



HRVATSKA KOMORA INŽENJERA GRAĐEVINARSTVA

15. Dani Hrvatske komore inženjera građevinarstva

Opatija, 2021.

HES KOSINJ

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Tehnička opravdanost projekta

Postojeće stanje

akumulacija Kruščica
 $V=135 \text{ mil. m}^3$

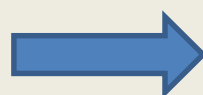


volumen preljeva
 $V=120 \text{ mil. m}^3 (16 \%)$

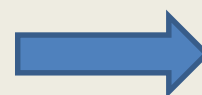
rijeka Lika i Bakovac
 $Q_{sr}=26 \text{ m}^3/\text{s}$



rijeka Gacka
 $Q_{sr}=14 \text{ m}^3/\text{s}$



Gusić polje
 $V=1,35 \text{ mil. m}^3$



HE Senj
 $Q=60 \text{ m}^3/\text{s}$

PROIZVODNJA
1.061 GWh



Tehnička opravdanost projekta

Planirano stanje

akumulacija Kruščica
 $V=135 \text{ mil. m}^3$
akumulacija Kosinj
 $V=340 \text{ mil. m}^3$



volumen preljeva
 $V=34 \text{ mil. m}^3$

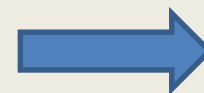
rijeka Lika i Bakovac
 $Q_{sr}=26 \text{ m}^3/\text{s}$



rijeka Gacka
 $Q_{sr}=14 \text{ m}^3/\text{s}$

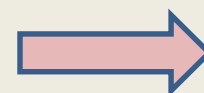


Gusić polje
 $V=1,35 \text{ mil. m}^3$



HE Senj
 $Q=60 \text{ m}^3/\text{s}$

Gusić polje 2
 $V=1,35 \text{ mil. m}^3$



HE Senj 2
 $Q=50 \text{ m}^3/\text{s}$

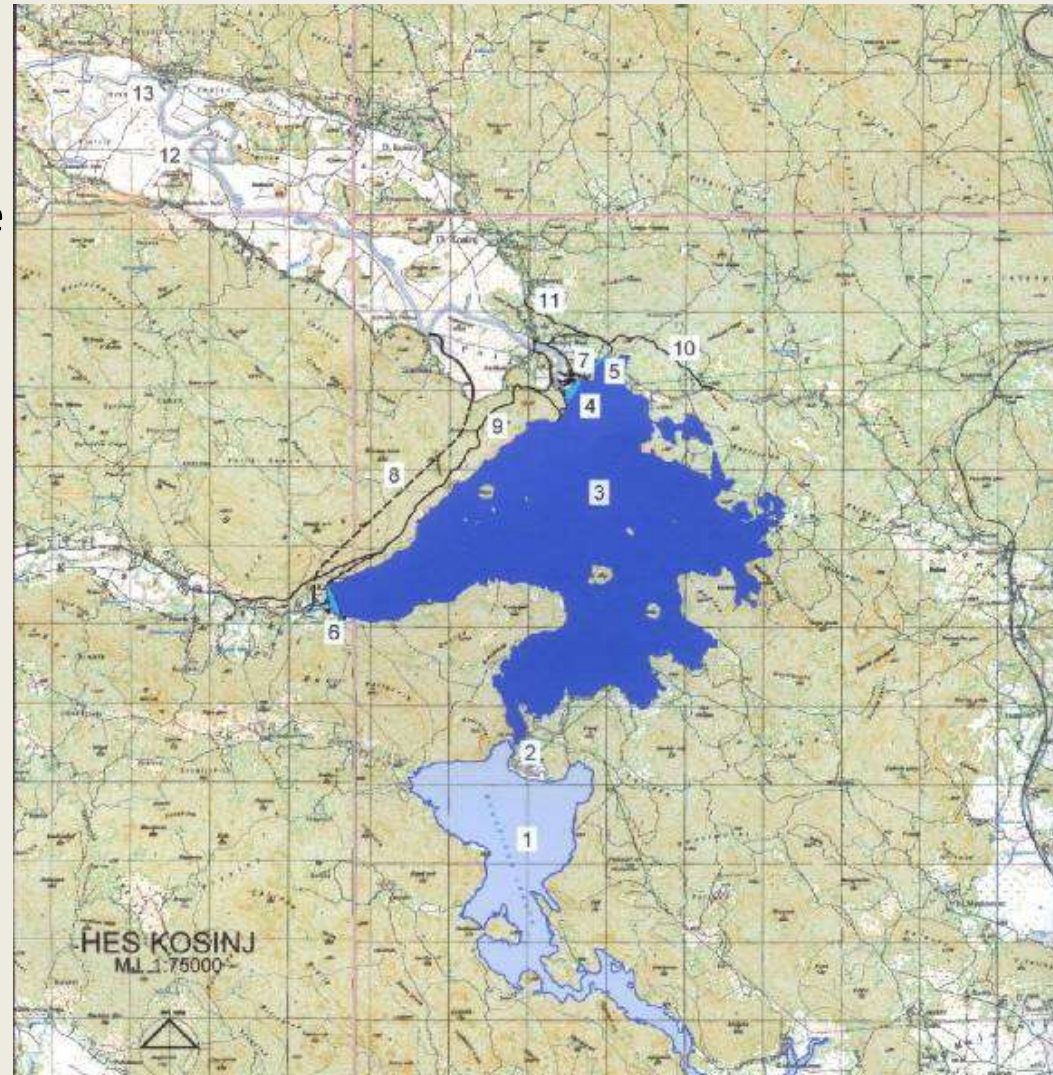
PROIZVODNJA

1.293 GWh (1.308 GWh)
+231 GWh (+246 GWh)



Osnovni podaci o HES Kosinj

- lokacija - općina Perušić
- akumulacijsko jezero zapremine 340 mil. m³ formirano s 3 brane (Kosinj, Sedlo, Bakovac)
- HE Kosinj
1x22MW + 1x13MW
- rekonstrukcija HE Sklope
25 MW
- tunel i kanal Bakovac - Lika
- zamjenske ceste:
Studenci - Sklope
Kosinj most - Bakovac

