



# FLOOD LIGHTING

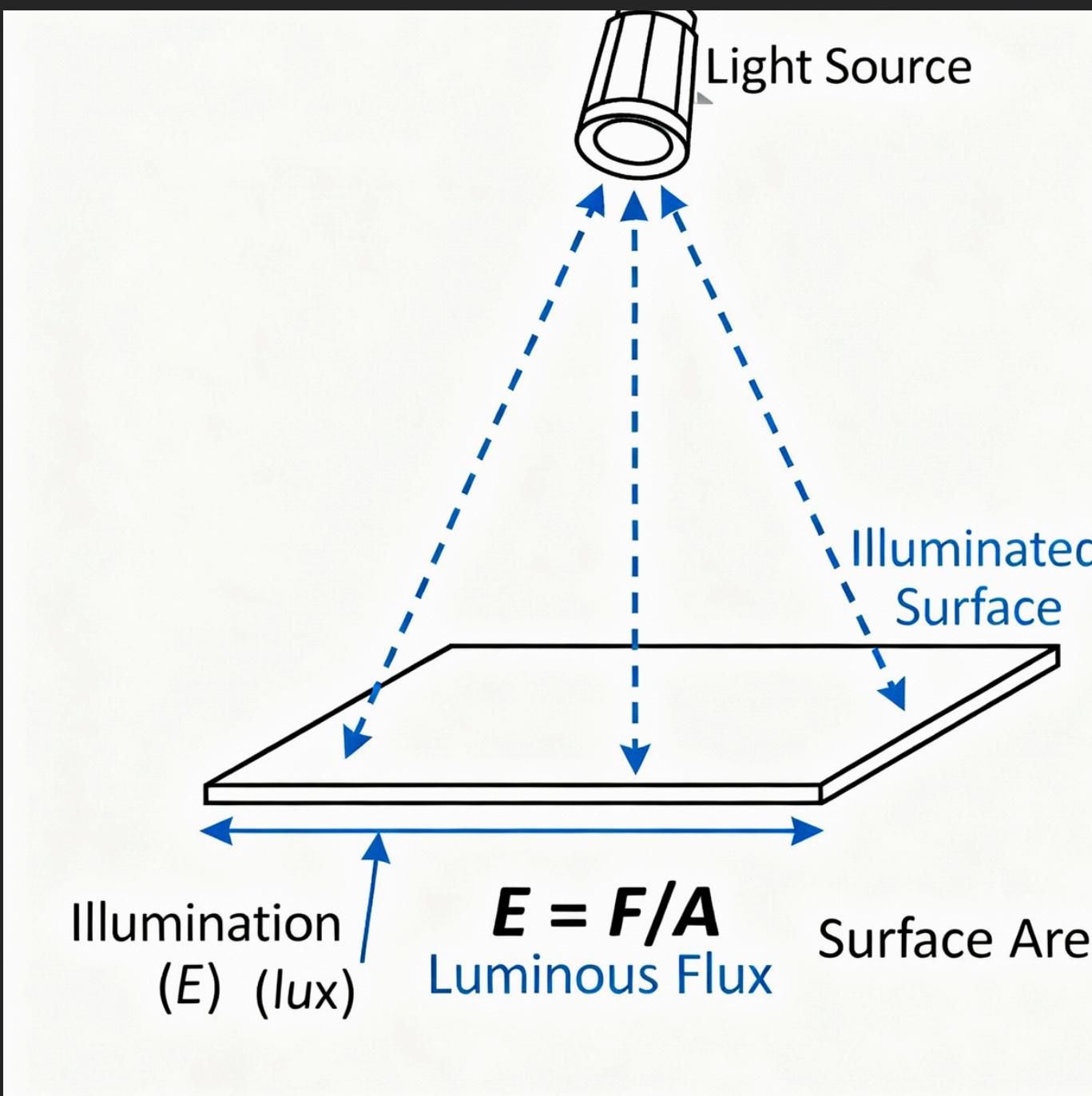


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# INTRODUCTION TO ILLUMINATION



Illumination is the amount of luminous flux (total light energy) falling on a surface per unit area, measured in lux (lumens per square meter). It is the result of light incident on a surface, making it visible to the human eye.

- Formula:  $E=F/A$
- E = illumination (lux)
- F = luminous flux (lumens)
- A = area (square meters)

# FLOOD LIGHTING



<b>Definition</b>	<p><b>Flood lighting means flooding of large surface areas with light from powerful projectors.</b></p>
<b>Context</b>	<p>An essential outdoor application of Illumination Engineering, alongside highway lighting.</p>
<b>Main Purpose</b>	<p>The following are the main purposes of employing flood lighting:</p> <ol style="list-style-type: none"><li>1. Beautification: Highlighting monuments, architectural facades, and landmarks.</li><li>2. Industrial and Commercial Flood-Lighting: Providing high-intensity light for security, storage, and work areas.</li></ol>

# INDUSTRIAL AND COMMERCIAL FLOOD LIGHTING

## Industrial Flood Light:

Industrial flood lights are high-intensity lighting fixtures designed to illuminate large outdoor or indoor areas such as factories, warehouses, workshops, and construction sites.

