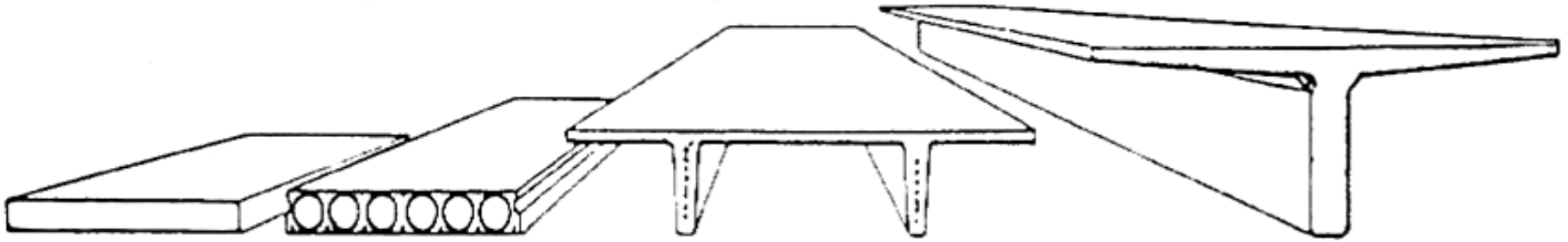
Montažne međuspratne konstrukcije

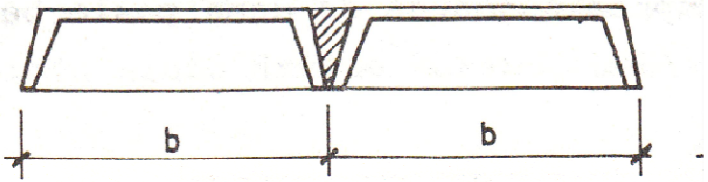


Ravne ploče Ošupljene ploče HC Korube

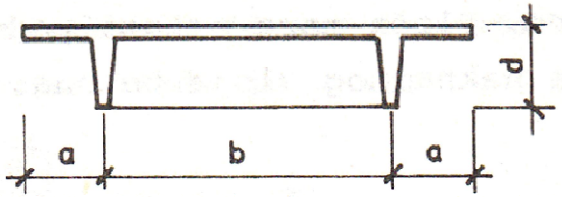
Korube

Klasično armirane
Prethodno napregnute

“П”



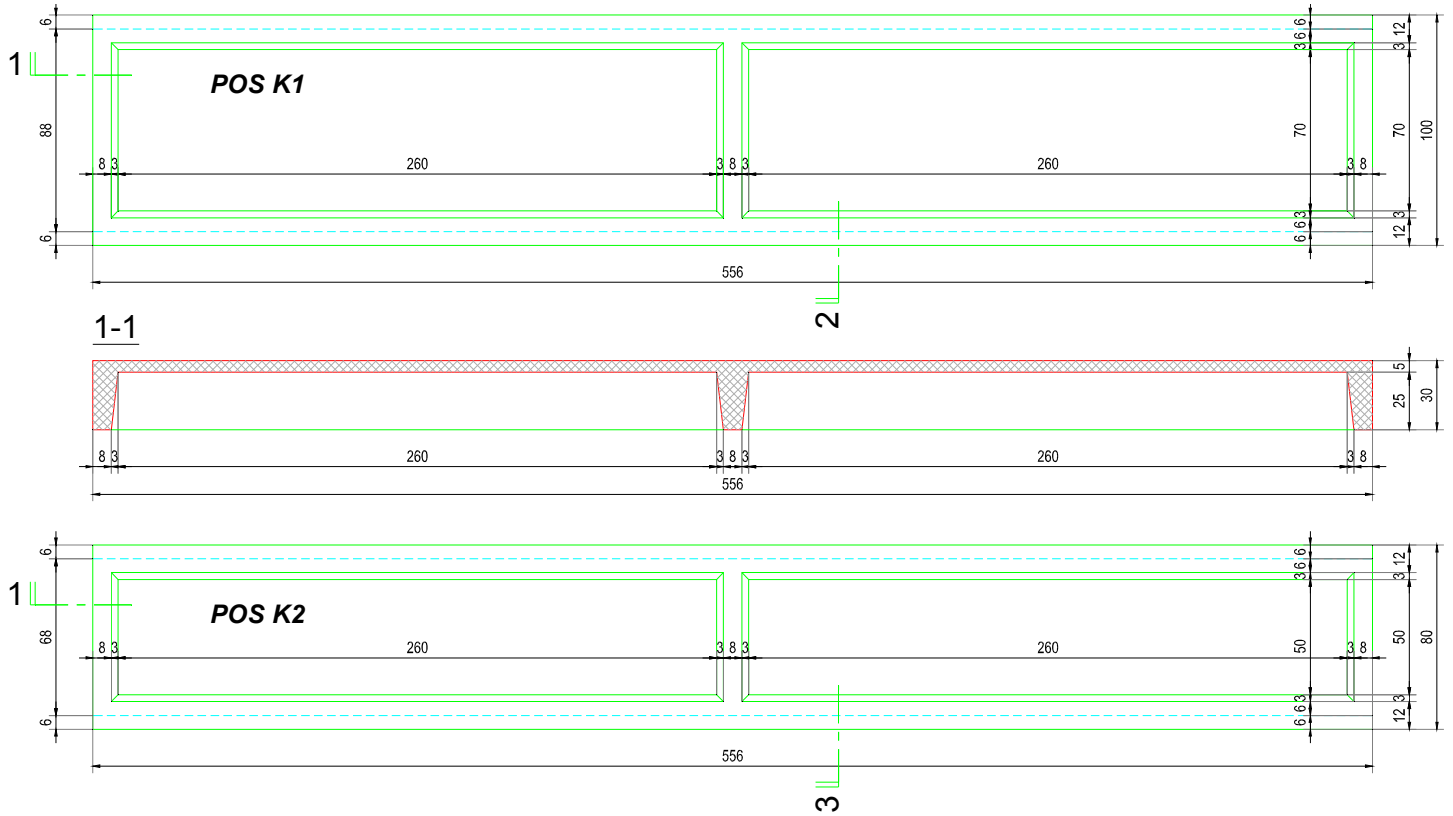
“ТТ”



