Lighting the Elizabeth Line

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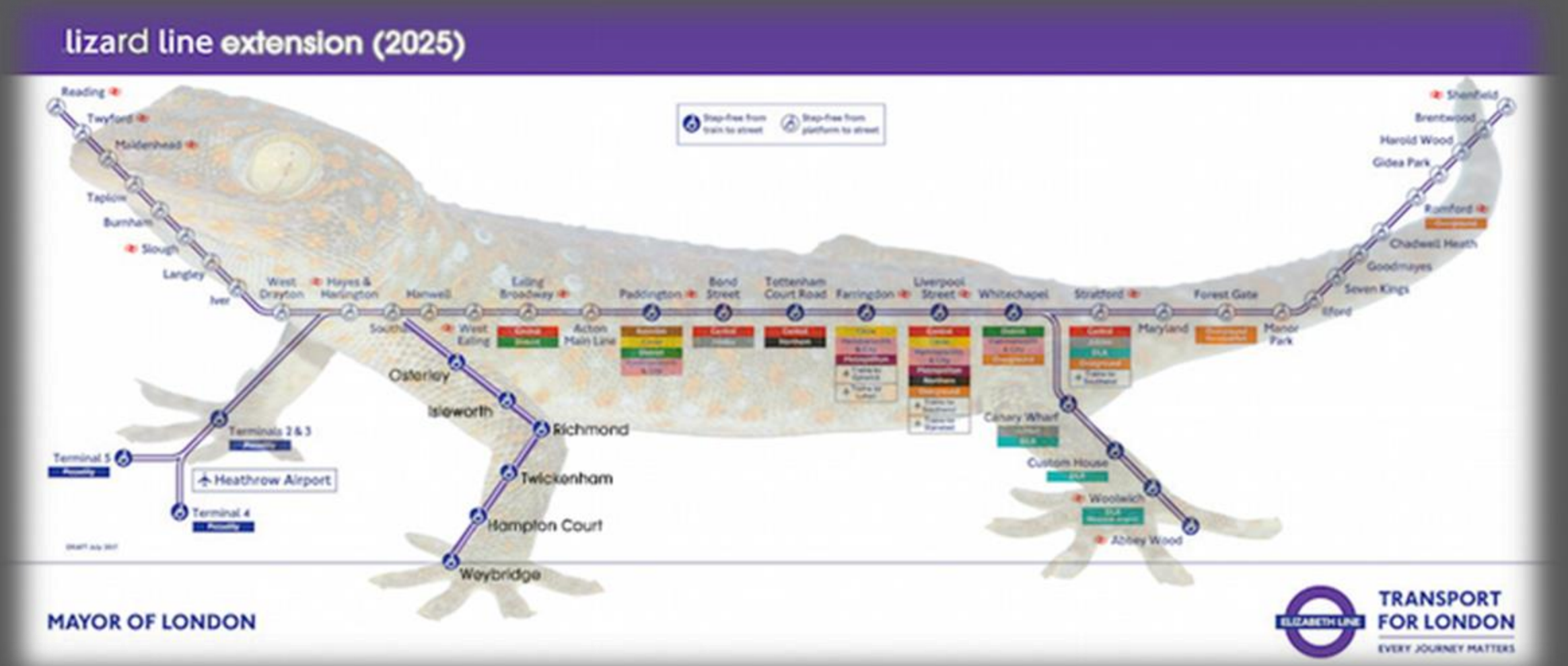
The Elizabeth Line by Numbers

Europe's largest construction project £16bn

8 new sub-surface stations and 1 surface station

The Elizabeth Line through central London will carry an estimated 200 million passengers annually

The Elizabeth Line



TFL Stakeholders & Operators

LUL will operate 5 stations

RFL will operate 4 stations

The Client Team Organisation

Crossrail Personnel

Multi Disciplinary Design Consortium incorporating:

