Replace Chapter 9 in its entirety with the Chapter 9 that follows.
Chapter 9 - Public Street Lighting Requirements

Presents the minimum design criteria & standards to develop and produce construction documents regarding the extension and development of the public street lighting system.

The purpose of this chapter is to outline the process to those design professionals involved in private land development projects on how to incorporate the City’s public street lighting requirements into their project. This document contains general information regarding the processes that are required during the construction document preparation; plan review, approval and permitting stages of land development.

Section 901 - General Information

901.1 The City of Mesa owns, operates and maintains street lighting for the public streets within the corporate limits of the City of Mesa. Information regarding the City of Mesa system can be obtained as outlined below.

901.2 Mesa’s system has been developed through a combination of Capital Improvement Projects (C.I.P.) and private land developments, which include both, land subdivisions or individual lot or tract type of land development.

901.3 Questions regarding the public street lighting system should be directed to the Streetlights System Supervisor at (480) 644-3783.

Section 902 - City Code, Policies & Regulations

902.1 The design professional should be aware of and become familiar with the following aspects of the various regulations that pertain to land development within the City of Mesa and its utility service areas.
Section 903 - City Code

903.1 Title 9, Public Ways & Property contains information regarding the construction of public street lighting in association with private land development. Chapter 6 of Title 9 pertains to land subdivision projects, while Chapter 8 deals with individual lot or parcel development (non-subdivision) projects.

903.2 Title 4, Building Regulations contains information regarding light pollution and light trespass. Chapter 4, Mesa Lighting and Electrical Code deals primarily with private lighting and does not apply to the lighting of public streets.

Section 904 - City Policy

904.1 All private land development projects, as formalized by the City Code are required to provide street lighting that meets City of Mesa standards, for all public streets within, adjacent or affected by the proposed project.

Section 905 - Arizona State Statutes

905.1 Title 49 – The Environment, Chapter 7 – Light Pollution contains requirements for shielding of outdoor light fixtures as well as the prohibition of mercury vapor light fixtures. The provisions of this Title apply to both public and private lighting systems.

905.2 In accordance with ARS Title 49, the City of Mesa requires the use of full cutoff light fixtures on the public street lighting system and prohibits the use of Mercury Vapor (MV) lamps.

905.3 Title 4, Chapter 4 of the Mesa City Code pertaining to Mesa Lighting and Electrical Code supersedes the requirements of the Title 49 in accordance with Article 49-1106.

Section 906 - Public Street Lighting System Design

906.1 General Information: In addition to the M.A.G. Uniform Standards, Mesa’s amendments to M.A.G, and Mesa’s Streetlight Technical Manual; Mesa has also established the Mesa Electric Code. For additional information please see Title 4, Chapter 4 of the Mesa City Code.

906.2 Design Criteria: It is the City of Mesa’s intention to provide illumination of the public street transportation system in accordance with the “American National Standard Practice for Roadway Lighting” (RP-8-00) as published by American National Standards Institute (ANSI) and the Illuminating Engineering Society of North America (IESNA).

906.3 Copies of RP-8-00 are available by contacting the Illuminating Engineering Society of North America at 120 Wall Street, New York, New York 10005 or at http://www.iesna.org.

906.4 Design Method: While the RP-8-00 Standard Practice contains three different design criteria methodologies for designing roadway lighting, designs in the City of Mesa are to utilize the “Illuminance Criteria” method.

906.5 Minimum Values: Tables 2 & 9, of RP-8-00 provide the minimum recommended values that are to be met by all public street lighting designs within the City of Mesa.
906.6 Maximum Values: Designs shall not exceed the recommended Uniformity Ratio Value for the appropriate street classification.

906.7 Footcandles Required: Calculations provided to prove conformance to the minimum recommended values in Table 2 of RP-8-00 are to be in footcandles (fc). The maximum lighting level shall not exceed the recommended “minimum maintained average values” of Table 2, RP8-00 by over twenty-five percent (25%).

