

Hanlon Industries Pty Ltd
22 Clevedon Street
Botany NSW 2019

Project 220606.00
13 February 2023
R.001.Rev0
AK

Attention: Dean Johns

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Preliminary Geotechnical Assessment
Proposed Digital Sign
331 Pacific Highway, Lindfield

1. Introduction

This letter presents the results of a preliminary geotechnical assessment for a proposed digital sign at 331 Pacific Highway, Lindfield, for Hanlon Industries Pty Ltd (HI). It is understood that following demolition and removal of four existing signs, a cantilevered, digital billboard sign supported by a monopole on a pile footing is proposed to be installed adjacent to the downside (i.e., south-western side) boundary within the rail corridor at Lindfield Railway Station.

This preliminary geotechnical assessment has included a site inspection (from nearby vantage points outside of the rail corridor), a review of published information, and a review of DP archives for site investigations completed near to the site.

This advice is intended to provide a general overview of the subsurface geotechnical conditions likely to be encountered at the proposed structure location. Detailed site investigations will be required at a later stage of the project to provide detailed geotechnical information for design and construction purposes.

This letter should be read in conjunction with the attached notes 'About this Report'.

2. Site Description

The site of the proposed sign is located at the south-eastern end of the bin storage area of Lindfield Railway Station, within the railway corridor. The bin storage area is bounded by the Pacific Highway to the south-west and by the railway corridor on its remaining sides, with the down line to the north-east. An aerial photograph showing the indicative location of the proposed sign is shown in Figure 1.

The site is located approximately at-grade on relatively level ground. The ground surface at the south-eastern end of the existing bin storage area is covered by a concrete ground slab on its south-western side, and by asphaltic concrete for the remainder. A Streetview image of the site from the southbound

side of the Pacific Highway is shown in Figure 2, and a Streetview image of the site taken from Platform 3 of Lindfield railway station is shown in Figure 3.



Figure 1: Aerial photograph of the site area (red mark)



Figure 2: Streetview image of the site location from the Pacific Highway



Figure 3: View of site from Lindfield railway station platform

3. Data Sources

Data sources reviewed for this preliminary geotechnical assessment included:

- DA design drawings by Dennis Bunt Consulting Engineers Pty Ltd, specifically:
 - o Drawing No. DA01 Revision B dated 19 October 2022;
 - o Drawing No. DA02 Revision C dated 19 July 2022;
- NSW 2 m elevation contour data, NSW Department of Lands (April 2009);
- Seamless Geology Web Map, Geological Survey of NSW;
- Sydney 1:100 000 Soils Landscape Mapping Sheet, Soil Conservation Service of NSW;
- The Australian Soil Resource Information System (ASRIS) national map of published acid sulfate soil mapping, compiled by the CSIRO;
- Report on Geotechnical Investigation, 'Nick's Pizzeria, 374 Pacific Highway, Lindfield', Douglas Partners Pty Ltd (Ref: 27575, dated 28 August 1998); and
- Report on Geotechnical Investigation, 'Proposed Mixed-Use Development, 23-27 Lindfield Avenue and 11 Havilah Lane, Lindfield', Douglas Partners Pty Ltd (Ref: 73174, dated 11 January 2013).

4. Review of Information

A review of the available information indicates the following:

- The proposed cantilevered, digital sign structure is to be located outside the Danger Zone, approximately 3.5 m from the down rail of the track of the down line. The proposed sign is to be

approximately 8.3 m tall with a monopole base of section 450 mm by 650 mm, supported on a pile footing.

- Lindfield Railway Station is located on the North Shore ridgeline which separates the catchments of Middle Harbour and Lane Cove River.
- The proposed site for the sign is located adjacent to the Pacific Highway and towards the Country (i.e., north-western) end of the railway station, where the railway lines transition from shallow cut to shallow fill.
- The site is underlain by Wianamatta Group Ashfield Shale of the Triassic Period, which typically comprises black to light grey shale and laminite.

The logs of nearby boreholes suggest that the weathered bedrock surface may occur at depths ranging from 3 m to 4 m below the ground surface, and that the bedrock may comprise shale, interbedded shale and siltstone, and laminite, with sandstone at depth.

- The site is located within the Glenorie erosional soil landscape unit, which the soil landscape map notes indicate is typically characterised by a topography of undulating to rolling low hills with narrow ridges, hillcrests and valleys. Local relief is indicated to typically range from 50 m to 80 m with slope grades ranging from 5% to 20%.

The soil landscape map notes further indicate that the bedrock is typically overlain by shallow to moderately deep (i.e., less than 1.0 m thick) red podzolic soils on crests, by moderately deep (i.e., 0.7-1.5 m thick) red and brown podzolic soils on upper slopes, by deep (i.e., greater than 2.0 m thick) yellow podzolic soils on lower slopes, and by humic gleys, yellow podzolic soils and gleyed podzolic soils along drainage lines.

Nearby boreholes suggest that surficial fill may overlie residual clays above the bedrock surface.

- There is a low probability of occurrence of acid sulphate soil (ASS) at the site.
- Given the site elevation, at about RL 99.3 m relative to the Australian height datum (AHD), temporary 'perched' groundwater could be expected to occur above the bedrock surface following periods of wet weather but could vary in depth depending on seasonal and climatic factors.

5. Likely Subsurface Profile

Based on the available geotechnical information and the site inspection, the subsurface profile at the proposed location of the structure is likely to be:

- Fill up to 1 m thick; overlying
- Residual clay, ranging from stiff to hard consistency with depth, to depths of between 3 m and 4 m; overlying
- Extremely weathered siltstone of hard clay consistency to depths of between 4 m and 7 m; overlying
- Siltstone and laminite, of very low and low-to-medium strength to depths of between 7 m and 12 m; overlying

- Siltstone and sandstone, of medium to high strength.

6. Geotechnical Constraints

Access for machinery and personnel to the proposed location is possible from the Pacific Highway due to the presence of a gate into the railway corridor adjacent to the site. The main geotechnical constraint requiring consideration for footing design would be the likely presence of surficial fill above natural ground at the site. The capacity of the ground to resist both vertical and lateral forces will be uncertain though likely non-uniform where fill is present within the ground profile, so the proposed footing will need to be founded in natural ground below fill (if present), and no reliance should be placed on the engineering properties of the fill for the design of the footing, i.e., where present, the existing fill should be ignored for footing design.

