

TECHNICAL LIGHTING ASSESSMENT  
OF PROPOSED ILLUMINATED SIGNAGE

# WESTMEAD HOSPITAL

SPECIALIST LIGHTING SERVICES

**JHA**

CONSULTING ENGINEERS

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## DOCUMENT CONTROL SHEET

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Description	Technical Lighting Assessment of Proposed Illuminated Signage
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# 1 EXECUTIVE SUMMARY

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JHA were engaged to review the proposed façade mounted illuminated signs for Westmead Hospital and the impact they may have on the surrounds. In particular, to review and comment on whether the proposed designs are in accordance with all relevant standards.

We identify the following standards as relevant and have reviewed the requirements nominated within each in detail;

- State Environmental Planning Policy No. 64 (SEPP64)
- Transport Corridor Outdoor Advertising Signage Guidelines – Department of Planning and Environment 2017 Government NSW
- AS/NZS 4282:2019: Control of the obtrusive effects of outdoor lighting
- AS/NZS 1158.0:2005: Lighting for roads and public spaces

JHA also conducted an onsite night time analysis of the surrounding environment, and documented the key vistas and views of the proposed signs. Based on our observations we have noted the aspects which are most sensitive.

Based on the key considerations raised within the various standards above, JHA have provided design parameters which must be adopted by the signage manufacturer to mitigate the risk of obtrusive visual effects, and potential non-compliance with the standards.

Based on our analysis of the proposed signage design details and the relevant standards, we believe the proposed signage is in accordance with all standards, as long as the signs themselves are manufactured within the parameters proposed, in particular, the 250cd/m<sup>2</sup> illuminance limit.

The proposal to include dimmable drivers is a further measure proposed to give flexibility should any concerns be raised at a later date as to the brightness of the signs.

## 2 INTRODUCTION

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JHA has been engaged to conduct a technical lighting assessment of the proposed façade mounted illuminated signage for Westmead Hospital, and provide professional opinion regarding the potential compliance to all relevant standards and codes.

The following methodology was applied to conduct the study;

- Detailed review of the signage design (including materials and finishes, mounting type, location etc);
- Detailed analysis of all relevant standards;
- Analysis of the visibility of the proposed signage from different points of interest (i.e. Darcey Road, Hawkesbury Road) in night time conditions;
- Analysis of the potential effects from the proposed illuminated signage on the surrounding environment;
- Investigation into potential design parameters and lighting control strategies.

### 2.1 RELEVANT STANDARDS AND CODES

The following standards and codes are deemed to be relevant to this signage proposal. These have been reviewed in detail and referenced throughout this report;

- State Environmental Planning Policy No. 64 (SEPP64)
- Transport Corridor Outdoor Advertising Signage Guidelines – Department of Planning and Environment 2017 Government NSW
- AS/NZS 4282:2019: Control of the obtrusive effects of outdoor lighting
- AS/NZS 1158.0:2005: Lighting for roads and public spaces

### 3 SIGNAGE PROPOSAL

#### 3.1 PROPOSED SIGNAGE LOCATION PLAN

The proposed illuminated signs will be located on the façade of Westmead Hospital. The location plan below is extracted from the signage design package provided by Multiplex. Refer to Appendix B.

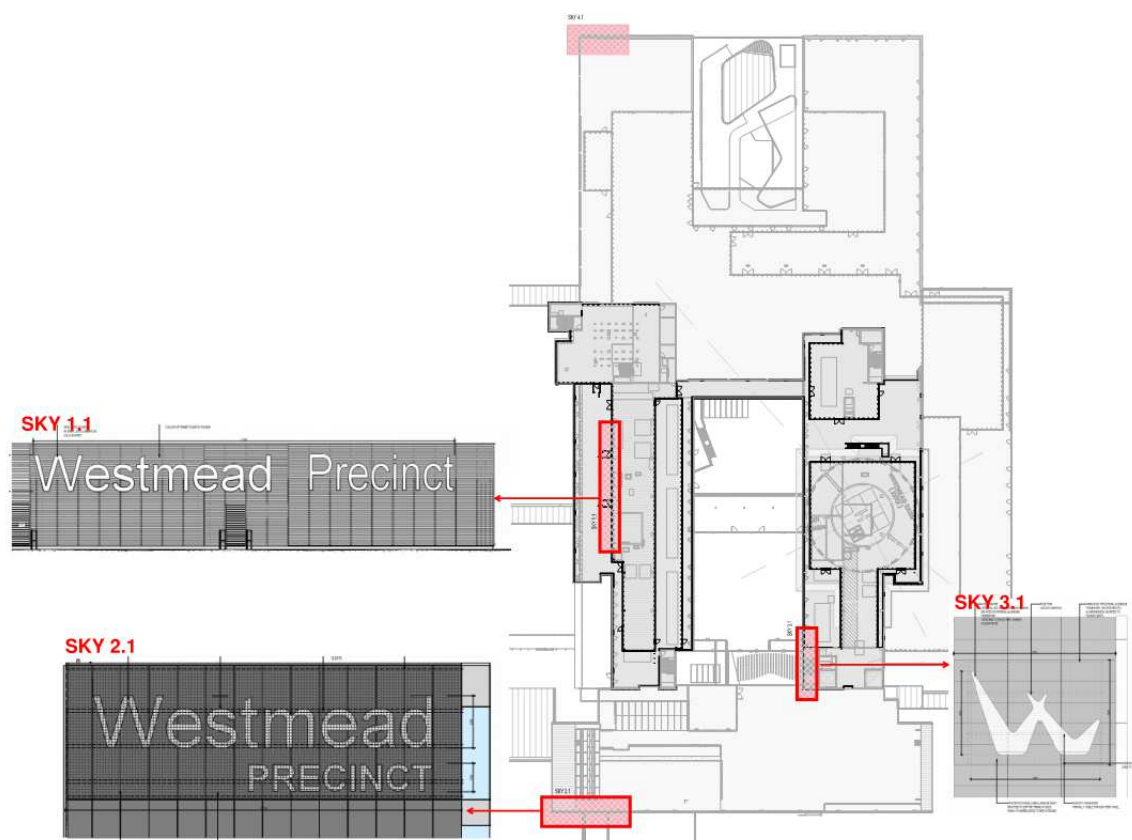


Figure 1: Signage Location Plan

#### 3.2 PROPOSED SIGNAGE DETAILS

- **Sky 1.1: Located on the South West Façade**  
White 180mm deep fabricated aluminium letterform with opal acrylic face with internal LED illumination. Charcoal trim and returns. No lighting is emitted from the sides. Mounted to framework installed behind architectural façade
- **Sky 2.1: Located on the South- East Façade**  
White 200mm deep letterform with opal acrylic face with internal LED illumination. Charcoal trim and returns. No lighting is emitted from the sides. Mounted onto fabricated structural aluminium framework and perforated cladding mounted to façade cleats.
- **Sky 3.1: Critical Care 'W' Sign: Courtyard East Façade**  
White 200mm deep sign housing with tensioned flexface vinyl banner with internal LED illumination. Charcoal trim and returns. No lighting is emitted from the sides. Mounted on internal aluminium framework.

Since all three signs are effectively light boxes with light emitted only from the front face, which is covered, the potential obtrusive lighting effects caused by a direct view of the light source are nil, i.e. the light source is fully concealed.