Primer gotove tavanice sa “П” korubama

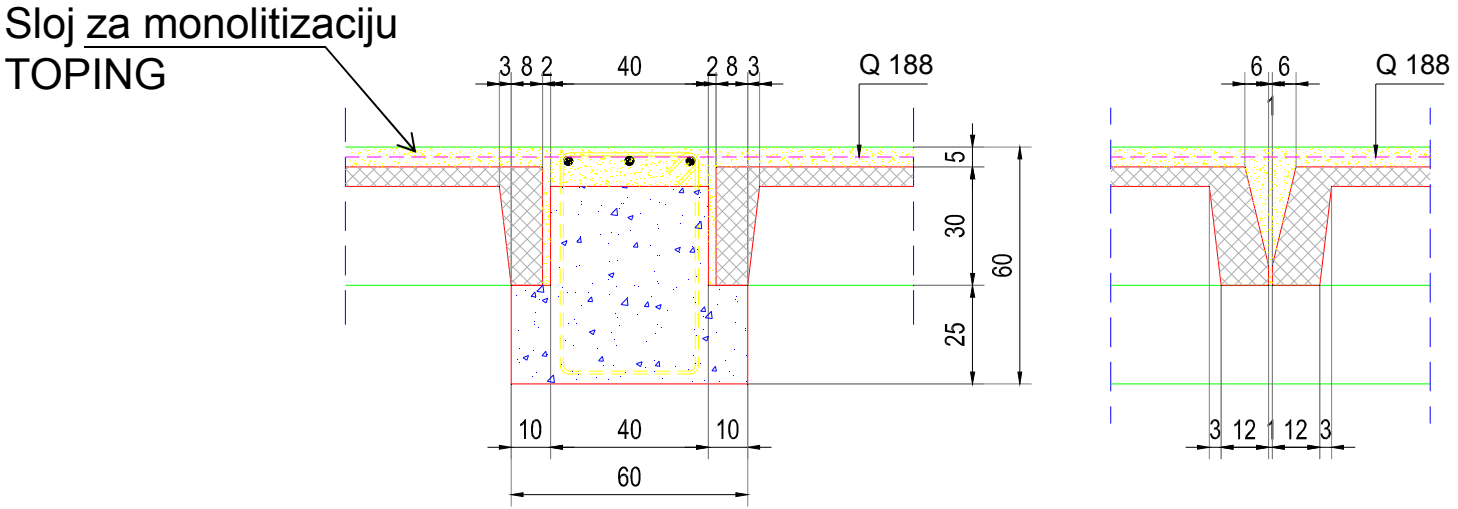
Garaža u Mileševskoj

Primer gotove tavanice sa “TT” korubama



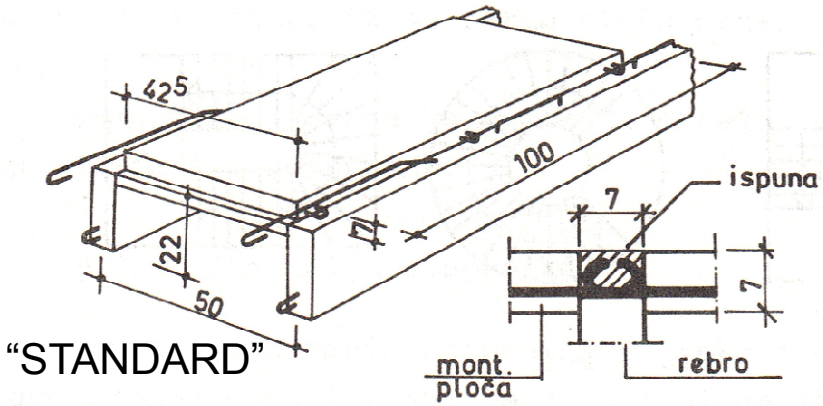
POS	*K1*	*K2*	
n	156	60	komada
$G_k^{(1)}$	15.62	13.85	kN
$V_b^{(1)}$	0.625	0.554	m^3
ΣV_b	97.50	33.24	m^3

DETALJ OSLANJANJA KORUBA



Ravne montažne međuspratne ploče

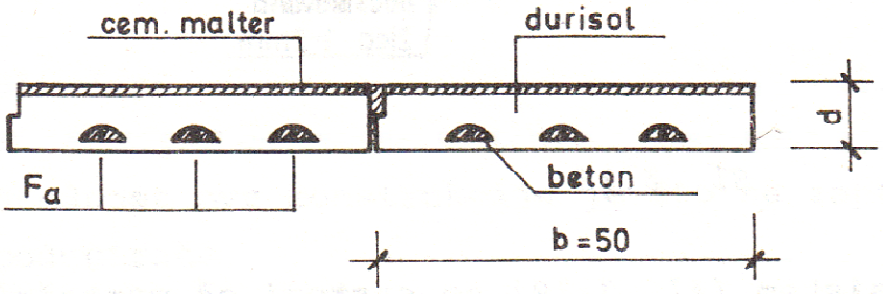
Klasično armirane
Prethodno napregnute



"STANDARD"

Punog preseka
Ošupljene

Od betona sa agregatom normalne težine
Od lakoagregatnog betona
- Durisol
- Siporeks

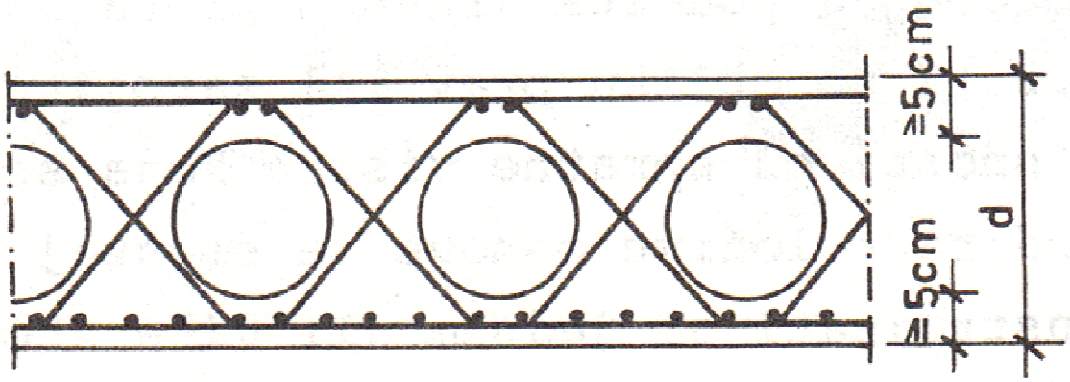


DURISOL ploče, L≤5m, γ=10kN/m^3

Ošupljene ploče

Klasično armirane d_{min} = 24cm

Proračun za rebro **I** preseka

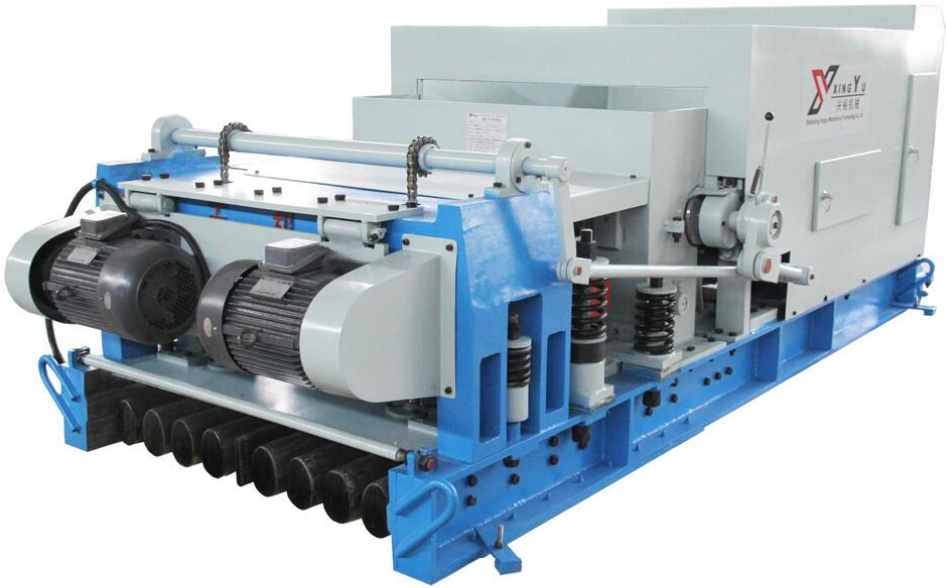


Ošupljene ploče – HC (Hollow Core)

Prethodno napregnute

Proizvodnja predhodnapregnutih HCploča

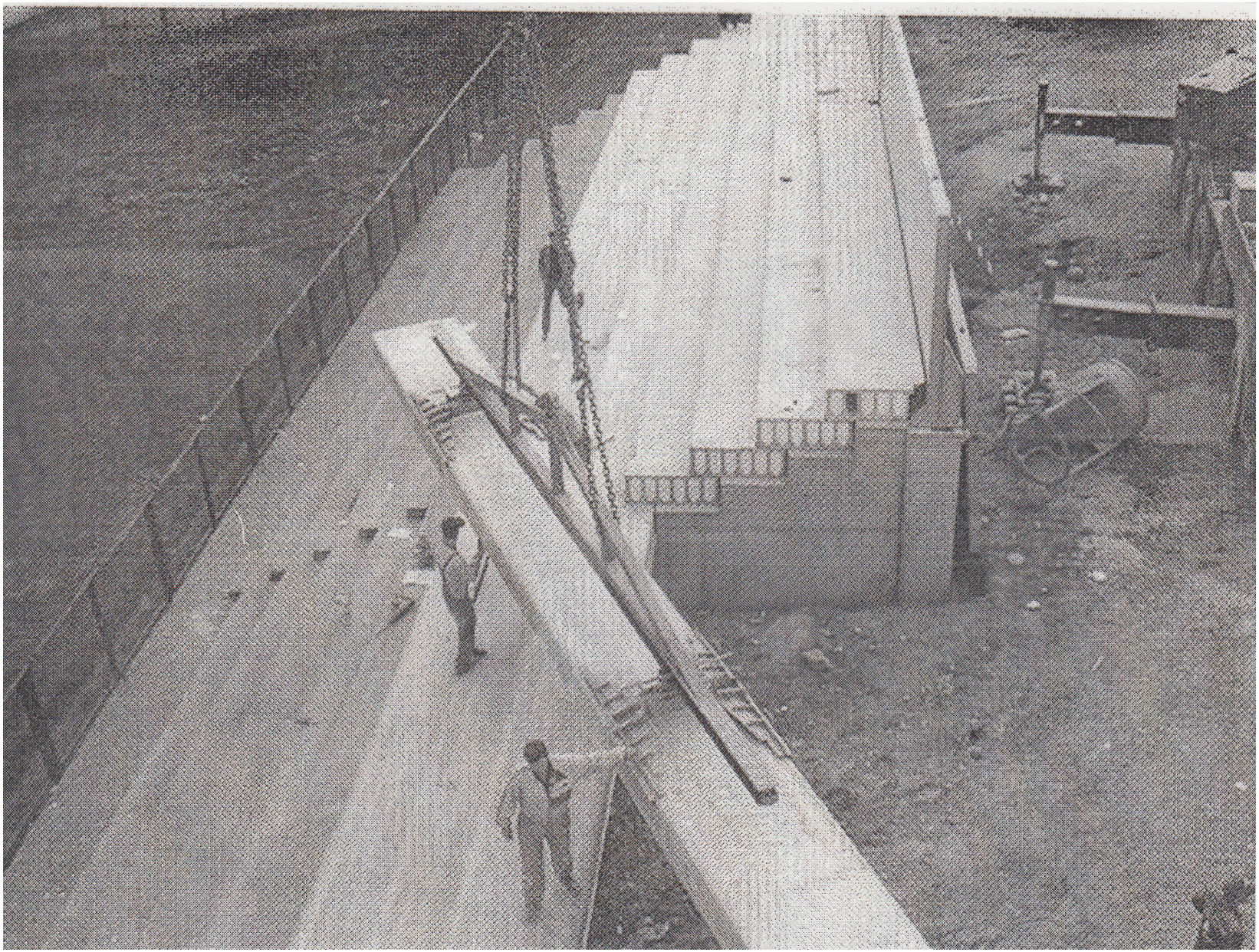
1. Proizvodnja na stazama za prednaprezanje



