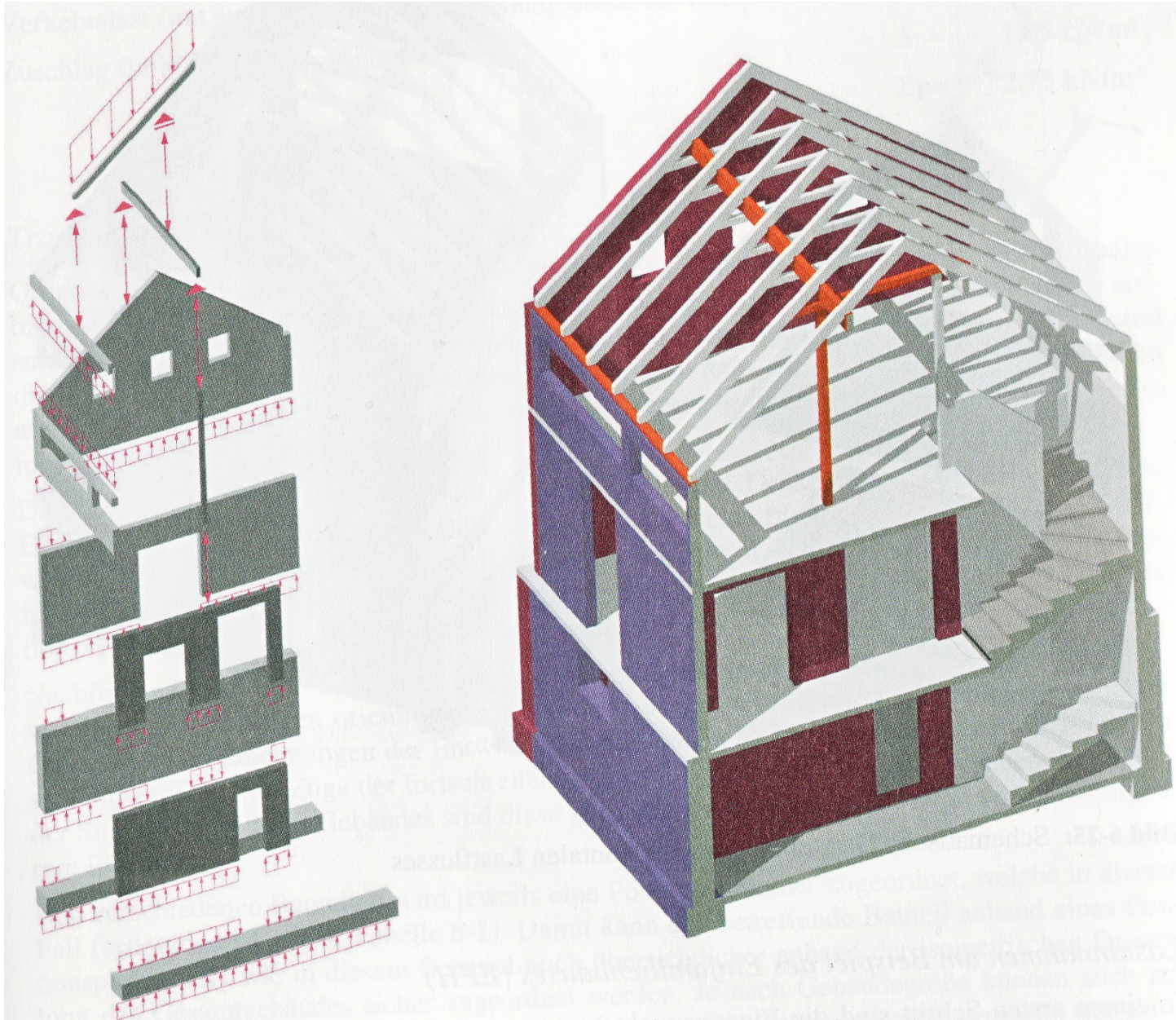


PERENCANAAN TEKNOLOGI
& SISTEM BANGUNAN
(PTSB) 03



OUTLINE

**BUILDING
SYSTEMS**

Wall construction



- Exterior wall supports floors
- Thickest at base
- Punched windows
- Heavy

Bearing Wall



- Floors support Exterior wall
- Thin throughout--allows open ground floor
- Skin can be transparent, translucent or opaque
- Very light

Curtain Wall

OUTLINE

BUILDING SYSTEMS

Basic concept

Structural systems

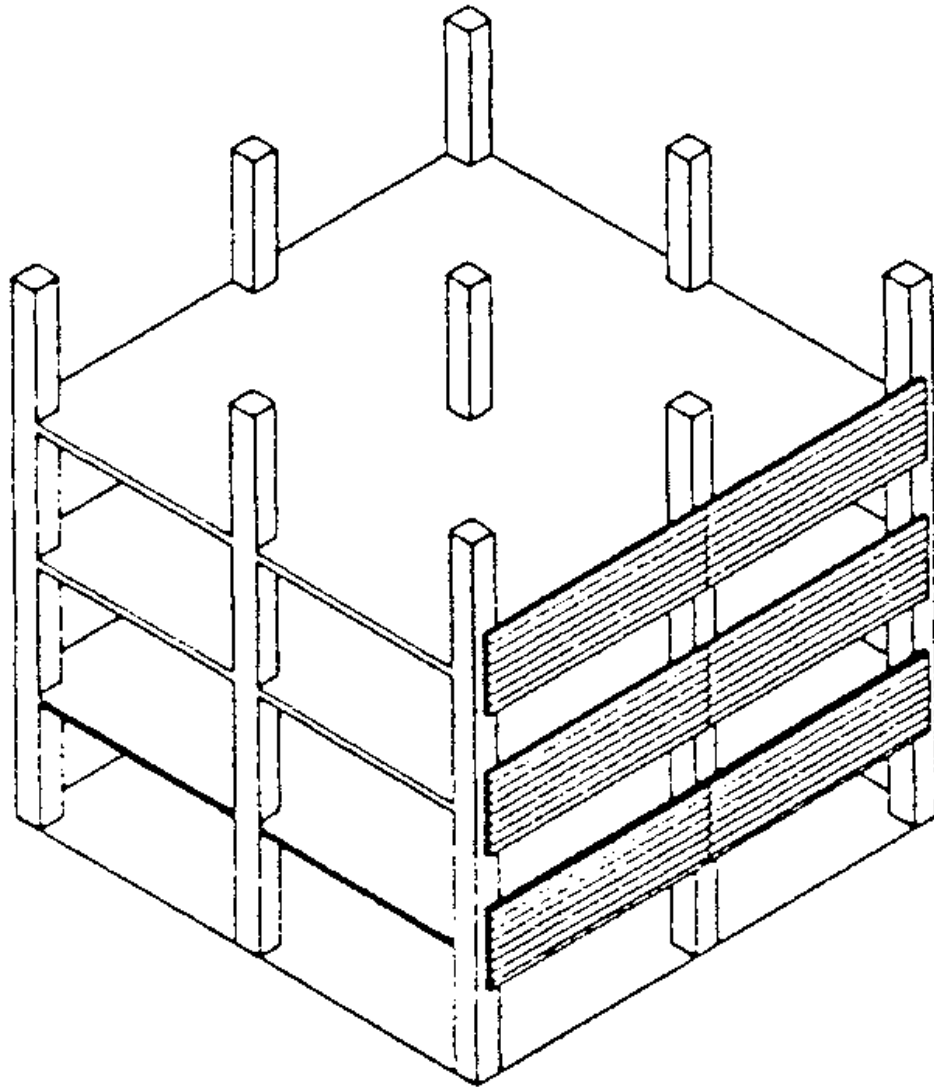
Topography

SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction



**PREFABRICATED
PANEL
CURTAIN WALL
SYSTEM**

*Load bearing frame
system*

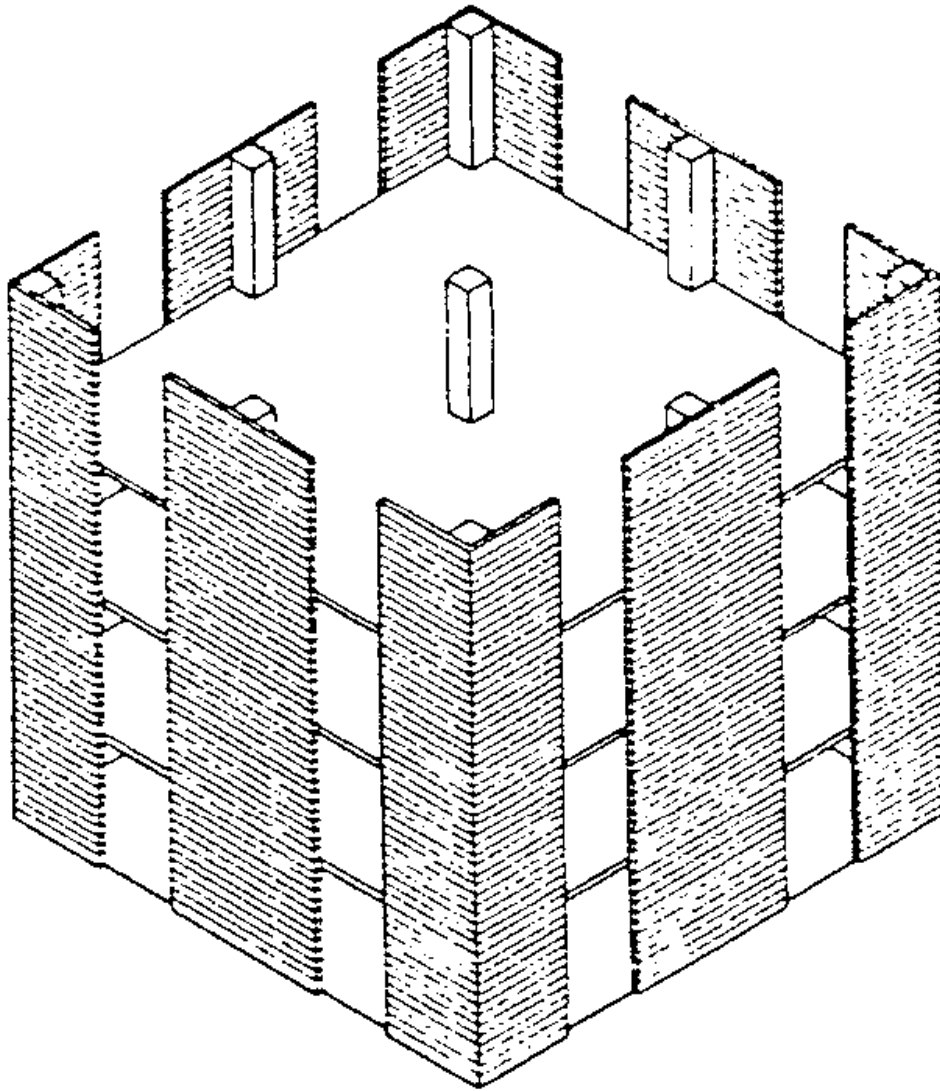
*Prefabricated or
laid - in - place panel*

OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Step 3: Think about **SYSTEM!**