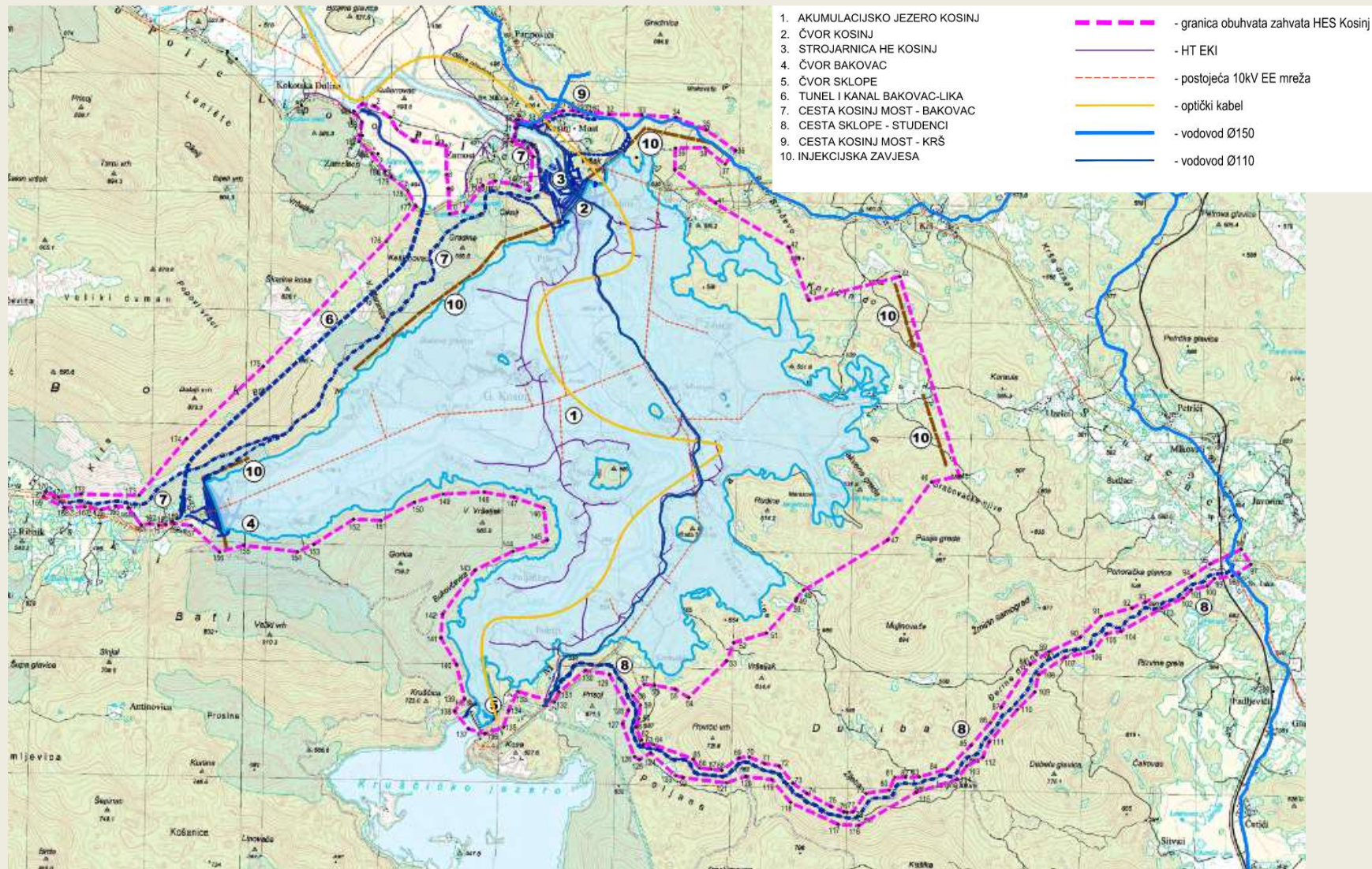


Građevine

- Čvor Kosinj
 - Brana Kosinj
 - Brana Sedlo
 - Temeljni ispust
 - Preljev
 - Turbinski dovod
 - Pristupne ceste
- Čvor Bakovac
 - Brana Bakovac
 - Temeljni ispust
 - Pristupne ceste
- Strojarnica HE Kosinj
- Rasklopno postrojenje HE Kosinj 110 kV
- Rekonstrukcije HE Sklope sa pripadnim građevinama
 - Strojarnica HE Sklope
 - Novi preljev na brani Sklope
 - Pristupne ceste
- Rasklopno postrojenje HE Sklope GIS 110 kV
- Uređenje prostora akumulacije Kosinj
- Izgradnja zamjenskih građevina
 - Cesta Studenci - HE Sklope
 - Cesta Kosinj most - Bakovac
 - Tunel i kanal Bakovac - Lika (novo korito potoka Bakovac)



