



Roadway Safety +

A road construction industry training program

Lighting for Night Work

Nighttime work zones use temporary lighting to mitigate the hazard of reduced visibility. This module covers requirements for work zone illumination.



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Some of the content contained in this course is derived from the Manual on Uniform Traffic Control Devices (MUTCD), the National Work Zone Safety Information Clearinghouse, and various State departments of transportation.

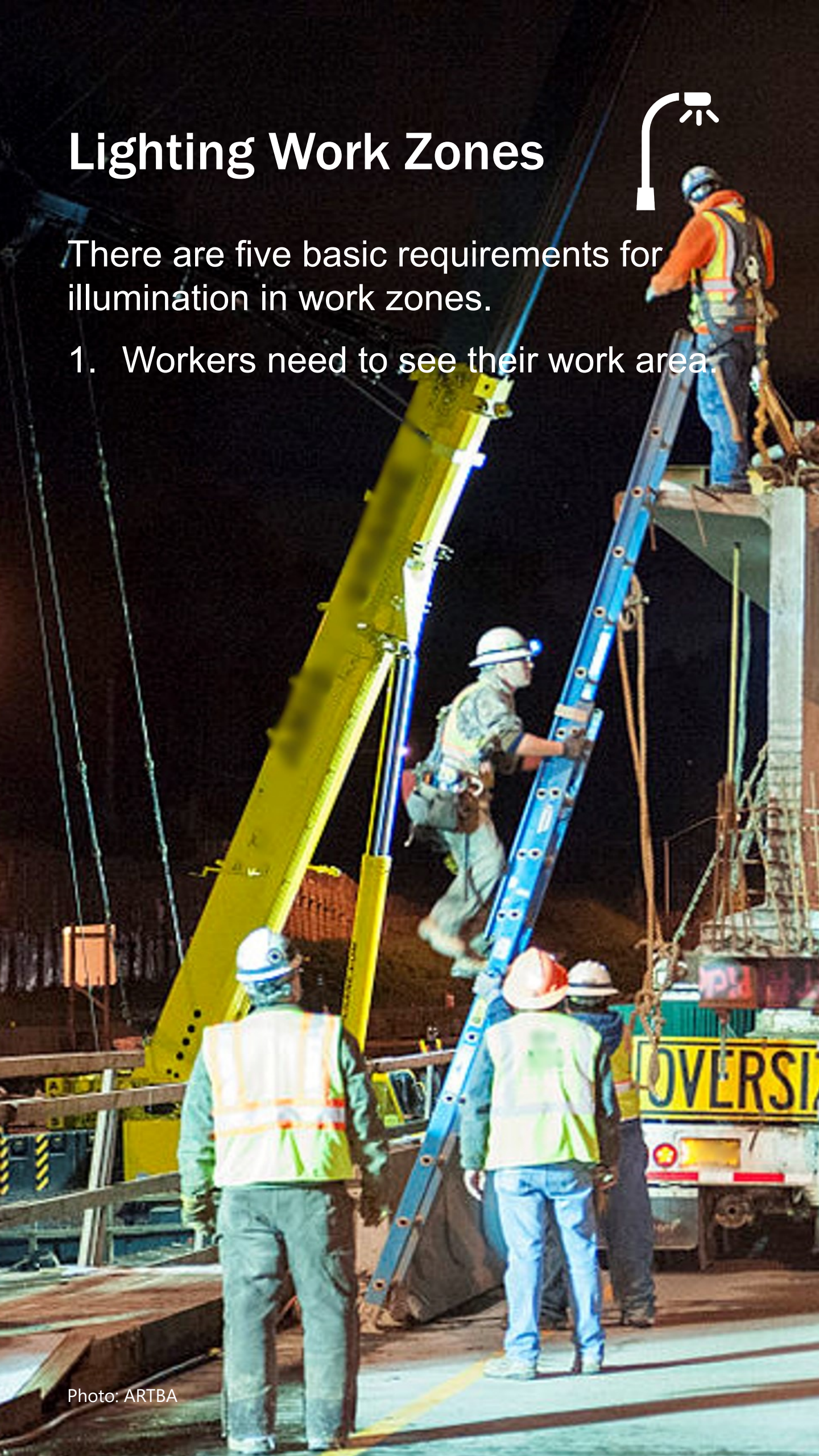
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Lighting Work Zones



There are five basic requirements for illumination in work zones.

1. Workers need to see their work area.



Lighting Work Zones

2. Motorists need to see flaggers.



Lighting Work Zones



3. Workers and motorists need to see equipment.



Lighting Work Zones



4. Rotating equipment needs 360-degree lighting.

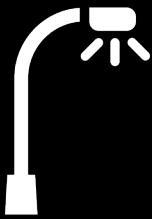


Lighting Work Zones

5. Mounted lights should not shadow the work space.



Light Requirements for Work Zones

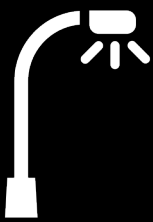


The illumination of a work zone is determined by the type of work being done, how long the project is expected to last, and the size of the work zone. These factors will determine how bright lights need to be, as well as the type of lights being used.

