



Bonneagar Iompair Éireann
Transport Infrastructure Ireland

TII Publications



Standard Construction Details - Series 1800

April 2017

Standard Construction Details (SCDs) – Series 1800

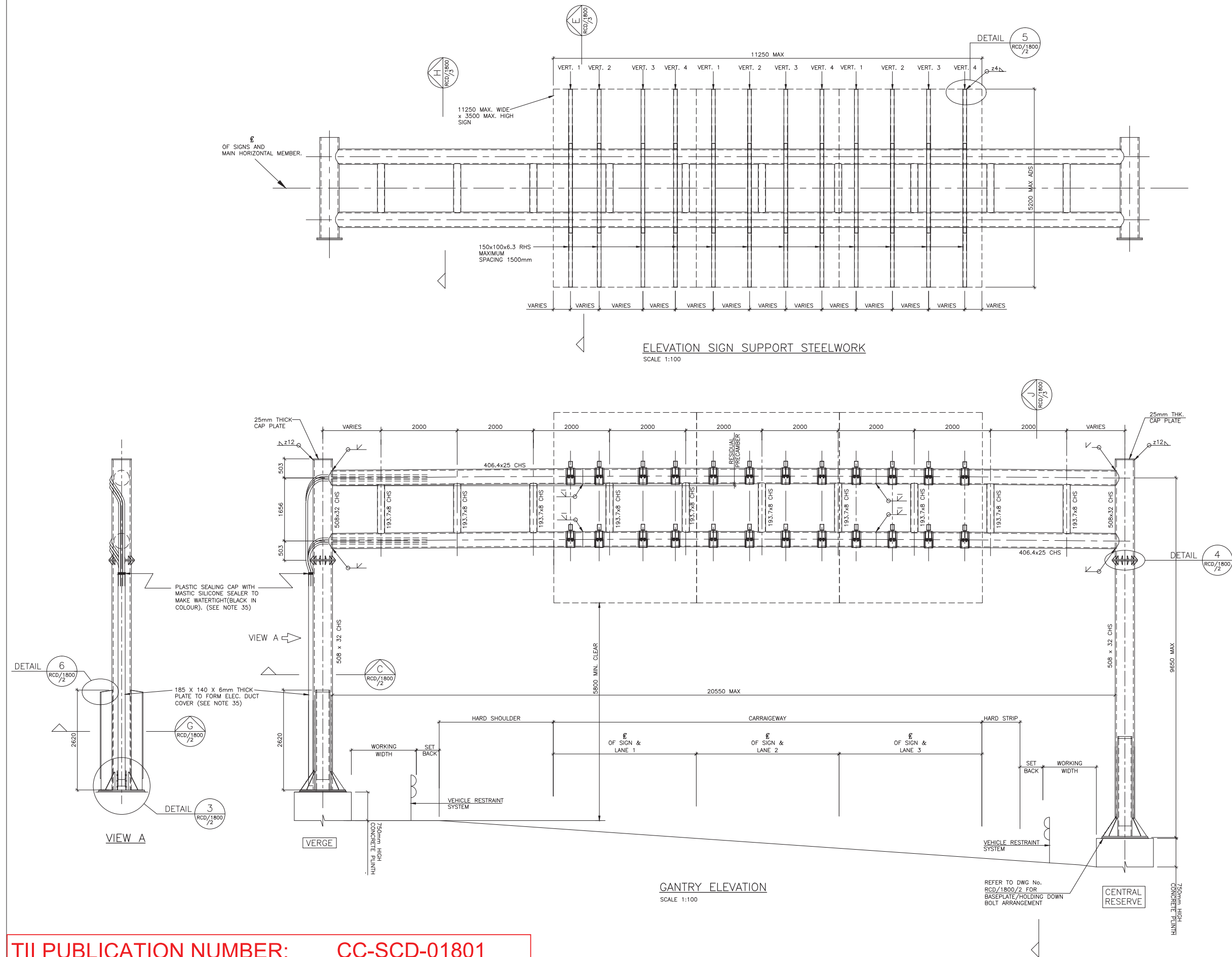
TII Publications contains Standard Construction Details (SCDs) for use on National Road schemes in Ireland. This composite document brings together all the Series 1800 SCDs from TII Publications current at the date of this document's publication, into a single location for convenience.

Every effort has been made to keep this composite document updated and available from the TII Publications website (<http://www.tiipublications.ie/>). Please note that the SCD drawings available from the TII Publications website (individually linked below) are the controlled versions for all SCDs.

The SCDs contained in this document are as follows:

Series 1800 Structural Steelwork

CC-SCD-01801	Gantry Group 1 - General Arrangement of Gantry Group 1 Sheet 1 of 3
CC-SCD-01802	Gantry Group 1 - Details of Gantry Group 1 Sheet 2 of 3
CC-SCD-01803	Gantry Group 1 - Details of Gantry Group 1 Sheet 3 of 3
CC-SCD-01804	Gantry Group 2 - General Arrangement of Gantry Group 2 Sheet 1 of 3
CC-SCD-01805	Gantry Group 2 - Details of Gantry Group 2 Sheet 2 of 3
CC-SCD-01806	Gantry Group 2 - Details of Gantry Group 2 Sheet 3 of 3
CC-SCD-01807	Gantry Group 3 - General Arrangement of Gantry Group 3 Sheet 1 of 3
CC-SCD-01808	Gantry Group 3 - Details of Gantry Group 3 Sheet 2 of 3
CC-SCD-01809	Gantry Group 3 - Details of Gantry Group 3 Sheet 3 of 3
CC-SCD-01810	Gantry Group 4 - General Arrangement of Gantry Group 4 Sheet 1 of 2
CC-SCD-01811	Gantry Group 4 - Details of Gantry Group 4 Sheet 2 of 2
CC-SCD-01812	Gantry Group 5 - General Arrangement of Gantry Group 5 Sheet 1 of 2
CC-SCD-01813	Gantry Group 5 - Details of Gantry Group 5 Sheet 2 of 2
CC-SCD-01814	Gantry Group 6 - General Arrangement of Gantry Group 6 Sheet 1 of 4
CC-SCD-01815	Gantry Group 6 - General Arrangement of Gantry Group 6 Sheet 2 of 4
CC-SCD-01816	Gantry Group 6 - General Arrangement of Gantry Group 6 Sheet 3 of 4
CC-SCD-01817	Gantry Group 6 - General Arrangement of Gantry Group 6 Sheet 4 of 4
CC-SCD-01818	Gantry Group 7 - General Arrangement of Gantry Group 7 Sheet 1 of 4
CC-SCD-01819	Gantry Group 7 - General Arrangement of Gantry Group 7 Sheet 2 of 4
CC-SCD-01820	Gantry Group 7 - General Arrangement of Gantry Group 7 Sheet 3 of 4
CC-SCD-01821	Gantry Group 7 - General Arrangement of Gantry Group 7 Sheet 4 of 4



- NOTES
1. THE PURPOSE OF THIS DETAIL IS TO ENSURE A CONSISTENCY OF STRUCTURAL FORM FOR GROUP 1 GANTRIES ACROSS THE NATIONAL ROAD NETWORK. ALL SECTION SIZES AND DETAILS ARE MINIMUM INDICATIVE SIZE ONLY. THE NRA TAKE NO RESPONSIBILITY FOR THE STRUCTURAL OR GEOMETRICAL ADEQUACY OF THESE DETAILS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ANALYSE, DESIGN AND DETAIL THE GROUP 1 GANTRY, CONNECTION DETAILS AND ITS ASSOCIATED REINFORCED CONCRETE FOUNDATION IN ACCORDANCE WITH THE EUROCODES, THEIR ASSOCIATED IRISH NATIONAL ANNEXES, NRA BD 51, NRA BD 60, NRA BD 2 AND ALL OTHER DESIGN DOCUMENTS AS APPROPRIATE TO THE ROAD BEING SPANNED.
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 3. ALL DIMENSIONS ARE IN MILLIMETRES.
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 6. STEEL SHALL BE S355J2G3 TO IS EN 10025-2 TO IS EN 10025-6 UNLESS NOTED OTHERWISE. HOLLOW SECTIONS TO BE GRADE S355J2H TO IS EN 10210 UNLESS NOTED OTHERWISE.
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 10. DIFFERENTIAL SETTLEMENT BETWEEN THE END SUPPORTS IS TAKEN AS 15mm. A SITE SPECIFIC ASSESSMENT OF DIFFERENTIAL SETTLEMENT SHALL BE CARRIED OUT, WITH 15MM DESIGNED FOR AS A MINIMUM.
 11. LIFTING EYES TO BE DESIGNED BY STEELWORK FABRICATOR AND SUBMITTED TO THE DESIGNER OF SPECIFIC GANTRIES FOR APPROVAL AT LEAST 4 WEEKS PRIOR TO FABRICATION. TEMPORARY WELDED ATTACHMENTS REQUIRED FOR ERECTION SHALL BE REMOVED AND PROTECTIVE COATING SYSTEM APPLIED IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW.
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 18. COPE HOLES AND RE-ENTRANT CORNERS SHALL HAVE A RADIUS OF AT LEAST 50mm OR 1.25 TIMES THE PLATE THICKNESS, WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
 19. HARD STAMPING SHALL NOT BE PERMITTED ON ANY PERMANENTLY EXPOSED SURFACES
 20. ASSUMED MAX WEIGHT OF ADS 20kg/m².
 21. MAXIMUM DEPTH OF SIGN TO BE 400mm.
 22. STRUCTURAL STEELWORK SUPPORTING SIGNAGE OFF GANTRIES HAS A MAX. ASSUMED WEIGHT OF 27.9kg/m. THE STRUCTURAL ADEQUACY OF ALTERNATIVE ARRANGEMENTS PROPOSED BY THE DESIGNERS OF SPECIFIC GANTRIES TO ACCOMMODATE SPECIFIC SIGNS SHALL BE VERIFIED BY THE DESIGNERS OF SPECIFIC GANTRIES.
 23. VERTICALS 1 AND 4 ARE DESIGNED TO SUPPORT VARIABLE MESSAGE SIGNAGE (VMS). VERTICALS 2 AND 3 ARE OMITTED TO ALLOW ACCESS TO BACK OF VMS. ALL VERTICALS ARE REQUIRED FOR ADVANCED DIRECTIONAL SIGNAGE. SIZE AND SPACING OF VERTICALS TO BE CONFIRMED BY THE DESIGN ENGINEER.
 24. WIND LOADING SHALL BE IN ACCORDANCE WITH IS EN 1991-1-4 AND THE ASSOCIATED IRISH NATIONAL ANNEX.
 25. ALL BOLTS AND NUTS TO BE VIBRATION RESISTANT.
 26. ALL WELDS ARE IN TENSION UNDER TEMPORARY AND IN-SERVICE CONDITIONS.
 27. MINIMUM CLASS OF CONCRETE IN FOUNDATION TO BE C32/40.
 28. ALL ELEMENTS TO BE LIFTED FROM LIFTING EYES. SLINGS NOT TO BE USED TO PREVENT DAMAGE TO PROTECTIVE COATING.
 29. GANTRIES ARE ASSUMED PERPENDICULAR TO THE MAINLINE.
 30. SECONDARY SIGNWORK STRUCTURAL STEELWORK NOT TO BE USED FOR LIFTING.
 31. THE RESIDUAL PRECAMBER AFTER PERMANENT AND SUPER-IMPOSED DEAD LOADS FOR SPECIFIC SCHEMES SHALL BE SPAN/400 AND BE ACHIEVED AT MID-SPAN WITH A SMOOTH CURVE BETWEEN MID-SPAN AND END SUPPORTS.
 32. CARRIAGEWAY CROSS SECTION IS INDICATIVE ONLY.
 33. SIGN SUPPORT DETAILS AND CABLE RUNS REQUIRED SHALL BE CONFIRMED BY THE DESIGNER OF THE SPECIFIC GANTRIES WITH ELECTRICAL SUPPLIER.
 34. DUCTING TO BE PROVIDED BY SPECIALIST SUBCONTRACTORS.
 35. PROVISION OF ELEMENTS SUPPORTING AND ACCOMMODATING ELECTRICAL EQUIPMENT AT SPECIFIC GANTRIES TO BE CONFIRMED WITH THE NRA.
 36. THE DESIGNER OF SPECIFIC GANTRIES SHALL BE SUBJECT TO, AND SHALL COMPLY WITH THE TECHNICAL APPROVAL PROCEDURES FOR STRUCTURES CONTAINED WITHIN NRA BD2 OF THE NRA DMRB.

