

6. DOME INVENTORY - PRINCIPAL TIMBER ELEMENTS DETAILS

6.6 H - Wall boarding

Timber element location on plan: -

- H - Wall boarding ■

Construction Description:

The wall boarding are a series of timber panels which sit upright and form the dome enclosure at lower level. The wall studs provide a framework for the wall boarding which are supported directly on the RCC slab. A lead flashing would have originally protected the base of the timber panels, however in more recent times, this was replaced by self adhesive lead tape flashing (Flashband).

The timber roof rolls (base level) are affixed on the wall boarding on the external side.

Condition:

While a significant part of the wall boarding was completely destroyed by the fire, charred timber panels were preserved in situ on the west, north and north east sides.

Samples taken:

One single panel of the wall boarding and a second sample showing connection between wall stud and ties (B) were salvaged and catalogued.

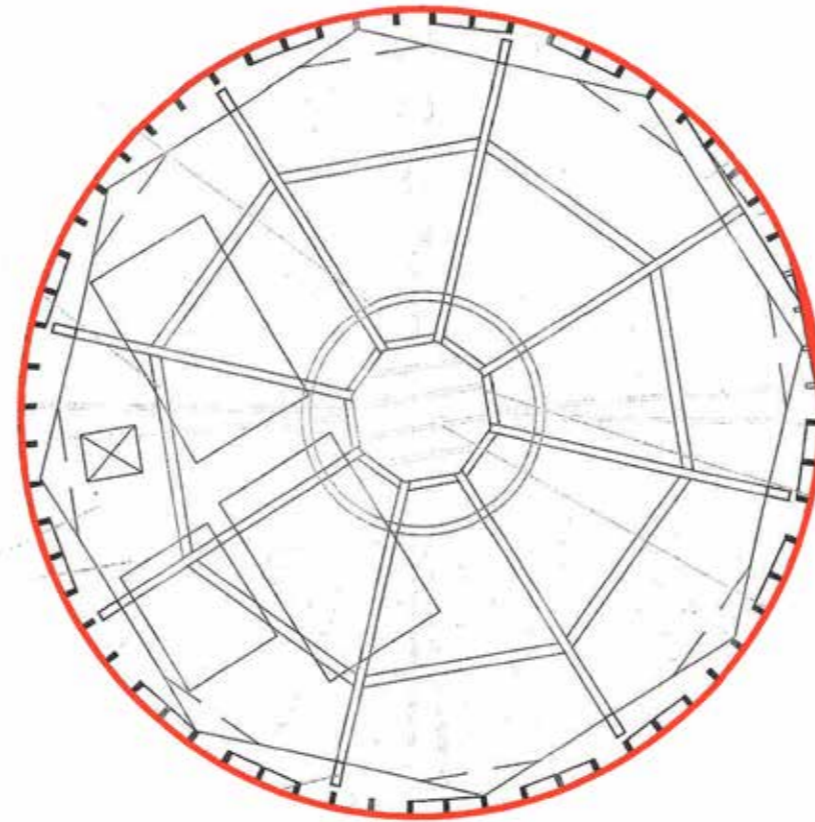


Figure 103: Wall boarding (H) in plan view (2019) © H&R (SLHA edit)