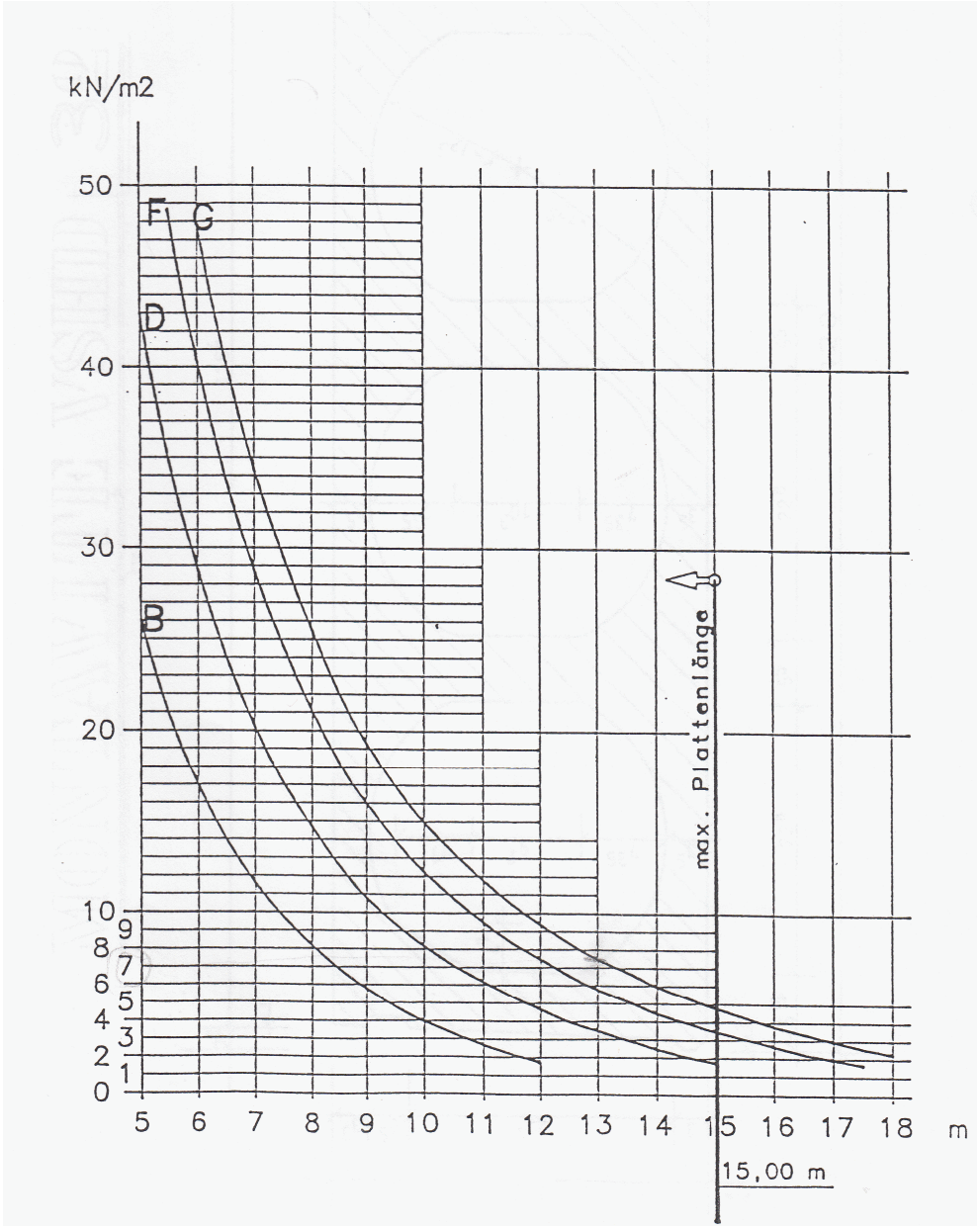
2. Betoniranje pomoću vibrofinišera sa ekstruderom – sitnozrni beton velike čvrstoće

3. Rezanje ploča na projektovanu dužinu nakon očvršćavanja i odlaganje

Ugradnja predhodnapregnutih HCploča

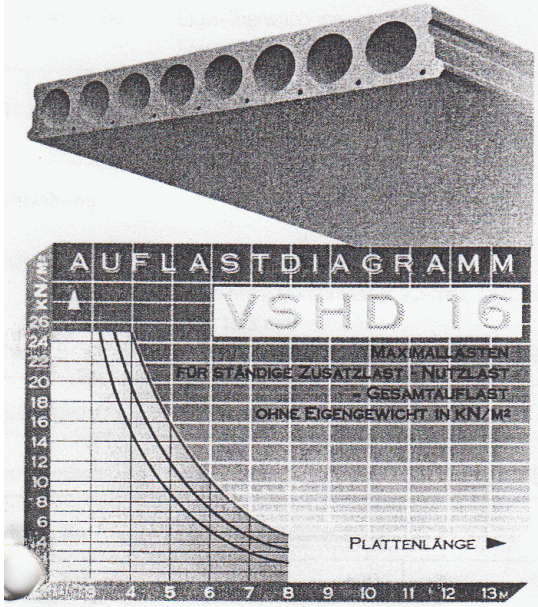


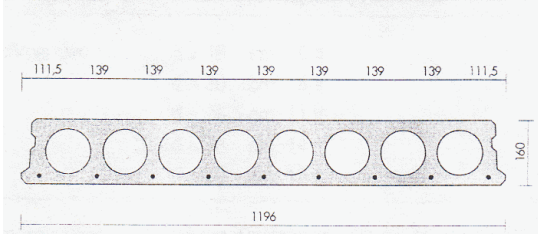
Proračun PN ošupljenih ploča



VSHD 16

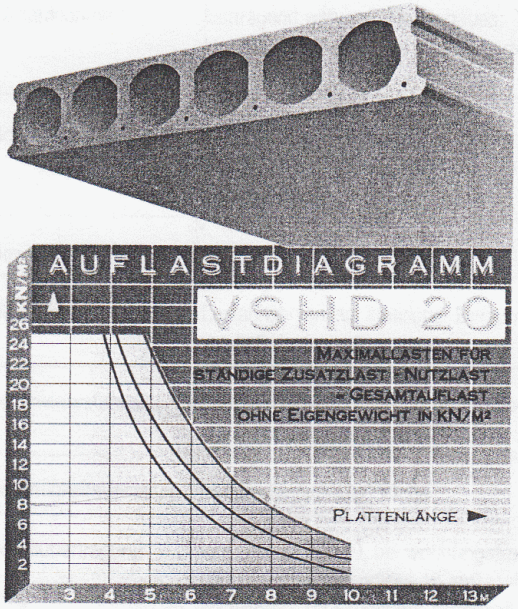
Deckenstärke	16 cm
Eigengewicht	2,40 kN/m²
Betongüte	B 600
Vergußbeton Körnung 0/4 - 0/8 K3 B 300	6 l/m²

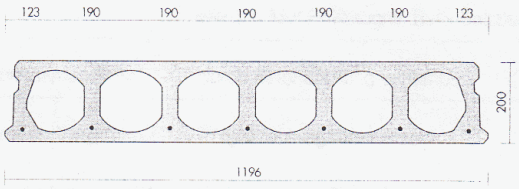




VSHD 20

Deckenstärke	20 cm
Eigengewicht	2,70 kN/m²
Betongüte	B 600
Vergußbeton Körnung 0/4 - 0/8 K3 B 300	8 l/m²



