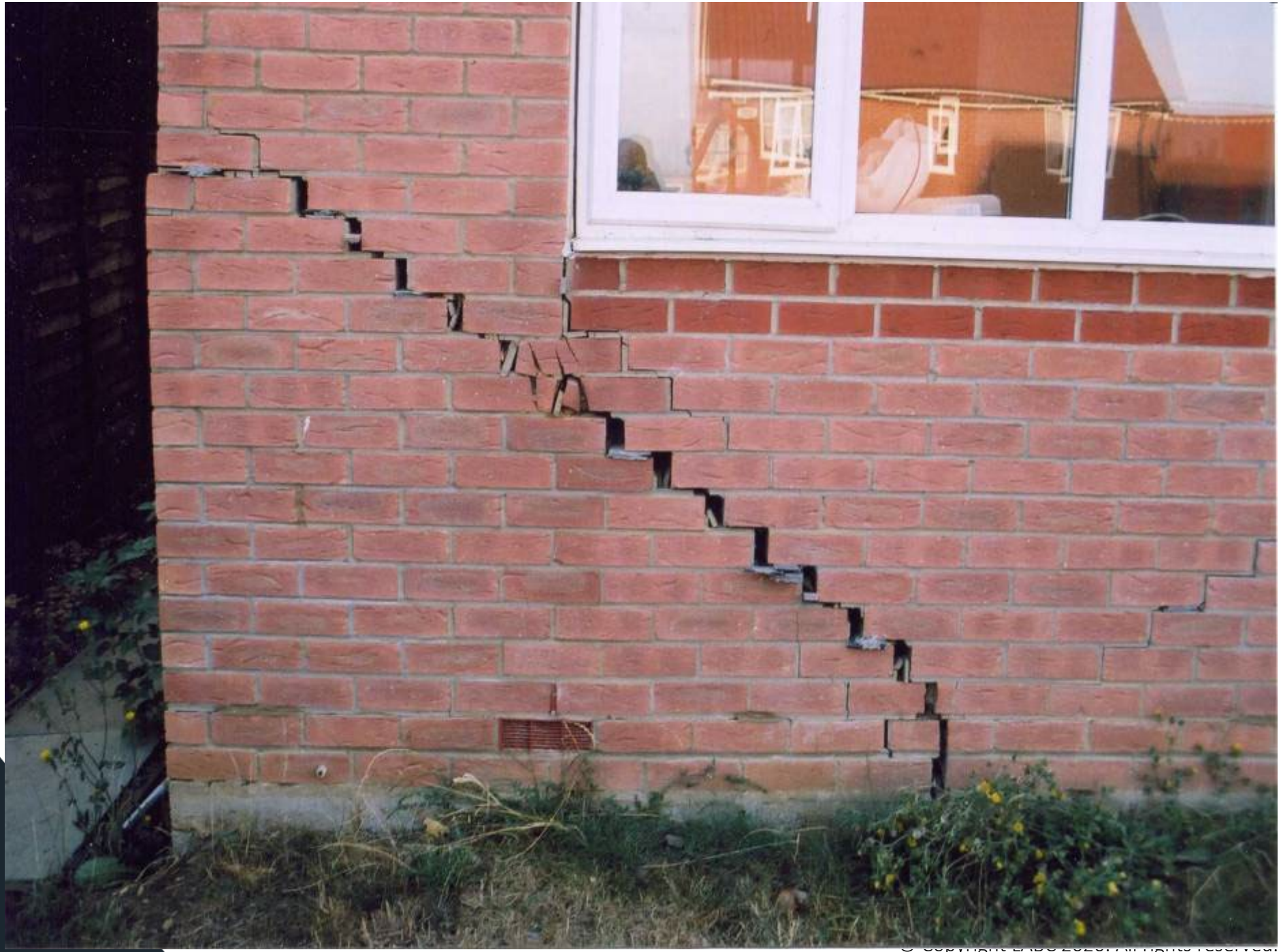
Subsidence 2022/23

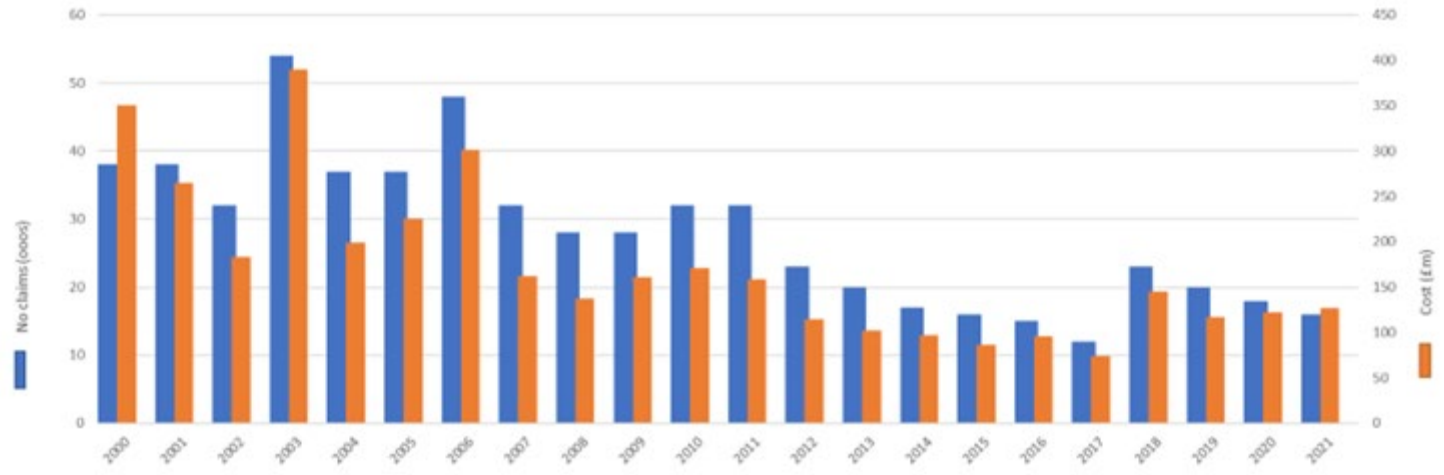
Tree close to structure



ensure all **foundations** are **adequate**

Information available now

Claims 2000 - 2021



MORECS

Metrological Office Rainfall and Evaporation Calculation System……

- Daily hours of sunshine
- Air temperature
- Vapour pressure
- Wind speed
- Rainfall

2022

Europe – 2022 was the hottest on record!