Figure 104: Wall boarding (H) in situ (interior view) (2020) © SLHA

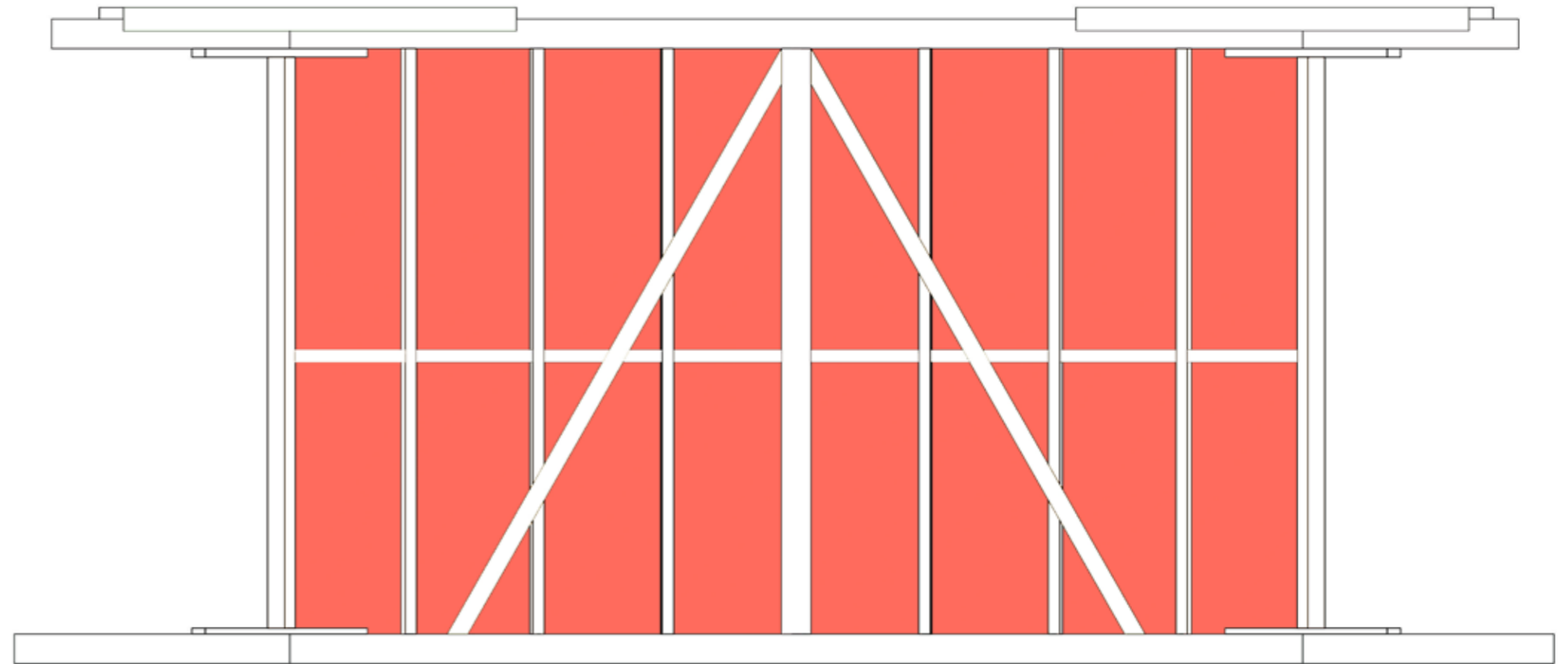


Figure 105: 1:20 post-fire measured survey - wall boarding (H) indicated in dome wall interior elevation (2020) © SLHA



Figure 106: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 107: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 108: Wall boarding (H) in situ (exterior view) (2020) © SLHA