906.8 Design Grid: The Calculation/Measurement Grid shall extend to the face of curb on both sides of the public street rather than to the edge of pavement as described in Annex A of RP-8-00. This includes but is not limited to public street cul-de-sacs, traffic circles or roundabouts and traffic calming devices.

906.9 Intersection Levels: Intersection lighting levels shall be a minimum of the sum of the values recommended for each public street that forms the intersection. See Table 9, RP-8-00. For the purposes of this analysis, the area is defined by the extension of the face of curb alignment across the street to match the opposing face of curb alignment. Roundabouts (Major & Collector Streets) and Traffic Circles (Local Streets) shall be considered and analyzed as an intersection.

906.10 Pedestrian Area Calculations: Separate calculations for the pedestrian areas are not required, even if the pedestrian sidewalk is separated from the street curb.

906.11 Street Classifications: The RP-8-00 document classifies the various types of streets found in the transportation system into roadway classifications. The following Table 9.1 provides the conversions between the RP-8-00 classes to the equivalent City of Mesa designation.

<table>
<thead>
<tr>
<th>Table 9.1 Street Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RP-8-00 Designation</strong></td>
</tr>
<tr>
<td>Freeway Class A</td>
</tr>
<tr>
<td>Freeway Class B</td>
</tr>
<tr>
<td>Expressway</td>
</tr>
<tr>
<td>Major</td>
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<tr>
<td>Collector</td>
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<tr>
<td>Local</td>
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</tbody>
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906.12 Pedestrian Areas: The RP-8-00 Standard also defines areas in which pedestrian traffic may come into contact or conflict with vehicular traffic, such as at intersections or mid-block crossings. The following examples specific to Mesa help clarify the application of these definitions.

906.12.1 High: Areas with significant numbers of pedestrians expected to be on the sidewalks or crossing the streets during darkness. Examples in and around the City of Mesa would be adjacent to regional shopping centers such as Superstition Springs Mall; areas around a concert venue such as the Mesa Arts Center, stadiums such as Sloan Park, and around cinema complexes such as the Harkins or AMC multi-screen theatres.

906.12.2 Medium: Areas where lesser numbers of pedestrians utilize the streets at night. Typical examples would be office complexes, apartments or multi-family residences and neighborhood shopping centers that are usually located at arterial street intersections.
906.12.3 **Low**: Areas with very low volumes of night pedestrian usage. These are typified by low-density residential developments such as suburban ranch or single residential zoning districts.

906.13 **Pavement Classification**: RP-8-00 Standard Practice also defines the reflectance characteristics of the roadway surface.

906.13.1 The pavement classes to use for fixed roadway lighting in the City of Mesa are R2 & R3.

**Section 907 - Lighting Analysis**

907.1 All land development projects that are required to improve or install public street lighting shall conduct a lighting analysis of the existing conditions, the proposed improvements and any future street widening, which is based on the adopted 2040 Mesa Transportation Plan. The result of this analysis shall be included in the construction document submittals.

907.2 **Existing Public Lighting**: Where the land development project is adjacent to or adjoining an existing public street, the developer shall perform a lighting analysis for any project that results in a change of pedestrian conflict area classification (see 906.12 for definitions), results in a change in adjacent or adjoining streets or access, or requires the addition, conversion, removal, replacement, or relocation of any street light(s).

907.2.1 Projects in which the lighting analysis shows that lighting levels do not meet required standards shall improve the existing public street lighting system to meet the current required standards.

907.2.2 Exemption from lighting analysis and public street light improvements can be granted if all the following are true:

- Criteria of 907.2 does not apply.
- Adjacent or adjoining street characteristics – alignment, profile and cross section – have not been modified.
- Adjacent or adjoining pedestrian access – sidewalks and handicap ramps – has not been modified.
- Adjacent or adjoining vehicular access – driveways – has not been modified.

907.3 An analysis of the existing public streets adjoining the proposed project shall be performed. The area to be examined shall be as described in 906.8.

907.4 **Public Street Widening**: A separate “proposed” analysis of the public streets to be widened by the land development project is required. Analysis shall include all right turn lanes and tapers.

