

Civil and Architectural Drawing

Civil and
Architectural Drawing

Civil

Architecture

Steel

Irrigation

Part (1)

Steel Structure

STEEL CONSTRUCTION (SYMBOLS & CONVENTIONS)

الرموز والمصطلحات في رسم المنشآت المعدنية

SIMPLE ROLLED STEEL SECTIONS:

أقسام الشكيلة البسيطة:

1200
 or $200 \times 10 \dots 1200$
 $= b \times t$
 length

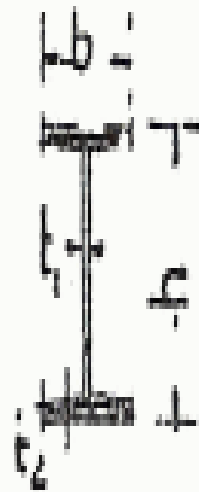
$L 100 \times 100 \times 10$
 or 100×10
 $= b \times b \times t$

$L 120 \times 80 \times 10$
 $= b \times a \times t$

I BEAM (standard sec.)

$$I = \frac{160 \times 74}{6 \times 8} = \frac{h \times b}{t_1 \times t_2}$$

or I No 16



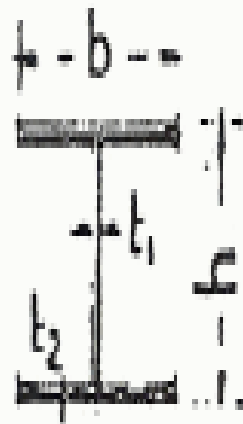
كمره I (قطاع عادى)

$$I = \frac{\text{الارتفاع} \times \text{العرض}}{\text{سمك الرق} \times \text{سمك الشفا}} = \frac{74 \times 160}{9 \times 6} I$$

أو I 16

I BEAM (broad flange)

$$B.F.I = \frac{150 \times 150}{8 \times 12} = \frac{h \times b}{t_1 \times t_2}$$



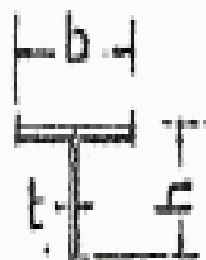
كمره I بعريضة

$$I = \frac{\text{الارتفاع} \times \text{العرض}}{\text{سمك الرق} \times \text{سمك الشفا}} = \frac{150 \times 150}{12 \times 8} I$$

T SECTION

$$T 120 \times 80 \times 10 = b \times h \times t$$

$$T 80 \times 80 \times 10 = b \times h \times t$$



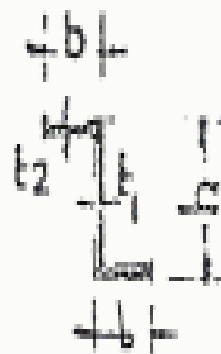
كمره T

$$10 \times 80 \times 80 \times T \quad 10 \times 80 \times 120 \times T$$

العرض \times الارتفاع \times السمك

L SECTION

$$L \frac{100 \times 55}{6 \times 8} = \frac{h \times b}{t_1 \times t_2}$$



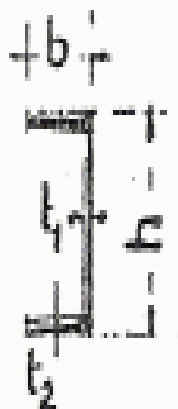
كمره L

$$\frac{\text{الارتفاع} \times \text{العرض}}{\text{سمك الرجح} \times \text{سمك الشفة}} = \frac{55 \times 100}{8 \times 6} L$$

CHANNEL

$$C \frac{140 \times 60}{7 \times 10} = \frac{h \times b}{t_1 \times t_2}$$

or EN^o14

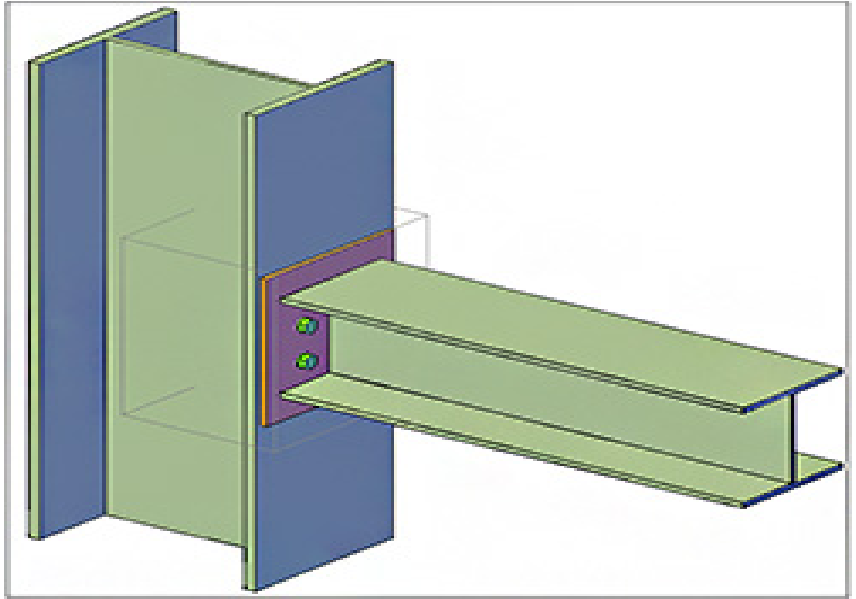
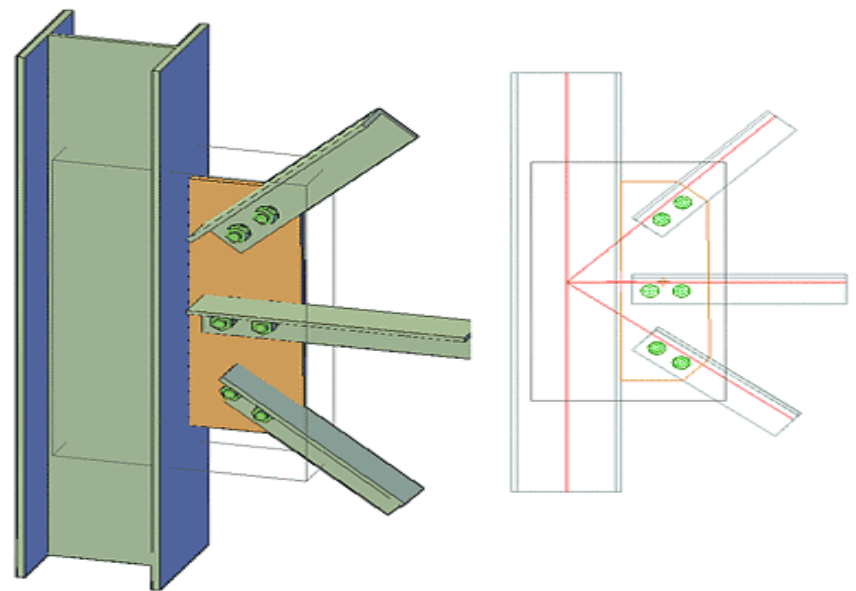
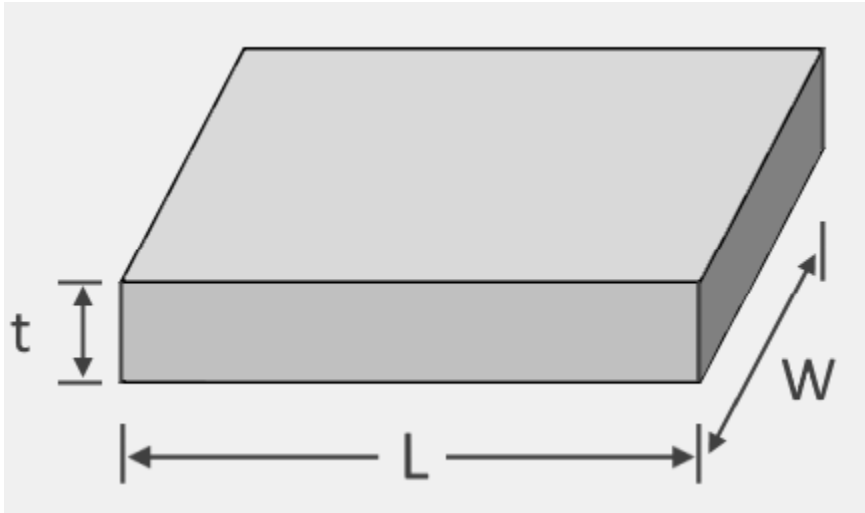


كمره مجرى

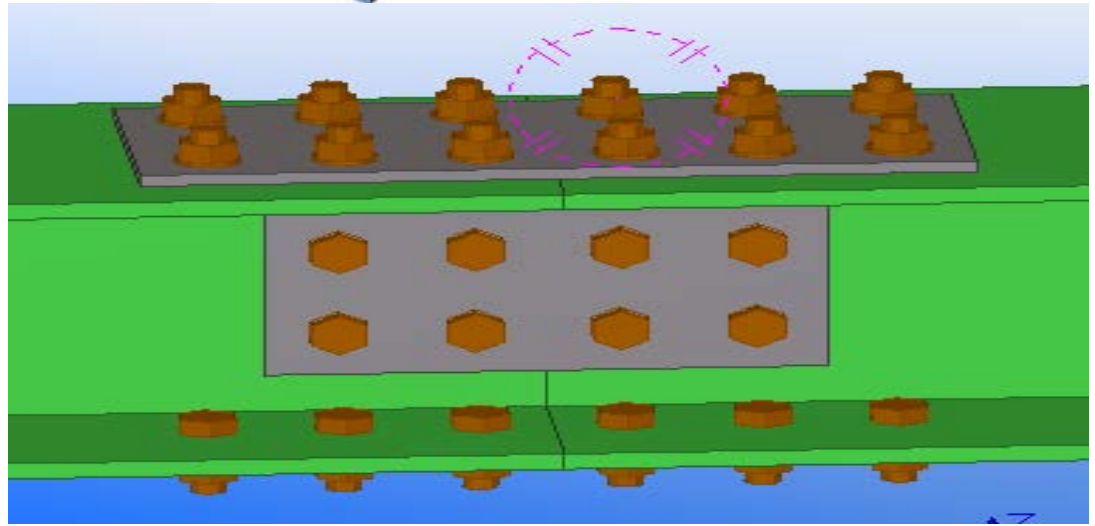
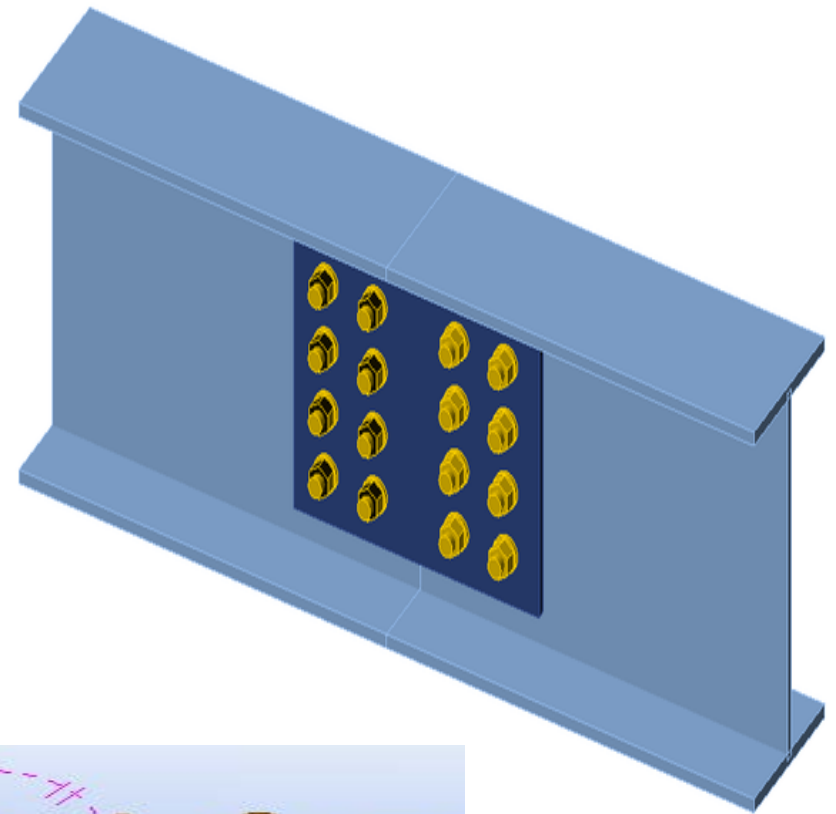
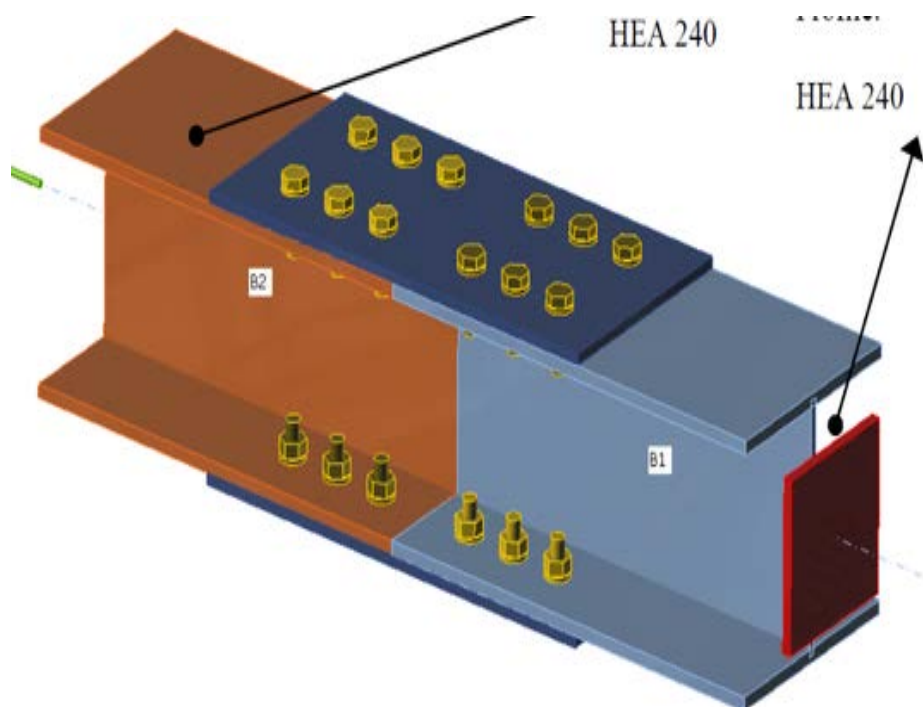
$$\frac{\text{الارتفاع} \times \text{العرض}}{\text{سمك الرجح} \times \text{سمك الشفة}} = \frac{7 \times 140}{10 \times 7} C$$

او 14

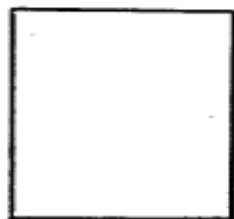
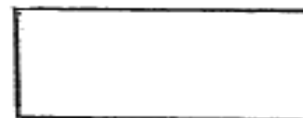
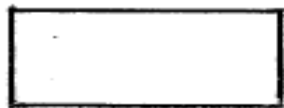
Plates



Plates



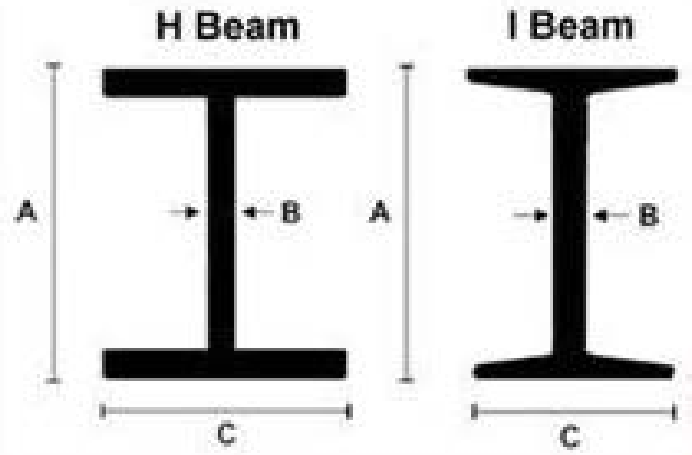
Plate



I-Beams



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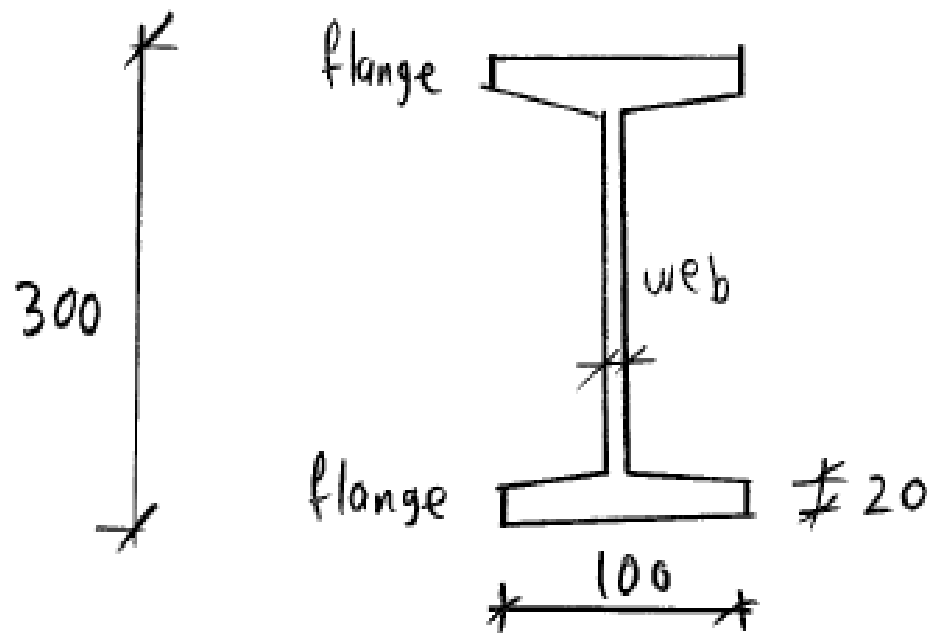


I $\frac{300 \times 100}{10 \times 20}$

I-Beam

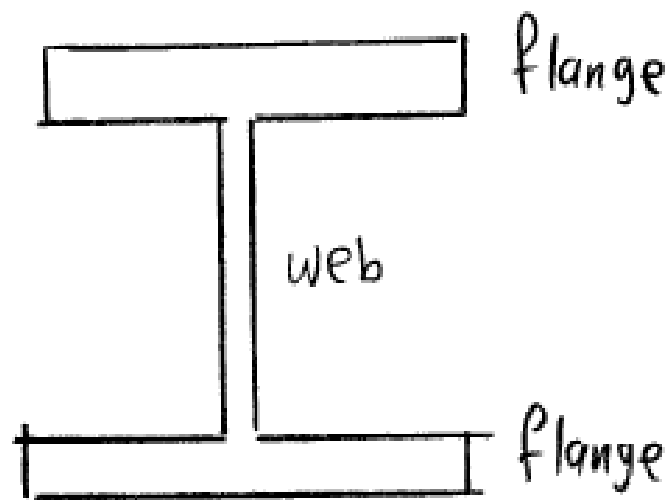
standard

Broad Flange I



* طول ال flange < طول ال web

* المفروض عمل ميول في ال flange

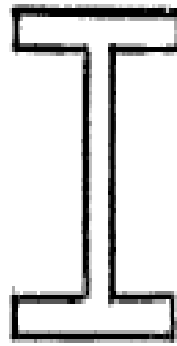
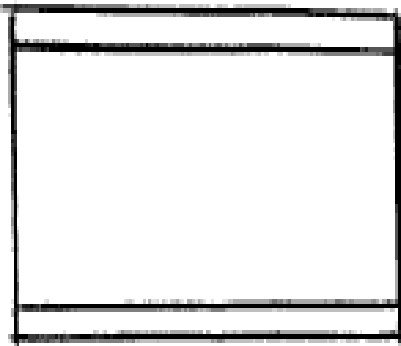