UK – Driest July since 1935!

Last proper surge event 2018

Before that, 2003

What happened in 2018

- 23000 claims
- Value £145m
- LV reported a 205% jump from June 22 to July 22
- Most Insurance companies reported factor of 5 increase
- Most loss adjusters reported 300 – 400% increase
- Repudiations – 35%

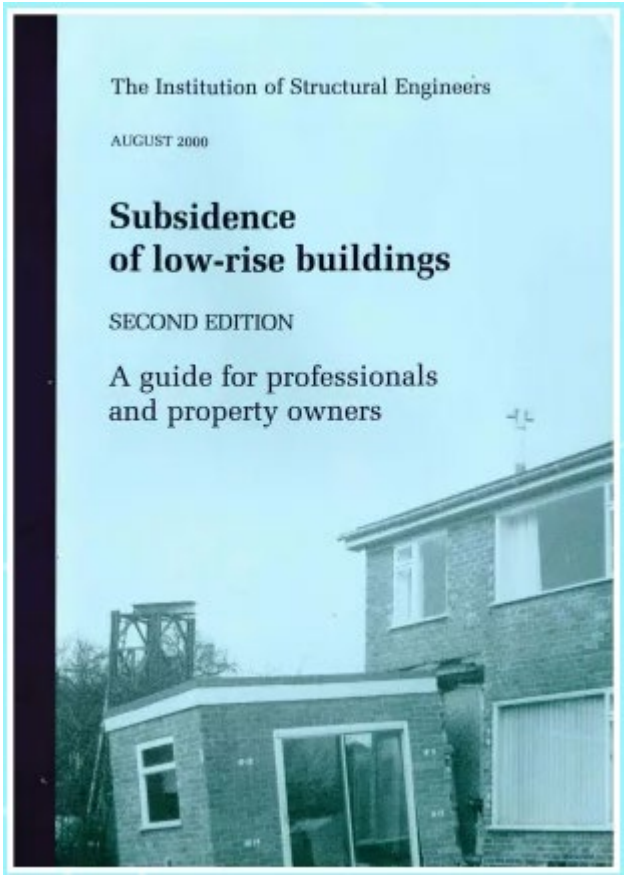
What's happening now……..

- Clay and trees (Existing and New developments)
- Leaking drains (drain testing++)
- Flood susceptibility (prolonged and deluge)
- Storm water attenuation (Groundwater fluctuation)
- Mining (Tin, Lithium, China clay)
- Ground source heat pumps

Useful publications

IStructE “Subsidence”

- Panel of experts (JP Chair)
- Complete review of Edition 2 (2000)
- All chapters wholly or partially rewritten
- Additional diagnostic information where re
- Alternative rectification processes
- More direct guidance
- Further research proposals



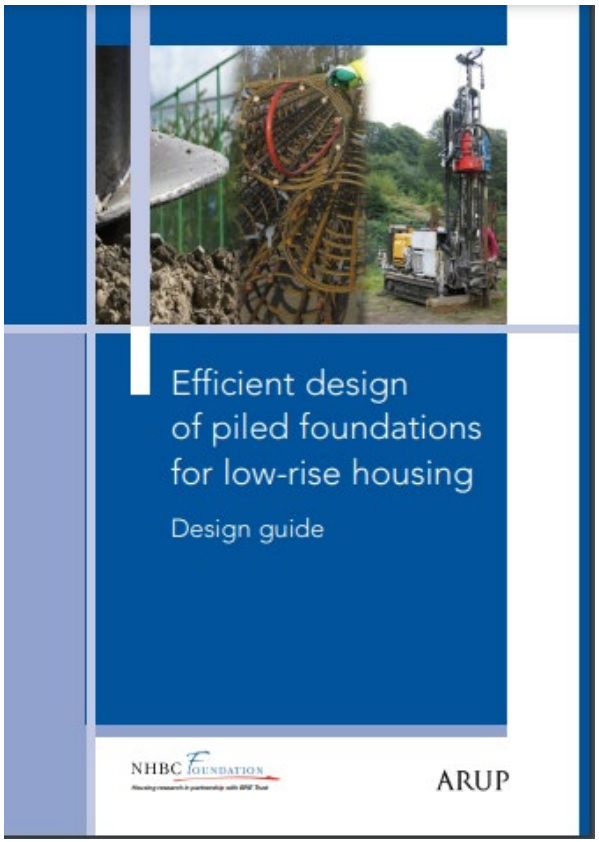
LABC

NHBC NF93

- Impact of climate change on buildings
- Implications for the design and const o
- The Climate Emergency
- Extreme weather
- Higher intensity storms
- Higher temperatures
- Increased flooding and sea-level rise
  - Shrink/swell
  - Washout
  - Reduction of soil strength with increase in pore water pressure
  - Dissolution/Mining
  - Collapse settlements
  - Corrosion of Foundations due to salt water

LABC

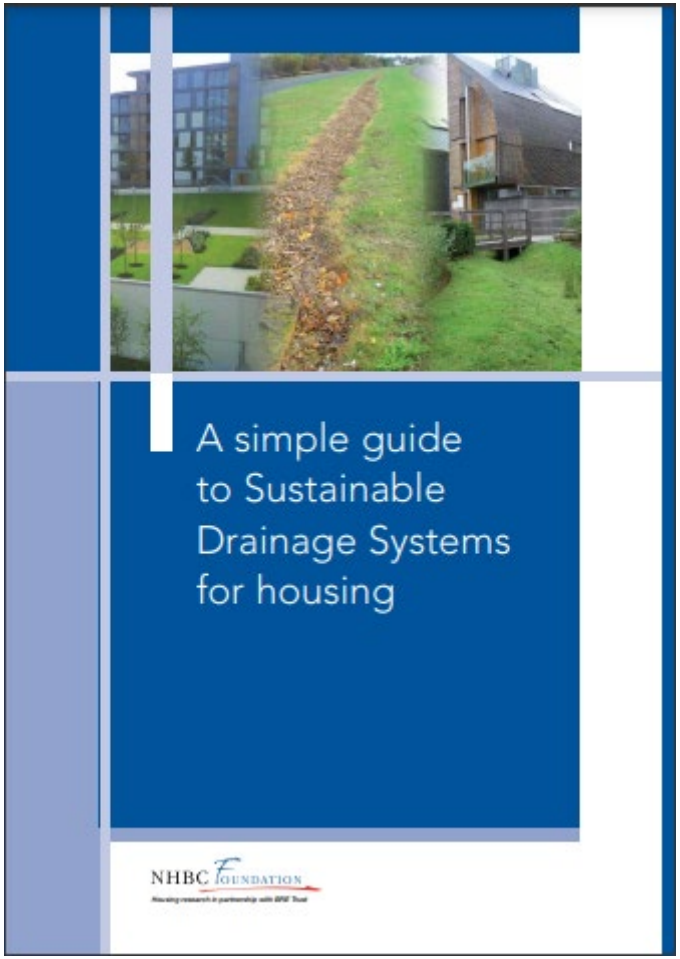
Alternative Foundations



- Design guide for low-rise buildings
- Performance of low-rise foundations
- Choice of foundations
- Site investigation
- Pile design and construction
- Environmental impact of foundation solutions
- Acceptable foundation movements