7. Possible Footing System Options

The current footing system being considered, as understood from the drawings provided, is a pile footing.

The lateral and vertical bearing capacity requirements for a footing are dependent on the structural engineer's requirements of the foundation to resist design loadings (both vertical and lateral) and to limit deflections (both vertical and lateral), as well as the geological conditions to be confirmed by intrusive investigations prior to the detailed design stage.

Subject to site access constraints and the structural loadings, a large pad footing founded on natural clay could be considered for support of the proposed digital sign, provided the footing embedment is limited to no more than 1.5 m in order to avoid the need for temporary shoring that requires engineering design.

Alternatively, conventional bored piles may be considered where the lateral and vertical bearing capacities for a high-level pad footing prove inadequate for the structural loadings, following intrusive geotechnical investigations. It is noted that socketing a bored pile in bedrock would significantly improve the foundation lateral and vertical bearing capacities to resist design structural loads in comparison to a pile socketed in the overlying natural clay soils above the bedrock.

8. Risks and Opportunities

Risks that should be considered during design and construction at this site include:

- the potential presence of buried services;
- working close to existing rail infrastructure;

- possible train exclusion zones or other management measures, if construction work is to proceed outside of a track possession period;
- pedestrian and traffic management along the nearby footpath at the Pacific Highway;
- depending on footing excavation depth and depth of fill (if present), the need for temporary excavation support (e.g., temporary batters/benching or shoring boxes for a pad footing, casing for a bored pile);
- potential groundwater inflow into deep footing excavations founded in weathered rock, which could require dewatering prior to placement of concrete; and
- the potential need for powerful piling rigs if pile footings are to be socketed into medium to high strength rock.

9. Recommendations for Further Investigation

The following intrusive site investigation is recommended at this site:

- Drilling a cored borehole at the structure location to log the ground profile and obtain samples of soil and rock for laboratory testing. The borehole should extend at least 4 m into the bedrock;
- In situ strength testing of the soil profile below any existing fill, using either a hand-operated Dynamic Cone Penetrometer (DCP) or a rig-operated Standard Penetration Test (SPT);
- Laboratory testing of the recovered soil and rock samples, specifically
 - o Atterberg limits and linear shrinkage tests of the natural clay to for soil classification and assessment of soil reactivity;
 - o Aggressivity testing of soil (i.e., electrical conductivity (EC), pH, chloride- and sulfate-ions);
 - o Point load strength index testing of rock core samples at 1 m depth intervals; and
- Preparation of a summary report on the results of the field work and laboratory testing, together with comments on the relevant issues, including but not limited to excavations, excavation support, footings and foundations, and soil aggressivity to buried structural elements.

10. Limitations

Douglas Partners (DP) has prepared this report for this project at 331 Pacific Highway, Lindfield, in accordance with DP's proposal dated 1 February 2023 and acceptance received from Hanlon Industries Pty Ltd dated 2 February 2023. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Hanlon Industries Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or another site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon published information sources and the conditions observed during a site inspection from outside the rail corridor boundary fence. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site and may also be limited by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.


Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd


Atha Kapitanof
Associate

Reviewed by


Scott Easton
Principal

Attachments: About this Report
 Architectural DA Drawings

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

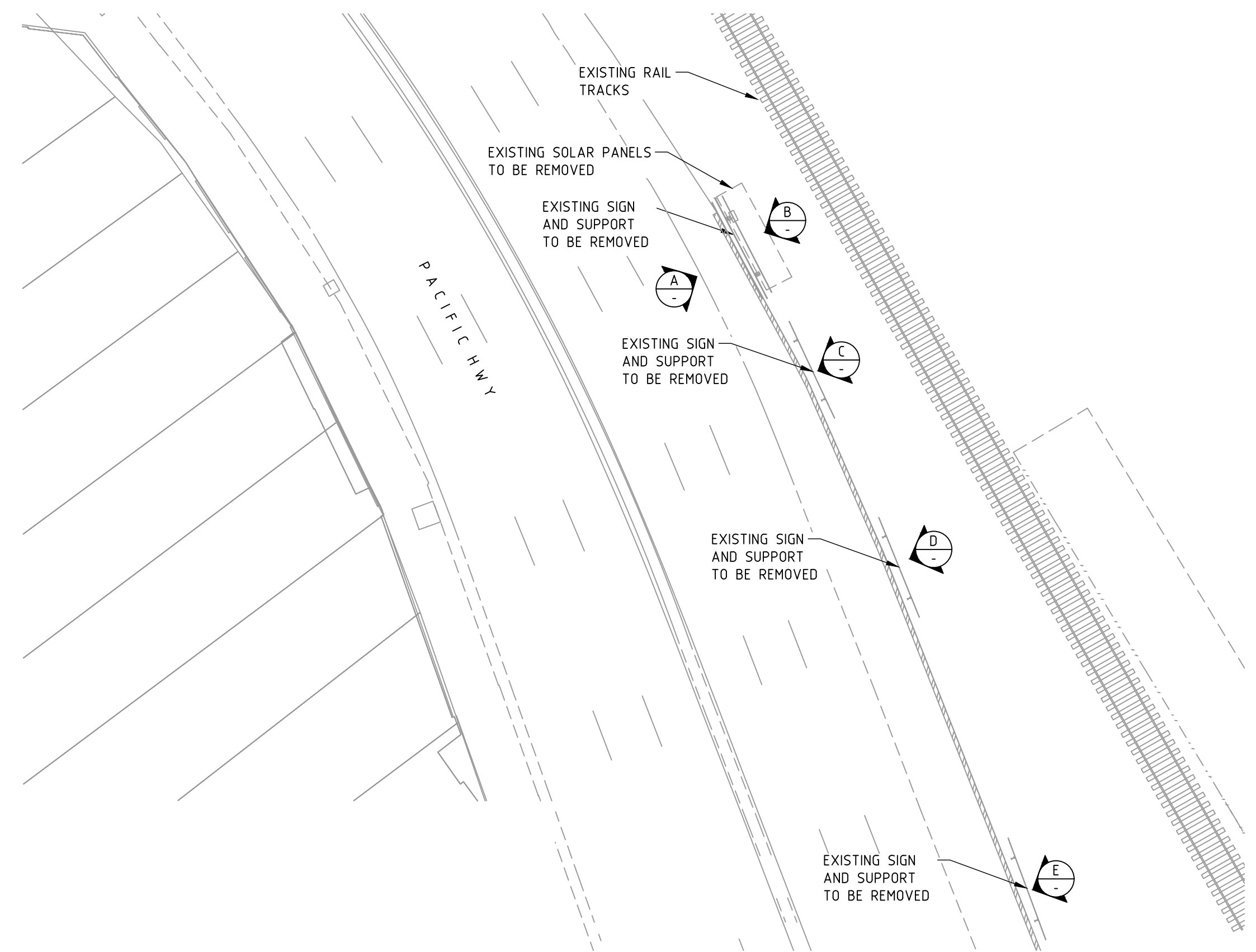
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



