

TOPIC SCHEDULE

		LECTURE	PRACTICAL
week	Date	Topics	Topics
5.		Building materials and their applications: STONE	

Today's Lecture: Building materials: Natural and artificial stone

I. Natural (mined) stone:

In areas where stone was abundant it was also used for erecting walls laying the rouble stones in mud, which provided an even distribution of loads and excluded any draught and insects. The progress in making metal tools enabled the stone to be shaped to exact geometric forms, plans and rectangles, which led to the dressed-stone walls and ashlar-walls and to dressed arching and vaulting techniques, later to decorative mouldings and tracery.

a) Physical Properties: eg.: Density: 1200-2800 kg/m³ (must learn)

The **strength** of building stones displays a large variety. The same applies to **specific gravity**, **workability**, **porosity**, **permeability** and **absorption**. To obtain the necessary information about durability of stones freezing and thawing tests are carried out. The stone has high **compression strength** capacity, but very low bending and tensions **stress capacity**. The thermal insulation capacity of stone is low as well.

b) Types: The principal building stones generally used are (must learn):

igneous:	sedimentary:	metamorphic:
basalt, granite	sandstone, limestone	slate marble, marble

c) Manufactured building construction elements:

Dimensions of stone elements depend on the type of stone and application fields. This can be from more than 1 m until 5 mm.

II. Artificial (manufactured) stone

Artificial stone has been made of crushed stone, cement and water basically.

APPLICATIONS FIELDS OF STONE (WHERE WE USE IT) – simple, must-learn list

1. Load bearing and supporting constructions

1.1. Load bearing walls and vaults

2. Coverings

2.1. Wall covering

2.2. Floor covering

2.3. Pitched roof covering

In other areas the soil itself soon appeared as a building material: digging out holes, where the ground water was deep enough, and the excavated earth was used for wall-like filling or to cover a primitive timber-roof. /Similar air-raid shelters were made during the second World War and people even lived in them for some time./

Gypsies with a low income also lived in such types of shanties up to the Second World War.

Later it was learned that a certain type of soil as clay is exceptionally apt for making walls, specially if plastified by water and mixed with fibrous materials such as: straw, grass, and animal hair, etc. First dabs were made which were put beside each other and above each other to obtain a wall, when it dried, assumed a considerable strength and was capable of carrying a floor and roof. Wattle walls were also made in a single or double layer with a gap in between filled and covered with cob. ^{E29}

When a mud-wall or cob wall ^{E27} was completed and nearly dry, it was trimmed with a spade to produce a comparatively smooth surface.

Even later a primitive sort of shuttering was used, equal with the thickness of the wall. About 50cm high and lifted as the walling proceeded. This was followed by using bottom-less mould ^{E30} to produce adobe bricks, ^{E31} and walls were built by laying these bricks in bound. /Laying in bound means that no vertical brick-joint should be continuous over the horizontal layers. They shouldn't be "in line". In areas where stone was abundant it was also used for erecting walls laying the rough stones ^{E22} in mud, which provided an even distribution of loads and excluded any draught and insects. The progress in making metal tools enabled the stone to be shaped to exact geometric forms, ^{E26} plans and rectangles, which led to the dressed-stone walls and ashlar walls and to dressed arching and vaulting techniques, later to decorative mouldings and tracery. The principal building stones generally used are:

