COWPASTURE ROAD BOSSLEY PARK NSW - EXISTING ADVERTISING SIGNS

Structural Assessment

Structural Consulting Engineering Services

Prepared for
oOh! Media Operations Pty Ltd

Prepared by
JMP Consulting Engineers

REV	DATE	STATUS	PREPARED BY INIT	PREPARED BY SIGN	PROJECT LEADER INIT	PROJECT LEADER SIGN	DESIGN REVIEWER INIT	DESIGN REVIEWER SIGN
B	29/02/2024	Information Added as per DPHI Requirements	EVL		EVL		MB	
A	27/02/2024	For Information	EVL		EVL		MB	

Ref: 20 24/87/4979 01/SD01, © John Mullen & Partners Pty Ltd

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Introduction

This report has been commissioned by oOh! Media for JMP to appraise the structural design and strength of the existing advertising signage structure attached to the roof of the pedestrian bridge over Cowpasture Road, Bossley Park, NSW.

The purpose of this appraisal is to evaluate the structure for compliance as part of the oOh! Media development application to the Department of Planning, Housing and infrastructure (DPHI) in NSW. DPHI requested oOh! Media to confirm that the specifications of the original structural design of the sign is compliant with current Design Standards and whether the "as built" structure conforms to the current relevant standards to be undertaken by a suitably registered structural engineer.

Our appraisal has been based upon information provided in the form of extracts from the original structural design drawings and a Structural Condition Report included within Appendix 1 and Appendix 2 respectively.

This report is not intended to be a dilapidation survey of the condition of the existing steel structure and that JMP have not witnessed the structure in person.

We have excluded from this appraisal an assessment of the existing bridge structure itself and maintenance access provisions, for conformance with the current BCA/NCC or other relevant Australian Standards.

This report is prepared by a Qualified Structural Engineer.

Description

The signage structure is commonly referred to as a double-sided front supersite having a nominal display size of 12,660mm long x 3,350mm high. The width of the display is approximately 1100mm wide.

The signage structure comprises a galvanised structural steel framed box structure with circular hollow section (CHS) legs. The legs penetrate the roof and are fully welded to the top of the bridge frame structures.

The structural steel framed box of the sign has upper and lower maintenance access catwalks which provide the sign installers access to the top and bottom of the sign for each face.

Design Methodology and Design Parameters

This report details the structural assessment of the existing steel framed box sign structure supporting the static screen for the Ultimate Limit State and Serviceability Limit State Loading Cases.

Wind loading used in the assessment is as per AS1170.2:2021 with the appropriate factors and wind speed for the region.

The weight of the advertising fixed banner skin, 12.66m x 3.35m applied on the structure is 15kgs each side. This load is equivalent to 0.35kg /m^2. Other accessories such as access catwalks are added as super imposed dead loads on the structure. Live loads on the walkways are also considered in accordance with AS1657.

The design evaluation of the signage framing members was undertaken using Space Gass and Toolkit software. Steel connections were evaluated using in house design procedures.

Steel Parameters

E = 200,000 MPa

Yield strength of plates = 300 MPa

Yield strength of hollow sections = 350 MPa

Yield strength of all other members = 250 MPa

Weld yield strength = 480 MPa

Design Codes and References

AS/NZS 1170.0:2002 Structural Design Actions – Part 0: General Principles.

AS/NZS 1170.1:2002 Structural Design Actions – Part 1: Permanent, Imposed and other actions.

AS/NZS 1170.2:2021 Structural Design Actions – Part 2: Wind Loads.

AS1657:2018 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation.

AS2312.1:2014 Guide to the Protection of Structural Steel against Atmospheric Corrosion by the Use of Protective Coatings.

AS4100:2020 Steel Structures

AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

Load Combinations

Load Combinations are based on the requirements of AS1170.0. Refer to Space Gass Input (Section D.2) for load combinations used in this assessment.

Summary of Results

Based upon our analysis, we have found that all steel members are adequate for Ultimate Limit State Load Case.

All steel connections shown on the design drawings and depicted in the photos are adequate to resist the design forces.

All predicted displacements of the boxed frame are within the normal industry accepted Serviceability Limit State specified in AS1170.0.

Those recommendations nominated in the structural conditions report prepared by Arcadis should be implemented in the short term to prolong the longevity of the structure and be more serviceable.

The above-mentioned results and implementation of the recommendations ensure the structural viability of the signage structure and compliance with relevant Building Code of Australia (BCA) requirements and Australian Standards.

Site Location

JOHN MULLEN & PARTNERS
J M P
A SPECIALIST PRACTICE

Project: EXISTING ADVERTISING SIGNAGE , COWPASTURE ROAD, BOSSLEY PARK.

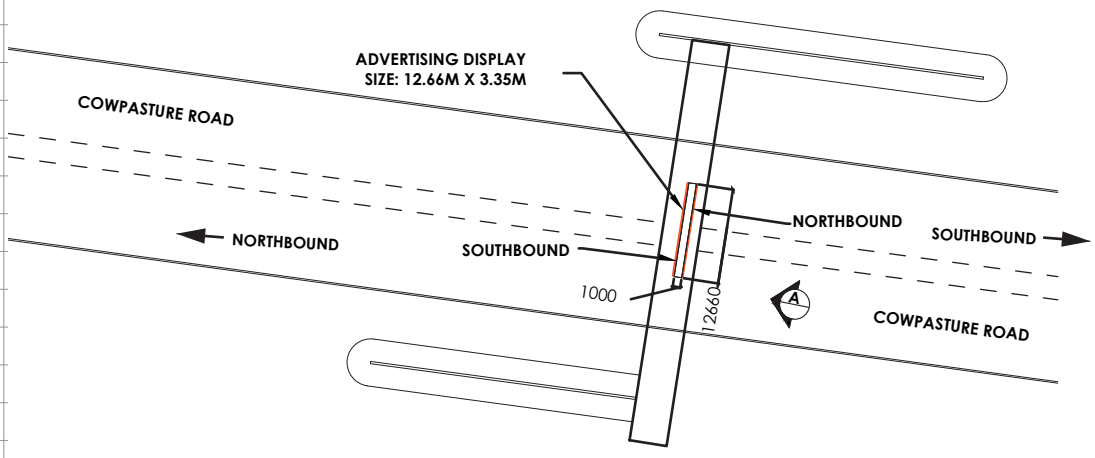
COMPUTATION SHEET

Designer: EL Date: 26.02.2024 Project No: 4979 01

Project Leader: EL Reviewer: MB Date: 29.02.2024 Sheet of

Level 7, 400 Collins Street
Melbourne 3000
Telephone (03) 9600 0366
jmpmelb@jmp.com.au

PHOTOGRAPHIC VIEW



SITE PLAN

Existing Structure Geometry and Sizes

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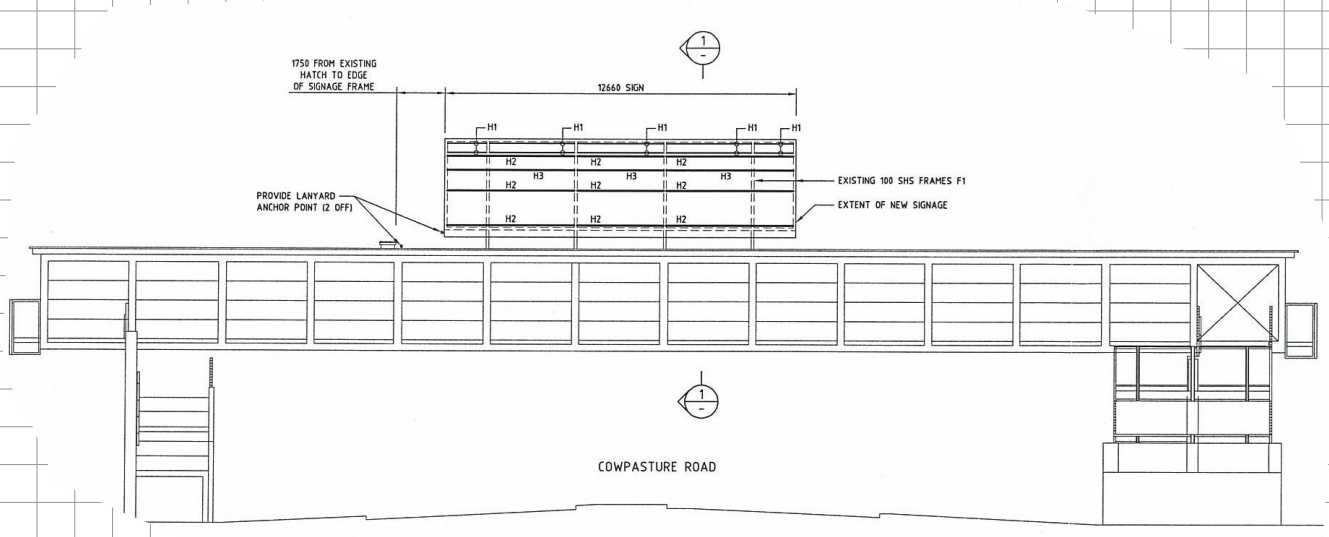

SOUTH ELEVATION
SCALE 1:100

MEMBER SCHEDULE		
MEMBER	SIZE	REMARKS
H1	50x50x4.0 SHS	SITE WELD TO F1
H2	75x75x4.0 SHS	SITE WELD TO F1
H3	125x75x6.0 UA	SITE WELD TO F1
H4	50x50x4.0 SHS	SITE WELD TO END F1'S
NOTE: ALL MEMBERS TO BE FULLY HOT DIP GALVANISED AFTER FABRICATION. TOUCH UP ON SITE.		

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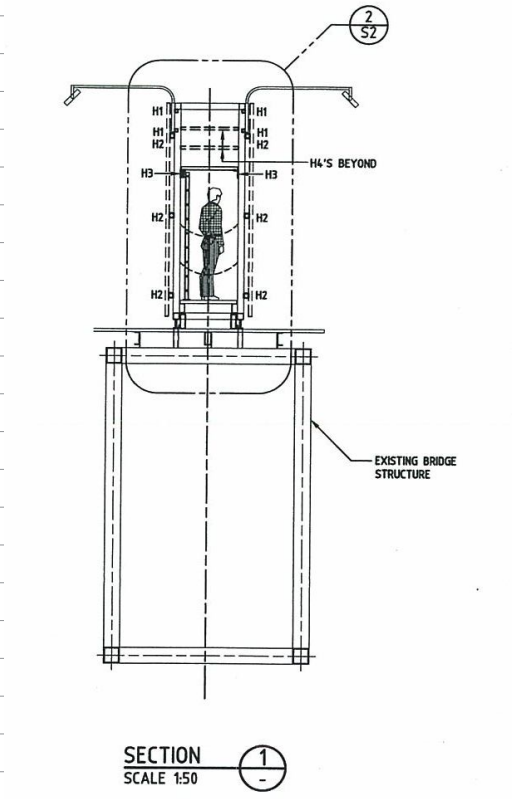
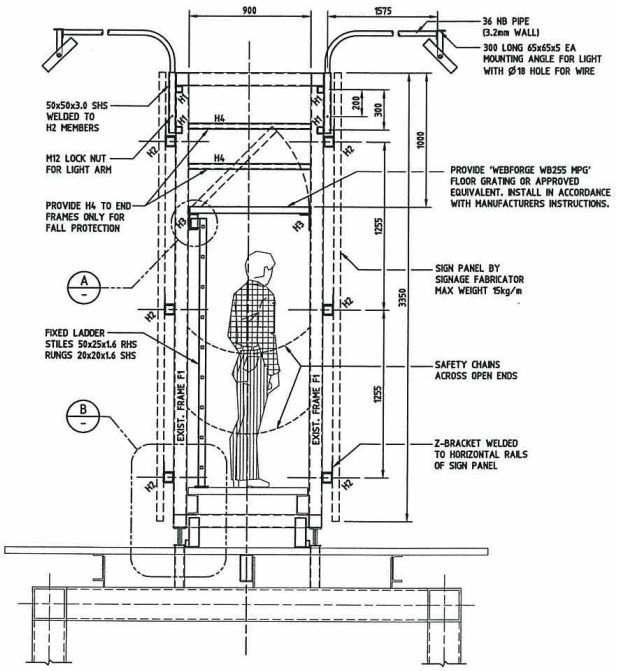
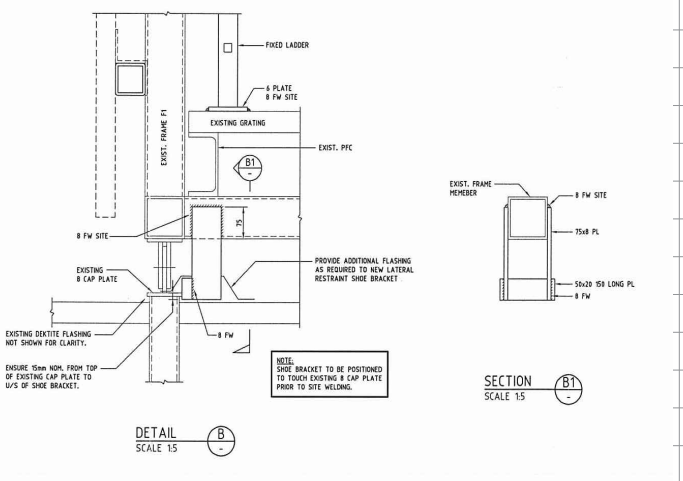


SECTION 1 / SCALE 1:50



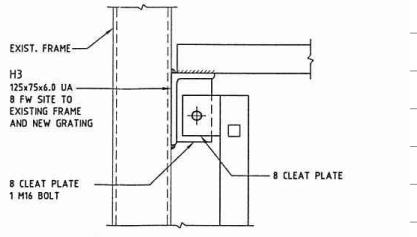
DETAIL 2 / S1 / SCALE 1:20

NOTE:
LOCATION AND SUPPORT OF SIGN STRUCTURE DETERMINED BY EXISTING FRAMES F1. CHECK DIMENSIONS ON SITE.

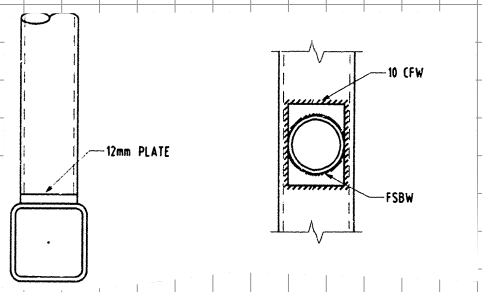


DETAIL B / SCALE 1:5

SECTION B1 / SCALE 1:5



DETAIL A / SCALE 1:5



CHS CONNECTION TO BRIDGE FRAMING

Signage Weight and Wind Loading

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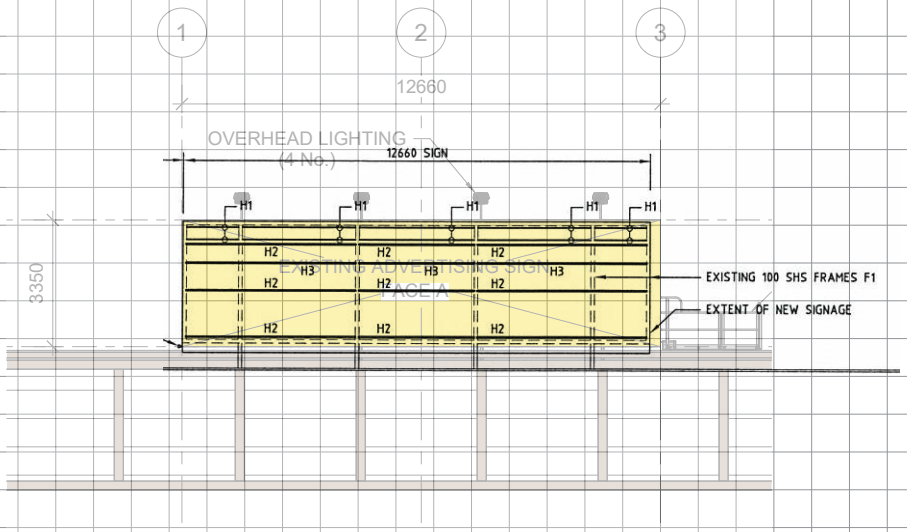

WEIGHT OF SUPERSITE STATIC SCREEN = 0.035KN/m^2

STEEL WEIGHT DENSITY =7,800 KG/M

NORTH- SOUTH DIRECTION

qu = 1.17 kPa

Cpn = 1.54

Wind Load =1.17 X1.54= 1.80 kPa

PLATFORM LIVE LOAD=2.5kPa

REFER SPACEGASS OUTPUT.

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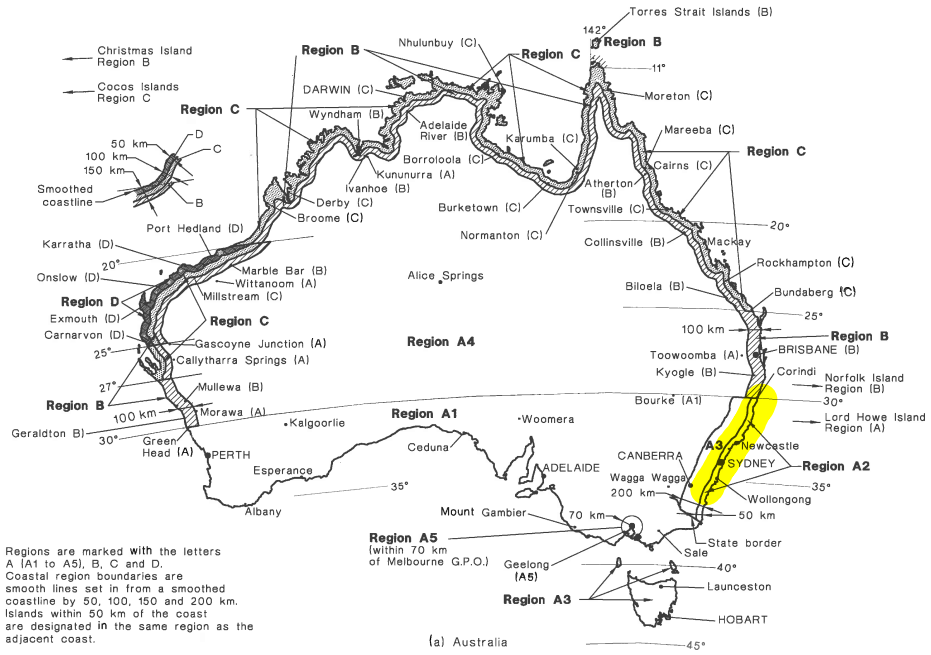

FIGURE 3.1(A) WIND REGIONS

Wind Actions

Wind Loads shall be calculated in accordance with AS1170.2:2021 Structural design actions - Wind Actions as specified below.