907.5 **Future Street Widening**: A separate “future” analysis will be required when the public street does not meet the ultimate street width, such as when the opposing side of the public street has not been widened or improved. The analysis shall utilize the future street widths and shall propose the locations of the future streetlights to meet the required lighting levels.

907.6 Land development projects that include or adjoin a public street intersection shall include separate intersection(s) calculations as part of the required lighting analysis.
Section 908 - Design Standards, Specifications & Guidelines

908.1 All adjacent streetlight poles, mast arms and luminaires shall be of the same height, length and type when installed on local streets unless otherwise directed and approved by the City of Mesa Transportation Department Director or designee.

908.2 Luminaires: The City of Mesa has thousands of luminaires in the public streetlight system and in order to efficiently manage the system the Transportation Department has standardized the luminaire specification.

908.2.1 All luminaires installed on the public street lighting system must be from one of the following approved manufacturers:

GE (General Electric) Lighting Systems, Inc.
Philips Lighting, or
City of Mesa approved equal.

908.2.2 All luminaires installed are to be as follows:

- Classified as a “full – cutoff”;
- Housings are to be fitted with tool-less entry for mounting of driver and terminal buss. Luminaire shall mount to a horizontal 2.375” tenon with no more than 4 bolts. Cooling shall be done with heat sinks.
- Driver shall be 120-277 60 HZ input with surge protection per ANSI C136.2-2015. Driver shall be replaceable and have plug connections. Drivers for light emitting diode (LED) shall be capable of 0-10V dimming.
- Fixture shall have ANSI C136.331 seven (7) pin receptacle.

908.3 Mesa Streetlight Technical Details SL-71 series have additional specifications, such as the IES Distribution, Type, Housing Color, etc., which all luminaires installed in the City of Mesa street lighting system must comply with. Use of non-standard IES distribution may be allowed with approval from the City. The Streetlight Technical Manual is available at https://www.mesaaz.gov/residents/transportation/streetlights-signs-striping. Details found in the Streetlight Technical Manual have an “SL” prefix.

908.4 Optics: Fixture shall utilize high bright light emitting diodes (LEDs) with a CCT (Correlated Color Temperature) of 3000k. Luminaire shall meet IESNA full cutoff classification (BUG rating of U0) and have IESNA Type II, Type III, or TYPE IV distribution. Luminaire shall have an option for a field installable house side shield from manufacturer. Lumen maintenance at 50,000 and 25° C based on TM-21 testing shall be 92% or greater. Luminaire IES files must be generated in accordance with IESNA standards LM-79-08 for absolute photometry, by NVLAP accredited lab.

908.5 Nodes: All land development projects that are required to improve or install public street lighting shall provide the City of Mesa with a Philips City Touch Connector Node Hardware: 120-277 CTCN for each new street light fixture installation. Nodes shall be commissioned to the City of Mesa with a 10-year City Touch service agreement and 10-year system hardware warranty.
908.6 **Poles:** Streetlight poles to be installed on a local or collector street are to be either a P-104 or P-106 per Mesa Streetlight Detail SL-73.01 Series unless otherwise approved in accordance with 908.6.1.

908.6.1 **Non-Standard Poles:** The use of non-standard, specialty materials within City of Mesa rights-of-way or easements for infrastructure to be owned, operated or maintained by the City of Mesa is typically not allowed. “Specialty materials” are defined as items, such as streetlight poles, streetlight fixtures and street name signs which are not on the City of Mesa’s approved products lists or otherwise not fully in accordance with the City of Mesa’s standard details and specifications.

Any desired specialty items must be discussed with the City during the planning and zoning phases of a project and shall not be proposed in plans submitted for review without prior discussion or notice. The City will typically require execution of a development agreement with the developer during the project planning stage to set forth the requirements for the installation and maintenance of specialty items and, when specialty items are desired, the developer shall allot time for this activity. The City is not under any obligation to approve non-standard, specialty items.