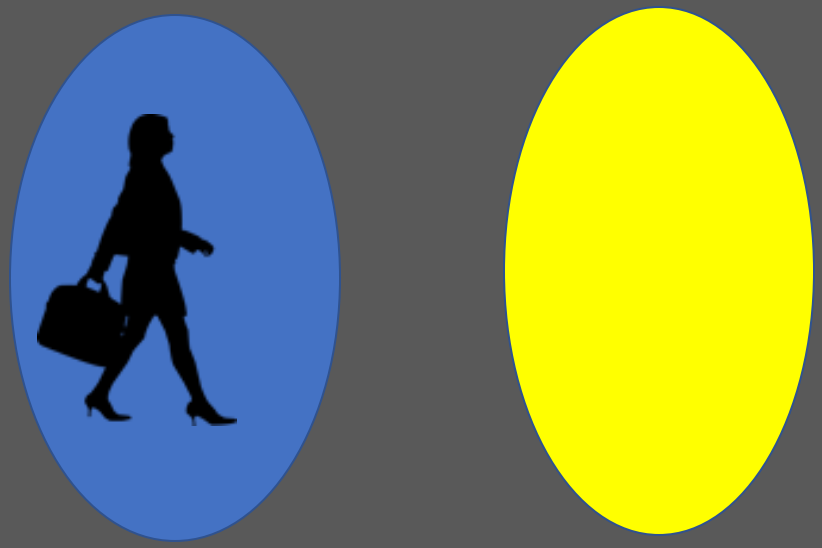
- Atkins
- Grimshaw
- GIA Equation
- Future Designs
- DAL Design Architectural Lighting

The Strength of Relationships

Common Lighting Components

- Platform Screen Lighting
- Totem Lighting
- Cross Passage Lighting
- Escalator Lighting

Intuitive Way Finding



- Fast moving spaces have cool colour temperatures of 5000K
- Slow moving spaces or intersections and choices of direction have a warm colour temperature of 3000K
- Natural movement is towards warm colour temperatures creating intuitive way finding

Design Compliance

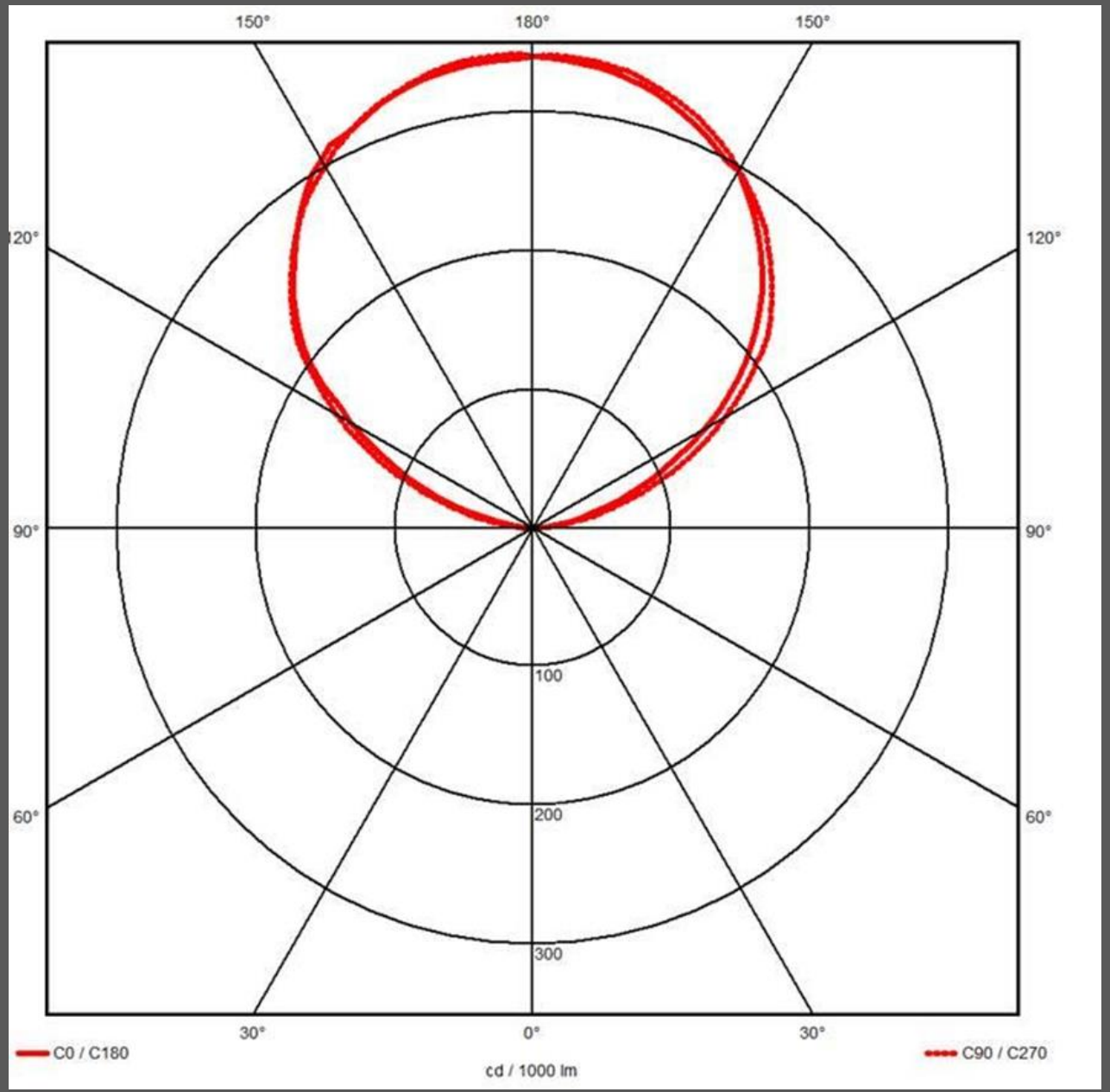
- Lighting LUX levels to comply with LUL 1066 issue A2
- All mission critical components to be plug and play for ease of maintenance
- Compliance to sub-surface fire and blast regulations
- DALI lighting control

