

HOUSEPLANSDIRECT TECHNICAL GUIDES

UNDERPINNING EXPLAINED

A complete guide to investigating, designing and constructing foundation strengthening



Underpinning transfers an existing building safely to a stronger or deeper support system.

NINE-PART PUBLICATION EDITION

Diagnosis · Systems · Load path · Anatomy · Construction · Monitoring · Compliance · Defects ·
Inspection

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About this guide

This guide explains underpinning and related foundation-strengthening work for low-rise housing in England. It is intended for owners, designers and site teams who need to understand diagnosis, system selection, structural load transfer, temporary works, construction sequencing, monitoring, regulation and inspection. Underpinning is high-risk project-specific work: the structural and geotechnical designs, Party Wall advice, Building Control requirements and specialist method statement always take precedence.

SCOPE Underpinning is high-risk structural and geotechnical work. Diagnosis, permanent design, temporary works, sequence, monitoring and approvals are project-specific. Figures are explanatory and must not be scaled.

Part 1 – Introduction: What Is Underpinning?

Strengthening or extending support beneath an existing building

Underpinning modifies the support of an existing structure by transferring loads to stronger, deeper or differently arranged foundations. It may be required after movement, for an alteration that changes loads or levels, or where nearby excavation affects support. It should follow evidence-based diagnosis: cracking alone does not prove foundation failure, and stabilising the cause may be more appropriate than underpinning.



Figure 1 – Traditional staged underpinning transfers an existing wall to deeper competent ground.

1.1 Principal elements

Component	Primary role
Existing structure	Supplies the loads and geometry that must remain supported.
Ground and cause	Determines why movement occurred and where support is feasible.
Temporary works	Maintains stability through every excavation and transfer stage.
Underpin system	Carries loads to the designed bearing or piled support.
Monitoring and records	Demonstrate response, compliance and completed construction.

1.2 Benefits and limitations

- Can stabilise existing construction where the cause and load path are properly understood.
- Allows local strengthening or deeper formation while much of the building remains in place.
- Introduces temporary instability, access, groundwater, neighbour and movement risks during construction.
- May not remedy continuing drainage, tree, slope or ground processes unless those causes are addressed.

KEY PRINCIPLE Investigate and design before disturbing support. Evidence, load paths, uncertainty and inspection must remain connected throughout the work.