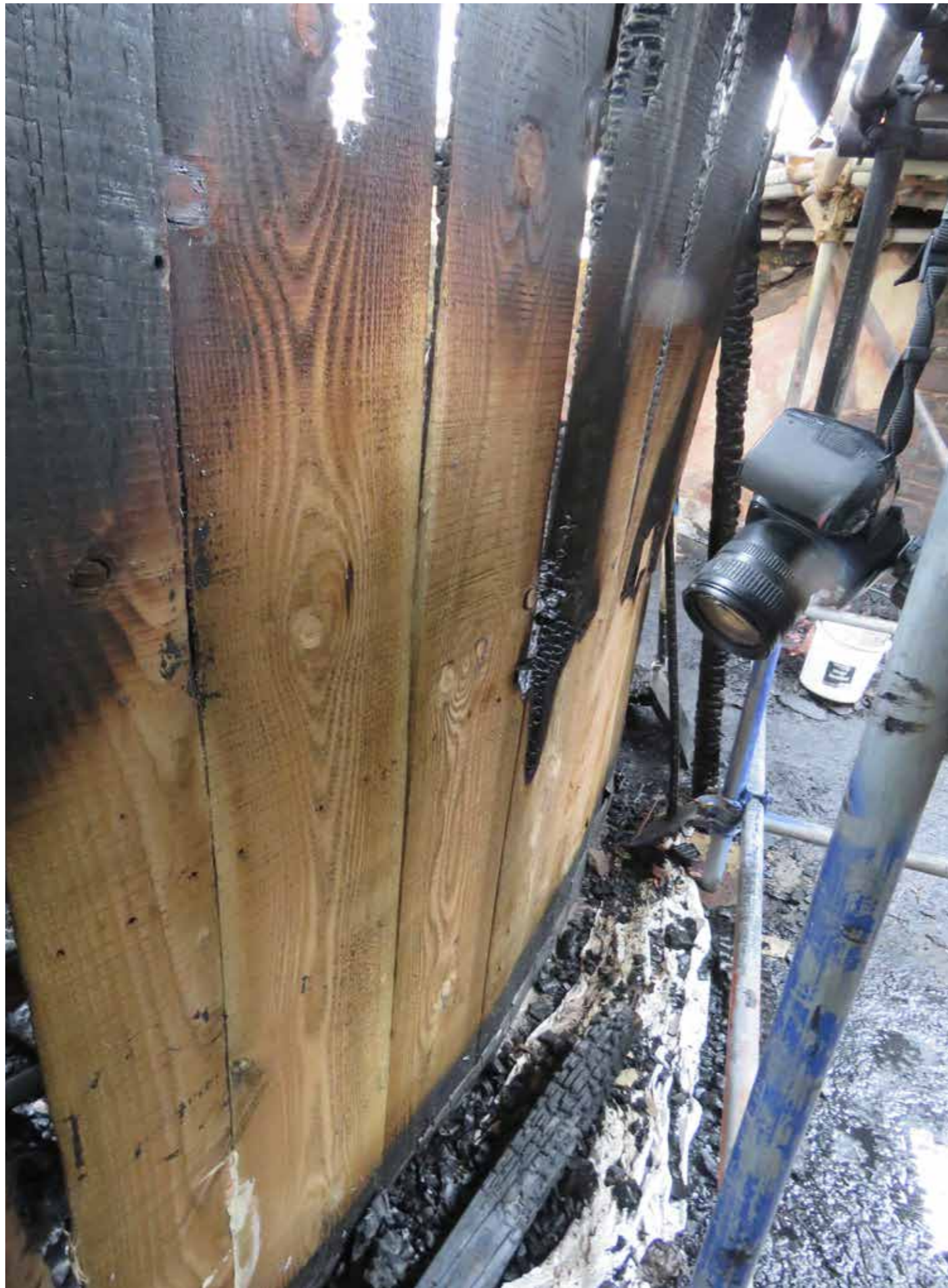


Figure 109: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 110: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 111: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 112: Wall boarding (H) on wall construction in situ (exterior view) (2020) © SLHA



Figure 113: Wall boarding (H) in situ (exterior view) (2020) © SLHA



Figure 114: Wall boarding (H) in situ (exterior view) (2020) © SLHA




Figure 115: Wall boarding (H) in situ (exterior view) (2020) © SLHA

6. DOME INVENTORY - PRINCIPAL TIMBER ELEMENTS DETAILS

6.7 I - Apex inner ring beam

Timber element location on plan: -

- I - Inner apex ring beam 

Timber Species:

European Redwood

Construction Description:

The inner apex ring beam is the highest element of the dome construction and consists of 8 wide pieces of timber that are joined together in the form of an octagon.

The timber trusses and 2 part timber ribs culminated at the inner apex ring beam.

Condition:

The inner apex ring beam was completely destroyed by fire and only a small fragment was discovered in the debris.

Samples taken:

Only one section of the inner apex ring beam was identified within the debris and has been salvaged and catalogued.

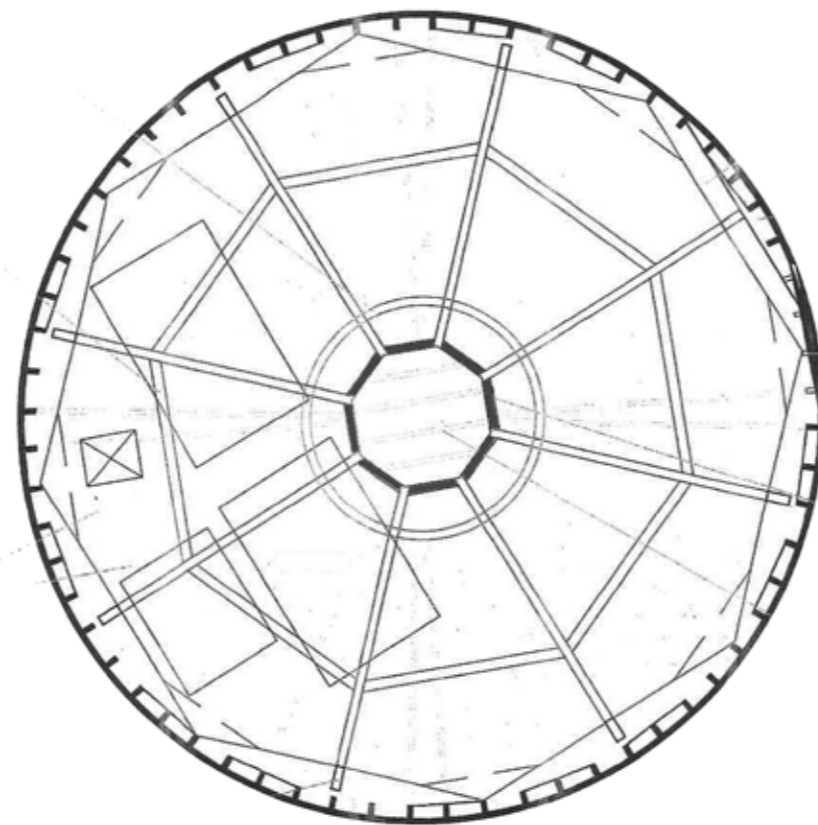


Figure 116: Inner apex ring beam (I) in plan view (2019) © H&R (SLHA edit)



