BLAN d.o.o.
Storitve v gradbeništvu in rudarstvu
Špeglova ulica 47, 3320 Velenje

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# NASLOVNA STRAN Z OSNOVNIMI PODATKI O NAČRTU

**NAČRT IN ŠTEVILČNA OZNAKA NAČRTA:**

Načrt s področja geotehnologije in rudarstva, GM – 94 / 2026

Načrt podpornih konstrukcij

**NAROČNIK:**

Občina Mislinja, Šolska cesta 34, 2382 Mislinja

**NAZIV TER VRSTA GRADNJE:**

Sanacija LC 261071 Šentlenart-Zilc, III.faza

**VRSTA PROJEKTNE DOKUMENTACIJE:**

PZI – projektna dokumentacija za izvedbo gradnje

**PODATKI O IZDELOVALCU ELABORATA ( PI ):**

Dr. Andrej BLAŽIČ,univ.dipl.inž.rud in geotehnol. RG-0119

**PODATKI O PROJEKTANTU:**

BLAN d.o.o., Špeglova ulica 47, 3320 Velenje

**VODJA PROJEKTA:**

Dr. Andrej BLAŽIČ,univ.dipl.inž.rud in geotehnol. RG-0119

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IZS RG0119

**KRAJ IN DATUM IZDELAVE ELABORATA:**

Velenje, junij 2026

**PRILOGA 1C**

# NASLOVNA STRAN NAČRTA

| | | |
|---|---|---|
| | | **7 Načrt s področja geotehnologije in rudarstva**<br>**NAČRT PODPORNIH KONSTRUKCIJ** |
| **PODATKI O GRADNJI** | | |
| naziv gradnje | | **Sanacija LC 261071 Šentlenart-Zilc, III.faza** |
| kratek opis gradnje | | **Izvedena bo II.faza sanacije lokalne ceste LC Šentlenart-Zilc.**<br><br>**Predmetni načrt obravnava izvedbo dveh novih podpornih konstrukcij (pilotno steno in kamnito zložbo), ki se izvedeta za ureditev in sanacijo ceste.** |
| VRSTE GRADNJE | ☐ | **NOVOGRADNJA - NOVOZGRAJEN OBJEKT** |
| *označiti vse ustrezne vrste gradnje* | ☐ | **NOVOGRADNJA - PRIZIDAVA** |
| | ☑ | **REKONSTRUKCIJA** |
| | ☐ | **SPREMEMBA NAMEMBNOSTI** |
| | ☐ | **ODSTRANITEV CELOTNEGA OBJEKTA** |
| | ☐ | **LEGALIZACIJA** |
| | ☐ | **MANJŠA REKONSTRUKCIJA** |
| **PODATKI O PROJEKTNI DOKUMENTACIJI** | | |
| vrsta dokumentacije | | **PZI (Projektna dokumentacija za izvedbo gradnje)** |
| številka projekta | | **GM 94/2026** |
| **PODATKI O NAČRTU** | | |
| strokovno področje načrta | | **7 Načrt s področja geotehnologije in rudarstva** |
| naziv načrta | | **NAČRT PODPORNIH KONSTRUKCIJ** |
| številka načrta | | **GM 94/2026** |
| datum izdelave | | **junij 2026** |
| datum spremembe | | **/** |
| **PODATKI O PROJEKTANTU NAČRTA** | | |
| projektant načrta (naziv družbe) | | **BLAN d.o.o.** |
| naslov | | **Špeglova ulica 47, 3320 Velenje** |
| odgovorna oseba projektanta načrta | | **Andrej Blažič** |
| podpis odgovorne osebe projektanta načrta | |  |
| **PODATKI O IZDELOVALCU NAČRTA** | | |
| ime in priimek pooblaščenega arhitekta, pooblaščenega inženirja | | **Dr. Andrej Blažič,univ. dipl. inž. rud in geotehnol.** |
| identifikacijska številka | | **RG-0119** |
| podpis pooblaščenega arhitekta, pooblaščenega inženirja | |  |

**PRILOGA 2C**

# IZJAVA PROJEKTANTA NAČRTA IN POOBLAŠČENEGA STOKOVNJAKA, KI JE IZDELAL NAČRT V PZI IN PID

| **PROJEKTANT NAČRTA** | |
|---|---|
| projektant načrta (naziv družbe) | **BLAN d.o.o.** |
| naslov | **Špeglova ulica 47, 3320 Velenje** |
| odgovorna oseba projektanta načrta | **Andrej Blažič** |

| **IN POOBLAŠČENI STROKOVNJAK, KI JE IZDELAL NAČRT** | |
|---|---|
| pooblaščeni strokovnjak | **Dr. Andrej Blažič,univ. dipl. inž. rud in geotehnol.** |

**IZJAVLJAVA:**

***da načrt***

| | |
|---|---|
| vrsta dokumentacije | **PZI (projektna dokumentacija za izvedbo gradnje)** |
| strokovno področje načrta | **7 Načrt s področja geotehnologije in rudarstva** |
| naziv načrta | **NAČRT PODPORNIH KONSTRUKCIJ** |
| številka načrta | **GM 94/2026** |
| datum izdelave | **junij 2026** |

***upošteva relevantne predpise in druge normativne dokumente ter da so upoštevane ustrezne bistvene in druge zahteve.***

| | |
|---|---|
| pooblaščeni strokovnjak | **Dr. Andrej Blažič,univ. dipl. inž. rud in geotehnol.** |
| identifikacijska številka | **RG-0119** |
| podpis pooblaščenega strokovnjaka |   |
| odgovorna oseba projektanta načrta | **Andrej Blažič** |
| podpis odgovorne osebe projektanta načrta |   |

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# T. TEHNIČNI DEL

# T.1. SPLOŠNO

Predmet tega načrta je izvedba podpornih konstrukcij za sanacijo ceste LC 261071 Šentlenart-Zilc, III.faza. Vzdolž obravnavanega odseka cestišča je potrebno izvesti tri nove podporne konstrukcije in sicer dve pilotni steni in en oporni zid. Osnova za izdelavo tega načrta so pred izdelane podloge (geodetski načrt, geomehansko poročilo, profili nove ceste…) na podlagi katerih so bila določena kritična mesta in dimenzionirani potrebni podporni ukrepi.



**Slika 1: Obravnavana lokacija**

# T.2. VHODNI PODATKI - PODLOGE

Za potrebe obdelave projekta smo uporabili naslednje geodetske podloge:

- Tahimetričen geodetski posnetek.
- Ortofoto posnetek
- Geološko geomehansko poročilo
- Situacija in prerezi novo predvidenega stanja ceste

# T.3. POVZETEK GEOLOŠKO GEOMEHANSKEGA POROČILA

Obravnavano območje leži v tektonski enoti imenovani Vzhodne Alpe. Vzhodne Alpe so zgrajene pretežno iz metamorfnega kompleksa in staropaleozojskih anhimetamorfnih skrilavcev. Preko teh kamnin so bili odloženi posamezni členi permotriasa, srednjega in zgornjega triasa, zgornje krede in miocena. Sedimentirali so se tudi kvartarni sedimenti.
Kobanska serija je sestavljena iz blestnika, granatovega blestnika, ki prehaja navzgor v stavrolitski blestnik. Sledi amfibolov skrilavec, amfibolit in uralitiziran diabaz. V istem nivoju nastopa biotitnokloritni do amfibolov skrilavec.
Na obravnavanem območju se nahajajo aluvialni sedimenti.

V hidrogeološkem smislu je mogoče obravnavati aluvialne sedimente (prod, pesek,..) kot dobro prepustne, gline kot slabo prepustne, medtem, ko laporje, glinavce, tufe in meljevce kot neprepustne kamnine.
Izvedene so bile terenske preiskave iz katerih so bili določeni parametri (vhodni podatki) sestave tal na obravnavanem območju. Lastnosti sestave tal so podane v geološko geomehanskem poročilu in povzete pri pripravi statičnih analiz obravnavanih v tem dokumentu.
V sklopu geološko geomehanske analize je bila izvedena tudi povratna analiza.

Pri izvajanju del je potrebno upoštevati tudi določila glede izvedbe izkopa in zagotovitve stalnega geomehanskega nadzora.

# T.4. IZVEDBA PODPORNIH KONSTRUKCIJ

Izvedena bo sanacija ceste LC Šentlenart-Zilc, II.faza. Vzdolž obravnavanega odseka cestišča je potrebno izvesti tri nove podporne konstrukcije in sicer dve pilotni steni in en oporni zid.

Izvedena bo tudi ureditev in sanacija odvodnjavanja (mulde, drenaže, prepusti,...) ter sanacija cestišča, kar pa je predmet ločene projektne dokumentacije.

### T.4.1. Pripravljalna dela

Pripravljalna dela:

Pred izvedbo del je potrebno:

- odstraniti morebitno grmovje in drevesa,
- urediti gradbišče in območje gradnje,
- izvesti morebitne zakoličbe ali prestavitve obstoječih vodov (elektrika, vodovod, TK…),
- ureditev delovnega platoja,
- zakoličba konstrukcij,…

## T.4.2. Izvedba izkopov, dostopna pot in delovni plato

Podporne konstrukcije se izvajajo ob obstoječi cesti, ki bo morala biti v času izvajanja del popolno zaprta in bo lahko služila kot dostopna pot in delovni plato. Izvedba pilotov bo v večini mogoča s postavitvijo vrtalne garniture na obstoječi cesti. Pri izvedbi dela pilotne stene (med profili A23 in A28) bo potrebno izvesti začasni razširjeni delovni plato. Območje razširjenega delovnega platoja za izvedbo pilotov se na zunanjem delu lokalne ceste nad strmo brežino zavaruje z jeklenimi profili HEA 200 med katere se založi lesene deske debeline 5 cm. Dolžine jeklenih profilov znašajo 6 m, na spodnjem koncu so priostreni in zabiti v podlago v rastrih 1 m. Varovanje z jeklenimi profili HEA se izvaja v kampadah ≈ 10 m, da zmanjšamo potrebno število le-teh. Jekleni profili HEA in deske se po končani kampadi izvlečejo in uporabijo pri naslednji kampadi.

Širina razširitve delovnega platoja (obstoječe ceste) znaša cca. 3 m oziroma kolikor je mogoče, glede na prostorske možnosti. Delovni plato je potrebno do končne višine nasuti s kamnitim drobljencem D32 v slojih debeline cca 30 cm s sprotnim utrjevanjem.

Najprej se izvede delovni plato za izvedbo uvrtanih AB pilotov. Vrhnja kota delovnega platoja se izvede na višini predvidene vrhnje kote vezne grede. Po končani izvedbi pilotov se delovni plato poglobi za izvedbo vezne grede. Vrhnja kota poglobljenega delovnega platoja se izvede na višini spodnje kote vezne grede.

## T.4.3. Uvrtani AB piloti

Po dolžini pilotne stene se na vzdolžnih medsebojnih razdaljah 1.8 m izvedejo vrtine premera 60 cm ter globine 5.5 m. Vrtine se nato zalijejo ≈ 0.3-0.4 m nad zgornjo projektirano koto pilotov, zaradi kasnejšega odbijanja »glave« AB pilota.

Pri izvedbi uvrtanih AB pilotov se uporabi beton C30/37, XD3, XF4, PV-II, D32, S3. Armaturni koš je izveden iz 8 vzdolžnih palic premera Φ25 mm, armaturnih obročev premera Φ16 mm v rastrih 0.75 m, ki povezujejo vzdolžne palice ter spiralne strižne armature premera Φ10 mm v rastrih 0.25 m. Zaščitni sloj armature znaša 8 cm, sidrna dolžina vzdolžnih palic v vezno gredo pa najmanj 60 cm.

Pilote se izvede tako, da se zaporedoma izdela vsak drugi pilot, nato pa se izdela še vmesni. Pri betonaži je pomembno, da je kontraktorska cev vedno potopljena v beton najmanj 1 m, saj na takšen način preprečimo segregacijo betona.

Pred izvedbo vezne grede je potrebno odbiti »glavo« pilota v zgornji višini 0.3-0.4 m, pusti se le 0.1 m »glave« pilota, ki služi kot strižni zob.

Po končani izvedbi pilotov je potrebno izvesti test zveznosti AB pilotov. Test zveznosti se izvede minimalno na 1/4 pilotov.

Število uvrtanih AB pilotov znaša:

- 76 pilotov pri PS1 in
- 58 pilotov pri PS2

Piloti so uvrtani v trdno podlago (najmanj ¼ pilota).

## T.4.4. Vezna greda

Osnova za izgradnjo vezne grede na predvideni lokaciji so predhodno izvedeni uvrtani piloti ter stabilna betonska podlaga – podložni beton C12/15 v debelini 10 cm.

Pri izvedbi vezne grede se uporabi beton C30/37, XD3, XF4, PV-II, D32, S3. Armaturni koš je izveden iz vzdolžne in stremenske armature premera Φ10 in Φ12 mm. Nad vsakim drugim pilotom (na rastru 3.60 m) se predvidi rezervno sidrišče. Rezervno sidrišče se izvede tako, da se v območju sidranja prilagodi armaturo grede in v opažu pustijo PVC cevi premera 110 mm ter vgradi dodatna ojačitev s spiralno armaturo. Zaščitni sloj armature znaša 5 cm, prekrivanje vzdolžnih armaturnih palic pa znaša najmanj 60 cm. Pri izvedbi vezne grede je potrebno zgornje

robove ustrezno pobrati oziroma jih urediti s trikotnimi letvami 2x2 cm. Na razdalji ≈ 20 m vezne grede se izvede dilatacijska rega, pri tem je potrebno paziti, da se ta izvede na območju med pilotoma. Vezno gredo se po potrebi prilagodi terenu, tako, da je vrh grede na koti terena. Zgornje robove vezne grede se pobere oziroma uredi s trikotnimi letvami 2x2 cm.

Na vrh opornega zidu se po končani gradnji postavi jeklena varnostna ograja (JVO).

### T.4.5. Brizgani beton

Glede na stanje terena med profiloma A23 in A27 se za preprečevanje posuvanja materiala med piloti izvede brizgani beton (torkret). Pred izvedbo brizganja je potrebno očistiti ter odstraniti del odvečnega materiala med piloti. Izvede se siranje z uvrtanjem armaturnih palic fi 14 mm v pilot. Sidra se uvrtajo do globine cca 15-20 cm, na vertikalnem razmaku cca 0,5 m. Sidra se lepijo s kemično maso (kot npr. Hilti HIT-HY 200-A).

Pri izvedbi je predvideno vgrajevanje brizganega betona v debelini 15 cm. Kvaliteta betona mora dosegati vsaj C20/25 ali boljše. Za armaturo se uporabijo armaturne mreže Q-196. Prekrivanje armaturnih mrež znaša minimalno 0,20 m oziroma dve polji.

Izvedba naj se izvaja po sledečem vrstnem redu:

- vgradnja sider,
- 7,5 cm kontaktni obrizg,
- vgradnja armaturne mreže Q-196
- 7,5 cm končni obrizg

Izvedba se bo izvajala fazno od spodaj navzgor ali obratno. Faze so razdeljene na vertikalne odseke v dolžini razmaka med piloti. Naslednja faza se lahko prične, ko je izdelan celoten odsek.

### T.4.6. Odvodnjavanje

Za odvodnjavanje prostih talnih vod se na notranjo stran vezne grede vgradi PE drenažna cev ϕ200mm. Na zaledni strani vezne grede se izdela kamniti drenažni zasip D16/32, širine 0.3 – 0.5 m. Za izvedbo drenažnega zasipa se lahko uporabi tudi izpran rečni prod. Drenažna cev je

speljana v zbirne jaške lociranine ob pilotni steni na medsebojni razdalji cca 40 m. Dobavijo in vgradijo se betonski zbirni jaški DN 800/600 z litoželeznim pokrovom, globine 2,0 m. Jašek ima dno spuščeno za 40 cm od kote iztoka, ki služi kot peskolov. Iz zbirnega jaška se voda preko PE kanalizacijskih cevi DN 200 spelje do iztoka, kjer se izdela kamnita iztočna glava.

Kanalizacijske in drenažne cevi se izvede pod naklonom min. 1 %. Za izvedbo naklonov se vgradi naklonski beton C12/15.

## T.4.7. Konstrukcija OP4

Na odseku med profiloma A87 in A92 je predvidena razširitev krivine, ki posega v zaledno brežino. Za podprtje strme zaledne brežine je potrebno izvesti nov oporni zid. Nov oporni zid sledi poteku ceste. Skupna tlorisna dolžina opornega zidu je cca 73 m. Zid višinsko sledi terenu in je visok od cca 2,5 m do cca 4,5 m. Zaradi spreminjajoče višine se izvedeta dve različni velikosti temeljne pete in sicer je na nižjem delu zidu v profilih A88 in A89 temelj širine 1.90 m, na višjem delu v profilih A90 in A91 pa je temelj širine 2.80 m.

Temeljna tla se pripravi z vgradnjo podložnega betona v debelini 20 cm.
Zid višinsko sledi terenu in je visok od cca 2,5 m do cca 4,5 m. Stena opornega zidu je debeline 30 cm. Zaradi spreminjajoče višine se izvedeta dve različni velikosti temeljne pete in sicer je na nižjem delu zidu v profilih A88 in A89 temelj širine 1.90 m, na višjem delu v profilih A90 in A91 pa je temelj širine 2.80 m.
Oporni zid se izvaja po kampadah dolžine cca 6 m. Na takšni razdalji (cca 6 m) se izvedejo tudi dilatacije. Pri izvedbi vrha zidu je potrebno zgornje robove ustrezno pobrati s trikotnimi letvami 2/2 cm.
Za izvedbo opornega zidu se uporabi beton kvalitete C30/37, XD1, XF3, PV-II, D16, S3. Zaščitni sloj armature znaša 5 cm.

Za odvodnjavanje prostih talnih vod se skozi prerez stene opornega zidu, na višini cca 0.70 m nad vrhom temelja, vgradi izcednice iz PE kanalizacijskih cevi ϕ200mm. Izcednice se vgradi v naklonu cca 2%. Na zaledni strani se izdela kamniti drenažni zasip D16/32, širine 0.3 – 0.5 m. Za izvedbo drenažnega zasipa se lahko uporabi tudi izpran rečni prod.

# T.5. STABILNOSTNO STATIČNI IZRAČUN

## T.5.1. Splošno

Osnova za stabilnostno-statični izračun so pridobljene geološko – geotehnične raziskave in geomehanske karakteristike zemljin pri povratni analizi, geodetski posnetek ter profili terena in cestišča.

Pri izračunu so upoštevane karakteristike slojev podane v geološko geomehanskem poročilu:

| Sloj | Kohezija (kPa) | Strižni kot (°) | Prostorni. teža (kN/m$^3$) |
|---|---|---|---|
| Nasutje | 0 | 35 | 21 |
| Nizko plastična glina z gruščem | 0.8 | 39.6 | 19.8 |
| Peščen prod | 0 | 36 – 38 | 20 |
| Preperel blestnik | 20 | 30 | 23 |
| Blestnik | 50 | 30 | 23 |

Prometno obtežbo smo upoštevali skladno s tabelo 4.6 (SIST EN 1991-2:2004 - UDL – obtežni primer LM1): q = 9 kPa - vozni pas 1.

Namesto tandemskega sistema TS smo upoštevali prometno obtežbo skladno s preglednico 6.7 in 6.8 (SIST EN 1991-1-1:2004): q = 5 kPa – razporejena po celotni širini vozišča (prometne in parkirne površine za srednje težka vozila → s skupno težo > 30 kN; < 160 kN, z dvema osema).

Prometna obtežba skupaj: q = 14 kPa - vozni pas 1

Statične izračune podpornih konstrukcij smo izvedli s programom GEO5 po EC2.

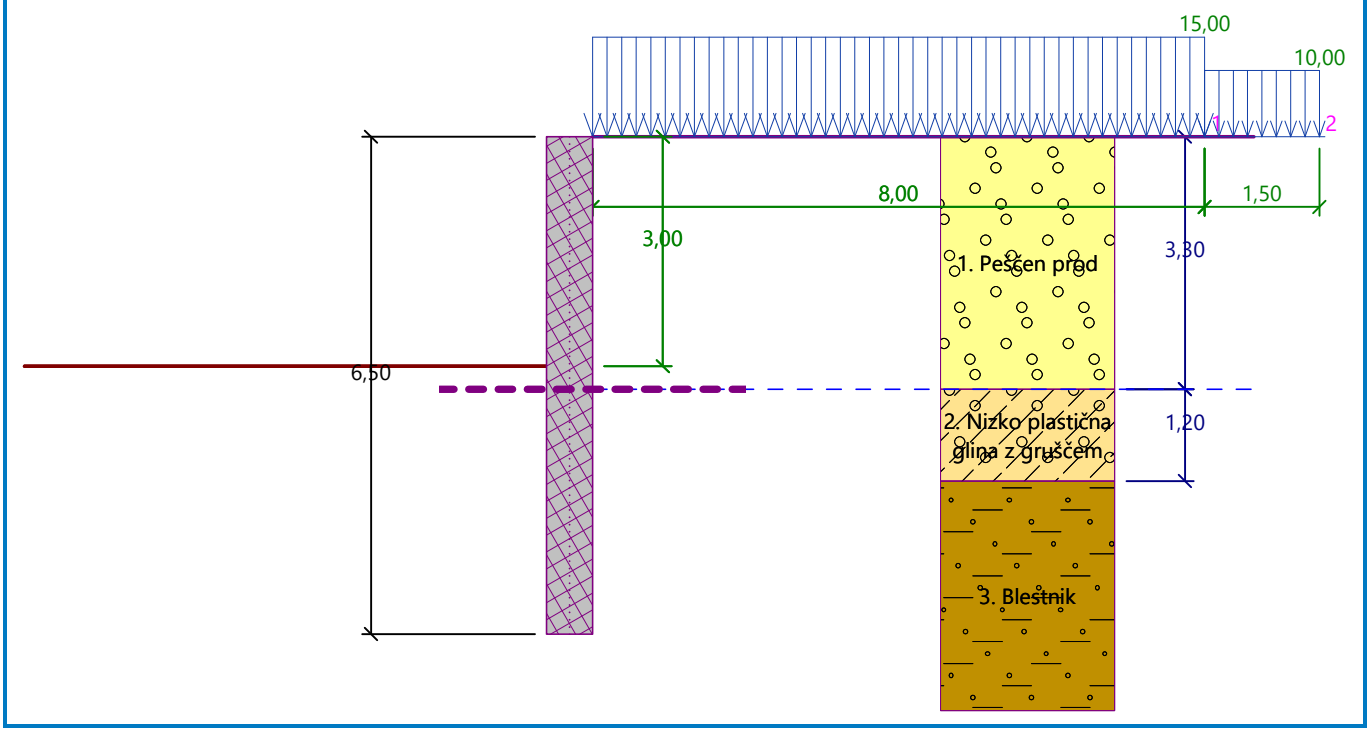
## T.5.2. Izpis stabilnostno statičnega izračuna pilotne stene

# Analysis of anti-slide pile

## Input data

Project : Sanacija LC 261071 Šentlenart-Zilc. III. Faza
Part : Pilotna stena
Author : BLAN d.o.o.
Project number : GM - 94/2026

| Name : Project | Stage - analysis : 1 - 0 |
|---|---|




### Settings

Slovenia - EN 1997

### Materials and standards

| | |
|---|---|
| Concrete structures : | EN 1992-1-1 (EC2) |
| Coefficients EN 1992-1-1 : | standard |
| Circle pile shear : | simplified method |
| Steel structures : | EN 1993-1-1 (EC3) |
| Partial factor on bearing capacity of steel cross section : | $\gamma_{M0}$ = 1,00 |

### Pressure analysis

| | |
|---|---|
| Verification methodology : | according to EN 1997 |
| Active earth pressure calculation : | Coulomb |
| Passive earth pressure calculation : | Caquot-Kerisel |
| Earthquake analysis : | Mononobe-Okabe |
| Modulus of subsoil reaction : | standard |

Consider reduction of the modulus of subsoil reaction for a braced sheeting

| | |
|---|---|
| Pressures below the slip surface : | standard |
| Design approach : | 2 - reduction of actions and resistances |

| Partial factors on actions (A) | | | |
|---|---|---|---|
| Transient design situation | | | |
| | | Unfavourable | Favourable |



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| Partial factors on actions (A) | | | | | |
|---|---|---|---|---|---|
| Transient design situation | | | | | |
| Permanent actions : | $\gamma_G$ = | 1,20 | [–] | 1,00 | [–] |
| Variable actions : | $\gamma_Q$ = | 1,30 | [–] | 0,00 | [–] |
| Water load : | $\gamma_w$ = | 1,20 | [–] | | |

| Partial factors for resistances (R) | | | |
|---|---|---|---|
| Transient design situation | | | |
| Partial factor on earth resistance : | $\gamma_{Re}$ = | 1,40 | [–] |

## Anchors

Verification methodology : Limit states (LSD)

| Reduction coefficients | | | |
|---|---|---|---|
| Reduction. coeff of steel strength : | $\gamma_s$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (soil) : | $\gamma_e$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (grouting) : | $\gamma_c$ = | 1,35 | [–] |

## Geometry of structure

Structure length = 6,50 m

Cross-section name : Pile curtain d = 0,60 m, a = 1,80 m
Material of pile : concrete
Input coefficient of pressure reduction below the ditch= 0,75
Area of cross-section A = 1,57E-01 $m^2/m$
Moment of inertia I = 3,53E-03 $m^4/m$

## Forces above the slip surface

Depth of slip surface $h_{s1}$ = 3,30 m
Input of active horizontal force : active pressure
Input of passive horizontal force : springs

Coeff. of increase of active pressure = 1,00

## Material of structure

Analysis of concrete structures carried out according to the standard EN 1992-1-1 (EC2).

**Concrete: C 25/30**
Cylinder compressive strength $f_{ck}$ = 25,00 MPa
Tensile strength $f_{ctm}$ = 2,60 MPa
Elasticity modulus $E_{cm}$ = 31000,00 MPa
Shear modulus G = 12917,00 MPa

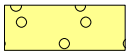
**Longitudinal reinforcement: B500B**
Yield strength $f_{yk}$ = 500,00 MPa

**Transverse reinforcement: B500B**
Yield strength $f_{yk}$ = 500,00 MPa

## Modulus of reaction

Modulus of subsoil reaction is computed by method Schmitt.

## Basic soil parameters

| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m³] | $\gamma_{su}$ [kN/m³] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod |  | 30,20 | 0,00 | 20,00 | 10,00 | 20,13 |



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| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m$^3$] | $\gamma_{su}$ [kN/m$^3$] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 2 | Nizko plastična glina z gruščem | | 33,50 | 0,60 | 20,30 | 10,30 | 22,30 |
| 3 | Blestnik | | 30,00 | 24,80 | 21,00 | 11,00 | 20,00 |

## Soil parameters to compute pressure at rest

| No. | Name | Pattern | Type calculation | $\varphi_{ef}$ [°] | $\nu$ [–] | OCR [–] | $K_r$ [–] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | cohesive | - | 0,30 | - | - |
| 2 | Nizko plastična glina z gruščem | | cohesive | - | 0,30 | - | - |
| 3 | Blestnik | | cohesive | - | 0,30 | - | - |

## Parameters of soils to compute modulus of subsoil reaction (Schmitt)

| No. | Name | Pattern | $\nu$ [–] | $E_{oed}$ [MPa] | $E_{def}$ [MPa] |
|---|---|---|---|---|---|
| 1 | Peščen prod | | 0,30 | 20,00 | - |
| 2 | Nizko plastična glina z gruščem | | 0,30 | 10,00 | - |
| 3 | Blestnik | | 0,30 | 30,00 | - |

## Soil parameters

**Peščen prod**

Unit weight : $\gamma$ = 20,00 kN/m$^3$
Stress-state : effective
Angle of internal friction : $\varphi_{ef}$ = 30,20 °
Cohesion of soil : $c_{ef}$ = 0,00 kPa
Angle of friction struc.-soil : $\delta$ = 20,13 °
Soil : cohesive
Poisson's ratio : $\nu$ = 0,30
Oedometric modulus : $E_{oed}$ = 20,00 MPa
Saturated unit weight : $\gamma_{sat}$ = 20,00 kN/m$^3$

**Nizko plastična glina z gruščem**

Unit weight : $\gamma$ = 20,30 kN/m$^3$
Stress-state : effective
Angle of internal friction : $\varphi_{ef}$ = 33,50 °
Cohesion of soil : $c_{ef}$ = 0,60 kPa
Angle of friction struc.-soil : $\delta$ = 22,30 °
Soil : cohesive
Poisson's ratio : $\nu$ = 0,30
Oedometric modulus : $E_{oed}$ = 10,00 MPa
Saturated unit weight : $\gamma_{sat}$ = 20,30 kN/m$^3$

**Blestnik**

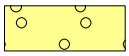
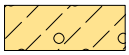
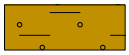
Unit weight : $\gamma$ = 21,00 kN/m$^3$



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| | | | |
|---|---|---|---|
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,00 ° |
| Cohesion of soil : | $c_{ef}$ | = | 24,80 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,00 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 30,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 21,00 kN/m$^3$ |

### Geological profile and assigned soils

| No. | Thickness of layer t [m] | Depth z [m] | Assigned soil | Pattern |
|---|---|---|---|---|
| 1 | 3,30 | 0,00 .. 3,30 | Peščen prod |  |
| 2 | 1,20 | 3,30 .. 4,50 | Nizko plastična glina z gruščem |  |
| 3 | - | 4,50 .. ∞ | Blestnik |  |

### Excavation

Soil in front of wall is excavated to a depth of 3,00 m.

### Terrain profile

Terrain behind the structure is flat.

