



**WHINBARROW DESIGN
SERVICES LIMITED**
CIVIL & STRUCTURAL
ENGINEERS

**Whinbarrow House
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VISUAL STRUCTURAL INSPECTION

OF THE

**FARM HOUSE & BARN BUILDINGS
HIGH LING BANK
Nr EGREMONT
CUMBRIA**

FOR

GVA

Reference - WDS/05/4233/REP01

Date - 29/03/2019

1.0 BRIEF

- 1.1** WDS Limited were instructed by GVA to carry out a structural inspection of the Farmhouse, attached Barn Building, Coach House and Outbuildings at High Ling Bank, near Egremont. The survey was limited to a non-disruptive visual structural inspection of the various buildings where access allowed.
- 1.2** The farmhouse comprises random stone masonry walls which support the slated traditional purlin/truss roof structure and the first floor joists. The ground floor comprises ground bearing slabs. To the rear of the property is a modern lean-to UPVC conservatory. The barn is formed in similar masonry to the farmhouse which supports a slated timber purlin and king post truss roof structure. There are two outbuildings adjacent to the farmhouse; a coach house off the left hand gable of the house and some general outbuildings opposite the house which bound the courtyard; these buildings are of similar construction to the main house and barn
- 1.3** The buildings are all of similar age and are over 100 years old.
- 1.4** The inspection was carried out on the 4th March 2019. On the day of the inspection the weather was overcast but dry.
- 1.5** It should be noted that there may be faults with the building which are masked or hidden by finishes that are not normally identified during a non disruptive inspection.
- 1.6** The foundations to the buildings were not exposed at the time of this inspection therefore no comment can be made as to their condition at this time.
- 1.7** For the purposes of this report all locations will be referenced as if looking at the front elevation, that is the elevation facing the courtyard.

2.0 OBSERVATIONS

- 2.1** The roof to the barn undulates excessively. This is due to creep of the timber purlins which is common in buildings of this type and age. There is some evidence of infestation to the timber elements although not significant. A small area of roof has fell in to the front face of the barn, this appears due to impact damage rather than any structural defect. The rafters adjacent to this area have been affected by water ingress and are rotten.
- 2.2** The arch to the front elevation of the barn is distorted and the keystone has dropped slightly. There is an outward bow to the rear wall of the barn, separation cracking is apparent where the internal wall meets the rear elevation. The timber lintel over the internal doorway in the brick wall has deflected excessively and needs replaced.
- 2.3** The right hand gable end wall to the farmhouse is excessively weathered and appears to bow outwards, significant cracking is also apparent in various locations, the masonry also appears to have lost its cohesion. Internally there is no evidence of structural movement. It appears that the outer face of stone has de-bonded from the inner; the rubble fill has probably slumped and caused the outward bulging apparent. The wall to the right hand end of the front elevation is in a similar condition to the gable.
- 2.4** The rear wall of the farmhouse is significantly out of plumb above the conservatory. Significant cracking is not apparent which suggests the masonry has been like this for some time.
- 2.5** The timber roof purlins to the farmhouse have suffered creep which has resulted in the slate finish undulating.
- 2.6** Trees and large bushes are growing within 3m of the right hand gable of the farmhouse, their roots may affect the buildings footings in the future.
- 2.7** There is a crack in the party wall between the house and barn toward the front portion of the wall. The crack extends above first floor level. It appears due to the outward movement of the barn front wall.
- 2.8** Separation cracking is apparent at the rear left hand corner of the coach house. The masonry arches above the main doors have suffered movement. The keystones need reseated.

2.9 The canopy structure to the rear of the coach house is in a poor condition. The timber lintels are rotten as are the rafter ends over. In addition the pillar supports to the lintels are structurally inadequate and need replaced with a suitably designed structure.