The Totem

- The Totem is the primary source of lighting in the lower concourse
- Totems are spaced at 9m intervals illuminating a tunnel area of 8.1m in diameter with a 120 degree beam angle
- They combine way finding signage and life safety systems

FUTURE DESIGNS

ELIZABETH LINE



Totem Beam Angle

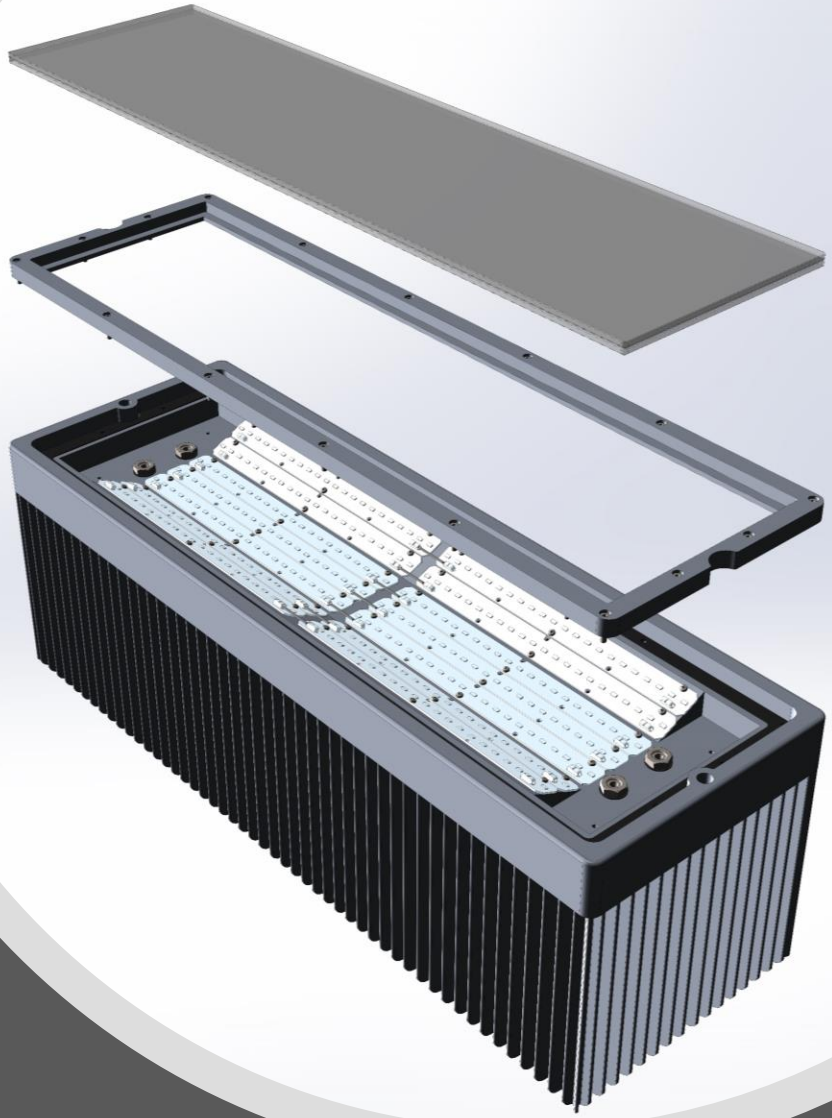
- Polar Curve demonstrates 120 degree light output
- Critical to preventing a scalloping effect across the surface of the tunnel