### Water influence

GWT behind the structure lies at a depth of 3,30 m

### Input surface surcharges

| No. | Surcharge new | Surcharge change | Action | Mag.1 [kN/m$^2$] | Mag.2 [kN/m$^2$] | Ord.x x [m] | Length l [m] | Depth z [m] |
|---|---|---|---|---|---|---|---|---|
| 1 | Yes | | variable | 15,00 | | 0,00 | 8,00 | on terrain |
| 2 | Yes | | permanent | 10,00 | | 8,00 | 1,50 | on terrain |

| No. | Name |
|---|---|
| 1 | Promet |
| 2 | Koristna |

### Global settings

Number of FEs to discretize wall = 100
Analysis of depending pressures : reduce according to analysis settings
Minimum pressure is considered as $\sigma_{a,min} = 0{,}20\sigma_z$

### Settings of the stage of construction

Design situation : transient

## Analysis results

### Pressure above the slip surface

| Depth [m] | Passive pressure [kPa] | Active pressure [kPa] |
|---|---|---|
| 0 | 0,00 | - |
| 3,00 | 0,00 | - |
| 3,00 | 0,00 | - |
| 3,30 | 0,00 | - |



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## Active pressure - above slip surface

| Depth [m] | Active pressure [kPa] |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.03 | 0.19 |
| 0.03 | 5.61 |
| 2.40 | 21.36 |
| 3.00 | 25.34 |
| 3.00 | 19.94 |
| 3.00 | 25.34 |
| 3.30 | 27.33 |

## Distribution of pressures acting on the structure (in front and behind the wall) - below the slip surface

| Depth [m] | Ta,p [kPa] | Tk,p [kPa] | Tp,p [kPa] | Ta,z [kPa] | Tk,z [kPa] | Tp,z [kPa] |
|---|---|---|---|---|---|---|
| 3.30 | -0.84 | -1.93 | -23.73 | 17.30 | 21.22 | 244.76 |
| 3.39 | -1.24 | -2.52 | -30.55 | 18.33 | 27.50 | 248.71 |
| 3.67 | -2.48 | -4.37 | -51.69 | 21.50 | 30.58 | 260.95 |
| 3.96 | -3.72 | -6.21 | -72.82 | 24.67 | 33.64 | 273.18 |
| 4.24 | -4.96 | -8.06 | -93.95 | 27.84 | 36.69 | 285.42 |
| 4.50 | -6.10 | -9.76 | -113.46 | 30.77 | 39.23 | 296.72 |
| 4.50 | 0.00 | -9.76 | -142.13 | 13.88 | 39.23 | 280.88 |
| 4.52 | 0.00 | -9.91 | -143.39 | 14.14 | 39.45 | 281.66 |
| 4.80 | 0.00 | -11.77 | -159.41 | 17.46 | 42.23 | 291.53 |
| 4.81 | 0.00 | -11.87 | -160.27 | 18.74 | 42.38 | 292.07 |
| 5.09 | 0.00 | -13.72 | -176.11 | 21.93 | 45.15 | 301.82 |
| 5.37 | 0.00 | -15.63 | -192.47 | 25.23 | 48.02 | 311.91 |
| 5.65 | 0.00 | -17.54 | -208.83 | 28.53 | 50.90 | 321.99 |
| 5.93 | 0.00 | -19.44 | -225.19 | 31.83 | 53.79 | 332.08 |
| 6.22 | 0.00 | -21.35 | -241.55 | 35.12 | 56.70 | 342.16 |
| 6.50 | 0.00 | -23.26 | -257.91 | 38.42 | 59.62 | 352.24 |

## Distributions of the modulus of subsoil reaction and internal forces on the structure

| Depth [m] | kh,p [MN/m3] | kh,z [MN/m3] | Displacement [mm] | Pressure [kPa] | Shear Force [kN/m] | Moment [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | -39.44 | 0.00 | -0.00 | -0.00 |
| 0.33 | 0.00 | 0.00 | -36.96 | 7.57 | -1.93 | 0.27 |
| 0.65 | 0.00 | 0.00 | -34.48 | 9.73 | -4.75 | 1.34 |
| 0.98 | 0.00 | 0.00 | -31.99 | 11.89 | -8.26 | 3.43 |
| 1.30 | 0.00 | 0.00 | -29.51 | 14.05 | -12.48 | 6.78 |
| 1.63 | 0.00 | 0.00 | -27.04 | 16.21 | -17.39 | 11.62 |
| 1.95 | 0.00 | 0.00 | -24.58 | 18.37 | -23.01 | 18.16 |
| 2.28 | 0.00 | 0.00 | -22.14 | 20.53 | -29.33 | 26.65 |
| 2.60 | 0.00 | 0.00 | -19.72 | 22.68 | -36.35 | 37.30 |
| 2.93 | 0.00 | 0.00 | -17.34 | 24.84 | -44.08 | 50.35 |
| 2.99 | 0.00 | 0.00 | -16.87 | 25.27 | -45.70 | 53.27 |
| 3.00 | 0.00 | 0.00 | -16.77 | 25.07 | -46.06 | 53.92 |
| 3.25 | 0.00 | 0.00 | -15.01 | 8.25 | -50.16 | 65.83 |



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| Depth [m] | kh,p [MN/m3] | kh,z [MN/m3] | Displacement [mm] | Pressure [kPa] | Shear Force [kN/m] | Moment [kNm/m] |
|---|---|---|---|---|---|---|
| 3.30 | 0.00 | 0.00 | -14.68 | 5.10 | -50.46 | 68.15 |
| 3.32 | 0.00 | 0.00 | -14.55 | -7.38 | -50.38 | 69.11 |
| 3.58 | 0.00 | 0.00 | -12.74 | -23.90 | -46.31 | 81.77 |
| 3.90 | 0.00 | 0.00 | -10.55 | -44.56 | -35.19 | 95.20 |
| 4.22 | 7.09 | 0.00 | -8.45 | -40.22 | -20.11 | 104.08 |
| 4.55 | 0.00 | 0.00 | -6.45 | -130.54 | -6.21 | 108.74 |
| 4.88 | 30.68 | 0.00 | -4.56 | -132.73 | 38.34 | 103.53 |
| 5.20 | 30.68 | 0.00 | -2.76 | -76.03 | 72.19 | 85.07 |
| 5.53 | 30.68 | 0.00 | -1.05 | -21.83 | 88.03 | 58.56 |
| 5.85 | 30.68 | 30.68 | 0.61 | 71.42 | 81.32 | 30.14 |
| 6.18 | 0.00 | 30.68 | 2.24 | 124.92 | 49.22 | 8.47 |
| 6.50 | 0.00 | 30.68 | 3.86 | 177.96 | 0.00 | -0.00 |

## Maximum values of internal forces acting on the structure

Maximum shear force = 89,28 kN/m
Maximum moment = 108,87 kNm/m
Maximum displacement = 39,4 mm
Displacement in the depth of slip surface = 14,7 mm

## Maximum internal forces on cross-section

Maximum shear force = 160,70 kN
Maximum moment = 195,96 kNm

## Terrain settlement behind the structure

Terrain settlement $\delta_{max}$ = 24,8 mm

| | Coordinates x [m] | Settlement z [mm] |
|---|---|---|
| 1 | 0,00 | 17,8 |
| 2 | 0,55 | 24,9 |
| 3 | 1,11 | 30,1 |
| 4 | 1,66 | 33,3 |
| 5 | 2,21 | 34,5 |
| 6 | 2,76 | 33,7 |
| 7 | 3,32 | 30,9 |
| 8 | 3,87 | 26,2 |
| 9 | 4,42 | 19,4 |
| 10 | 4,98 | 10,7 |
| 11 | 5,53 | 0,0 |

## Utilization of passive pressure

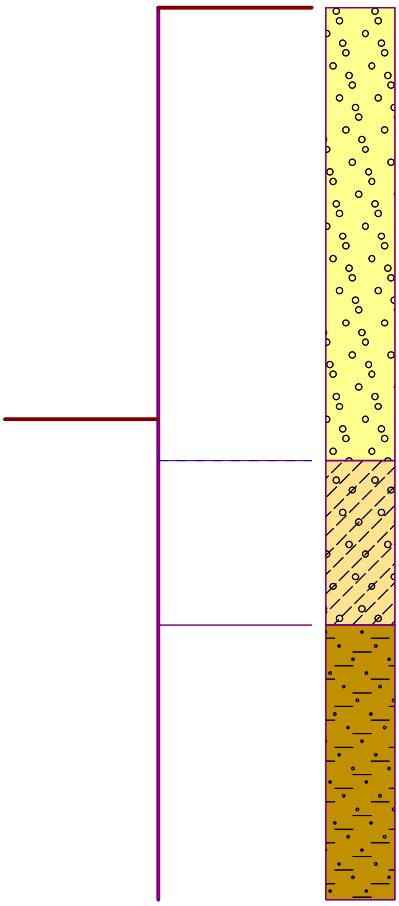
Maximum passive pressure $R_{max}$ = 485,73 kN/m
Mobilized passive pressure $R_{mob}$ = 200,06 kN/m

Requested safety factor $SF_p$ = 1,50 < 2,43
**Overall verification of passive pressure utilization is SATISFACTORY**

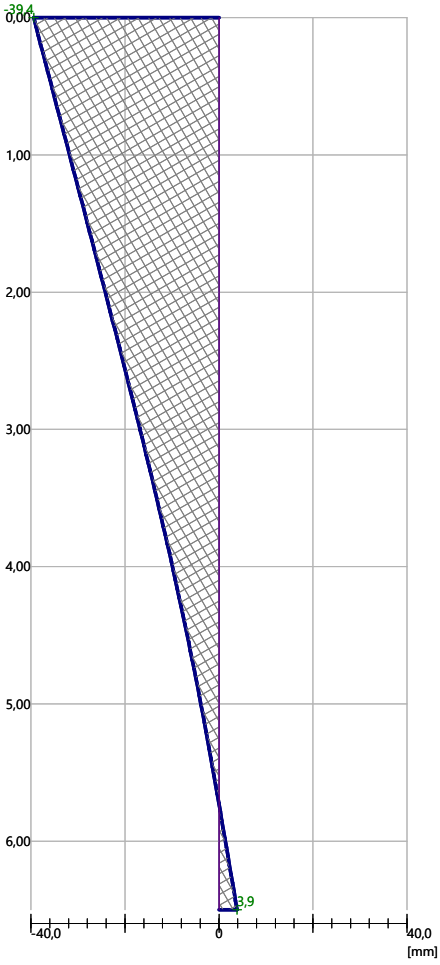

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## Name : Analysis Deformations+stresses | Stage - analysis : 1 - -1

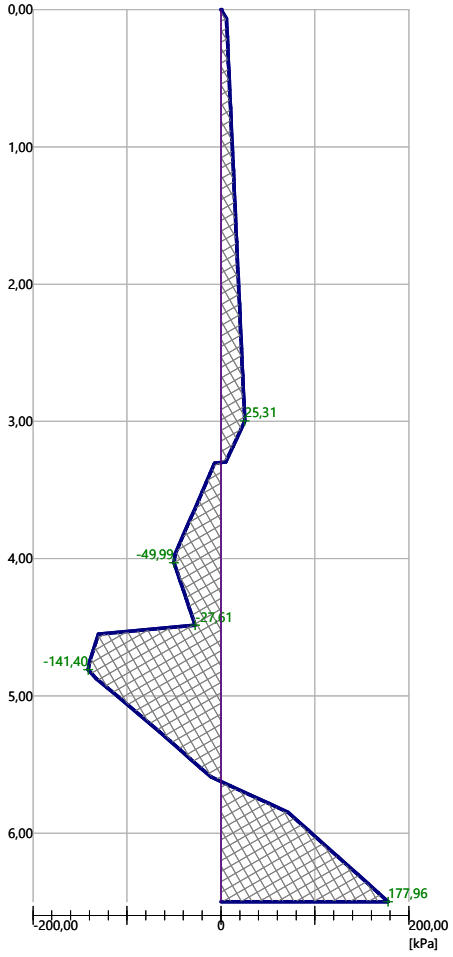
**Geometry of structure**
Length of structure = 6,50m



**Displacement of structure**
Max. disp. = 39,4 mm



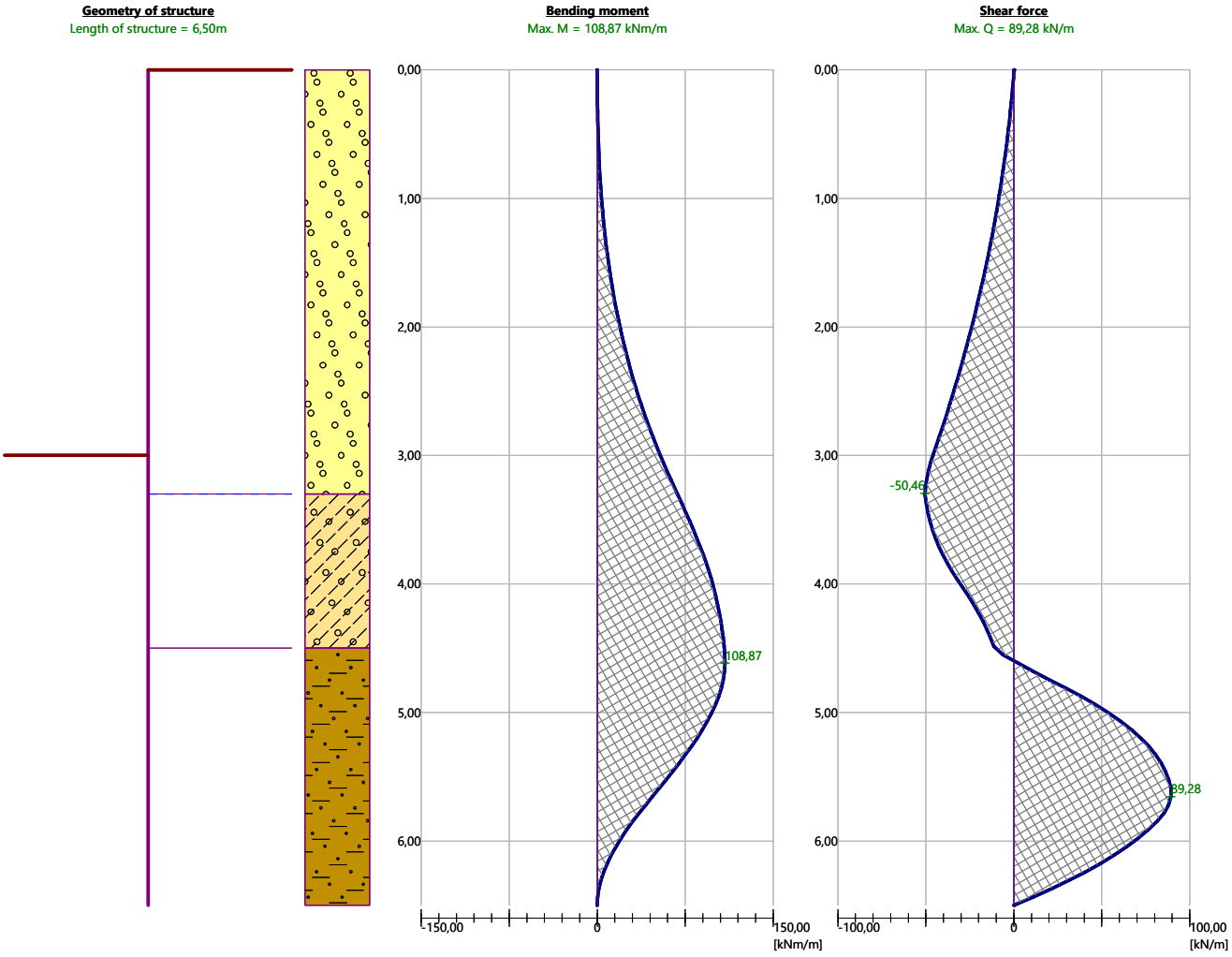

**Pressure acting on structure**
Max. pressure = 177,96 kPa



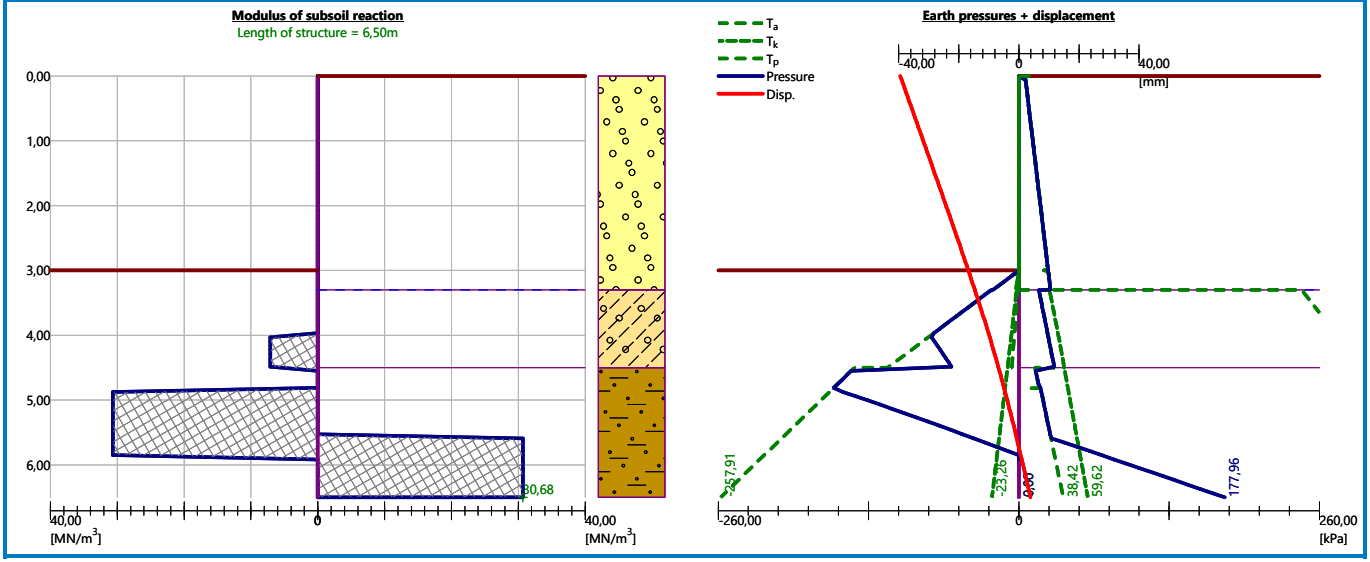



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## Name : Analysis Internal forces | Stage - analysis : 1 - -1



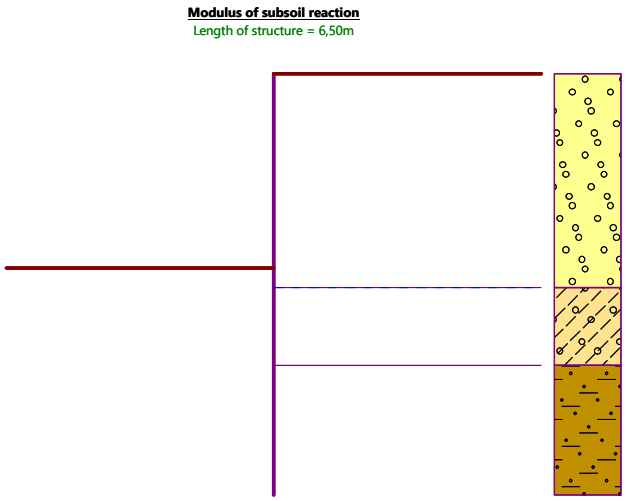

## Name : Analysis Kh+Pressures | Stage - analysis : 1 - -1

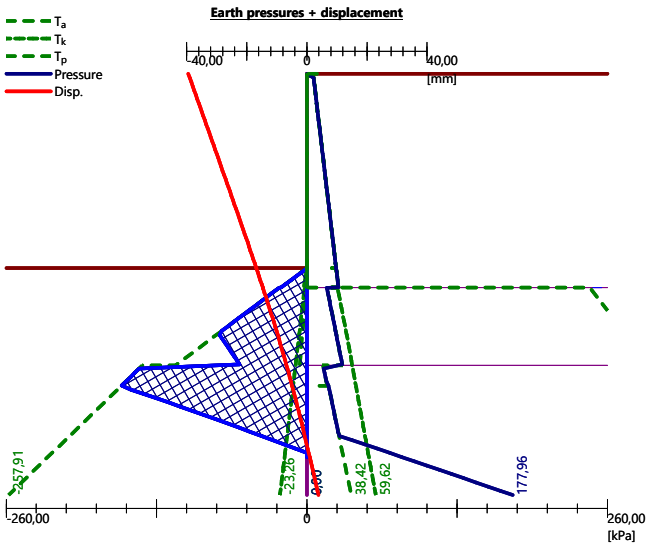




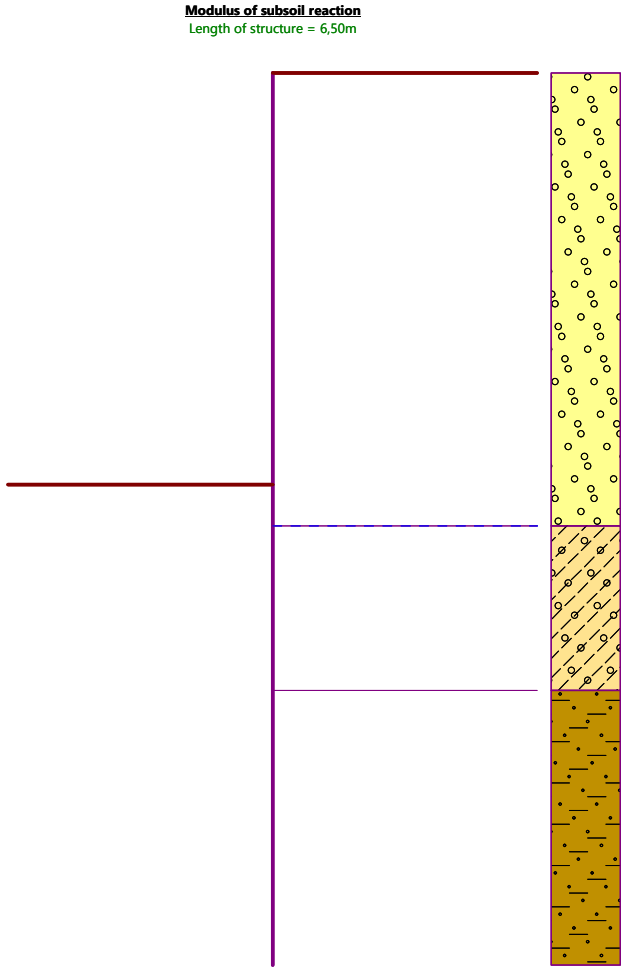

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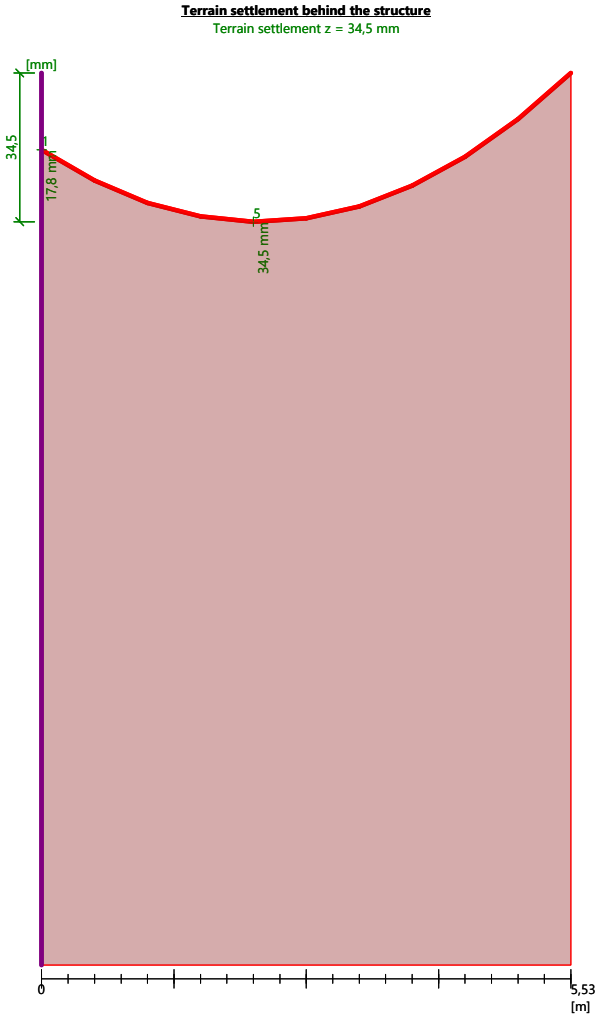
## Name : Analysis Passive pressure utilization | Stage - analysis : 1 - -1




## Name : Analysis Settlement | Stage - analysis : 1 - -1






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# Dimensioning No. 1

## Distribution of forces on construction

| | Disp. min [mm] | Disp. max [mm] | Shear force min. [kN/m] | Shear force max [kN/m] | Moment min. [kNm/m] | Moment max. [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | -39.44 | -39.44 | -0.00 | -0.00 | -0.00 | -0.00 |
| 0.33 | -36.96 | -36.96 | -1.93 | -1.93 | 0.27 | 0.27 |
| 0.65 | -34.48 | -34.48 | -4.75 | -4.75 | 1.34 | 1.34 |
| 0.98 | -31.99 | -31.99 | -8.26 | -8.26 | 3.43 | 3.43 |
| 1.30 | -29.51 | -29.51 | -12.48 | -12.48 | 6.78 | 6.78 |
| 1.63 | -27.04 | -27.04 | -17.39 | -17.39 | 11.62 | 11.62 |
| 1.95 | -24.58 | -24.58 | -23.01 | -23.01 | 18.16 | 18.16 |
| 2.28 | -22.14 | -22.14 | -29.33 | -29.33 | 26.65 | 26.65 |
| 2.60 | -19.72 | -19.72 | -36.35 | -36.35 | 37.30 | 37.30 |
| 2.93 | -17.34 | -17.34 | -44.08 | -44.08 | 50.35 | 50.35 |
| 2.99 | -16.87 | -16.87 | -45.70 | -45.70 | 53.27 | 53.27 |
| 2.99 | -16.87 | -16.87 | -45.70 | -45.70 | 53.27 | 53.27 |
| 3.00 | -16.83 | -16.83 | -45.86 | -45.86 | 53.55 | 53.55 |
| 3.00 | -16.83 | -16.83 | -45.86 | -45.86 | 53.55 | 53.55 |
| 3.00 | -16.77 | -16.77 | -46.06 | -46.06 | 53.92 | 53.92 |
| 3.00 | -16.77 | -16.77 | -46.06 | -46.06 | 53.92 | 53.92 |
| 3.25 | -15.01 | -15.01 | -50.16 | -50.16 | 65.83 | 65.83 |
| 3.30 | -14.68 | -14.68 | -50.46 | -50.46 | 68.15 | 68.15 |
| 3.30 | -14.68 | -14.68 | -50.46 | -50.46 | 68.15 | 68.15 |
| 3.30 | -14.63 | -14.63 | -50.46 | -50.46 | 68.55 | 68.55 |
| 3.30 | -14.63 | -14.63 | -50.46 | -50.46 | 68.55 | 68.55 |
| 3.32 | -14.55 | -14.55 | -50.38 | -50.38 | 69.11 | 69.11 |
| 3.32 | -14.55 | -14.55 | -50.38 | -50.38 | 69.11 | 69.11 |
| 3.58 | -12.74 | -12.74 | -46.31 | -46.31 | 81.77 | 81.77 |
| 3.90 | -10.55 | -10.55 | -35.19 | -35.19 | 95.20 | 95.20 |
| 4.22 | -8.45 | -8.45 | -20.11 | -20.11 | 104.08 | 104.08 |
| 4.55 | -6.45 | -6.45 | -6.21 | -6.21 | 108.74 | 108.74 |
| 4.88 | -4.56 | -4.56 | 38.34 | 38.34 | 103.53 | 103.53 |
| 5.20 | -2.76 | -2.76 | 72.19 | 72.19 | 85.07 | 85.07 |
| 5.53 | -1.05 | -1.05 | 88.03 | 88.03 | 58.56 | 58.56 |
| 5.85 | 0.61 | 0.61 | 81.32 | 81.32 | 30.14 | 30.14 |
| 6.18 | 2.24 | 2.24 | 49.22 | 49.22 | 8.47 | 8.47 |
| 6.50 | 3.86 | 3.86 | 0.00 | 0.00 | -0.00 | -0.00 |

## Maximum values of internal forces

Maximum displacement = -39,4 mm
Minimum displacement = 3,9 mm
Maximum bending moment = 108,87 kNm/m
Minimum bending moment = 0,00 kNm/m
Maximum shear force = 89,28 kN/m

## Verification of RC cross section (Pile curtain d = 0,60 m, a = 1,80 m)

All construction stages are taken into the analysis.
Partial factor on load = 1,00

## Verification of cross section in bending:

Reinforcement - 8 pc bars 25,0 mm; cover 80,0 mm



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Type of structure (reinforcement ratio) : beam
Reinforcement ratio ρ = 0,694 % > 0,135 % = $\rho_{min}$
Load : $M_{Ed}$ = 195,96 kNm
Bearing capacity : $M_{Rd}$ = 331,44 kNm

**Designed pile reinforcement is SATISFACTORY**

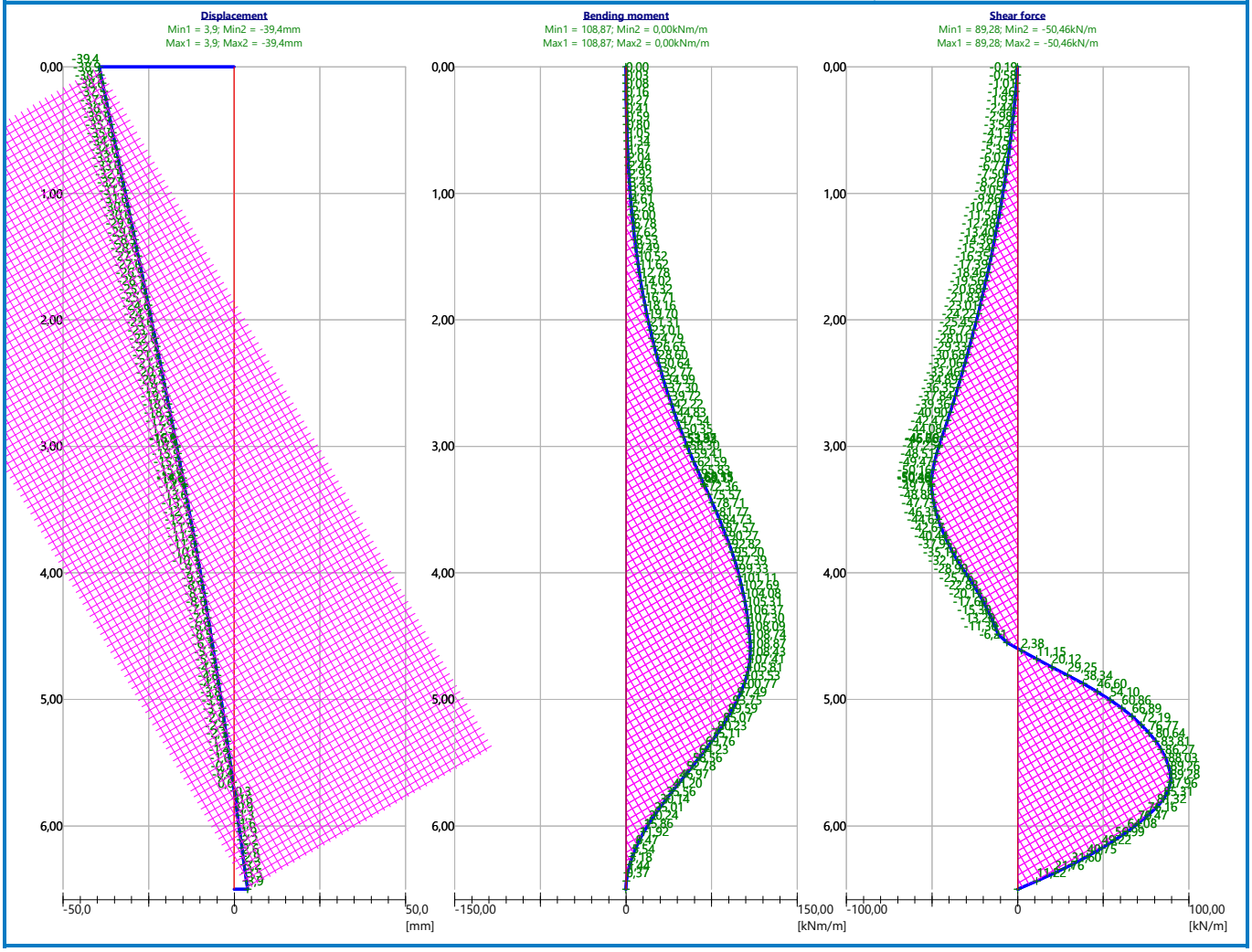
**Verification of cross section in shear:**

Shear reinf. - profile 16,0 mm; spacing 1000,0 mm
$A_{sw}$ = 2 x 201,1 = 402,1 mm$^2$
$b_w$ = 0,53 m; d = 0,48 m
Ultimate shear force: $V_{Rd}$ = 188,82 kN > 160,70 kN = $V_{Ed}$

**Cross-section is SATISFACTORY.**

**Overall verification: Cross-section is SATISFACTORY**

| Name : Dimensioning | Stage - analysis : 1 - 1 |
|---|---|






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## T.5.3. Izpis stabilnostno statičnega izračuna opornega zidu (A88, A89)

# Cantilever wall analysis

## Input data

Project : Sanacija LC 261071 Šentlenart-Zilc. III. Faza
Part : Oporni zid (A88, A 89)
Author : BLAN d.o.o.
Project number : GM - 94/2026

### Settings

Slovenia - EN 1997

### Materials and standards

Concrete structures : EN 1992-1-1 (EC2)
Coefficients EN 1992-1-1 : standard

### Wall analysis

Verification methodology : according to EN 1997
Active earth pressure calculation : Coulomb
Passive earth pressure calculation : Caquot-Kerisel
Earthquake analysis : Mononobe-Okabe
Shape of earth wedge : Calculate as skew
Base key : The base key is considered as inclined footing bottom
Allowable eccentricity : 0,333
Design approach : 2 - reduction of actions and resistances

| Partial factors on actions (A) | | | | | |
|---|---|---|---|---|---|
| Permanent design situation | | | | | |
| | | Unfavourable | | Favourable | |
| Permanent actions : | $\gamma_G$ = | 1,35 | [–] | 1,00 | [–] |
| Variable actions : | $\gamma_Q$ = | 1,50 | [–] | 0,00 | [–] |
| Water load : | $\gamma_w$ = | 1,35 | [–] | | |

| Partial factors for resistances (R) | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Partial factor on overturning : | $\gamma_{Rv}$ = | 1,40 | [–] |
| Partial factor on sliding resistance : | $\gamma_{Rh}$ = | 1,10 | [–] |
| Partial factor on bearing capacity : | $\gamma_{Re}$ = | 1,40 | [–] |

| Partial factors for variable actions | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Factor for combination value : | $\psi_0$ = | 0,70 | [–] |
| Factor for frequent value : | $\psi_1$ = | 0,50 | [–] |
| Factor for quasi-permanent value : | $\psi_2$ = | 0,30 | [–] |

### Material of structure

Unit weight $\gamma$ = 23,00 kN/m$^3$
Analysis of concrete structures carried out according to the standard EN 1992-1-1 (EC2).