LABC

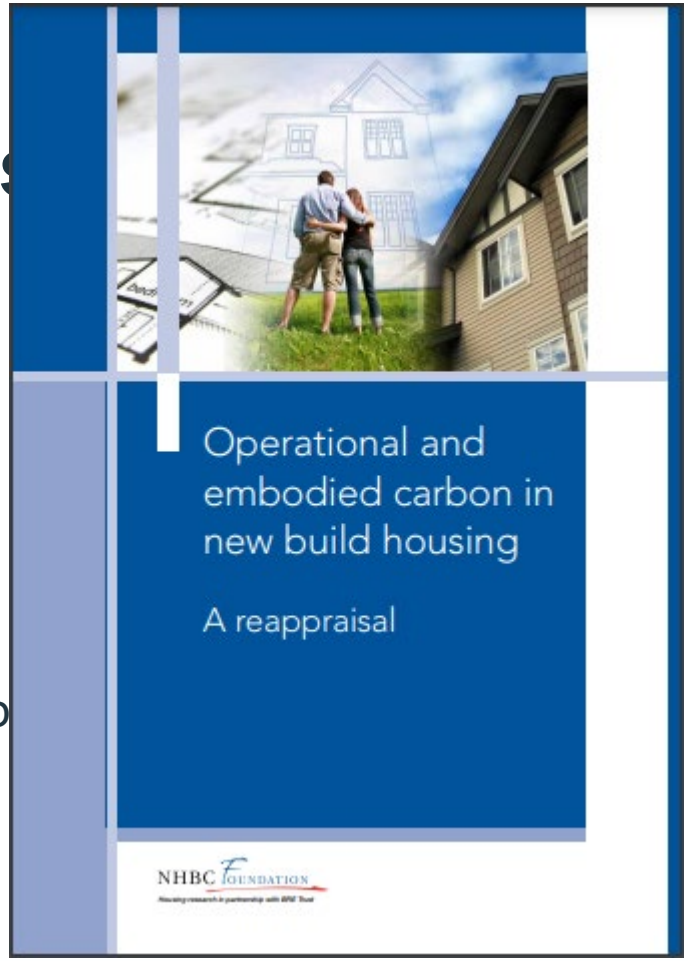
Drainage



Carbon in new-build hous

- Embodied CO2
- Operational CO2
- Life cycle assessments
- Two built forms (detached and mid-terrace)
- Two construction weights (masonry and timb
- Two dwelling lifespans (60 and 120 years)

- Foundations and ground floors circa 30%



LABC

WATCHET

'Unstable' clifftop development vetoed

A major clifftop housing development in Somerset has been refused planning permission because it is on land known to be geologically unstable.

The proposal for up to 136 houses and the rerouting of a coastal road on Cleeve Hill in Watchet was rejected at a Somerset West & Taunton Council meeting on 5 January.

The council had previously refused a planning application for a development on the site in 2020.

It was concerned that the development would contribute to slope instability and subsidence.

The land around Cleeve Hill overlies a geologically soft and heavily faulted subsurface, making it more prone to coastal erosion and landslides in recent decades.

On 12 January, the coastal road was closed to all road users after a geotechnical survey, combined with expert advice, indicated significant movement within the coastal slope next to the road.

Last April, subsidence in a section of the clifftop was also reported to Watchet Town Council.

At its meeting on 5 January Somerset & West Taunton council concluded that the development falls "in close proximity to land known to be, or which may be, unstable" and therefore was unsuitable.

