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COOPER Crouse-Hinds

Instruction Manual



*Taxiway, Metric Hardware, Below Grade Shallow Base,
Color Gold
Part Number 21378*

**Cooper Industries
Crouse-Hinds Division
Crouse-Hinds Airport
Lighting**
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Instruction Manual
Taxiway, Metric Hardware, Below Grade Shallow Base, Color Gold
Part Numbers 21378**1 Revisions**

Revision Number	Issue/Reissue Letter Number	Description	/29/06Checked	Approved
A	A206-319	Initial issue	3/13/07	PG
B	A207-021H	Revised instructions to indicate proper sequence of installation steps, use of 87105 installation fixture and illustrations indicating the various potting compounds, depth heights and fixture use.	7/5/07	PG
C	A208-082	87106-1 was 87105 in all locations	5/23/08	PG

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2 Limited Product Warranty

THE FOLLOWING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT BY WAY OF LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

Crouse-Hinds Airport Lighting Products (“the Company”) warrants to each original Buyer of Products manufactured by the Company that such Products are, at the time of delivery to the Buyer, free of material and workmanship defects, provided that no warranty is made with respect to:

- (a) any Product which has been repaired or altered in such a way, in Company’s judgment, as to affect the Product adversely;
- (b) any Product which has, in Company’s judgment, been subject to negligence, accident or improper storage;
- (c) any Product which has not been operated and maintained in accordance with normal practice and in conformity with recommendations and published specification of Company; and,
- (d) any Products, component parts or accessories manufactured by others but supplied by Company (any claims should be submitted directly to the manufacturer thereof).

Crouse-Hinds Airport Lighting Products’ obligation under this warranty is limited to use of reasonable means to repair or, at its option, replace, during normal business hours, at any authorized service facility of Company, any Products which in its judgment proved not to be as warranted within the applicable warranty period. All costs of transportation of Products claimed not to be as warranted and of repaired or replacement Products to or from such service facility shall be borne by Purchaser. Company may require the return of any Product claimed not to be as warranted to one of its facilities as designed by Company, transportation prepaid by Purchaser, to establish a claim under this warranty. The cost of labor for installing a repaired or replacement product shall be borne by Purchaser. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period of the Products upon which they are installed to the same extent as if such parts were original components thereof. Warranty services provided under the Agreement do not assure uninterrupted operations of Products; Company does not assume any liability for damages caused by any delays involving warranty service. The warranty period for the Products is 24 months from date of shipment or 12 months from date of first use whichever occurs first.

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This equipment is normally used or connected to circuits that may employ voltages that are dangerous and may be fatal if accidentally contacted by operating or maintenance personnel. Extreme caution should be exercised when working with this equipment. While practical safety precautions have been incorporated in this equipment, the following rules must be strictly observed:

3.1 KEEP AWAY FROM LIVE CIRCUITS

Operating and maintenance personnel must at all times observe all safety regulations. Do not perform maintenance on internal components or re-lamp with power ON.

3.2 RESUSCITATION

Maintenance personnel should familiarize themselves with the technique for resuscitation found in widely published manuals of first aid instructions.



See Advisory Circular AC 150/5340-26 for additional information.

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Part Numbers 21378**5 General Description****5.1 Shallow Base P/N 21378**

The 21378 shallow base is designed to mount a Crouse –Hinds eight-inch diameter inset fixture into a taxiway location that will experience roll over loads. It is constructed of gold color anodized cast aluminum. The 21378-1 version has one molded feed-thru connector with an L-823 receptacle and 457mm (18 inches) long, #16 AWG leads. The 21378-2 version has two molded feed-thru connectors, 180° apart from each other, with L-823 receptacles and 457mm (18 inches) long, #16 AWG leads. The 21378-3 version has one hole in the bottom with a flexible grommet sized for a 1 inch (1.315 OD) pipe. The 21378-4 has one 100mm (3.94 inch) hole in the bottom. All versions have a M5 ground screw located on the inside bottom surface. An optional external ground wire is offered for all versions. The overall height of the base is 150.0mm (5.91 inches) , with a maximum diameter of 231.1mm (9.10 inches). The weight of the base is 3.8kg (8.4 pounds). There are two M10 (1.5mm pitch) threaded holes and two M10 hardened stainless steel studs on the mounting surface of the base for securing a fixture. The fixture is supplied with an exterior grade plywood cover held in place by two M10 (1.5mm pitch) x 25mm long A4 (316) stainless steel hex bolts and two M10 split lock washers, A4 (316) stainless steel. The hex bolts and split lock washers may be re-used to secure the light fixture to the base after initial bonding of base to pavement.