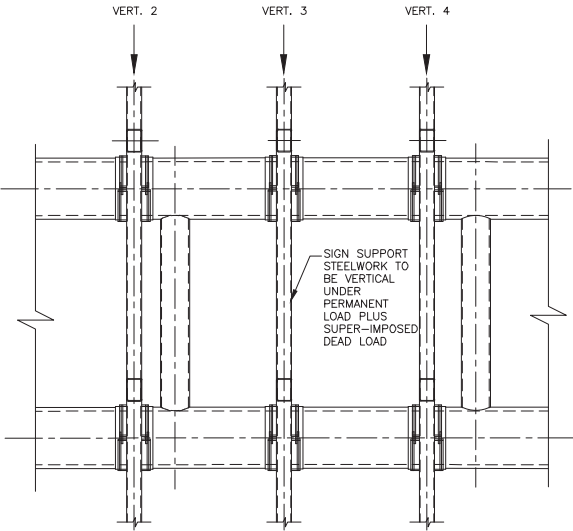
LEGEND

ADS - ADVANCED DIRECTIONAL SIGN

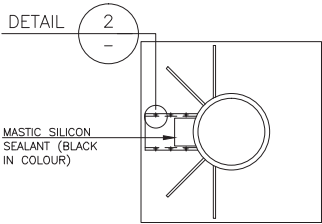
TII PUBLICATION NUMBER: CC-SCD-01801

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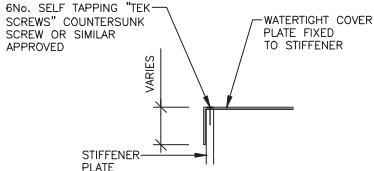
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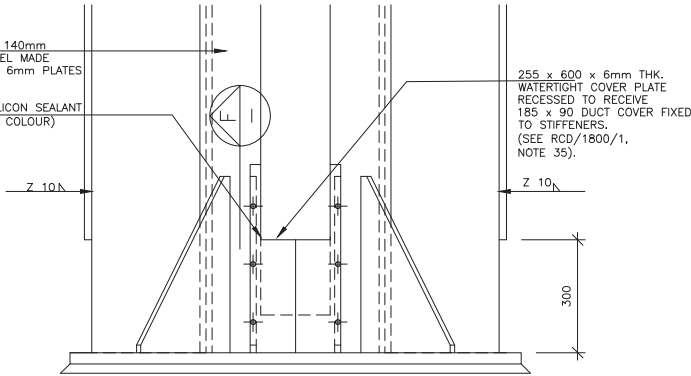
SIGN SUPPORT STEELWORK
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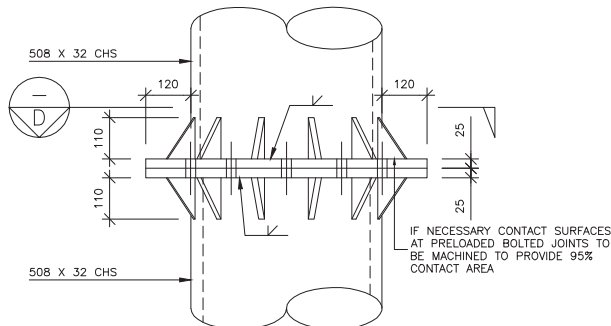
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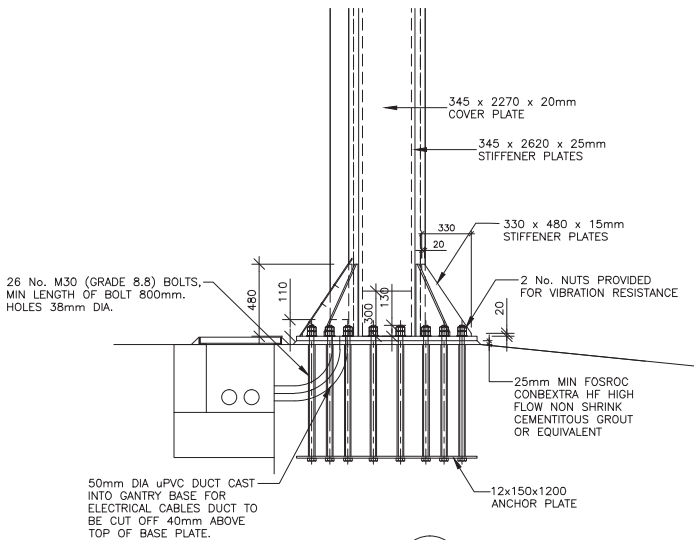
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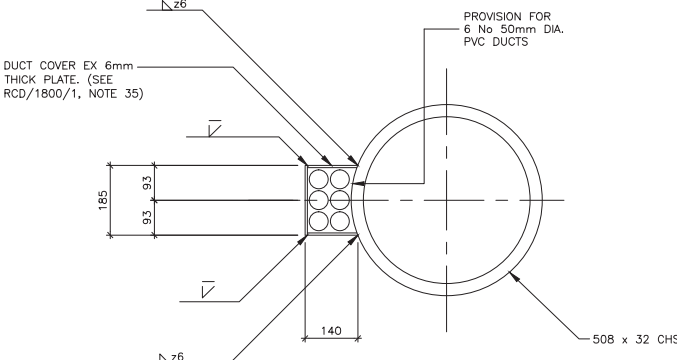
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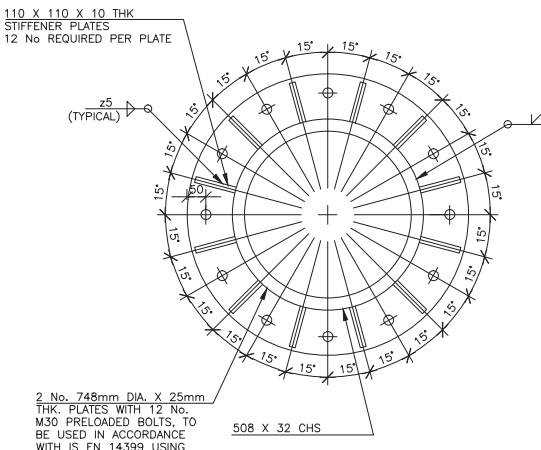
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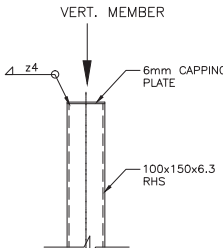
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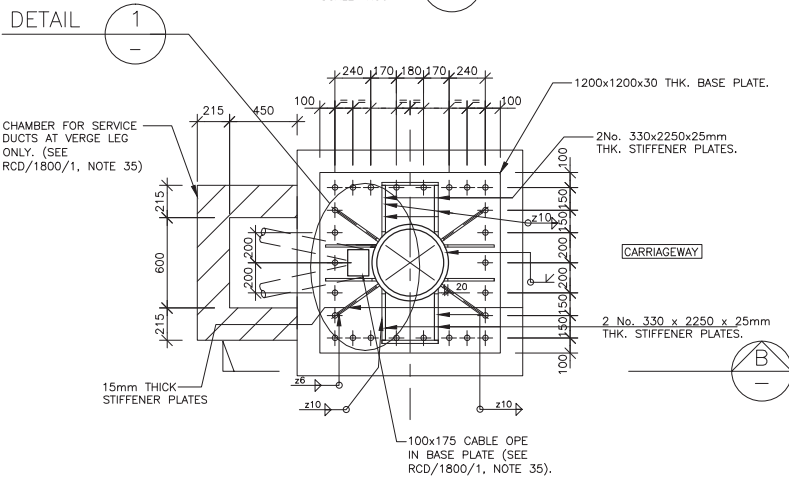
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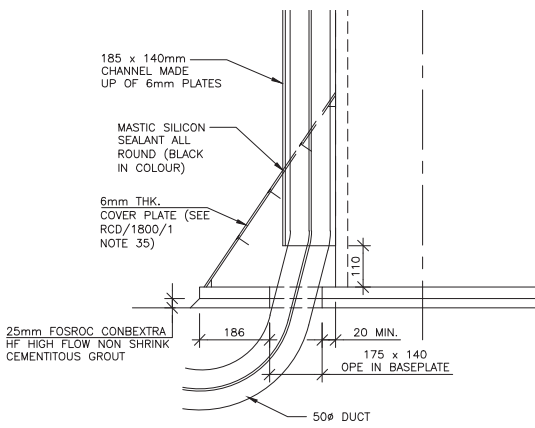
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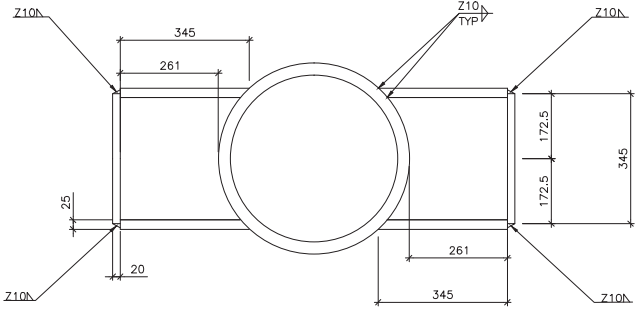
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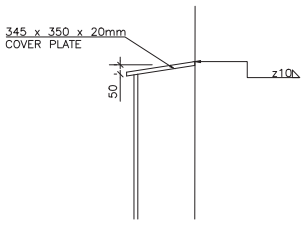
PLAN ON BASE PLATE
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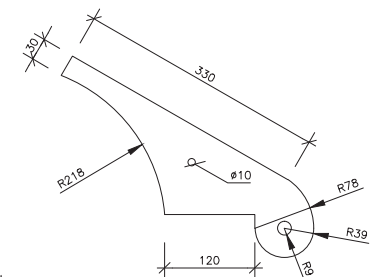
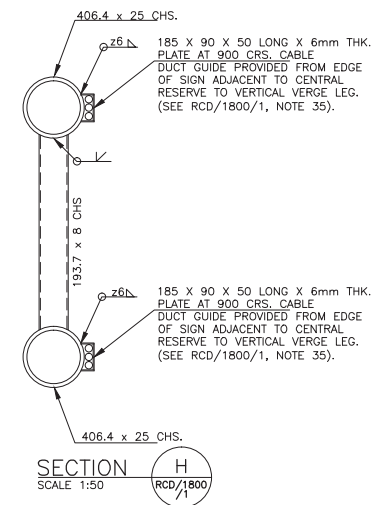
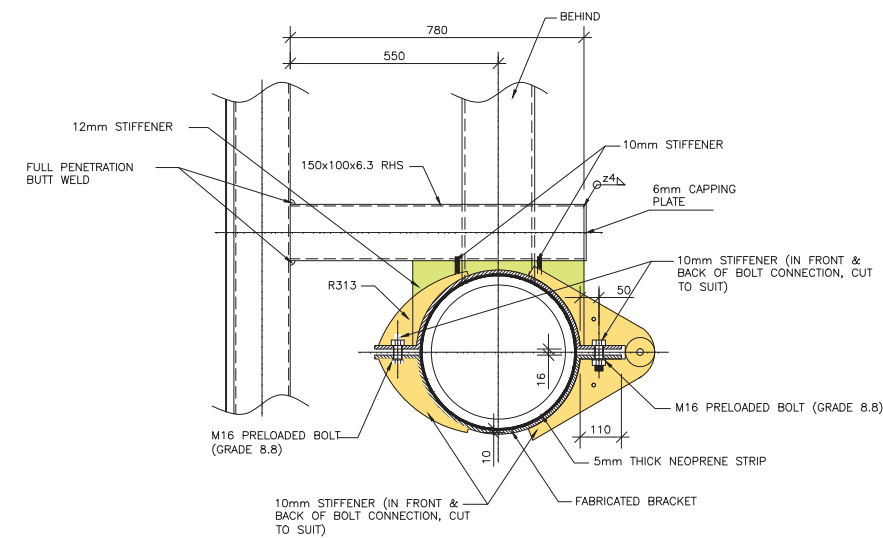
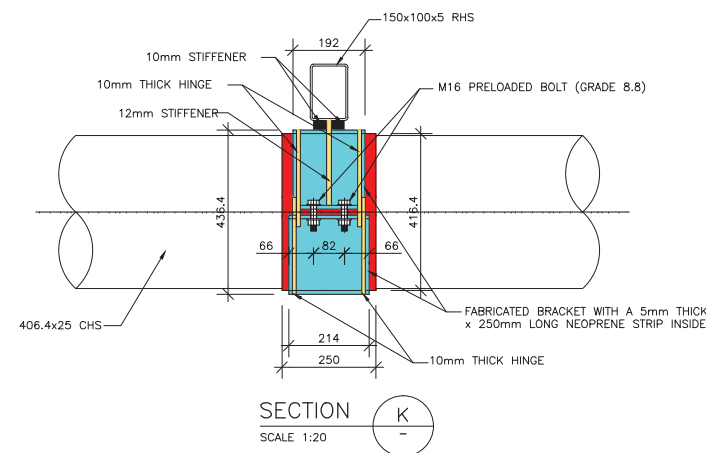
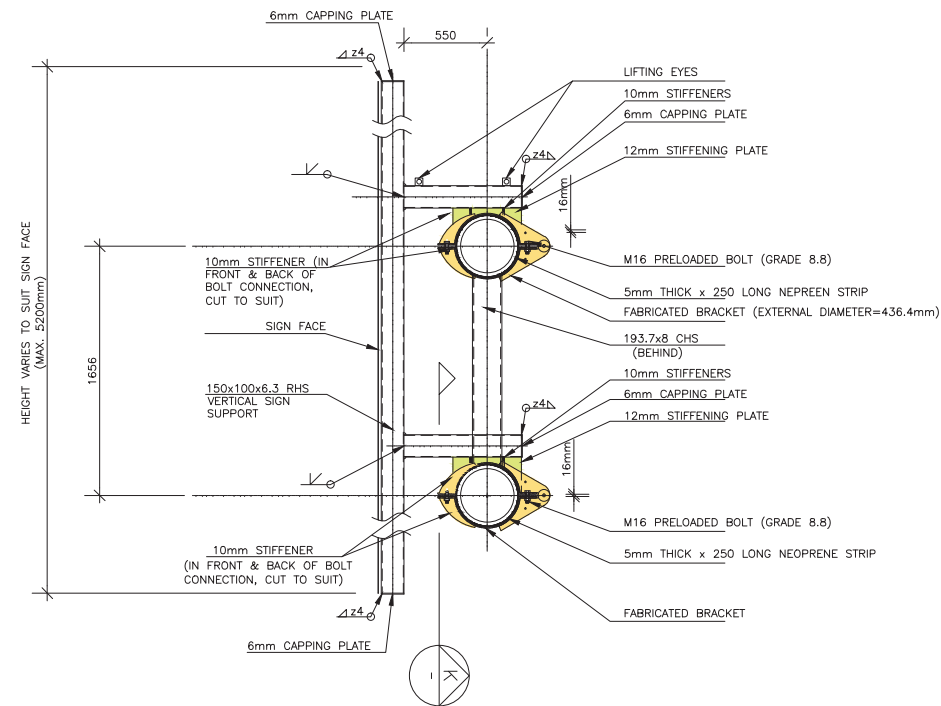
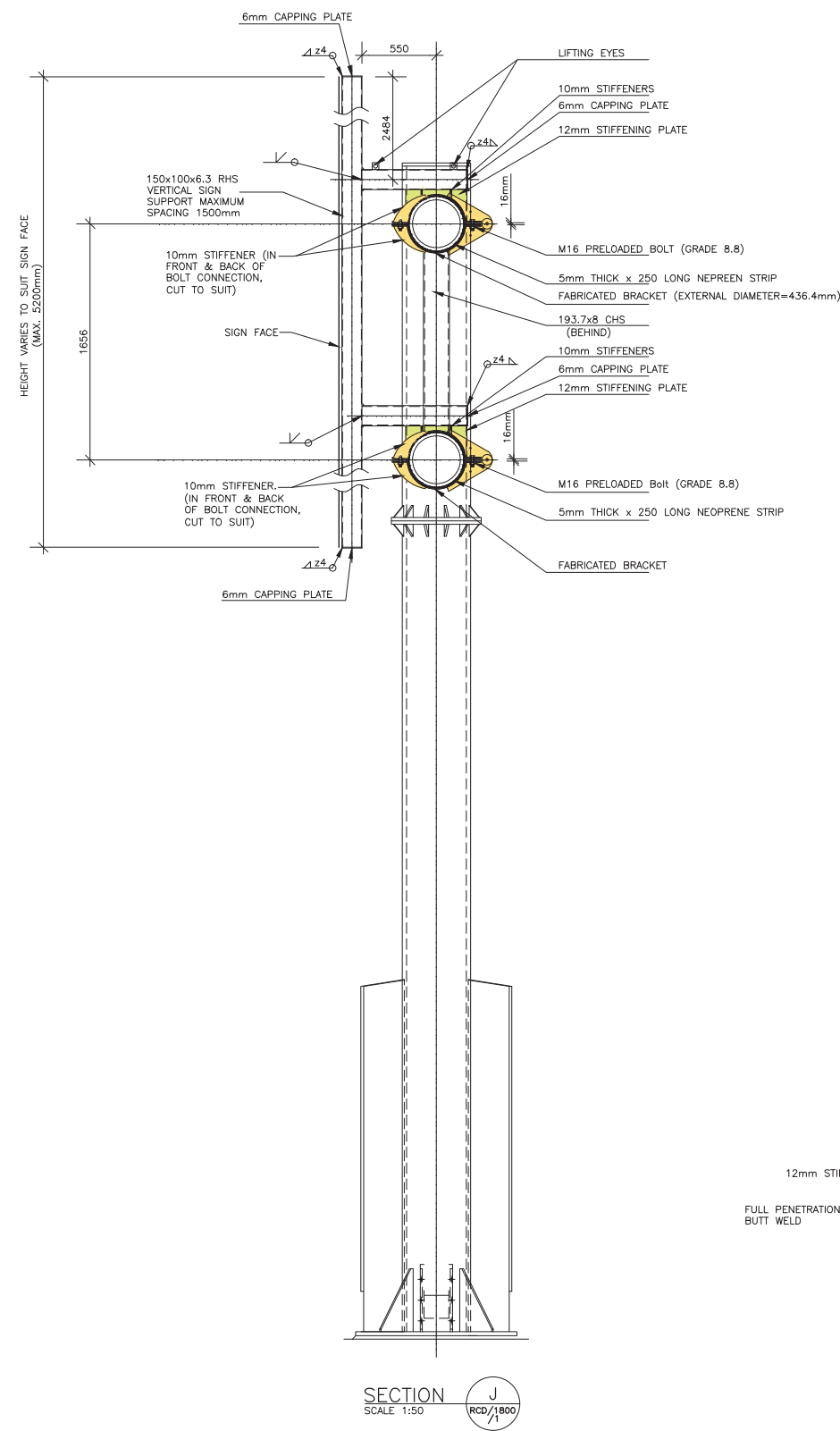
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SECTION G
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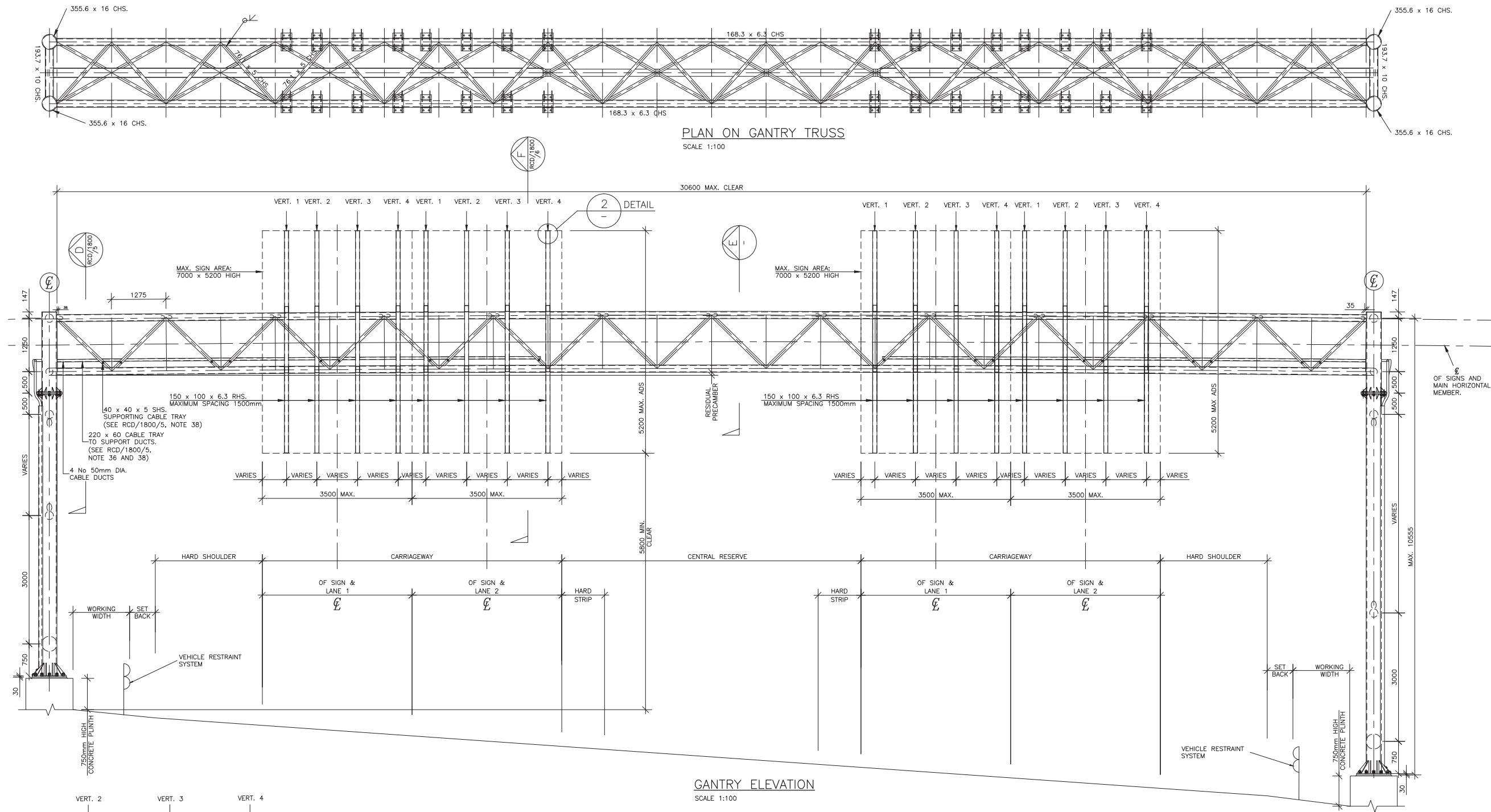


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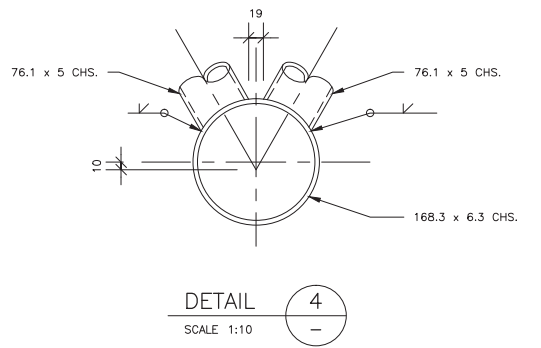
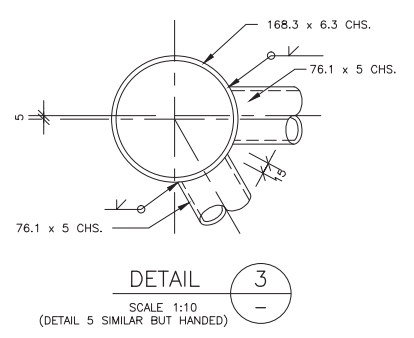
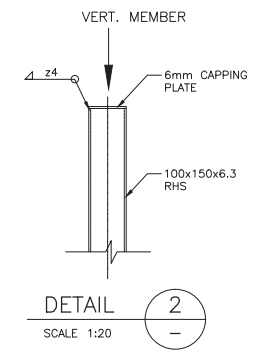
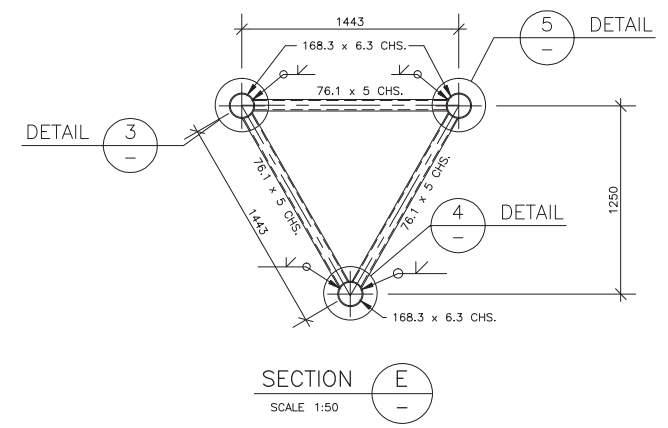
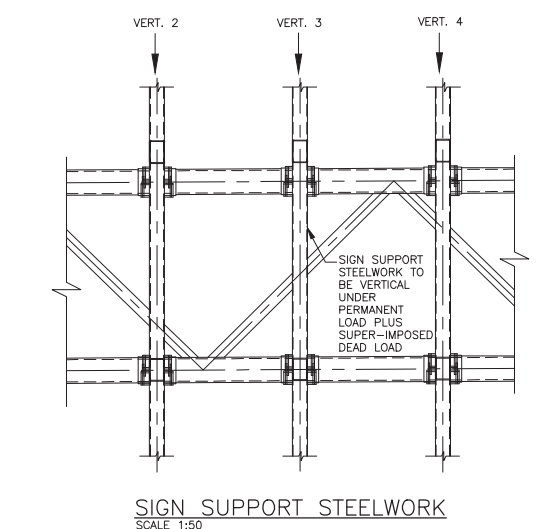


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 2. FOR FABRICATION OF CLAMPS, ALL WELDS TO BE 8mm MINIMUM FILLET WELDS AND CONTINUOUS UNLESS NOTED OTHERWISE. DESIGN ENGINEER TO VERIFY.
 3. THE NRA TAKE NO RESPONSIBILITY FOR THE STRUCTURAL ADEQUACY OF THESE CLAMPING DETAILS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ANALYSE, DESIGN AND DETAIL ALL ASPECTS OF THE CLAMPING CONNECTION.
 4. EACH VERTICAL MEMBER SUPPORTING SIGNS WILL REQUIRE A SET OF CLAMPS TO CONNECT TO THE GANTRY.