LABC

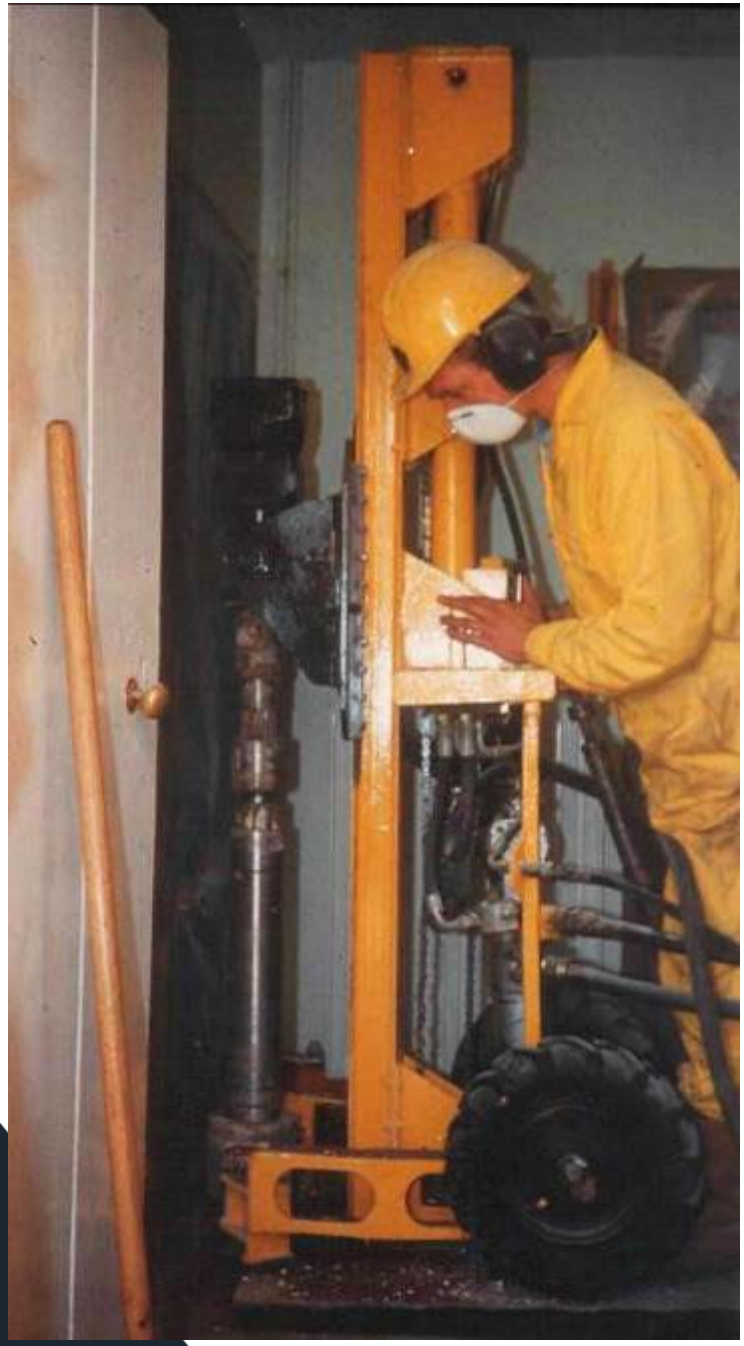
Subsidence Repair

The key elements of Underpinning Design and Construction are…….

a) Safety
b) Permanent and Temporary works
c) Site Investigation
d) Condition assessment
e) Environment and Sustainability
f) Cost

- Safety – design and construction needs to comply with CDM 15, specifically Regulation 22 – Excavations.
- Co-ordination of the Temporary and Permanent works is vital for safe construction and a viable outcome.
- Ground condition knowledge is crucial.
- The condition of the existing building or structure must be determined as, in the temporary condition the structure is likely to be additionally stressed.
- The environmental impact must be assessed as should sustainability.
- Cost including contingencies must be accurately determined to ensure viability.