For proposed specialty items, detailed shop drawings, including product data sheets, must be provided to the City for review, included and shown in the permit drawings, and must be approved by the City of Mesa (including approval by the City of Mesa departments that own, operate or maintain such items) during the plan review process. Approval must be obtained prior to permit issuance. If the use of specialty materials is approved, the associated shop drawings shall remain a part of the approved building permit plan set that is used for construction. The permittee shall ensure that the materials delivered and installed in the field are in full and complete compliance with the shop drawings in the approved plan set.

The requirements of this section do not apply to capital improvement projects contracted for and administered by the City of Mesa (i.e., where the City is the contracting agency).

908.7 Streetlight poles to be installed on a four (4) lane collector or major street are to be a P-206, when the light pole is adjacent to or within a residential neighborhood. A P-207 may be used when in office, retail, commercial or industrial zoning districts. See Mesa Streetlight Detail SL-73.02 series.

908.8 **Pole Foundations:** Streetlight pole foundations shall be per Mesa Streetlight Details SL-74.03 & M-74.08.

908.9 Where a proposed pole foundation will be in conflict with an existing City of Mesa natural gas main, the gas main shall be sleeved and encased per City of Mesa Natural Gas Detail GD-3.6 (Contact City of Mesa Gas Engineering for a copy of this detail). Where the existing gas main cannot be encased per GD-3.6, an offset or spread foundation must be designed or the utility must be relocated. See Mesa Streetlight Details SL-74.06 and SL-74.07.

908.10 **Conduits:** Conduits shall run in a direct line from pole to pole or pull box to pull box.

908.10.1 **Material:** Unless otherwise approved, conduits that are part of the public street lighting system shall be schedule 40, rigid PVC, UL approved for use with 90° C wire above and below ground.
908.10.2 **Location:** Conduits shall be dimension on the plan with a minimum of one foot (1') from edge of sidewalk, or two feet (2') from the curb in median islands when median lighting is approved.

908.10.3 **Minimum Depth:** Minimum depth from the top of curb or street pavement finish grade is to be twenty-four inches (24") and a maximum of thirty-six inches (36") unless otherwise approved.

908.10.4 **Rigid Steel Conduit:** Areas where twenty-four inches (24") cover is not possible, galvanized rigid steel conduit (G.R.S.) may be installed. G.R.S. conduit shall be double wrapped with 20-mil tape to six inches (6") past the threaded metal coupling. Compression couplings are not allowed. Prior approval is required for any design proposing to use G.R.S. conduit.

908.10.5 **Sizes:** Acceptable sizes of conduit on the public street lighting system are: one and one-half inch (1 ½") or two-inch (2") in diameter as described below.

908.10.5.1 Conduits on major streets are required to be two-inch (2") diameter, except that a one and one-half inch (1 ½") diameter conduit shall be used between the circuit pull box and the streetlight pole.

908.10.5.2 Conduits on collector or local streets shall be one and one-half inch (1 ½") or larger if required by the conductor size. Conduit on collector or local streets shall be one and one-half inch (1 ½") from pull box to streetlight pole and one and one-half inch (1 ½") or larger from pull box to pull box.

908.10.5.3 A two-inch (2") in diameter conduit shall be installed from the streetlight control cabinet to the pull & junction box located at the point of service connection.

908.10.5.4 Conduits containing photo control wiring shall be one and one-half inch (1 ½") minimum.

908.10.6 The conduit from the point of service connection to the electric utility’s facilities shall be per the specifications of the electric utility.

908.10.7 A two-piece expansion joint coupling shall be installed in all conduits at intervals not to exceed one hundred feet (100').

908.10.8 Conduit stubs that are twenty feet (20') or longer are required to be terminated with a sweep into a temporary pull box.

**Section 909 - Circuits, Wire & Conductors**

909.1 The public street lighting system is composed of the following circuits:

909.2 **Supply Circuit:** The circuit, which is from the electric utilities facilities to the approved point of service, is known as the supply circuit.

