

LIMITED STRUCTURAL REPORT

By Email Only

Prepared for:
Hopton Estates Ltd
C/o Nic Young
10a Woodbottom
Mirfield
WF14 8EG



“Ariel View”

Project	Liley Hall Farm, Liley Lane, Mirfield, WF14 8EG
Project Number	2024/086
Date	30 April 2024

Our Ref: 2024/086/sgm

30 April 2024

Hopton Estates Ltd
c/o Nic Young
10a Wood Bottom
Mirfield
WF14 8EG



Dear Nic,

**Limited Structural Conditional Report on
Liley Hall Farm buildings, Liley Lane, Mirfield, WF14 8EG
for the Purposes of Conversion into Domestic Dwellings**

Following your verbal instruction we have carried out a limited inspection of the Eight Barns and out-buildings at Liley Hall Farm on 11th April 2024, in order to assess and comment on the structural integrity and condition of the buildings prior to the submission of the planning application for conversion to a domestic residence.

This report should be read in conjunction with the proposed Scheme Drawings prepared by Wood Associates Architecture and Interiors drawings prepared by Richard Wood.

The inspection was carried out during fine dry weather.

No inspection has been carried out to non-structural items such as window frames, doors, fixtures, and fittings etc. No inspection has been made to plumbing or electrical installations. No inspection has been carried out to the existing drainage.

The inspection was limited to immediately visible and accessible areas only. No high-level access has been carried out, only inspection from internal floor levels and external ground levels.

No intrusive exploratory work was carried out during the inspection. No trial holes to inspect ground conditions or foundations were carried out as part of this investigation.

This report does not provide a comprehensive list of all structural or potential structural defects, which may be present with the property. This includes issued hidden behind existing finishes which may impact on the integrity of floor joists and rafters etc.

No materials testing has been carried out unless specifically stated.

No inspection or testing has been carried out on any defective woodwork, exposed or hidden. Advice should be taken from suitably qualified timber treatment and preservative specialist contractors.

No damp testing has been undertaken, again advice should be obtained from suitable qualified specialists.

No enquiries have been made with Statutory Authorities with regards to Planning or Building Regulations.

The Report of the Inspection is for the sole use of the Client and the Client's professional advisers and should not be reproduced in whole or in part or relied upon by any third parties for any use without the express written approval of SGM Structural Design Ltd.

Executive Conclusion for Buildings to be Developed

1. It would be prudent to excavate trial holes to inspect and review the condition, sizes and depths of the existing footings, and the ground conditions they are founded on.
2. Underpinning with deeper, wider footings cannot be discounted at this stage. However, this may only be necessary in certain circumstances.
3. In some areas there was historical evidence of movement to some of the masonry panels caused by tree action, local settlement or impact damage. These are local defects that can be resolved during the development of the old barns after a basic ground investigation. Traditional underpinning techniques can readily be adopted to find a greater depth.
4. The presence of the roof finishes to all the barns has helped maintain the integrity of the structures. The proposed scheme, of course, requires new insulated roof finishes to be incorporated to meet the thermal characteristics of the new shells to meet Building Regulations requirements. Roof purlins and frame strength can be assessed once final finishes and weights are known.
5. Strengthening of all the rafters and frames can readily be achieved from our detailed inspection. Localised strengthening of connections can readily be achieved.
6. The overall eight structures are in very good condition, and all are capable of being developed without any significant structural alteration or remedial works necessary.
7. Building Regulation Calculations can be undertaken to all of the frames, and we see no reason why simple bolting on of additional steel members cannot simply be undertaken.
8. The mature tree near the front left corner of Barn 1 should be completely removed, as should the two at the rear of Barn number 2.
9. Building 7 with the outward lean of the blockwork will simply need new deeper footings installing to sound ground prior to re-building the right-hand gable wall.
10. Building 8 simply needs some minor localised underpinning to the front right corner in order to stabilise the current footing stones.
11. Existing timber lintels should be strengthened by bolting new timbers alongside. Again sizes can be determined after completing of structural calculations necessary for Building Regulations.
12. No significant demolition is required, only minor rebuilding work will be necessary during formation of the new properties.

Executive Conclusion Statement 1

1. The purpose of this structural inspection of the barns was to establish if the buildings are capable of conversion into domestic dwellings.