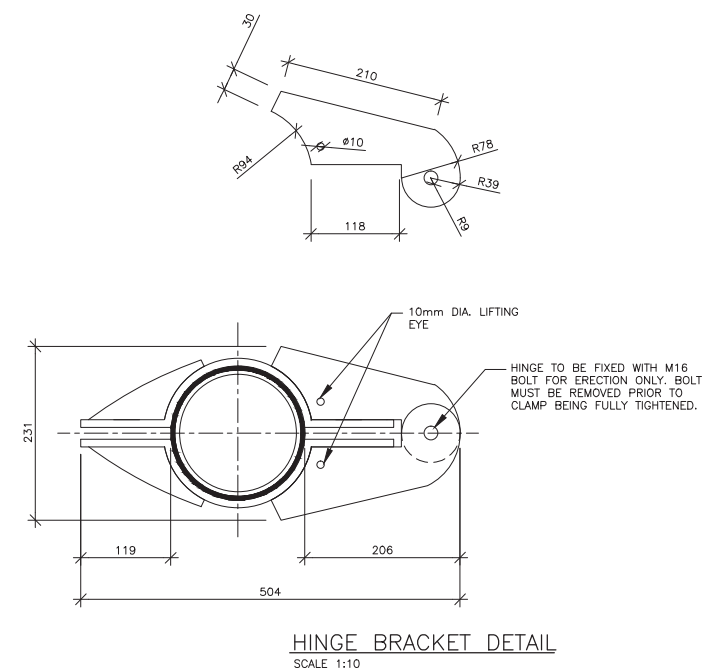
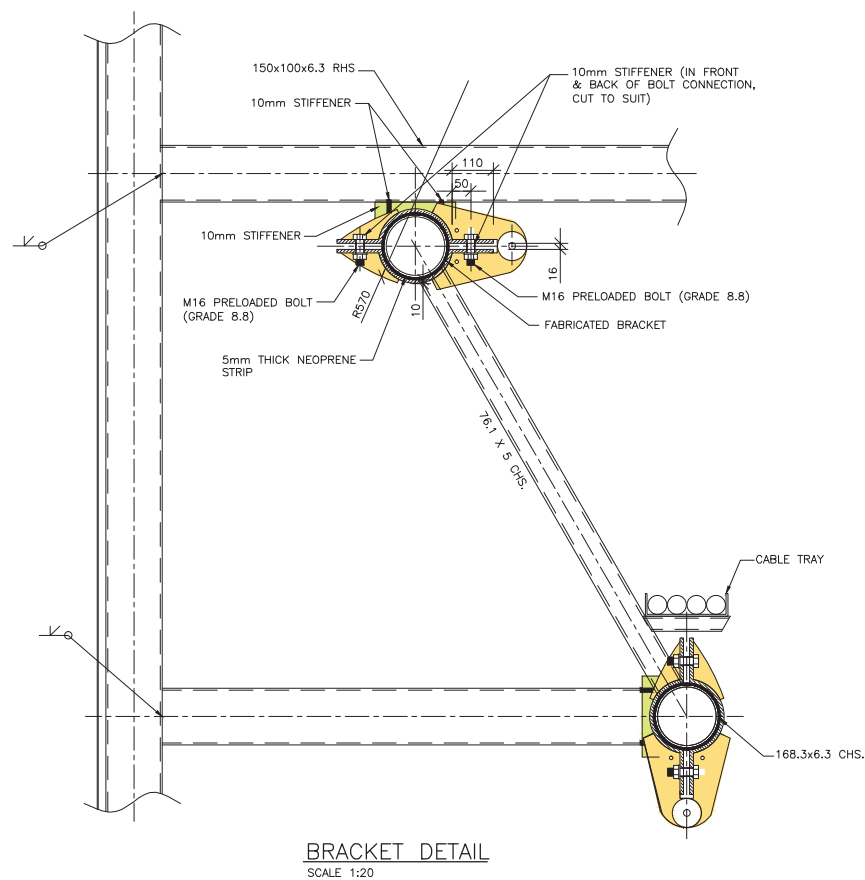
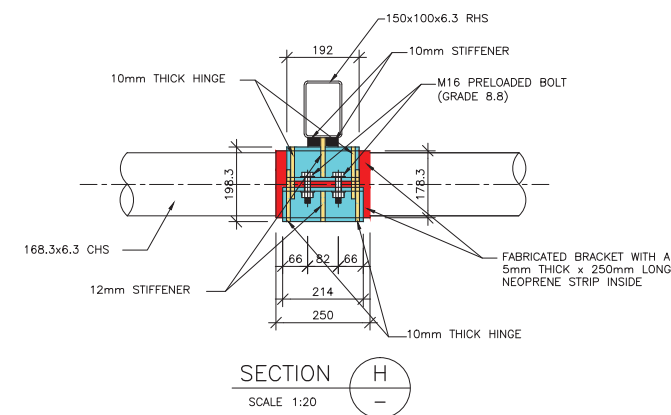
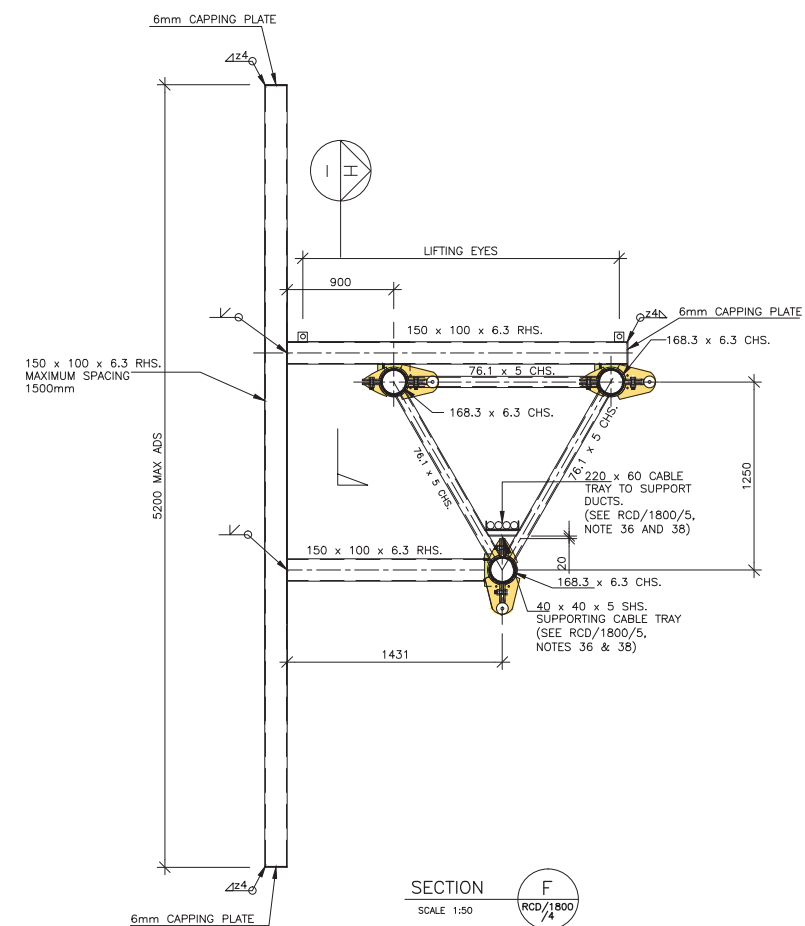
TII PUBLICATION NUMBER: CC-SCD-01803



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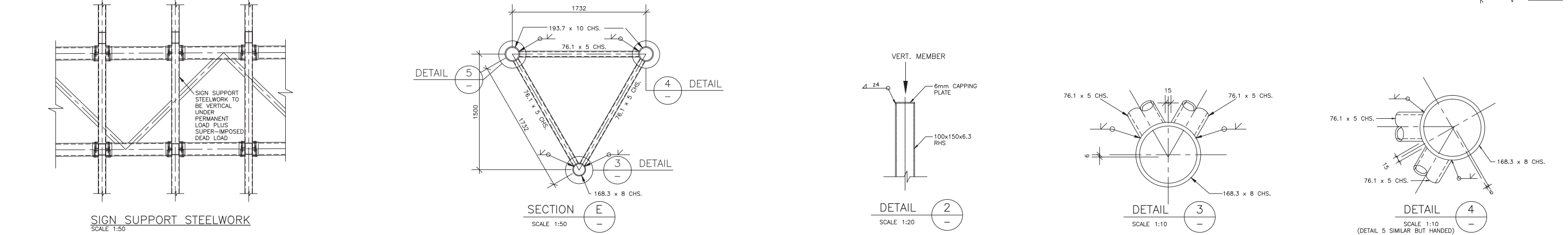
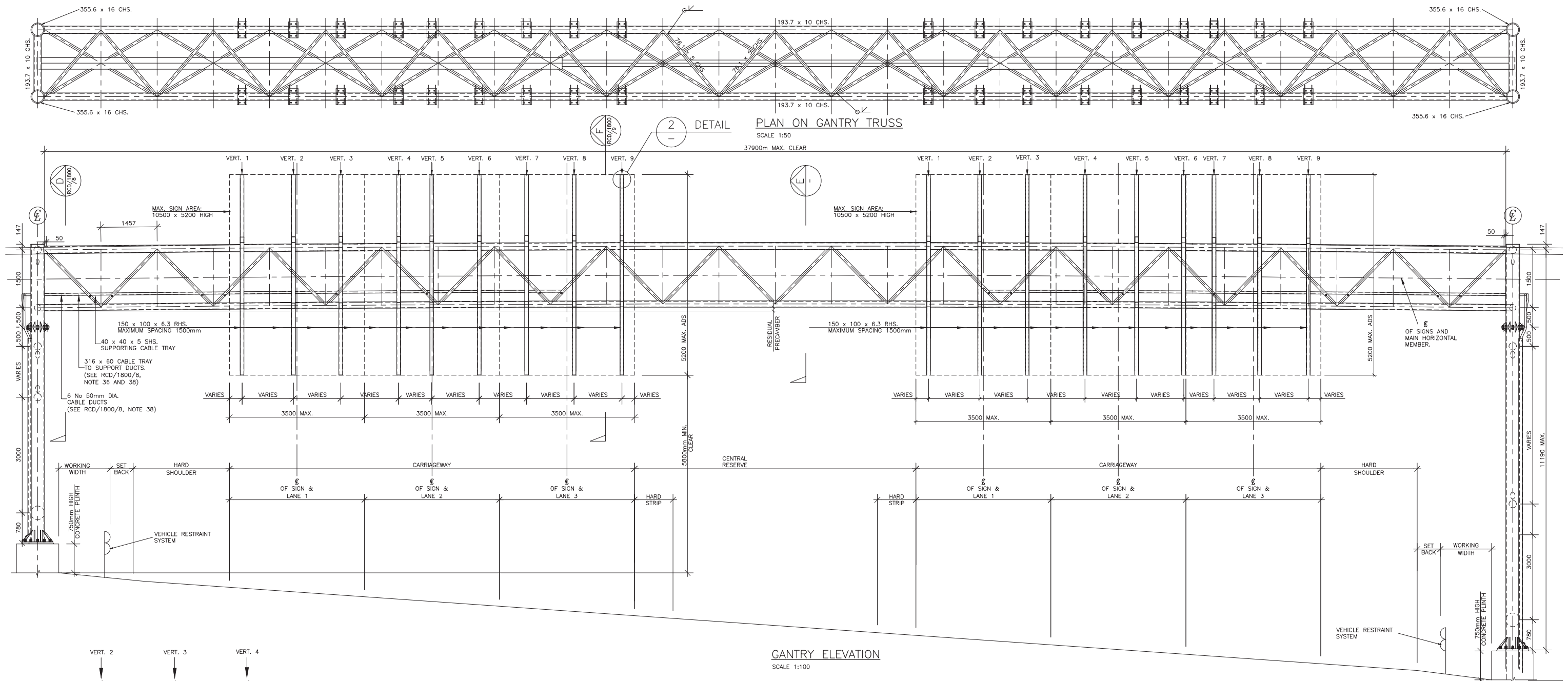
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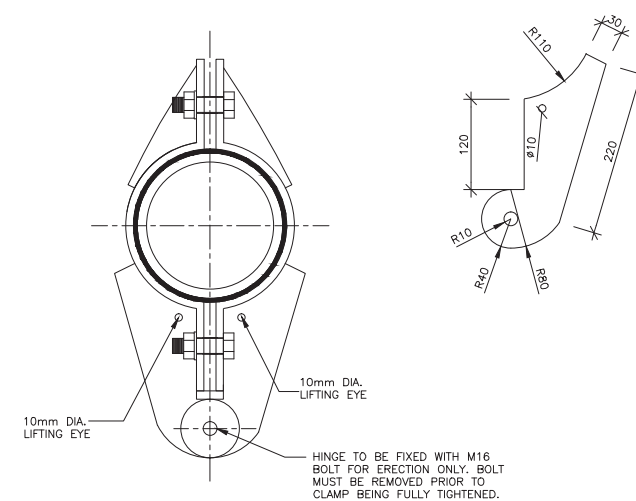
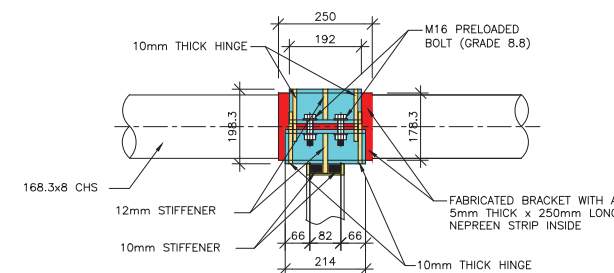
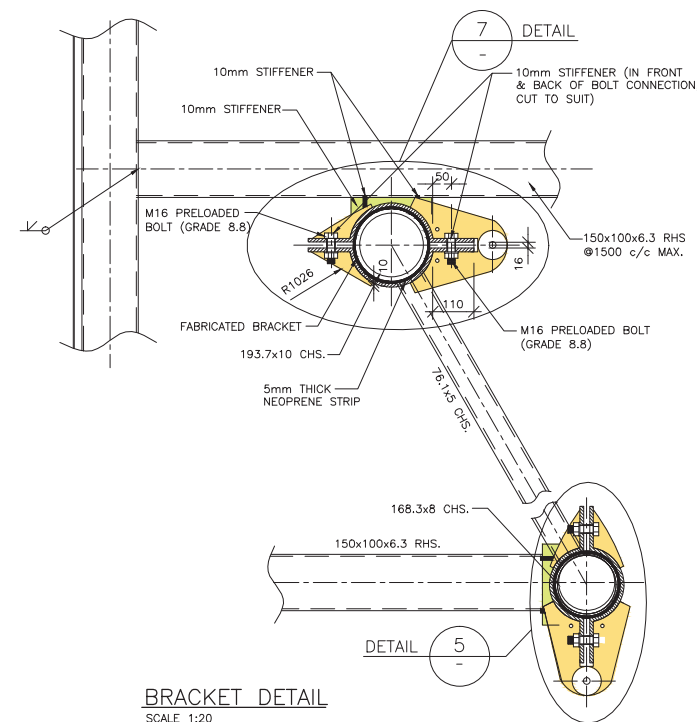
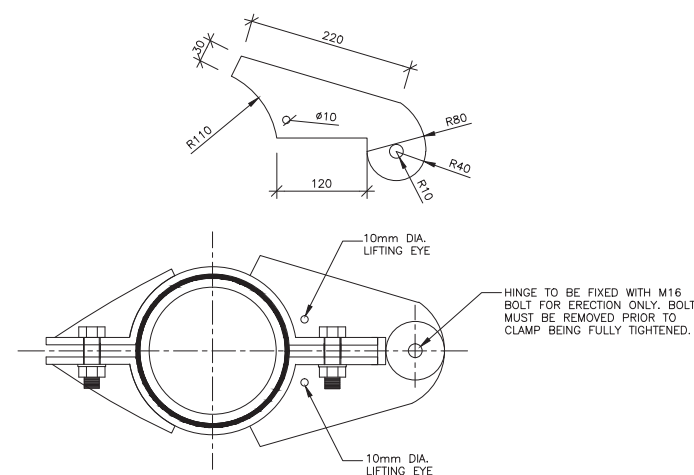
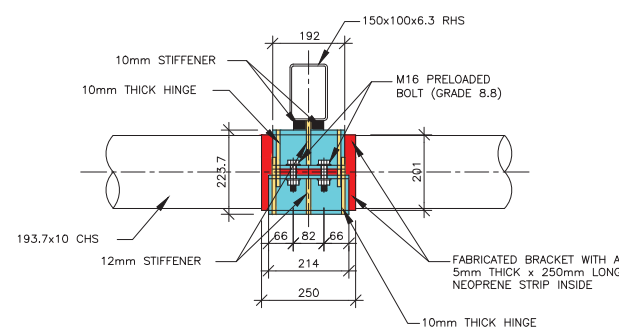
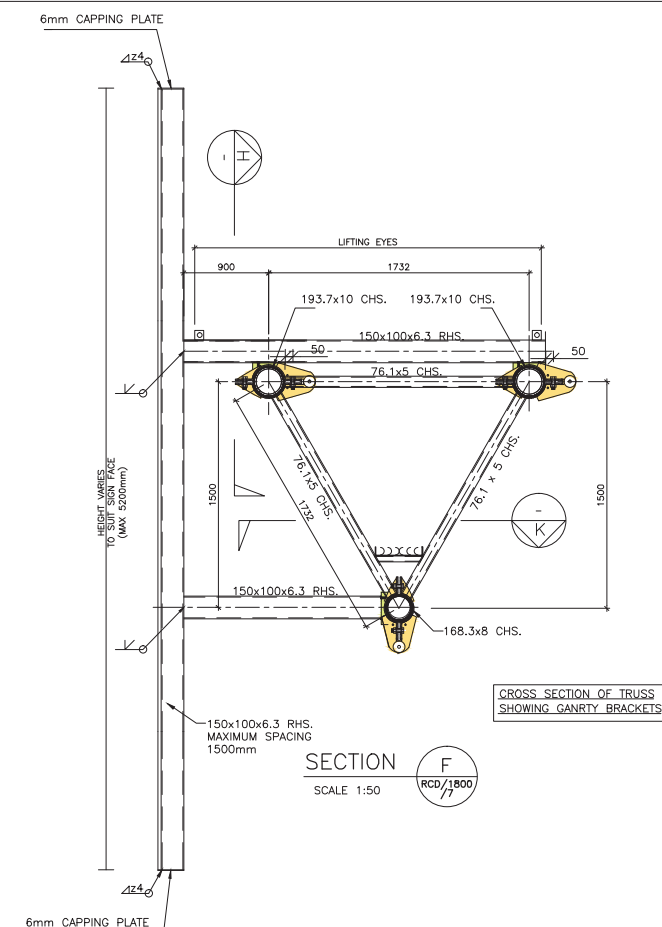


