposed equipment shall be listed in the order in which it is located in the plans.

Wiring Diagram: This sheet should include an overall schematic of the street lighting circuitry from each service enclosure. The center to center distance between street light equipment should be indicated on the diagram. A summary table for each circuit should also be included on this sheet indicating the conductor size, circuit length, input amperage, percent voltage drop, circuit assignment at the service enclosure, and branch circuit breaker trip rating.

Street Design Requirements

ROW WIDTH	ADT	Design Speed	Road Width (Parking 2 sides)	Curb & Gutter	Buffer Strip	Sidewalk Width
55'	Up to 2,000	25 mph	30'	CG-6	5'	5'
65'	2,001 to 4,000	25 mph	36'	CG-6	7'	5'

Staff notes: VDOT was fine with the 55' and 65' ROW widths. Their rule of thumb for a typical subdivision street is that ROW is a minimum of one (1) foot behind the sidewalk or any other maintenance item for future maintenance or replacement.

Street Lights

The purpose of local streets is to provide enough light on the street to enhance the safety of the street users but to avoid over lighting the area. All streetlights on local streets will be installed in conformance with the following general guidelines.

- *At intersections:*
In order to provide lighting within the intersection area of two local streets, a light ball shall be installed on one corner of any intersection or opposite the intersection in the case of a T-intersection.
- *Within cul-de-sac bulbs:*
A light pole will be installed within the cul-de-sac bulb when the cul-de-sac street is longer than 200 feet measured from the intersection of the intersection streets to the center of the cul-de-sac bulb.
- *Mid-block streetlights:*
A minimum number of mid-block streetlights shall be installed in order to achieve a desired pole spacing of approximately 250 feet. The maximum spacing between lights should not exceed 300 feet and the minimum spacing between lights should not be less than 200 feet unless otherwise approved by the Director of Public Works. Lights should desirably be located on or near property lines and not in front of structures when possible.

Staff notes: I did not find any definitive rule for spacing street lights. Specific spacing was determined by a number of factors including pole height, street classification, posted speed limit, road width, and foot-candles.

Other items to consider include (REC may have requirements for some or all of these items):

- Pole height minimums/maximums
- pole setbacks
- coordination of existing buildings, trees, driveways with identification of pole locations
- OHW
- LED requirement

- Location of conduit (consistent offset from back of curb, avoidance of conflicts with other utilities, stormwater facilities, or other obstructions)
- Coordination with REC on their requirements including numbering

Christy Dunkle

From: Jeff Hinson <jhinson@myrec.coop>
Sent: Wednesday, December 13, 2023 3:07 PM
To: Christy Dunkle
Cc: David Keller
Subject: RE: Street light specifications
Attachments: lighting guide exterior.pdf

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Christy,

About the only lighting standard we use is that colonial post top LEDs are installed on 18' fiberglass poles which are about 3' in the ground.

We have no spacing standards. REC's overhead-fed lights on wood poles are limited by our existing pole locations and we place them where members ask. For underground-fed subdivisions, an engineer/architect typically specifies the light locations and we simply put them there.

Some counties have required that lights be installed at intersections and cul-de-sacs at a minimum. The Town could create their own standard based on what they see in an existing subdivision at night, and perhaps require this spacing before approving future subdivisions.

It's up to our members to decide how many lights they want and where they want them. Therefore, we do not control lighting levels. The Illuminating Engineering Society (IES) does publish recommended lighting levels for certain types of areas. I've shared the attachment with you and Keith in the past.

Thanks and I hope you have a very Merry Christmas!

Jeff Hinson, P.E., C.E.M.
Director of Member Services & Community Relations
Blue Ridge Office
Rappahannock Electric Cooperative
137 Kelley Court
Front Royal, VA 22630
540-622-5163
www.myrec.coop



From: Christy Dunkle <planner@berryvilleva.gov>
Sent: Wednesday, December 13, 2023 12:16 PM
To: Jeff Hinson <jhinson@myrec.coop>
Cc: David Keller <dkeller@myrec.coop>
Subject: [EXT] RE: Street light specifications

[EXT] Verify links & attachments.

Council has been receiving complaints about (I believe) lack of lighting in certain areas. Can you forward your standards so I can discuss them with the Streets and Utilities Committee meeting on December 19?
Thank you.

