

# 2018 GLAS Traditional Farm Buildings Grant Scheme Seminar

Hodson Bay Hotel, Athlone. Co. Roscommon  
7<sup>th</sup> March 2018

## Typical Structural Issues and Possible Solutions

Austin Dennany  
Chartered Engineer

# What is the GLAS Scheme?

- Annual grant scheme for conservation and repair of traditional farm buildings and other related structures.
- Only farmers approved in the Glas scheme can apply.
- Principle objective is to ensure that traditional farm buildings and other related structures that contribute to the character of the landscape , and are of significant heritage value, are conserved for active agricultural use.
- Apply principles of conservation and in particular, minimum intervention. I.e. Keep as much as possible and change as little as possible whilst consolidating the structure.

# Common Misconceptions

- Fear of perceived costs and perceived restrictions associated with conservation works.
- The structure shall be totally refurbished as part of the grant scheme.

# Structural Elements

- Roof
- Walls
- First Floor / Loft

# Roof Coverings

- Common roof coverings
  - Natural Slate
  - Galvanised Iron
  - Thatch

# Natural Slate Roof

- Typical Issues/Repairs:
  - Slipped slates – usually due to corrosion of nails and/or rot of battens rather than problem with slate.
  - Slipped slates can be repaired by installing lead clips or stainless steel hooks.



# Natural Slate Roof



- When 25% - 30% of slates have slipped you should consider full re-slate of roof.

# Natural Slate Roof

- Allow 25% loss when removing existing slate.
- Source new natural slate to match existing dimensions, colour and texture.
- Salvaged slate should not be used as it creates a market which may be detrimental to existing buildings.
- Take care when replacing battens as new timber battens are generally thicker than original ones. This can lead to problems at junctions with adjoining structures or barges.



# Natural Slate Roof



- Mix slate where possible to avoid large areas of a different colour.

# Natural Slate Roof



- Provide lime parging to underside of slates. This provides additional protection water ingress and also resistance to wind suction.

# Galvanised Iron Roof

- Typical Issues/Repairs
  - Corrosion of fixings – If replacing fixings, use galvanised mild steel with weather proofing washers. Take care not to damage corrugated sheets when using nail bar or hammer to remove fixings.
  - Corrosion of corrugated sheets – It is possible to significantly extend the lifespan of the corrugated sheets by cleaning, removing rust and painting with a corrosion resistant paint.





# Galvanised Iron Roof



- When roof sheeting is excessively corroded, the only solution is to replace.

# Galvanised Iron Roof



# Roof Structure

- Typical Issues/Repairs
  - Roof structures will vary but generally rafters shall span from eaves to apex and may be supported by timber purlins. The purlins will span between gable walls, internal cross-walls and/or supporting timber trusses.
  - Undulations in a roof will generally be due to undersized purlins deflecting over time and/or rot of purlin ends and/or rot of supporting Truss ends.
  - Where timber is built into a damp wall it will be susceptible to rot. This is true for all timber elements such as wall plate; rafter ends; Truss ends, etc.
  - If truss ends are rotten – rotten section should be cut out and a galvanised steel 'shoe' or similar remedial detail installed on end of truss.
  - Similarly, ends of rotten rafters should be cut out and the rafter spliced with a new treated timber rafter to extend past cut by 1 metre min.
  - As much of the existing timber should be retained as possible.



# Roof Structure



- New Timbers constructed over existing so that ceiling could be maintained.

# Roof Structure



- Original Ceiling maintained internally.



# Roof Structure



- New battens on existing timbers. Some timbers spliced.

# Walls

- Typical Issues/Repairs
  - Lean outwards in wall – This can be due to rotation at foundation level and/or horizontal thrust from roof.
  - Walls generally 450mm to 600mm thick – Rule of thumb – If in excess of one third thickness of wall out of plumb over height, action is required.
  - Lean could be historic. Perhaps monitor by fixing bracket internally to allow use of plumb line. When used outside can be inaccurate due to wind. If ongoing movement recorded identify source.
  - Rotation at foundation can be caused by undermining of wall base by excavation for drain or lowering of yard. Remove drain if undermining foundation and fill with concrete.
  - Can also be caused by rainwater discharging to ground softening earth at base of wall. – Fix rainwater goods and discharge to soak away or water course.
  - Rot of timber lintels – These should be replaced with oak or precast concrete lintels depending on spans, and agreement with Heritage Council.

# Walls



- Rotation of front wall caused by constant drip of water from roof softening ground at foundation/wall base.
- Walls can be restrained by using stainless steel ties to tie back to internal return walls and also to floor joists. Another method is to run a tension bar through the building and fix pattress plates on threaded ends on outside of front and rear walls.



# Walls



- Cracking in gable wall as result of movement of front wall

# Walls



- Stitching of crack using stainless steel twisted rods and chemical grout.



# Walls



- Cracks may no longer be opening up and can be stitched and filled.

# Walls



- Undersized rafters and lack of adequate horizontal tie shall contribute to rotation of the walls.

# Walls



- Significant rotation of rear wall. Ground conditions very poor in close proximity to Shannon River



# Walls



- Solutions considered:
  - Insufficient internal walls to 'stitch' back to.
  - Pattsess plates and steel ties would render internal of shed unusable.
  - Conservation officer was amenable to construction of concrete buttresses to halt rotation of wall.

# First Floors/Lofts

- Typical Issues/Repairs
  - Rot to ends of joists where embedded in damp walls. May be possible to cut out rot and splice floor joists if sufficient space available to seat new timber into wall. Alternatively new timber or steel wall plate can be inserted under existing joists to support.
  - Undersized joists – Existing joists may be strengthened by fixing new timber joists alongside the existing
  - Rot/infestation to floor boards - Woodworm will generally attack softer sap wood or hard wood that has been softened by moisture. Floor boards in many cases will have to be replaced. It may be possible to treat larger timber sections for woodworm.

# Conclusion

- Although these are some common problems, every structure will present its own particular issues.
- It is important to carry out a detailed inspection and understand the construction , history of the building, and cause of defects before proceeding.
- It is essential to remember that as much of the original material should be kept where possible.
- Thank you for your time and attention.