Obuhvat zahvata



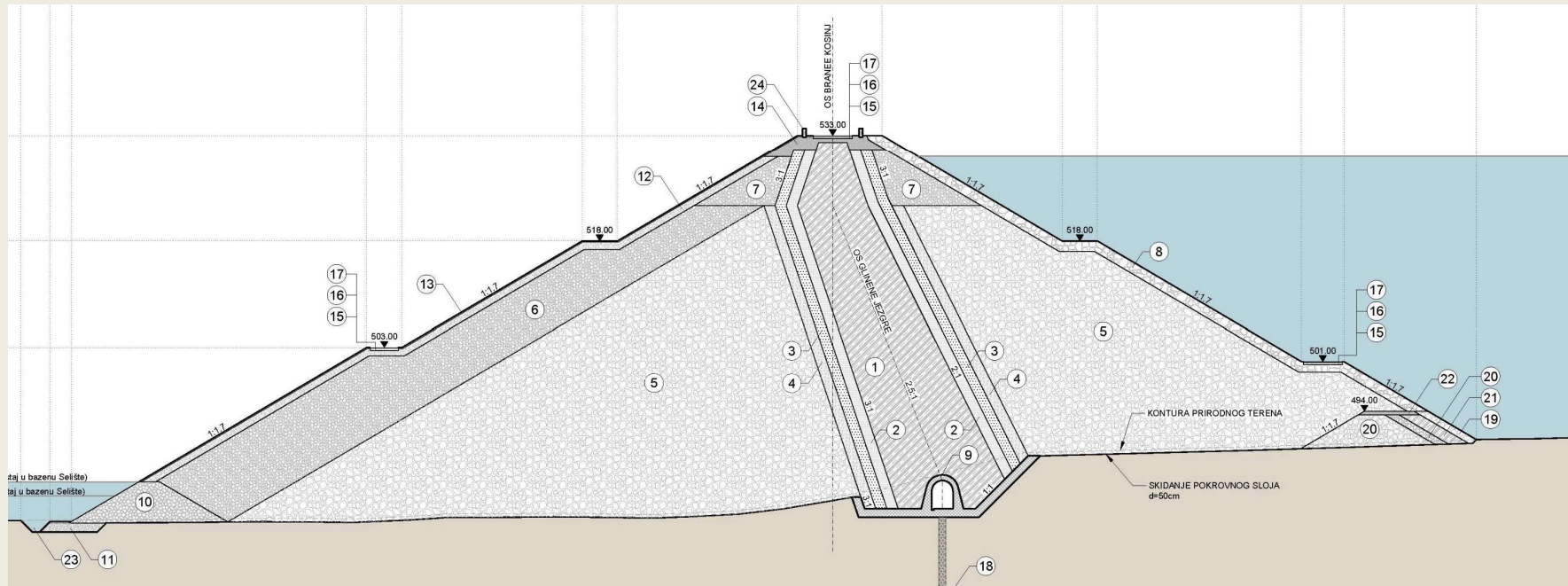
Čvor Kosinj

- Brana Kosinj
- Brana Sedlo
- Temeljni ispušt
- Preljev
- Pristupne ceste
- Turbinski dovod
- Slapište



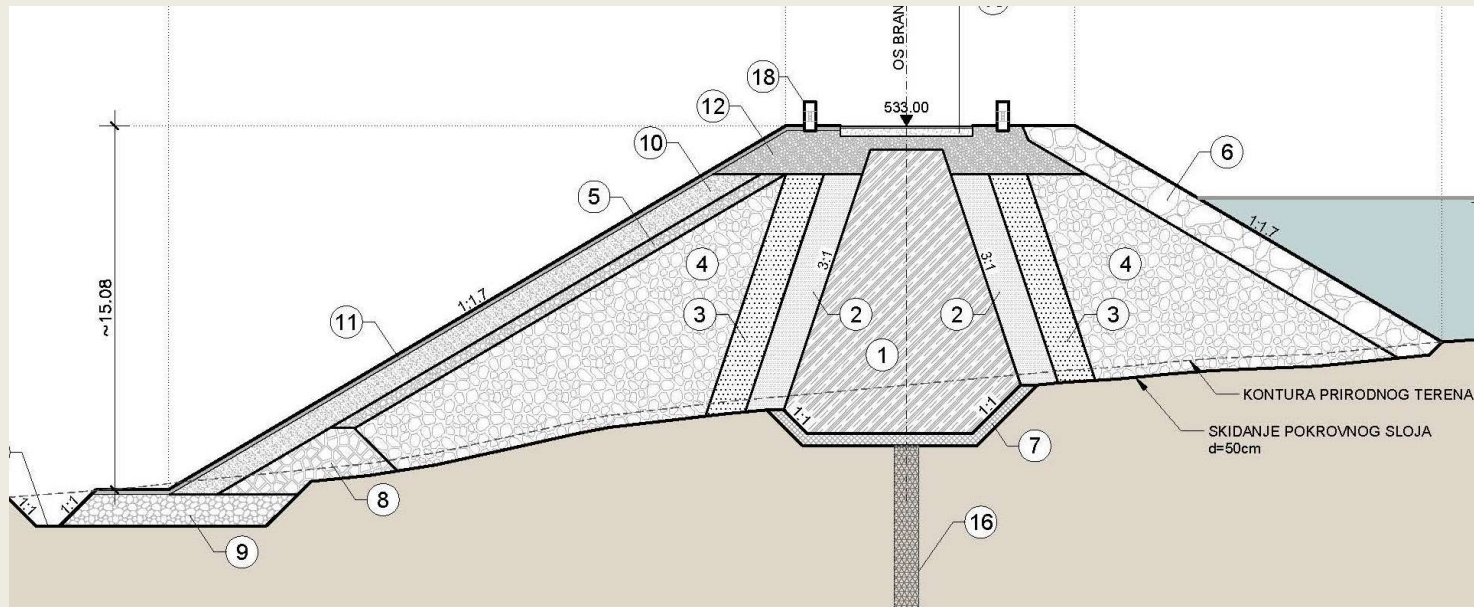
Čvor Kosinj

Brana Kosinj



- zonirana brana s potpornim zonama od lomljenog kamena i kosom glinenom jezgrom
- kota krune 533 m n.m.
- visina brane 58,50 m
- duljina brane 383 m
- širina krune brane 12 m

