

INSPECTION / ASSESSMENT REPORT

‘STABLES’ 33 ISABELLA STREET, WINGHAM, TAREE.



10.1.2011.

Re: Inspection of the fire damaged ‘charred structure’ - Stables Report and assessment on its condition in relation to the likelihood of the Structure being a danger to the public.

Dear Sir,

Further to your brief, I attended the site of the Wingham Hotel Stables 33 Isabella Street Wingham. NSW 2429, adjacent to the recently fire destroyed Wingham Hotel on Thursday 6.1.2011.

INTRODUCTION.

A visual inspection of the Structure was requested in order to assess the general condition of the Structure with respect to 'charring' fire damage sustained from the adjacent Wingham Hotel fire.

It must be pointed out that the assessment of charring of timber is dependent on numerous factors, such as wood species (density, permeability and composition), moisture content and direction of heat transfer (parallel or perpendicular to the grain) compression, tension and shear. Only some of these factors can be considered in a visual assessment

Methodology: NDT. Visual Report.

Weather: Heavy showers / wet / overcast conditions

Access: Restricted

DESCRIPTION OF PROPERTY.

The stables are adjacent to the Wingham Hotel. The structure is constructed of hardwood poles embedded in the ground with hardwood perimeter beams, Douglass Fir Trusses and Douglass Fir Fascias. It has galvanized metal corrugated roof sheeting with quad gutters and is approximately 32metres long x 15metres wide and approximately 5 metres high to the underside of the bottom chords of the trusses. The structure incorporates large clear spans with a small timber weatherboard garage (storage area / extension) incorporated into the Western corner of the Stables.

I understand that,

1. The adjacent Hotel was destroyed by fire approximately 6 months previously
2. It is privately owned
3. The stables were built about 1900
4. Local hardwood timber was used for the poles and beams
5. Imported prefabricated trusses were used
6. The Stables had an important Historical Association complimenting the Wingham Hotel.

7. Partial Remedial works were carried out in 1998, with replacement of a number of poles with H1 rating, to bring the structure to a reasonable standard allowing limited use, however not realizing full conservation.

General.

The whole of the site (incorporating and adjacent to the detritus from the fire-destroyed Wingham Hotel) is contained by barrier fencing. General access was limited and restricted due to ACM materials being present. No general access was available to the perimeter areas.

Therefore the inspection was restricted to internal areas of the Stables as the Southern side perimeter was inaccessible, garage storage area was inaccessible and there are timber gable slats to the Western end.

The Stables are aligned North and comprise 10 open bays of approximately 3.5mtrs each, standing via 22 main varying 350mm diameter earth-embedded hardwood poles. It has timber trusses, scarfed repetition jointed construction, bolted connections and a galvanized corrugated metal roof; most of the fabric is in poor condition. There is an enclosed garage / storage area mostly within the line of the Stables, but does not appear to be of great architectural interest or antiquity. Nonetheless it has some merit from being within the cartilage of the Stables and has a place in the evolution of the Stables, presumably its later use.

Note: Reference was made to Pole numbering drawing of existing posts, Plan drawing No B192 dated July 1995 from Bill Jordan & Associations Pty. Ltd.

The fire impacted the South side of Pole number 21, bay three looking West, the truss end P21/ P4 and the connecting beam between Pole number 21 and Pole 22, including the fascia in this area. There was extensive fire damage to the protruding Southern and Western side external horizontal weather boards of the storage / garage structure, with minor internal fire evidence to the underside of the roof sheeting, battens, electrical wiring and appurtenances in this area.

Fire Observations.

1. Charring was present midway to upper section of Pole 21, Western face. Not knowing the original dimensions of Pole 21, dimensional changes were unable to be confirmed
2. Connection bolting to the cross beam supporting truss P21/P4 were considerably loose (this joint connection area is where the fire was most concentrated and some cross section reduction was evident in this member)
3. Extensive charring and section loss was evident to the bottom chord end of truss P21
4. Extensive 'charring' evident to the middle section of the cross beam P21-P22, no real section loss evident

5. Significant 'charring damage' to the fascia board P21-P22 and evidence of section loss
6. Significant 'charring' to weatherboards on the Western sides of the garage / storage area

There appeared no real distress or deadload deflections as a result of elevated temperatures to any of these members and connections to Pole 21 also no indication of continued smoldering or continued water applied. The amount of charring, depth of charring and location of charring to P21 indicates not a long exposure to high intense temperatures (chemical reactions). There is no evidence of damage to bolted connections, due to elevated temperatures, however, charring depths to cross member section P21-P22 and to the fascia member P21-P22 displayed more elevated temperature exposure.

