



M A R K H O D K I N S O N P T Y L T D
C o n s u l t i n g S t r u c t u r a l E n g i n e e r s

Werribee Hangar Relocation Project

Geelong Road

Werribee



Prepared by

Mark Hodkinson

Mark Hodkinson Pty Ltd

25th February 2019

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E m a i l m a i l @ m h p l . n e t . a u A B N 6 2 0 5 2 9 5 9 9 1 2

Mr Brian O'Driscoll
Melbourne Water
990 La Trobe Street
Docklands 3008

Dear Brian,

**Re : Werribee Hangar Relocation Project
Geelong Road
Werribee**

We are writing to report further on Hangers 1 and 2 at the Satellite Airfield site in Geelong Road, Werribee.

1 Introduction

Hangars 1 and 2 at the Satellite Airfield site in Geelong Road, Werribee, were constructed in 1942 and 1943 and the hardwood timber trusses, frames and other structural members were in general connected together via Timber Engineering Company (TECO) shear plate and split ring connectors. Of the five Hangars that were originally constructed only Hangars 1 (130 ft span (39.63 m)) and Hangar 2 (96 ft span (29.26 m)) survive.

In 2012 Mark Hodkinson Pty Ltd was engaged by The Planning Group on behalf of Places Victoria to conduct a Partial Peer Review of the *Structural Engineering Audit* report prepared by Hyder Consulting Pty Ltd (HYDER) dated 20th August 2009. In the preparation of the Partial Peer Review we inspected the interiors of Hangars 1 and 2 from the floor levels of the Hangars, inspected the truss that was salvaged from the pre-extant Hangar 4 and now located at the south eastern corner of Hangar 1, and analysed one typical roof truss of Hangar 1 and one typical roof truss of Hangar 2.

Subsequent to our 2012 Partial Peer Review we were further engaged by Places Victoria in 2015 to carry out a limited high-level inspection of two of the Hangar 1 roof trusses. In addition to our inspection Mr John Hay of JB & PF Consulting Services was engaged to carry out a visual stress grading of a number of the Hanger 1 roof trusses as HYDER had adopted a relatively low stress grading of F11 for the seasoned hardwood structure. Of the 560 truss members that Mr Hay inspected 546 members (97.5%) were graded as F17, 10 members (1.8%) were graded as F14 and 4 members (0.7%) were identified as requiring replacement.



2 Brief

In accordance with your *Request for Quotation* brief dated 11th July 2018 it is proposed to conduct the project in two stages, viz

Stage 1 - Heritage Permit Application

- Undertake a ground level inspection of Hangar 2.
- Provide a summary of observed structural condition and outline scope of works for economical in-situ repair and conservation solution for Hangar 2.
- Provide a summary of structural condition of Hangar 1 and "its ability to be relocated" (as requested by Heritage Victoria) based on previous inspections and reports (ref Partial Peer Review, 2013 & Further Investigation of Hangar 1, 2015).
- Provide detailed scope of repair works including any relevant sketches or drawings where appropriate.
- Brief report documenting the above to be submitted in draft, for MW review, and final versions.

Stage 2 - Detailed Design

Will be requested and agreed subsequent to Heritage permit Approval.

3 Stage 1 - Heritage Permit Application

3.1 Ground Level Inspection of Hangar 2

Our ground level inspection of the interior of Hangar 2 revealed that apart from some dry rot in the internal Door Dock framework, the timber appears to be in good condition, noting that the roof structure was not able to be adequately inspected from the ground level, and not all of the sub-roof structure was visible. Note that in 2015 we did not carry out a high-level inspection of the Hangar 2 roof structure. Our inspection of the external flying struts revealed that whilst the flying struts along the western side of the Hangar have been remediated and capped with metal flashing, the flying struts along the eastern side suffer from dry rot and need to be replaced.

3.2 In-situ repair and conservation of Hangar 2

Hyder reported in their 2009 Structural Engineering Audit report :-

"Findings from the inspection of Hangar #2 were similar to those from Hangar #1 with the structural framework, connection detailing and member condition being similar. However, the roof cladding to this building has remained in tact thus preventing extensive deterioration resulting from weather exposure as observed in some areas of Hangar #1. Main areas of decay caused by weather exposure occurred in the corner structures near the main sliding doors where the detailing of the cladding has not prevented water entry or sun exposure." (Section 3.2.2, page 9)

Hyder's part summary of the condition of Hangar 1 follows :-

"Most evidence of deterioration was, not unexpectedly, observed in the area of damaged roof sheeting where the framing members have been exposed to weather conditions over many years. In such areas, severe timber decay was evident indicating that the structural integrity of those decayed members has been compromised." And further "Although some incidences of major member failure were recorded, the majority of defects were confined to the member end connections in the main roof trusses. Typically, this appeared as timber splits protruding along the length of the member originating from behind the steel cover plates forming the connection." (Section 3.2.1, pages 7 and 8)

Our 2012 desk-top analysis of a typical Hangar 2 primary roof truss found that the truss appeared to be adequate for the Dead and Live Load case and for the Dead and Wind Load case (with the northern door closed) the typical truss appeared to be adequate with the exception of the bottom chord. We understand that both Melbourne Water and the B24 Group have opted to retain the existing temporary props in the short term and as such there is no immediate need to remediate the bottom chords of the main trusses.

3.3 Relocation of Hangar 1

Notwithstanding that our 2015 brief was to inspect two typical primary roof trusses, our cursory inspection of other parts of the structure revealed a number of broken bottom chords, dry rot in the roofing members where the roofing was missing or had otherwise failed, dry rot in the base of one timber post, and some dry rot in the internal Door Dock framework. Our inspection of the flying struts that are located along the eastern and western external walls of the Hangar revealed extensive dry rot. In general and as per Hyder's findings, the majority of the defects that we observed from our high level inspection were in the roof structure and were generally confined to splitting of the timber members at the joints.

Given that the trusses and bracing frames of Hangar 1 were originally prefabricated and then erected, it will be possible to dismantle, remediate and then re-erect the Hangar at the new site to the south of Hangar 2, in a similar manner to the original erection of the Hangar 1 structure. As most of the structural member connections are bolted it should be possible to disassemble the components of the Hangar without causing damage to those members. Refer to Appendix A for drawings showing the proposed works.

We understand that as an alternative to the dismantling of Hangar 1 Mammoth Movers have proposed to move the Hangar emasse via a system of longitudinal and traverse beams and trusses that will allow the Hanger structure (without the Asbestos cement cladding) to be lifted vertically. Once lifted 'dollies' (or small trailers) would be positioned below the temporary steel beams and the dollies would be connected in unison to a prime-mover which would then pull the Hangar along a new road to the new location. Whilst the Mammoth Movers proposal allows the structure to be moved emasse, it has the disadvantage that it



does not address the remedial works that are required to the structure, whereas the disassembly and re-erection of the Hangar structure allows the primary roof trusses and other structural members to be remediated from the ground level.

Conclusion

We trust that the above is explanatory enough for your purposes and please do not hesitate to contact us on 9381 1239 or 0417 36 34 32 if you have any queries or require further information.

Yours faithfully,

Mark Hodkinson Pty Ltd

Mark Charles Hodkinson

Registered Building Practitioner EC-1016

BE(Civil) Grad Dip Struct Comps MIE(Aust) CPEng M.ICOMOS RBP

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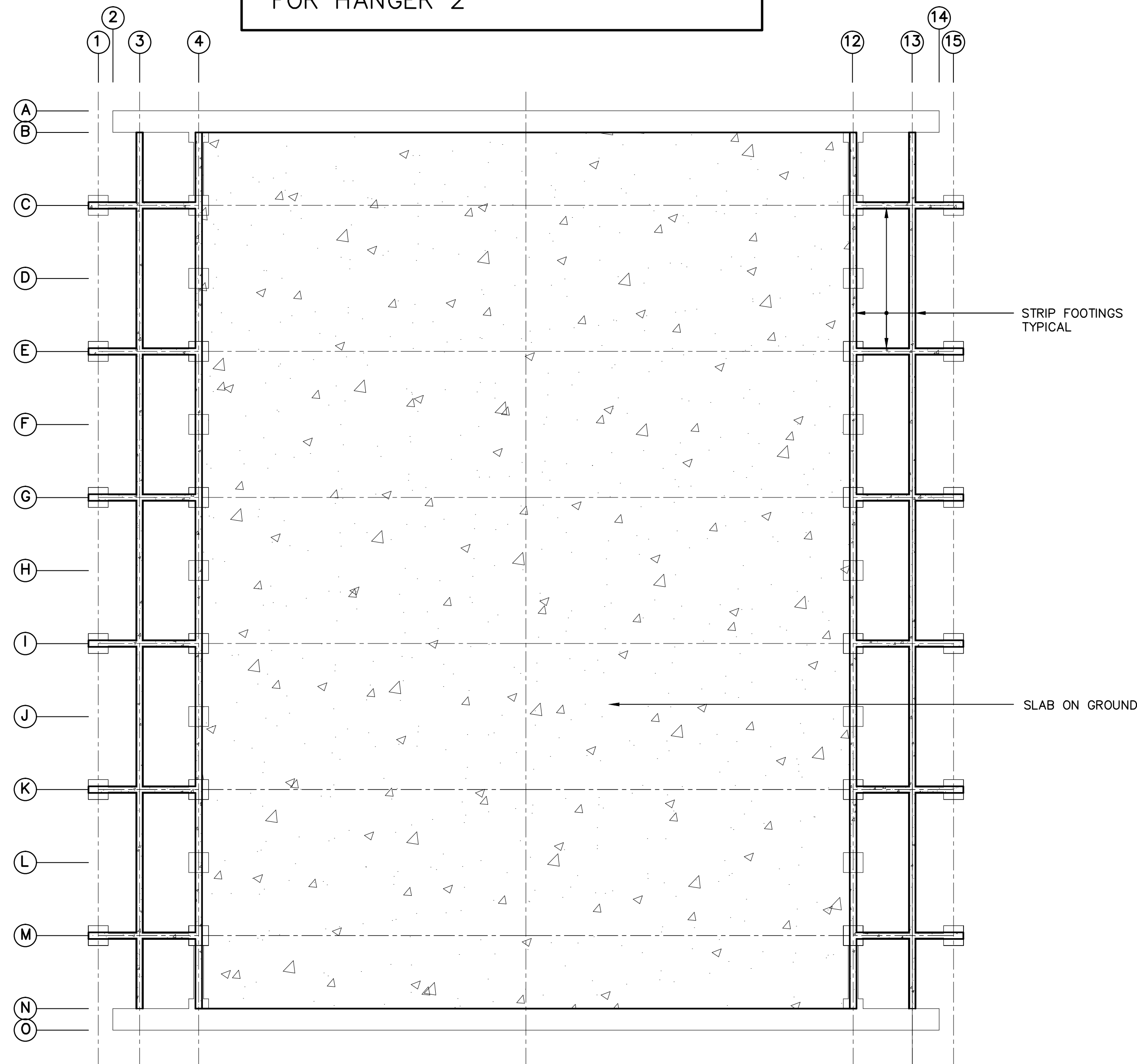
M A R K H O D K I N S O N P T Y L T D
C o n s u l t i n g S t r u c t u r a l E n g i n e e r s

APPENDIX A

DRAWINGS

M a r k H o d k i n s o n P t y L t d A C N 0 5 2 9 5 9 9 1 2
6 2 4 R a t h d o w n e S t r e e t N o r t h C a r l t o n 3 0 5 4
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E m a i l m a i l @ m h p l . n e t . a u A B N 6 2 0 5 2 9 5 9 9 1 2

DO NOT OPEN OR LEAVE OPEN THE SOUTHERN OR NORTHERN SLIDING DOORS WHEN THE PREDICTED OR MEASURED WIND SPEEDS IN A GIVEN DAY EXCEEDS 55 KM/HR (15 M/S). THIS WIND SPEED IS BASED ON THE CURRENT OPERATIONAL PROCEDURE FOR HANGER 2



NOTIONAL NEW FOOTING PLAN

NOTIONAL DISASSEMBLY AND RE-RECTION SEQUENCE FOR HANGER 1 NOTES

THE DISASSEMBLY AND RE-ERECTION OF THE HANGAR 1 STRUCTURE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. THE BUILDER SHALL SUPPORT THE PRIMARY ROOF TRUSSES FROM A CRANE DURING THE WORKS AND PROP AND SUPPORT THE OTHER STRUCTURE AS NECESSARY DURING THE WORKS TO ENSURE THAT THE STRUCTURE REMAINS IN A STABLE CONDITION AT ALL TIME.

- 1 CONSTRUCT THE NEW FOOTINGS AND SLAB ON GROUND.
- 2 REMOVE THE CLADDING FROM THE HANGAR AND CLEAN THE SITE OF ALL HAZARDOUS MATERIALS.
- 3 STARTING AT THE NORTHERN END OF THE HANGAR DISMANTLE THE DOORS, TRACKS, STEEL BRACKETS, ETC, REMEDIATE THE STRUCTURE AND THEN RE-ERECT THE STRUCTURE WITHOUT THE DOORS ON THE NEW FOOTINGS.
- 4 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS B AND C AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID B, POSTS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT IT ON THE NEW FOOTINGS.
- 5 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS C AND D AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID C, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 6 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS D AND E AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID D, POSTS, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 7 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS E AND F AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID E, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 8 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS F AND G AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID F, POSTS, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 9 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS G AND H AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID G, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 10 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS H AND I AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID H, POSTS, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 11 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS I AND J AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID I, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 12 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS J AND K AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID J, POSTS, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS. PROP THE RE-ERECTED STRUCTURE.
- 13 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS K AND L AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID K, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 14 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS L AND M AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID L, POSTS, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 15 REMOVE THE ROOFING PURLINS, BRACING AND OTHER STRUCTURE FROM BETWEEN GRIDS M AND N AND THEN REMOVE THE PRIMARY ROOF TRUSS ON GRID M, POSTS, BRACING FRAME, SKILLION ROOF FRAMING, STUD WALLS, STEEL BRACKETS, ETC. REMEDIATE THE REMOVED STRUCTURE AND THEN RE-ERECT THE STRUCTURE ON THE NEW FOOTINGS.
- 16 DISMANTLE THE DOORS, TRACKS, STEEL BRACKETS, ETC, AT THE SOUTHERN END, REMEDIATE THE STRUCTURE AND THEN RE-ERECT THE STRUCTURE WITHOUT THE DOORS ON THE NEW FOOTINGS.
- 17 RE-INSTALL THE DOORS PROP THE TRUSS BOTTOM CHORD PANEL POINTS AND THEN RECLAD THE HANGAR.

NOTIONAL REMEDIAL WORKS FOR HANGAR 1 NOTES

THE REMEDIAL WORKS FOR HANGAR 1 SHALL BE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING NOTES.