Čvor Kosinj Brana Sedlo



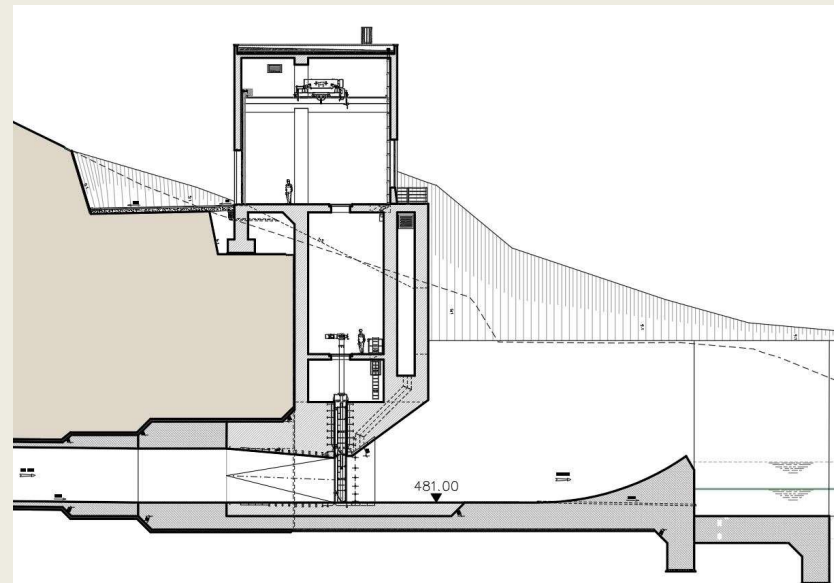
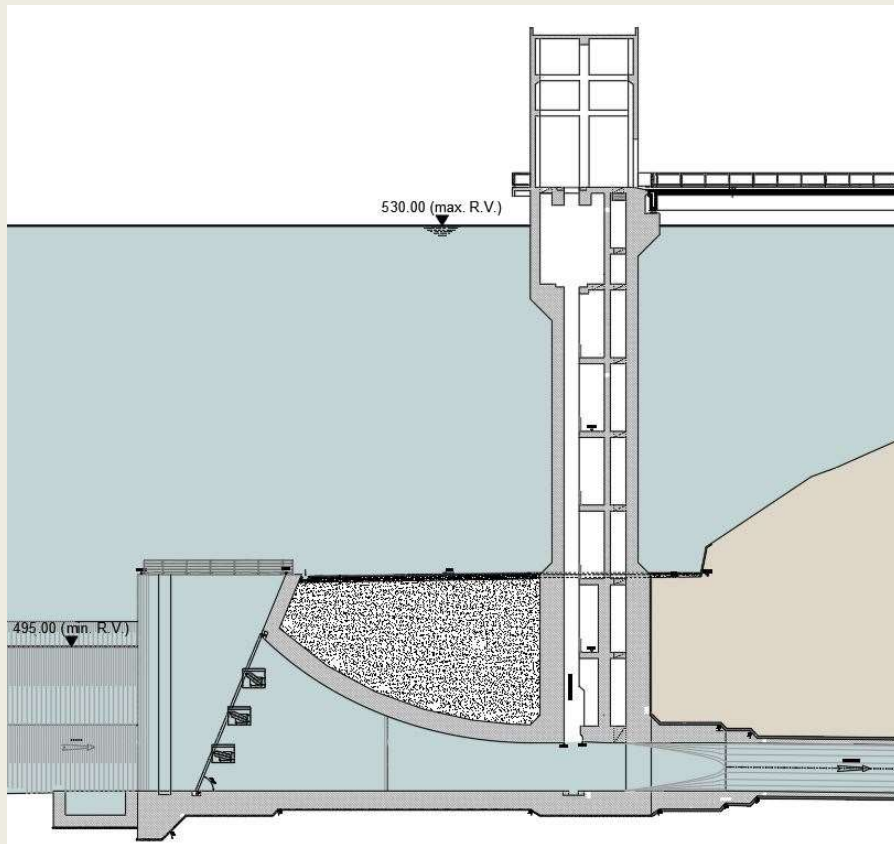
- zonirana brana s potpornim zonama od lomljenog kamena i vertikalnom glinenom jezgrom
- kota krune 533 m n.m.
- visina brane 13 m
- duljina brane 319 m
- širina krune brane 12 m



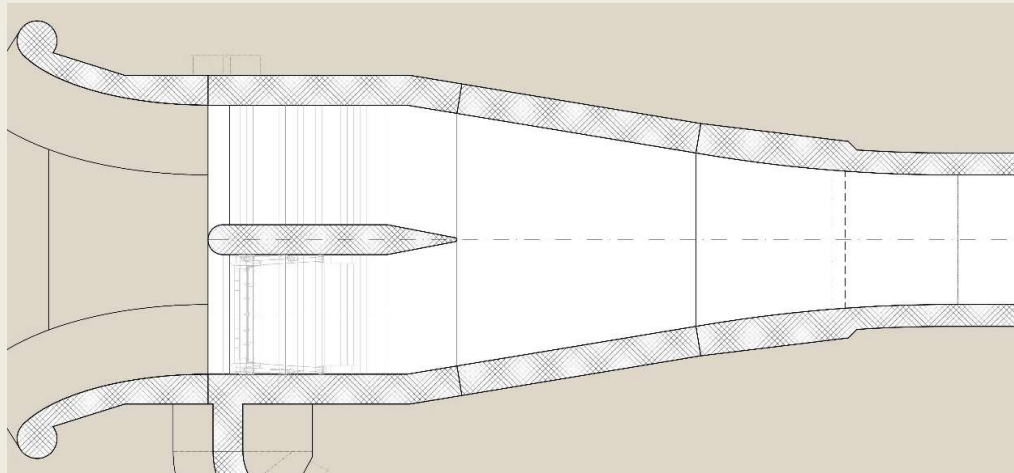
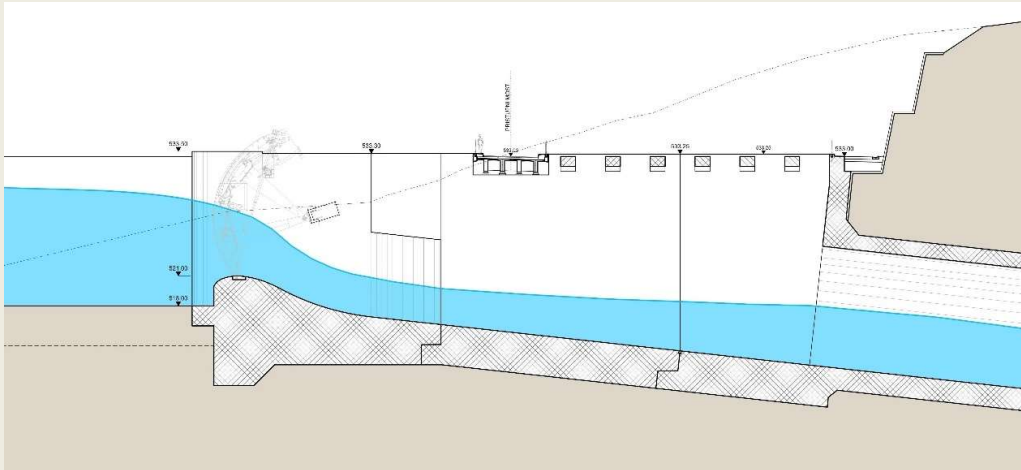
Čvor Kosinj