Although timber is classified as a combustible material, some species (hardwood with high densities, say 650 –800 kg/m³) have been recognized as performing very well in fire. These timbers have good inherent fire resistance because a 'char' layer is formed that retards the heat penetration.

The fire performance of timber is dependent on the charring rate and the loss in strength and modulus of elasticity. Strength and stiffness properties depend on temperature and moisture content, large solid timber sections perform well in fires, even better than steel.

It is possible to design timber to resist collapse for a given period of time. For instance, the rate of charring and hence the rate of reduction of load carrying capacity due to section loss of cross section can be calculated. With Pole 21, calculation cannot be done due to not knowing the original design criteria although Pole 21 being of large member size, has displayed good resistance to the fire.

In heavy timber (mill type) constructional bearing walls and bearing portions walls are non-combustible and could have a minimum fire resistance rating of up to 2 hours. Columns and beams, usually heavy structural members, are unprotected wood with large cross sectional areas. Pole 21 is approximately 350mm diameter and would be considered to be well over the minimum dimension for a structural support member.

Conclusion.

- It is my opinion that the members inspected and affected by the fire, do not display at this point, a likelihood of being structurally unsafe, though minor remedial repair works in relation to Pole 21 joint connection could be undertaken to ensure a sound connection with the cross beam and truss.
- It should be considered that the 'Stables' are beyond 'reasonable repairs'. Major works are now required as the Stables are not well preserved.

- There was no noticeable visual termite activity.

Not being fully conversant with the history of the ‘Stables’ one could consider The Wingham Stables ‘Pole Timber’ construction and the use of substantial sized ‘milled’ poles, an example of Rural construction with the ‘Poles’ being of Heritage Significance. (However the trusses appear questionable as far as ‘significance’ in design and originality). I understand that the trusses were introduced from another area and are not an example of fabrication of ‘local milled hardwoods’. Being of Oregon, they could be of North American, New Zealand or to a limited extent Australian origin and their design appears to be a modified version of a Pratt and Howe truss design. Further investigation of the configuration and design of the compression / tension members would need to be undertaken but it appears the Stables are largely unaltered and the carpentry appears typical for a structure of the period and locality.

Recommendations.

As a result of being exposed to the fire;

1. Cross member P21-P22 replacement is required within a short time
2. P21 Truss member end remedial works required in the short term
3. P21-P22 fascia board requires replacement in the short term
4. P21 connection bolting re-tensioning and replacement is required, short term. Further investigation should be carried out to determine the effects that the bolts had on the fire temperature in the wood and on the connection and to determine the bolt strength and load carrying capacities. There did not appear to be any conductivity of heat through the bolts as the large washers used would have protected the timber to an extent
5. There was significant ‘charring’ to weatherboards on the Western sides of the garage / storage area. The cladding and framing do not appear to be impacting on the structural integrity and safety of the Stables. However a more intrusive investigation of the construction needs to be carried out before partial or complete removal (these works do not really ‘tell a story’). If removal is to occur a photographic record should be undertaken and sketches made of both sides of the boards.
6. Truss P14-P11 is under threat of collapse. The bottom chord is significantly deteriorated and tension and compression members have failed or are failing
7. A number of structural defects and general deterioration of members was visually noted.

Further recommendations and suggestions;

8. Significant section decay was noted to the back and inside of the connection of the cross beam to Pole 21. Further investigation is required of the seated bolted connection at the top of Pole 21

9. From what was observed (from ground observation) of the Wingham Stables overall structure, there is significant immediate Remedial Structural works required.
10. A more detailed structural survey would be prudent of all members and components. Extensive longitudinal splitting and decay was noticed in the bottom chords of the trusses and pole structural members. This survey would identify significant defects and signs of deterioration and link this to their true causes (e.g. deflections etc that may well be present due to the age of the structure and characteristic of the Stables)
11. Confirm past proposed Remedial works carried out and pole replacement
12. Confirm timber species, densities, fire resistance, durability ratings and classifications
13. Confirm the poles in situ condition so their remaining service life can be evaluated
14. Complete structural evaluation and analysis of the trusses to be carried out asap, to better gain an understanding of 'wind actions' on the structure
15. Full Remedial works are required to all trusses after the above analysis is performed. Strength and loading requirements need to be confirmed
16. All seated bolted connections at the tops of the poles for lateral stability is required to be checked
17. Advanced truss and pole top connection decay requires further investigation
18. Full structural analysis of the 'structure' needs to be carried out to determine the overall structural integrity and stress levels of members
19. Advanced current and past decay mechanisms are at work, and though sounding was carried out to number of posts at ground level, it would be prudent to further investigate and test the soundness of all posts
20. In-ground embedment of the posts needs to be investigated and condition testing done. There is evidence of some movement and resistance to horizontal and uplift-forces which need to be confirmed. (Most of the poles have considerable evidence of deterioration and decay mechanisms such as moisture, fungi and soil factors at their most highly stressed level i.e. ground level)
21. A full roof member, fixings and condition assessment needs to be done; the roof appears to be in an advanced state of deterioration
22. A comprehensive formal investigation and assessment is required which will enable the Heritage significance of the pole construction to be established. The roof trusses do not appear significant although they could 'tell a story.' Serious consideration of alternative means of strengthening all members and its effect on the preservation of the fabric would be required. (refer Burra Charter)

