



THE RIBBON FACADE
LIGHTING DA REPORT

1913

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Electrolight has been engaged by Grocon to provide a facade lighting design scheme for The Ribbon.

The facade lighting design approach is to provide integrated lighting to accentuate the key architectural elements of the building, activating the primary elevations in a way that is both engaging and sympathetic to the unique character of Darling Harbour and its urban surrounds.

The proposed facade lighting design is a subtle and considered response to the flowing organic profile of the building. An indirect linear detail provides soft and glare free illumination to the "eyebrow" overhang around the perimeter of the building. This indirect detail proposes a series of 3000K colour temperature white light sources that vary in intensity to create a slow, subtle chase effect around the building between dusk and 12am daily. After 12am, the lighting is proposed to remain static (no chasing) until dawn.

At the podium level Hotel Entry, the curved awning structure is softly illuminated using controlled inground wall washing uplights. The porte cochere is further accented by directional downlighting and inground uplighting to the decorative structural column. All uplights are located under the building soffit / structure to minimise light pollution and prevent direct uplight into the night sky.

High efficiency LED light sources (with long life) have been selected for consistent illumination for the years to come, ensuring the future aesthetic of the building is maintained throughout the design life.



The lighting design for the facade lighting of The Ribbon references the following design standards and guidelines:

- AS/NZS 4282 – Control of the Obtrusive Effects of Outdoor Lighting (1997)

It should be noted that whilst AS4282 has specific exclusions relevant to this installation (for eg floodlit buildings, cyclic lighting etc), it is still the most appropriate standard for determining any potential obtrusive lighting effects, and so in the absence of any other available standard it will be adopted for this project.

AS4282 provides design limits to minimise obtrusive lighting effects to nearby residents, transport systems and astronomical observations. The metrics in the standard to assess these impacts are:

- Vertical Illuminance (the amount of light entering residential dwellings)
- Luminous Intensity (brightness caused by viewing a light source directly)
- Threshold Increment (glare to road users caused by bright light sources)

The design limits of the above are dependent on the area the lighting is situated in. Under the Standard, the Ribbon Project is located in a Commercial area (or at a boundary of commercial and residential areas), meaning the following design limits apply:

Pre Curfew Periods (6am to 11pm)

- Illuminance - 25 lux at relevant residential boundary
- Luminous Intensity - 7500 cd
- Threshold Increment - 20% (adaptation luminance 10cd/m²)

Curfew Periods (11pm to 6am)

- Illuminance - 4 lux at relevant residential boundary
- Luminous Intensity - 2500 cd
- Threshold Increment - 20% (adaptation luminance 10cd/m²).

The facade lighting will be operational all night, meaning the stricter curfew limits for curfewed operation will apply.

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Illuminance Assessment

The Ribbon Building's site is unique in that it is enveloped by elevated roads on both sides. These roads effectively shield parts of the building from view from nearly all viewing angles. As a result, any light spill is likely to be mitigated by the existing site conditions. Furthermore, there are no residential developments in the immediate vicinity, with the nearest being the Park Royal Hotel at a distance of 130m. Given that all facade lighting is subtle and the result of indirect illumination, the amount of illuminance leaving the site is negligible. When this is coupled with the large distance to adjacent residential developments, it can be determined that the proposed facade lighting is well within the curfewed limits of AS4282 for vertical illuminance.

Luminance Intensity Assessment

The perimeter "eyebrow" facade lighting detail has been design so that the light sources are fully concealed from view in all directions, meaning the luminous intensity limits comply with the limits in AS4282. Likewise, the luminaires used in the podium level have shielded optics that do not light beyond the boundary of the site. All Facade luminaires therefore comply with the limits of AS4282 for Luminance Intensity.

Threshold Increment Assessment

As all luminaires are fully shielded, there is no glare to traffic caused by viewing high intensity light sources. The resulting Threshold increment is therefore below the 20% limit and compliant with AS4282.