**Concrete: C 25/30**

| | | | |
|---|---|---|---|
| Cylinder compressive strength | $f_{ck}$ = | 25,00 | MPa |
| Tensile strength | $f_{ctm}$ = | 2,60 | MPa |
| Elasticity modulus | $E_{cm}$ = | 31000,00 | MPa |

**Longitudinal reinforcement: B500B**

| | | | |
|---|---|---|---|
| Yield strength | $f_{yk}$ = | 500,00 | MPa |



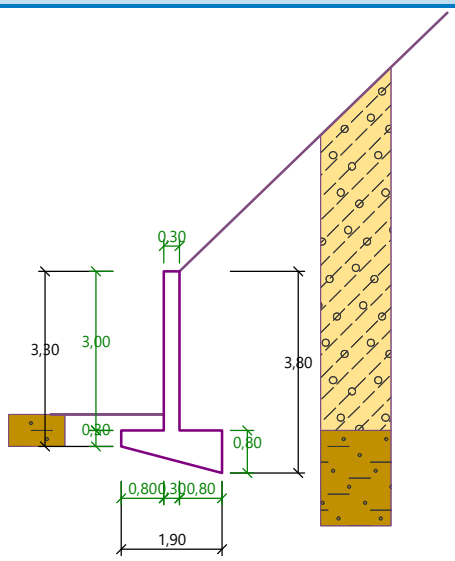
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## Geometry of structure

| No. | Coordinate X [m] | Depth Z [m] |
|---|---|---|
| 1 | 0,00 | 0,00 |
| 2 | 0,00 | 3,00 |
| 3 | 0,80 | 3,00 |
| 4 | 0,80 | 3,80 |
| 5 | -1,10 | 3,30 |
| 6 | -1,10 | 3,00 |
| 7 | -0,30 | 3,00 |
| 8 | -0,30 | 0,00 |

The origin [0,0] is located at the most upper right point of the wall.
Wall section area = 1,94 m².

**Name : Geometry** | **Stage - analysis : 1 - 0**




## Basic soil parameters

| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m³] | $\gamma_{su}$ [kN/m³] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | 30,20 | 0,00 | 20,00 | 10,00 | 20,13 |
| 2 | Nizko plastična glina z gruščem | | 33,50 | 0,60 | 20,30 | 10,30 | 22,30 |
| 3 | Blestnik | | 30,00 | 24,80 | 21,00 | 11,00 | 20,00 |

## Soil parameters to compute pressure at rest

| No. | Name | Pattern | Type calculation | $\varphi_{ef}$ [°] | $\nu$ [–] | OCR [–] | $K_r$ [–] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | cohesive | - | 0,30 | - | - |
| 2 | Nizko plastična glina z gruščem | | cohesive | - | 0,30 | - | - |
| 3 | Blestnik | | cohesive | - | 0,30 | - | - |



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## Soil parameters

**Peščen prod**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,20 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,00 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,13 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,00 kN/m$^3$ |

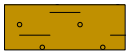
**Nizko plastična glina z gruščem**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,30 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 33,50 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,60 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 22,30 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,30 kN/m$^3$ |

**Blestnik**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 21,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,00 ° |
| Cohesion of soil : | $c_{ef}$ | = | 24,80 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,00 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ | = | 21,00 kN/m$^3$ |

## Geological profile and assigned soils

| No. | Thickness of layer t [m] | Depth z [m] | Assigned soil | Pattern |
|---|---|---|---|---|
| 1 | 3,00 | 0,00 .. 3,00 | Nizko plastična glina z gruščem |  |
| 2 | - | 3,00 .. ∞ | Blestnik |  |

## Foundation

Type of foundation : soil from geological profile

## Terrain profile

Terrain behind construction has the slope 1: 1,04 (slope angle is 44,00 °).

## Water influence

Ground water table is located below the structure.

## Resistance on front face of the structure

Resistance on front face of the structure: 1/3 pass., 2/3 at rest
Soil on front face of the structure - Blestnik

| | | | |
|---|---|---|---|
| Angle of friction struc.-soil | $\delta$ | = | 0,00 ° |
| Soil thickness in front of structure | h | = | 0,60 m |

Terrain in front of structure is flat.



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### Settings of the stage of construction

Design situation : permanent
The wall is free to move. Active earth pressure is therefore assumed.
Reduction of soil/soil friction angle : do not reduce

## Verification No. 1

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. overtur. | Coeff. sliding | Coeff. stress |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -0,84 | 44,74 | 1,03 | 1,000 | 1,000 | 1,350 |
| Weight - soil | 0,00 | -0,45 | 5,04 | 0,40 | 1,000 | 1,000 | 1,350 |
| FF resistance | -21,96 | -0,28 | 0,03 | -0,40 | 1,000 | 1,000 | 1,350 |
| Weight - earth wedge | 0,00 | -2,00 | 54,99 | 1,52 | 1,000 | 1,000 | 1,350 |
| Active pressure | 204,90 | -1,05 | 117,42 | 1,90 | 1,350 | 1,350 | 1,350 |

### Verification of complete wall

**Check for overturning stability**
Resisting moment $M_{res}$ = 308,90 kNm/m
Overturning moment $M_{ovr}$ = 285,13 kNm/m

**Wall for overturning is SATISFACTORY**

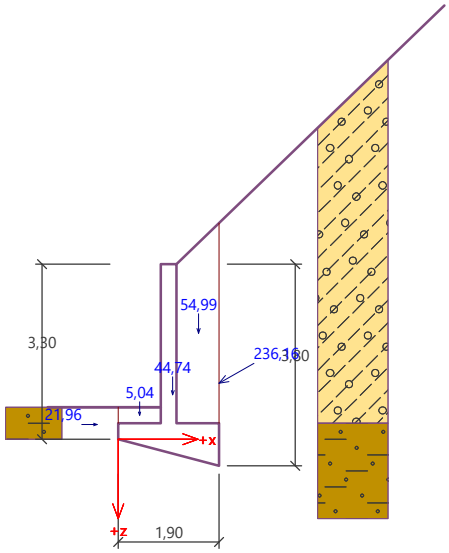
**Check for slip**
Resisting horizontal force $H_{res}$ = 188,47 kN/m
Active horizontal force $H_{act}$ = 179,26 kN/m

**Wall for slip is SATISFACTORY**

**Overall check - WALL is SATISFACTORY**

Maximum stress in footing bottom : 346,33 kPa

| Name : Verification | Stage - analysis : 1 - 1 |
|---|---|




## Bearing capacity of foundation soil

**Design load acting at the center of footing bottom**

| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] | Eccentricity [–] | Stress [kPa] |
|---|---|---|---|---|---|
| 1 | 151,32 | 352,97 | 149,00 | 0,226 | 318,77 |



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| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] | Eccentricity [–] | Stress [kPa] |
|---|---|---|---|---|---|
| 2 | 166,48 | 319,46 | 164,97 | 0,274 | 346,33 |

**Service load acting at the center of footing bottom**

| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] |
|---|---|---|---|
| 1 | 112,09 | 261,46 | 110,37 |

### Verification of foundation soil

Stress in the footing bottom : rectangle

**Eccentricity verification**

Max. eccentricity of normal force $e = 0,274$
Maximum allowable eccentricity $e_{alw} = 0,333$

**Eccentricity of the normal force is SATISFACTORY**

**Verification of bearing capacity**

Ultimate bearing capacity of found. soil $R = 500,00$ kPa
Partial factor on bearing capacity $\gamma_{Rv} = 1,40$
Max. stress at footing bottom $\sigma = 346,33$ kPa
Allowable bearing capacity of foundation soil $R_d = 357,14$ kPa

**Bearing capacity of foundation soil is SATISFACTORY**

**Overall verification - bearing capacity of found. soil is SATISFACTORY**

## Dimensioning No. 1

### Wall stem check - front reinf.

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. moment | Coeff. norm.force | Coeff. shear for. |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -1,50 | 20,69 | 0,15 | 1,000 | 1,350 | 1,000 |
| FF resistance | -9,75 | -0,14 | 0,00 | 0,00 | 1,000 | 1,000 | 1,000 |
| Pressure at rest | 106,21 | -1,00 | 0,00 | 0,30 | 1,350 | 1,000 | 1,350 |

### Wall stem check - front reinf.

Front reinforcement is not required.

### Wall stem check - back reinf.

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. moment | Coeff. norm.force | Coeff. shear for. |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -1,50 | 20,69 | 0,15 | 1,000 | 1,350 | 1,000 |
| FF resistance | -9,75 | -0,14 | 0,00 | 0,00 | 1,000 | 1,000 | 1,000 |
| Pressure at rest | 106,21 | -1,00 | 0,00 | 0,30 | 1,350 | 1,000 | 1,350 |

### Wall stem check - back reinf.

Wall check at the construction joint 3,00 m from the wall crest
Reinforcement and dimensions of the cross-section
5 prof. 20,0 mm, cover 50,0 mm
Inputted reinforcement area = 1570,8 $mm^2$
Required reinforcement area = 1479,1 $mm^2$
Cross-section width = 1,00 m
Cross-section height = 0,30 m



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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reinforcement ratio | ρ | = | 0,65 | % | > | 0,14 | % | = $\rho_{min}$ |
| Position of neutral axis | x | = | 0,06 | m | < | 0,15 | m | = $x_{max}$ |
| Ultimate shear force | $V_{Rd}$ | = | 139,86 | kN | > | 133,64 | kN | = $V_{Ed}$ |
| Ultimate moment | $M_{Rd}$ | = | 151,09 | kNm | > | 141,93 | kNm | = $M_{Ed}$ |

**Cross-section is SATISFACTORY.**

## Wall jump check

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Design coefficient |
|---|---|---|---|---|---|
| Weight - wall | 0,00 | -0,84 | 44,74 | 1,03 | 1,350 |
| Weight - soil | 0,00 | -0,45 | 5,04 | 0,40 | 1,350 |
| FF resistance | -21,96 | -0,28 | 0,03 | -0,40 | 1,350 |
| Weight - earth wedge | 0,00 | -2,00 | 54,99 | 1,52 | 1,350 |
| Active pressure | 204,90 | -1,05 | 117,42 | 1,90 | 1,350 |

## Wall jump check

Reinforcement and dimensions of the cross-section
5 prof. 14,0 mm, cover 50,0 mm

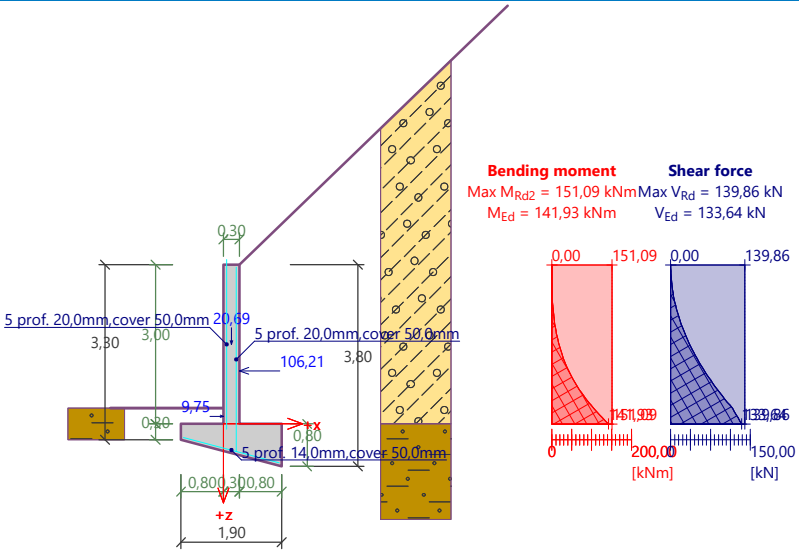
| | | | |
|---|---|---|---|
| Inputted reinforcement area | = | 769,7 | $mm^2$ |
| Required reinforcement area | = | 735,4 | $mm^2$ |
| Cross-section width | = | 1,00 | m |
| Cross-section height | = | 0,51 | m |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reinforcement ratio | ρ | = | 0,17 | % | > | 0,14 | % | = $\rho_{min}$ |
| Position of neutral axis | x | = | 0,03 | m | < | 0,28 | m | = $x_{max}$ |
| Ultimate moment | $M_{Rd}$ | = | 148,40 | kNm | > | 141,93 | kNm | = $M_{Ed}$ |

Cross-section must be reinforced by shear reinforcement with minimal area of 584,6 $mm^2/m$. $V_{Ed}$ = 259,36kN

**Cross-section is SATISFACTORY.**

| Name : Dimensioning | Stage - analysis : 1 - 1 |
|---|---|






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## T.5.4. Izpis stabilnostno statičnega izračuna opornega zidu (A90, A91)

# Cantilever wall analysis

## Input data

Project : Sanacija LC 261071 Šentlenart-Zilc. III. Faza
Part : Oporni zid (A90, A91)
Author : BLAN d.o.o.
Project number : GM - 94/2026

### Settings

Slovenia - EN 1997

### Materials and standards

Concrete structures : EN 1992-1-1 (EC2)
Coefficients EN 1992-1-1 : standard

### Wall analysis

Verification methodology : according to EN 1997
Active earth pressure calculation : Coulomb
Passive earth pressure calculation : Caquot-Kerisel
Earthquake analysis : Mononobe-Okabe
Shape of earth wedge : Calculate as skew
Base key : The base key is considered as inclined footing bottom
Allowable eccentricity : 0,333
Design approach : 2 - reduction of actions and resistances

| Partial factors on actions (A) | | | | | |
|---|---|---|---|---|---|
| Permanent design situation | | | | | |
| | | Unfavourable | | Favourable | |
| Permanent actions : | $\gamma_G$ = | 1,35 | [–] | 1,00 | [–] |
| Variable actions : | $\gamma_Q$ = | 1,50 | [–] | 0,00 | [–] |
| Water load : | $\gamma_w$ = | 1,35 | [–] | | |

| Partial factors for resistances (R) | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Partial factor on overturning : | $\gamma_{Rv}$ = | 1,40 | [–] |
| Partial factor on sliding resistance : | $\gamma_{Rh}$ = | 1,10 | [–] |
| Partial factor on bearing capacity : | $\gamma_{Re}$ = | 1,40 | [–] |

| Partial factors for variable actions | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Factor for combination value : | $\psi_0$ = | 0,70 | [–] |
| Factor for frequent value : | $\psi_1$ = | 0,50 | [–] |
| Factor for quasi-permanent value : | $\psi_2$ = | 0,30 | [–] |

### Material of structure

Unit weight $\gamma$ = 23,00 kN/m$^3$
Analysis of concrete structures carried out according to the standard EN 1992-1-1 (EC2).

**Concrete: C 25/30**

| | | | |
|---|---|---|---|
| Cylinder compressive strength | $f_{ck}$ = | 25,00 | MPa |
| Tensile strength | $f_{ctm}$ = | 2,60 | MPa |
| Elasticity modulus | $E_{cm}$ = | 31000,00 | MPa |

**Longitudinal reinforcement: B500B**

| | | | |
|---|---|---|---|
| Yield strength | $f_{yk}$ = | 500,00 | MPa |



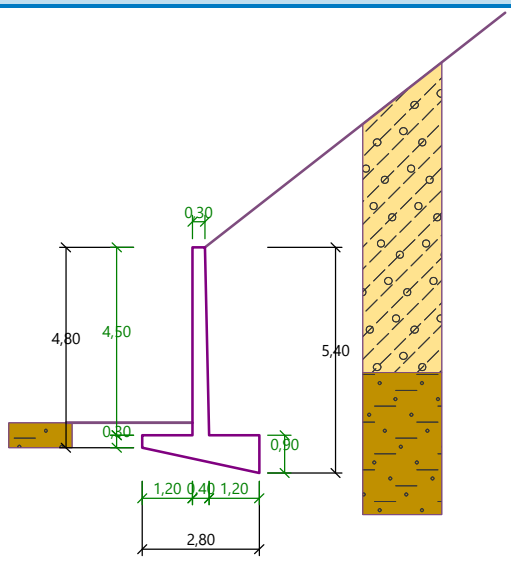
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## Geometry of structure

| No. | Coordinate X [m] | Depth Z [m] |
|---|---|---|
| 1 | 0,00 | 0,00 |
| 2 | 0,10 | 4,50 |
| 3 | 1,30 | 4,50 |
| 4 | 1,30 | 5,40 |
| 5 | -1,50 | 4,80 |
| 6 | -1,50 | 4,50 |
| 7 | -0,30 | 4,50 |
| 8 | -0,30 | 0,00 |

The origin [0,0] is located at the most upper right point of the wall.
Wall section area = 3,25 m$^2$.

**Name : Geometry** | **Stage - analysis : 1 - 0**




## Basic soil parameters

| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m$^3$] | $\gamma_{su}$ [kN/m$^3$] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | 30,20 | 0,00 | 20,00 | 10,00 | 20,13 |
| 2 | Nizko plastična glina z gruščem | | 33,50 | 0,60 | 20,30 | 10,30 | 22,30 |
| 3 | Blestnik | | 30,00 | 24,80 | 21,00 | 11,00 | 20,00 |

## Soil parameters to compute pressure at rest

| No. | Name | Pattern | Type calculation | $\varphi_{ef}$ [°] | $\nu$ [–] | OCR [–] | $K_r$ [–] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | cohesive | - | 0,30 | - | - |
| 2 | Nizko plastična glina z gruščem | | cohesive | - | 0,30 | - | - |
| 3 | Blestnik | | cohesive | - | 0,30 | - | - |



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## Soil parameters

**Peščen prod**

| | | |
|---|---|---|
| Unit weight : | $\gamma$ = | 20,00 kN/m$^3$ |
| Stress-state : | | effective |
| Angle of internal friction : | $\varphi_{ef}$ = | 30,20 ° |
| Cohesion of soil : | $c_{ef}$ = | 0,00 kPa |
| Angle of friction struc.-soil : | $\delta$ = | 20,13 ° |
| Soil : | | cohesive |
| Poisson's ratio : | $\nu$ = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ = | 20,00 kN/m$^3$ |

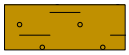
**Nizko plastična glina z gruščem**

| | | |
|---|---|---|
| Unit weight : | $\gamma$ = | 20,30 kN/m$^3$ |
| Stress-state : | | effective |
| Angle of internal friction : | $\varphi_{ef}$ = | 33,50 ° |
| Cohesion of soil : | $c_{ef}$ = | 0,60 kPa |
| Angle of friction struc.-soil : | $\delta$ = | 22,30 ° |
| Soil : | | cohesive |
| Poisson's ratio : | $\nu$ = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ = | 20,30 kN/m$^3$ |

**Blestnik**

| | | |
|---|---|---|
| Unit weight : | $\gamma$ = | 21,00 kN/m$^3$ |
| Stress-state : | | effective |
| Angle of internal friction : | $\varphi_{ef}$ = | 30,00 ° |
| Cohesion of soil : | $c_{ef}$ = | 24,80 kPa |
| Angle of friction struc.-soil : | $\delta$ = | 20,00 ° |
| Soil : | | cohesive |
| Poisson's ratio : | $\nu$ = | 0,30 |
| Saturated unit weight : | $\gamma_{sat}$ = | 21,00 kN/m$^3$ |

## Geological profile and assigned soils

| No. | Thickness of layer t [m] | Depth z [m] | Assigned soil | Pattern |
|---|---|---|---|---|
| 1 | 3,00 | 0,00 .. 3,00 | Nizko plastična glina z gruščem |  |
| 2 | - | 3,00 .. ∞ | Blestnik |  |

## Foundation

Type of foundation : soil from geological profile

## Terrain profile

Terrain behind construction has the slope 1: 1,28 (slope angle is 38,00 °).

## Water influence

Ground water table is located below the structure.

## Resistance on front face of the structure

Resistance on front face of the structure: 1/3 pass., 2/3 at rest
Soil on front face of the structure - Blestnik

| | |
|---|---|
| Angle of friction struc.-soil | $\delta$ = 0,00 ° |
| Soil thickness in front of structure | h = 0,60 m |

Terrain in front of structure is flat.



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### Settings of the stage of construction

Design situation : permanent
The wall is free to move. Active earth pressure is therefore assumed.
Reduction of soil/soil friction angle : do not reduce

## Verification No. 1

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. overtur. | Coeff. sliding | Coeff. stress |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -1,17 | 74,86 | 1,51 | 1,000 | 1,000 | 1,350 |
| Weight - soil | 0,00 | -0,45 | 7,56 | 0,60 | 1,000 | 1,000 | 1,350 |
| FF resistance | -21,96 | -0,28 | 0,03 | -0,60 | 1,000 | 1,000 | 1,350 |
| Weight - earth wedge | 0,00 | -2,83 | 128,87 | 2,19 | 1,000 | 1,000 | 1,350 |
| Active pressure | 325,55 | -1,56 | 181,15 | 2,80 | 1,350 | 1,350 | 1,350 |

### Verification of complete wall

**Check for overturning stability**
Resisting moment $M_{res}$ = 775,05 kNm/m
Overturning moment $M_{ovr}$ = 679,15 kNm/m

**Wall for overturning is SATISFACTORY**

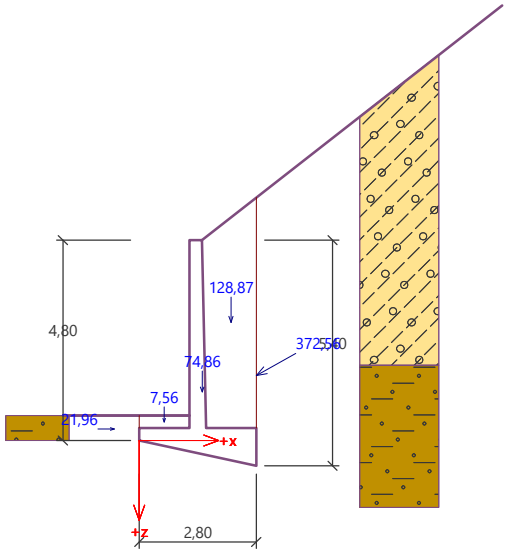
**Check for slip**
Resisting horizontal force $H_{res}$ = 314,20 kN/m
Active horizontal force $H_{act}$ = 312,74 kN/m

**Wall for slip is SATISFACTORY**

**Overall check - WALL is SATISFACTORY**

Maximum stress in footing bottom : 350,26 kPa

| Name : Verification | Stage - analysis : 1 - 1 |
|---|---|




## Bearing capacity of foundation soil

**Design load acting at the center of footing bottom**

| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] | Eccentricity [–] | Stress [kPa] |
|---|---|---|---|---|---|
| 1 | 316,57 | 603,96 | 274,20 | 0,187 | 332,71 |



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| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] | Eccentricity [–] | Stress [kPa] |
|---|---|---|---|---|---|
| 2 | 357,57 | 533,24 | 296,53 | 0,239 | 350,26 |

**Service load acting at the center of footing bottom**

| No. | Moment [kNm/m] | Norm. force [kN/m] | Shear Force [kN/m] |
|---|---|---|---|
| 1 | 234,50 | 447,37 | 203,11 |

### Verification of foundation soil

Stress in the footing bottom : rectangle

**Eccentricity verification**

Max. eccentricity of normal force $e$ = 0,239
Maximum allowable eccentricity $e_{alw}$ = 0,333

**Eccentricity of the normal force is SATISFACTORY**

**Verification of bearing capacity**

Ultimate bearing capacity of found. soil $R$ = 500,00 kPa
Partial factor on bearing capacity $\gamma_{Rv}$ = 1,40
Max. stress at footing bottom $\sigma$ = 350,26 kPa
Allowable bearing capacity of foundation soil $R_d$ = 357,14 kPa

**Bearing capacity of foundation soil is SATISFACTORY**

**Overall verification - bearing capacity of found. soil is SATISFACTORY**

## Dimensioning No. 1

### Wall stem check - front reinf.

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. moment | Coeff. norm.force | Coeff. shear for. |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -2,14 | 36,21 | 0,18 | 1,350 | 1,350 | 1,000 |
| FF resistance | -9,75 | -0,14 | 0,00 | 0,00 | 1,000 | 1,000 | 1,000 |
| Pressure at rest | 197,48 | -1,48 | 5,73 | 0,37 | 1,350 | 1,350 | 1,350 |

### Wall stem check - front reinf.

Front reinforcement is not required.

### Wall stem check - back reinf.

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Coeff. moment | Coeff. norm.force | Coeff. shear for. |
|---|---|---|---|---|---|---|---|
| Weight - wall | 0,00 | -2,14 | 36,21 | 0,18 | 1,350 | 1,350 | 1,000 |
| FF resistance | -9,75 | -0,14 | 0,00 | 0,00 | 1,000 | 1,000 | 1,000 |
| Pressure at rest | 197,48 | -1,48 | 5,73 | 0,37 | 1,350 | 1,350 | 1,350 |

### Wall stem check - back reinf.

Wall check at the construction joint 4,50 m from the wall crest
Reinforcement and dimensions of the cross-section
5 prof. 28,0 mm, cover 50,0 mm
Inputted reinforcement area = 3078,8 $mm^2$
Required reinforcement area = 3043,4 $mm^2$
Cross-section width = 1,00 m
Cross-section height = 0,40 m



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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reinforcement ratio | ρ | = | 0,92 | % | > | 0,14 | % | = $\rho_{min}$ |
| Position of neutral axis | x | = | 0,08 | m | < | 0,21 | m | = $x_{max}$ |
| Ultimate moment | $M_{Rd}$ | = | 399,29 | kNm | > | 393,60 | kNm | = $M_{Ed}$ |

Cross-section must be reinforced by shear reinforcement with minimal area of 781,5 mm²/m. $V_{Ed}$ = 256,86kN
**Cross-section is SATISFACTORY.**

### Wall jump check

### Forces acting on construction

| Name | $F_{hor}$ [kN/m] | App.Pt. z [m] | $F_{vert}$ [kN/m] | App.Pt. x [m] | Design coefficient |
|---|---|---|---|---|---|
| Weight - wall | 0,00 | -1,17 | 74,86 | 1,51 | 1,350 |
| Weight - soil | 0,00 | -0,45 | 7,56 | 0,60 | 1,350 |
| FF resistance | -21,96 | -0,28 | 0,03 | -0,60 | 1,350 |
| Weight - earth wedge | 0,00 | -2,83 | 128,87 | 2,19 | 1,350 |
| Active pressure | 325,55 | -1,56 | 181,15 | 2,80 | 1,350 |

### Wall jump check

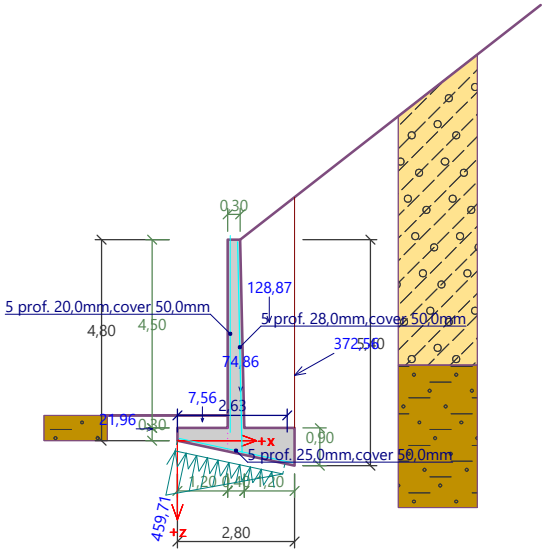
Reinforcement and dimensions of the cross-section
5 prof. 25,0 mm, cover 50,0 mm

| | | | | |
|---|---|---|---|---|
| Inputted reinforcement area | = | 2454,4 | mm² | |
| Required reinforcement area | = | 1928,3 | mm² | |
| Cross-section width | = | 1,00 | m | |
| Cross-section height | = | 0,56 | m | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reinforcement ratio | ρ | = | 0,50 | % | > | 0,14 | % | = $\rho_{min}$ |
| Position of neutral axis | x | = | 0,08 | m | < | 0,31 | m | = $x_{max}$ |
| Ultimate moment | $M_{Rd}$ | = | 493,66 | kNm | > | 393,60 | kNm | = $M_{Ed}$ |

Cross-section must be reinforced by shear reinforcement with minimal area of 848,0 mm²/m. $V_{Ed}$ = 410,31kN
**Cross-section is SATISFACTORY.**

| Name : Dimensioning | Stage - analysis : 1 - 1 |
|---|---|






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# T.5.5. Izpis stabilnostno statičnega izračuna jeklenih profilov varovanja platoja

# Analysis of anti-slide pile

## Input data

Project : Sanacija LC 261071 Šentlenart-Zilc. III. Faza
Part : HEA PROFILI (varovanje delovnega platoja)
Author : BLAN d.o.o.
Project number : GM - 94/2026

### Settings

Slovenia - EN 1997

### Materials and standards

Concrete structures : EN 1992-1-1 (EC2)
Coefficients EN 1992-1-1 : standard
Circle pile shear : simplified method
Steel structures : EN 1993-1-1 (EC3)
Partial factor on bearing capacity of steel cross section : $\gamma_{M0}$ = 1,00

### Pressure analysis

Verification methodology : according to EN 1997
Active earth pressure calculation : Coulomb
Passive earth pressure calculation : Caquot-Kerisel
Earthquake analysis : Mononobe-Okabe
Modulus of subsoil reaction : standard
Consider reduction of the modulus of subsoil reaction for a braced sheeting
Pressures below the slip surface : standard
Design approach : 2 - reduction of actions and resistances

| Partial factors on actions (A) | | | | | |
|---|---|---|---|---|---|
| Permanent design situation | | | | | |
| | | Unfavourable | | Favourable | |
| Permanent actions : | $\gamma_G$ = | 1,35 | [–] | 1,00 | [–] |
| Variable actions : | $\gamma_Q$ = | 1,50 | [–] | 0,00 | [–] |
| Water load : | $\gamma_w$ = | 1,35 | [–] | | |

| Partial factors for resistances (R) | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Partial factor on earth resistance : | $\gamma_{Re}$ = | 1,40 | [–] |

### Anchors

Verification methodology : Limit states (LSD)

| Reduction coefficients | | | |
|---|---|---|---|
| Reduction. coeff of steel strength : | $\gamma_s$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (soil) : | $\gamma_e$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (grouting) : | $\gamma_c$ = | 1,35 | [–] |

### Geometry of structure

Structure length = 6,00 m

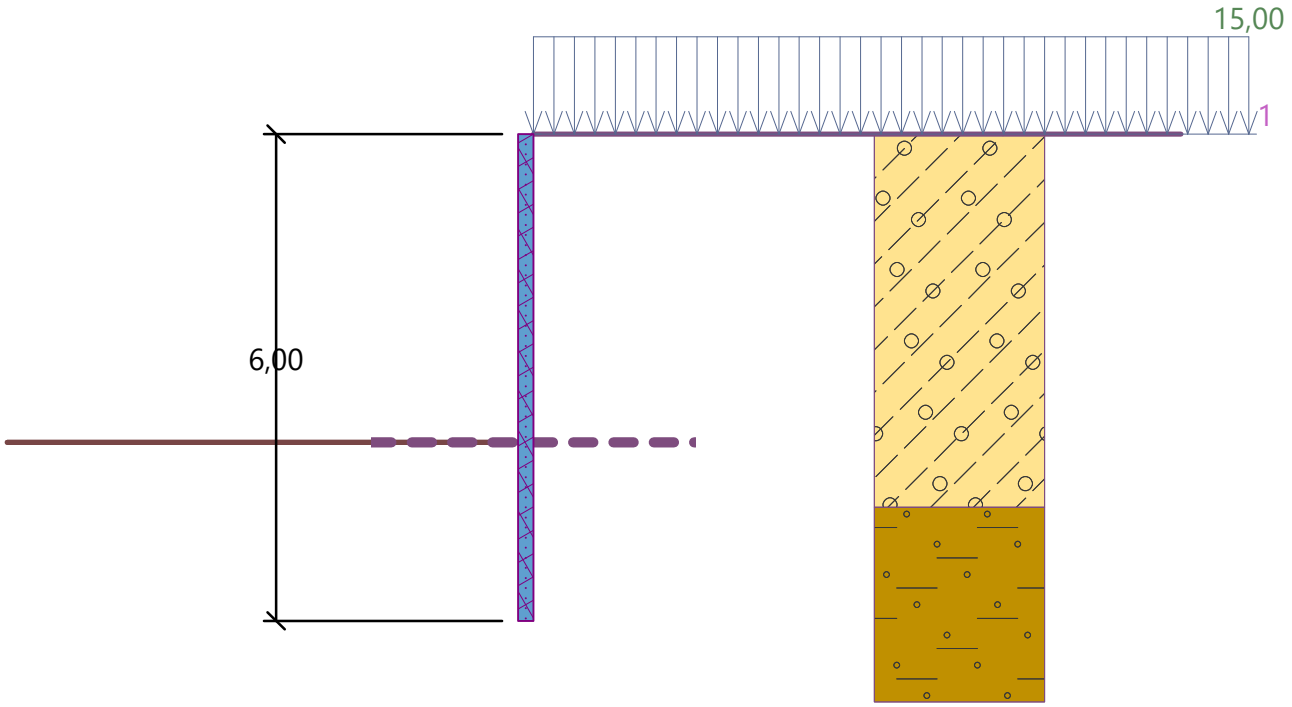
Cross-section name : I-section : HE 200 A, a = 1,00 m
Computed coefficient of pressure reduction below the ditch = 0,80
Area of cross-section A = 5,38E-03 $m^2/m$
Moment of inertia I = 3,69E-05 $m^4/m$
Sectional modulus W = 3,886E-04 $m^3/m$



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Plastic sectional modulus $W_{pl}$ = 4,295E-04 $m^3/m$

| Name : Geometry | Stage - analysis : 1 - 0 |
|---|---|




## Forces above the slip surface

Depth of slip surface $h_{s1}$ = 3,80 m
Input of active horizontal force : residual active force
Input of passive horizontal force : residual passive force

Active horizontal force T = 0,00 kN/m
Passive horizontal force P = 0,00 kN/m

Distribution of active force : triangle
Distribution of passive force : triangle

## Material of structure

**Structural steel: S 235**

Yield strength $f_y$ = 235,00 MPa
Elasticity modulus E = 210000,00 MPa
Shear modulus G = 81000,00 MPa

## Modulus of reaction

Modulus of subsoil reaction is computed by method Schmitt.