6 Installation**6.1 General**

This manual recommends standard methods and techniques for installing inset light bases in existing pavement. These instructions are general guidelines. They do not provide information for every possible contingency that may occur on the job site. Other methods and variations of those outlined herein may be used. The correct orientation of the light fixtures is extremely important. Careful attention to surveying and light base placement is required. Approval by the appropriate authority, consulting engineer or FAA Airports District Office should be granted for the installation method and materials to be used. Before starting any work; read and understand all instructions, consult the cement/epoxy manufacturer for any special weather considerations, verify that the correct materials, equipment and personnel are in place. For further information, see FAA Advisory Circular 150/5340-30 (latest revision), Design and Installation Details for Airport Visual Aids and FAA Advisory Circular 150/5370-10 (latest revision), Standards for Specifying Construction of Airports, Item P-605 and Item P-606. Use Item P-605 and P-606 materials compatible with the pavement the base will be installed into.



Caution: *Never handle the assembly by the leads as this can break the waterproof seal*

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6.2 Instructions

- 6.2.1 Mark the location of the light fixture and the wireway(s) to it. This is accomplished by using survey markers/reference points previously laid out by the survey team.
- 6.2.2 Saw cut the wireway. Consult with the appropriate engineer or drawing for the proper wireway width and depth. These dimensions will vary with the size and number of conductors to be installed in the wireway. Typically, the wires are at least 12.7mm (½-inch) below the pavement surface and existing joint seals. Chamfer a 50.8mm (2-inch) radius at all intersections and corners. Where practicable, saw cut through the light location at base depth. This will allow the pavement material to be easily broken and removed after the hole is drilled. If the wireway(s) have been wet-sawed, flush with a high velocity stream of water immediately after sawing.
- 6.2.3 Drill the light base hole. Consult with the appropriate engineer or drawing for the proper width and depth. These dimensions will vary with the method and materials to be used. Typically, there should be a minimum 6.4mm (¼-inch) clearance between the light base side/bottom and the drilled hole when a liquid sealer is to be used.
- 6.2.4 Thoroughly clean and dry the hole and wireway(s) to insure a proper bond between pavement and sealer. Sandblast the hole and wireway(s) if necessary.
- 6.2.5 Attach the light base to a Part Number 87106-1 installation fixture by removing and retaining the hex bolts and split lock washers for future use when installing the light fixture. The plywood cover is to be left on the base during the installation process. Make sure the leveling screws on the installation fixture are in proper working order.
- 6.2.6 Set the base/fixture assembly in the prepared hole with the alignment notches and leads-to-wireway arrangements in the correct orientation.
- 6.2.7 Level the fixture with the adjustment screws and a good quality calibrated spirit level (See Figure 1). Set the top of the light base to 2.7 to 4.3mm (.11 to .17 inches) below grade (See Figure 2) or lowest point of grade if on a sloping surface. Base on a sloping surface is to be level to itself and not with pavement.
- 6.2.8 Remove the base/fixture assembly from the hole. Verify that the outside surface of the light base is free of any dirt or foreign material, clean as necessary.
- 6.2.9 Splice the wires together in the wireway. Install wedges or clips to hold the conductors in place. Consult with the appropriate engineer or drawing for the approved methods and materials. Typically, non-wooded wedges/clips are placed on three foot centers, with the wires at least ½-inch below the pavement surface and joint seals
- 6.2.10 Terminate the leads per the appropriate drawing. Install temporary dams, if required, to block the wireway entrance to the drilled hole.
- 6.2.11 Prepare the FAA Item P-606 *paste* and *liquid* sealing material per manufacturers instructions. Apply FAA Item P-606 *paste* to the bottom of cored pavement hole so when base is installed on top of it, the paste will be forced up the exterior sides of base at least 3.2mm (1/8 inch). See Section 8 for calculating the area to be filled.
- 6.2.12 Slowly press the base/fixture assembly into the hole. The piston action of the base will spread out the sealer and push it up the walls. Work out any trapped air with a slight rocking motion. Seat the installation fixture firmly on the pavement, weights (sandbags, blocks, etc.) maybe required to keep the fixture in place. Add FAA Item P-606 *liquid* material as needed to fill the hole up to within 19mm (.75 inches) from top of the light base.