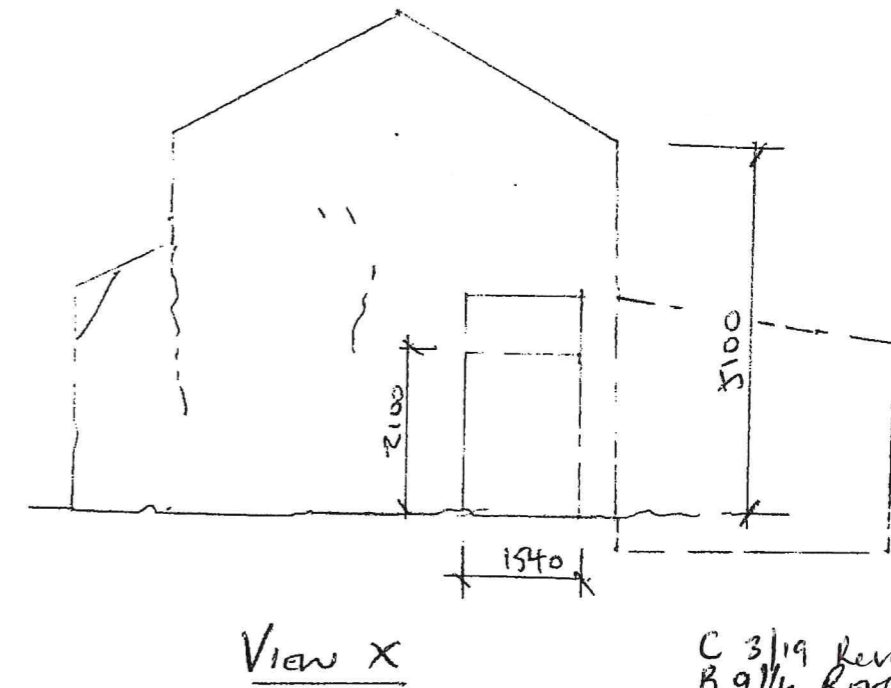
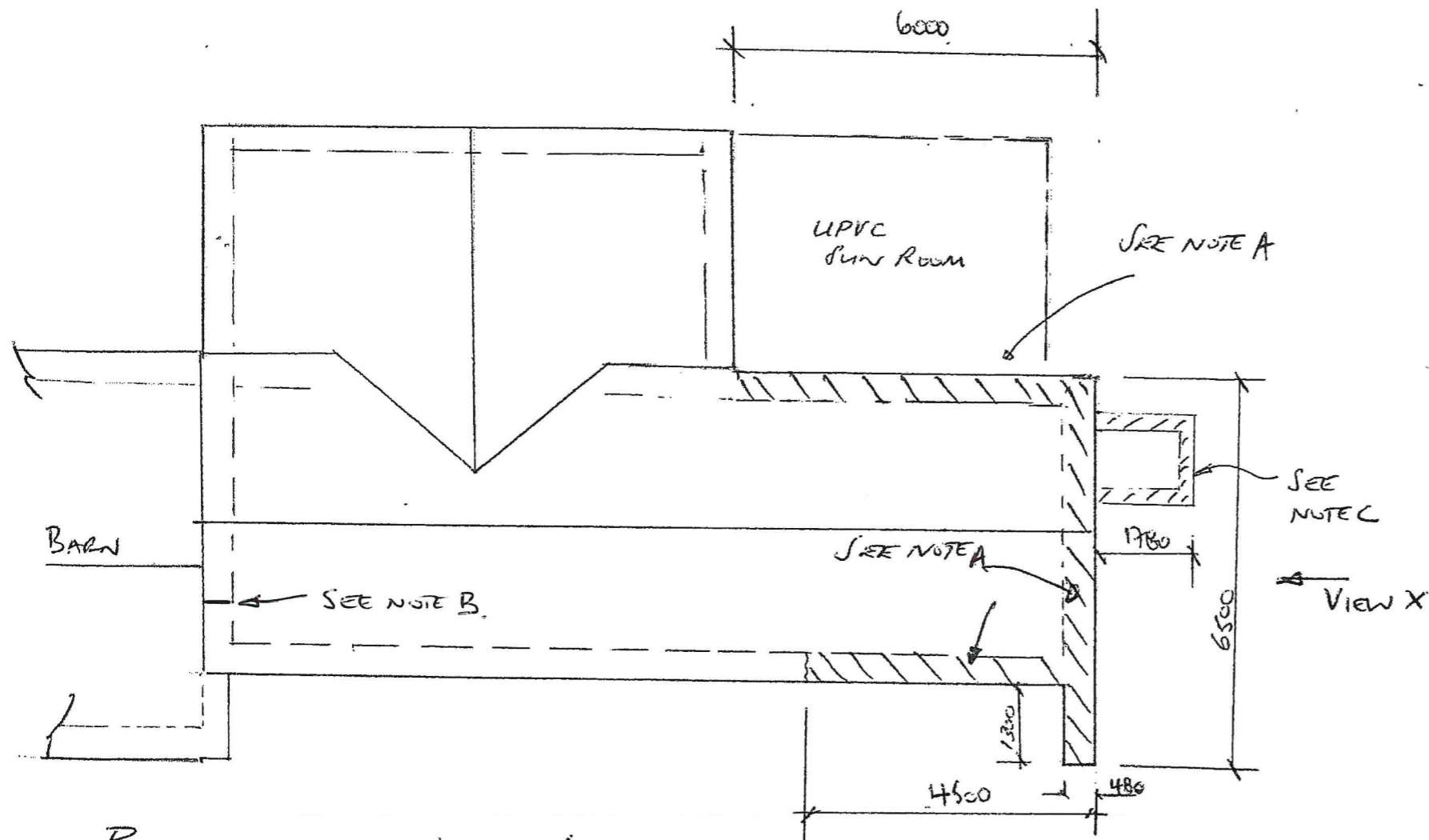
2.10 Separation cracking is evident in the left hand gable and internal walls of the outbuildings which suggest the building has suffered structural movement. It is likely that the movement is historic. The masonry to the building is heavily weathered. In addition there is a sandstone post which supports the front portion of the roof to the left hand bay to the building. The post is out of plumb and appears to have been undermined, the post is structurally inadequate. The roof timber have some infestation and are affected by damp in areas.