## Basic soil parameters

| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m³] | $\gamma_{su}$ [kN/m³] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | 30,20 | 0,00 | 20,00 | 10,00 | 20,13 |
| 2 | Nizko plastična glina z gruščem | | 33,50 | 0,60 | 20,30 | 10,30 | 22,30 |
| 3 | Blestnik | | 30,00 | 24,80 | 21,00 | 11,00 | 20,00 |



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## Soil parameters to compute pressure at rest

| No. | Name | Pattern | Type calculation | $\varphi_{ef}$ [°] | v [–] | OCR [–] | $K_r$ [–] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | cohesive | - | 0,30 | - | - |
| 2 | Nizko plastična glina z gruščem | | cohesive | - | 0,30 | - | - |
| 3 | Blestnik | | cohesive | - | 0,30 | - | - |

## Parameters of soils to compute modulus of subsoil reaction (Schmitt)

| No. | Name | Pattern | v [–] | $E_{oed}$ [MPa] | $E_{def}$ [MPa] |
|---|---|---|---|---|---|
| 1 | Peščen prod | | 0,30 | 20,00 | - |
| 2 | Nizko plastična glina z gruščem | | 0,30 | 10,00 | - |
| 3 | Blestnik | | 0,30 | 30,00 | - |

## Soil parameters

**Peščen prod**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,20 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,00 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,13 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 20,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,00 kN/m$^3$ |

**Nizko plastična glina z gruščem**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,30 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 33,50 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,60 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 22,30 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 10,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,30 kN/m$^3$ |

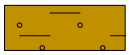
**Blestnik**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 21,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,00 ° |
| Cohesion of soil : | $c_{ef}$ | = | 24,80 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,00 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 30,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 21,00 kN/m$^3$ |



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### Geological profile and assigned soils

| No. | Thickness of layer t [m] | Depth z [m] | Assigned soil | Pattern |
|---|---|---|---|---|
| 1 | 4,60 | 0,00 .. 4,60 | Nizko plastična glina z gruščem |  |
| 2 | - | 4,60 .. ∞ | Blestnik |  |

### Excavation

Soil in front of wall is excavated to a depth of 3,80 m.

### Terrain profile

Terrain behind the structure is flat.

### Water influence

Ground water table is located below the structure.

### Input surface surcharges

| No. | Surcharge new | Surcharge change | Action | Mag.1 [kN/m²] | Mag.2 [kN/m²] | Ord.x x [m] | Length l [m] | Depth z [m] |
|---|---|---|---|---|---|---|---|---|
| 1 | Yes | | permanent | 15,00 | | | | on terrain |

| No. | Name |
|---|---|
| 1 | KORISTNA PROMET |

### Global settings

Number of FEs to discretize wall = 100
Analysis of depending pressures : reduce according to analysis settings
Minimum pressure is considered as $\sigma_{a,min} = 0{,}20\sigma_z$

### Settings of the stage of construction

Design situation : permanent

## Analysis results

### Pressure above the slip surface

| Depth [m] | Passive pressure [kPa] | Active pressure [kPa] |
|---|---|---|
| 0 | 0,00 | 0,00 |
| 3,80 | 0,00 | 0,00 |
| 3,80 | 0,00 | 0,00 |
| 3,80 | 0,00 | 0,00 |

### Distribution of pressures acting on the structure (in front and behind the wall) - below the slip surface

| Depth [m] | Ta,p [kPa] | Tk,p [kPa] | Tp,p [kPa] | Ta,z [kPa] | Tk,z [kPa] | Tp,z [kPa] |
|---|---|---|---|---|---|---|
| 3.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.82 | 0.00 | -0.10 | -2.93 | 23.41 | 31.70 | 364.98 |
| 3.90 | 0.00 | -0.72 | -10.03 | 23.88 | 32.31 | 372.09 |
| 4.60 | -3.66 | -5.57 | -65.54 | 27.54 | 37.16 | 427.60 |
| 4.60 | 0.00 | -5.57 | -110.08 | 14.94 | 37.16 | 381.03 |
| 6.00 | 0.00 | -15.65 | -196.53 | 19.64 | 47.24 | 467.48 |



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## Distributions of the modulus of subsoil reaction and internal forces on the structure

| Depth [m] | kh,p [MN/m3] | kh,z [MN/m3] | Displacement [mm] | Pressure [kPa] | Shear Force [kN/m] | Moment [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | -3.91 | 0.00 | -0.00 | 0.00 |
| 0.30 | 0.00 | 0.00 | -3.69 | 0.00 | 0.00 | -0.00 |
| 0.60 | 0.00 | 0.00 | -3.46 | 0.00 | 0.00 | -0.00 |
| 0.90 | 0.00 | 0.00 | -3.24 | 0.00 | 0.00 | -0.00 |
| 1.20 | 0.00 | 0.00 | -3.02 | 0.00 | 0.00 | -0.00 |
| 1.50 | 0.00 | 0.00 | -2.80 | 0.00 | 0.00 | -0.00 |
| 1.80 | 0.00 | 0.00 | -2.58 | 0.00 | 0.00 | -0.00 |
| 2.10 | 0.00 | 0.00 | -2.35 | 0.00 | 0.00 | -0.00 |
| 2.40 | 0.00 | 0.00 | -2.13 | 0.00 | 0.00 | -0.00 |
| 2.70 | 0.00 | 0.00 | -1.91 | 0.00 | 0.00 | -0.00 |
| 3.00 | 0.00 | 0.00 | -1.69 | 0.00 | 0.00 | -0.00 |
| 3.30 | 0.00 | 0.00 | -1.47 | 0.00 | 0.00 | -0.00 |
| 3.60 | 0.00 | 0.00 | -1.25 | 0.00 | 0.00 | -0.00 |
| 3.78 | 0.00 | 0.00 | -1.11 | 0.00 | 0.00 | -0.00 |
| 3.80 | 0.00 | 0.00 | -1.09 | 0.00 | 0.00 | -0.00 |
| 3.81 | 0.00 | 0.00 | -1.09 | 20.56 | -0.10 | 0.00 |
| 3.90 | 0.00 | 0.00 | -1.02 | 14.15 | -1.60 | 0.08 |
| 4.20 | 18.29 | 0.00 | -0.80 | 7.95 | -4.01 | 0.95 |
| 4.50 | 18.29 | 0.00 | -0.60 | 11.25 | -6.90 | 2.56 |
| 4.80 | 79.12 | 0.00 | -0.42 | -24.42 | -1.92 | 4.21 |
| 5.10 | 79.12 | 79.12 | -0.29 | -13.71 | 3.91 | 3.83 |
| 5.40 | 79.12 | 79.12 | -0.20 | 0.19 | 5.80 | 2.27 |
| 5.70 | 79.12 | 79.12 | -0.14 | 9.89 | 4.22 | 0.69 |
| 6.00 | 79.12 | 79.12 | -0.08 | 18.17 | -0.00 | 0.00 |

## Maximum values of internal forces acting on the structure

Maximum shear force = 7,59 kN/m
Maximum moment = 4,28 kNm/m
Maximum displacement = 3,9 mm
Displacement in the depth of slip surface = 1,1 mm

## Maximum internal forces on cross-section

Maximum shear force = 7,59 kN
Maximum moment = 4,28 kNm

## Terrain settlement behind the structure

Terrain settlement $\delta_{max}$ = 2,6 mm

| | Coordinates x [m] | Settlement z [mm] |
|---|---|---|
| 1 | 0,00 | 2,0 |
| 2 | 0,53 | 2,7 |
| 3 | 1,06 | 3,2 |
| 4 | 1,59 | 3,6 |
| 5 | 2,12 | 3,7 |
| 6 | 2,65 | 3,6 |
| 7 | 3,19 | 3,3 |
| 8 | 3,72 | 2,8 |
| 9 | 4,25 | 2,0 |



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| | Coordinates x [m] | Settlement z [mm] |
|---|---|---|
| 10 | 4,78 | 1,1 |
| 11 | 5,31 | 0,0 |

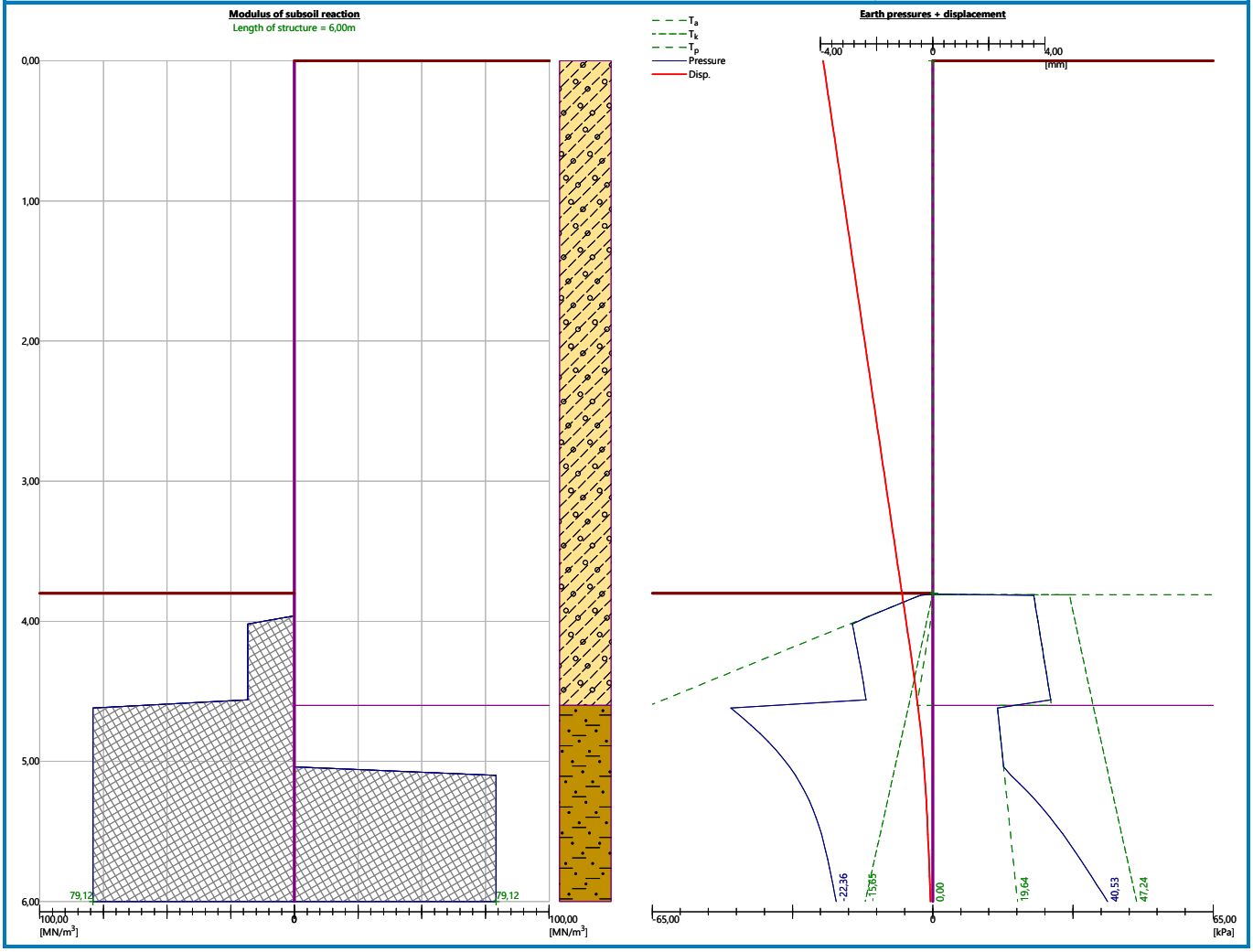
## Utilization of passive pressure

Maximum passive pressure $R_{max}$ = 241,52 kN/m
Mobilized passive pressure $R_{mob}$ = 55,22 kN/m

Requested safety factor $SF_p$ = 1,50 < 4,37

**Overall verification of passive pressure utilization is SATISFACTORY**

| Name : Analysis | Stage - analysis : 1 - -1 |
|---|---|

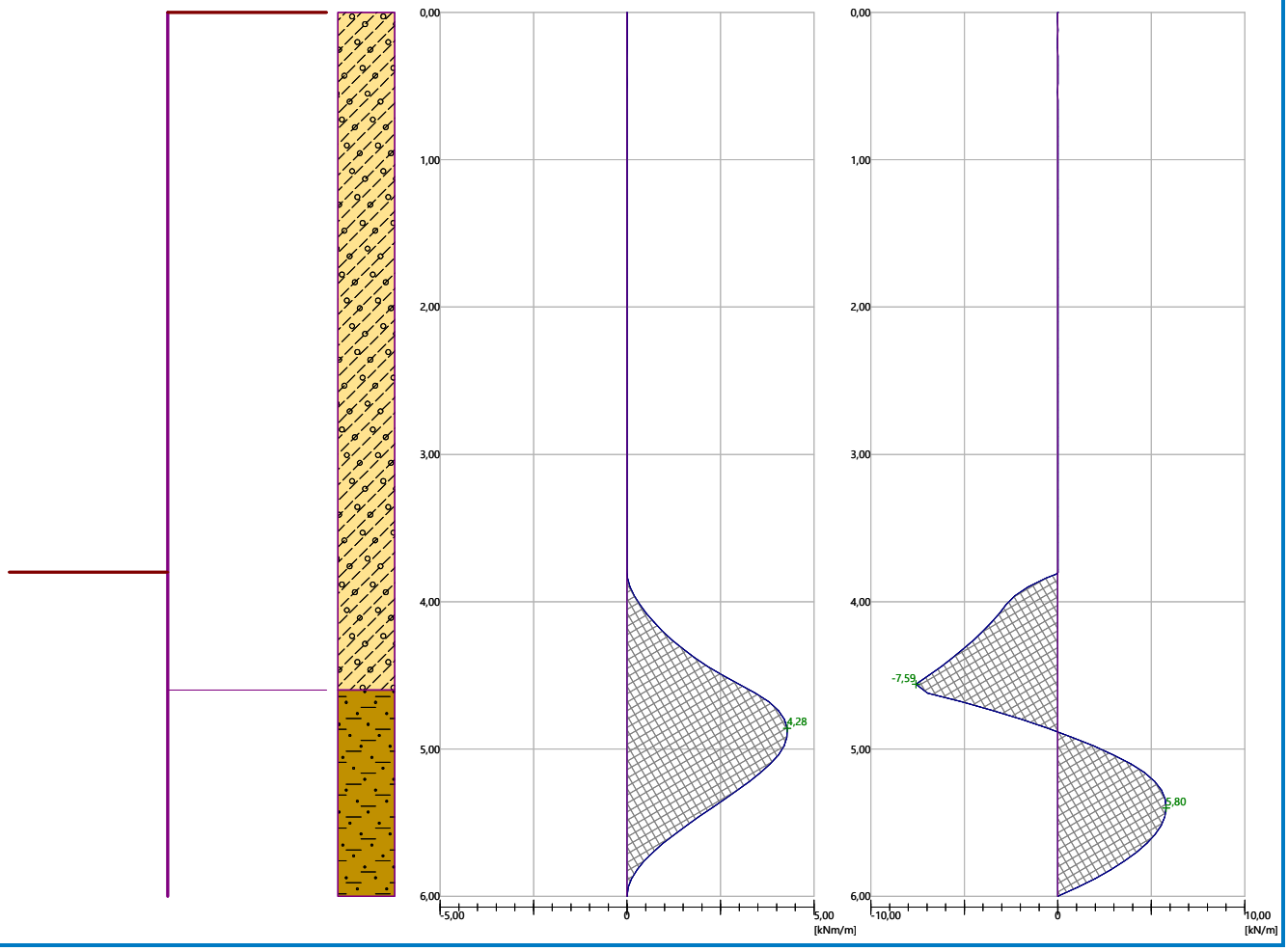





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## Name : Analysis

## Stage - analysis : 1 - -1



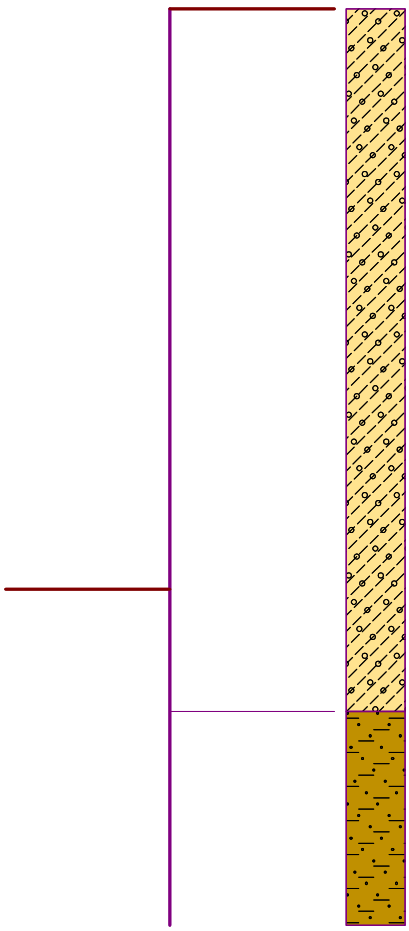



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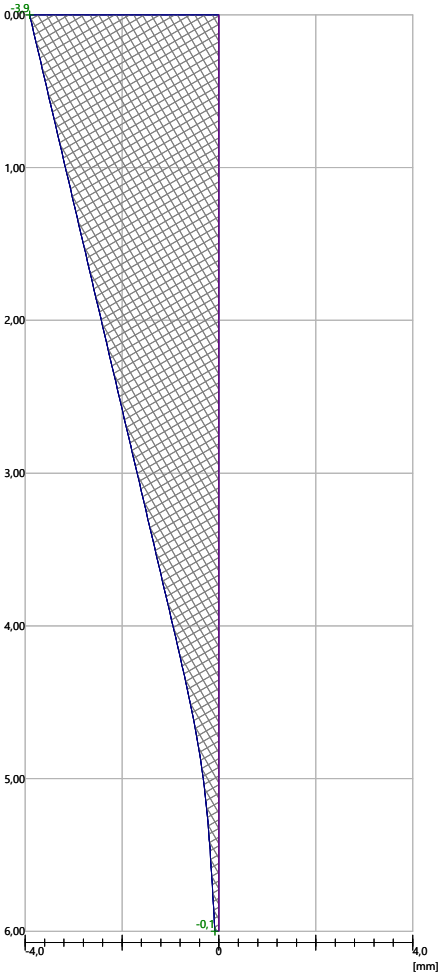
## Name : Analysis

## Stage - analysis : 1 - -1

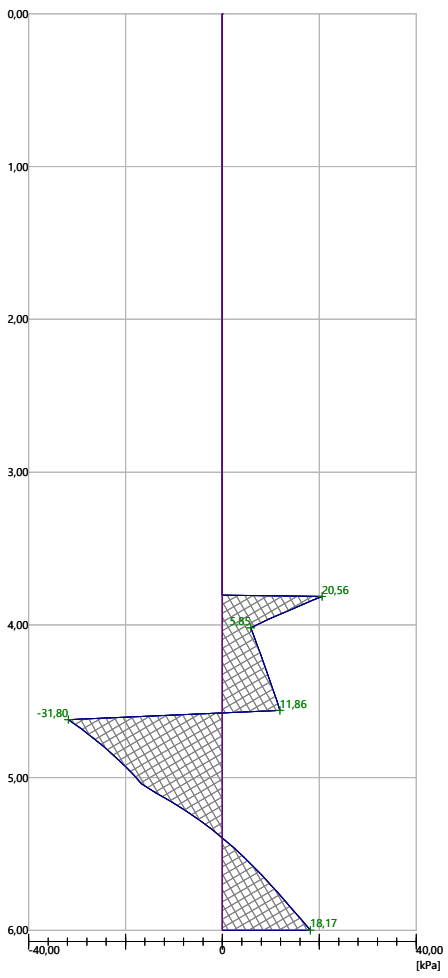
**Geometry of structure**
Length of structure = 6,00m



**Displacement of structure**
Max. disp. = 3,9 mm




**Pressure acting on structure**
Max. pressure = 31,80 kPa



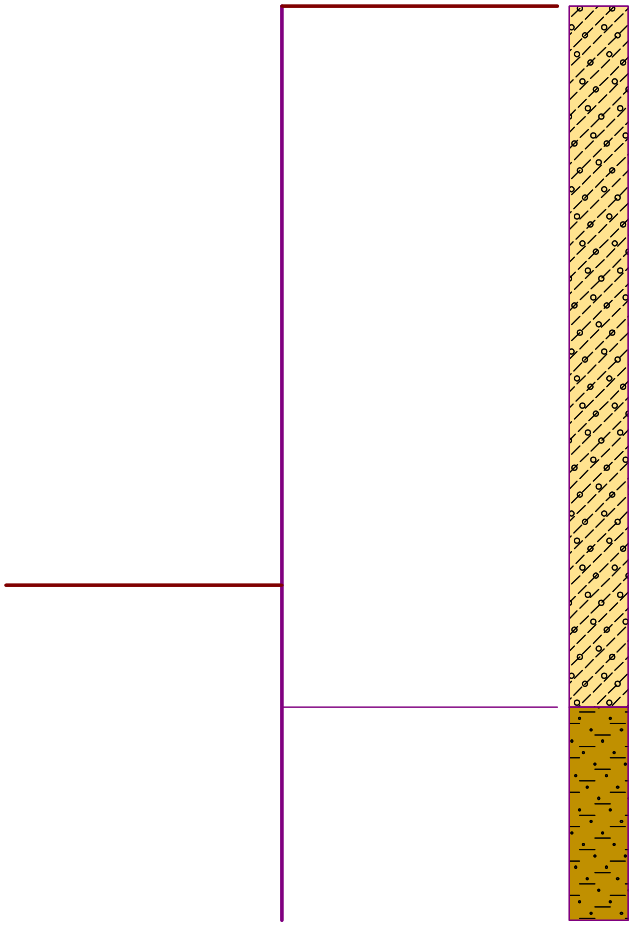



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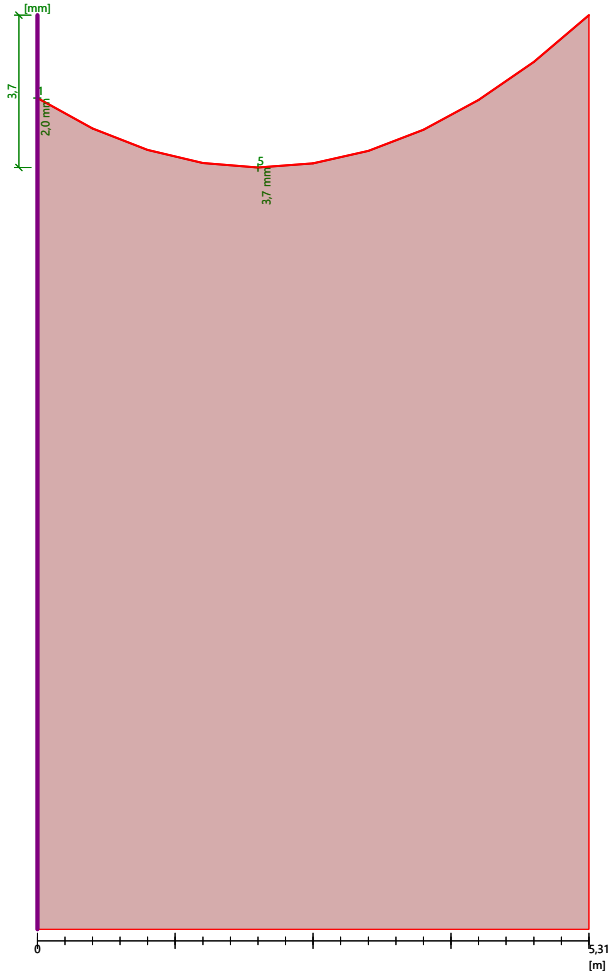
## Name : Analysis

## Stage - analysis : 1 - -1

**Modulus of subsoil reaction**
Length of structure = 6,00m



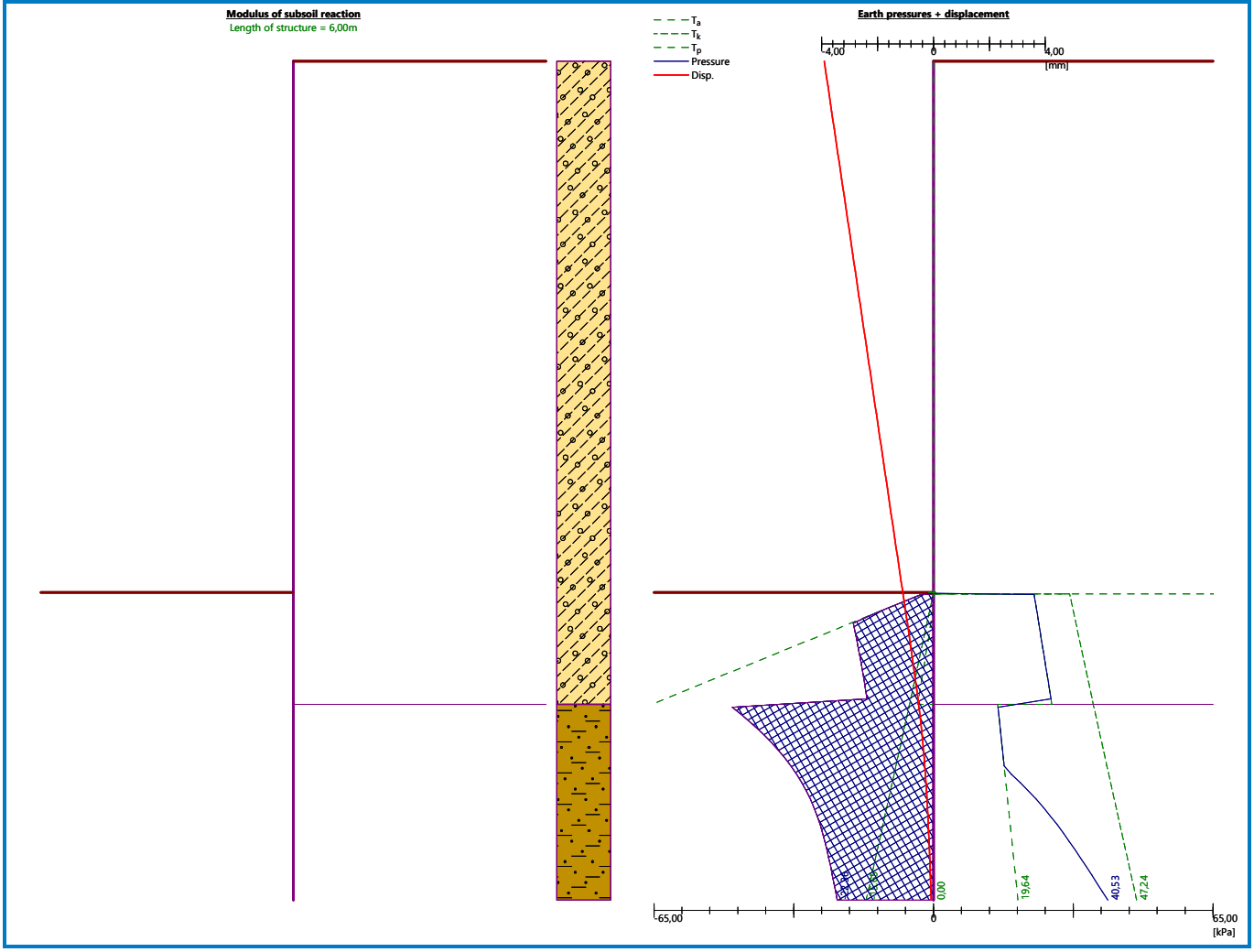
**Terrain settlement behind the structure**
Terrain settlement z = 3,7 mm






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| Name : Analysis | Stage - analysis : 1 - -1 |
|---|---|




## Dimensioning No. 1

### Distribution of forces on construction

| | Disp. min [mm] | Disp. max [mm] | Shear force min. [kN/m] | Shear force max [kN/m] | Moment min. [kNm/m] | Moment max. [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | -3.91 | -3.91 | -0.00 | -0.00 | 0.00 | 0.00 |
| 0.30 | -3.69 | -3.69 | 0.00 | 0.00 | -0.00 | -0.00 |
| 0.60 | -3.46 | -3.46 | 0.00 | 0.00 | -0.00 | -0.00 |
| 0.90 | -3.24 | -3.24 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.20 | -3.02 | -3.02 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.50 | -2.80 | -2.80 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.80 | -2.58 | -2.58 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.10 | -2.35 | -2.35 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.40 | -2.13 | -2.13 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.70 | -1.91 | -1.91 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.00 | -1.69 | -1.69 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.30 | -1.47 | -1.47 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.60 | -1.25 | -1.25 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.78 | -1.11 | -1.11 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.80 | -1.10 | -1.10 | 0.00 | 0.00 | -0.00 | -0.00 |



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| | Disp. min [mm] | Disp. max [mm] | Shear force min. [kN/m] | Shear force max [kN/m] | Moment min. [kNm/m] | Moment max. [kNm/m] |
|---|---|---|---|---|---|---|
| 3.80 | -1.09 | -1.09 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.81 | -1.09 | -1.09 | -0.10 | -0.10 | 0.00 | 0.00 |
| 3.90 | -1.02 | -1.02 | -1.60 | -1.60 | 0.08 | 0.08 |
| 4.20 | -0.80 | -0.80 | -4.01 | -4.01 | 0.95 | 0.95 |
| 4.50 | -0.60 | -0.60 | -6.90 | -6.90 | 2.56 | 2.56 |
| 4.80 | -0.42 | -0.42 | -1.92 | -1.92 | 4.21 | 4.21 |
| 5.10 | -0.29 | -0.29 | 3.91 | 3.91 | 3.83 | 3.83 |
| 5.40 | -0.20 | -0.20 | 5.80 | 5.80 | 2.27 | 2.27 |
| 5.70 | -0.14 | -0.14 | 4.22 | 4.22 | 0.69 | 0.69 |
| 6.00 | -0.08 | -0.08 | -0.00 | -0.00 | 0.00 | 0.00 |