## 4 SITE CONTEXT ANALYSIS

### 4.1 VIEWS & VISTAS

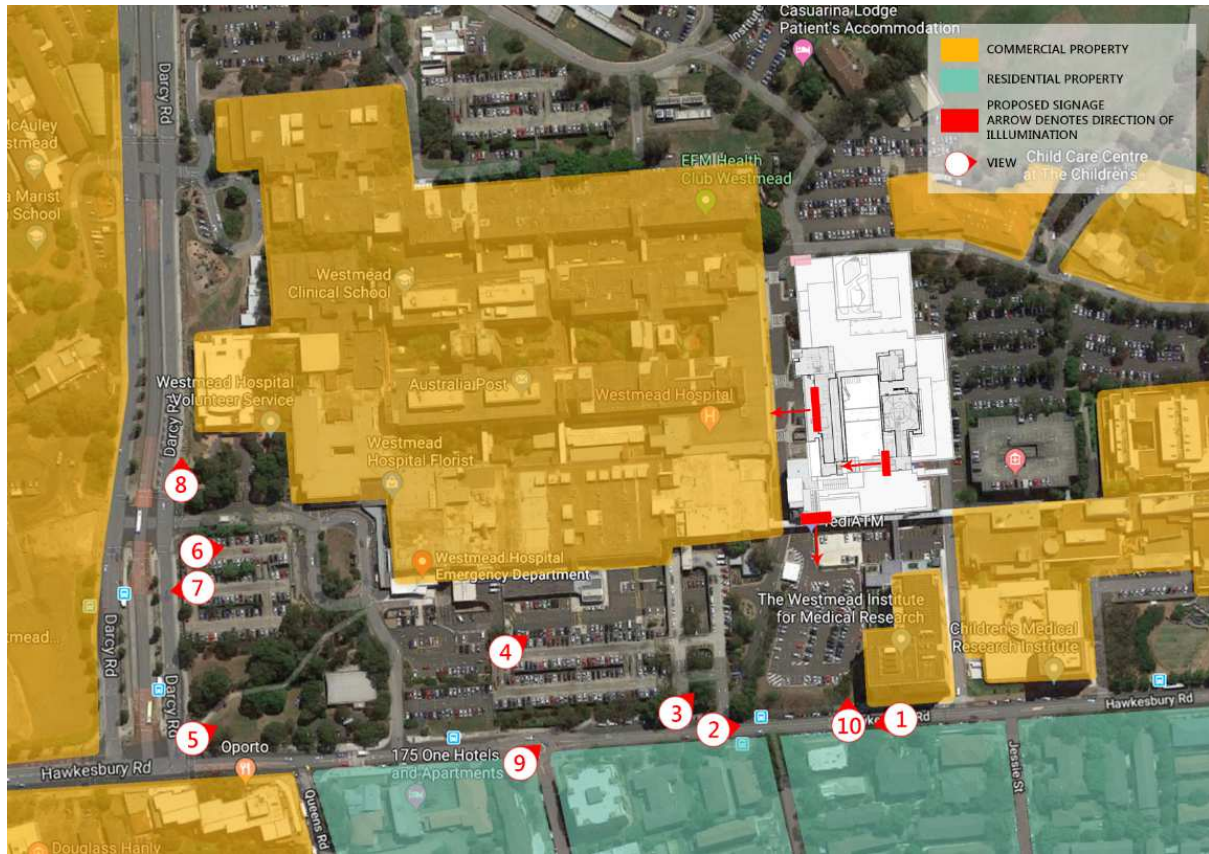


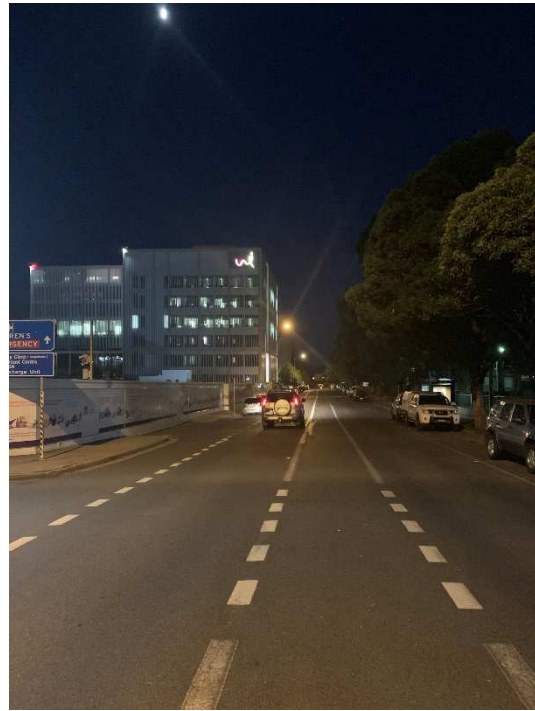
Figure 8: Overall Site Plan



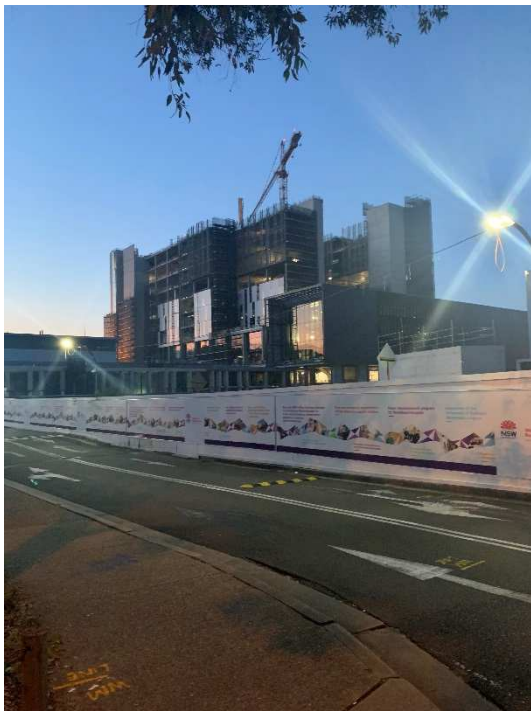
Refer to Figure 8 for direction of views that correlate to the images below.



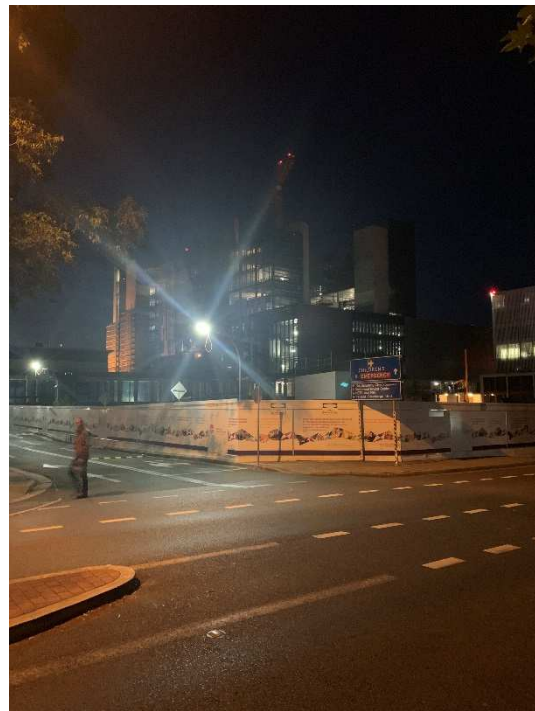
View 1



View 2



View 3



View 3





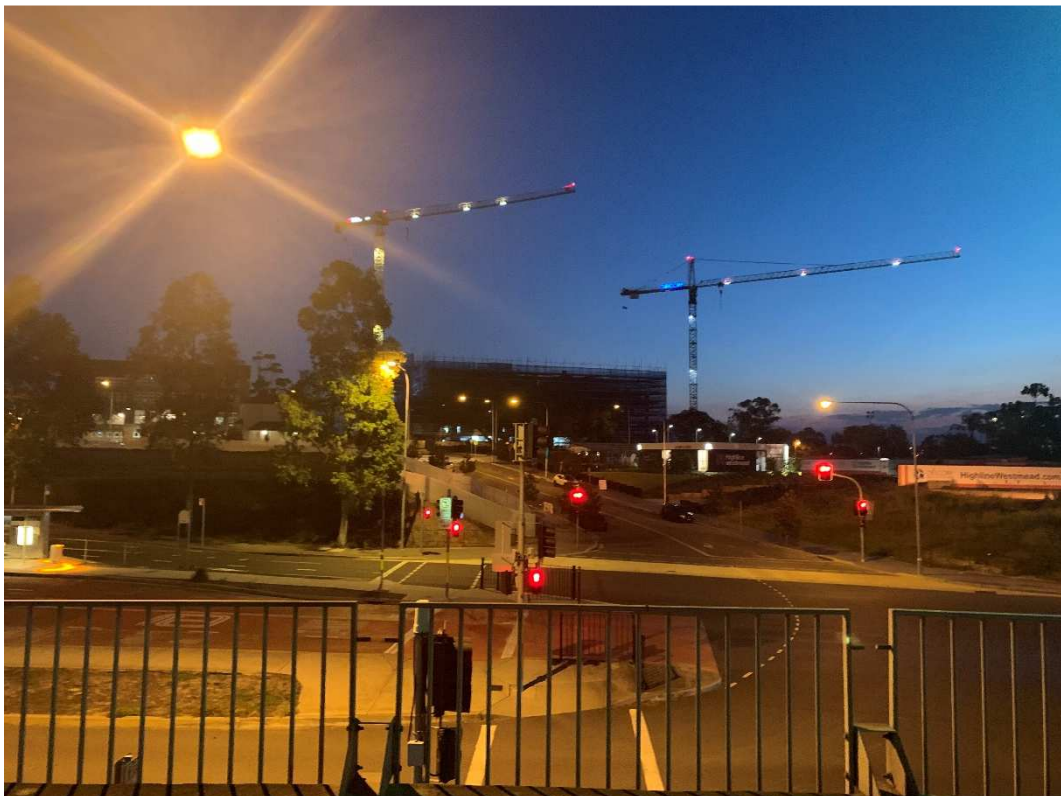
View 4



View 5



View 6



View 7

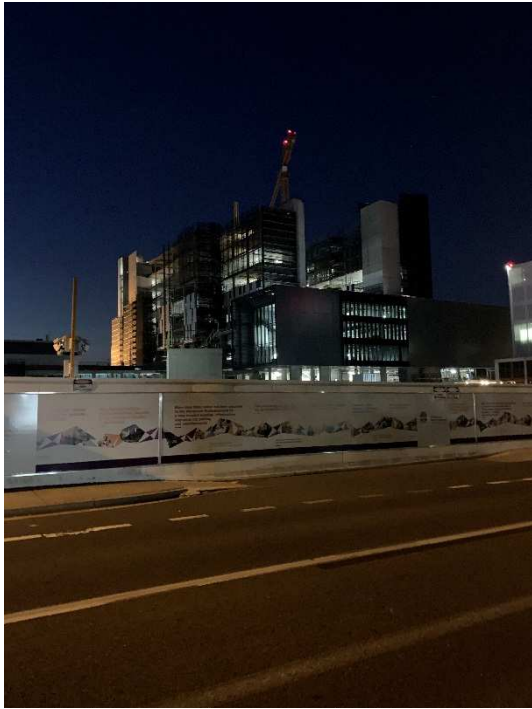




View 8



View 9



View 10

### 4.3 SUMMARY OF IMMEDIATE CONTEXT

Neighbouring buildings which are proximate to the proposed signage are listed below;

- Hawkesbury Road, predominantly residential
- Westmead Hospital Facilities
- Carparks to facilitate Westmead Hospital
- Darcy Road, Commercial and Educational



Figure 9: Approximate location of proposed signage.