Parameters	ULS (1/500)	SLS (1/25)
Importance Level	IL2	
Wind Region	A2 (Sydney)	
Regional Gust Wind Speed, V_R	45 m/s	37 m/s
Terrain category	2	
Terrain/height multiplier, $M_{z,cat}$	As per Table 4.1 of AS/NZS 1170.2	
Directional multiplier, M_d	As per Table 3.2 of AS/NZS 1170.2	
Shielding multiplier, M_s	1.0	
Topographic multiplier, M_t	1.0	
Net pressure coefficient, $C_{p,n}$	As per Table B.2 of AS/NZS 1170.2	
Net porosity factor, K_p	1.0	
Aerodynamic shape factor, C_{shp}	$C_{p,n} \times K_p$	

WIND V5.03

JMP

Design: **(Wind Analysis WA01) Sydney, Non-temporary structure**
Importance: **All other structures not included in 1,3 or 4, Life = 50 years, Non-Cyclonic, APE = 500 years, APE.Serv = 25 years**
Pressures: **Wu.max = 1.29kPa, Ws/Wu =0.68**

Location - Fig 3.1(A), 3.1(B)

Location =	Sydney		
Region =	A	Figure 3.1(A)	
Sub region =	2	Figure 3.1(A)	
Cyclonic =	N (Y)es, (N)o	Table 3.2(A)	

Importance

All other structures not included in 1,3 or 4

Importance level =	2	1,2,3,4,(C)ustom
Design working life =	50	Years

Annual prob. of exceedance (APE) = 1/	500	years	AS1170.0 - Table F2
Annual prob. of exceed. Serv. (APE.s) = 1/	25	years	AS1170.0 - Appendix C

Design wind speed (Vdes,q) - Cl 2.3

Ultimate regional wind speed (VR) =	45	m/s	For a 1/500 APE - Table 3.1
Serv. regional wind speed (VR.s) =	37	m/s	For a 1/25 APE.s - Table 3.1
Climate change multiplier(Mc) =	1.00		Table 3.3
Minimum ultimate speed (Vdes,θ) =	30	m/s	- Cl 2.3
Ratio VR.s / VR =	0.82		
Ratio Ws / Wu =	0.68		

Design wind data for non-cyclonic areas with APE of 1:500 years

Dir (b)	Vdes,θ m/s	Wu kPa	Ws kPa	Dir (b)	Vdes.θ m/s	Wu kPa	Ws kPa
N	44.1	1.17	0.79	**NE**	39.5	0.93	0.63
S	44.1	1.17	0.79	**SW**	46.4	1.29	0.87
E	44.1	1.17	0.79	**SE**	44.1	1.17	0.79
W	46.4	1.29	0.87	**NW**	46.4	1.29	0.87

Site wind data for non-cyclonic areas with APE of 1:500 years

Dir (b)	Md (*1)	VR*Mc*Md m/s	Ave. Ht (z) m	Cat	Mz,cat	Ms	Mt	Vsit,β m/s	Wu.sit kPa
N	0.85	38.3	13.2	2	1.03	1.00	1.00	39.5	0.93
NE	0.75	33.8	13.2	2	1.03	1.00	1.00	34.8	0.73
E	0.85	38.3	13.2	2	1.03	1.00	1.00	39.5	0.93
SE	0.95	42.8	13.2	2	1.03	1.00	1.00	44.1	1.17
S	0.95	42.8	13.2	2	1.03	1.00	1.00	44.1	1.17
SW	0.95	42.8	13.2	2	1.03	1.00	1.00	44.1	1.17
W	1.00	45.0	13.2	2	1.03	1.00	1.00	46.4	1.29
NW	0.95	42.8	13.2	2	1.03	1.00	1.00	44.1	1.17

*1 - Refer to Table 3.2 and Cl 3.3, TC interpolated

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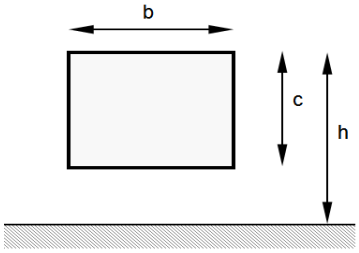
HOARDINGS V5.01

JMP

Member: **(Hoarding H01) 12.7m wide x 3.4m high, 13.2m to top (9.9m gap under)**
Normal: **Cp,n = 1.54**
Wind at θ=45: **Cp,n = 1.54**
Wind at θ=90: **Cp,n = ±1.2 - 0 to 2c, ±0.6 - 2c to 4c, then ±0.3**

Freestanding hoardings and walls - Appendix B.2

Breadth (b) =	12660	mm
Element height (c) =	3350	mm
Total height (h) =	13200	mm
Ratio (b/c) =	3.78	
Ratio (c/h) =	0.25	



Aerodynamic shape factor (Cshp) = Cp,n*Kp Equ B.2
Cp,n = Net pressure coefficient - Cl B.2.1
Kp = Net porosity factor - Cl B.1.4

Wind normal to hoarding or wall θ = 0° - Table B.2(A)

Ratio (b/c) =	3.78	
Ratio (c/h) =	0.25	
Cp,n = 1.3 + 0.5(0.3+log10(b/c))*(0.8-c/h) =	1.54	
Vertical height of resultant (h-c/2) =	11525	mm above the surface
Horizontal eccentricity of resultant (e = 0) =	0	mm (No eccentricity)

Wind at θ = 45° to hoarding or wall - Table B.2(B) & B.2(C)

Ratio (b/c) =	3.78	
Ratio (c/h) =	0.25	
Cp,n = 1.3 + 0.5(0.3+log10(b/c))*(0.8-c/h) =	1.54	
Vertical height of resultant (h-c/2) =	11525	mm above the surface
Horizontal eccentricity of resultant (e = 0.2*b) =	2532	mm
From Table B.2(B)		

Wind parallel to hoarding or wall θ = 90° - Table B.2(D)

Ratio (b/c) =	3.78	
Ratio (c/h) =	0.25	
Cp,n =	±1.2 - 0 to 2c, ±0.6 - 2c to 4c, then ±0.3	

Net porosity factor - B.1.4

Solidity factor (δ) =	1.000	ratio of solid area to total area of structure
Net porosity factor Kp = 1-(1-δ)² =	1.000	

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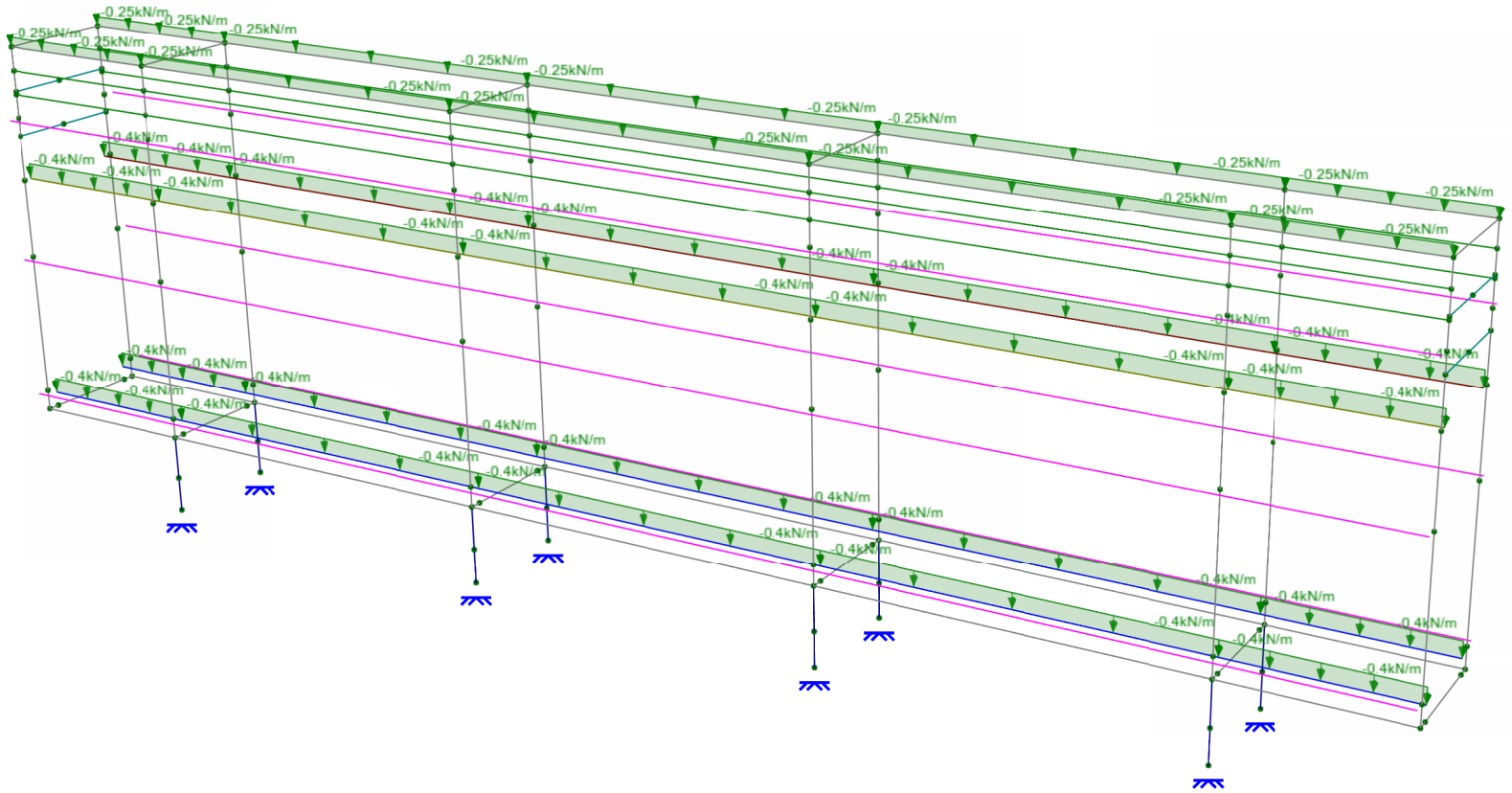
Load case 2
2 Dead Load + Signage Load

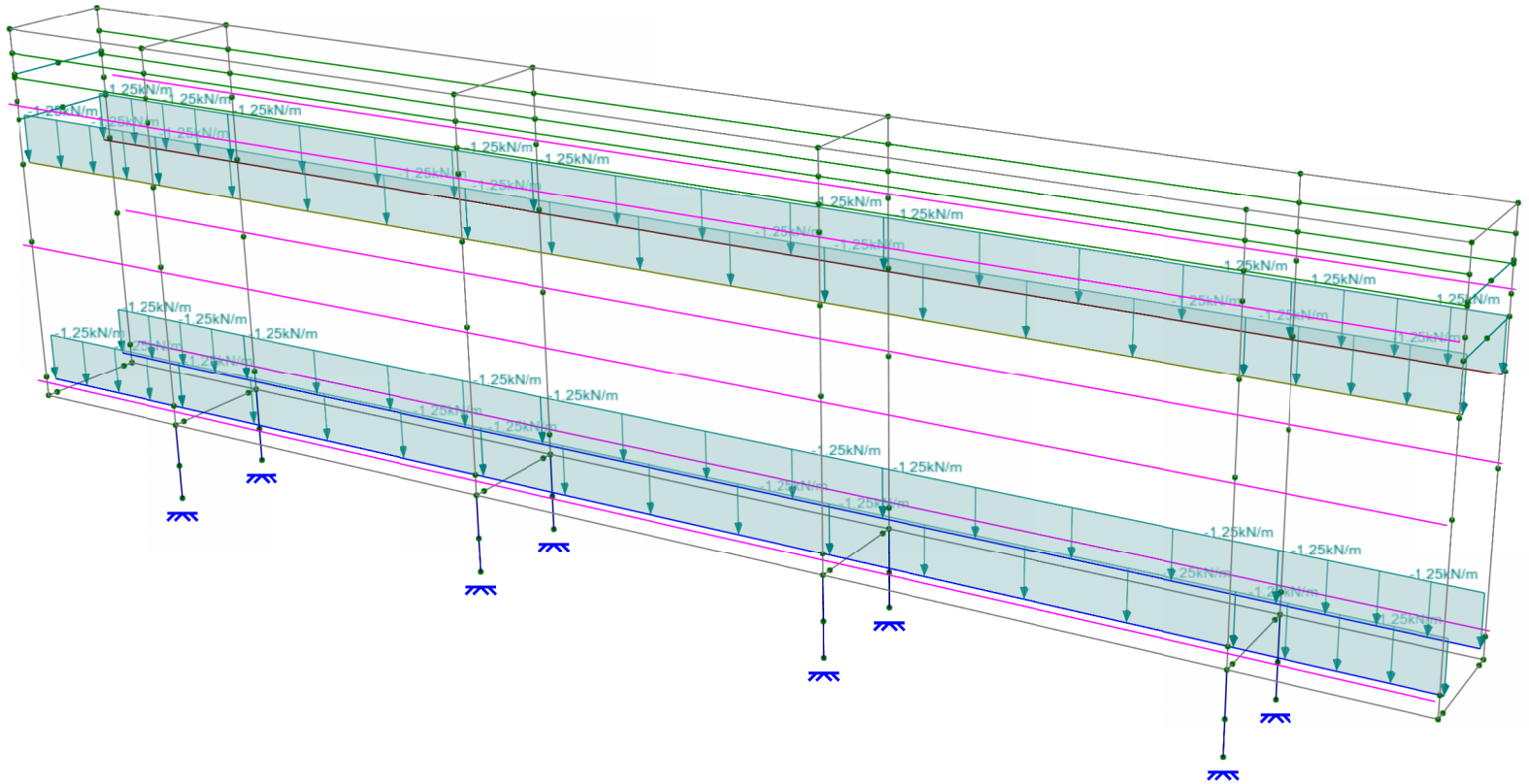


Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (29,18), Loads

Load case 3
3 Live Load



Viewpoint (29,18), Loads

Sections:
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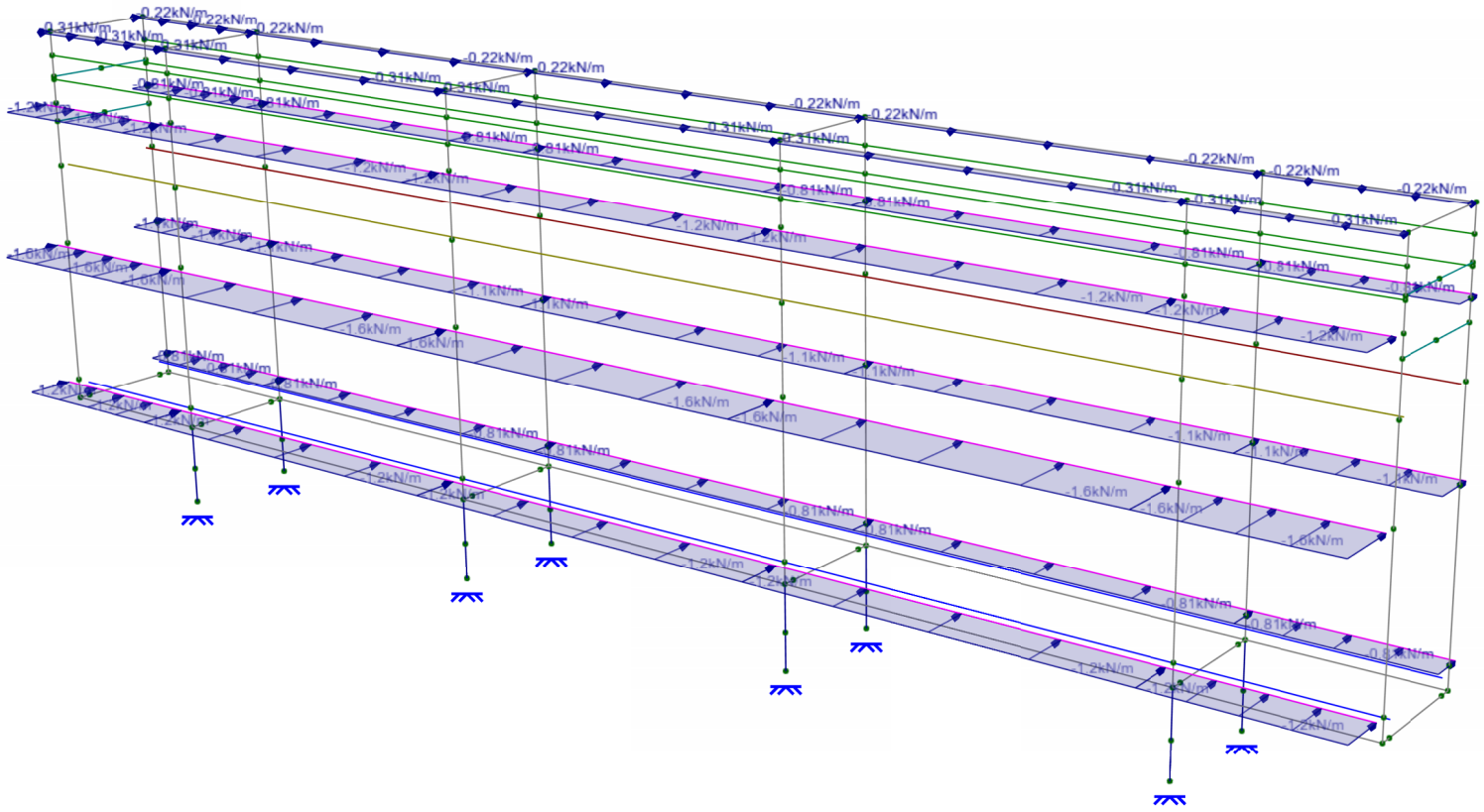
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Load case 4
4 Wu