## Maximum values of internal forces

Maximum displacement = -3,9 mm
Minimum displacement = -0,1 mm
Maximum bending moment = 4,28 kNm/m
Minimum bending moment = 0,00 kNm/m
Maximum shear force = 7,59 kN/m

## Verification of steel section according to EN 1993-1-1

All construction stages are taken into the analysis.
Partial factor on load = 1,00

**Internal forces per I-section**

$M_{max}$ = 4,28 kNm; Q = 0,52 kN
$Q_{max}$ = 7,59 kN; M = 2,99 kNm

**Verification of max. moment $M_{max}$ + Q:**

**Verification of bending:**

$M_{max}/M_{c,Rd} = 0,047 \leq 1$ **Is satisfactory**

**Verification of shear:**

$Q/V_{c,Rd} = 0,003 \leq 1$ **Is satisfactory**

**Verification of plane state of stress:**

Normal stress $\sigma_{x,Ed}$ = 9,86 MPa
Shear stress $\tau_{Ed}$ = 0,39 MPa

Verification: $(\sigma_{x,Ed}/(f_y/\gamma_{M0}))^2 + 3*(\tau_{Ed}/(f_y/\gamma_{M0}))^2 = 0,002 \leq 1$ **Is satisfactory**

**Verification of max. shear force $Q_{max}$ + M:**

**Verification of bending:**

$M/M_{c,Rd} = 0,033 \leq 1$ **Is satisfactory**

**Verification of shear:**

$Q_{max}/V_{c,Rd} = 0,050 \leq 1$ **Is satisfactory**

**Verification of plane state of stress:**

Normal stress $\sigma_{x,Ed}$ = 6,89 MPa
Shear stress $\tau_{Ed}$ = 5,69 MPa

Verification: $(\sigma_{x,Ed}/(f_y/\gamma_{M0}))^2 + 3*(\tau_{Ed}/(f_y/\gamma_{M0}))^2 = 0,003 \leq 1$ **Is satisfactory**

**Cross section is SATISFACTORY**



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# T.5.6. Izpis stabilnostno statičnega izračuna jeklenih profilov varovanja izkopov

# Analysis of anti-slide pile

## Input data

Project : Sanacija LC 261071 Šentlenart-Zilc. III. Faza
Part : HEA PROFILI (varovanje delovnega platoja)
Author : BLAN d.o.o.
Project number : GM - 94/2026

### Settings

Slovenia - EN 1997

### Materials and standards

Concrete structures : EN 1992-1-1 (EC2)
Coefficients EN 1992-1-1 : standard
Circle pile shear : simplified method
Steel structures : EN 1993-1-1 (EC3)
Partial factor on bearing capacity of steel cross section : $\gamma_{M0}$ = 1,00

### Pressure analysis

Verification methodology : according to EN 1997
Active earth pressure calculation : Coulomb
Passive earth pressure calculation : Caquot-Kerisel
Earthquake analysis : Mononobe-Okabe
Modulus of subsoil reaction : standard
Consider reduction of the modulus of subsoil reaction for a braced sheeting
Pressures below the slip surface : standard
Design approach : 2 - reduction of actions and resistances

| Partial factors on actions (A) | | | | | |
|---|---|---|---|---|---|
| Permanent design situation | | | | | |
| | | Unfavourable | | Favourable | |
| Permanent actions : | $\gamma_G$ = | 1,35 | [–] | 1,00 | [–] |
| Variable actions : | $\gamma_Q$ = | 1,50 | [–] | 0,00 | [–] |
| Water load : | $\gamma_w$ = | 1,35 | [–] | | |

| Partial factors for resistances (R) | | | |
|---|---|---|---|
| Permanent design situation | | | |
| Partial factor on earth resistance : | $\gamma_{Re}$ = | 1,40 | [–] |

### Anchors

Verification methodology : Limit states (LSD)

| Reduction coefficients | | | |
|---|---|---|---|
| Reduction. coeff of steel strength : | $\gamma_s$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (soil) : | $\gamma_e$ = | 1,35 | [–] |
| Reduction coefficient of pull out resistance (grouting) : | $\gamma_c$ = | 1,35 | [–] |

### Geometry of structure

Structure length = 6,00 m

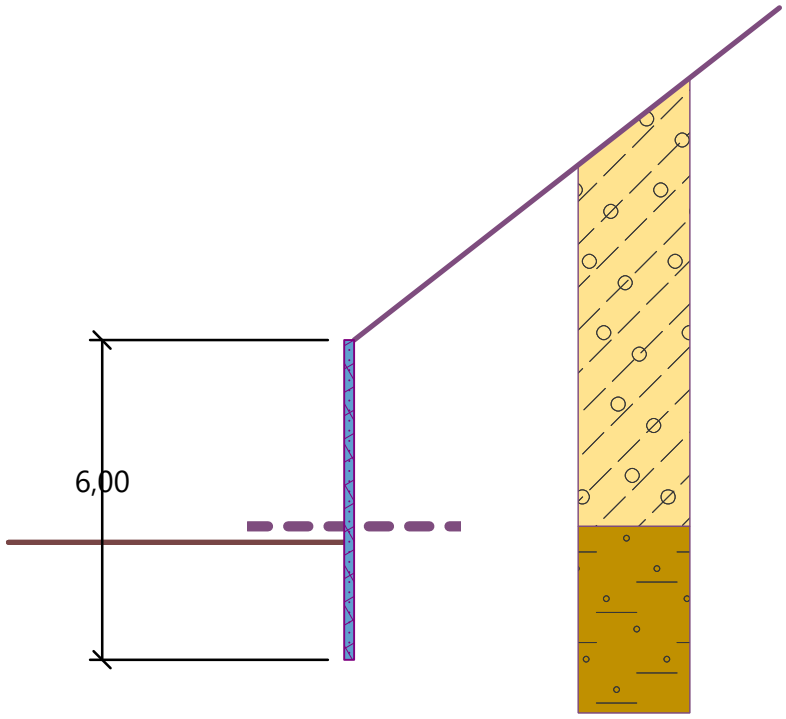
Cross-section name : I-section : HE 200 A, a = 1,00 m
Computed coefficient of pressure reduction below the ditch = 0,80
Area of cross-section A = 5,38E-03 $m^2/m$
Moment of inertia I = 3,69E-05 $m^4/m$
Sectional modulus W = 3,886E-04 $m^3/m$



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Plastic sectional modulus $W_{pl}$ = 4,295E-04 $m^3/m$

| Name : Geometry | Stage - analysis : 1 - 0 |
|---|---|




## Forces above the slip surface

Depth of slip surface $h_{s1}$ = 3,50 m
Input of active horizontal force : residual active force
Input of passive horizontal force : residual passive force

Active horizontal force T = 0,00 kN/m
Passive horizontal force P = 0,00 kN/m

Distribution of active force : triangle
Distribution of passive force : triangle

## Material of structure

**Structural steel: S 235**

Yield strength $f_y$ = 235,00 MPa
Elasticity modulus E = 210000,00 MPa
Shear modulus G = 81000,00 MPa

## Modulus of reaction

Modulus of subsoil reaction is computed by method Schmitt.

## Basic soil parameters

| No. | Name | Pattern | $\varphi_{ef}$ [°] | $c_{ef}$ [kPa] | $\gamma$ [kN/m³] | $\gamma_{su}$ [kN/m³] | $\delta$ [°] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | 30,20 | 0,00 | 20,00 | 10,00 | 20,13 |
| 2 | Nizko plastična glina z gruščem | | 33,50 | 0,60 | 20,30 | 10,30 | 22,30 |
| 3 | Blestnik | | 30,00 | 24,80 | 21,00 | 11,00 | 20,00 |



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## Soil parameters to compute pressure at rest

| No. | Name | Pattern | Type calculation | $\varphi_{ef}$ [°] | v [–] | OCR [–] | $K_r$ [–] |
|---|---|---|---|---|---|---|---|
| 1 | Peščen prod | | cohesive | - | 0,30 | - | - |
| 2 | Nizko plastična glina z gruščem | | cohesive | - | 0,30 | - | - |
| 3 | Blestnik | | cohesive | - | 0,30 | - | - |

## Parameters of soils to compute modulus of subsoil reaction (Schmitt)

| No. | Name | Pattern | v [–] | $E_{oed}$ [MPa] | $E_{def}$ [MPa] |
|---|---|---|---|---|---|
| 1 | Peščen prod | | 0,30 | 20,00 | - |
| 2 | Nizko plastična glina z gruščem | | 0,30 | 10,00 | - |
| 3 | Blestnik | | 0,30 | 30,00 | - |

## Soil parameters

**Peščen prod**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,20 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,00 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,13 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 20,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,00 kN/m$^3$ |

**Nizko plastična glina z gruščem**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 20,30 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 33,50 ° |
| Cohesion of soil : | $c_{ef}$ | = | 0,60 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 22,30 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 10,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 20,30 kN/m$^3$ |

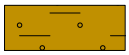
**Blestnik**

| | | | |
|---|---|---|---|
| Unit weight : | $\gamma$ | = | 21,00 kN/m$^3$ |
| Stress-state : | effective | | |
| Angle of internal friction : | $\varphi_{ef}$ | = | 30,00 ° |
| Cohesion of soil : | $c_{ef}$ | = | 24,80 kPa |
| Angle of friction struc.-soil : | $\delta$ | = | 20,00 ° |
| Soil : | cohesive | | |
| Poisson's ratio : | v | = | 0,30 |
| Oedometric modulus : | $E_{oed}$ | = | 30,00 MPa |
| Saturated unit weight : | $\gamma_{sat}$ | = | 21,00 kN/m$^3$ |



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### Geological profile and assigned soils

| No. | Thickness of layer t [m] | Depth z [m] | Assigned soil | Pattern |
|---|---|---|---|---|
| 1 | 3,50 | 0,00 .. 3,50 | Nizko plastična glina z gruščem |  |
| 2 | - | 3,50 .. ∞ | Blestnik |  |

### Excavation

Soil in front of wall is excavated to a depth of 3,80 m.

### Terrain profile

Terrain behind construction has the slope 1: 1,28 (slope angle is 38,00 °).

### Water influence

Ground water table is located below the structure.

### Global settings

Number of FEs to discretize wall = 100
Analysis of depending pressures : reduce according to analysis settings
Minimum pressure is considered as $\sigma_{a,min} = 0{,}20\sigma_z$

### Settings of the stage of construction

Design situation : permanent

## Analysis results

### Pressure above the slip surface

| Depth [m] | Passive pressure [kPa] | Active pressure [kPa] |
|---|---|---|
| 0 | 0,00 | 0,00 |
| 3,50 | 0,00 | 0,00 |
| 3,50 | 0,00 | 0,00 |
| 3,50 | 0,00 | 0,00 |

### Distribution of pressures acting on the structure (in front and behind the wall) - below the slip surface

| Depth [m] | Ta,p [kPa] | Tk,p [kPa] | Tp,p [kPa] | Ta,z [kPa] | Tk,z [kPa] | Tp,z [kPa] |
|---|---|---|---|---|---|---|
| 3.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.52 | 0.00 | 0.00 | 0.00 | 3.33 | 3.76 | 41.34 |
| 3.80 | 0.00 | 0.00 | 0.00 | 66.66 | 75.11 | 826.75 |
| 3.80 | 0.00 | -0.00 | -62.33 | 53.33 | 60.09 | 661.42 |
| 6.00 | 0.00 | -15.84 | -198.18 | 101.98 | 101.98 | 997.87 |

### Distributions of the modulus of subsoil reaction and internal forces on the structure

| Depth [m] | kh,p [MN/m³] | kh,z [MN/m³] | Displacement [mm] | Pressure [kPa] | Shear Force [kN/m] | Moment [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | -3.10 | 0.00 | 0.00 | -0.00 |
| 0.30 | 0.00 | 0.00 | -2.95 | 0.00 | 0.00 | 0.00 |
| 0.60 | 0.00 | 0.00 | -2.80 | 0.00 | 0.00 | -0.00 |
| 0.90 | 0.00 | 0.00 | -2.65 | 0.00 | 0.00 | -0.00 |
| 1.20 | 0.00 | 0.00 | -2.50 | 0.00 | 0.00 | -0.00 |
| 1.50 | 0.00 | 0.00 | -2.35 | 0.00 | 0.00 | -0.00 |



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| Depth [m] | kh,p [MN/m³] | kh,z [MN/m³] | Displacement [mm] | Pressure [kPa] | Shear Force [kN/m] | Moment [kNm/m] |
|---|---|---|---|---|---|---|
| 1.80 | 0.00 | 0.00 | -2.20 | 0.00 | 0.00 | -0.00 |
| 2.10 | 0.00 | 0.00 | -2.05 | 0.00 | 0.00 | -0.00 |
| 2.40 | 0.00 | 0.00 | -1.90 | 0.00 | 0.00 | -0.00 |
| 2.70 | 0.00 | 0.00 | -1.75 | 0.00 | 0.00 | -0.00 |
| 3.00 | 0.00 | 0.00 | -1.60 | 0.00 | 0.00 | -0.00 |
| 3.30 | 0.00 | 0.00 | -1.45 | 0.00 | 0.00 | -0.00 |
| 3.48 | 0.00 | 0.00 | -1.36 | 0.00 | 0.00 | -0.00 |
| 3.51 | 0.00 | 0.00 | -1.35 | 1.33 | -0.02 | 0.00 |
| 3.51 | 0.00 | 0.00 | -1.34 | 3.11 | -0.04 | 0.00 |
| 3.60 | 0.00 | 0.00 | -1.30 | 22.22 | -1.12 | 0.04 |
| 3.78 | 0.00 | 0.00 | -1.21 | 62.21 | -8.72 | 0.82 |
| 3.80 | 0.00 | 0.00 | -1.20 | -9.16 | -9.97 | 1.04 |
| 3.90 | 0.00 | 0.00 | -1.15 | -12.96 | -8.91 | 1.95 |
| 4.20 | 79.12 | 0.00 | -1.03 | -21.83 | -3.30 | 3.83 |
| 4.50 | 79.12 | 0.00 | -0.94 | -10.80 | 1.50 | 4.02 |
| 4.80 | 79.12 | 0.00 | -0.91 | -3.39 | 3.54 | 3.20 |
| 5.10 | 79.12 | 0.00 | -0.91 | 1.08 | 3.83 | 2.07 |
| 5.40 | 79.12 | 0.00 | -0.93 | 3.62 | 3.09 | 1.01 |
| 5.70 | 79.12 | 0.00 | -0.97 | 5.19 | 1.75 | 0.27 |
| 6.00 | 79.12 | 0.00 | -1.01 | 6.45 | 0.00 | -0.00 |

## Maximum values of internal forces acting on the structure

Maximum shear force = 9,97 kN/m
Maximum moment = 4,11 kNm/m
Maximum displacement = 3,1 mm
Displacement in the depth of slip surface = 1,3 mm

## Maximum internal forces on cross-section

Maximum shear force = 9,97 kN
Maximum moment = 4,11 kNm

## Terrain settlement behind the structure

Terrain settlement $\delta_{max}$ = 2,8 mm

| | Coordinates x [m] | Settlement z [mm] |
|---|---|---|
| 1 | 0,00 | 2,1 |
| 2 | 0,48 | 2,9 |
| 3 | 0,96 | 3,4 |
| 4 | 1,44 | 3,8 |
| 5 | 1,93 | 3,9 |
| 6 | 2,41 | 3,8 |
| 7 | 2,89 | 3,5 |
| 8 | 3,37 | 3,0 |
| 9 | 3,85 | 2,2 |
| 10 | 4,33 | 1,2 |
| 11 | 4,82 | 0,0 |
| 12 | 4,82 | 0,0 |


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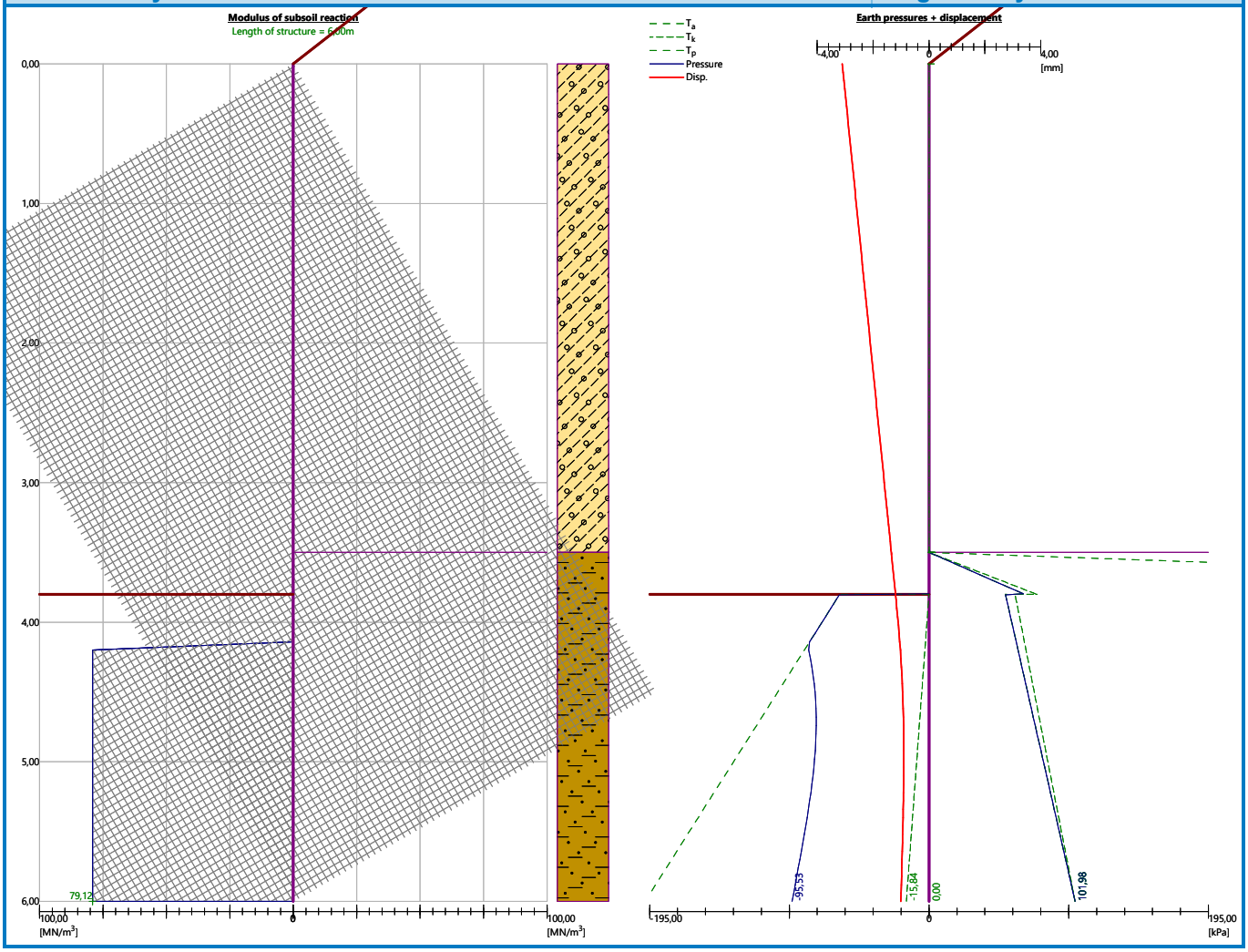
## Utilization of passive pressure

Maximum passive pressure $R_{max}$ = 286,55 kN/m
Mobilized passive pressure $R_{mob}$ = 180,77 kN/m

Requested safety factor $SF_p$ = 1,50 < 1,59

**Overall verification of passive pressure utilization is SATISFACTORY**

| Name : Analysis | Stage - analysis : 1 - -1 |
|---|---|

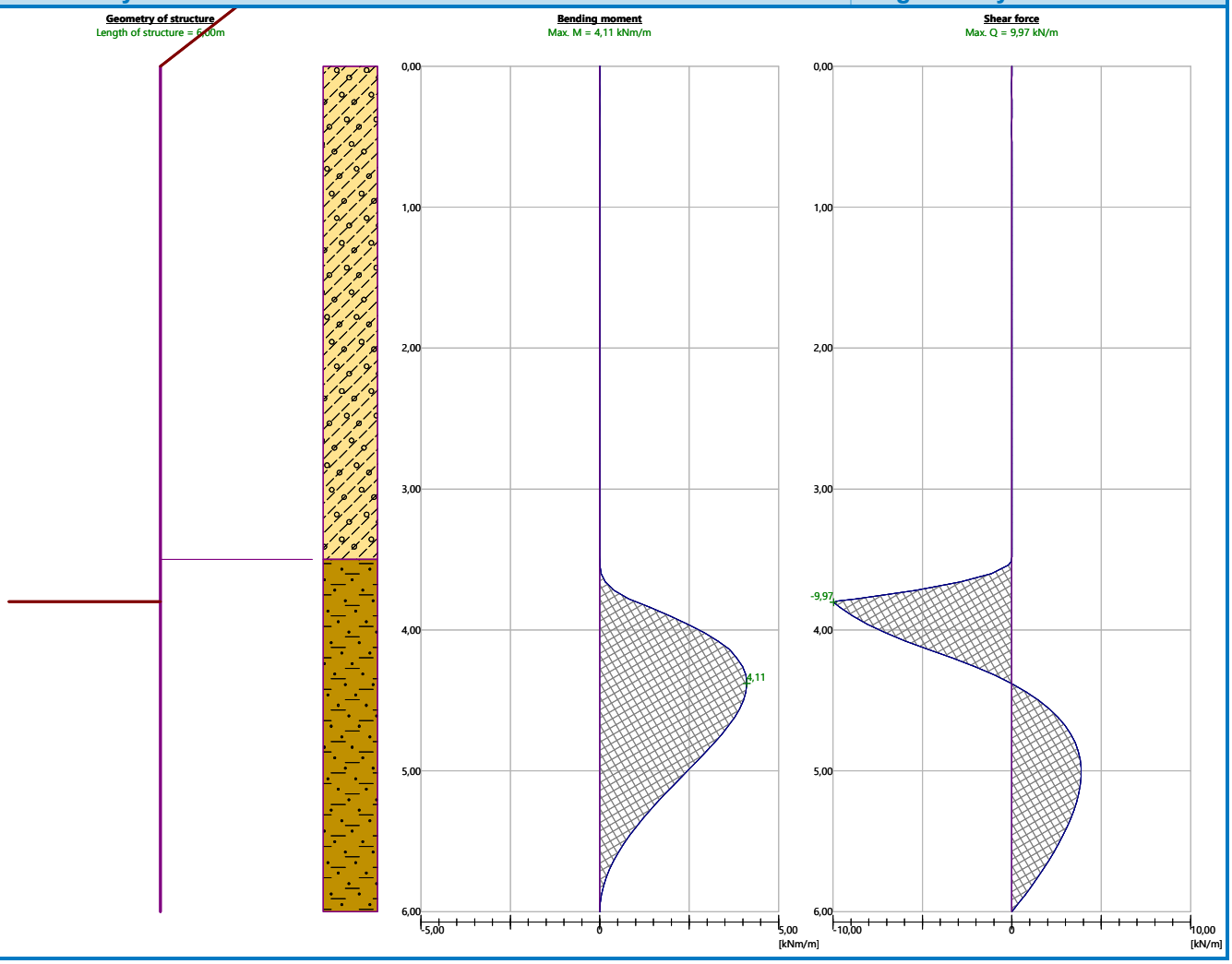





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## Name : Analysis

## Stage - analysis : 1 - -1

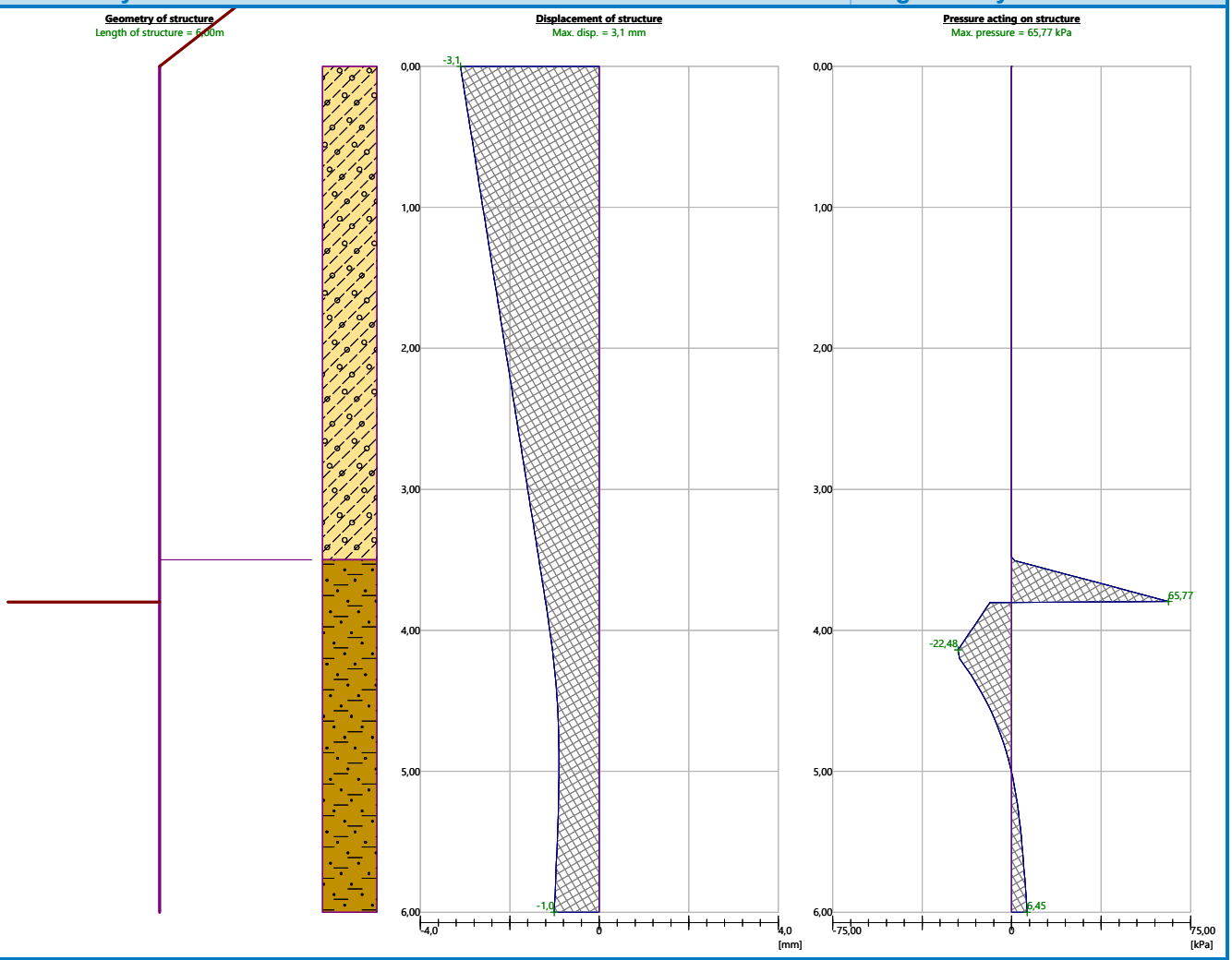





[GEO5 - Anti-Slide Pile (64 bit) | version 5.2024.122.0 | hardware key 9398 / 2 | BLAN d.o.o. | Copyright © 2024 Fine spol. s r.o. All Rights Reserved | www.finesoftware.eu]

## Name : Analysis

## Stage - analysis : 1 - -1

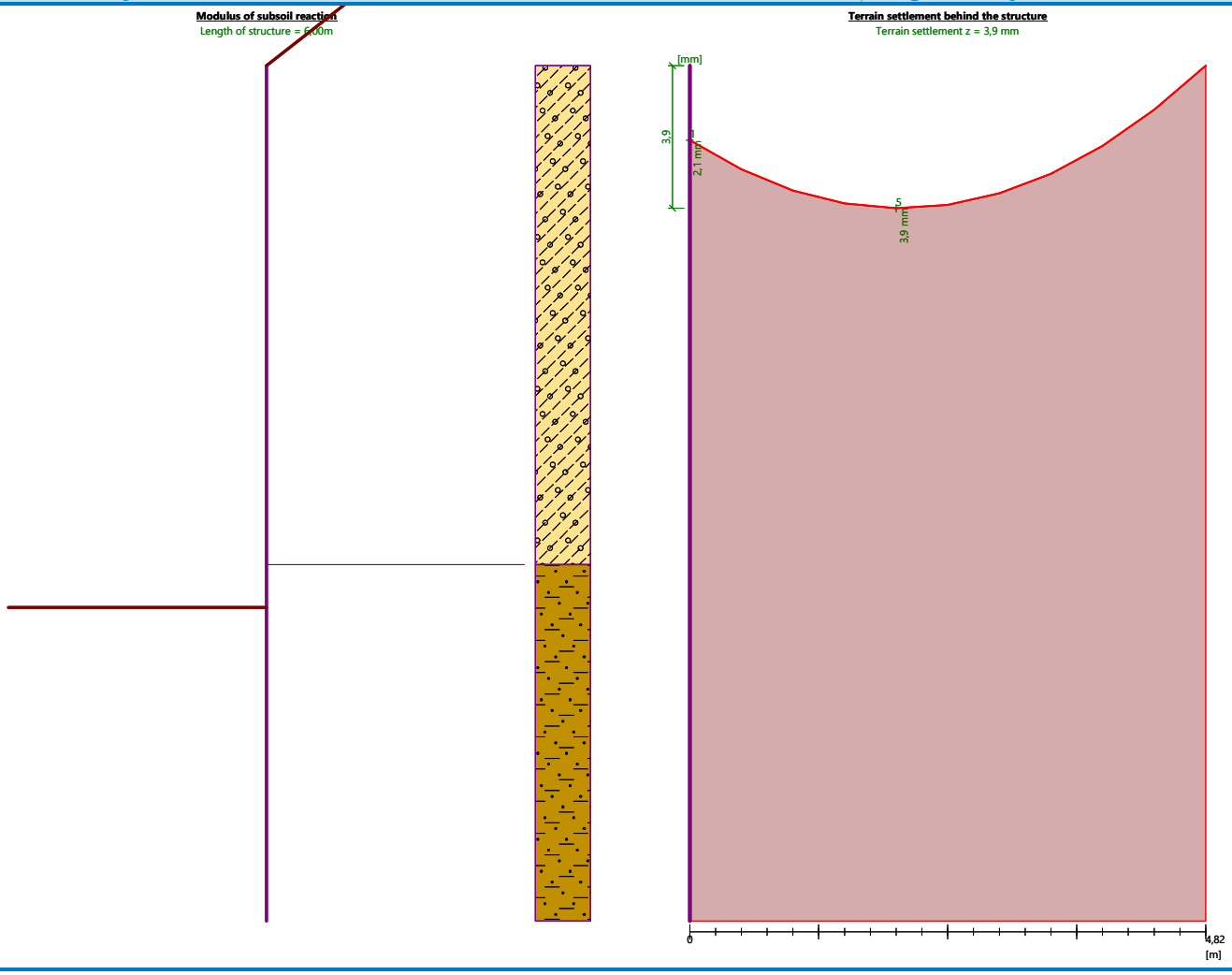





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## Name : Analysis

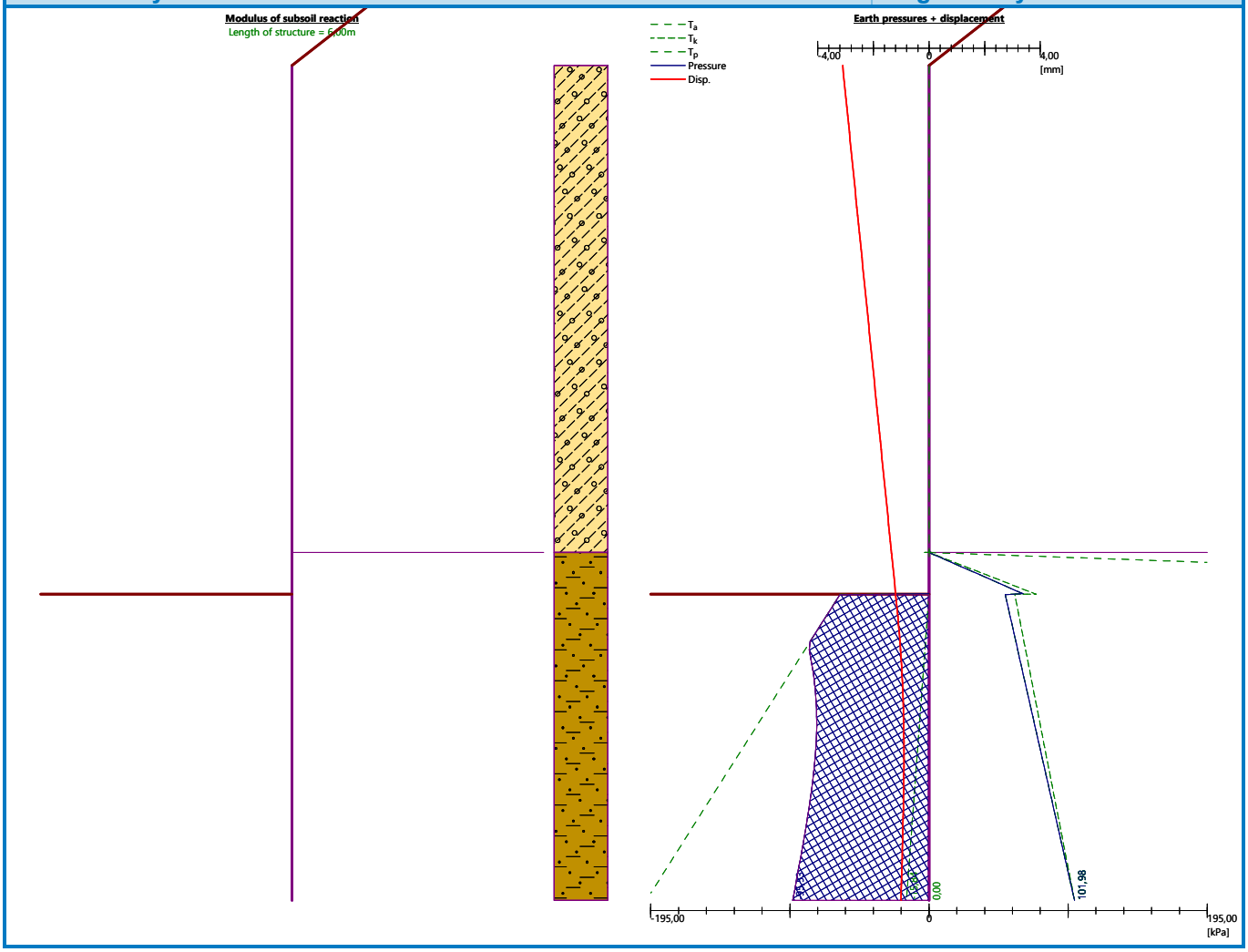
## Stage - analysis : 1 - -1






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| Name : Analysis | Stage - analysis : 1 - -1 |
|---|---|