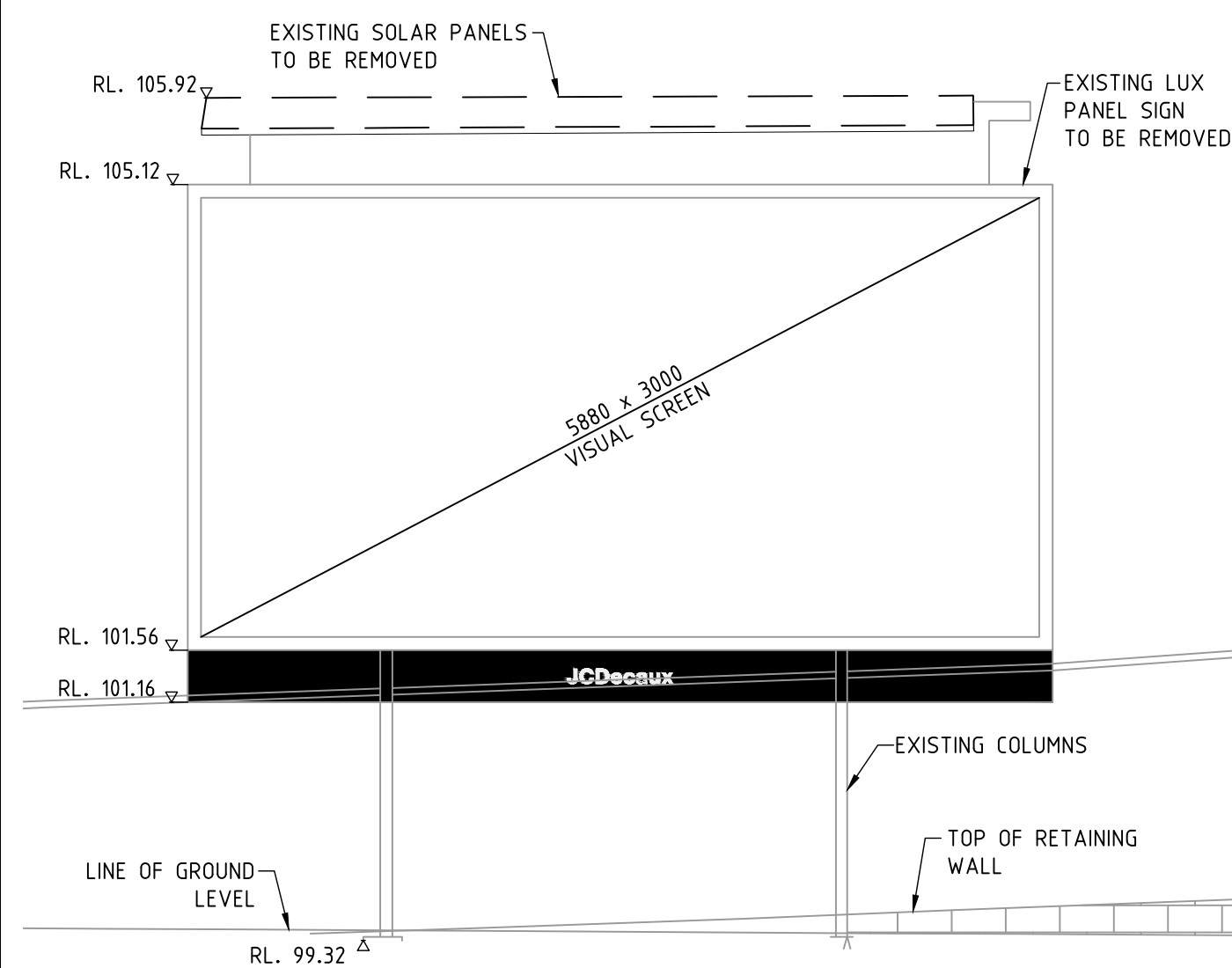
AERIAL PHOTO
NTS

DEMOTION PROCEDURE FOR EXISTING SIGNS

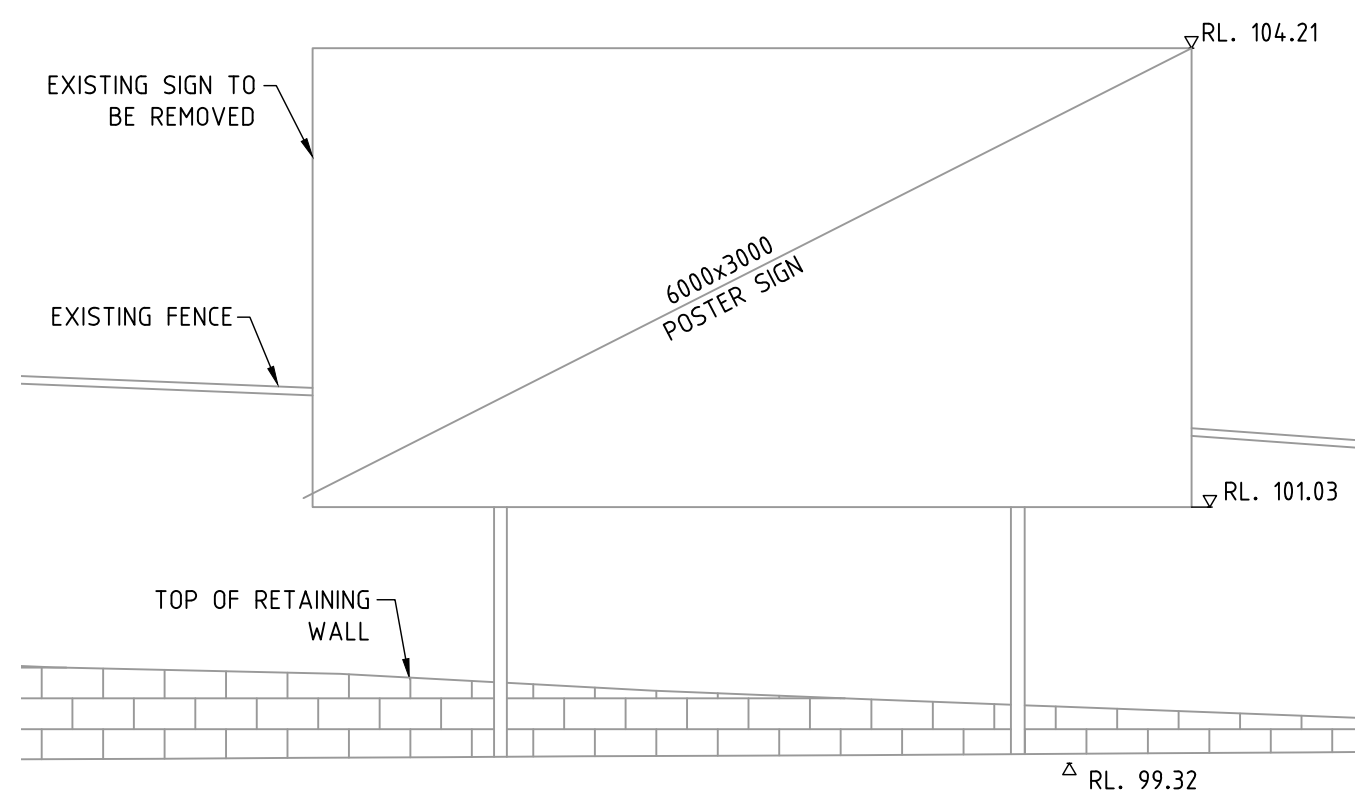
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2. CUT BACK EXISTING PILES TO A DEPTH OF 300M BELOW GROUND.
3. COAT ANY EXPOSED REINFORCEMENT WITH AN APPROVED EPOXY GROUT.
4. REINSTATE SOIL OVER THE TOP OF THE PILES.