Temeljni ispust

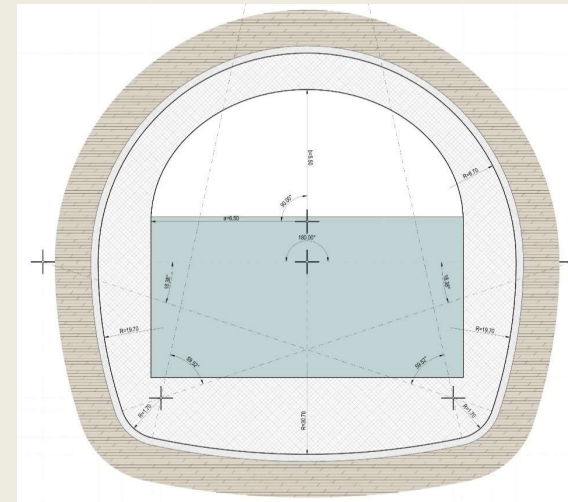
- duljina temeljnog ispusta 275,5 m
- duljina tunela 180 m
- promjer tunela 4,0 m
- prag ulazne građevine 483 m n.m.
- $Q_{\max} \approx 200 \text{ m}^3/\text{s}$
- $v_{\max} \approx 16 \text{ m/s}$



Čvor Kosinj Preljev



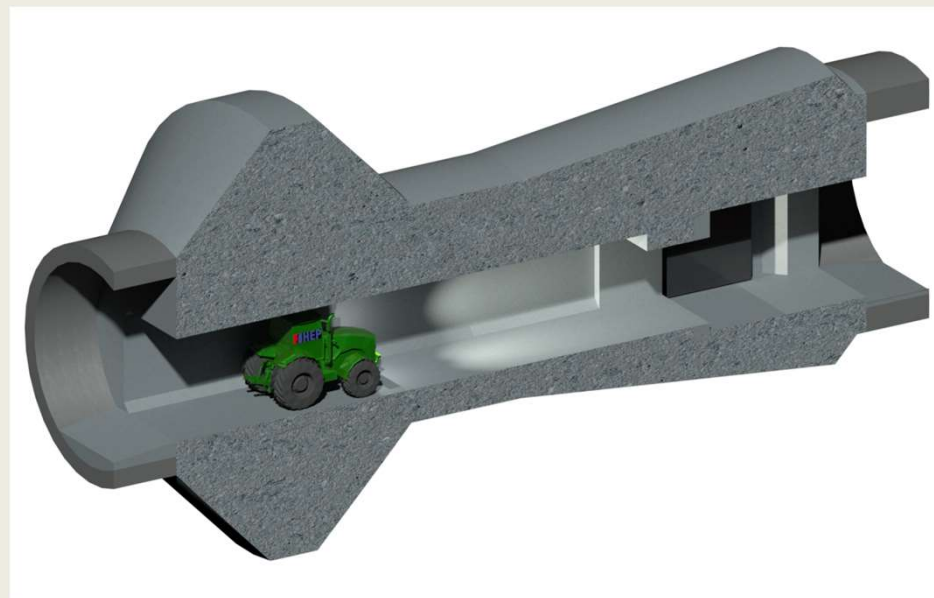
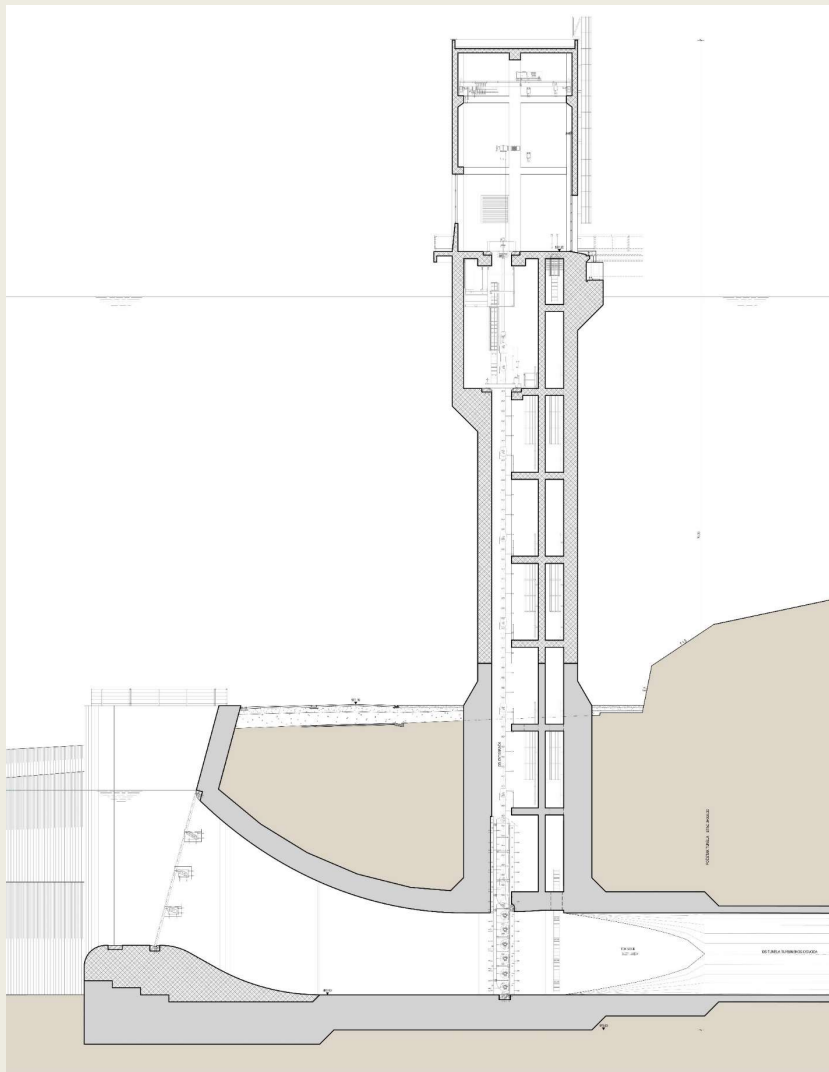
- segmentne zapornice 12 m x 9 m
- duljina preljeva 311 m
- duljina tunela 134 m
- svjetla širina tunela 13 m
- kota preljevnog praga 521 m n.m.
- kota odskoka 492 m n.m.
- maksimalni protok 1261 m³/s



Čvor Kosinj

Turbinski dovod

- duljina turbinskog dovoda 274 m
- tunel duljine 230 m
- promjer tunela 5,8 m
- kota praga ulazne građevine 484 m n.m.