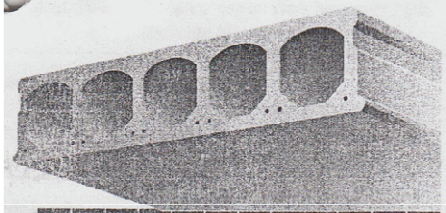


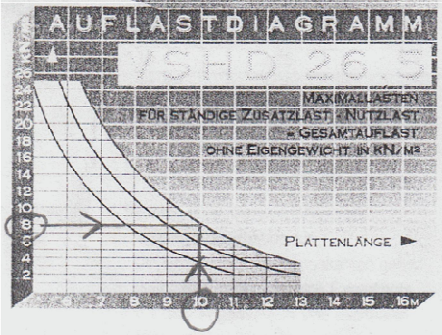
Max L 10m

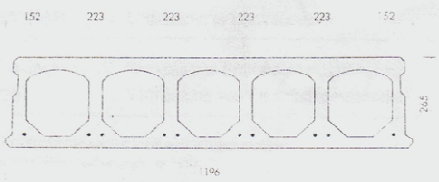
za d 20cm

VSHD 26,5

Deckenstärke	26,5 cm
Eigengewicht	3,40 kN/m²
Betongüte	B 600
Vergußbeton Körnung 0/4-0/8 K3 B 300	11 l/m²

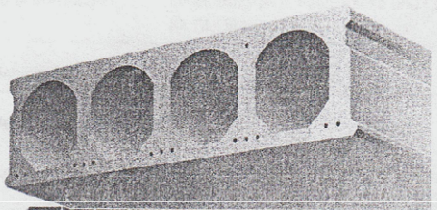


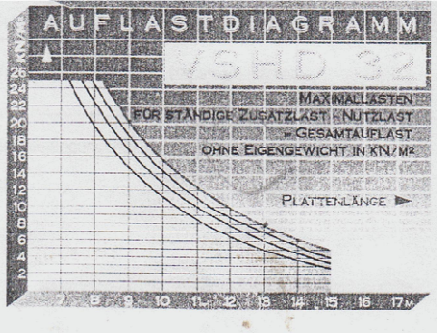


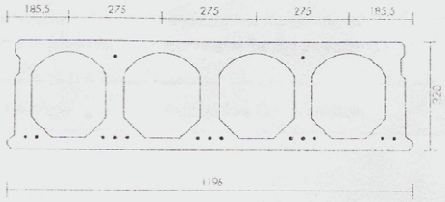


VSHD 32

Deckenstärke	32 cm
Eigengewicht	4,00 kN/m²
Betongüte	B 600
Vergußbeton Körnung K3-0-4 mm B 300	14 l/m²

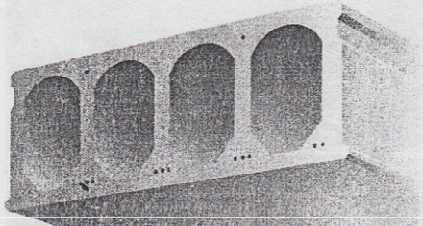


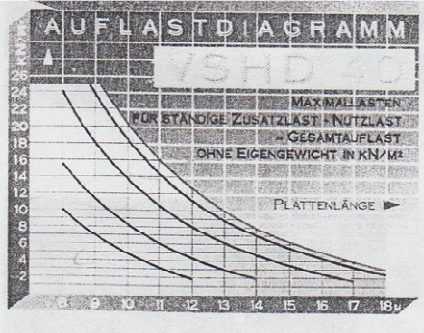


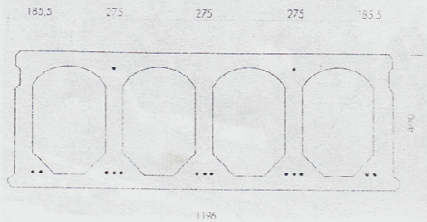


VSHD 40

Deckenstärke	40 cm
Eigengewicht	4,55 kN/m²
Betongüte	B 600
Vergußbeton Körnung 0/4-0/8 K3 B 300	19 l/m²



