

Structural Criticality - Concrete Plank Grouting



On a recent steel frame and concrete plank project, an issue has been found relating to the procurement, design specification, checking and installation of grouting. In this case unclear information from the outset resulted in the criticality of reliance on grouting to prevent diaphragm action between precast units when trafficking. The result being a structure not being in use for its intended purpose, with financial and reputational loss to Morgan Sindall. There were numerous contributory factors to this failing which could have been avoided at intervention points in the project journey, before any work had started. In this case the issue was highlighted post completion by investigation of another defect by the client.

Common Causation



Unclear information prior to order being placed, conflicting information post order led to an unclear strategy for developing an inspection and testing regime. That which was developed didn't include the need for taking cubes of grout, managing hold points, or an understanding of manufacturers requirement for correct installation. There were no allocation for roles and responsibilities within the plan. Lack of early engagement with Structural Engineer, management team and supply chain on quality in all appointments was evident. Designers understanding the needs of clients, being managed by Morgan Sindall, as to the actual end use of the asset. Commercial decisions made in isolation of

other parties. Understanding and awareness of all parties of the contributory strength of grout, to the overall strength of structure. A lack of awareness of the effect of hand mixing may have on strength of concrete. The need for competence checking at all levels, from designers, agency engineers, managers through to operatives.

Considerations in steel frame concrete plank structures

- Competence of designers should be verified and tested independently.
- Steel frame design needs to incorporate a plan for pre-cast unit manufacturers design requirements regarding cut outs, minimum bearing and strength of grouting. These need to be included into specification.
- Clients requirements need to be checked and matched to design, particular attention to value engineering as it maybe purely cost driven. Ask yourself has the client had previous projects incorporating this type of design and what issues have they had, then go and visit the projects as a reference/sample to what we are going to produce and how they use it
- Orders for work packages containing critical structural elements need to be verified by competent person outside commercial discipline, and pre-lets should not be carried out in isolation. Decisions made on procurement should not be weighted for commercial ease, but balanced using risk levels determined in safety and quality planning.
- Testing regime should be agreed to by all stakeholders, used in hold points, priced for and included in orders.
- Manufacturers instructions on shuttering should be communicated to all parties, they should be adopted, installed and checked according to the Inspection Test Plan agreed
- Additional management/supervision and checking should be planned for in the use of agency personnel, in our structure as well as subcontract management.
- Storage of precast units need to be in line with manufacturers requirements, with bearers placed in line taking regard of cambers. Greater care should be taken to inspect units on delivery and storage prior to lifting into position.
- Where possible grout mixes should be batched off site to the correct design mix. Method of placement and finishing should form part of the RAMS, and incorporate manufacturers instructions. Be wary of excess distances at floor levels that grout may have to be transported.

This advice should be used, where the above is applicable, and the information discussed with your team highlighting the following points:

- Does this alert apply to anything you are estimating, procuring or building currently?
- Communicate the information to your teams, make it relevant to your project
- No work should start without an plan for quality compliance and the development of an ITP
- If you don't know, or understand or are in any doubt, ASK!

SHEQ Alert date:	04/2020	Display until:	30/04/2020					
Distribution:	Morgan Sindall	Y	Supply Chain	x	Plant Hire Desk	x	Morgan Sindall Group	x
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Everyone has the right to be

100% Safe