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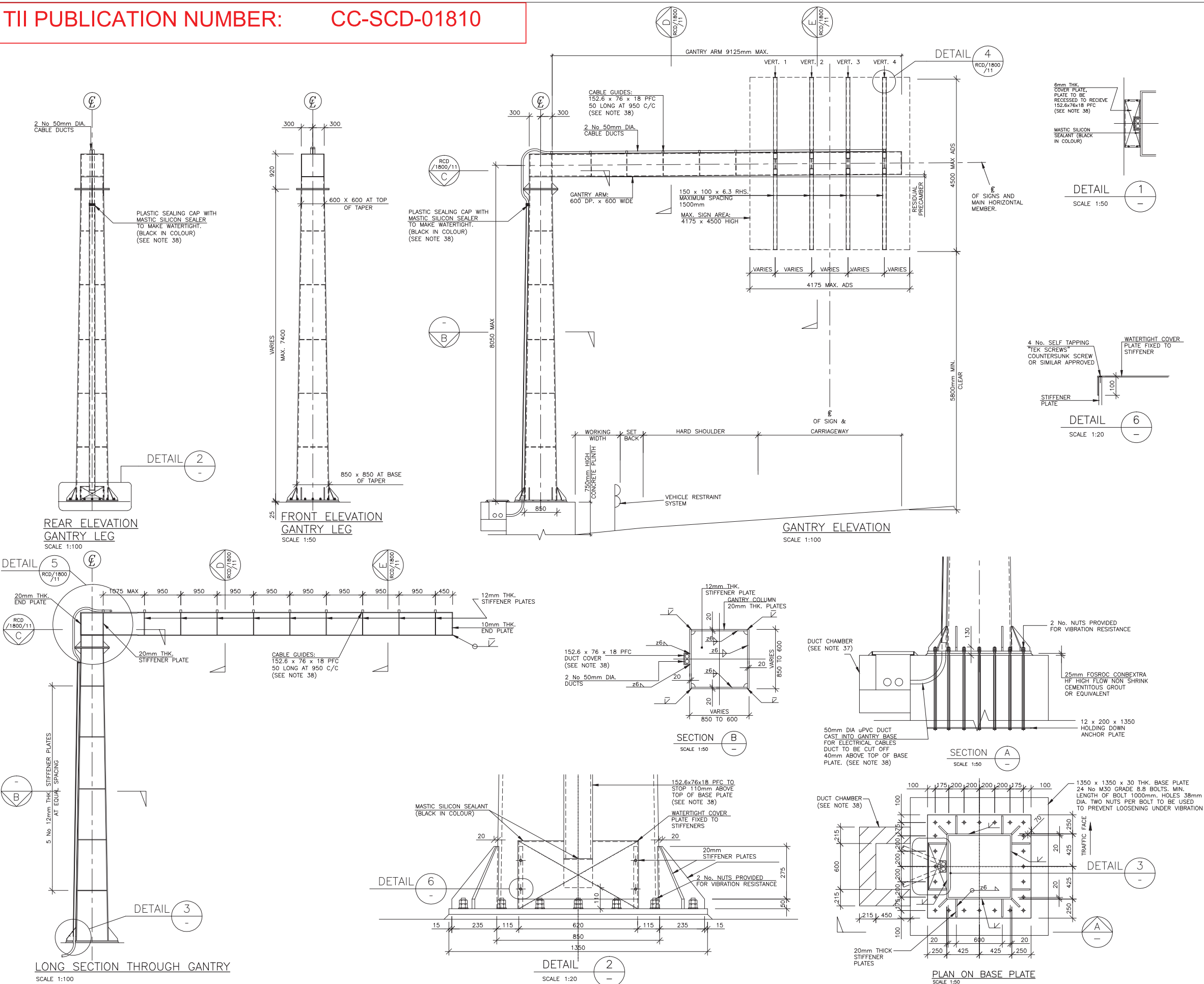
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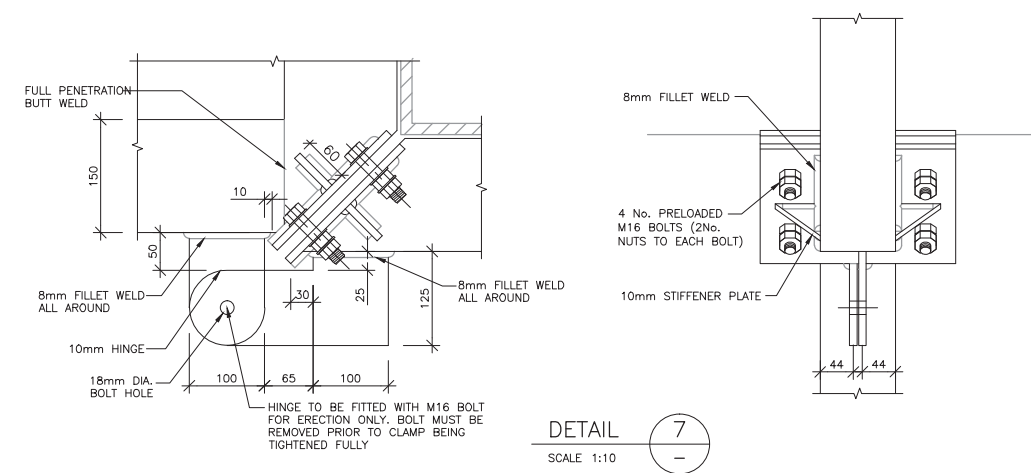
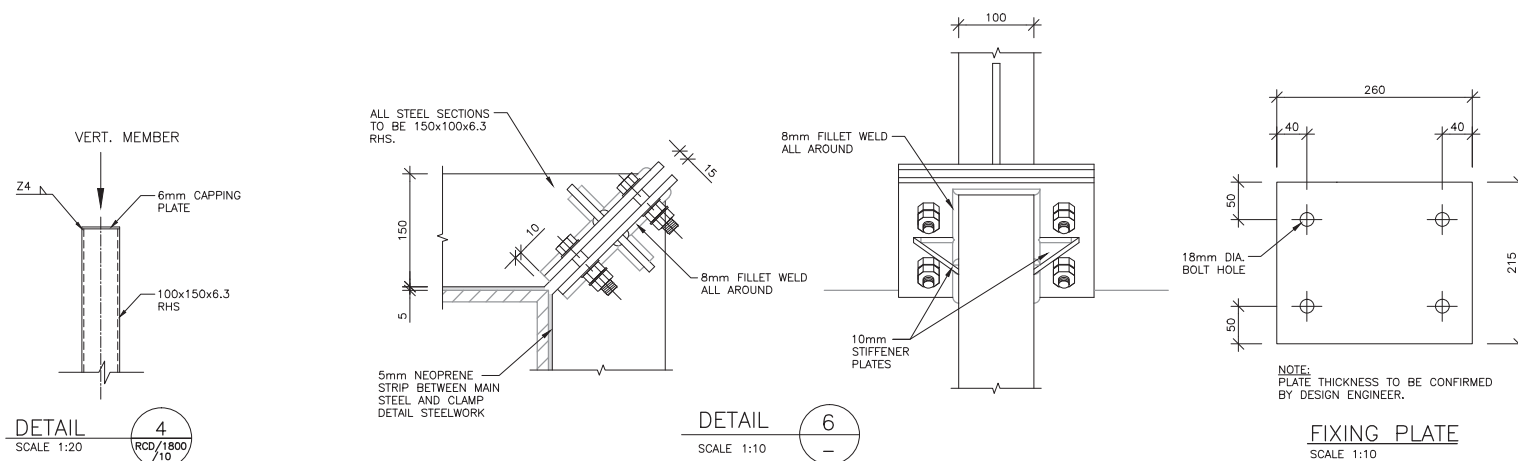
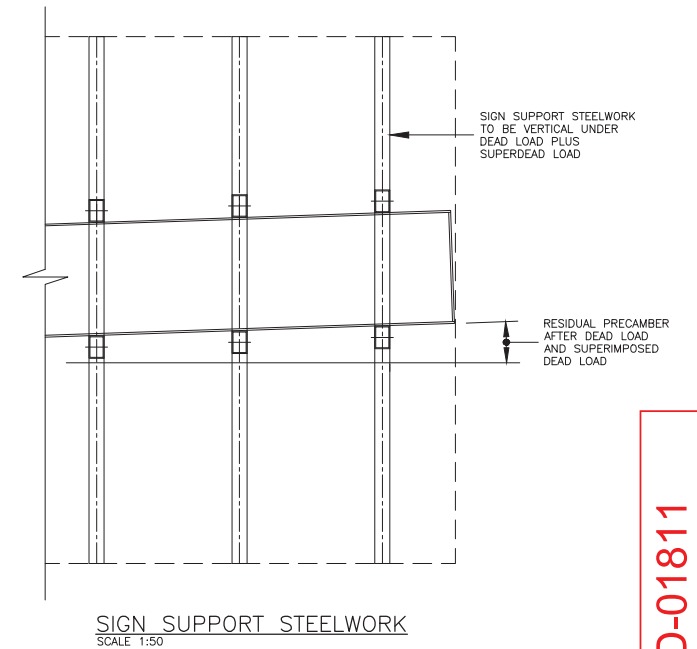
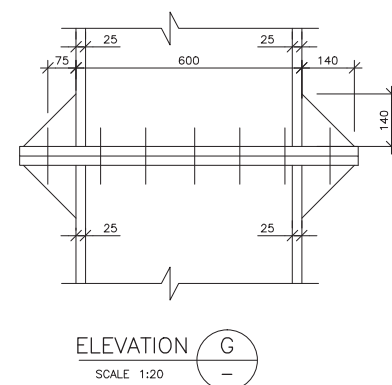
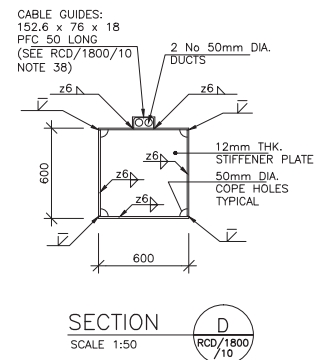


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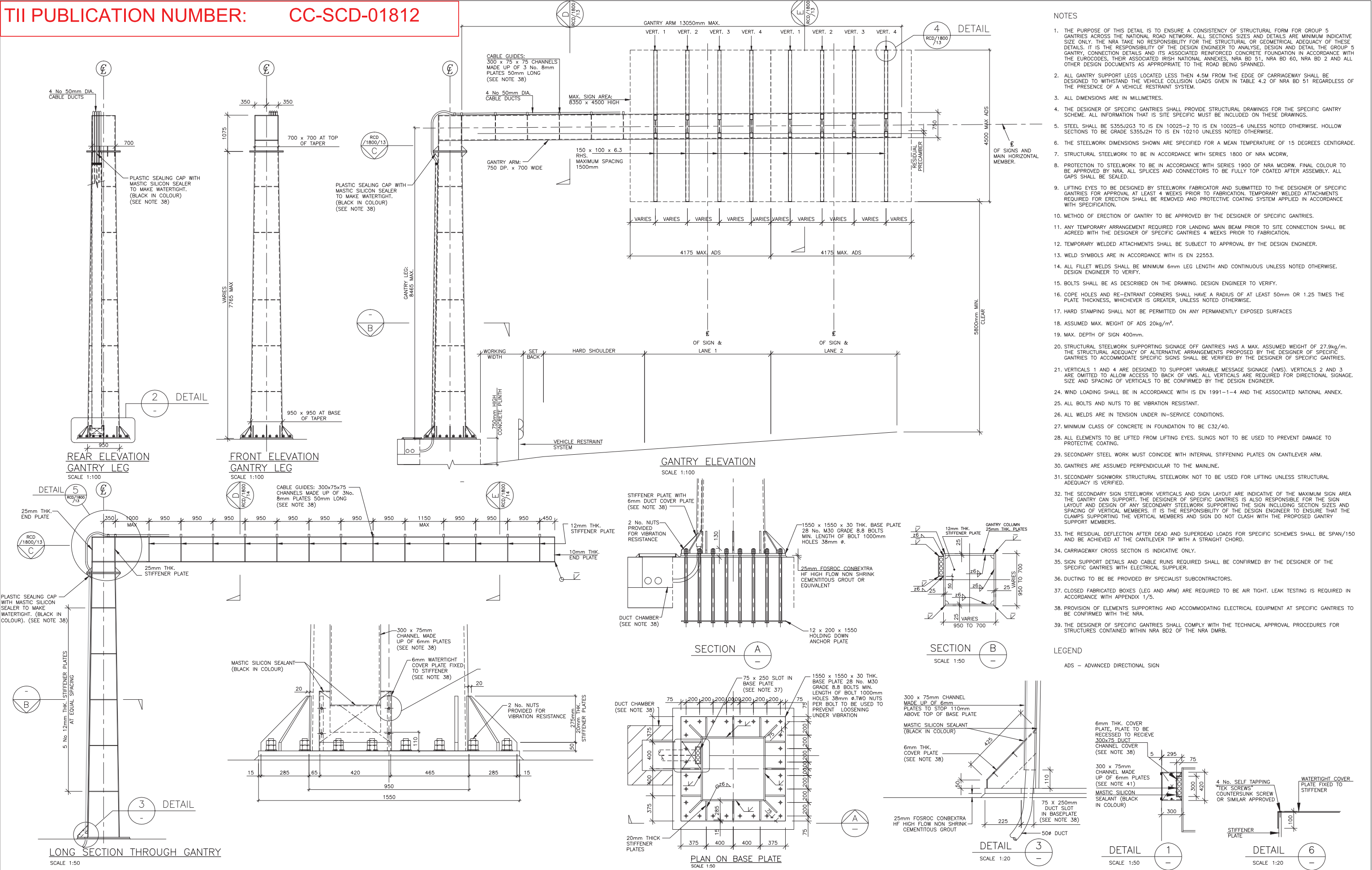
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18. ASSUMED MAX. WEIGHT OF ADS 20kg/m².
19. MAX. DEPTH OF SIGN 400mm.
20. STRUCTURAL STEELWORK SUPPORTING SIGNAGE OFF GANTRIES HAS A MAX. ASSUMED WEIGHT OF 27.9kg/m. THE STRUCTURAL ADEQUACY OF ALTERNATIVE ARRANGEMENTS PROPOSED BY THE DESIGNER OF SPECIFIC GANTRIES TO ACCOMMODATE SPECIFIC SIGNS SHALL BE VERIFIED BY THE DESIGNER OF SPECIFIC GANTRIES.
21. VERTICALS 1 AND 4 ARE DESIGNED TO SUPPORT VARIABLE MESSAGE SIGNAGE (VMS). VERTICALS 2 AND 3 ARE OMITTED TO ALLOW ACCESS TO BACK OF VMS. ALL VERTICALS ARE REQUIRED FOR DIRECTIONAL SIGNAGE. SIZE AND SIGNAGE OF VERTICALS TO BE CONFIRMED BY THE DESIGN ENGINEER.
24. WIND LOADING SHALL BE IN ACCORDANCE WITH IS EN 1991-1-4 AND THE ASSOCIATED IRISH NATIONAL ANNEX.
25. ALL BOLTS AND NUTS TO BE VIBRATION RESISTANT.
26. ALL WELDS ARE IN TENSION UNDER IN-SERVICE CONDITIONS.
27. MINIMUM CLASS OF CONCRETE IN FOUNDATION TO BE C32/40.
28. ALL ELEMENTS TO BE LIFTED FROM LIFTING EYES. SLINGS NOT TO BE USED TO PREVENT DAMAGE TO PROTECTIVE COATING.
29. SECONDARY STEEL WORK MUST COINCIDE WITH INTERNAL STIFFENING PLATES ON CANTILEVER ARM.
30. GANTRIES ARE ASSUMED PERPENDICULAR TO THE MAINLINE.
31. SECONDARY SIGNWORK STRUCTURAL STEELWORK NOT TO BE USED FOR LIFTING UNLESS STRUCTURAL ADEQUACY IS VERIFIED.
31. THE SECONDARY SIGN STEELWORK VERTICALS AND SIGN LAYOUT ARE INDICATIVE OF THE MAXIMUM SIGN AREA THE GANTRY CAN SUPPORT. THE DESIGNER OF SPECIFIC GANTRIES IS ALSO RESPONSIBLE FOR THE SIGN LAYOUT AND DESIGN OF ANY SECONDARY STEELWORK SUPPORTING THE SIGN INCLUDING SECTION SIZES AND SPACING OF VERTICAL MEMBERS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ENSURE THAT THE CLAMPS SUPPORTING THE VERTICAL MEMBERS AND SIGN DO NOT CLASH WITH THE PROPOSED GANTRY SUPPORT MEMBERS.
32. THE RESIDUAL DEFLECTION AFTER PERMANENT AND SUPERIMPOSED DEAD LOADS FOR SPECIFIC SCHEMES SHALL BE SPAN/150 AND BE ACHIEVED AT THE CANTILEVER TIP WITH A STRAIGHT CHORD.
33. CARRIAGEWAY CROSS SECTION IS INDICATIVE ONLY.
34. SIGN SUPPORT DETAILS AND CABLE RUNS REQUIRED SHALL BE CONFIRMED BY THE DESIGNER OF THE SPECIFIC GANTRIES WITH ELECTRICAL SUPPLIER.
35. DUCTING TO BE PROVIDED BY SPECIALIST SUBCONTRACTORS.
36. CLOSED FABRICATED BOXES (LEG AND ARM) ARE REQUIRED TO BE AIR TIGHT. LEAK TESTING IS REQUIRED IN ACCORDANCE WITH APPENDIX 1/5.
37. PROVISION OF ELEMENTS SUPPORTING AND ACCOMMODATING ELECTRICAL EQUIPMENT AT SPECIFIC GANTRIES TO BE CONFIRMED WITH THE NRA.
38. THE DESIGNER OF SPECIFIC GANTRIES SHALL COMPLY WITH THE TECHNICAL APPROVAL PROCEDURES FOR STRUCTURES CONTAINED WITHIN NRA BD2 OF THE NRA DMRB.