FUTURE DESIGNS

ELIZABETH LINE

Totem Design Challenges

- 60,000 lumin output, comparable to 700 watts of conventional lighting output
- Required to achieve 150 lux at 0.5 (Uo) on the floor
- Passive heat sink array to draw the heat from beneath the LEDs



FUTURE DESIGNS

ELIZABETH LINE

Totem Emergency Lighting

- There are six emergency lighting units per Totem
- UPS supported for 3 hours
- Providing an emergency lighting source of 15 lux

FUTURE DESIGNS

ELIZABETH LINE

Totem Control Equipment

- Plug and Play drivers for easy swap out replacement
- DALI controlled

FUTURE DESIGNS

ELIZABETH LINE

Cross Passage Light Boom

- Wide angle, symmetrical distribution of light
- Boom incorporates Life Safety Systems
  - PA Speakers
  - Dome Cameras
  - Antenna

ELIZABETH LINE

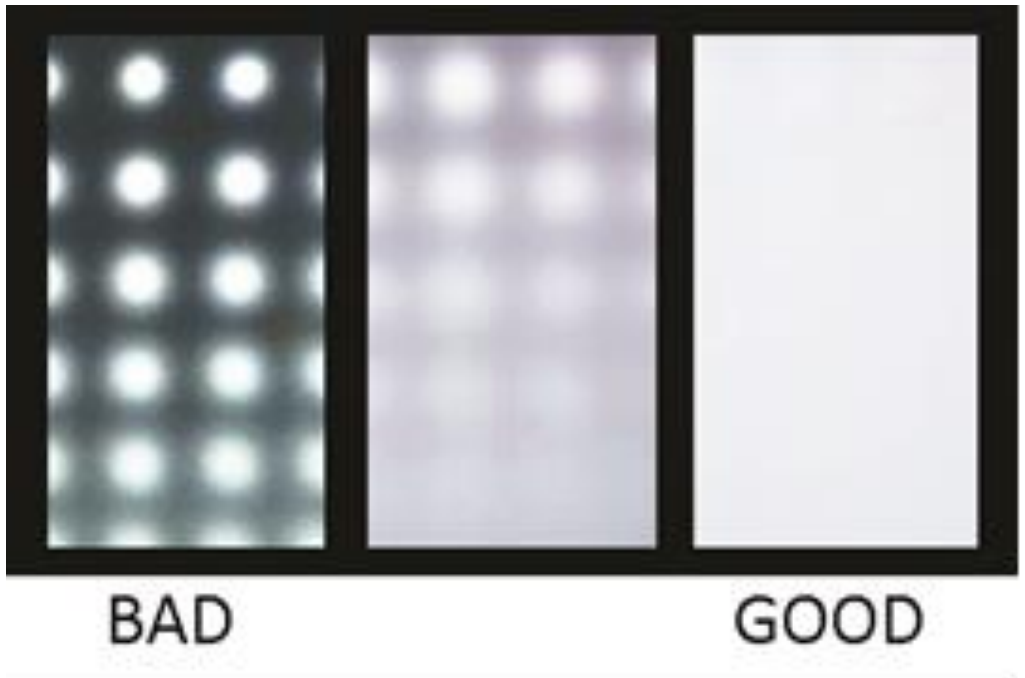
DESIGNED ARCHITECTURAL LIGHTING

Cross Passage Lighting Design Challenges

- Limited space for Lighting Modules
- Co-ordination of Third Party Interface's
- Each cross passage is unique with curves, angles and lengths