LABC



HYDRAULIC

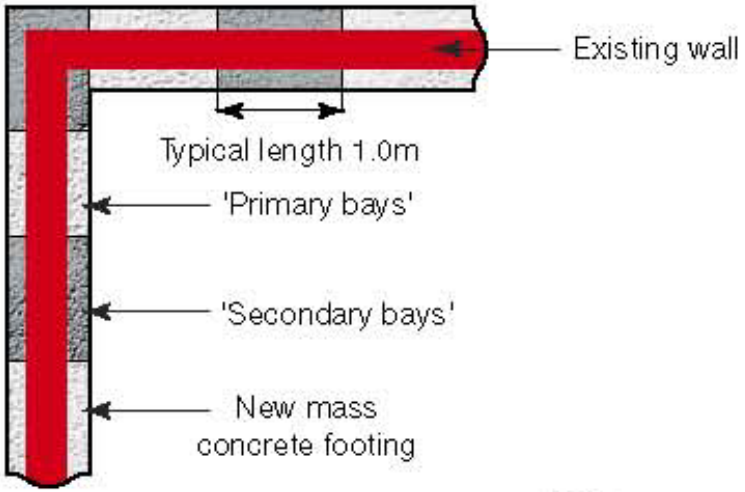
DROP-HAMMER

ROGER BULLIVANT

UNDERPINNING SYSTEMS

TRADITIONAL

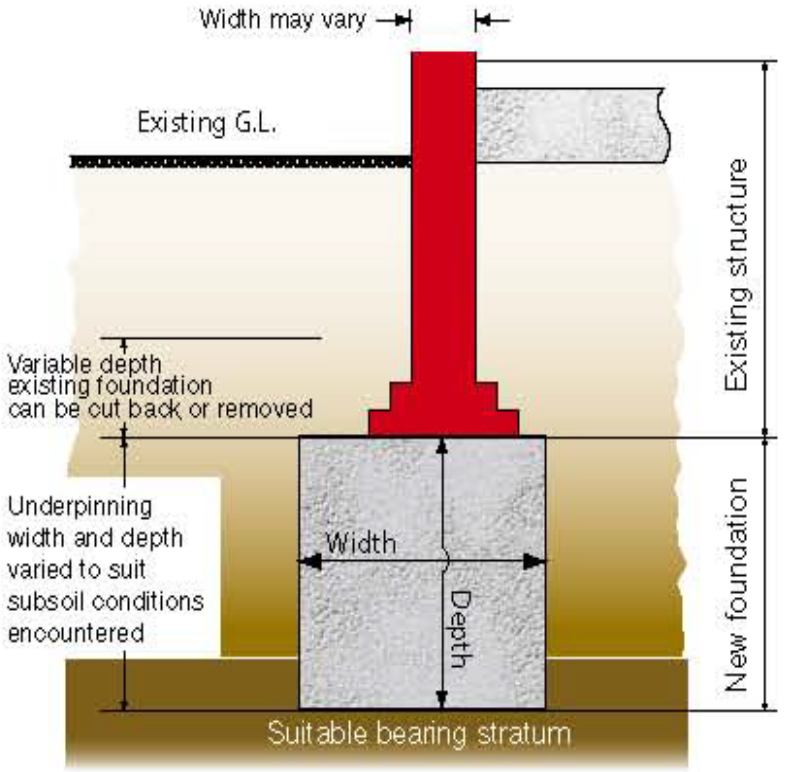
SUPPORT SYSTEM



Plan of foundation

U1a

Preparation to a corner section of a basement



Section through foundation

Shear key to be formed between bays
Can be adapted to suit heave conditions

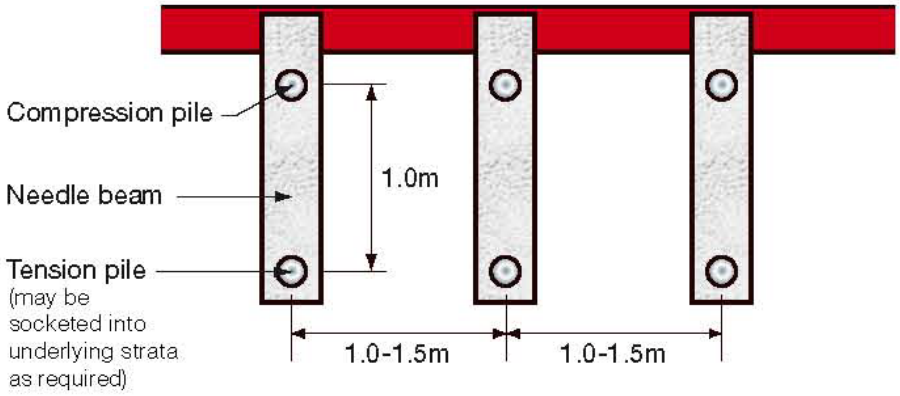
ROGER BULLIVANT

LABC

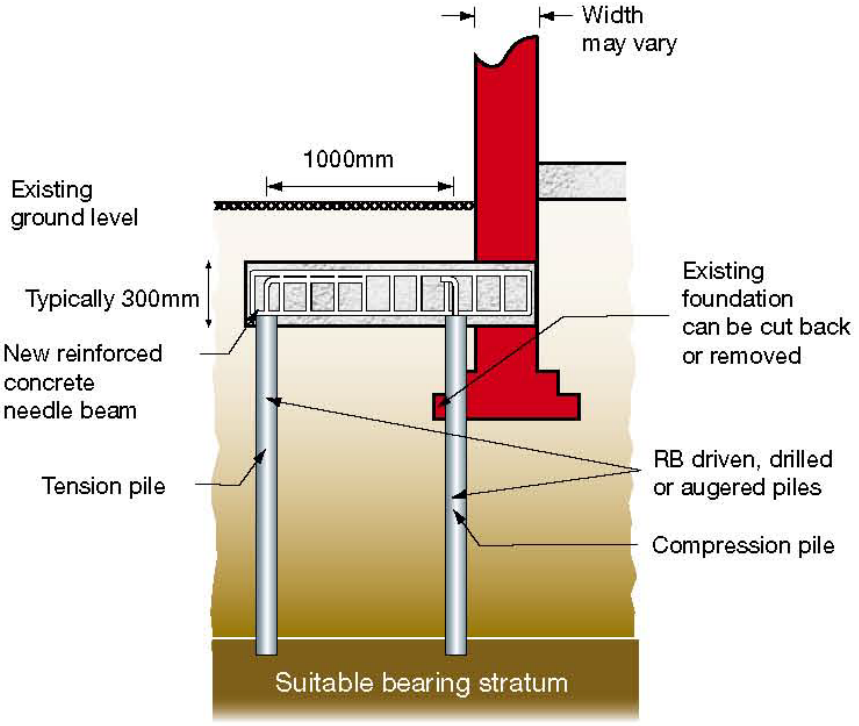
CANTILEVER BEAM

SUPPORT SYSTEMS

Piles completed - Beam steel reinforcement positioned



U3a Plan of foundation