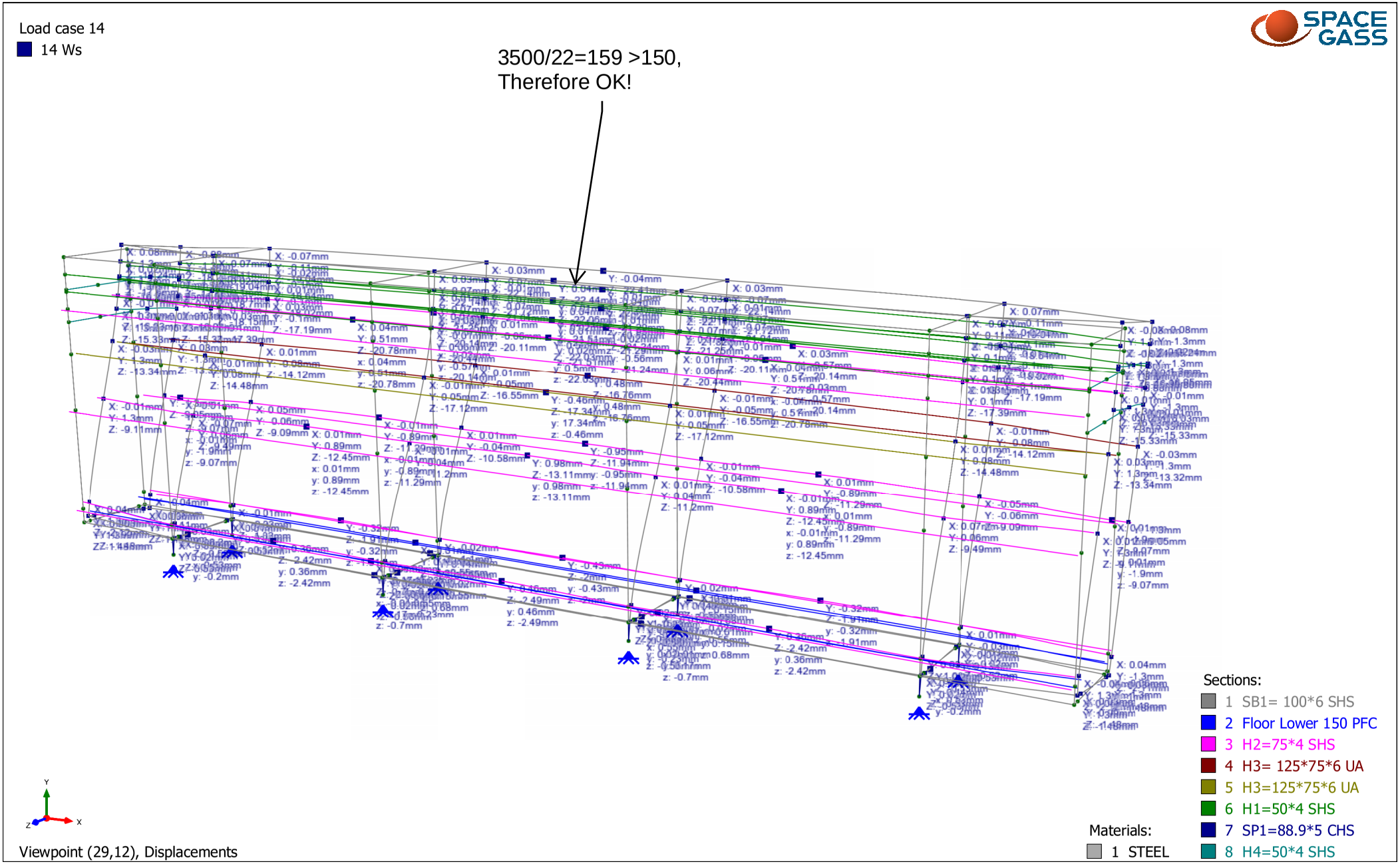


Viewpoint (35,15), Loads

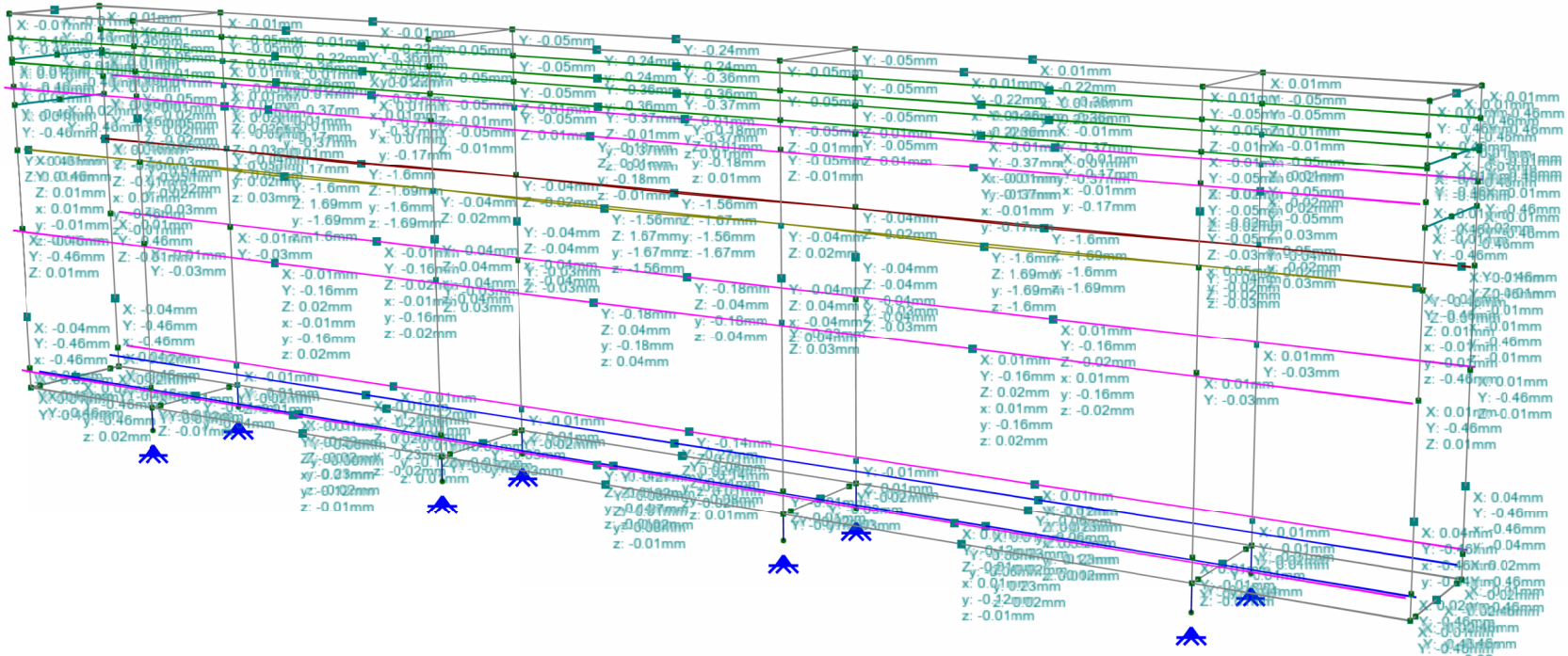
Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Serviceability Assessment


Load case 14
14 Ws
3500/22=159 >150,
Therefore OK!
SPACE GASS
Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS
Materials:
1 STEEL
Y
Z
X
Viewpoint (29,12), Displacements

Load case 13
13 (SW) DL+0.7LL



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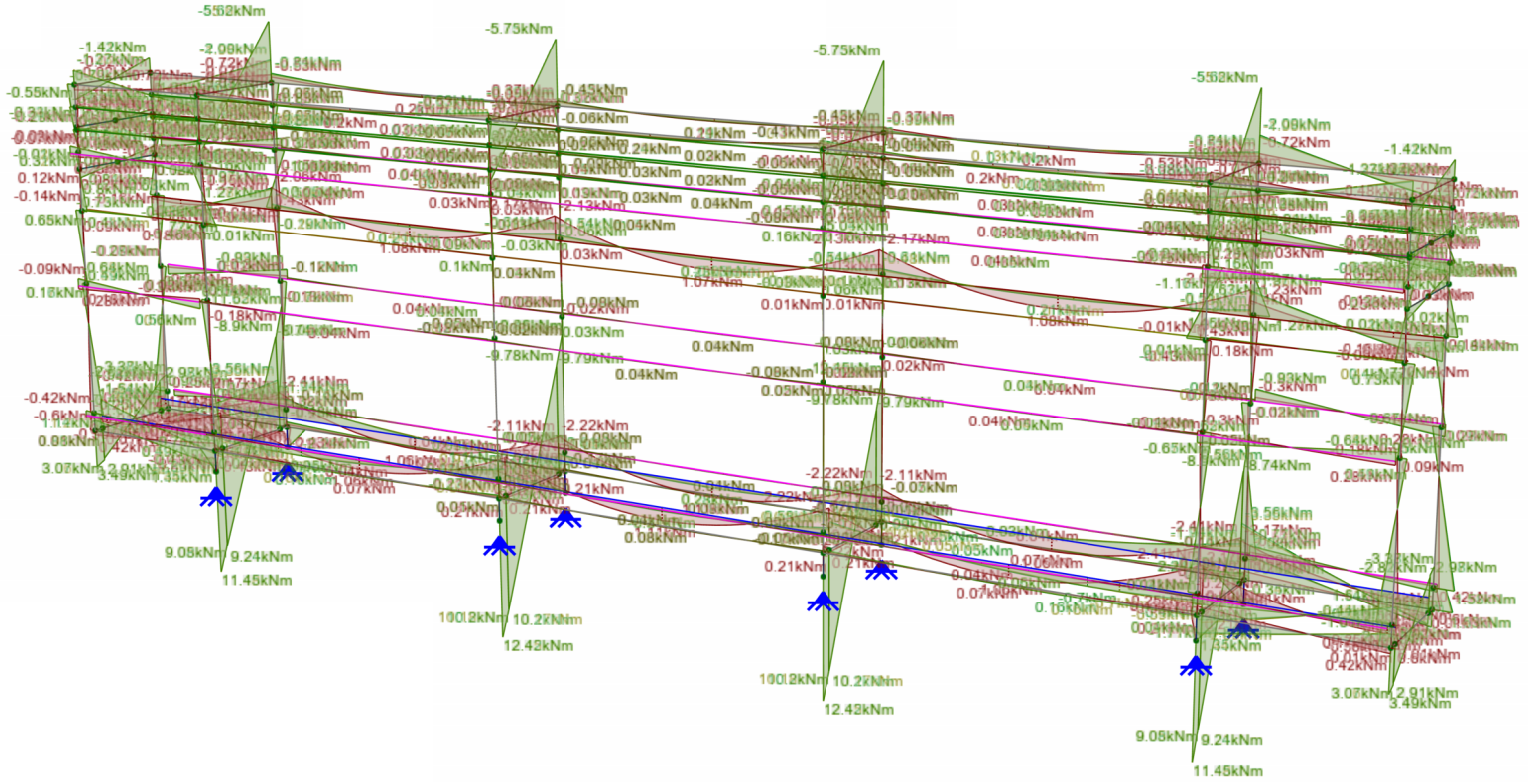
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (31,10), Displacements

Strength Assessment

Load cases 10-12
(1) Strength
10 (SW) 1.2DL+1.5LL
11 (SW) 0.9DL+ Wu
12 (SW) 1.2DL+ Wu



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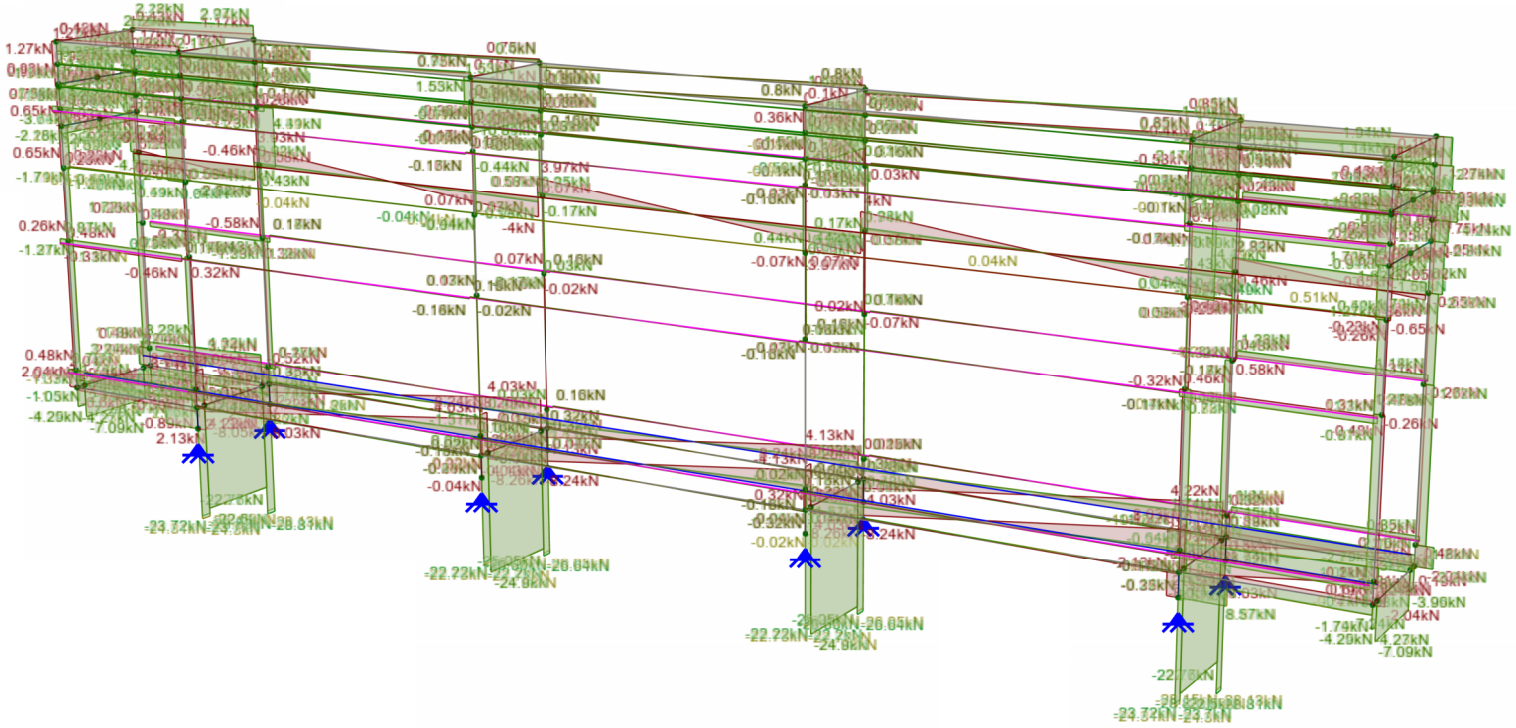
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (29,12), Moments

Load cases 10-12
(1) Strength
10 (SW) 1.2DL+1.5LL
11 (SW) 0.9DL+ Wu
12 (SW) 1.2DL+ Wu



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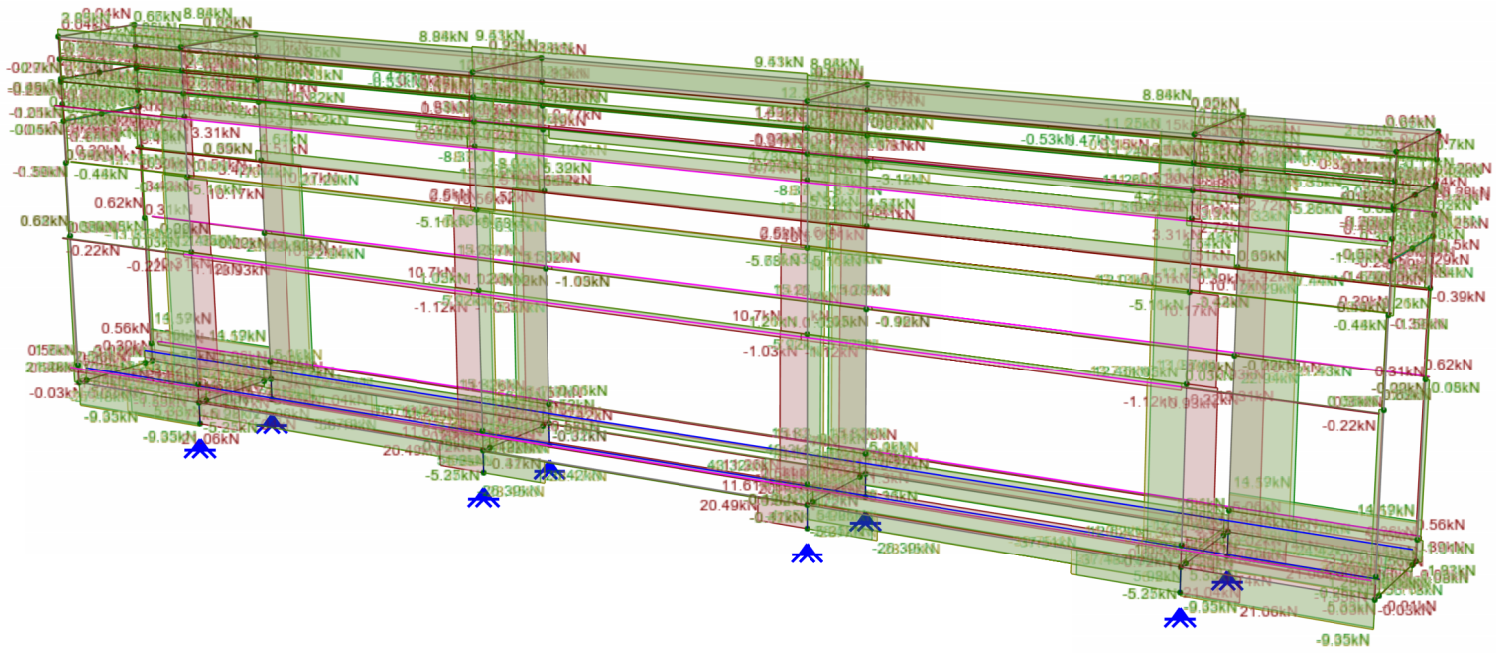
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (29,12), Shears