3.0 DISCUSSION/RECOMMENDATIONS

3.1 Due to the size of the property and numerous buildings I have captured our proposed recommendations on the attached 4 sketches. In summary however the property is generally in a poor condition and in needs of significant remedial measures.

For and on behalf of WDS Limited

Tom Short BEng (Hons) CEng MICE



PLAN ON MAIN HOUSE (1:100 @ A3)

SPECIFICATION

NOTE A

TAKE DOWN GABLE AND WALLS AS INDICATED ON THE PLAN AND REBUILD IN 7N/mm² CONCRETE BLOCK 440mm WIDE TO SUIT EXISTING WALL WIDTH. WALL TO COMPRISE 215mm INNER LEAF 100mm INSULATED CAVITY AND 100 BLOCK OUTER LEAF. CAVITY TIES PROVIDED AT 450v AND 700h CENTRES. FULLY BUILD INTO THE REMAINING WALLS. WALL TO BE BUILT OFF A 750x225mm DEEP MASS CONCRETE STRIP FOOTING CAST 1500mm BELOW EXISTING GROUND LEVEL TO SUIT BUILDING NEAR TREES REQUIREMENTS. FRONT BUTTRESS IS NOT REQUIRED HOWEVER IF TO BE REBUILT TO BE FORMED IN 215mm THICK CONCRETE BLOCKWORK. FORMATION TO FOUNDATIONS TO BE APPROVED ON SITE.

EXPAMET TO BE FIXED TO WALL ACROSS INTERFACE BETWEEN NEW AND EXISTING MASONRY PRIOR TO RENDERING.

INTERNAL ROOF AND FIRST FLOOR TO BE FULLY PROPPED PRIOR TO REMOVING THE EXISTING WALLS.