Executive Conclusion Statement 2

2. We can confirm that structural elements of all of the existing buildings are more than capable of supporting loadings from the conversion albeit with some minor strengthening of steelwork and underpinning of foundations.

Executive Conclusion Statement 3

3. Any significant additional loadings to the roof, such as Solar PV panels fixed on top the roof would require a simple prop to be added under the ridge, and possibly additional timber purlins added.

I trust the above and attached Appendix meets your present requirements, should you have any queries with regard to the above, please do not hesitate to contact me.

Yours sincerely,

Redacted

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Director

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APPENDIX A

Building Descriptions and Photos from Survey




Ref.	Building 1 - Photo	Notes
P101		<p>Description - Steel trusses comprising of single steel angle top chord, bottom chord and web members. Trusses sat on cap plates on steel columns. Steel angle roof bracing. No side wall bracing. Steel gable posts. Steel angle purlins & side rails. Goods door to Right-hand side.</p> <p>Cladding – Blockwork dado panels full perimeter. Steel sheeting to left & right gables. Open timber boards front and rear elevation up to eaves. Asbestos cement roof panels.</p> <p>Size - 22.8m long internally x 10.46m wide. 3.93m floor (earth) to sheeting at eaves & 6.4m floor to sheeting U/S at ridge pad foundation seen internally. Measured as 600x300mm projection. Seen where earth floor has been scraped away. Strip footings have 100mm projection.</p> <p>Defects – 13m high sycamore 650mm diameter only 350mm from blockwork face and 1.4m from front right corner of the building. Cracking to blockwork of Building 1 and also adjacent Building 4. Side block panels are generally in good condition.</p> <p>Inspection of the front elevation reveals immediately the self-seeded mature sycamore tree seen to front left corner which was seen touching the building</p>
P102		<p>Left-hand side – Front left panel of blockwork has cracking, most likely caused by the sycamore tree.</p>



Ref.	Building 1 - Photo	Notes
P103		Left-hand foundation – Very shallow footings seen to side walls. There were voids seen below the footings.
P104		Rear Elevation –Modern vertical metal cladding was noted over the dado height of the blockwork perimeter wall.



Ref.	Building 1 - Photo	Notes
P105		<p>General Internal View showing steel trussed roof structure – Steel angle purlins were seen supporting the asbestos cement roof panels. Open timber vertical side cladding boards are supported on timber cladding rails above the blockwork dado height panels.</p>
P106		<p>Column Base Pad Foundation – Minimal concrete pad foundations were seen internally together with undermined strip footings to the rear right-hand side perimeter walls.</p>



Ref.	<u>Building 1 - Conclusion</u>	<u>Building 1 - Recommendations</u>
<p>P101 - 106</p>	<ol style="list-style-type: none"> 1. The 13m high self-seeded mature sycamore tree has caused damage to building 1 and possibly building 4. This should be removed. 2. Side block panels are generally in good condition despite the footings being of minimal size and voids seen below. 3. The pad foundations to the steel frame were very minimalistic. 4. The steel trusses frame can readily be checked for adequacy to meet Building Regulations calculation requirements. 	<ol style="list-style-type: none"> 1. The sycamore tree should be removed, and roots grubbed up. 2. The ground conditions need to be explored and footings underpinned to achieve deeper foundations bearing on stable ground. 3. Once ground conditions are confirmed the minimal pad footings can be underpinned with larger pads. 4. Wood Associates Architectural drawing 22026D-20-R01 shows the proposed house layout with glazed link corridor to the garage annex Building 4. The double columns shown in the garage annex and first floor lounge can be omitted as the 5 Tonne independent Crane can be removed. 5. The steel trusses can readily be strengthened by bolting new on supplementary members alongside the existing.