- 1 LABEL THE MEMBERS WITH ENGRAVED NAME PLATES PRIOR TO THEIR DIS-ASSEMBLY TO ENSURE THAT THEY ARE RE-ERECTED IN THE CORRECT LOCATIONS.
- 2 REMEDIATE THE PRIMARY TRUSS JOINTS IN ACCORDANCE WITH THE 'TYPICAL PRIMARY TRUSS JOINT REMEDIATION DETAIL' ON S7. NOTE THAT WHERE THE TRUSS MEMBERS ARE ROTTED, CRUSHED OR OTHERWISE DEEMED SUB-STANDARD BY THE STRUCTURAL ENGINEER THEY SHALL BE REPLACED WITH F27 SEASONED DURABLE RECYCLED HW THE SAME DIMENSIONS AS THE MEMBER THAT IS TO BE REPLACED. PRIOR TO THE RE-ASSEMBLY OF THE JOINTS THE TECO SHEAR-PLATE AND SPLIT-RING CONNECTORS AND THE BOLTS AND WASHERS SHALL BE GRIT BLASTED AND PAINTED.
- 3 REMEDIATE THE SECONDARY TRUSS JOINTS IN ACCORDANCE WITH THE 'TYPICAL SECONDARY TRUSS JOINT REMEDIATION DETAIL' ON S7. NOTE THAT WHERE THE TRUSS MEMBERS ARE ROTTED, CRUSHED OR OTHERWISE DEEMED SUB-STANDARD BY THE STRUCTURAL ENGINEER THEY SHALL BE REPLACED WITH F27 SEASONED DURABLE RECYCLED HW THE SAME DIMENSIONS AS THE MEMBER THAT IS TO BE REPLACED. PRIOR TO THE RE-ASSEMBLY OF THE JOINTS THE TECO SHEAR-PLATE AND SPLIT-RING CONNECTORS AND THE BOLTS AND WASHERS SHALL BE GRIT BLASTED AND PAINTED.
- 4 PRIOR TO THE RE-ASSEMBLY OF ALL JOINTS THE TECO SHEAR-PLATE AND SPLIT-RING CONNECTORS AND THE BOLTS AND WASHERS SHALL BE GRIT BLASTED AND PAINTED.
- 5 WHERE THE TIMBER MEMBERS HAVE NAILED JOINTS DO NOT SPLIT THE TIMBER WHEN REMOVING THE MEMBERS, AND FOLLOWING THE REMOVAL OF THE TIMBER REMOVE THE NAILS AND RE-FIX THE MEMBER WITH #14 BATTEN SCREWS.
- 6 WHERE THE TIMBER MEMBERS HAVE BOLTED JOINTS REMOVE THE BOLTS AND WASHERS FOR RE-USE. GRIT BLAST AND PAINT THE BOLTS AND WASHERS PRIOR TO THEIR RE-USE.
- 7 REMEDIATE THE POST BASES IN ACCORDANCE WITH THE POST SPLICE DETAIL ON DRAWING S7.
- 8 THESE DRAWINGS HAVE BEEN PREPARED ON THE UNDERSTANDING THAT THE EXISTING SUPER-SIX ASBESTOS CEMENT SHEETING WILL BE REPLACED WITH TEGRAL PROFILE 6R ROOF SHEETING, AND THE CGI SHEETING WILL BE REPLACED WITH A SIMILAR SHEETING.
- 9 REPLACE ALL TIMBER THAT DOES NOT HAVE A STRESS GRADING OF AT LEAST F17, OR THAT HAS FAILED OR CRUSHED, OR IS ROT OR TERMITE AFFECTED, ETC, WITH F27 SEASONED DURABLE RECYCLED HW OF THE SAME DIMENSIONS.

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NOT TO BE USED FOR CONSTRUCTION OR COSTING PURPOSES

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|-----|---------|-----------------------------|----|
| A | 21.2.19 | HERITAGE PERMIT APPLICATION | |
| P3 | 12.2.19 | FOR COMMENT | MH |
| P2 | 20.9.18 | FOR COMMENT | MH |
| P1 | 4.9.18 | FOR COMMENT | MH |
| No. | Date | Revision | By |

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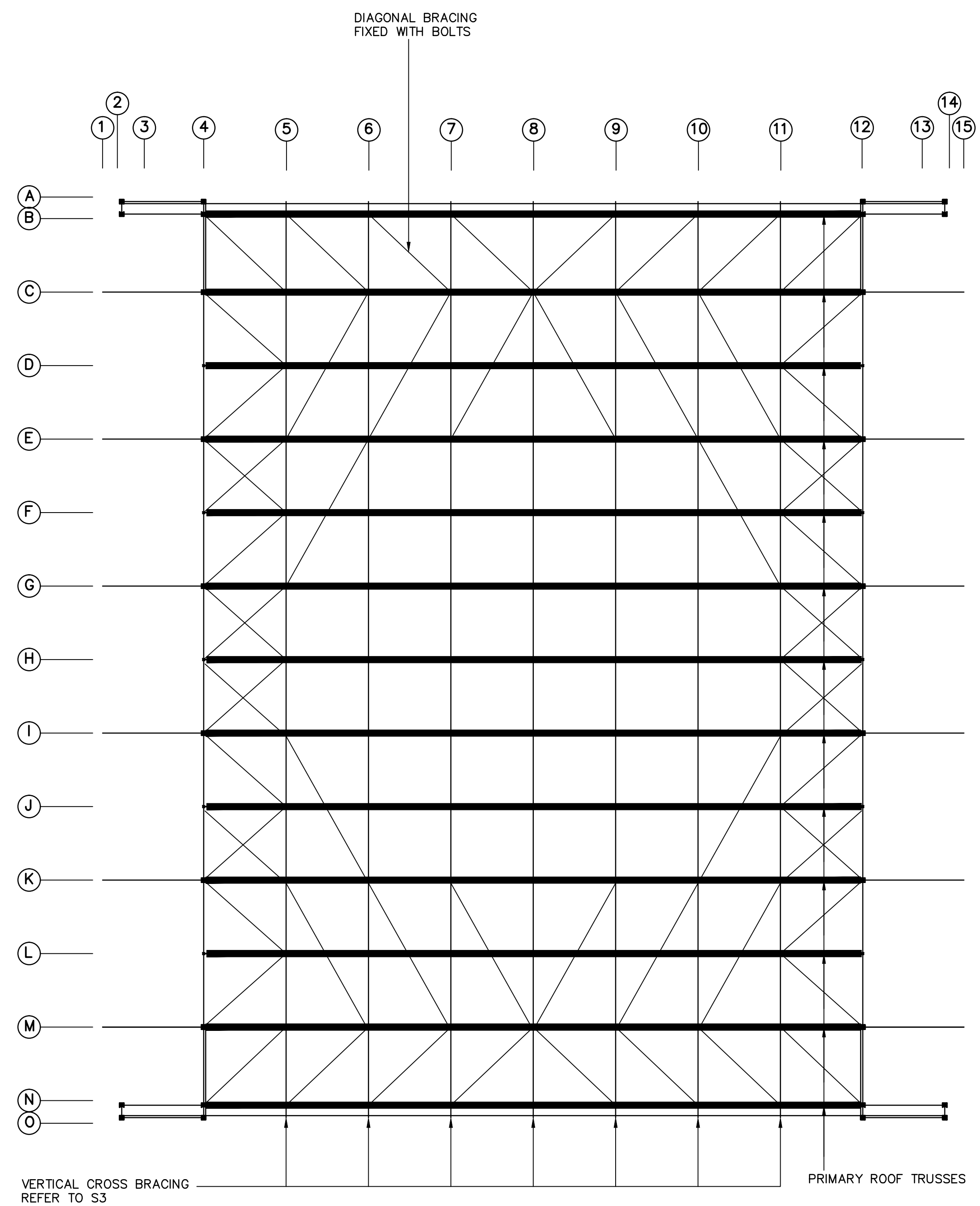
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HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEELONG ROAD
WERRIBEE

Architect
RBA

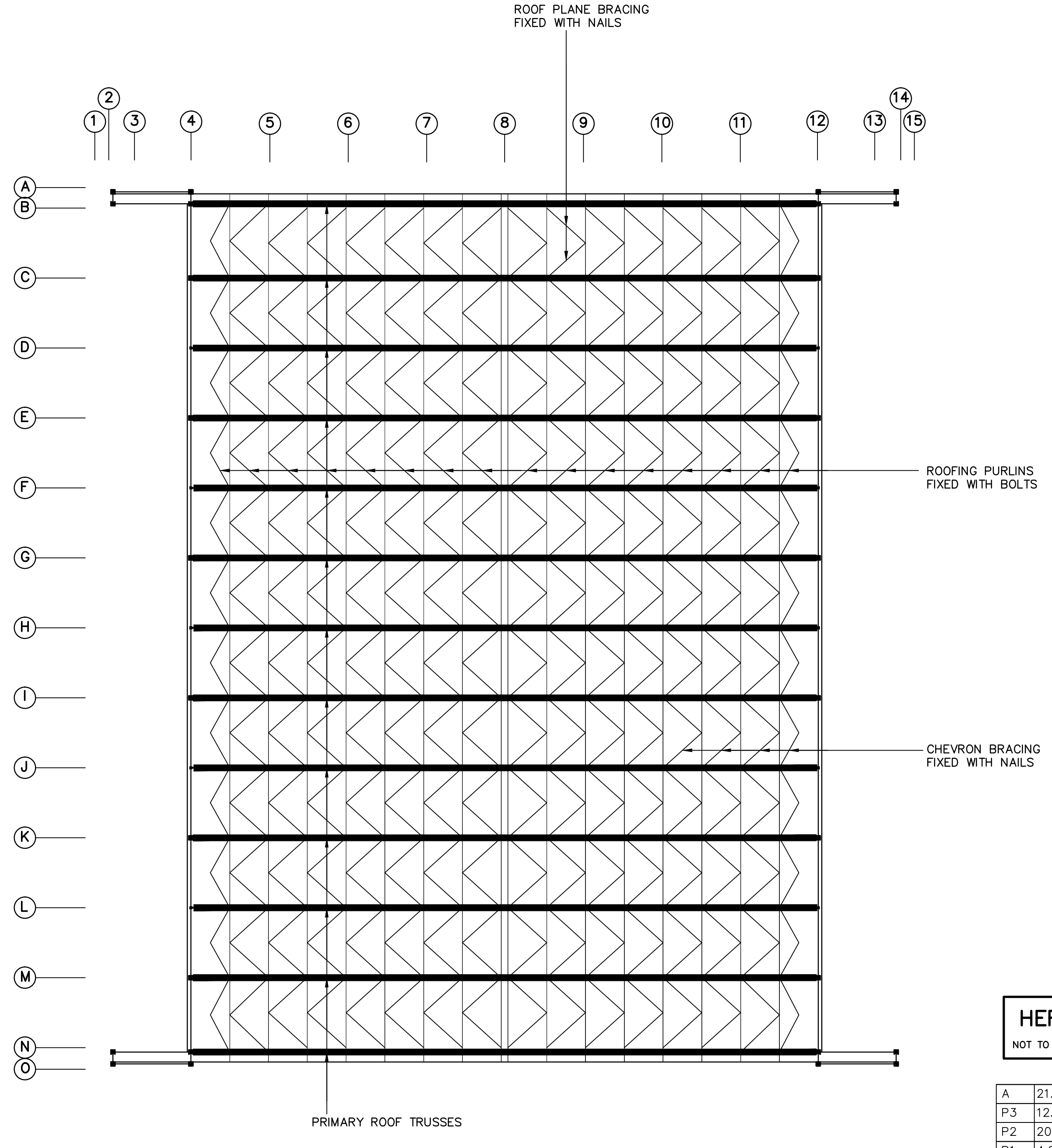
Client
MELBOURNE WATER

Drawing Title
HANGAR 1 FOOTING PLAN

| | | |
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| Project No. | Date | Scale |
| 3482 | FEB 2019 | N.T.S. |
| Design | Drawn | Sheet Size |
| MH | PWG | A1 |
| Project North | Drawing No. | Revision |
| ↑ | S1 | A |



PRIMARY ROOF TRUSS BOTTOM CHORD LEVEL PLAN



PRIMARY ROOF TRUSS TOP CHORD LEVEL PLAN

| ASSUMED EXISTING MEMBER CONNECTIONS | |
|-------------------------------------|-------|
| PRIMARY ROOF TRUSSES | B |
| ROOFING PURLINS | B |
| HORIZONTAL BOTTOM CHORD BRACING | B |
| VERTICAL CROSS BRACING | B |
| ROOF PLAN "CHEVRON" BRACING | N |
| MISCELLANEOUS BRACING | B / N |
| STUD WALLS | B / N |
| SIDE SKILLION ROOF RAFTERS | B / N |
| SIDE SKILLION ROOF BATTENS | B / N |
| MISCELLANEOUS MEMBERS | B / N |

B = BOLTED CONNECTION
N = NAILED CONNECTION

NOTE THAT THIS DRAWING DOES NOT SHOW ALL OF THE STRUCTURAL MEMBERS AND TIMBER FRAMING

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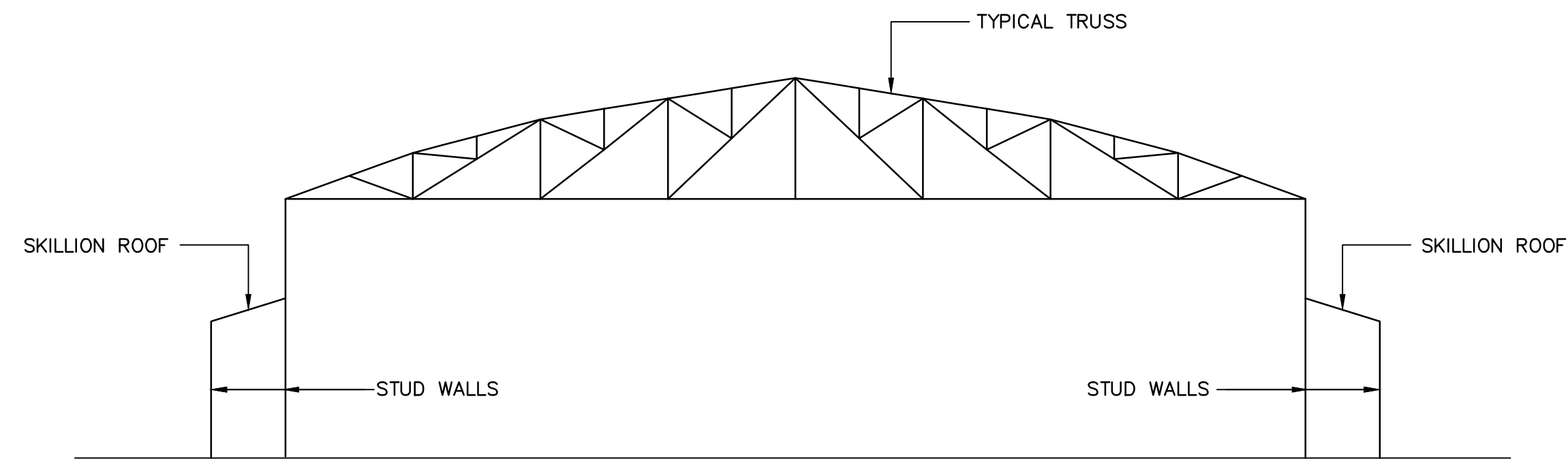
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Architect
RBA