Astronomical Assessment

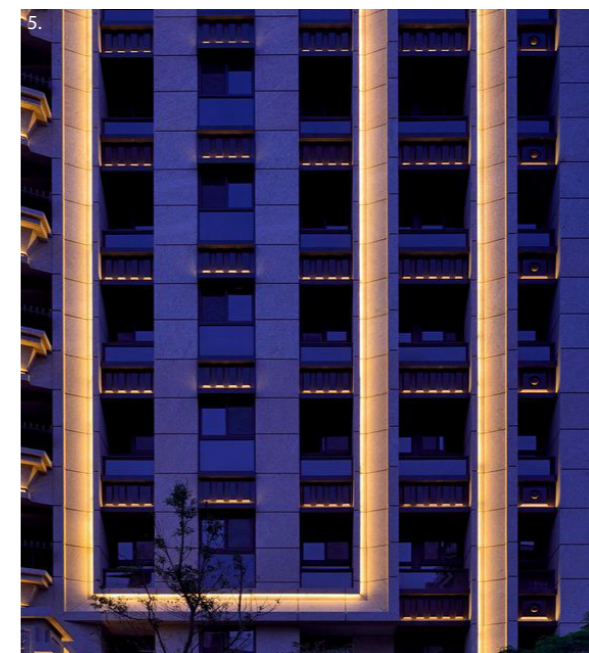
The effects of light spill on astronomical observations can be broken down into two main categories: direct light from the installation falling directly on to the Telescope/s and a lightening of the night sky caused by scattering of stray light in the atmosphere ie "Sky glow". The nearest Observatory is Sydney Observatory at Observatory Hill, approximately 1.6km away from the site and will form the basis of the assessment.