General Comment

If Remedial works are to be carried out, very experienced and qualified Structural Remedial Professional Companies and Management should be engaged. Apart from the Heritage principle considerations, there would be significant 'risk factors' to be taken

into account, as this type of work is not for the unqualified or volunteers. An extremely detailed technical specification and brief would have to be developed and other Professional Consultancies would have to be involved e.g.

1. CPEng Structural Engineer
2. CPEng Civil Engineer
3. CPEng Geotechnical Engineer
4. Practicing Remedial Structural / Civil / Materials Engineer
5. Hydraulics Consultant
6. Structural Heritage Consultant
7. Heritage Architect (as proposed remedial works would impact greatly on Conservation Principles)
8. Remedial /Structural / Heritage Project Manager
9. Environmental / Hazardous Materials Consultant (site envelope clearances required)

Reference Photo's.

Photo 1.



Photo 2.

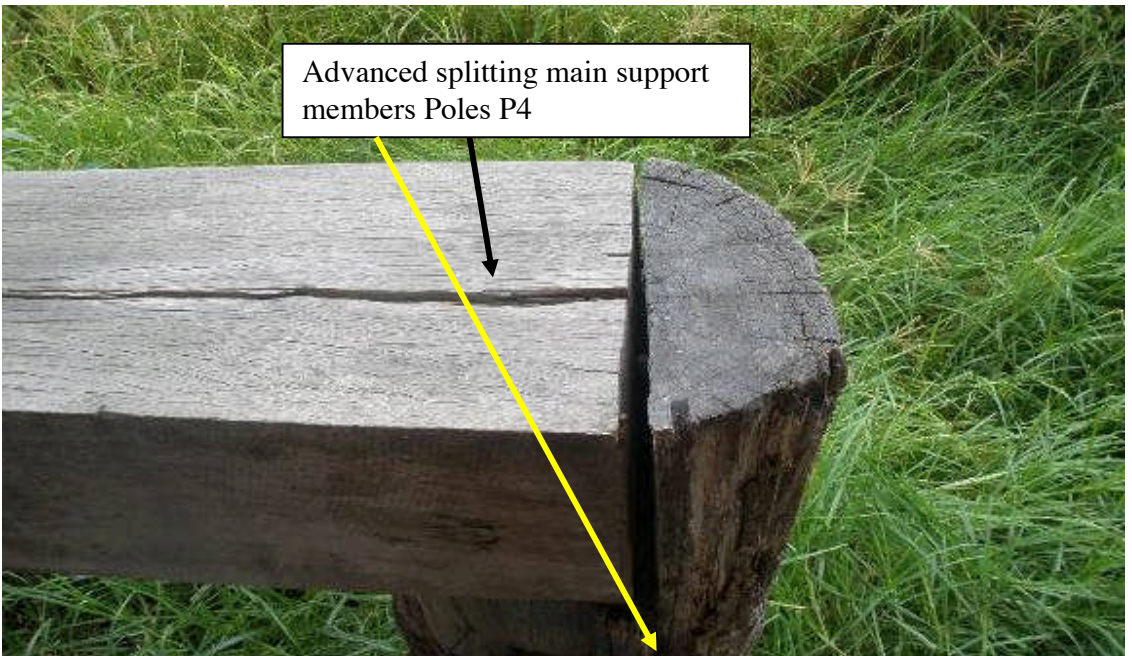


Photo 3.