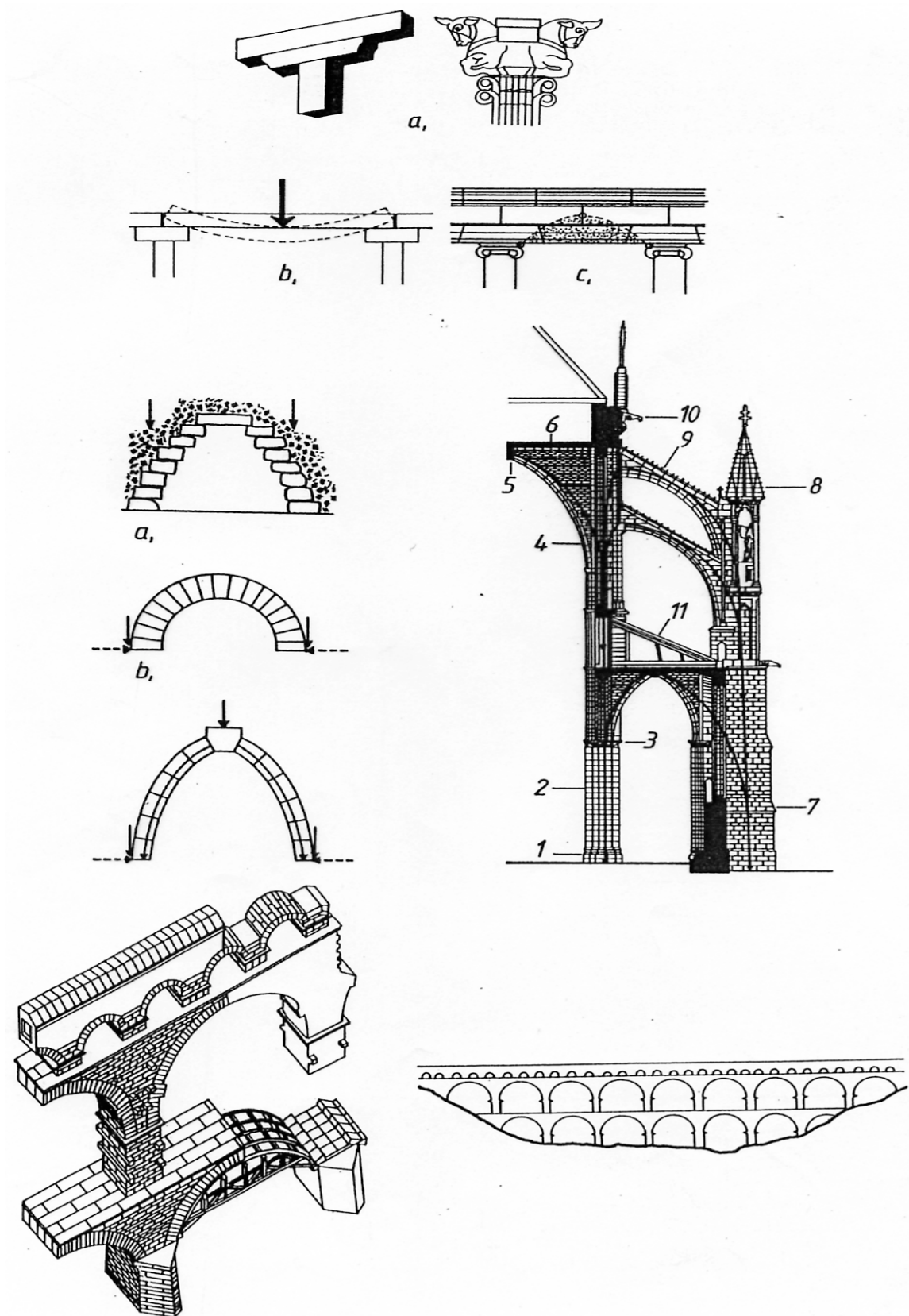
- <u>igneous</u> :	- <u>sedimentary</u> :	<u>metamorphic</u> :
basalte	sandstone	slate marble
granite	limestone	marble

The strength of building stones display a large variety.

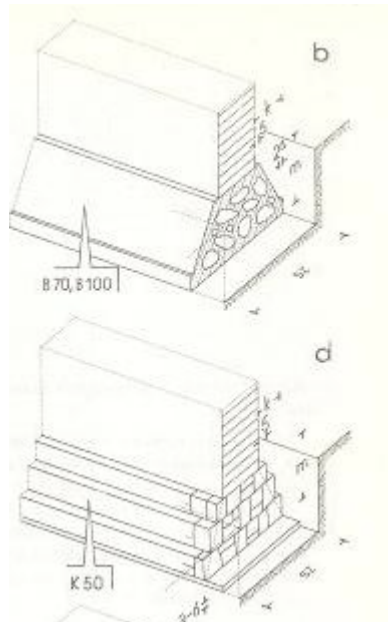
The same applies to specific gravity, workability, porosity, permeability and absorption. To obtain the necessary information about the durability of stones, freezing and thawing tests are carried out.