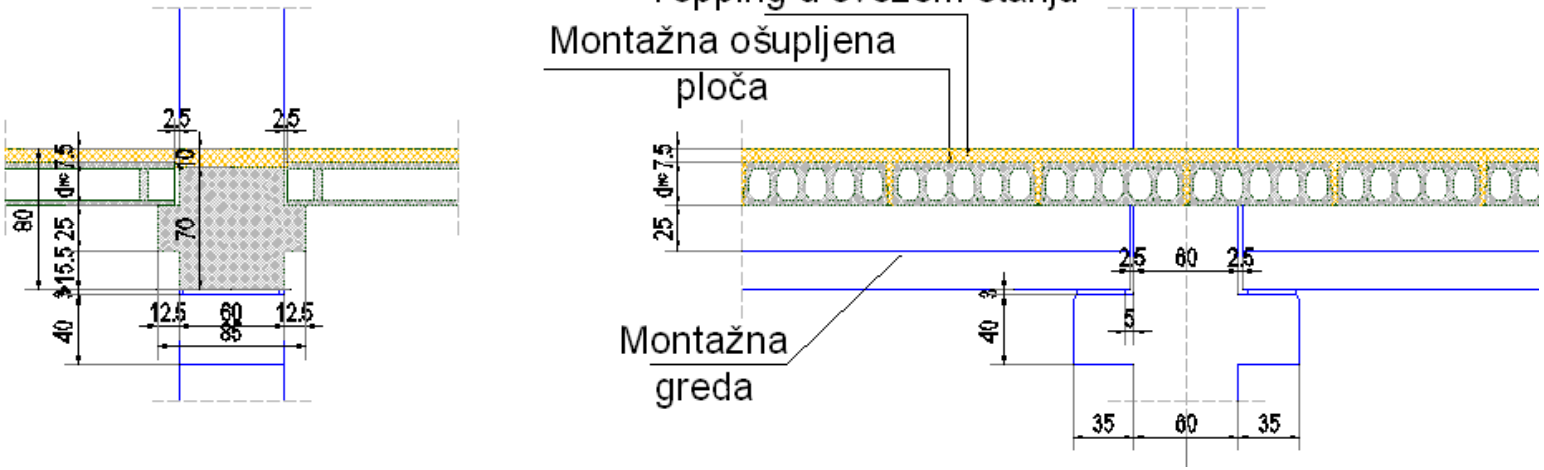




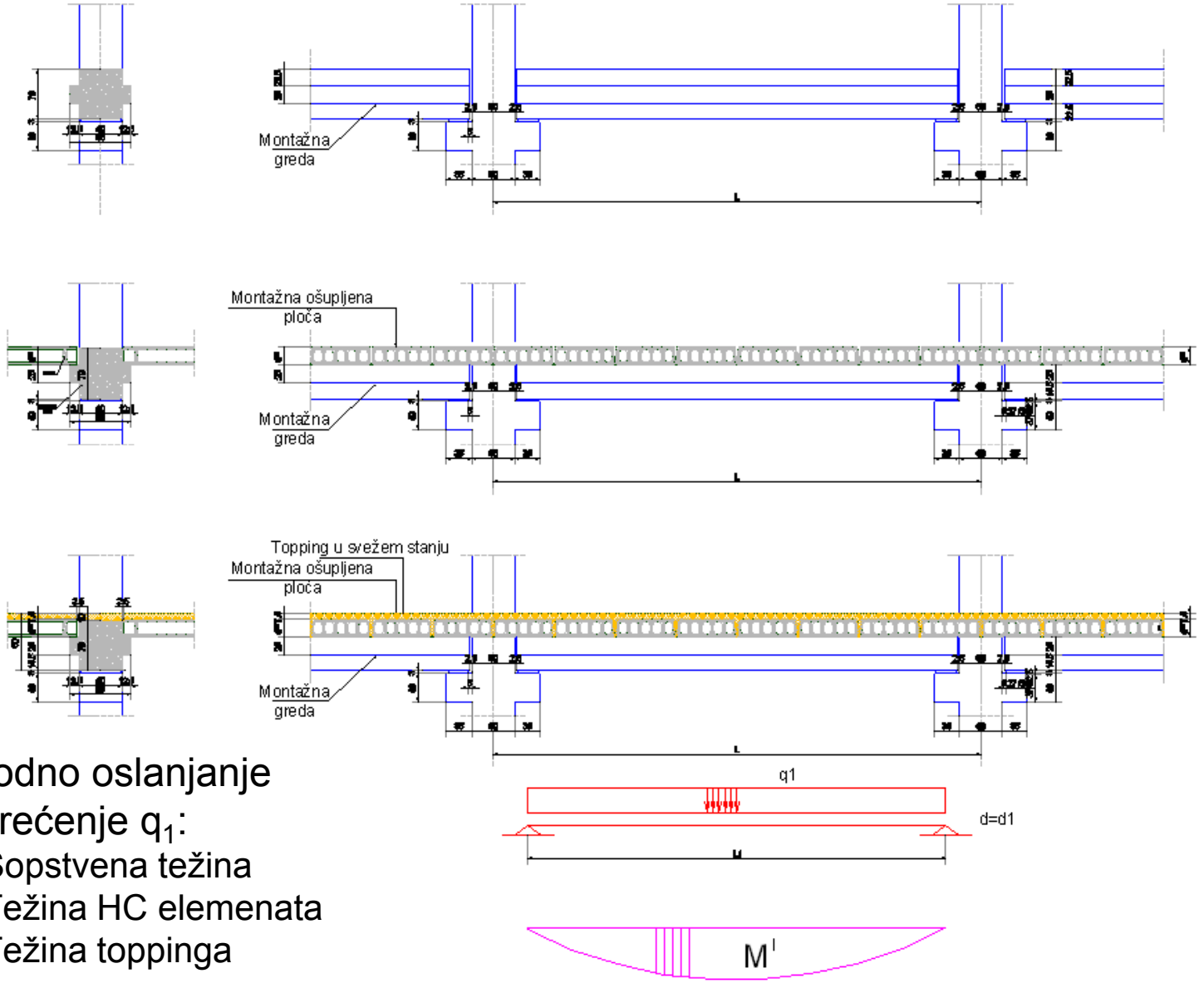
Max L 18m

za d 40cm

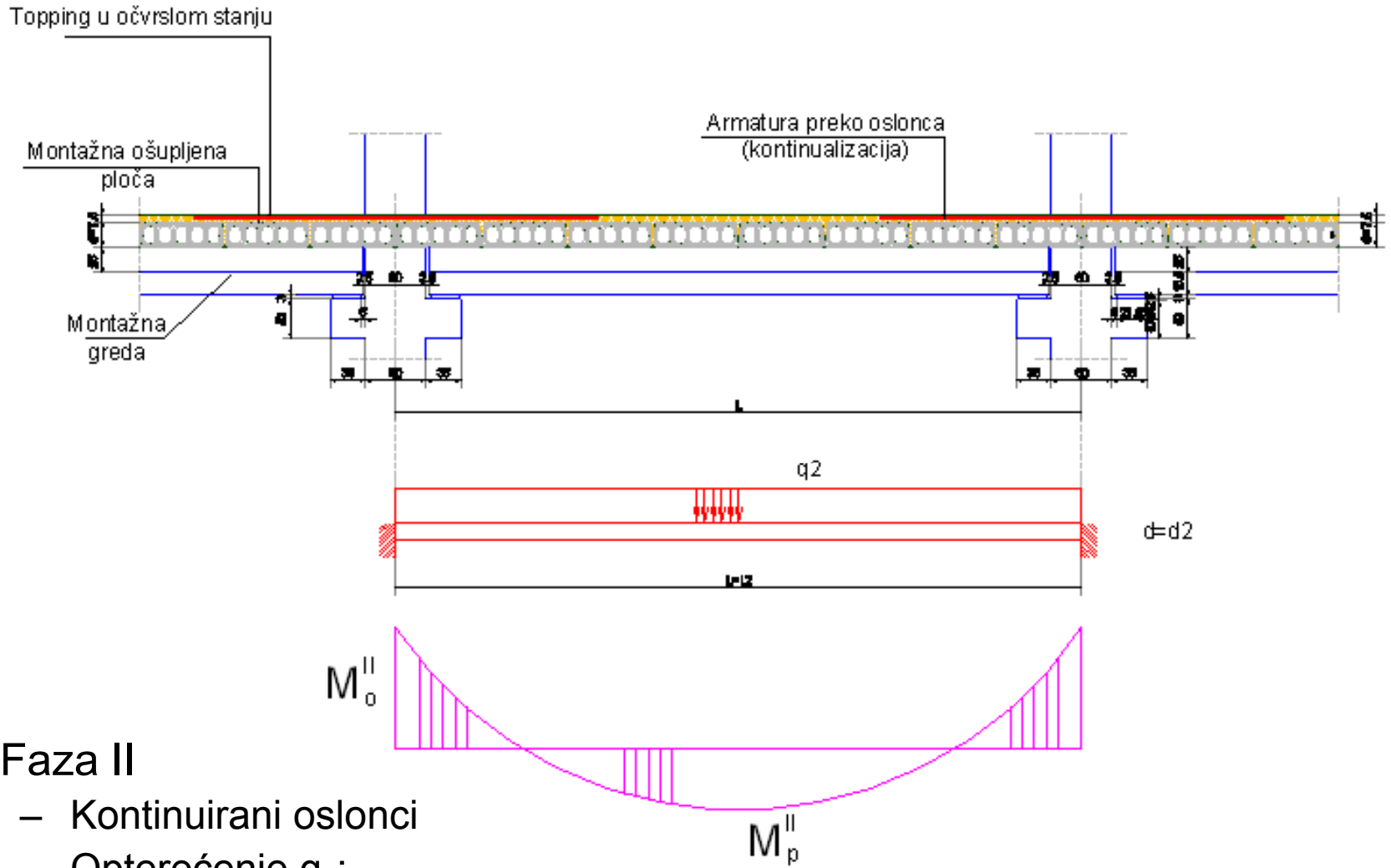
Faze gradnje i odgovarajući proračun



Bez dodatnog podupiranja

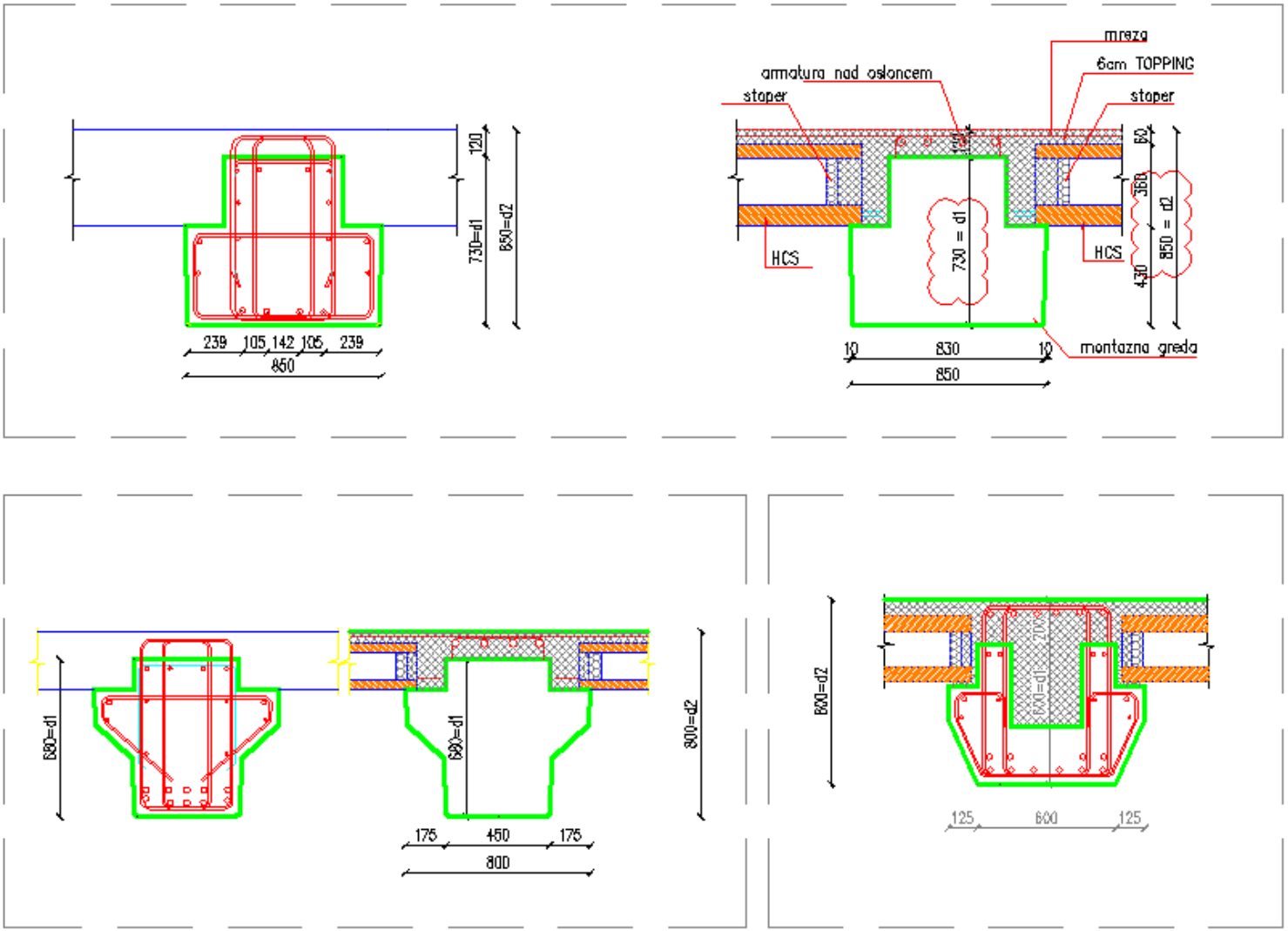


- Faza I
  - Slobodno oslanjanje
  - Opterećenje q_1:
    - Sopstvena težina
    - Težina HC elemenata
    - Težina toppinga