Photo 4

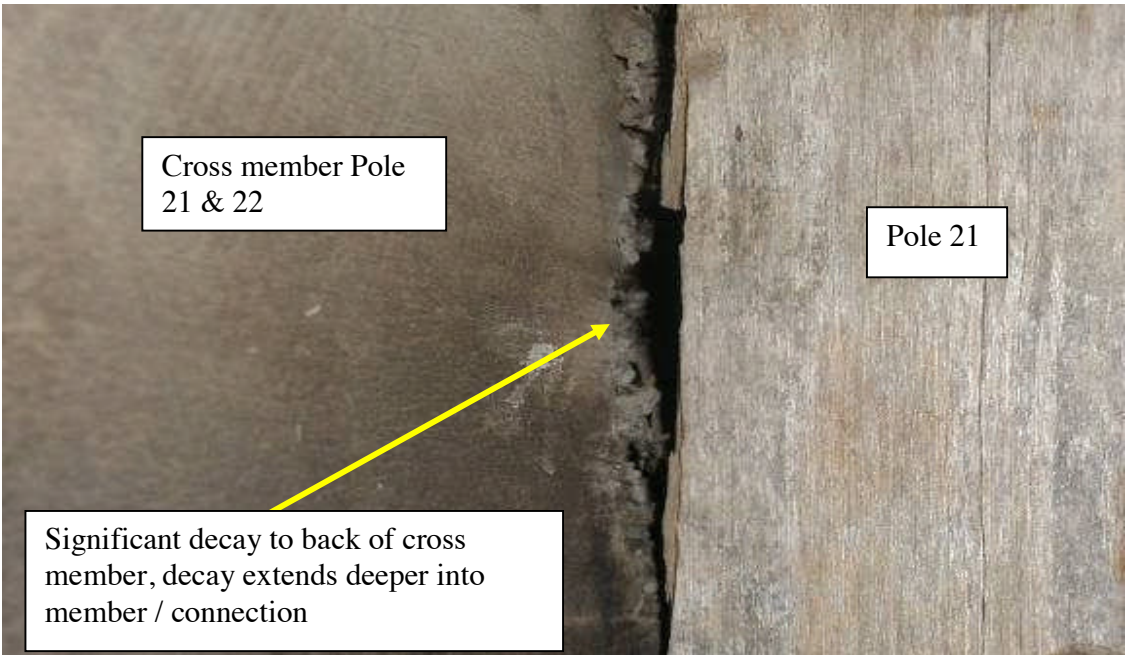


Photo 5.

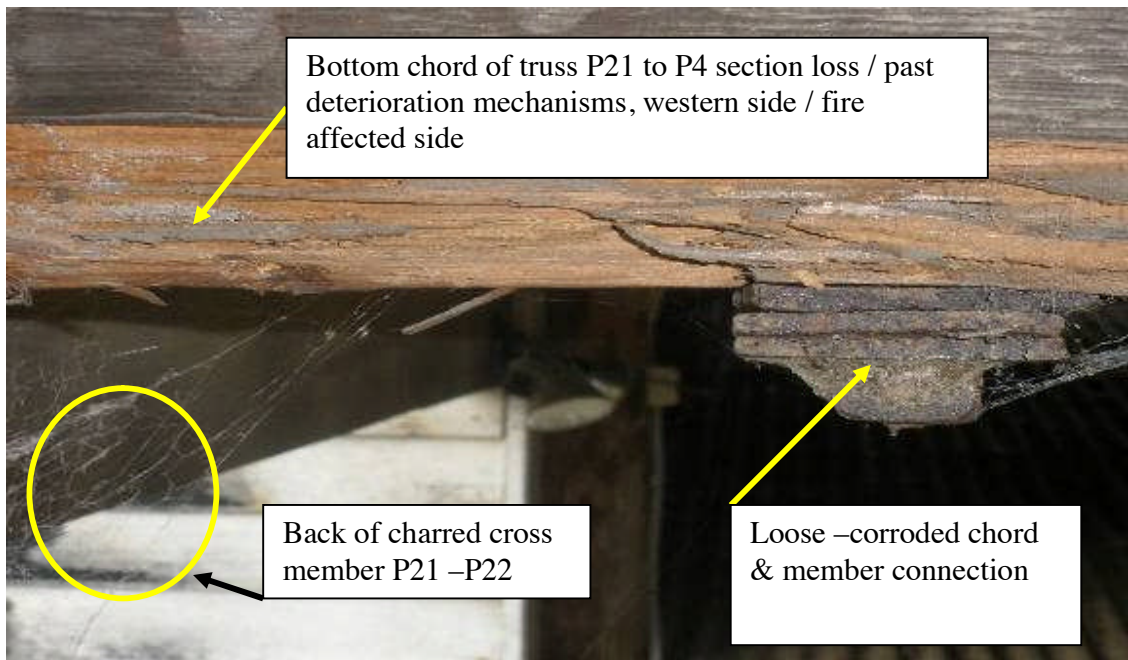


Photo 6.