STRUCTURAL "SKIN"
CURTAIN WALL
SYSTEM

Load bearing moment
–resting space frame

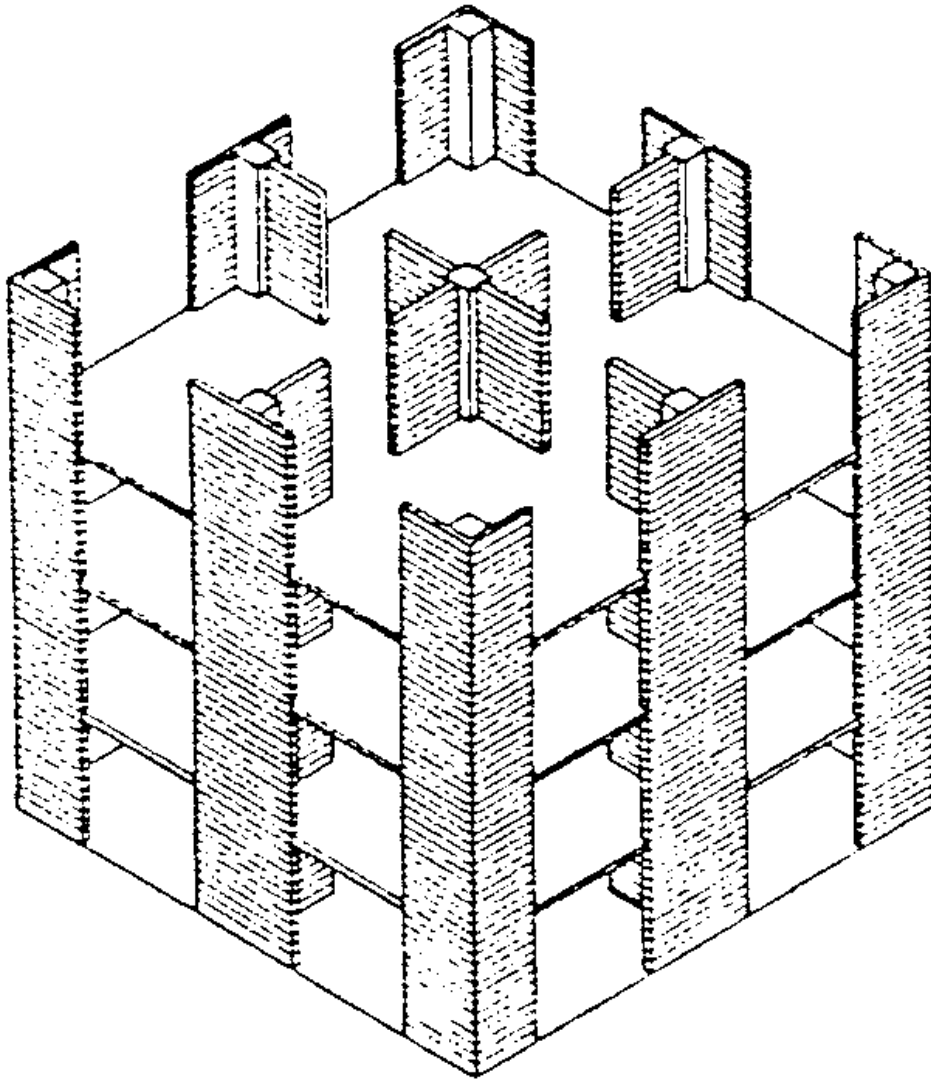
Cladding system

OUTLINE

BUILDING
SYSTEMS

Wall construction

Step 3: Think about **SYSTEM!**



DUAL FRAMING SYSTEM

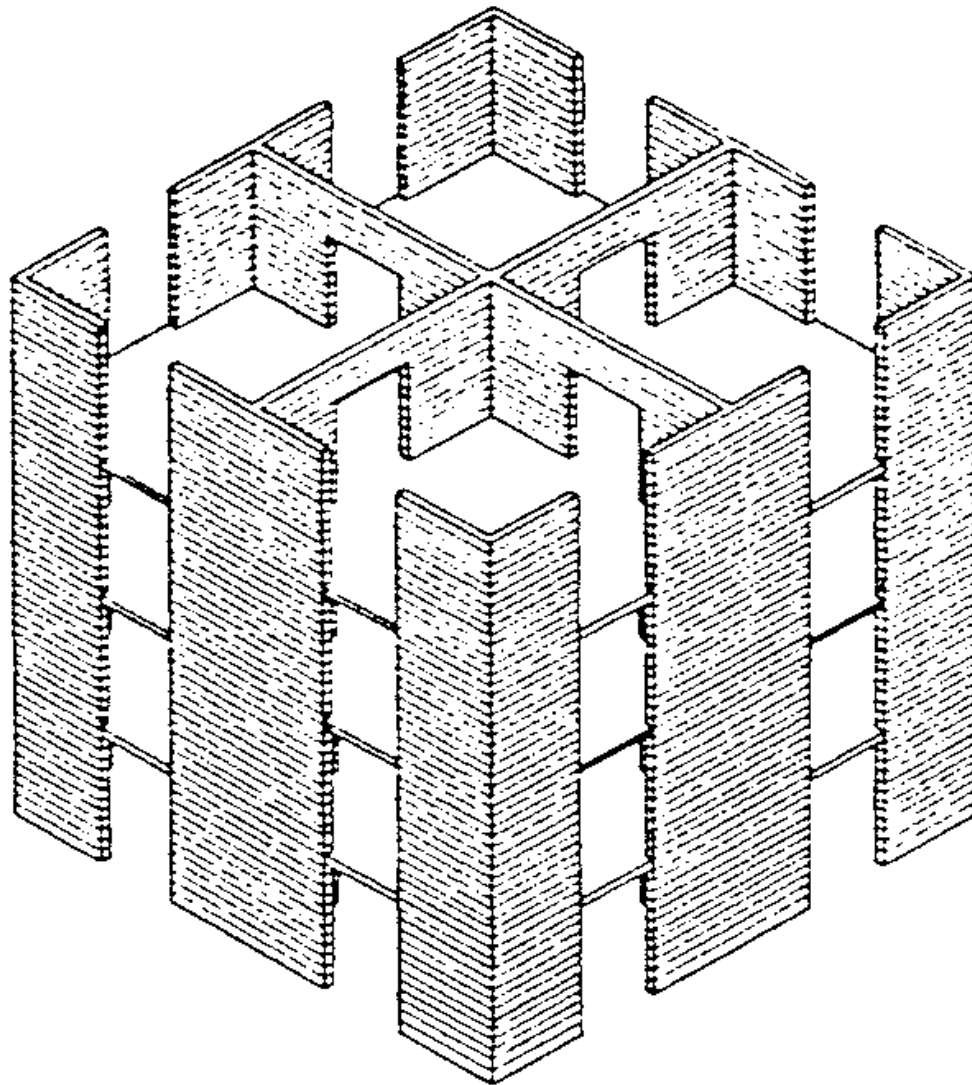
Only 25% of the shear load is transferred to the frame system

OUTLINE

BUILDING SYSTEMS

Wall construction

Step 3: Think about **SYSTEM!**



LOAD BEARING
SHEAR WALL SYSTEM

OUTLINE

BUILDING
SYSTEMS

Wall construction

Step 3: Think about **SYSTEM!**



OUTLINE

**BUILDING
SYSTEMS**

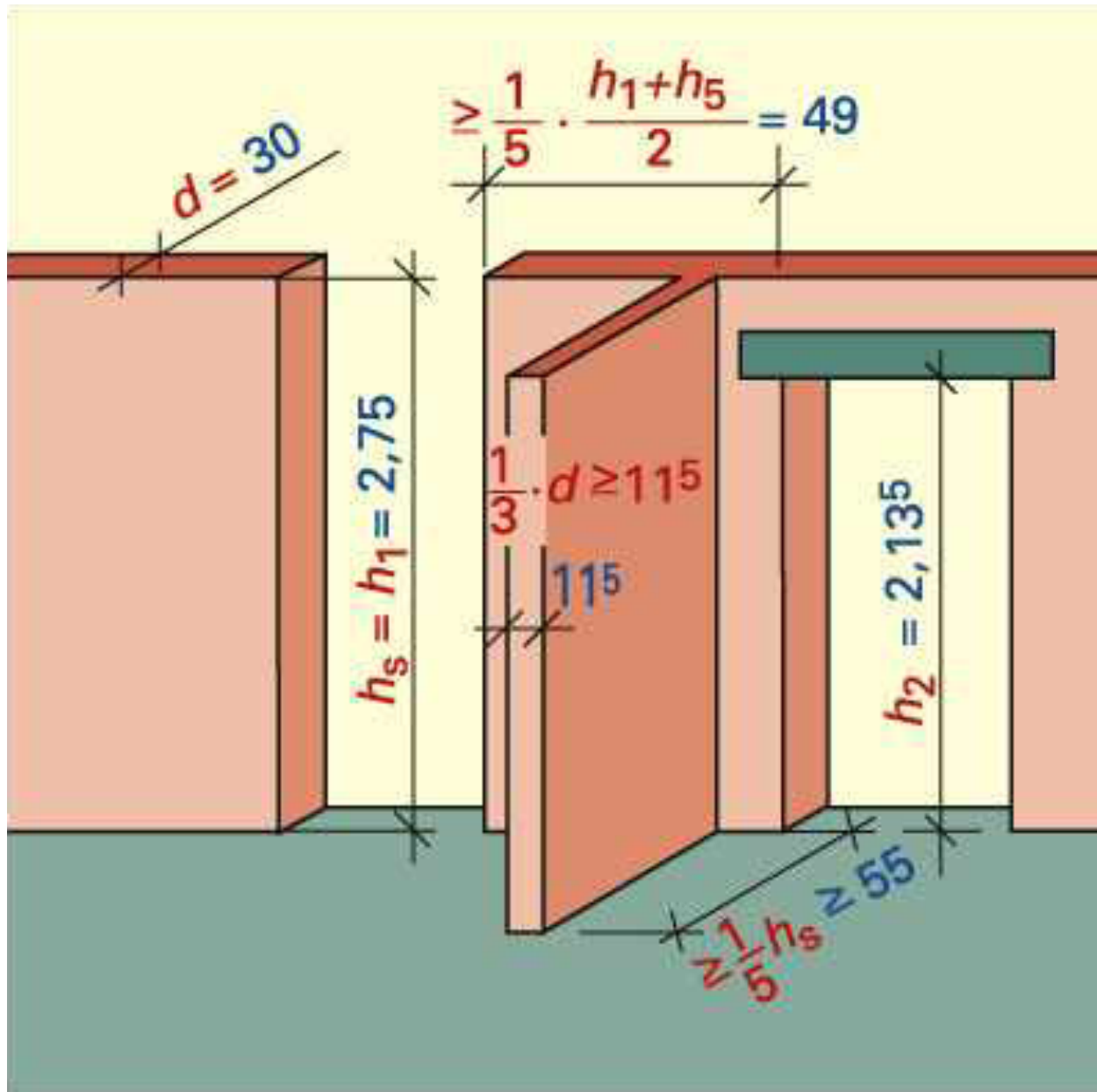
Wall construction

Load-bearing wall

$$A \geq 1000 \text{ cm}^2$$

$$k_1 = 1,0 \text{ for wall}$$

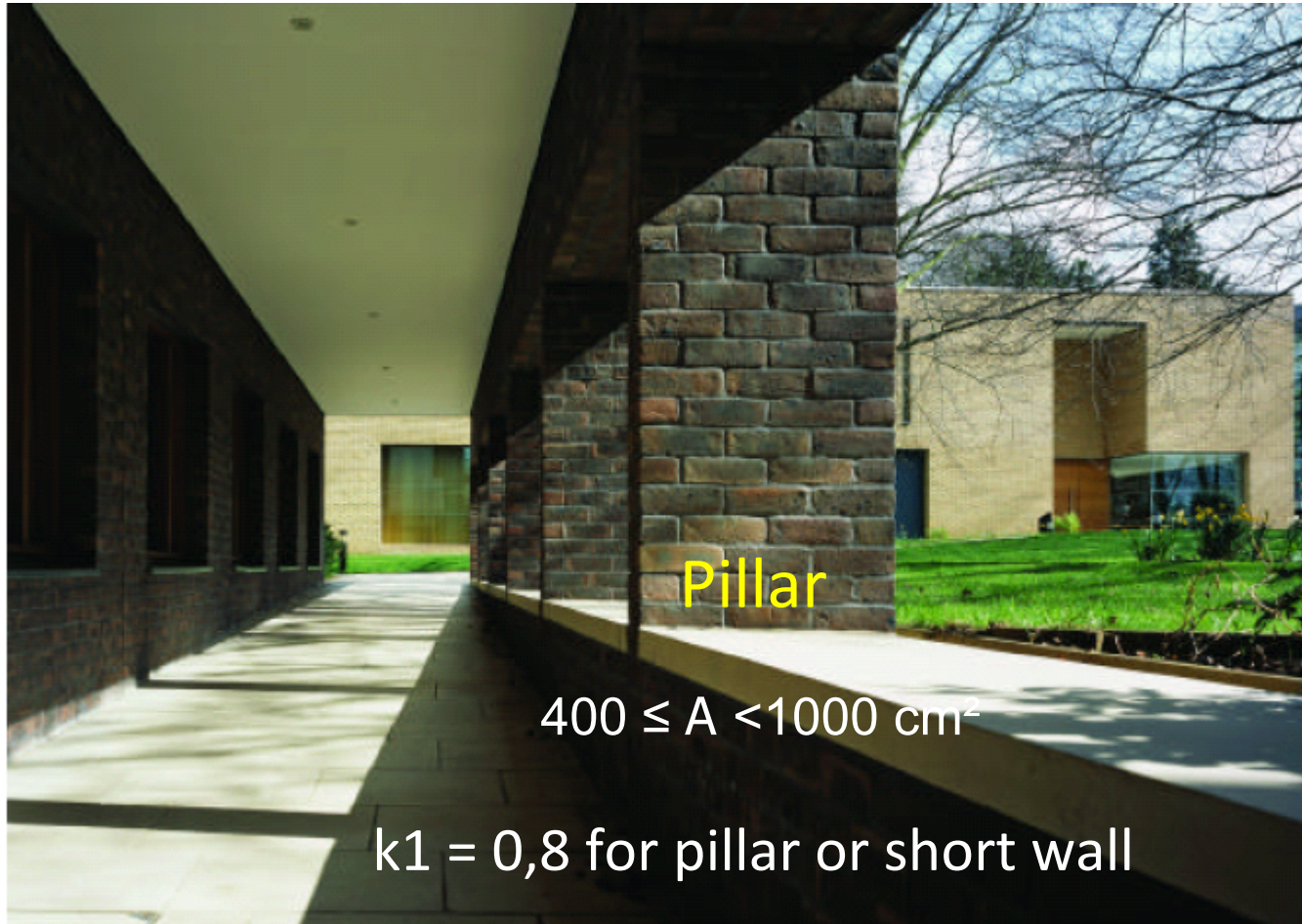
Source: Brick Development Association, *Brick Bulletin*, Summer 2000



OUTLINE

**BUILDING
SYSTEMS**

Wall construction



OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Source: Brick Development Association, *Brick Bulletin*, Summer 2000



OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

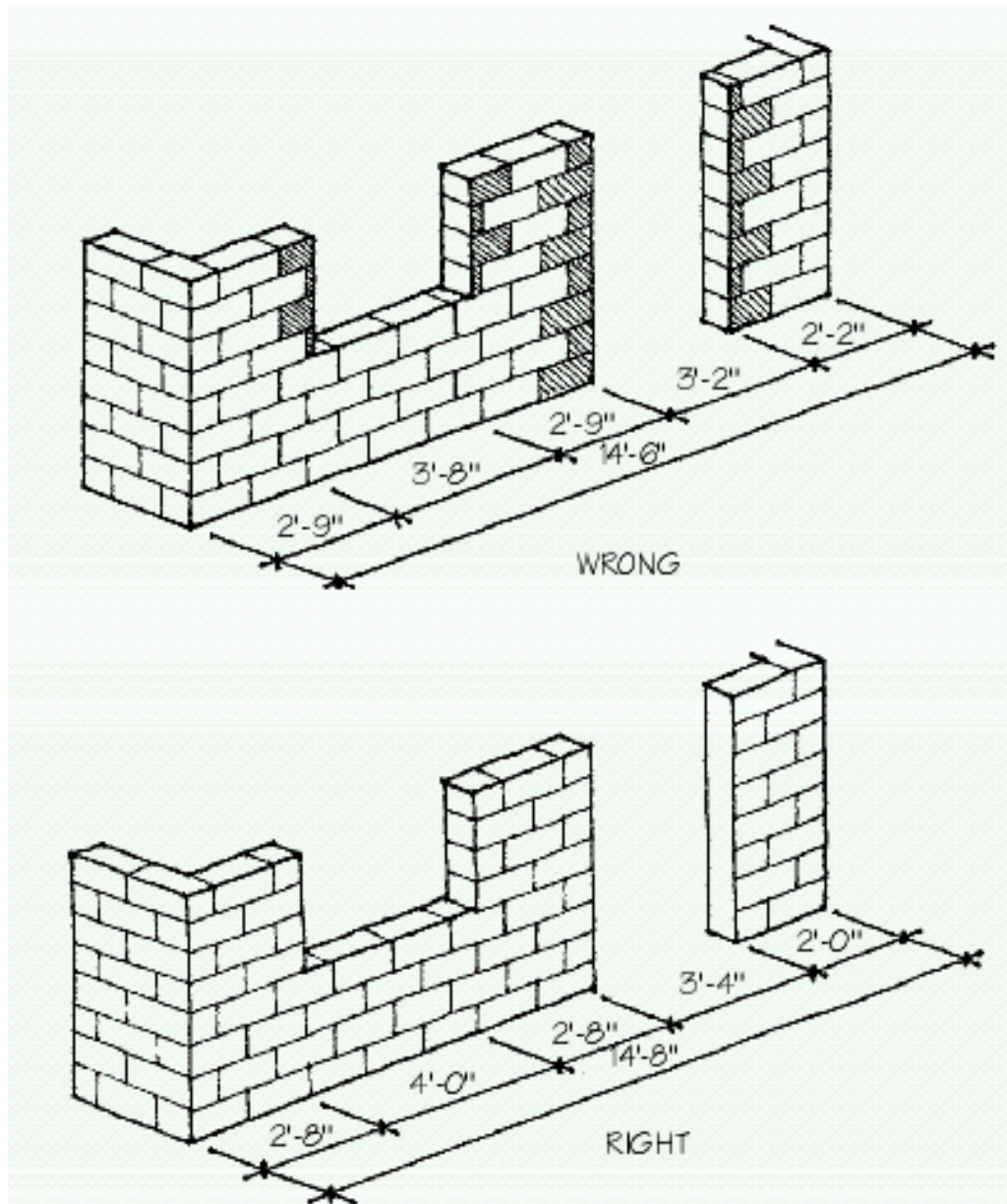
Topography

SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction



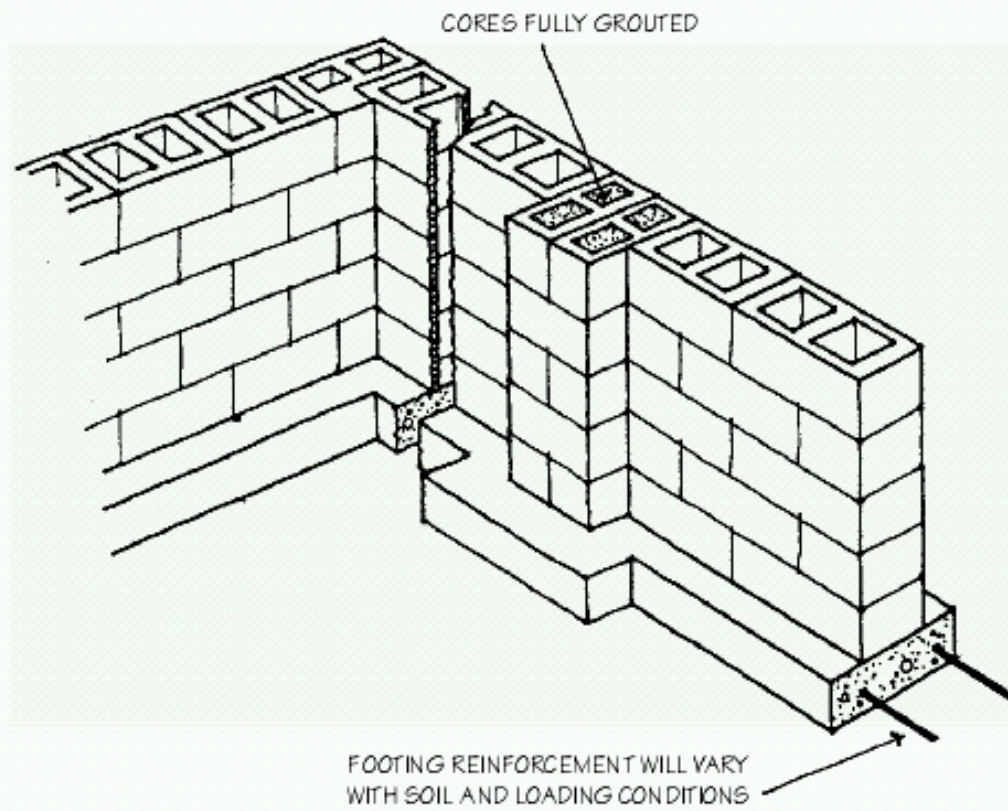
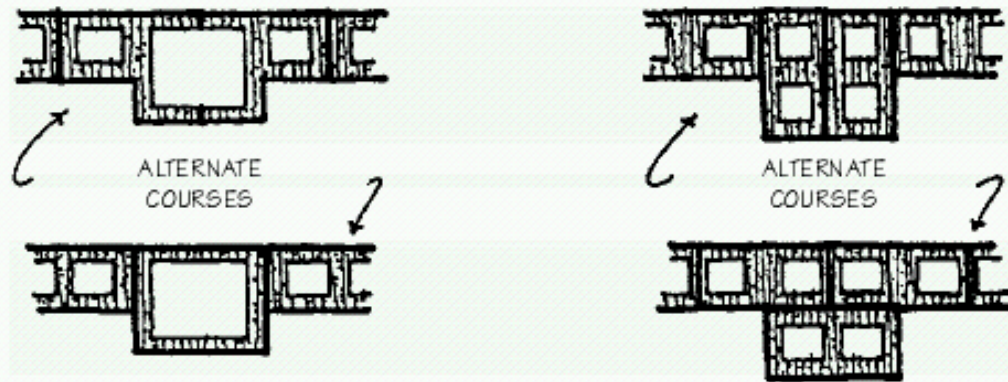
OUTLINE