#### Signage SKY 1.1

Is located on the south-west façade at approximately 58m high. Due to the setback from Darcy Road, illuminated signs are well concealed from Darcy Road at street level from neighbouring Westmead facilities and foliage (View 5). However, will be visible from the rooftop carparks as shown in views 6 and 4. As we approach closer to Hawkesbury Road portions of the sign become more visible.

#### Signage SKY 2.1

Is located on the south east façade at approximately 60m high. This illuminated sign faces a large portion of residential dwellings and may be of high risk in regards to obtrusive spill light into habitable spaces. This sign is highly visible throughout a large portion of Hawkesbury road as shown in views 3 and 10.

#### Signage SKY 3.1

Is also located on the south west façade at approximately 25m high. This illuminated sign is partially concealed from Darcy Road however is mainly visible throughout a portion of Hawkesbury Road as shown in views 3 and 4.



## 4.4 POTENTIAL AREAS OF RISKS

Shown below in yellow are the areas that may have a direct view of the signage;



Figure 10: Sky 1.1

Signage Sky 1.1 is predominantly visible throughout a large portion of Hawkesbury Road which consists of a combination of residential and commercial property. As we approach Darcy Road the building is well concealed behind foliage, neighbouring buildings and carparks as they are at higher level.

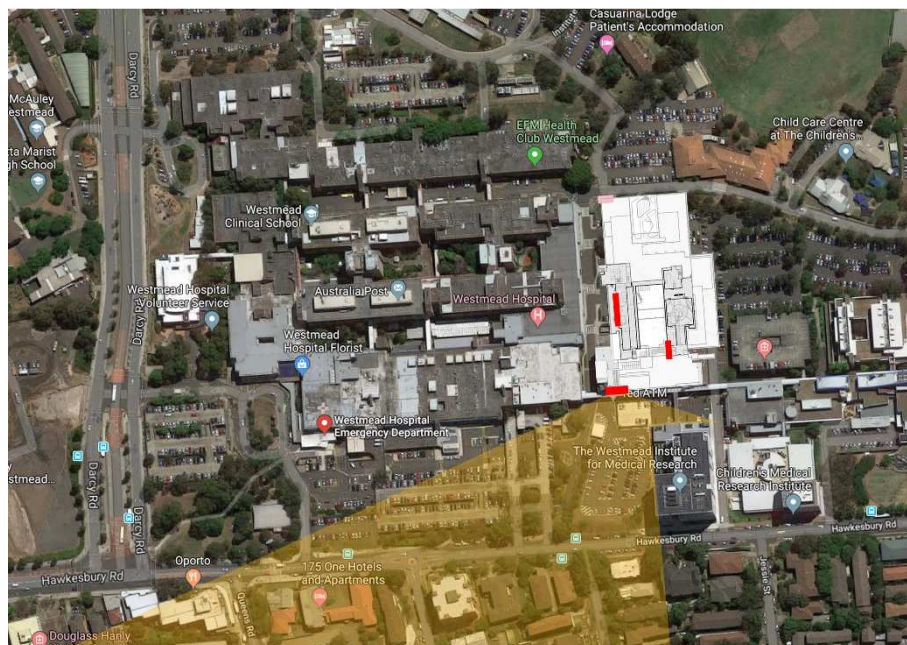


Figure 11: Sky 2.1

Signage Sky 2.1 is south-east facing and will illuminate majority of Hawkesbury Road. A portion of the sign will be concealed behind neighbouring buildings but also the foliage within the park on the corner of Darcy and Hawkesbury Road.



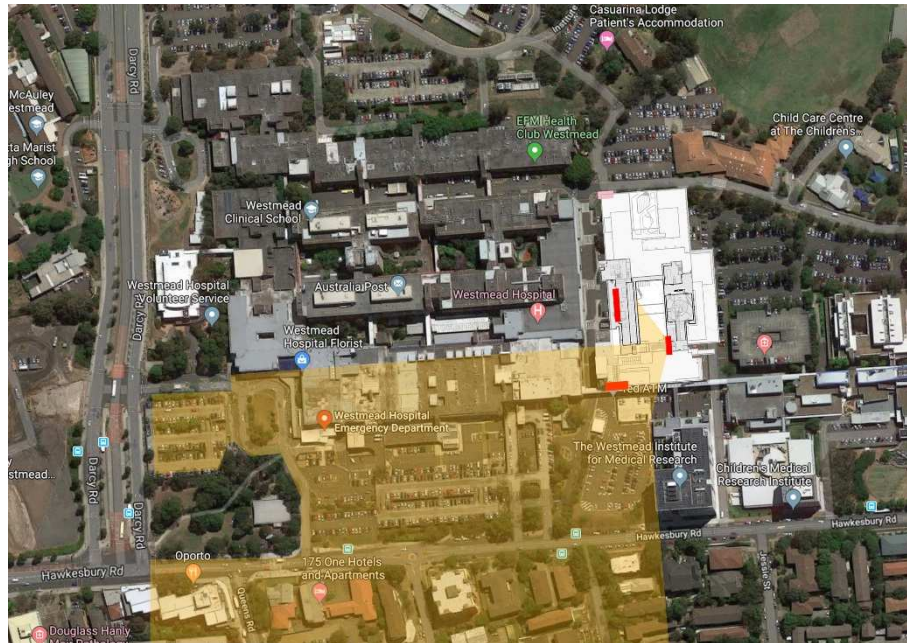


Figure 12: Sky 3.1

Signage Sky 3.1 sits the highest of all the proposed signs and therefore will be the most visible particularly along Hawkesbury Road. A portion of the sign is concealed due to the architectural nature of the building and neighbouring buildings.

We note that within the existing surrounds, similar installations of illuminated signs have been installed on neighbouring buildings and from a visitor's perspective they do not appear to cause any issues with glare and minimal obtrusive effects into neighbouring buildings.

## 5 COMPLIANCE CONSIDERATIONS

### 5.1 ASSESSMENT CRITERIA FOR COMPLIANCE WITH SEPP 64

As set out in State Environmental Planning Policy No 64—Advertising and Signage Schedule 1, there are a number of explorative questions provided to guide the design analysis of the proposed signage. The questions are designed to assist the consenting authority to determine compliance with the policy.

JHA have provided an opinion as to the answers to these questions, and this body of work is set out in the attached Appendix A.

### 5.2 AUSTRALIAN STANDARDS FOR ILLUMINATED SIGNAGE

AS4282-2019 'Control of the obtrusive effects of outdoor lighting' is the current and relevant standard for obtrusive lighting. This standard defines 'spill light' (stray light) as; 'light emitted by a lighting installation that falls outside of the design area. Spill light may or may not be obtrusive depending on what it affects.'

Due to the proposed signage and its relative proximity to residential properties in some directions, we have considered within this report the potential effects on residents of the surrounding properties.

The following is a simplified summary of the key measures of assessing compliance with the standard;

- The illuminance at the neighbouring property boundary (particularly the windows of habitable rooms);
- The direct view of bright luminaires from normal viewing directions causing annoyance, distraction or discomfort;
- General luminous glow (sky glow).

The permissible light technical parameters (or limits) of these measures are influenced by the ambient lighting existing in the environment. Different ambient environments are categorised into zones within the Standard. Refer to **Figure 2**.

JHA determines zone A3 'Medium district brightness – Suburban areas in towns and cities' appropriate for this application. See **Figure 3** for the light technical parameters allowed for Zone A3.

Curfews are nominated within the standard to provide tighter parameters at later timeframes when more people are likely to be affected by obtrusive light. Complying with the curfew parameters at all times means the signage may be in operation 24 hours per day.

ENVIRONMENTAL ZONES		
Zones	Description	Examples
A0	Intrinsically dark	UNESCO Starlight Reserve. IDA Dark Sky Parks. Major optical observatories No road lighting -unless specifically required by the road controlling authority
A1	Dark	Relatively uninhabited rural areas No road lighting - unless specifically required by the road controlling authority
A2	Low district brightness	Sparsely inhabited rural and semi-rural areas
A3	Medium district brightness	Suburban areas in towns and cities
A4	High district brightness	Town and city centres and other commercial areas Residential areas abutting commercial areas
TV	High district brightness	Vicinity of major sports stadium during TV broadcasts
V	Residences near traffic routes	Refer AS/NZS1158.1.1
R1	Residences near local roads with significant setback	Refer AS/NZS 1158.3.1
R2	Residences near local roads	Refer AS/NZS 1158.3.1
R3	Residences near a roundabout or local area traffic management device	Refer AS/NZS 1158.3.1
RX	Residences near a pedestrian crossing	Refer AS/NZS 1158.4

NOTE: Recreational areas are not considered commercial.