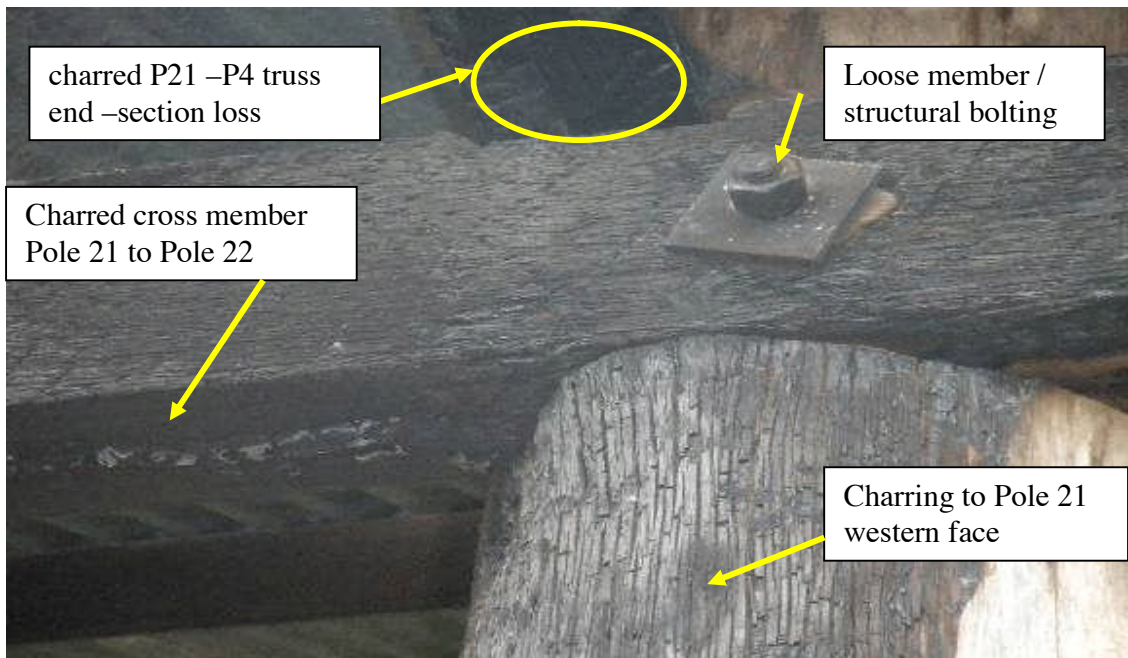


Photo 7. (Western –fire affected side)