BUILDING SYSTEMS

Basic concept
 Structural systems
 Topography

SEISMIC RESISTANT BUILDING

Phenomenon
 Design failure
 Construction



OUTLINE

BUILDING SYSTEMS

Basic concept
 Structural systems
 Topography

SEISMIC RESISTANT BUILDING

Phenomenon
 Design failure
 Construction



Terra-cotta panel façade, *GoettschPartners*,

OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

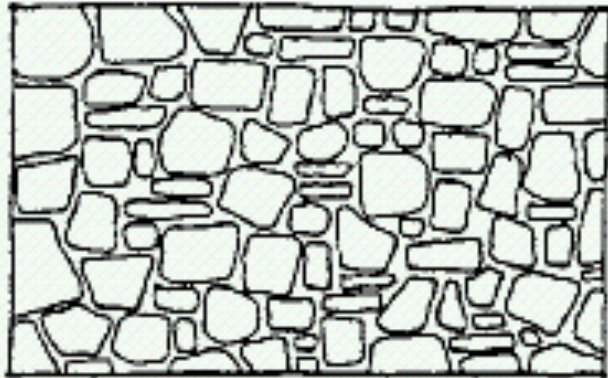
Topography

SEISMIC RESISTANT BUILDING

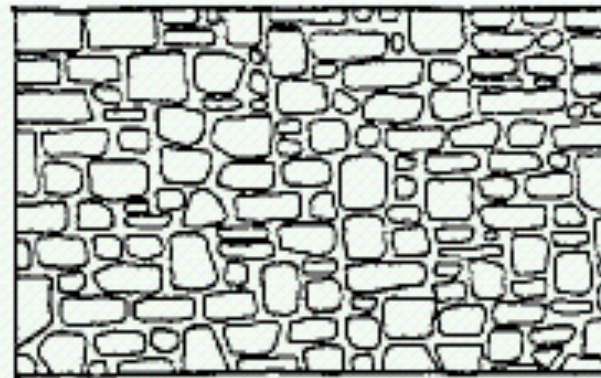
Phenomenon

Design failure

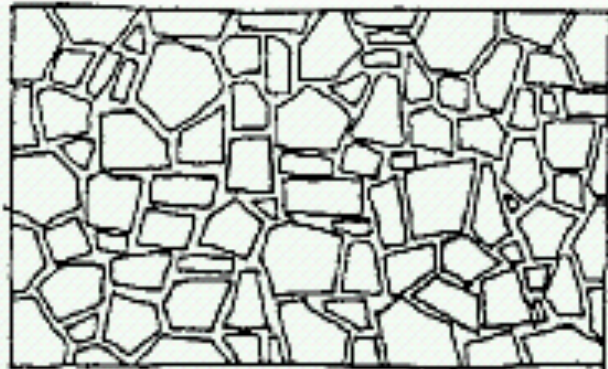
Construction



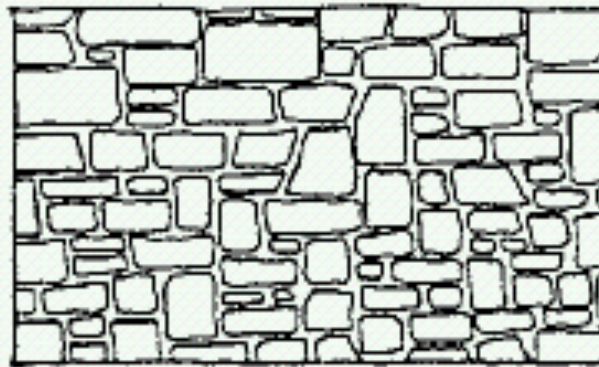
UNCOURSED RUBBLE



COURSED RUBBLE



RANDOM MOSAIC



COURSED, ROUGHLY
SQUARED RUBBLE

OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

Topography

SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction



OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

Topography

SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction



OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

Topography

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Phenomenon

Design failure

Construction



OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

Topography

SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction



OUTLINE

**BUILDING
SYSTEMS**

Wall construction



OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Load-bearing wall

OUTLINE

**BUILDING
SYSTEMS**

Basic concept

Structural
systems

Topography

**SEISMIC
RESISTANT
BUILDING**

Phenomenon

Design failure

Construction



Load-bearing wall

OUTLINE

BUILDING SYSTEMS

Basic concept

Structural
systems

Topography

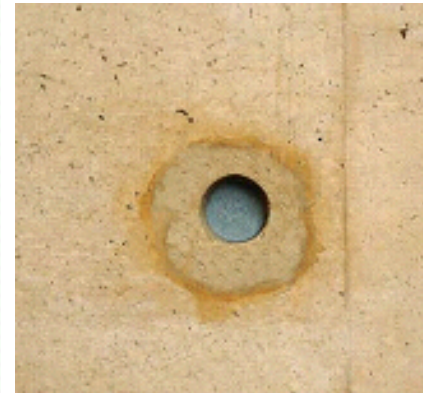
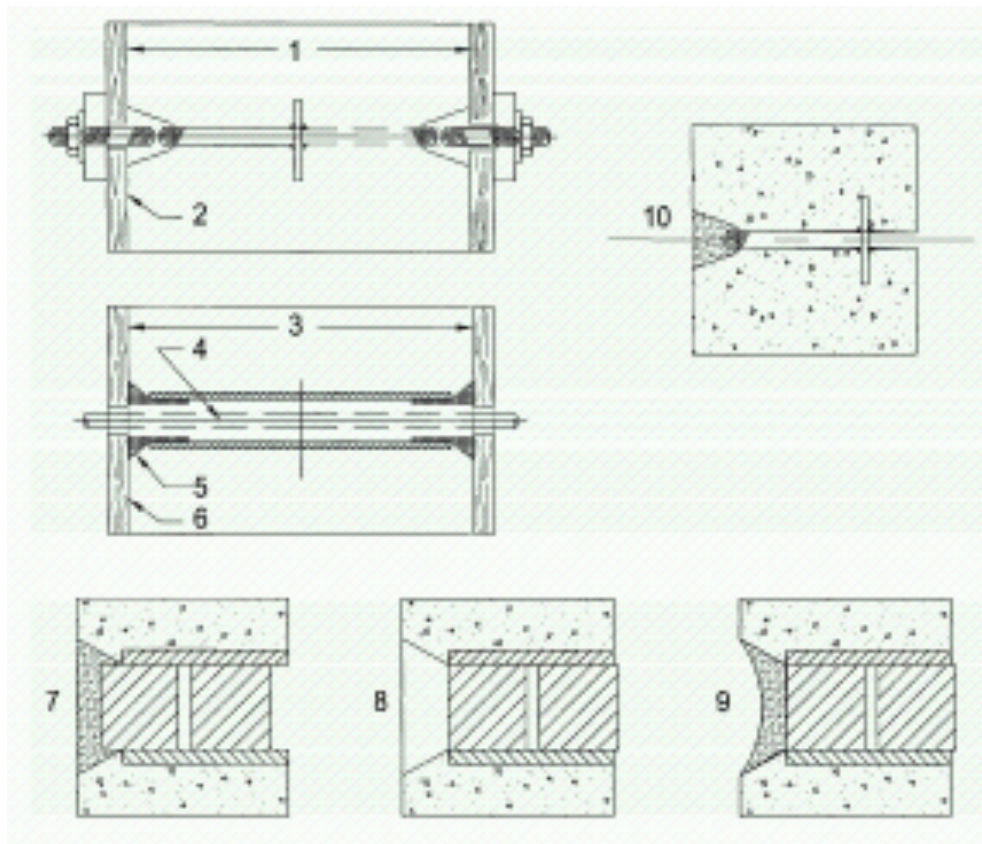
SEISMIC RESISTANT BUILDING

Phenomenon

Design failure

Construction





OUTLINE

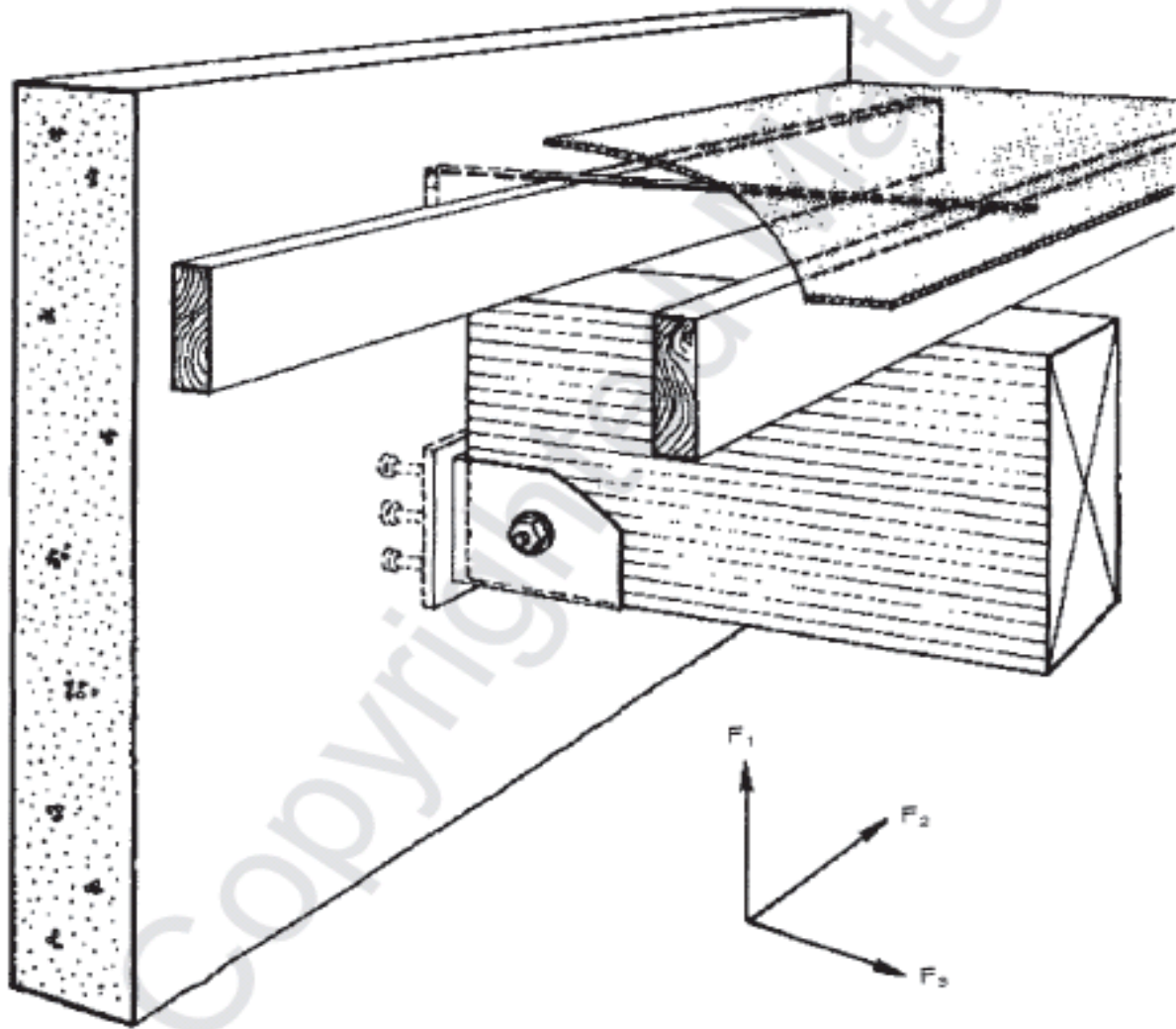
BUILDING SYSTEMS

Basic concept
 Structural systems
 Topography

SEISMIC RESISTANT BUILDING

Phenomenon
 Design failure
 Construction

- 1 Welded water stop plate, 2 Metal or plastic cone, 3 Wall thickness,
 4 Formwork anchor (thread-ed rod), 5 Plastic cone, 6 Formwork,
 7 Filled with mortar, 8 Plugged (e.g. with lead),
 9 Filled and shaped with mortar,
 10 Filled with mortar

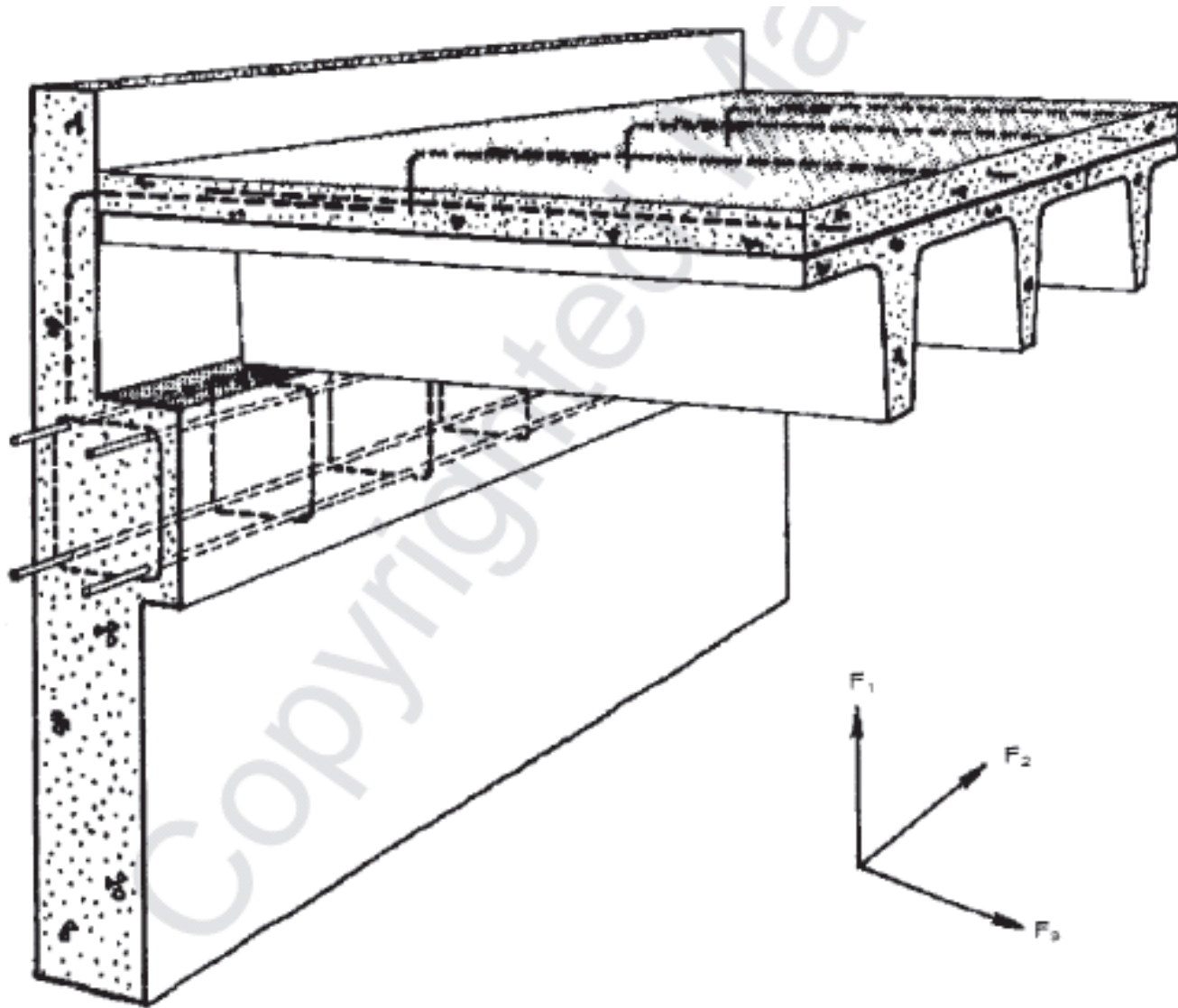


OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Heavy Timber Beam / Wall Connection with Steel Shoe

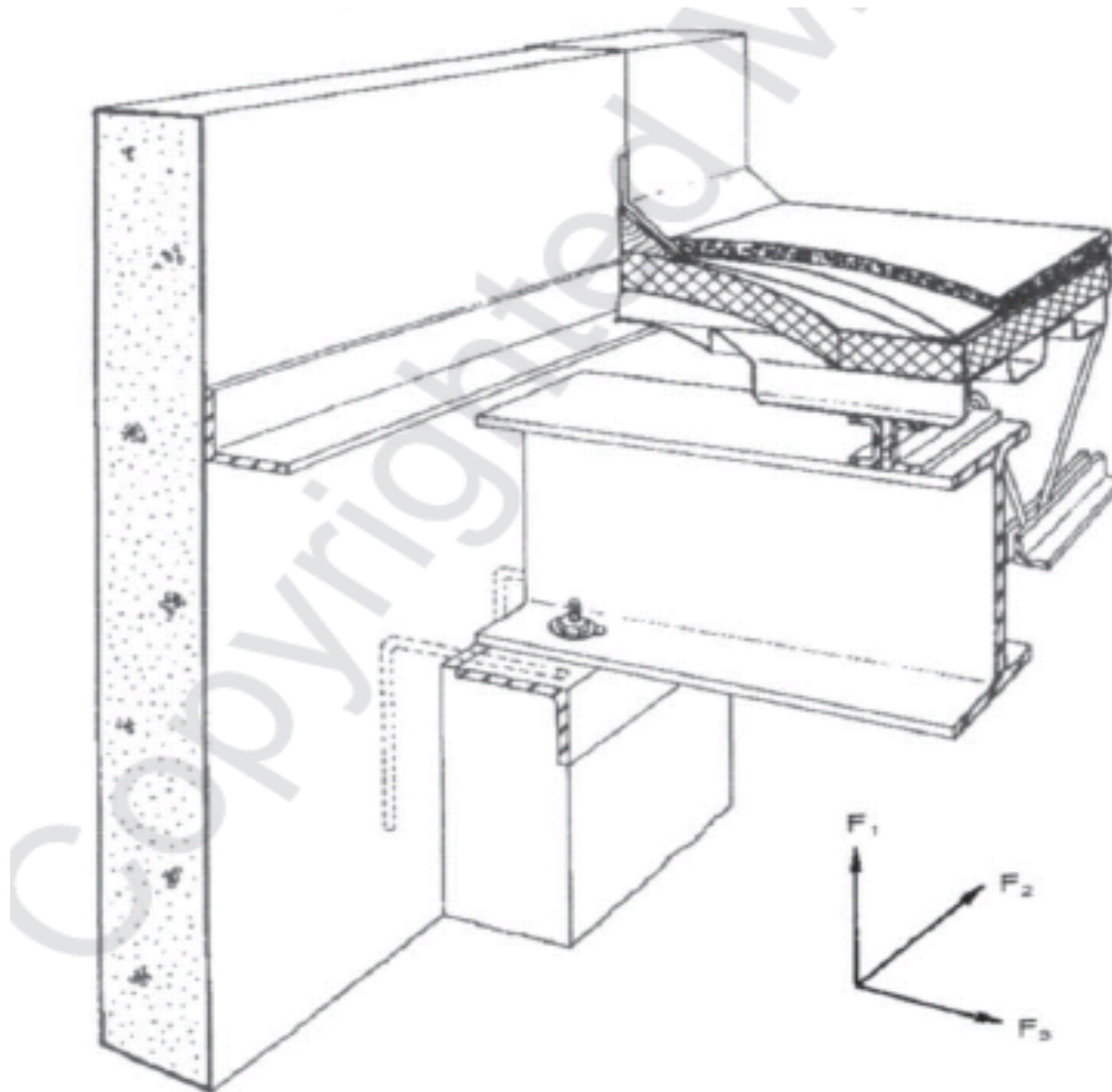


OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Precast Double Tee / Wall Connection with Ledge

