# VISUAL APPRAISAL SURVEY

CHYMBLA HOUSE AND WINKLOW HOUSE,
FORMER REDRUTH BREWERY SITE,
REDRUTH,
CORNWALL, UK

MAY 2022 | PROJECT REF: 21294

# DOCUMENT CONTROL SHEET

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# APPENDICES

# 1.0 INTRODUCTION & CLIENT BRIEF

1.1 MBA's Client is Redruth Town Council. This report is private and confidential to our Client and their appointed advisors.

1.2 At the request of our Client, through an appointment with PBWC architects, MBA carried out a Visual Appraisal Survey of the two buildings named in the report title. In accordance with the brief provided by the client, this report aims to identify, where possible, within the confines of a purely visual inspection;

- A summary of the structural condition of the buildings.
- Areas and nature of any obvious structural distress.
- Whether any perceived movement could potentially be progressive.
- The outline nature of any remedial works required.
- The potential for the Lamella roof structure of Winklow House to be re-used or dismantled and re-erected at an alternative site.
- The works required to ensure that the existing structure of Chymbla House is structurally sound for roofing, flooring and re-use.

Our report excludes inspection of building services and external works including outbuildings and boundary treatments.

1.3 Our investigation was carried out without the benefit of opening-up works. We have not inspected woodwork or other parts of the structure, fabric or finishes which, at the time of our inspection, was covered, unexposed or not readily accessible and are therefore unable to report that any such part of the buildings is free from defects. Any crack widths provided are estimated based on the visual inspection and have not been measured due to lack of access to do so.

1.4 Our inspection was carried out on the morning of the 27th April 2022. The weather at the time of our inspection was dry with patchy cloud.

1.5 We understand from PBWC that it was not possible to obtain permission for access into the buildings for our inspection. Our survey was therefore carried out from publicly accessible areas to the perimeter of the security fencing. This permitted reasonable coverage of the buildings with the exception of the east elevation of Winklow House where a combination of vegetation and lack of public access to the eastern boundary (partly due to the presence of Chapel Street West a former bonded warehouse) restricted the visual inspection.

1.6 MBA survey drawings are included as Appendix A. MBA Photographic plates for Chymbla House are included as Appendix B and Winklow House as Appendix C.

1.7 A brief history of both of the buildings along with further information on the Lamella roof construction of Winklow House was provided by Redruth Town Council and this has been reviewed for the purposes of this report. From the brief, we understand that neither building is listed however both are within a Conservation Area and are Non-Designated Heritage Assets (NDHA). Chymbla House is also in the World Heritage Site (WHS) and has Outstanding Universal Status within this. We also understand that Chymbla House was originally a fuse factory building constructed in 1848 and was then used as offices and that Winklow House was constructed as a drill hall in the 1930s for the Territorial Army (TA) and then used for various purposes including the Brewery shop and a Toyshop after the regiment based at the site was disbanded in the mid C20.

# 2.0 CHYMBLA HOUSE OBSERVATIONS & COMMENTS

## 2.1 General

2.1.1 The building is a stone-built two storey structure located on the former Redruth Brewery Site in Redruth - Grid Reference SW695422. The building is currently derelict with temporary security fencing to the east, south and west elevations preventing access to the face of the building or inside it. The building's North elevation borders the B3300 (road) which extends from Portreath in the North through Redruth terminating in Pennance near Lanner to the South. No fencing is present on the north elevation.

2.1.2 The external walls are formed in random rubble stonework with granite facing although this is concealed by render / plaster on some elevations. Granite quoins are present at returns. Two internal random rubble separating walls with areas of brick infill split the building's footprint into three distinct areas. The external walls previously supported a timber roof structure although this has since collapsed. It was noted during the inspection that the debris from this collapse visible inside the building is fire damaged but it was not possible to confirm whether this was the cause of the collapse or the fire occurred after the collapse. The form of construction of the previous first floor is not known but it would be reasonable to assume that this was also timber given that this has, at least in the central section of the building, collapsed. The presence of a first floor structure to the north and south areas of the building could not be determined due to lack of access however, the height of vegetation visible above the external walls suggests that the floor structure in these areas is unlikely to be intact and, if it is, is likely to be in a very poor condition. The loss of the roof and first floor structure has reduced the lateral restraint to the external and separating walls resulting in these being more vulnerable to collapse under lateral loading particularly the pressures and suctions associated with high wind events.

2.1.3 Window and door openings in the external wall are formed with substantial granite reveals and external granite facing lintels. The internal lintels appear to be formed in timber and further comment on this is provided later in the report. The cills are generally granite although some appeared to be formed in slate or concrete based on their appearance from a distance. A closer inspection of these to confirm the material is required however this is not considered critical for the purposes of this report.

2.1.4 Ground levels around the building are generally level at approximately the same level as the former internal ground floor of the building with the exception of the north elevation. On this elevation, the road rises from east to west generating a level difference of approximately 600-800mm across the external wall on the North West corner of the building. A low level boundary wall acts as a retaining structure continuing west from the elevation between the highway and the external area to the west of the building.

2.1.5 The orientation of the elevations is assumed to be as noted on MBA drawing 21294-01 included as Appendix A. The terms 'left' and 'right' when referring to each external elevation assumes the reader is viewing it from outside the building. A measured building survey has not been made available to MBA therefore the survey elevations are based on approximate dimensions / proportions and should be regarded as sketches to assist with describing the findings of this visual appraisal survey only. The survey was conducted in a clockwise fashion starting with the North Elevation.

2.1.6 Reference has been made to an archive photograph of the Redruth Brewery site available from the Kresen Kernow website courtesy of Tempest reproduced as Figure 1 below.

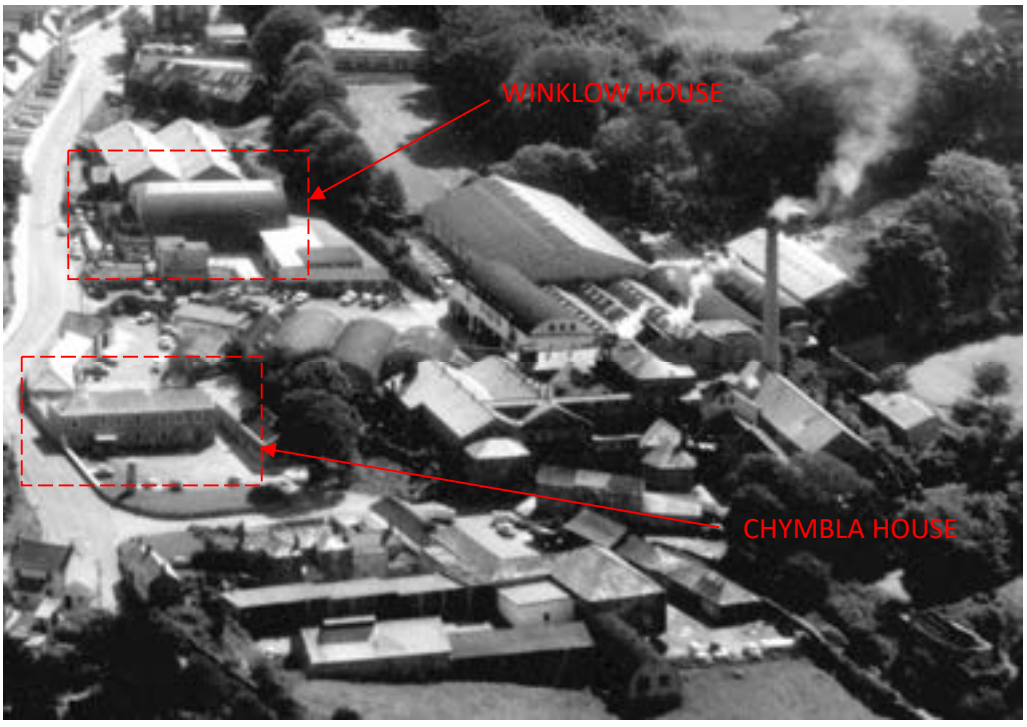


*Figure 1 – Historic view of Redruth Brewery Site taken in the 1960s*
*(Source: https://kresenkernow.org /exhibitions/redruth-brewery/)*

This shows the original roof profile including a hipped end to the north end of the building which has been included for context as a red dashed line on the elevation drawings for the building in MBA drawing 21274-01 included in Appendix A of this report.

2.1.7 Vegetation is present on all elevations of the building both in close proximity to the external face of the structure and growing from the wall itself. Specific details are provided on the commentary on each elevation. Where vegetation has been growing from the elevation it is likely that the root network will have caused damage to the mortar joints in the stonework. Whilst some of this damage is visible, there are areas where the vegetation growth is likely to be concealing any damage and the full extent of remedial works required will therefore not be known until the vegetation is removed. Whilst vegetation growth is visible in nearly all of the photographs provided in Appendix B, refer to B11 and B16 for typical examples of this.

2.1.8 No rainwater goods were observed on the elevations of the building although various other features associated with former signage and lighting are fixed to the walls and described in section 2.2.