Load cases 10-12
(1) Strength
10 (SW) 1.2DL+1.5LL
11 (SW) 0.9DL+ Wu
12 (SW) 1.2DL+ Wu



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4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

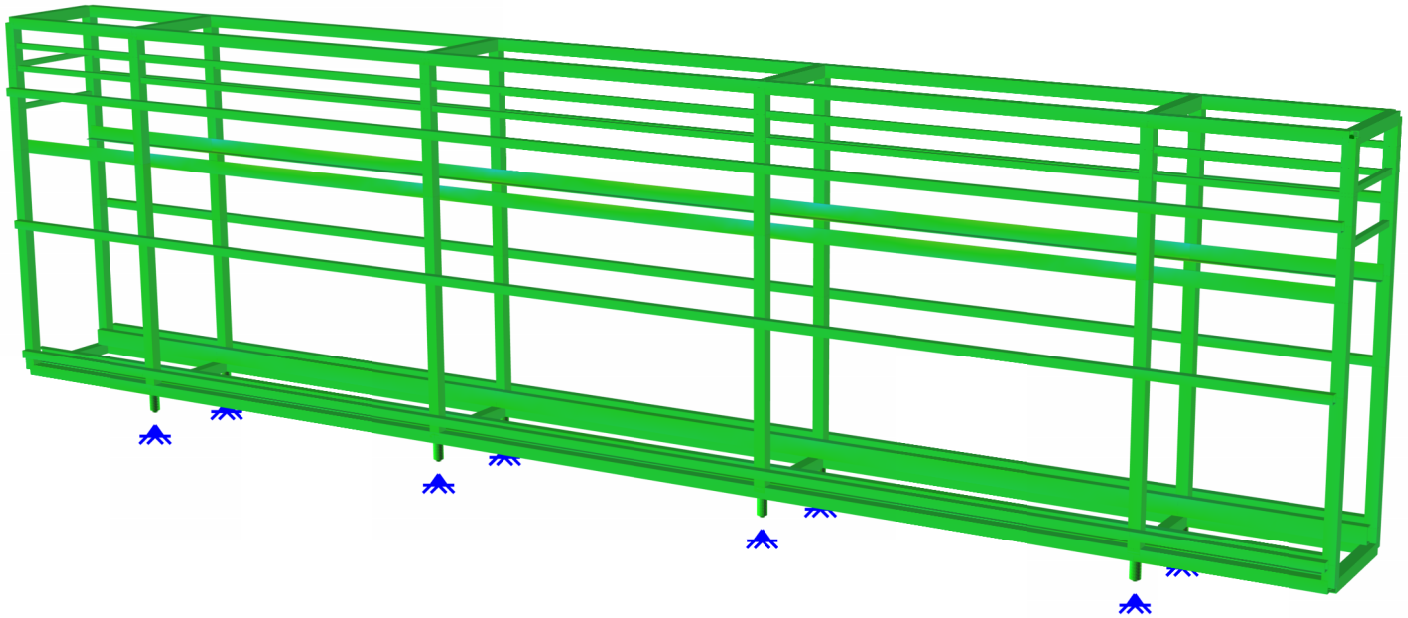
Materials:
1 STEEL

Viewpoint (29,12), Axial forces

Load cases 10-12
(1) Strength
Axial + Bending Stress:

300*0.9=270MPa(OK!)

- 237.62 MPa
- 214.14 MPa
- 190.66 MPa
- 167.18 MPa
- 143.70 MPa
- 120.21 MPa
- 96.73 MPa
- 73.25 MPa
- 49.77 MPa
- 26.29 MPa
- 2.80 MPa
- -20.68 MPa
- -44.16 MPa
- -67.64 MPa
- -91.12 MPa
- -114.61 MPa
- -138.09 MPa
- -161.57 MPa
- -185.05 MPa
- -208.53 MPa



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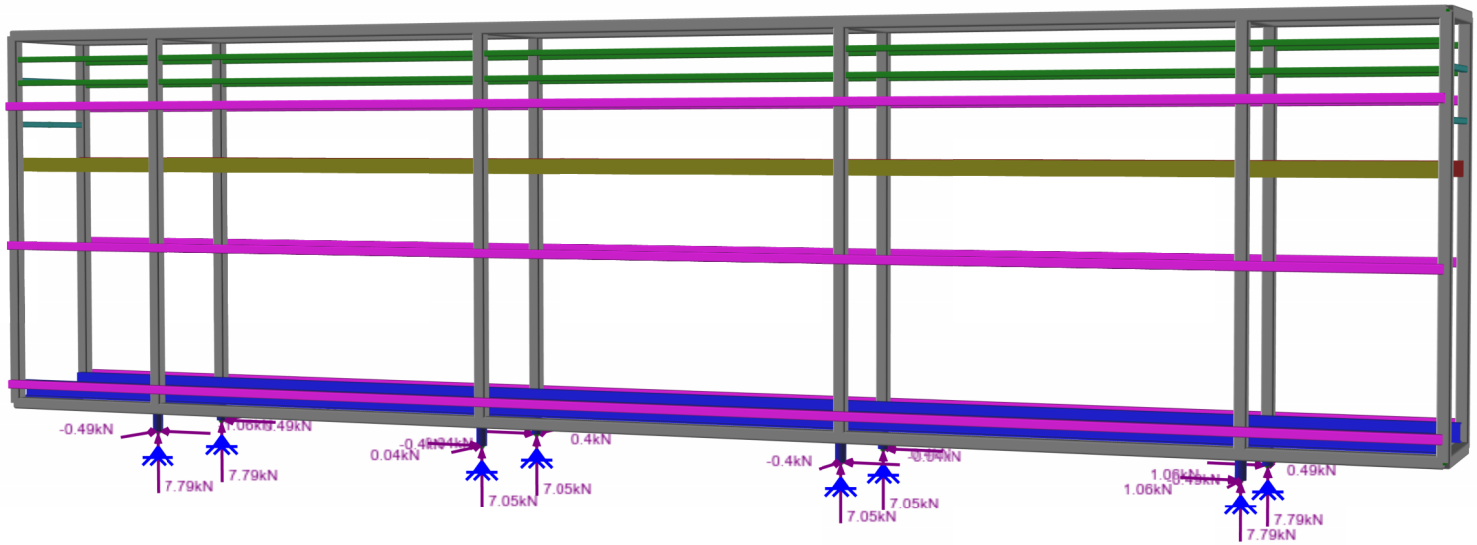
- 3 H2=75*4 SHS
- 4 H3= 125*75*6 UA
- 5 H3=125*75*6 UA
- 6 H1=50*4 SHS
- 7 SP1=88.9*5 CHS
- 8 H4=50*4 SHS

Materials:
- 1 STEEL

Viewpoint (29,12)

Load case 5
5 (SW) G

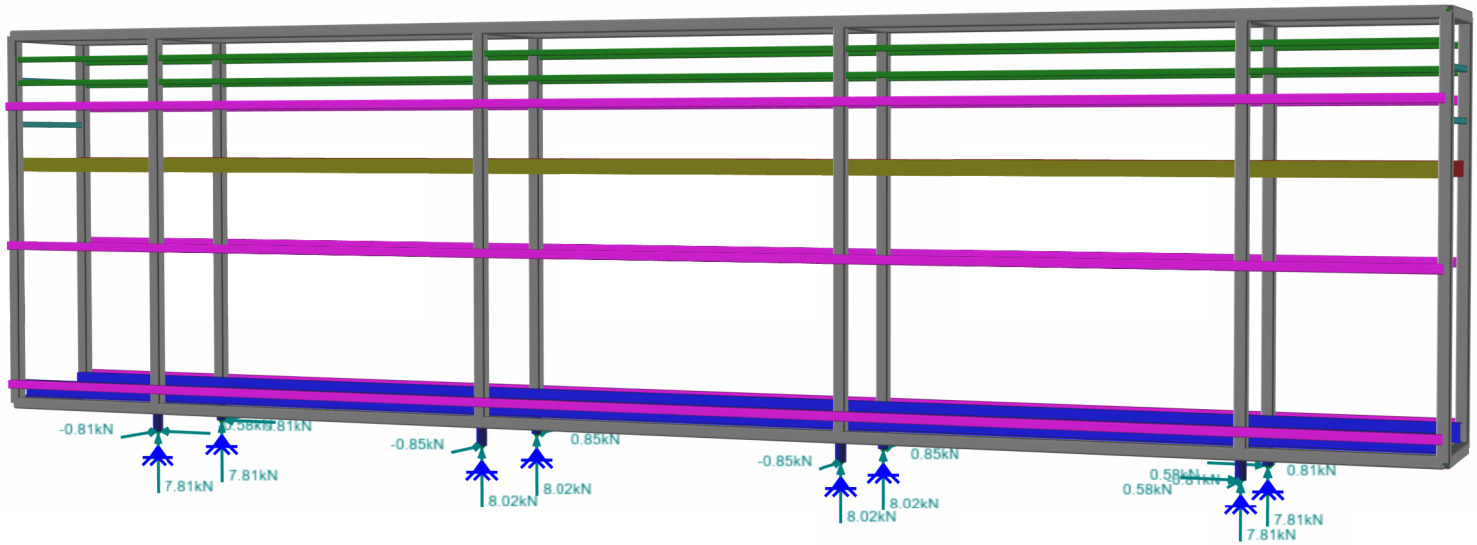


Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (21,2), Reactions

Load case 3
3 Live Load

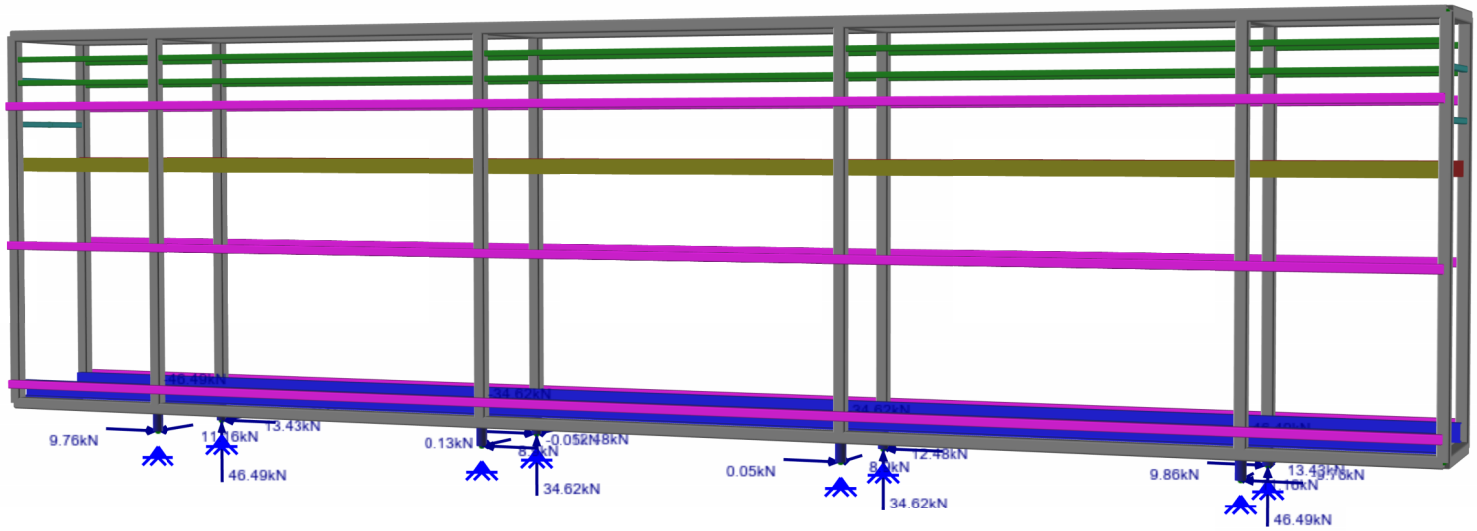


Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (21,2), Reactions

Load case 4
4 Wu



Sections:
1 SB1= 100*6 SHS
2 Floor Lower 150 PFC
3 H2=75*4 SHS
4 H3= 125*75*6 UA
5 H3=125*75*6 UA
6 H1=50*4 SHS
7 SP1=88.9*5 CHS
8 H4=50*4 SHS

Materials:
1 STEEL

Viewpoint (21,2), Reactions

JOHN MULLEN & PARTNERS
J M P
A SPECIALIST PRACTICE

Project: EXISTING ADVERTISING SIGNAGE , COWPASTURE ROAD, BOSSLEY PARK.

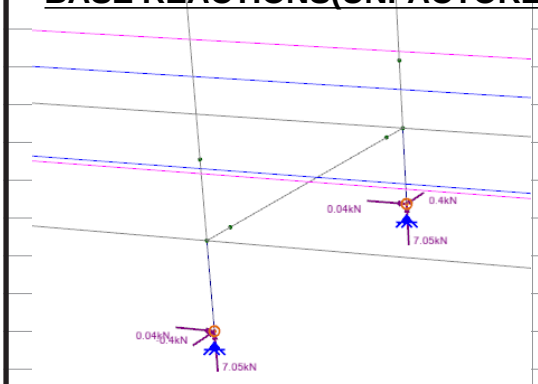
COMPUTATION SHEET

Designer: EL Date: 26.02.2024 Project No: 4979 01

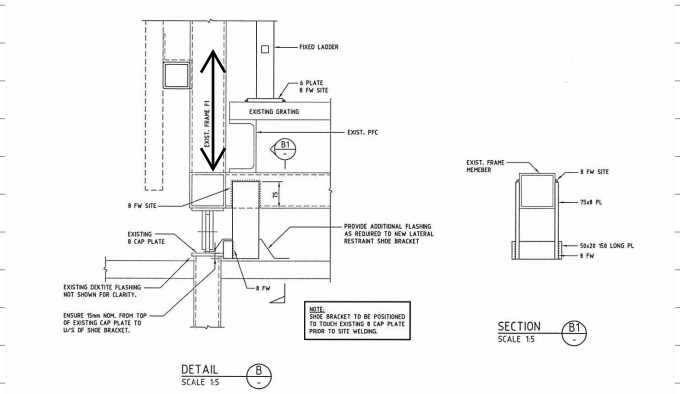
Project Leader: EL Reviewer: MB Date: 29.02.2024 Sheet of

Level 7, 400 Collins Street
Melbourne 3000
Telephone (03) 9600 0366
jmpmelb@jmp.com.au

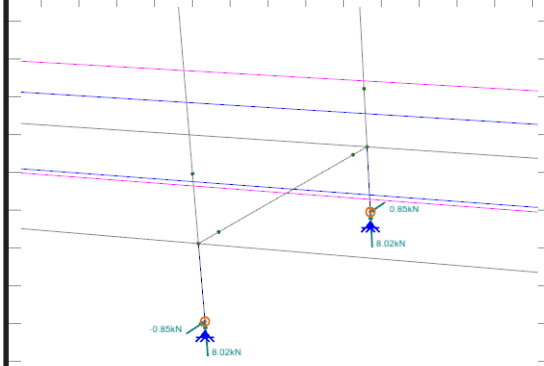
BASE REACTIONS(UNFACTORED)



DEAD LOAD



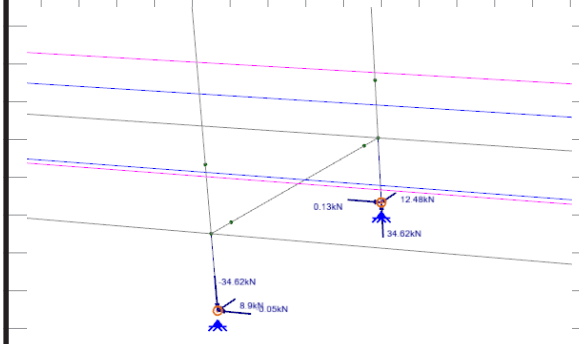
Vt* =28KN; Nc*=43kN



LIVE LOAD

BOLTS IN SHEAR					
V*				43.0	kN
TRY	1	16	Bolts	8.8	/S
kr				1	
fuf				830	MPa
nn				1	
Ac				76	mm^2
nx				0	
Ao				0	mm^2
0.8 0.62 kr fuf (nnAc + nxAo)				50.5	kN
				ok	1.173581
adopt	1, 16 Bolts 8.8 /S				

BOLT BEARING AND TEARING					
V*/bolt				43.0	kN
TRY	M 16		Bolts	40	mm edge distance
	tp	8	mm thick	250	MPa
ae				48	mm
0.9 ae tp fup				86.4	kN
0.9 3.2 df tp fup				92.16	kN
				ok	2.009302
adopt	M16 Bolts 40mm edge distance 8mm thick 250MPa Plate				



WIND LOAD

Compressive Capacity of 100mm plate 100wide.