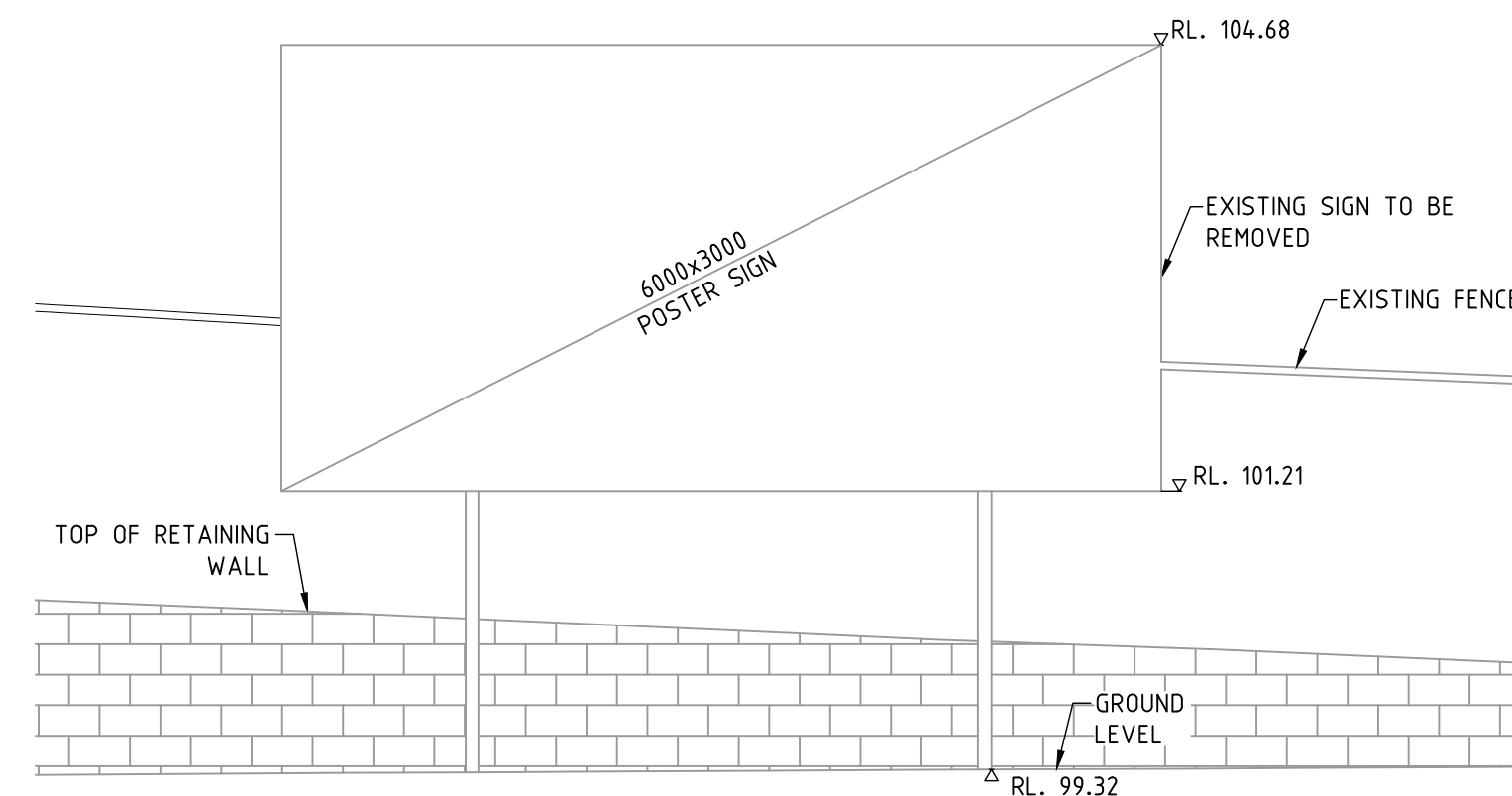
SITE PLAN
SCALE 1:250



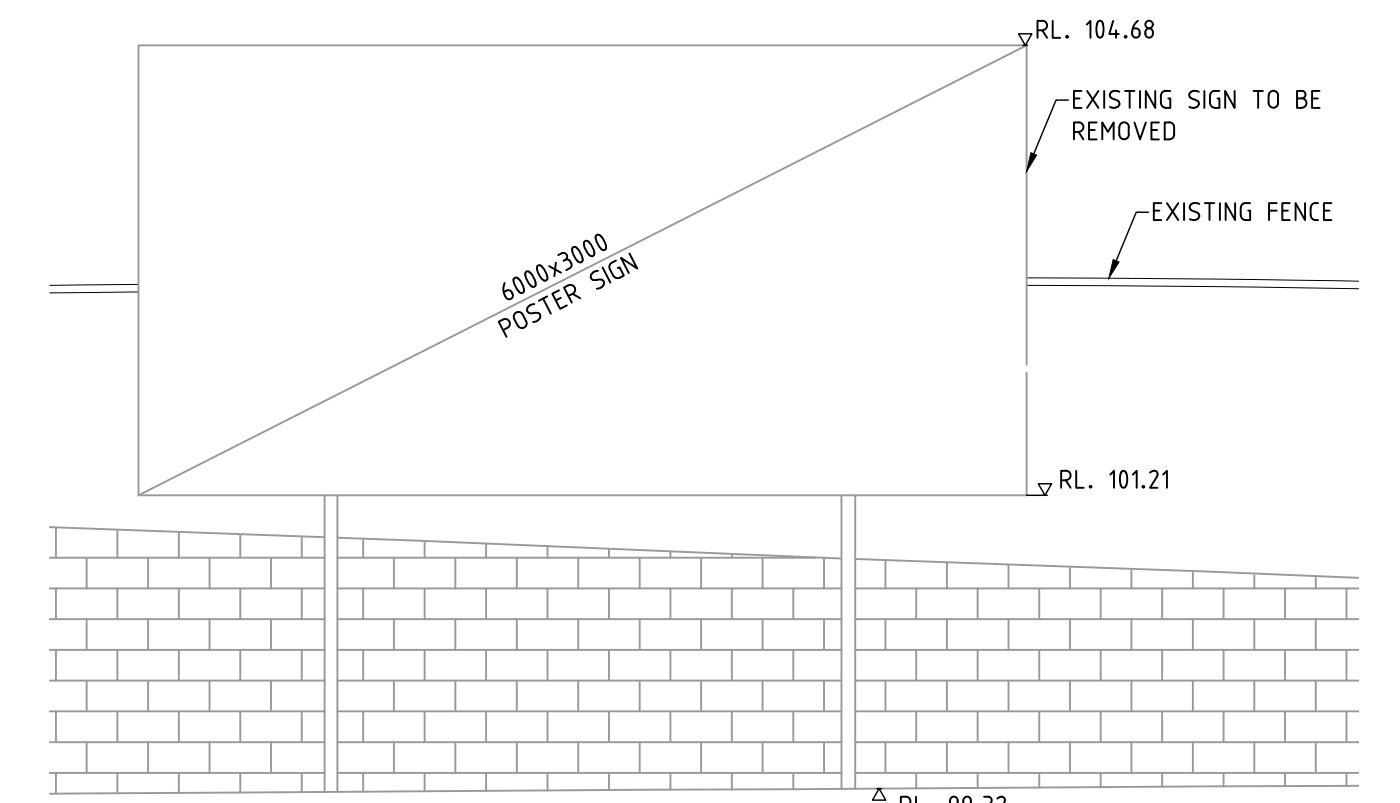
ELEVATION A
SCALE 1:50



ELEVATION B
SCALE 1:50



ELEVATION C
SCALE 1:50



ELEVATION D
SCALE 1:50

NOT FOR CONSTRUCTION

ISS	DATE	COMMENT
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B	19/10/22	ISSUED FOR APPROVAL