## 2.2 External Inspection

### 2.2.1 North Elevation

1. The stonework to this elevation is exposed (photo B1). The wall appears to be reasonably plumb although this was not measured during our inspection. The top of wall is level as the former roof profile included a hip end to the north of the building. With the exception of the defects described in the sections that follow, the stonework appears to be in a satisfactory condition.

2. The stonework has been re-pointed using cement based mortar as part of historic maintenance of the building. This mortar appears to have become de-bonded from the stonework / original mortar behind and gapping is present between the stonework and cement based mortar (photo B5).

3. A substantial tree / large shrub is growing from the top of the wall towards the middle of the elevation (photo B1). This has resulted in an outward bulge in the external face of the wall due to root growth behind (photo B3). A vertical crack is also present which propagates from this bulge down to approximately first floor level. It is considered likely that this crack is also associated with this vegetation growth.

Other minor vegetation growth on the top of the wall is also present and is likely to have caused damage to the joints in the stonework in the top 200-300mm of the wall (photo B5).

4. An outward bulge is present in the wall to the right hand side of the elevation. The cause of this bulge is not known and may be an original feature of the building's construction or a defect associated with separation of the facing stonework from the random rubble stonework (not visible during the inspection) forming the internal face of the wall. Further investigation is required to determine the cause of this.

5. The highway (B3300) slopes up from left to right of the elevation resulting in a retaining condition of approximately 600-800mm at the north west corner of the building (photo B1).

6. A sloping wall extends beyond the right hand end of the elevation with an angled concrete coping (photo B2). This wall then continues as a low level boundary / retaining wall accommodating the level difference between the highway and the open area to the west of Chymbla House.

7. Three corroded metal fixings are embedded in the wall to the bottom left of the elevation (photo B4). The purpose of these is not known but two potential reasons for their presence could be:
    - Redundant fixings from a previous scaffold installation.
    - Method of securing loose stonework. The extent of these fixings should be investigated to rule out this possibility prior to removal.

### 2.2.2 East Elevation

1. The stonework to the external face of the east elevation is generally exposed however some areas are concealed by vegetation and render / plaster as visible in Photos B7 and B8 and as annotated on MBA drawing 21294-01. The covered areas are located where a now demolished extension to Chymbla House is visible in the archive photograph presented as figure 1. It has been assumed that the render / plaster finish would be removed in any re-development of the building and detailed comments on its condition is therefore excluded from this report. A majority of openings in the wall have been boarded however some of these remain open providing a view into the building. Access to the face of the wall was not possible due to the hoarding. With the exception of the defects discussed in the points that follow, the stonework appears to be in a reasonable condition.

2. A vertical crack is present to the right hand side of the northmost internal separating wall (photos B9 and B10). The building to the right (north) of this is suspected to be an extension constructed at a later date due to the presence of granite quoins at the junction between the left hand external wall and internal separating wall. This is a suspicion and has not been proven through historical research. The crack appears to be approximately 15mm wide at the top and it extends down into the rendered / plastered area at ground floor level (photo B10).

3. Hairline cracks were noted in the perpend joints adjacent to the ends of two first floor lintels (second opening from left at first floor level and fourth opening from the left at first floor level) (photo B14). This cracking is thought to be associated with either thermal movements in the wall or minor movements in the un-restrained wall under wind loads.

4. The mortar joints to the stonework at the top of the wall have degraded as a result of vegetation growth and exposure to the elements resulting in the top 200-300mm of stonework becoming loose (photos B9/B11/B14/B15/B16). Remedial works will be required to stabilize this stonework.

5. The collapsed roof and potentially first floor and partition wall structures are visible through the ground and first floor openings towards the middle of the elevation (photo B13). Charred remains indicate that the building was subject to a fire (possibly arson) previously. It is not known whether the fire/s happened after the roof / floor had collapsed or was the cause of the collapse itself.

6. To the right hand side of the elevation at ground floor level, blockwork has been bonded into the wall presumably where a now demolished building was previously connected to Chymbla house (photo B6). This blockwork should be removed and infilled as part of any regeneration scheme.

7. A number of ancillary features are visible on this elevation including a mortar fillet and evidence of a former flashing in two locations (photo B11 and B15). A flat corroded metal bar is embedded in the wall and projecting out from it to the left hand end of one of the ground floor openings (photo B15). A small black device (purpose not known) is also fixed to the wall to the right hand side of the left most opening at first floor level.

8. Towards the base of one of the first floor openings in what previously would have been an internal space due to the presence of an adjoining building, block reveals are visible below the plaster line. These were perhaps used to provide a square reveal prior to finishing (photo B12).

9. Whilst the external lintels, where not concealed by vegetation or render / plaster, are formed in granite, the lintels behind these which support the remainder of the wall's thickness appear to be formed in timber. These timber lintels have been fire damaged in the past and charring is visible in some instances (photo B32 attempts to show this although the internal position of these lintels and the angles available to view these made this difficult to photograph clearly). On one of the first floor openings in this elevation it was noted that the timber lintel has failed and the stonework above appears to be supported by just the outer granite lintel despite its relatively narrow width in comparison to the overall thickness of the wall.

### 2.2.3 South Elevation

1. Whilst this elevation is anticipated to be formed in random rubble stonework to match the other elevations, the wall is finished in render concealing this from view (photo B17). This elevation is the gable end of the building and includes a triangular panel above the former eaves level that extends up to a ridge. The render is in poor condition with localized failures noted behind the peeling paint particularly to the left hand side of the elevation where sections of render were missing at the return with the west elevation. Minor hairline cracking / crazing is present across the elevation although it is not known whether this extends into the stonework behind (photo B19). Due to the poor condition of the render, it is anticipated that this will be removed as part of any re-development scheme. This will allow a visual inspection of the external face of the stonework behind to be undertaken. Direct access to the face of the wall was not possible during the inspection due to the presence of a metal hoarding offset from the elevation.

2. Diagonal cracking is present to the top left and top right hand corner of the elevation as shown on MBA drawing 21294-01 and photos B18 and B20. These cracks are of structural significance and appear to be linked to a combination of vegetation growth and possible movement of the top of the south elevation's wall towards the south.

3. A cementitious mortar capping is present at the top of the wall forming this elevation (photo B16). In some areas, this appears to have been damaged by vegetation growth and this mortar capping should be removed and replaced as part of any re-development works.

4. Historic photographs of the Redruth Brewery site appear to show a chimney at this end of the building however the section of chimney above the former pitched roof line is no longer present (photo B7 and B17). It is not known whether this was removed prior to the building being abandoned or if this has collapsed at a later date. It is considered likely that the former flue is located within the thickness of the wall.

### 2.2.4 West Elevation

1. The granite facing stonework to this elevation is generally visible with the exception of areas concealed by thick vegetation as indicated on MBA drawing 21294-01 (photos B21 and B24). Direct access to the face of the wall was not possible due to the fencing installed to three sides of the building to mitigate against the risk of public access. A majority of openings have been boarded using plywood although some have been infilled with concrete blockwork instead. Mortar fillets are present to the reveals of some openings although a number of failures of this fillet are visible particularly on the ground floor doorway to the right hand end of the elevation. Other than the defects described in the points that follow, the stonework generally appears to be in a reasonable condition.

2. An area of the elevation has suffered from a historic collapse between two first floor openings (photo B25). The extent of the collapse includes the stonework above the lintels, the lintels to both openings, and the walling between the openings. Using the archive photograph provided as figure 1, the profile of this wall pre-collapse is shown using red dashed lines on MBA drawing 21294-01. It is not known when the collapse occurred or whether it was the result of a high wind event or occurred as a result of the collapse of the roof / floor structure.

3. A diagonal crack approximately 10-15mm wide is present adjacent to the top right hand corner of the elevation along with a predominately vertical crack to the left of this approximately 5mm in width (photo B22). This cracking is considered to be potentially associated with outward movement of the south elevation relative to the west elevation particularly towards the top of the wall. Vegetation growth may also be a contributing factor.

4. Orange staining is visible between the cill of one of the first floor openings and the lintel of the ground floor doorway (photo B23). It is suspected that this is associated with leaching of iron pyrite from the slate cill of the first floor opening.

5. The granite lintel above the second first floor window opening from the left hand end of the elevation appears to have been subject to a past crack repair towards the middle of its span (photo B27). The lintel is supporting a very small amount of stone walling over and appears to be performing this role adequately at present. However, it is recommended that this potential defect is investigated to determine the depth of any cracking behind the repair to allow comments to be made on the anticipated longevity of this lintel in any re-development scheme. An allowance should be made at this stage for the replacement of this granite lintel.

6. Hairline cracking is present in various locations across the elevation including a vertical hairline crack to the left side of the far right hand ground floor doorway (photo B23) and in the mortar below the cill of the leftmost first floor opening (photo B28).

7. A former single storey structure adjoins this elevation in the position indicated on MBA drawing 21294-01 (photo B26). This structure consists of a low level granite plinth with timber framing above. The timber has been fire damaged and does not appear to be in a salvageable condition. The granite plinth is in a reasonable condition although minor cracking was noted adjacent to the doorway in the west elevation.

8. As per the east elevation, there was evidence of a joint approximately 4-5m from the north elevation suggesting that the left hand area may have been constructed at a later date (photo B27). This is an assumption though and has not been evidenced through historic research.

