Building design and storage
Grain Stores
Introduction

• Operational considerations
• Preferred building materials
• Drying
• Ventilation
• Lighting
• Insulation
• Case Study
Operational considerations

- Siting of the building
  - Access (road & land)
  - Services availability
  - Planning issues
  - Ground conditions
- Dimensions
  - Amount of crop storage required
  - Mix of crops
  - Machinery used
Preferred Building Materials

• Concrete panel grain walling
  • Easy to install and maintain
  • No foundations required
  • Capital allowances

• Fibre cement roofing or anti-condensation/ composite steel sheeting

• Plastisol-coated steel cladding

• Powerfloat concrete slabs tied into the feet of the steel columns

• Electrically operated roller doors with separate personnel doors

• Structural steel finish – painted or galvanised

• Avoid internal and valley gutters wherever possible
Typical Grain Store Examples
Drying – Do you need to dry crops?

Yes
• Either:
  • Separate drying facility (e.g. mobile, batch, continuous flow dryer)
  • On-floor solution (static or stirrers)
• Drying plant will usually need access to 3-phase electric and gas
• Drying floors and tunnels can be either timber or concrete
• Drying floors usually need a fan house/ room within the building
• After drying you may also need conditioning via drying floor or pedestals/ pipes

No
• For some farmers on-site drying is not always the best solution
• Can store on-floor conditioning with pedestals or perforated pipe
Ventilation

- Natural ventilation louvres for dust control on non-insulated stores
- Bird mesh required to avoid bird intrusion
- Mechanical ventilation louvres usually needed for heat dissipation from drying and conditioning
Lighting

• Reduce natural lighting in the building to avoid bird intrusion
  • Ideally very few or no rooflights
  • Open doors will provide enough natural lighting for low level working light
  • May be supplemented with artificial lighting to inspect grain

• Sealing with good workmanship
  • Cladding flashings
  • Building material interfaces
  • Especially key on insulated crop stores
Insulation

• Crop stores such as potato stores need to be insulated to provide the best long-term return on investment to reduce energy bills
• Better U-values can be achieved with thicker composite panels for relatively little extra investment
• Sealing of the insulated store is also key to avoid increased energy bills and protect the crops
• Sealing is even more important for controlled atmospheres such as fruit stores. These are usually free-standing rooms within a building
Case Study: Martin Clifton LTD, Priory Lands, Romney Marsh

• With 3,000 acres of combinable crops to store – and a long-term view of farming and the family business – Martin Clifton turned to Robinson Structures for the 6,000 tonne grain store he needed.

• The main aims of the new build was to improve efficiency, to ensure they had enough on-farm storage and to cope with the future; in terms of productivity and legislation.
The double span building houses four stores and is 7 m to the eaves to allow tipper access.

We designed the building with purlins strong enough to support the solar panels and brought in Torran Construction to carry out the groundworks, lay the internal and external concrete floor slabs and install the drainage.
Each store accommodates six, six-metre bays with 4 meter high internal walls.
The gas-powered heating system is driven by two centrifugal fans that can each move 115,000 cubic feet of air per minute, at five-inch water gauge.

One advantage of the new system is that the fan automatically senses the amount of moisture remaining in the grain and reduces its power accordingly.
Thank You