STRUCTURAL ELEMENTS

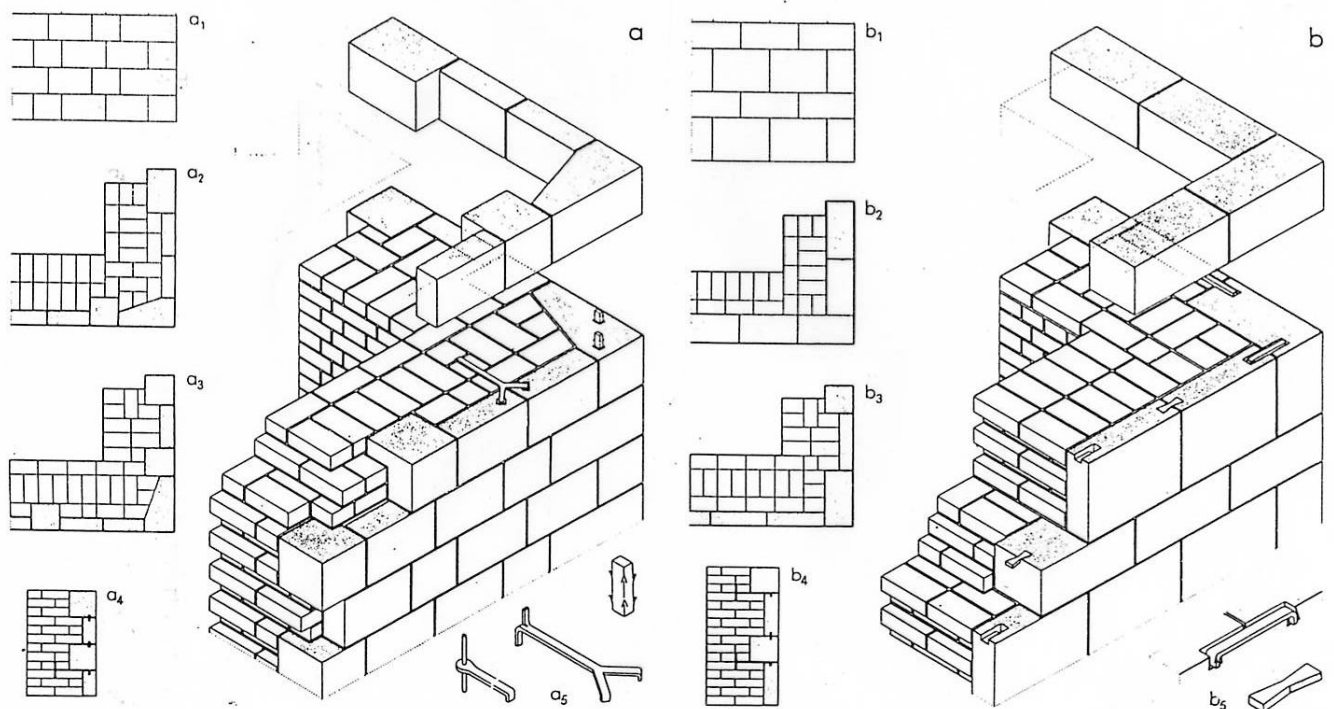
ARCHES