9. Various items are fixed to the wall including:
    - Building alarm.
    - Lengths of steel angle thought to be associated with former signage on the building.
    - External lights.
    - OSB plate.

These are secured using metal fixings which, in some cases, are displaying signs of corrosion (photo B27 and B29). Unless it is essential for these to remain as part of the proposed redevelopment, it is recommended that these items are removed and the wall locally repaired.

10. The stonework to the top 200-300mm of the wall is loose with open joints between stones (photos B22, B23 and B27). It is thought that this is due to vegetation growth and erosion due to exposure to the elements following collapse of the roof structure. Allowance should be made to re-build this section of the wall as part of any proposed re-development.

## 2.3 Internal Inspection

2.3.1 Access into the building or the area between the hoarding and building was not possible during the inspection therefore comments on the internal structures have been based on what can be seen from outside of the fence line. Accordingly, these comments will be subject to refinement once improved access is possible.

2.3.2 The building is split into three distinct sections by two masonry separating walls. Other timber partition walls, some of which may have been loadbearing, could have been present however these have since collapsed and therefore this could not be verified during the inspection.

2.3.3 The masonry separating wall closest to the south elevation comprises a substantial chimney breast and is constructed in random rubble stone with large granite quoins on the returns (photo B30). A triangular brick panel is present on the west side of the chimney with mortar joints appearing to be in a poor condition. No such brickwork is present on the east side of the chimney suggesting a possible historic collapse in this area. The stonework to the top of the chimney appears to be very loose and potentially unstable in high wind events.

2.3.4 The masonry separating wall closest to the north elevation appears to be predominately constructed in random rubble stonework with four courses of brickwork visible at high level to form the peak at the ridge (photo 31). It is possible that this was the original gable end of the building prior to extension northwards although this has not been verified by historic research.

# 3.0 CHYMBLA HOUSE - CONCLUSIONS AND RECOMMENDATIONS

3.1 Based on the observations and comments made in section 2.2, the following additional works would be recommended to inform the detailed design of a re-development scheme for the building:

1. Remove vegetation and render / plaster currently concealing the stonework to permit a visual inspection of these areas to be undertaken. A suitable allowance for defects exposed as part of these works should be made at this stage.

2. An internal inspection of the building structure should be undertaken. Given the danger associated with the collapsed internal structure, it is anticipated that this would be undertaken from a mobile elevated working platform (MEWP) positioned adjacent to the building and extending over the external walls. An alternative to this, may be to use a drone with video / photo capture technology to obtain internal views of the building. This should also aim to identify the presence of any chimney flues that exist within the existing walls.

3. An asbestos survey should be undertaken particularly on the debris associated with the former collapses. Input from an asbestos specialist will be required to determine how the necessary samples can be obtained safely.

4. Excavate trial pits adjacent to the existing walls to determine the depth, size and bearing stratum of the existing footings as well as carry out sampling for contamination testing. Allow for inspection of trial pits by a suitably qualified geo-technical engineer and the costs associated with the necessary laboratory testing.

5. Undertake structural calculations to determine the loadbearing capability of the existing walls to determine the form (span lengths and directions) of the replacement floor and roof structures.

6. Concrete screening tests to be carried out on any retained concrete by a suitably qualified specialist. Given that the majority of the building is formed in stonework, this is anticipated to be minimal and it may be simpler to remove the isolated areas of concrete blockwork instead of retaining these. If this were possible, then the screening would not be necessary.

7. Undertake an intrusive drilling investigation to the bulge in the north elevation to check for voiding in the wall behind the bulge.

8. Consultation with appropriate heritage organizations to ensure that any structural works undertaken are in compliance with their requirements.

9. Obtain a mining search (desktop study initially) for the building from a suitably qualified mining specialist to identify any known features in the vicinity of the building.

3.2 The following works would be anticipated to bring the building back into a habitable condition:

1. Develop a strategy with a suitably qualified contractor to determine the form and extent of temporary works to secure the existing structure and allow works to be undertaken safely within the existing building.

2. Re-build the top 200-300mm of all walls where the stonework is currently loose with open joints. Re-instate mortar capping to top of walls where this is currently present.

3. Rake out the existing cementitious mortar joints and replace these with a flexible lime mortar. As part of these works, the hairline cracking identified within this report should also be raked out and re-filled.

4. Install new timber roof structure including treated timber wall plate strapped down to the wall below to provide a stable structure for installation of the roof finish and to re-instate lateral restraint to the top of the existing walls. The roof structure will need to be designed in such a way that the trusses do not transfer lateral thrust / spread loads to the walls as the walls are unlikely to be capable of resisting these.

5. Install horizontal lateral restraint straps between the walls that extend above eaves level and the new roof structure to provide lateral restraint to the walls at ceiling tie and rafter level.

6. Install new first floor structure fixed back to the existing walls to provide vertical support to the new floor and further lateral restraint to the existing walls. To limit the loads on the existing walls, it is anticipated that these floors will be formed using either solid timber joists or engineered timber joists. Depending on the final scheme, it is anticipated that the internal walls may be used as loadbearing and an allowance for new foundations to support these should be made at this stage.

7. The ground floor slab could not be inspected however it is considered unlikely that any slab present will include adequate damp-proofing, radon protection or insulation to meet the current Building Regulations and it should be assumed that a new floor slab will be required. As this new build-up is likely to be greater in thickness and installed at the same level as the current ground floor slab, checks will need to be undertaken to ensure that the excavation required for this does not extend below the base level of the existing walls. This should identify if any additional measures, such as underpinning of the existing walls or segmental construction of the new slabs will be required. A suitable allowance at this stage should be made for this.

8. Replace all timber inner lintels (i.e. those concealed behind the granite facing lintels) with replacement precast concrete lintels to provide support to the full width of the stone wall in the long term. Apply bituminous paint to lintel ends to protect exposed reinforcement / pre-stressing strands prior to building these into the wall. Temporary propping will be required to support the wall above these openings during removal of the existing timber sections and installation of the new concrete lintels.

9. Repair diagonal cracking on the south, west and potentially east elevation adjacent to the south east and south west corners of the building using a proprietary stainless steel crack stitching system (Helifix or similar). Input will be required from the specialist installer on the installation methodology and the required extent of the bonded bars.

10. Investigate the potential defect in the granite lintel on the west elevation and replace with a reclaimed granite lintel if deemed necessary.

11. Remove the fire damaged timberwork that previously formed the single storey structure to the west of the building and re-build this in new timberwork treated against decay and woodboring beetle attack.

12. Develop waterproofing strategy for the north elevation wall which retains the B3300 (road). This will require input from the appointed architect along with a waterproofing specialist as part of the general review of the damp proofing strategy for the building.

13. Install new rainwater goods to the building connected into a suitable surface water disposal system developed in accordance with sustainable urban drainage principles. This system will need to be developed in accordance with a flood risk assessment carried out for the site with due consideration made to the site's location in the Camborne, Pool, Illogan and Redruth critical drainage area identified within the strategic flood risk assessment interactive mapping produced by Cornwall Council. We are aware, from experience on other nearby sites, that the area may be susceptible to flooding and this will require detailed review as the project progresses.

14. If voiding is encountered within the wall behind the bulge in the north elevation, develop a suitable remedial strategy to secure this and implement this on site.

15. Remove the metal fixings embedded into the wall to mitigate against the risk of future expansive corrosion damaging the stonework. Any new fixings into the wall should be suitable for external exposure (i.e. stainless steel).

3.3 It is our opinion that, subject to the findings of the further investigations described in section 3.1 and the works described in 3.2 being completed, that the building structure is generally suitable for re-instatement as a habitable building from a structural perspective.

3.4 If remedial works are not carried out to the building in the relatively near future, the following is likely to occur:

1. Further degradation of the joints in the stonework to the top of the walls loosening this stonework further and making it more susceptible to collapse during cold weather (freeze / thaw action) or high wind events.

2. Potential collapse of further areas of walling (such as that which has already collapsed on the west elevation) due to one, or a combination of, root penetration into the wall loosening the joints between stonework, failure of internal timber lintels and/or high wind events applying lateral loads which the lightly restrained walls are unable to resist.

At a minimum if a re-development scheme is not progressed, to mitigate against the risk of the above, it is recommended that a scheme of securing works is developed to stabilize the building in its derelict state. This is likely to involve removal of the vegetation, taking down and re-building unstable sections of walling and re-building the top sections of the walls where stonework is loose. The condition of the timber lintels would also need to be assessed and these replaced where necessary. Stability checks on the relatively tall lightly restrained walls would need to be carried out and additional restraint provided where necessary to ensure their long term stability.

# 4.0 WINKLOW HOUSE - OBSERVATIONS & COMMENTS

## 4.1 General

4.1.1 The main building presents as a curved roof structure clad in sinusoidal roof sheeting. Given the age of the roof sheeting and its visual appearance it is considered likely that this contains asbestos however it is not possible to definitively determine this from a purely visual inspection and testing should be carried out by a suitably qualified laboratory. A long rooflight is present at the top of the roof extending almost the full length of the building between gable ends. The north and south elevations are formed as vertical walls with a curved top of wall profile at the intersection with the roof sheeting. Various door and window openings are present. A chimney approximately square in plan extends above the roof surface on the south elevation. Evidence of demolished buildings that were previously attached to the north and south elevation is visible and these former extensions can be seen in the historic photograph presented as figure 1. The site is fenced to a majority of its perimeter preventing access to the building itself. It was noted that there were open doorways in two elevations which could potentially be used to provide access into the building if access into the fenced area were to be permitted by the building owner and suitable risk assessments developed.