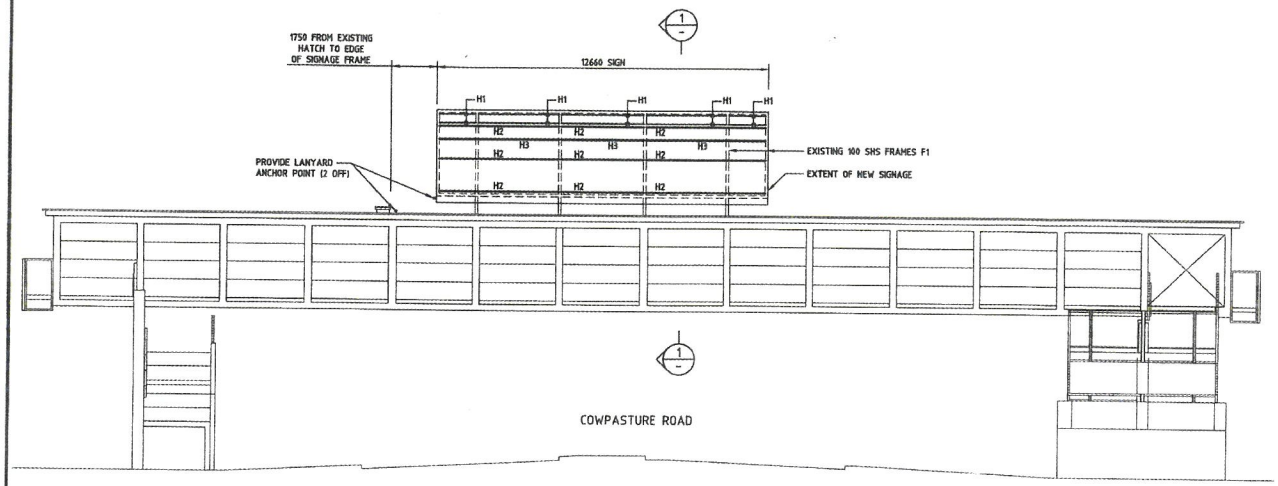
An=100*10 -(20^2*3.14/4)=686mm^2

ØNc=686 * 250/10^3 = 171.5KN

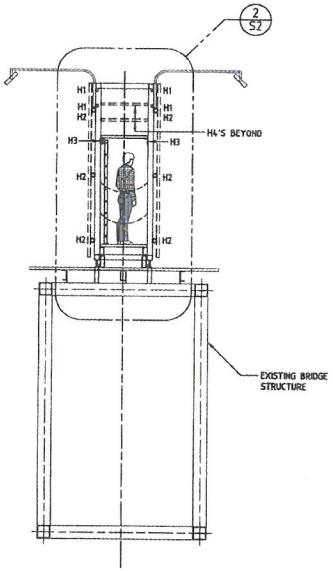
By inspection, the plate is ok in Compression even without the consideration of the plates flitching the SHS.

Appendices

Appendix 1 Original Structural Design Drawings



SOUTH ELEVATION
SCALE 1:100



SECTION 1
SCALE 1:50

MEMBER SCHEDULE		
MEMBER	SIZE	REMARKS
H1	50x50x4.0 SHS	SITE WELD TO F1
H2	75x75x4.0 SHS	SITE WELD TO F1
H3	125x75x6.0 UA	SITE WELD TO F1
H4	50x50x4.0 SHS	SITE WELD TO END F1'S

NOTE: ALL MEMBERS TO BE FULLY HOT DIP GALVANISED AFTER FABRICATION. TOUCH UP ON SITE.

STRUCTURAL NOTES

GENERAL

G1. THESE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH THE WORK.

G2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BUILDING CODE OF AUSTRALIA.

G3. ALL DIMENSIONS SHOWN ON THESE STRUCTURAL DRAWINGS SHALL BE VERIFIED BY THE BUILDER ON SITE. THESE STRUCTURAL DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.

G4. UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.

G5. THE STRUCTURAL COMPONENTS DETAILED ON THESE STRUCTURAL DRAWINGS HAVE BEEN DESIGNED FOR THE FOLLOWING APPLIED LOADINGS. REFER TO ARCHITECTURAL DRAWINGS FOR PROPOSED FLOOR USAGE.

FLOOR USAGE	LIVE LOAD (kN)	ALLOWANCE FOR SUPERIMPOSED DEAD LOAD (kPa)
WALKWAY	2.7	-

G6. WIND LOADINGS ARE IN ACCORDANCE WITH AS.1170.2. AS FOLLOWS:-
BASIC WIND VELOCITY:- V20 = 37 m/s (ISSRV)
V500 = 45 m/s (ULT)
REGION - A
TERRAIN CATEGORY - 3

G7. SEISMIC LOADINGS ARE IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF AS.1170.4:-
DESIGN CATEGORY - A
SITE FACTOR S - 0.67
GROUND ACCELERATION 'a':- 0.08 g
STRUCTURE TYPE - 1.

G8. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERLOADED. TEMPORARY BRACING SHALL BE PROVIDED BY THE CONTRACTOR IN ORDER TO KEEP THE BUILDING WORKS AND EXCAVATIONS STABLE AT ALL TIMES.

STRUCTURAL STEELWORK

SS1. ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH AS.4100. FABRICATION SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 14 OF AS.4100. ERECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 15 OF AS.4100.

SS2. UNLESS NOTED OTHERWISE, ALL STEEL SHALL BE OF THE FOLLOWING GRADES IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS:-

TYPE OF STEEL	GRADE
UNIVERSAL BEAMS AND COLUMNS, PARALLEL FLANGE CHANNELS, LARGE ANGLES TO AS/NZS.3679.1	300
WELDED SECTIONS TO AS/NZS.3679.2	300
HOT ROLLED PLATES, FLOOR PLATES AND BLABS TO AS/NZS.3679	250
HOLLOW SECTIONS TO AS.1163	C250 (C250 FOR DIA<90mm)
COLD FORMED PURLINS AND GIRTS TO AS.1397.	G450, Z350
TAPER FLANGE CHANNELS AND BEAMS, SMALL ANGLES TO AS/NZS.3679.1	250

SS3. THREE (3) COPIES OF WORKSHOP FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AT LEAST 14 DAYS PRIOR TO COMMENCEMENT OF FABRICATION. FABRICATION SHALL NOT COMMENCE WITHOUT THE STRUCTURAL ENGINEERS REVIEW APPROVAL OF THE WORKSHOP DRAWINGS WHICH EXCLUDES DIMENSIONS. ALL SETOUT DIMENSIONS TO BE OBTAINED FROM SITE AND/OR ARCHITECTURAL DRAWINGS.

SS4. PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING OTHER ELEMENTS TO THE STEEL WHETHER OR NOT DETAILED ON THE STRUCTURAL DRAWINGS.

SS5. ALL BEAMS AND RAFTERS SHALL BE FABRICATED AND ERECTED WITH NATURAL CAMBER UP.

SS6. ALL MEMBERS SHALL BE SUPPLIED IN SINGLE LENGTHS. SPLICES SHALL ONLY BE PERMITTED IN LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS.

SS7. ALL STEELWORK SHALL BE SECURELY TEMPORARILY BRACED AS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION.

BOLTING

SS8. BOLTING CATEGORIES ARE IDENTIFIED ON THE STRUCTURAL DRAWINGS IN THE FOLLOWING MANNER:-
4.6/S - COMMERCIAL BOLTS OF GRADE 4.6 TO AS.1111 SNUG TIGHTENED.
8.8/S - HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS.1252 SNUG TIGHTENED.
8.8/TB - HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS.1252 FULLY TENSIONED TO AS.4100 AS A BEARING TYPE JOINT.
8.8/TF - HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS.1252 FULLY TENSIONED TO AS.4100 AS A FRICTION TYPE JOINT WITH FAYING SURFACES LEFT UNCOATED.

SS9. UNLESS NOTED OTHERWISE ALL BOLTS SHALL BE M20 CATEGORY 8.8/S AND CLEAT PLATES 10mm THICK. NO CONNECTION SHALL HAVE LESS THAN 2 BOLTS. ALL BOLTS AND WASHERS SHALL BE GALVANIZED. ALL HOLES SHALL BE 2mm LARGER THAN THE BOLT DIAMETER UNLESS NOTED OTHERWISE.

SS10. /TB AND /TF BOLT CATEGORIES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 15 OF AS.4100, USING EITHER THE PART-TURN METHOD OR THE DIRECT-TENSION INDICATOR METHOD.

WELDING

SS11. ALL WELDING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS.1554.1. ELECTRODES SHALL BE TO EITHER AS.1553, AS.1858, AS.2203 OR AS.2717, AS APPROPRIATE.

SS12. UNLESS NOTED OTHERWISE, ALL FILLET WELDS SHALL BE 6mm CONTINUOUS CATEGORY SP USING E48XX ELECTRODES OR EQUIVALENT. ALL BUTT WELDS SHALL BE COMPLETE PENETRATION BUTT WELDS CATEGORY SP TO AS.1554.1.

SS13. THE EXTENT OF NON-DESTRUCTIVE WELD EXAMINATION SHALL BE AS NOTED BELOW. RADIOGRAPHIC OR ULTRASONIC EXAMINATION SHALL BE TO AS.1554.1, AS.2177.1 AND AS.2207 AS APPROPRIATE AND CARRIED OUT BY AN INDEPENDENT NATA REGISTERED/CERTIFIED WELDING INSPECTOR.

TYPE OF WELD CATEGORY	EXAMINATION METHOD	EXTENT (% OF TOTAL LENGTH OF WELD TYPE)
FILLET WELDS, GP + SP	VISUAL INSPECTION	100
BUTT WELDS, GP	VISUAL INSPECTION	100
BUTT WELDS, SP	VISUAL INSPECTION	100
	RADIOGRAPHIC OR ULTRASONIC INSPECTION	10

SS14. A REPORT APPROVING ALL WELDING SHALL BE FORWARDED TO THE STRUCTURAL ENGINEER PRIOR TO THE STEELWORK BEING DELIVERED TO SITE.

CORROSION PROTECTION

SS15. STRUCTURAL STEELWORK NOT ENCASED IN CONCRETE SHALL HAVE THE FOLLOWING CORROSION PROTECTION:-

ELEMENT	SURFACE PREPARATION	PRIME COAT
ALL	CLASS 2 ABRASIVE BLAST CLEANING	HOT DIP GALVANISED

SS16. ALL GALVANIZING OF STRUCTURAL STEELWORK SHALL BE TO AS.4680. THE CONTINUOUS AVERAGE ZINC COATING MASS SHALL BE 600g/m² (85µm) MINIMUM.

SS17. PROVIDE SEAL PLATES TO THE ENDS OF ALL HOLLOW SECTIONS, WITH 'BREATHER' HOLES IF MEMBERS ARE TO BE HOT DIP GALVANIZED.

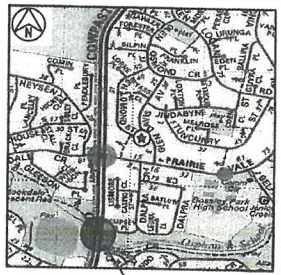
SS18. STEELWORK INTENDED TO BE CONCRETE ENCASED SHALL BE UNPAINTED. ENCASING CONCRETE SHALL BE GRADE 25 MPa PROVIDING A COVER ADEQUATE TO SUIT FIRE RATING OR EXPOSURE CONDITIONS. CONCRETE ENCASEMENT SHALL BE CENTRALLY REINFORCED WITH 5mm WIRE TO AS.4671 OR 6mm STRUCTURAL GRADE BARS TO AS.4671 AT 150mm PITCH.

SS19. COATINGS DAMAGED DURING ERECTION OR SUBSEQUENT STAGES OF THE WORK SHALL BE MADE GOOD AND/OR REPAIRED.

NOTE:
LOCATION AND SUPPORT OF SIGN STRUCTURE DETERMINED BY EXISTING FRAMES F1. CHECK DIMENSIONS ON SITE.

COPY

ISSUED FOR RTA APPROVAL



LOCATION PLAN
NOT TO SCALE

2			
RE-ISSUED FOR RTA APPROVAL		PMA	10.05.06
1			
ISSUED FOR RTA APPROVAL		PMA	05.05.06
AMENDMENT		APP'D	DATE

	BY	CHECKED	DATE
DESIGN	MFC	PMA	05.05.06
DRAWN	WJW	CJS	05.05.06
APPROVED	P.M.ALLEN		05.05.06

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EYE CORP
Level 5/35 Saunders Street
Pyrmont NSW, 2009
Tel: +61 2 8584 2222

OPUS INTERNATIONAL CONSULTANTS
Sydney Office
Opus International Consultants
Level 5, 411 Victoria Ave
Chatswood 2067, Australia
PO Box 5340
Sydney, Australia
Tel: +61 2 9904 6555
Fax: +61 2 9904 6777
ACN 001 184 894

TITLE
NEW SIGNAGE STRUCTURE
PEDESTRIAN BRIDGE OVER
COWPASTURE ROAD
BOSSLEY PARK

GENERAL ARRANGEMENT

STATUS	PRELIMINARY	
SCALE	AS SHOWN	PLOT DATE: MAY 2006
FILE		

FEATURE IDENTIFIER	CODE	SHEET	REVISION
11086-02	-	S1	2

11086.02_GA.dwg ORIGINAL SHEET SIZE A1 [840x594]

GRAPHIC SCALES
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200
100
50
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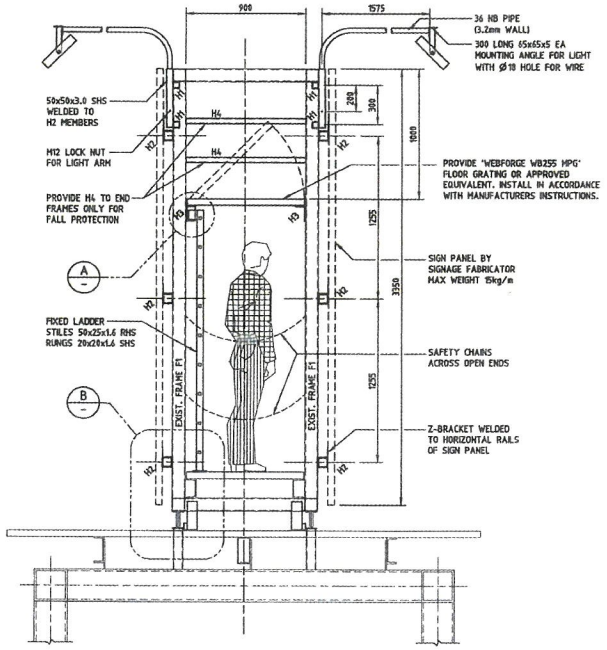
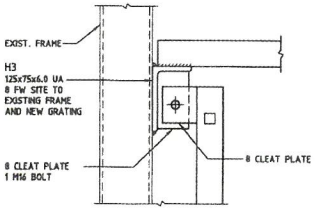
10/05/2006 9:22

NOTES:
FOR STRUCTURAL NOTES REFER DWG No.S1

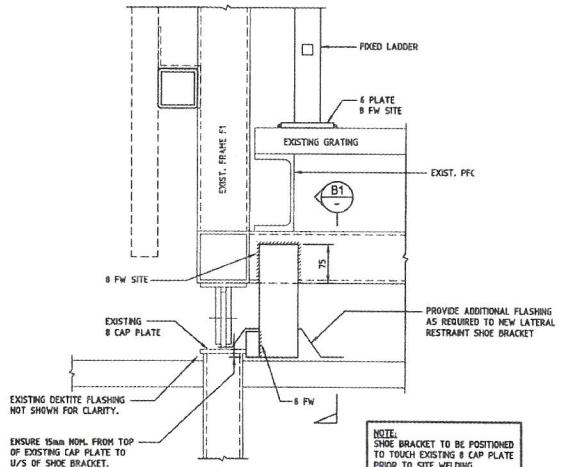


DETAIL 2 / S1
SCALE 1:20

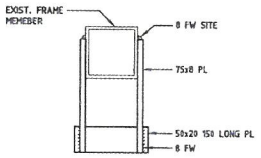
NOTE:
LOCATION AND SUPPORT OF SIGN STRUCTURE DETERMINED BY EXISTING FRAMES F1. CHECK DIMENSIONS ON SITE.



DETAIL A
SCALE 1:5



DETAIL B
SCALE 1:5



SECTION B1
SCALE 1:5

COPY

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RE-ISSUED FOR RTA APPROVAL		PMA	10.05.06
1			
ISSUED FOR RTA APPROVAL		PMA	05.05.06
AMENDMENT		APP'D	DATE

	BY	CHECKED	DATE
DESIGN	MFC	PMA	05.05.06
DRAWN	WJW	CJS	05.05.06
APPROVED	P.M.ALLEN		05.05.06

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Level 5, 411 Victoria Ave
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PO Box 5340
Sydney, Australia
Tel: +61 2 9904 6555
Fax: +61 2 9904 6777
ACN 001 164 694

TITLE
NEW SIGNAGE STRUCTURE
PEDESTRIAN BRIDGE OVER
COWPASTURE ROAD
BOSSLEY PARK

MOUNTING DETAILS

STATUS			
PRELIMINARY			
SCALE	PLOT DATE		
AS SHOWN	MAY 2006		
FILE			
FEATURE IDENTIFIER	CODE	SHEET	REVISION
11086-02	–	S2	2

11086.02_MD.dwg ORIGINAL SHEET SIZE A1 (840x594)

GRAPHIC SCALES
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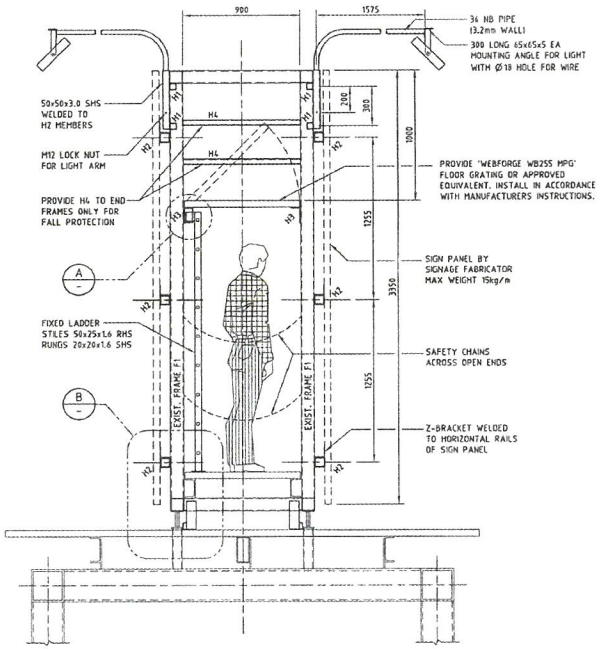
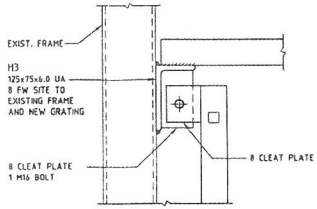
19/05/2006 9:20

NOTES:
FOR STRUCTURAL NOTES REFER DWG No.S1

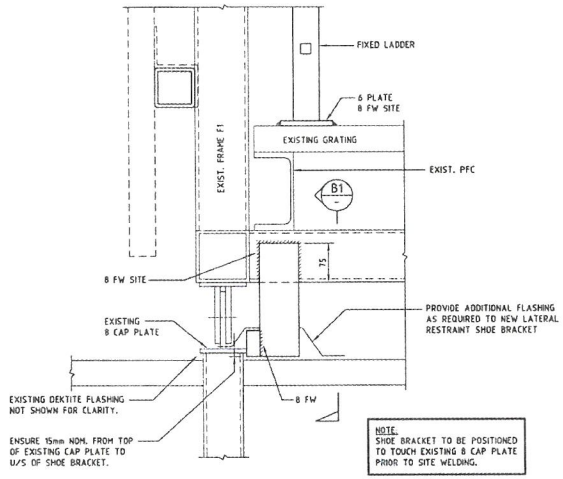


DETAIL 2 / S1
SCALE 1:20

NOTE:
LOCATION AND SUPPORT OF SIGN STRUCTURE DETERMINED BY EXISTING FRAMES F1. CHECK DIMENSIONS ON SITE.