909.3 **Power Circuit:** The power circuit, which is the circuit from the point of service to the streetlight control cabinet.
909.3.1 All conductors in the power circuit shall be XHHW/XHHW-2. Insulation color shall be black (power), and white (neutral). It is also acceptable to use black insulation for the neutral wire, when each end of the conductor is marked with white tape, six-inches (6") in length. Exception: power conductors from pole hand hole in luminaire may be THHN/THWN insulation.

909.3.2 The wire to be used in the power circuit (i.e., from the point of service to the streetlight control cabinet) shall be:

- Minimum gauge (AWG): No. 2 XHHW/XHHW-2
- Maximum gauge (AWG): No. 2/0 XHHW/XHHW-2

909.4 **Streetlight Circuit** The street lighting circuits, which are from the streetlight control cabinet to the streetlight poles & luminaires.

909.4.1 The maximum numbers of streetlight circuits from a lighting control cabinet is two (2) and are usually designated as circuits “A” and “B”. Note that the typical total load of a single circuit shall not exceed 24 amps for HPS and 12 amps for LED.

909.4.2 Where a control cabinet is utilized the streetlight circuit shall be 240 volt.

909.4.3 Where a control cabinet is not utilized the streetlight circuit shall be 120 volt. Note that the electric service shall still be 120/240 volt.

909.4.4 Bond wire for streetlight circuits shall be #8 seven strand bare and green #6 XHHW for foundation ground.

909.4.5 The wire to be used as a conductor in the streetlight circuits shall be based on the Voltage Drop Calculations. The minimum and maximum gauges are:

- Minimum gauge (AWG); No. 8 XHHW/XHHW-2
- Maximum gauge (AWG); No. 2/0 XHHW/XHHW-2

909.5 **Photo Control Circuit:** The photo control circuits, which are from streetlight control cabinets to the photoelectric controls, shall be 120 volts.

909.5.1 The photo control circuit wiring is to run continuously, without splices, from the photocell to the pole’s hand hole then from the hand hole to the lighting control cabinet.

909.5.2 Photo control circuit shall be three (3) No. 14 XHHW-2 (RRCP 14/3) conductors contained in a TC (CPE Jacket) type control cable with a sunlight-resistant CPE jacket. Individual insulation colors shall be black (power to photocell), red (power from photocell) and white (neutral).

909.6 **Streetlight Pole:** The wire to be used as a conductor in the streetlight pole (i.e., hand hole to the luminaire) shall be No. 12 (AWG).
909.7 **Wire:** All wire used in the public street lighting system shall be stranded copper. Aluminum wire is prohibited.

909.7.1 **Ground (Bond):** All wires intended to be used as a ground (bond) shall be seven (7) strand copper, minimum gauge is No 8 (AWG).

**Section 910 - Point Of Service (POS)**

910.1 The design engineer shall contact the appropriate electric utility company to establish a “point of service”. It is the responsibility of the designer to coordinate the proposed project design with the utility company’s approved point of delivery (P.O.D.). Placement of point of service pull box shall be per SL 76.02 and SL 77.11 of the Streetlight Technical Manual.

910.2 When the proposed development is within the City of Mesa Electric Service area, the design engineer shall provide with the construction documents submittal, a “Point of Service form” sometimes referred to as a “meter spot form” identifying the approved point of service.

910.3 Point of Service forms shall include the stationing identification for the point of service delivery.

910.4 Point of Service forms shall also identify all lots or tracts of the proposed projects within the vicinity of the point of service.

**Section 911 - Power Supply**

911.1 When the public street lighting improvement plans are approved and CAD drawings and PDF reproducibles are received and processed, the City of Mesa Transportation Department will submit a copy of the approved design to the public utility supplying electricity to the proposed development. This will allow that agency to initiate the final power design for the public street lighting system.

**Section 912 - Voltage Drop**

912.1 Voltage drop calculations are required to be submitted with the construction documents.

912.2 The voltage drop between the electric utility point of delivery pull box and the lighting control cabinet shall not exceed one percent (1%), assuming 240 volts at the pull box and a maximum 48 amp load at the lighting control cabinet.