## Dimensioning No. 1

### Distribution of forces on construction

| | Disp. min [mm] | Disp. max [mm] | Shear force min. [kN/m] | Shear force max [kN/m] | Moment min. [kNm/m] | Moment max. [kNm/m] |
|---|---|---|---|---|---|---|
| 0.00 | -3.10 | -3.10 | 0.00 | 0.00 | -0.00 | -0.00 |
| 0.30 | -2.95 | -2.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.60 | -2.80 | -2.80 | 0.00 | 0.00 | -0.00 | -0.00 |
| 0.90 | -2.65 | -2.65 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.20 | -2.50 | -2.50 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.50 | -2.35 | -2.35 | 0.00 | 0.00 | -0.00 | -0.00 |
| 1.80 | -2.20 | -2.20 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.10 | -2.05 | -2.05 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.40 | -1.90 | -1.90 | 0.00 | 0.00 | -0.00 | -0.00 |
| 2.70 | -1.75 | -1.75 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.00 | -1.60 | -1.60 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.30 | -1.45 | -1.45 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.48 | -1.36 | -1.36 | 0.00 | 0.00 | -0.00 | -0.00 |
| 3.51 | -1.35 | -1.35 | -0.02 | -0.02 | 0.00 | 0.00 |
| 3.51 | -1.34 | -1.34 | -0.04 | -0.04 | 0.00 | 0.00 |



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| | Disp. min [mm] | Disp. max [mm] | Shear force min. [kN/m] | Shear force max [kN/m] | Moment min. [kNm/m] | Moment max. [kNm/m] |
|---|---|---|---|---|---|---|
| 3.60 | -1.30 | -1.30 | -1.12 | -1.12 | 0.04 | 0.04 |
| 3.78 | -1.21 | -1.21 | -8.72 | -8.72 | 0.82 | 0.82 |
| 3.80 | -1.20 | -1.20 | -9.75 | -9.75 | 0.96 | 0.96 |
| 3.80 | -1.20 | -1.20 | -9.97 | -9.97 | 1.04 | 1.04 |
| 3.90 | -1.15 | -1.15 | -8.91 | -8.91 | 1.95 | 1.95 |
| 4.20 | -1.03 | -1.03 | -3.30 | -3.30 | 3.83 | 3.83 |
| 4.50 | -0.94 | -0.94 | 1.50 | 1.50 | 4.02 | 4.02 |
| 4.80 | -0.91 | -0.91 | 3.54 | 3.54 | 3.20 | 3.20 |
| 5.10 | -0.91 | -0.91 | 3.83 | 3.83 | 2.07 | 2.07 |
| 5.40 | -0.93 | -0.93 | 3.09 | 3.09 | 1.01 | 1.01 |
| 5.70 | -0.97 | -0.97 | 1.75 | 1.75 | 0.27 | 0.27 |
| 6.00 | -1.01 | -1.01 | 0.00 | 0.00 | -0.00 | -0.00 |

## Maximum values of internal forces

Maximum displacement = -3,1 mm
Minimum displacement = -0,9 mm
Maximum bending moment = 4,11 kNm/m
Minimum bending moment = 0,00 kNm/m
Maximum shear force = 9,97 kN/m

## Verification of steel section according to EN 1993-1-1

All construction stages are taken into the analysis.
Partial factor on load = 1,00

**Internal forces per I-section**

$M_{max}$ = 4,11 kNm; Q = 0,03 kN
$Q_{max}$ = 9,97 kN; M = 1,04 kNm

**Verification of max. moment $M_{max}$ + Q:**

**Verification of bending:**

$M_{max}/M_{c,Rd} = 0,045 \leq 1$ **Is satisfactory**

**Verification of shear:**

$Q/V_{c,Rd} = 0,000 \leq 1$ **Is satisfactory**

**Verification of plane state of stress:**

Normal stress $\sigma_{x,Ed}$ = 9,46 MPa
Shear stress $\tau_{Ed}$ = 0,02 MPa

Verification: $(\sigma_{x,Ed}/(f_y/\gamma_{M0}))^2 + 3*(\tau_{Ed}/(f_y/\gamma_{M0}))^2 = 0,002 \leq 1$ **Is satisfactory**

**Verification of max. shear force $Q_{max}$ + M:**

**Verification of bending:**

$M/M_{c,Rd} = 0,011 \leq 1$ **Is satisfactory**

**Verification of shear:**

$Q_{max}/V_{c,Rd} = 0,066 \leq 1$ **Is satisfactory**

**Verification of plane state of stress:**

Normal stress $\sigma_{x,Ed}$ = 2,40 MPa
Shear stress $\tau_{Ed}$ = 7,48 MPa

Verification: $(\sigma_{x,Ed}/(f_y/\gamma_{M0}))^2 + 3*(\tau_{Ed}/(f_y/\gamma_{M0}))^2 = 0,003 \leq 1$ **Is satisfactory**

**Cross section is SATISFACTORY**



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# T.6. POPIS DEL IN OCENA INVESTICIJE

# POPIS DEL Z OCENO INVESTICIJE

## Sanacija LC 261071 Šentlenart-Zilc, III.faza

## Načrt opornih konstrukcij, GM 94 - 2026

# REKAPITULACIJA

| | | |
|---|---|---|
| 1.0 | PREDDELA | 7,590.00 |
| 2.0 | PILOTNI STENI PS1 IN PS2 | 302,218.95 |
| 3.0 | OPORNI ZID | 159,539.60 |
| 4.0 | TUJE STORITVE | 18,436.00 |
| | **SKUPAJ :** | **487,784.55** |
| | **DDV 22%** | **107,312.60** |
| | **VSE SKUPAJ :** | **595,097.15** |

# POPIS DEL Z OCENO INVESTICIJE

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

| Št. | Šifra | OPIS DELA | Enota | Količina | Cena | VREDNOST |
|---|---|---|---|---|---|---|
| | **1.1** | **PREDDELA** | | | | |
| | | | | | | |
| 1. | | Geodetska dela - postavitev zakoličbenih točk ter druga geodetska dela | kpl | 1.00 | 2,500.00 | 2,500.00 |
| | | | | | | |
| 2. | | Postavitev in zavarovanje prečnih profilov | kos | 20.00 | 20.00 | 400.00 |
| | | | | | | |
| 3. | | Priprava delovišča, zaščita delovišča, priprava deloviščne table, postavitev kontejnerjev, odstranitev dreves, začasna zaščitna ograja pod cesto - varovanje pred izpadom kamenja na spodnje nivoje ter druga pripravljalna dela … | kpl | 1.00 | 1,500.00 | 1,500.00 |
| | | | | | | |
| 4. | | Dobava in postavitev popolne ali polovične cestne zapore v času gradnje, komplet z vsemi deli in materialom. + Elaborat zapore ceste | kpl | 1.00 | 2,500.00 | 2,500.00 |
| | | | | | | |
| | **1.1** | **PREDDELA SKUPAJ:** | | | | **6,900.00** |

# REKAPITULACIJA

| | | |
|---|---|---|
| 1.1 | PREDDELA | 6,900.00 |
| 1.2 | NEPREDVIDENA DELA 10% | 690.00 |
| | **SKUPAJ :** | **7,590.00** |
| | **DDV 22%** | **1,669.80** |
| | **VSE SKUPAJ :** | **9,259.80** |

# POPIS DEL Z OCENO INVESTICIJE

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

| Št. | Šifra | OPIS DELA | Enota | Količina | Cena | VREDNOST |
|---|---|---|---|---|---|---|
| | **2.1** | **ZEMELJSKA DELA** | | | | |
| | | | | | | |
| 1. | | Dobava, priostrenje, transport, zabijanje in izvlek profilov HEA 200 dolžine 6 m, S235 - varovanje delovnega platoja, 20 profilov (predviden večkratni izvlek in ponovna vgradnja profilov) | kg | 5,160.00 | 1.80 | 9,288.00 |
| | | | | | | |
| 2. | | Dobava smrekovih desk dolžine 1,0 m, debeline 5 cm in vgradnja med jeklene profile za varovanje delovnega platoja, vključno z odstranitvijo | m3 | 3.00 | 70.00 | 210.00 |
| | | | | | | |
| 3. | | Dobava in izdelava delovnega platoja iz drobljenega kamnitega materiala D32 z utrjevanjem, vključno z odstranitvijo | m3 | 850.00 | 20.00 | 17,000.00 |
| | | | | | | |
| 4. | | kategorije s prekladanjem zemljine na začasno mesto na delovišču, vključno z zasipavanjem izkopanega materiala ter utrjevanjem po slojih | m3 | 319.00 | 8.50 | 2,711.50 |
| | | | | | | |
| 5. | | Strojni izkopi v zemljini III. in IV. kategorije, vključno z nakladanjem in prevozom na deponijo na razdalji do 10 km in stroški deponiranja | m3 | 213.00 | 6.50 | 1,384.50 |
| | | | | | | |
| 6. | | Nakladanje in prevoz izkopanega materiala na deponijo na razdalji do 10 km in stroški deponiranja - material iz vrtin. | m3 | 247.00 | 5.50 | 1,358.50 |
| | | | | | | |
| 7. | | Izravnava in urejanje poškodovanih površin, humuziranje in zatravitev | m2 | 726.00 | 3.00 | 2,178.00 |
| | | | | | | |
| | **2.1** | **ZEMELJSKA DELA SKUPAJ :** | | | | **34,130.50** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **2.2** | **UVRTANI AB PILOTI** | | | | |
| | | | | | | |
| 1. | | Transport vrtalne garniture ter preostale opreme za vrtanje pilotov ϕ60 cm, vključno s premiki po gradbišču | kpl | 1.00 | 1,200.00 | 1,200.00 |
| | | | | | | |
| 2. | | Izdelava vrtin Φ60 cm v zemljini III., IV. in V. kategorije (prevladujejo: glina, grušč, tuf), vključno s cevitvijo. Vrtine dolžin 5,5 m ≈ 1 m. Skupaj 134 vrtin | m | 871.00 | 80.00 | 69,680.00 |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3. | | Dobava in kontraktorska vgradnja črpnega betona C25/30 XC2 PV-II D32 S3 v prerez nad 0,25 m3/m2-m1. | m3 | 247.00 | 100.00 | 24,700.00 |
| | | | | | | |
| 4. | | Dobava armaturnih palic B500-B ϕ10, ϕ12, ϕ16, ϕ25, izdelava armaturnih košev, transport in vgradnja | kg | 35,000.00 | 1.10 | 38,500.00 |
| | | | | | | |
| 5. | | Odbijanje glave pilota (v višini 0.3-0.5 m) iz ojačenega (armiranega) cementnega betona. Premer pilota 60 cm. | kos | 134.00 | 18.00 | 2,412.00 |
| | | | | | | |
| 6. | | Dobava in vgradnja inklinometrske PVC cevi premera npr. Ø60/71 ali Ø67/77 mm, dolžine 10 m, vključno z zaščitno kapico, spojkami in konico. | kos | 4.00 | 500.00 | 2,000.00 |
| | | | | | | |
| 7. | | Meritve zveznosti pilota. | kos | 134.00 | 90.00 | 12,060.00 |
| | | | | | | |
| | **2.2** | **UVRTANI AB PILOTI SKUPAJ :** | | | | **150,552.00** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **2.3** | **VEZNA AB GREDA** | | | | |
| | | | | | | |
| 1. | | Izdelava podprtega opaža za ravne temelje, komplet vsa dela z razopaževanjem, čiščenjem, zlaganjem ter vsemi transporti. - podložni beton | m2 | 107.00 | 16.00 | 1,712.00 |
| | | | | | | |
| 2. | | Izdelava dvostranskega vezanega opaža za ravne kampade (predpostavljena višina 1.0 m), komplet vsa dela z razopaževanjem, čiščenjem, zlaganjem ter vsemi transporti. Vključno s trikotnimi letvicami 2/2 cm za pobiranje vidnih robov. | m2 | 532.00 | 18.00 | 9,576.00 |
| | | | | | | |
| 3. | | Dobava in vgraditev podložnega cementnega betona C12/15 v prerez do 0,15 m3/m2-m1. | m3 | 64.00 | 90.00 | 5,760.00 |
| | | | | | | |
| 4. | | Dobava in vgraditev cementnega betona C30/37, XD3/XF4, PV-II, D32, S3 v prerez nad 0,50 m3/m2-m1. | m3 | 213.00 | 120.00 | 25,560.00 |
| | | | | | | |
| 5. | | Dobava in postavitev rebrastih armaturnih palic iz visokovrednega naravno trdega jekla B500-B s premerom 10 in 12 mm, za srednje zahtevno ojačitev. | m3 | 10,500.00 | 1.00 | 10,500.00 |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6. | | Material za dilatacijske rege debeline 2.0 cm, vključno z vgradnjo in izdelavo reg - trda penasta plošča (stirodur), trajno elastični zapolnitveni material in trajna elastična masa za stike -1.0m x 0.8m | kos | 13.00 | 30.00 | 390.00 |
| | | | | | | |
| 7. | | Dobava in vgradnja PVC cevi DN 110 v opaž grede pod naklonom 22 stopinj, dolžina cca. 1,0 m, luknja za rezervna sidrišča | kos | 67.00 | 15.00 | 1,005.00 |
| | | | | | | |
| | **2.3** | **VEZNA AB GREDA SKUPAJ :** | | | | **54,503.00** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **2.4** | **ODVODNJAVANJE** | | | | |
| | | | | | | |
| 1. | | Izdelava vzdolžne drenaže, globoke do 1,0 m, na podložni plasti iz cementnega betona, debeline 10 cm, z gibljivimi plastičnimi drenažnimi cevmi premera 20 cm | m1 | 242.00 | 14.00 | 3,388.00 |
| | | | | | | |
| 2. | | Zasip drenažne cevi z drenažnim zasipom D16/32 | m3 | 79.00 | 19.00 | 1,501.00 |
| | | | | | | |
| 3. | 43 186 | Dobava PE cevi DN 200 SN8 in izvedba odvoda vod na peščeni posteljici (pesek, brez kamnov) z zasipom po navodilih proizvajalca | m1 | 70.00 | 35.00 | 2,450.00 |
| | | | | | | |
| 4. | 43 833 | Preizkus tesnosti cevi premera 20 cm | m1 | 70.00 | 5.00 | 350.00 |
| | | | | | | |
| 5. | 44 173 | Izdelava jaška iz cementnega betona, krožnega prereza s premerom 800 cm, globokega 2,0 m, vključno z izdelavo betonskega ležišča C16/20 debeline 15 cm; z ureditvijo direktnega vtoka, vtoka drenaže, vtoka cestnega požiralnika in iztoka. | kos | 7.00 | 450.00 | 3,150.00 |
| | | | | | | |
| 6. | 44 799 | Preskus tesnosti jaška premera 80 cm | kos | 7.00 | 50.00 | 350.00 |
| | | | | | | |
| 7. | 44 917 | Dobava in vgradnja LTŽ pokrova (400 kN) vključno z vencem in razbremenilnim obročem. Všeta tudi izkop/zasip ter izdelava betonskega ležišča. | kos | 7.00 | 400.00 | 2,800.00 |
| | | | | | | |
| 8. | | Dobava in vgradnja betona C20/25 in lomljenec 20 cm v razmerju 30:70 za izdelavo in ureditev vtočnih in iztočnih glav iztokov. (2 iztoka dimenzije cca 3 x 1 m) | kos | 7.00 | 110.00 | 770.00 |
| | | | | | | |
| | **2.4** | **ODVODNJAVANJE SKUPAJ :** | | | | **14,759.00** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **2.5** | **BETONSKA OBLOGA** | | | | |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | | Transport opreme za izdvedbo brizganja betona vključno s premiki po gradbišču. | kpl | 1.00 | 800.00 | 800.00 |
| | | | | | | |
| 2. | | Zaščita brežine med piloti s cementnim brizganim betonom C25/30, d=15 cm. Zagladitev vidnega dela! V ceni upoštevati debelino d=20 cm (pribitek zaradi neravnin). | m2 | 185.00 | 60.00 | 11,100.00 |
| | | | | | | |
| 3. | | Dobava in vgradnja armaturnih mrež Q196 v brizgani beton, jeklo S500. Mreže se vgradijo v redino prereza betonske obloge. | kg | 1,000.00 | 1.40 | 1,400.00 |
| | | | | | | |
| 4. | | Dobava in vgradnja sider iz armaturnih palic fi 14 mm, uvrtana v AB pilote do globine 20 cm in lepljena s sidrno maso (kot npr. Hilti HIT HY 200A ali podobno) na vertikalnem razmaku cca 50 cm. Vključno z vsemi prenosi in vsem potrebnim pomožnim materialom in delom. | kos | 500.00 | 15.00 | 7,500.00 |
| | | | | | | |
| | **2.5** | **BETONSKA OBLOGA SKUPAJ :** | | | | **20,800.00** |

# REKAPITULACIJA

| | | |
|---|---|---|
| 2.1 | ZEMELJSKA DELA | 34,130.50 |
| 2.2 | UVRTANI AB PILOTI | 150,552.00 |
| 2.3 | VEZNA AB GREDA | 54,503.00 |
| 2.4 | ODVODNJAVANJE | 14,759.00 |
| 25 | ODVODNJAVANJE | 20,800.00 |
| 2.6 | NEPREDVIDENA DELA 10% | 27,474.45 |
| | **SKUPAJ :** | **302,218.95** |
| | **DDV 22%** | **66,488.17** |
| | **VSE SKUPAJ :** | **368,707.12** |

# POPIS DEL Z OCENO INVESTICIJE

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

| Št. | Šifra | OPIS DELA | Enota | Količina | Cena | VREDNOST |
|---|---|---|---|---|---|---|
| | **3.1** | **OPORNI ZID** | | | | |
| | | | | | | |
| 1. | | Dobava, priostrenje, transport, zabijanje in izvlek profilov HEA 200 dolžine 6 m, S235 - varovanje delovnega platoja, 20 profilov (predviden večkratni izvlek in ponovna vgradnja profilov) | kg | 5,160.00 | 1.80 | 9,288.00 |
| | | | | | | |
| 2. | | Dobava smrekovih desk dolžine 1,0 m, debeline 5 cm in vgradnja med jeklene profile za varovanje delovnega platoja, vključno z odstranitvijo | m3 | 3.00 | 70.00 | 210.00 |
| | | | | | | |
| 3. | | Strojni izkopi zemljini 3-5. kategorije (50:50) vključno z nakladanjem in prevozom na stalno deponijo. | m3 | 584.00 | 6.00 | 3,504.00 |
| | | | | | | |
| 4. | | Strojni izkopi v zemljini zemljini 3-5. kategorije (50:50) vključno s prenosom in deponiranjem na začasni deponiji ter ponovnim prenosom, vgradnjo in komprimiranjem za zasutje gradbene jame. | m3 | 1,246.00 | 6.00 | 7,476.00 |
| | | | | | | |
| 5. | | Dobava in vgradnja podložnega betona C12/15 debeline 20 cm za izravnavo temeljnih tal opornega zidu. | m3 | 42.00 | 90.00 | 3,780.00 |
| | | | | | | |
| 6. | | Dobava in vgradnja betona C30/37, XD3, XF4, PV-II; D32, S3 za temelj opornega zidu. | m3 | 167.00 | 150.00 | 25,050.00 |
| | | | | | | |
| 7. | | Dobava in vgradnja betona C30/37, XD3, XF4, PV-II; D32, S3 za steno opornega zidu. | m3 | 154.00 | 150.00 | 23,100.00 |
| | | | | | | |
| 8. | | Izdelava dvostranskega opaža s trikotnimi letvicami 2/2 cm za steno opornega zidu.<br>Komplet vsa dela z razopaževanjem, čiščenjem, zlaganjem lesa ter vsemi transporti. Upoštevan material za dilatacijske rege (trajna elastična zmes za stike, trajno elastični zapolnitveni material, polnilo za stike - 14 dilatacij). | m2 | 484.00 | 24.00 | 11,616.00 |
| | | | | | | |
| 9. | | Izdelava dvostranskega opaža za temelj opornega zidu.<br>Komplet vsa dela z razopaževanjem, čiščenjem, zlaganjem lesa ter vsemi transporti. | m2 | 106.00 | 19.00 | 2,014.00 |
| | | | | | | |
| 10. | | Dobava in vgradnja armature za oporni zid (skupna teža armature za temelj in steno opornega zidu). Betonsko jeklo kvalitete S 500B. Količina vključuje palice ϕ10, ϕ14, ϕ22, ϕ28,… | kg | 42,000.00 | 1.30 | 54,600.00 |
| | | | | | | |
| 11. | | Dobava in vgradnja drenažnega zasipa. | m3 | 82.00 | 19.00 | 1,558.00 |

| Št. | Šifra | OPIS DELA | Enota | Količina | Cena | VREDNOST |
|---|---|---|---|---|---|---|
| | | | | | | |
| 12. | | Dobava in vgradnja ločilnega geosintetika (filc) za ločitev dranažnega in zalednega zasipa vključno z izvedbo ustreznega prekrivanja. | m2 | 296.00 | 2.50 | 740.00 |
| | | | | | | |
| 13. | | Dobava in vgradnja PE kanalizacijskih cevi Ø 200 mm za izvedbo izcednic na višini cca 0,7 m nad vrhom temelja. Vključno z vsem potrebnim pomožnim materialom, razrezom in vgradnjo kosov v opaž. | m | 20.00 | 25.00 | 500.00 |
| | | | | | | |
| 14. | | Izravnava in urejanje poškodovanih površin, ureditev brežine pod opornim zidom, humuziranje celotnega dela in druga zaključna dela | m2 | 800.00 | 2.00 | 1,600.00 |
| | | | | | | |
| | **3.1** | **OPORNI ZID SKUPAJ :** | | | | **145,036.00** |

## REKAPITULACIJA

| | | |
|---|---|---|
| 3.1 | OPORNI ZID | 145,036.00 |
| 3.2 | NEPREDVIDENA DELA 10% | 14,503.60 |
| | **SKUPAJ :** | **159,539.60** |
| | **DDV 22%** | **35,098.71** |
| | **VSE SKUPAJ :** | **194,638.31** |

# POPIS DEL Z OCENO INVESTICIJE

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

**Sanacija LC 261071 Šentlenart-Zilc, III.faza**

| Št. | Šifra | OPIS DELA | Enota | Količina | Cena | VREDNOST |
|---|---|---|---|---|---|---|
| | **4.1** | **TUJE STORITVE** | | | | |
| | | | | | | |
| 1. | | Projektnatsko geomehanski nadzor (vključeni potni stroški + nadzor) | kos | 1.00 | 5,500.00 | 5,500.00 |
| | | | | | | |
| 2. | | Izdelava PID | kos | 1.00 | 6,500.00 | 6,500.00 |
| | | | | | | |
| 3. | | Meritve zbitosti tamponskega nasutja z dinamično krožno ploščo | kom | 12.00 | 30.00 | 360.00 |
| | | | | | | |
| 4. | | Vgradnja reperjev v vezno gredo in geodetsko opazovanje v smereh y,x,z (2 meritve), vključno z izdelavo poročila | kpl | 4.00 | 800.00 | 3,200.00 |
| | | | | | | |
| 5. | | Izvedba inklinometrskih meritev. Skupaj: 4 inklinometri. Referenčna in prva meritev. Izdelava poročila inklinometrskih meritev. | kpl | 1.00 | 1,200.00 | 1,200.00 |
| | | | | | | |
| | **4.1** | **TUJE STORITVE SKUPAJ:** | | | | **16,760.00** |

# REKAPITULACIJA

| | | |
|---|---|---|
| 4.1 | TUJE STORITVE | 16,760.00 |
| 4.2 | NEPREDVIDENA DELA 10% | 1,676.00 |
| | **SKUPAJ :** | **18,436.00** |
| | **DDV 22%** | **4,055.92** |
| | **VSE SKUPAJ :** | **22,491.92** |

# G. RISBE

# KAZALO RISB


| Št. | Vsebina risbe | Oznaka prikaza |
|---|---|---|
| 1. | Gradbena in ureditvena situacija - pilotna stena PS1 | G.1 |
| 2. | Zakoličbena situacija - pilotna stena PS1 | G.2 |
| 3. | Gradbena in ureditvena situacija - pilotna stena PS2 | G.3 |
| 4. | Zakoličbena situacija - pilotna stena PS2 | G.4 |
| 5. | Gradbena in ureditvena situacija - oporni zid | G.5 |
| 6. | Zakoličbena situacija - Oporni zid | G.6 |
| 7. | Pilotna stena PS 1 – tloris in razviti pogled | G.7 |
| 8. | Pilotna stena PS 2 – tloris in razviti pogled | G.8 |
| 9. | Pilotni steni PS 1in PS2 – armaturni načrt | G.9 |
| 10. | Pilotni steni PS 1 – profili | G.10 |
| 11. | Pilotni steni PS2 – profili | G.11 |
| 12. | Oporni zid – Tloris in razviti pogled | G.12 |
| 13. | Oporni zid – armaturni načrt | G.13 |
| 14. | Oporni zid – profili | G.14 |

739/1

739/42

S 324
739/30

S 326
739/31

S 327
739/32

S 329
739/33

S 331
739/34

S 334
739/35

A22 0+380.00

A23 0+400.00

A24 0+420.00

A25 0+440.00

A26 0+460.00

A27 0+480.00

A28 0+500.00

A29 0+516.16

Razširitev za izvoz Vlačilcev

R=500.00

2262/17

2.50%

asfalt

Zbirni jašek
-fi 80
-globina cca 2,0 m

Drenažna cev fi 200mm
in drenažni zasip

Pilotna stena PS1, l=cca 137 m
-piloti fi 60 cm / 1,8 m, l=5,5m
-vezna greda 80/100 cm

AB pilot
fi 60 cm

AB vezna greda
80/100 cm

Kamniti iztok

VGJ berlinska stena
-HEA 200/1 m, l=6m
-deske d=5cm

Delovni plato
-nasutje D32

602.82 602.21 602.57 602.06 602.71 602.42 602.82 602.95 602.50 602.84 602.76 602.83 603.05 603.16 603.43 603.68 603.28 603.57 604.34 605.09 605.89 606.07 606.60 606.95 606.86 604.97 605.14 605.44 605.74 605.84 607.08 607.11 605.17 605.85 602.28 602.24 605.57 606.08 604.69

S 1505

*352

S 499

731

## Legenda:

— Parcelne meje — Odvodnjavanje — Nasutje

— Pilotna stena/oporni zid

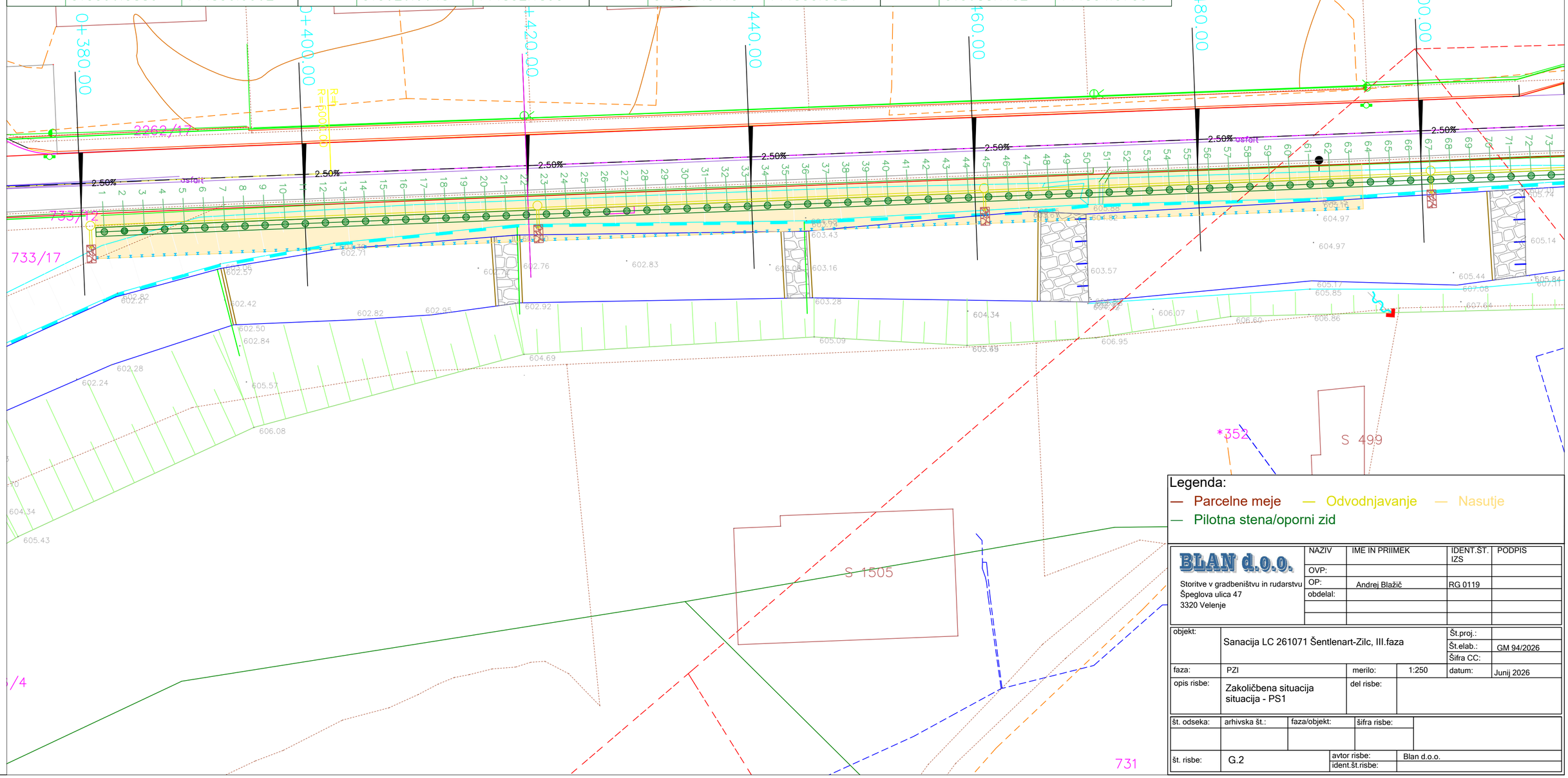
| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Gradbena in ureditvena situacija - PS1 | del risbe: | | | |

| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | |
|---|---|---|---|---|
| | | | | |
| št. risbe: | G.1 | avtor risbe: | Blan d.o.o. | |
| | | ident.št.risbe: | | |