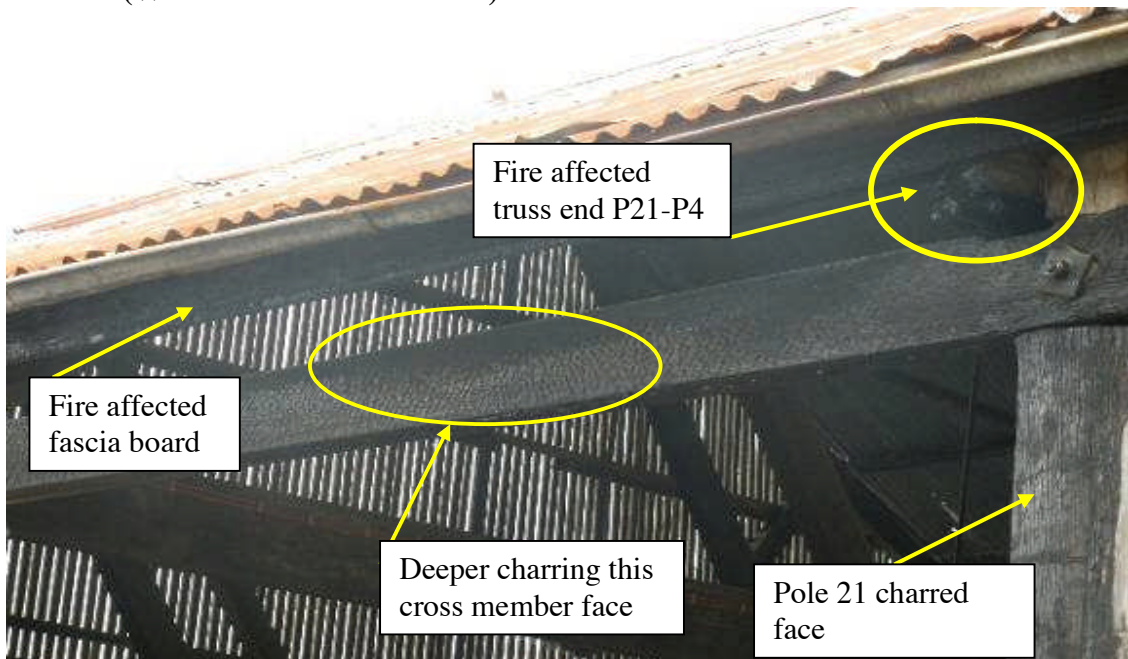


Photo 8. (garage / storage extension –Western cnr.)



Photo 9. Looking West Extension



Photo 10.

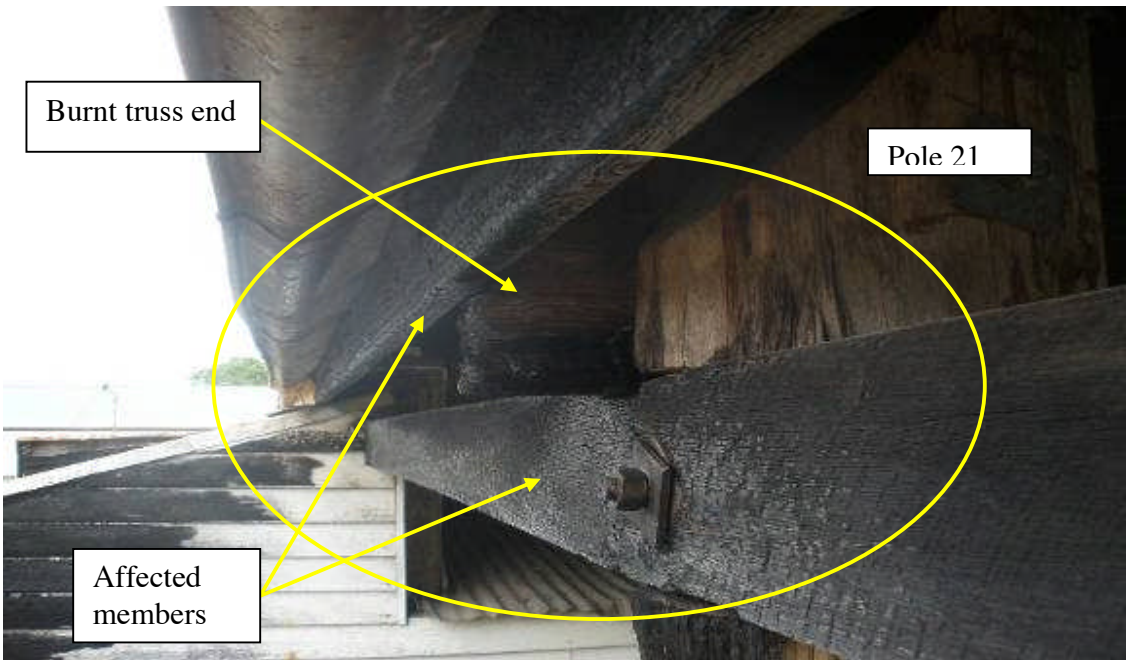


Photo 11.