912.3 The voltage drop between the lighting control cabinet and the end of each lighting circuit shall not exceed three percent (3%) for HPS and five percent (5%) for LED circuits.

**Section 913 - Photometrics**

913.1 The photometric results of the lighting analysis shall be shown on plan sheets that utilize the civil engineering base sheets for the proposed public street improvements. The X/Y coordinates shall match the stationing on the civil engineering improvement plans.
Section 914 - Location

914.1 The public streetlight system shall be designed for public right-of-way installation and shall be installed in the public street right-of-way. If existing conditions are such that the streetlight system cannot be located within the right-of-way, Public Utilities and Facilities Easements (PUFE) shall be dedicated, or cause to be dedicated for the public facilities.

914.2 Local Streets: Streetlights are typically installed on the south or west side of the public street.

914.3 Collector Streets: Streetlights are typically installed on the south or west side of the public street.

914.4 Major Streets: Streetlights are typically installed on both sides of the major (arterial and collector) streets with staggered spacing. Street lighting located in the center raised median is discouraged. Median lighting may be installed on arterial and collector streets only when approved by the City of Mesa Transportation Department.

914.5 Lot Lines: Streetlights in residential areas should be installed on the intersecting lot lines.

914.6 Intersections: There shall be at least one streetlight located at each public street intersection.

914.7 Curb Return Locations: Streetlight poles shall not be located within the radius of a corner at a public street intersection.

914.8 Cul-De-Sac’s: Cul-de-sac type streets shall have streetlights installed within the cul-de-sac to meet the recommended light levels if the radius point of the cul-de-sac is fifty-seven feet (57’’) or greater from the centerline of the intersecting street.

914.9 Adjacent to Sidewalk: Streetlight foundations and lighting control cabinet pads shall be adjacent to the sidewalk when feasible. Pull boxes shall be installed one foot (1’) behind sidewalk when feasible.

914.10 Curb Offsets: Streetlight poles shall be offset from the back of curb per the following:

914.11 For streetlights installed on a local street, the poles shall be offset from the back of curb a minimum of three feet (3’) and a maximum of six feet (6’).

914.12 For streetlights installed on collector or arterial streets, the poles shall be offset from the back of curb seven-and-one-half feet (7- ½ ’).

914.13 In areas where concrete curbing (vertical or ribbon) does not exist, the streetlight poles shall be offset eight feet (8’) from the edge of pavement.

914.14 Luminaire Overhang: Luminaires shall overhang the public street paving a minimum of one-foot (1’) unless otherwise approved and noted on the improvement plans.

914.15 Pole Spacing: Pole spacing shall be based on the results of the lighting analysis.

Section 915 - Clearances

915.1 The following minimum clearances are to be met around all streetlight poles:
915.2 **Local Streets:** A minimum of three feet (3') of clearance shall be maintained around all streetlight pole foundations installed on local streets.

915.3 **Major Streets:** A minimum of four feet (4') of clearance shall be maintained around all streetlight pole foundation installed on collector or arterial streets.

915.3.1 **Exception:** The exception to the required four feet (4') of clearance involves public utilities. The normal clearance between a public utility and the street pole foundation is one foot (1'), the minimum clearance allowed is six inches (6”).

915.4 **Fire Hydrants:** There shall be a minimum of five feet (5') of clearance between any streetlight pole or lighting control cabinet and a fire hydrant.

915.5 **Driveways:** There shall be a minimum of six feet (6') of clearance between any streetlight pole or lighting control cabinet and a driveway as measured from the exterior driveway wing contraction joint.

915.6 **Landscaping – Trees:** There shall be a minimum of eighteen feet (18’) of clearance as measured from base of tree trunk to outside edge of between any streetlight pole or lighting control cabinet.

915.7 **Landscaping – Shrubs:** There shall be a minimum of seven feet (7’) of clearance as measured from centerline of shrubs and outside of streetlight pole or lighting control cabinet.