4.1.2 The ground around the perimeter of the building is level with no significant level differences identified. A stream is present in relatively close proximity to the south elevation of the building. The B3300 (road) runs in an east-west direction to the north of the building.

4.1.3 Significant vegetation growth, both directly in front of the building elevations and growing from it, is present in a number of areas with the approximate extent visible in the photographs included as Appendix C and MBA drawings 21294-02 and 03. This is particularly dense to the east of the building and this, combined with the presence of another building which is understood to have also been part of the former Redruth Brewery site, significantly limited the visual inspection which was possible to this elevation.

4.1.4 Whilst internal access into the building was not possible, we understand from the tender enquiry documentation that the building is constructed as a Lamella roof structure patented by Hugo Junkers which can be described as a geodetic barrel. This form of construction comprises lamellas produced from sheet steel formed into C-sections with corrugations to improve the rigidity of the sections. The lamellas are connected using rigid joints in all directions with further braces running perpendicular to the curvature of the roof. As requested in the brief, reference has been made to the internal photographs provided and commentary given on these. These photographs are dated and do not depict the current condition of the roof structure. An internal inspection is therefore imperative once suitable arrangements can be put in place. Measurements taken using Google Earth suggest that the building is approximately 20m in width which would mean that the building is a relatively short span example of this form of construction which is published as being capable of accommodating spans of up to 40m.

## 4.2 External Inspection

### 4.2.1 North Elevation

1. The north elevation is finished in painted render (photo C1). Horizontal and vertical lines in the render finish appear to be hairline cracking however it is not possible to determine if these extend into the wall structure behind and further investigation of these is required. With the exception of the circular high level window, it is thought that all of the openings were boarded at some point in time however, this boarding has been partially removed on the main entrance to the building and completely removed on the doorway to the left hand side of the elevation.

2. Damage to the curved roof sheeting at its junction with this elevation is present, with one area offering a view on the wall construction indicating that this is constructed using cavity blockwork (photo C2 however it is difficult to see this from the photograph due to the vegetation growth adjacent to the building). It was not possible to determine details of the ties which secure the two leaves of blockwork together and further investigation is required to determine the form and condition of these ties.

3. Cracking is present as indicated on MBA drawing 21294-02 with various vertical, horizontal and diagonal cracks identified (photos C3, C4 and C5). Generally, the pattern of this cracking appears to be consistent with 'shrinkage' cracking. No movement joints are apparent in the elevation which, given the length of this, would be required under modern codes of practice to control cracking associated with thermal and moisture content changes in the masonry.

4. Rainwater down pipes are present which appear to have previously drained the high level flat roof area onto the lower level flat roofs. Since the lower flat roofs have now been demolished, the system is no longer effective (photos C2 and C6).

5. Pockets at regular centers are visible in the external face of the main elevation where joists have previously been built into the wall to form a flat roof (photos C2, C3 and C6). These should be infilled as part of any proposed works to the building.

6. Along with the doorways, where boarding appears to have been removed, the main circular window has had its glass broken exposing the internal structure to the elements (photo C4).

7. A number of vents are present in the wall which are likely to have formed part of the ventilation strategy for the building although it was not possible confirm this during our inspection (photos C1, C2, C3, C4 & C6).

8. The area above the main entrance is clad using horizontal boarding (photo C5). A decayed timber infill panel is present below this. No lintel is visible however it is possible that this is concealed by the cladding or the concrete roof slab has been designed to span across to the wall on either wide of the entrance door.

9. The edge of the concrete flat roof structure is visible with embedded timbers at regular centers to the perimeter of the roof (photo C4). It is anticipated that the timbers were cast into the slab to provide a fixing point for the roof fascia which has since become detached from the building. From a distance, the concrete appears to be porous with large voids visible between the aggregate suggesting that this may be a relatively weak mix.

10. Given the elevations height and width, it is anticipated that the main masonry elevation is tied back to the steel framing beyond. Photographs from the brief showing the building during construction support this statement with steel gable posts visible in four locations on the north elevation. The details of how the wall is tied back to these columns are not known and should be investigated to check the form and condition of this connection.

### 4.2.2 East Elevation

1. The east elevation is mostly obscured from view with very limited access due, in part, to the presence of another former Redruth Brewery building to the east. Significant vegetation growth is present adjacent to the elevation which further restricted the visual inspection (photos C7, C8 and C9).

2. The surface of the roof sheeting is visible from a distance and no obvious signs of distortion is evident to the area which can be seen above the vegetation.

3. The rooflight is visible from areas to the north east and south east of the building and, from a distance, it appears as though there may be damage to this (photo C8). Reference to an aerial view of the building from Google Maps support this statement with sections of glazing seemingly damaged. If damage is present then this would expose the internal steelwork to external conditions which could accelerate corrosion of the steel sections.

### 4.2.3 South Elevation

1. As per the north elevation, it is thought that this elevation is formed in cavity masonry however it was not possible to confirm this during the inspection. This elevation is rendered with a rougher texture grey render compared to the north elevation which does not appear to have been painted. Vegetation is present on the verge of the roof to the right hand side of the elevation (photo C10). Damage has occurred to the roof sheeting on the verge in a number of locations potentially allowing water to penetrate into the building (photo C21, C22 and C23). Three ‘rows’ of openings are present with doors at ground level and two upper rows of windows, one at the top of the elevation and one towards the middle.

2. The middle row of window openings appear to be formed using steel lintels with corrosion visible on the soffit of these (photo C14). The lintel over the far right opening has failed as a result of this corrosion with horizontal cracks visible in the wall above the lintel and extending either side (photo C12). Corrosion of the lintel over the window opening on the far left of the elevation is also anticipated to be a contributing factor to a horizontal becoming vertical crack to the left of the lintel (photo C21). A further horizontal crack extending from the ground floor opening to the bottom left of the elevation may also be due to corrosion of the lintel although opening up works will be required to confirm this (photo C22).

3. A number of timber and metal service features including a vertical flue to the left of the chimney, thought to be redundant, are fixed to the elevation using metal fixings, some of which exhibit signs of corrosion (photo C21). A horizontal chase is also visible on the elevation which is considered to be associated with the connection with a building adjacent to this elevation which has since been demolished. Three steel straps are fixed to the elevation to the bottom right hand corner which are thought to have been used to secure a metal fence which has either collapsed or been partially removed (photo C11).

4. A concrete roof slab is located approximately 2.5m above ground floor level adjacent to the chimney (photo C13). This slab has been cut back to the wall on the left hand side of the chimney (photo C18) and cut back to approximately the face of the chimney on the right hand side. Where the slab has been partially demolished, the reinforcement has been exposed and minor corrosion of this mild steel reinforcement is visible along with loose concrete on the top edge of the slab (photo C19).

5. The chimney extends from ground floor level to above the top of the curved roof. A vertical crack is present at the top of the chimney directly below vegetation (photo C16). A series of metal ladder rungs are embedded in the chimney which appear to be in reasonable condition although surface corrosion was visible in some areas (photo C15).

6. A majority of the openings have been boarded but some have been left open and glazing has been broken, likely by vandals. The openings which are not protected are allowing the elements into the building potentially affecting the longevity of the internal structure. One of the openings had been infilled with blockwork although it is not known whether this was done prior to demolition of the adjacent building or not (photo C20).

7. Horizontal cracking is present in the render to the right hand side of the chimney in an alcove created by a projecting cavity blockwork wall and the concrete slab referred to in 4.2.3.4 (photo C17). This is potentially due to minor foundation movement and requires investigation starting with removal of the render to determine the size and extent of any cracking in the blockwork behind this.

### 4.2.4 West Elevation

1. This elevation predominately comprises sinusoidal profile roof sheeting laid to a curved roof form to match the profile of the lamella roof structure (photo C24). A two leaf access door is present towards the right hand side of the elevation (photo C26). No obvious distortion of the roof surface is apparent which would suggest that the roof structure is distressed.

2. Damage to the roof sheeting has occurred in multiple locations compromising the weather proof envelope of the building (photo C25).

3. The same comments made in relation to the rooflight located at the top of the barrel vault roof of the east elevation apply to the west as well (photo C24).

## 4.3 Internal Inspection

4.3.1 Access into the building or the area between the wire fence and the building was not possible during the inspection limiting our comments to what could be seen through openings in the north and south elevations. An internal inspection will be essential to provide detailed commentary on the condition of the existing structural elements forming the roof.

4.3.2 The lamella roof structure below the rooflight was visible through high level openings in both the north and south elevations (photo C4). The distance between the inspector and the structural elements prevents detailed comments being made on the condition of this although it was noted that guano could be seen on the members.

4.3.3 A small section of ground floor of the building was visible through a partial opening in the north elevation however debris, including shards of glass, obscure the surface of this and no meaningful observations can be made.