LEGEND

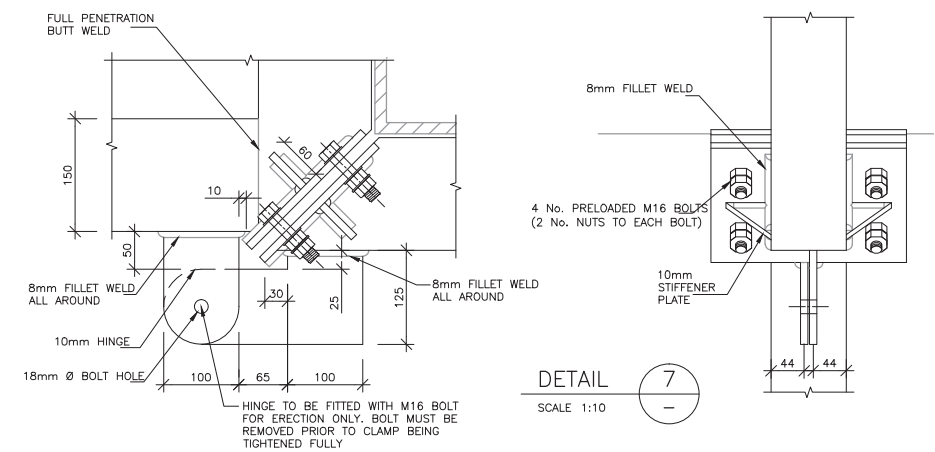
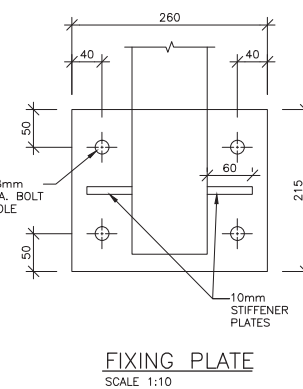
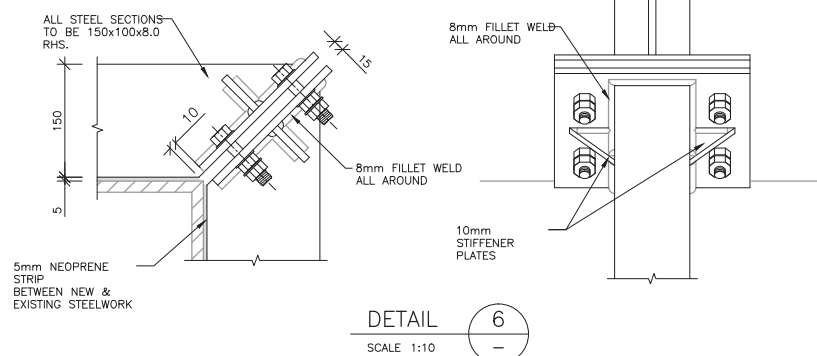
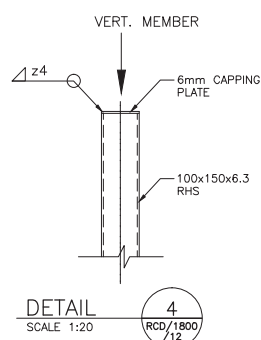
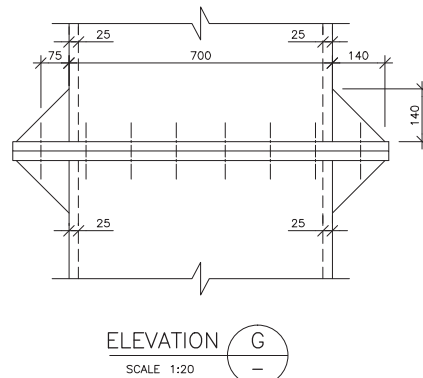
ADS - ADVANCED DIRECTIONAL SIGN



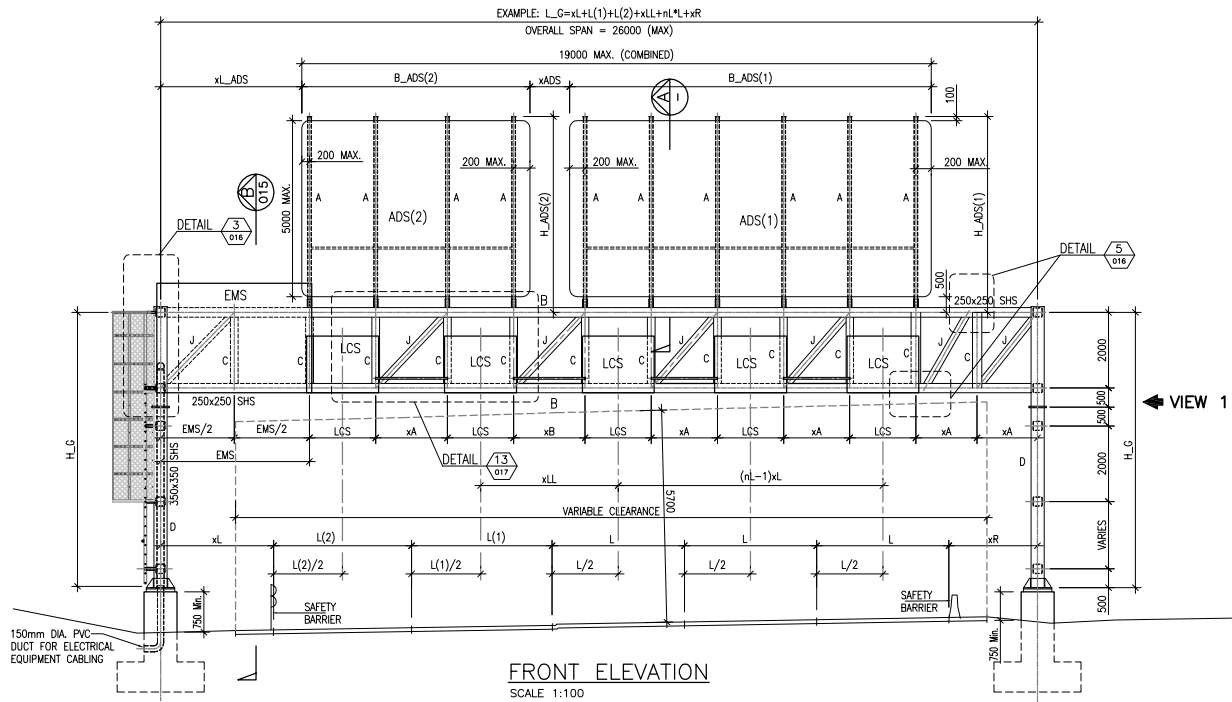
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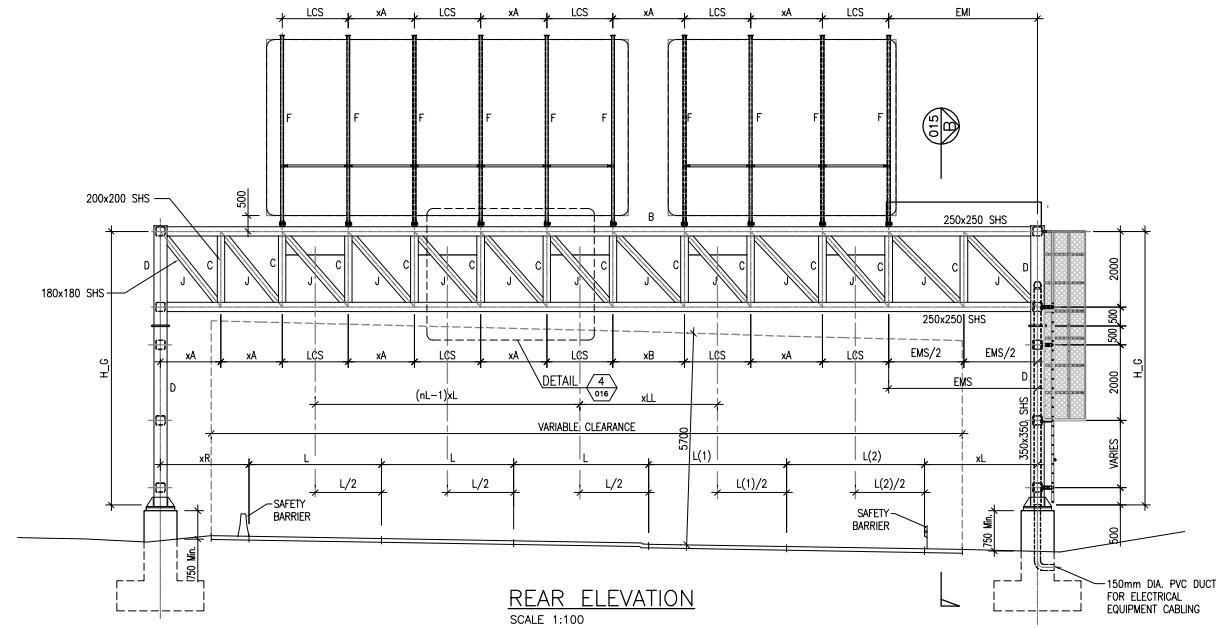
- NOTES
- THE PURPOSE OF THIS DETAIL IS TO ENSURE A CONSISTENCY OF STRUCTURAL FORM FOR GROUP 5 GANTRIES ACROSS THE NATIONAL ROAD NETWORK. ALL SECTIONS SIZES AND DETAILS ARE MINIMUM INDICATIVE SIZE ONLY. THE NRA TAKE NO RESPONSIBILITY FOR THE STRUCTURAL OR GEOMETRICAL ADEQUACY OF THESE DETAILS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ANALYSE, DESIGN AND DETAIL THE GROUP 5 GANTRY, CONNECTION DETAILS AND ITS ASSOCIATED REINFORCED CONCRETE FOUNDATION IN ACCORDANCE WITH THE EUROCODES, THEIR ASSOCIATED IRISH NATIONAL ANNEXES, NRA BD 51, NRA BD 60, NRA BD 2 AND ALL OTHER DESIGN DOCUMENTS AS APPROPRIATE TO THE ROAD BEING SPANNED.
 - ALL GANTRY SUPPORT LEGS LOCATED LESS THEN 4.5M FROM THE EDGE OF CARRIAGEWAY SHALL BE DESIGNED TO WITHSTAND THE VEHICLE COLLISION LOADS GIVEN IN TABLE 4.2 OF NRA BD 51 REGARDLESS OF THE PRESENCE OF A VEHICLE RESTRAINT SYSTEM.
 - ALL DIMENSIONS ARE IN MILLIMETRES.
 - THE DESIGNER OF SPECIFIC GANTRIES SHALL PROVIDE STRUCTURAL DRAWINGS FOR THE SPECIFIC GANTRY SCHEME. ALL INFORMATION THAT IS SITE SPECIFIC MUST BE INCLUDED ON THESE DRAWINGS.
 - STEEL SHALL BE S355J2G3 TO IS EN 10025-2 TO IS EN 10025-6 UNLESS NOTED OTHERWISE. HOLLOW SECTIONS TO BE GRADE S355J2H TO IS EN 10210 UNLESS NOTED OTHERWISE.
 - THE STEELWORK DIMENSIONS SHOWN ARE SPECIFIED FOR A MEAN TEMPERATURE OF 15 DEGREES CENTIGRADE.
 - STRUCTURAL STEELWORK TO BE IN ACCORDANCE WITH SERIES 1800 OF NRA MCDRW.
 - PROTECTION TO STEELWORK TO BE IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW. FINAL COLOUR TO BE APPROVED BY NRA. ALL SPLICES AND CONNECTORS TO BE FULLY TOP COATED AFTER ASSEMBLY. ALL GAPS SHALL BE SEALED.
 - LIFTING EYES TO BE DESIGNED BY STEELWORK FABRICATOR AND SUBMITTED TO THE DESIGNER OF SPECIFIC GANTRIES FOR APPROVAL. TEMPORARY WELDED ATTACHMENTS REQUIRED FOR ERECTION SHALL BE REMOVED AND PROTECTIVE COATING SYSTEM APPLIED IN ACCORDANCE WITH SPECIFICATION.
 - METHOD OF ERECTION OF GANTRY TO BE APPROVED BY THE DESIGNER OF SPECIFIC GANTRIES.
 - ANY TEMPORARY ARRANGEMENT REQUIRED FOR LANDING MAIN BEAM PRIOR TO SITE CONNECTION SHALL BE AGREED WITH THE DESIGNER OF SPECIFIC GANTRIES 4 WEEKS PRIOR TO FABRICATION.
 - TEMPORARY WELDED ATTACHMENTS SHALL BE SUBJECT TO APPROVAL BY THE DESIGN ENGINEER.
 - WELD SYMBOLS ARE IN ACCORDANCE WITH IS EN 22553.
 - ALL FILLET WELDS SHALL BE MINIMUM 6mm LEG LENGTH AND CONTINUOUS UNLESS NOTED OTHERWISE. DESIGN ENGINEER TO VERIFY.
 - BOLTS SHALL BE AS DESCRIBED ON THE DRAWING. DESIGN ENGINEER TO VERIFY.
 - COPE HOLES AND RE-ENTRANT CORNERS SHALL HAVE A RADIUS OF AT LEAST 50mm OR 1.25 TIMES THE PLATE THICKNESS, WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
 - HARD STAMPING SHALL NOT BE PERMITTED ON ANY PERMANENTLY EXPOSED SURFACES
 - ASSUMED MAX. WEIGHT OF ADS 20kg/m².
 - MAX. DEPTH OF SIGN 400mm.
 - STRUCTURAL STEELWORK SUPPORTING SIGNAGE OFF GANTRIES HAS A MAX. ASSUMED WEIGHT OF 27.9kg/m. THE STRUCTURAL ADEQUACY OF ALTERNATIVE ARRANGEMENTS PROPOSED BY THE DESIGNER OF SPECIFIC GANTRIES TO ACCOMMODATE SPECIFIC SIGNS SHALL BE VERIFIED BY THE DESIGNER OF SPECIFIC GANTRIES.
 - VERTICALS 1 AND 4 ARE DESIGNED TO SUPPORT VARIABLE MESSAGE SIGNAGE (VMS). VERTICALS 2 AND 3 ARE OMITTED TO ALLOW ACCESS TO BACK OF VMS. ALL VERTICALS ARE REQUIRED FOR DIRECTIONAL SIGNAGE. SIZE AND SPACING OF VERTICALS TO BE CONFIRMED BY THE DESIGN ENGINEER.
 - WIND LOADING SHALL BE IN ACCORDANCE WITH IS EN 1991-1-4 AND THE ASSOCIATED NATIONAL ANNEX.
 - ALL BOLTS AND NUTS TO BE VIBRATION RESISTANT.
 - ALL WELDS ARE IN TENSION UNDER IN-SERVICE CONDITIONS.
 - MINIMUM CLASS OF CONCRETE IN FOUNDATION TO BE C32/40.
 - ALL ELEMENTS TO BE LIFTED FROM LIFTING EYES. SLINGS NOT TO BE USED TO PREVENT DAMAGE TO PROTECTIVE COATING.
 - SECONDARY STEEL WORK MUST COINCIDE WITH INTERNAL STIFFENING PLATES ON CANTILEVER ARM.
 - GANTRIES ARE ASSUMED PERPENDICULAR TO THE MAINLINE.
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 - THE RESIDUAL DEFLECTION AFTER DEAD AND SUPERDEAD LOADS FOR SPECIFIC SCHEMES SHALL BE SPAN/150 AND BE ACHIEVED AT THE CANTILEVER TIP WITH A STRAIGHT CHORD.
 - CARRIAGEWAY CROSS SECTION IS INDICATIVE ONLY.
 - SIGN SUPPORT DETAILS AND CABLE RUNS REQUIRED SHALL BE CONFIRMED BY THE DESIGNER OF THE SPECIFIC GANTRIES WITH ELECTRICAL SUPPLIER.
 - DUCTING TO BE PROVIDED BY SPECIALIST SUBCONTRACTORS.
 - CLOSED FABRICATED BOXES (LEG AND ARM) ARE REQUIRED TO BE AIR TIGHT. LEAK TESTING IS REQUIRED IN ACCORDANCE WITH APPENDIX 1/5.
 - PROVISION OF ELEMENTS SUPPORTING AND ACCOMMODATING ELECTRICAL EQUIPMENT AT SPECIFIC GANTRIES TO BE CONFIRMED WITH THE NRA.
 - THE DESIGNER OF SPECIFIC GANTRIES SHALL COMPLY WITH THE TECHNICAL APPROVAL PROCEDURES FOR STRUCTURES CONTAINED WITHIN NRA BD2 OF THE NRA DMRB.