Figure 117: Inner apex ring beam (I) in situ (2020) © SLHA



Figure 118: Inner apex ring beam (I) in situ (2020) © SLHA



Figure 119: Sample #16 - Inner apex ring beam (I) in situ (2020) © SLHA



Figure 120: Inner apex ring beam (I) in situ (2020) © SLHA



Figure 121: Inner apex ring beam (I) in situ (2020) © SLHA

6. DOME INVENTORY - PRINCIPAL TIMBER ELEMENTS DETAILS

6.8 L - Timber roof rolls

Timber element location on plan: -

- L - Timber roof rolls ■

Timber Species:

European Redwood

Construction Description:

The timber roof rolls are the external framework over the dome and wall boarding over which the copper sheets were fixed. 24 such rolls/ ribs formed part of the dome and the dome wall. Each roll is of a semicircular cross section and is curved to the profile of the dome. Each timber roof roll (dome) extends from the base level of the dome (upper rafter plate level) to the apex (inner apex ring beam) and was supported over the corresponding wall timber roll.

Condition:

The roof rolls of the dome were significantly damaged by the fire and some were found within the debris.

Samples taken:

One loose sample from the dome timber roof roll and one sample of the wall timber roll were salvaged and have been catalogued.

Timber roof rolls on extrados of dome: -

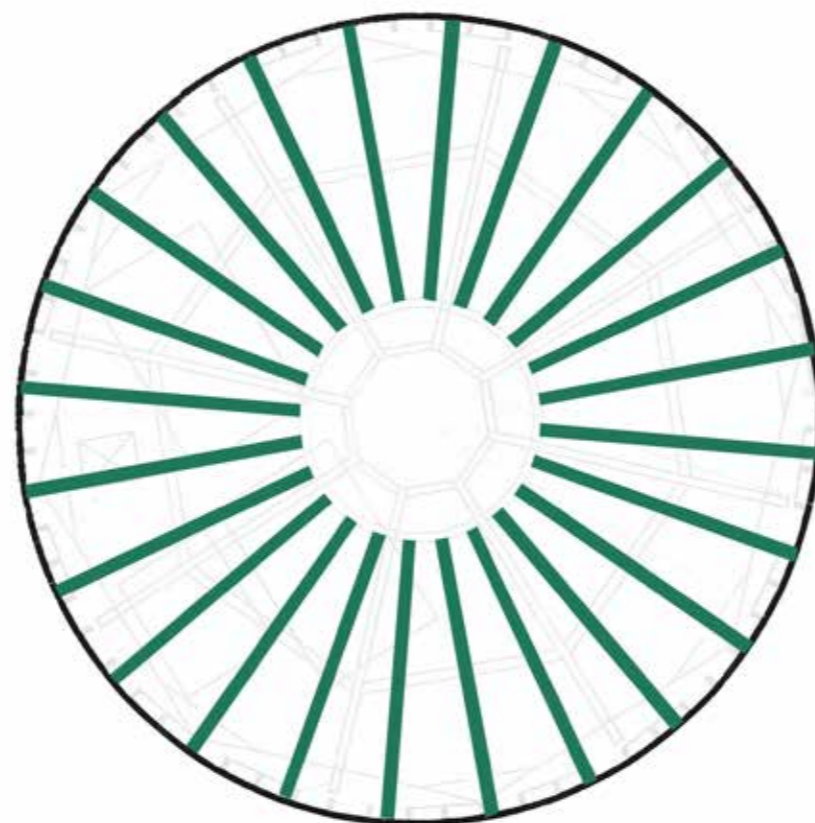


Figure 122: Timber roof rolls (L) in plan view (2019) © H&R (SLHA edit)