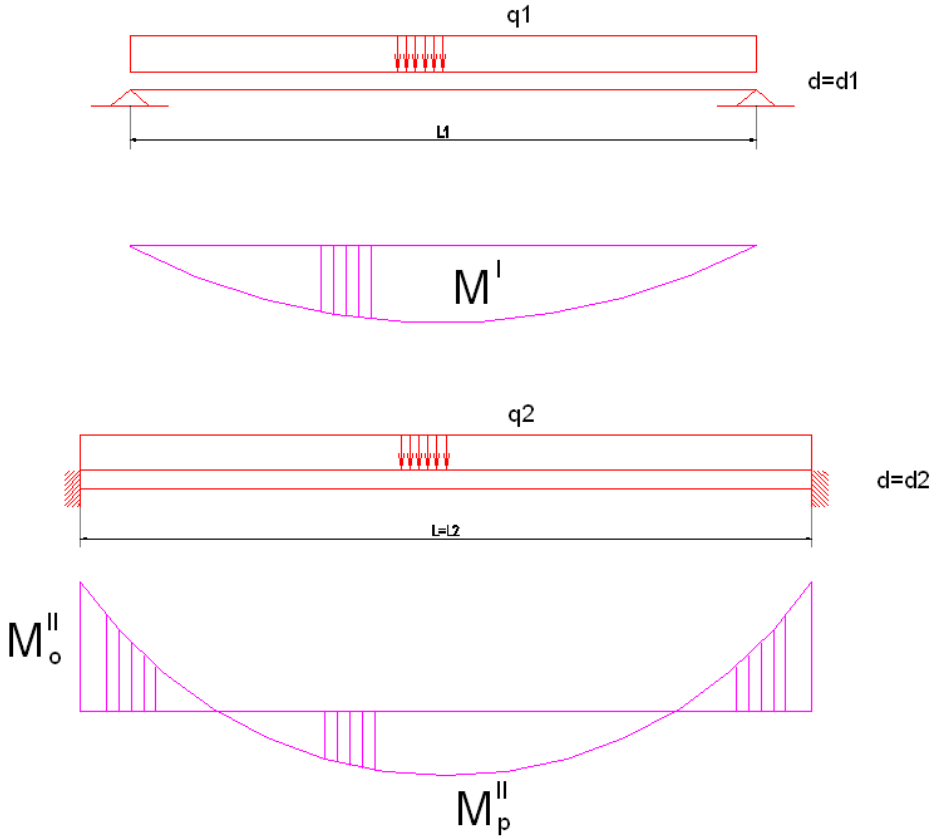


- Faza II
  - Kontinuirani oslonci
  - Opterećenje q_2:
    - Težina poda, instalacija, pregrada (dodatno stalno)
    - Povremeno opterećenje

Poprečni preseci po fazama



Proračun armature



Faza I:

$A_{a,p}{}^{I}=f(M^{I},d_1)$

Faza II:

$A_{a,p}{}^{II}=f(M_p{}^{II},d_2)$

$A_{a,o}{}^{II}=f(M_o{}^{II},d_2)$

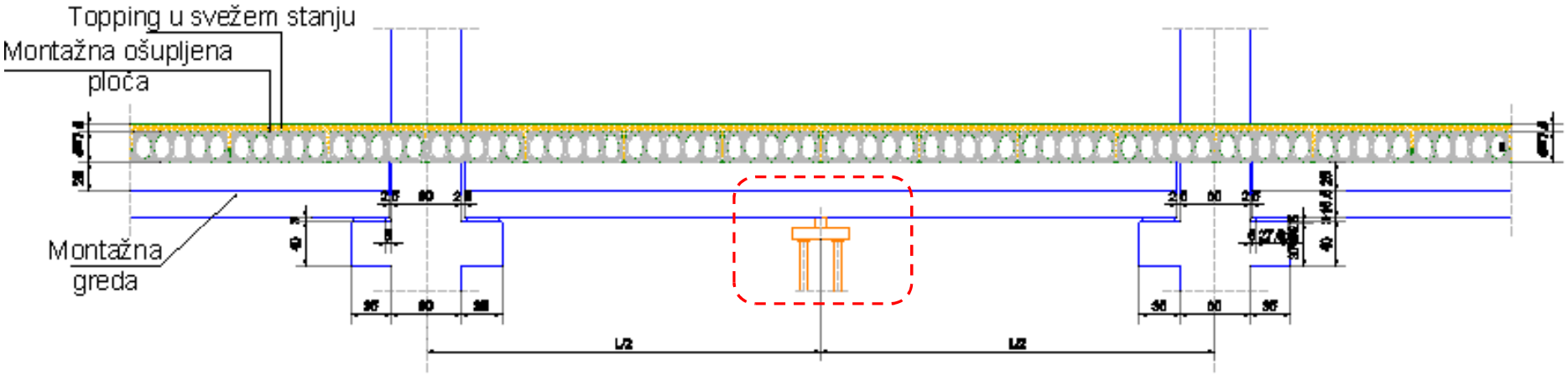
Konačno:

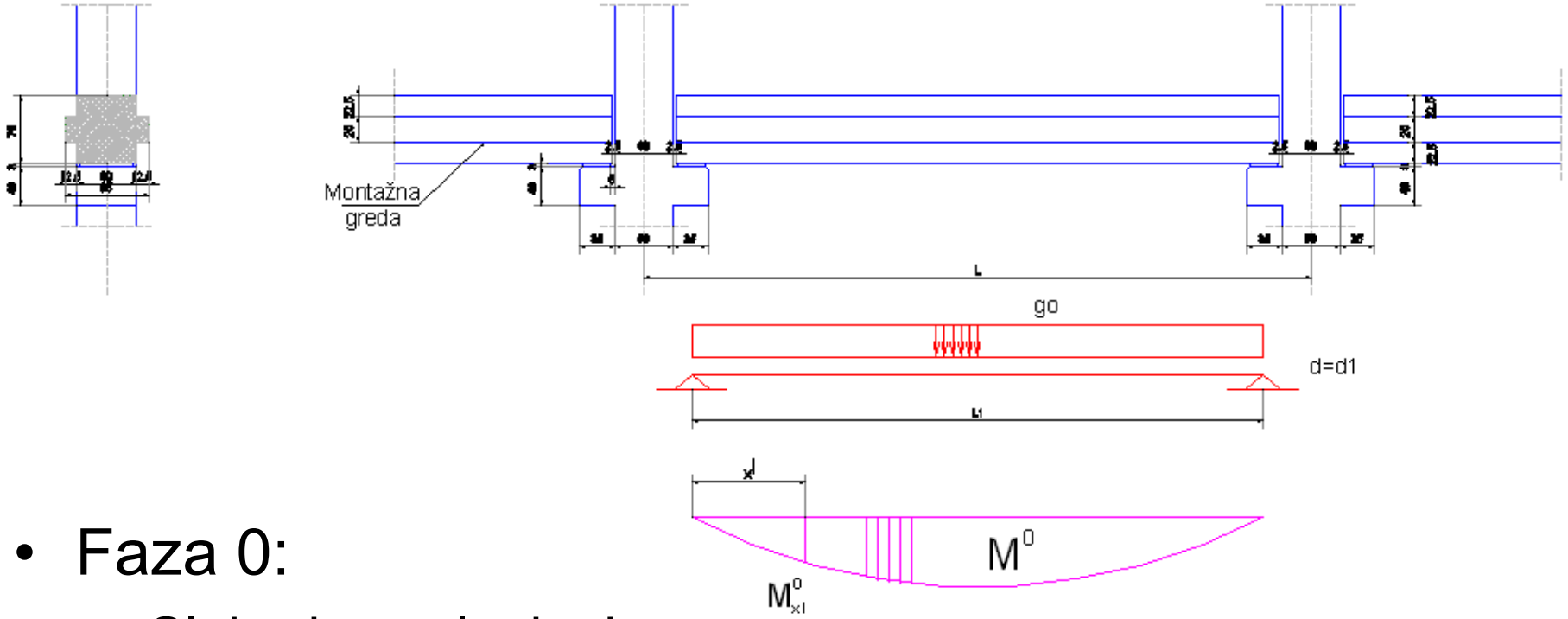
$A_{a,p} = A_{a,p}{}^{I} + A_{a,p}{}^{II}$