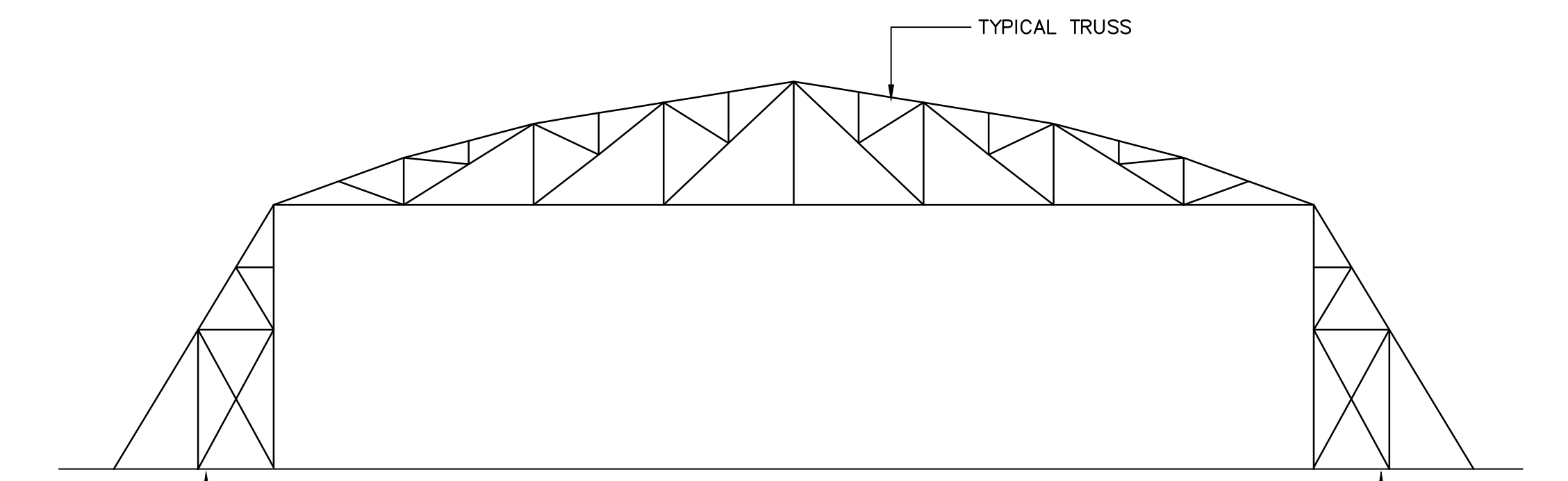
Client
MELBOURNE WATER

Drawing Title
HANGAR 1 ROOF PLAN

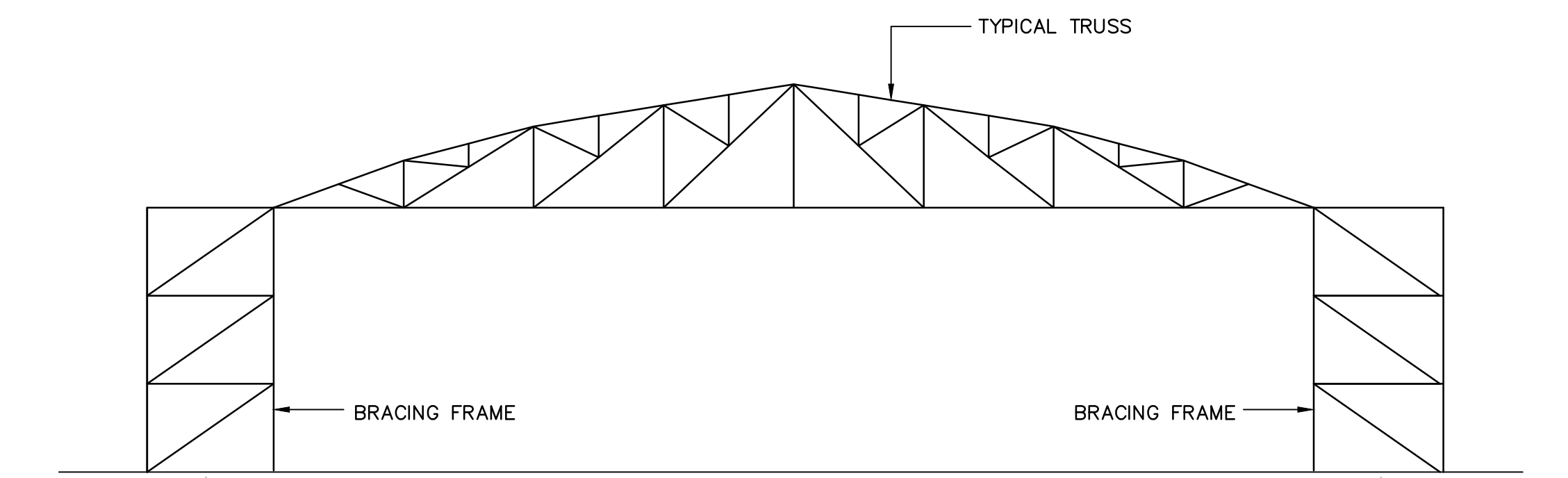
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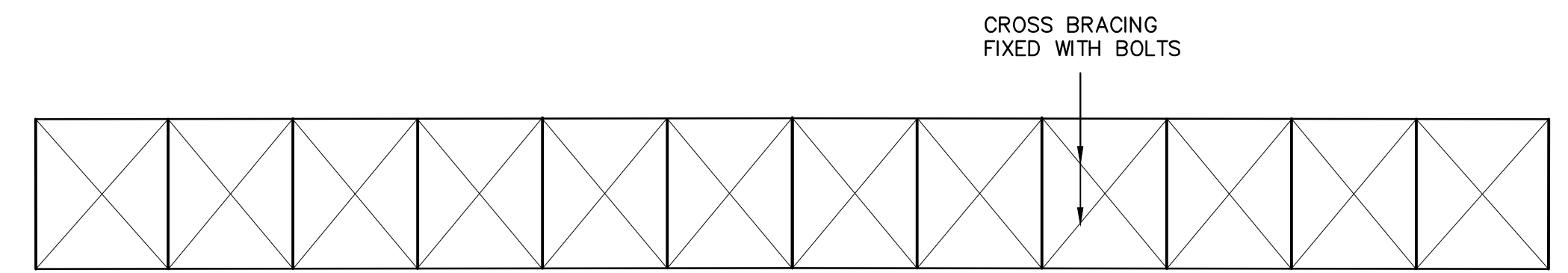
PRIMARY ROOF TRUSS & WALL ELEVATION ON GRIDS (D) (F) (H) (J) (L)



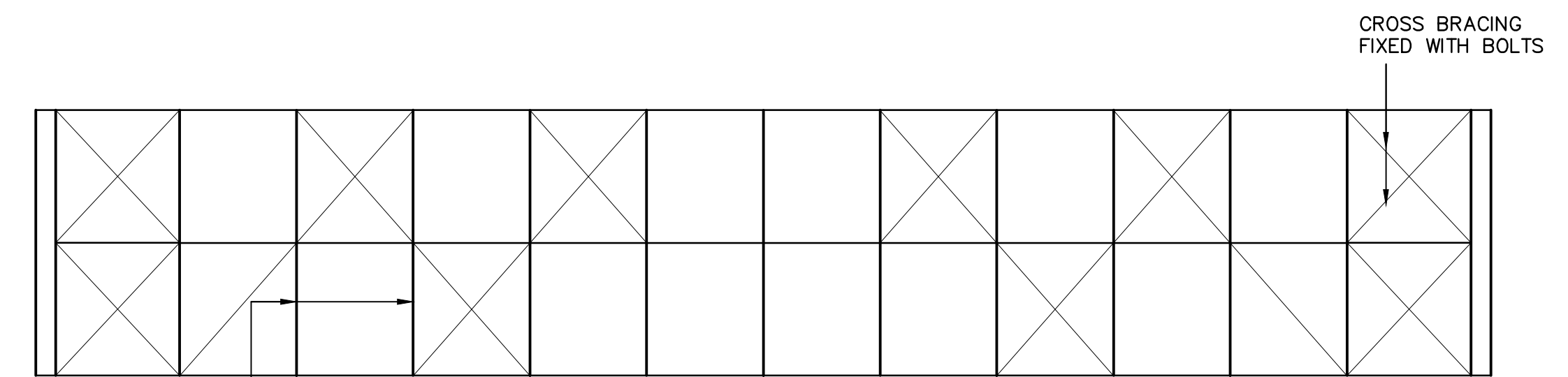
PRIMARY ROOF TRUSS & BRACING ELEVATION ON GRIDS (C) (E) (G) (I) (K) (M)



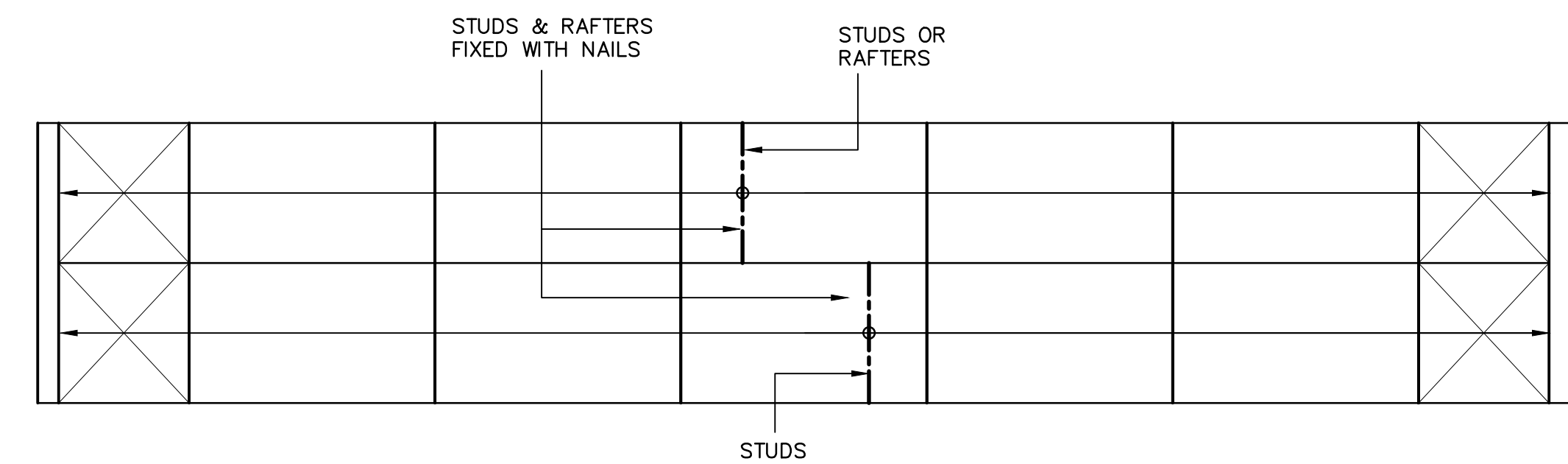
ASSUMED PRIMARY ROOF TRUSS & BRACING ELEVATION ON GRIDS (B) & (N)



TYPICAL VERTICAL ROOF CROSS BRACING ELEVATION FOR GRIDS (5) TO (11)



VERTICAL BRACING ON GRIDS (4) + (12)



LONG WALL CONSTRUCTION ON GRIDS (4) + (12)

NOTE THAT THIS DRAWING DOES NOT SHOW ALL OF THE STRUCTURAL MEMBERS AND TIMBER FRAMING

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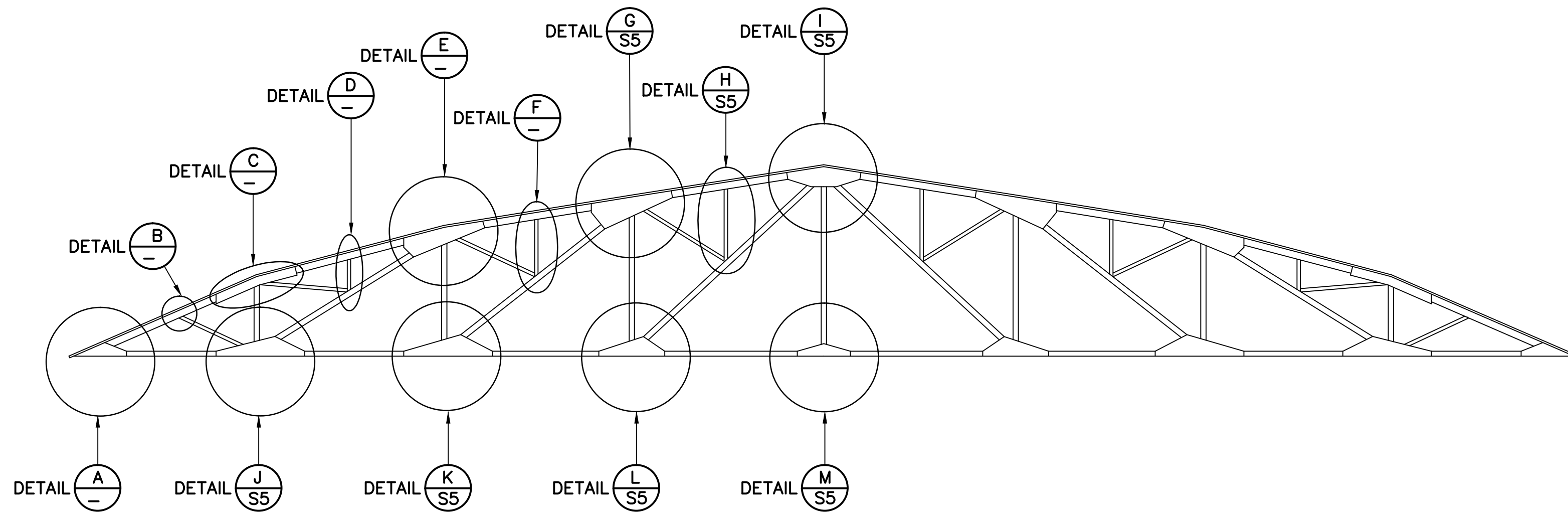
Project
HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEE LONG ROAD
WERRIBEE

Architect
RBA

Client
MELBOURNE WATER

Drawing Title
HANGAR 1
ELEVATIONS & SECTIONS

| | | |
|---------------------|-------------------|------------------|
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| Design MH | Drawn PWG | Sheet Size A1 |
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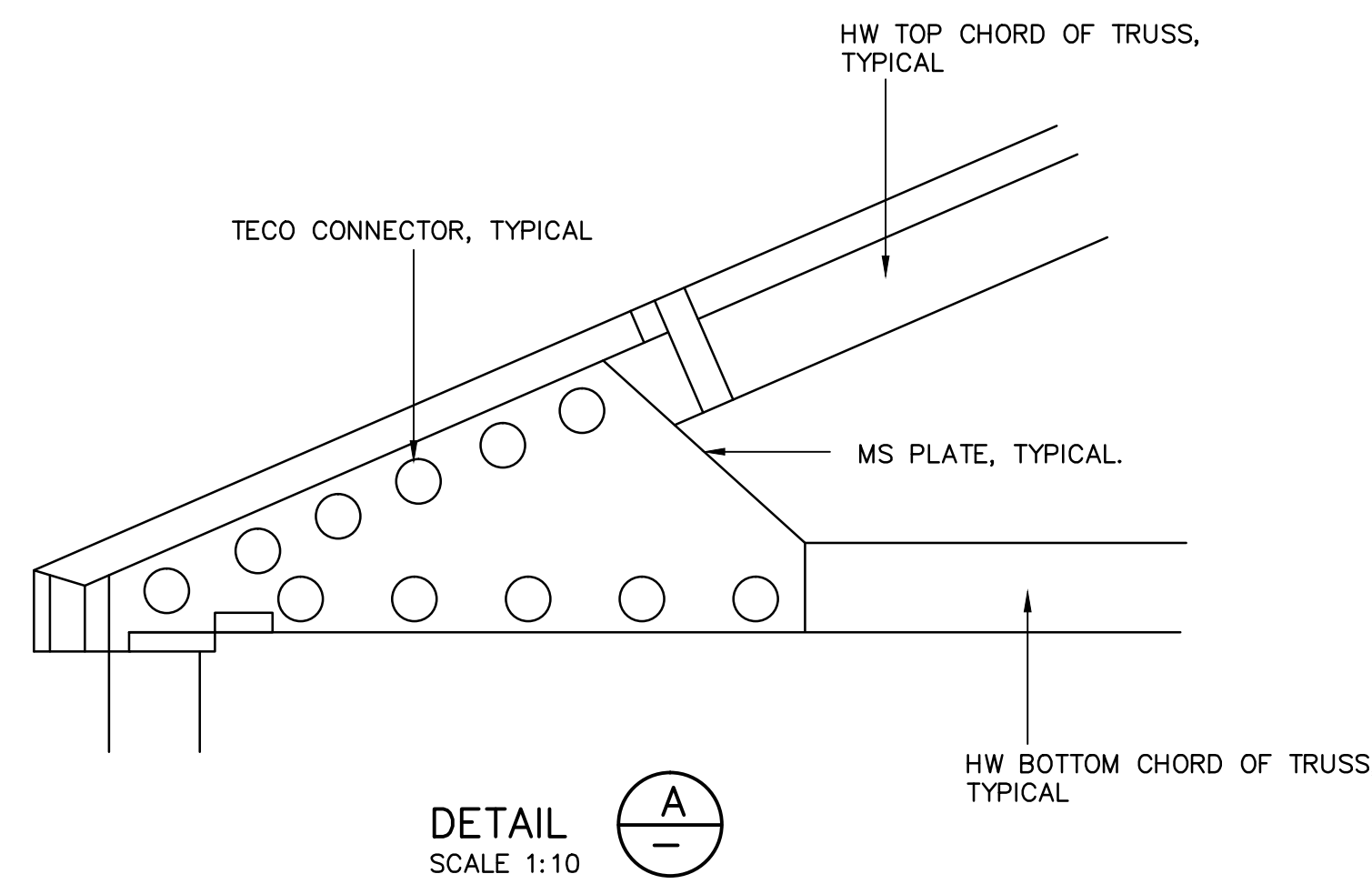