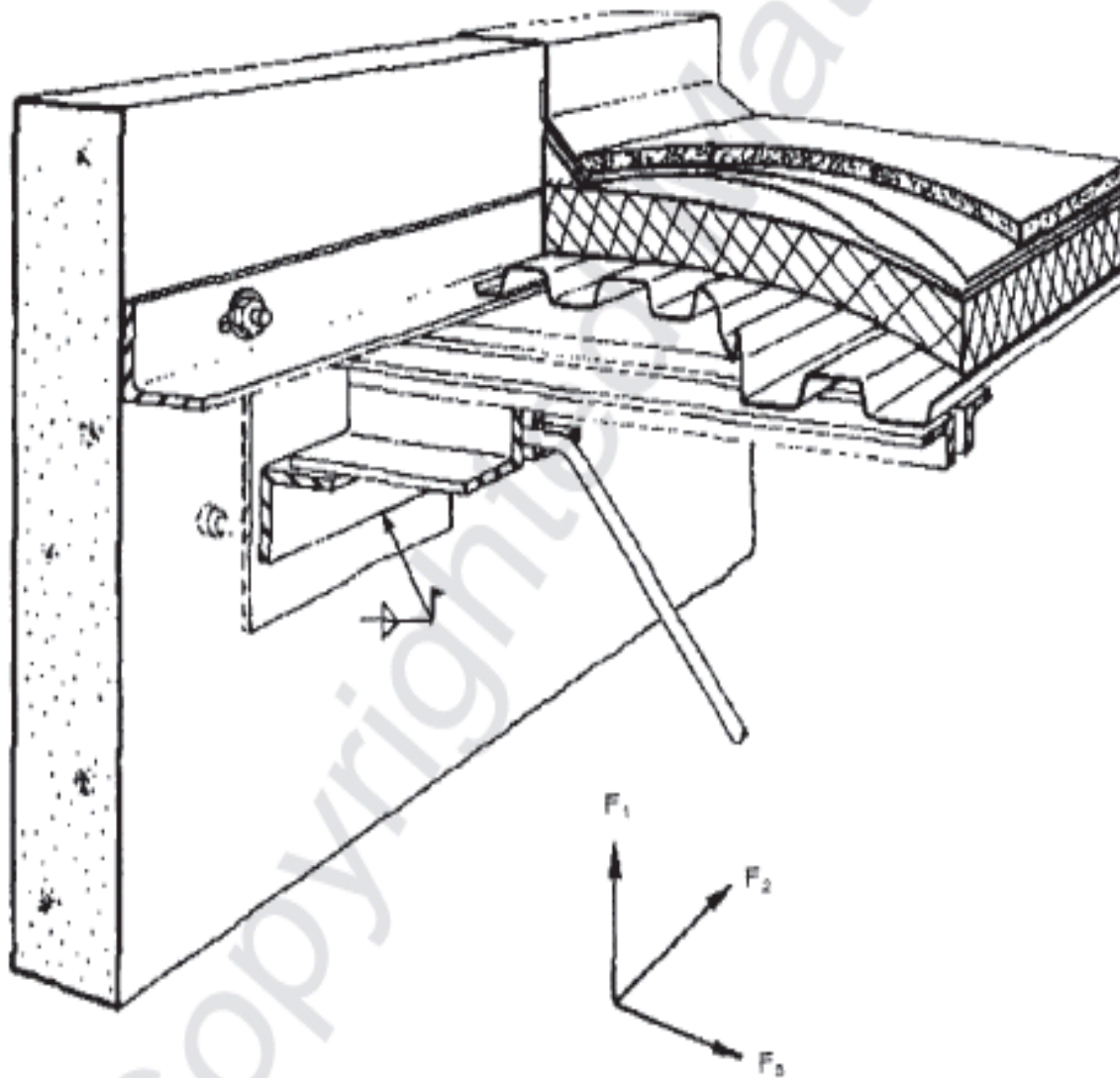


OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Steel Girder / Pilaster / Wall Connection

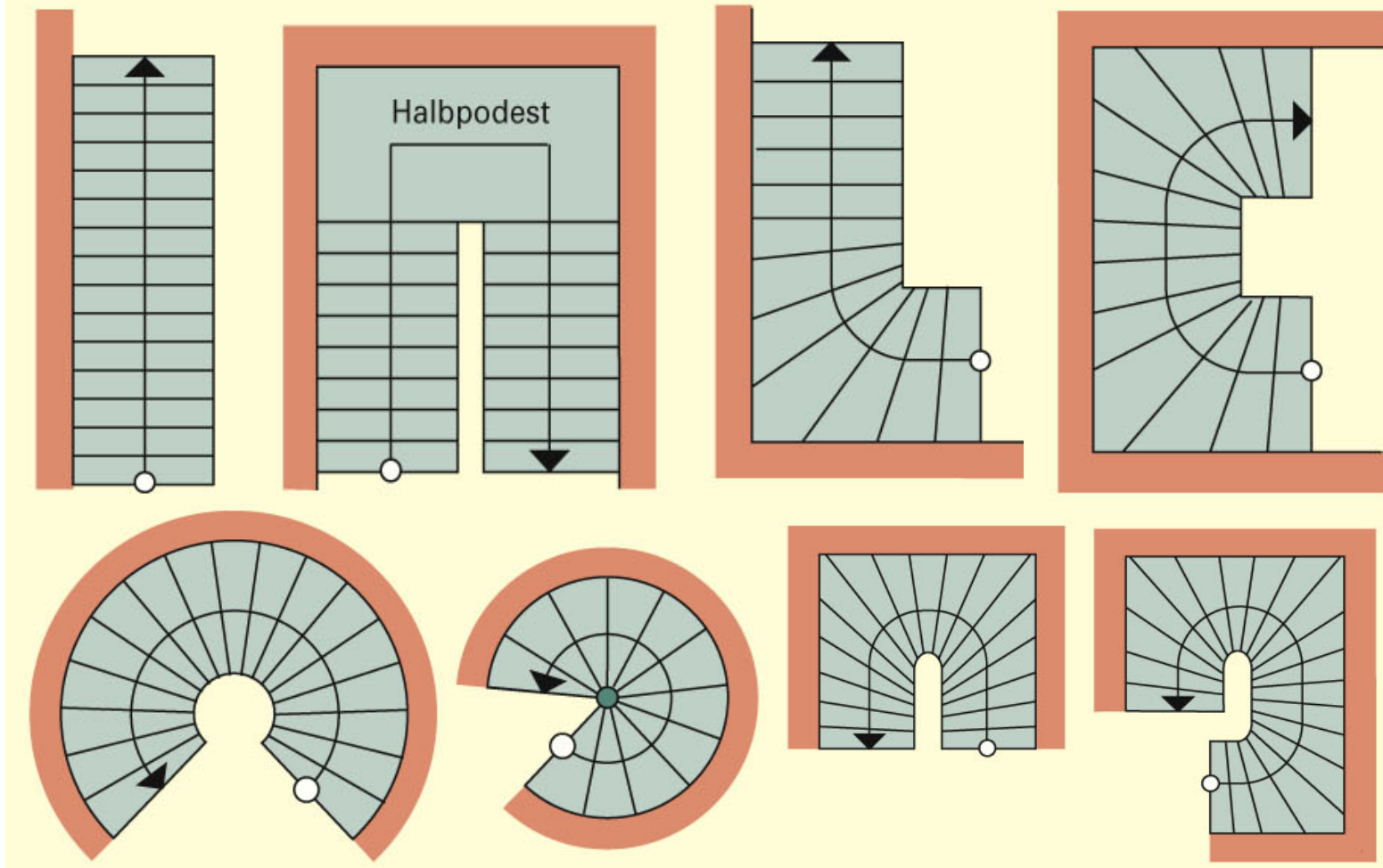


OUTLINE

**BUILDING
SYSTEMS**

Wall construction

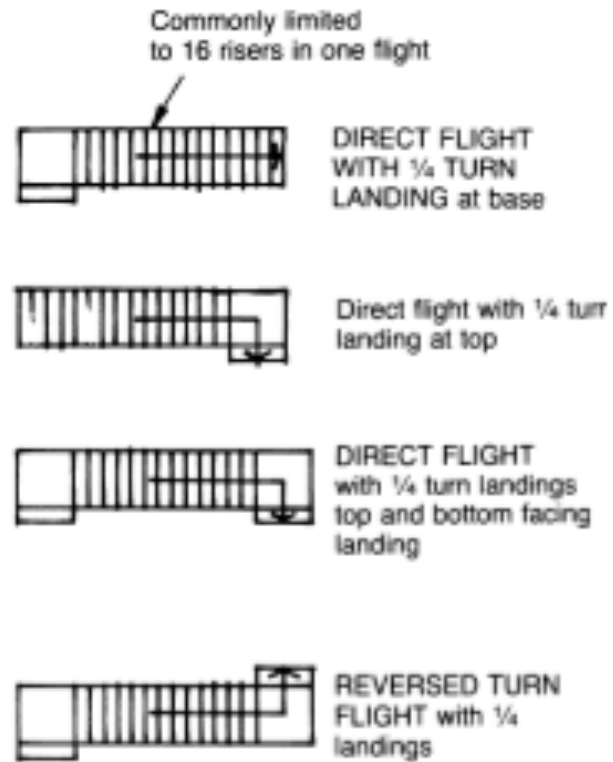
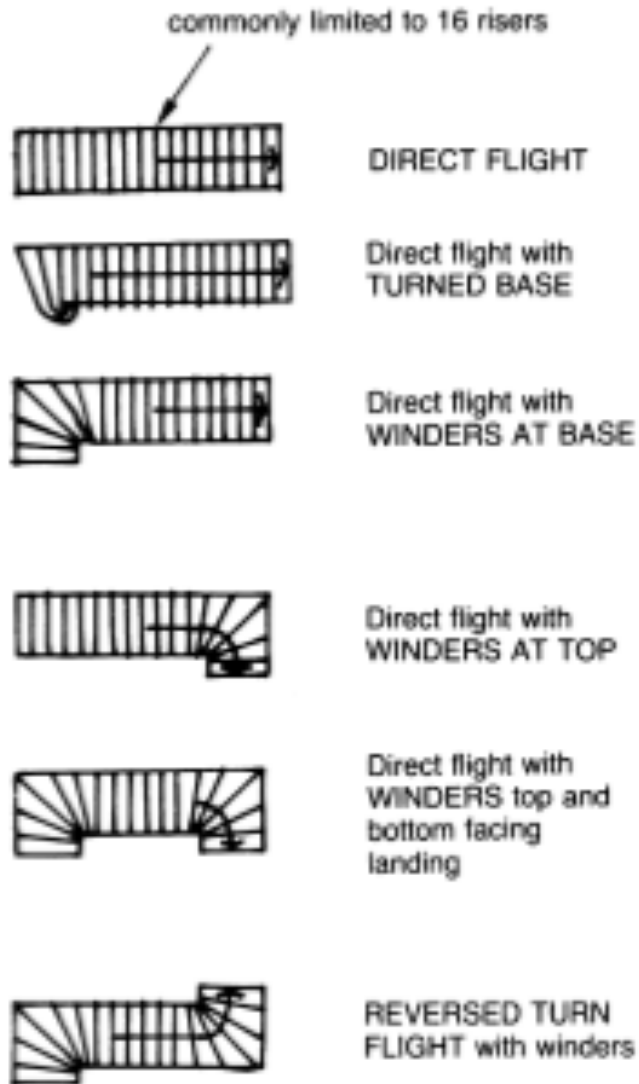
Steel Joist / Wall Connection with Seat Angle