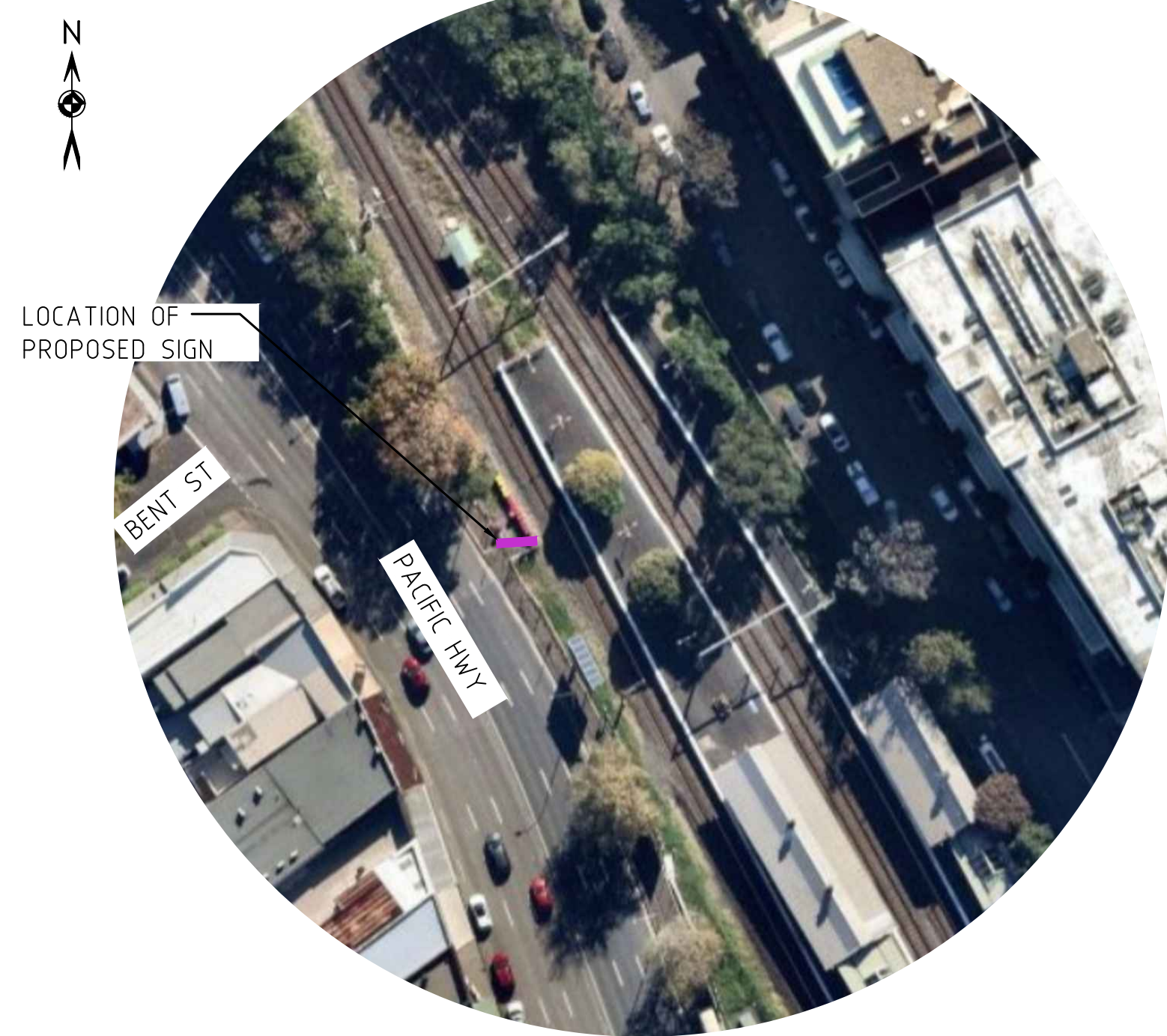


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ABN 23 039 013 724

CLIENT:
JCDecaux
PROJECT:
PACIFIC HIGHWAY AFTER
HAVILAH RD, LINDFIELD

TITLE:
EXISTING SIGN
GENERAL ARRANGEMENT &
SITE PLAN

DRAWN M.T	DESIGN J.L	DATE: JUN 22