$A_{a,o} = A_{a,o}{}^{II}$

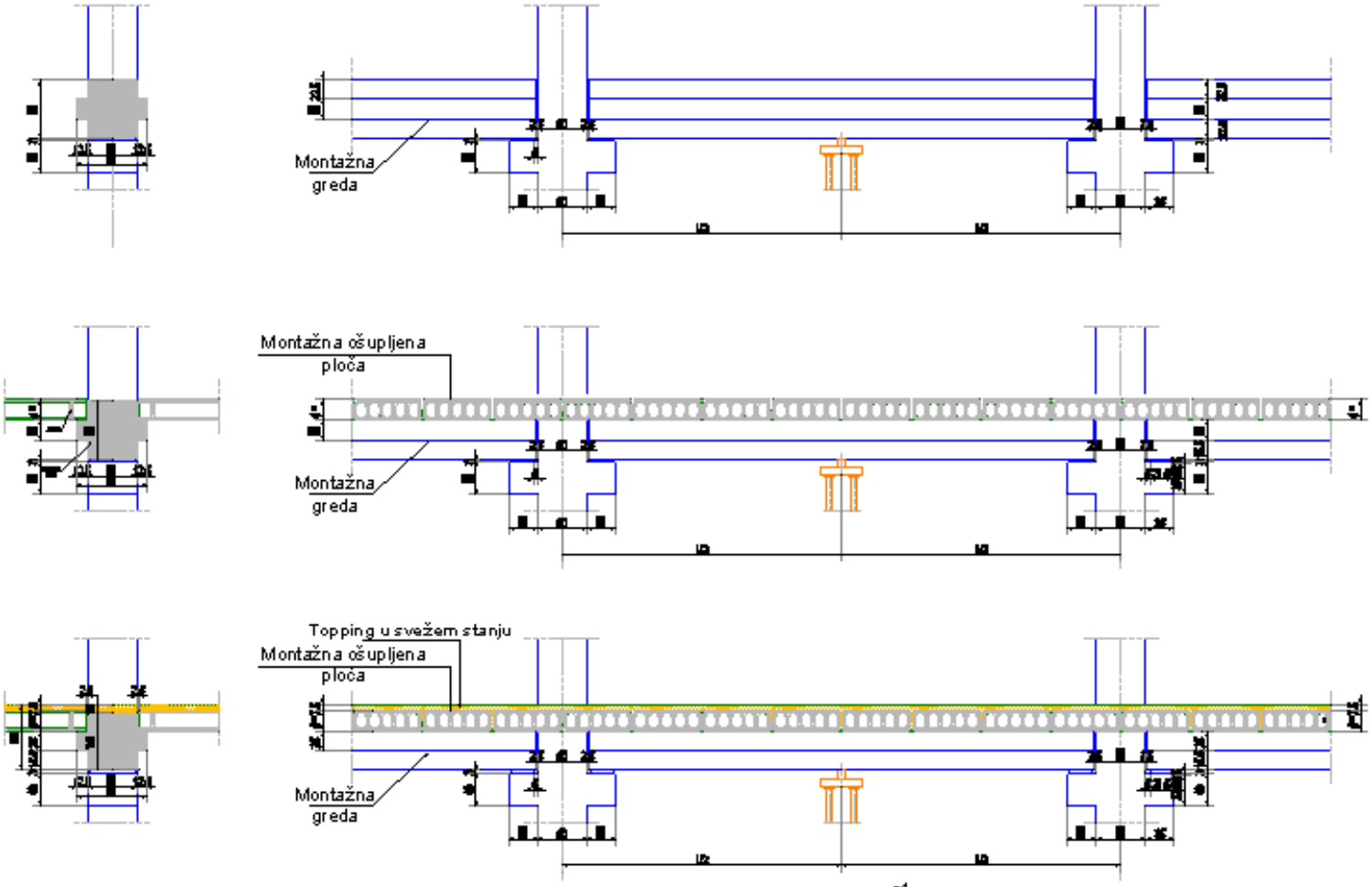
Potrebno je proračunati stanja napona i prslina za pojedine faze i za konačno stanje