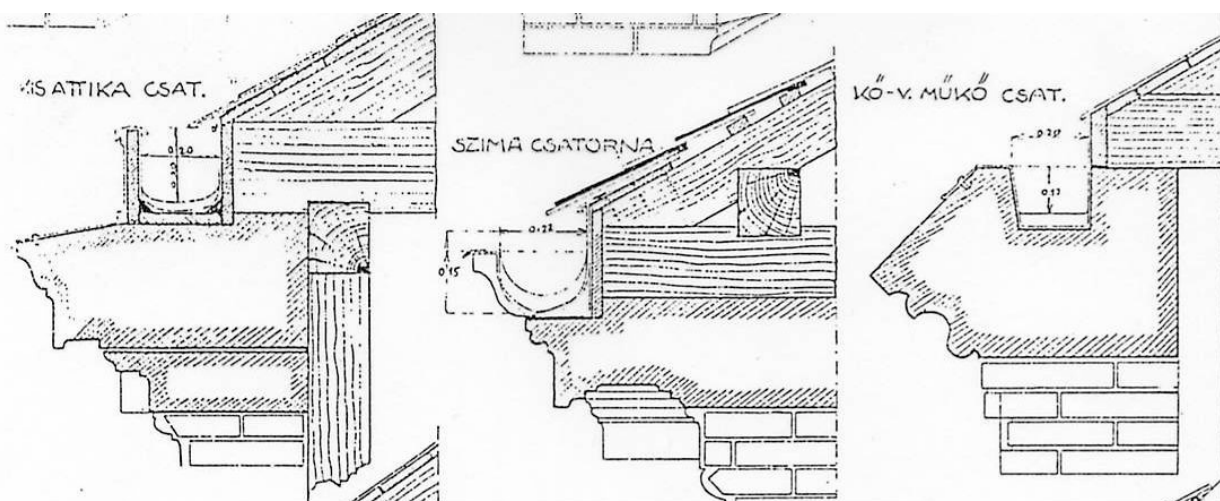
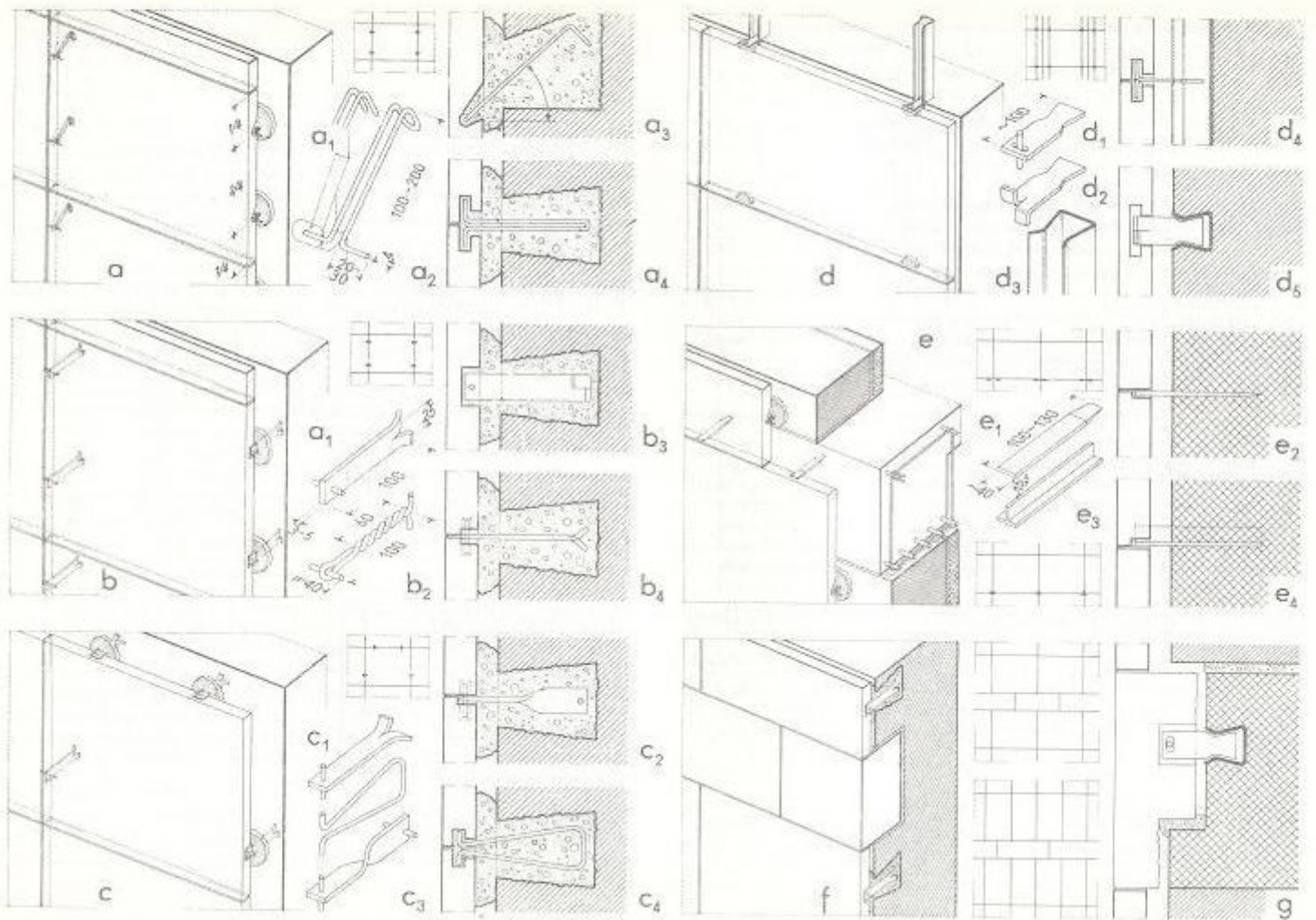
FOUNDATIONS



