

## Technical Update

August 2020

### Technical note for the use of Lantoom Quarry stone

#### Introduction

Following investigation of a number of problems reported in cavity walls which incorporated Lantoom Quarry stone in their construction, we have determined that the primary causal factors are mortar shrinking, cracking, debonding from the stone and mortar becoming weakened. This has led to damage to the stone units.

As a consequence we have issued this technical note to assist building designers using this type of stone.

Your attention is drawn to the disclaimer at the end of this specification.

#### Use of pre-mixed mortars

Pre-mixed mortars should not be used with Lantoom Quarry stone.

In use they have proven to have properties that are incompatible with Lantoom Quarry stone resulting in premature deterioration of the mortar and consequential damage to the wall structure.

#### Site mixed mortars

Mortars should be designed and specified as part of an integrated approach to the building and wall design. The following factors must be positively taken into account

- Mortar Classification – All of Cornwall and most of Devon is categorised as a Very Severe Exposure Zone. The mortar should comply with building regulation and warranty provider standards in regard to the level of exposure of the site. This means that in most cases a Designation (ii) mortar will be appropriate.
- Lime – Lime improves the flexibility of mortar joints and improves bonding between the mortar and stone. Lime should be used.
- Sand – Local sand should be used. It should be well graded and the maximum particle size should be approximately 1/3 of the width of the mortar joint. e.g. For a 15mm joint thickness, the maximum sand particle size should be 5mm.
- Good site practice – Mortars should be mixed in accordance with good site practice to ensure they are made in accordance with the mortar design requirements and be adequately mixed.

- Air entrainment and other plasticisers – These must be used with care to avoid excessive air entrainment.

### **Mortar joints**

- Mortar joints must be either flush or bucket handle.
- Recessed joints must not be used.
- Joints should be pressed to ensure adequate mortar compaction. Where brushing is used, brushing should not be relied upon to provide adequate compaction.

This reduces the potential for water penetration of the wall and subsequent damage due to moisture. Recessed jointing increases the exposed surface area of the wall, exposes stone to greater weathering, encourages water penetration and reduces the rate of wall drying.

### **Good site practice**

- Recognised good site practice must be used. The Quality Triangle means that if time and/or cost are compromised, construction quality will fall.
- Stones should be tapped and examined prior to use to ensure defects are identified before being built into a wall. Particular care should be taken for stone to be used as quoins or around openings as these will be at greater exposure.
- Stones should be washed with clean water to remove mud and dust immediately prior to use to help develop a good bond between the mortar and the stone
- Stones should only be laid on their bed.
- “Gone off” mortars must be discarded and should not be “re-worked” by the additional of water or other additives
- Stone and mortar wall construction must be adequately managed, supervised and inspected.

### **Use of stone for the construction of the outer leaf of a cavity wall**

- Stone used for the outer leaf of a cavity should be 150mm bed depth where no dense concrete backing block or Surecav is used in the wall construction.
- 100mm bed depth Lantoom Quarry stone should only be used for the outer leaf of a cavity wall in conjunction with a dense concrete backing block or Surecav.

### **Wall ties**

- Wall ties must be suitable for the prevailing conditions and be suitably anchored within mortar joints.
- Designers should consider the need for additional wall ties at the corners of walls.

### **Importance of design**

- Site and design specific criteria – Every site and plot should be individually assessed and its design take its individual circumstances into account. Standard designs should be positively verified to be suitable for construction in any particular location.
- Designs must take weather exposure to wind driven rain into account.
- Design details must take into account the characteristics of stone.
- Lantoom stone is a rubble walling material and designers must take into account its differences with other materials such as brick
- Movement joints should be designed to take into account the characteristics of the site and

the stone including thermal and moisture related movement.

### **Disclaimer**

Lantoom Ltd are not construction designers and consequently cannot give comprehensive advice regarding the suitability of a particular stone or of a particular design or mortar at a particular site location. You should take your own professional advice in that regard because the performance of a stone wall using Lantoom Quarry stone involves many factors outside of our knowledge or control.