## 4.4 Commentary on internal photographs provided by client

4.4.1 Three internal photographs have been provided by the client taken by Phil Copleston on the 16th June 2005 which we understand is shortly after the brewery site's closure in 2004. These images will be reviewed and discussed individually.

4.4.2 Photo 1 Captioned "Interior – rear of front wall". This shows the distinct high level circular window on the north elevation. It also shows a single storey high block built just inside the building, the opposite side of which is now visible through the main opening in the north elevation. The gable posts which can be seen in the photograph of the building under construction from the briefing document can be seen projecting from the internal face of the wall forming the north elevation.

4.4.3 Photo 2 Captioned "Interior – roof construction detail and light well ('clerestory')". The soffit of the Lamella roof structure appears to be boarded to both sides with the exception of the area below the rooflight. The rooflight and circular window both appear to be intact at the time the image was captured. The lamella roof structure is visible and zooming in to the image reveals:

- The lamella sections appear to be formed in steel and have a c-section profile with stiffening ribs.
- No notable signs of corrosion are visible however, this is representative of the condition at the point in time which the photo was taken and not the current condition of the roof structure.
- The joint details are visible but the type and position of fixings is unfortunately not. Understanding this will be essential to assess the viability of deconstruction of the building and re-erection at an alternate site.

4.4.4 Photo 3 Captioned "Internal - tiled floor, visible at side entrance and elsewhere (partially covered by tarmac flooring)". This shows an area of the floor finish which unfortunately does not provide any information on the construction or condition of the ground floor structure below although the caption insinuates that the floor may have been tarmacked in some areas.

# 5.0 WINKLOW HOUSE - CONCLUSIONS AND RECOMMENDATIONS

5.1 The inspection was significantly limited by being restricted to outside of the fenced perimeter only so the conclusions and recommendations we can provide are unfortunately also restricted. Whilst there are no signs that the Lamella roof structure is distressed based on the profile of the roof cladding, this provides a very limited insight into its condition and, with the Lamella sections being formed from relatively thin steel plate (literature suggests 3mm to 6mm), corrosion could easily led to significant section loss which may have rendered the structure capable of supporting the cladding weight but not significant snow or wind loads.

5.2 Based on the inspection, the following works should be expected in order to bring the building structure back into serviceable condition. This list is not exhaustive and further items (particularly with respect to the Lamella roof structure) will need to be added in the future.

1. Open up all lintels to determine their condition. Based on the extent of corrosion and the failure observed on the south elevation, an allowance should be made at this stage to replace all lintels in the north and south elevations with new precast concrete lintels.

2. Crack stitching using a proprietary stainless steel system (Helifix or similar) will be required at all crack locations prior to raking out and re-filling the cracks themselves.

3. If required as a result of a wall tie survey (see 5.3.7) provide remedial ties to secure the two blockwork leaves together.

4. The surface water from the roofs of the building should be collected using new rainwater goods and carried to an appropriate sustainable surface water drainage system.

5. Infill the notches in the north elevation where flat roof joists were previously built in to prevent further water ingress into the cavity of the cavity walling.

6. Infill open door / window openings to prevent ongoing weather ingress.

7. Re-build the top section of the chimney to address the vertical cracking observed.

8. Repair or replace the roof sheeting. Whilst outside of our area of expertise as structural engineers, given the age and condition of the roof sheeting and potential for this to contain asbestos, replacement may represent a better long term solution. The weight of the roof sheeting should be no greater than the existing to avoid application of additional loads to the existing roof structure. The same applies to any ceiling and services installed within the building. Should this be un-avoidable, the residual capacity of the roof structure would need to be assessed by structural analysis.

9. The ground floor structure could not be inspected however it is considered unlikely that any slab present will include adequate damp-proofing, radon protection or insulation to meet the current Building Regulations and it should be assumed that a new floor slab will be required.

Note that, a flood risk assessment will also be required as a part of any planning permission due to the site's location in the Camborne, Pool, Illogan and Redruth critical drainage area. We are aware, from experience on other nearby sites, that the area may be susceptible to flooding and this will require detailed review as the project progresses.

5.3 The following additional survey / inspection works will be necessary to fully understand the scope of works required to bring the building back into use:

1. Remove vegetation around and on the building to permit a full visual inspection to be undertaken.

2. Carry out a visual inspection of the inside of the building following an appropriate risk assessment process. This inspection will provide an initial indication of any corrosion present. Ideally, this would include the use of a Mobile Elevated Work Platform (MEWP) to gain access to the higher areas of the roof. Ideally the soffit cladding / ceiling would be removed prior to this inspection subject to findings of the asbestos survey (see item 5.3.3). This will allow a full inspection to be undertaken particularly at the interface between the roof construction and the foundations where moisture is likely to have accumulated and the risk of corrosion is therefore higher.

3. An asbestos survey should be undertaken by a suitably qualified business. This should include, but not be limited to, the roof sheeting and the ceiling / soffit cladding to the Lamella roof structure.

4. Investigate the foundation details of the building through trial pitting to determine whether the horizontal thrust from the arch is being carried by the foundations or resisted by tie rods in / below the ground floor structure. In the case of the latter an investigation into the condition of the tie rods will be required as failure could result in a collapse of the roof structure.

5. Remove render at all crack locations to determine whether these extend into the blockwork and allow remedial details to be developed.

6. Carry out mundic testing on a representative sample of concrete taken from all blockwork walls and slabs (including the flat roof adjacent to the north elevation) which are proposed to be retained. This should be carried out by an appropriately qualified specialist.

7. Carry out a wall tie survey to all cavity masonry walling to determine the type, condition and density of the wall ties securing the two leaves together. Also investigate the connection between the masonry walling to the north and south elevation and the embedded steel members installed as part of the Lamella roof structure to check the integrity of this connection.

8. A mining investigation should be carried out to identify the risk to the site from past metalliferous mining in the area.

9. Should any new build elements be proposed as part of any scheme, a ground investigation should be carried out to identify the extent of contamination on the site and the parameters for design of the new foundations.

5.4 With limited information known about the condition of the elements forming the roof structure and the connections between these elements, the input we can provide on the suitability of the building for disassembly and re-erection at an alternate site is limited. However, the following items will need to be considered as part of any scheme which involves this:

1. The fixings between Lamellas may have seized over time and it may not be possible to remove these using similar tools to those used to install them. Any alternate method of removal will need to ensure that the works do not damage the Lamellas which, given that they are formed in relatively thin plate, are relatively fragile and therefore susceptible to damage.

2. A safe strategy for disassembly would need to be developed which ensures the stability of the roof structure as elements are removed. The literature regarding the system seems to suggest that these were erected without extensive temporary works however, the viability of disassembly without temporary support would require careful consideration of the condition of all elements of the roof structure (including the foundations) which may have changed over time as well as modern health and safety requirements.

3. The connection between the roof structure and the foundations would need to be fully understood and a similar detail provided at a new location. The new foundation would need to be capable of resisting the lateral thrust from the arched roof structure.

5.5 Our main concern in the short term is that the weather tightness of the building envelope has been compromised and this could result in accelerated corrosion of the internal structure. As a priority, it is recommended that the areas that are allowing water into the building are covered with temporary boarding / sheeting to limit this. These works would be subject to appropriate permissions being in place with the building owner.