ROOF STRUCTURE TO BE PROVIDED WITH TEMPORARY SUPPORT PRIOR TO DEMOLITION WORKS COMMENCING. UPVC SUN ROOM TO BE PROPPED AND REFITTED ONCE WALL BUILT WITH AN INTEGRAL CAVITY TRAY AND FLASHING AT THE INTERFACE BETWEEN THE NEW WALL AND CONSERVATORY ROOF.

NOTE B

TIE CRACK IN GABLE END BY INSTALLING 750mm LONG SPANLITE LINTELS INTO THE WALL ACROSS THE CRACK LOCATION AT 600mm VERTICAL CENTRES. THE CRACK SHOULD BE THEN BE FILLED WITH A SAND/CEMENT MORTAR. EXPAMET SHOULD BE FITTED TO THE WALL FACE ACROSS THE CRACK LOCATION PRIOR TO REAPPLYING RENDER OR PLASTER.

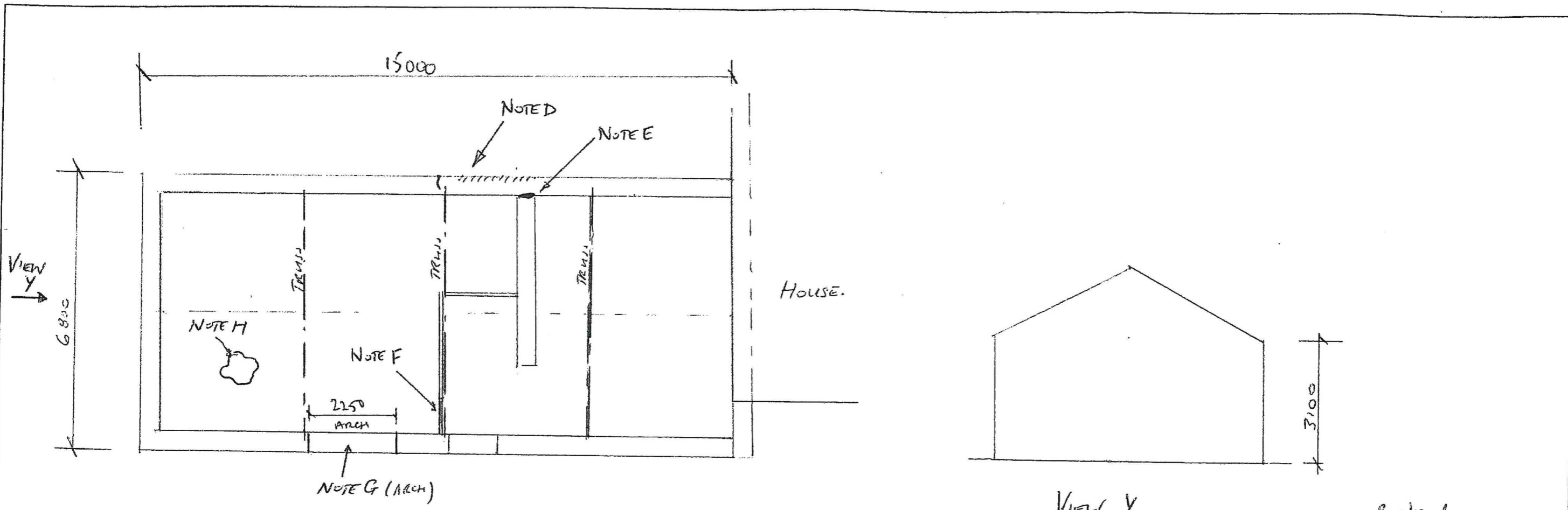
NOTE C

UNUSED OUT BUILDING TO BE DEMOLISHED AND THE REQUIREMENT TO REBUILD CONFIRMED WITH THE BUILDING OWNER. IF REBUILDING REQUIRED FORM IN CONCRETE BLOCK, 100mm THICK, FULLY TIED INTO THE NEW GABLE WALL AND BUILT OFF 450x150 DEEP CONCRETE STRIP FOOTINGS CAST HOMOGENEOUS WITH THE GABLE FOUNDATION. ROOF TO BE REPLACED LIKE FOR LIKE