DESIGNED ARCHITECTURAL LIGHTING

ELIZABETH LINE

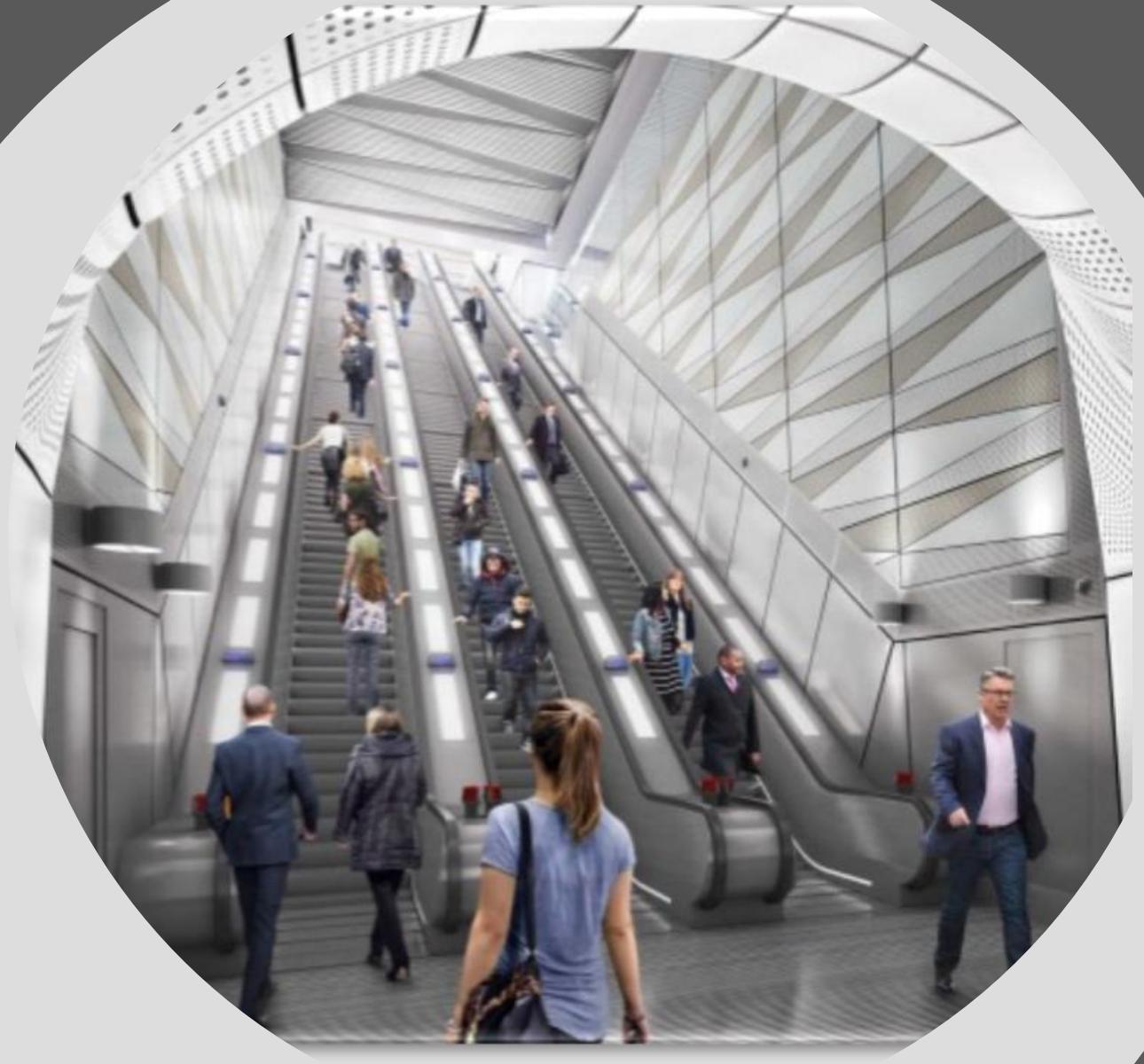


Optimum LED Diffusion of Cross Passage Lighting

DESIGNED ARCHITECTURAL LIGHTING

Escalator Deck Lighting

- Lighting scheme consists of functional step lighting and deck uplighters
- Zero maintenance burden of lights over escalators
- Provides a guiding light to passengers direction of travel