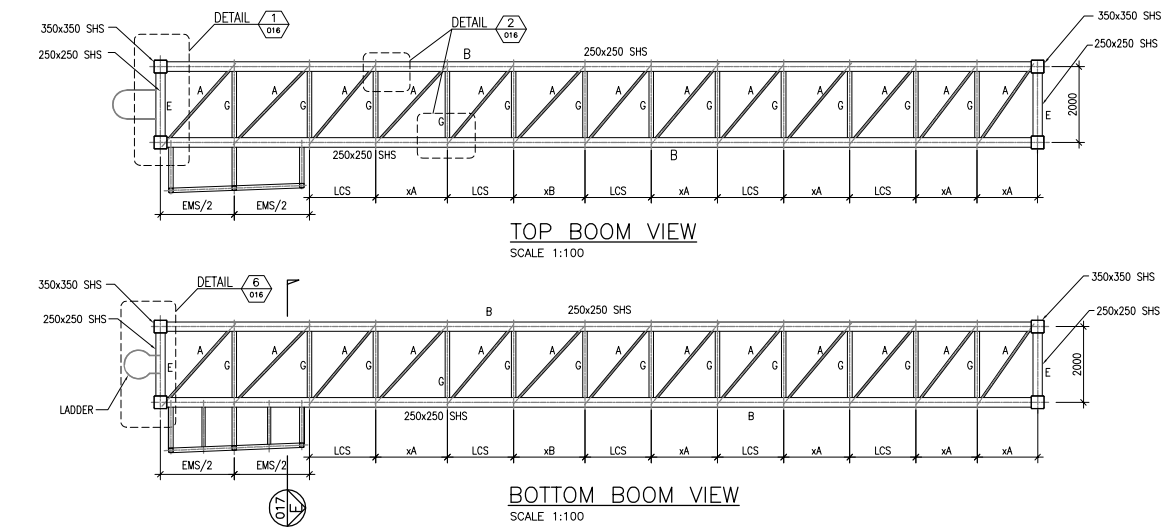
- TII PUBLICATION NUMBER: CC-SCD-01813



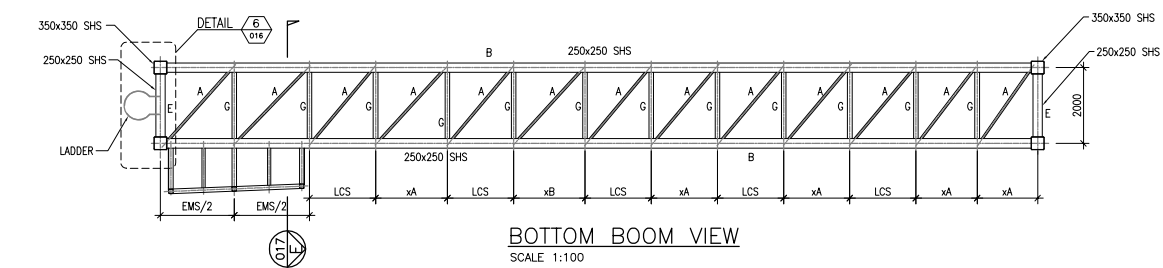
FRONT ELEVATION
SCALE 1:100



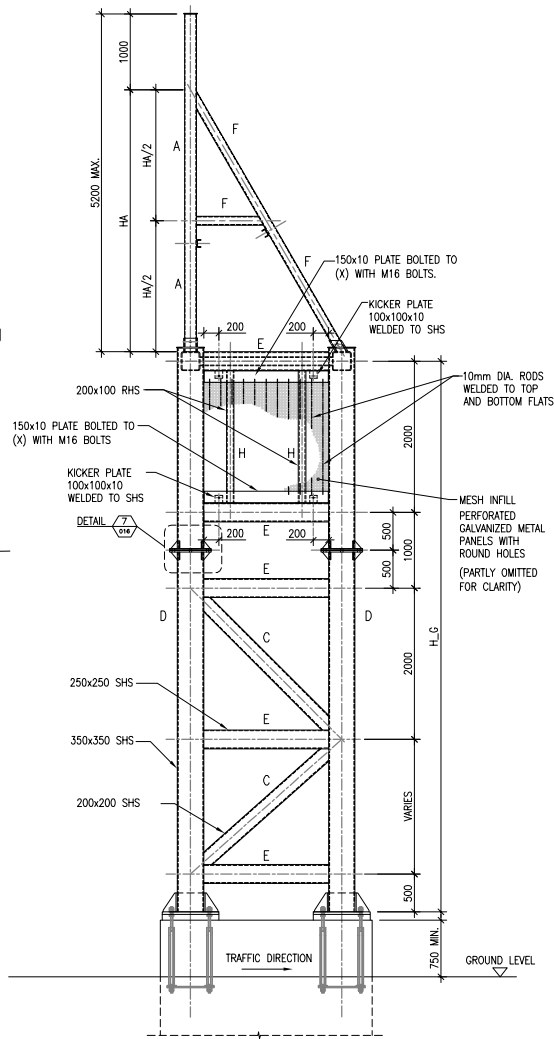
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SCALE 1:100



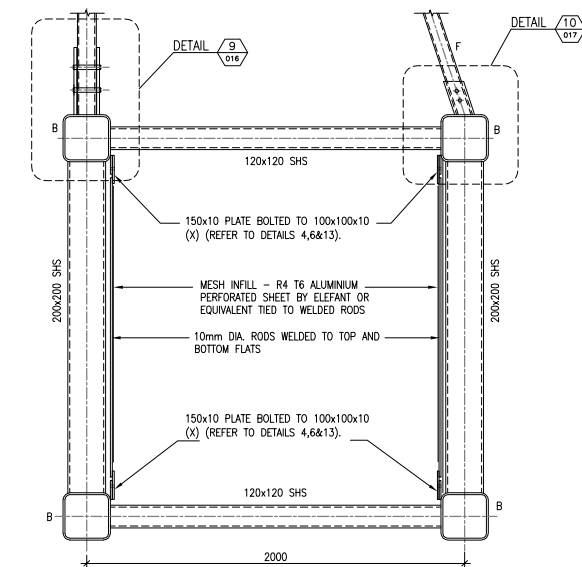
TOP BOOM VIEW
SCALE 1:100



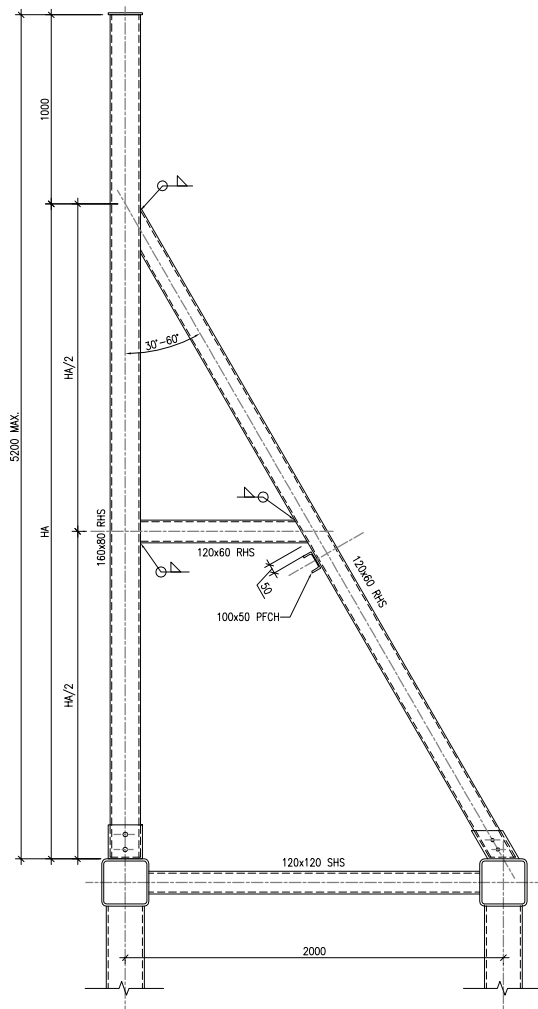
BOTTOM BOOM VIEW
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VIEW 1
SIDE ELEVATION
SCALE 1:50



TYPICAL CROSS SECTION THROUGH BOOM
SCALE 1:20



SECTION A
SCALE 1:20

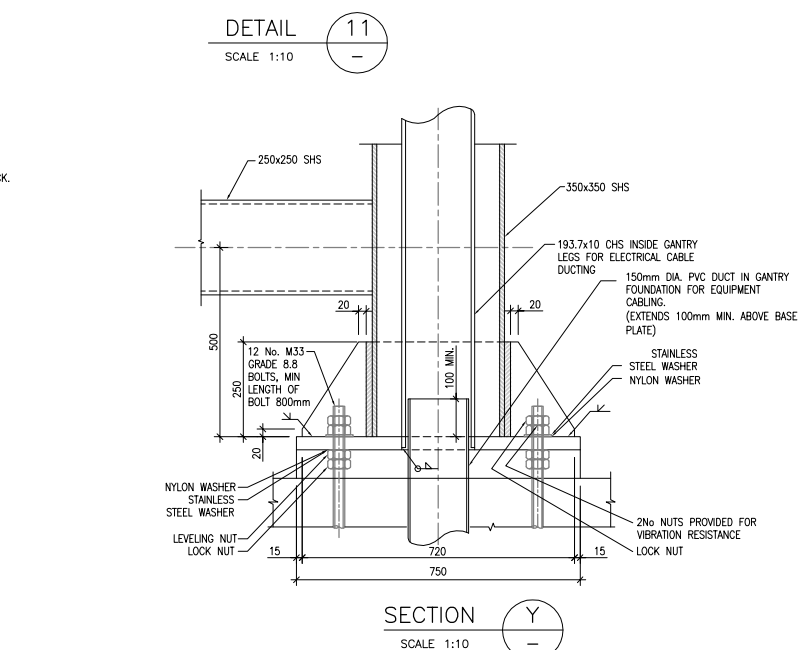
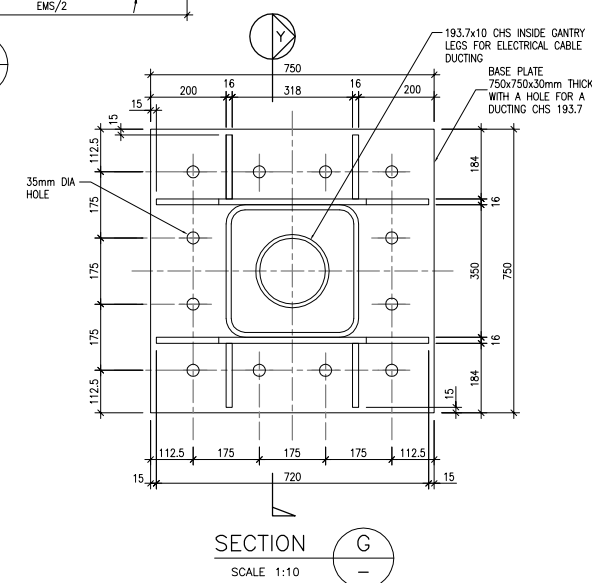
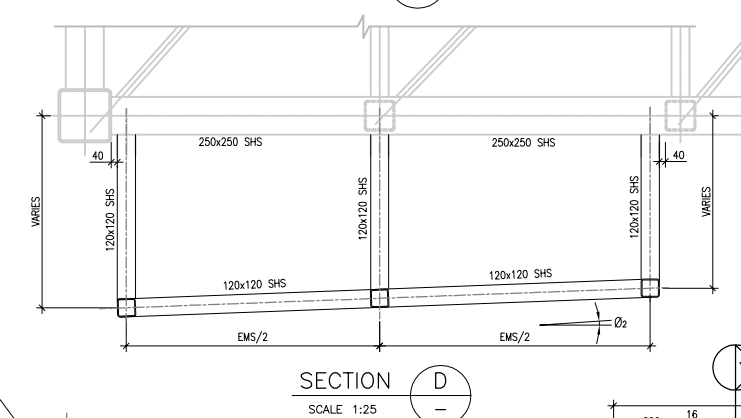
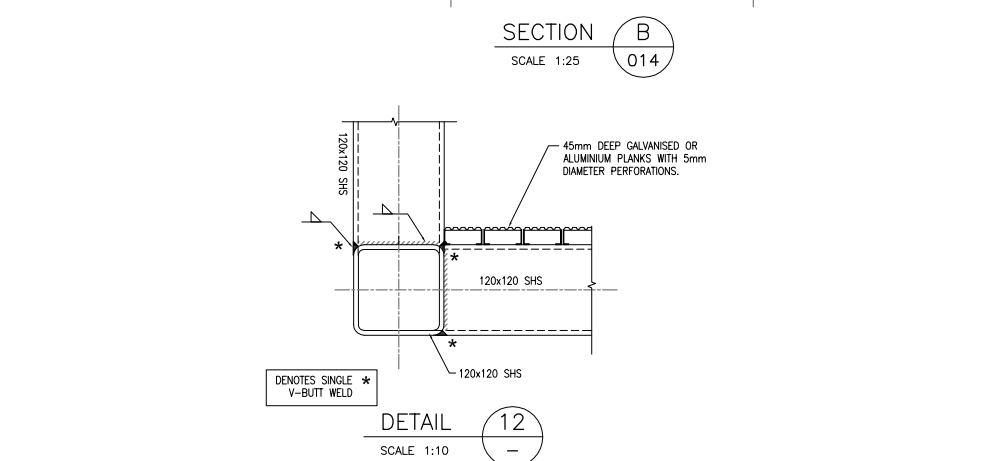
VARIABLES	
H _G	TO BE ADJUSTED TO COMPLY WITH 'VARIES' LEG LENGTH
L _G	MAXIMUM DIMENSION DERIVED FROM FORMULA
LCS	CORRESPONDS WITH LCS SIZE (MAX. 2m)
nLCS	NUMBER OF LCS PANELS
EMS	CORRESPONDS WITH EMS SIZE (MAX. 2m)
H _{ADS} (1), H _{ADS} (2)	PANEL HEIGHT PLUS 500mm AT THE BOTTOM AND 100mm AT THE TOP.
B _{ADS} (1), B _{ADS} (2)	PANEL WIDTH
X _{ADS} (1)	DISTANCE BETWEEN ADS PANELS (IF APPLICABLE)
xL	REFER TO FRONT/REAR VIEW
L(1)	DIVERGE LANE No1 (OPTIONAL)
L(2)	DIVERGE LANE No2 (OPTIONAL)
HA	DIMENSION RELATED TO ADS SIGN HEIGHT
nL	NUMBER OF LANES
L	CARRIAGEWAY LANE WIDTH
xR	REFER TO FRONT/REAR VIEW
xLL	DISTANCE BETWEEN STANDARD ROAD SECTION AND DIVERGE LANES
xA	DETERMINED AS $(L_G - EMS - nLCS \times LCS - xB) / DIVISION_FACTOR$ = MIN. 0.7H & MAX. 2m
xB	MINIMUM 0.7H; MAXIMUM 2.0m.
DIVISION_FACTOR	THE FACTOR SHOULD BE ITERATED TO ACCOMMODATE THE REQUIRED xA

TABLE 1 SIZE OF STEEL MEMBER	
TYPE	SECTION
A	160 x 80 SHS
B	250 x 250 SHS
C	200 x 200 SHS
D	350 x 350 SHS
E	250 x 250 SHS
F	120 x 60 RHS
G	120 x 120 SHS
J	180 x 180 SHS
H	200 x 100 RHS

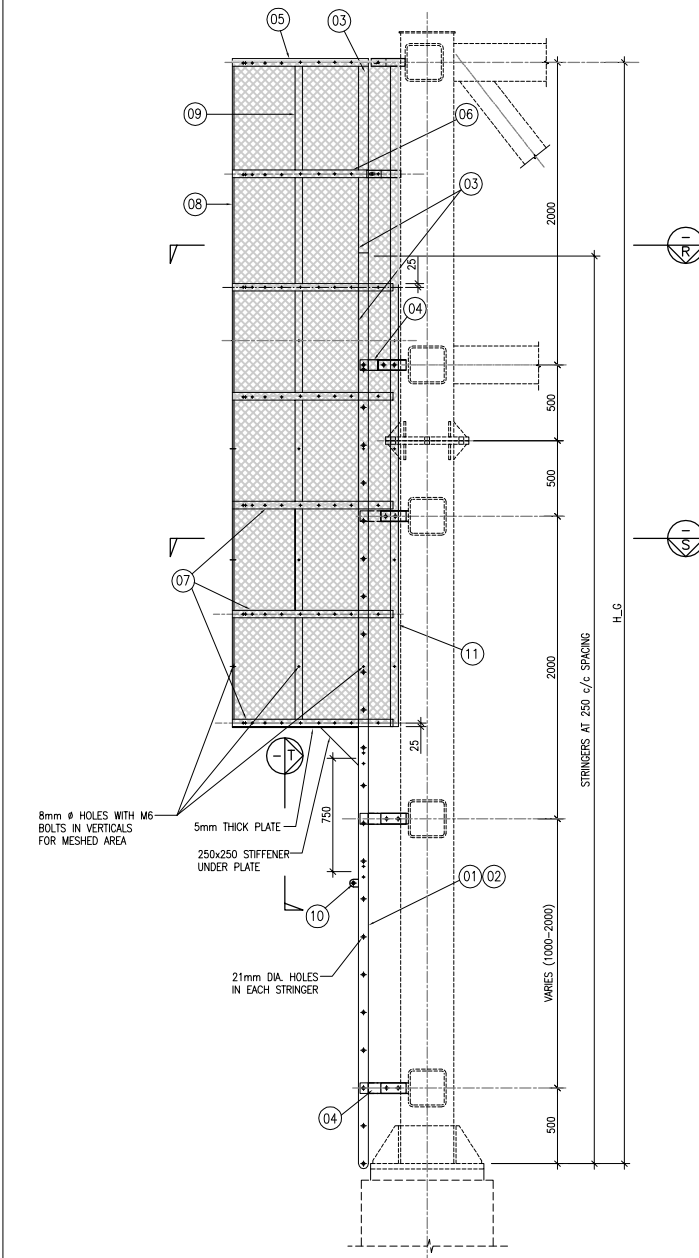
LEGEND:
EMS - ENHANCED MOTORWAY SIGN
ADS - ADVANCE DIRECTION SIGN
LCS - LANE CONTROL SIGNAL