Figure 2: Environmental Zones AS/NZS4282: 2019

### MAXIMUM VALUES OF LIGHT TECHNICAL PARAMETERS

Zones	Vertical illuminance levels ( $E_v$ ) lx		Threshold increment (TI)		Sky glow
	Non-curfew	Curfew	%	Default adaptation level ( $L_{ad}$ )	Upward light ratio
A0	See Note 1	0	N/A	N/A	0
A1	2	0.1	N/A	N/A	0
A2	5	1	20%	0.2	0.01
A3	10	2	20%	1	0.02
A4	25	5	20%	5	0.03
TV	See Table 3.4	N/A	20%	10	0.08
V	N/A	4	Note 2	Note 2	Note 2
R1	N/A	1	20%	0.1	Note 3
R2	N/A	2	20%	0.1	Note 3
R3	N/A	4	20%	0.1	Note 3
RX	N/A	4	20%	5	Note 4

#### NOTES:

- 1 For A0,  $E_v$  shall be as close to zero as practicable without impacting safety considerations.
- 2 Refer to AS/NZS 1158.1.1.
- 3 Refer to AS/NZS 1158.3.1.
- 4 Refer to AS/NZS 1158.4.
- 5 N/A means 'Not Applicable'.
- 6 For an internally illuminated sign in an A2 zone,  $L_{ad} \leq 0.25$  cd/m<sup>2</sup>.

Figure 3: Maximum values of light technical parameters AS/NZS 4282:2019

### MAXIMUM LUMINOUS INTENSITIES PER LUMINAIRE

Zone	Luminous intensity ( $I$ ), cd		
	Non-curfew L1	Non-curfew L2	Curfew
A0	See Note	See Note	0
A1	2 500	5 000	500
A2	7 500	12 500	1 000
A3	12 500	25 000	2 500
A4	25 000	50 000	2 500
TV	100 000	150 000	0

NOTE: For A0,  $I$  shall be as close to zero as practicable without impacting safety considerations.

Figure 4: Maximum Luminous Intensities Per Luminaire AS/NZS 4282:2019

### MAXIMUM AVERAGE LUMINANCE OF SURFACES (cd/m<sup>2</sup>)

Application conditions	Environmental zones				
	A0	A1	A2	A3	A4
See Clause 3.3.5.4	0.1	0.1	150	250	350

Figure 5: Maximum Average Luminance AS/NZS 4282:2019

## 6 ILLUMINATED SIGNAGE DESIGN PARAMETERS

### 6.1 UNIT OF MEASUREMENT

Lighting can be expressed in a number of different units; illuminance, luminous flux and luminance.

Luminance, is a measure of concentration, or 'intensity density' of a light source. Also defined in AS1158.0:2005 as: 'The physical quantity corresponding to the brightness of a surface (e.g. lamp, luminaire or reflecting material, such as the road surface) when viewed from a specified direction. Unit: candela per square metre ( $\text{cd}/\text{m}^2$ )'.

Signage lighting is typically expressed in luminance.

### 6.2 ILLUMINATED SIGNAGE SPECIFICATION

AS/NZS 4282:2019 nominates maximum average luminance of surfaces, expressed in  $\text{cd}/\text{m}^2$ . For a type A3 environmental zone, the maximum average luminance of the signage elements should be less than  $250 \text{ cd}/\text{m}^2$  (Figure 5).

Therefore, JHA's recommendation is for a maximum average illuminance of  $250 \text{ cd}/\text{m}^2$  for all signs within this proposal.

Typically, signage of this nature is illuminated using specially designed wide beam LED modules, such as: 0.23W GE lighting Tetra MS, or 0.72W Meanwell LED modules, spaced to ensure luminance levels within this range are achieved.



Figure 6: GE Tetra MS



Figure 7: Meanwell LED modules

The mounting direction of the LED must be at 90 degrees when installed on the facade, and interior surfaces of each signage element painted consistently to ensure no one sign has a ULR greater than 50%.

We recommend for these modules to have the capability of dimming and to be controlled via time clock to enable fine tuning after installation, should any concerns be raised regarding brightness or hours of operation.

## 7 CONCLUSION

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The proposed signage package has been thoroughly reviewed against the parameters established in the relevant standards and it is the opinion of JHA that the design of the signage is in accordance with all relevant parameters.

The manufacturer of the signage must adhere to the specification recommendations set out in section 7.2 to ensure the design is executed in accordance with the findings of this assessment.

## APPENDIX A

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### SCHEDULE 1: ASSESSMENT CRITERIA SEPP 64

#### Character of The Area

**Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?**

The proposed illuminated signage is to allow for clear identification of the building for staff and visitors.

**Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?**

Existing illuminated signs exist within the neighbouring area and this proposal for illuminated signs within the façade are consistent with this aesthetic

#### Special Areas

**Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?**

Within the vicinity of Westmead hospital is a combination of commercial and residential dwellings. We are conscious that key design parameters are to be considered to ensure that no obtrusive spill light exceeds the recommended values within AS4282 and are sensitive to habitable areas. Refer to clause 4.1

#### Views and Visas

**Does the proposal obscure or compromise important views?**

The proposed illuminated façade lighting does not compromise important views. The luminaire is located within the Westmead Hospital property boundary lines and are surrounded by other Westmead Hospital facilities.

**Does the proposal dominate the skyline and reduce the quality of vistas?**

The proposal does not dominate the skyline and is well contained within the boundaries of the façade. The illuminated sign does not impact any important vistas.

**Does the proposal respect the viewing rights of other advertisers?**

All proposed illuminated signs are consistent with Westmead Hospital's vision where no opposing parties are to be utilising this space.

#### Streetscape, Setting or Landscape

**Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?**

The proposal has been architecturally coordinated and remains consistent with the overall aesthetic of the area.

**Does the proposal contribute to the visual interest of the streetscape, setting or landscape?**

The proposal allows for intuitive wayfinding which is important for visitors, patients and staff to locate the amenity clearly.

**Does the proposal reduce clutter by rationalising and simplifying existing advertising?**

N/a. No existing signage or advertisements.

**Does the proposal screen unsightliness?**



No, the proposal has been architecturally coordinated and remains consistent with the overall aesthetic of the area.

**Does the proposal protrude above buildings, structures or tree canopies in the area or locality?**

No, the proposed sign is well maintained within the boundaries of the building.

**Does the proposal require ongoing vegetation management?**

No.

## **Site and Building**

**Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?**

The proposal has been architecturally coordinated where scale, finish and location has been integrated as part of the architectural design.

**Does the proposal respect important features of the site or building, or both?**

The proposal is appropriately design for the building.

**Does the proposal show innovation and imagination in its relationship to the site or building, or both?**

The proposal is appropriately design for the building.

## **Associated Devices and Logos with Advertisements and Advertising Structures**

**Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?**

Integral light sources as shown in the design documentation.

## **Special Areas**

**Would illumination result in unacceptable glare?**

The illumination of the signage will need to meet the relevant limits stated within AS4282 to ensure no annoyance, distraction or discomfort is experienced in the nominated direction of the proposed luminaire. Refer to clause 4.1 for listed design parameters.

**Would illumination affect safety for pedestrians, vehicles or aircraft?**

The listed design parameters (clause 4.1) to the best of our knowledge are within safe limits for pedestrian vehicles and aircraft.

**Would illumination detract from the amenity of any residence or other form of accommodation?**

The illumination would not detract from the amenity, however will aid in way finding for visitors to locate the premises.

**Can the intensity of the illumination be adjusted, if necessary?**

We have recommended for the proposal to be dimmable.

**Is the illumination subject to a curfew?**

The illumination may be subject to curfew between the times of 11pm-6am, should the town planner deem it appropriate. Two limits are typically nominated and are respectively based on the times that the lighting system is to operate. A higher level of light may be less obtrusive in the earlier hours of the evening when there is more activity and the majority of people are awake. For the later times (in the curfew period) lower limits can be applied.

## **Safety**

### **Would the proposal reduce the safety for any public road?**

The listed design parameters (clause 4.1) to the best of our knowledge are within safe limits for any public road.

### **Would the proposal reduce the safety for pedestrians or bicyclists?**

The listed design parameters (clause 4.1) to the best of our knowledge are within safe limits for pedestrian and bicyclists.

### **Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?**

The listed design parameters (clause 4.1) to the best of our knowledge are within safe limits for pedestrians and do not obscure sightlines from public areas.

## APPENDIX B

---

SIGNAGE DOCUMENTATION PROVIDED



**CLIENT:**  
Level 14, 77 Pacific Highway  
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F: (02) 9322 2001  
[www.multiplex.global](http://www.multiplex.global)