C 3/19 REVISED
B 9/16 REVISED
A 8/16 FIRST ISSUE

Rev	Date	Description	DR	CR		
WDS LTD						
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Tel/Fax: 016973 21984 Mob: 07803 943 248						
Client GVA Bilfinger						
Job Title HIGH LINE BANK CALDER BRIDGE CUMBRIA						
Drawing Title MAIN HOUSE STRUCTURAL REMEDIAL SCOPE						
Status INFORMATION						
Scale AS SHOWN						
Date AUG 16						
Drawn By T-SHORT						
Checked Approval						
<table border="1" style="width: 100%;"> <tr> <td>Proj. No. 05-4415-100</td> <td>Rev C</td> </tr> </table>					Proj. No. 05-4415-100	Rev C
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A3 ORIGINAL




PLAN ON BARN (1:100 @ A3)

View Y

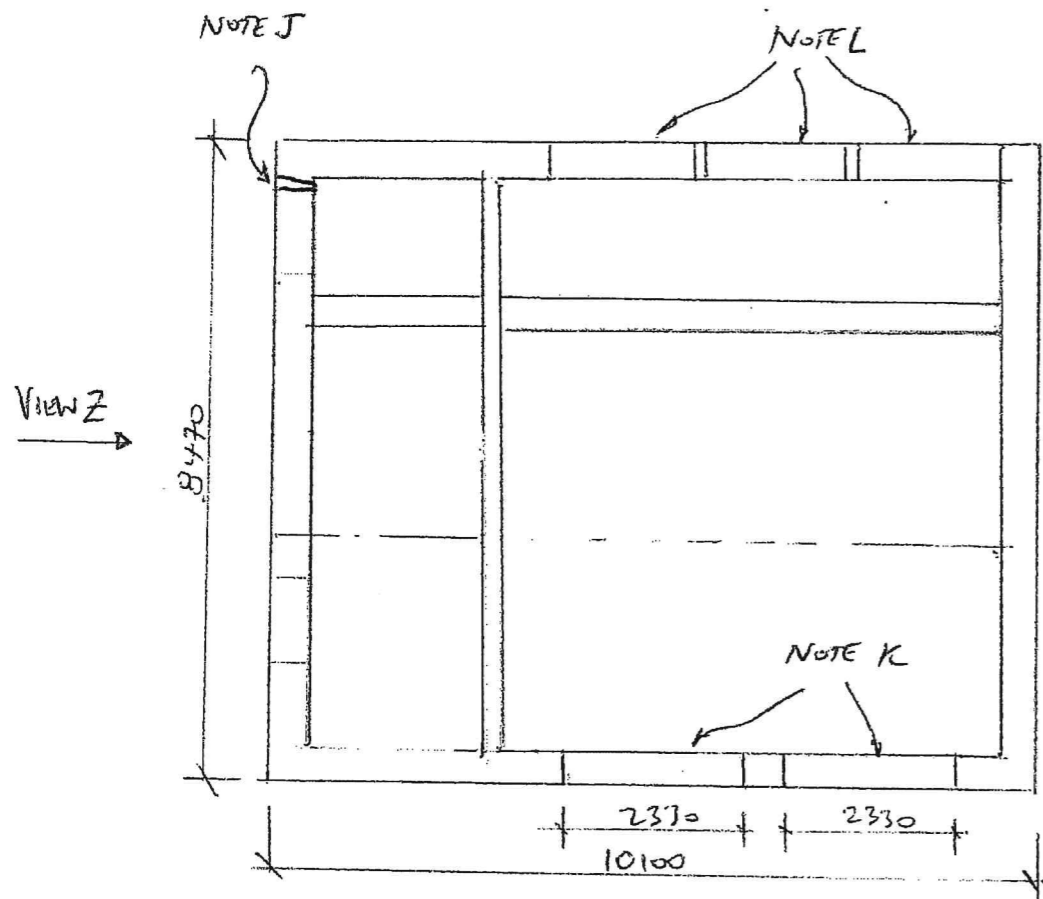
SPECIFICATION

- NOTE D**
 REAR ELEVATION HEAVILY WEATHERED, MASONRY APPEARS LOOSE. REINSTATE LOOSE STONEMWORK AND POINT (APPROXIMATE 10m2 AREA). TIE VERTICAL CRACK IN REAR ELEVATION USING 750mm LONG SPANLITE LINTELS BUILT INTO WALL AT 450mm VERTICAL CENTRES AND FILL CRACK WITH SAND/CEMENT. ALTERNATIVELY USE HELIFIX Lid CRACK STITCHING SYSTEM.
 GENERALLY EXTERNAL BARN ELEVATIONS NEED REPOINTED.
- NOTE E**