* طول ال flange = طول ال web

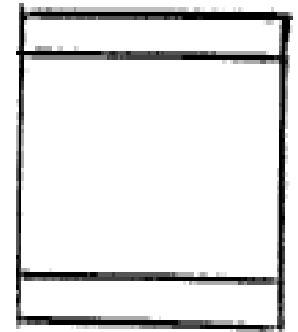
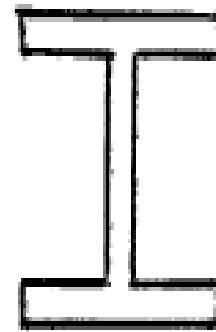
* لا يتم سلب ال BFI-Beam

* ال web دائماً طويل ورفيع وال flange قصير وسميك

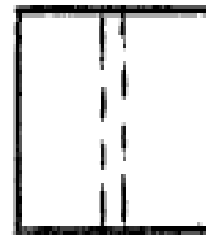
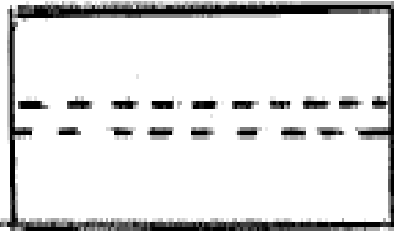
I Beam

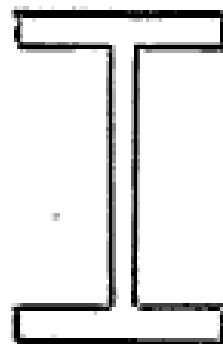
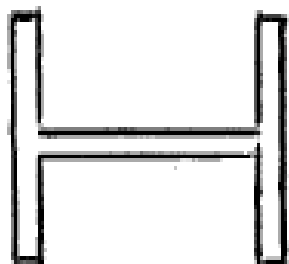
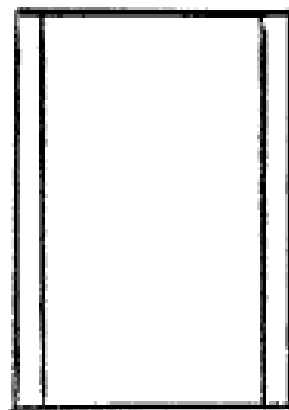
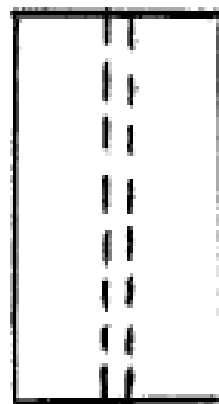
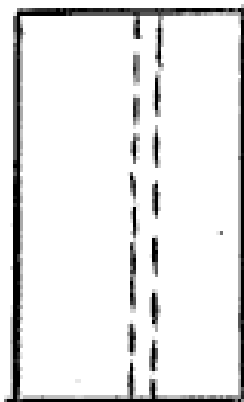
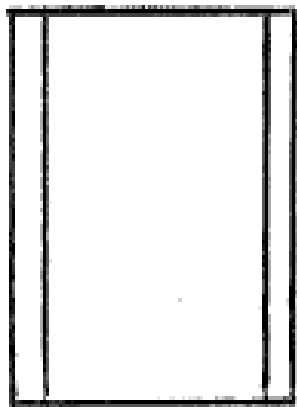


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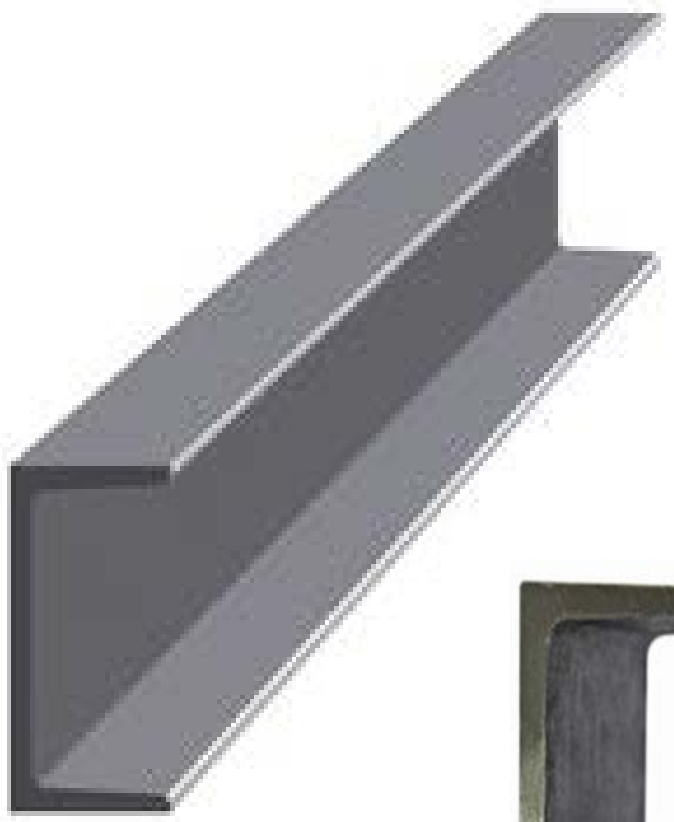
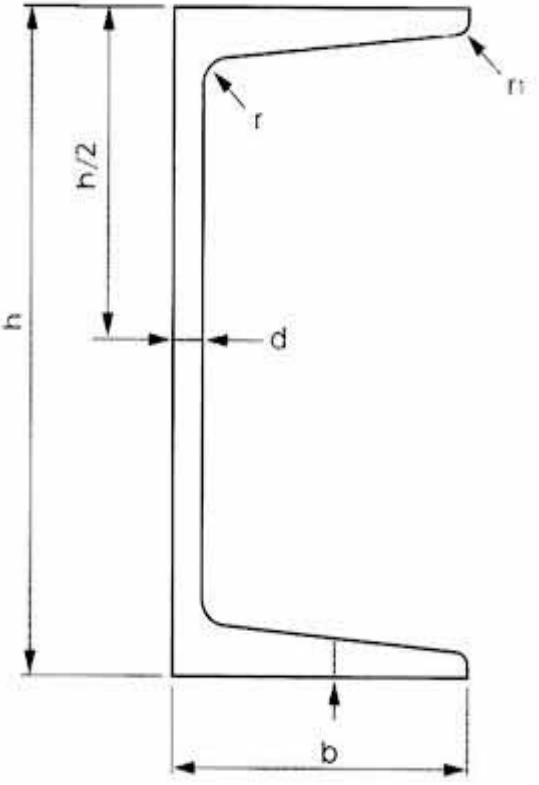


Given

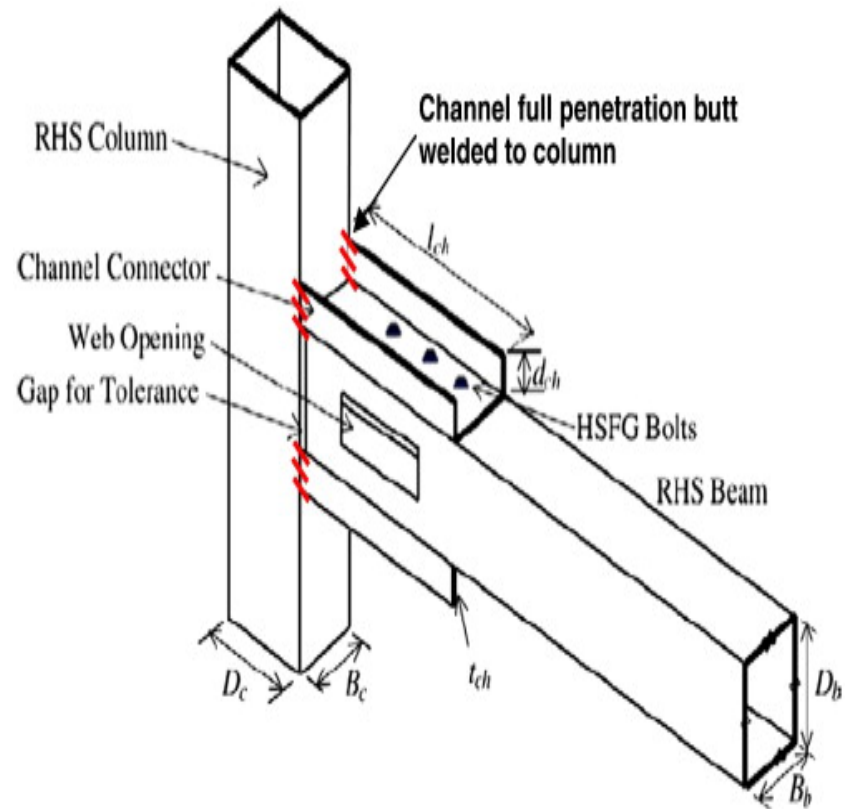
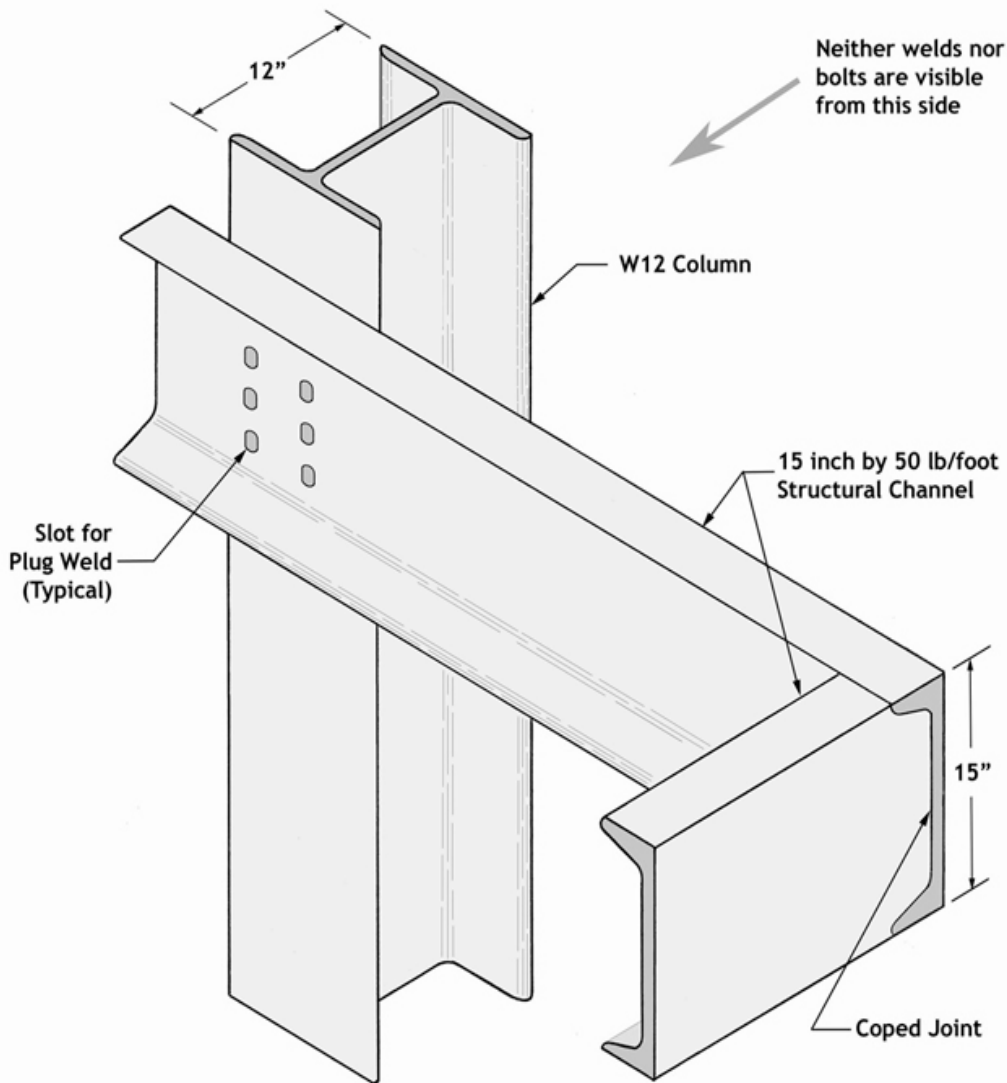




Channel

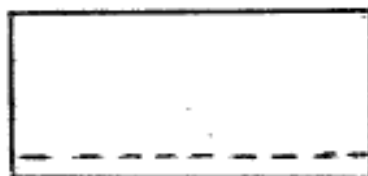
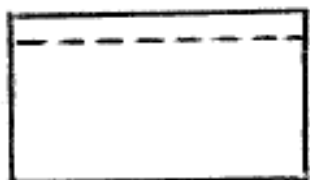
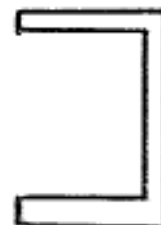
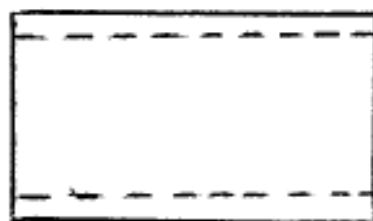
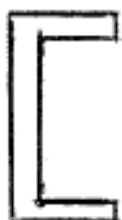
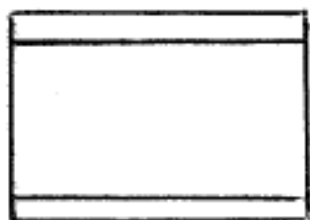
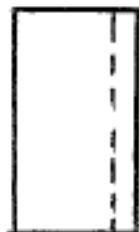
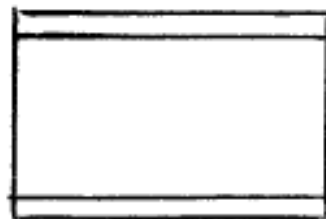
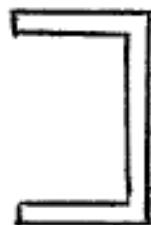
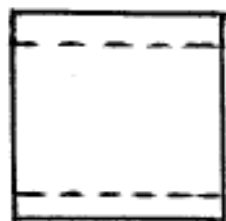
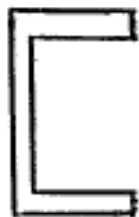


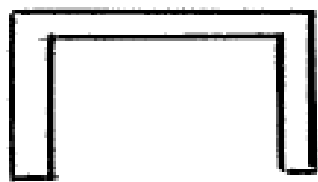
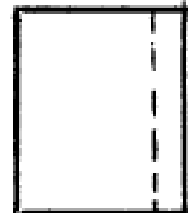
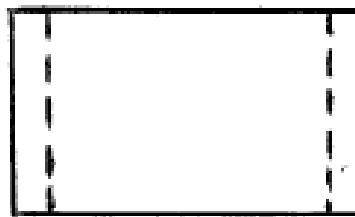
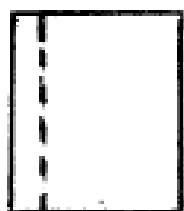
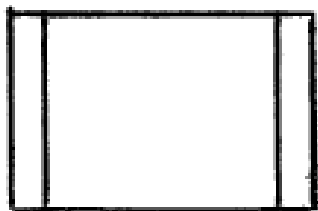
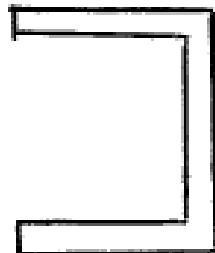
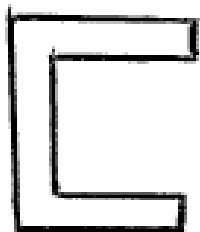
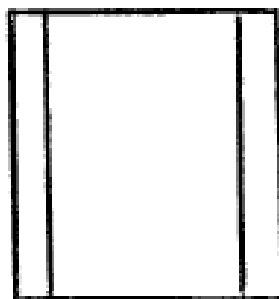
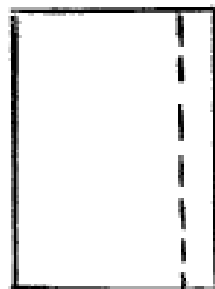
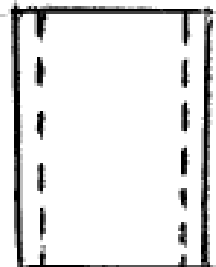
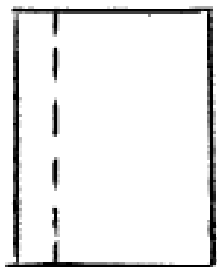
Channel



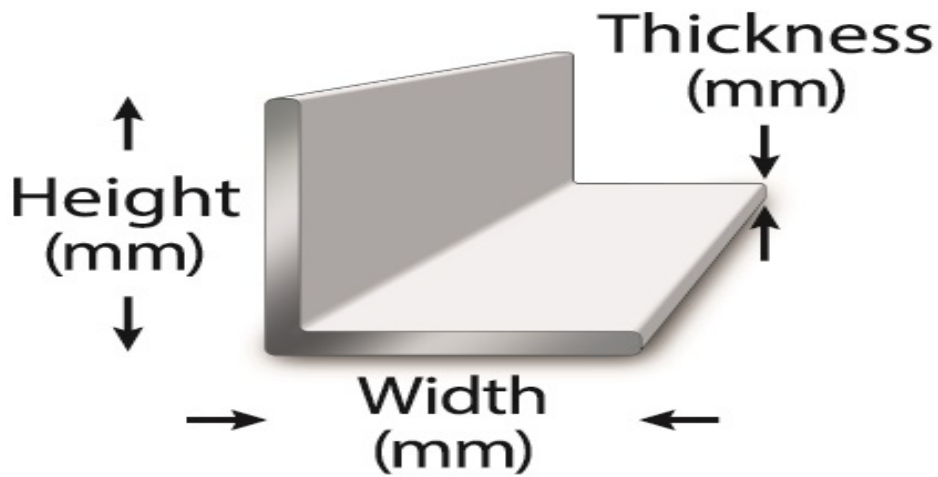
Channel

8

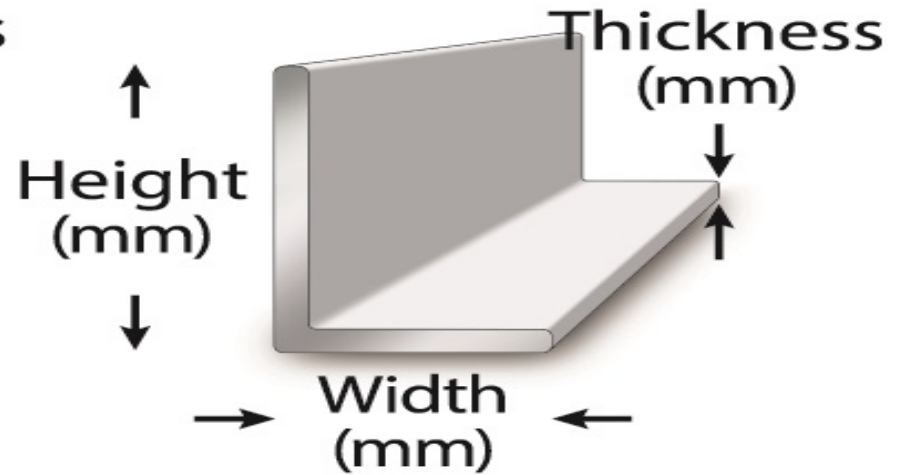




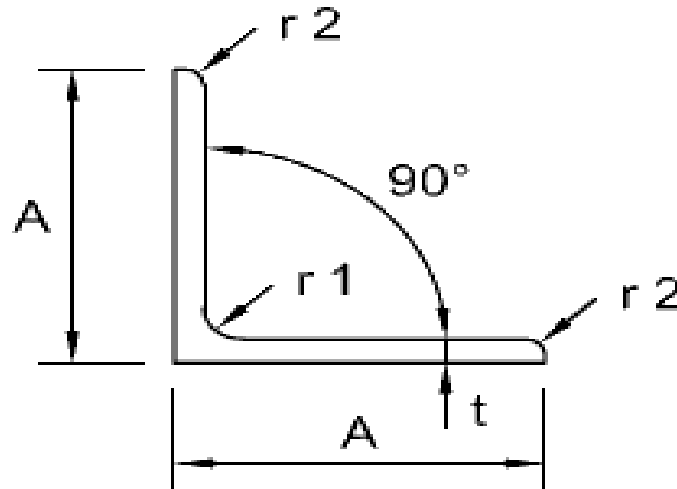
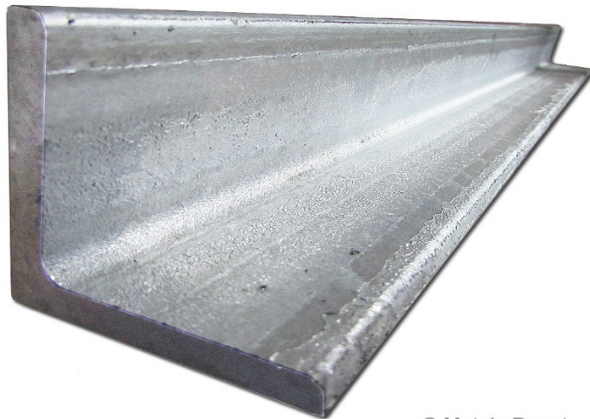
Angles