Signed.....Dated: 04th May 2022

MATT HUMPHREY MEng (hons) CEng MIStructE
FOR AND ON BEHALF OF
MBA CONSULTING

# APPENDIX A

MBA Survey Drawings

# REPORT

ISO 9001 REGISTERED FIRM

## NOTES

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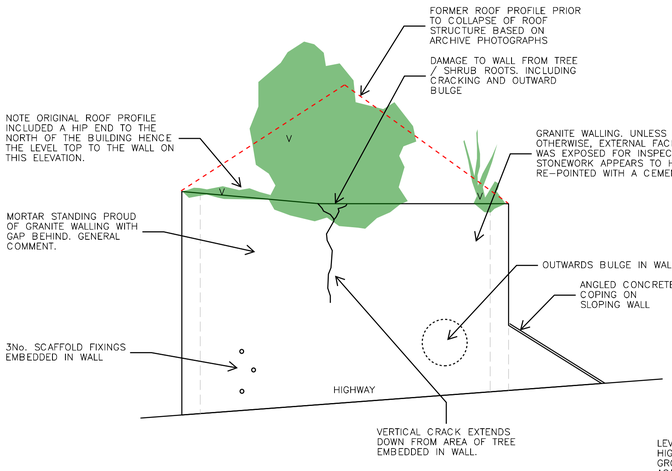
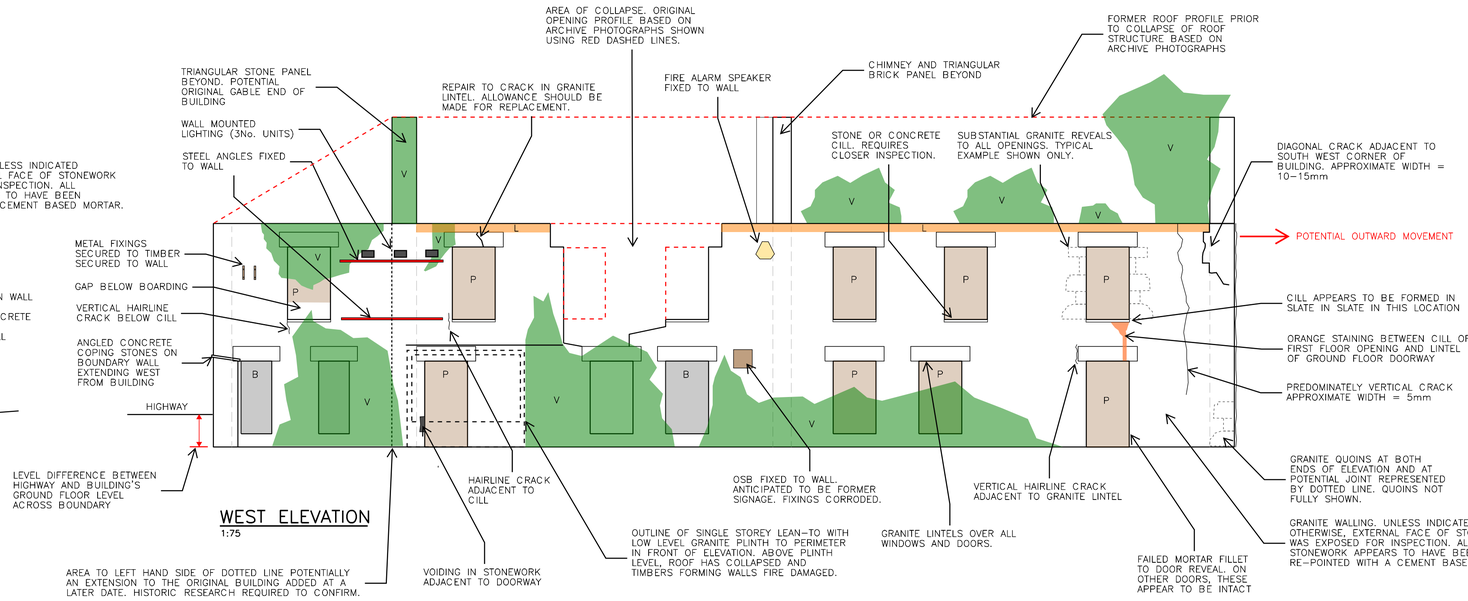



NORTH ELEVATION
1:75




WEST ELEVATION
1:75

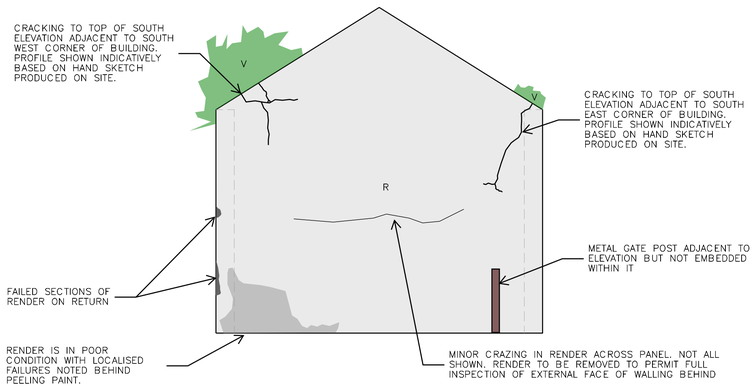
## NOTES

ALL CRACK WIDTHS GIVEN ARE ESTIMATES BASED ON VISUAL APPROXIMATION DUE TO LACK OF ACCESS TO MEASURE THESE. FURTHER INVESTIGATION REQUIRED ONCE ACCESS IS GRANTED.

DRAWING TO BE READ IN CONJUNCTION WITH MBA REPORT 21294R1 FOR CLARITY.

## KEY

| | |
|---|---|
| L | LOOSE STONEWORK TO TOP 200-300mm OF WALL DUE TO MOISTURE INGRESS AND VEGETATION GROWTH. |
| V | VEGETATION EITHER DIRECTLY IN FRONT OF ELEVATION OR GROWING FROM ELEVATION OBSCURRING VISUAL INSPECTION OF WALL FACE - SEE PHOTOGRAPHS. |
| B | FORMER OPENING INFILLED WITH BLOCKWORK. |
| P | FORMER OPENING INFILLED WITH PLYWOOD BOARDING. |
| R | RENDERED / PLASTERED FINISH OBSCURRING STONE WALL BEHIND. |




SOUTH ELEVATION
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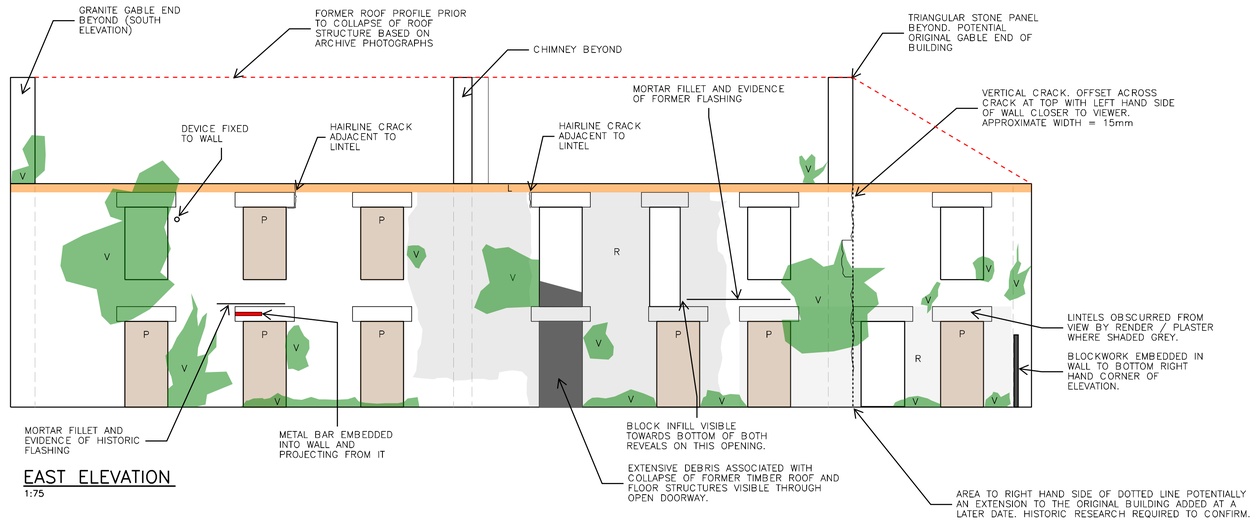


EAST ELEVATION
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| | DATE | REVISION SUMMARY | BY | CHK |
|---|---|---|---|---|
| A | 04.05.22 | REPORT ISSUE | MJH | CCO |

JOB TITLE:
CHYMBLA HOUSE
VISUAL APPRAISAL SURVEY

CLIENT:
REDRUTH TOWN COUNCIL

DETAIL:
SURVEY NOTES
ELEVATIONS

DRN. BY: A. ASHMAN

DATE: APRIL 2022 SCALE: 1:75

| JOB NO: | DRAWING No: | REV: |
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# REPORT

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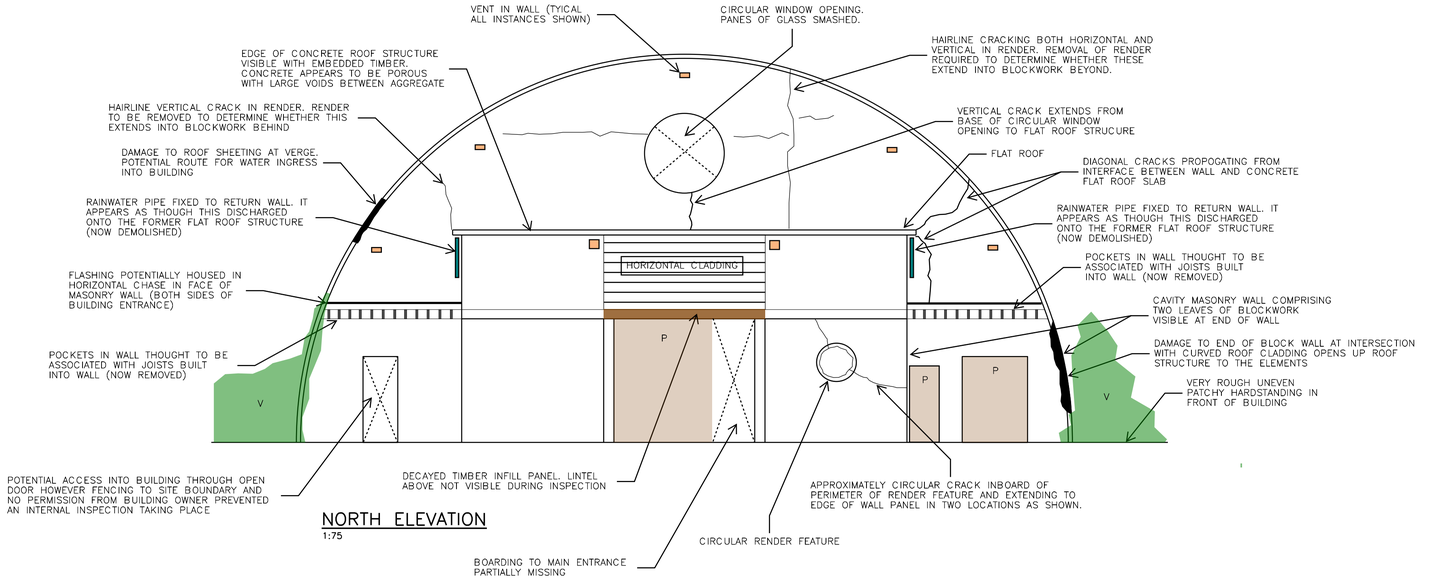


NORTH ELEVATION
1:75

## NOTES

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N.B. TIMBER WINDOW FRAME DETAILS NOT SHOWN ON SKETCH.