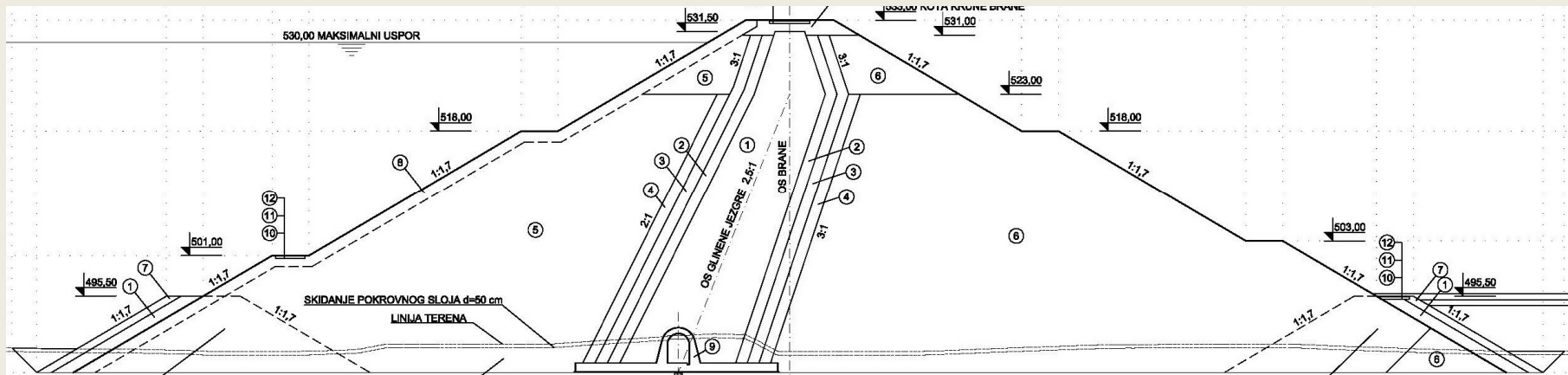


Čvor Bakovac

- Brana Bakovac
- Pristupne ceste
- Temeljni ispust
- TS 10(20)/0,4 kV



Čvor Bakovac Brana Bakovac



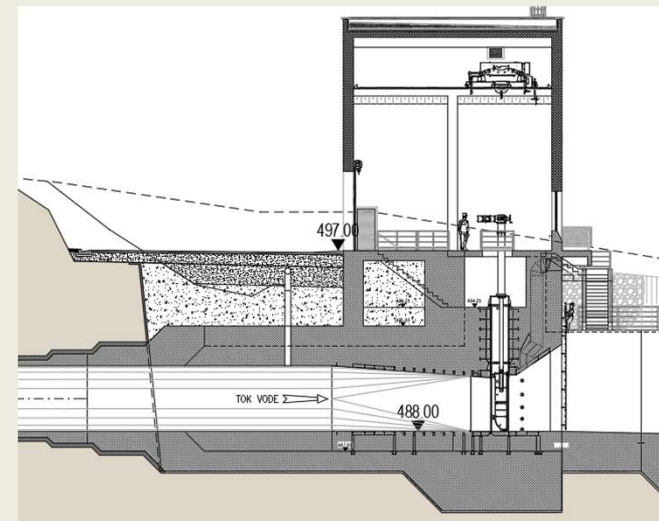
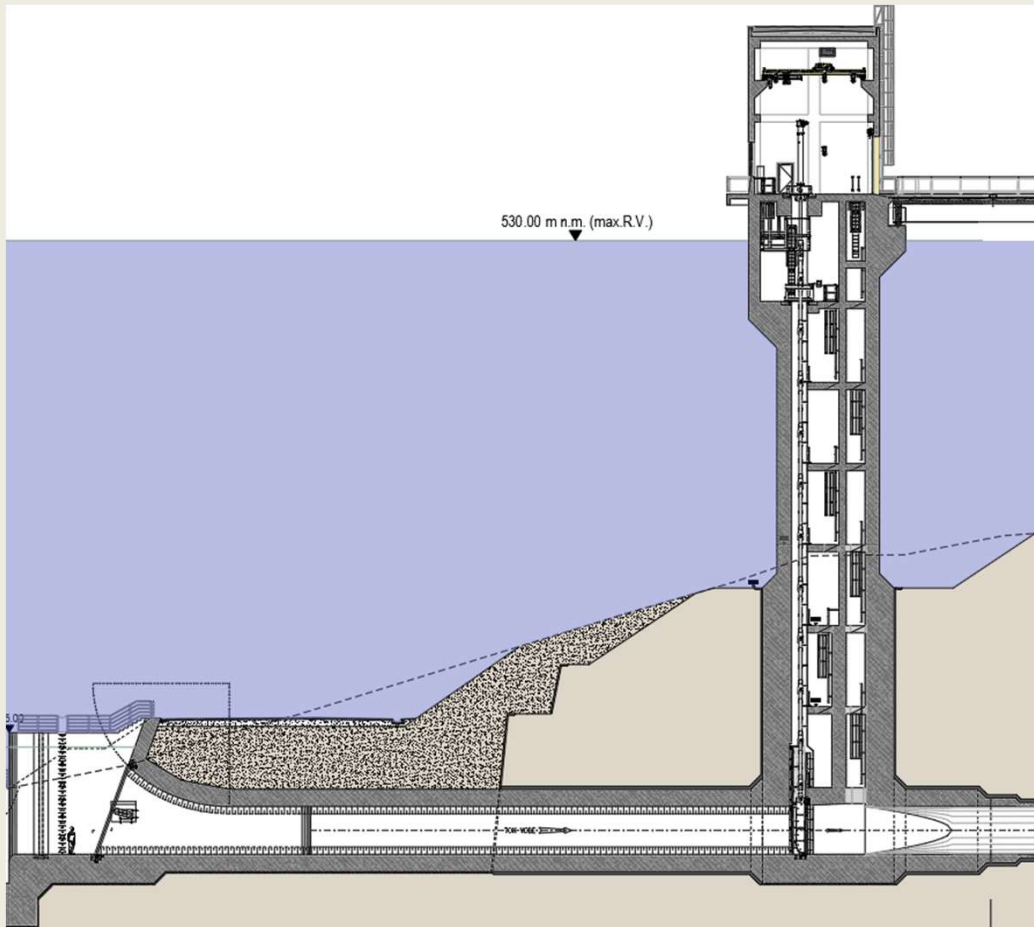
- zonirana brana s potpornim zonama od lomljenog kamena i kosom glinenom jezgrom
- kota krune 533 m n.m.
- visina brane 47,9 m
- duljina brane 383 m
- širina krune brane 12 m