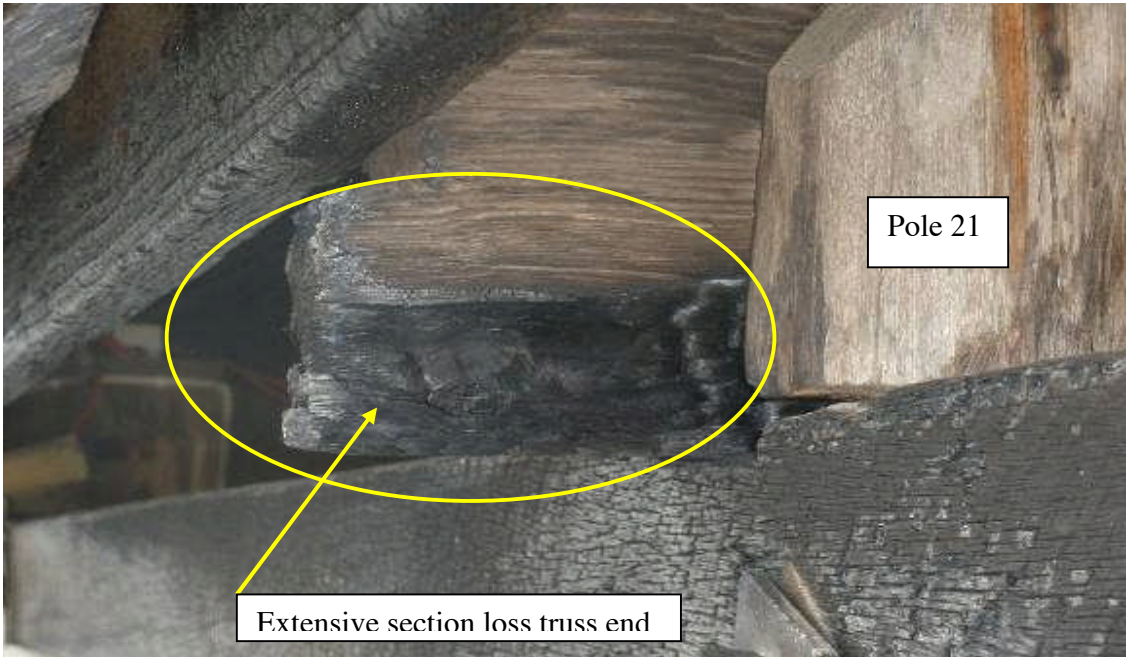


Photo 12.

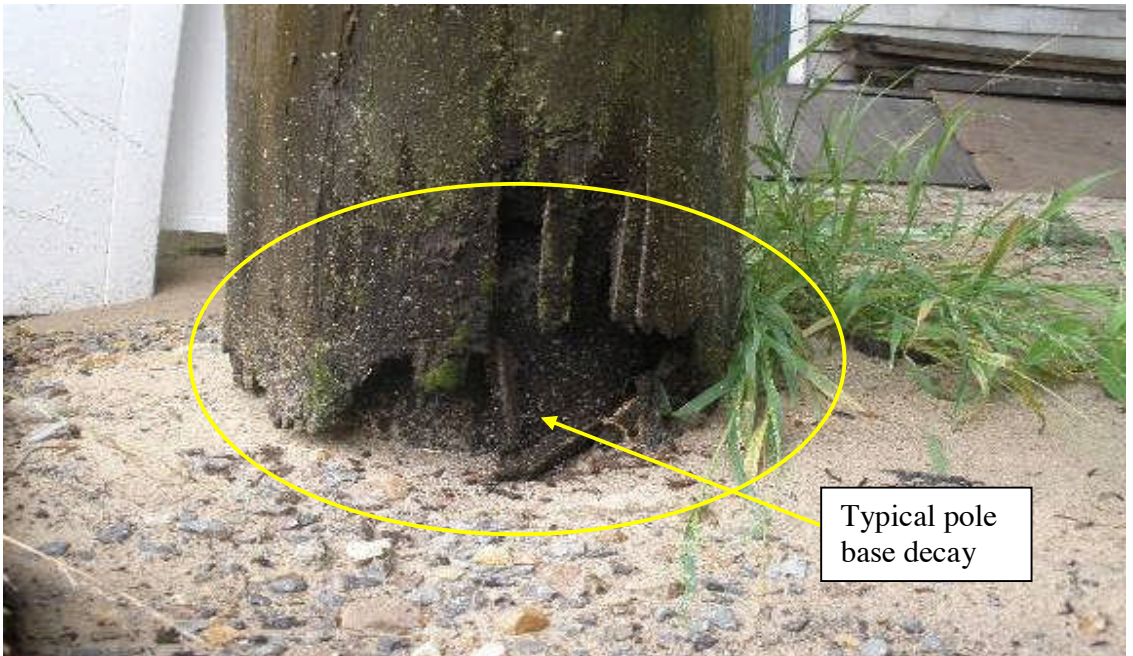


Photo 13.