TYPICAL PRIMARY ROOF TRUSS

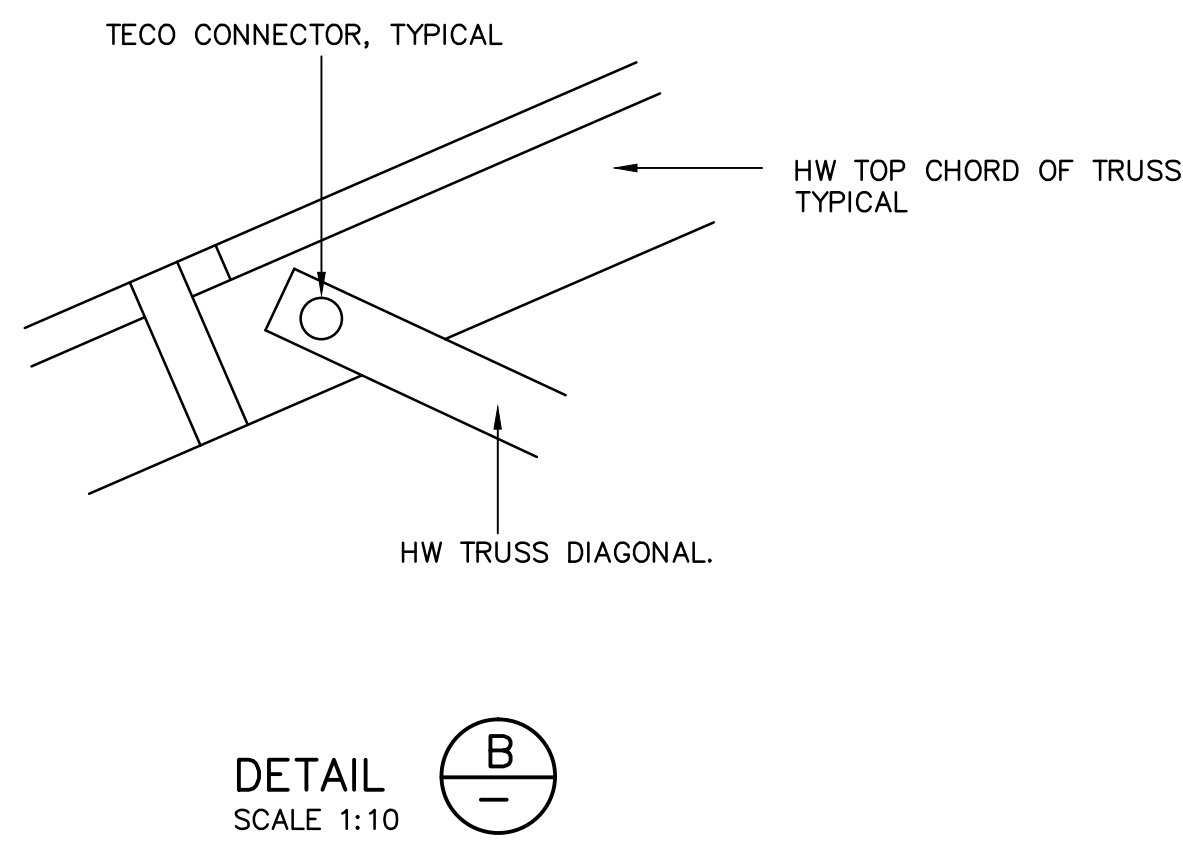
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REFER TO S1 & S7
FOR THE NOTIONAL
REMEDIAL WORKS

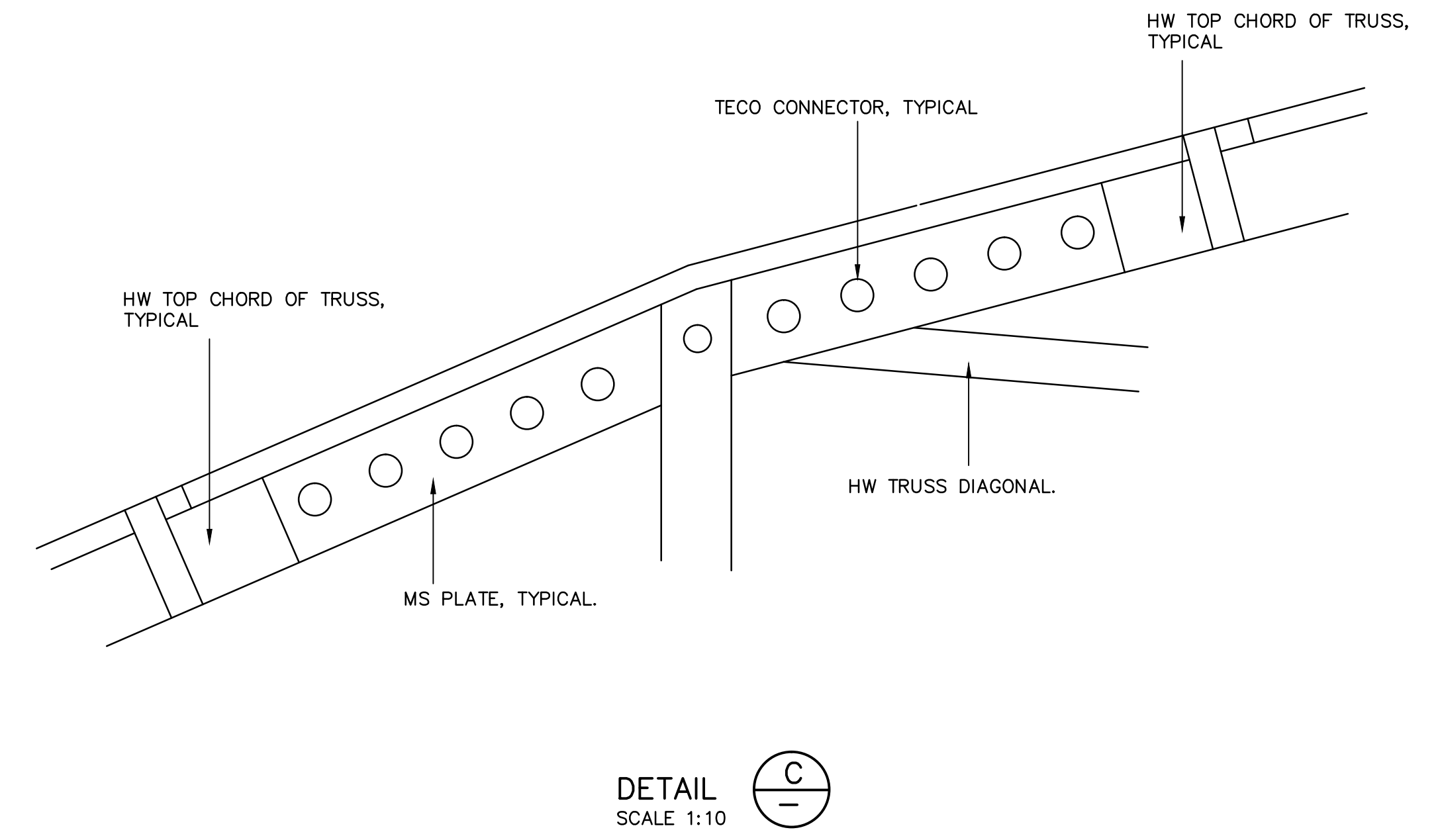
NOTE THAT THIS DRAWING DOES
NOT SHOW ALL OF THE
STRUCTURAL MEMBERS AND
TIMBER FRAMING



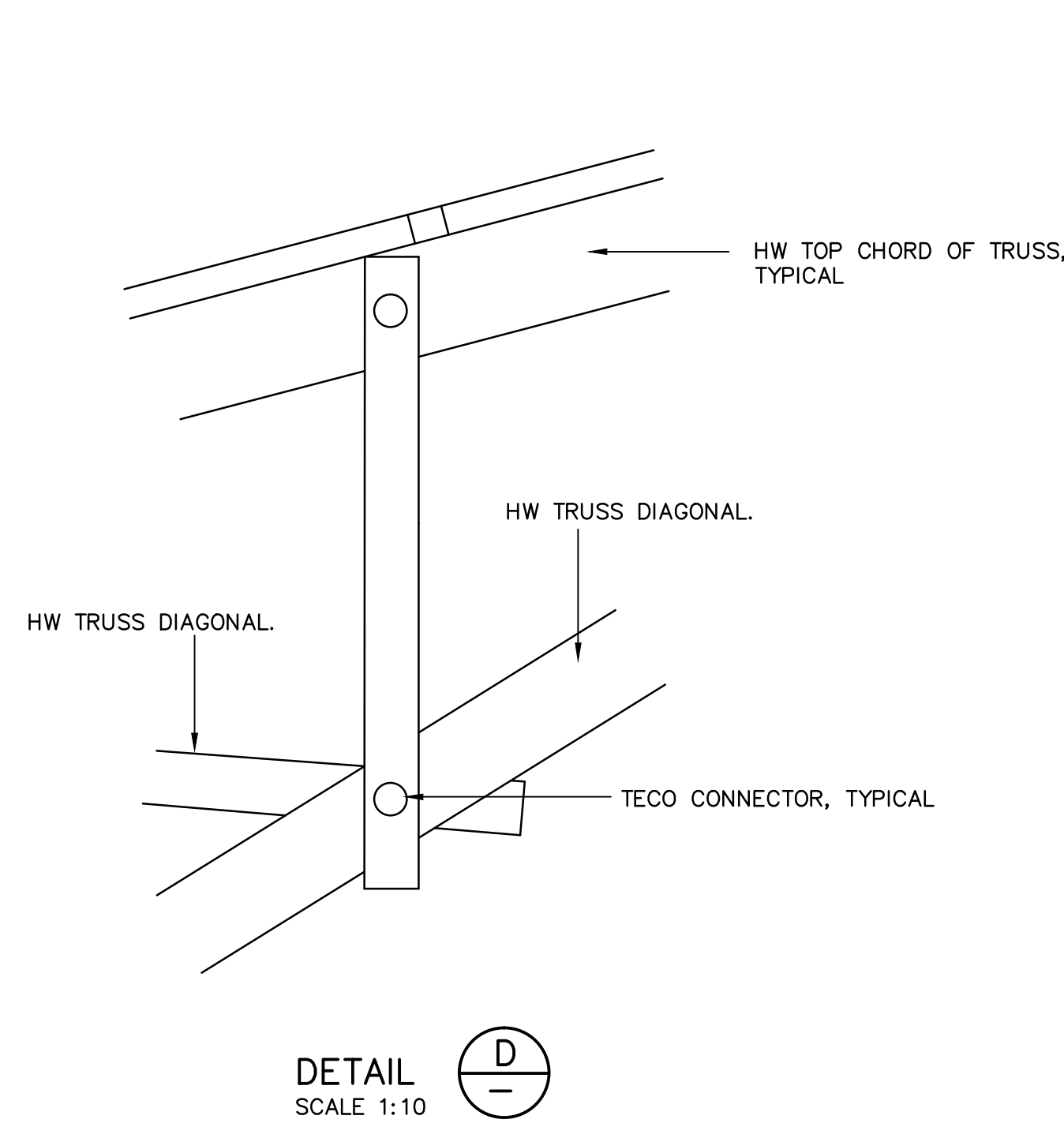
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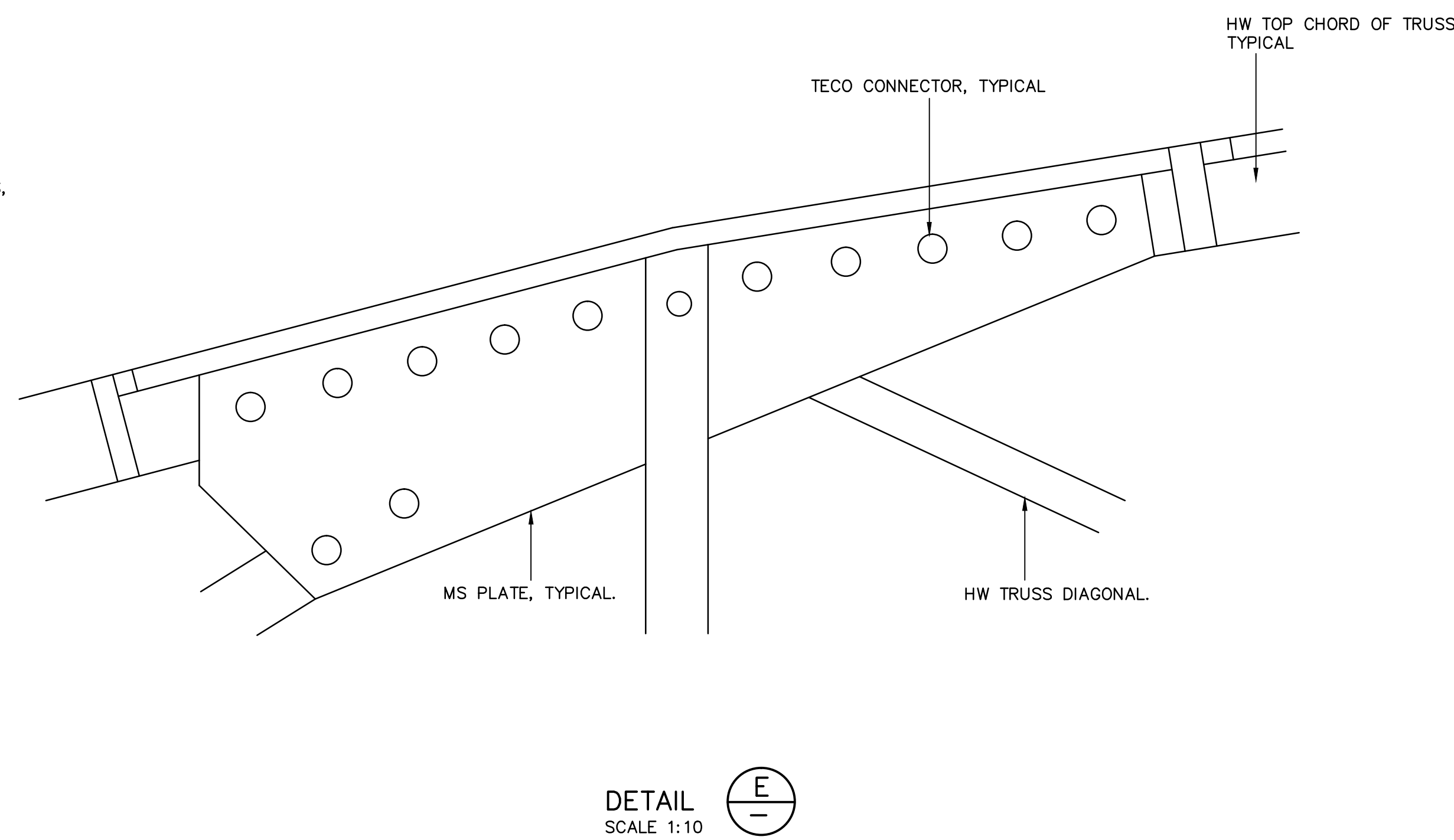
DETAIL B
SCALE 1:10