Ref.	Building 2 - Photo	Notes
P201		<p>Description – Mono-pitch steel frame building with frames at each end.</p> <p>Size – 6.9m wide left to right x 7.7m deep front to rear. 2.6m high to front eaves. 4.1m high approx. to rear eaves.</p> <p>Cladding – Undersized cold rolled purlins Zed profile span the 6.9m between the steel end frame rafters. Hence the excessive deflection. No midspan tube spacers or bracing. Precast concrete dado with wall panels to rear, left and right. Open to the front. Steel plastisol coated panels above dado concrete panels. Zed side rails to sides and rear.</p> <p>Front elevation of Building 2 – Part vertical metal sheeting with open aspect and gates each side. Single central column supporting front eaves beam. No mono-pitch rafter present.</p>
P202		<p>Internal View of Right-hand Elevation – Steel columns support precast concrete dado height panels. Cold rolled sheeting rails spanning from corner stanchions onto inadequate diagonal steel angle gable posts. No diagonal wall bracing.</p>


Ref.	Building 2 - Photo	Notes
P203		<p>Internal view of Roof Structure – Steel roof sheeting supported by undersized cold rolled purlins with no tube spacer or diagonal wire restraint system. No diagonal roof bracing.</p>
P204		<p>Internal view of left-hand Gable Structure – Part sheeting rails seen. Inadequate support to precast concrete dado side panels.</p>



Ref.	Building 2 - Photo	Notes
P205		<p>Internal View on rafter to column connection – This connection should be strengthened to cater for the bending forces when converted.</p>
P206		<p>Rear elevation Cladding – Cladding in poor condition in its present state.</p>



Ref.	Building 2 – Conclusion	Building 2 - Recommendations	
<p>P201 - 206</p>	<ol style="list-style-type: none"> 1. Two mature trees in close proximity of the rear wall. Both are of significant diameter and age. 2. There is no central rafter hence the purlins are over spanned for their size. Causing the deflection seen. 3. There is a lack of roof bracing and side braced for long term frame stability. 	<ol style="list-style-type: none"> 1. The trees should be removed. 2. A central rafter should be added into the frame system. 3. Diagonal roof bracing can readily be bolted into the rafters running between the frames and rafters. 4. Purlin restraint struts should be added in. 5. Wood Associates Architectural drawing 22026D-20-R02 shows the proposed Annex building layout integral with part of the adjoining Building 3. We confirm that this open aspect layout can readily be achieved with the existing structure. 	



Ref.	Building 3 - Photo	Notes
P301		<ul style="list-style-type: none"> • No internal access due to Bull present. <p>Description – 'L'-shaped building so part mono-pitch steel frame and part duo-pitch usual portal frame. Tubular steel roof bracing to both ends of shed. No vertical bracing to front elevation.</p> <p>Size – Mono-pitch area measures 704m front to rear. Duo-pitch portal measures 11.9m approx. front to rear. Whole shed measured 22.1m long. Notch out mono-pitch was 6.8m wide left to right.</p> <p>Cladding – Cold rolled Zed purlins on steel rafters. Steel angle cladding rails to front elevation, Precast concrete up to dado height. Mid-strut and third span struts present to roof. None to walling sheeting rails.</p> <p>Front Elevation of building 3 - Open aspect for the Bull.</p>
P302		<p>Internal view of mono-pitch roof profile – Steel sheeting on cold rolled purlins with restraint system present and diagonal roof bracing. Rear sheeting spanning vertically onto rail system.</p>



Ref.	Building 3 - Photo	Notes
P303		Left-hand External view – A symmetric roof profile seen of steel frame. Substantial roof purlins seen.
P304		Internal view of Left-hand end of the shed – Roof structure in good condition.



Ref.	Building 3 - Photo	Notes
P305		<p>Steel Frame connection – Rafter to column connection appears to be inadequate and will require strengthening.</p>
P306		<p>Left-hand End Wall – This sheeting is part building 4 and part building 3. This needs substantial work.</p>



Ref.	Building 3 – Conclusion	Building 3 - Recommendations
<p>P301 - 306</p>	<ol style="list-style-type: none"> 1. There was an electric mast was very close to front of building. This will need relocating in order to convert the property into domestic as shown on Wood Architectural Drawings. 2. Main frame appears to be in good condition with purlins of sufficient size and centres and some diagonal bracing present. 3. Connections look a little undersized and would need proving by calculation. 	<ol style="list-style-type: none"> 1. The steel frame sizes would need checking by calculation and connections strengthening. 2. Cladding rails and purlins would also need checking out for their sizes. 3. All the existing structural frame sizes and frame layout lends itself to the development shown on Wood Associates and Architects drawings 22026D