1

## SIGNAGE - North-West

1 : 400



Westmead  
PRECINCT

**ADULT  
EMERGENCY**

2

### SIGNAGE - South-East

1 : 400

**Health Infrastructure**  
**232186**  
**Westmead Hospital**  
Hawkesbury Rd, Westmead, NSW, 2145

Sheet Name  
**SIGNAGE LOCATION ELEVATIONS  
SHEET 1**

Scale  
1 : 400@ A1

Sheet Number  
**CASB-HDR-AR-SL-400051**

### Project Status

### Revision

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## MULTIPLEX



### SIGNAGE - South-West

1:400



2

### SIGNAGE - LARGE COURTYARD - EAST

1:400

**Health Infrastructure**  
**232186**  
**Westmead Hospital**  
Hawkesbury Rd, Westmead, NSW, 2145

Sheet Name

**SIGNAGE LOCATION ELEVATIONS**

**SHEET 2**

Scale  
1 : 400@ A1

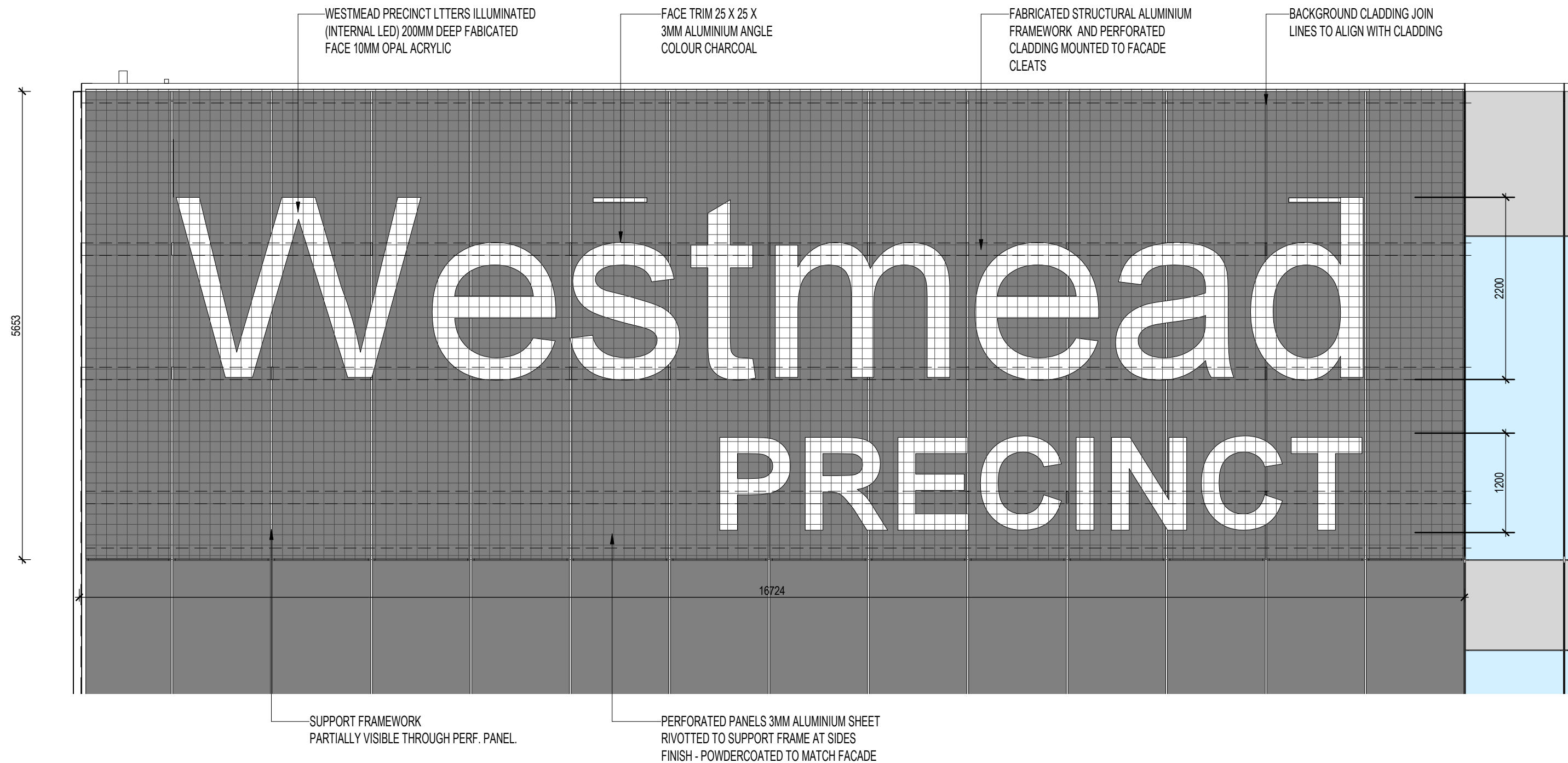
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**CASB-HDR-AR-SL-400052**

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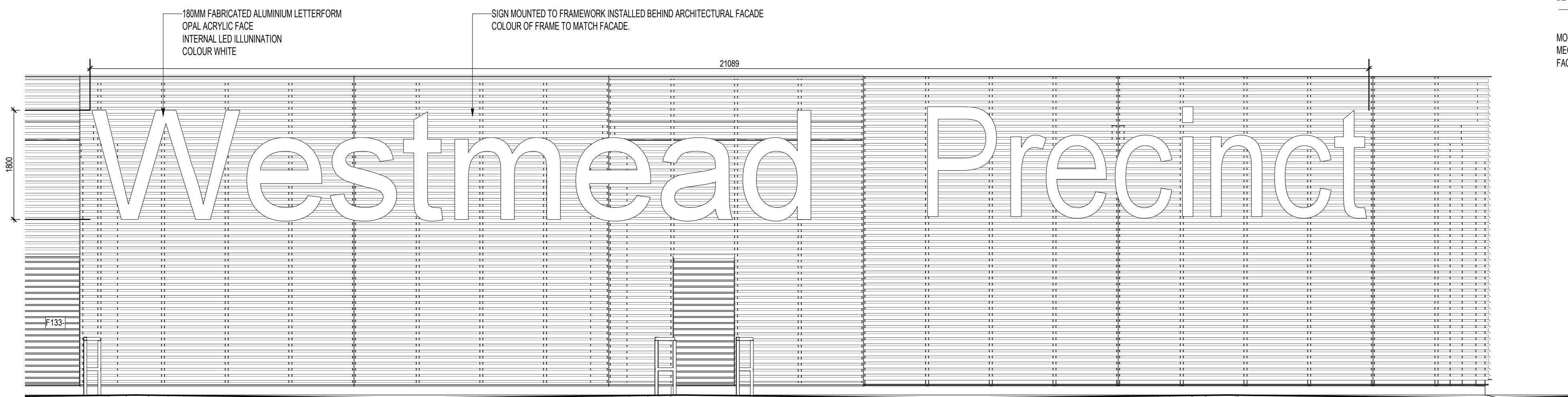
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## 2 SKY 3.1 BUILDING IDENTIFICATION

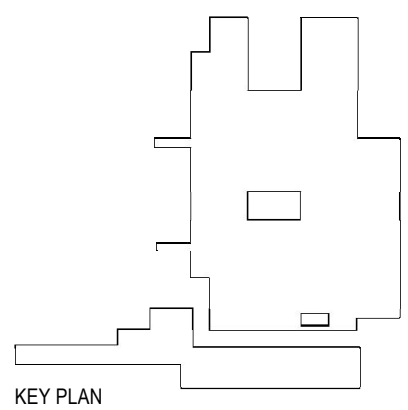
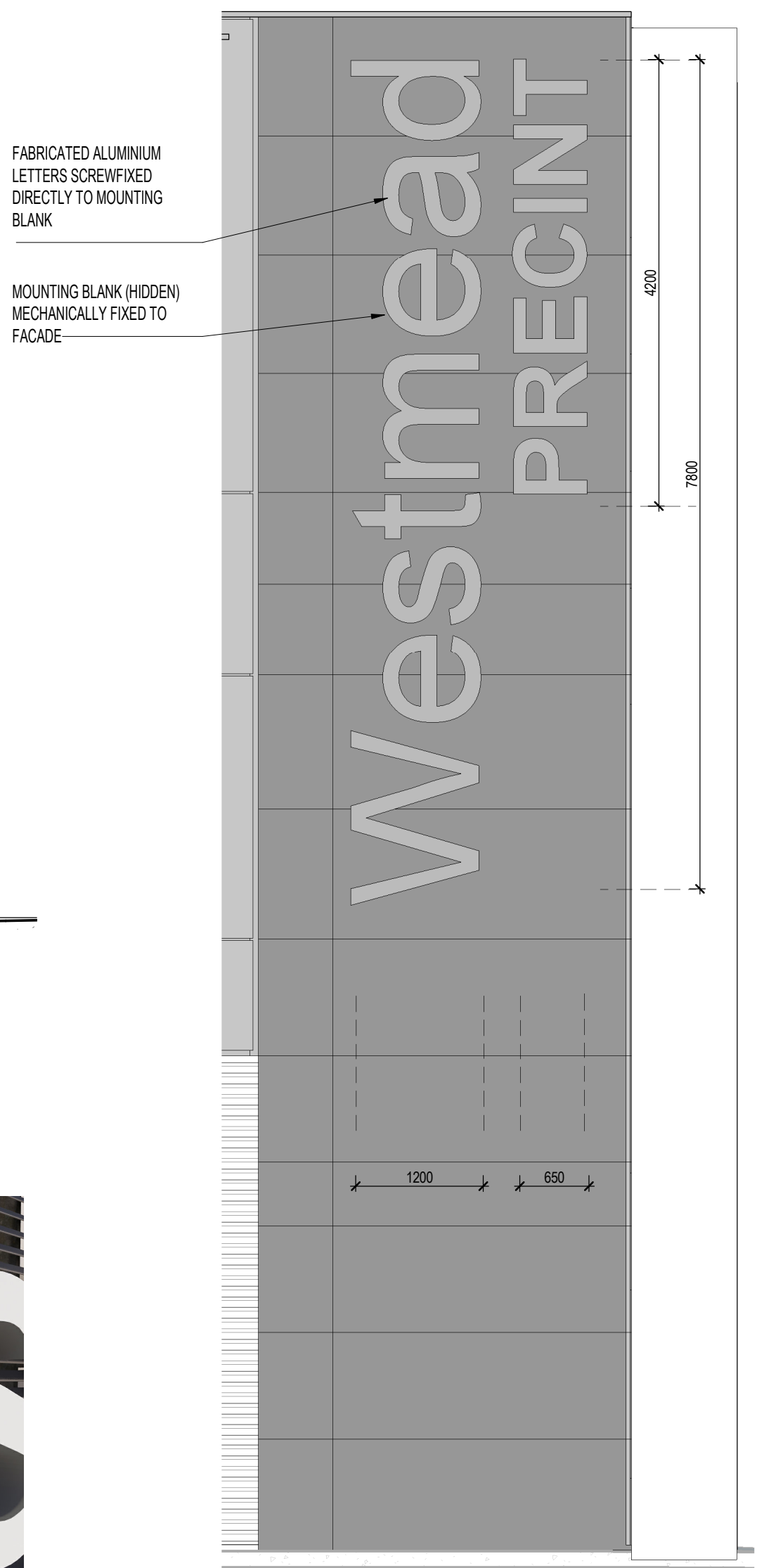


## 1 SKY 1.1 BUILDING IDENTIFICATION

5 LETTERS



## SKY 4.1 BUILDING IDENTIFICATION



Level 1, 110 Walker Street, North Sydney NSW 2060, Australia  
+61 2 9956 2666 | [hdrisc.com.au](http://hdrisc.com.au)  
The Rice Daubney Group (NSW) Pty. Limited as trustee for  
The Rice Daubney Trading Trust ABN 56 880 304 993 trading as HDR.