 RE-TIE INTERNAL WALL TO REAR WALL USING SIMILAR STITCHING TECHNIQUE AS NOTED ABOVE, REQUIRED OVER FULL HEIGHT OF WALL.
- NOTE F**
 REPLACE TIMBER LINTEL OVER INTERNAL BRICK WALL WITH A 150x100 ACP Lid PSL2 LINTEL WITH 150mm BEARING AT EACH END. LOCALLY REBUILD BRICKWORK ABOVE.
- NOTE G**
 ARCH KEYSTONES NEED RE-FITTED AND PACKED. REMOVE MASONRY UP TO EAVES (PROP ROOF) AND REINSTATE ARCH OVER TEMPORARY CENTERING AND REBUILD WALL OVER. STRIKE CENTERING 7 DAYS AFTER WALL IS REINSTATED. ALTERNATIVELY REPLACE ARCH WITH A TRADITIONAL CONCRETE LINTEL SYSTEM COMPRISING 4No 215x100 ACP Lid PSL 4 LINTEL (TO SUIT WALL WIDTH) GIVEN 150mm END BEARING.
- NOTE H**
 ROOF LATS NEED REPLACED WHERE ROTTEN. FULL ROOF TIMBERS NEED INSPECTED BY A TIMBER SPECIALIST TO CONFIRM CONDITION. WHERE NECESSARY RAFTERS SHOULD BE REPLACED IN A LIKE OF LIKE FASHION, PURLINS SHOULD BE REPLACED WITH 225x100 C16 TREATED TIMBERS AT SAME CENTRES AS THE EXISTING LAPPED AND FIXED OVER THE TRUSSES.
- FIRST FLOOR**
 NO ACCESS WAS MADE ONTO THE FIRST FLOOR AS THE TENANT ADVISED THE FLOOR WAS UNSAFE. FLOOR SHOULD BE REMOVED AS PART OF THE REFURBISHMENT SCHEME IF NOT REQUIRED.