OUTLINE

BUILDING SYSTEMS

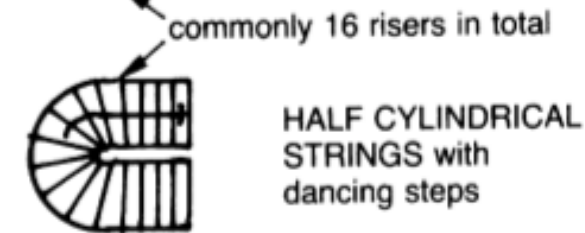
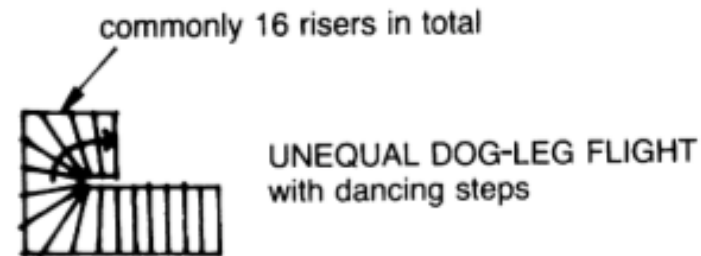
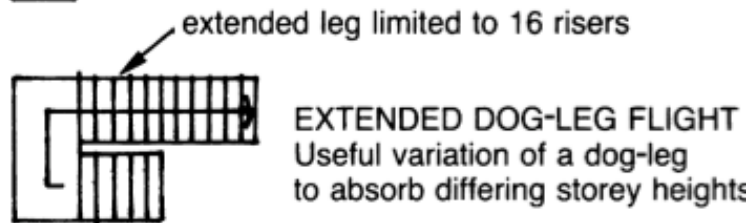
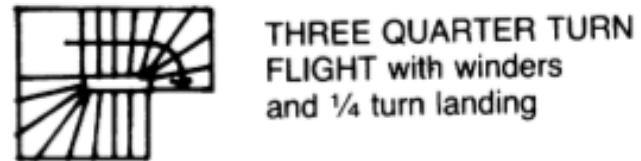
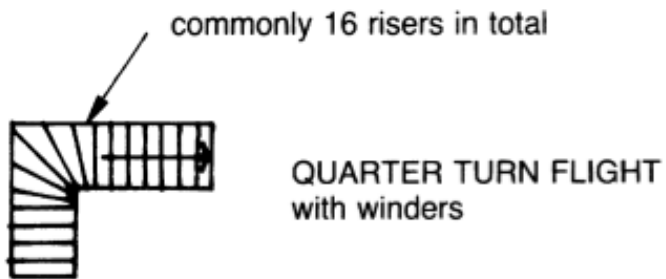
Wall construction



OUTLINE

BUILDING SYSTEMS

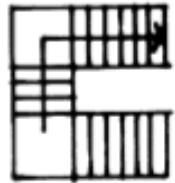
Wall construction



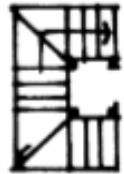
OUTLINE

BUILDING SYSTEMS

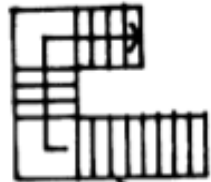
Wall construction



RETURN FLIGHT
with two landings

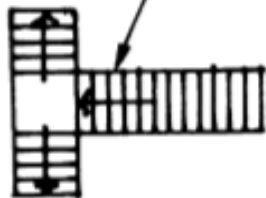


Return flight with most
compact form
using winders



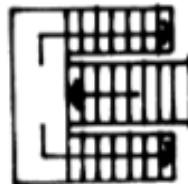
UNEQUAL RETURN
FLIGHT

16 risers max for long leg



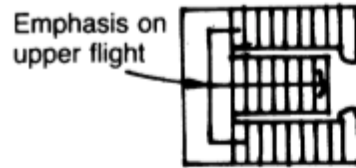
DIVIDED
FLIGHTS

Main flight often
twice width of upp
flight



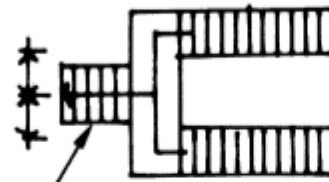
DIVIDED RETURN
FLIGHTS (emphasis
on lower flight)

extended tread at base



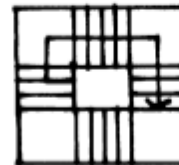
Emphasis on
upper flight

DIVIDED RETURN FLIGHT
main flight
often twice
the divided flights

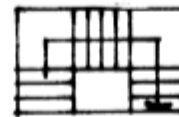


BROKEN DIRECT
FLIGHT
Landing often
used as
secondary approach

Emphasis
on upper flight (twice lower flight width)



FOUR QUARTER TURN
FLIGHT with
1/4 landings



RETURN FLIGHT
(reduced version of
two quarter turns for
lesser storeys)

OUTLINE

BUILDING SYSTEMS

Wall construction



OUTLINE

**BUILDING
SYSTEMS**

Wall construction



OUTLINE

**BUILDING
SYSTEMS**

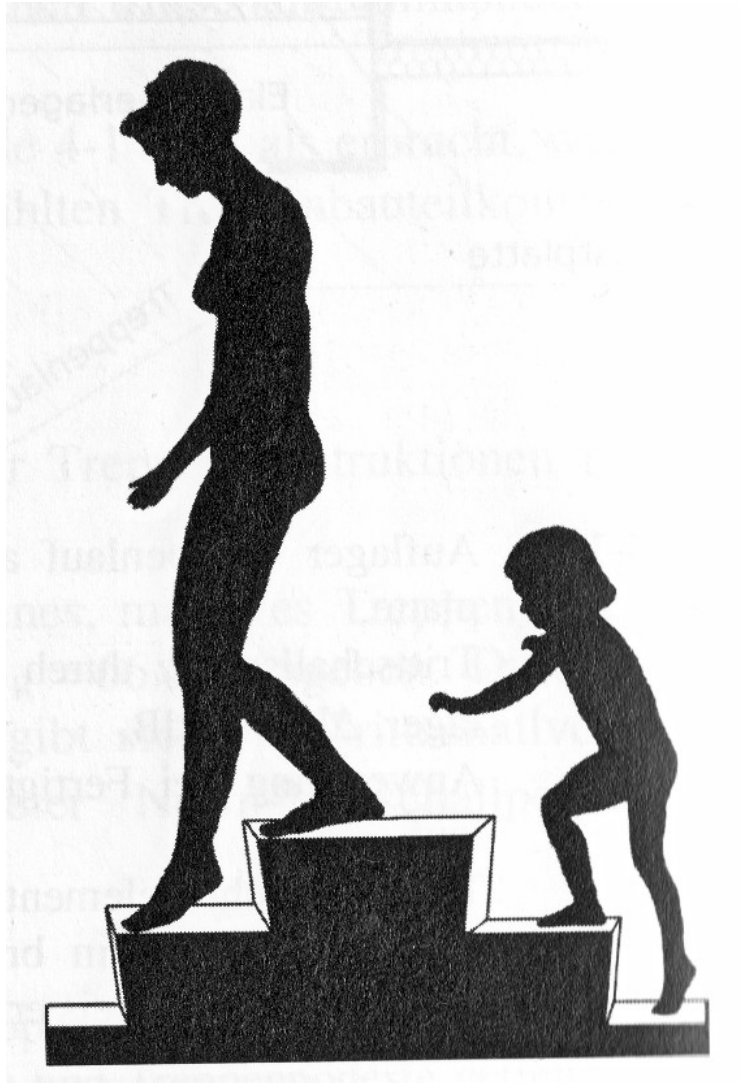
Wall construction



OUTLINE

**BUILDING
SYSTEMS**

Wall construction

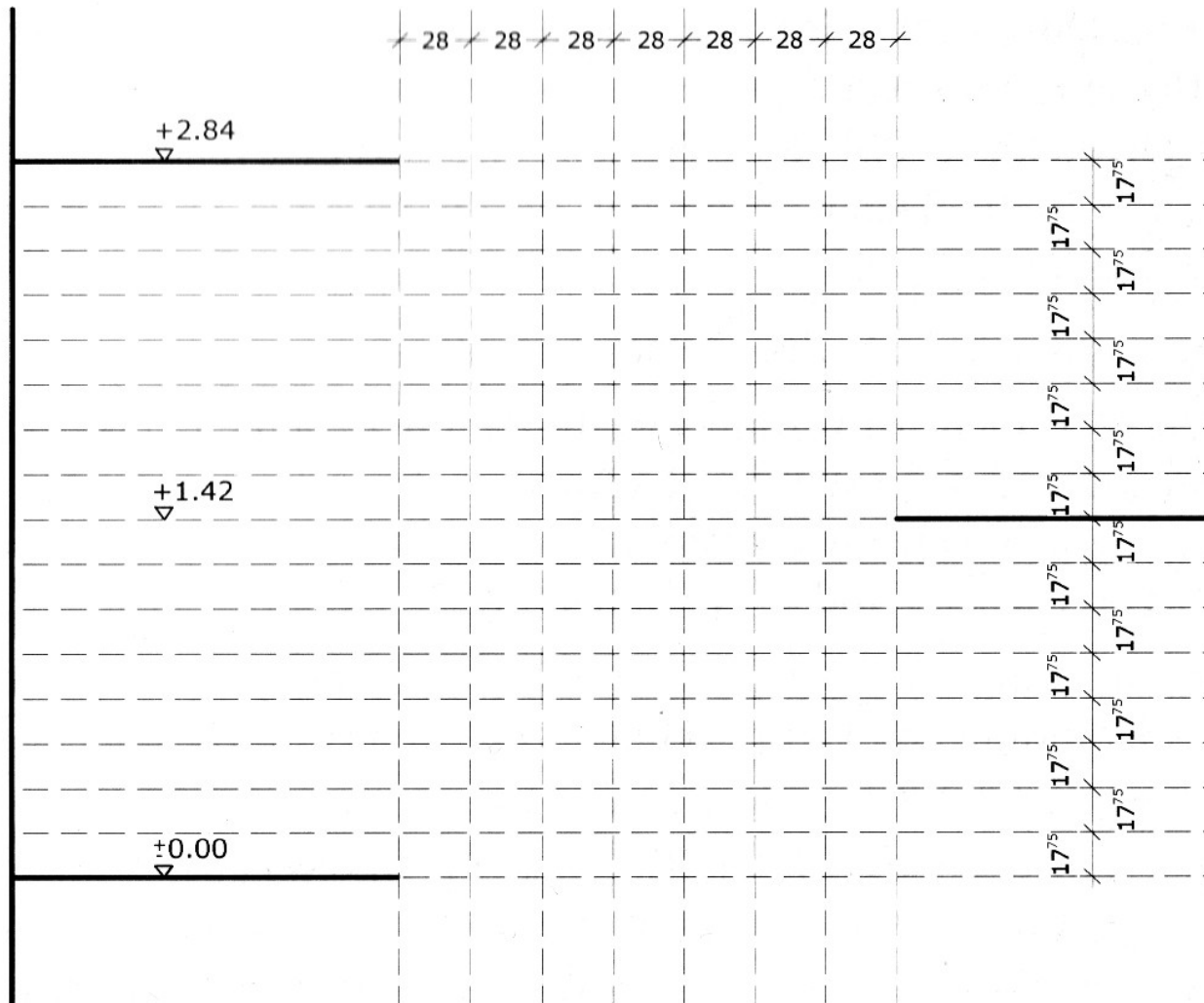


Normal = $2 \text{ uptrape } (s) + \text{antrape } (a) = 59 - 65 \text{ cm}$
Comfort = $a - s = 12 \text{ cm}$
Safety = $a + s = 46 \text{ cm} \pm 1 \text{ cm}$

OUTLINE

**BUILDING
SYSTEMS**

Wall construction

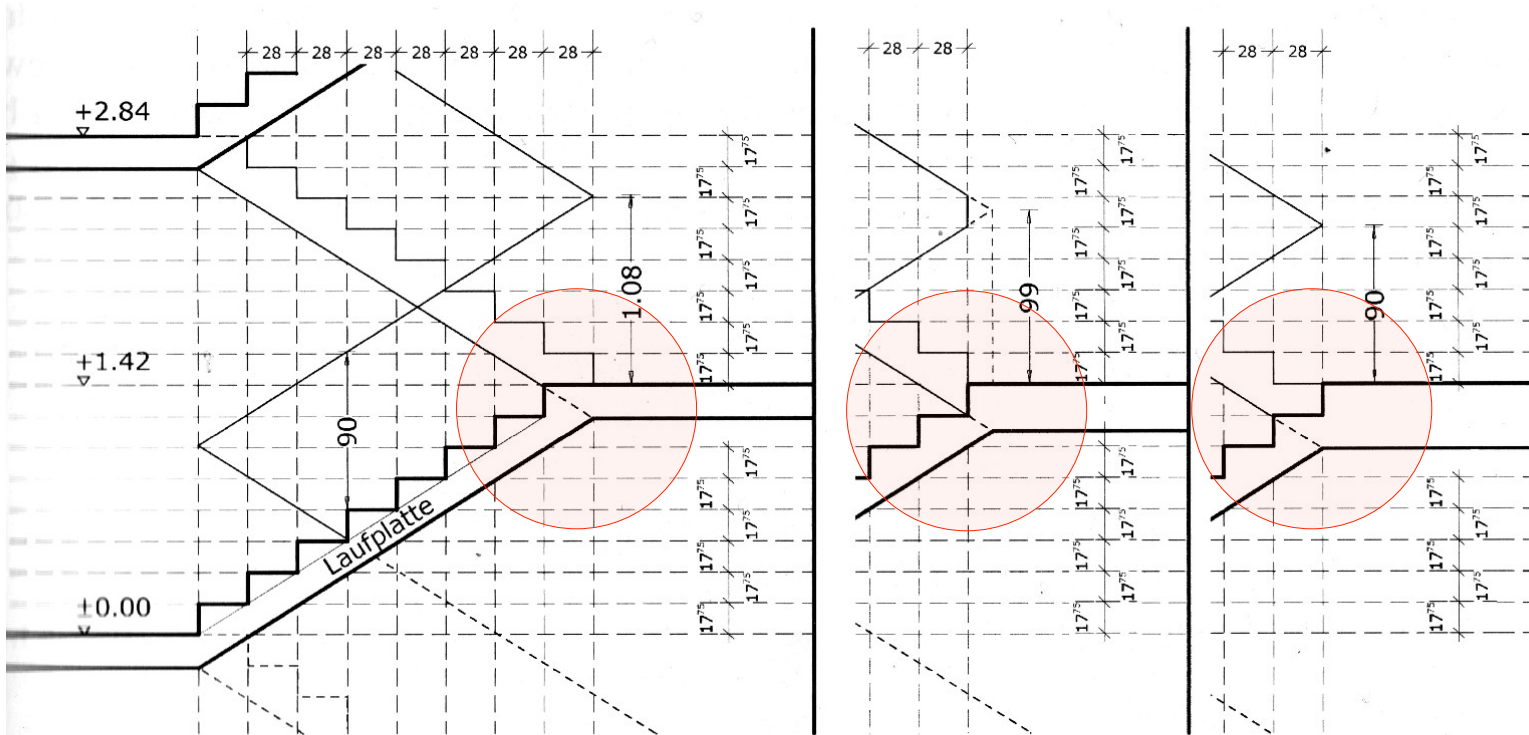


OUTLINE

**BUILDING
SYSTEMS**

Wall construction

Normal = 2 uptrape (s) + antrape (a) = 59 - 65 cm
Comfort = a - s = 12 cm
Safety = a + s = 46 cm ± 1 cm