Ref.	Building 4 - Photo	Notes
<p>P401</p>		<p>Description – Formerly an engineering workshop. Steel trusses at 2.43m centre comprising tubular members to top, bottom and web members. Cap plates onto steel RSJ columns build of a finished concrete slab which could possibly be a raft foundation. Steel angle roof purlins. Small steel channel side sheeting rails. RSJ steel gable posts and RHS goods door posts retro spectively fitted independent 5 tonne SWL crane track & rails.</p> <p>Size – Measures 9.15m Left to right x 7.38m Front to rear. 5.25m floor slab to sheeting U/S at eaves and 7.5m slab to ridge sheeting underside.</p> <p>Cladding – Asbestos cement roof panels. Blockwork dado walls up to 1.83m high (six foot). Front panels are approx. 2.1m high with a band of Clear Light glazing over up to eaves level. Left hand gable is poor – mixture of asbestos cement sheeting, plus glass, plus unknown flat panels. All in poor condition.</p> <p>Front elevation of Building 4</p>
<p>P402</p>		<p>Left-hand side wall with Personnel Door – This elevation has been extended front and rear with an additional window and timber panelling.</p>



Ref.	Building 4 - Photo	Notes
P403		<p>Edge of Concrete Slab Seen Externally – Concrete slab appears to be in good condition. Render has fallen off the external face of the blockwork.</p>
P404		<p>Internal view of Building No.4 – Purlins span onto tubular trusses supported by braced steel columns.</p>

Ref.	Building 4 - Photo	Notes
P405		<p>Retrospective 5 Tonne Crane – This later addition has independent bracing and can be stripped out without compromising the integrity of the original structure.</p>
P406		<p>Cracking to front right masonry panel – On close inspection, this cracking has been caused by internal impact cracking the render.</p>



Ref.	Building 4 Conclusion	Building 4 Recommendations
<p>P401 - 406</p>	<ol style="list-style-type: none"> 1. Rear right corner cracking possibly caused by Sycamore tree. 2. The 5-tonne crane can readily be removed as this was a retrospective addition to the main frames of the original building. 3. The ground floor ground bearing concrete slab has previously been used as an Engineering Workshop and would have likely been subject to high applied loads. 	<ol style="list-style-type: none"> 1. It is recommended to remove the self-seeded sycamore tree. 2. Wood Associates Architectural drawing 22026D-20-R01 shows the proposed house layout with glazed link corridor to the garage annex Building 4. The double columns shown in the garage annex and first floor lounge can be omitted as the 5 Tonne independent Crane can be removed. 3. The steel trusses can readily be adapted strengthened by bolting new on supplementary rafter members alongside the existing truss top chords and removing the bottom section of the trusses to create the double height garage with living accommodation above. 4. The ground floor ground bearing concrete slab can readily be used as a domestic car garage.



Ref.	Building 5 - Photo	Notes
P501		<p>*Limited access due to cattle and no access into RHS Yard*</p> <p>Description – Steel portal frame with cat slide roof profile. Asymmetric roof profile supporting timber purlins and ‘Big six’ asbestos cement roof panels. Diagonal roof bracing to one central bay. No wall bracing present. No intermittent rails to the vertical timber boards to left and right elevations. No sheeting to rear left elevation.</p> <p>Free standing internal columns between main RHS shed and Lefthand lean to cat-slide shed.</p> <p>Size – ‘L’- shaped on plan measuring 18mx6.1m left hand area of the ‘L’- shape. Larger right hand side measures 16.8m x 10m. Height of left-hand annex was measured as being 3.8m from slab to underside of the roofing panels.</p> <p>Cladding – ‘Big Six’ asbestos cement roof panels with translucent roof panel area left and right, plastisol coated steel to front elevation down to dado concrete blockwork wall. Left & Right sides are open vertical timber boards spanning full height eaves down to the 1.2m high blockwork dado wall. Rear was plastisol coated sheeting to upper gable 7 blockwork to layer 2.7m</p> <p>Front Elevation of Building 5 – Open vertical timber boarding present above the dado height concrete blockwork wall.</p>

<p>P502</p>		<p>Right-hand Elevation – This profile shows the Asymmetric profile of the roof. Minor impact damage to the steel sheeting noted.</p>
<p>P503</p>		<p>Left-hand set back portion of Building 4 – Higher blockwork dado wall panels due to slope of ground roof sheeting on timber purlins on braced steel frame.</p>

P504







Internal View on Main Shed – Asbestos sheeting spans onto timber purlins, onto steel portal rafters and columns. All in adequate condition. Concrete slab present.