Christy Dunkle
Community Development Director
Town of Berryville, VA
101 Chalmers Court, Ste. A
Berryville, VA 22611

540 955-4081

From: Jeff Hinson <jhinson@myrec.coop>
Sent: Wednesday, December 13, 2023 12:12 PM
To: Christy Dunkle <planner@berryvilleva.gov>
Cc: David Keller <dkeller@myrec.coop>
Subject: RE: Street light specifications

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi Christy,

Why would you all need such standards if REC is installing the lights according to our standards?

Jeff Hinson, P.E., C.E.M.
Director of Member Services & Community Relations
Blue Ridge Office
Rappahannock Electric Cooperative
137 Kelley Court
Front Royal, VA 22630
540-622-5163
www.myrec.coop



From: Christy Dunkle <planner@berryvilleva.gov>
Sent: Wednesday, December 13, 2023 11:41 AM
To: Jeff Hinson <jhinson@myrec.coop>
Subject: [EXT] Street light specifications

[EXT] Verify links & attachments.

Hi Jeff:

I hope all is going well. We would like to establish street light standards in the Town of Berryville for subdivision streets and collector roads. Do you have any information that I can get concerning spacing, pole heights and specifications, lighting standards, etc.? There is inconsistent information out there on separation between the lights and other requirements.

Thanks – and happy holidays.

Christy

Christy Dunkle
Community Development Director
Town of Berryville, VA
101 Chalmers Court, Ste. A
Berryville, VA 22611

540 955-4081

-Rappahannock Electric Cooperative Legal Disclaimer-

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Recommended Lighting Levels for Exterior Lighting

The Illuminating Engineering Society of North America (IESNA, or IES) gives in current IES publications quite a number of recommended illumination levels for outdoor lighting. We summarize some of these recommendations below, and in some cases the original tables have been simplified. Some of these illumination levels are currently under discussion by IES technical committees. It is important to note that these values are recommendations, not standards. Standards are set at the federal, state, county, or community level. The IES does not set standards, though IES recommendations are often used by those who set standards.

In fact, recommended illuminance levels are to some degree arbitrary. On p. 93 of the 1993 edition of the **IESNA Lighting Handbook**, it states that

It remains to be determined whether the added accuracy in predicting visual performance will be utilized in the illuminance selection procedure. A model of visual performance, no matter how accurate, is only part of illuminance selection. The cost of equipment and energy will always be an important part of the Society's decision. If electric energy prices were to double, recommended illuminance levels would certainly become lower. Further, there are other, perhaps more important, lighting design factors that the practicing illuminating engineer must consider in setting illuminance levels.

In all outdoor lighting applications, many factors come into play and should be considered: minimizing glare, mounting height and spacing, lighting system depreciation and life-cycle cost, conflict areas (such as between vehicles or between vehicles and pedestrians), access control and vandalism prevention, as well as the mix of commercial, industrial, and residential properties near the area to be illuminated. For example, in the presence of glare, one needs more illumination to try to overcome the adverse impact of the glare; without glare, lower illumination levels are possible, with an actual improvement in visibility. The key is that all outdoor lighting should be carefully done, with consideration given to all the relevant factors.

We give below a summary of the lighting illuminance levels in footcandles, as that is the most common unit used in the United States. However, lux is the preferred international unit, and the IES does officially recommend its use in the United States. A level of ten lux is about one footcandle (10.76 lx = 1 fc, exactly).

Roadway Lighting

	Average Maintained Illuminance (fc)	Uniformity (Avg/Min)
Freeway Class A	0.6 - 0.8	3/1
Freeway Class B	0.4 - 0.6	3/1
Expressway	0.6 - 1.3	3/1
Major road	0.6 - 1.6	3/1
Collector road	0.4 - 1.1	4/1
Local road	0.3 - 0.8	6/1

MAIN STREET
RESIDENTIAL STREET

Parking Lots

Level of Activity:	Horizontal Illuminance (Footcandles)		Uniformity Ratio
	Avg	Min	
High	3.6	0.9	4/1
Major League Athletic Events Major Cultural or Civic Events Regional Shopping Centers Fast Food Facilities			
Medium			
Community Shopping Centers	2.4	0.6	4/1

Cultural, Civic, or Recreational Events
 Office Parking
 Airports, Commuter Lots, etc.
 Residential Complex Parking
 Hospital Parking

Low

0.8

0.2

4/1

Neighborhood Shopping
 Industrial Employee Parking
 Educational Facilities

Churches

IES also states that the "Low" values are appropriate wherever there is a requirement to maintain security at any time in areas where there is a low level of nighttime activity.