- NOTES:
- THE PURPOSE OF THIS DETAIL IS TO ENSURE A CONSISTENCY OF STRUCTURAL FORM FOR GROUP 6 GANTRIES ACROSS THE NATIONAL ROAD NETWORK. ALL SECTIONS OUTSIDE DIMENSIONS AND DETAILS ARE MINIMUM INDICATIVE SIZES ONLY. THE NRA TAKE NO RESPONSIBILITY FOR THE STRUCTURAL AND/OR GEOMETRICAL ADEQUACY OF THESE DETAILS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ANALYZE, DESIGN SECTIONS THICKNESS AND DETAIL THE GROUP 6 GROUP GANTRY AND ITS ASSOCIATED REINFORCED CONCRETE FOUNDATION IN ACCORDANCE WITH THE EUROCODES, THEIR ASSOCIATED IRISH NATIONAL ANNEXES, NRA BD51, NRA BD60, NRA BD2 AND ALL OTHER DESIGN DOCUMENTS AS APPROPRIATE TO THE ROAD BEING SPANNED.
 - THE GANTRY IS DESIGNED TO SPAN OVER A MIN TWO-LANE ARRANGEMENT AND UP TO MAX 26m. THE GENERAL LAYOUT MAY BE USED FOR A ONE LANE ARRANGEMENT BUT MAY REQUIRE REDESIGN AND VERIFICATION WORKABILITY OF THE SECTION TYPES.
 - ALL GANTRY SUPPORT LEGS LOCATED LESS THEN 4.5M FROM THE EDGE OF CARRIAGEWAY SHALL BE DESIGNED TO WITHSTAND THE VEHICLE COLLISION LOADS GIVEN IN NRA BD51 REGARDLESS OF SAFETY BARRIER IN FRONT OR NOT.
 - ALL DIMENSIONS ARE IN MILLIMETERS.
 - THE DESIGNER OF SPECIFIC GANTRIES SHALL PRODUCE GENERAL ARRANGEMENT DRAWINGS FOR THE SPECIFIC GANTRY. ALL INFORMATION THAT IS SITE SPECIFIC MUST BE INCLUDED ON THESE DRAWINGS.
 - STEEL SHALL BE S355J2G3 TO IS EN 10025-2 TO IS EN 10025-6 UNLESS OTHERWISE NOTED. HOLLOW SECTIONS TO BE GRADE S355J2H TO IS EN 10210 UNLESS NOTED OTHERWISE.
 - THE STEELWORK DIMENSIONS SHOWN ARE SPECIFIED FOR A MEAN TEMPERATURE OF 15 DEGREES CENTIGRADE.
 - STRUCTURAL STEELWORK TO BE IN ACCORDANCE WITH SERIES 1800 OF NRA MCDRW.
 - PROTECTION TO STEELWORK TO BE IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW. FINAL COLOUR TO BE APPROVED BY NRA.
 - DIFFERENTIAL SETTLEMENT BETWEEN THE END SUPPORTS IS TAKEN AS 15mm.
 - LIFTING EYES TO BE DESIGNED BY STEELWORK FABRICATOR AND SUBMITTED TO THE DESIGNER OF SPECIFIC GANTRIES FOR APPROVAL AT LEAST 4 WEEKS PRIOR TO FABRICATION. TEMPORARY WELDED ATTACHMENTS REQUIRED FOR ERECTION SHALL BE REMOVED AND PROTECTIVE COATING SYSTEM APPLIED IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW.
 - METHOD OF ERECTION OF GANTRY TO BE APPROVED BY THE DESIGNER OF SPECIFIC GANTRIES.
 - ANY TEMPORARY ARRANGEMENT REQUIRED FOR LANDING MAIN BEAM PRIOR TO SITE CONNECTION SHALL BE AGREED WITH THE DESIGNER OF SPECIFIC GANTRIES 4 WEEKS PRIOR TO FABRICATION.
 - TEMPORARY WELDED ATTACHMENTS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.
 - WELD SYMBOLS ARE IN ACCORDANCE WITH IS EN 22553.
 - ALL FILLET WELDS SHALL BE 6mm LEG LENGTH AND CONTINUOUS UNLESS NOTED OTHERWISE. ENGINEER TO VERIFY.
 - BOLTS SHALL BE AS DESCRIBED ON THE DRAWING.
 - COPE HOLES AND RE-ENTRANT CORNERS SHALL HAVE A RADIUS OF AT LEAST 50mm OR 1.25 TIMES THE PLATE THICKNESS, WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
 - HARD STAMPING SHALL NOT BE PERMITTED ON ANY PERMANENTLY EXPOSED SURFACES.
 - ASSUMED MAXIMUM WEIGHT OF VMS: 90kg/m².
ASSUMED MAXIMUM WEIGHT OF ADS: 20kg/m².
ASSUMED MAXIMUM WEIGHT OF LCS: 95kg/m².
ASSUMED MAXIMUM WEIGHT OF EMS: 70kg/m².
 - MAXIMUM DEPTH OF SIGN IS TO BE 400mm.
 - STRUCTURAL STEELWORK SUPPORTING SIGNAGE OFF GANTRIES HAS A MAX. ASSUMED WEIGHT OF 27.9kg/m. THE STRUCTURAL ADEQUACY OF ALTERNATIVE ARRANGEMENTS PROPOSED BY THE DESIGNERS OF SPECIFIC GANTRIES TO ACCOMMODATE SPECIFIC SIGNS SHALL BE VERIFIED BY THE DESIGNERS OF SPECIFIC GANTRIES.
 - WIND LOADING SHALL BE IN ACCORDANCE WITH IS EN 1991-1-4 AND THE ASSOCIATED NATIONAL ANNEX.
 - ALL BOLTS AND NUTS TO BE VIBRATION RESISTANT.
 - ALL WELDS ARE IN TENSION UNDER TEMPORARY AND IN-SERVICE CONDITIONS.
 - MINIMUM CLASS OF CONCRETE IN FOUNDATION TO BE C32/40.
 - ALL ELEMENTS TO BE LIFTED FROM LIFTING EYES. SLINGS NOT TO BE USED TO PREVENT DAMAGE TO PROTECTIVE COATING.
 - GANTRIES ARE ASSUMED PERPENDICULAR TO THE MAINLINE.
 - SECONDARY SIGNWORK STRUCTURAL STEELWORK NOT TO BE USED FOR LIFTING.
 - THE SECONDARY SIGN STEELWORK VERTICALS AND SIGN LAYOUT ARE INDICATIVE OF THE MAXIMUM SIGN AREA THE GANTRY CAN SUPPORT. THE SIGN LAYOUT AND THE NUMBER OF SECONDARY SIGN STEELWORK VERTICALS SHOULD BE PROVIDED TO SUIT GANTRY SPECIFIC REQUIREMENTS AND NOT EXCEED THOSE SHOWN ON THE DRAWING.
 - THE RESIDUAL PRECAMBER SHALL BE SPAN/800 AND BE ACHIEVED AT MID-SPAN WITH A SMOOTH CURVE BETWEEN MID-SPAN AND END SUPPORTS.
 - CARRIAGEWAY CROSS SECTION IS INDICATIVE ONLY.
 - SIGN SUPPORT DETAILS AND CABLE RUNS REQUIRED SHALL BE CONFIRMED BY THE DESIGNER OF THE SPECIFIC GANTRIES WITH ELECTRICAL SUPPLIER.
 - PROVISION OF ELEMENTS SUPPORTING AND ACCOMMODATING ELECTRICAL EQUIPMENT AT SPECIFIC GANTRIES TO BE CONFIRMED WITH THE NRA.
 - A MIN CLEARANCE OF 5.7m IS TO BE PROVIDED.
 - ALL SOLUTIONS USED TO ATTACH GANTRY EQUIPMENT SHOULD BE PROTECTED AGAINST CORROSION.

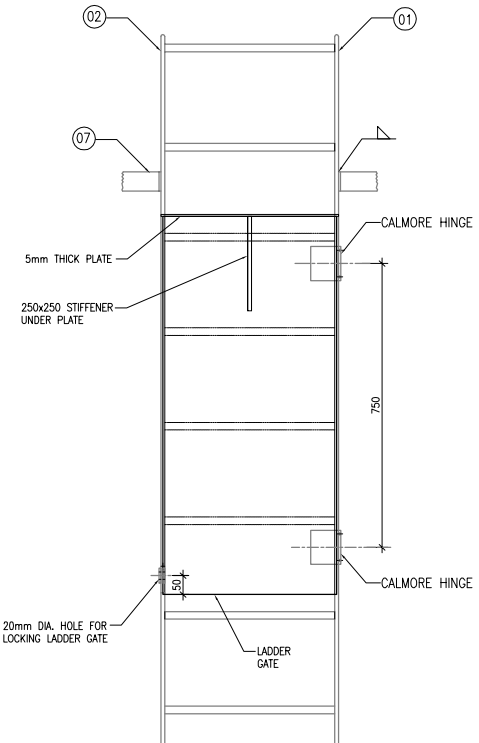
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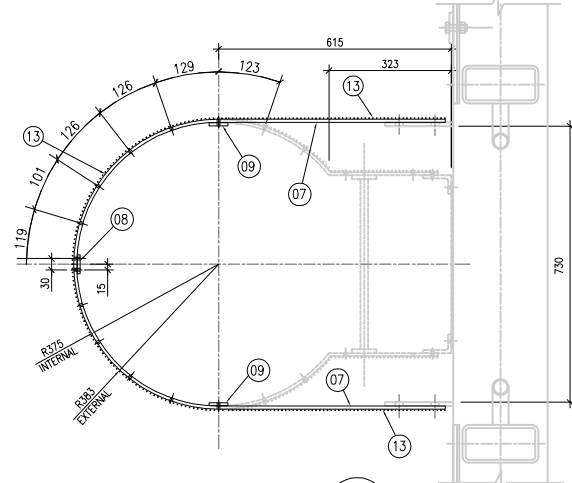


LADDER ELEVATION
SCALE 1:25

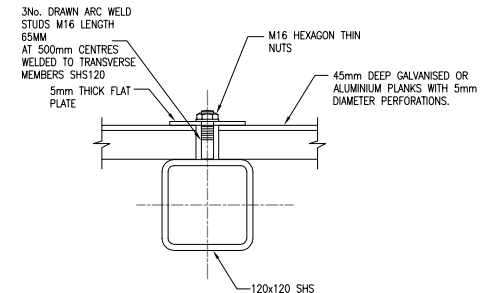
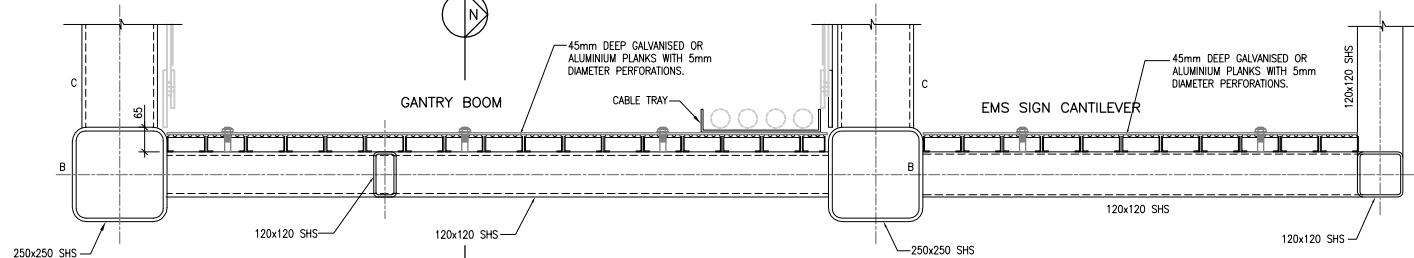
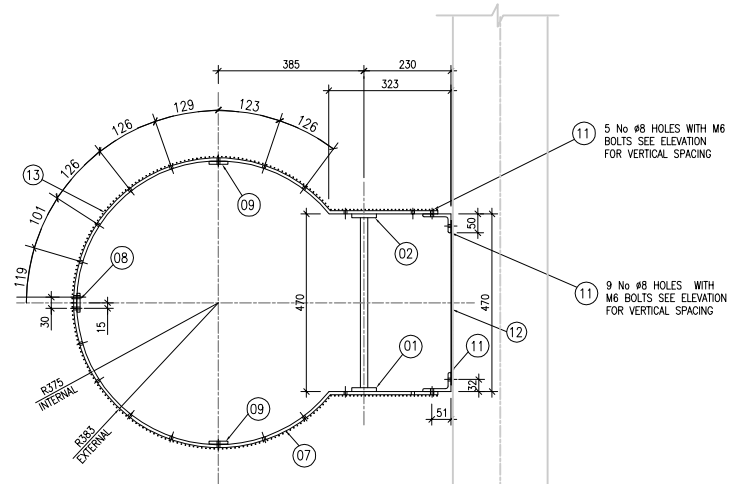
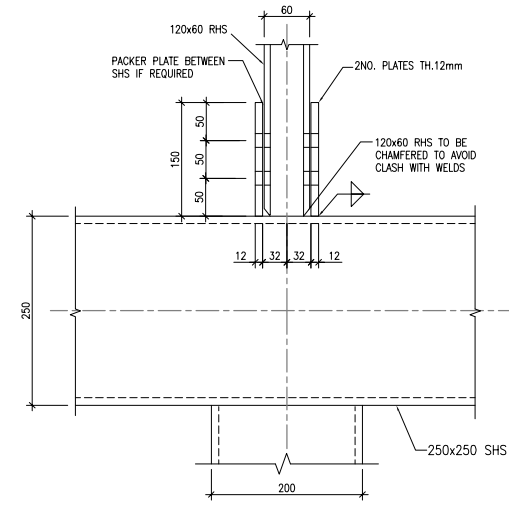
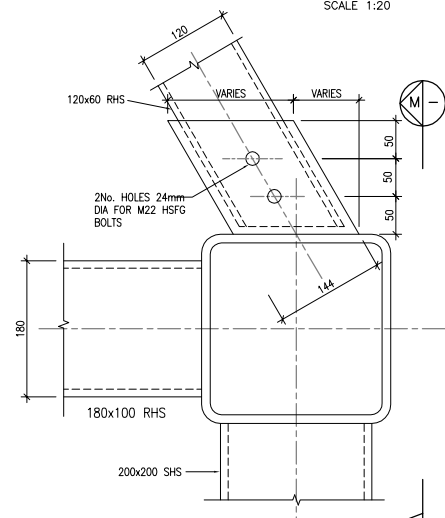
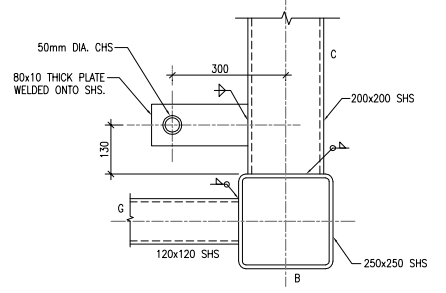
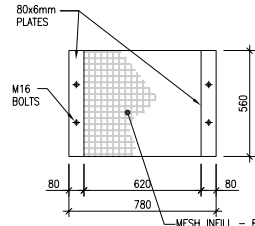
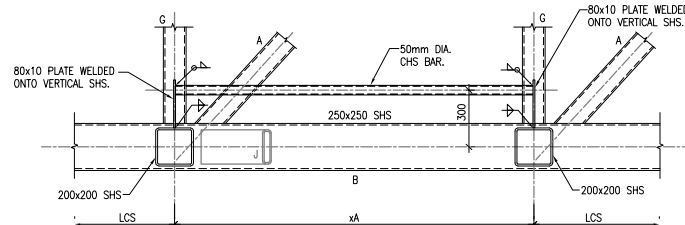
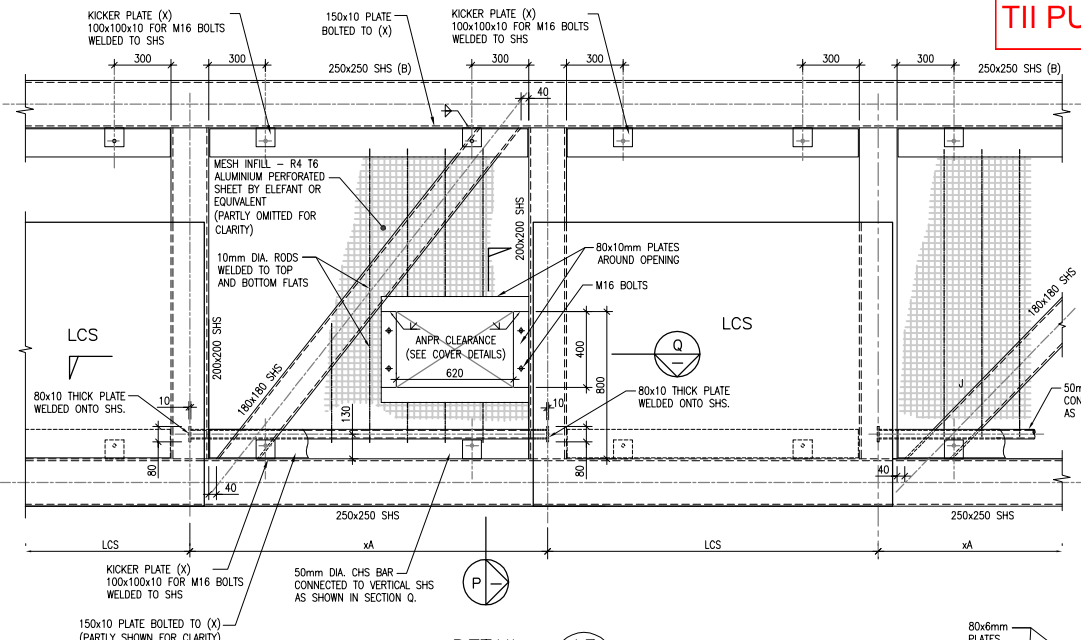


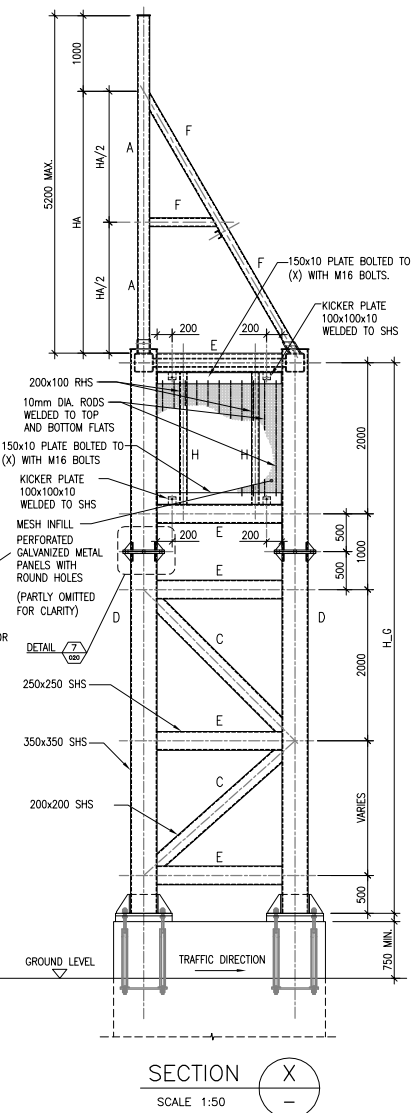
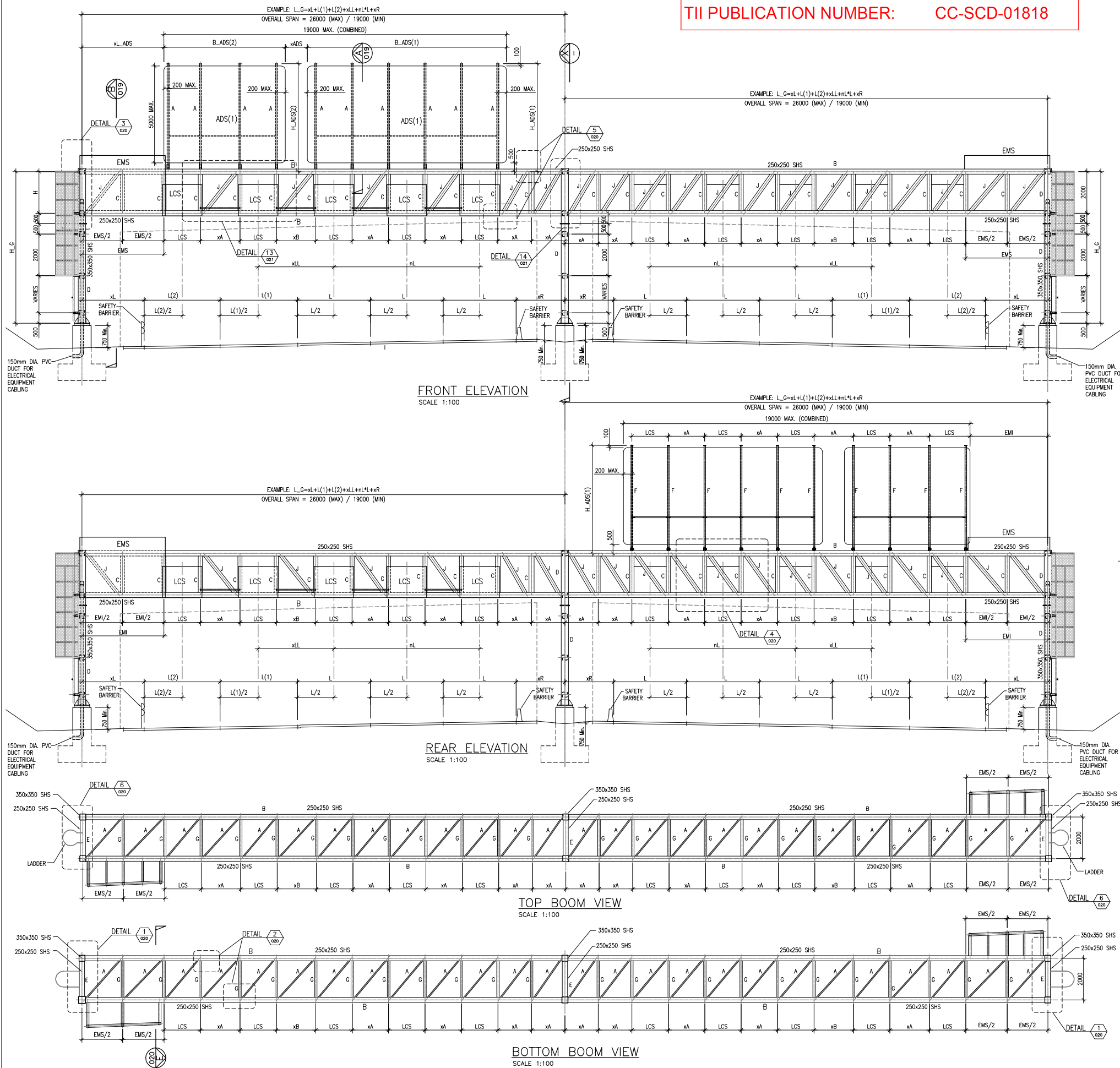
VIEW T
SCALE 1:10
SHOWING LADDER GATE DETAILS