U3b Section through foundation

ROGER BULLIVANT

CANTILEVER BEAM

SUPPORT SYSTEMS

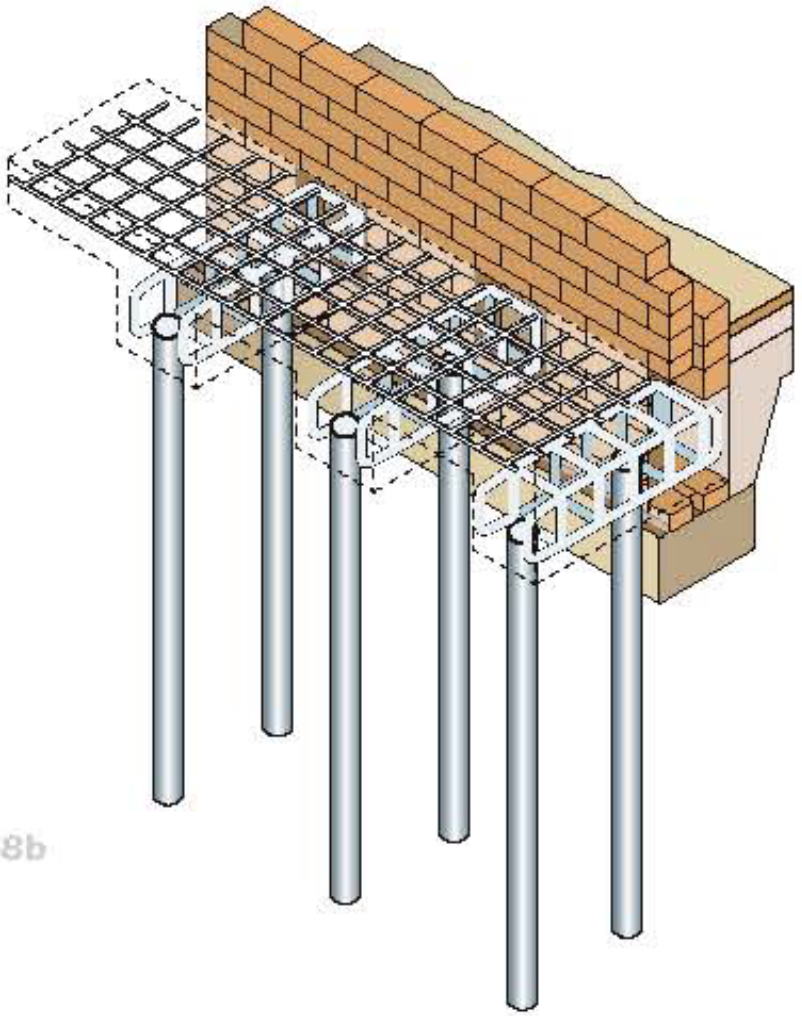
CANTILEVER BEAM

SUPPORT SYSTEMS

LABC

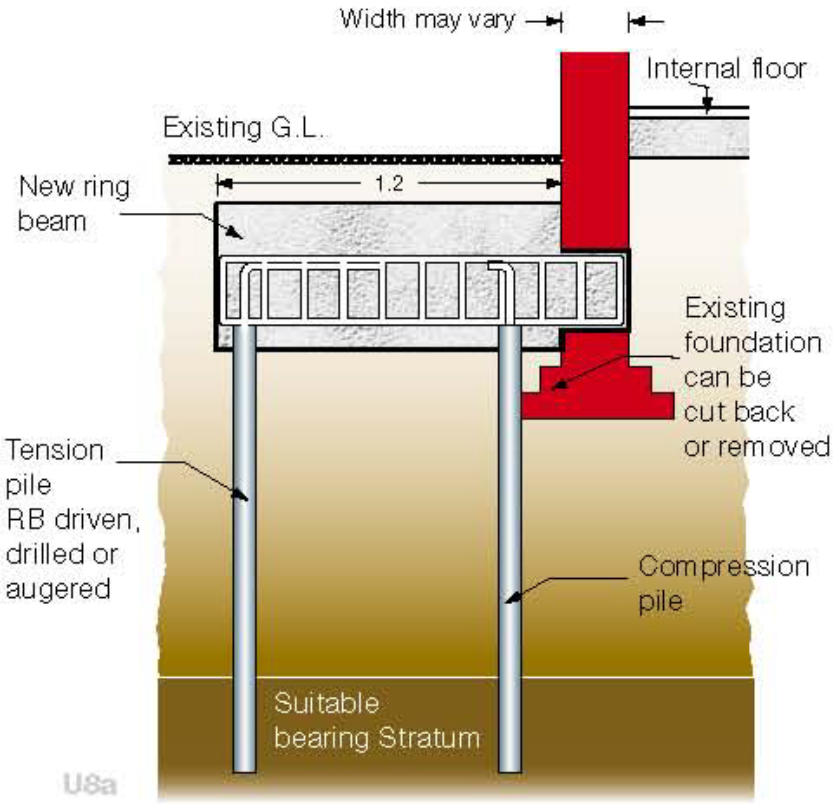
CANTILEVER BEAM

SUPPORT SYSTEMS



U8b

For more heavily loaded walls the needle beams may be structural steel sections.

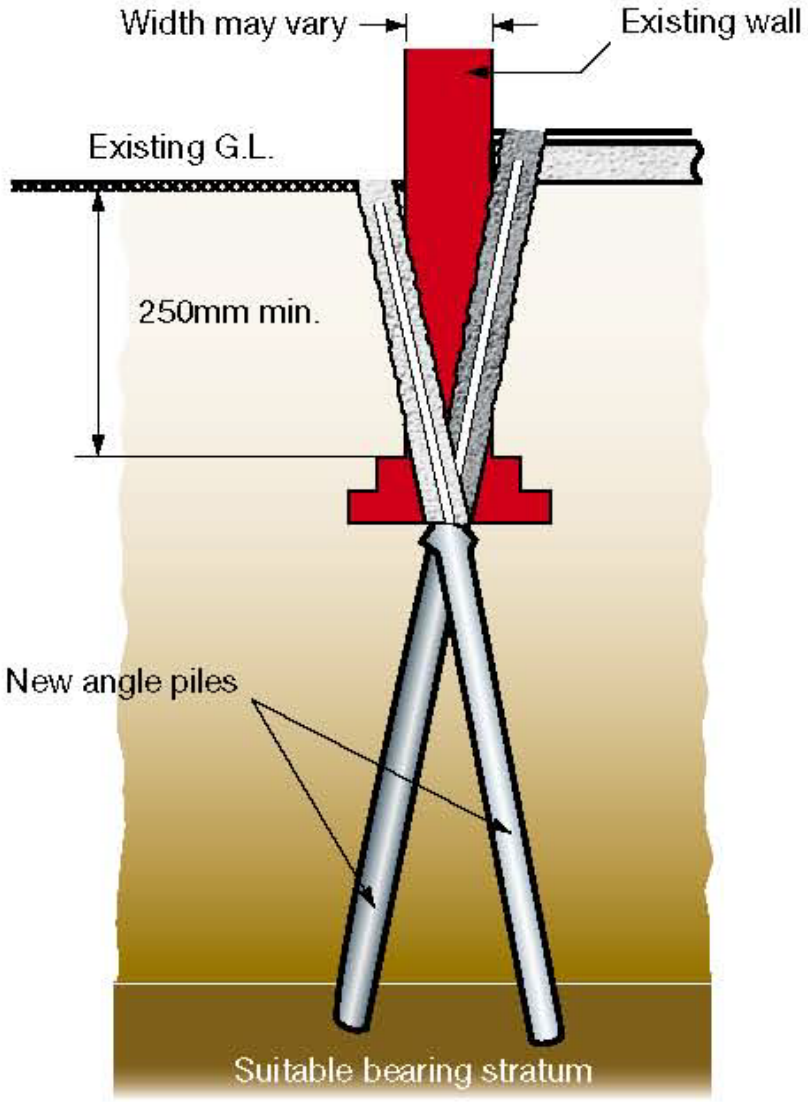


U8a

Section through foundation

ANGLE PILE

SUPPORT SYSTEM



Section through foundation

External Angle Piles - Ready for driving (Inset - External Angle Piles - Being driven to suitable bearing stratum)