915.8 **Utility Transformers:** Clearances shall be maintained around the electric utility company’s electrical transformer(s) in accordance with the City of Mesa and utility company’s requirements. See Salt River Project (SRP) Electric Service Specifications book for additional information.

915.9 **Overhead Electric Facilities:** The following clearances shall be maintained between streetlight equipment in accordance with Arizona Revised Statutes 40-360.42.

915.9.1 A minimum of ten feet (10’) of clearance shall be maintained between streetlight equipment and energized overhead electric lines or current carrying facilities.

915.9.2 A minimum of three feet (3’) of clearance shall be maintained between streetlight equipment and the overhead electric common neutral line.

915.9.3 A minimum of one foot (1’) of clearance shall be maintained between streetlight equipment and any other overhead utility line; this includes, but is not limited to, telephone and cable television lines.

915.10 **Responsibility to Relocate:** Where it is not possible to maintain the required clearances, it is the developer’s responsibility to relocate any underground or overhead facilities that are in conflict with the public street lighting system.

**Section 916 - Public Street Crossings**

916.1 Where a conduit for the public street lighting or traffic signal system is required to cross an existing paved public street, the crossing shall be via a horizontal bore in conformance with Mesa Standard Detail M-18.01 unless otherwise approved.
916.2 Where an open cut of the existing public street pavement has been approved, the trench backfill and pavement replacement shall be in accordance with Mesa Standard Detail M-19.04.1.

Section 917 - Desert Uplands

917.1 The Desert Uplands Area is that area of Mesa bounded by the Central Arizona Project (CAP) Canal on the west, Meridian Drive and Usery Mountain Regional Park on the east, University Drive on the south and Tonto National Forest boundary on the north.

917.2 Fixture: Ninety-degree full cutoff streetlight fixtures shall be required in the Desert Uplands Area. Fixtures shall be light emitting diode (LED). LED streetlight fixture installed in the Desert Uplands Area shall have a correlated color temperature of 3000 Kelvin.

917.3 Illumination & Spacing: Illumination and spacing of public streetlights in the Desert Uplands Area shall comply with City Code 9-6-5: Desert Uplands Development Standards.

917.4 Location: Approved streetlights (meaning City approval of the applicable building permit or right-of-way permit) shall be installed behind back of curb (e.g., adjacent to sidewalks). Mounting height shall be thirty-five feet (35') to forty feet (40') unless otherwise noted in City Code 9-6-5 (D).

917.5 Pull Boxes: Pull boxes shall be a maximum of two hundred ten feet (210') apart.

917.6 Other Requirements: Other requirements relating to streetlights within the Desert Uplands Area shall comply with City Code 9-6-5(D).

Section 918 - Public Street Lighting Components

918.1 Poles: All proposed or existing poles on the public streetlight system are required to be identified by stationing. Design plans shall show the station number for both proposed and future poles as well as any existing poles.

918.1.1 All poles on the public streetlight system are required to be identified by a public street address number. The Transportation Department will provide addresses during the plan review process.

918.2 Lighting Control Cabinets: The lighting control cabinet and pad shall be in accordance with Mesa Standard Detail SL-77 series and M-75.02 series.

918.2.1 All control cabinets on the public streetlight system are required to be identified by stationing. Design plans shall show the station number for both proposed cabinets as well as any existing cabinets within the vicinity of the project.

918.2.2 All control cabinets on the public streetlight system are required to be identified by a public street address number. Streetlight Engineering Technician will provide addresses during the plan review process.

918.2.3 Electrical service to the lighting control cabinet shall be 100 amps 120/240 volt single phase.
918.2.4 The engineer shall assure that the available fault current at the lighting control cabinet shall not exceed 10,000 amps.

918.2.5 Separate lighting control cabinets are typically required when streetlights are going to be installed on both sides of a public street.

918.2.6 It is the responsibility of the developer and the design team to assure that the locations of the lighting control cabinets coincide with the point of power delivery as established by the electric utility.