MATERIAL LIST	
ITEM	DESCRIPTION
1	65 x 10. FLAT
2	65 x 10. FLAT
3	65 x 10. FLAT
4	70 x 12. FLAT
5	50 x 8.0. FLAT
6	50 x 8.0. FLAT
7	50 x 8.0. FLAT
8	50 x 8.0. FLAT
9	50 x 8.0. FLAT
10	40 x 5.0 FLAT
11	75 x 50 x 6L
12	432 x 1440 MESH
13	1220 x 1440 MESH



SECTION R
SCALE 1:10





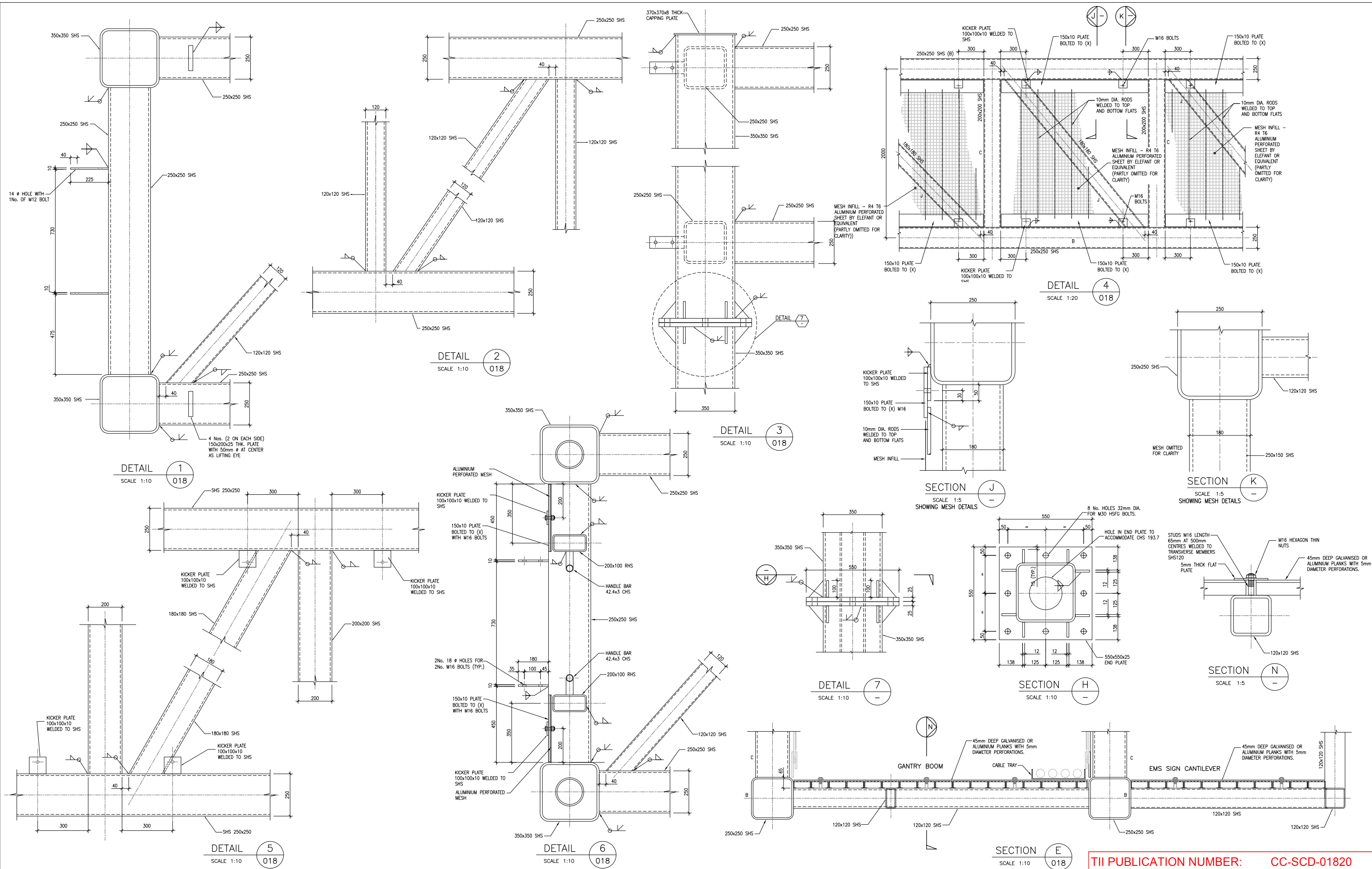
LEGEND:
EMS - ENHANCED MOTORWAY SIGN
ADS - ADVANCE DIRECTION SIGN
LCS - LANE CONTROL SIGNAL

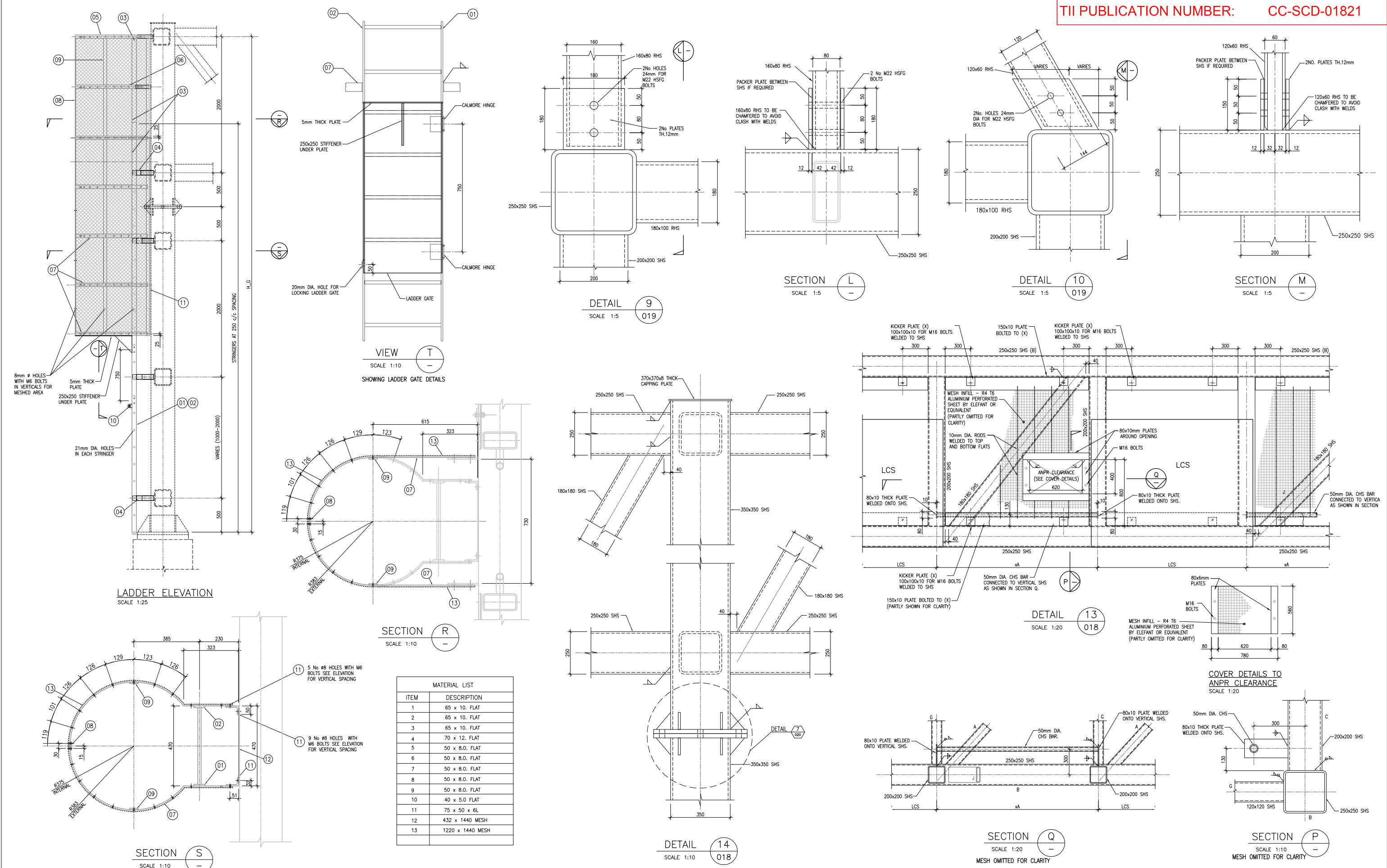
TABLE 1 SIZE OF STEEL MEMBER	
TYPE	SECTION
A	160 x 80 SHS
B	250 x 250 SHS
C	200 x 200 SHS
D	350 x 350 SHS
E	250 x 250 SHS
F	120 x 60 RHS
G	120 x 120 SHS
J	180 x 180 SHS
H	200 x 100 RHS

VARIABLES	
H _G	TO BE ADJUSTED TO COMPLY WITH 'VARIES' LEG LENGTH
L _G	MAXIMUM DIMENSION DERIVED FROM FORMULA
LCS	CORRESPONDS WITH LCS SIZE (MAX. 2m)
nLCS	NUMBER OF LCS PANELS
EMS	CORRESPONDS WITH EMS SIZE (MAX. 2m)
H _{ADS(1)} , H _{ADS(2)}	PANEL HEIGHT PLUS 500mm AT THE BOTTOM AND 100mm AT THE TOP.
B _{ADS(1)} , B _{ADS(2)}	PANEL WIDTH
X _{ADS(1)}	DISTANCE BETWEEN ADS PANELS (IF APPLICABLE)
xL	REFER TO FRONT/REAR VIEW
L(1)	DIVERGE LANE No1 (OPTIONAL)
L(2)	DIVERGE LANE No2 (OPTIONAL)
HA	DIMENSION RELATED TO ADS SIGN HEIGHT
nL	NUMBER OF LANES
L	CARRIAGEWAY LANE WIDTH
xR	REFER TO FRONT/REAR VIEW
xLL	DISTANCE BETWEEN STANDARD ROAD SECTION AND DIVERGE LANES
xA	DETERMINED AS $(L_G - EMS - nLCS \times LCS - xB) / DIVISION_FACTOR = \text{MIN. } 0.7H \text{ \& MAX. } 2m$
xB	MINIMUM 0.7H; MAXIMUM 2.0m
DIVISION_FACTOR	THE FACTOR SHOULD BE ITERATED TO ACCOMMODATE THE REQUIRED xA

- NOTES:
- THE PURPOSE OF THIS DETAIL IS TO ENSURE A CONSISTENCY OF STRUCTURAL FORM FOR GROUP 6 GANTRIES ACROSS THE NATIONAL ROAD NETWORK. ALL SECTIONS OUTSIDE DIMENSIONS AND DETAILS ARE MINIMUM INDICATIVE SIZES ONLY. THE NRA TAKE NO RESPONSIBILITY FOR THE STRUCTURAL AND/OR GEOMETRICAL ADEQUACY OF THESE DETAILS. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO ANALYZE, DESIGN SECTIONS THICKNESS AND DETAIL THE GROUP 6 GANTRY AND ITS ASSOCIATED REINFORCED CONCRETE FOUNDATION IN ACCORDANCE WITH THE EUROCODES, THEIR ASSOCIATED IRISH NATIONAL ANNEXES, NRA BD51, NRA BD60, NRA BD2 AND ALL OTHER DESIGN DOCUMENTS AS APPROPRIATE TO THE ROAD BEING SPANNED.
 - THE GANTRY IS DESIGNED TO SPAN OVER A MIN TWO-LANE ARRANGEMENT AND UP TO MAX 26m. THE GENERAL LAYOUT MAY BE USED FOR A ONE LANE ARRANGEMENT BUT MAY REQUIRE REDESIGN AND VERIFICATION WORKABILITY OF THE SECTION TYPES.
 - ALL GANTRY SUPPORT LEGS LOCATED LESS THEN 4.5M FROM THE EDGE OF CARRIAGEWAY SHALL BE DESIGNED TO WITHSTAND THE VEHICLE COLLISION LOADS GIVEN IN NRA BD51 REGARDLESS OF SAFETY BARRIER IN FRONT OR NOT.
 - ALL DIMENSIONS ARE IN MILLIMETERS.
 - THE DESIGNER OF SPECIFIC GANTRIES SHALL PRODUCE GENERAL ARRANGEMENT DRAWINGS FOR THE SPECIFIC GANTRY. ALL INFORMATION THAT IS SITE SPECIFIC MUST BE INCLUDED ON THESE DRAWINGS.
 - STEEL SHALL BE S355J2G3 TO IS EN 10025-2 TO IS EN 10025-6 UNLESS OTHERWISE NOTED. HOLLOW SECTIONS TO BE GRADE S355J2H TO IS EN 10210 UNLESS NOTED OTHERWISE.
 - THE STEELWORK DIMENSIONS SHOWN ARE SPECIFIED FOR A MEAN TEMPERATURE OF 15 DEGREES CENTIGRADE.
 - STRUCTURAL STEELWORK TO BE IN ACCORDANCE WITH SERIES 1800 OF NRA MCDRW.
 - PROTECTION TO STEELWORK TO BE IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW. FINAL COLOUR TO BE APPROVED BY NRA.
 - DIFFERENTIAL SETTLEMENT BETWEEN THE END SUPPORTS IS TAKEN AS 15mm.
 - LIFTING EYES TO BE DESIGNED BY STEELWORK FABRICATOR AND SUBMITTED TO THE DESIGNER OF SPECIFIC GANTRIES FOR APPROVAL AT LEAST 4 WEEKS PRIOR TO FABRICATION. TEMPORARY WELDED ATTACHMENTS REQUIRED FOR ERECTION SHALL BE REMOVED AND PROTECTIVE COATING SYSTEM APPLIED IN ACCORDANCE WITH SERIES 1900 OF NRA MCDRW.
 - METHOD OF ERECTION OF GANTRY TO BE APPROVED BY THE DESIGNER OF SPECIFIC GANTRIES.
 - ANY TEMPORARY ARRANGEMENT REQUIRED FOR LANDING MAIN BEAM PRIOR TO SITE CONNECTION SHALL BE AGREED WITH THE DESIGNER OF SPECIFIC GANTRIES 4 WEEKS PRIOR TO FABRICATION.
 - TEMPORARY WELDED ATTACHMENTS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.
 - WELD SYMBOLS ARE IN ACCORDANCE WITH IS EN 22553.
 - ALL FILLET WELDS SHALL BE 6mm LEG LENGTH AND CONTINUOUS UNLESS NOTED OTHERWISE. ENGINEER TO VERIFY.
 - BOLTS SHALL BE AS DESCRIBED ON THE DRAWING.
 - COPE HOLES AND RE-ENTRANT CORNERS SHALL HAVE A RADIUS OF AT LEAST 50mm OR 1.25 TIMES THE PLATE THICKNESS, WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
 - HARD STAMPING SHALL NOT BE PERMITTED ON ANY PERMANENTLY EXPOSED SURFACES.
 - ASSUMED MAXIMUM WEIGHT OF VMS: 90kg/m²
ASSUMED MAXIMUM WEIGHT OF ADS: 20kg/m²
ASSUMED MAXIMUM WEIGHT OF LCS: 95kg/m²
ASSUMED MAXIMUM WEIGHT OF EMS: 70kg/m²
 - MAXIMUM DEPTH OF SIGN IS TO BE 400mm.
 - STRUCTURAL STEELWORK SUPPORTING SIGNAGE OFF GANTRIES HAS A MAX. ASSUMED WEIGHT OF 27.9kg/m. THE STRUCTURAL ADEQUACY OF ALTERNATIVE ARRANGEMENTS PROPOSED BY THE DESIGNERS OF SPECIFIC GANTRIES TO ACCOMMODATE SPECIFIC SIGNS SHALL BE VERIFIED BY THE DESIGNERS OF SPECIFIC GANTRIES.
 - WIND LOADING SHALL BE IN ACCORDANCE WITH IS EN 1991-1-4 AND THE ASSOCIATED NATIONAL ANNEX.
 - ALL BOLTS AND NUTS TO BE VIBRATION RESISTANT.
 - ALL WELDS ARE IN TENSION UNDER TEMPORARY AND IN-SERVICE CONDITIONS.
 - MINIMUM CLASS OF CONCRETE IN FOUNDATION TO BE C32/40.
 - ALL ELEMENTS TO BE LIFTED FROM LIFTING EYES. SLINGS NOT TO BE USED TO PREVENT DAMAGE TO PROTECTIVE COATING.
 - GANTRIES ARE ASSUMED PERPENDICULAR TO THE MAINLINE.
 - SECONDARY SIGNWORK STRUCTURAL STEELWORK NOT TO BE USED FOR LIFTING.
 - THE SECONDARY SIGN STEELWORK VERTICALS AND SIGN LAYOUT ARE INDICATIVE OF THE MAXIMUM SIGN AREA THE GANTRY CAN SUPPORT. THE SIGN LAYOUT AND THE NUMBER OF SECONDARY SIGN STEELWORK VERTICALS SHOULD BE PROVIDED TO SUIT GANTRY SPECIFIC REQUIREMENTS AND NOT EXCEED THOSE SHOWN ON THE DRAWING.
 - THE RESIDUAL PRECAMBER SHALL BE SPAN/800 AND BE ACHIEVED AT MID-SPAN WITH A SMOOTH CURVE BETWEEN MID-SPAN AND END SUPPORTS.
 - CARRIAGEWAY CROSS SECTION IS INDICATIVE ONLY.
 - SIGN SUPPORT DETAILS AND CABLE RUNS REQUIRED SHALL BE CONFIRMED BY THE DESIGNER OF THE SPECIFIC GANTRIES WITH ELECTRICAL SUPPLIER.
 - PROVISION OF ELEMENTS SUPPORTING AND ACCOMMODATING ELECTRICAL EQUIPMENT AT SPECIFIC GANTRIES TO BE CONFIRMED WITH THE NRA.
 - A MIN CLEARANCE OF 5.7m IS TO BE PROVIDED.
 - ALL SOLUTIONS USED TO ATTACH GANTRY EQUIPMENT SHOULD BE PROTECTED AGAINST CORROSION.









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