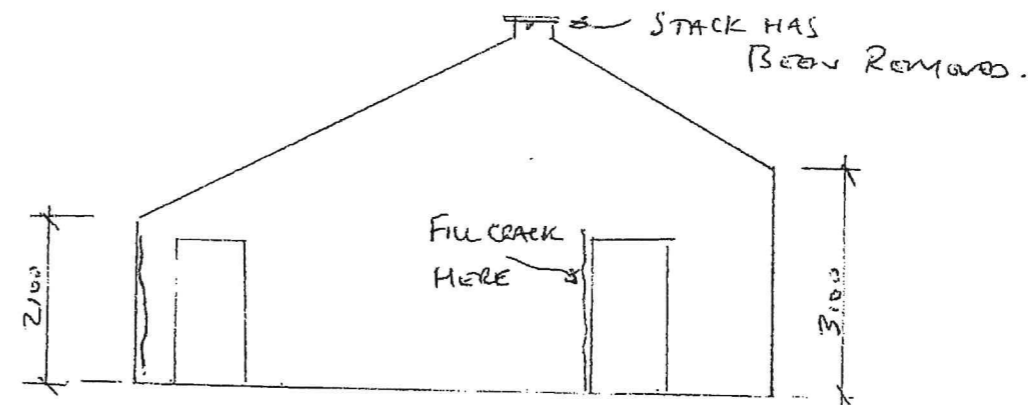
B 2/19 Revised
 A 8/16 FIRST ISSUE

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Client: GVA Bilfinger				
Job Title: HIGH LING BANK CALDER BRIDGE CUMBRIA				
Drawing Title: MAIN BARN STRUCTURAL REMEDIAL SCOPE				
Status: INFORMATION				
Scale:	AS SHOWN	Date:	AUG 16	
Drawn By:	T. SHORT	Checked:	Approved:	
Org. No.:	05-4415-101	Rev.:	B	

A3 ORIGINAL.



PLAN ON COACH HOUSE (1:100 @ A3)



VIEW Z

SPECIFICATION

NOTE J

SEPARATION CRACK TO BE TIED AS NOTED ON SKETCH 101.

GENERALLY EXTERNAL BARN ELEVATIONS NEED REPOINTED.

NOTE K

ARCH KEYSTONES NEED RE-FITTED AND PACKED. REMOVE MASONRY UP TO EAVES (PROP ROOF) AND REINSTATE ARCH OVER TEMPORARY CENTERING AND REBUILD WALL OVER. STRIKE CENTERING 7 DAYS AFTER WALL IS REINSTATED. ALTERNATIVELY REPLACE ARCH WITH A TRADITIONAL CONCRETE LINTEL SYSTEM COMPRISING 4No 215x100 ACP Ltd PSL 4 LINTEL (TO SUIT WALL WIDTH) GIVEN 150mm END BEARING.

NOTE L

TIMBER LINTELS ROTTEN AND RAFTER ENDS OVER. AREA IS NOT USED SUGGEST REMOVING ROOF OVER BACK TO MAIN INTERNAL WALL AND REMOVE SANDSTONE MULLIONS. AT PRESENT AREA IS STRUCTURALLY UNSAFE.

FIRST FLOOR

NO ACCESS WAS POSSIBLE ONTO THE FIRST FLOOR, ROOF TO MAIN AREA OBSCURED. SUGGEST ROOF TIMBERS ARE INSPECTED BY A TIMBER SPECIALIST AND IF NECESSARY REPLACE IN A LIKE FOR LIKE FASHION.