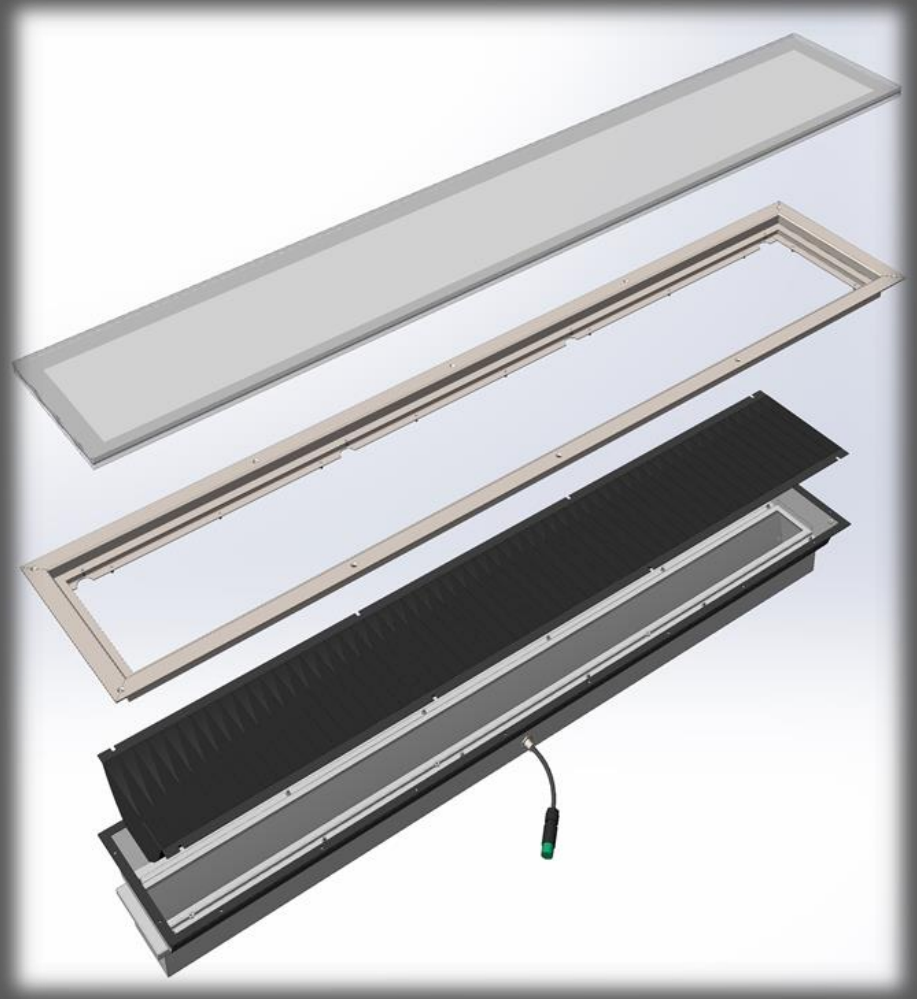


FUTURE DESIGNS

ELIZABETH LINE

Deck Light Design Challenges

- 70 degree beam angle
- 3 layers of optical diffusion
- Total eradication of glare