Timber roof rolls around perimeter ring of wall: -

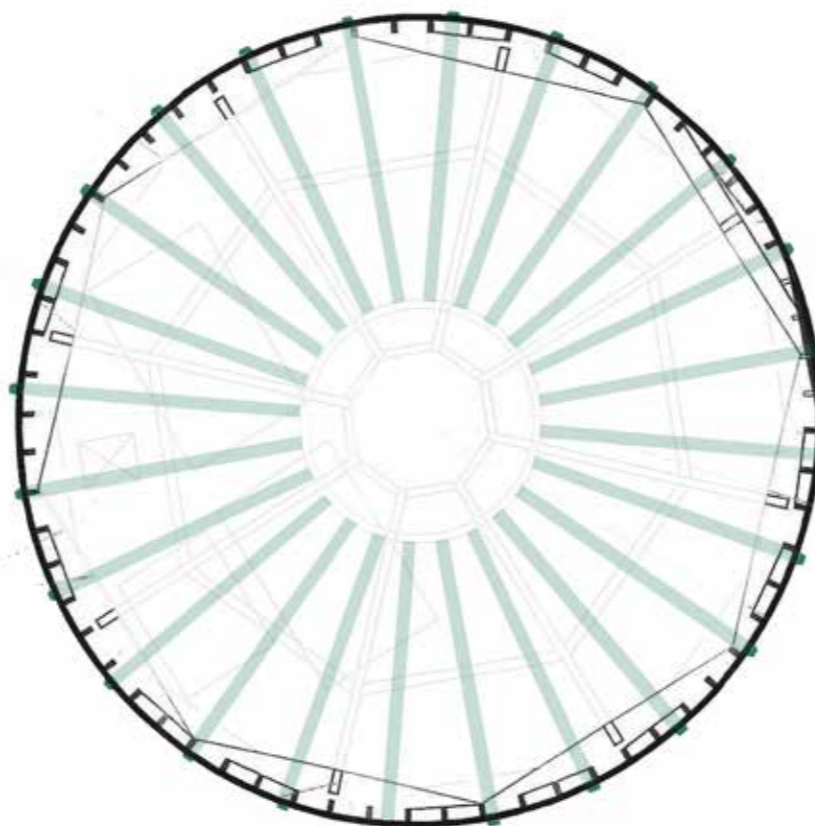


Figure 123: Timber roof rolls (L) at base level in plan view (2019) © H&R (SLHA edit)



Figure 124: Sample #17 - Timber roof rolls (L) (2020) © SLHA



Figure 125: Sample #18- Timber roof rolls (L) at base level with wall boarding (H) in situ (incorrect label during site survey) (2020) © SLHA



Figure 126: Timber roof rolls (L) in situ (2020) © SLHA



Figure 127: Timber roof rolls (L) in situ (2020) © SLHA



Figure 128: Timber roof rolls (L) at base level in situ (2020) © SLHA



Figure 129: Timber roof rolls (L) in situ (2020) © SLHA



Figure 130: Timber roof rolls (L) at base level in situ (2020) © SLHA



Figure 131: Timber roof rolls (L) at base level in situ (incorrect label during site survey) (2020) © SLHA



Figure 132: Sample #19 - Timber roof rolls (L) (2020) © SLHA



Figure 133: Timber roof rolls (L) in situ (2020) © SLHA



Figure 134: Sample #19 - Timber roof rolls (L) (2020) © SLHA

6. DOME INVENTORY - PRINCIPAL TIMBER ELEMENTS DETAILS

6.9 M - Horizontal Rafter ties

Timber element location on plan: -

M- Horizontal rafter wall ties ■

Timber Species:

European Redwood

Construction Description:

The horizontal rafter wall ties are located at the junctions of the upper rafter plates (corners of the octagon). They are connected to the upper rafter plate by lap joints. There are 8 horizontal rafter wall ties (one at each corner) and there is evidence of modern strengthening inserts used to connect them to the upper rafter plates.

Condition:

These elements have suffered similar damage as the upper rafter plate.

Samples taken:

One sample of this element showing the junction between the upper rafter plates (D) was salvaged and has been catalogued.