CONSIDER REMOVING TREES AND BUSHES TO AT LEAST 5.0m AWAY FROM THE BUILDING

B3/16 Revised
A8/16 FIRST ISSUE

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STRUCTURAL
REMOVAL SCOPE

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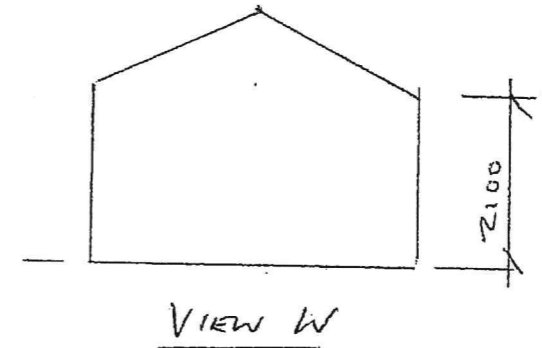
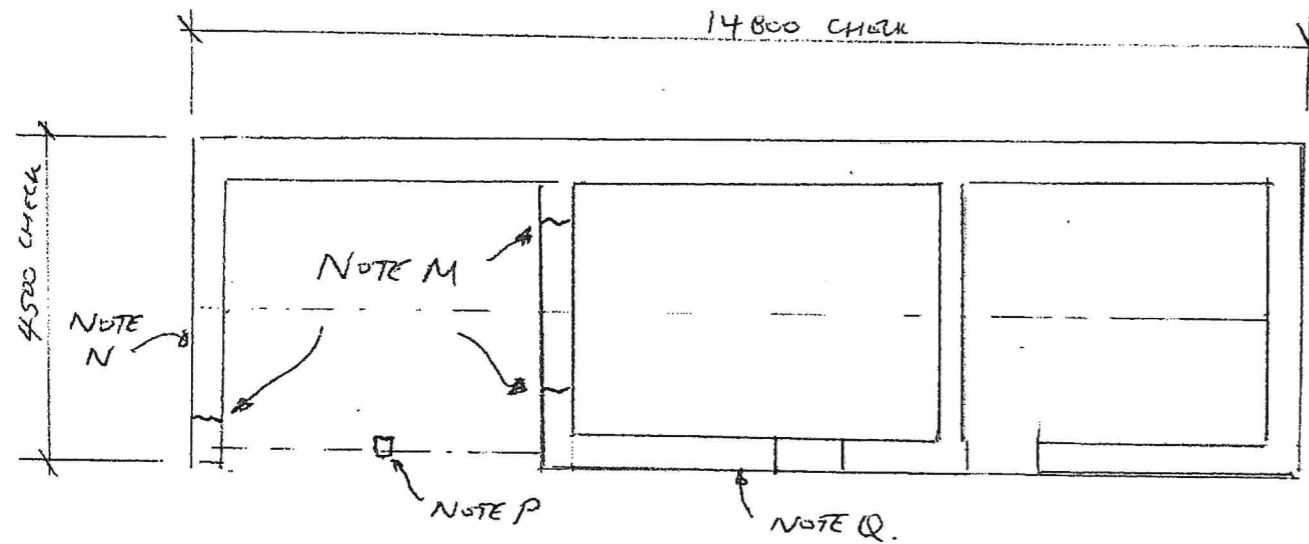
Date
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T-SHORT

Proj No
05-4415-102

Rev
B

A3 ORIGINAL




PLAN ON OUT BUILDINGS (1:100 @ A3)

SPECIFICATION

- NOTE M**
SEPARATION CRACK TO BE TIED AS NOTED ON SKETCH 101.
GENERALLY EXTERNAL ELEVATIONS NEED REPOINTED.
- NOTE N**
ELEVATION HEAVILY WEATHERED, MASONRY APPEARS LOOSE. REINSTATE LOOSE STONEMWORK AND POINT.
- NOTE P**
SANDSTONE POST ROOF SUPPORT UNDERMINED AND LEANS, THIS IS CURRENTLY STRUCTURALLY UNSAFE, PROPPING NEEDS PROVIDED. NEEDS REPLACED WITH A 325mm MASONRY PILLAR BUILT CENTRALLY OFF A 600x600x300mm DEEP MASS CONCRETE PAD FOUNDATION. LINTELS SUPPORTED TO BE STRAPPED DOWN PILLAR USING 1200mm LONG BAT STRAPS.
- NOTE Q**
MASONRY HEAVILY WEATHERED, MASONRY APPEARS LOOSE. REINSTATE LOOSE STONEMWORK AND POINT. LOWER PORTION OF WALL APPEARS TO HAVE DROPPED ADJACENT TO DRAIN SUGGEST CHECK DRAIN FOR LEAKS AND REINSTATE IF NECESSARY. LOCALLY REBUILD WALL (1.5m² AREA)
- ROOF TIMBERS TO BE INSPECTED BY A TIMBER SPECIALIST AND REPLACED IN A LIKE FOR LIKE MANNER WHERE NECESSARY.
- CONSIDER REMOVING TREES AND BUSHES TO AT LEAST 5.0m AWAY FROM THE BUILDING
- SUGGEST FULL DRAINAGE SURVEY IS CARRIED OUT FOR THE FULL PROPERTY BY UNBLOCK CUMBRIA TO TRACE ALL DRAIN RUNS AND CHECK CONDITION OF PIPES.

B31A Revised
A B16 First Issue

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Drawing Title OUT BUILDINGS				
Section INFORMATION				
Scale AS SHOWN		Date AUG 16		
Drawn By T-SHORT		Checked	Approved	
Dwg. No. 05-4415-103		Rev B		

A3 ORIGINAL.