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**Health**  
Infrastructure



## MULTIPLEX

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**Health Infrastructure**  
**232186**  
**Westmead Hospital**  
Hawkesbury Rd, Westmead, NSW, 2145

Sheet Name  
**SIGNAGE TYPES**

Scale  
As indicated@ A1

Sheet Number  
**CASB-HDR-AR-SL-400053**

### Project Status

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SKY2.1 BUILDING IDENTIFICATION/ SKY SIGN

PROJECT WESTMEAD REDEVELOPMENT	TITLE SIGNAGE AND WAYFINDING TENDER
--------------------------------------	--

DATE 06/02/2019	REVISION 2
--------------------	---------------

DESIGN SPECIFICATIONS NOTES

SKY 2.1 BUILDING IDENTIFICATION

CONSTRUCTION INTENT:  
ILLUMINATED LETTERS  
FABRICATED ALUMINIUM LETTERFORMS  
TRANSLUCENT OPAL ACRYLIC FACE  
REMOVABLE FACE TRIM  
INTERNAL LED ILLUMINATION

SIGN BACKGROUND  
FABRICATED STRUCTURAL ALUMINIUM FRAMEWORK  
PERFORATED CLADDING

MOUNTED TO FACADE CLEATS.

REQUIREMENTS:  
POWER- FOR INTERNAL ILLUMINATION OF GRAPHICS.  
DATA- NOT REQUIRED.



FRONT ELEVATION  
SCALE 1:200





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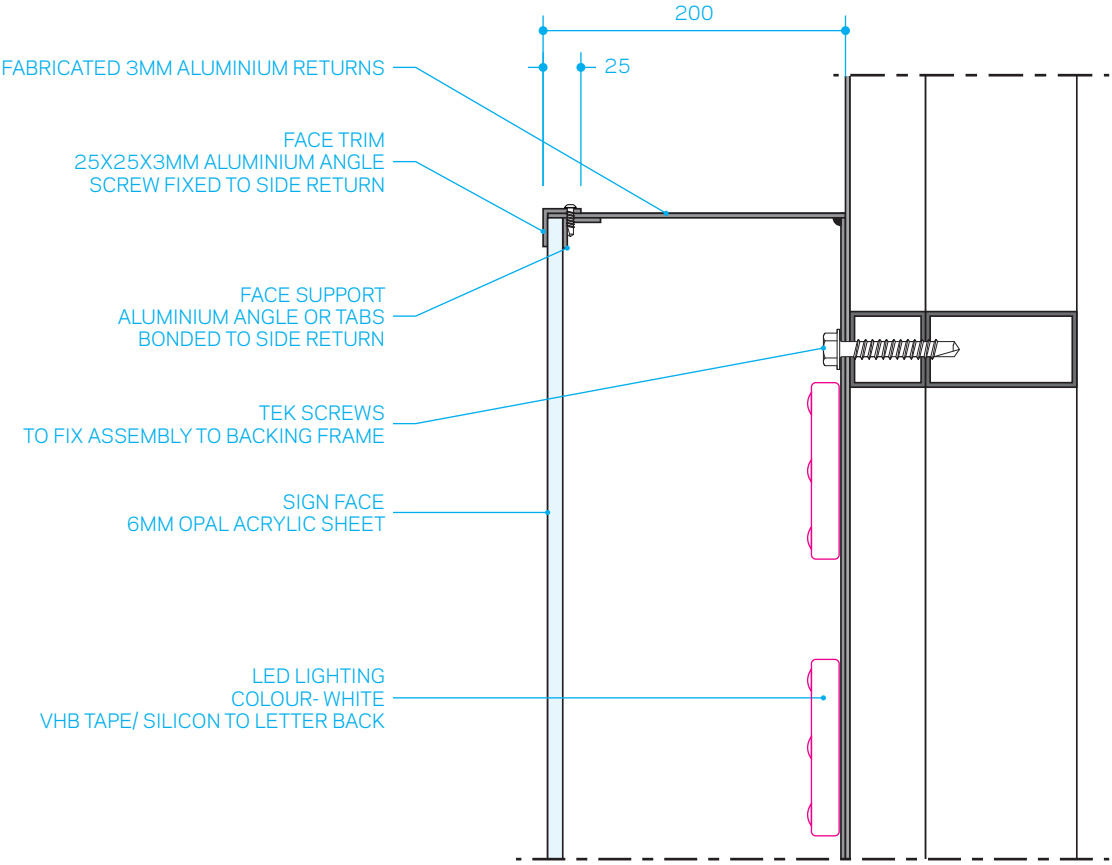
PROJECT  
WESTMEAD  
REDEVELOPMENT

TITLE  
SIGNAGE AND  
WAYFINDING  
TENDER

DATE  
06/02/2019

REVISION  
2

DESIGN SPECIFICATIONS NOTES



TYPICAL LETTER SECTION  
SCALE 1:5

FACE TRIM  
25X25X3MM ALUMINIUM ANGLE

SIGN FACE  
10MM OPAL ACRYLIC



SIGN LETTER DETAIL  
SCALE 1:50



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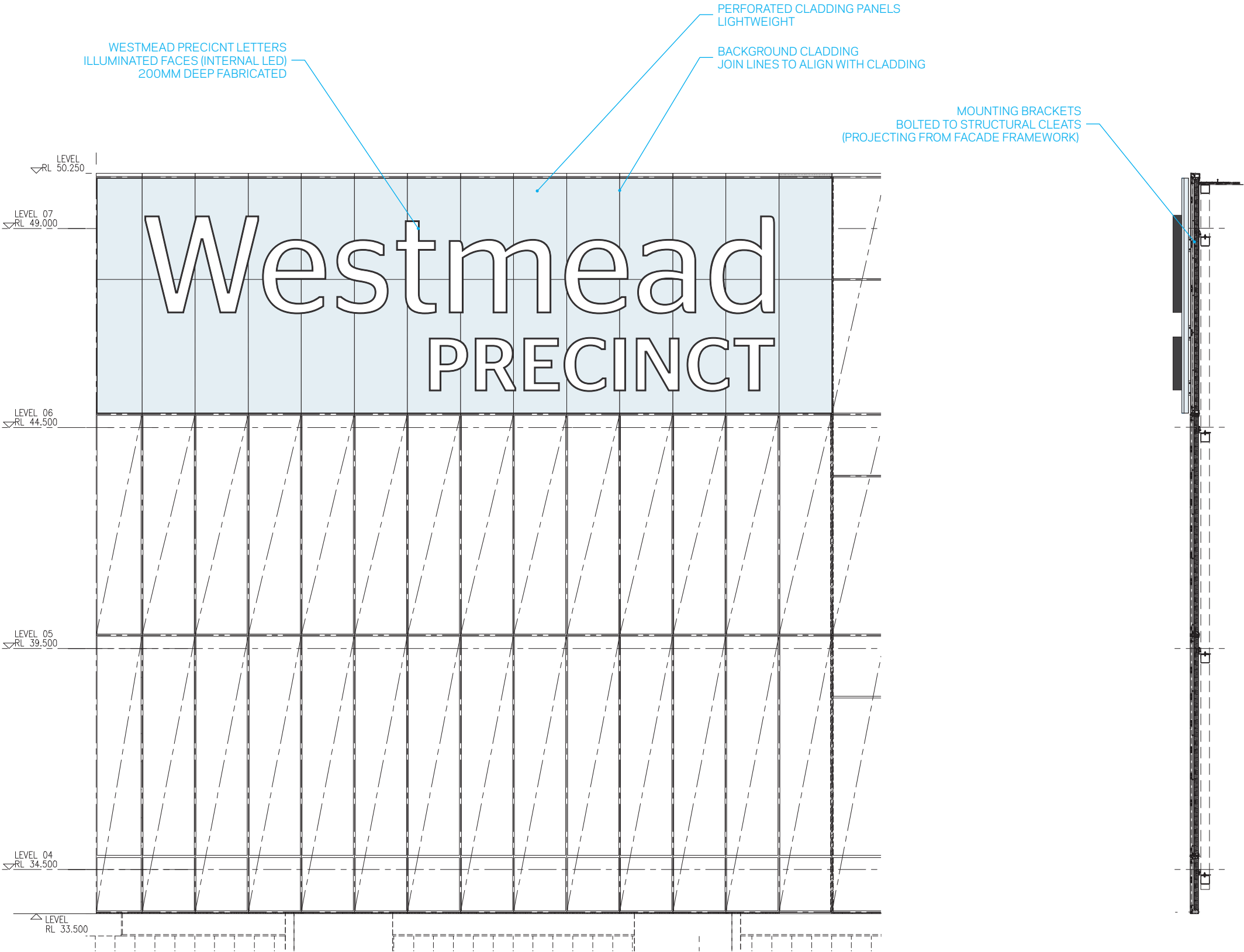
PROJECT  
WESTMEAD  
REDEVELOPMENT