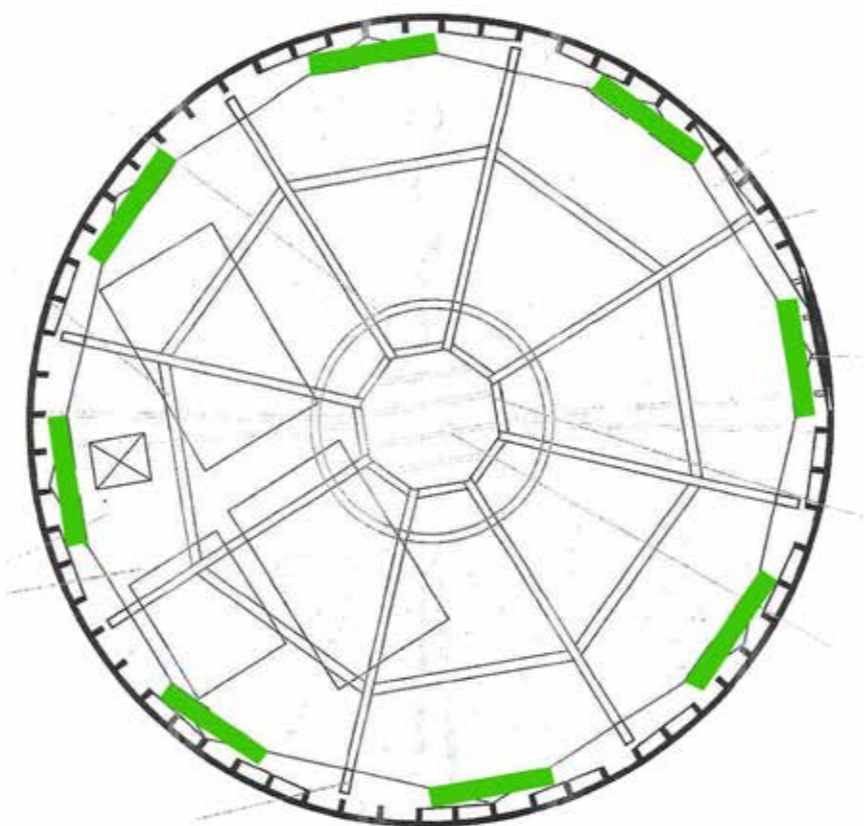


Figure 135: Horizontal rafter wall ties (M) in plan view (2019) © H&R (SLHA edit)



Figure 136: Horizontal rafter wall ties (M)s in situ (2020) © SLHA

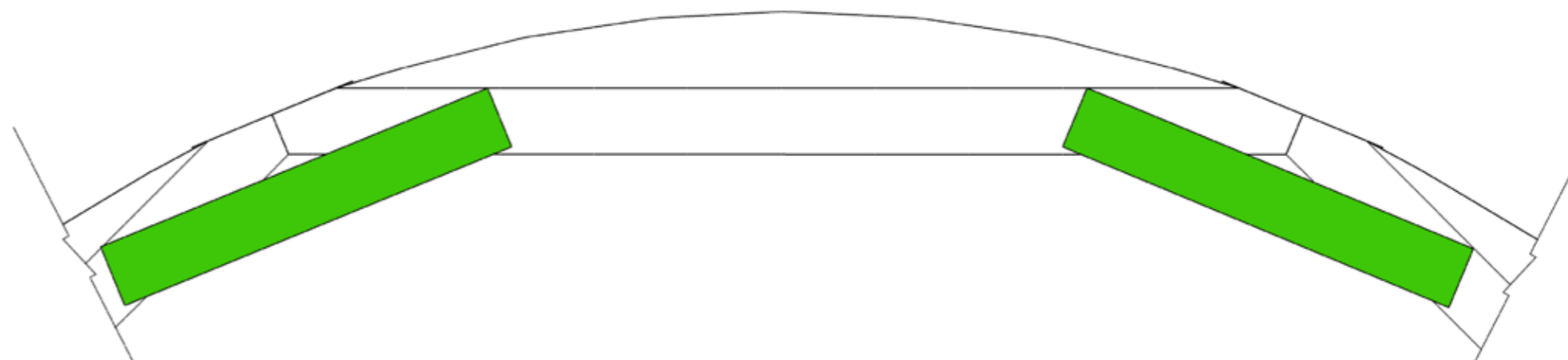


Figure 137: 1:20 post-fire measured survey - Horizontal rafter wall ties (M) in detail plan view (2020) © SLHA