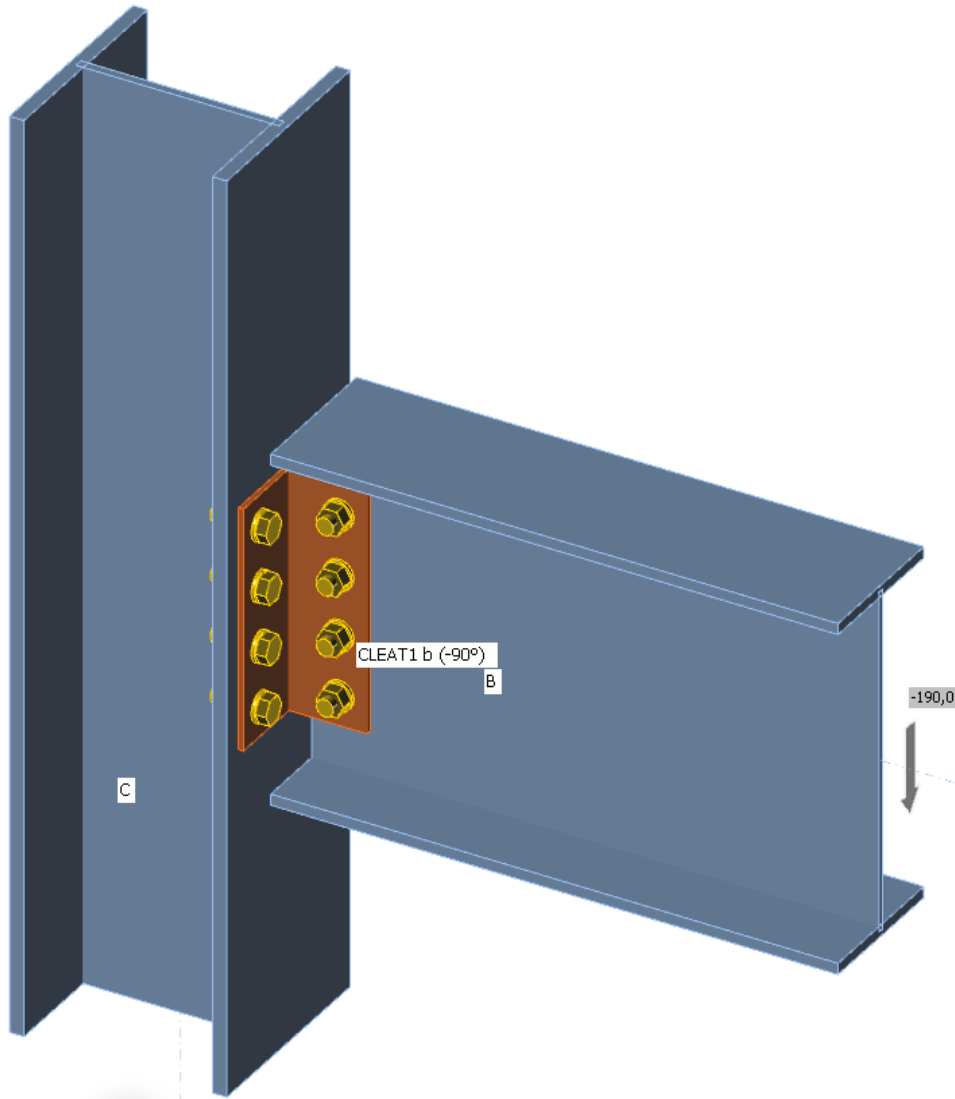
Equal Angle



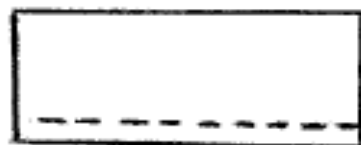
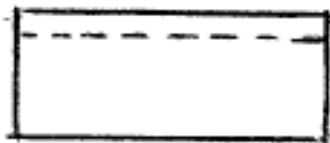
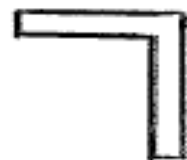
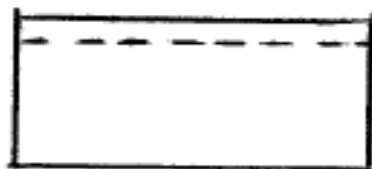
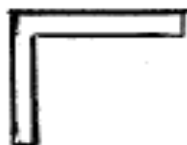
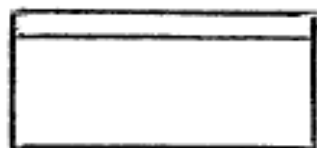
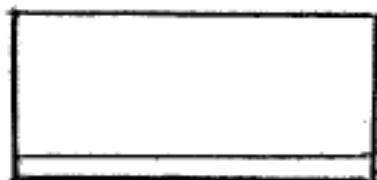
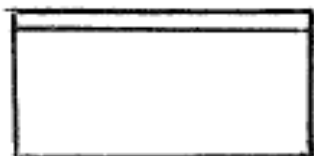
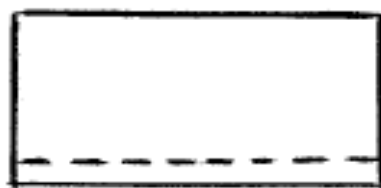
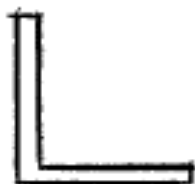
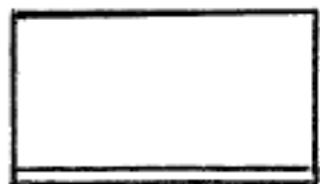
Unequal Angle

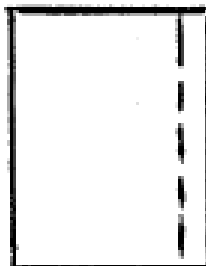
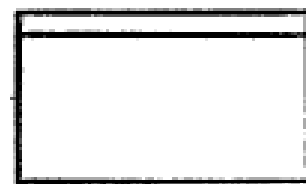
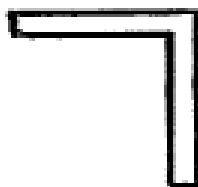
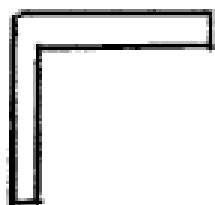
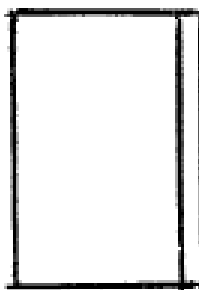
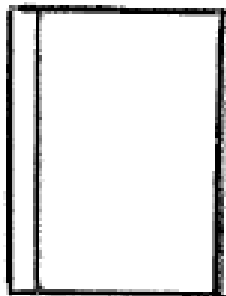
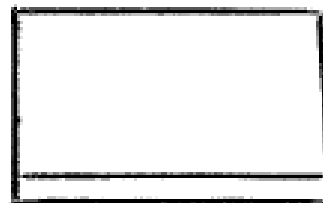
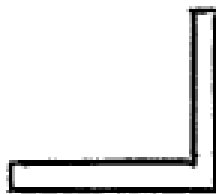
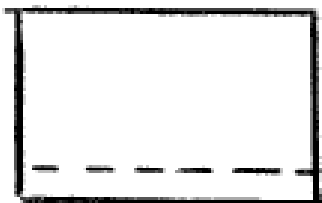
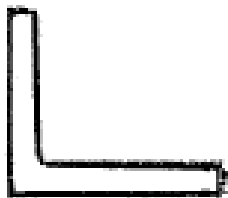


Angles

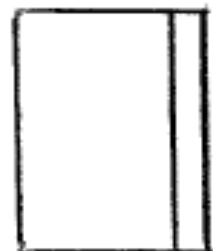
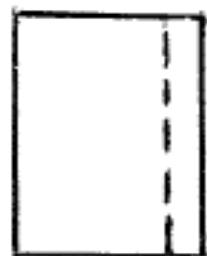
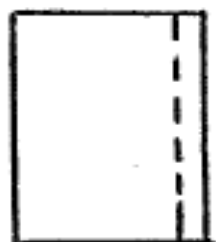
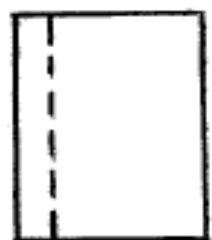
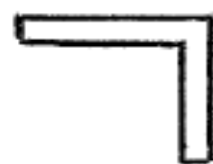
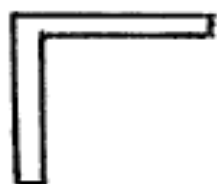
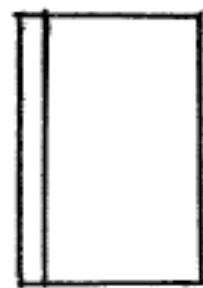
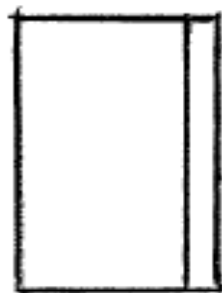
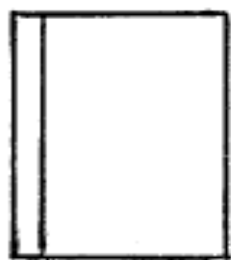


Angles

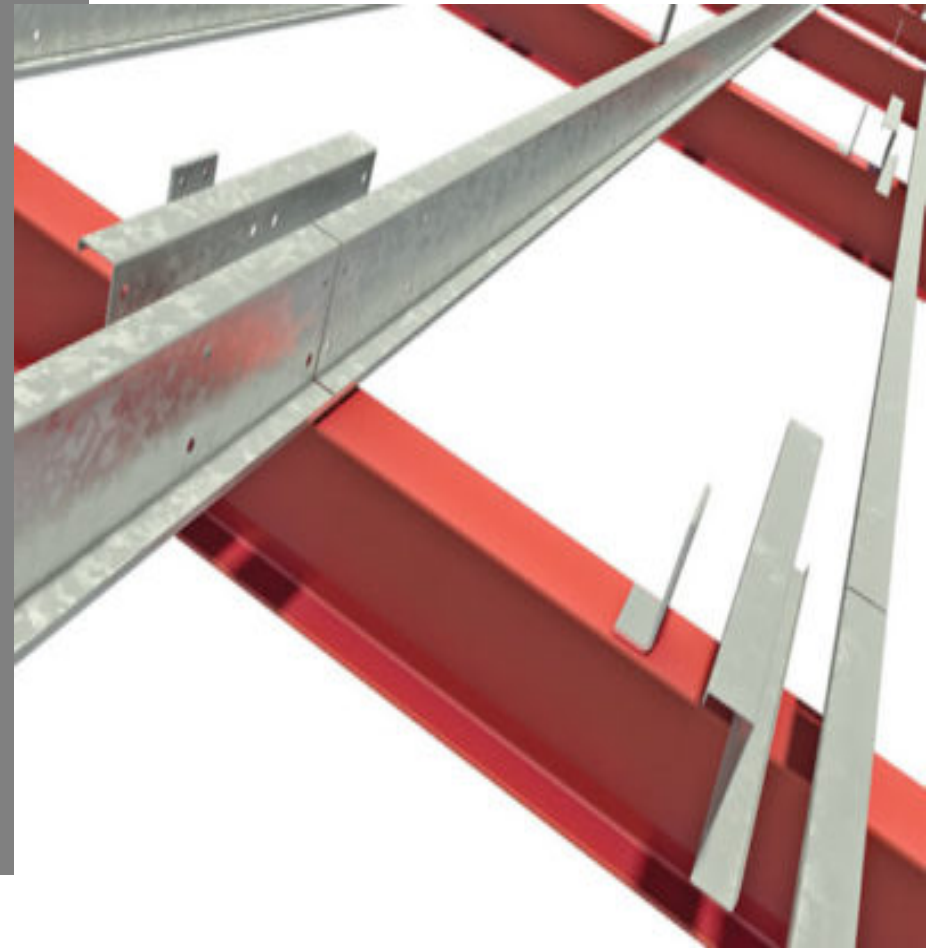
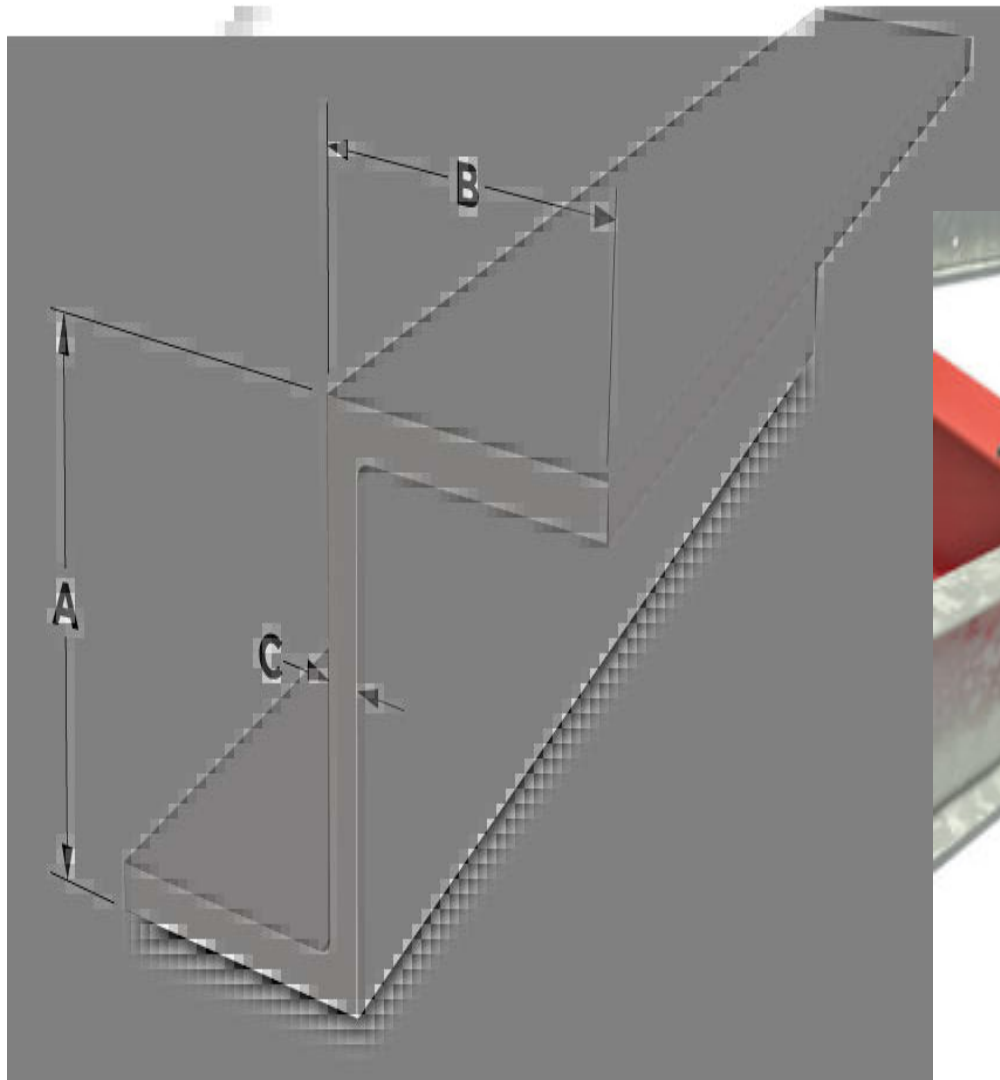




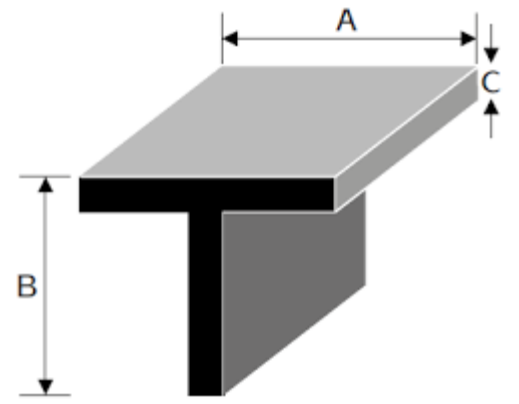
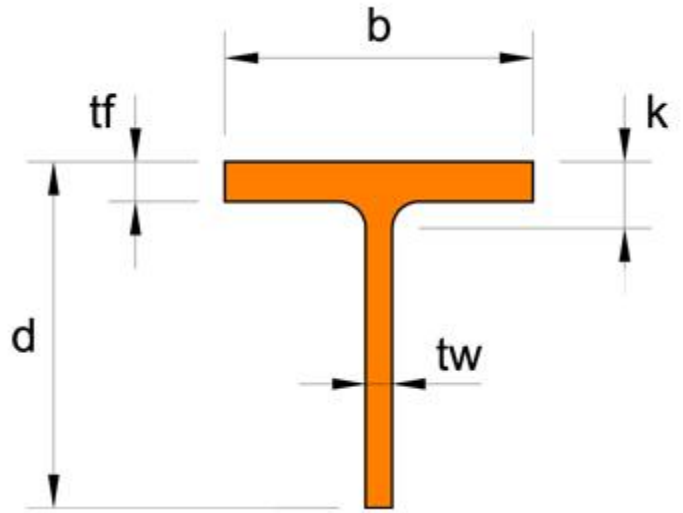
Angles

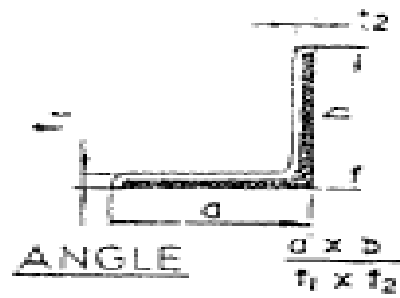


Z-section

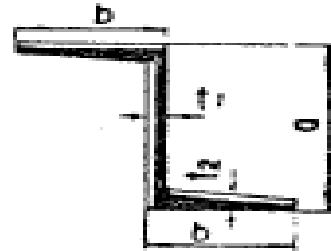
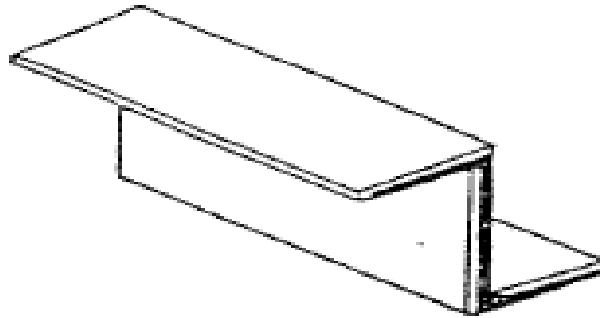
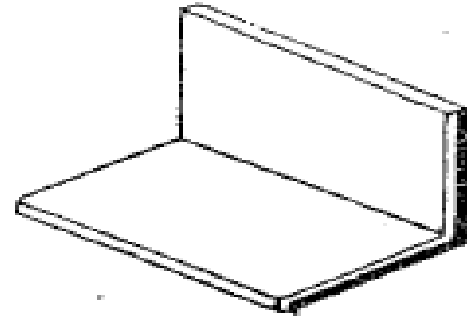
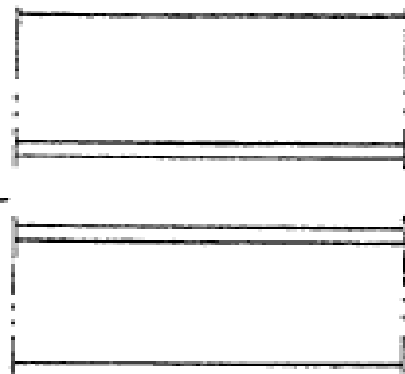