TITLE  
SIGNAGE AND  
WAYFINDING  
TENDER

DATE  
06/02/2019

REVISION  
2

DESIGN SPECIFICATIONS NOTES



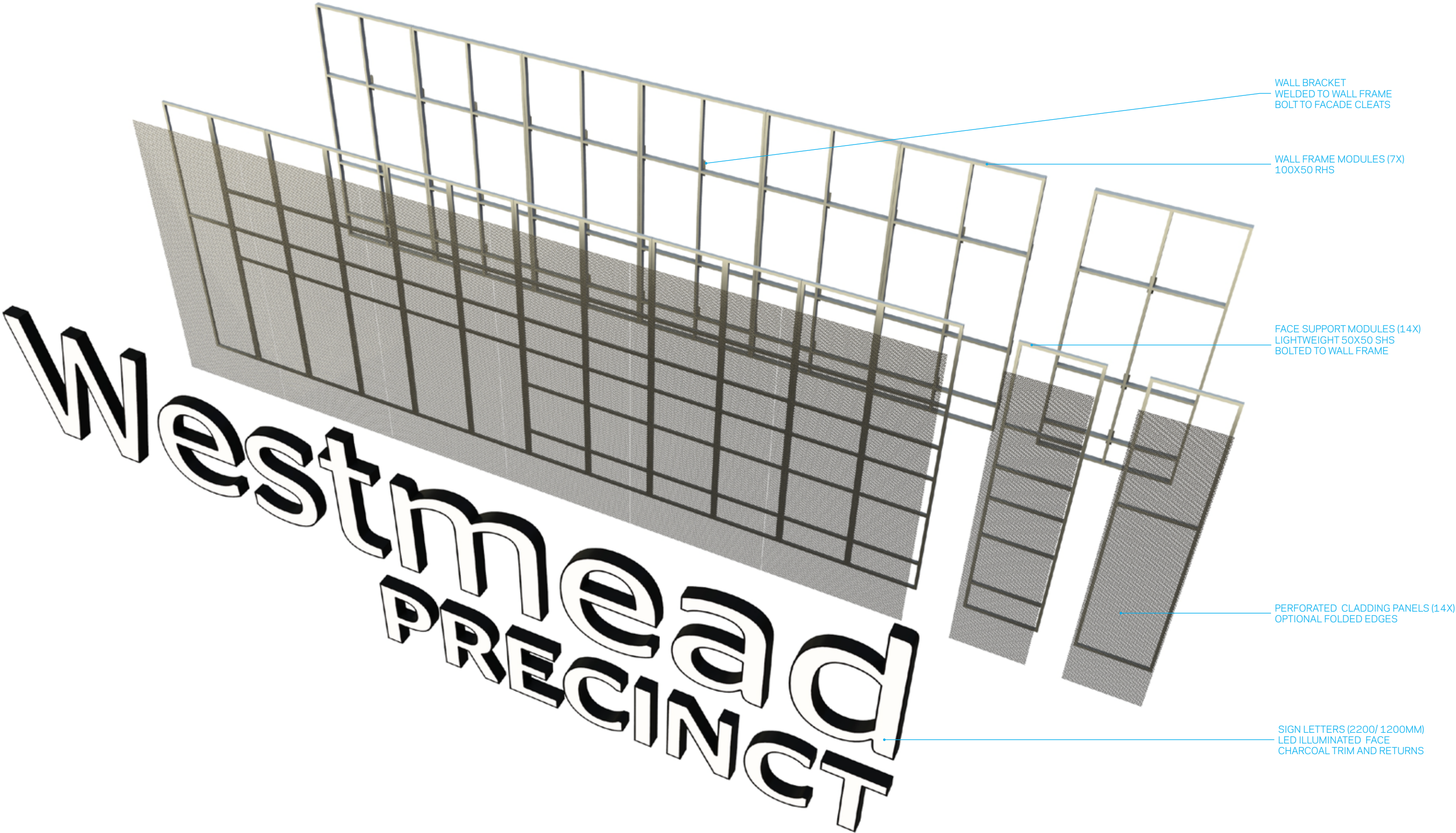
FRONT DETAIL  
SCALE 1:100

SIDE DETAIL  
SCALE 1:100

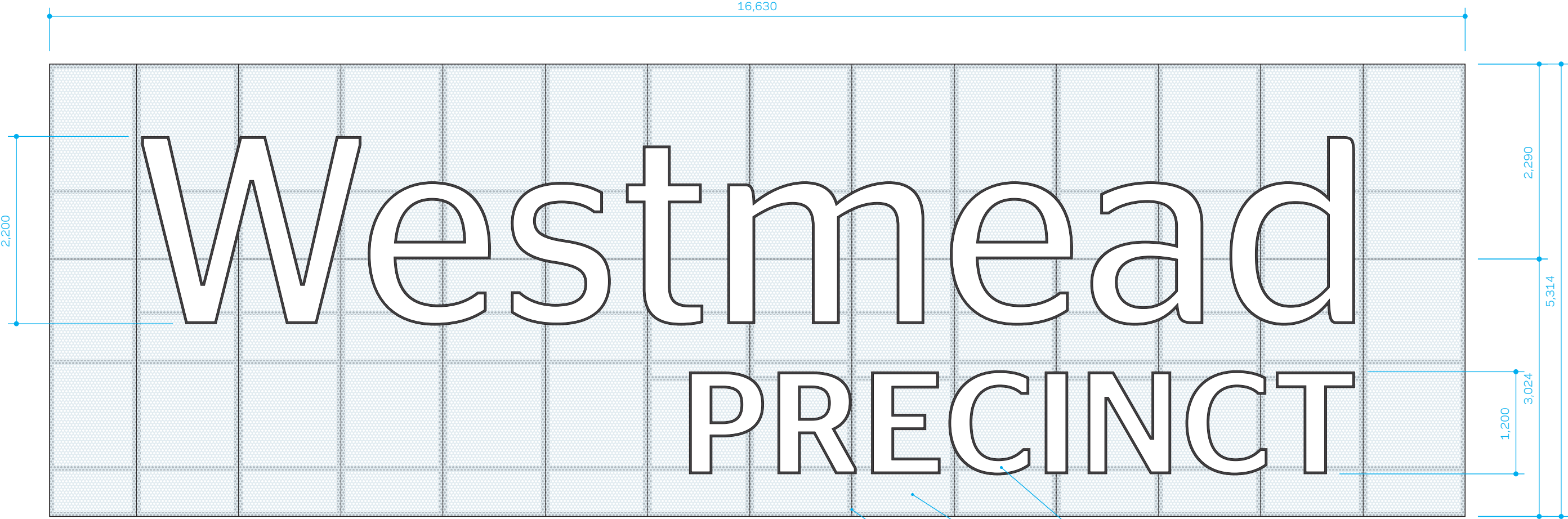


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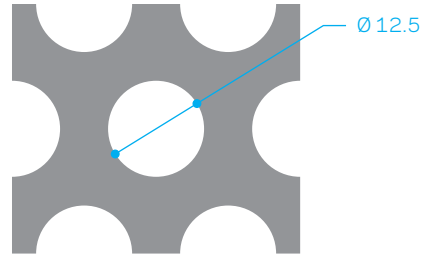
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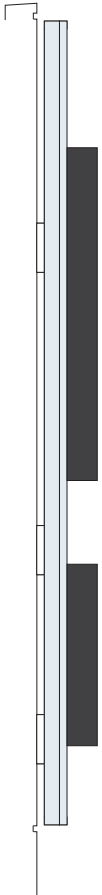