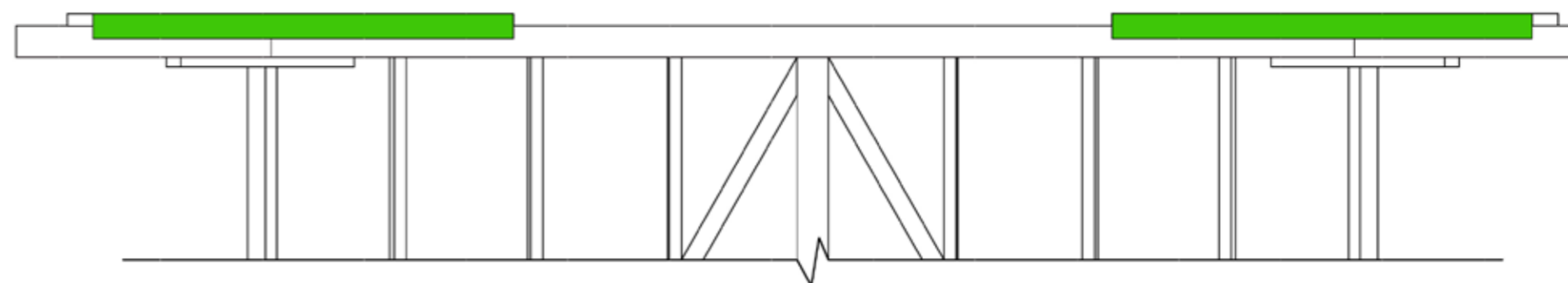


Figure 138: 1:20 post-fire measured survey - Horizontal rafter wall ties (M) indicated in dome wall interior elevation (2020) © SLHA



Figure 139: Sample #20 - Horizontal rafter wall ties (M) with upper rafter plate (E) - sample taken (2020) © SLHA



Figure 140: Horizontal rafter wall ties (M) with upper rafter plates (E) in situ (2020) © SLHA



Figure 141: Sample #20 - Horizontal rafter wall ties (M) with upper after plate (E) - sample taken (2020) © SLHA



Figure 142: Horizontal rafter wall ties (M) east end condition (2020) © SLHA



Figure 143: Horizontal rafter wall ties (M) with upper rafter plate (E) in situ. Note evidence of modern strengthening inserts used to connect them to the upper rafter plates. (2020) © SLHA



Figure 144: Horizontal rafter wall ties (M) with upper rafter plate (E) in situ (2020) © SLHA



Figure 145: Horizontal rafter wall ties (M) with upper rafter plate (E) in situ (2020) © SLHA



Figure 146: Horizontal rafter wall ties (M) with upper rafter plate (E) in situ (2020) © SLHA




Figure 147: Horizontal rafter wall ties (M) with upper rafter plate (E) and wall studs (B) in situ (2020) © SLHA





6. DOME INVENTORY - PRINCIPAL TIMBER ELEMENTS DETAILS

6.10 T- Truss

Timber element location on plan: -

- T - Truss 

Truss elements location on elevation: -

- T1 - Tie beam 
- T2 - King post 
- T3 - Principal Rafters 
- T4 - Metal braces 

Timber Species:

European Redwood

Construction Description:

There are 8 king post trusses which form the principal structural system of the dome. The truss comprises of:-

- horizontal tie beam (T1) connected to the

- principal rafter (T3) and

- king post (T2) using

- bolted metal braces (T4) at the junctions.

Further bracing has been applied to connect the principal rafter to the tie beam by a bolted arrowhead metal braces (T4). These braces metal braces are made of iron and they are intended to be tested, cleaned and re-used (if viable) for proposed reinstatement.

Each truss was pitched at an angle and spaced equally around the circular perimeter in order to create a spherical shape of the dome. Concentric purlins (N) running perpendicular to and spanning the king post and ribs add to the structural stability of the dome. Junctions of the truss with the upper rafter plate and inner apex ring beam are achieved through bird mouth joints.

Condition:

Though trusses did not disassemble during the fire, they collapsed and were discovered as whole elements.

Samples taken:

One whole truss was salvaged and has been catalogued. All bolted arrowhead braces have been salvaged and are proposed to be reused during the dome's reinstatement.