The amount of light is measured in “foot candles” (FC). This is equal to one lumen per square foot, or 10.7 LUX.

	Condition	Foot Candles	LUX
DAY	Sunlight	10,000	107,527
	Daylight	1,000	10,753
	Overcast day	100	1075
	Very dark day	10	108
	Twilight	1	11
NIGHT	Deep twilight	0.1	1
	Full moon	0.01	0.1
	Quarter moon	0.001	0.01
	Starlight	0.0001	0.001
	Overcast night	0.00001	0.0001

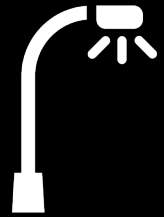
Light Requirements for Work Activities



Work activities are divided into three categories based on the level of accuracy needed for tasks and safety requirements. More light is required to perform more detailed and precise work and to operate safely around equipment.

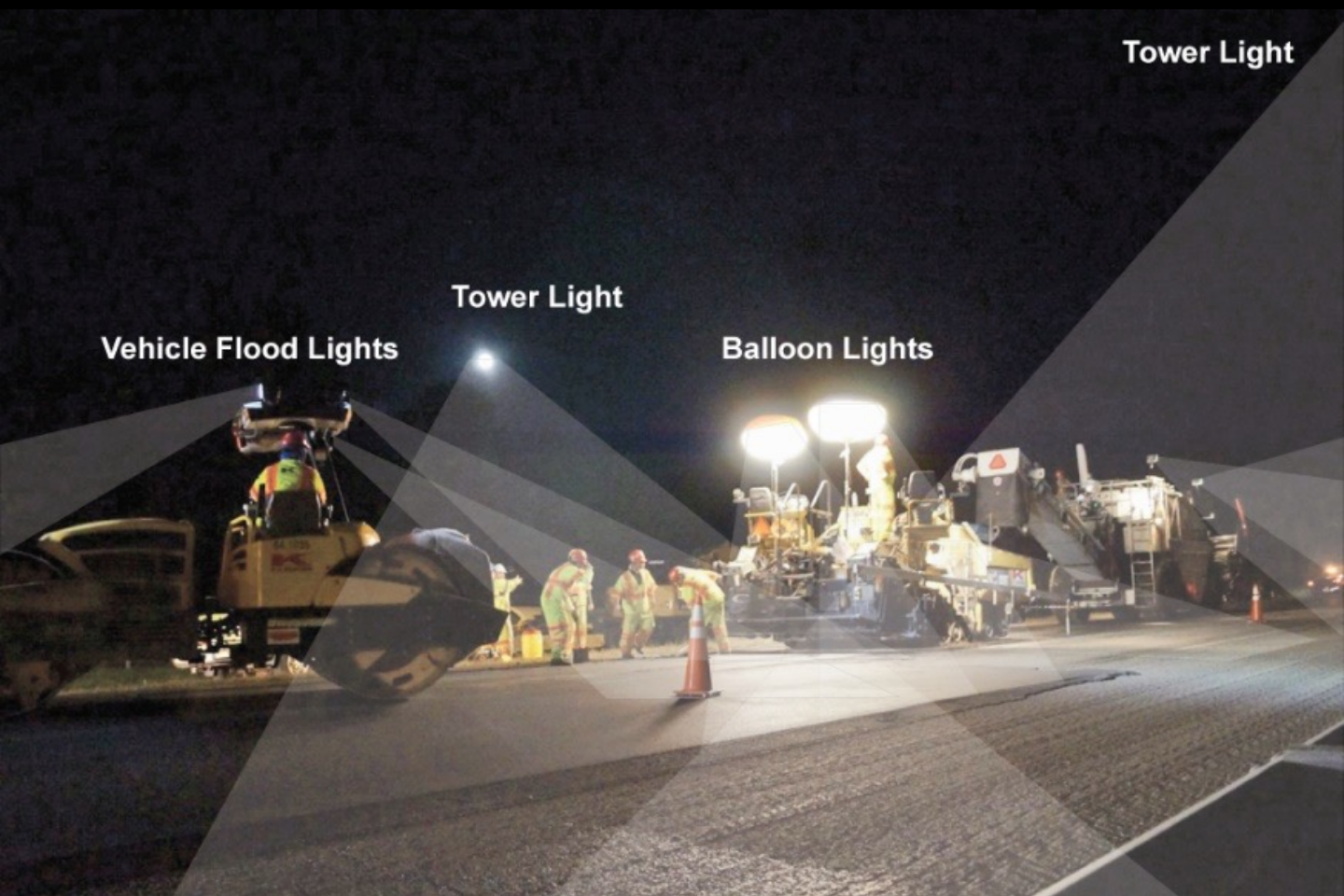
Light Level	Work Examples	Minimum Maintained Lighting Level
Category 1 <ul style="list-style-type: none">• Low accuracy tasks• General illumination for work zones	<ul style="list-style-type: none">• Set up of lane or road closures• Lane closure tapers• Excavation• Sweeping	5 FC between twilight and very dark day 54 LUX
Category 2 <ul style="list-style-type: none">• Medium accuracy tasks• General illumination Safety on or around equipment	<ul style="list-style-type: none">• Asphalt paving• Milling• Concrete placement or removal	10 FC a very dark day 108 LUX
Category 3 <ul style="list-style-type: none">• High accuracy tasks• Specific illumination on tasks requiring extreme caution and attention	<ul style="list-style-type: none">• Pavement or structural crack and pothole filling• Joint repair• Pavement patching and repairs• Installation of signal, electrical, or mechanical equipment	20 FC brighter than a very dark day but much dimmer than an overcast day. 216 LUX