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- 6.2.13 Immediately set alignment notches in fixture to survey reference points. This step is critical. The FAA tolerance light base alignment is $\pm 1/2^\circ$ from a line parallel with the runway centerline.
- 6.2.14 Double-check that the base is level and the top edge of the base (not the plywood) is set 2.7 to 4.3mm (.11 to .17 inches) below grade. Adjust as necessary.
- 6.2.15 Allow the sealer to cure per manufacture instructions.
- 6.2.16 When the cement/epoxy has cured initially, remove the installation fixture. Fill any voids between base and pavement with FAA Item P-606 *paste*. **Do not** fill the 19mm (.75 inch) gap around top of base with P-606 *paste*.
- 6.2.17 Fill the 19mm (.75 inch) void around top of base between the base exterior and pavement with FAA Item P-605 *flexible sealant*. Also fill any wireways in the pavement with the P-605 *flexible sealant*.
- 6.2.18 Remove plywood cover and mount the light fixture per paragraph 7.1. Verify that the light beam(s) and color(s) are orientated correctly. Install the mounting bolts per paragraph 7.2.

7 Maintenance

7.1 Water Removal

The 21390 light base is designed to exclude both ground and surface water from entering when mated with a Crouse-Hinds fixture. Never handle or carry a base by the lead assembly, this could break the feedthru seal and cause the base to leak. Before installing a light fixture, thoroughly clean the mounting surface and gasket sealing surface on the base. Foreign material on the mounting surface will cause the light fixture to not seat properly and surface water will enter. Apply a thin film of silicone grease (Dow Corning 1292 or similar)to the fixture gasket. Slowly press the fixture into the base. Install mounting hardware per paragraph 7.2. Establish a regular schedule to inspect and remove water from all light bases. In cold climate locations, freezing water can cause major damage to the light fixture and/or base. If water removal is not practicable, fill the void in the interior between the light fixture and base with pieces of ETHAFOAM brand polyethylene foam.

7.2 Mounting Bolts

It is recommended that the mounting bolts (M10 (1.5mm pitch) x 25mm long) and lock washers (M10) be type A4 (316) stainless steel (supplied with Crouse-Hinds base). Apply Loctite 242 to the bolts and torque them to 247 +5, -0 in-lbs. (27.9 +.6, -0 N-m). Establish a regular schedule to check the torque of the fixture mounting bolts. Light fixtures in and around the Touchdown Zone area are especially prone to vibration damage if the mounting bolts are not properly torqued. It is recommended that the lock washers be replaced every time a mounting bolt is removed. Check for proper torque at least once a month.

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Snowplow operators should exercise extra care not to strike the light fixtures with snowplow blades. After snowplow removal operations, inspect all light fixtures and bases to locate any damaged units. Base replacement in winter conditions may not be possible due to low ambient temperatures. Passes over the light rows should be made with a power broom only if practical. Whenever snowplows must traverse in-pavement light fixtures, they should be traveling at less than 8 kph or have the blades lifted clear of the fixtures. Recommended snow removal techniques are described in FAA AC 150/5200-30 (latest revision).

8 Volume Calculation

To calculate the amount of sealer material required to set a base in a drilled hole, subtract the volume of the base from the volume of the hole.