OUTLINE

BUILDING SYSTEMS

Wall construction

Normal = 2 uptrape (s) + antrape (a) = 59 - 65 cm

Comfort = a - s = 12 cm

Safety = a + s = 46 cm ± 1 cm

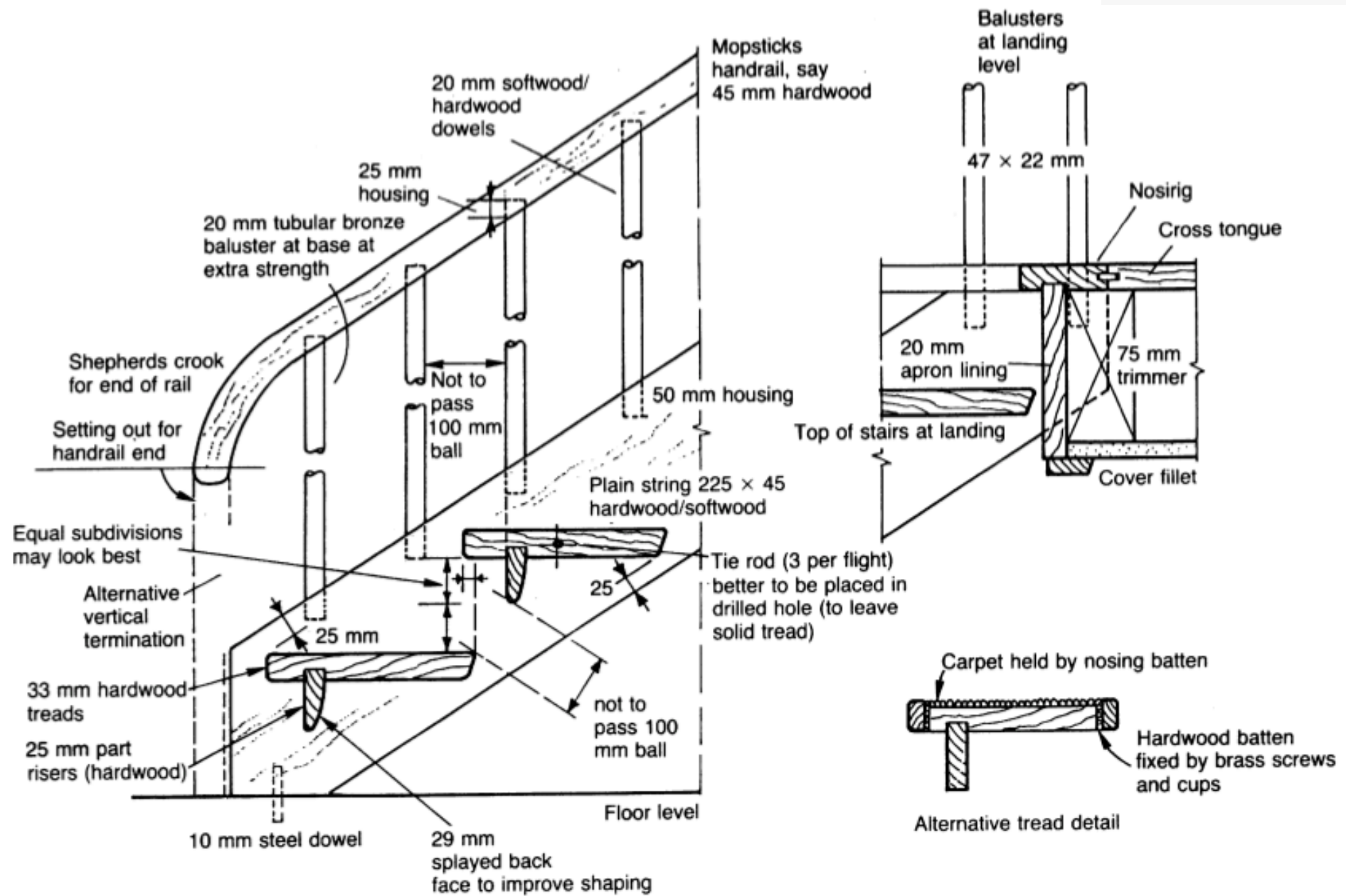


Figure 6.2c Framing timber stairs: Details of open tread stairs

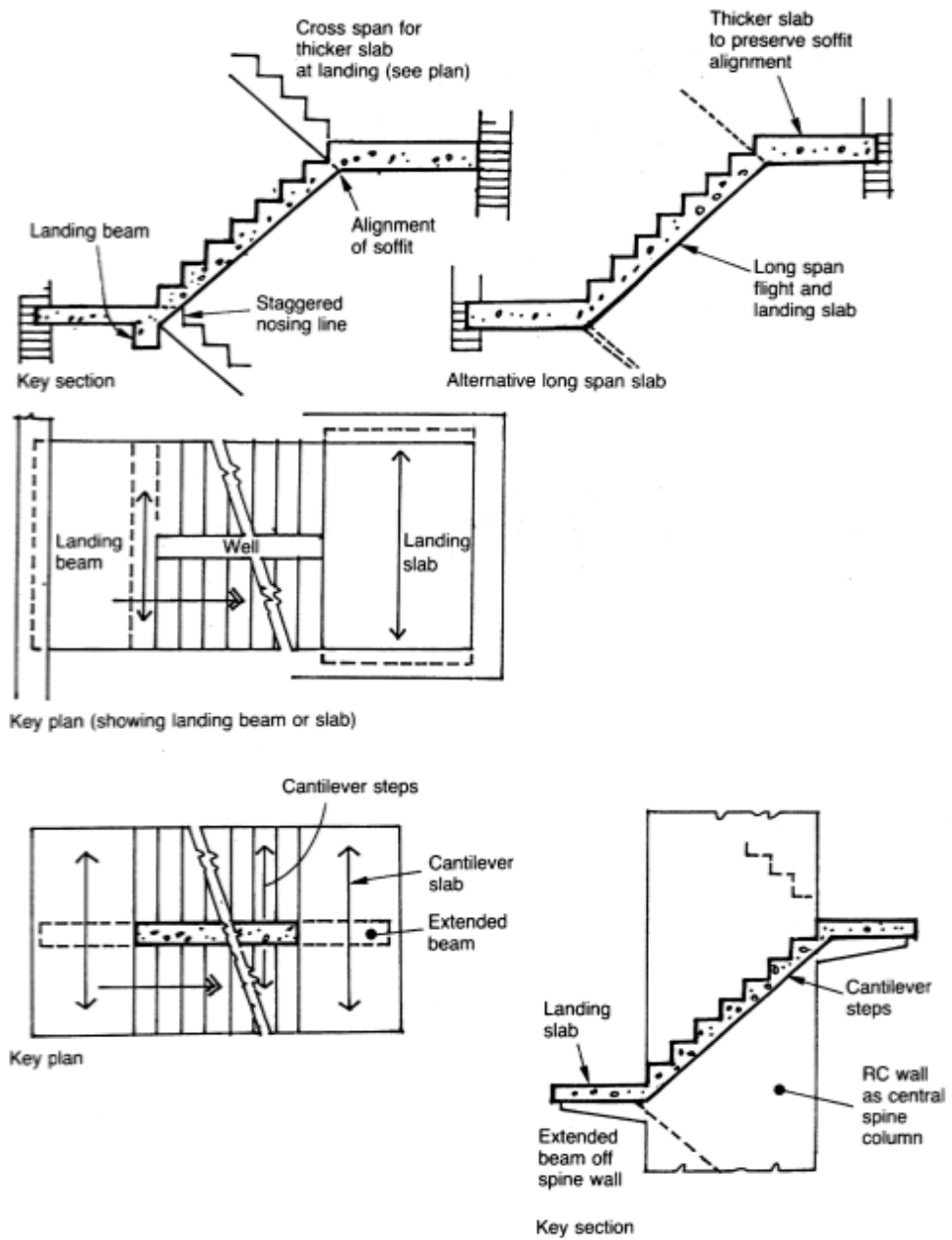


Figure 8.2a Developed forms of reinforced concrete stair: Simple RC slabs (with and without landing beams)

OUTLINE

BUILDING SYSTEMS

Wall construction



Figure 8.3b Pre-cast beam stair prepared for tread fixing

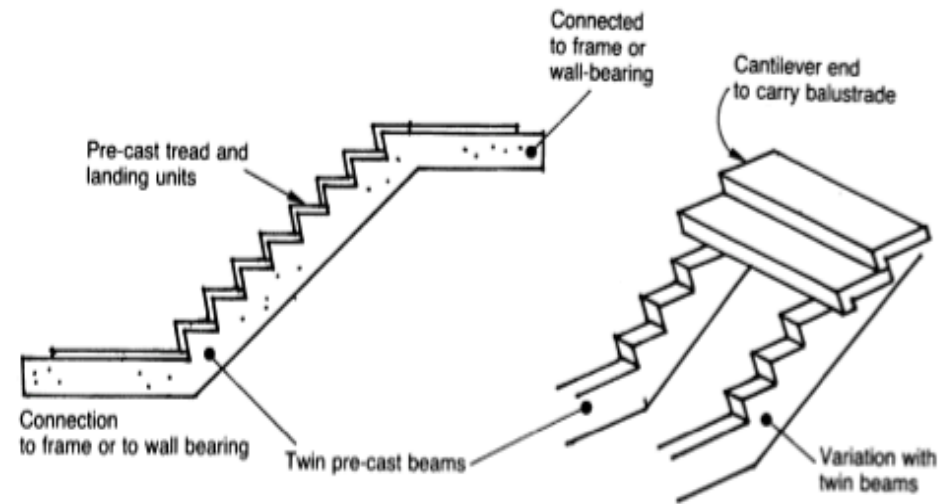


Figure 8.3c Completed work with treads and balusters in place

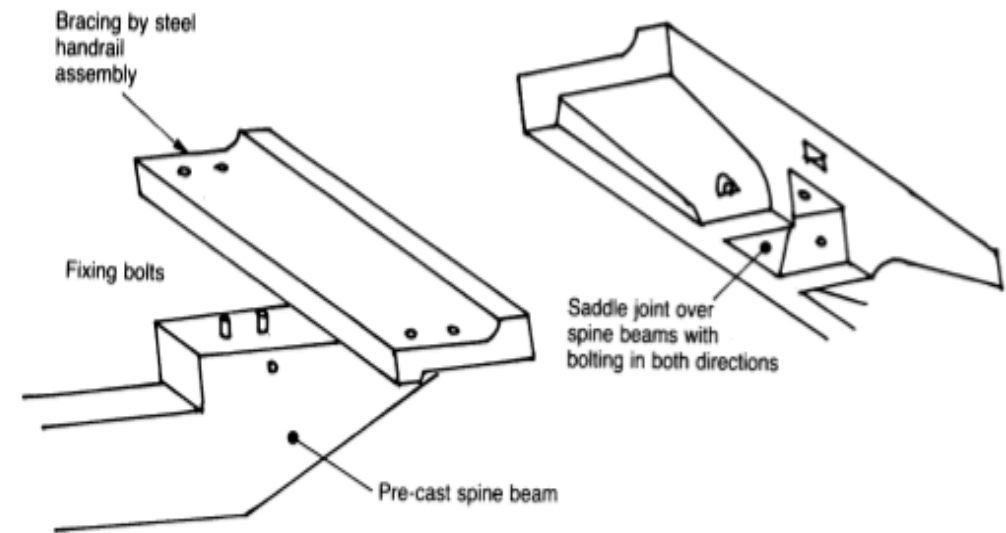


Figure 8.2c Spine beam support (with pre-cast treads)