Sa podupiranjem

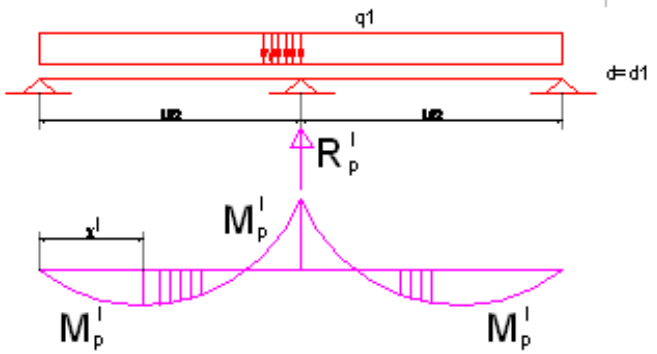


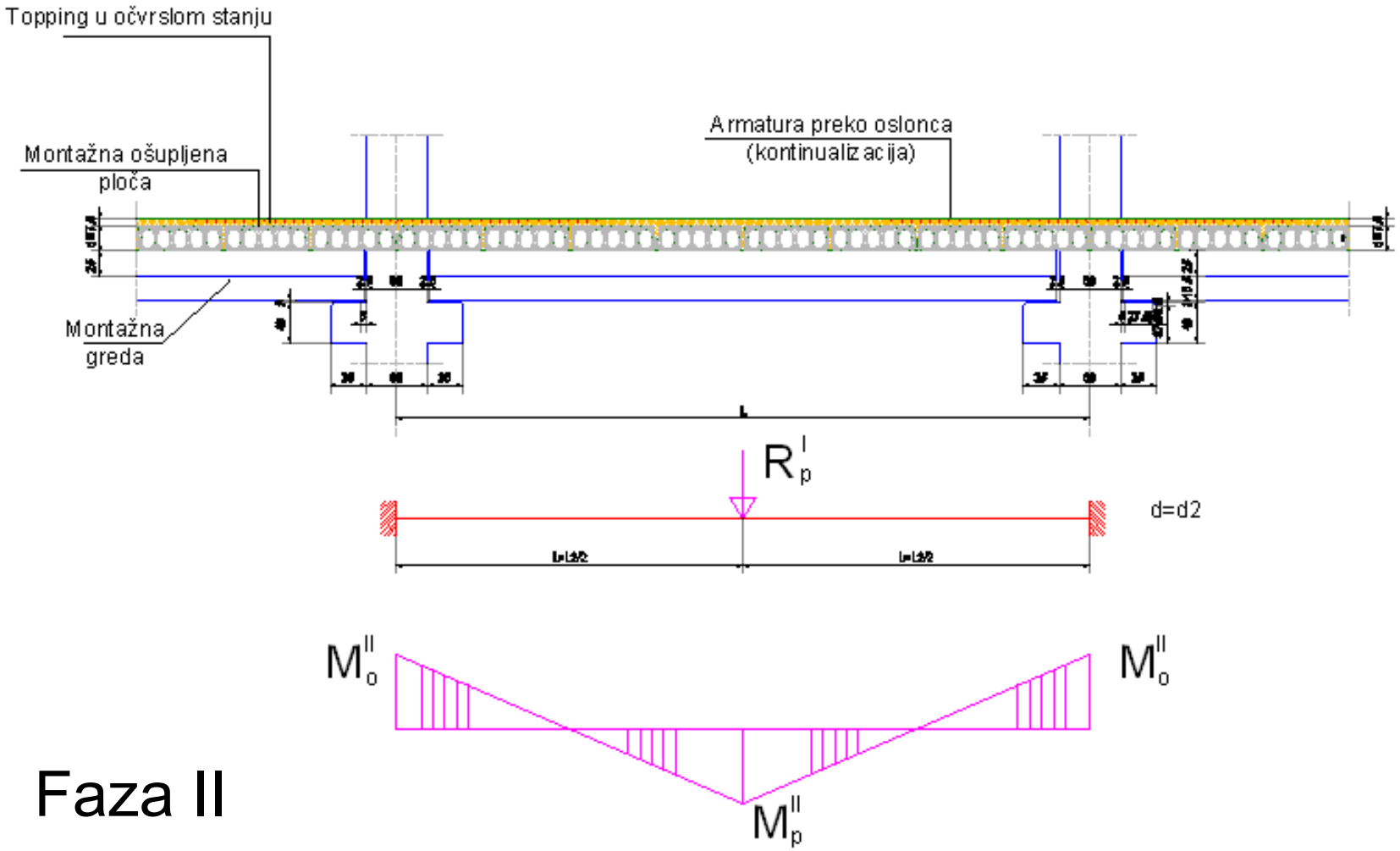


- Faza 0:
  - Slobodno oslanjanje
  - Opterećenje q_o:
    - Sopstvena težina

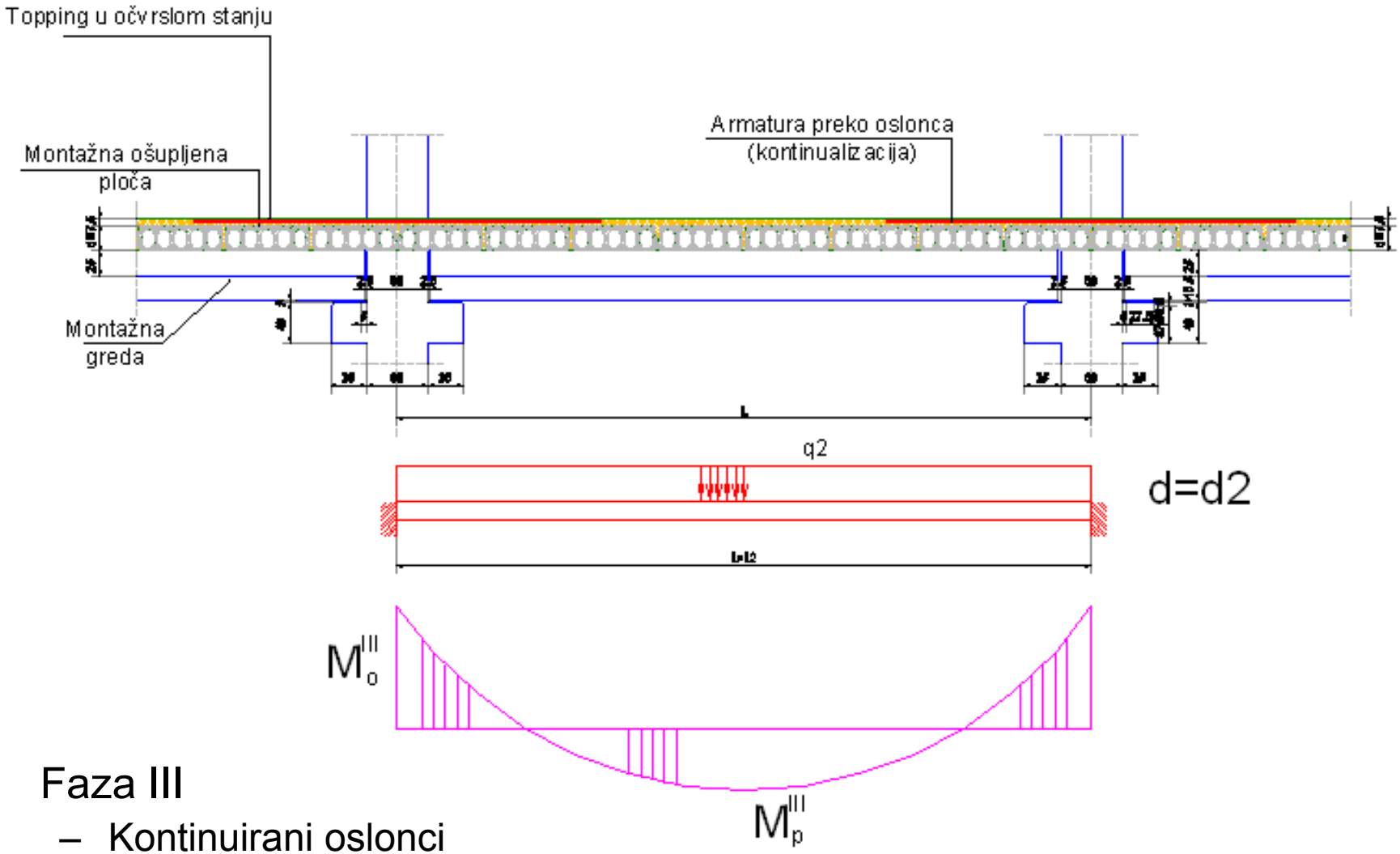


- Faza I
  - Slobodno oslanjanje
  - Opterećenje q_1:
    - Težina HC elemenata
    - Težina topinga



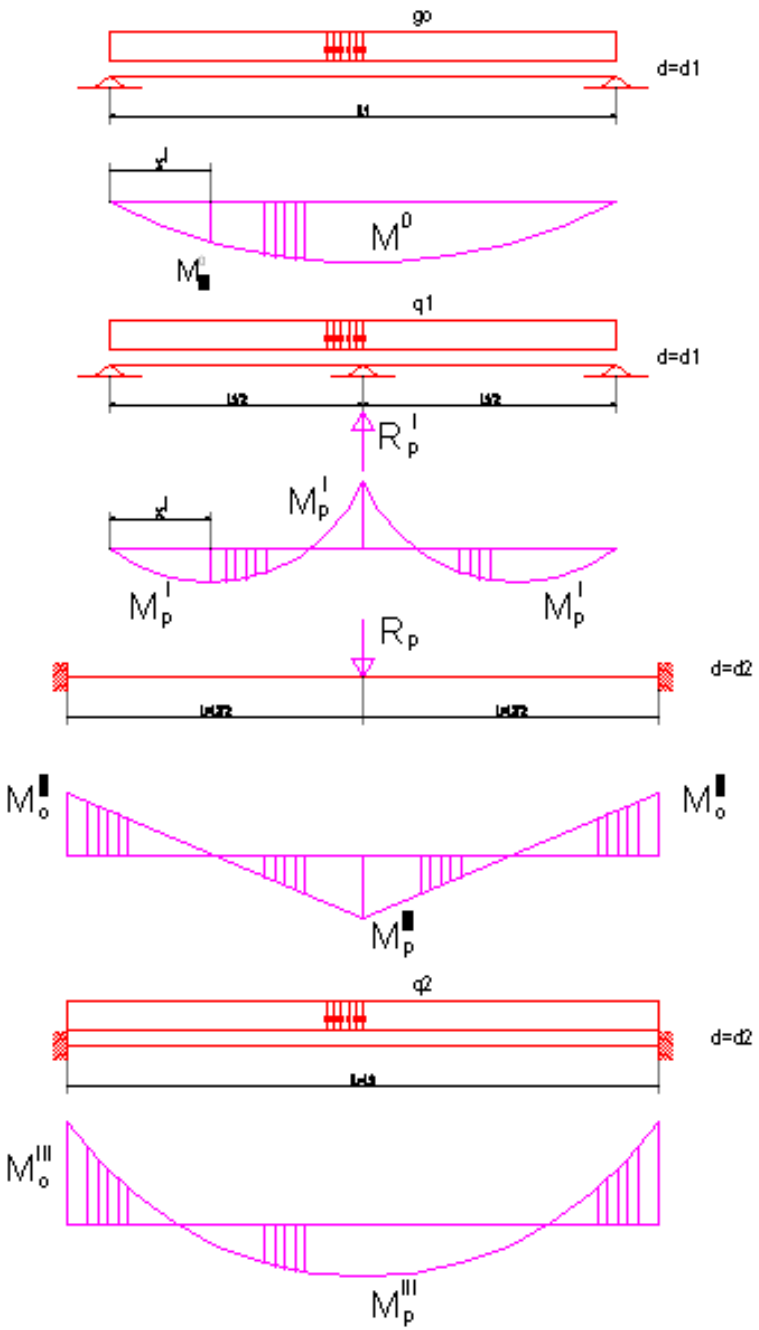


- Faza II
  - Kontinuirani oslonci
  - Uklanjanje podupirača



- Faza III
  - Kontinuirani oslonci
  - Opterećenje q_2:
    - Težina poda, instalacija, pregrada (dodatno stalno)
    - Povremeno opterećenje

Proračun armature



Faza 0:

$A_{a,p}{}^{0}=f(M^{0},d_1)$

$A_{a,xl}{}^{0}=f(M_{xl}{}^{0},d_1)$

Faza I:

$A_{a,p}{}^{I}=f(M_p{}^{I},d_1)$

$A_{a,o}{}^{I}=f(M_o{}^{I},d_1)$

Međufaza:

$A_{a,p,1} = \max(A_{a,p}{}^{0},(A_{a,xl}{}^{0}+A_{a,p}{}^{I}))$

Faza II:

$A_{a,p}{}^{II}=f(M_p{}^{II},d_2)$

$A_{a,o}{}^{II}=f(M_o{}^{II},d_2)$

Faza III:

$A_{a,p}{}^{III}=f(M_p{}^{III},d_2)$

$A_{a,o}{}^{III}=f(M_o{}^{III},d_2)$

Konačno:

$A_{a,p} = A_{a,p}{}^{0} + A_{a,p}{}^{II} + A_{a,p}{}^{III} > A_{a,p,1}$

$A_{a,o} = A_{a,o}{}^{II} + A_{a,o}{}^{III}$