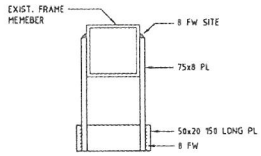


DETAIL A
SCALE 1:5



NOTE:
SHOE BRACKET TO BE POSITIONED TO TOUCH EXISTING 8 CAP PLATE PRIOR TO SITE WELDING.

DETAIL B
SCALE 1:5



SECTION B1
SCALE 1:5

ISSUED FOR RTA APPROVAL

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RE-ISSUED FOR RTA APPROVAL		PMA	10.05.06
1			
ISSUED FOR RTA APPROVAL		PMA	05.05.06
AMENDMENT		APP'D	DATE

	BY	CHECKED	DATE
DESIGN	MFC	PMA	05.05.06
DRAWN	WJW	CJS	05.05.06
APPROVED	P.M.ALLEN		05.05.06

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PO Box 5340
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Tel: +61 2 9904 6555
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ACN 001 184 694

TITLE
NEW SIGNAGE STRUCTURE
PEDESTRIAN BRIDGE OVER
COWPASTURE ROAD
BOSSLEY PARK

MOUNTING DETAILS

STATUS	PRELIMINARY	
SCALE	AS SHOWN	PLOT DATE: MAY 2006
FILE		

FEATURE IDENTIFIER	CODE	SHEET	REVISION
11086-02	–	S2	2

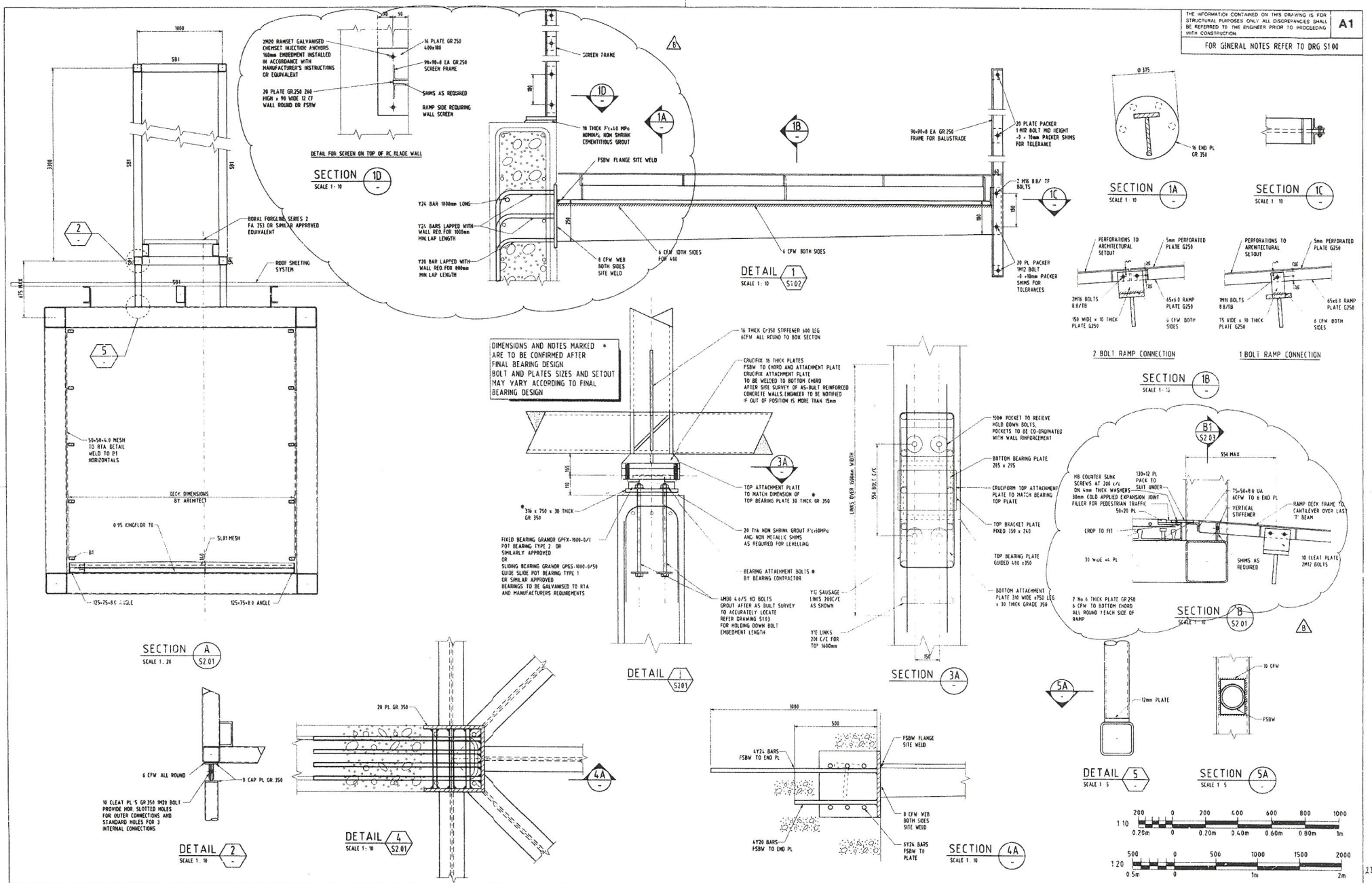
11086.02_MD.dwg ORIGINAL SHEET SIZE A1 [840x594]

GRAPHIC SCALES
350 mm
200
100
50
0 10 mm Limited
10/05/2006 9:20

THE INFORMATION CONTAINED ON THIS DRAWING IS FOR STRUCTURAL PURPOSES ONLY. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

A1

FOR GENERAL NOTES REFER TO DRG S100



Rev	Description	Date	Drn.	Chk'd
B	GENERAL REVS. - CONSTRUCTION ISSUE	18/10/02	JK	BRL
A	CONSTRUCTION ISSUE	7/08/02	JK	BDL

RECEIVED
27 OCT 2002
TRAFFIC PROJECTS

ARUP
Level 10, 201 Kent Street, Sydney N.S.W. 2000
P.O. Box 76, Millers Point N.S.W. 2000
Telephone (02) 9320 9320 Fax. (02)9320 9321

ARUP Authorisation Record

	NAME	SIGNATURE / INITIALS	DATE
Authorised for Tender	P.BAILEY	P.BAILEY	1/2/02
Authorised for Construction	P. BAILEY	P. BAILEY	8/8/02

DRG STATUS: FOR CONSTRUCTION

PROJECT: PEDESTRIAN FOOTBRIDGE
COWPASTURE ROAD
BOSSLEY PARK

DRAWING TITLE: STEELWORK SECTIONS AND DETAILS

Drawn	AHS
Scale	1:20, 1:10, 1:5
Date	18-OCT-2002 16:07
CAD File	G:\12159s\105\105-bridge2.DGN
Job No	12159/105
Drawing No	S2.02
Revision	B

0 100 200 on original

0648 156BC2503

REDUCTION RATIO

STEELWORK SCHEDULE		
MARK	SIZE	COMMENTS
B1	REFER DETAIL	ALSO REFER DETAIL 1 ON S2.02
B2	125×75×8.0 ANGLE	GRADE 300
VB1	250×250×9.0 SHS	GRADE 350
VB2	REFER DETAIL	FABRICATED BOX
VB3	250×250×6.0 SHS	GRADE 350
VB4	REFER DETAIL	FABRICATED BOX
VB5	REFER DETAIL	FABRICATED BOX
VB6	REFER DETAIL	FABRICATED BOX
SB1	100×100×6.0 SHS	GRADE 350
SP1	88.9x5 CHS	GRADE 350

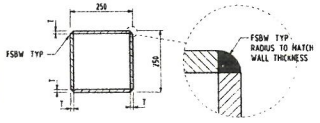
THE INFORMATION CONTAINED ON THIS DRAWING IS FOR STRUCTURAL PURPOSES ONLY. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

A1

FOR GENERAL NOTES REFER TO DRG S100

BEARING PERFORMANCE REQUIREMENTS							
BEARING TYPE	No. REQ'D.	MAX. VERTICAL SERVICEABILITY LOAD (kN)	MIN. SERVICEABILITY LOAD (kN)	HORIZONTAL SERVICEABILITY LOAD (kN)		MOVEMENT (mm)		MAX. ROTATION (radians)
				TRANSVERSE	LONGITUDINAL	TRANSVERSE	LONGITUDINAL	
TYPE 1	2	467	10	+/- 167	0	0	+/- 15	0.015
TYPE 2	2	467	10	+/- 167	+/- 35	0	0	0.015

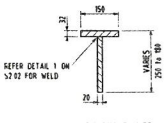
LOAD FACTOR FOR ULTIMATE LIMIT STATE 1.5 ON WORKING LOADS.
HORIZONTAL TRANSVERSE ULTIMATE DECK IMPACT LOAD (500 kN) IS DIVIDED BY 1.5 TO GIVE SERVICEABILITY LOAD AND IS ASSUMED TO BE SIMULTANEOUSLY SHARED BETWEEN THE TWO END BEARINGS.



GRADE 350 PLATE

MEMBER VB2, VB4, VB5 & VB6

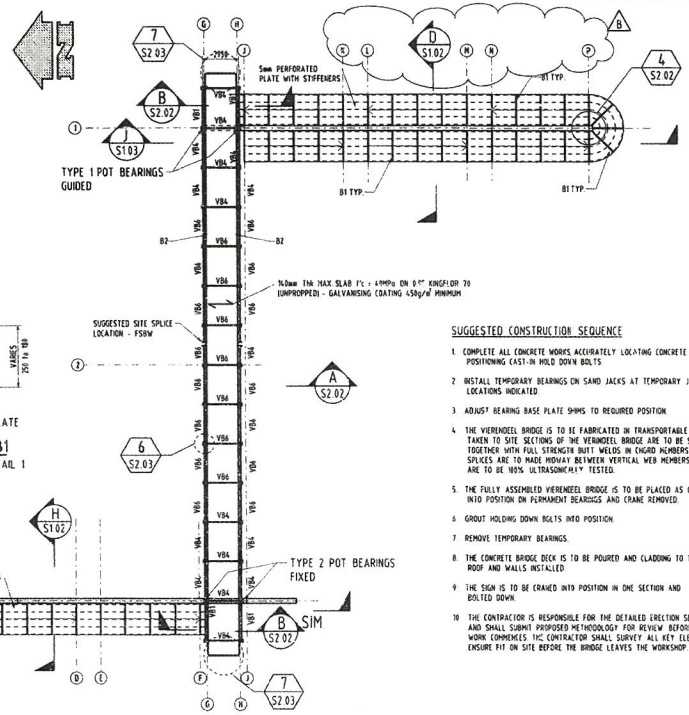
MEMBER	T
VB2	12
VB4	20
VB5	25
VB6	16



GRADE 350 PLATE

MEMBER B1

ALSO REFER DETAIL 1 ON DRG. S2.02



BRIDGE DESIGN LOADS

LIVE LOAD 4 kPa (ABDC)

ADVERTISING SIGNAGE LOADING ASSUMPTIONS

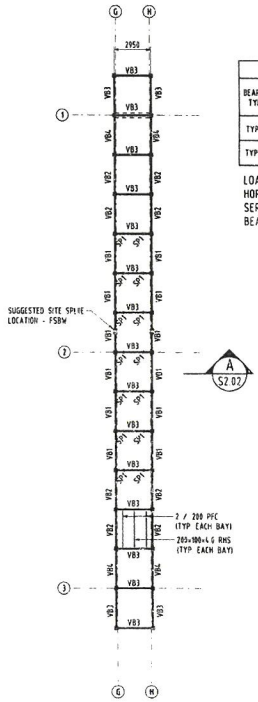
0.5 kPa ON ELEVATION, SIGNAGE HEIGHT
3350mm ASSUMED
NO ADVERTISING GANTRY LOAD ASSUMED
AS SIGN ACCESS IS VIA ROOF

DECK IMPACT LOAD

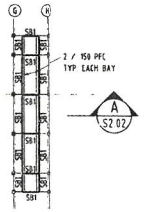
LATERAL ULTIMATE LOAD OF 500 kN APPLIED
ON THE BRIDGE DECK SECTION ABOVE THE ROADWAY

SUGGESTED CONSTRUCTION SEQUENCE

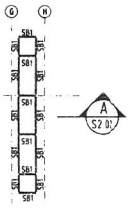
1. COMPLETE ALL CONCRETE WORKS ACCURATELY LOCATING CONCRETE WALLS AND POSITIONING CAST-IN HOLD DOWN BOLTS
2. INSTALL TEMPORARY BEARINGS ON SAND JACKS AT TEMPORARY JACKING LOCATIONS INDICATED.
3. ADJUST BEARING BASE PLATE SHIMS TO REQUIRED POSITION.
4. THE VIERENDEEL BRIDGE IS TO BE FABRICATED IN TRANSPORTABLE LENGTHS AND TAKEN TO SITE. SECTIONS OF THE VERINDEEL BRIDGE ARE TO BE SPLICED TOGETHER WITH FULL STRENGTH BUTT WELDS IN CNGRD MEMBERS ONLY. SPLICES ARE TO MADE MIDWAY BETWEEN VERTICAL WEB MEMBERS. ALL WELDS ARE TO BE 100% ULTRASONICALLY TESTED.
5. THE FULLY ASSEMBLED VIERENDEEL BRIDGE IS TO BE PLACED AS ONE PIECE INTO POSITION ON PERMANENT BEARINGS AND CRANE REMOVED.
6. GROUT HOLDING DOWN BOLTS INTO POSITION.
7. REMOVE TEMPORARY BEARINGS.
8. THE CONCRETE BRIDGE DECK IS TO BE POURED AND CLADDING TO THE BRIDGE ROOF AND WALLS INSTALLED.
9. THE SIGN IS TO BE CRANED INTO POSITION IN ONE SECTION AND BOLTED DOWN.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE DETAILED ERECTION SEQUENCES AND SHALL SUBMIT PROPOSED METHODOLOGY FOR REVIEW BEFORE WORK COMMENCES. THE CONTRACTOR SHALL SURVEY ALL KEY ELEMENTS TO ENSURE FIT ON SITE BEFORE THE BRIDGE LEAVES THE WORKSHOP.



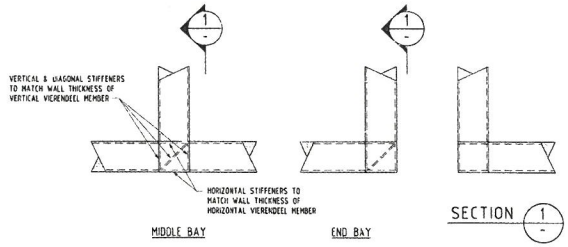
PLAN ON LOWER BRIDGE DECK

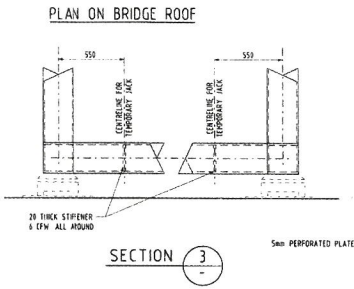


PLAN ON SIGNAGE FRAME FLOOR

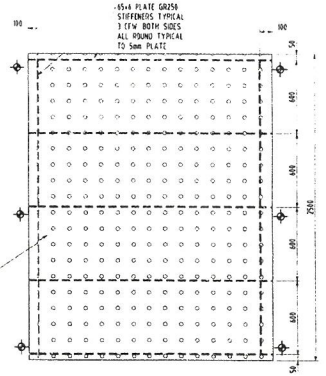


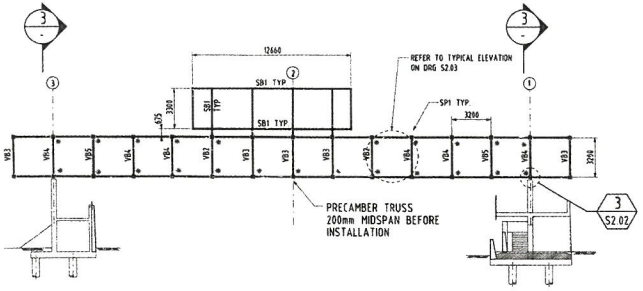
PLAN ON SIGNAGE FRAME ROOF





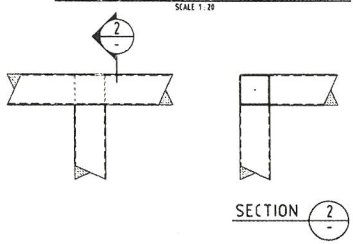
PLAN ON BRIDGE ROOF



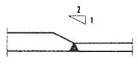


SOUTH ELEVATION ON BRIDGE
NORTH ELEVATION OPPOSITE HAND

TRUSS NODE CONNECTIONS MARKED THUS *
SCALE 1:20



TYPICAL NODE CONNECTIONS U.N.O.
SCALE 1:20



TYPICAL FSBW BETWEEN CHORDS

NOTE FOR TYPICAL NODE CONNECTIONS
ALL WELDS TO BE FULL STRENGTH BUTT WELDS AND TO BE PREPARED IN ACCORDANCE WITH AS 1554 PART 1 AS TENSION WELDS

TYPICAL RAMP DECK SEGMENT
SCALE 1:20

◈ DENOTES LOCATIONS OF CONNECTION TO SUPPORTING BEAM. REFER TO DETAILS ON DRAWING No. S2.02.