Figure 8.4c Artificial stone finish to spiral stair (courtesy of Cornish Spiral Stairs Ltd)

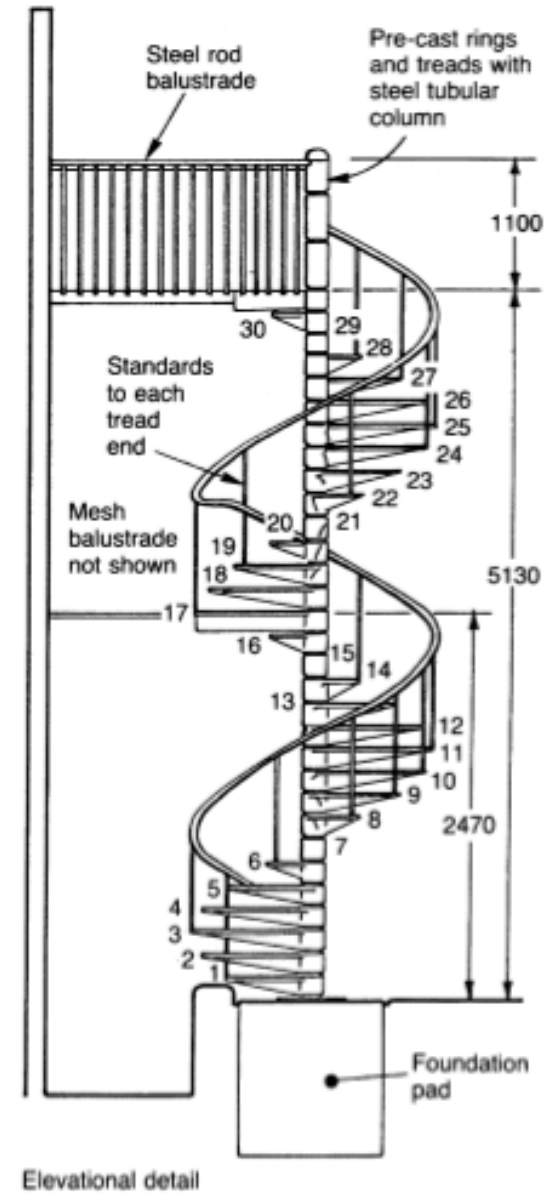
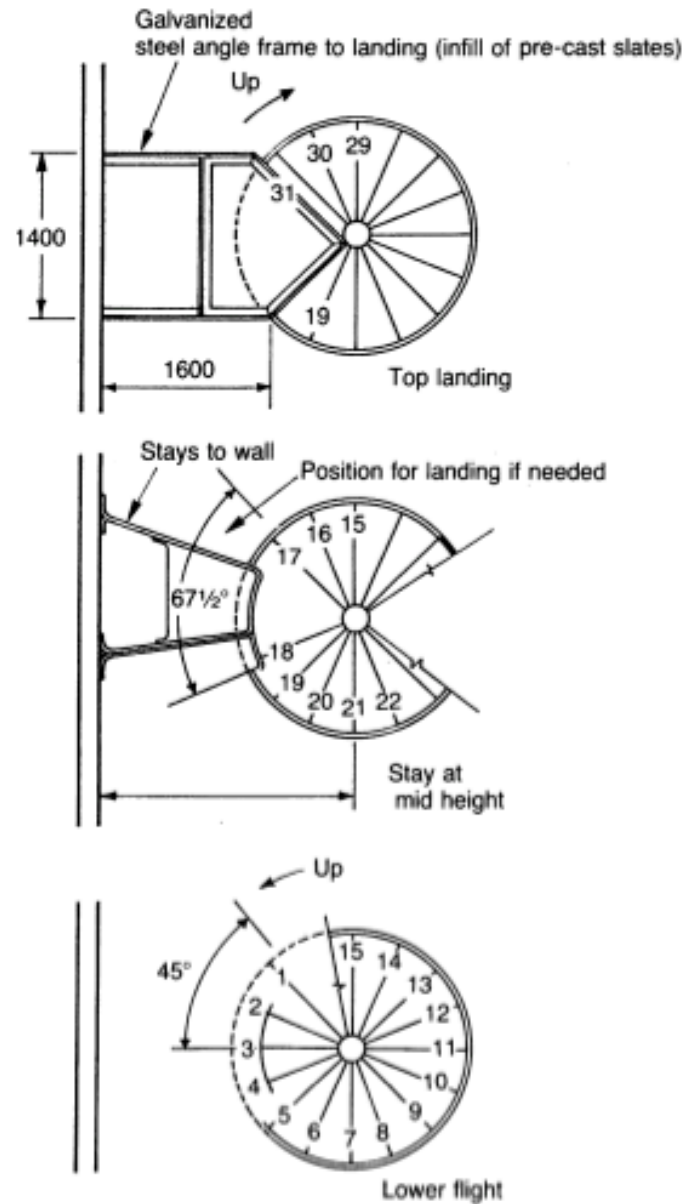
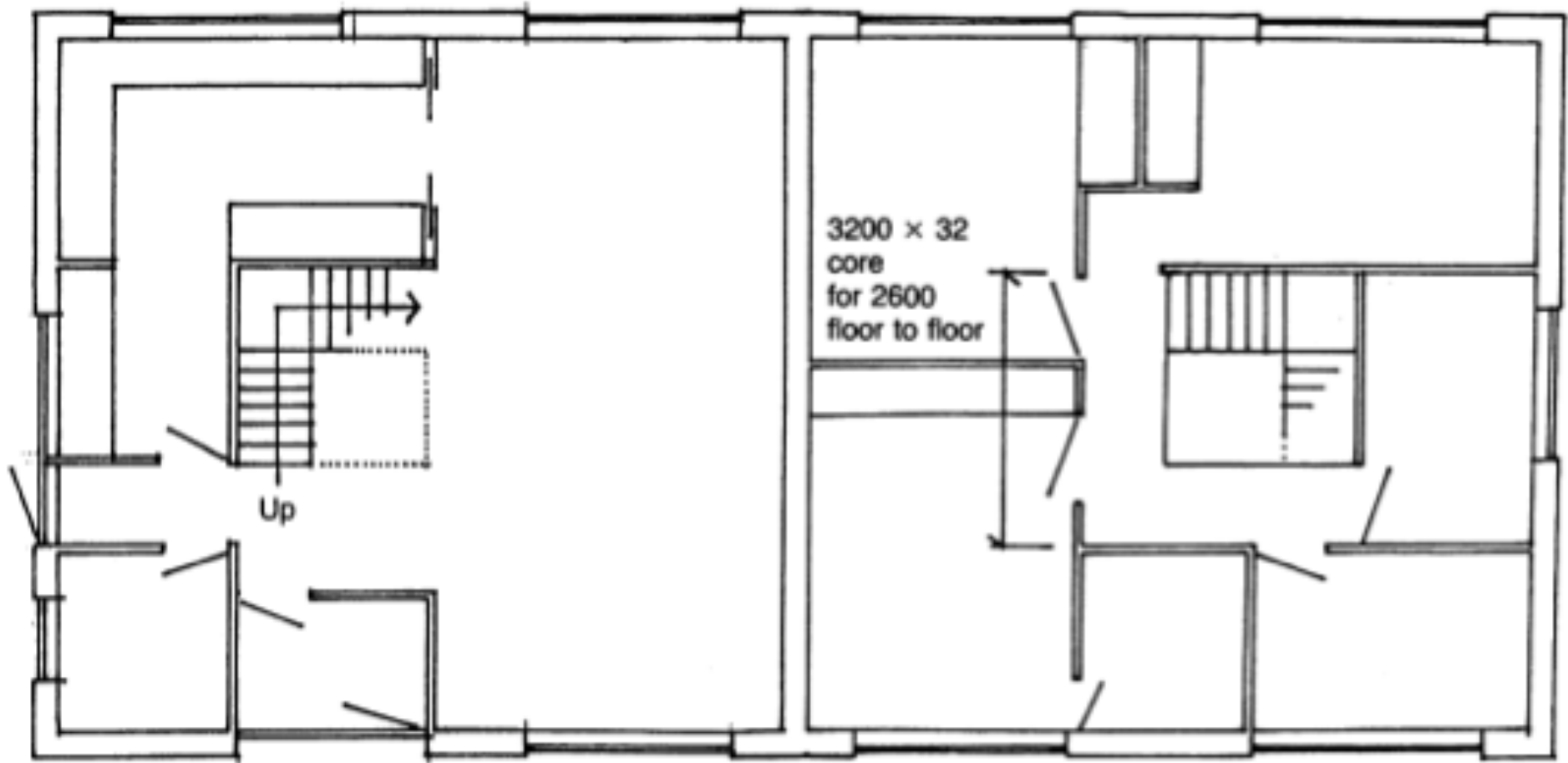
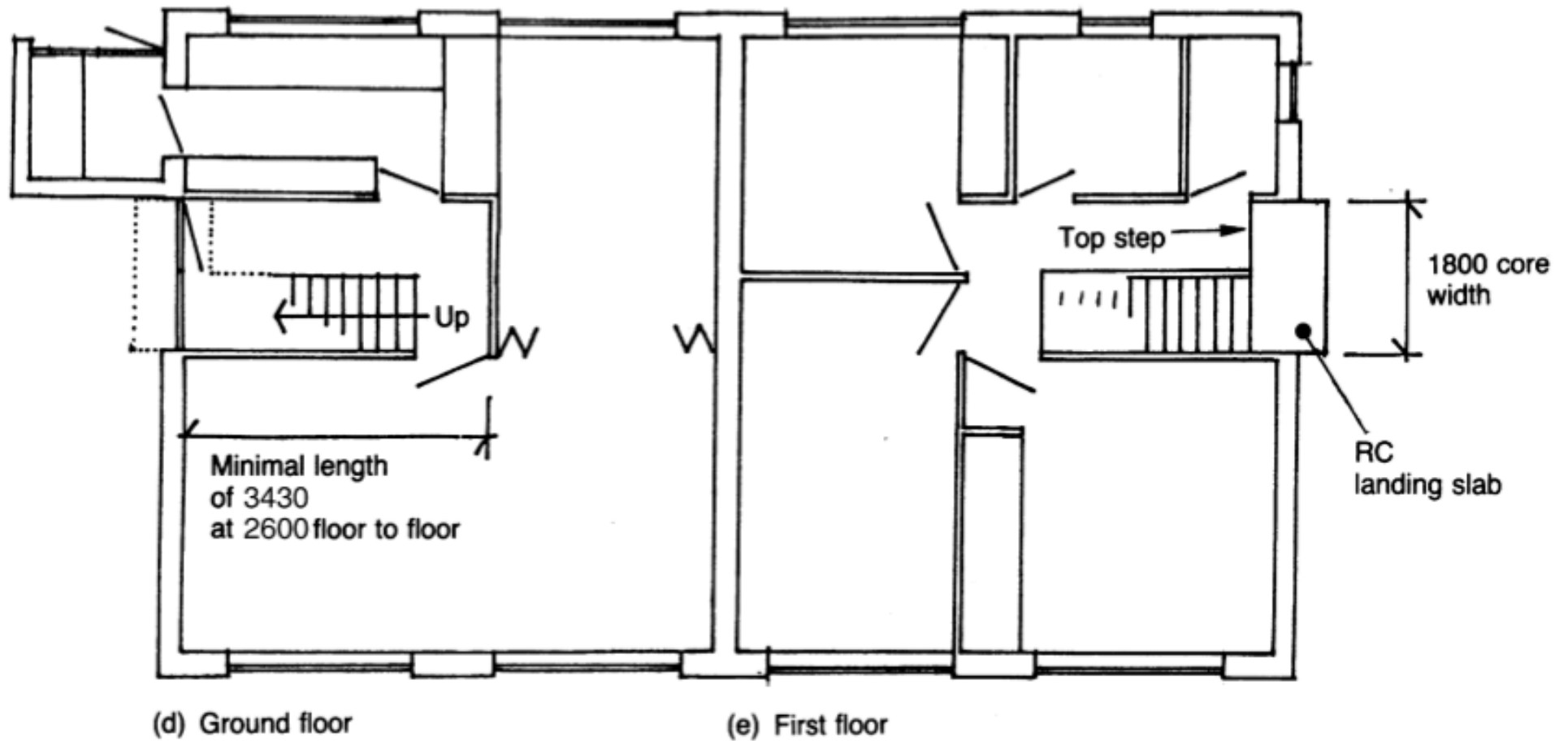


Figure 8.4a Pre-cast spiral stairs: Typical components using pre-cast treads and steel tubular column



(f) Ground floor

(g) First floor



Figures 4.2d and e Generic plans for houses: Turned double-fronted plan

Evaluasi Pertugasan

Selama masa UTS

Dikumpulkan tanggal 26 APRIL 2011

SITEPLAN, DENAH, POTONGAN, (+TAMPAK)

Assistensi minimal 2 x

OUTLINE

**BUILDING
SYSTEMS**

Wall construction