Types of Lighting

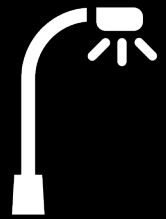


Any of these types of lighting can be used in a work zone to fulfill illumination requirements. Lighting must be able to follow the work when work zones move.

- Headlights and vehicle flood lights
- Balloon lights
- Portable light towers
- Roadway luminaries mounted on temporary poles.



Minimum Illumination Levels

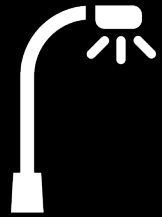


If minimum illumination levels are not maintained, safety may be compromised. You may perform tasks more slowly and your work may be of a lower quality if you can't see well.

The Federal Highway Administration has information on lighting nighttime work zones, and the MUTCD has specifications for work zone safety at night.



Photo: skeeze from Pixabay

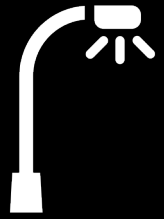


Summary

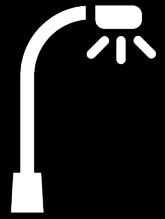
This module presented information on the requirements for lighting nighttime work zones. Lighting can be provided by a variety different ways. The amount of light is determined by the tasks performed and any applicable safety standards.

Test your knowledge on the following slides by answering the quiz questions.

Quiz Question 1



True or false, only workers need to see equipment operating in a work zone?

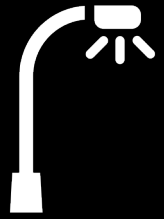


Answer 1

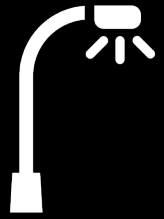
True or false, only workers need to see equipment operating in a work zone?

False! Motorists also need to see equipment to ensure that they are safely navigating through or around the work zone.

Quiz Question 2



What is the unit of measurement for determining the brightness of light?

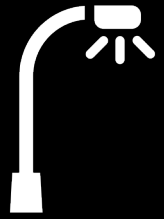


Answer 2

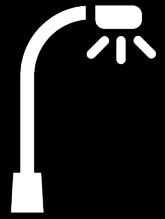
What is the unit of measurement for determining the brightness of light?

Foot candles (FC) or LUX.

Quiz Question 3



True or false, the best way to illuminate a work zone is with balloon lights?



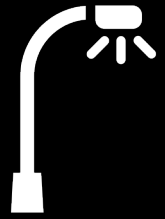
Answer 3

True or false, the best way to illuminate a work zone is with balloon lights?

False! There are many different types of lights that can be used in work zones including:

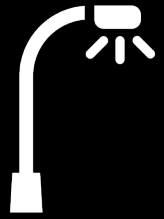
- Headlights and vehicle flood lights
- Balloon lights
- Portable light towers
- Roadway luminaries mounted on temporary poles

Selecting lights depends on the amount of light required and any movement of the work zone.



Quiz Question 4

What two factors determine how much light you need in the work zone?

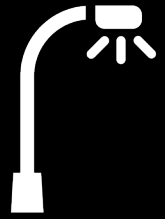


Answer 4

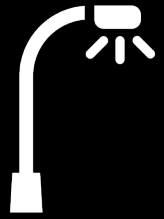
What two factors determine how much light you need in the work zone?

The level of **accuracy** needed for tasks and **safety** requirements. More light is required to perform more detailed and precise work and to operate safely around equipment.

Quiz Question 5



Besides safety, what two ways could your work be affected if you do not have enough light to perform your tasks?

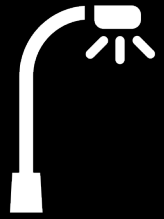


Answer 5

Besides safety, what two ways could your work suffer if you do not have enough light to perform your tasks?

You may **perform tasks more slowly** and your work may be of a **lower quality** if you can't see well.

Additional Resources



Nighttime Lighting Guidelines for
Work Zones