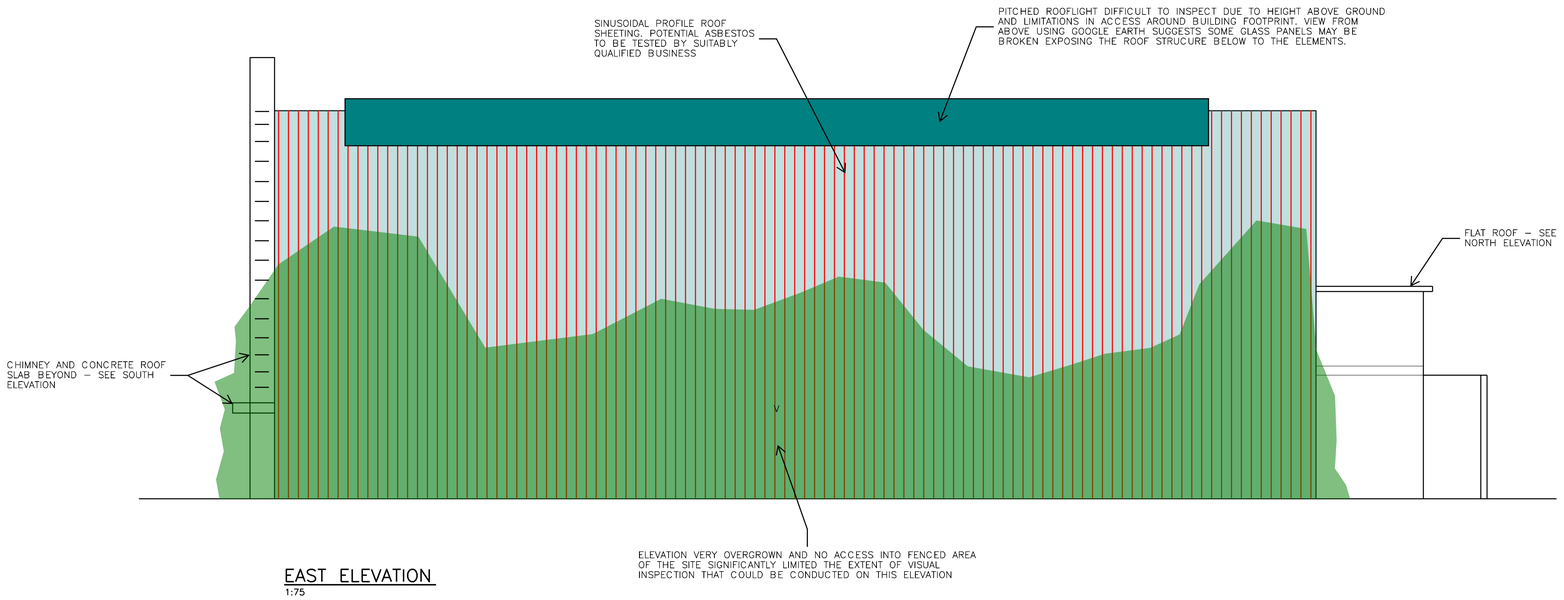
DRAWING TO BE READ IN CONJUNCTION WITH MBA REPORT 21294R1 FOR CLARITY.

## KEY

V VEGETATION EITHER DIRECTLY IN FRONT OF ELEVATION OR GROWING FROM ELEVATION OBSCURRING VISUAL INSPECTION OF WALL FACE – SEE PHOTOGRAPHS.

P FORMER OPENING INFILLED WITH PLYWOOD BOARDING.

R RENDERED / PLASTERED FINISH OBSCURRING STONE WALL BEHIND.




EAST ELEVATION
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| | DATE | REVISION SUMMARY | BY | CHK |
|---|---|---|---|---|
| A | 04.05.22 | REPORT ISSUE | MJH | CCO |

JOB TITLE:
WINKLOW HOUSE
VISUAL APPRAISAL SURVEY

CLIENT:
REDRUTH TOWN COUNCIL

DETAIL:
SURVEY NOTES
ELEVATIONS

DRN. BY: A. ASHMAN

DATE: APRIL 2022 SCALE: 1:75

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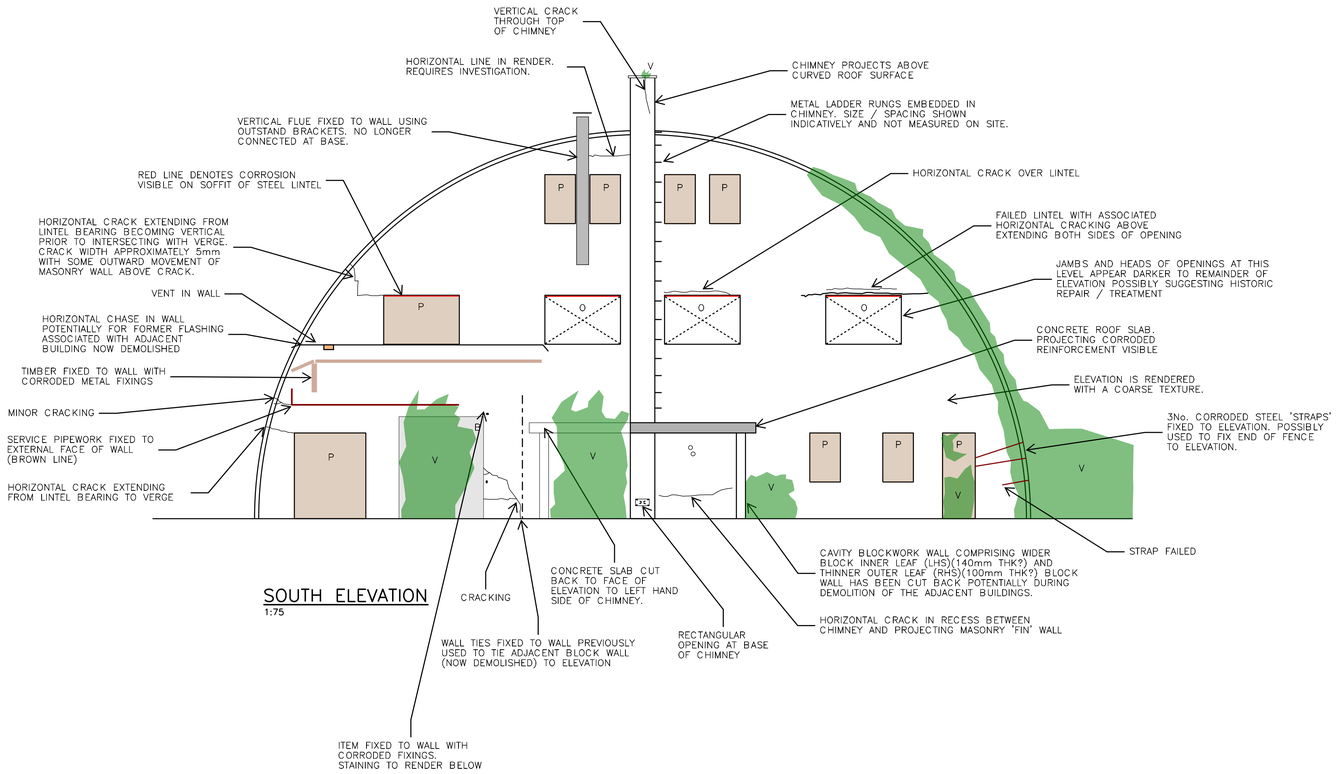