T-section

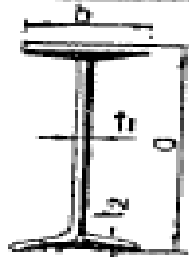
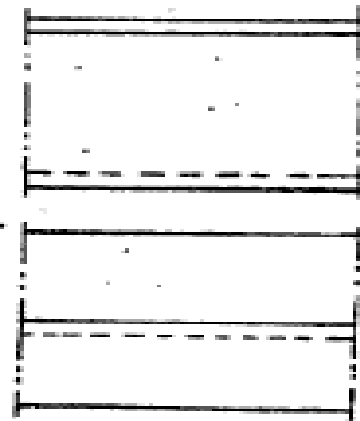




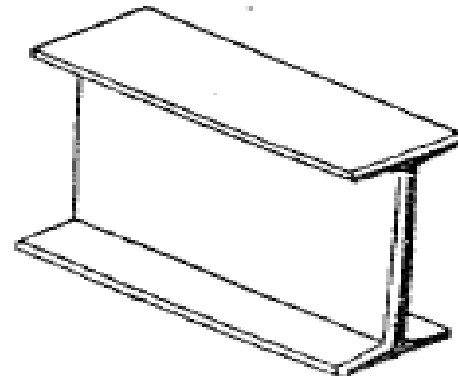
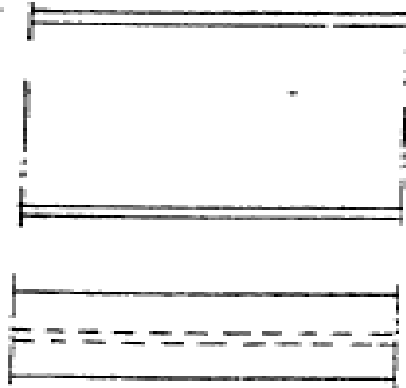
$$\frac{a \times b}{t_1 \times t_2}$$



$$\frac{a \times b}{t_1 \times t_2}$$



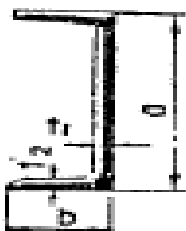
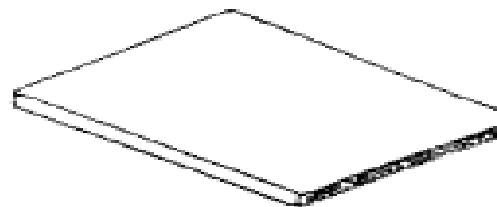
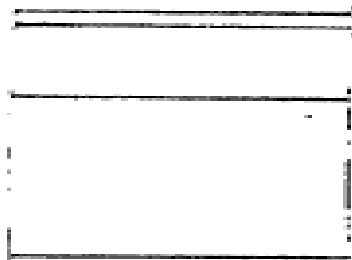
$$\frac{a \times b}{t_1 \times t_2}$$



Steel

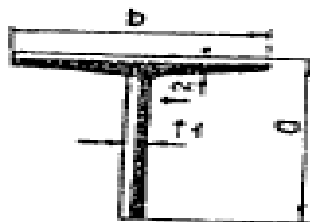
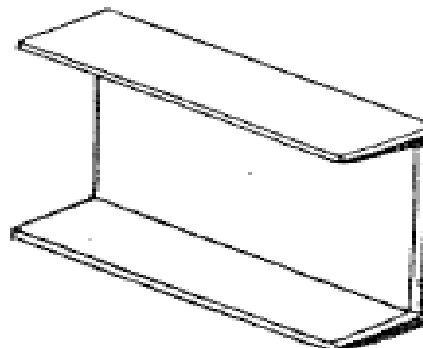
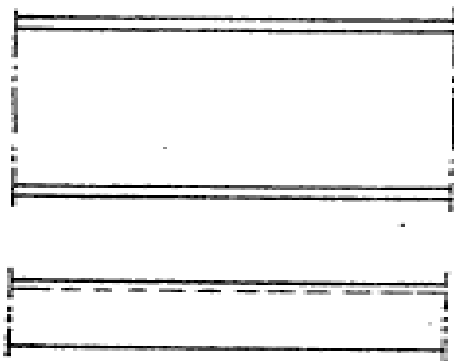


PLATE $b \times t$

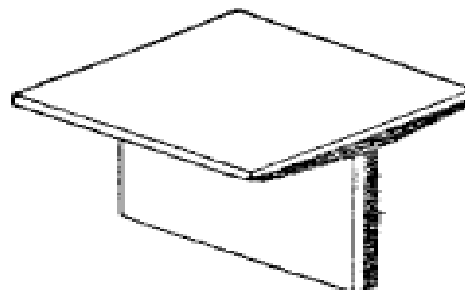
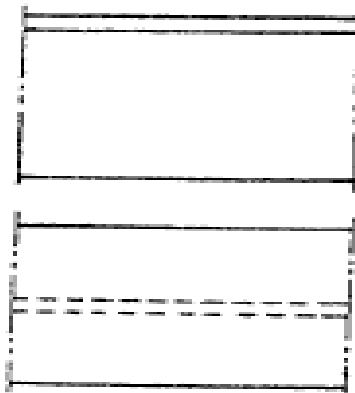


CHANNEL

$\frac{b \times D}{t \times t_2}$

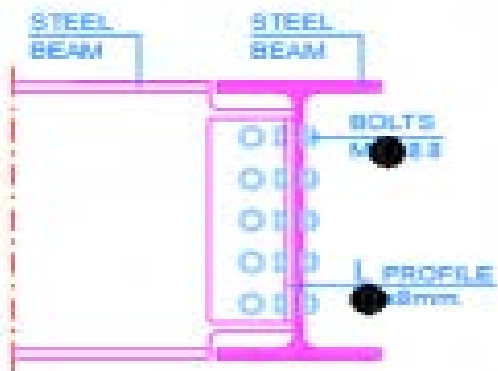


T $\frac{b \times D}{t \times t_2}$

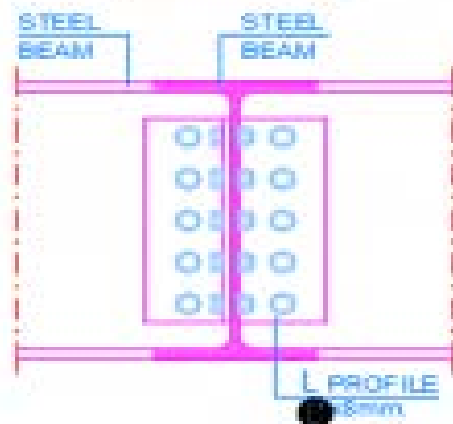


Beam to Beam Connection

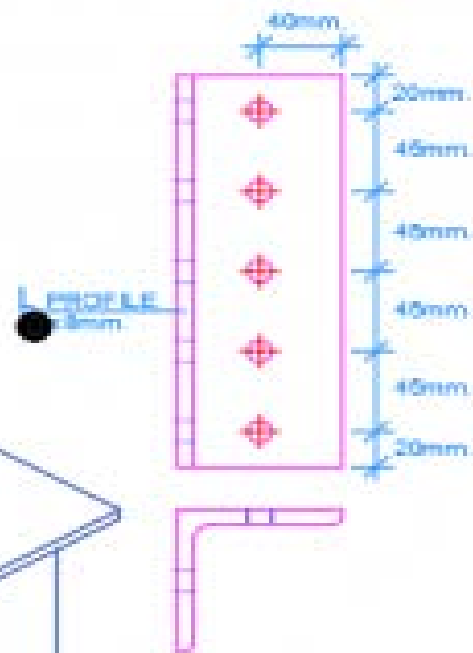
SECTION



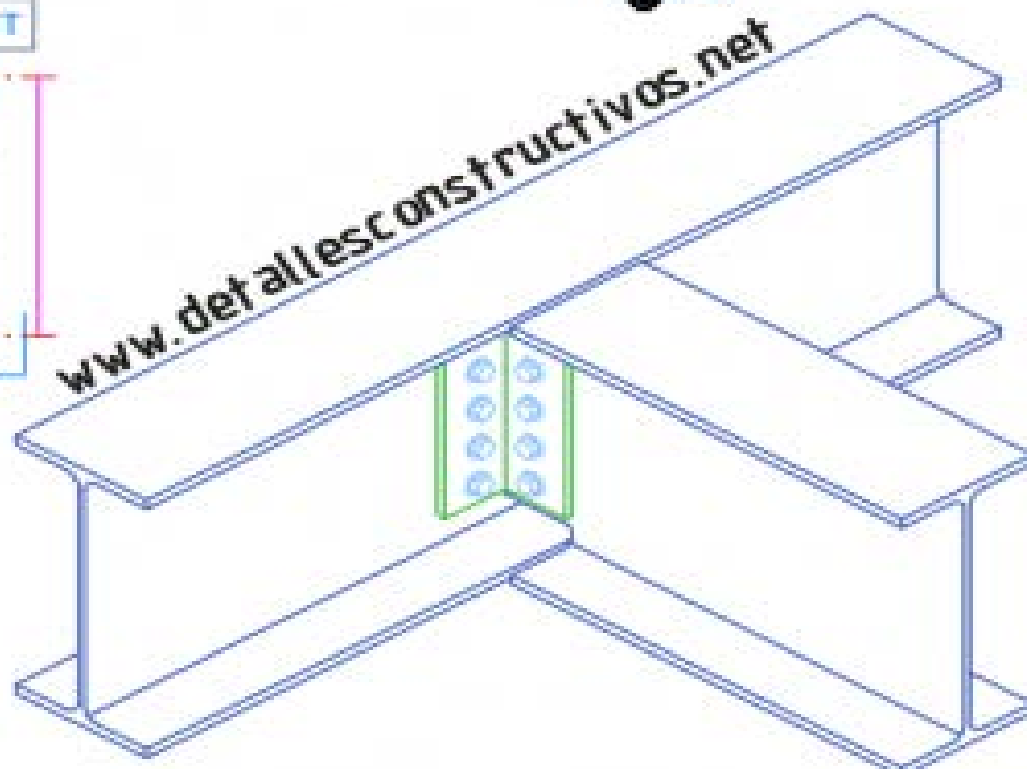
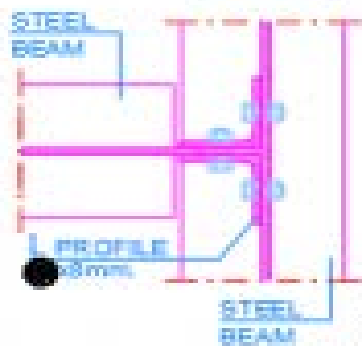
ELEVATION