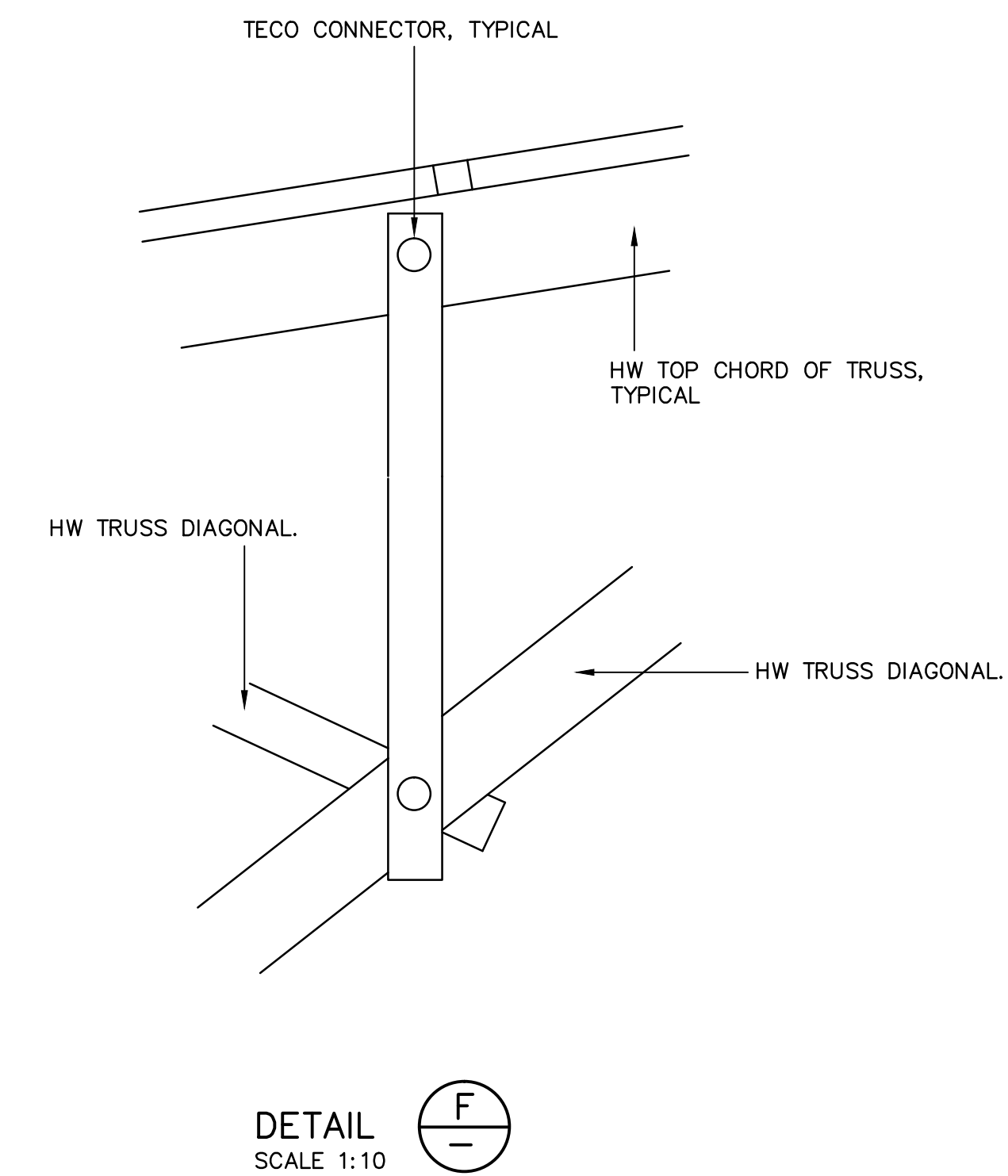
DETAIL C
SCALE 1:10



DETAIL D
SCALE 1:10



DETAIL E
SCALE 1:10



DETAIL F
SCALE 1:10

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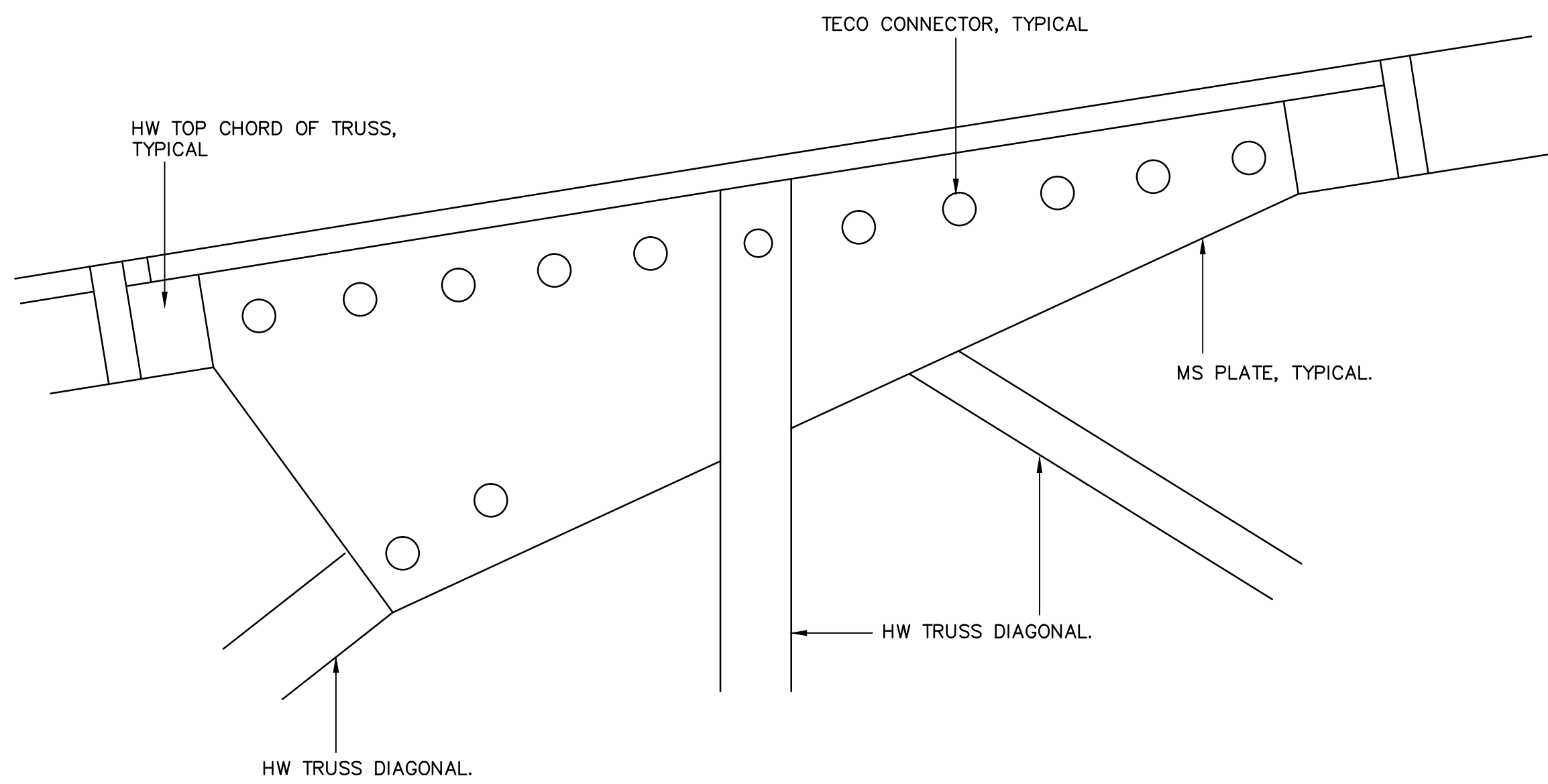
Project
**HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEELONG ROAD
WERRIBEE**

Architect
RBA

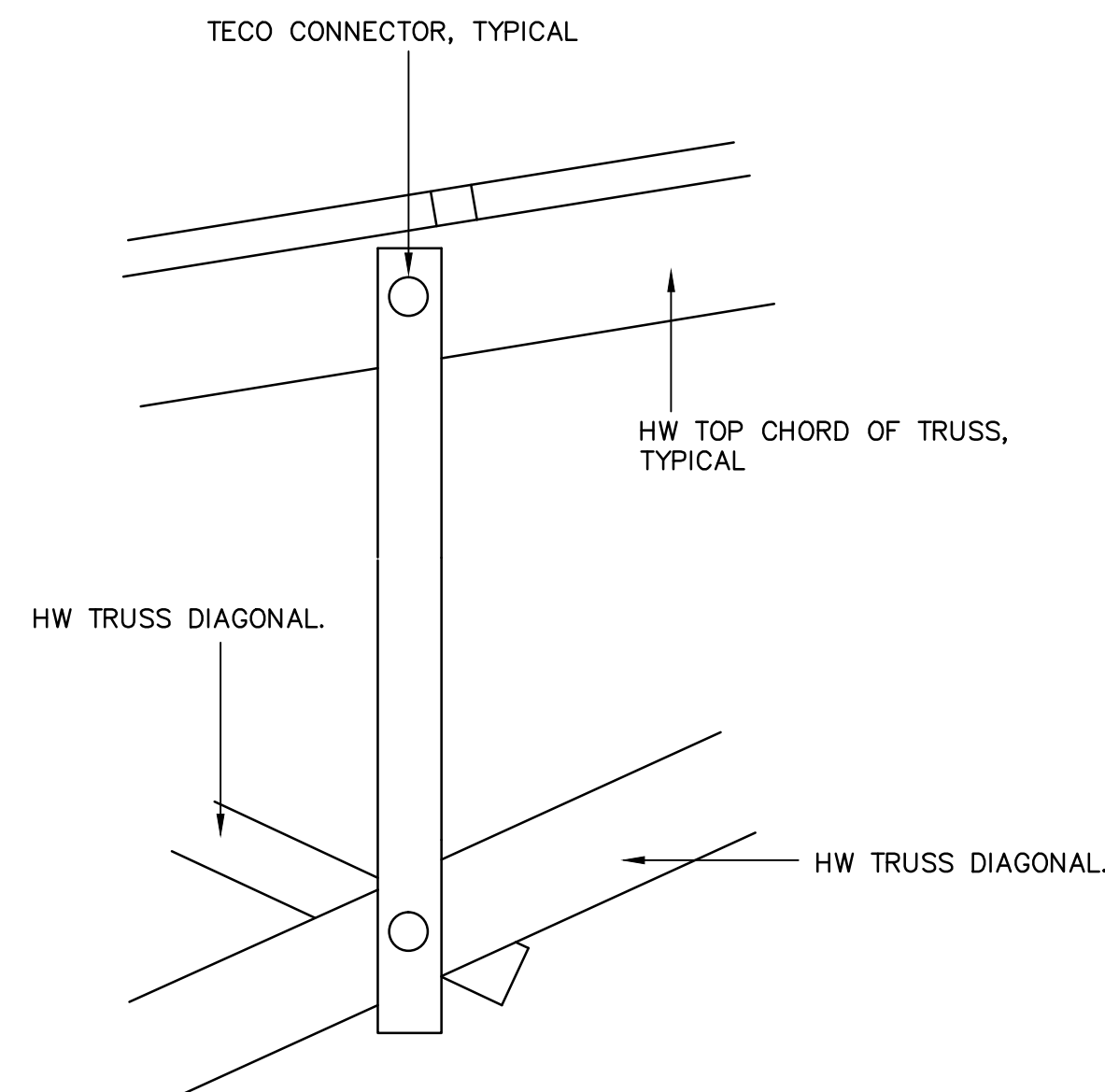
Client
MELBOURNE WATER

Drawing Title
HANGAR 1 ROOF TRUSS DETAILS

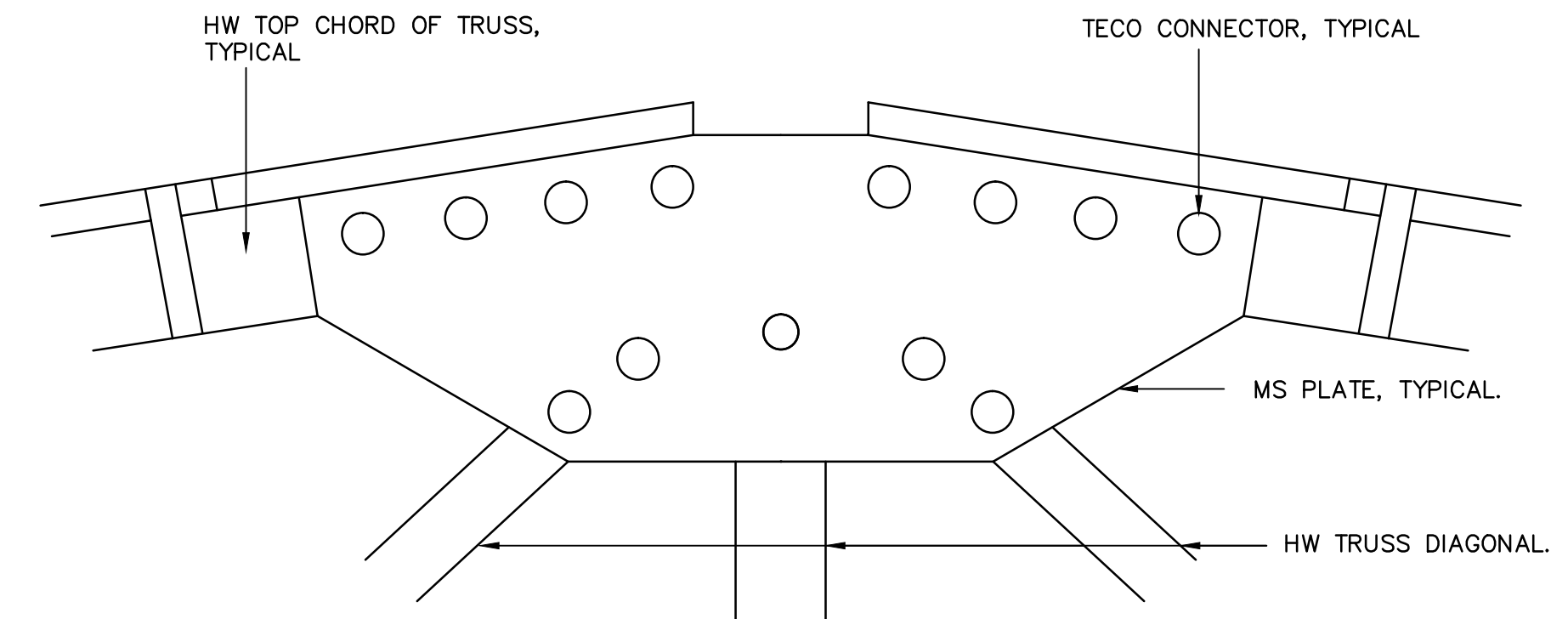
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| Project No. 3482 | Date FEB 2019 | Scale AS SHOWN |
| Design MH | Drawn PWG | Sheet Size A1 |
| Project North | Drawing No. S4 | Revision A |