- Volume of Part Number 21378 base = 383in^3 (6.3 liters)

1. (Volume of Drilled Hole) - (Volume of Base) = Volume of Sealer Required.
2. $(\pi R^2 H) - (\text{Volume of Base}) = \text{Volume Required}$, where R = Radius of Drilled Hole, and H = Depth of Drilled Hole.

Example:

A 21378 base in a 10 inch (254mm) diameter, 6.5-inch (165mm) deep hole.

$$3.1415 \times 5\text{in}^2 \times 6.5\text{in} = 510\text{in}^3, 510\text{in}^3 - 383\text{in}^3 = 127\text{in}^3 \text{ [or } 127\text{in}^3 \div 1728 = .07\text{ft}^3 \text{ (2.0 liters)}]$$

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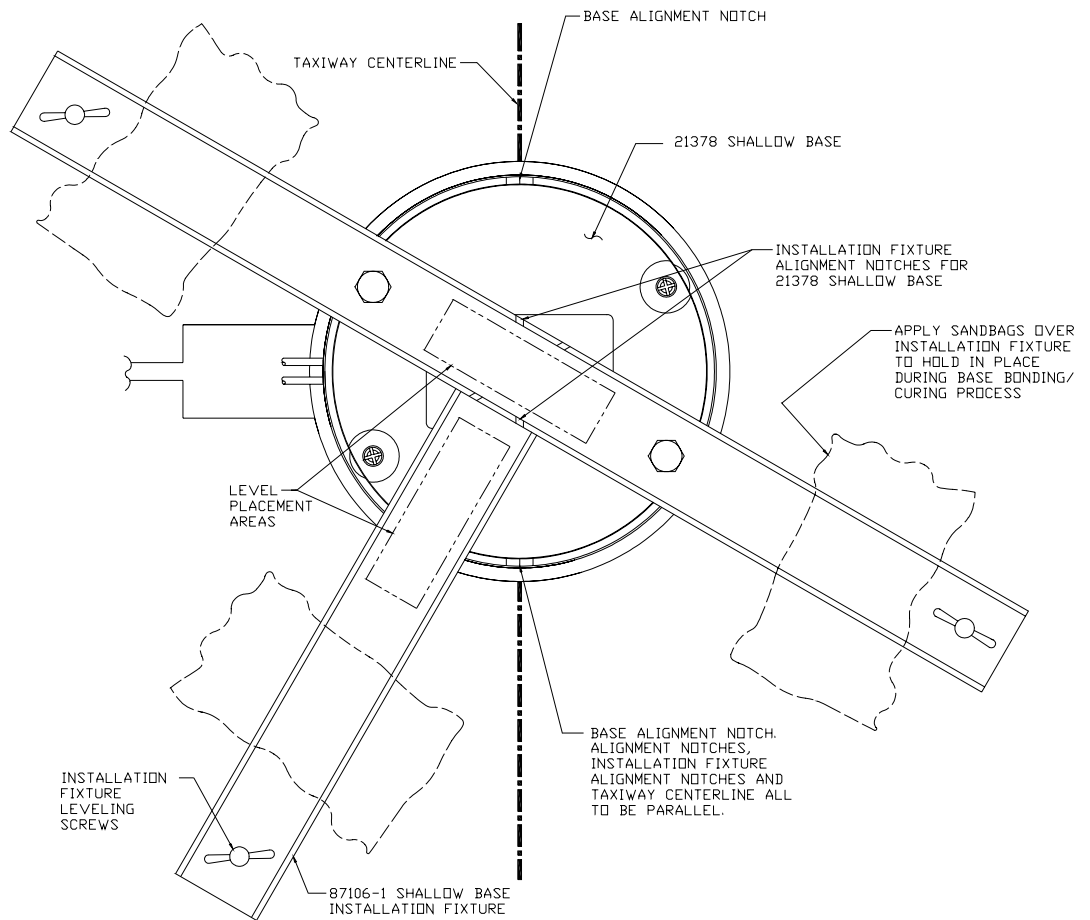