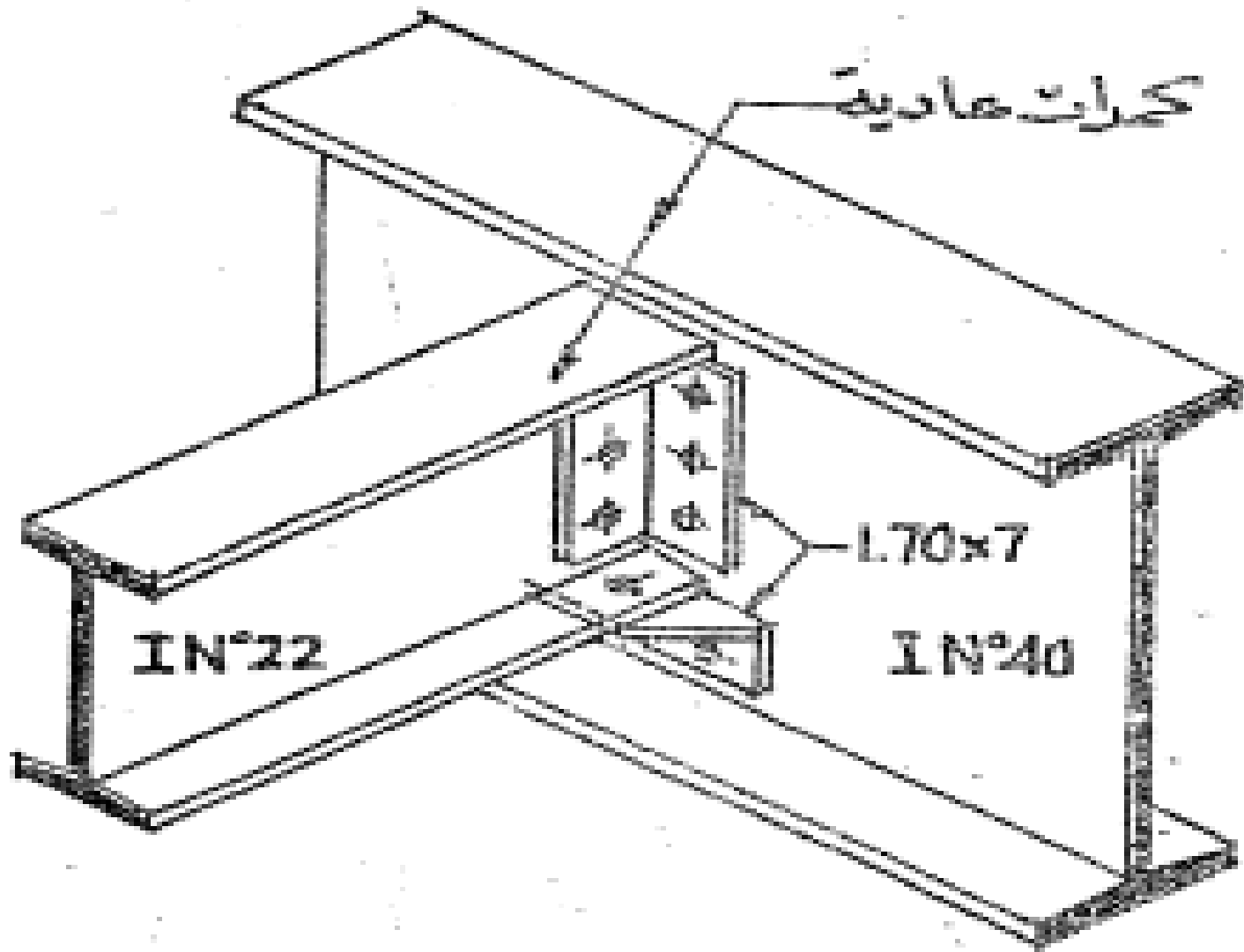


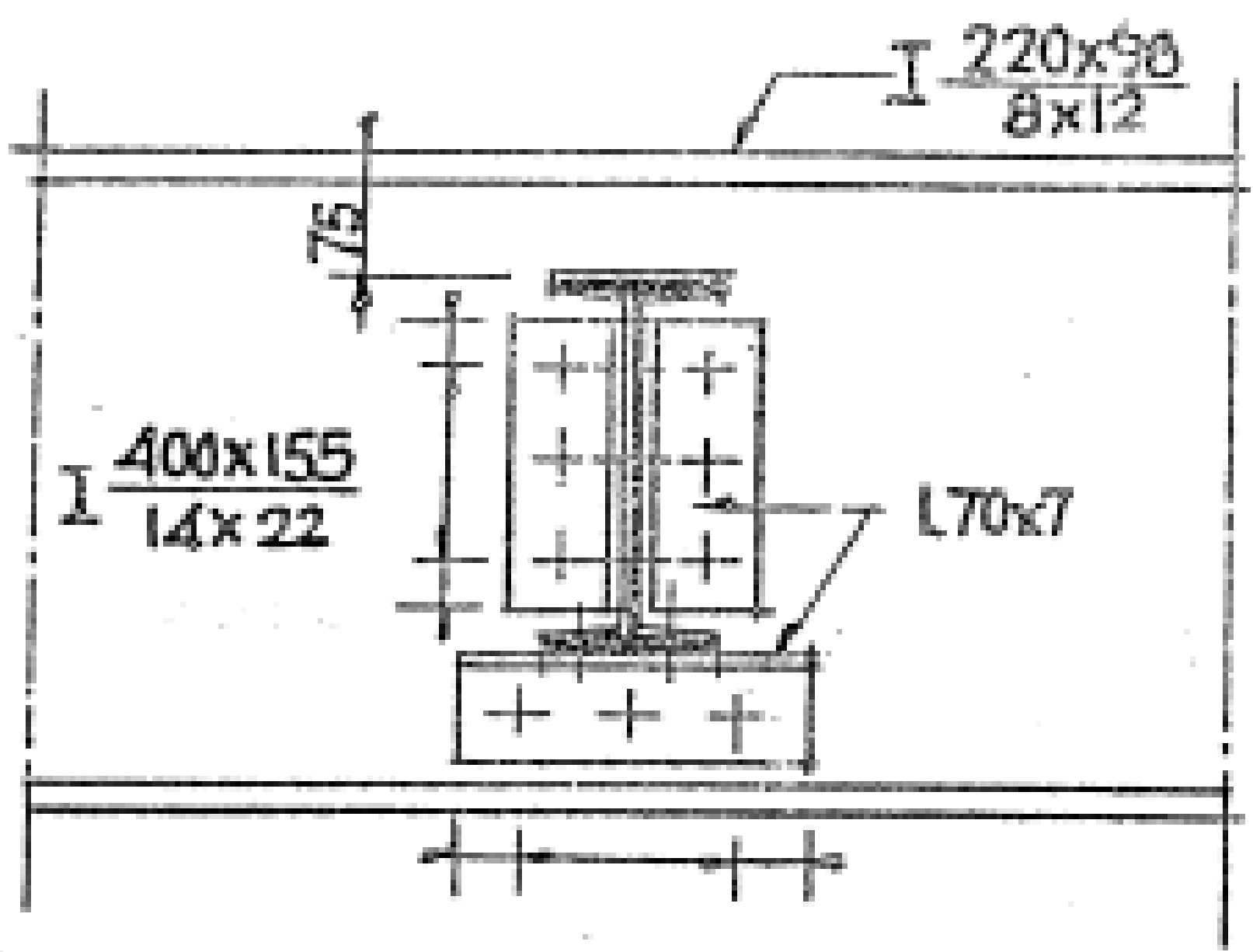
HOLE DETAIL

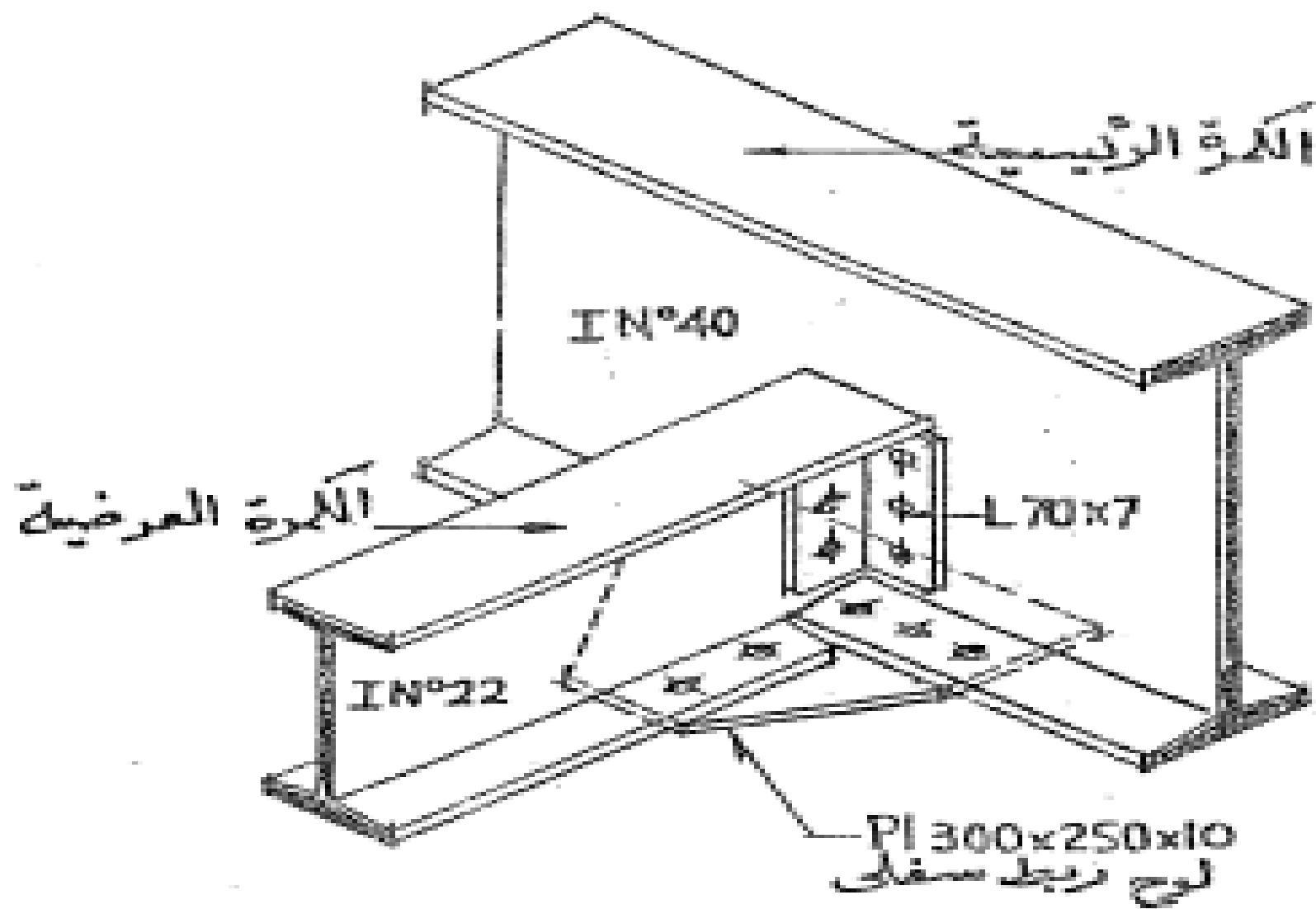


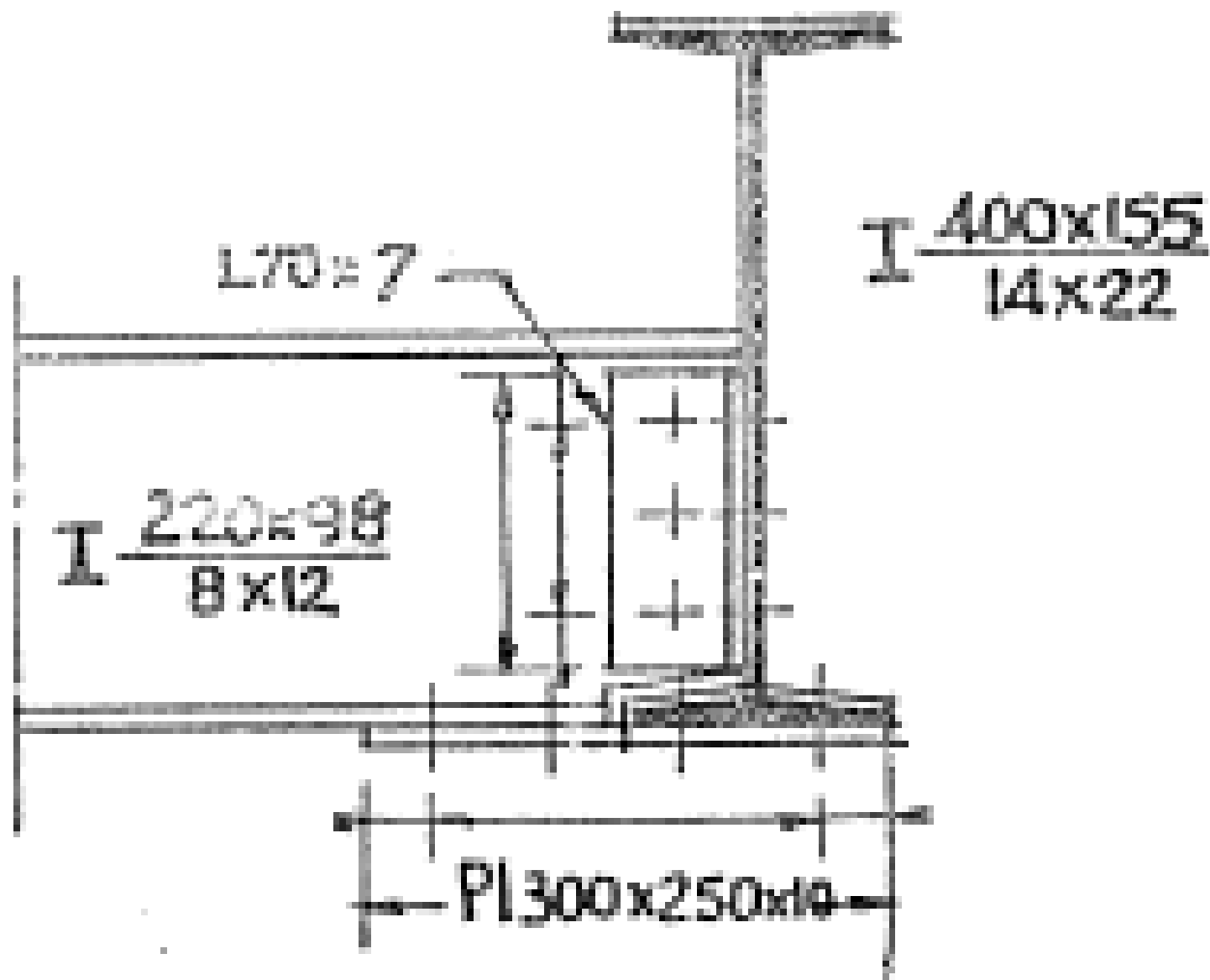
PLANT

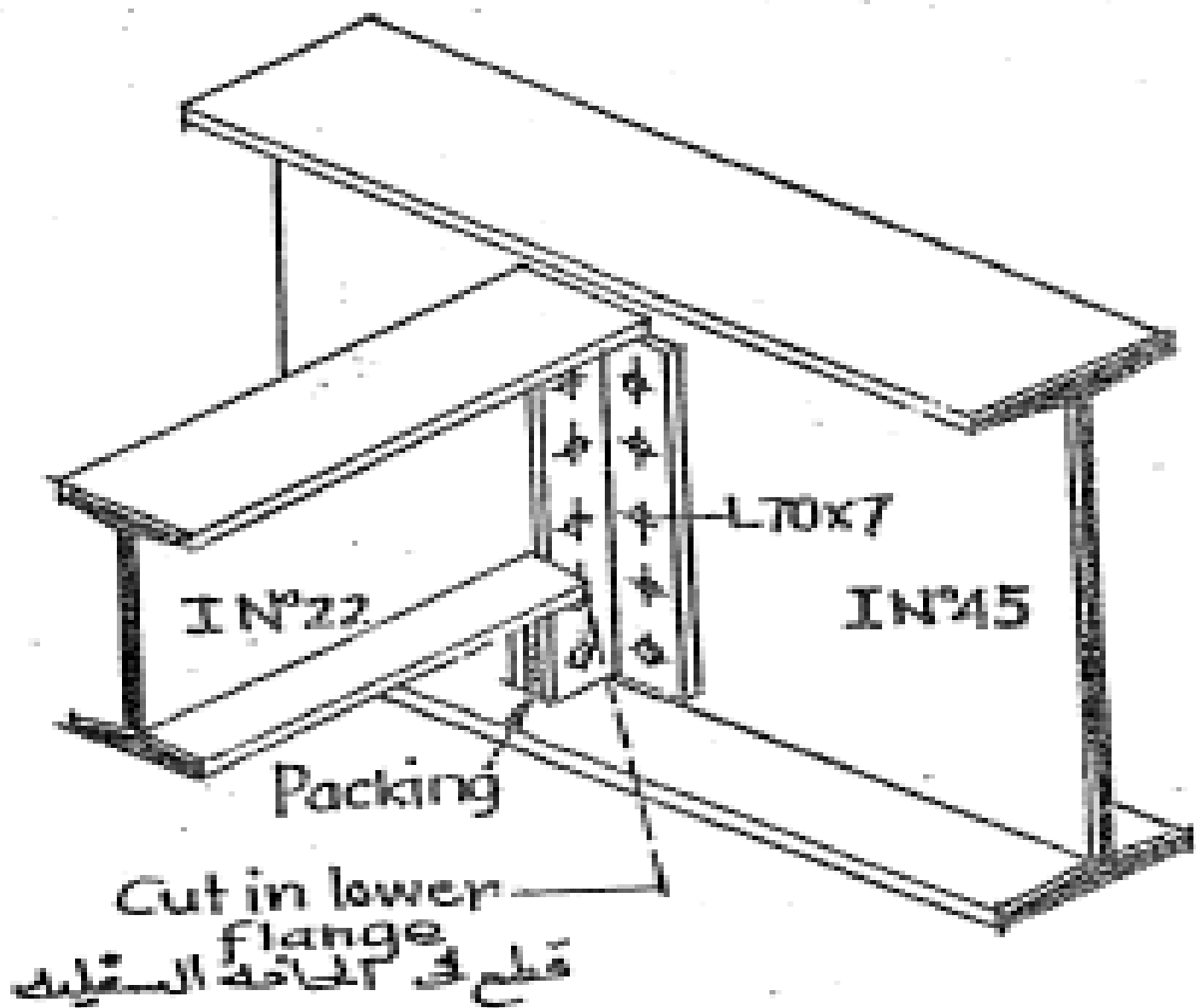


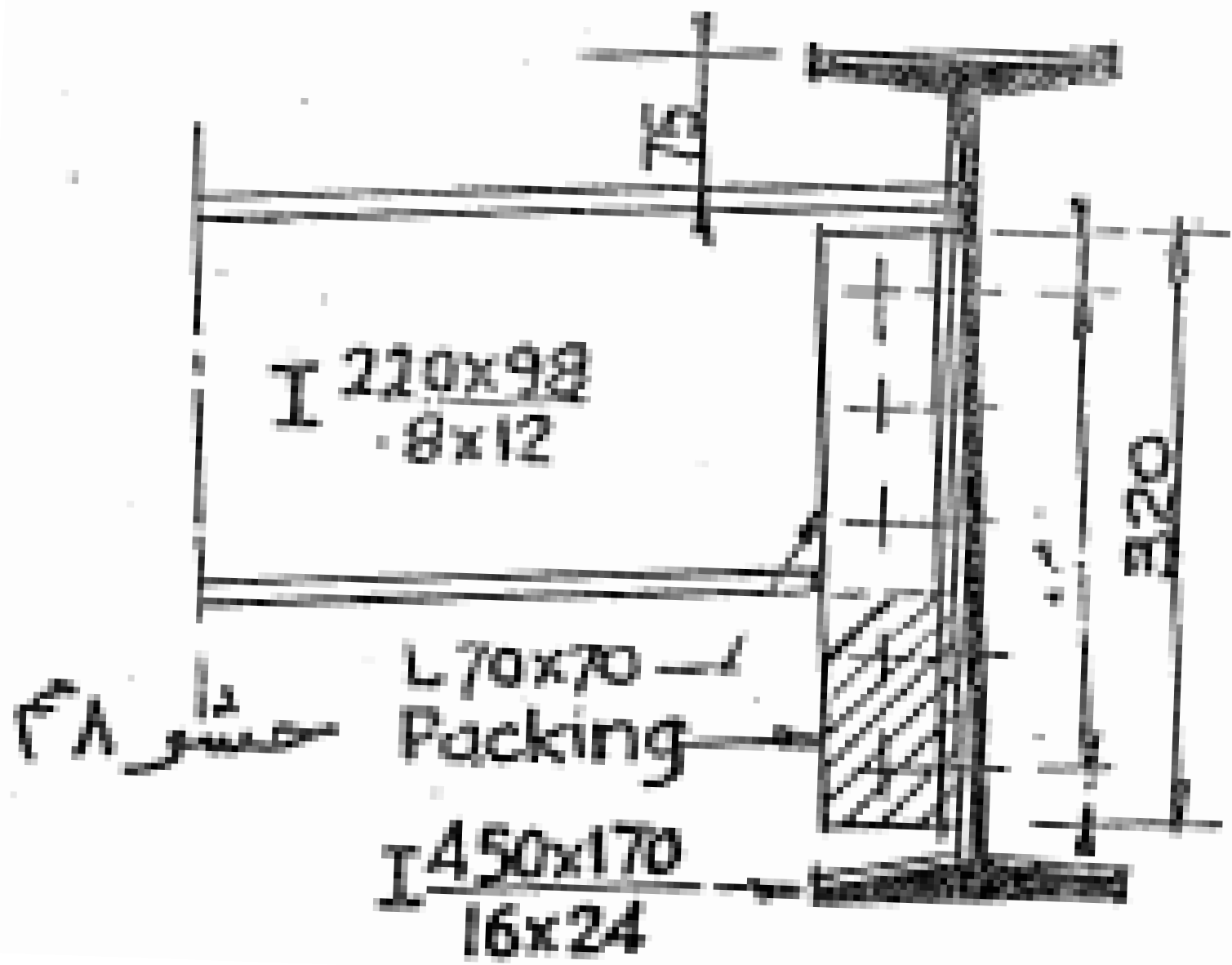




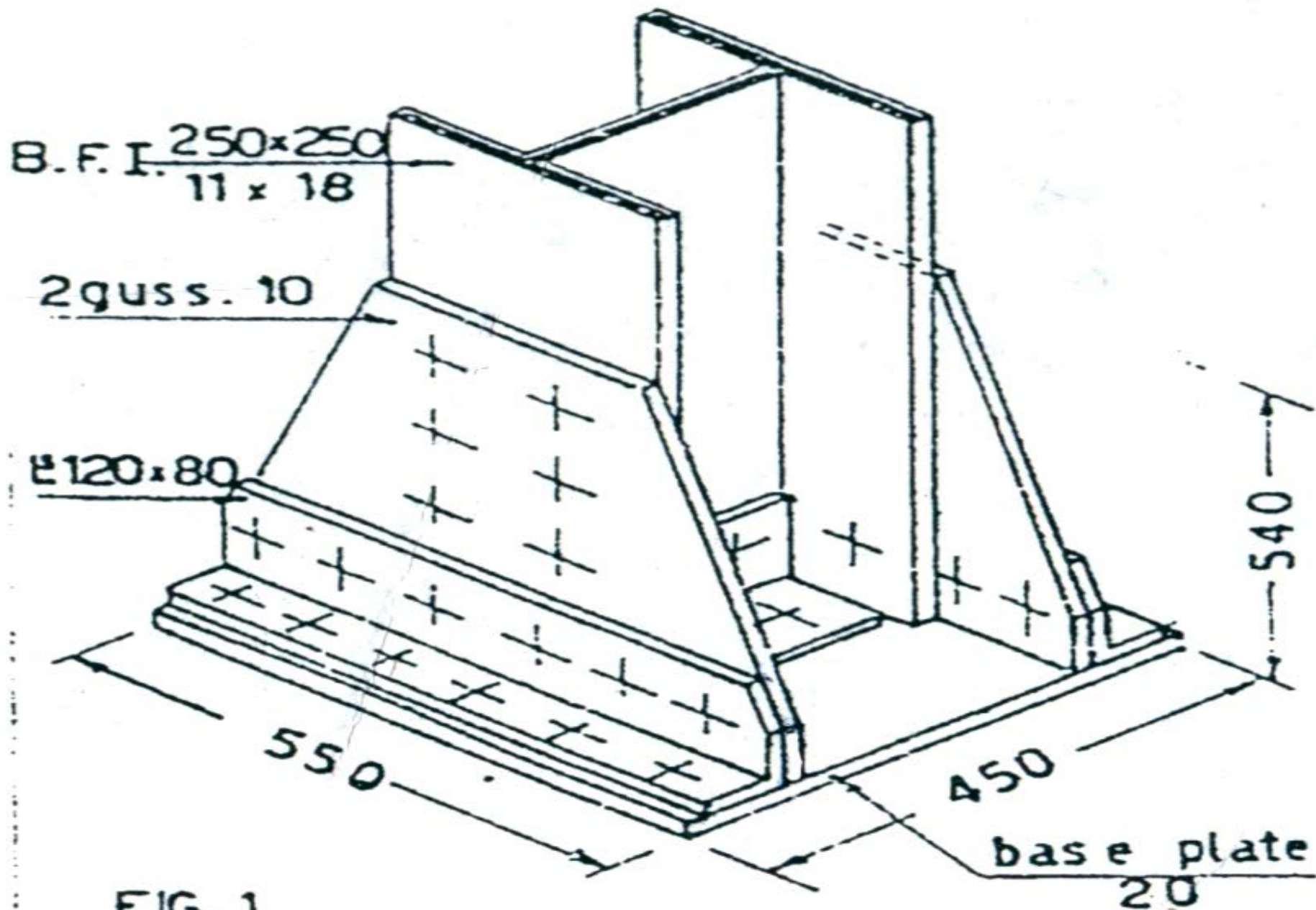








Column Base Connection



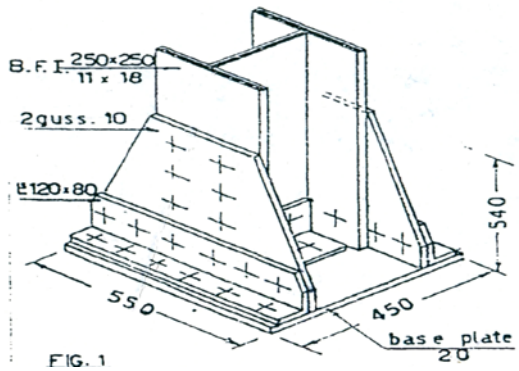


FIG. 1

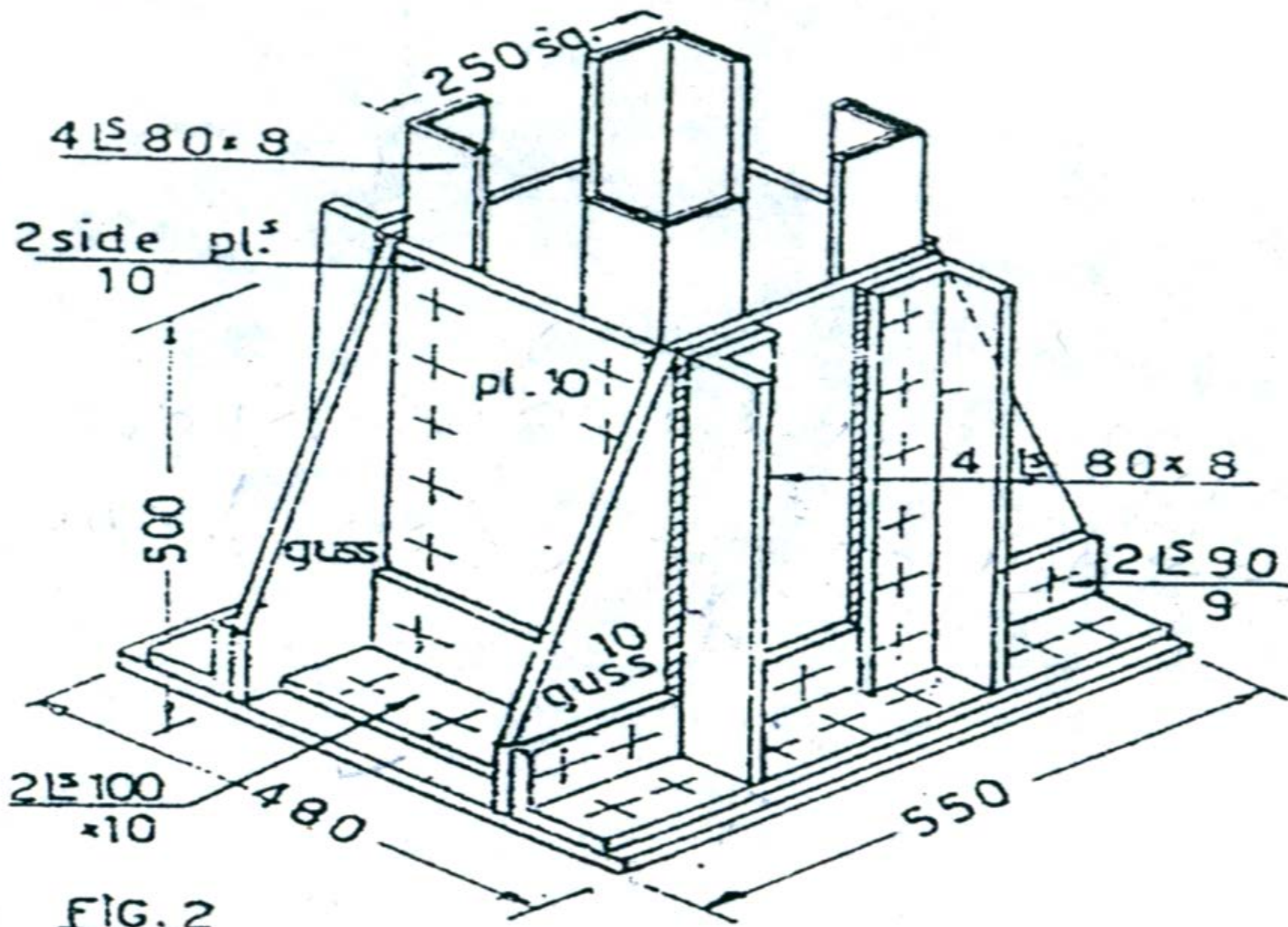


FIG. 2

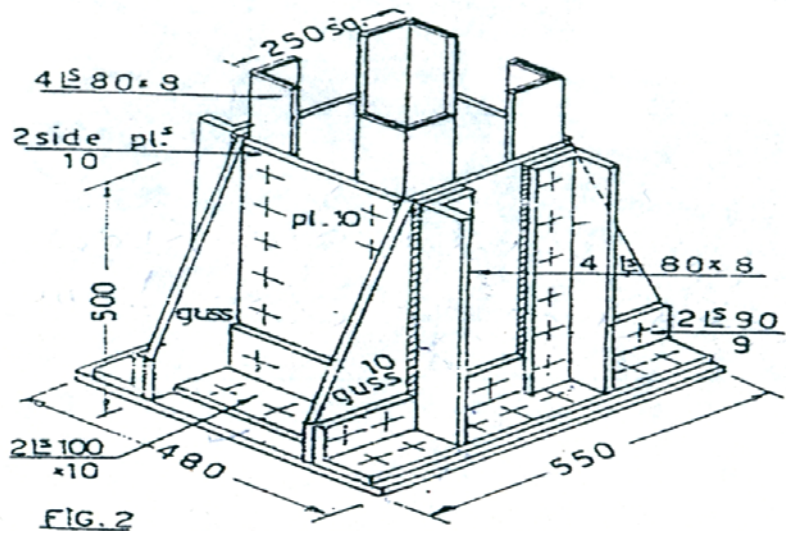
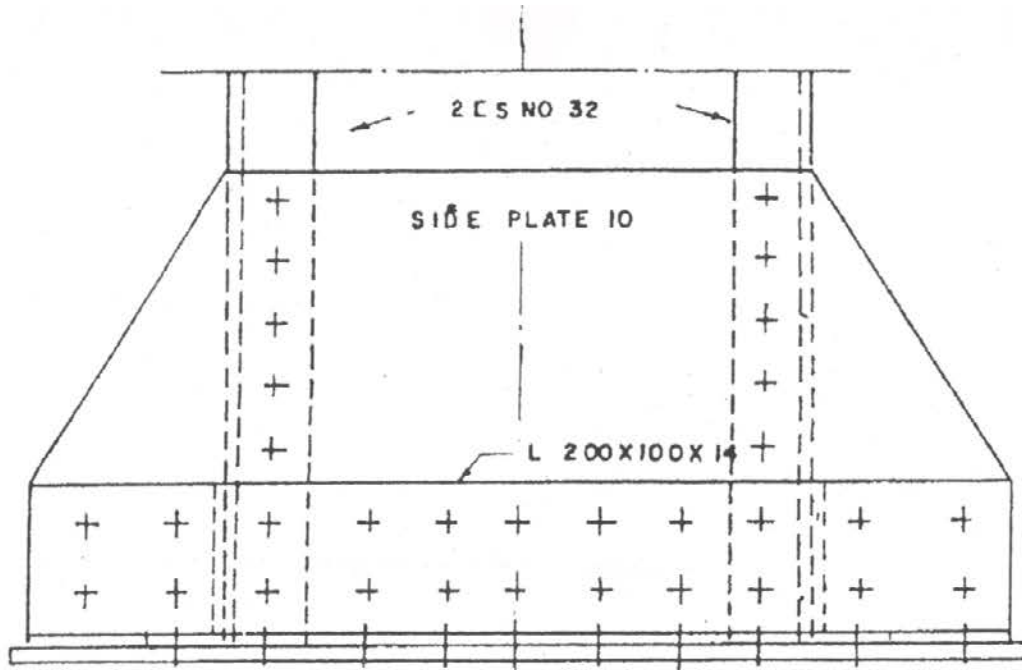


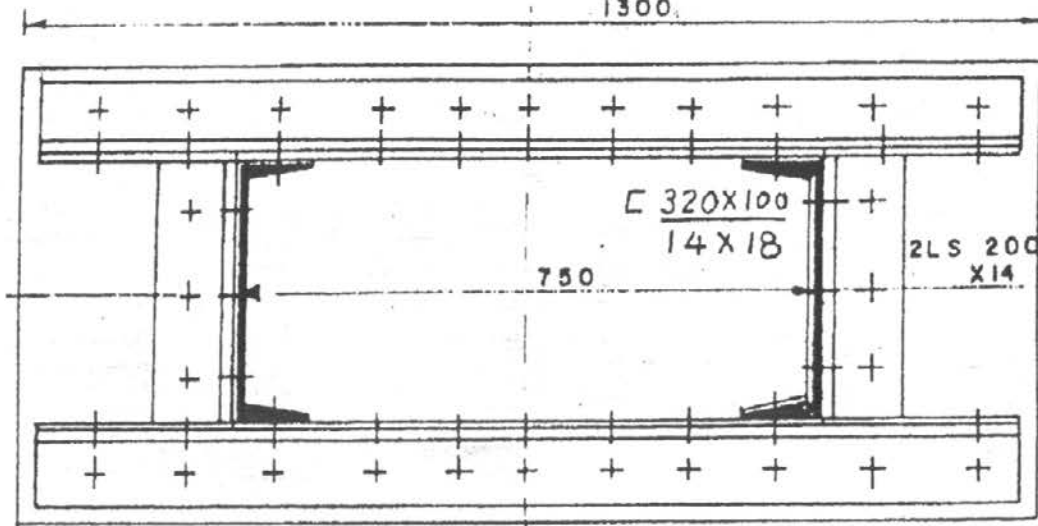
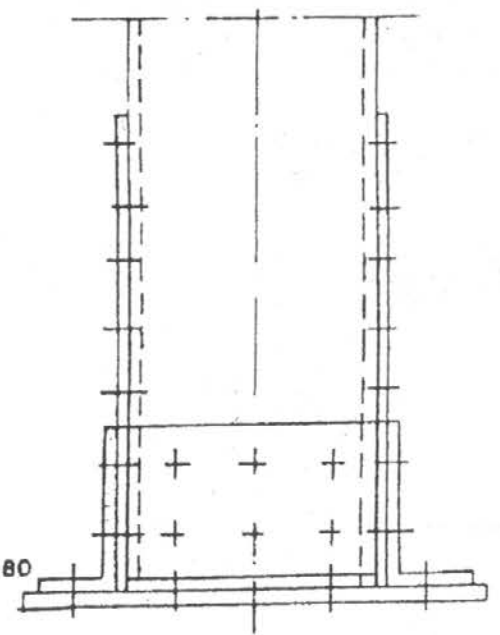
FIG. 2



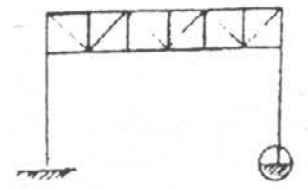
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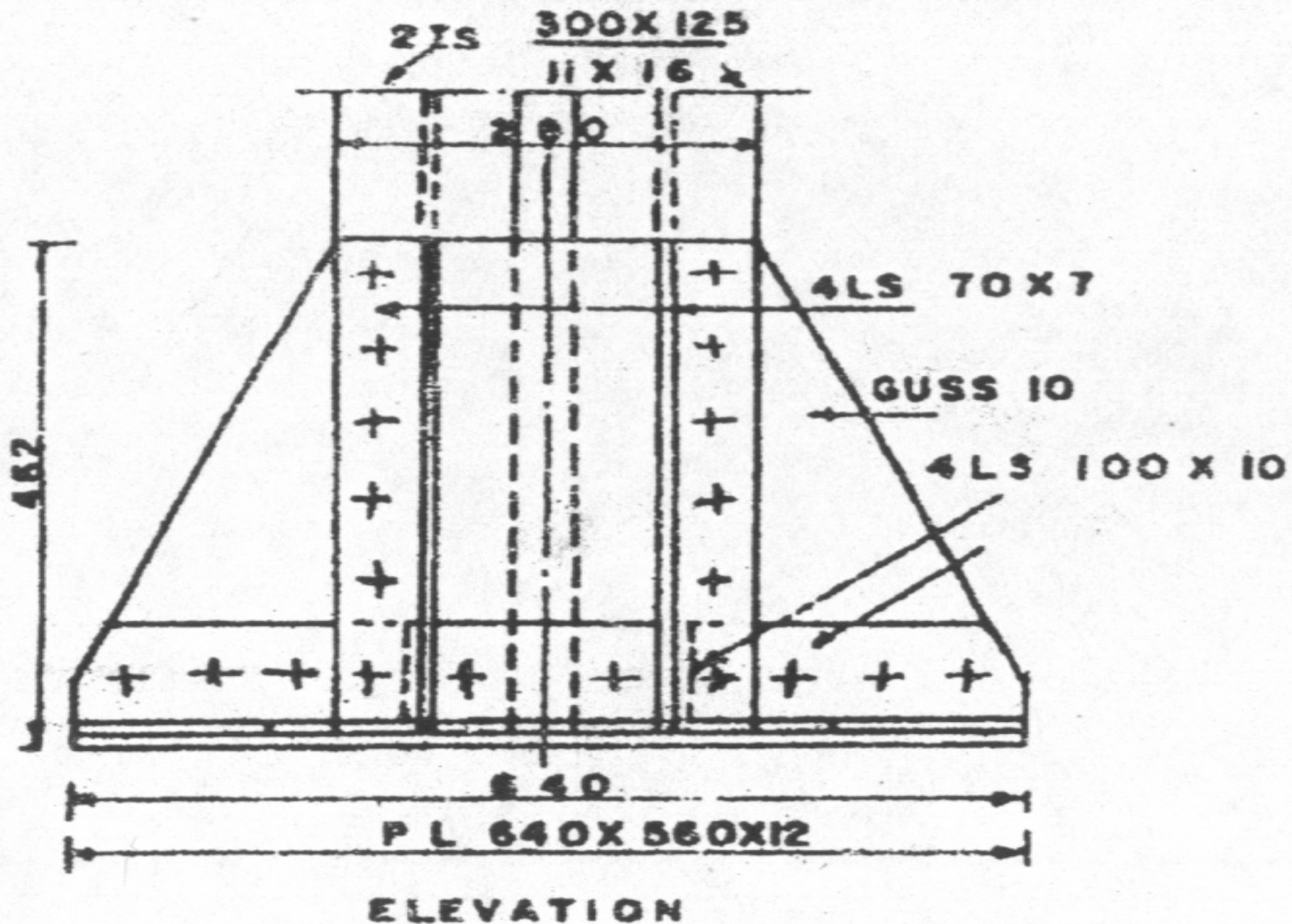
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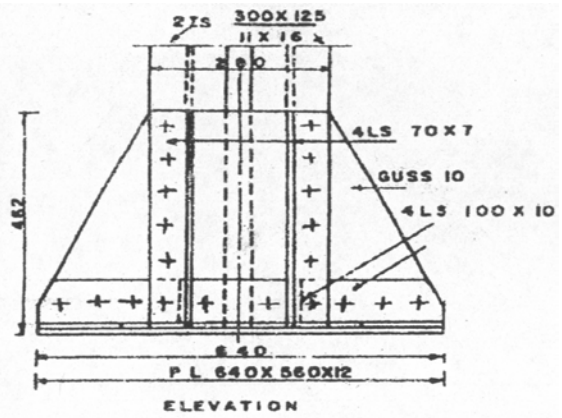
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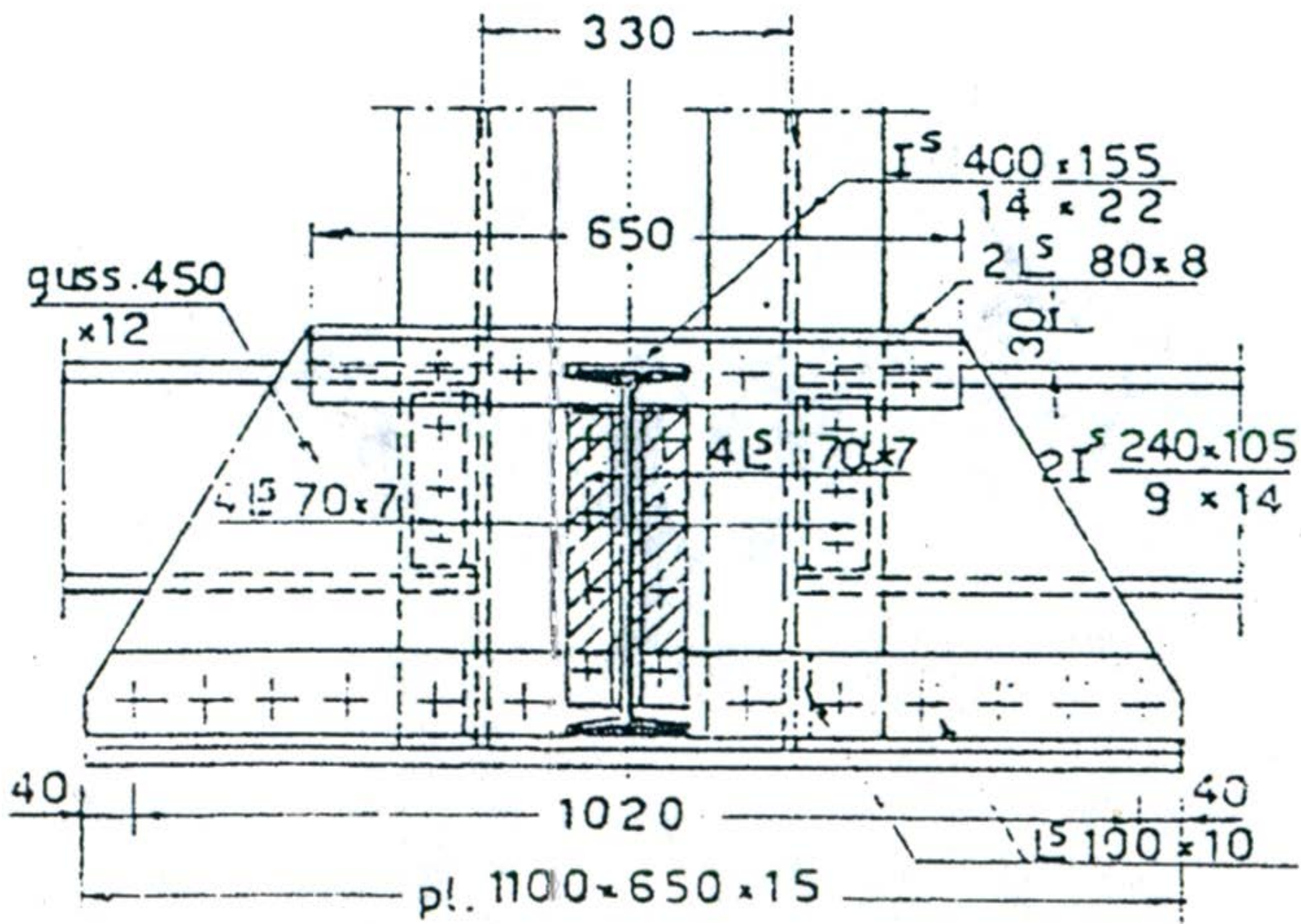


PLAN









Part (2)

Irrigation Structure

Irrigation:

Is providing water artificially through canals to the root zone it achieve the required moisture needed for plant's growth.

Drainage:

Is removing the excess water artificially through drains from the root zone it achieve the required moisture needed for plant's growth.

Canals



Canals



Canals



Canals



Drains





Classification of water structures:

1. Crossing structures (Culvert, Bridge, Syphon, Aqueduct)
2. Heading up (control) structures (Weirs, Regulators)
3. Escape structures (Tail, and Intermediate escapes)
4. Navigational structures (Lock, Berth)
5. Storage Structures (Dams)
6. Pump stations

1 - Crossing structures

1-Culvert

Location:

Intersection of main roadway with secondary waterway.

Function:

Water transport under the roadway

Culvert



Culvert



Culvert



2- Bridges

Location:

Intersection of main waterway with secondary roadway

Function:

Traffic transport over the waterway

Bridge



Bridge



Bridge



3- Siphon

Location:

Intersection of main waterway (like canal) with secondary waterway (like drain)

Function:

Water transport under the waterway

Syphon



Syphon



Syphon



4- Aqueduct

Location:

Intersection of secondary waterway (like drain) with main waterway (like canal)

Function:

Water transport over the waterway

Aqueduct



Aqueduct



Type	Structure	Location	Function
Crossing structures	Culvert	Intersection of main roadway with secondary waterway	Water transport under the roadway
	Bridge	Intersection of main waterway with secondary roadway	Traffic transport over the waterway
	Syphon	Intersection of main waterway (like canal) with secondary waterway (like drain)	Water transport under the waterway
	Aqueduct	Intersection of secondary waterway (like drain) with main waterway (like canal)	Water transport over the waterway

2- Heading up (control) structures

1- Weirs

Location:

Main Waterways

Function:

Control the water levels and discharge measurements

Weirs



Weirs



Weirs



2- Regulators

Location:

Main Waterways

Function:

Control the water levels and discharge measurements

Regulators

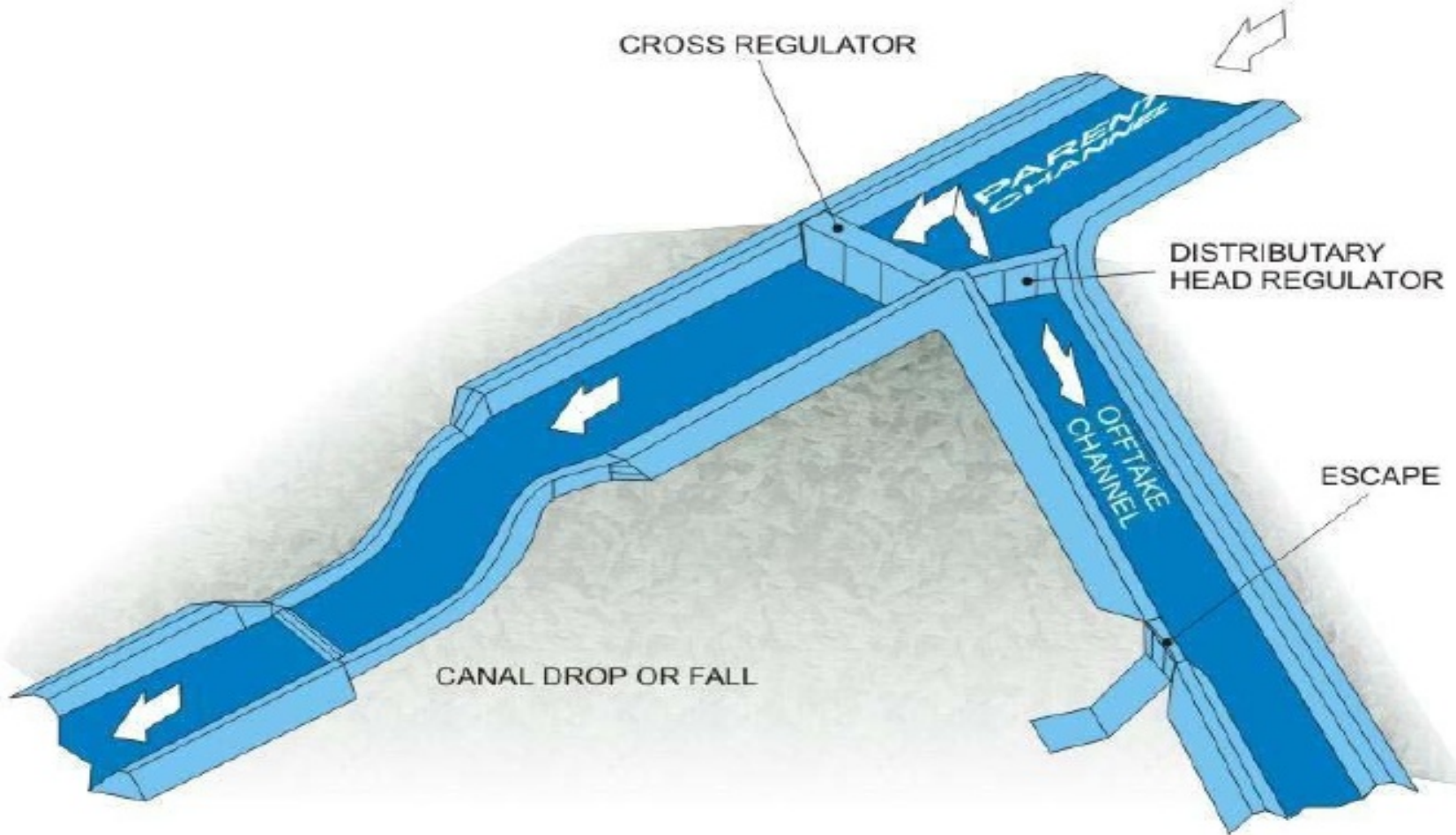


FIGURE 1. Canal structures for flow regulation and control

Regulators



Regulators



Regulators



Type	Structure	Location	Function
Heading up (control) structures	Weirs and Regulators	Waterways	Control the water levels and discharge measurements