## TOČKE ZAKOLIČBE – PS1

| Točka | X | Y |
|---|---|---|
| 1 | 515571.2089 | 144829.9718 |
| 2 | 515573.0074 | 144830.0458 |
| 3 | 515574.8058 | 144830.1198 |
| 4 | 515576.6043 | 144830.1938 |
| 5 | 515578.4028 | 144830.2678 |
| 6 | 515580.2013 | 144830.3418 |
| 7 | 515581.9998 | 144830.4158 |
| 8 | 515583.7982 | 144830.4898 |
| 9 | 515585.5967 | 144830.5638 |
| 10 | 515587.3952 | 144830.6378 |
| 11 | 515589.1937 | 144830.7118 |
| 12 | 515590.9921 | 144830.7858 |
| 13 | 515592.7908 | 144830.8559 |
| 14 | 515594.5894 | 144830.9260 |
| 15 | 515596.3880 | 144830.9962 |
| 16 | 515598.1867 | 144831.0664 |
| 17 | 515599.9853 | 144831.1366 |
| 18 | 515601.7839 | 144831.2068 |
| 19 | 515603.5826 | 144831.2769 |
| 20 | 515605.3812 | 144831.3471 |
| 21 | 515607.1798 | 144831.4173 |
| 22 | 515608.9785 | 144831.4875 |
| 23 | 515610.7771 | 144831.5577 |
| 24 | 515612.5757 | 144831.6279 |
| 25 | 515614.3743 | 144831.6980 |
| 26 | 515616.1730 | 144831.7682 |
| 27 | 515617.9716 | 144831.8384 |
| 28 | 515619.7702 | 144831.9086 |
| 29 | 515621.5689 | 144831.9788 |
| 30 | 515623.3675 | 144832.0489 |
| 31 | 515625.1661 | 144832.1191 |
| 32 | 515626.9648 | 144832.1893 |
| 33 | 515628.7634 | 144832.2595 |
| 34 | 515630.5620 | 144832.3297 |
| 35 | 515632.3607 | 144832.3999 |
| 36 | 515634.1593 | 144832.4700 |
| 37 | 515635.9579 | 144832.5402 |
| 38 | 515637.7566 | 144832.6104 |
| 39 | 515639.5552 | 144832.6806 |
| 40 | 515641.3538 | 144832.7508 |
| 41 | 515643.1524 | 144832.8209 |
| 42 | 515644.9511 | 144832.8911 |
| 43 | 515646.7497 | 144832.9613 |
| 44 | 515648.5483 | 144833.0315 |
| 45 | 515650.3470 | 144833.1017 |
| 46 | 515652.1456 | 144833.1719 |
| 47 | 515653.9442 | 144833.2420 |
| 48 | 515655.7429 | 144833.3122 |
| 49 | 515657.5415 | 144833.3824 |
| 50 | 515659.3401 | 144833.4526 |
| 51 | 515661.1388 | 144833.5228 |
| 52 | 515662.9374 | 144833.5929 |
| 53 | 515664.7360 | 144833.6631 |
| 54 | 515666.5347 | 144833.7333 |
| 55 | 515668.3333 | 144833.8035 |
| 56 | 515670.1319 | 144833.8737 |
| 57 | 515671.9305 | 144833.9439 |
| 58 | 515673.7292 | 144834.0140 |
| 59 | 515675.5278 | 144834.0842 |
| 60 | 515677.3264 | 144834.1544 |
| 61 | 515679.1251 | 144834.2246 |
| 62 | 515680.9237 | 144834.2948 |
| 63 | 515682.7223 | 144834.3649 |
| 64 | 515684.5210 | 144834.4351 |
| 65 | 515686.3196 | 144834.5053 |
| 66 | 515688.1182 | 144834.5755 |
| 67 | 515689.9169 | 144834.6457 |
| 68 | 515691.7155 | 144834.7159 |
| 69 | 515693.5141 | 144834.7860 |
| 70 | 515695.3128 | 144834.8562 |
| 71 | 515697.1114 | 144834.9264 |
| 72 | 515698.9100 | 144834.9966 |
| 73 | 515700.7086 | 144835.0668 |
| 74 | 515702.5086 | 144835.1370 |
| 75 | 515704.3059 | 144835.2071 |
| 76 | 515706.1045 | 144835.2773 |




Legenda:
- Parcelne meje
- Odvodnjavanje
- Nasutje
- Pilotna stena/oporni zid

| | | | | |
|---|---|---|---|---|
| BLAN d.o.o.<br>Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
| | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Zakoličbena situacija<br>situacija - PS1 | del risbe: | | | |

| | | | | |
|---|---|---|---|---|
| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | |
| | | | | |
| št. risbe: | G.2 | avtor risbe: | Blan d.o.o. | |
| | | ident.št.risbe: | | |

S 334
739/35
S 336
739/36
S 337
739/37
S 347
739/38
S 349
739/39
739/44
739/53
739/54
2262/19
2307/16
729/8
729/10
729/7
70/8
70/10
70/9
S 496
A29 0+516.16
A30 0+524.62
A31 0+540.00
A32 0+560.00
A33 0+580.00
A34 0+600.00
A35 0+620.00
A36 0+640.00
Razširitev za izvoz vlačilcev
ležeči policaj
Zbirni jašek – fi 80 – globina cca 2,0 m
Drenažna cev fi 200mm in drenažni zasip
Pilotna stena PS2, l=cca 105 m -piloti fi 60 cm / 1,8 m, l=5,5m -sidra grede 80/100 cm
AB pilot fi 60 cm
AB vezna greda 80/100 cm
kamnita zložba
Kamniti iztok
asfalt
4.61
5.00
2.50%
Mislinja
610

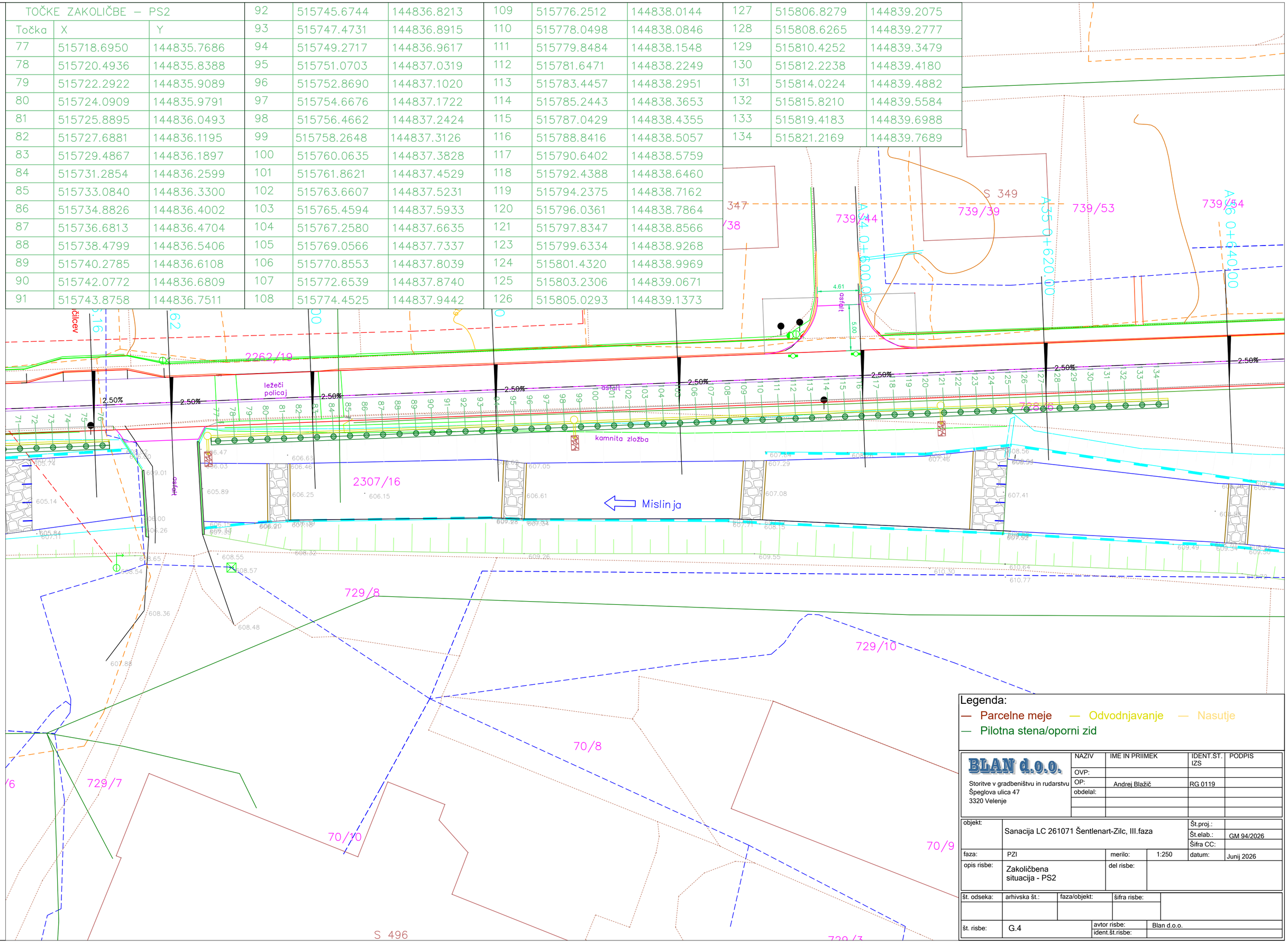
Legenda:
— Parcelne meje — Odvodnjavanje — Nasutje
— Pilotna stena/oporni zid

| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Gradbena in ureditvena situacija - PS2 | del risbe: | | | |

| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | |
|---|---|---|---|---|
| | | | | |
| št. risbe: | G.3 | avtor risbe: | Blan d.o.o. | |
| | | ident.št.risbe: | | |

| TOČKE ZAKOLIČBE – PS2 | | |
|---|---|---|
| Točka | X | Y |
| 77 | 515718.6950 | 144835.7686 |
| 78 | 515720.4936 | 144835.8388 |
| 79 | 515722.2922 | 144835.9089 |
| 80 | 515724.0909 | 144835.9791 |
| 81 | 515725.8895 | 144836.0493 |
| 82 | 515727.6881 | 144836.1195 |
| 83 | 515729.4867 | 144836.1897 |
| 84 | 515731.2854 | 144836.2599 |
| 85 | 515733.0840 | 144836.3300 |
| 86 | 515734.8826 | 144836.4002 |
| 87 | 515736.6813 | 144836.4704 |
| 88 | 515738.4799 | 144836.5406 |
| 89 | 515740.2785 | 144836.6108 |
| 90 | 515742.0772 | 144836.6809 |
| 91 | 515743.8758 | 144836.7511 |
| 92 | 515745.6744 | 144836.8213 |
| 93 | 515747.4731 | 144836.8915 |
| 94 | 515749.2717 | 144836.9617 |
| 95 | 515751.0703 | 144837.0319 |
| 96 | 515752.8690 | 144837.1020 |
| 97 | 515754.6676 | 144837.1722 |
| 98 | 515756.4662 | 144837.2424 |
| 99 | 515758.2648 | 144837.3126 |
| 100 | 515760.0635 | 144837.3828 |
| 101 | 515761.8621 | 144837.4529 |
| 102 | 515763.6607 | 144837.5231 |
| 103 | 515765.4594 | 144837.5933 |
| 104 | 515767.2580 | 144837.6635 |
| 105 | 515769.0566 | 144837.7337 |
| 106 | 515770.8553 | 144837.8039 |
| 107 | 515772.6539 | 144837.8740 |
| 108 | 515774.4525 | 144837.9442 |
| 109 | 515776.2512 | 144838.0144 |
| 110 | 515778.0498 | 144838.0846 |
| 111 | 515779.8484 | 144838.1548 |
| 112 | 515781.6471 | 144838.2249 |
| 113 | 515783.4457 | 144838.2951 |
| 114 | 515785.2443 | 144838.3653 |
| 115 | 515787.0429 | 144838.4355 |
| 116 | 515788.8416 | 144838.5057 |
| 117 | 515790.6402 | 144838.5759 |
| 118 | 515792.4388 | 144838.6460 |
| 119 | 515794.2375 | 144838.7162 |
| 120 | 515796.0361 | 144838.7864 |
| 121 | 515797.8347 | 144838.8566 |
| 123 | 515799.6334 | 144838.9268 |
| 124 | 515801.4320 | 144838.9969 |
| 125 | 515803.2306 | 144839.0671 |
| 126 | 515805.0293 | 144839.1373 |
| 127 | 515806.8279 | 144839.2075 |
| 128 | 515808.6265 | 144839.2777 |
| 129 | 515810.4252 | 144839.3479 |
| 130 | 515812.2238 | 144839.4180 |
| 131 | 515814.0224 | 144839.4882 |
| 132 | 515815.8210 | 144839.5584 |
| 133 | 515819.4183 | 144839.6988 |
| 134 | 515821.2169 | 144839.7689 |




Legenda:

— Parcelne meje — Odvodnjavanje — Nasutje

— Pilotna stena/oporni zid

| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Zakoličbena situacija - PS2 | del risbe: | | | |

| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | |
|---|---|---|---|---|
| | | | | |
| št. risbe: | G.4 | avtor risbe: | Blan d.o.o. | |
| | | ident.št.risbe: | | |

MEJA OBDELAVE
NAVEZAVA NA OBSTOJEČ ASFALT
Km 0+700.00

A92 1+659.26
A91 1+640.00
A90 1+620.00
A89 1+600.00
A88 1+580.00
A87 1+560.00
A86 1+540.00
A85 1+520.00

TS6
TS15
TS14
TS13

DSE=40
2.50%
Razširitev krivine B=1.50m
Temelj opornega zidu
Stena opornega zidu
Oporni zid
l = cca 75 m
-h = 2,5 - 4,5 m
asfalt
makedam
tlakovci
R=199.99
R=199.99

646
648/2
649/2
648/4
649/1
S 590
S 586
139

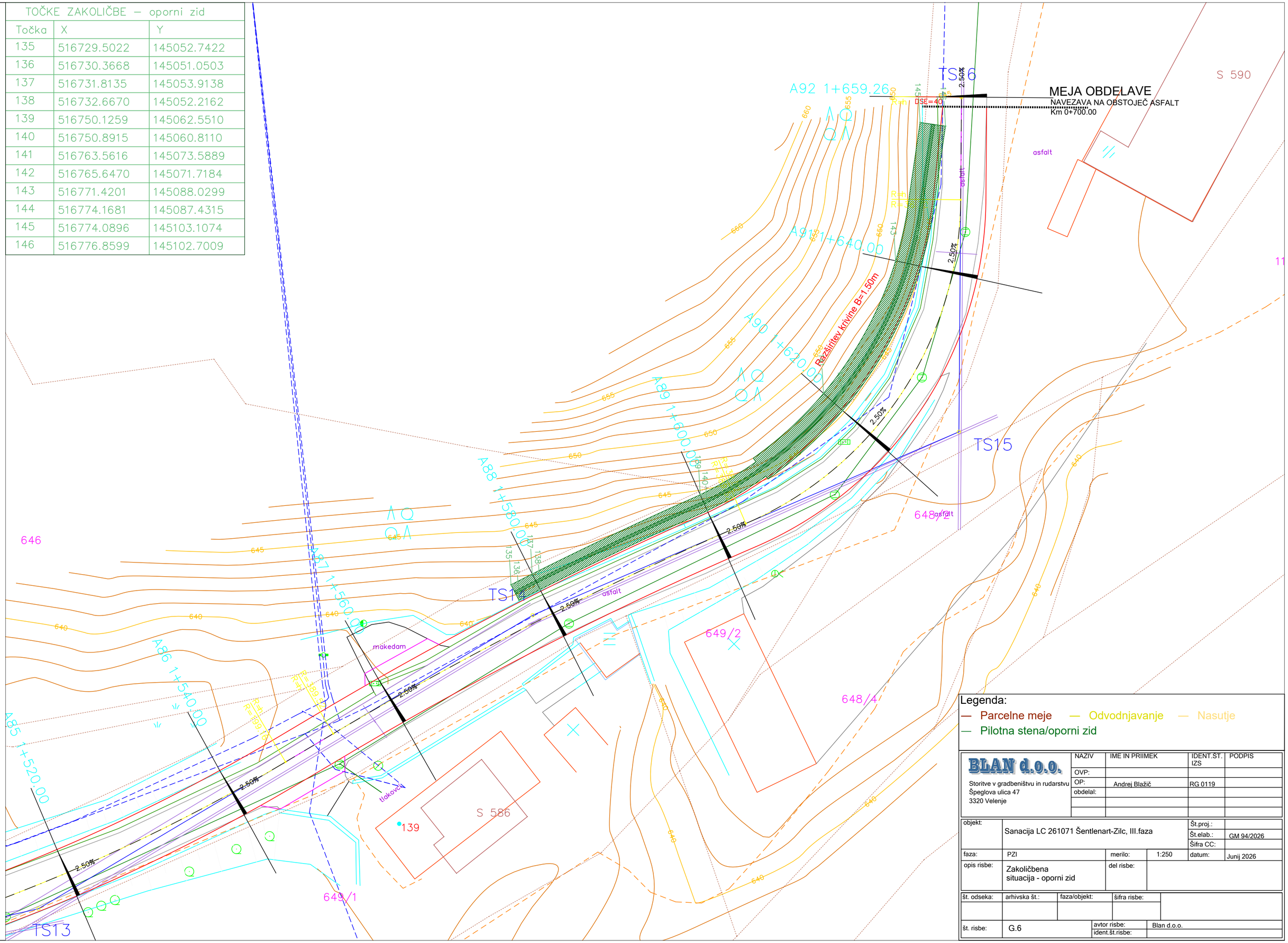
Legenda:
— Parcelne meje — Odvodnjavanje — Nasutje
— Pilotna stena/oporni zid

| | | | | |
|---|---|---|---|---|
| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Gradbena in ureditvena situacija - oporni zid | del risbe: | | | |

| | | | | | |
|---|---|---|---|---|---|
| št. odseka: | arhivska št.: | faza/objekt: | | šifra risbe: | |
| | | | | | |
| št. risbe: | G.5 | | avtor risbe: | Blan d.o.o. | |
| | | | ident.št.risbe: | | |

| TOČKE ZAKOLIČBE – oporni zid | | |
|---|---|---|
| Točka | X | Y |
| 135 | 516729.5022 | 145052.7422 |
| 136 | 516730.3668 | 145051.0503 |
| 137 | 516731.8135 | 145053.9138 |
| 138 | 516732.6670 | 145052.2162 |
| 139 | 516750.1259 | 145062.5510 |
| 140 | 516750.8915 | 145060.8110 |
| 141 | 516763.5616 | 145073.5889 |
| 142 | 516765.6470 | 145071.7184 |
| 143 | 516771.4201 | 145088.0299 |
| 144 | 516774.1681 | 145087.4315 |
| 145 | 516774.0896 | 145103.1074 |
| 146 | 516776.8599 | 145102.7009 |




Legenda:

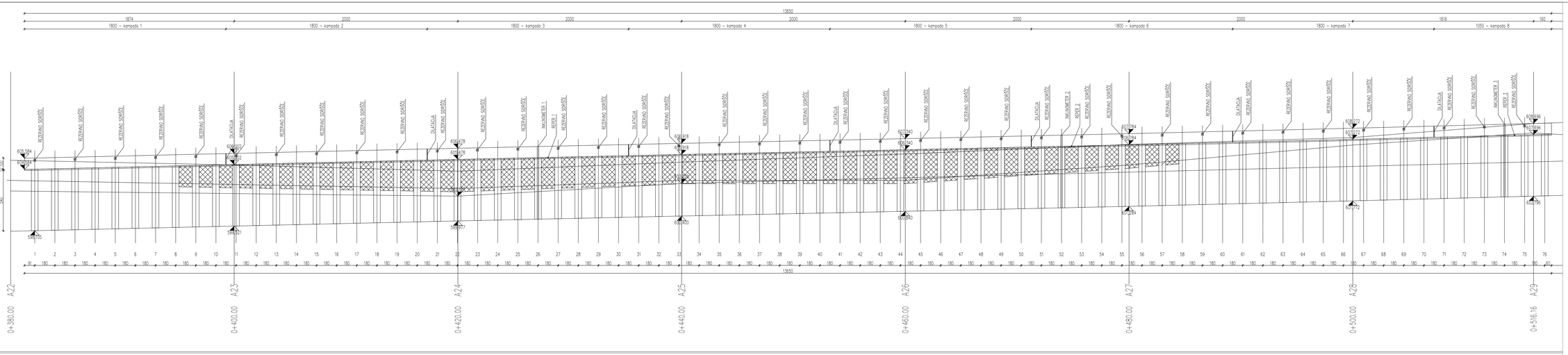
— Parcelne meje — Odvodnjavanje — Nasutje

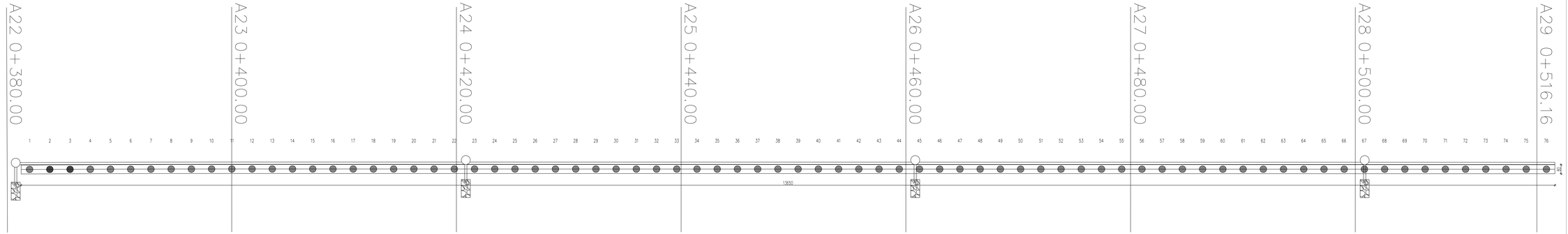
— Pilotna stena/oporni zid

| | | | | | |
|---|---|---|---|---|---|
| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | | IDENT.ŠT. IZS | PODPIS |
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | | |
| | OP: | Andrej Blažič | | RG 0119 | |
| | obdelal: | | | | |
| | | | | | |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Zakoličbena situacija - oporni zid | del risbe: | | | |


| | | | | | |
|---|---|---|---|---|---|
| št. odseka: | arhivska št.: | faza/objekt: | | šifra risbe: | |
| | | | | | |
| št. risbe: | G.6 | avtor risbe: | Blan d.o.o. | | |
| | | ident.št.risbe: | | | |




| | | | | | |
|---|---|---|---|---|---|
| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | | IZVEDBENI ST. IZ | PODPIS |
| Storitve v gradbeništvu in rudarstvu | DVP | | | | |
| Špeglova ulica 47 | OP: | Andrej Blažič | | HG 0119 | |
| 3320 Velenje | odobril: | | | | |
| | | | | | |

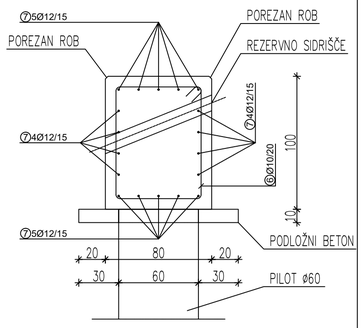
| | | | | |
|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentjanart-Zikl, III.faza | | G.proj.: | |
| | | | Ši.elab.: | GM 36/2026 |
| | | | Šeifra CC: | |
| faza: | PZI | merilo: | 1:100 | datum: Junij 2026 |
| opis naloge: | Pilotna stena PS1 - Boris in vzdolzni pogled | del naloge: | | |
| Gl. vzdelska: | arhivska št.: | fazaobjekt: | šifra naloge: | |
| št. naloge: | G_7 | avtor naloge: | Blan d.o.o. | |
| | | stanš št. naloge: | | |



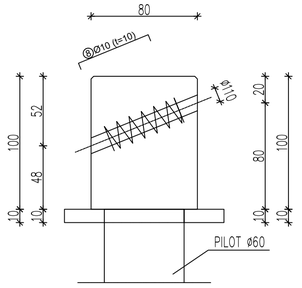

| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | | |
|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:100 | datum: | Junij 2026 |
| opis risbe: | Pilotna stena PS2 - tloris in vzdolzni pogled | del risbe: | | | |
| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | | |
| št. risbe: | G.8 | avtor risbe: | Blan d.o.o. | | |
| | | ident.št.risbe: | | | |

## SKICA ARMIRANJA POVEZOVALNE GREDE TIPIČNI PREREZ, M 1:25

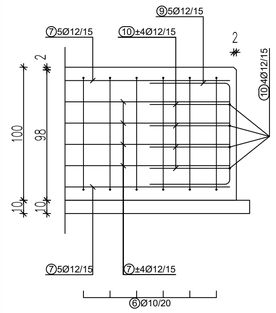



## SKICA ARMIRANJA REZERVNEGA SIDRIŠČA, M 1:25

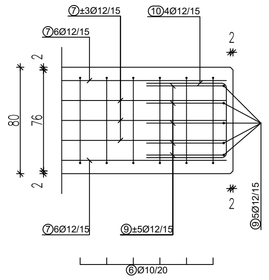



OPOMBE!
Porezani robovi se izdelajo z letvicami 2x2 cm.
Rezervno sidrišče se predvidi nad vsakim drugim pilotom.
Razrez in krivljenje palic št. 5 po opažu, na licu mesta!
Armaturo, po potrebi, prilagoditi na licu mesta!

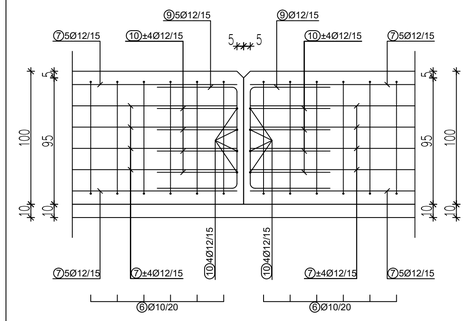
## ZAČETEK / KONEC POVEZOVALNE GREDE STRANSKI RIS, M 1:25



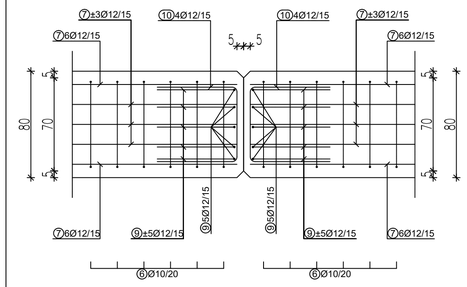

## ZAČETEK / KONEC POVEZOVALNE GREDE TLORIS, M 1:25



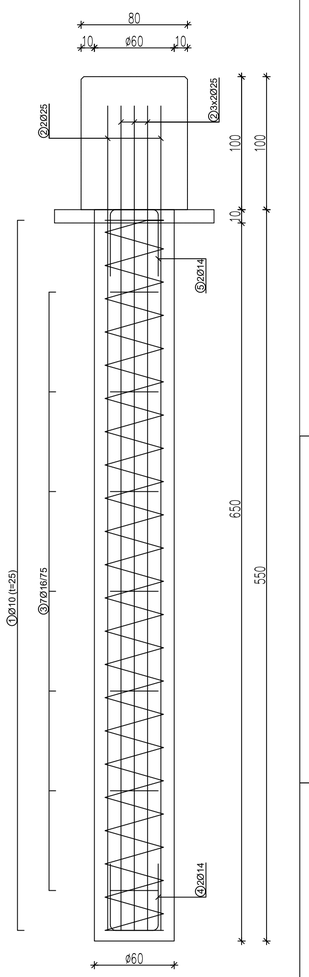

## DETAJL DILATACIJE POVEZOVALNE GREDE STRANSKI RIS, M 1:25



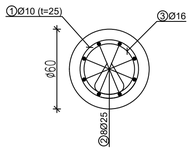

## DETAJL DILATACIJE POVEZOVALNE GREDE TLORIS, M 1:25

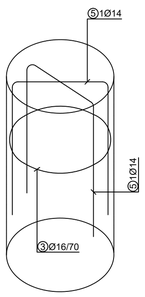


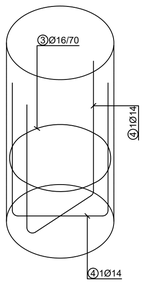

## SKICA ARMIRANJA PILOTA POGLED, M 1:25



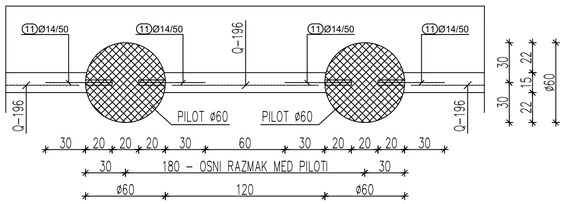

## TIPIČNI PREREZ, M 1:25



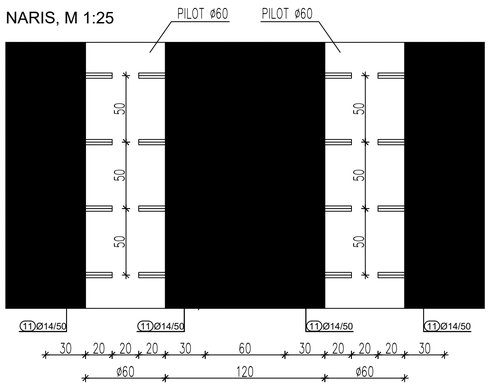




## SKICA SIDRANJA TORKTNIH STEN V PILOTE TLORIS, M 1:25




OPOMBE!
Palice št. 7 so sidra, ki se z uvrtanjem vgradijo v AB pilote.
Ø vrtine je 16 mm, globina je 200 mm.
Stik sidra in vrtine ojačati z dvokomponentnim lepilom (HILTI HIT)
Pred vgradnjo lepila, vrtino temeljito očistiti.