FACE CLADDING DETAIL  
SCALE 1:50



PERFORATED PATTERN  
SCALE 1:1



SIDE DETAIL  
SCALE 1:100

SIGN LETTERS  
BOLTED TO SUPPORT FACE FRAMEWORK

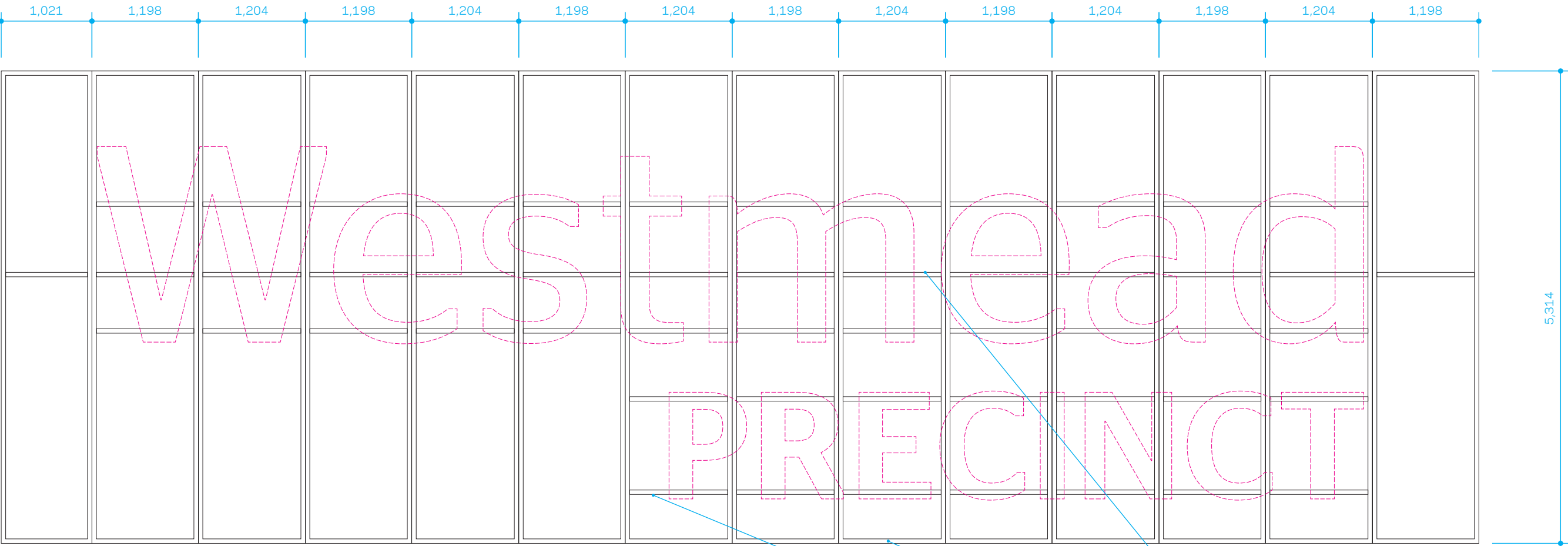
PERFORATED PANELS  
3MM ALUMINIUM SHEET (OR 1.6MM MILD STEEL SHEET) TBC  
RIVOTTED TO SUPPORT FRAME AT SIDES  
FINISH- POWDERCOATED TO MATCH FACADE

SUPPORT FRAMEWORK  
PARTIALLY VISIBLE THROUGH PERF. PANEL

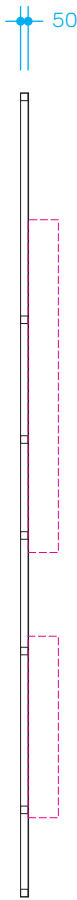


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FRAMEWORK DETAIL  
SCALE 1:50



SIDE DETAIL  
SCALE 1:100

CLADDING PANEL BRACE

FACE SUPPORT MODULES

LETTER MOUNTING BRACE

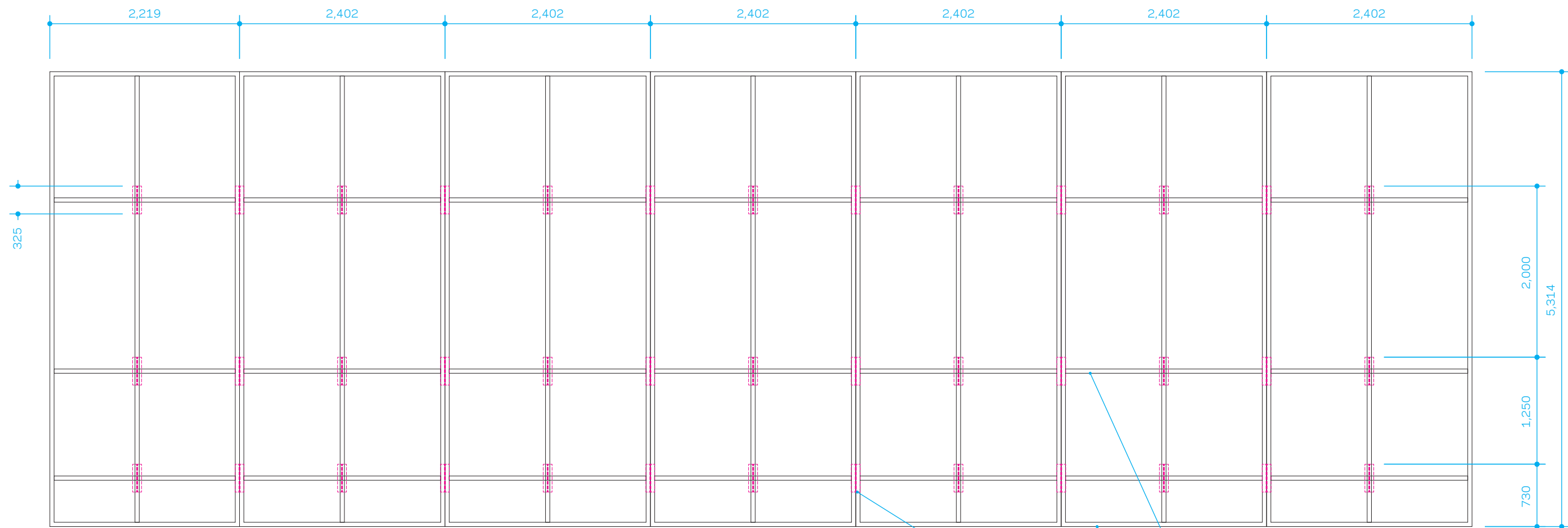
FACE SUPPORT MODULES (14X)  
FABRICATED 50X50X3MM SHS ALUMINIUM  
FINISH- POWDERCOATED



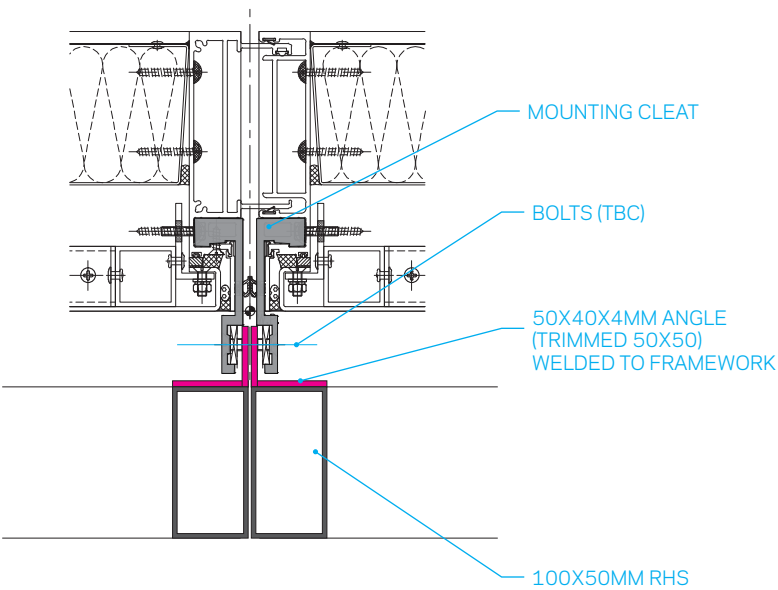
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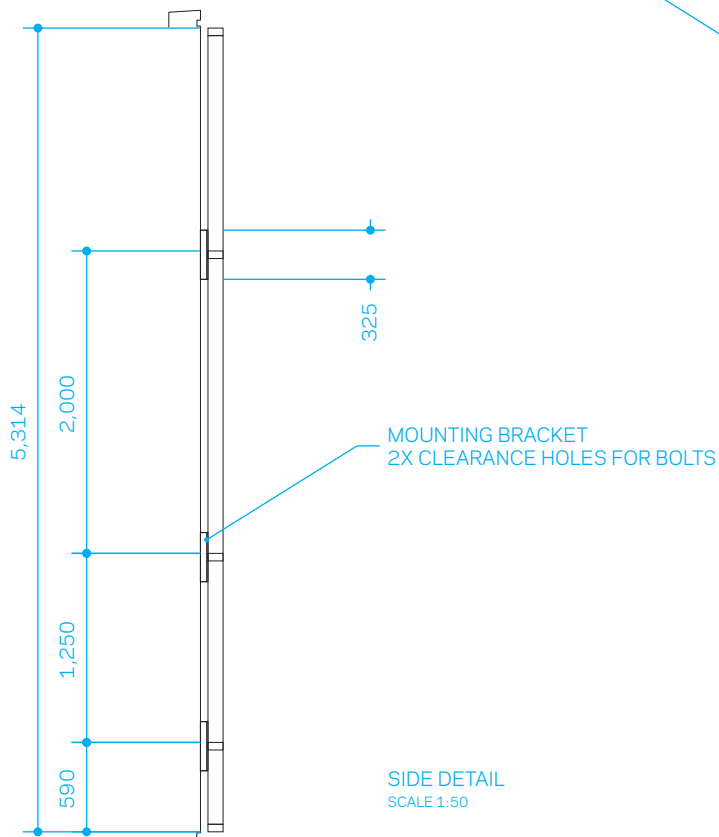
SKY2.1 BUILDING IDENTIFICATION/ SKY SIGN



FRAMEWORK DETAIL  
SCALE 1:50



BRACKET DETAIL  
SCALE 1:5



SIDE DETAIL  
SCALE 1:50

BRACE  
100X50X3MM RHS ALUMINIUM

WALL FRAME MODULE  
100X50X3MM RHS ALUMINIUM  
MODULES BOLTED ALONG VERTICAL RHS

MOUNTING CLEAT



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