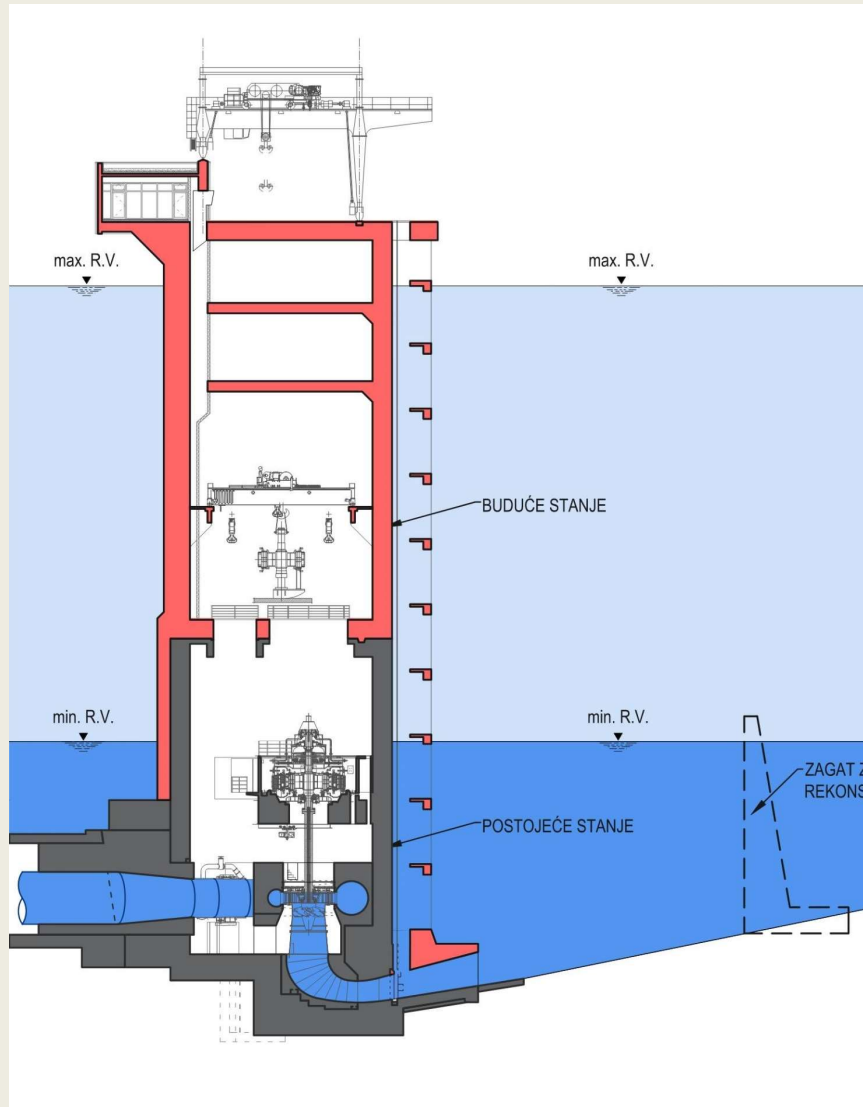
Čvor Bakovac

Temeljni ispust

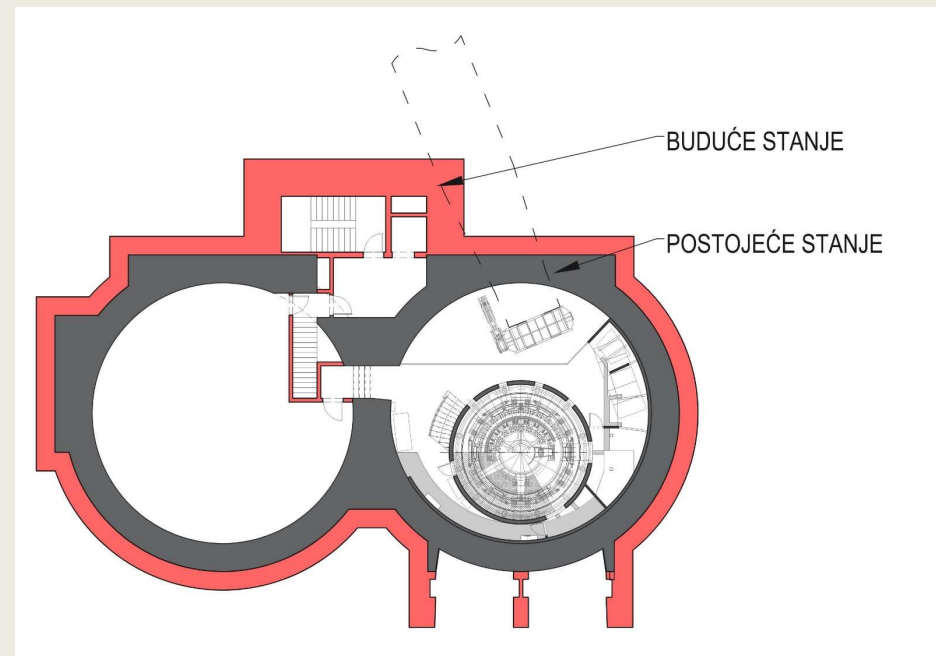
- duljina temeljnog ispusta 378 m
- tunel duljine 286 m
- promjer tunela 3,3 m
- kota praga ulazne građevine 487,6 m n.m.
- $Q_{\max} = 114 \text{ m}^3/\text{s}$
- $Q_{\text{dop}} = 70 \text{ m}^3/\text{s}$
- $v_{\max} = 13 \text{ m/s}$