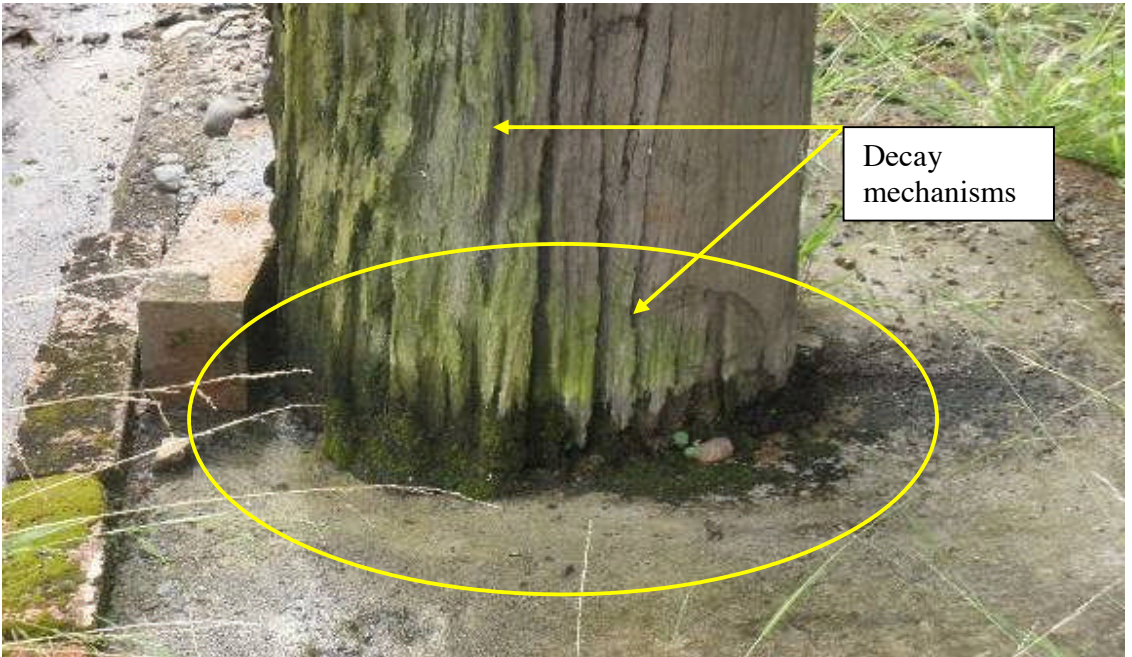


Photo 14. Eastern End Failed Truss (P11-P14) immediate remedial works required



Photo 15.



Photo 16.

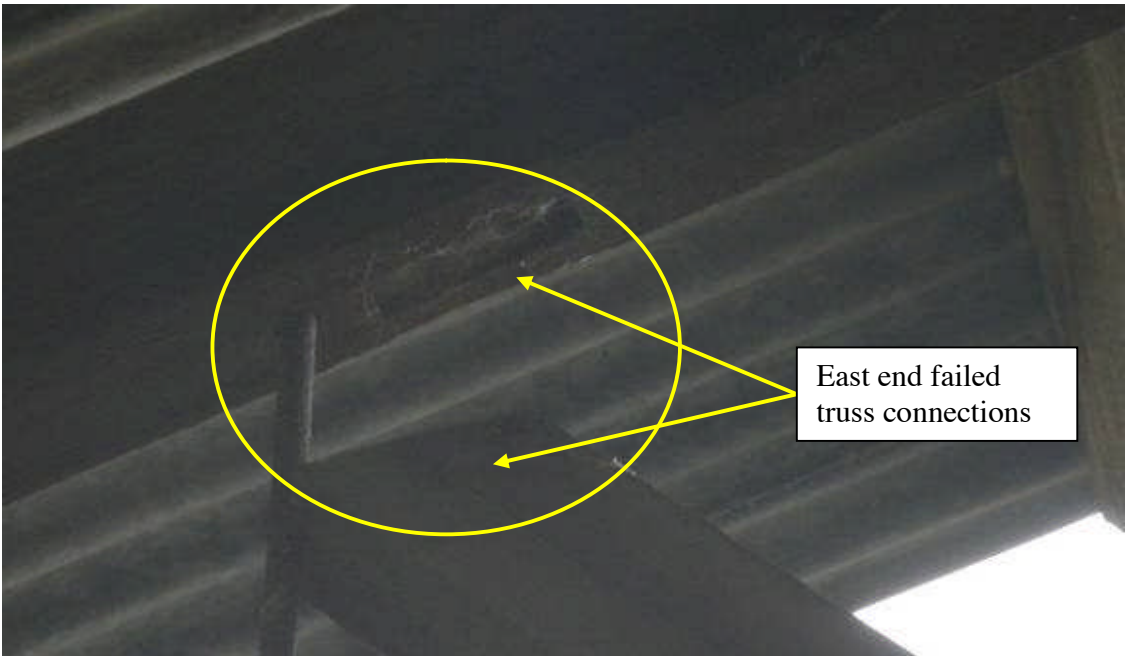


Photo 17. Garage /storage internal minor fire affected roof battens



Photo 18. Fire affected weatherboards



Photo 19. Internal of garage / storage –assessment of the construction to be made with main structure (poles) to be determined if removal of addition being considered?