JOB NO: 22097	DWG NO: DA01	
SCALE @ A1: AS SHOWN	REV: B	

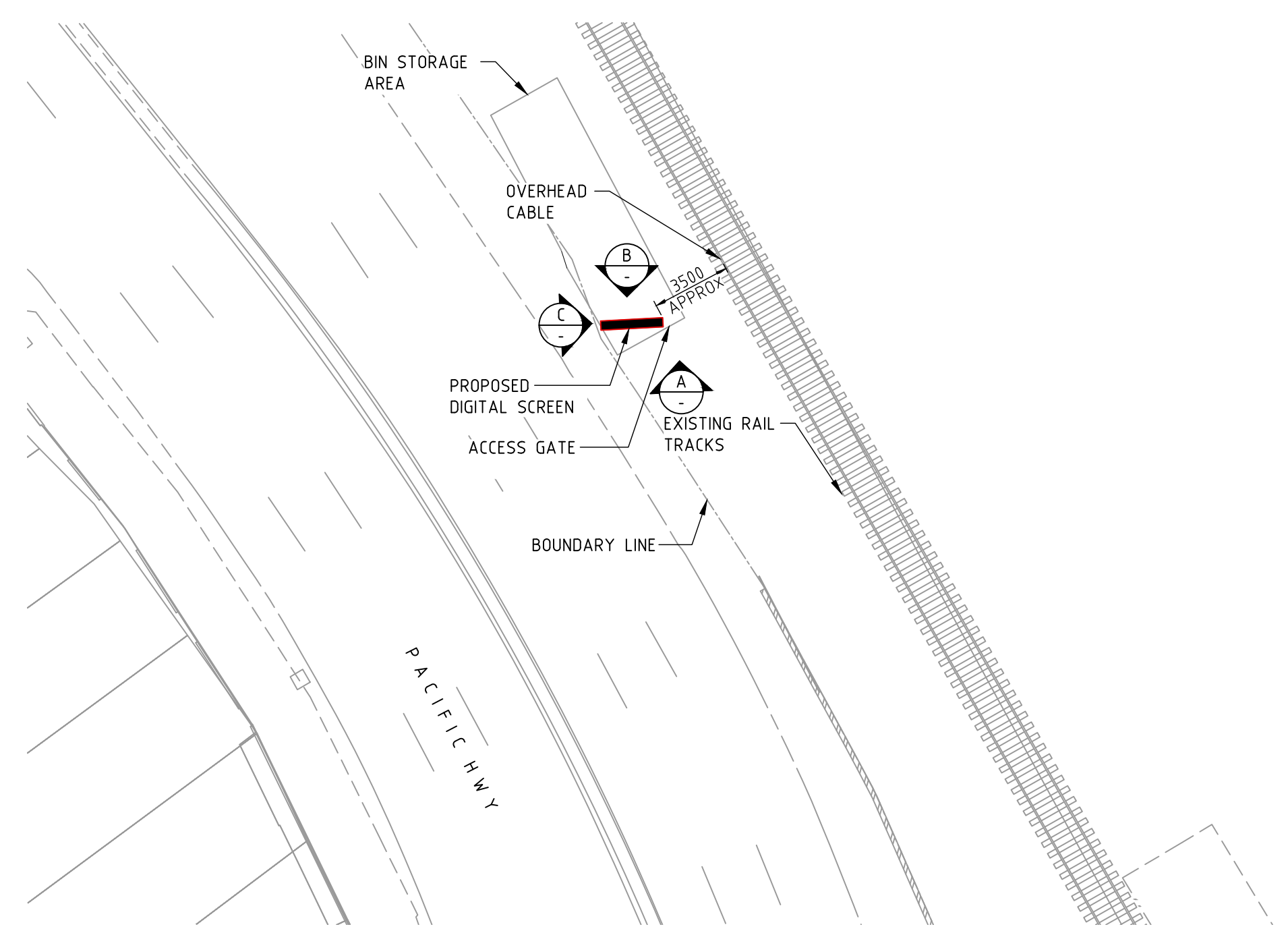


LOCATION OF
PROPOSED SIGN

BENT ST

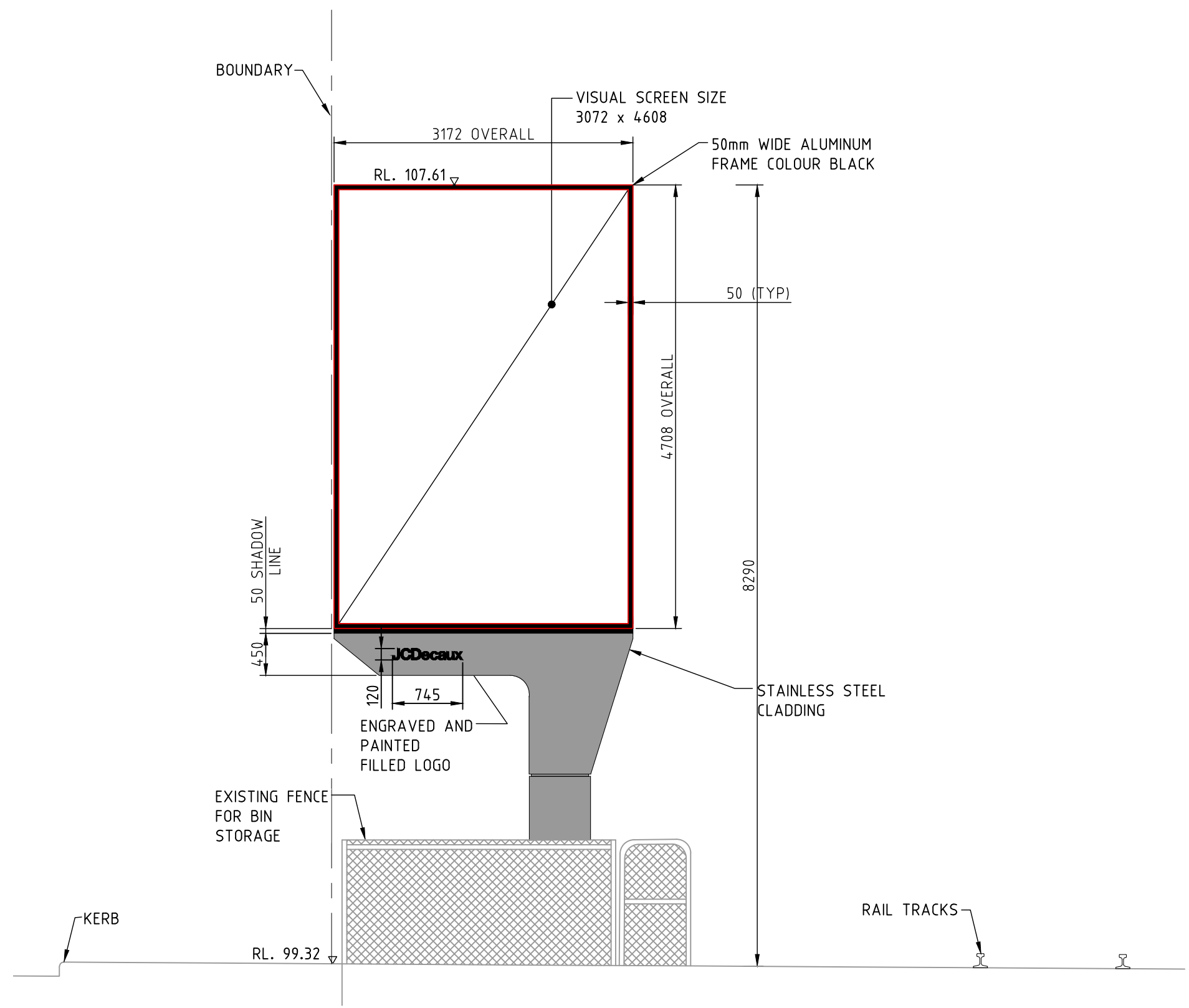
PACIFIC HWY

AERIAL PHOTO
NTS

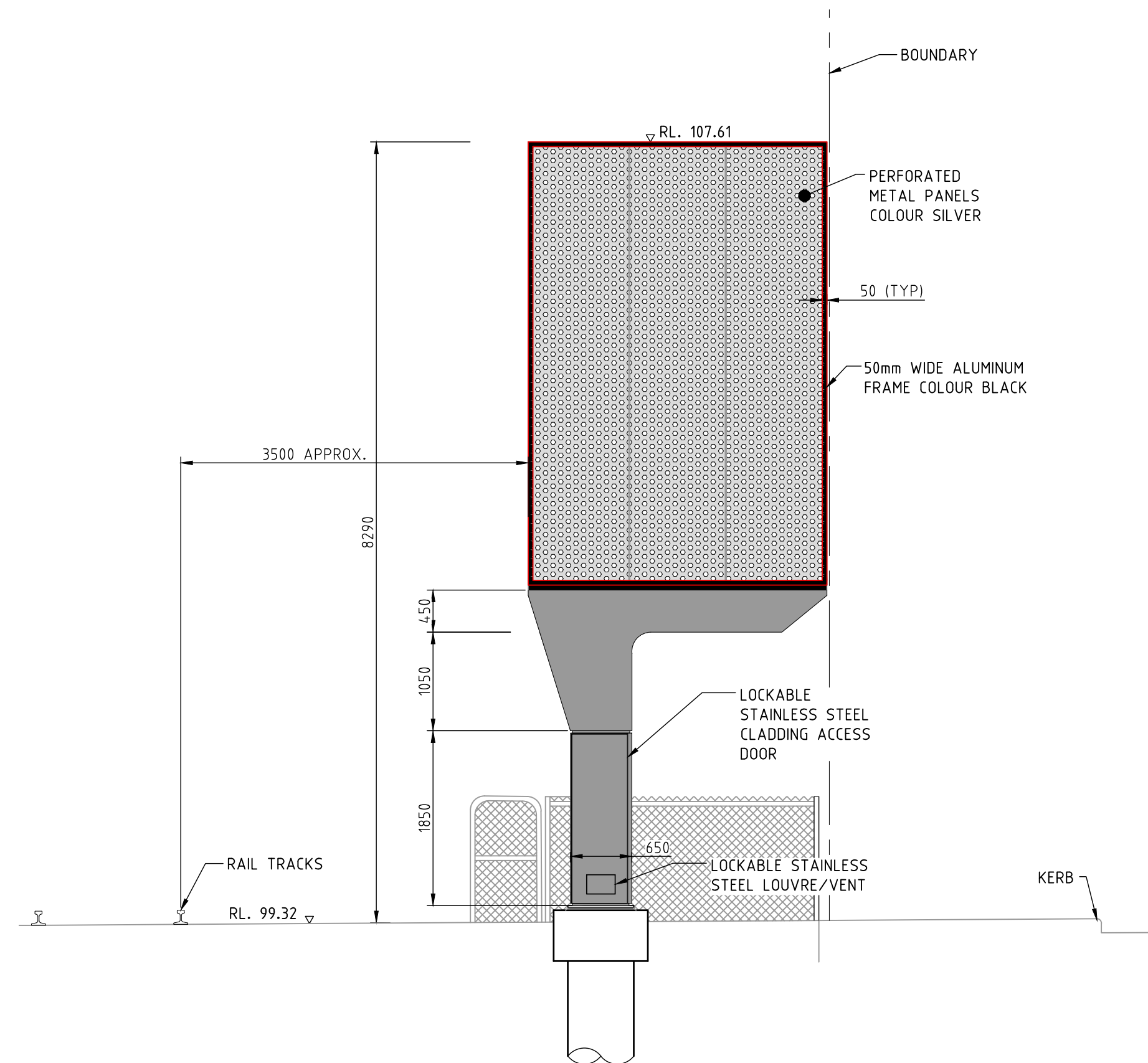


PACIFIC HWY