FUTURE DESIGNS

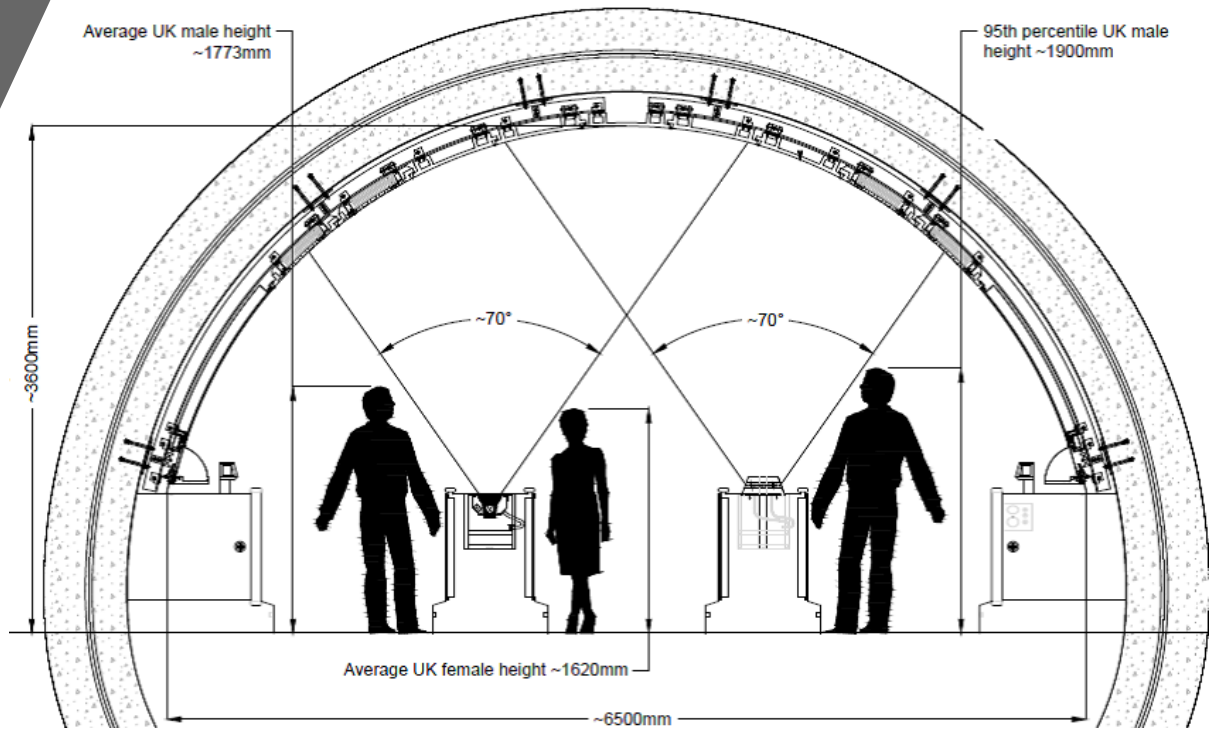
ELIZABETH LINE

Escalator Tread Lighting

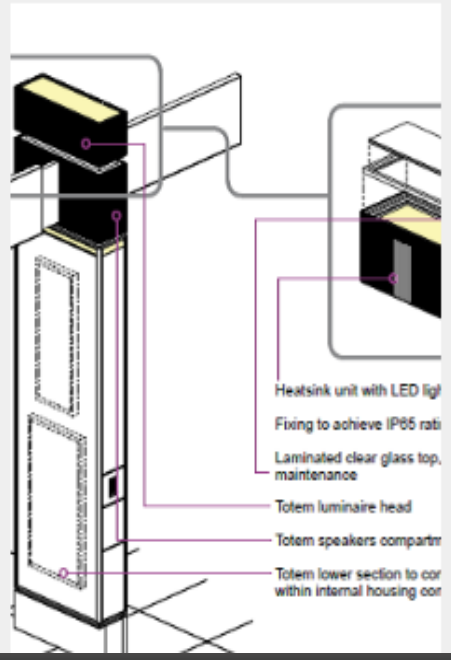
- UPS emergency backed
- Staggered 5 metre strips on either side to provide maximum lighting resilience
- Creating passenger awareness of the escalator direction

Deck Light Perception

- Passenger to passenger facial recognition
- Comfort in transition through the escalator barrel
- A welcoming, glare free environment



Happy to take any questions .....



LIGHTING DESIGN AND STRATEGY FOR STATIONS, SHAFTS AND PORTALS ON THE CROSSRAIL PROJECT

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