Ref.	Building 5 - Photo	Notes
P505	 A photograph showing the left-hand open side of a large main shed. The structure features a concrete base and vertical corrugated metal siding. Steel columns and gable posts are visible, supporting the roof. The interior shows a dirt floor and some equipment.	Left-hand Open side of Main Shed – Set back portion of the main shed seen to the left. Steel columns and gable posts.
P506	 A photograph showing the rear elevation of a building with vertical timber boarding. The boarding appears weathered, with some sections that have shrunk and twisted. A metal railing is visible in the foreground, and the interior of the building shows some equipment and a dirt floor.	Rear Elevation of Building 6 – Timber vertical boarding has shrunk and twisted.



Ref.	Building 5 - Conclusion	Building 5 - Recommendations
501 - 506	<ol style="list-style-type: none">1. It is intended to remove the left-hand part of the 'L'-shaped building to leave the right-hand substantial portion of the original cow shed.2. Little structural defects were noted with the frame of this building.	<ol style="list-style-type: none">1. This relatively modern new style portal frame building will need very little strengthening in order to convert the frame into the three domestic properties shown on Wood Associates Architectural layout drawings 22026D-22-R01 and 23-R01.

Ref.	Building 6 - Photo	Notes
P601		<ul style="list-style-type: none"> • No access inside due to presence of cattle <p>Description – Timber roof purlins on two steel portal frames with steel gable frames to front and rear ends.</p> <p>Size – Width Left to right = 16.5m. Measured internally. 6.4m eaves height.</p> <p>Cladding – Plastisol coated steel to rear elevation on timber side rails. Front, left and right are all vertical open boards on horizontal timber rails above horizontal sleepers sat between vertical steels. Approx 2.8m high sleeper walls</p> <p>Front elevation of Building 6 – Open vertical timber cladding spans onto timber sheeting rails. Heavy sleeper planks have been used to span below the steel gable posts.</p>
P602		<p>Left Side Wall – Similar construction to that seen with the front elevation.</p>



Ref.	Building 6 Photo	Notes
P603		Right Side Wall – Right side wall abuts the higher Building 7, seen to the rear.
P604		Internal View of Building 6 – Asbestos cement roof sheeting supported on timber purlins spanning from front gable frame onto internal steel portal frame.



Ref.	Building 6 - Photo	Notes
P605		<p>Roof Structure – Adequate steel ridge connection seen. Lack of roof bracing noted, but can be added in.</p>
P606		<p>Rear gable where the wall abuts the lower Building 7 – vertical modern sheeting seen spanning onto timber rails supported by steel gable posts.</p>



Ref.	Building 6 - Conclusion	Building 6 - Recommendations
P601 - 606	<ol style="list-style-type: none">1. It is intended to convert this double height building into two semi-detached houses.2. Little structural defects were noted with the frame of this building.	<ol style="list-style-type: none">1. This relatively modern new style portal frame building will need very little strengthening in order to convert the frame into the two domestic properties shown on Wood Associates Architectural layout drawings 22026D-24-R01 and 25-R01.



Ref.	Building 7 Photo	Notes
<p>P701</p>		<p>No internal access possible due to the presence of cattle. Internal building measured 19.3m wide Front to Rear. Tas no left-hand gable sheeting as this elevation as integral with the adjoining higher Building 6. The roof comprised timber purlins on steel portal framed rafters at regular centres. All main frames were generally in good condition. Cladding – ‘Big Six’ Asbestos roof on timber purlins. Open timber boards down to dado block panels left and right.</p> <p>Front Elevation of Building 7 – A mixture of open vertical boarding cladding and metal cladding together with concrete blockwork.</p>
<p>P702</p>		<p>Right Hand Elevation – Asbestos cement sheeting to this gable over blockwork. Significant self-seeded Sycamore tree present.</p>