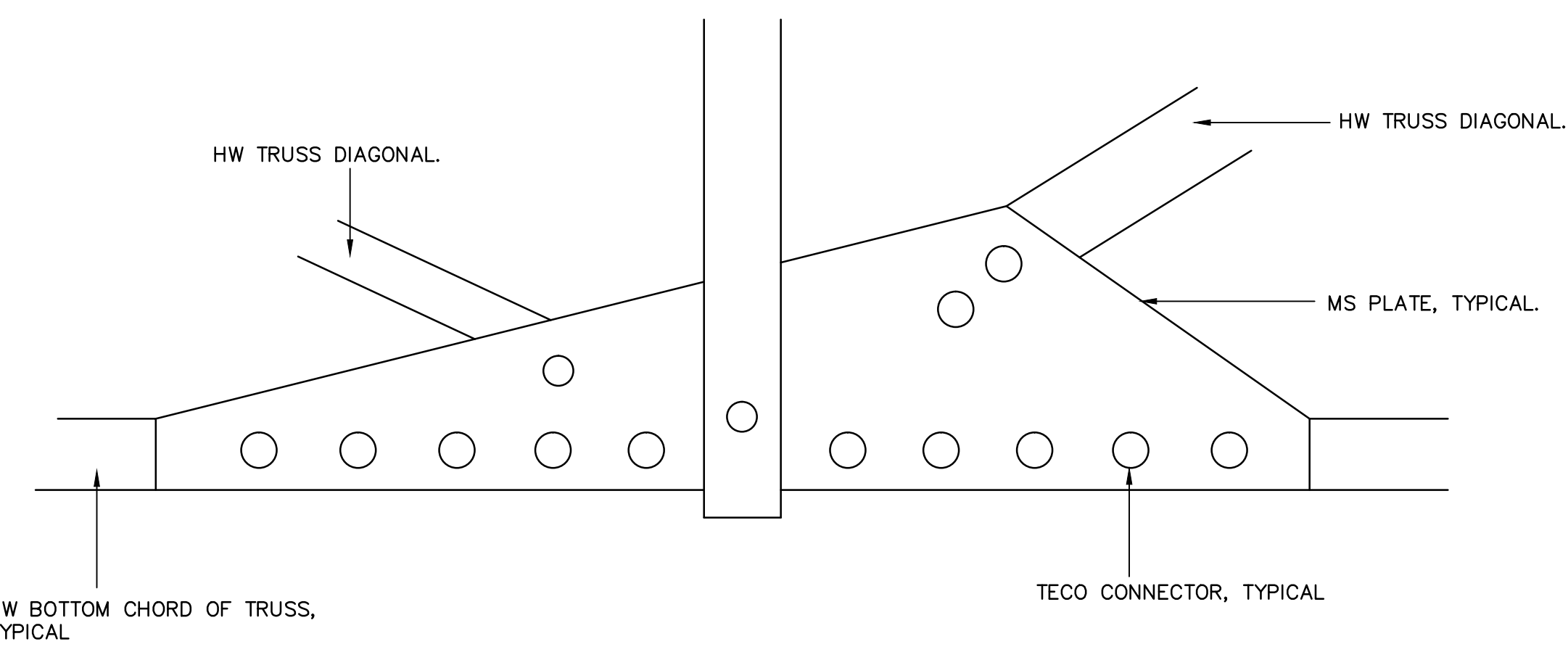
DETAIL **G**
SCALE 1:10 **S4**



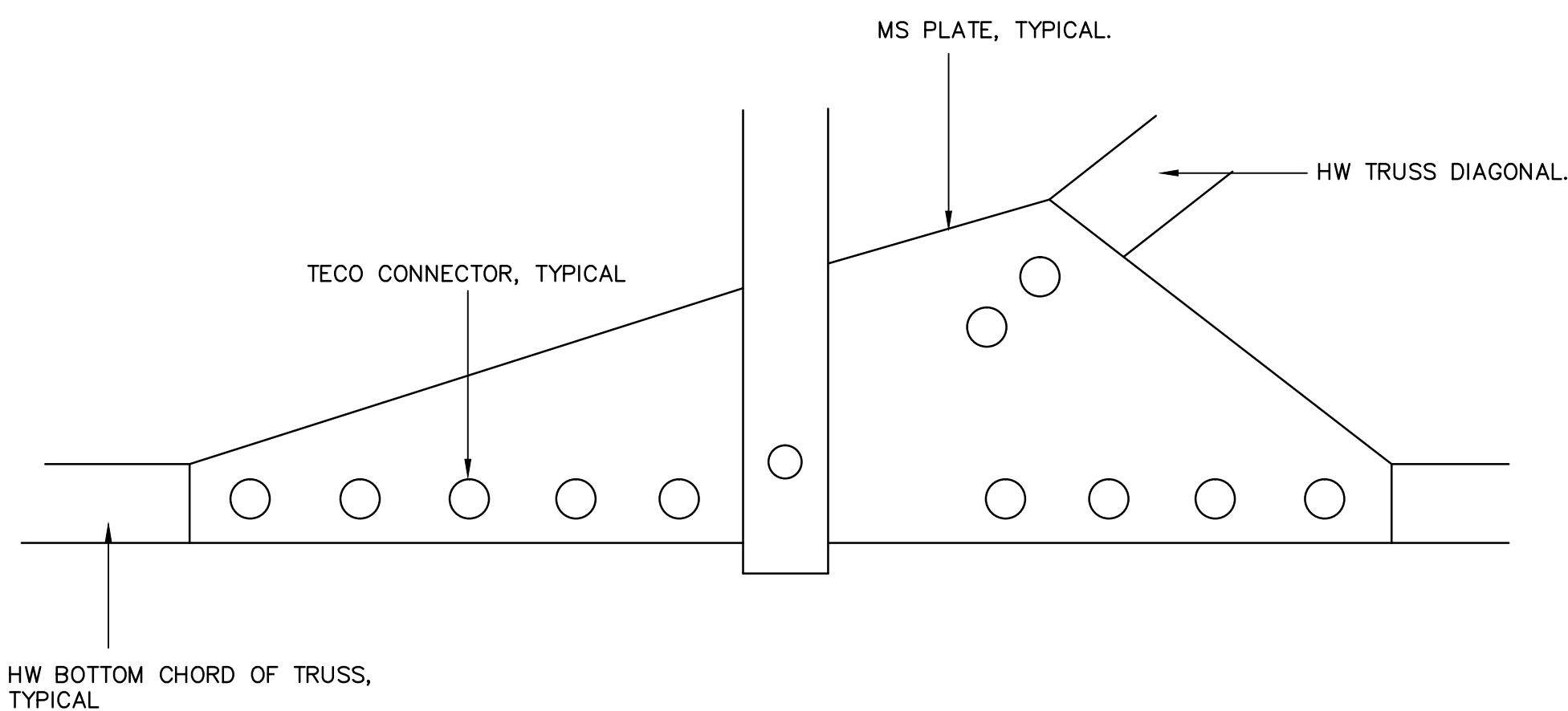
DETAIL **H**
SCALE 1:10 **S4**



DETAIL **I**
SCALE 1:10 **S4**



DETAIL **J**
SCALE 1:10 **S4**



DETAIL **K**
SCALE 1:10 **S4**

NOTE THAT THIS DRAWING DOES NOT SHOW ALL OF THE STRUCTURAL MEMBERS AND TIMBER FRAMING

HERITAGE PERMIT DRAWING
NOT TO BE USED FOR CONSTRUCTION OR COSTING PURPOSES

| | | | |
|-----|---------|-----------------------------|----|
| A | 21.2.19 | HERITAGE PERMIT APPLICATION | |
| P3 | 12.2.19 | FOR COMMENT | MH |
| P2 | 20.9.18 | FOR COMMENT | MH |
| P1 | 4.9.18 | FOR COMMENT | MH |
| No. | Date | Revision | By |

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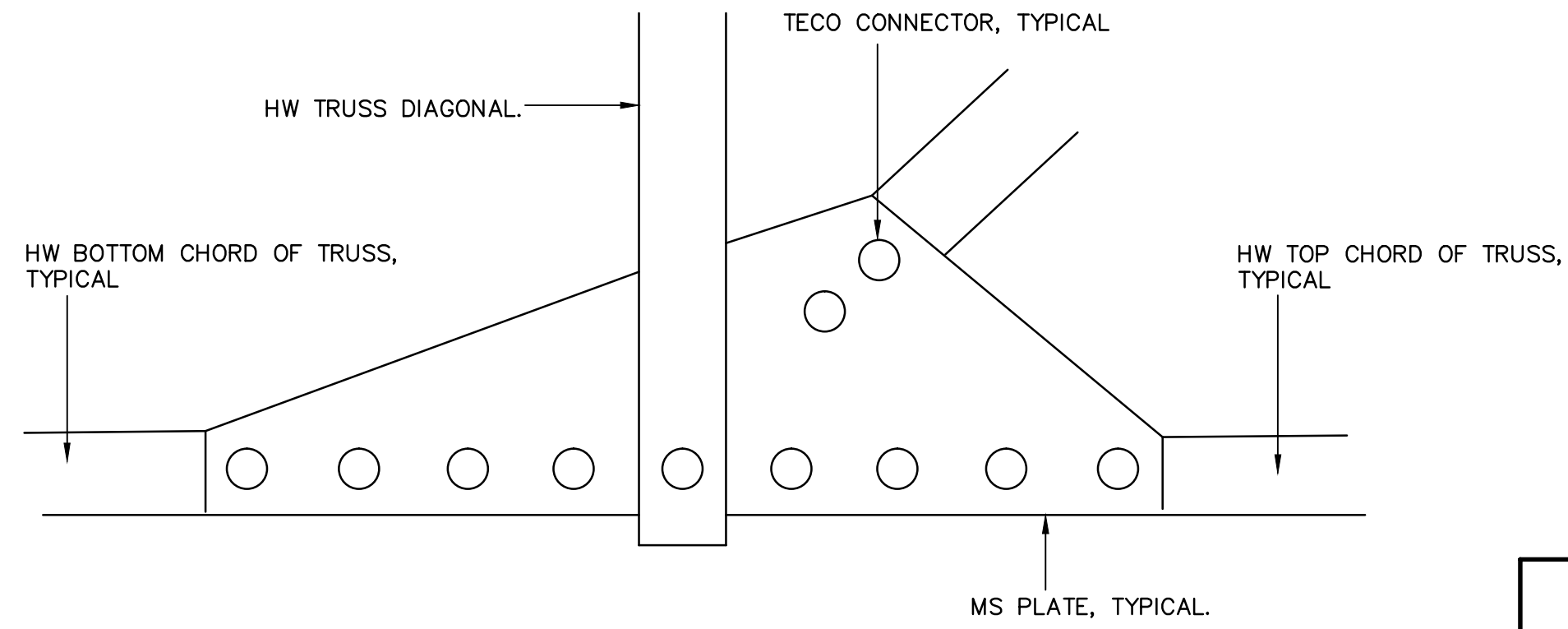
Project
**HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEE LONG ROAD
WERRIBEE**

Architect
RBA

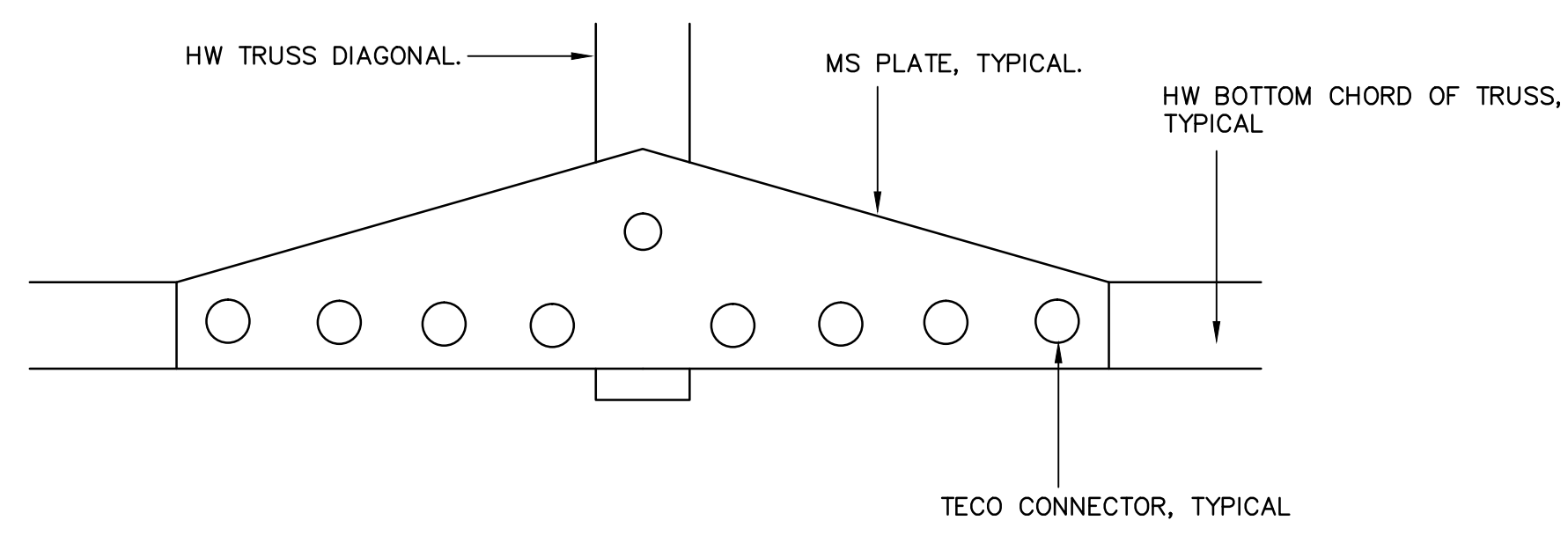
Client
MELBOURNE WATER

Drawing Title
HANGAR 1 ROOF TRUSS DETAILS

| | | |
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| Design MH | Drawn PWG | Sheet Size A1 |
| Project North | Drawing No. S5 | Revision A |

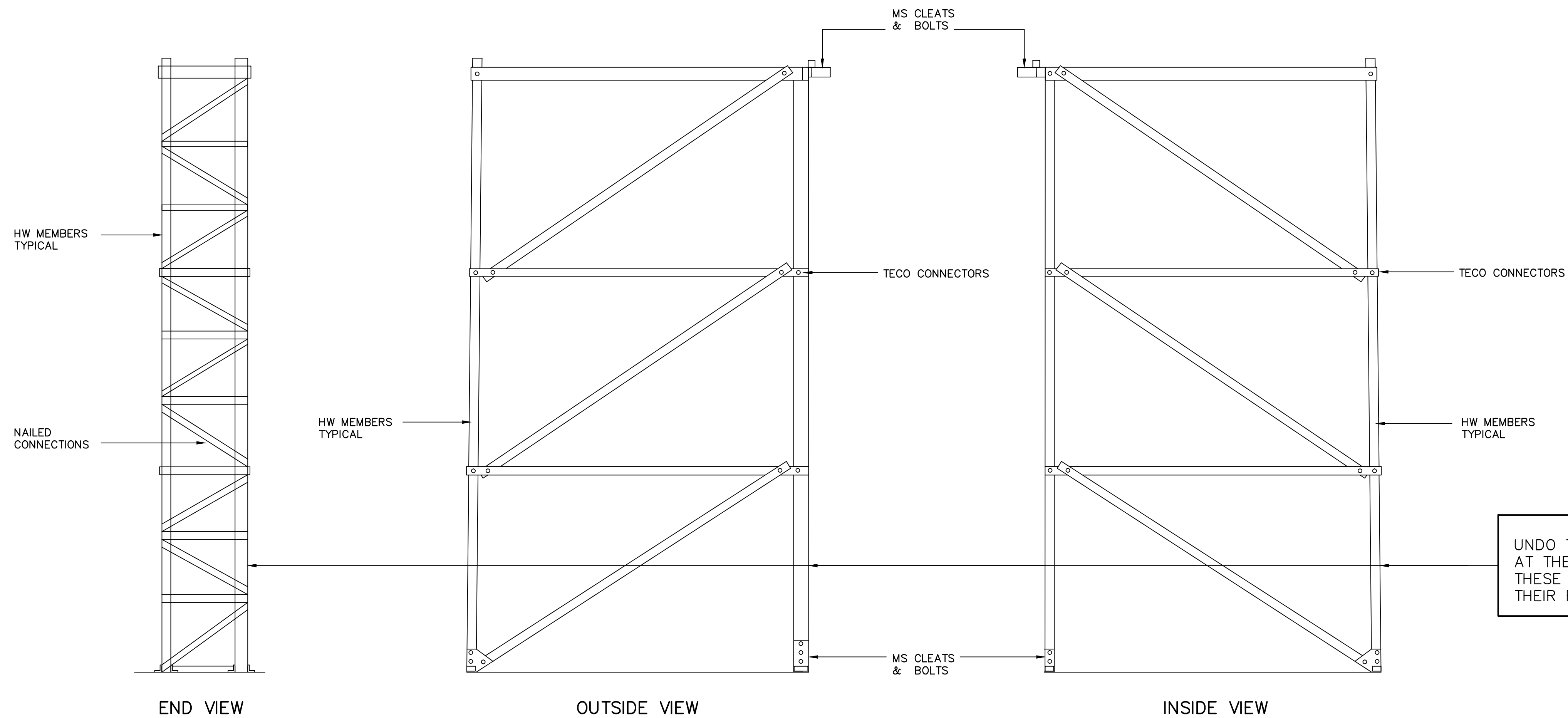


DETAIL **L**
SCALE 1:10 **S4**



DETAIL **M**
SCALE 1:10 **S4**

REFER TO S1 & S7
FOR THE NOTIONAL
REMEDIAL WORKS



NOTE THAT THIS DRAWING DOES NOT SHOW ALL OF THE STRUCTURAL MEMBERS AND TIMBER FRAMING

UNDO THE BOLTED CONNECTIONS AT THE TOPS AND THE BASES OF THESE FRAMES TO ALLOW FOR THEIR RELOCATION.

