Concrete Honeycombing

What's Wrong with This Concrete?



What is honeycombing? | Why does it happen? | How should we deal with it?

1 Meet the Problem



What Is Honeycombing?

A concrete defect where the mortar **does not fully fill** the formwork, leaving voids and a rough, porous surface with exposed aggregate (and sometimes reinforcement).



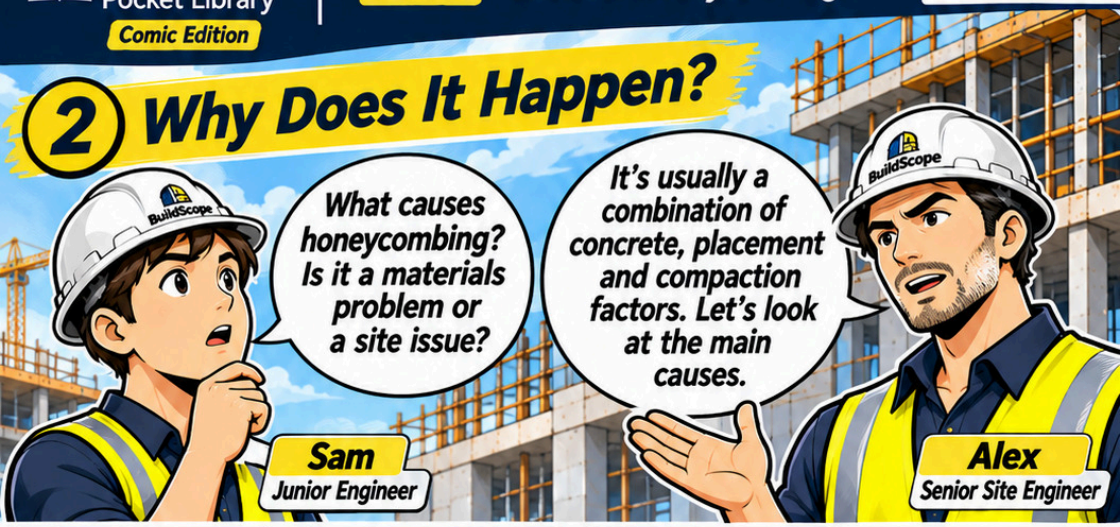


Key Questions at This Stage

- **Where is it?** (e.g. wall, column, beam, slab)
- **How extensive is it?** (e.g. area, length, depth)
- **Is any reinforcement exposed?**
- **Could it affect the structural performance or durability?**



2 Why Does It Happen?



1 Inadequate Compaction



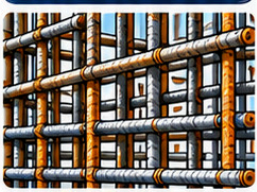
Concrete is not properly vibrated, so air voids remain in the concrete.

2 Low Workability (Poor Flow)



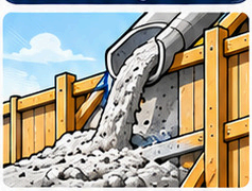
The concrete is too stiff (low slump), making it difficult to flow and fully fill the formwork.

3 Congested Reinforcement



Tight spacing or complex rebar arrangement can block the flow of concrete.

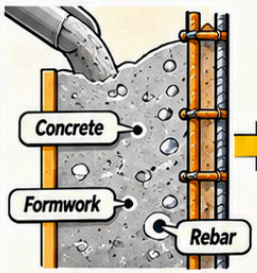
4 Inadequate Placing Method



Dropping concrete from too high or pouring unevenly can cause segregation and voids.

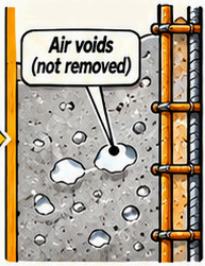
How It Happens

1 Pouring



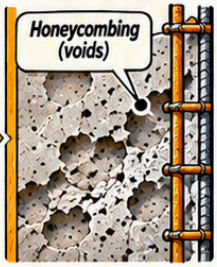
Concrete is placed into the formwork around the rebar.

2 Voids Trapped



If not properly compacted or if the concrete cannot flow, air voids remain in the mix.