ROGER BULLIVANT

HEAVE

SUPPORT SYSTEM

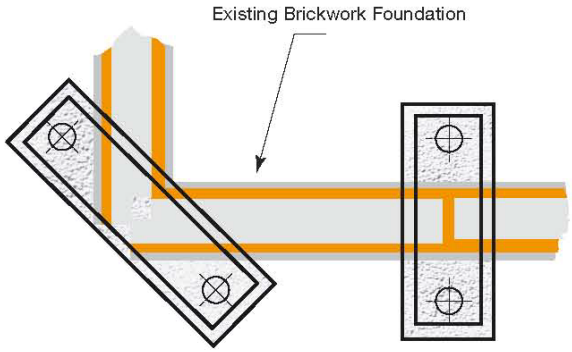


Fig 1 - Part plan of foundation at lintel level

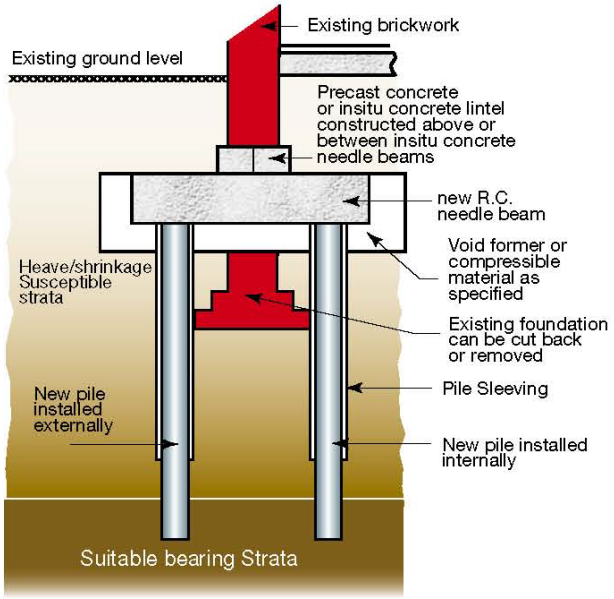


Fig 2 - Section through foundation

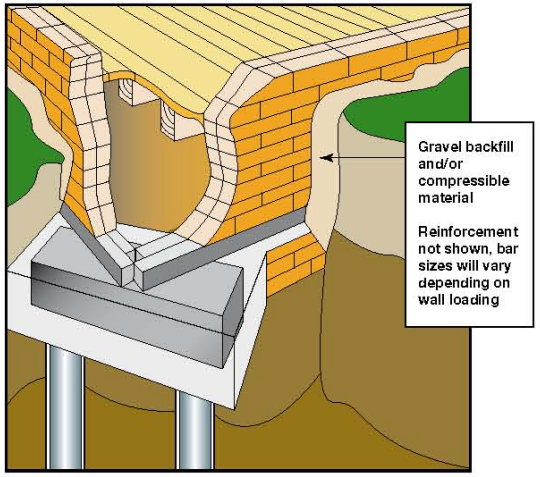


Fig 3 - View of foundation at a typical corner detail

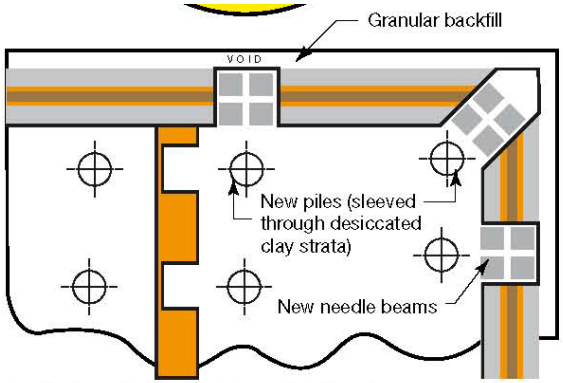


Fig 4 - Part plan of foundation at lintel level

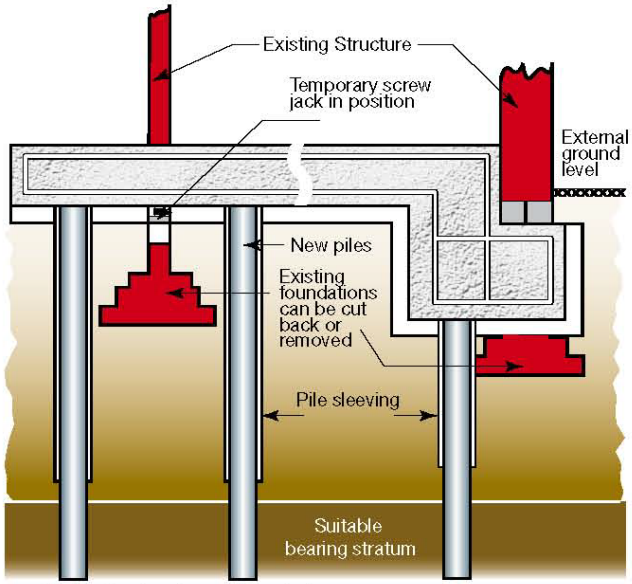


Fig 5 - Section through foundation

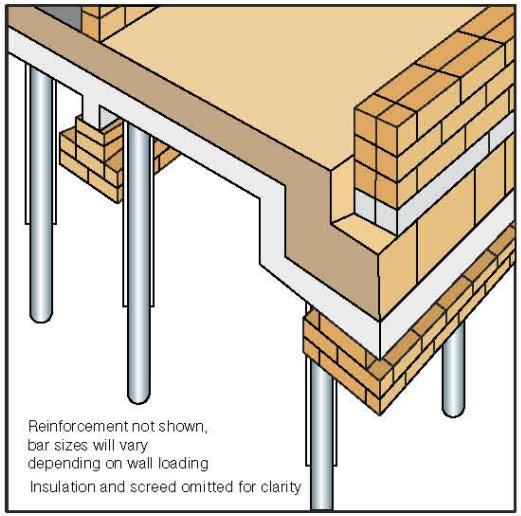
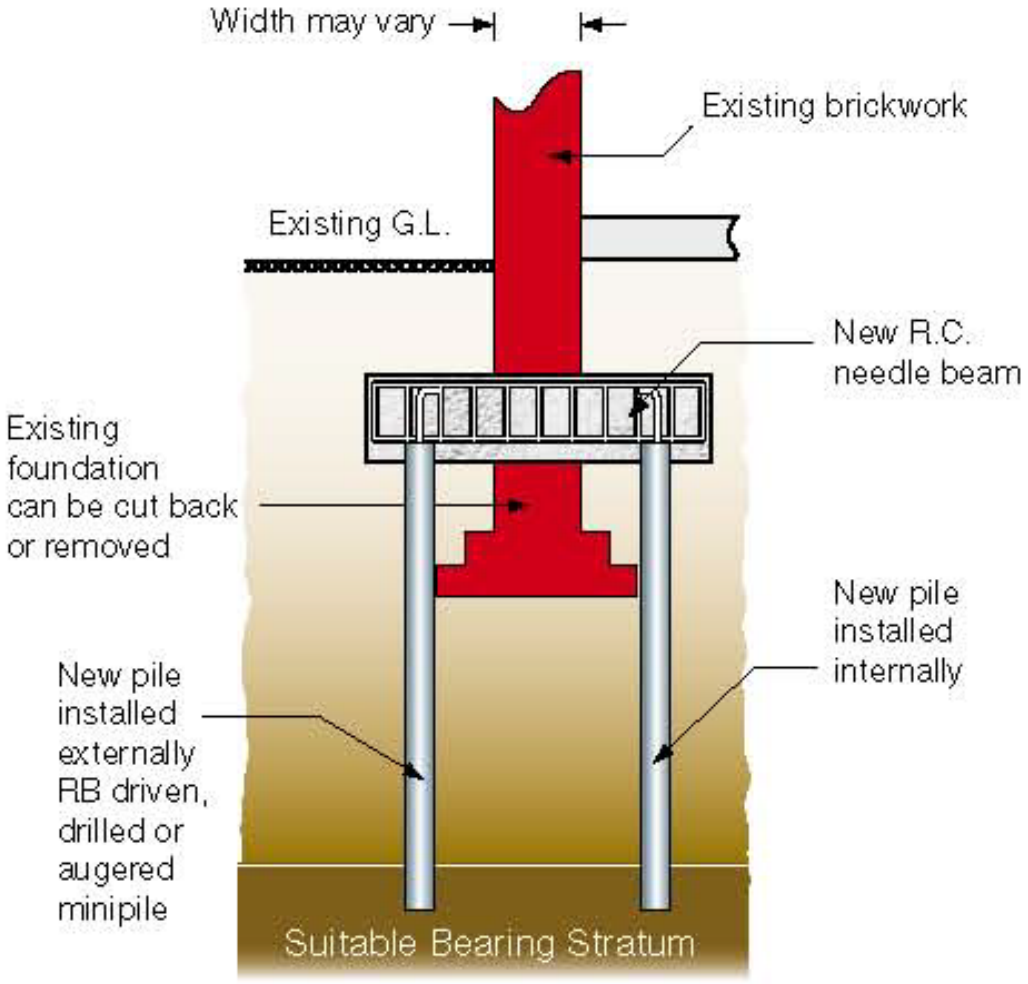