## SOUTH ELEVATION
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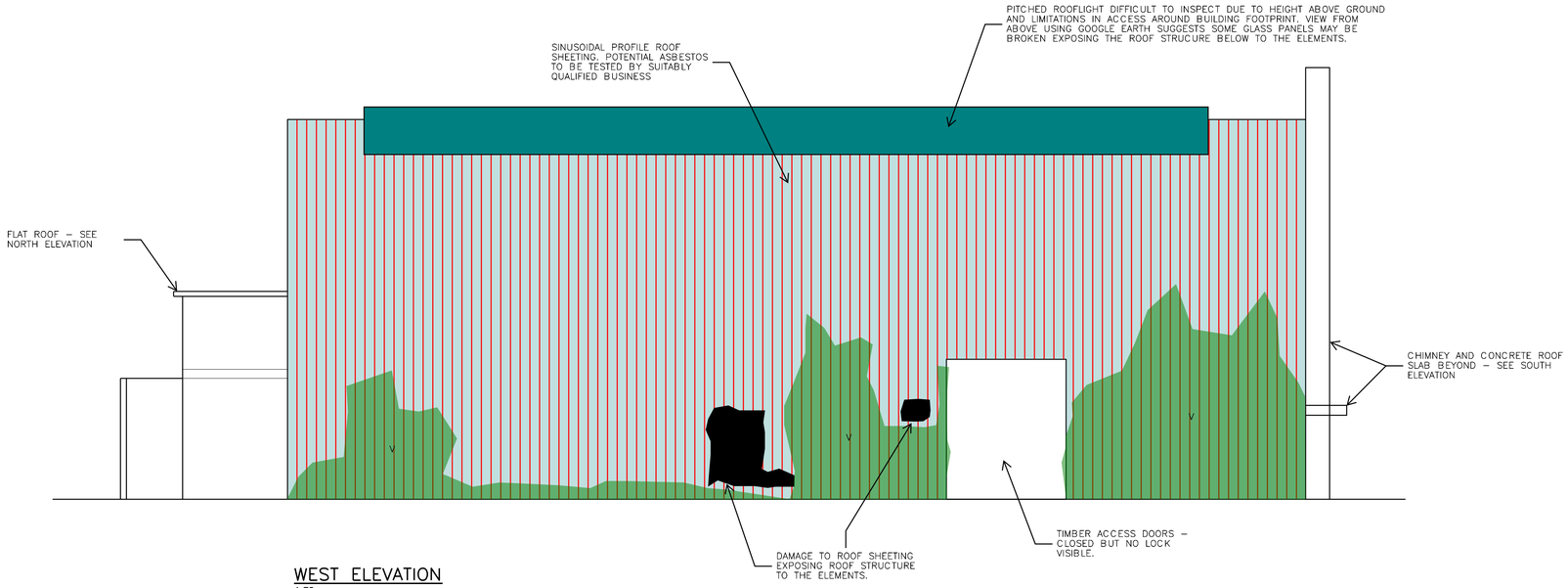


## WEST ELEVATION
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## KEY

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B FORMER OPENING INFILLED WITH BLOCKWORK.

P FORMER OPENING INFILLED WITH PLYWOOD BOARDING.

R RENDERED / PLASTERED FINISH OBSCURRING STONE WALL BEHIND.

O OPEN DUE TO WINDOWS BEING BROKEN. SOME GLASS FRAGMENTS INTACT.

| | DATE | REVISION SUMMARY | BY | CHK |
|---|---|---|---|---|
| A | 04.05.22 | REPORT ISSUE | MJH | CCO |

JOB TITLE:
**WINKLOW HOUSE**
**VISUAL APPRAISAL SURVEY**

CLIENT:
REDRUTH TOWN COUNCIL

DETAIL:
SURVEY NOTES
ELEVATIONS

DRN. BY: A. ASHMAN

DATE: APRIL 2022 SCALE: 1:100

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# APPENDIX B

MBA Photographic Plates – Chymbla House

1. North elevation.

2. Angled concrete coping on boundary wall extending from north west corner of building.

3. Damage to stonework on north elevation.

4. Fixings embedded in the north elevation potentially from previous scaffold installation but checks required to ensure these are not securing the stonework.

5. Gapping between mortar and stonework on north elevation.

6. North east corner of building. Blockwork infill and loose stonework.

7. East elevation View 1.

8. East elevation View 2.

9. Vertical crack and loose stonework to top of wall.

10. Vertical crack extends into render at ground floor level.

11. Vegetation growing from wall.

12. Block reveals to first floor doorway.  Former internal area.

13. View into inside of building showing charred rubble.

14. Crack to left hand end of first floor lintel.  Walling obscured by plaster / render.

15. Loose stonework to top of wall on east elevation. Embedded metal to left hand end of ground floor lintel.

16. Vegetation obscuring window opening on east elevation.

17. South elevation (right of frame).

18. Cracking on south elevation adjacent to south east corner.

19. Minor crazing to render. Investigation required to determine whether this extends into the stonework beyond.

20. Cracking to top of wall adjacent to the south west corner of building.

21. West elevation.

22. Cracking on west elevation adjacent to the south west corner. Note gapping between render on south elevation and wall.

23. Cracking to left hand end of lintel over ground floor doorway and staining on stonework between the first floor and ground floor openings.

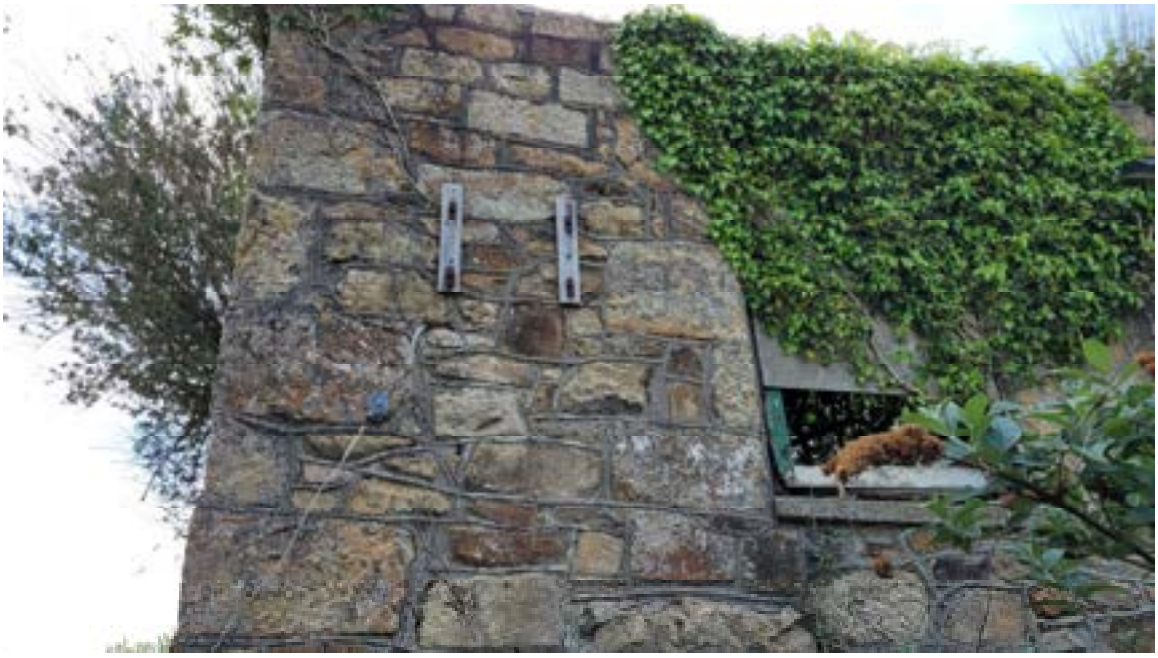
24. Southern end of west elevation.

25. Collapsed section of first floor walling approximately halfway along west elevation.

26. Fire damaged single storey lean-to with granite plinth.

27. Loose stonework at top of the wall and metal angles fixed to the wall. Potential failure and past repair to granite lintel.

28. Minor cracking in mortar below cill. Ground floor window opening blocked up towards bottom of frame.



29. Timber and metal fixings secured to wall. Window opening partially obscured by vegetation to right hand side of frame.

30. View on chimney showing brick panel and loose stonework to top of chimney.

31. View of internal gable towards north end of building showing brick top to gable.

32. Close up view on lintel showing granite external lintel and charred timber internal lintel behind.

# APPENDIX C

MBA Photographic Plates - Winklow House

1. North elevation.

2. Partially demolished cavity wall in foreground.


3. Pockets in wall where joists in wall appear to have been previously built in.


4. View on circular window opening showing vertical crack below. Note concrete roof slab below.


5. False timber panel above entrance with significant decay. Lintel not visible.

6. Evidence of joists previously built into wall and diagonal becoming vertical crack to left hand side of flat roof slab.

7. East elevation obscured by vegetation.

8. East elevation in background showing damage to roof lights to top of barrel vault roof.

9. East elevation – significant vegetation restricted visual inspection.

10. South elevation.

11. Metal strapping secured to wall on south east corner of building.

12. Failed lintel due to corrosion.

13. Concrete roof slab adjacent to chimney.

14. Corrosion to lintel soffit on middle band of window openings.

15. Metal ladder rungs embedded into chimney.

16. Vertical crack to top of chimney below vegetation.

17. Minor horizontal cracking to render to right hand side of chimney on south elevation.

18. Concrete slab cut back to face of elevation. Possibly during demolition of the other buildings on the site.

19. Degradation of concrete slab adjacent to chimney.

20. Opening infilled with blockwork at ground floor level on the south elevation. Note minor horizontal crack to left hand side at lintel bearing.

21. Degradation of roof sheeting on verge. Horizontal crack propagating from lintel bearing becoming vertical. Timber and metal pipework fixed to wall. Note chase in wall above these.

22. Minor horizontal crack propagating from ground floor opening adjacent lintel to south west corner of building on south elevation.

23. Damage to roof sheeting on south west corner of building.

24. West elevation overview.

25. West elevation looking north.

26. West elevation access door.