3 Honeycombing

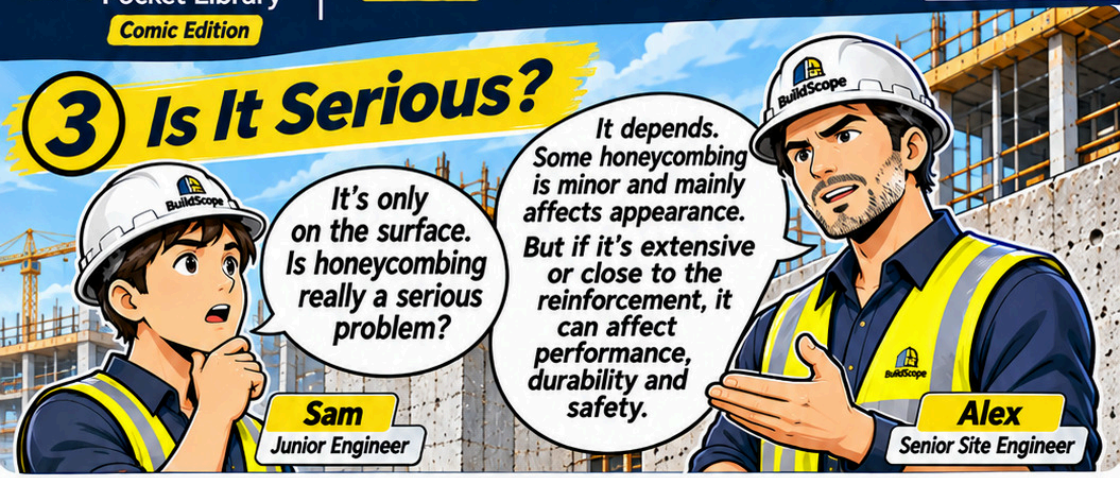


After hardening, the surface becomes porous and rough — this is honeycombing.

Key Takeaway (Causes)

- ✔ **Insufficient compaction** (vibration)
- ✔ **Poor workability** (e.g. low slump)
- ✔ **Congested reinforcement** (limited space)
- ✔ **Inadequate placing** (e.g. excessive drop height)
- ✔ **A combination of the above** (often the real situation)

3 Is It Serious?



Two Common Situations

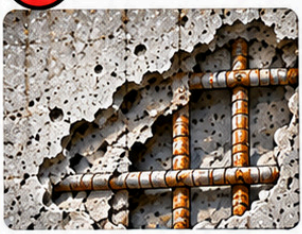
Minor (Less Serious)



- Localised and shallow
- No exposed reinforcement
- Limited impact on strength and durability

Usually acceptable after assessment and repair.

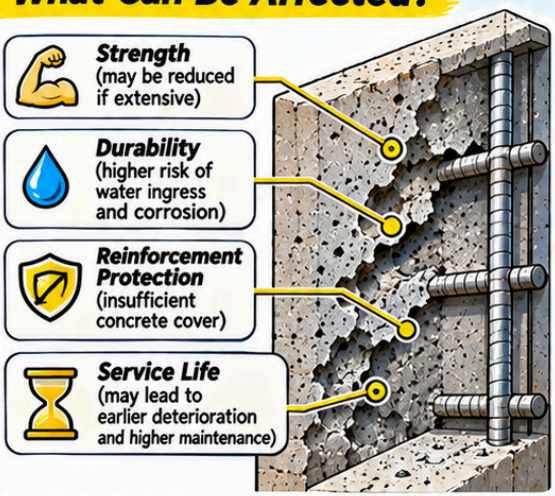
Serious (Needs Assessment)



- Extensive or deep voids
- Reinforcement exposed or insufficient cover
- May reduce structural capacity and durability (e.g. corrosion)

Requires Engineer's assessment and an approved repair method.

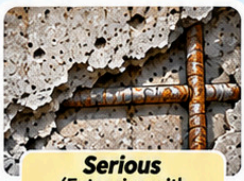
What Can Be Affected?



Real Site Examples



Minor (Localised)



Serious (Extensive with exposed rebar)

Key Takeaway

Not all honeycombing is critical, but you must assess the extent, location and impact before deciding on the repair.



4 The Wrong Fix



Common Wrong Approach

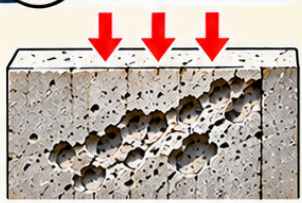


Why It's Risky

- Hides the true extent of the defect.
- May not bond properly if the surface is not prepared.
- Does not address the root cause (e.g. poor compaction or low workability).
- Could lead to early reappearance, water ingress or reinforcement corrosion.

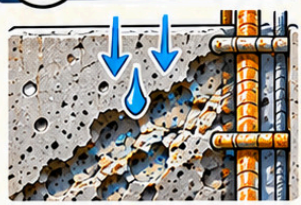
Possible Consequences

Reduced Strength



The effective concrete section may be reduced if the defect is extensive.