Recommendations for other outdoor lighting levels (footcandles)

Building exteriors

Entrances

Active (pedestrian and/or conveyance)	5
Inactive (normally locked, infrequently used)	1
Vital locations or structures	5
Building surrounds	1

Floodlit Buildings and Monuments Dark surroundings Bright surroundings

Light surfaces	5	15
Medium light surfaces	10	20
Medium dark surfaces	15	30
Dark surfaces	20	50

Loading and Unloading Platforms 20

Service Stations

Approach	1.5	3
Driveway	1.5	5
Pump Island	20	30
Service Areas	3	7

Storage Yards

Active	20
Inactive	1

Retail Outdoor Lighting

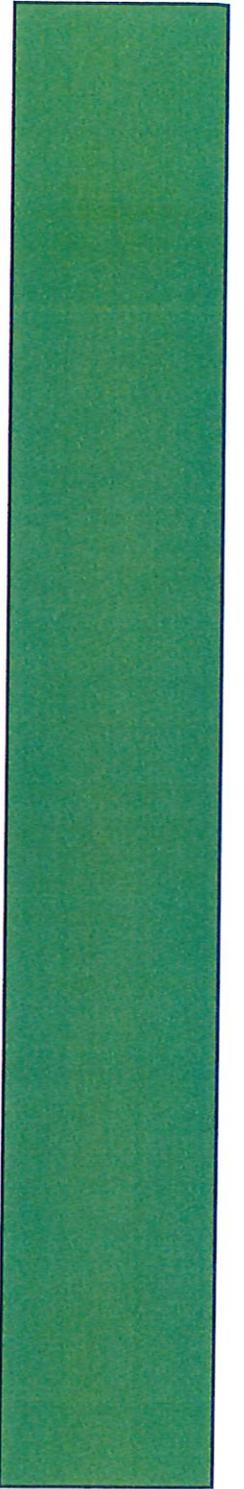
Illumination Level of Surrounding Area
 High Medium Low

Seasonal	Circulation	10	7	5
	Marketing area	30	20	10
	Feature display	60	40	20

Auto Lots

Circulation	10	7	5
Merchandise	50	30	20
Feature display	75	50	35

IES states that the illuminance in exterior retail selling areas should not exceed 10 times that of the surrounding area. Measurements should be referenced from the roadway.



**Streets and Utilities Report
19 December 2023**

Item Title: Truck Route

Prepared By: Jean Petti

Activity to date:

Following October Streets and Utilities meeting, staff inquired of VDOT as to the feasibility of establishing a truck route rather than truck length restrictions. As of 15 December 2023, this request was confirmed as having been submitted to VDOT engineering for evaluation and comment

Attachments: Copy of email 4 December 2023, including map of proposed route

Revised request concerning S. Church Street truck traffic

Deputy Town Manager <deputytownmanager@berryvilleva.gov>

Mon 12/4/2023 4:16 PM

To: Carter, Edwin (VDOT) <edwin.carter@vdot.virginia.gov>

Cc: Keith Dalton <townmanager@berryvilleva.gov>; Diane Harrison <dharrison@berryvilleva.gov>; Ryan Tibbens <rtibbens@berryvilleva.gov>; Neal White <chiefofpolice@berryvilleva.gov>

 2 attachments (6 MB)

Streets and Utilities Agenda Packet 10.24.23.pdf; Screenshot (9).png;

Dear Ed,

We would like to follow up on the recommendation included in an email from Mike True to Darin Simpson on September 7, 2023 (see page 17 of October S&U report) and establish a Truck Route that would guide trucks up past the south end of Church Street, following Buckmarsh north to bypass Route 7, directing them eastbound on bypass Route 7 to the light, and bringing them back into town on E. Main Street to Jack Enders Blvd (see attached). If possible, this signage could include the BVG logo.

These requests, if accepted, would replace the previous request for truck length restrictions. Please advise as to what next steps will be needed to advance this request.

Thank you,
Jean

Jean Petti, Deputy Town Manager
Town of Berryville, VA
101 Chalmers Court, Suite A
Berryville, VA 22611
540.955.1099