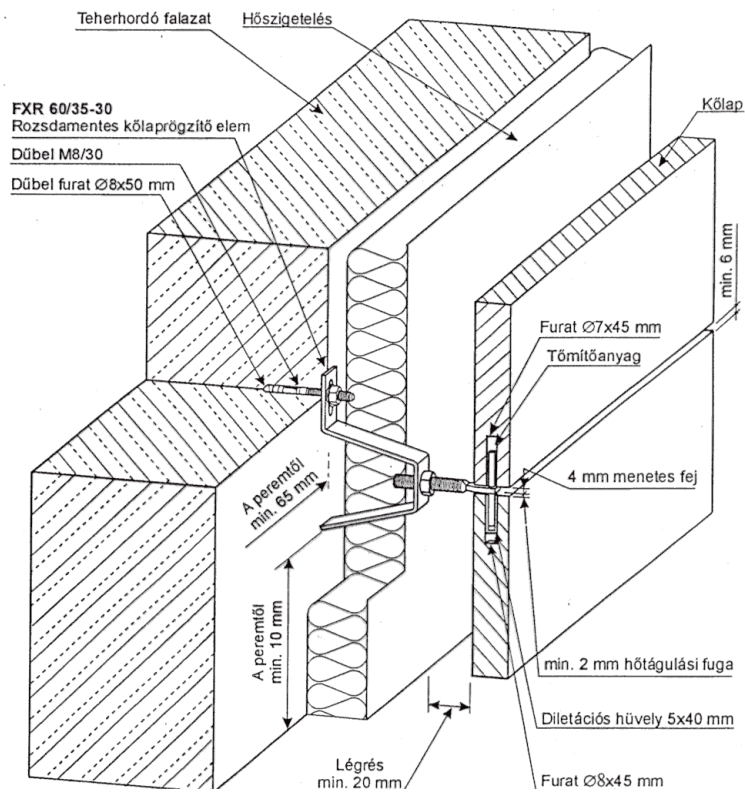
WALLS



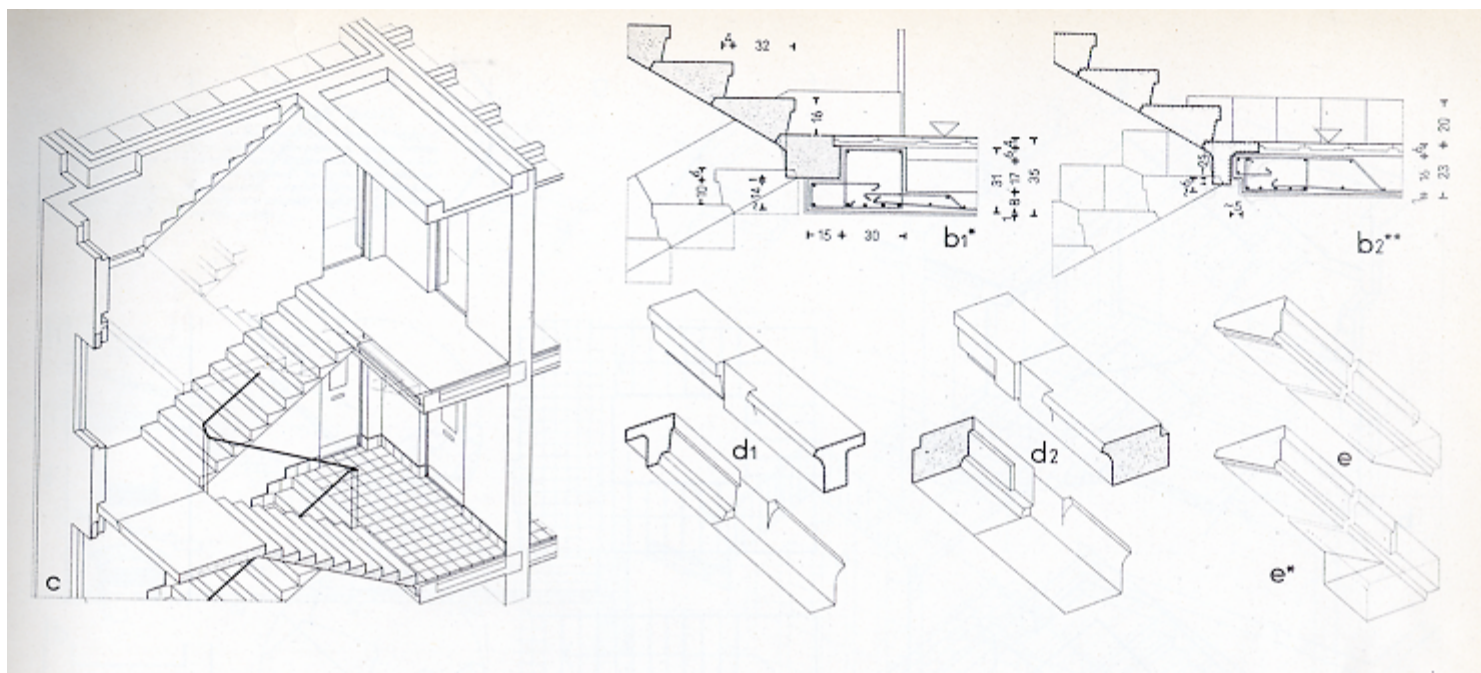
WALL COVERING



EAVES DETAILS OF THE PITCHED ROOF