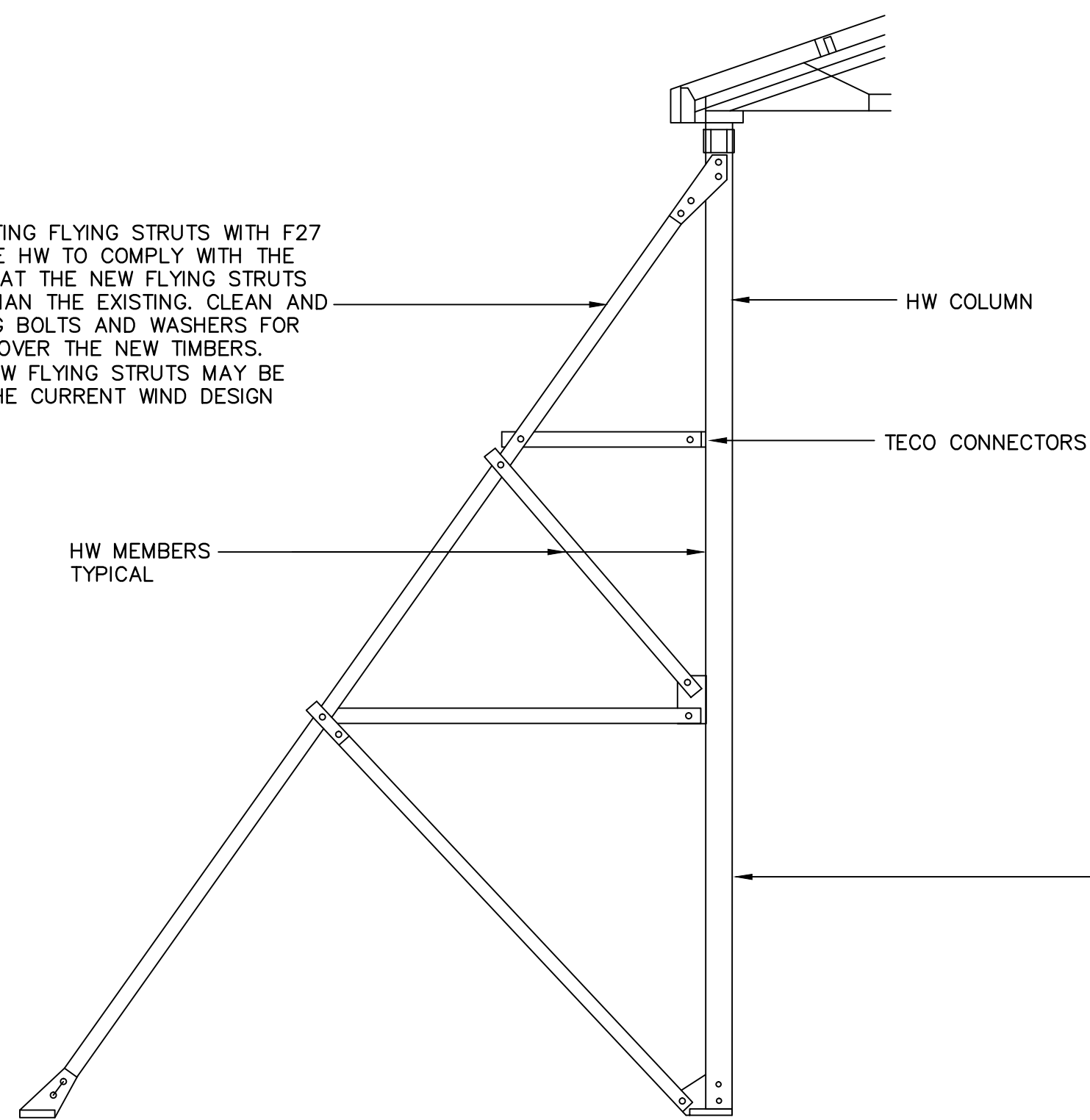
END VIEW

OUTSIDE VIEW

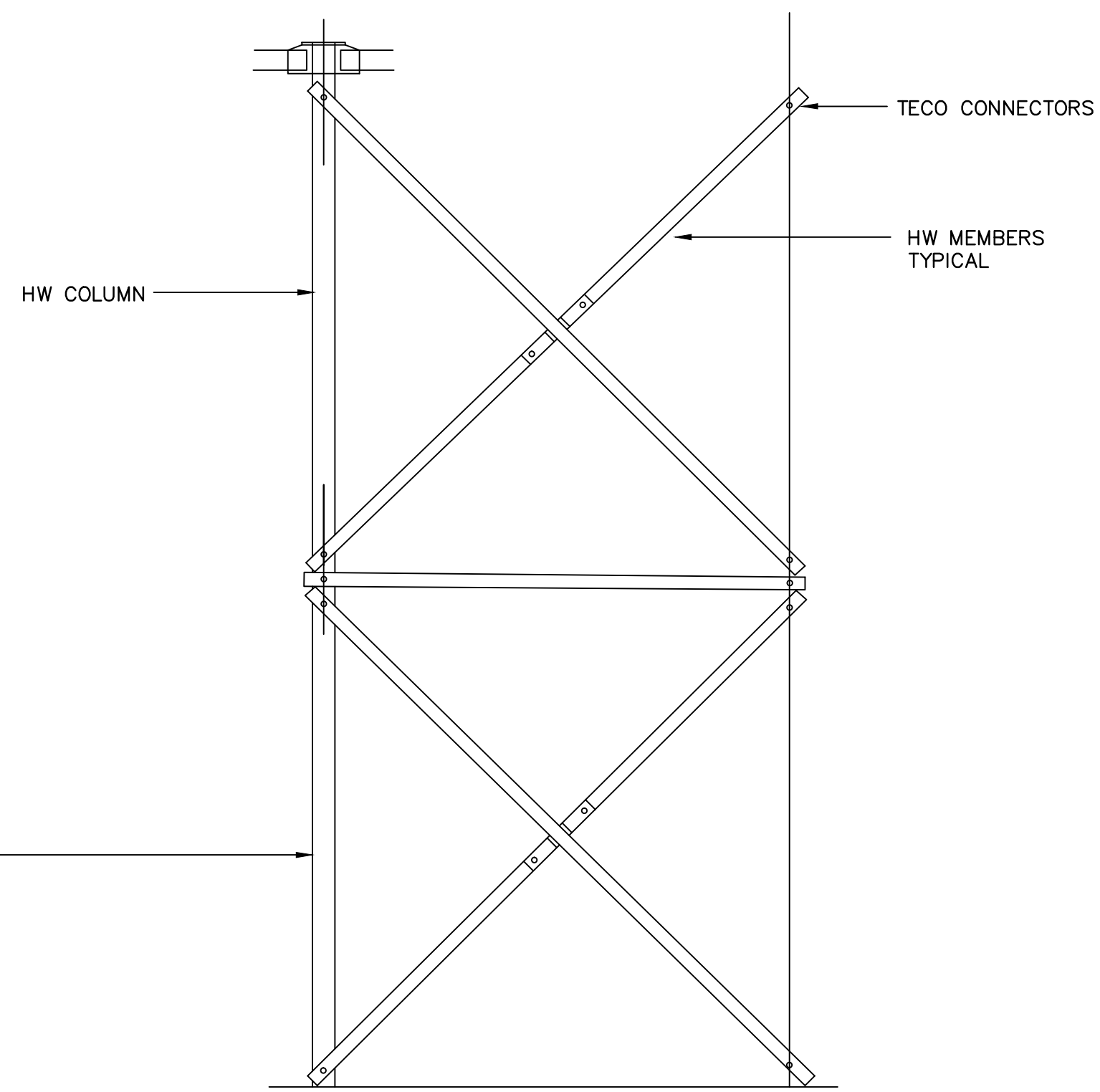
INSIDE VIEW

DOOR DOCK ELEVATIONS

REPLACE THE EXISTING FLYING STRUTS WITH F27 SEASONED DURABLE HW TO COMPLY WITH THE BCA, AND NOTE THAT THE NEW FLYING STRUTS MAY BE LARGER THAN THE EXISTING. CLEAN AND PAINT THE EXISTING BOLTS AND WASHERS FOR RE-USE AND CAP OVER THE NEW TIMBERS. NOTE THAT THE NEW FLYING STRUTS MAY BE LARGER TO SUIT THE CURRENT WIND DESIGN LOADINGS.



BRACING FRAME ELEVATION



END BAY BRACING FRAME ELEVATION

UNDO THE BOLTED CONNECTIONS AT THE TOPS AND THE BASES OF THESE FRAMES TO ALLOW FOR THEIR RELOCATION.

HERITAGE PERMIT DRAWING

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| No. | Date | Revision | By |

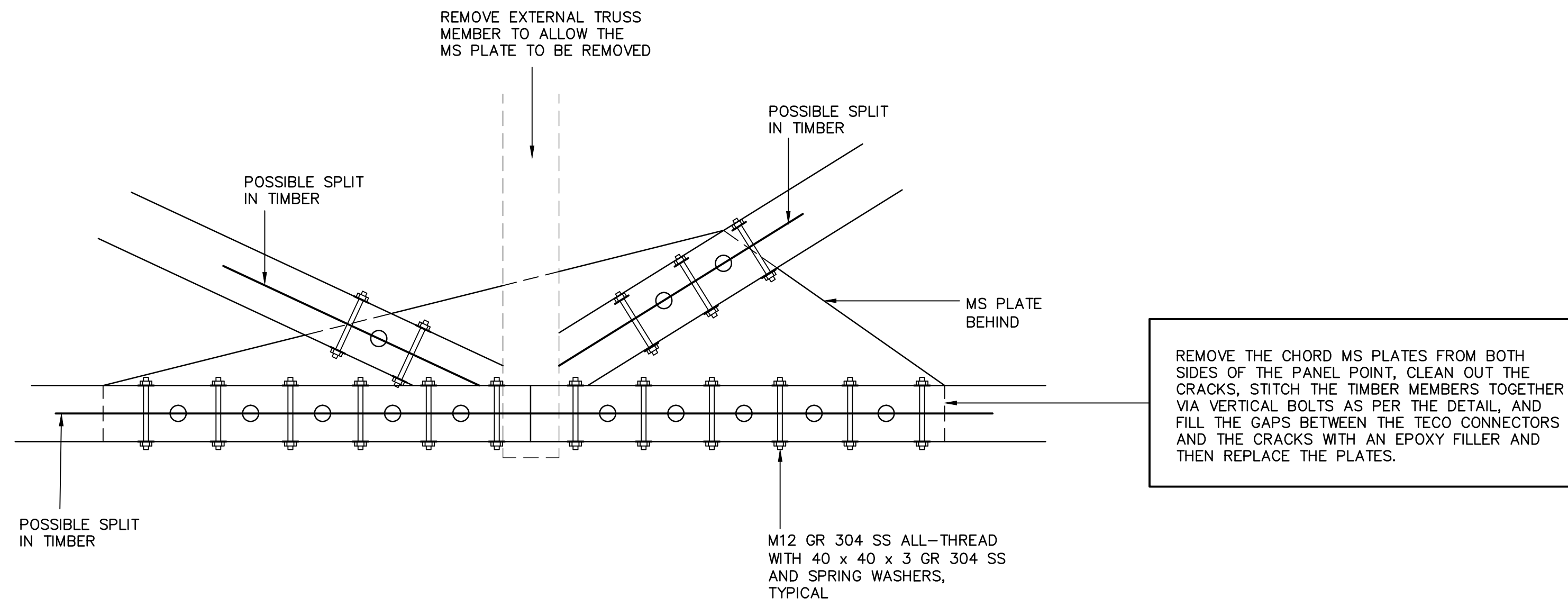
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Project
HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
HANGAR RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEE LONG ROAD
WERRIBEE