3- Escape structures

1- Tail escape

Location:

The end of waterway

Function:

Remove the excess water from the waterway

Tail escapes



Tail escapes



2- Intermediate escape

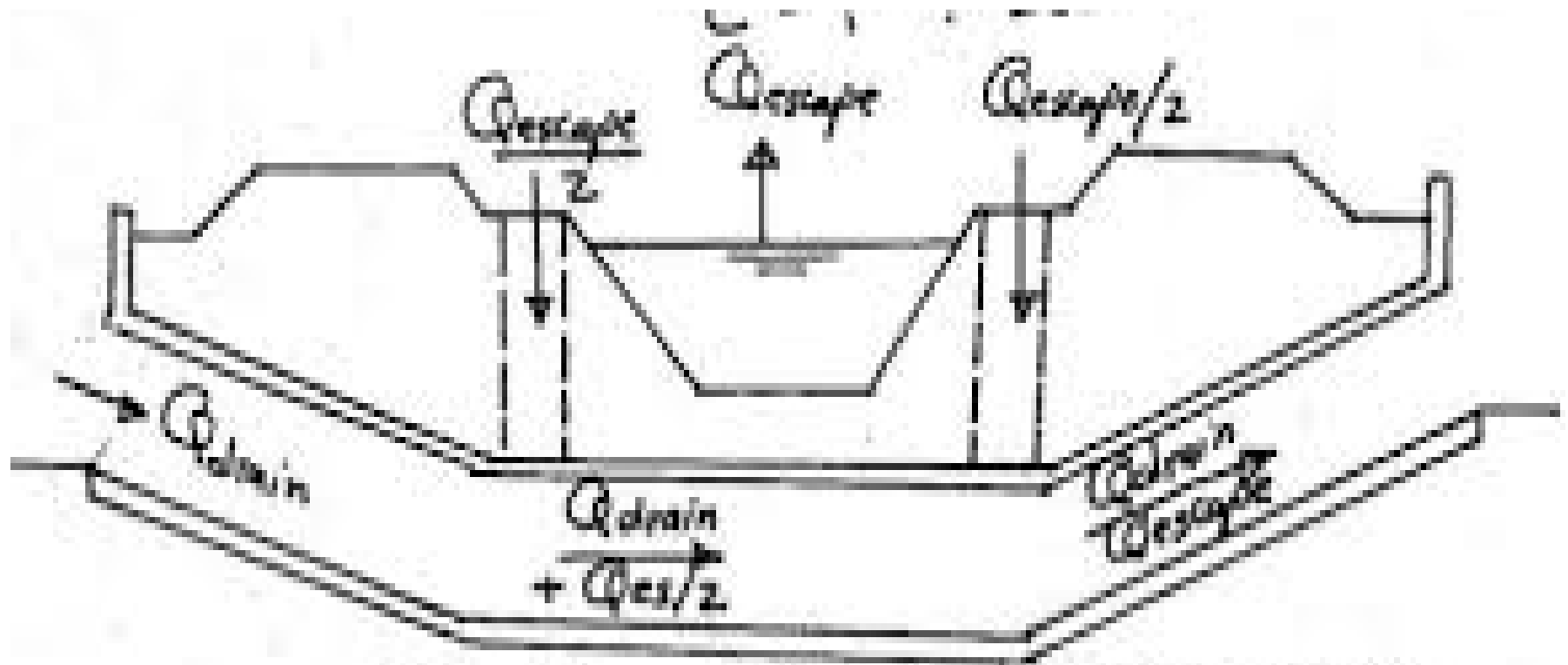
Location:

At Syphon

Function:

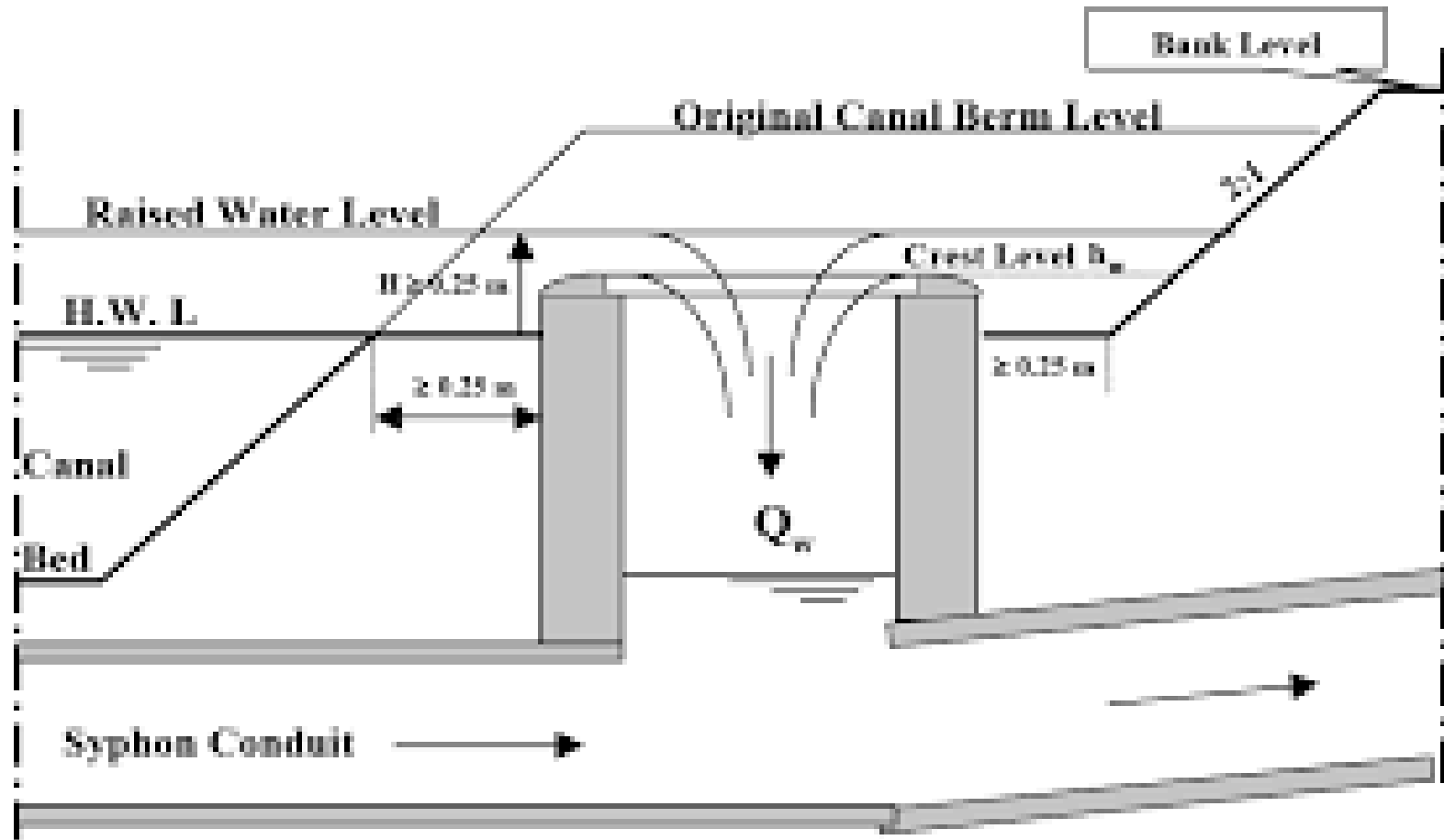
Remove the excess water from the waterway

Intermediate escapes



عند هذه الحالة تتغير اتجاه الجريان من مكان إلى مكان

Intermediate escapes



Type	Structure	Location	Function
Escape structures	Tail escapes	The end of waterway	Remove the excess water from the waterway
	Intermediate escapes	Syphon	

4- Navigational structures

1- Locks

Location:

Navigable waterways associated with water structure

Function:

Ship passage

Locks



Locks



2- Berths

Location:

Navigable waterways

Function:

Ship berths

Berths



5- Storage Structures

1- Dams

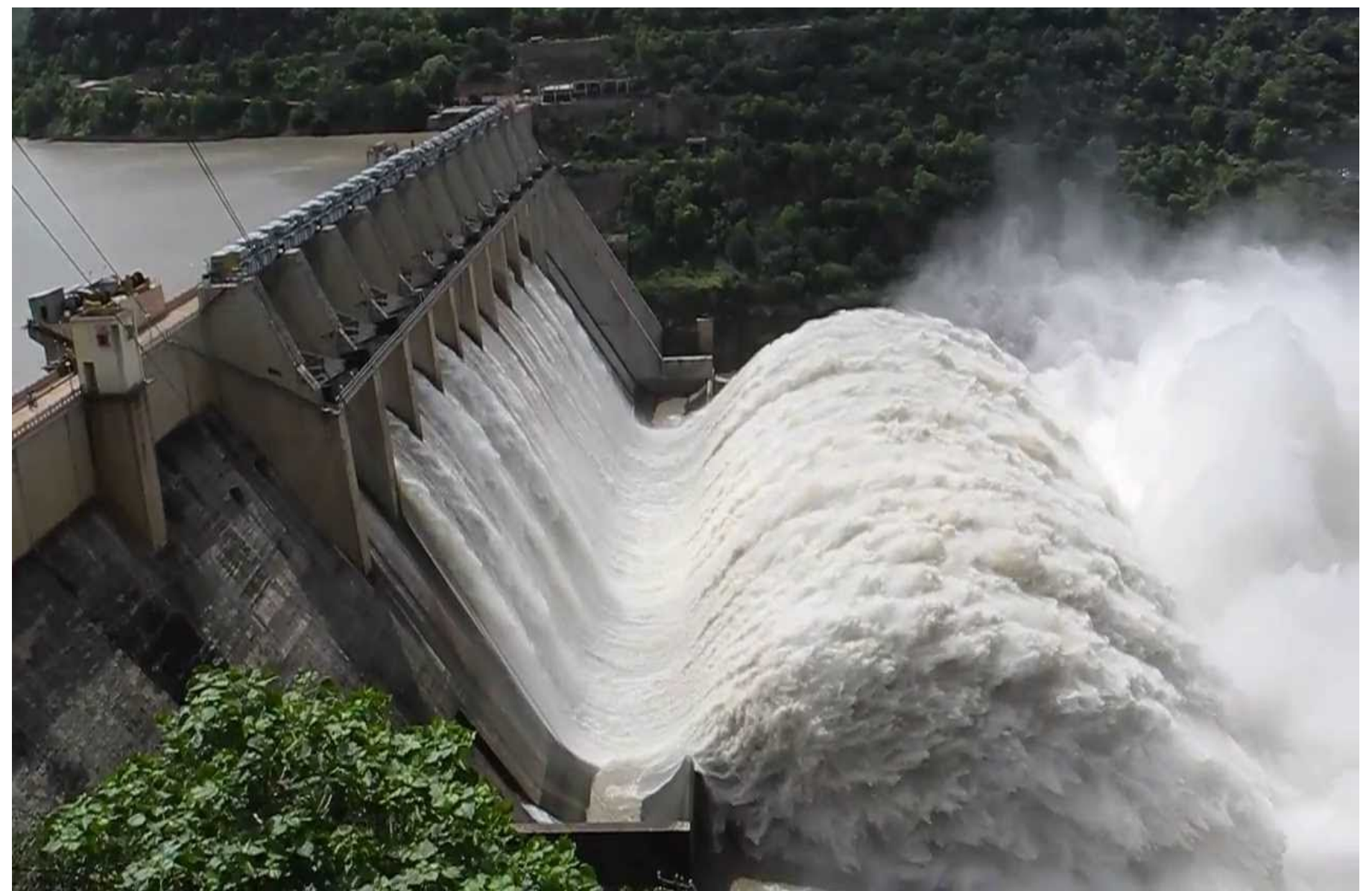
Location:

Rivers

Function:

Reserve water upstream and electricity generation

Dams



6- Pump stations

1- Pump stations

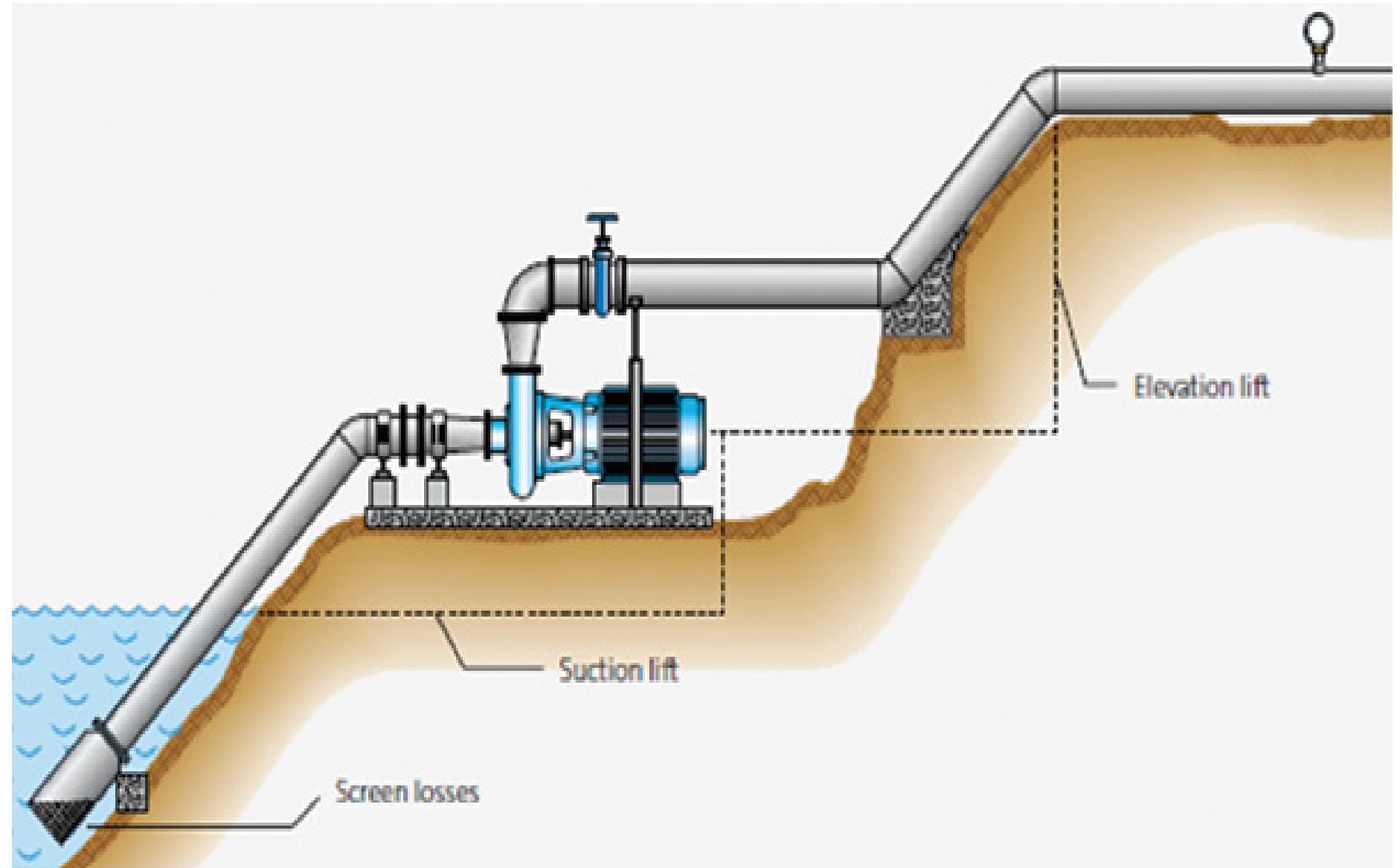
Location:

Rivers

Function:

Elevate the water from lower level to higher one

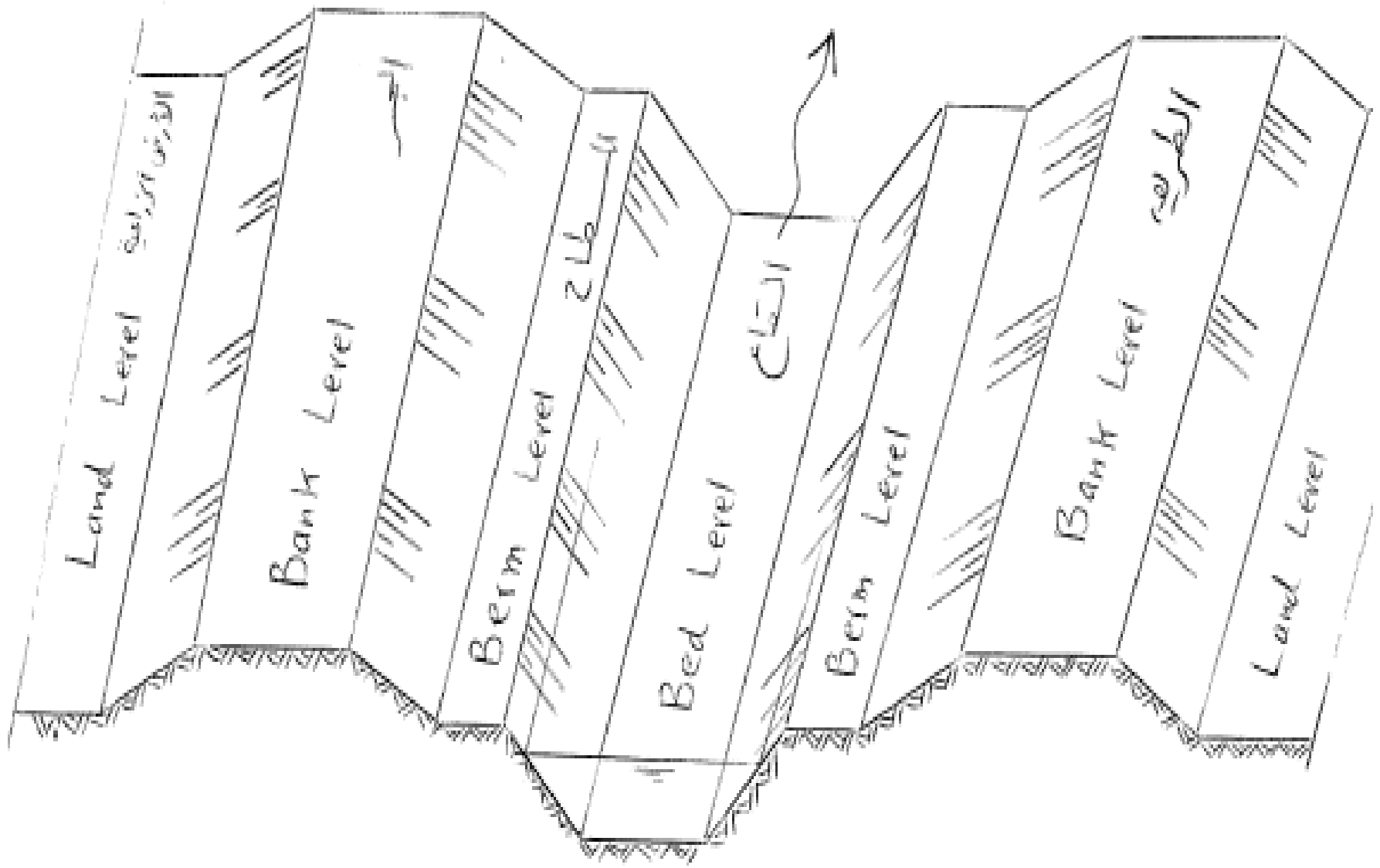
Pump station

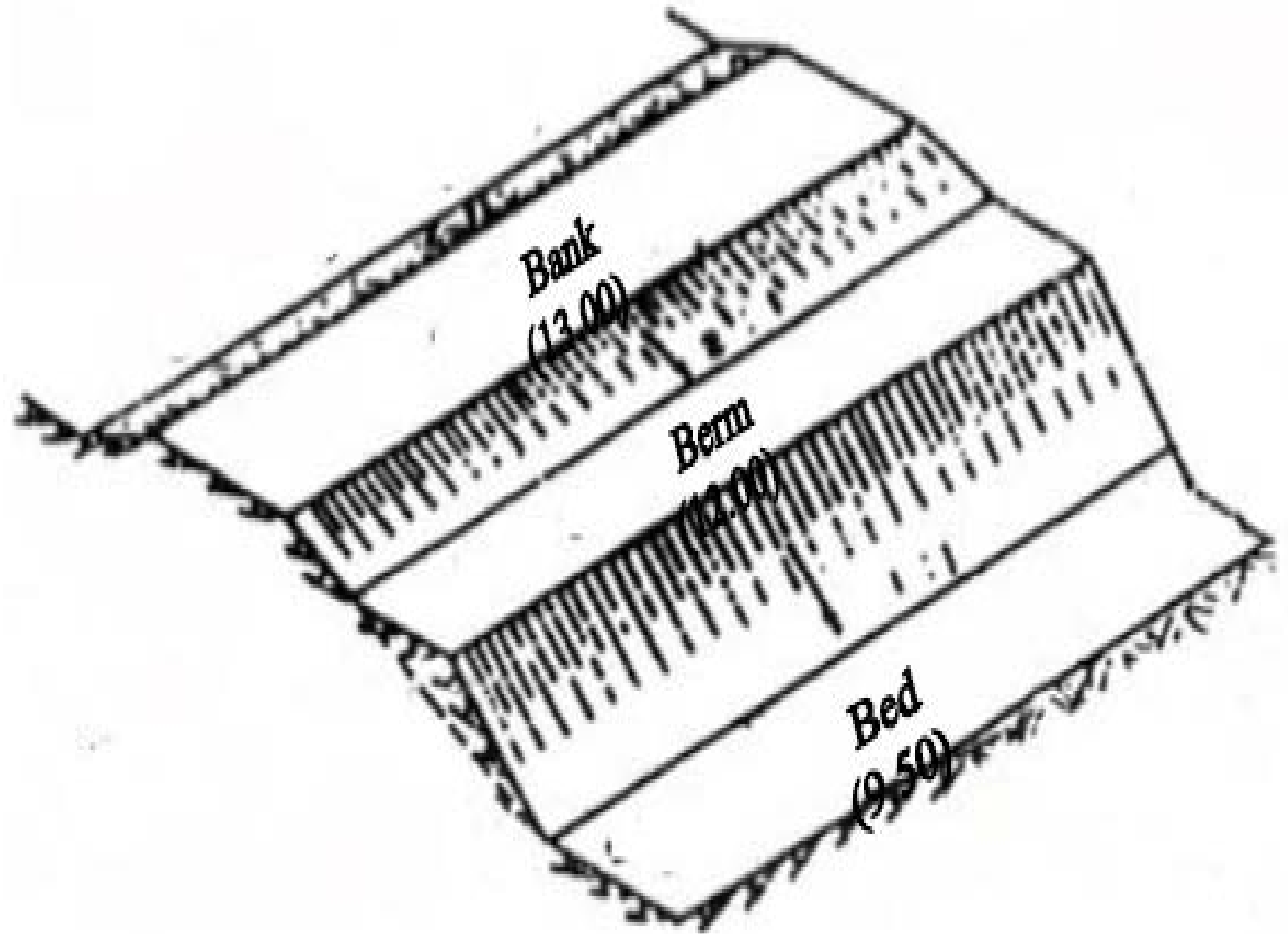


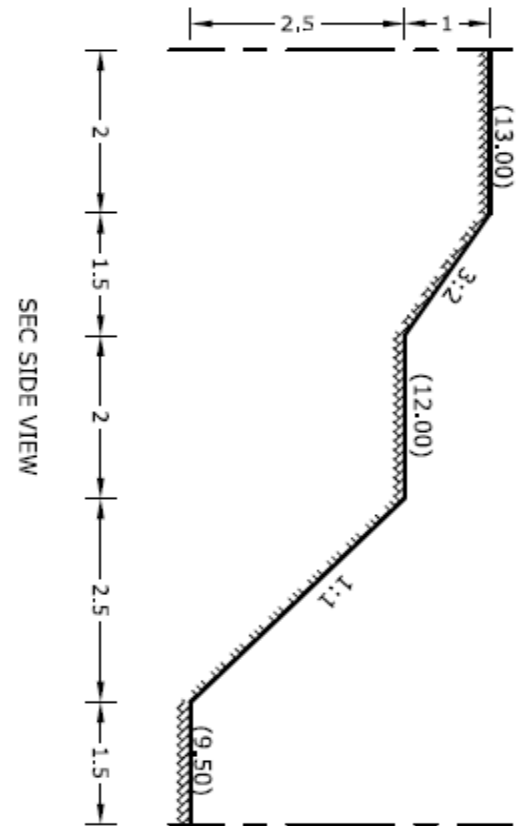
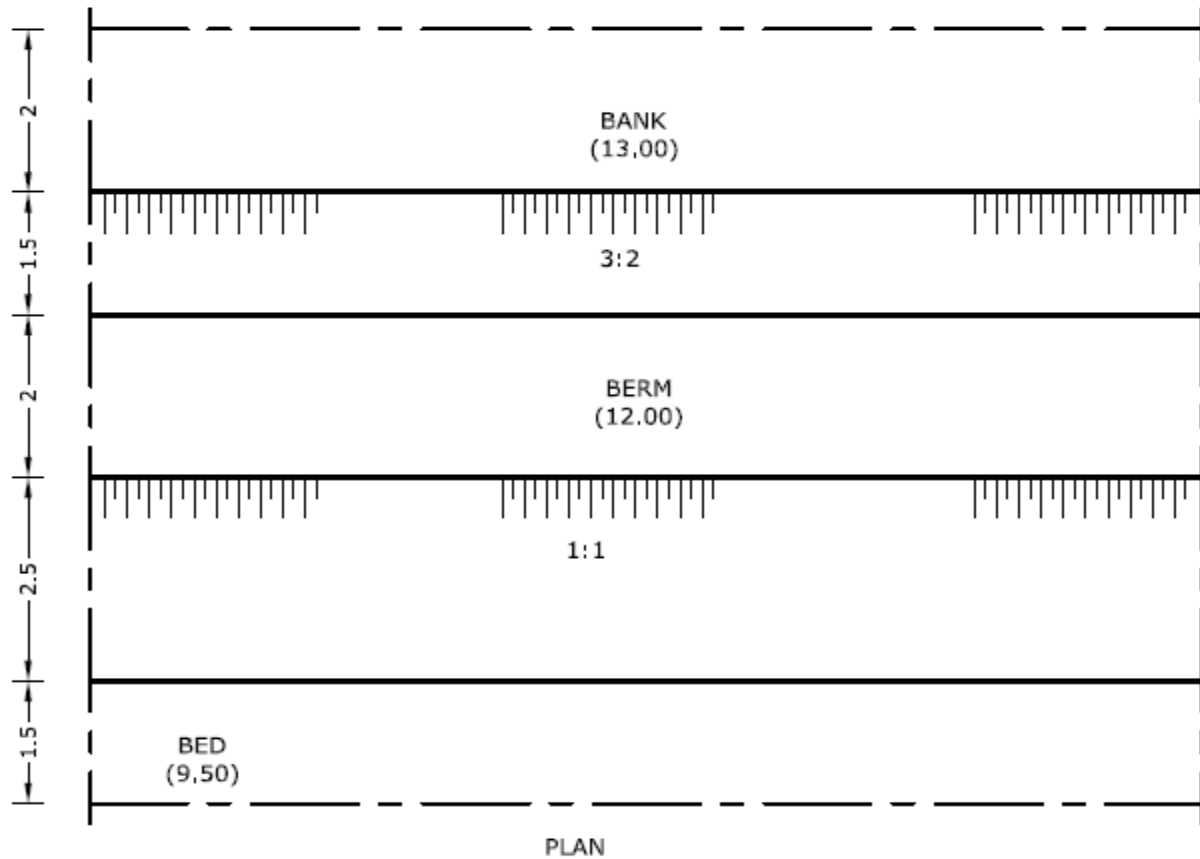
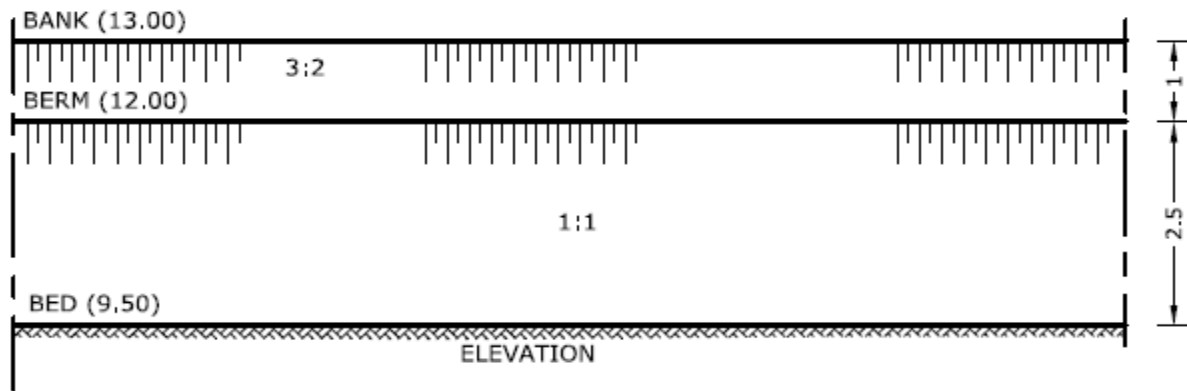
Pump station



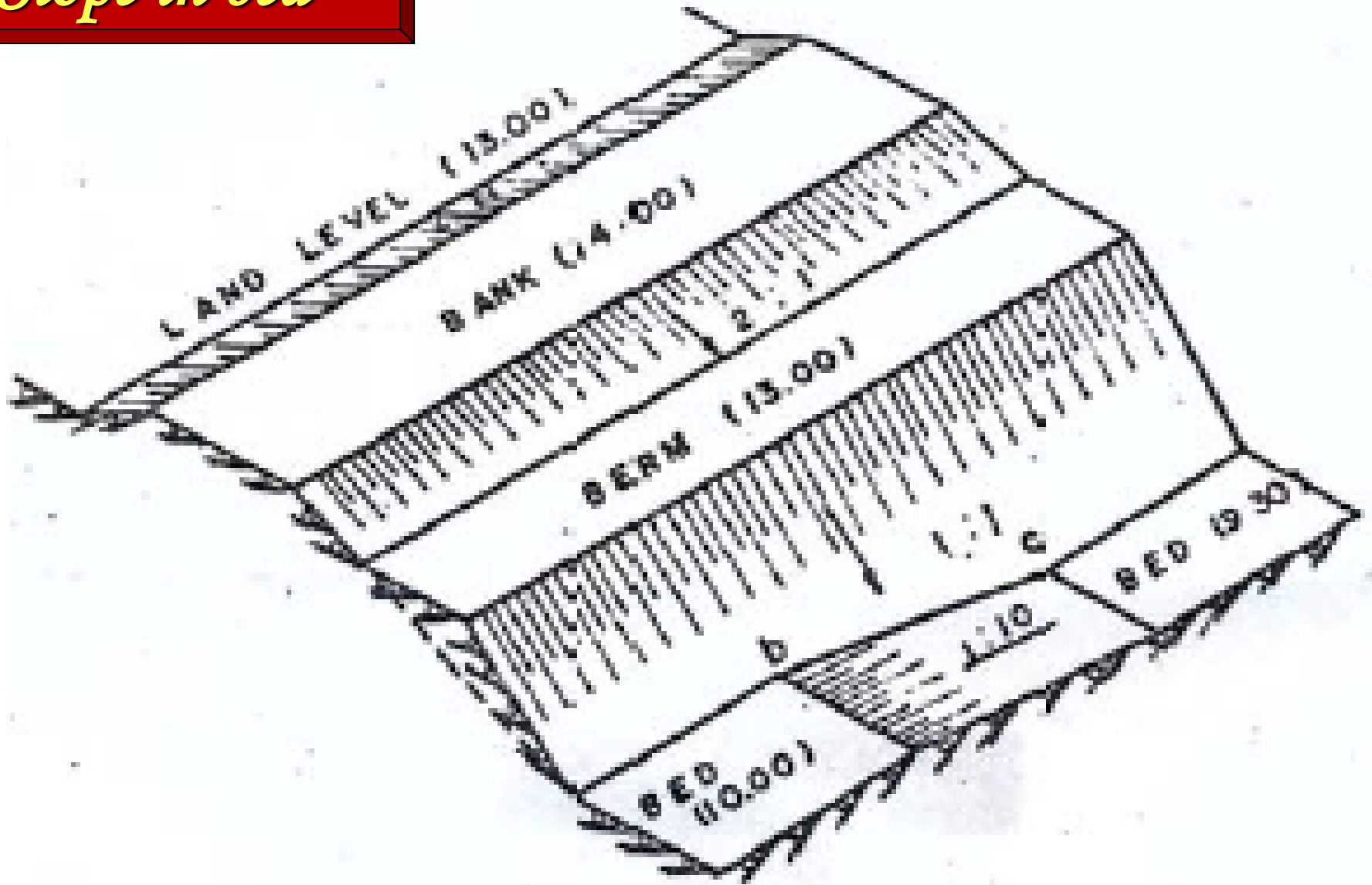
Earth works

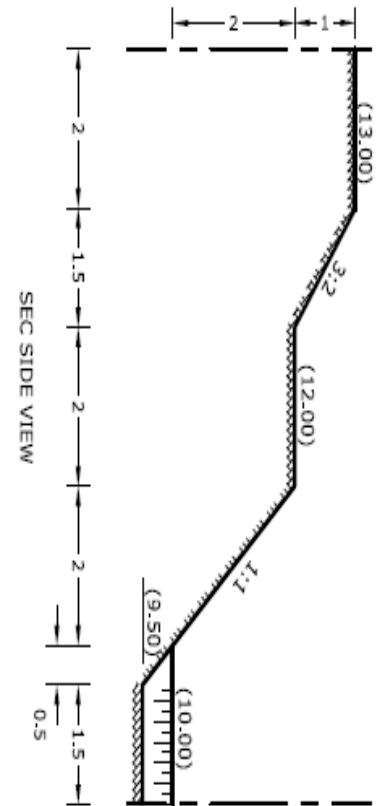
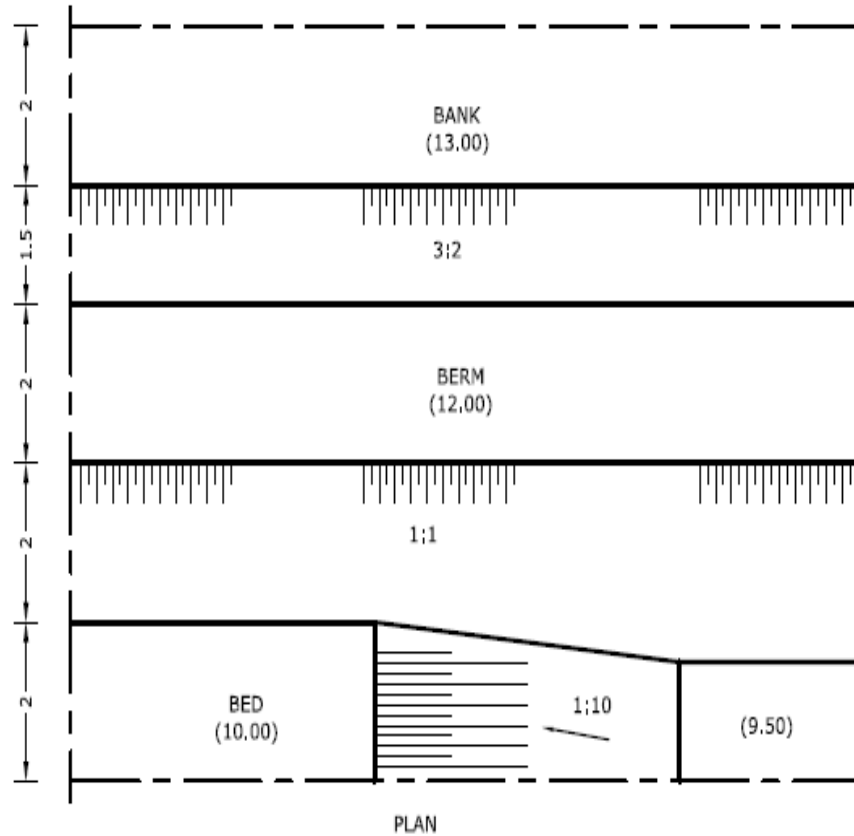
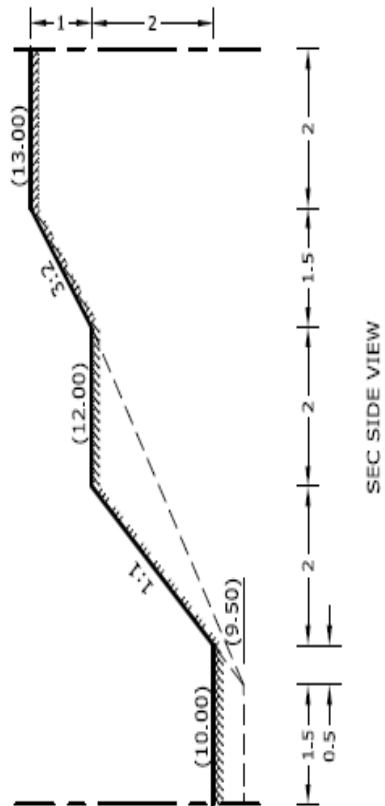
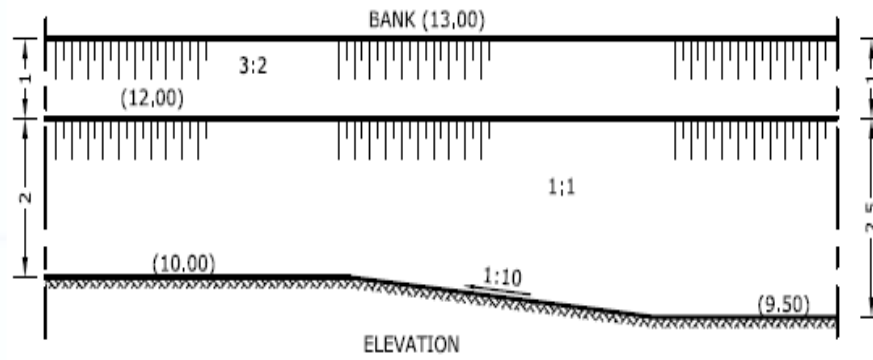
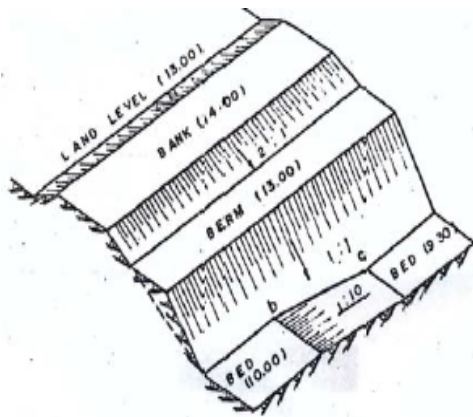






Slope in bed





Slope in berm