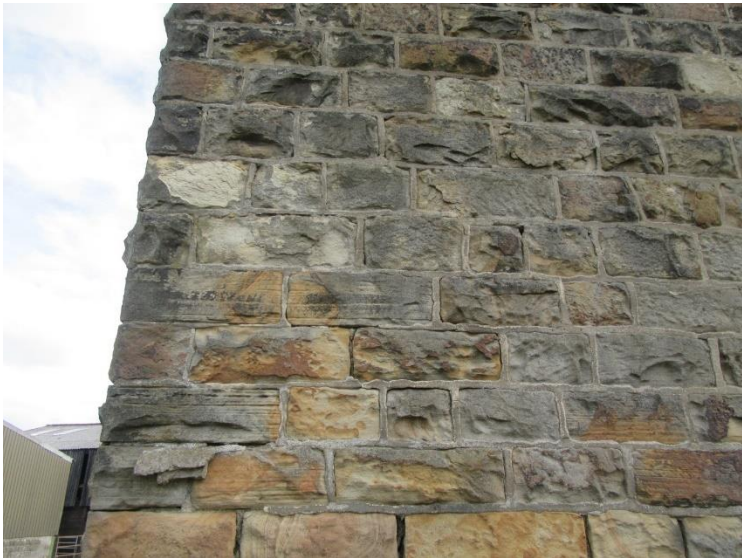
Ref.	Building 7 Photo	Notes
P703		Rear right area of Right-hand gable – Further older tree seen here.
P704		Right-hand blockwork – Significant outward bowing was seen to the blockwork wall which was likely caused by presence of the tree.



Ref.	Building 7 Photo	Notes
P705		<p>General Internal View of Shed 7– Again, asbestos sheeting on timber purlins on steel portal frame with inadequate connections.</p>
P706		<p>Cracking to blockwork wall panels and concrete slab edge – Inadequate substrata seen below the concrete slab edge has caused settlement and cracking. This can easily be underpinned to the edge.</p>



Ref.	Building 7 Conclusion	Building 7 Recommendations
<p>P701 - 706</p>	<ol style="list-style-type: none"> 1. Significant outward bowing was seen to the right-hand side gable blockwork wall caused by presence of the adjacent trees. The trees will have caused the foundations to have settled and rotate which as caused the blockwork to push out. 2. Inadequate substrata were seen below the concrete slab edge causing the edge slab to have settled causing cracking of the blockwork panels above and the concrete edge slab. 	<ol style="list-style-type: none"> 1. The two trees adjacent the right-hand gable wall should be removed, and roots grubbed up. 2. The ground conditions need to be explored and footings underpinned to achieve deeper to provide foundations to bear onto stable ground. 3. Once ground conditions are confirmed the minimal pad footings can be underpinned with larger pads. 4. Wood Associates Architectural drawings 22026D-26-R01 and 22026D – 27-R02 show the proposed house layout for the tree properties. 5. The steel portal frames can readily be strengthened if needed by bolting new on supplementary members on.

Ref.	Building 8 Photo	Notes
P801		Front elevation of Building 8 in good condition– Natural stone barn building with two circular windows and feature arch. Heavy natural stone roof finishes present.
P802		Rear Elevation – Rear elevation of barn in good condition.

Ref.	Building 8 Photo	Notes	
P803		<p>Left-hand Gable – Evidence of previous lean-to building seen. Holes noted in stonework where previous structure would have sat.</p>	
P804		<p>Part right-hand gable – Cracking noted to gable and front elevation indicative of localised settlement of this front, right corner.</p>	

Ref.	Building 8 Photo	Notes
P805		<p>Internal View – The queen post trusses were noted to have ‘lozenged’ over towards the left. The later cross bracing seen here will have undoubtedly helped reduce the movement.</p>
P806		<p>Internal View of right-hand end Panel – Purlins were seen to have a slight curve due to the very heavy weight of the natural stone roof finishes. These purlins can readily be strengthened by bolting additional timbers alongside.</p>



Ref.	Building 8 - Conclusion	Building 8 - Recommendations
P801 - 806	<ol style="list-style-type: none">1. Building 8 is intended to become the Service building for the development as shown on Wood Associates Architects Drawing 22026D-38-R012. There was minor settlement seen to the front right corner of the building.3. The building is in very good condition with little structural defects.4. The roof structure has a slight lean with the trusses having lozenged over.	<ol style="list-style-type: none">1. Ground conditions should be explored by the front right corner and possibly an underpinning scheme drawn up in order to site the footing stones to a deeper depth.2. The roof structure should have a designed bracing system installed in order to prevent further twisting and leaning of the trusses.