They are built for durability, energy efficiency, and long operating hours, often using LED technology to withstand harsh environmental conditions like dust, heat, and moisture.



## Commercial Flood Light:

Commercial flood lights are powerful lighting systems used for lighting up commercial spaces such as parking lots, building exteriors, sports grounds, billboards, and public areas.

They provide broad, uniform illumination to enhance visibility, safety, and aesthetic appeal, while also being cost-efficient and weather-resistant.

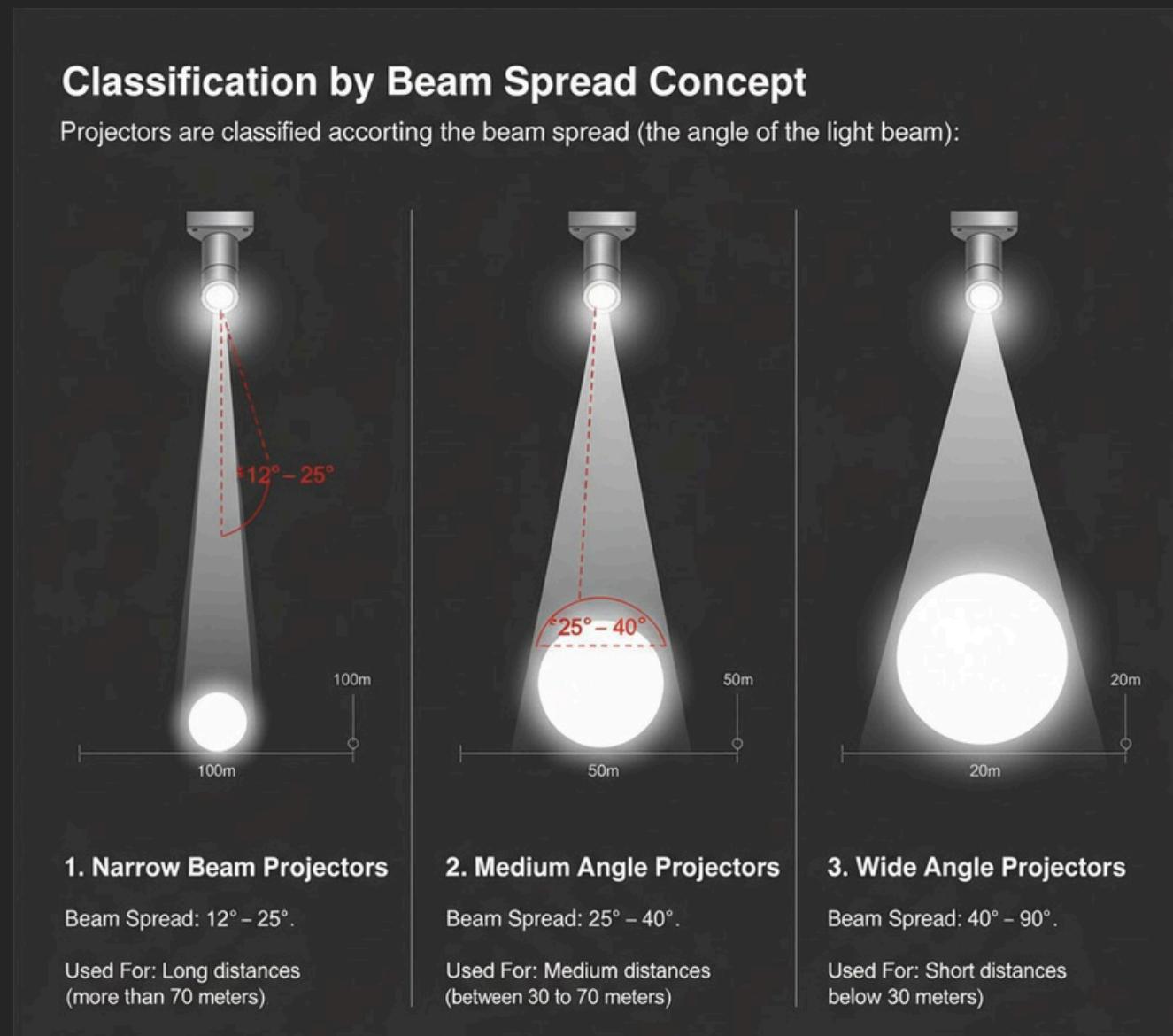
For flood lighting it is necessary to concentrate the light from light source into a narrow beam. **The type of reflector and its housing used for concentrating the light into narrow beam is known as flood light projector.** The reflecting surface is made of silvered glass or stainless steel. Metal reflectors being more robust are usually preferred. The casing and its mounting are arranged in such a manner that the beam can be in horizontal and a vertical direction on site. When higher wattage of projector lamp i.e. 500 W or 1000 W is used in projectors, then ventilation may be provided for cooling properly.