UP TO DATE STONE WALL CLADDING



STAIRS



S T O N E S L A T I N G

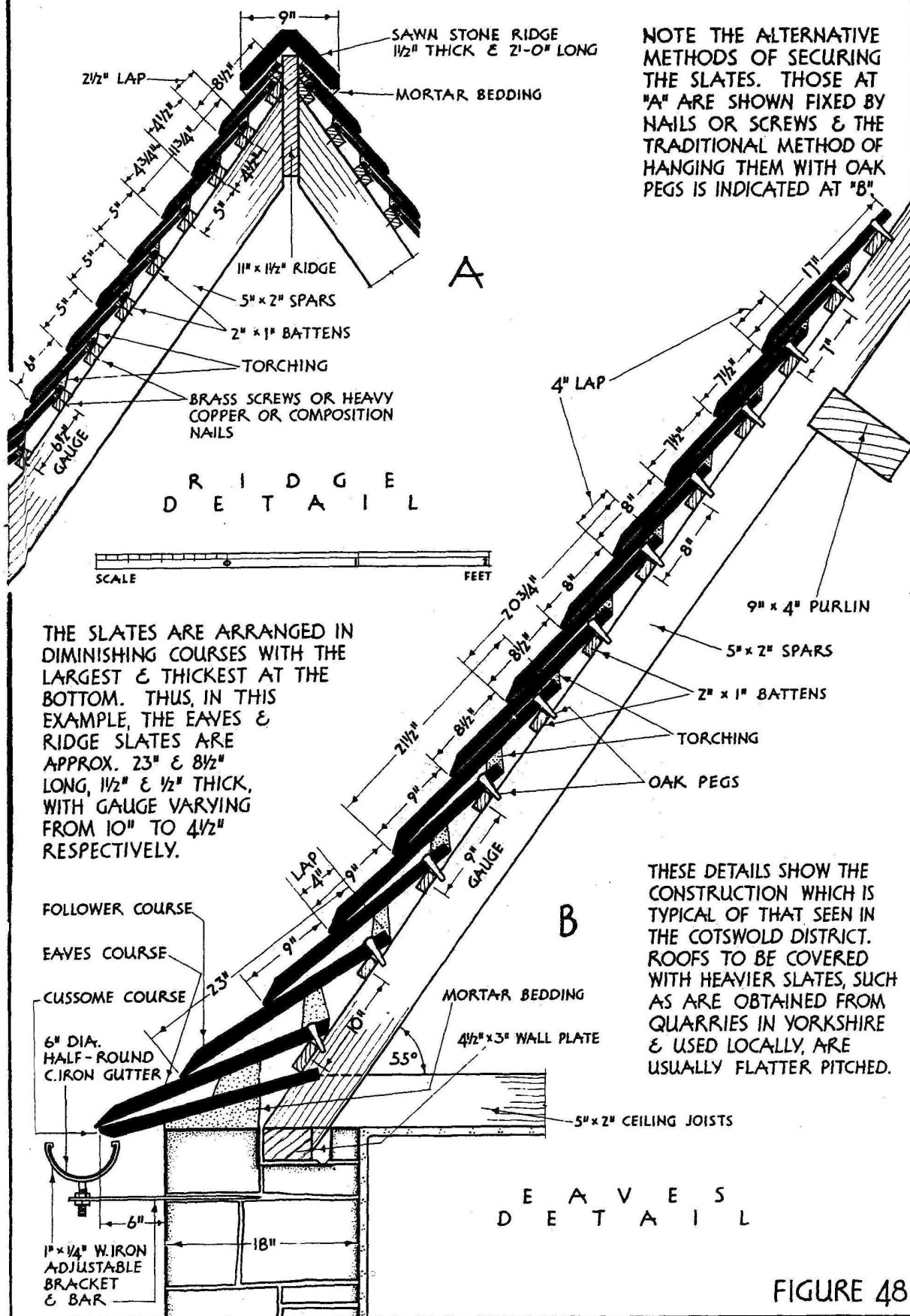


FIGURE 48

FLOOR COVERING