Figure 1

Installation Fixture 87106-1

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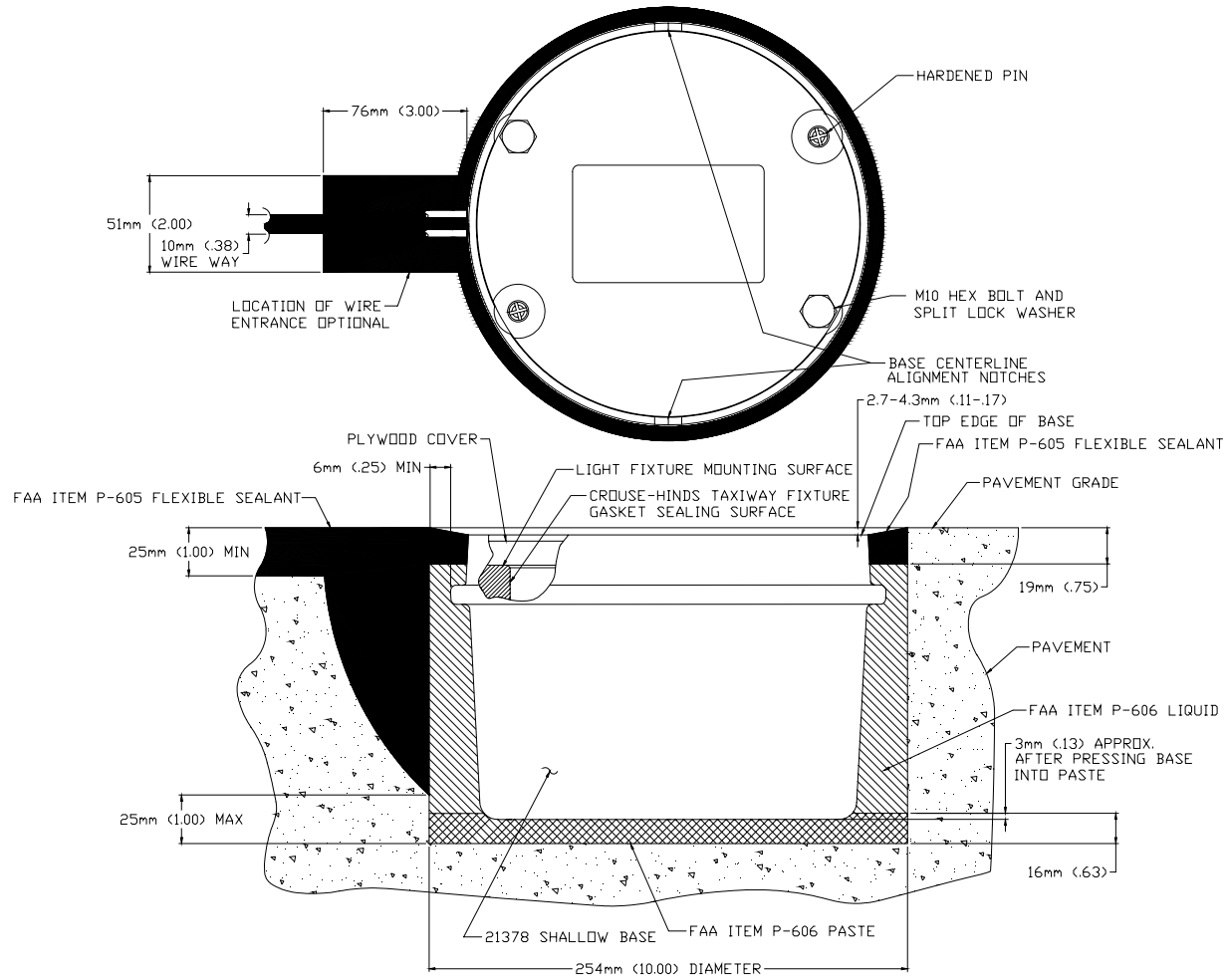
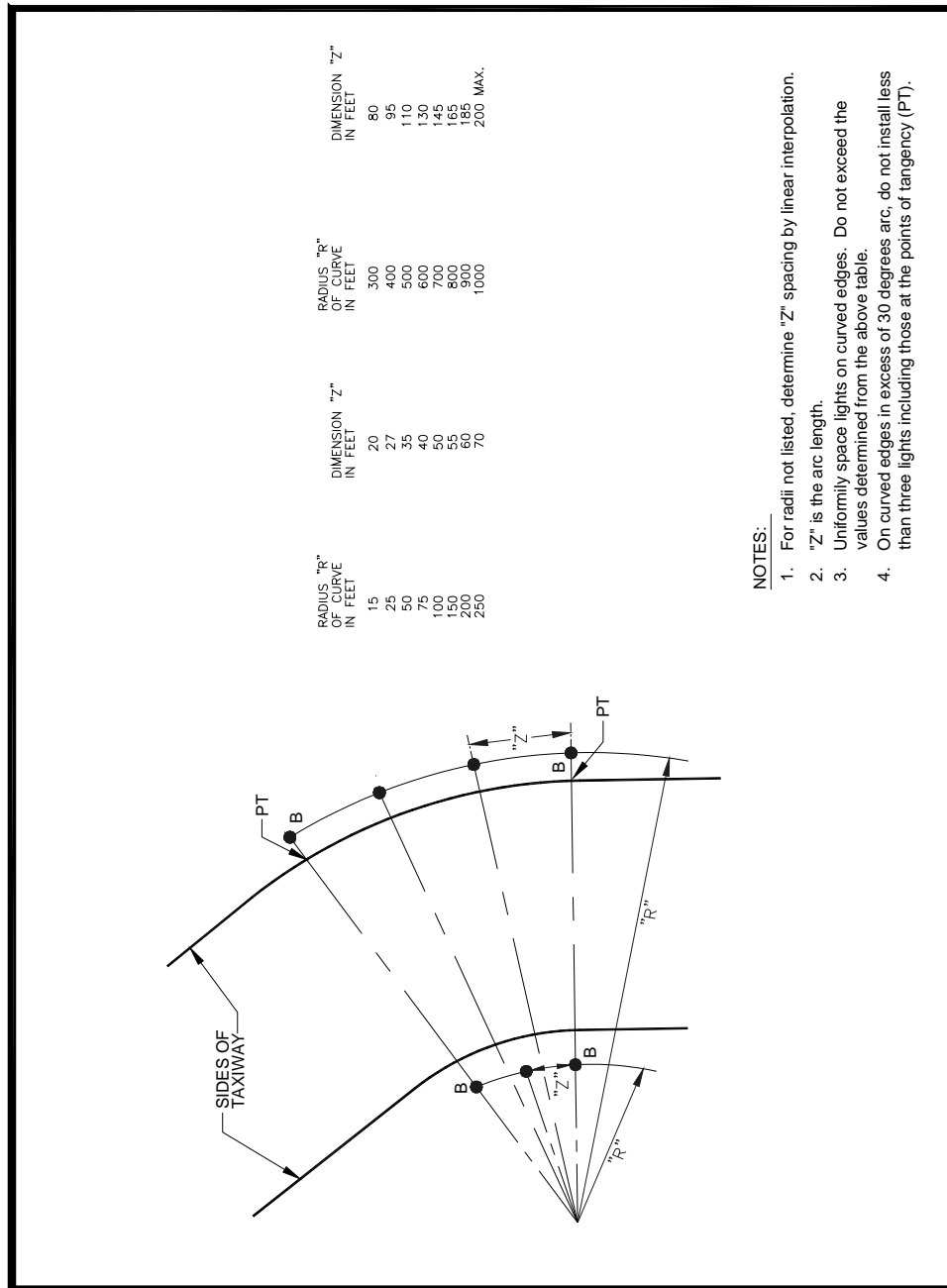


Figure 2

Base/Pavement detail

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NOTES:

1. For radii not listed, determine "Z" spacing by linear interpolation.
2. "Z" is the arc length.
3. Uniformly space lights on curved edges. Do not exceed the values determined from the above table.
4. On curved edges in excess of 30 degrees arc, do not install less than three lights including those at the points of tangency (PT).

Figure 3
Spacing of Lights on Curved Taxiway Edges