**The Flood Light Projector**

Function: Concentrate light into a narrow beam.  
Projector: Reflector & housing for narrow beam.

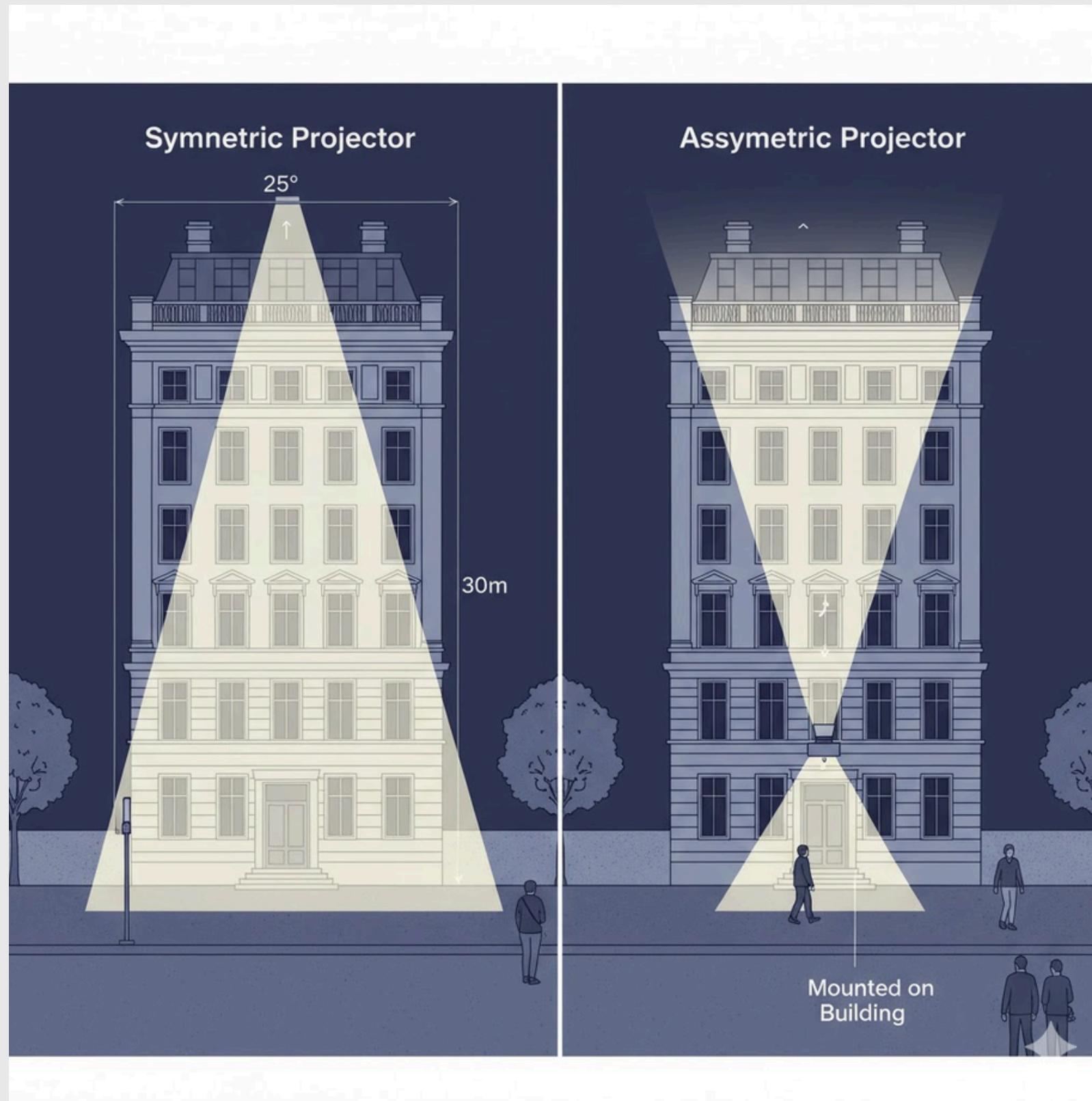
# PROJECTOR CLASSIFICATION



<b>Concept</b>	Projectors are classified according to the <b>beam spread</b> (the angle of the light beam):
Narrow Beam Projectors	In this type of projector beam is spread between 12 – 25°. These are used for distance more than 70 meters
Medium Angle Projectors	Projectors with beam spread between 25 – 40°. These are used for distance between 30 to 70 meters.
Wide Angle Projectors	These are the projectors with beam spread between 40 – 90° and are used for distance below 30 meters.