1:200 5000 0 5000 10000 15000 20000
5m 0 5m 10m 15m 20m

Rev.	Description	Date	Drn.	Chk'd.
B	GENERAL REV'S - CONSTRUCTION ISSUE	30.09.02	SLP	BRL
A	CONSTRUCTION ISSUE	7.08.02	JR	BRL
09	REVISED ISSUE FOR TENDER	28.02.02	DVM	BRL
08	REVISED ISSUE FOR TENDER	15.02.02	SD	BRL
07	REVISED ISSUE FOR TENDER	1.02.02	JVM	BRL
06	REVISED ISSUE FOR TENDER	14.12.01	SD	BRL
05	REVISED FOR TENDER	20.4.01	BJR	BRL
04	ISSUED FOR REVIEW	29.3.01	GJR	BRL

ARUP
Level 10, 201 Kent Street, Sydney N.S.W. 2000
P.O. Box 76, Millers Point N.S.W. 2000
Telephone (02) 9320 9320 Fax. (02) 9320 9321

ARUP Authorisation Record

	NAME	SIGNATURE / INITIALS	DATE
Authorised for Tender	P.BAILEY	P.BAILEY	28/2/02
Authorised for Construction	P. BAILEY	P. BAILEY	8/8/02

DRG STATUS: FOR CONSTRUCTION

PROJECT: PEDESTRIAN FOOTBRIDGE
TOWPASTURE ROAD
BOSSLEY PARK

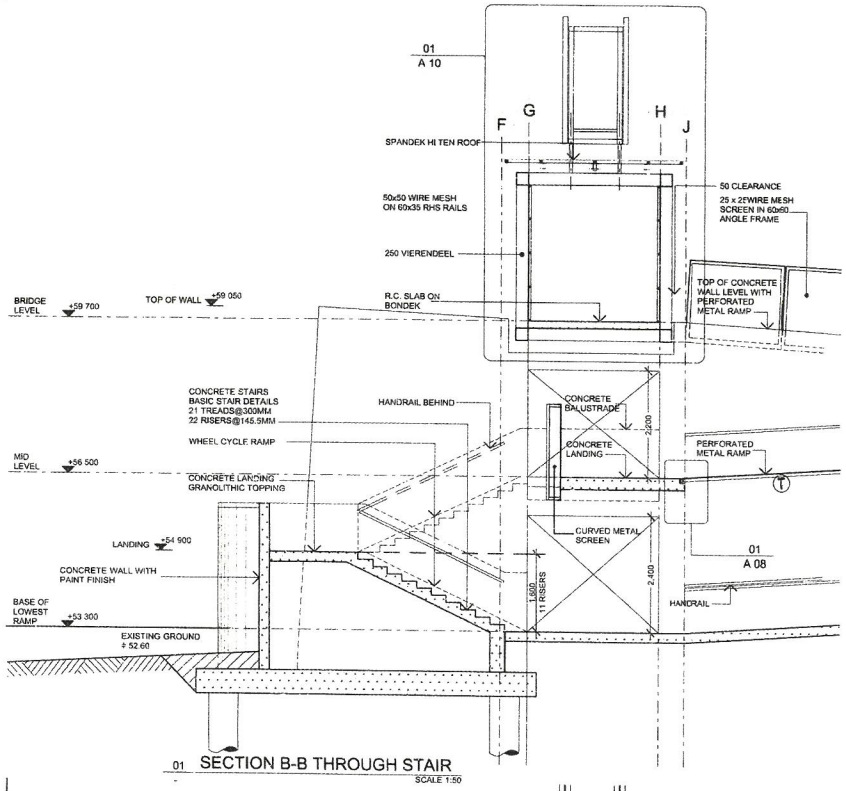
DRAWING TITLE: BRIDGE AND UPPER RAMPS MARKING PLANS

Drawn	AHS
Scale	1:200, 1:20
Date	30-SEP-2002 15:27
CAD File	G:\12159s\105\105-bridge.dgn
Job No	12159/105
Drawing No	S2.01
Revision	B

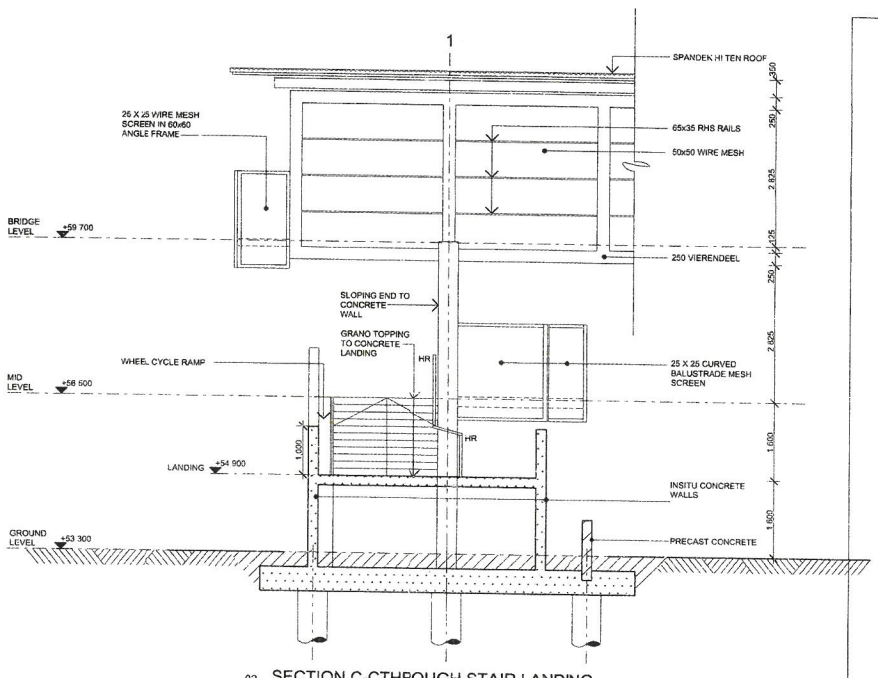
0 100 200 on original

0648 156BC2503

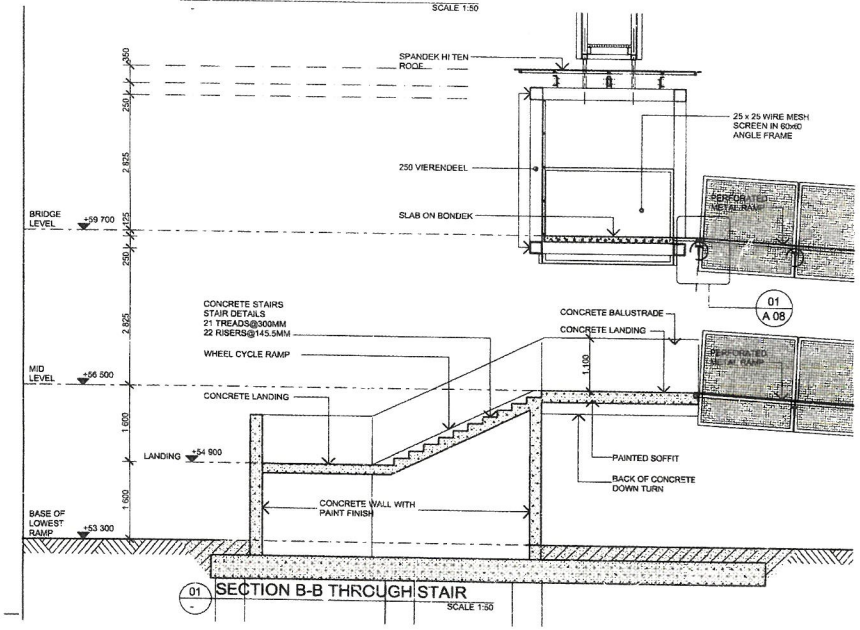
REDUCTION RATIO



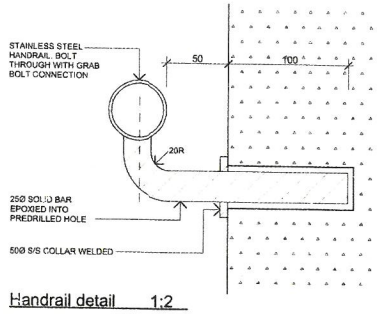
01 SECTION B-B THROUGH STAIR
SCALE 1:50



02 SECTION C-CTHROUGH STAIR LANDING
SCALE 1:50



01 SECTION B-B THROUGH STAIR
SCALE 1:50



Handrail detail 1:2

B	CONSTRUCTION ISSUE	01 AUGUST 200
A	TENDER ISSUE	30 MAY 2000
Issue	Revision	Date

PEDESTRIAN BRIDGE COWPASTURE RD BOSSLEY PARK

TONY CARO ARCHITECTURE
LEVEL 1, 2 GLEN STREET, MILSONS POINT, 2061
phone : 02 9964 9100 fax : 02 9964 9133

CLIENT:
ROADS & TRAFFIC AUTHORITY OF NSW
93 FLEMINGTON RD
BLACKTOWN

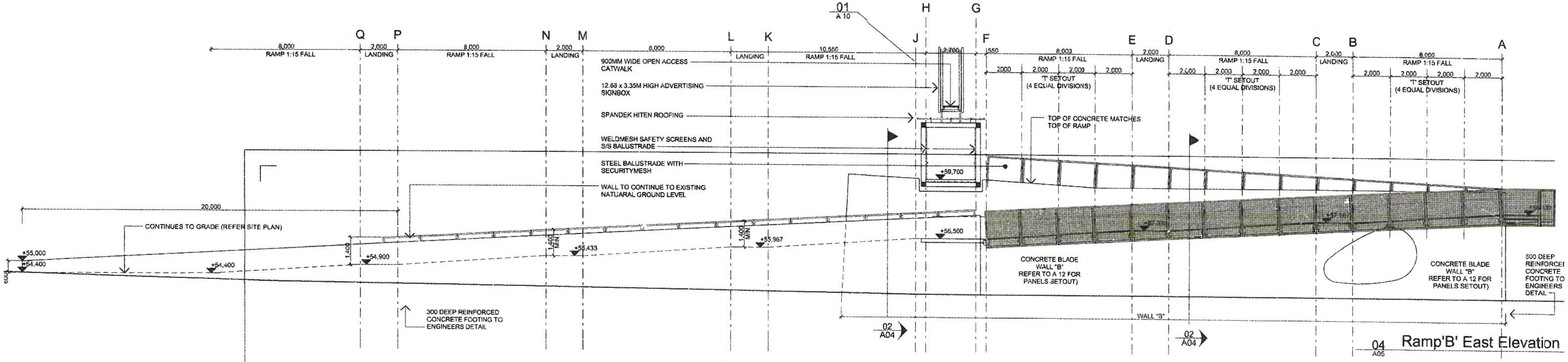
STRUCTURAL ENGINEER
OVE ARUP3
477 KENT STREET, SYDNEY

CONSULTANT PLANNERS
GARY SHIELS & ASSOCIATES
88 PADDINGTON ST
PADDINGTON

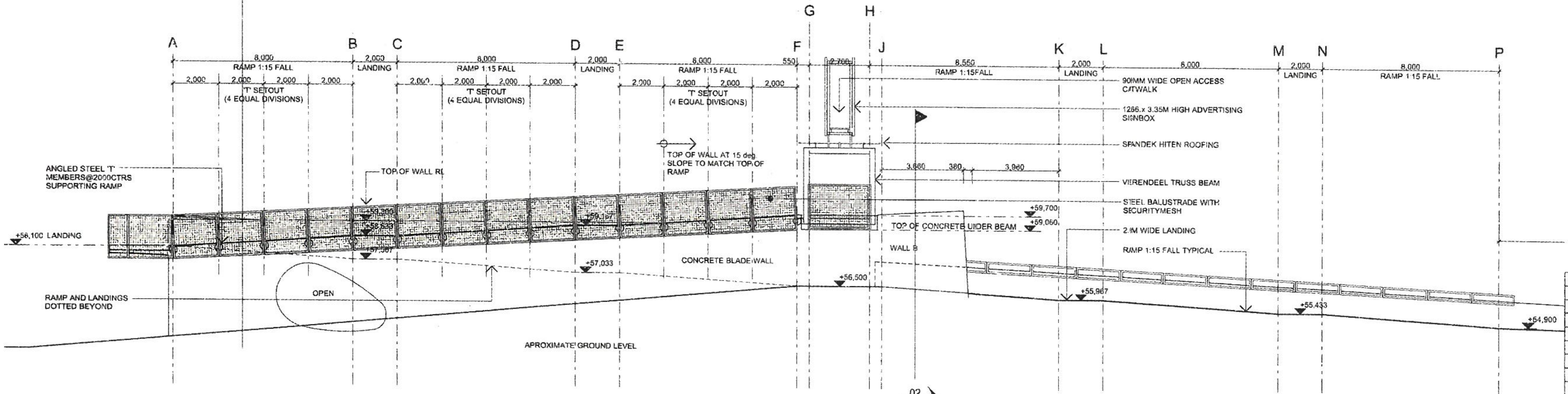
Title : DETAIL SECTIONS		Number : A - 06
Scale 1:50 at A1	Date : AUGUST 2001	Issue : B

0648 156BC2503

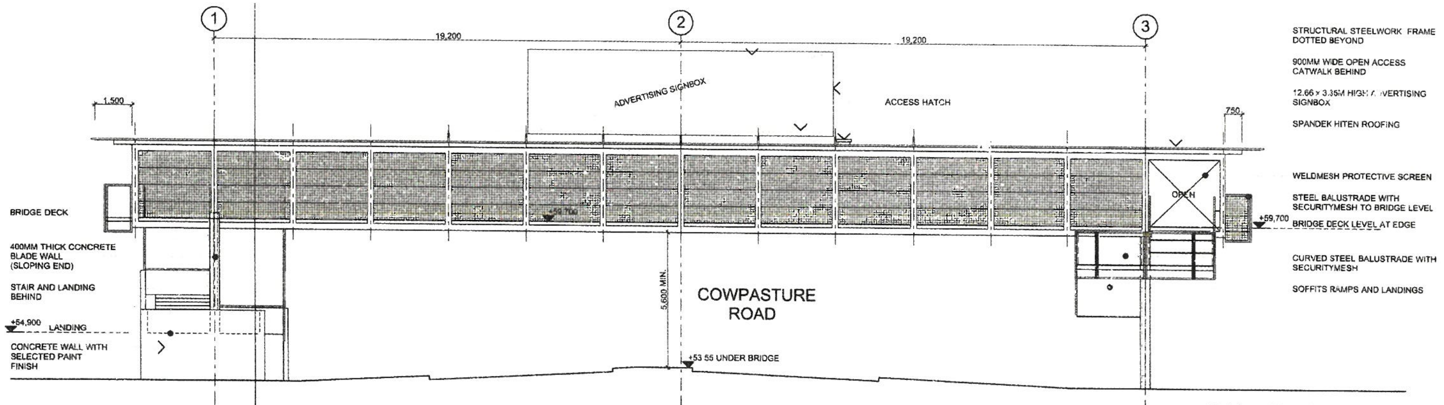
REDUCTION RATIO



04 Ramp'B' East Elevation



05 Ramp'B' West Elevation



06 Bridge North Elevation

Issue	Revision	Date
H	RL'S AMENDED TO TOP OF WALLS	08 OCT 2002
G	RL'S ADDED TO TOP OF WALLS, GENERAL AMENDMENTS	03 OCT 2002
F	FOR CONSTRUCTION	01 AUG 2002
E	SIGN SIZE CHANGED TO 12.66 x 3.35M	30 APRIL 2001
D	ISSUED FOR TENDER	30 MAY 2000
C	ISSUED FOR BA	3 APRIL 2000
B	REVISED DEVELOPMENT APPLICATION	1 FEB 2000
A	DEVELOPMENT APPLICATION	JAN 2000

PEDESTRIAN BRIDGE
COWPASTURE RD
BOSSLEY PARK

TONY CARO ARCHITECTURE

Title: ELEVATIONS RAMP B AND BRIDGE
Number: A - 05
Scale: 1:200 at A1
Date: ~~AUGUST~~ OCTOBER 2002
Issue: H