Water Ingress and Corrosion



Voids can allow water and chlorides to reach the reinforcement, leading to corrosion.

Quality and Approval Risk



The Engineer / Employer may reject the work, resulting in rework, delay and additional cost.

Key Takeaway

Don't rush to patch it up. Assess, confirm the cause, and follow an approved repair method.

5 The Right Approach

A practical step-by-step process to deal with honeycombing.



1 Record & Report



- Record the location, size and extent of the defect.
- Take clear photos and include it in the site record / NCR.

2 Assess the Defect



- Determine the extent and depth (e.g. visual check, tapping, or other testing if required).
- Check for exposed reinforcement and the adequacy of concrete cover.

3 Agree the Repair Method



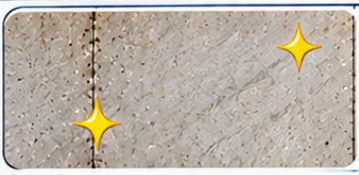
- Propose a suitable repair method (e.g. remove loose concrete, apply repair mortar or polymer-modified grout).
- Get approval from the Engineer / Employer before proceeding.

4 Carry Out the Repair



- Remove unsound material, clean the surface and prepare properly.
- Use an approved repair material and follow the specified procedure (e.g. curing, finishing, protection).

5 Reinspect & Close Out



- Inspect the repaired area to confirm workmanship and appearance.
- Update the records, close the NCR and keep evidence (photos, approval, etc.).

The Process in Short

Record → Assess → Agree → Repair → Reinspect

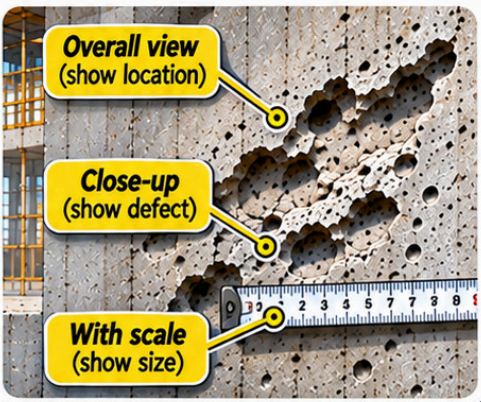
6 Site Inspection Checklist

A practical checklist for identifying, assessing and recording honeycombing on site.

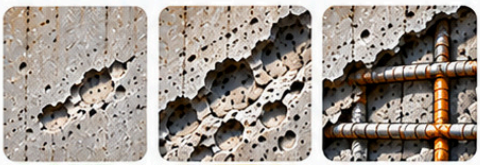


1. **Location & Element**
   (e.g. wall, column, beam, slab) ☐
2. **Extent / Size**
   (e.g. area, length, height, depth) ☐
3. **Site Photos**
   (overall and close-up, with scale/reference) ☐
4. **Visual Assessment**
   (depth, severity, any loose concrete) ☐
5. **Reinforcement Exposure**
   (any rebar exposed? cover affected?) ☐
6. **Possible Cause**
   (e.g. compaction, low workability, congestion, placing method) ☐
7. **Assessment & Action**
   - ☐ Minor – accept with repair
   - ☐ Significant – detailed assessment / Engineer's advice
   - ☐ Other: _____

Photo Record Guideline



Severity Reference *(For Guidance)*



Minor	Moderate	Severe
(Surface only)	(Partial depth) May affect cover	(Extensive / Deep) Engineer assessment required

On Site Tips

- ✓ Record early and clearly.
- ✓ Include photos with scale and reference.
- ✓ Seek the Engineer's / Employer's instruction before starting any repair.

Keep a Proper Record

Good records support a clear assessment, approval and final acceptance.

7 Remember This!

Sam
Junior Engineer

Got it! It's not just about making it look good. We must understand the cause, assess the impact and repair it properly.

Exactly! Honeycombing is a quality and durability issue. Don't just cover it up — follow the right process and keep proper records.

Alex
Senior Site Engineer

Key Takeaways



Know what it is
Voids in concrete, usually due to workability, compaction or placing.



Assess the extent
Check location, size, depth and impact on reinforcement and cover.



Use an approved repair method
Follow the Engineer / Employer's instruction (e.g. removal and repair, repair mortar or grout).



Keep good records
Record, photo, assess, approve and reinspect.

Common Mistakes to Avoid



Just patching with mortar without assessment.



Covering it up with render or paint to hide the defect.



Closing out the defect without proper records or approval.



Next Step

- Download the Site Inspection Checklist
- Learn more real site cases in the BuildScope Learning L
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