# LOCATION AND MOUNTING

Key Factor : The location of the projector is one of the most important factors affecting its selection.



1. Symmetric Projector : Used When: Projector can be placed 20 to 35 meters away from the surface. Beam: Provides an approximately parallel beam spread of 25 degree to 30 degree

2. Asymmetric Projector : Used When: Projector cannot be located away from the building (e.g., in a basement area or on a bracket).

Beam: The asymmetric reflector directs more intense light towards the top of the building to ensure uniform coverage from a close viewpoint.

# FLOOD-LIGHTING CALCULATIONS

Flood-Lighting Calculations and Design Factors : The following points are considered when estimating the number and size of projectors

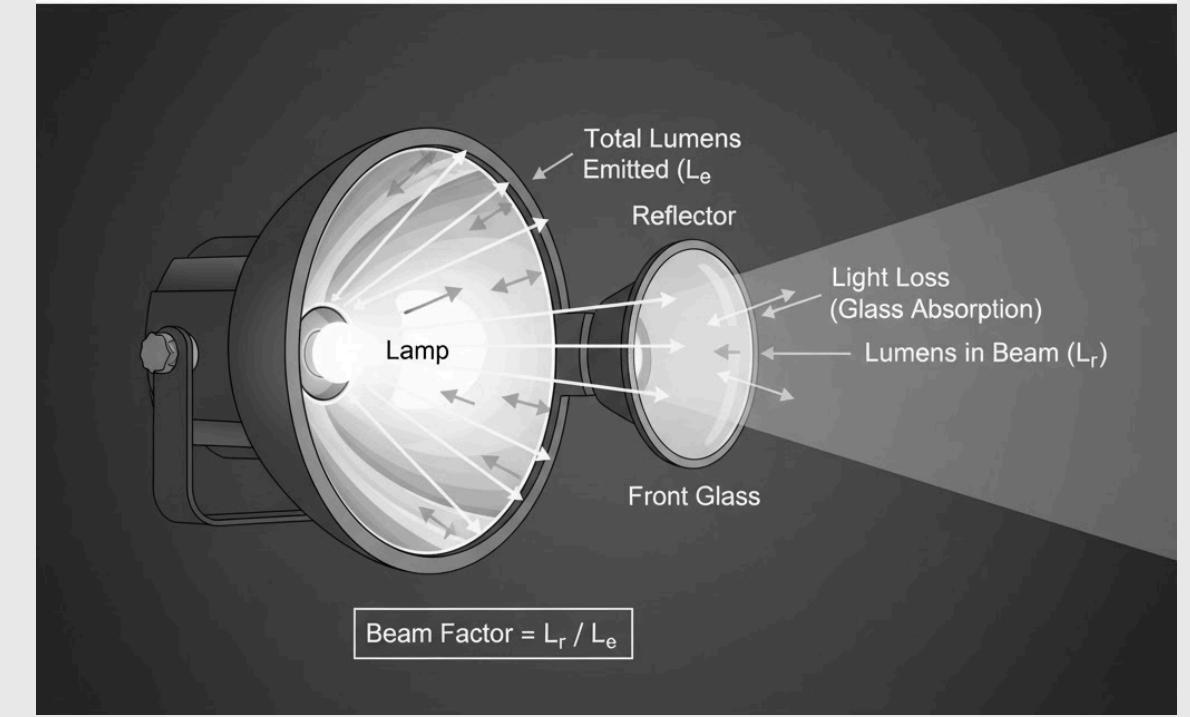
1. Illumination Level Required: Depends upon the type of building and the purpose of flood-lighting.
2. Type of Projector: Determined by the area covered by the beam and the illumination required. The Beam angle is decided by the distance of the projector from the surface.

Number of Projectors (N) : The number of projectors required for any desired intensity on a particular surface is obtained from a specific relation (formula).

Speaker Note : Mention that the calculation involves factors like beam factor, utilization factor, and maintenance factor (as learned in the Illumination unit).

# RELATED ILLUMINATION FACTORS

- **Beam Factor** (Relevant to Projectors):
  - Ratio of 'lumens in the beam of a projector' to the 'lumens given out by lamps'.
  - Value usually varies from 0.3 to 0.6.
  - Accounts for light absorption by the reflector and the front glass of the projector lamp.
- **Other Key Factors** (from Illumination Unit):
  - Illumination (E): Luminous flux received by the surface per unit area.
  - Utilization Factor (C): Ratio of total lumens reaching the working plane to the total lumens emitted from the source  
 $UF = L_r / L_e$ .
  - Maintenance Factor (M f): Ratio of illumination under normal working conditions to the illumination when everything is clean.





THANK  
YOU