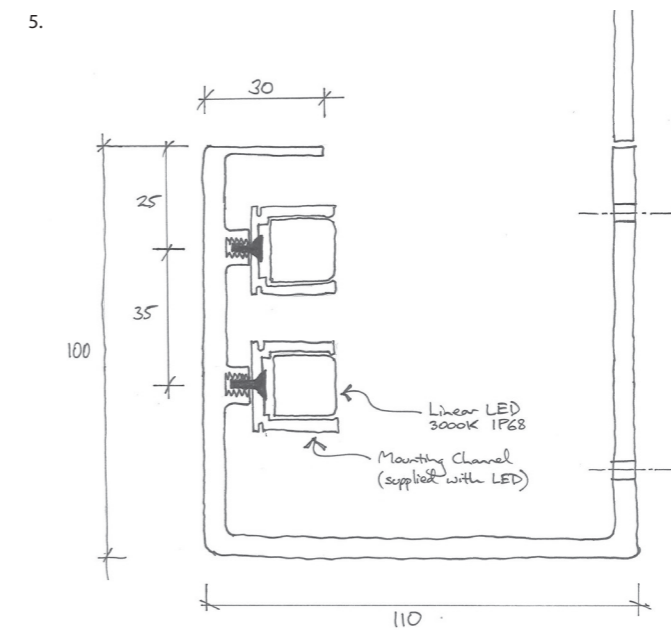
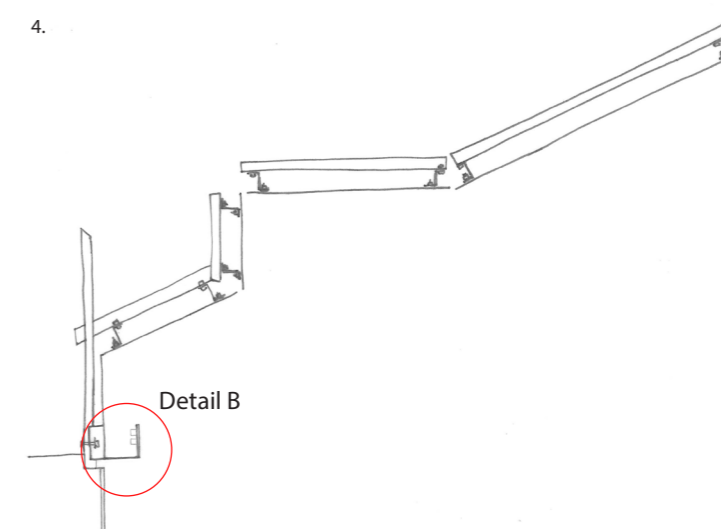
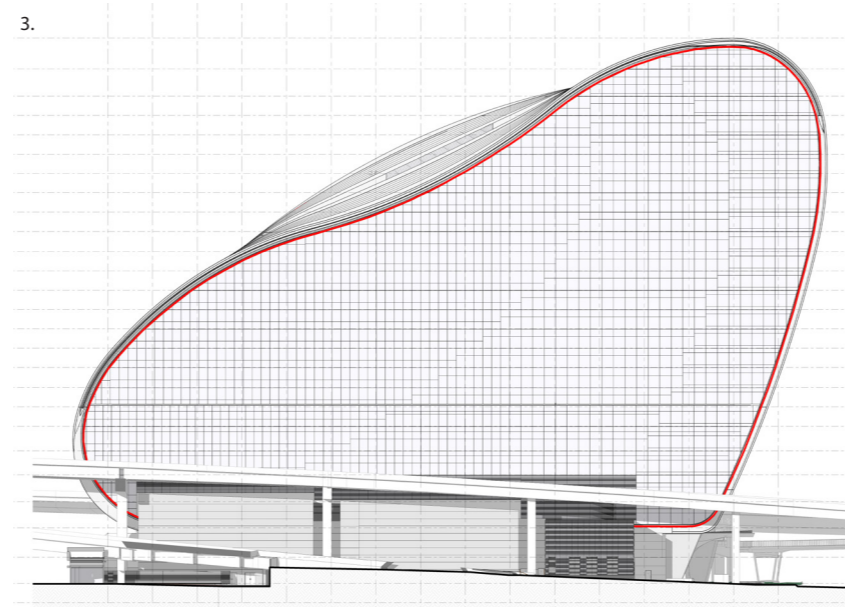
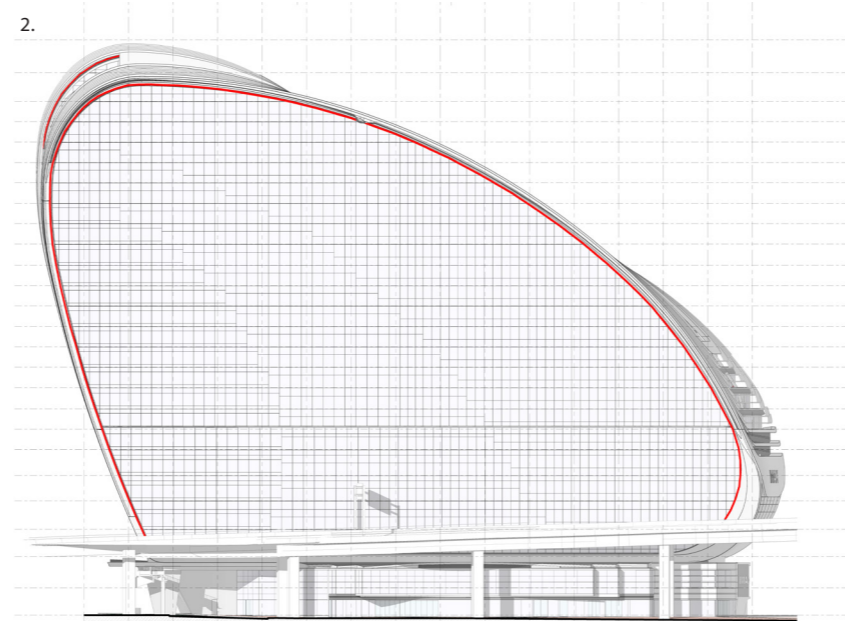
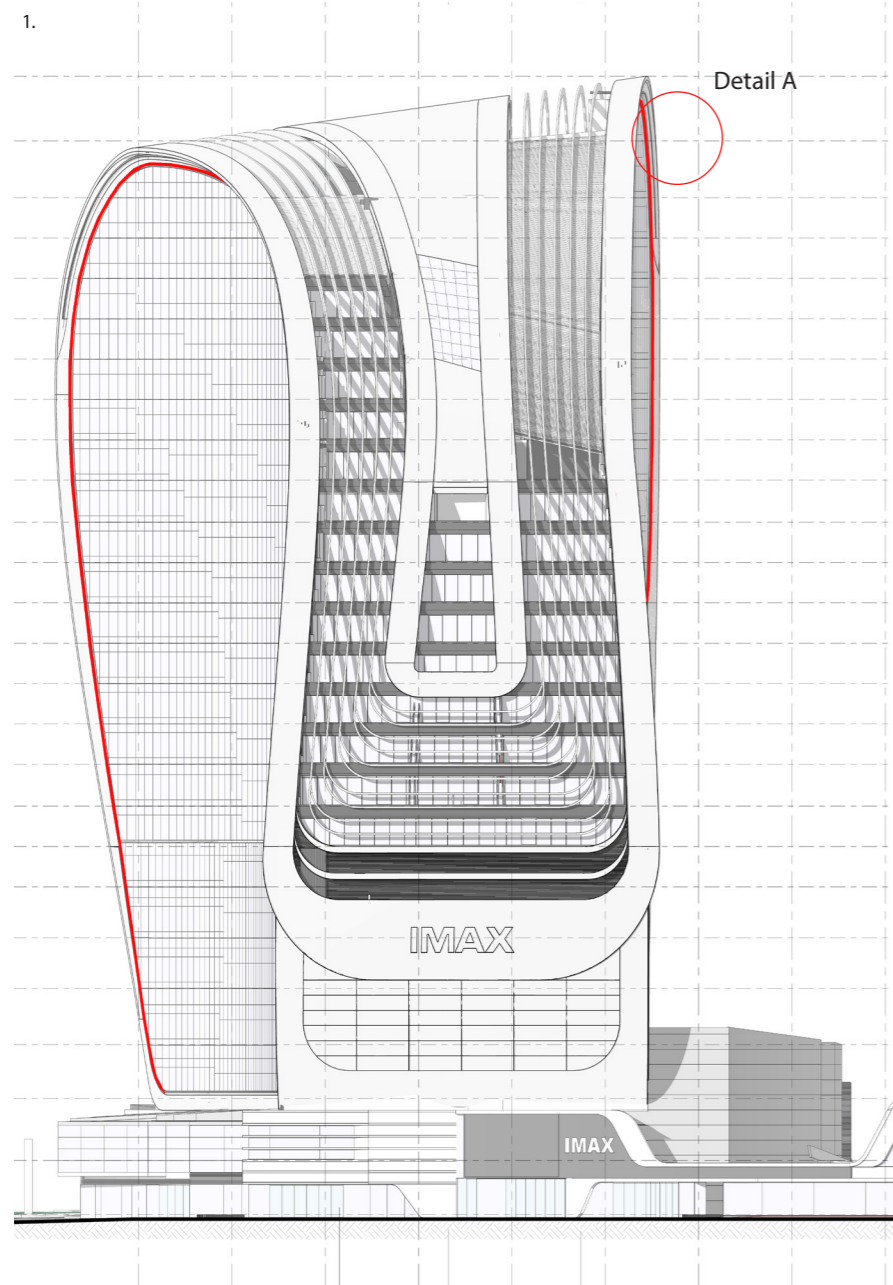
AS4282 states that if the installation complies with the limits under the standard, then the effects of direct lighting falling on to the Telescope/s will be mitigated. As the Facade lighting complies with the AS4282 limits, it can be seen that no direct light will detrimentally affect the Observatory.