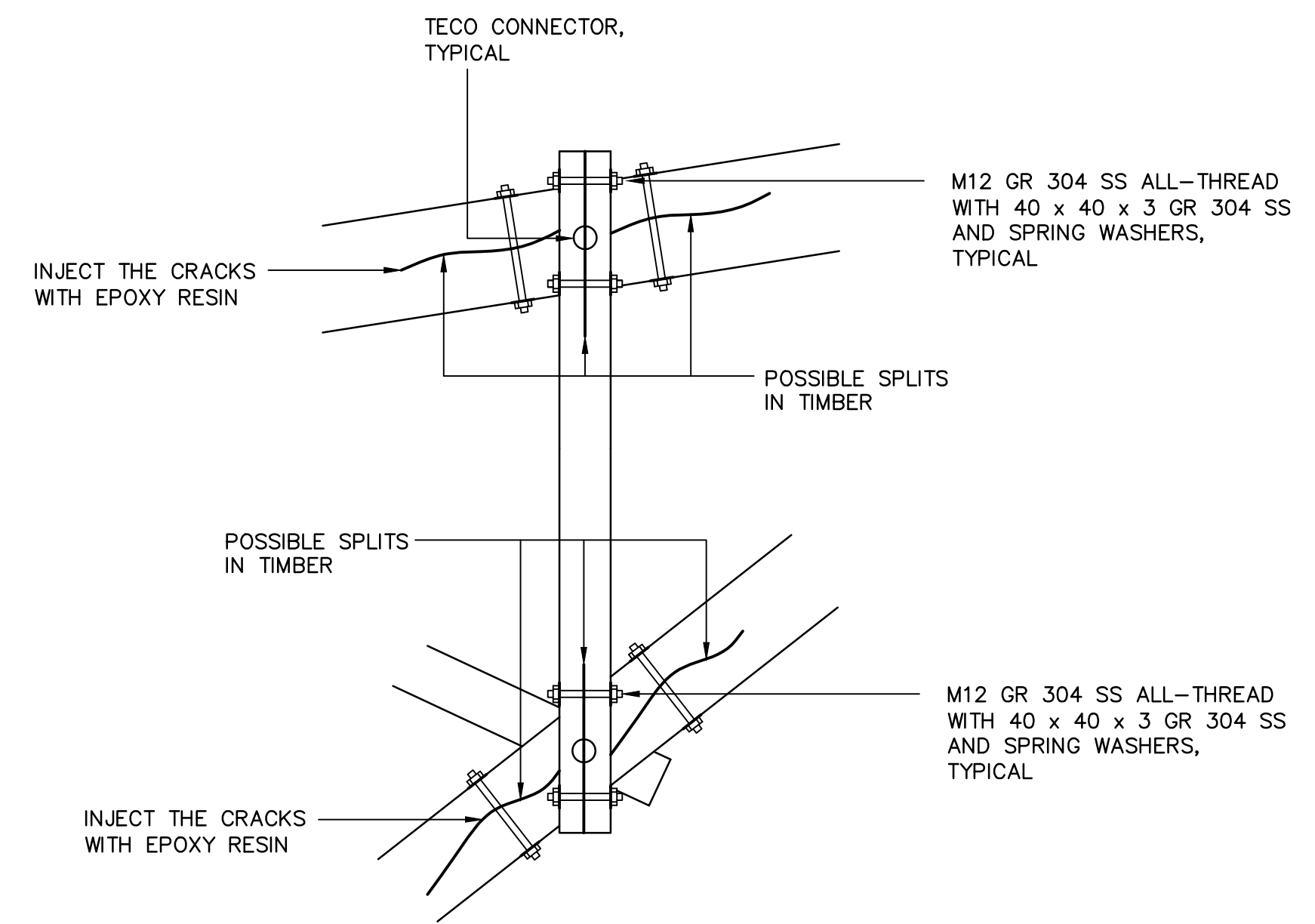
RBA
 Client
MELBOURNE WATER

Drawing Title
HANGAR 1 DETAILS

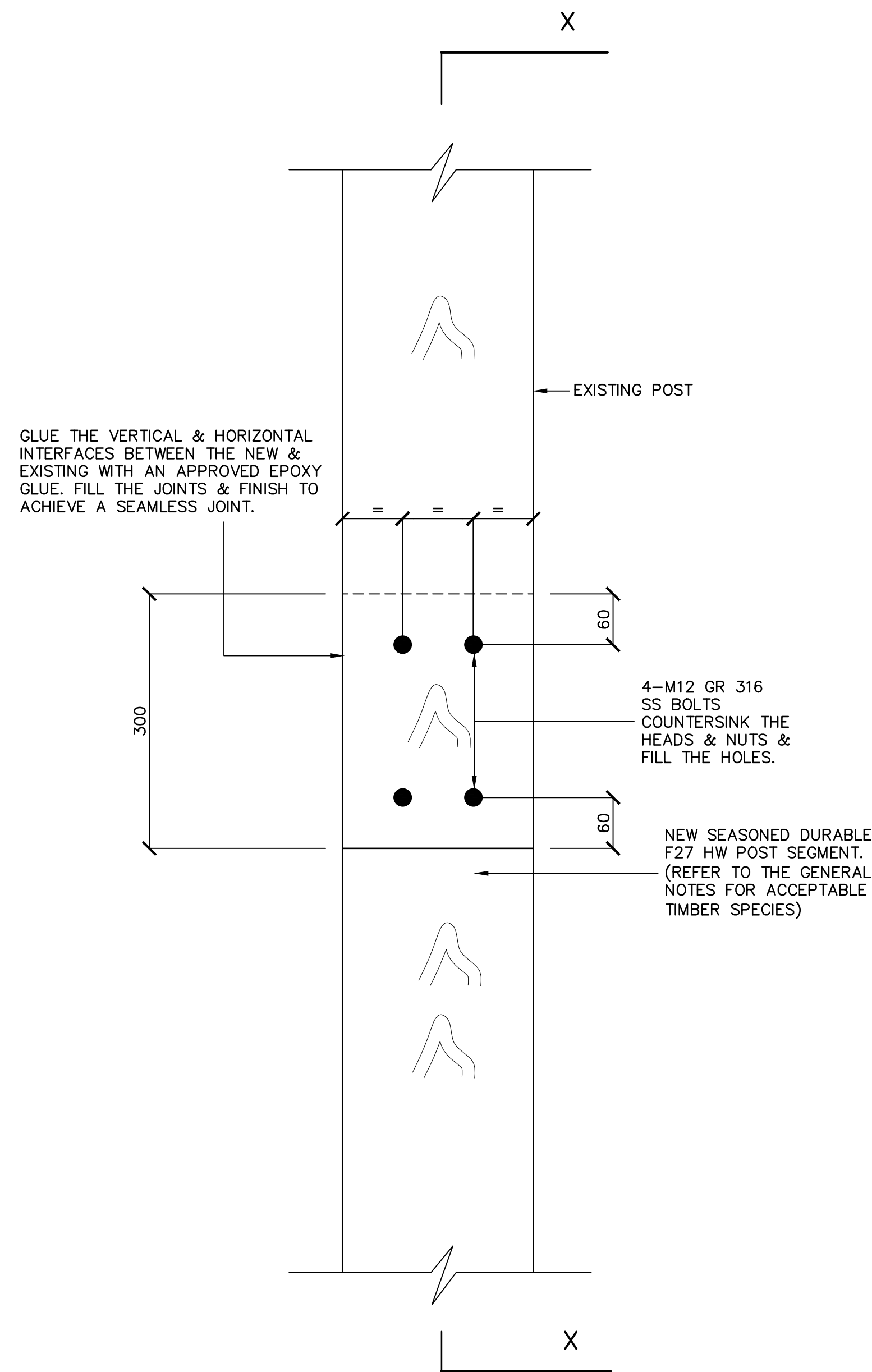
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| Project No. 3482 | Date FEB 2019 | Scale N.T.S. |
| Design MH | Drawn PWG | Sheet Size A1 |
| Project North ↑ | Drawing No. S6 | Revision A |



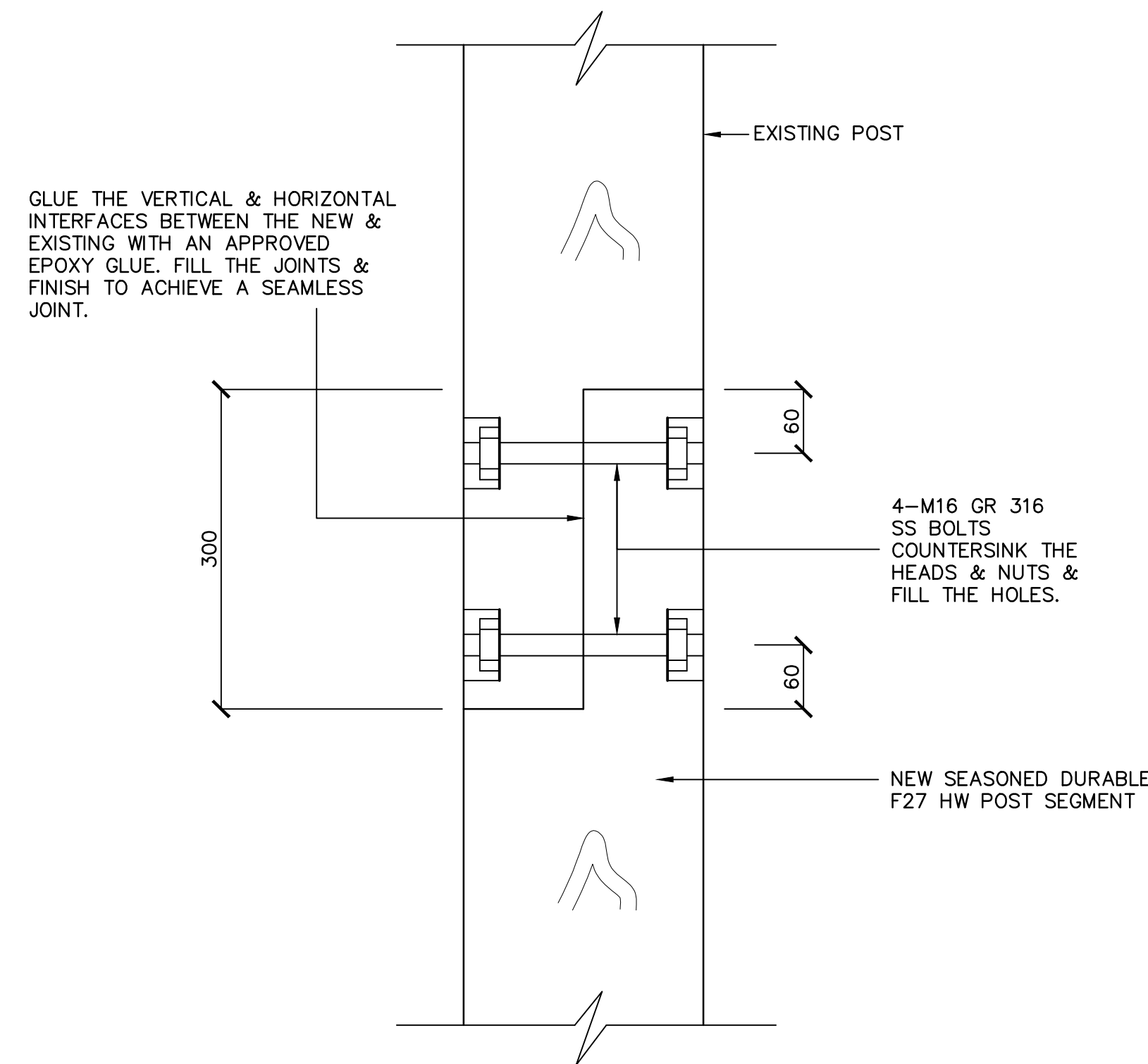
TYPICAL PRIMARY TRUSS JOINT REMEDIATION DETAIL



TYPICAL SECONDARY TRUSS JOINT REMEDIATION DETAIL



POST SPLICE DETAIL
N.T.S.



VIEW X-X
N.T.S.

NOTE THAT THIS DRAWING DOES NOT SHOW ALL OF THE STRUCTURAL MEMBERS AND TIMBER FRAMING

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| No. | Date | Revision | By |

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Project
**HANGAR 1 RELOCATION PROJECT
WERRIBEE SATELLITE AERODROME
GEELONG ROAD
WERRIBEE**

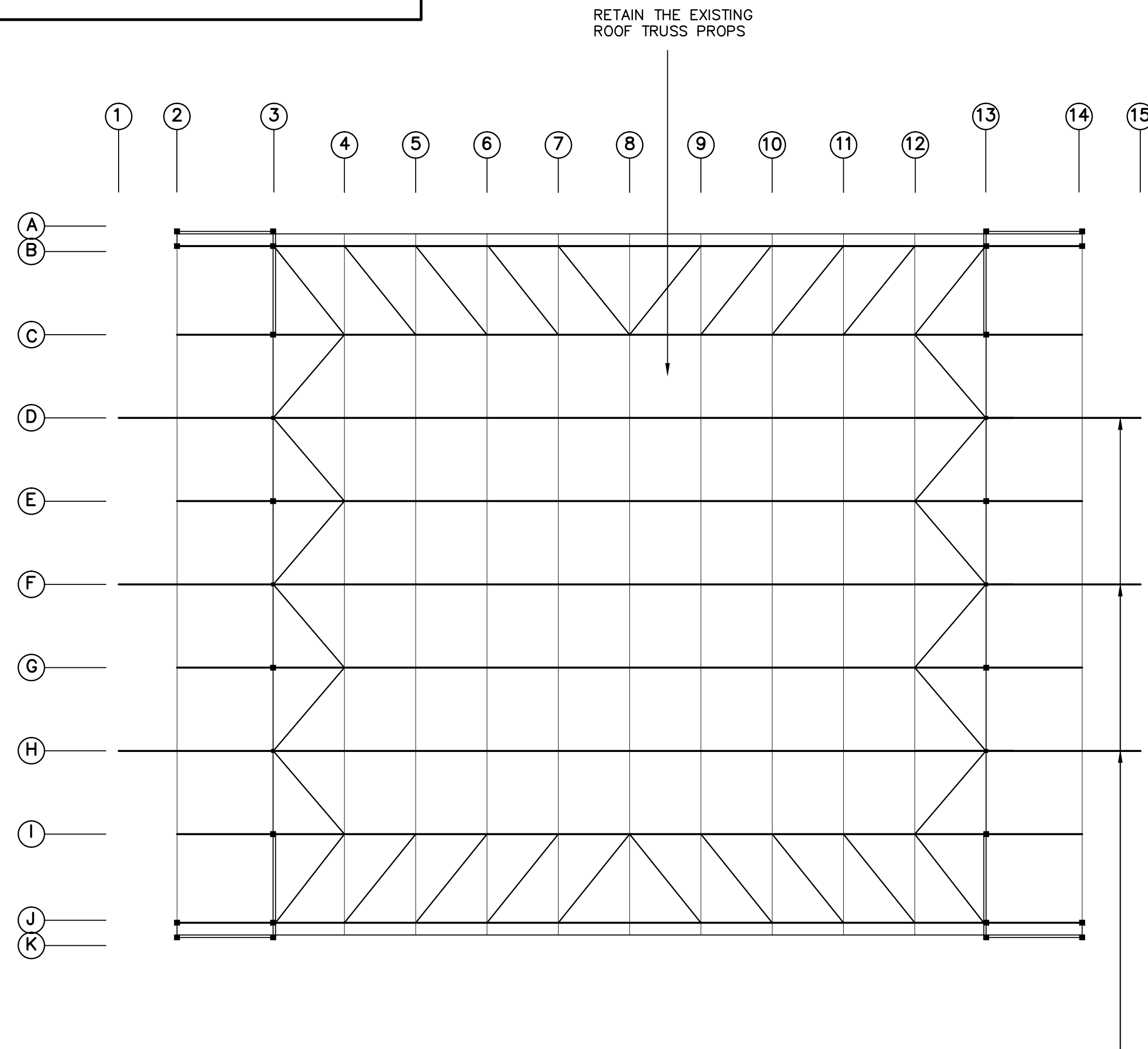
Architect
RBA

Client
MELBOURNE WATER

Drawing Title
HANGAR DETAILS

| | | |
|---------------------|-------------------|------------------|
| Project No. 3482 | Date FEB 2019 | Scale N.T.S. |
| Design MH | Drawn PWG | Sheet Size A1 |
| Project North | Drawing No. S7 | Revision A |

DO NOT OPEN OR LEAVE OPEN THE SOUTHERN OR NORTHERN SLIDING DOORS WHEN THE PREDICTED OR MEASURED WIND SPEEDS IN A GIVEN DAY EXCEEDS 55 KM/HR (15 M/S). THIS WIND SPEED IS BASED ON THE CURRENT OPERATIONAL PROCEDURE FOR HANGER 2



REPLACE THE EXISTING FLYING STRUTS WITH F17 SEASONED DURABLE HW TO MATCH THE EXISTING SIZES (2 OFF @ 145 x 70 AND ONE OFF @ 145 x 45). CLEAN AND PAINT THE EXISTING BOLTS AND WASHERS FOR RE-USE, AND CAP OVER THE TIMBER TO MATCH THE WESTERN FLYING STRUTS.

HANGER 2 – PRIMARY ROOF TRUSS BOTTOM CHORD LEVEL PLAN

HERITAGE PERMIT DRAWING

NOT TO BE USED FOR CONSTRUCTION OR COSTING PURPOSES

| | | | |
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Project
**HANGER 1 RELOCATION PROJECT
 WERRIBEE SATELLITE AERODROME
 GEELONG ROAD
 WERRIBEE**

Architect
RBA

Client
MELBOURNE WATER

Drawing Title
HANGER 2 ROOF PLAN

| | | |
|----------------------------|--------------------------|-------------------------|
| Project No. 3482 | Date FEB 2019 | Scale N.T.S. |
| Design MH | Drawn PWG | Sheet Size A1 |
| Project North ↑ | Drawing No. S8 | Revision A |