918.3 **Pull Boxes:** The distance between pull boxes (which also includes the hand holes on poles) shall not exceed two hundred feet (200').

918.3.1 Standard location of pull boxes is adjacent to the public sidewalk when possible.

918.3.2 A pull box shall be installed in any horizontal conduit run that has a change in direction greater than forty-five degrees (45°).

918.3.3 A pull box shall be installed whenever a conduit run branches to a conduit run on an intersecting public street.

918.3.4 A pull box shall be installed whenever a conduit crosses a public street. The pull box shall be installed in order to create the shortest conduit run possible crossing the public street.

918.3.5 Pull boxes are to be installed per Mesa Streetlight Details SL-75.01, SL-75.02, and SL-75.03. Pull boxes shall be offset from the light pole a minimum of five feet (5') (center to center).

918.3.6 Pull boxes to be installed on slopes shall be in conformance with Mesa Standard Detail M-74.02.2.

918.3.7 A pull box shall be installed at each streetlight pole where the conduit to be installed is one-and-one-half inches (1.5") or greater.

918.3.8 A No. 3.5 pull box shall be used on local or collector streets where one-and-one-half inches (1.5") conduit is used.

918.3.9 No. 5 pull boxes shall be used with a two-inch (2") conduits.

918.22 **Photo Cell:** The photocell for the photo control circuit is typically installed on the first streetlight pole on each circuit from the lighting control cabinet.

**Section 919 - Improvement Plans - Public Street Lighting**

919.1 **Basis:** Public street lighting plans shall be based on the civil engineering improvement plan base sheets and shall show all existing and/or proposed off-site public improvements (i.e., public street widening, right-turn decelerations for both public street intersections or private property, driveways, sidewalk ramps, public and private utilities, etc.). For those projects in which separate civil engineering design is not required (i.e., existing public street improvements), the streetlight plans shall be developed per the standards for Construction Documents as discussed in Section 1, General Requirements.
919.2 **General Notes:** Public street lighting shall include the City of Mesa general notes for public street lighting.

919.3 **Construction Notes:** Construction notes for public street lighting shall refer to the Mesa Detail number as well as the specific specification number (e.g., SL-73.01.01, P-106 pole).

919.4 **Stationing:** Stationing of public streetlight equipment or facilities shall be based on the same stationing as the civil engineering design or where civil engineering design is not required for the proposed project, stationing shall be based on a known survey monument on a public street centerline.

919.5 **Future Streetlight Locations:** The proposed future street light locations shall be shown on the street light design sheets. Any lighting used in the lighting analysis shall be shown on the plans. Future lights shall be clearly identified as future.

919.6 **Addressing Streetlight Facilities:** The City of Mesa requires that streetlights & control cabinets be addressed. Address for new facilities will be provided during the plan review process. New facilities shall have addresses enclosed within parentheses ( ) while existing addresses are to be enclosed in brackets [ ]. Addresses for existing facilities can be found on the approved street lighting plans for those facilities.

919.7 **Quantities List:** The quantities list on the streetlight plans for the public street lighting system shall show only the number of street lighting poles, luminaires, and lighting control cabinets, unless otherwise directed.

919.8 **Reproducibles:** Reproducible PDF and CAD drawings of the streetlight design sheets are required to be submitted upon approval of the public streetlight design.

919.9 **Incorporation into Civil Design:** When the streetlight design is in conjunction with other public works infrastructure improvements, the streetlight design sheets are to be incorporated into the civil engineering design set, the design sheets and the PDF and CAD drawings shall be sequentially numbered. The streetlight engineer shall coordinate with the project’s civil engineer.

919.10 **Construction Details:** The City of Mesa details for the public street lighting system are to be referenced in construction note callouts. These details shall not be included as details on the plans except where the project will receive federal funds for the construction of the public streetlights.

919.11 Details will be required for aspects of the public street lighting system (such as poles, luminaires, and/or pole foundations) that are not covered by Mesa’s details. Variations from the City of Mesa Standard Details or Streetlight Technical Manual must first be approved by the City of Mesa Transportation Department.