Sky glow is common in urban areas and is less readily controlled. Any light source visible in the environment, including light from buildings, street lights, car head lights etc will cause sky glow. As observatories desire the lowest possible amount of sky glow, and urban environments (such as the Sydney CBD) by their very nature produce large amounts of sky glow, the question becomes one of what is deemed reasonable by both parties. The growth and development of Sydney City cannot be expected to be unreasonably constrained by the requirements of an observatory, nor should individual urban developments significantly impact upon the successful operation of an observatory.

The proposed facade lighting at the Ribbon is very subtle, restrained and utilises indirect or fully shielded light sources of low intensity. The amount of light emitted from the facade lighting will be very small compared to the thousands of other light sources in the urban environment, a significant number of which are much closer to the observatory than the proposed installation. It is unlikely that the impact of any potential spill light from the proposed facade lighting would be detectable at Sydney Observatory approximately 1.6km away. It is therefore our opinion that the proposed Facade lighting design complies with the Astronomical requirements of AS4282.

It should be noted that lighting calculations demonstrating compliance with AS4282 (and associated design certification) will be provided during design development of the facade lighting.





N°1 Hotel entry lighting concept

N°2 Reference image - uplights

N°3 Reference image - uplights

N°4 Reference image - accent lighting to the pillar

N°5 Entrance section

1a. The curved wall structure is softly illuminated by in-ground asymmetrical wall washing uplights.

1b. The feature pillar is accentuated by recessed downlights at high level and inground uplights from ground level.