0648 156BC2503

REDUCTION RATIO

Appendix 2 Structural Condition Report

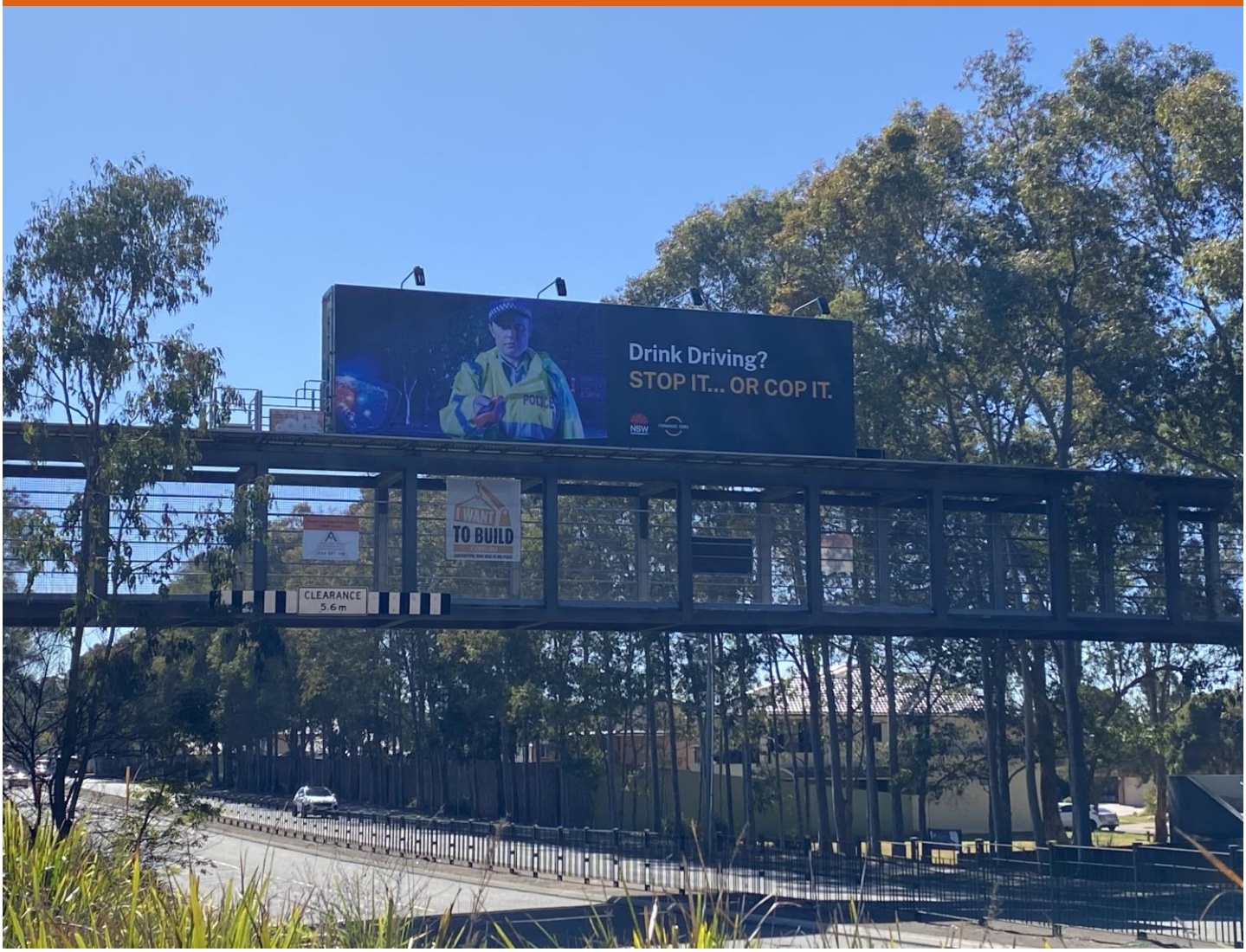
ARCADIS Design & Consultancy for natural and built assets

ADVERTISING SIGNAGE STRUCTURE

Cowpasture Road, Bossley Park – Inbound & Outbound

Structural Condition Report

21 AUGUST 2023



CONTACT

CHRIS SLATER
Senior Engineer

T 02 8907 3942
M 0410 630 972
E chris.slater@arcadis.com

Arcadis
Level 16, 580 George Street
Sydney NSW 2000

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OOH! MEDIA
ADVERTISING SIGNAGE STRUCTURE

Cowpasture Road, Bossley Park – Inbound & Outbound - Structural Condition Report

Author	Chris Slater	
Checker	Michael Cheng	
Approver	Michael Cheng	
Report No	30110779	
Date	21/08/2023	
Revision Text	1	

This report has been prepared for oOh! Media in accordance with the terms and conditions of appointment for TfNSW Large Format Inspection Reports, dated 13/10/2021. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
1	21/08/23	First issue	CS	MC

CONTENTS

1 INTRODUCTION

1.1 General

Arcadis Australia Pacific Pty Ltd (Arcadis) was engaged by oOh! Media to conduct a structural condition report on the advertising signage structure attached to the roof of the pedestrian bridge over Cowpasture Road, Bossley Park.

Figure 1 Locality Plan

1.2 Site Visit

Chris Slater of Arcadis visited the site on Thursday 17th August 2023. The purpose of this visit was to undertake a detailed inspection of the advertising signage structure from all accessible areas. The inspection was achieved using a safety harness and working at height precautions in accordance with Work Health and Safety Regulations 2017.

The weather at the time of the inspection was fine and sunny.

During this visit, information and photographs were recorded regarding the condition of the fixing components, framing members, protective surfacing, and other relevant material with respect to the performance of the signage structure. All caption comments are indicative, with the true condition record being the photographic record.

2 DESCRIPTION

The signage structure is commonly referred to as a double sided front lit ‘Supersite’, having a nominal display size of 12.660m long x 3.350m high.

The signage structure comprises a galvanised steel framed box structure with circular hollow section (CHS) legs. The legs penetrate the pedestrian bridge roof and are fully welded to the top of the main frames of the superstructure.

Photo 1 – Signage structure legs welded to bridge superstructure (circled).

The galvanised steel framed box structure is equipped with an upper and lower catwalk, providing the signage installers access to the top and bottom of the respective sign faces.

Both catwalks exceed minimum width requirements and are equipped with compliant handrails and kick rails (where required). A permanent fixed ladder located at each end of the catwalk, provides access between the gantry levels. The ends of the upper catwalk are only fitted with safety chains, which does not necessarily provide adequate fall protection.

Photo 2 – General end view of signage structure

Three horizontal rails (75 x 75 SHS) are connected to the front face of the signage box structure via bolted through bolts. These rails support the respective sign faces, which comprise steel framed sheet metal (Colorbond) segments, commonly referred to as `signage pans`.

The `signage pans` are separate entities, nominally 1200mm wide for the full height of the advertising sign, providing a flat backing for the vinyl advertising skin to be attached. These elements are fixed to the horizontal rails via angle brackets, and `Tek` screws.

The signage structure is also equipped with four overhead cantilever floodlights that illuminate the front of the advertising sign.

Access to the signage structure is gained via a padlocked access hatch in the roof of the pedestrian bridge. This access hatch permits entry to a galvanised steel-framed landing equipped with handrailing. An eyebolt has been fitted adjacent to the access hatch, providing a strong point for attaching a harness lanyard for ingress and egress purposes.

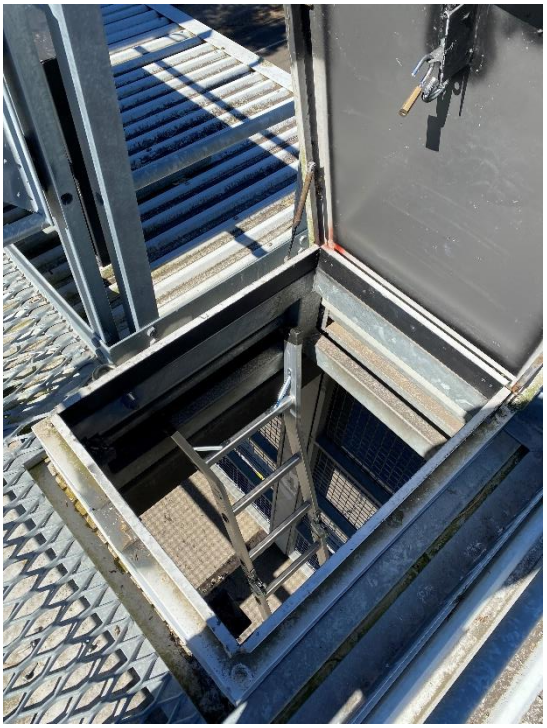

Photo 3 – Secured access hatch in roof of pedestrian bridge.

Photo 4 – Lanyard attachment eyebolt (circled)

During the inspection no other obvious defects that might warrant further investigation were noticed. However, that does not preclude the possibility that other less obvious defects may exist and were concealed.

For the intent of this report Arcadis has assumed that the existing signage structure has been designed in accordance with relevant Australian codes/standards and is structurally adequate for its purpose.

Advertising Signage Structure

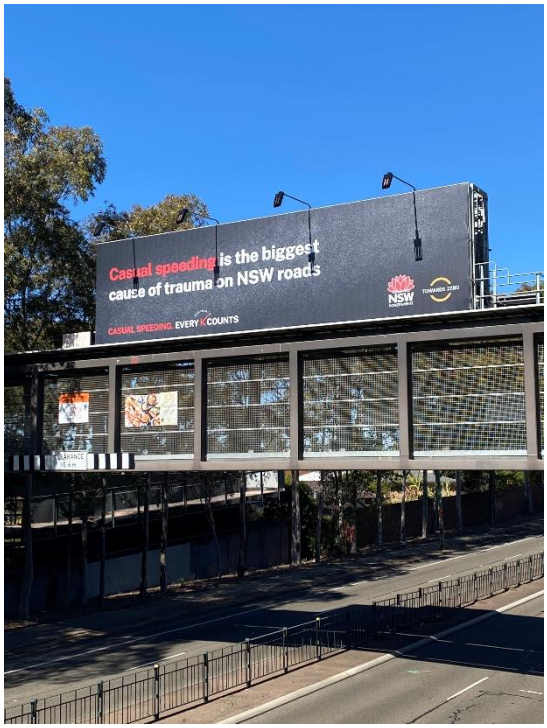

Photo 5 – General view of advertising signage structure.

3 STRUCTURAL CONDITION & OBSERVATIONS

Generally, the signage structure is in a satisfactory condition (refer photos 6 to 9).

Photo 6 – General view of landing area

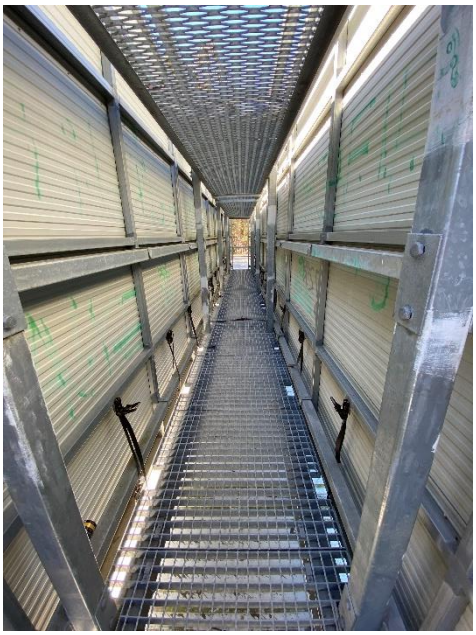

Photo 7 – General view of lower catwalk

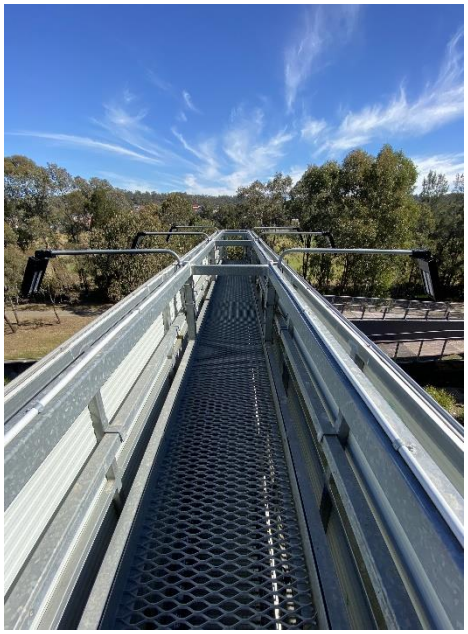

Photo 8 – General view of upper catwalk

Photo 9 – Typical horizontal rail connection

However, there are some issues that need to be addressed.

The issues observed were:

- Minor surface corrosion to logo box support framing (both sides).

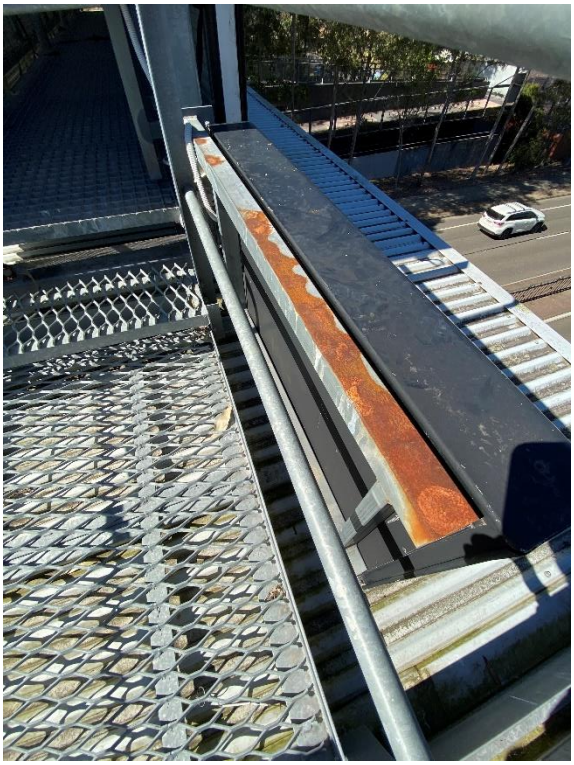

Photo 10 – Minor surface logo box support framing (west).

Photo 11 – Minor surface logo box support framing (east).

- Minor surface corrosion to vertical ladder support framing.

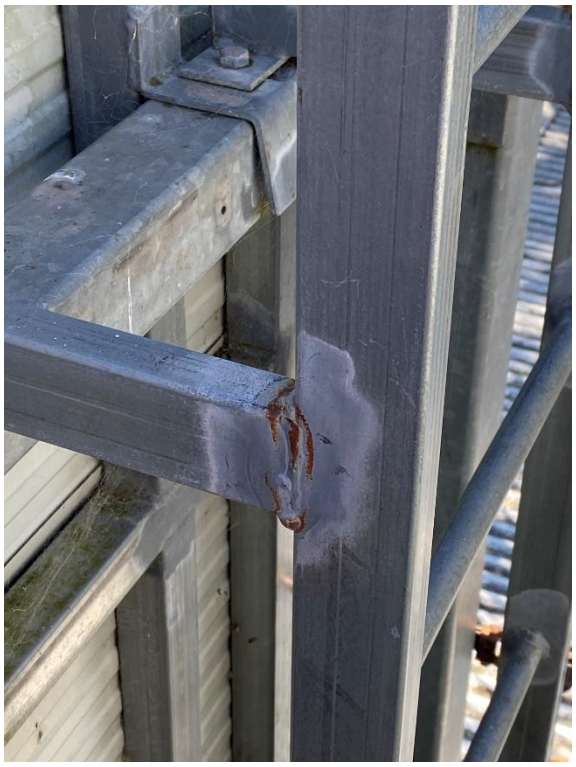

Photo 12 – Minor surface corrosion to vertical ladder support framing.

- Corroding nut to vertical ladder support framing.

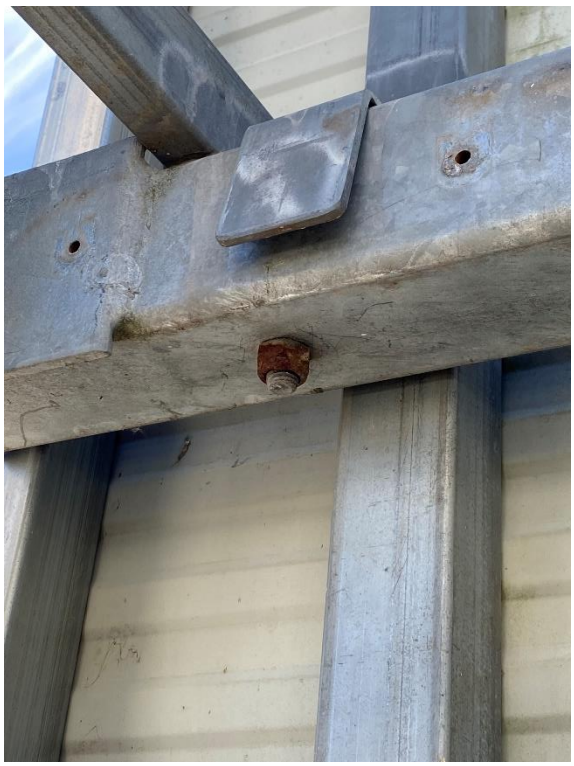

Photo 13 – Corroding nut to vertical ladder support framing.

- Deteriorating hatch strut.

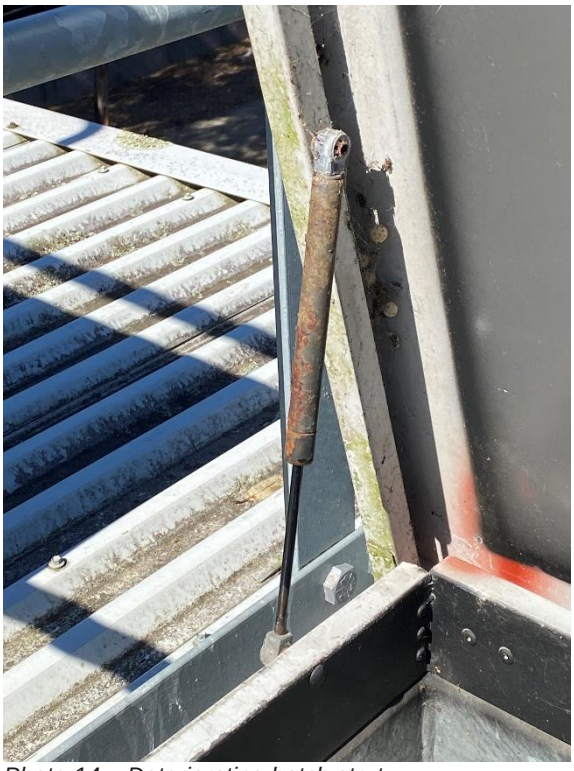

Photo 14 – Deteriorating hatch strut.

- Trip hazards to top catwalk.

Photo 15 – Trip hazards to top catwalk (circled).

4 RECOMMENDATIONS

We would recommend that the surface corrosion be wire brush cleaned and treated with a proprietary cold galvanising paint at the next scheduled maintenance programme, to avoid further corrosion developing and potentially more costly remediation. This may involve the complete replacement of nuts and bolts.

The deteriorating hatch struts be replaced.

Elimination of the trip hazards would necessitate total redesign and fabrication of the signage structure – a significantly costly exercise. In lieu of replacing the structure, measures such as ‘tiger tape’ on the trip hazard and warning signs should be instated.

Arcadis would recommend that the signage structure be re-inspected every three (3) years from the date of this report.

ARCADIS Design & Consultancy for natural and built assets