Čvor Sklope



- rekonstrukcija strojarnice
 $Q_i=50 \text{ m}^3/\text{s}$, $H= 25\text{-}60 \text{ m}$
- rekonstrukcija temeljnog ispusta
- novi preljev $Q=400 \text{ m}^3/\text{s}$



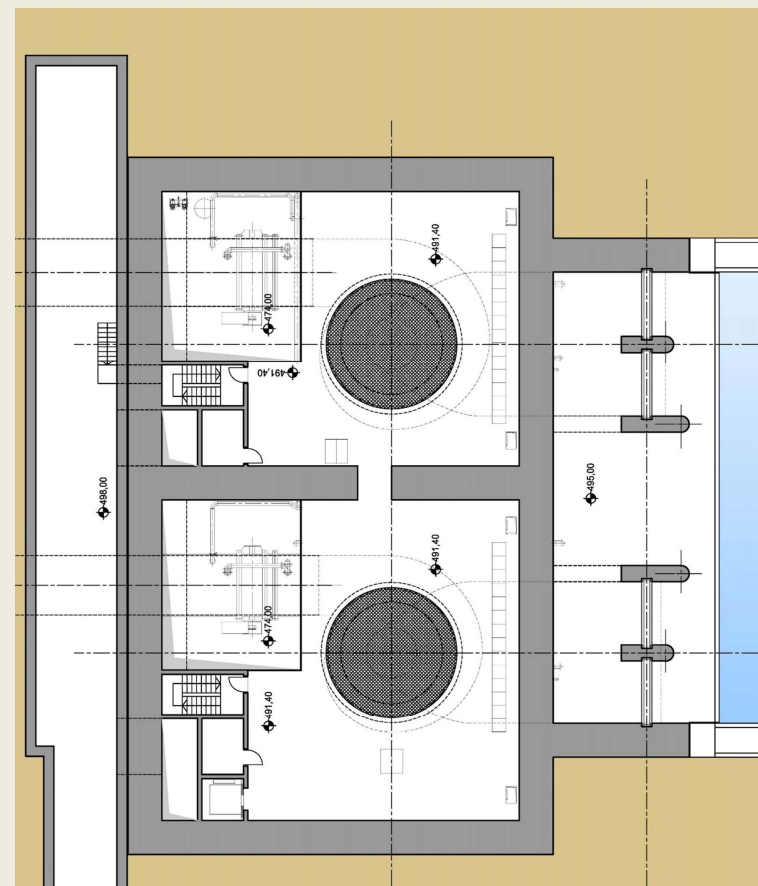
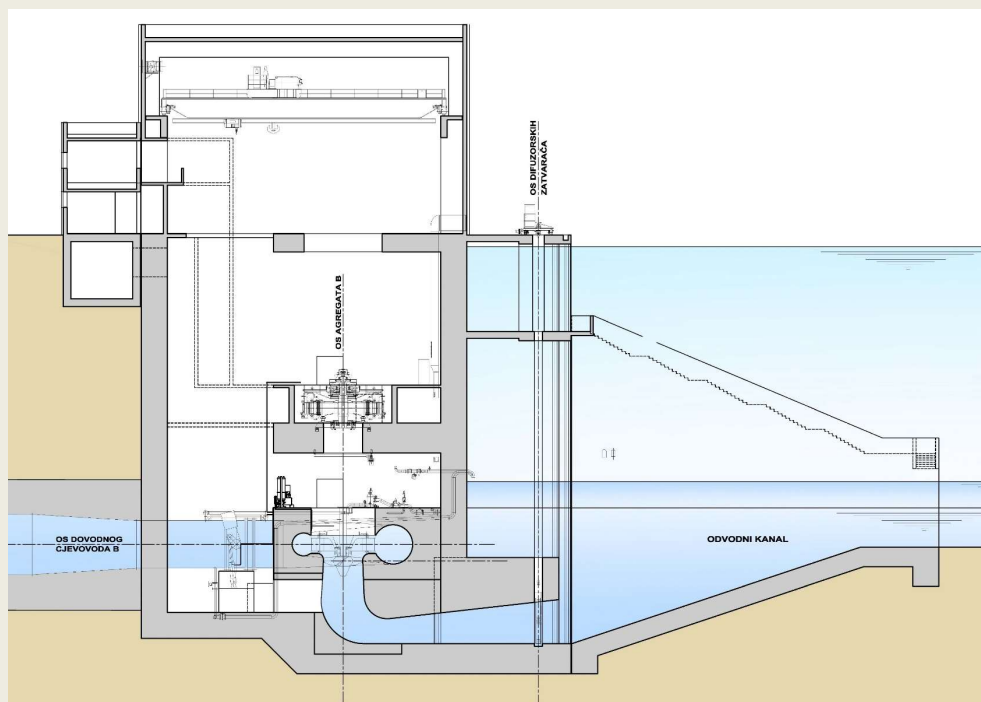
Strojarnica HE Kosinj

- Strojarnica i pristupni plato
- Rasklopno postrojenje 110 kV
- TS 10(20)/0,4 kV
- Pristupna cesta
- Odvodni kanal



Strojarnica HE Kosinj

- 2 proizvodna agregata - kota turbine 478 m n.m.
- A agregat - za vodostaje 515 - 530 m n.m. - $Q=50 \text{ m}^3/\text{s}$ - $H=\sim 48 \text{ m}$
- B agregat - za vodostaje 495 - 515 m n.m. - $Q=50 \text{ m}^3/\text{s}$ - $H=\sim 22 \text{ m}$



HVALA NA PAŽNJI