Fig 6 - View of foundation - external backfill removed for clarity - use gravel or compressible material

ROGER BULLIVANT

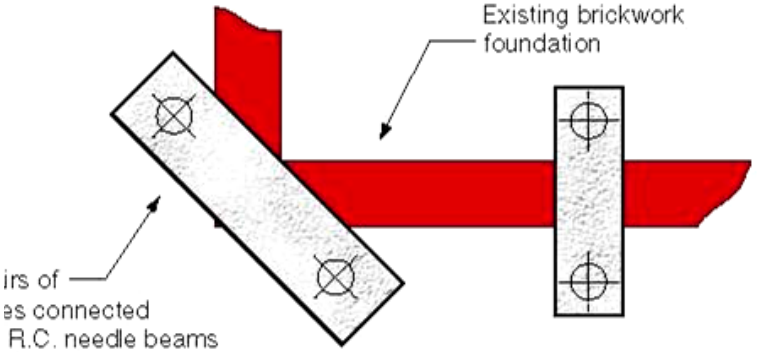
PILE & BEAM

SUPPORT SYSTEM



Section through foundation

U2b

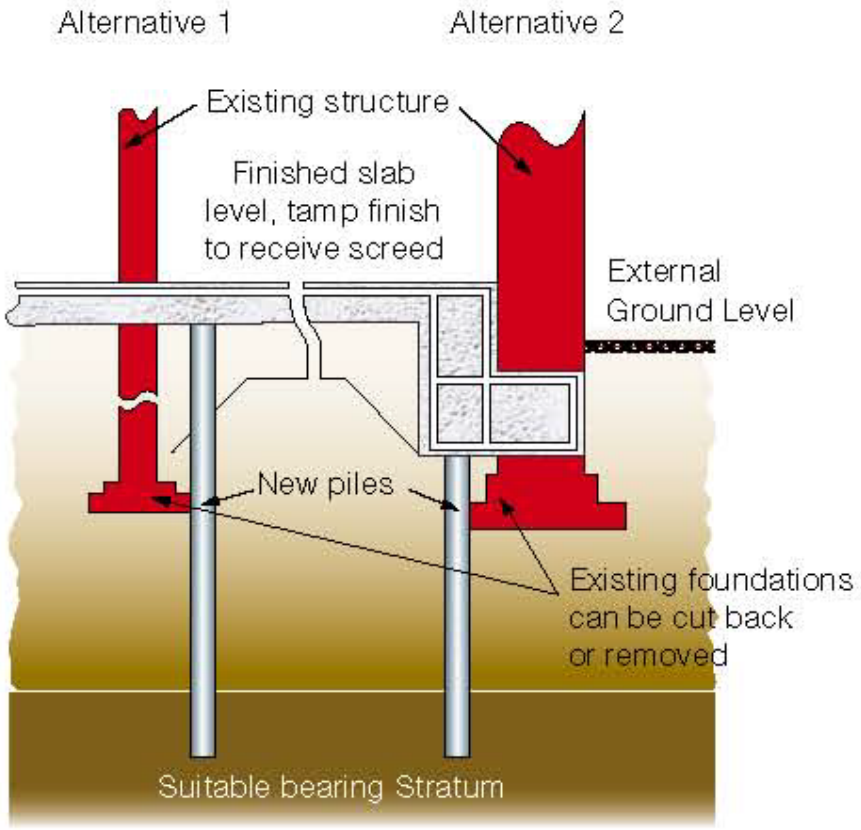


Plan of foundation

U2a

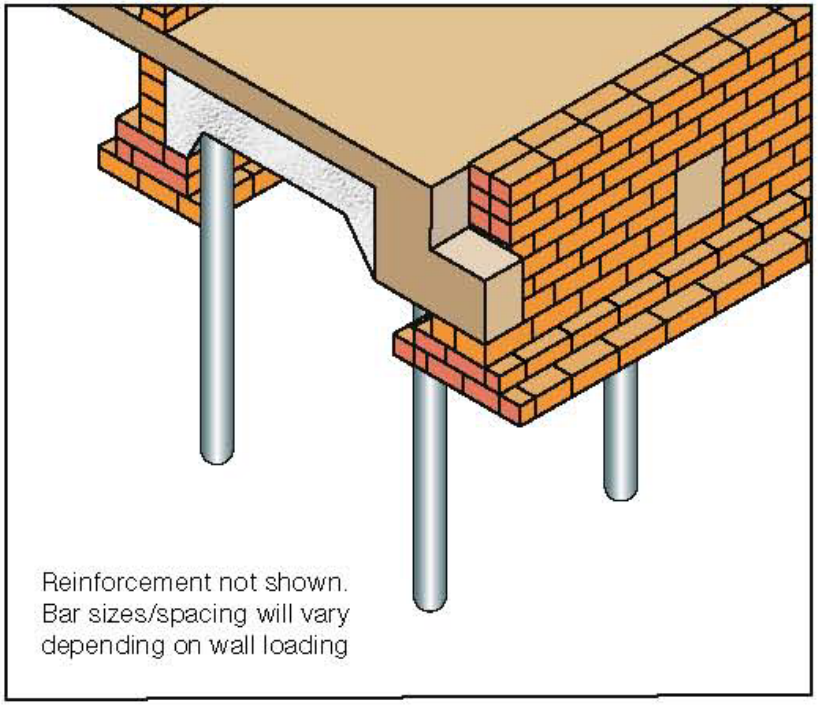
PILE & RAFT

SUPPORT SYSTEM



U5a

Section through foundation



U5b

View of piles and raft

Association of Specialist Underpinning Contractors

LABC