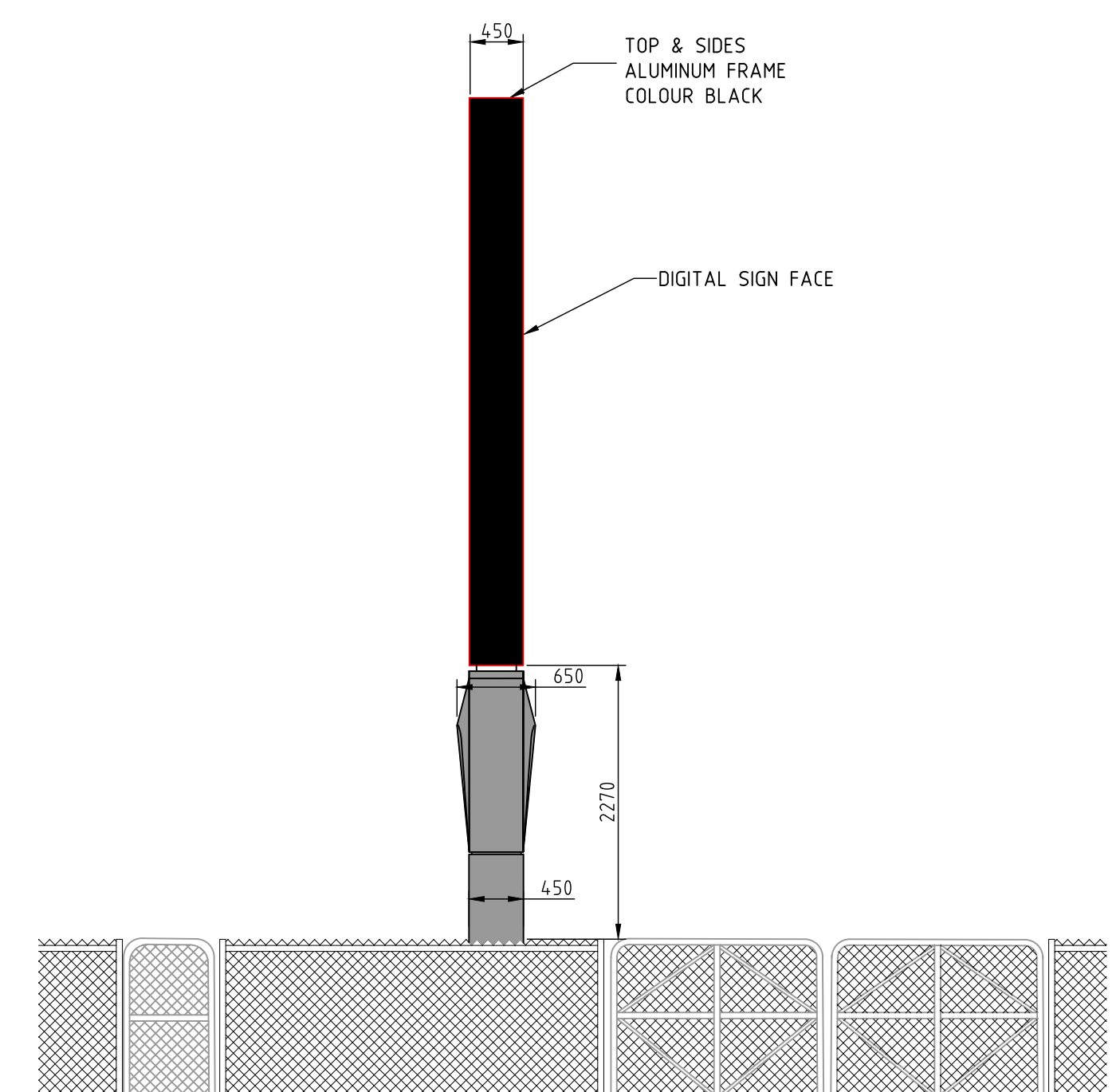
SITE PLAN
SCALE 1:250



SECTION A
SCALE 1:50



SECTION B
SCALE 1:50



SECTION C
SCALE 1:50

NOT FOR CONSTRUCTION

ISS	DATE	COMMENT
A	13/07/22	ISSUED FOR APPROVAL
B	22/07/22	ISSUED FOR APPROVAL
C	19/07/22	ISSUED FOR APPROVAL



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ABN 23 039 013 724

CLIENT:
JCDecaux

PROJECT:
**PACIFIC HIGHWAY AFTER
HAVILAH RD, LINDFIELD**

TITLE:
**PROPOSED DIGITAL SIGN
GENERAL ARRANGEMENT &
SITE PLAN**

DRAWN M.T.	DESIGN J.L.	DATE: JUN 22
JOB NO: 22097	DWG NO: DA02	
SCALE @ A1: AS SHOWN	REV: C	