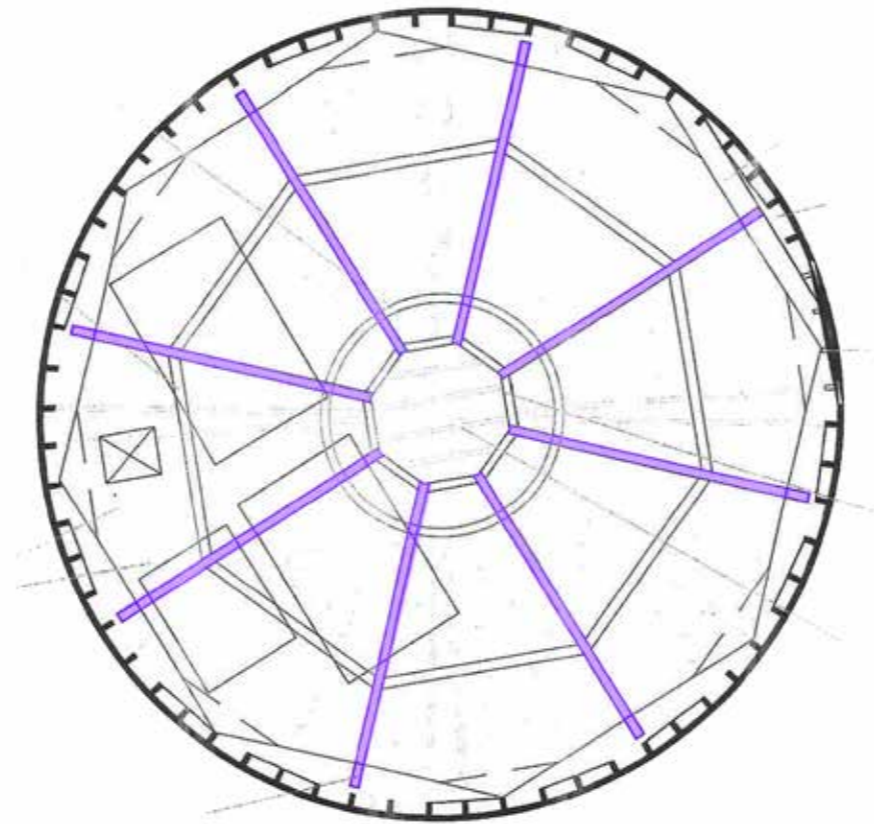


Figure 148: Trusses (T) in plan view (2019) © H&R (SLHA edit)



Figure 149: Trusses (T) found in debris (2020) © SLHA

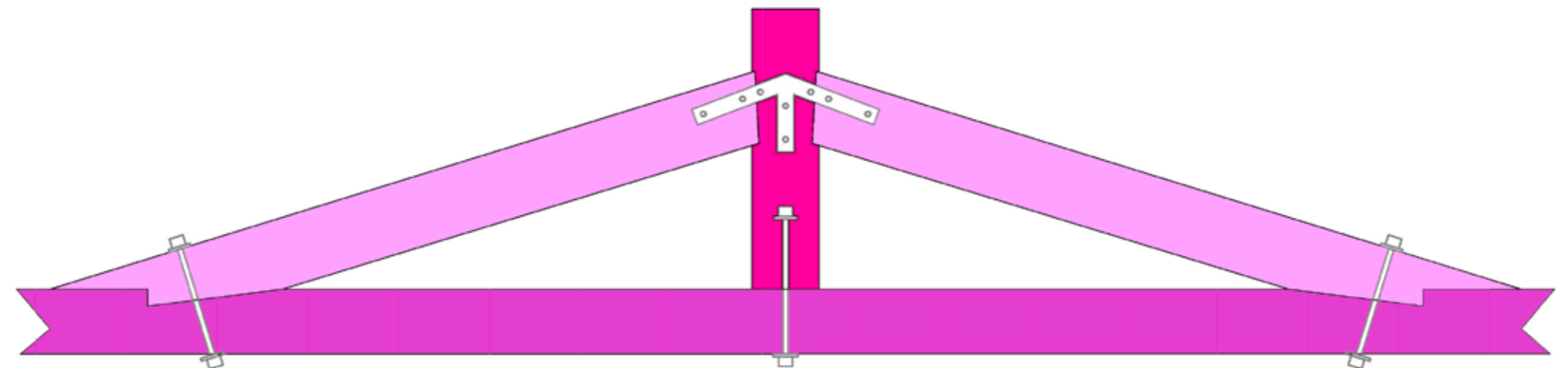


Figure 150: 1:20 post -fire measured survey - Truss (T) elevation with key elements include the Tie beam (T1), King Post (T2), Principle Rafters (T3) and Bolted metal braces (T4) (2020) © SLHA



Figure 151: Sample #21 - Trusses (T) found in debris (2020) © SLHA



Figure 152: Trusses (T) found in debris (2020) © SLHA



Figure 153: Trusses (T) found in debris (2020) © SLHA



Figure 154: Sample #22 - Bolted metal brace (T4) (2020) © SLHA



Figure 155: Bolted metal brace (T4) in situ (2020) © SLHA



Figure 156: Bolted metal brace (T4) connecting king post (T2) to tie beam (T1) in situ (2020) © SLHA



Figure 157: Sample #23 - Bolted arrowhead metal brace (T4) (2020) © SLHA



Figure 159: Sample #25 - Bolted arrowhead metal brace (T4) connecting king post (T2) to principal rafters (T3) sample taken (2020) © SLHA



Figure 158: Sample #24 - Bolted metal brace (T4) connecting tie beam (T1) to principal rafters (T3) sample taken (2020) © SLHA



Figure 160: Sample #26 - Bolted metal brace (T4) connecting king post (T2) to tie beam (T1) in situ (2020) © SLHA