## NARIS, M 1:25




## Palice - izvleček

| Ø [mm] | lgn [m] | Teža enote [kg/m'] | Teža [kg] |
|---|---|---|---|
| S 500-B | | | |
| 10 | 4727.48 | 0.65 | 3068.13 |
| 12 | 1021.60 | 0.92 | 939.87 |
| 14 | 1000.76 | 1.25 | 1252.95 |
| 16 | 1735.30 | 1.62 | 2812.92 |
| 25 | 6646.40 | 3.95 | 26259.93 |
| Skupaj (S 500-B) | | | 34333.81 |
| Skupaj | | | 34333.81 |

## Palice - specifikacija

| ozn | oblika in mere [cm] | Ø | lg [m] | n [kos] | lgn [m] |
|---|---|---|---|---|---|
| AB PILOT fi80 (134 kos) | | | | | |
| 1 | 25; 44; 11; 534 | 10 | 30.22 | 134 | 4049.48 |
| 2 | 620 | 25 | 6.20 | 1072 | 6646.40 |
| 3 | 38; 30; 18 | 16 | 1.85 | 938 | 1735.30 |
| 4 | 50; 41; 50 | 14 | 1.41 | 268 | 377.88 |
| 5 | 50; 41; 50 | 14 | 1.41 | 268 | 377.88 |
| AB POVEZOVALNA GREDA 80/100 (1 kos) | | | | | |
| 6 | 84; 64; 11; 64; 84 | 10 | 3.18 | 130 | 413.40 |
| 7 | 600 | 12 | 6.00 | 90 | 540.00 |
| 8 | 10; 20; 11; 57 | 10 | 3.78 | 70 | 264.60 |
| 9 | 80; 60; 60 | 12 | 2.00 | 140 | 280.00 |
| 10 | 60; 60; 60 | 12 | 1.80 | 112 | 201.60 |
| AB TORKRETNA STENA (1 kos) | | | | | |
| 11 | 50 | 14 | 0.50 | 490 | 245.00 |

## Mreže - izvleček

| Oznaka mreže | B [cm] | L [cm] | n | Teža enote [kg/m2] | Skupna teža celih mrež [kg] | Neto vgrajena teža [kg] |
|---|---|---|---|---|---|---|
| Q-196 | 215 | 600 | 13 | 3.08 | 516.52 | 516.52 |
| Skupaj | | | | | 516.52 | 516.52 |

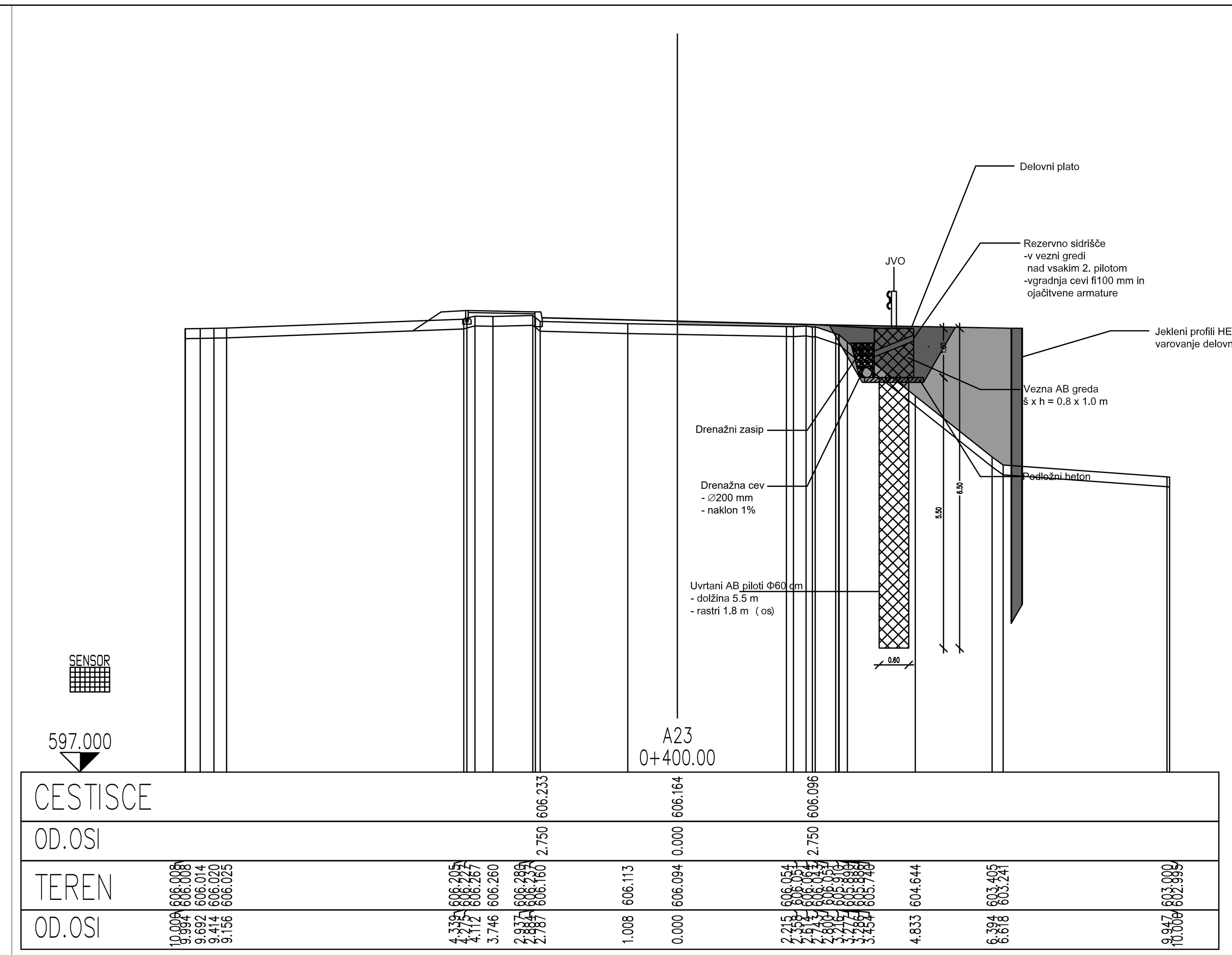
Uvrtani pilotI
Armaturno jeklo: B 500 B
Beton: C25/30, XC2, PV-II, D32, S3
Krovni sloj betona: 8 cm
Prekrivanje spiralne armature: min. 60 cm
Sidranje vzdolžne armature: min. 60 cm

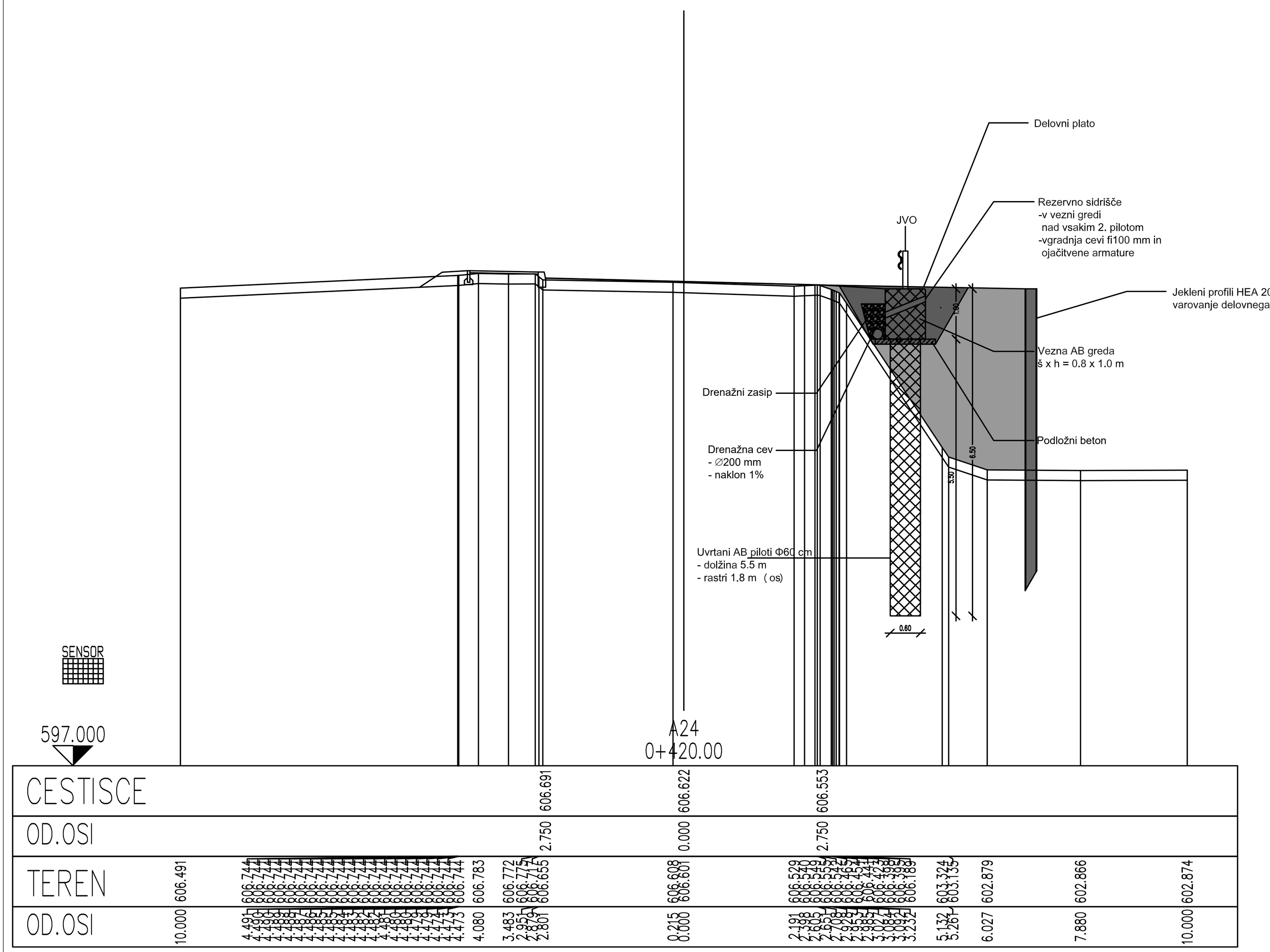
Vezna greda
Armaturno jeklo: B 500 B
Beton-stena: C30/37, XD3, XF4, PV-II, D32, S3
Krovni sloj betona: 5 cm
Prekrivanje vzdolžne armature: min. 60 cm

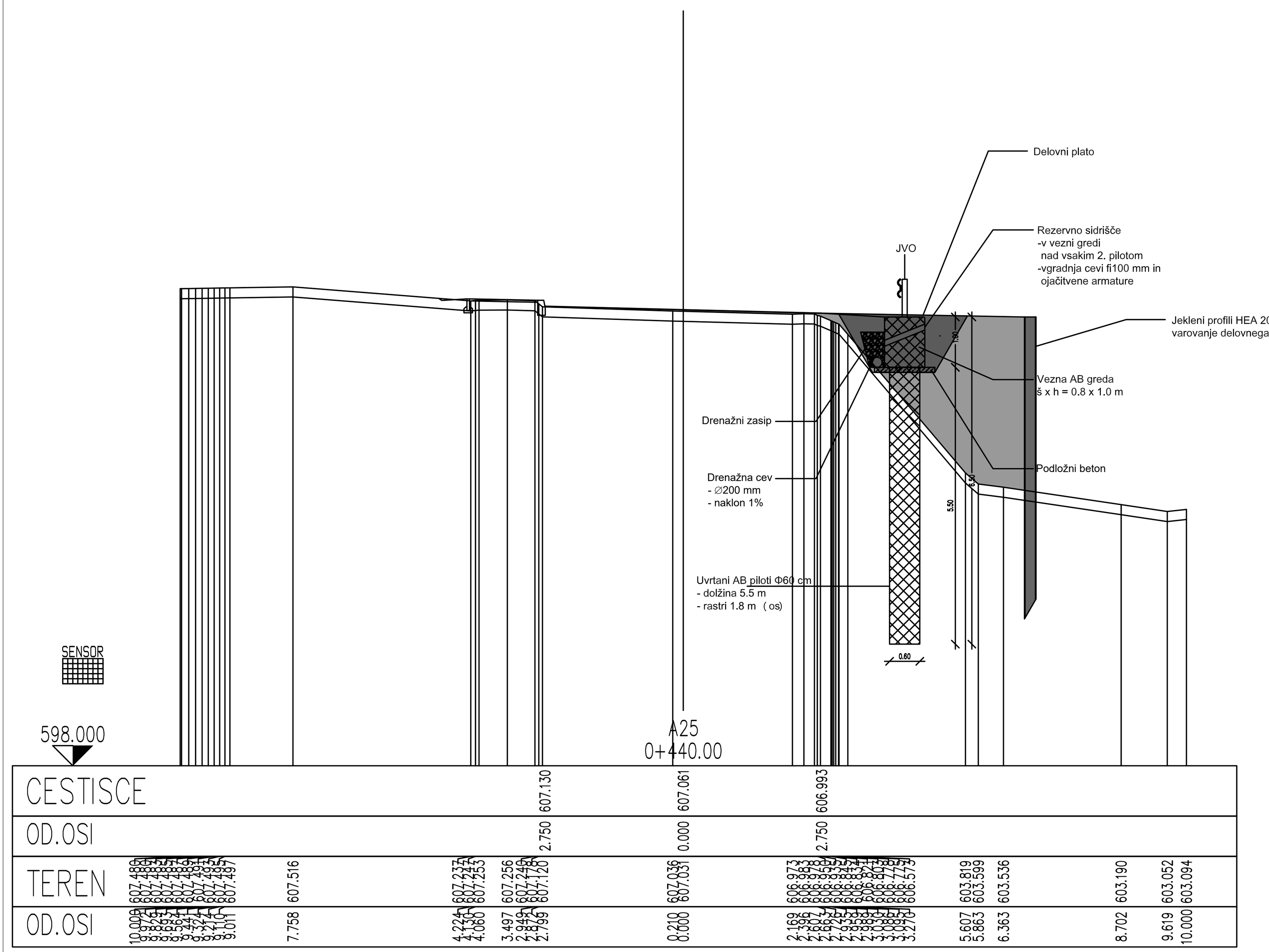
| | NAZIV | IME IN PRIIMEK | IDENT.ST. IZS | PODPIS |
|---|---|---|---|---|
| BLAN d.o.o. Storitve v gradbeništvu in rudarstvu, Špeglova ulica 47, 3320 Velenje | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | Št.proj.: | |
| | | | Št.elab.: | GM 94/2026 |
| | | | Šifra CC: | |
| faza: PZI | merilo: 1:250 | datum: Junij 2026 | | |
| opis risbe: Pilotni steni PS1 in PS2 - armaturni načrt | del risbe: | | | |

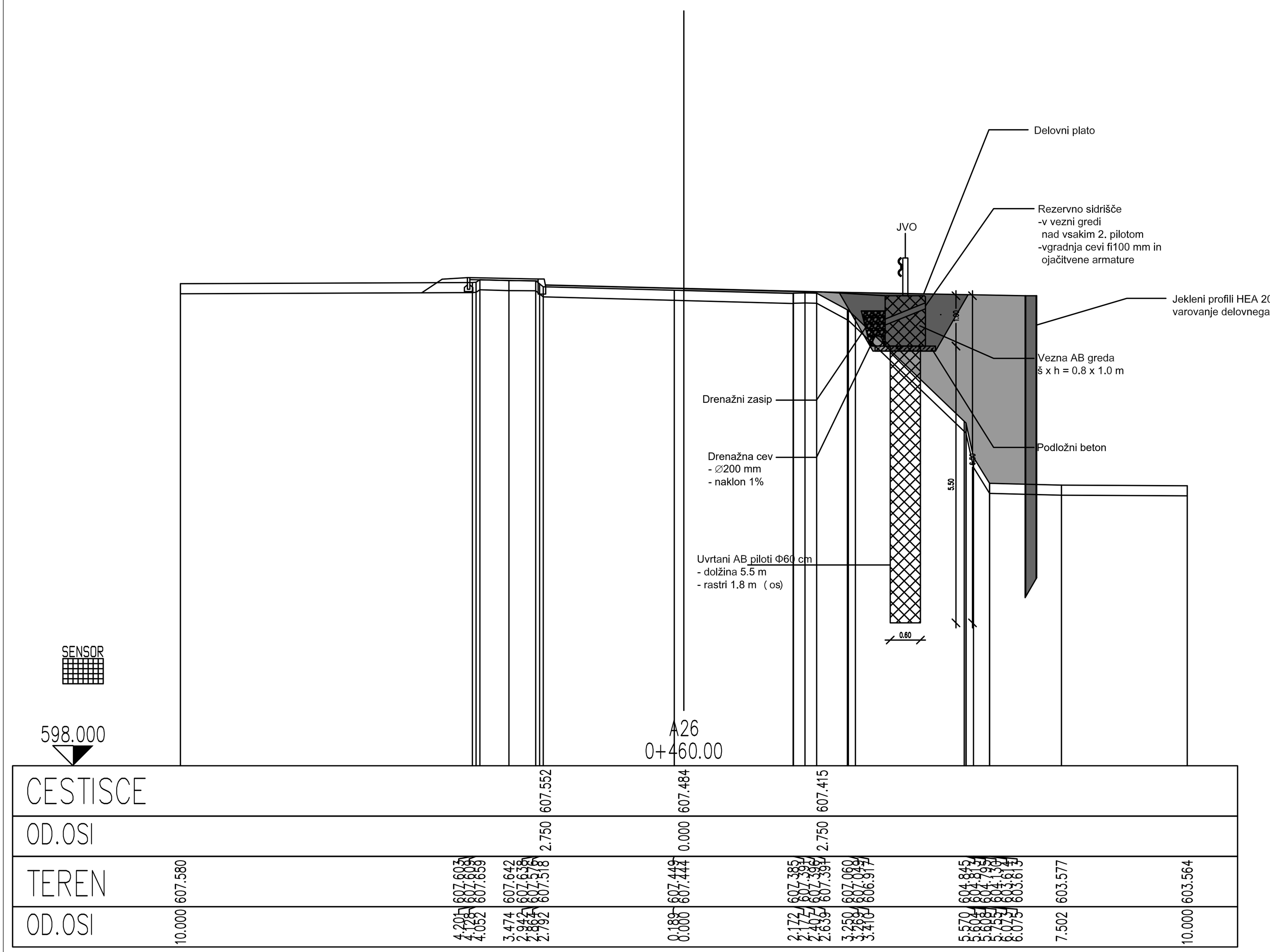
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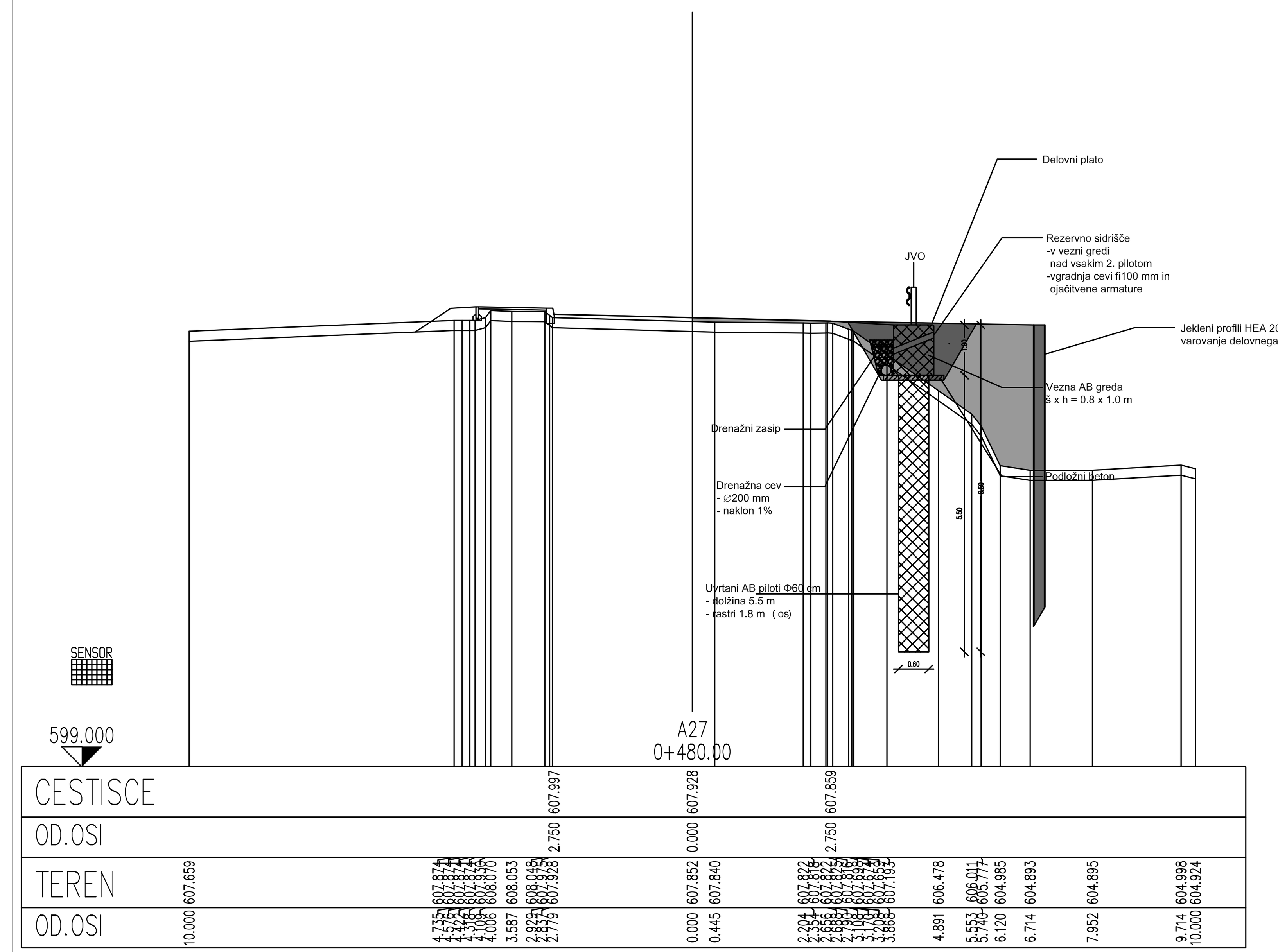
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| G.9 | ident.št.risbe: | |

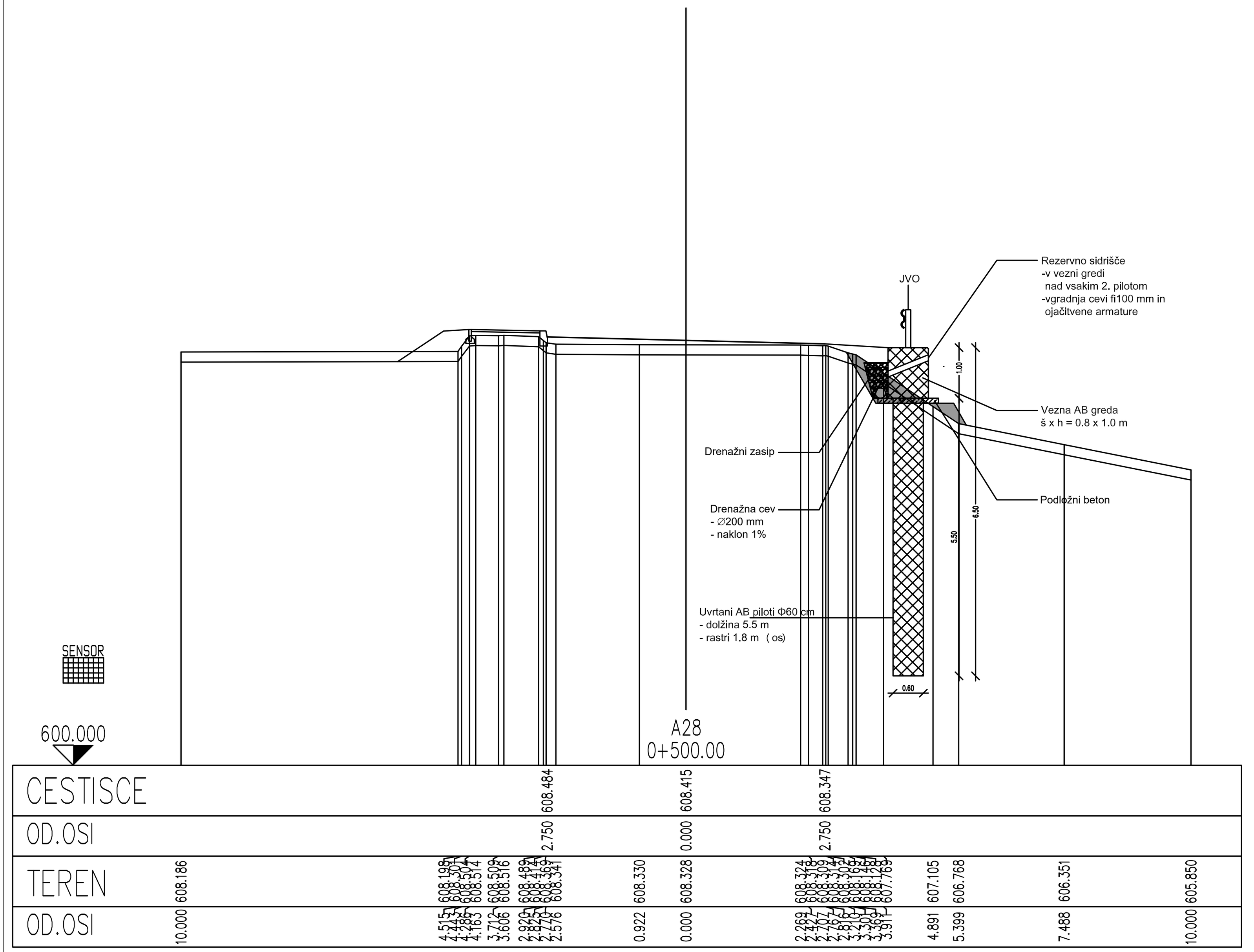


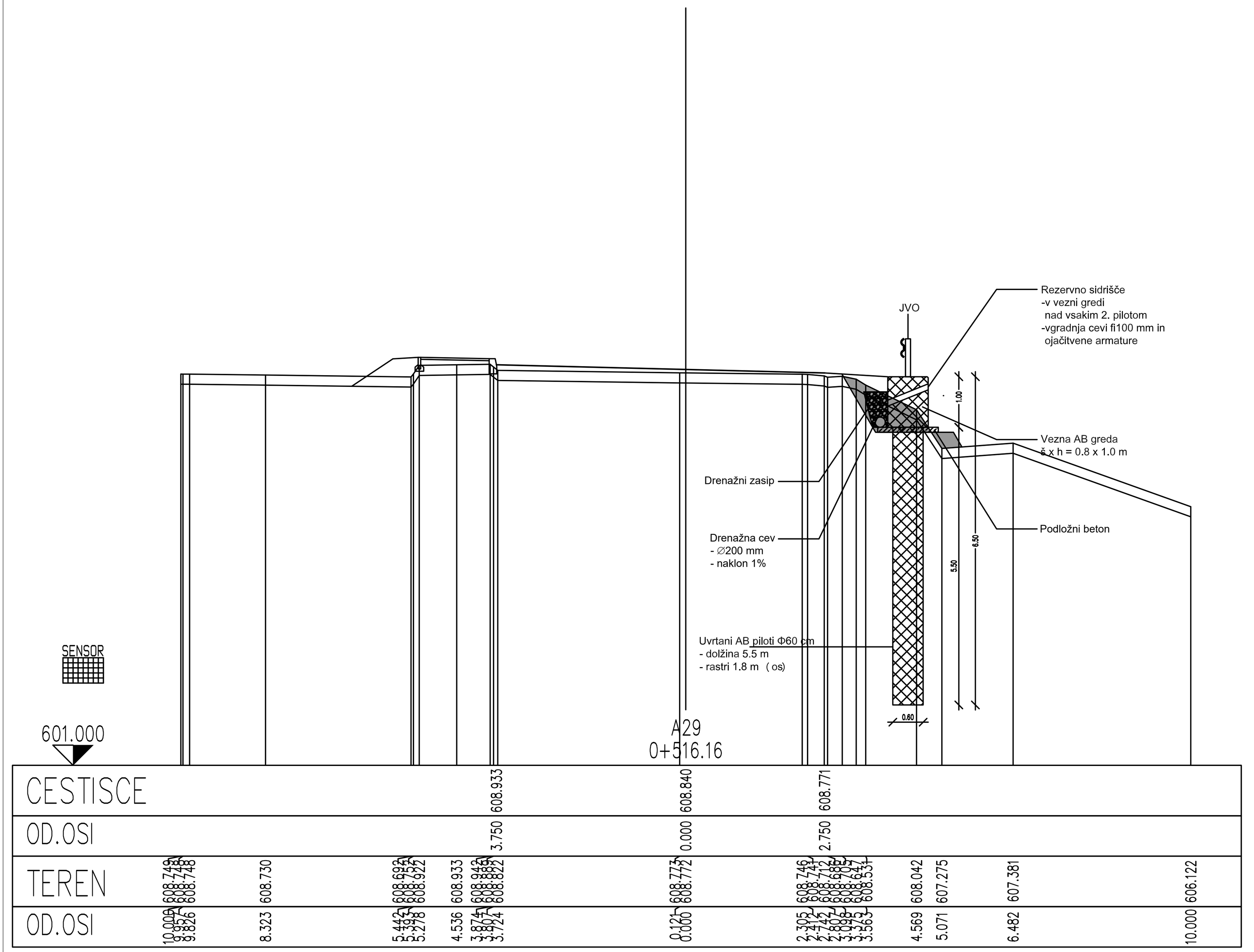




Uvrtani piloti
Armaturno jeklo: B 500 B
Beton: C25/30, XC2, PV-II, D32, S3
Krovni sloj betona: 8 cm
Prekrivanje spiralne armature: min. 60 cm
Sidranje vzdolžne armature: min. 60 cm

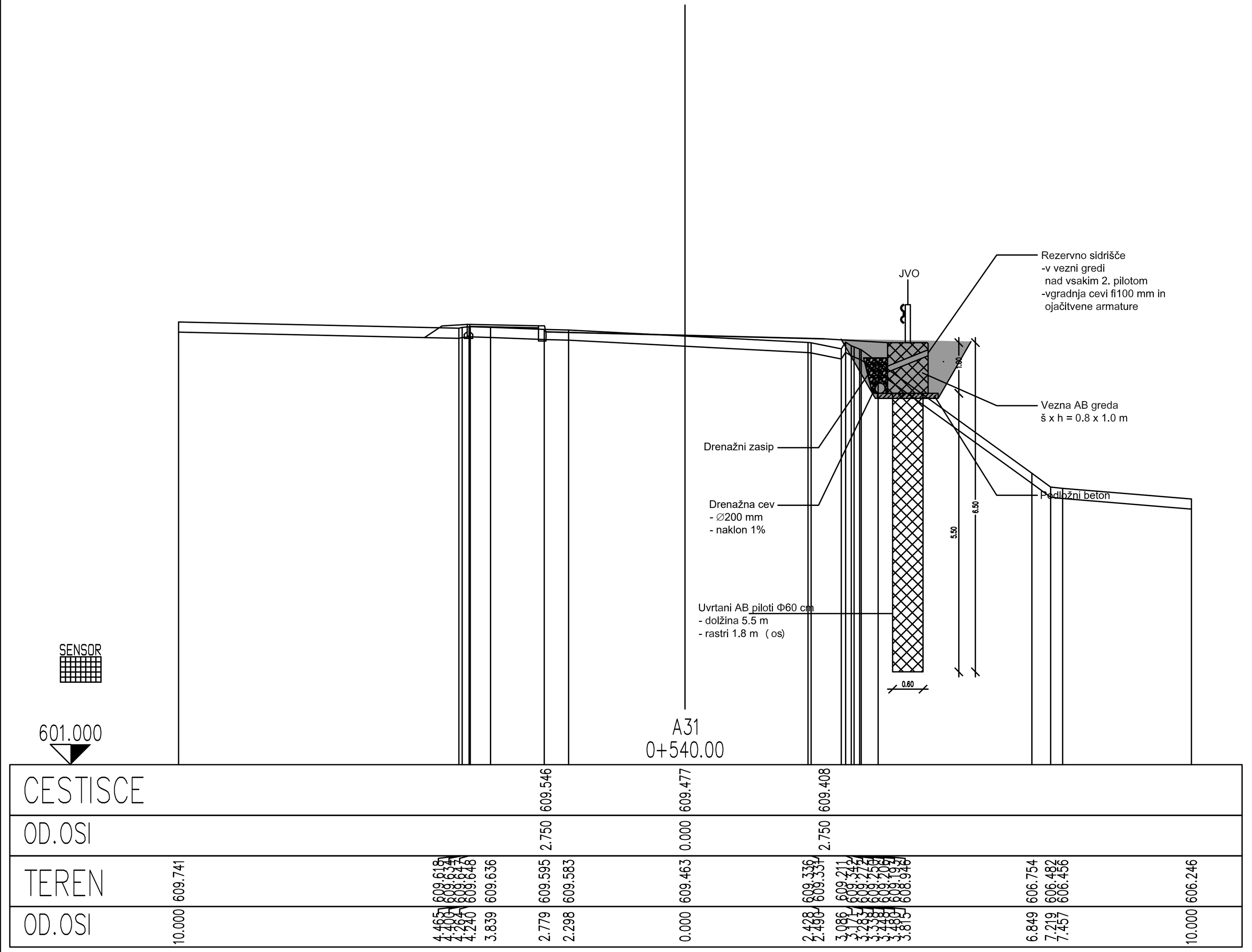
Vezna greda
Armaturno jeklo: B 500 B
Beton-stena: C30/37, XD3, XF4, PV-II, D32, S3
Krovni sloj betona: 5 cm
Prekrivanje vzdolžne armature: min. 60 cm

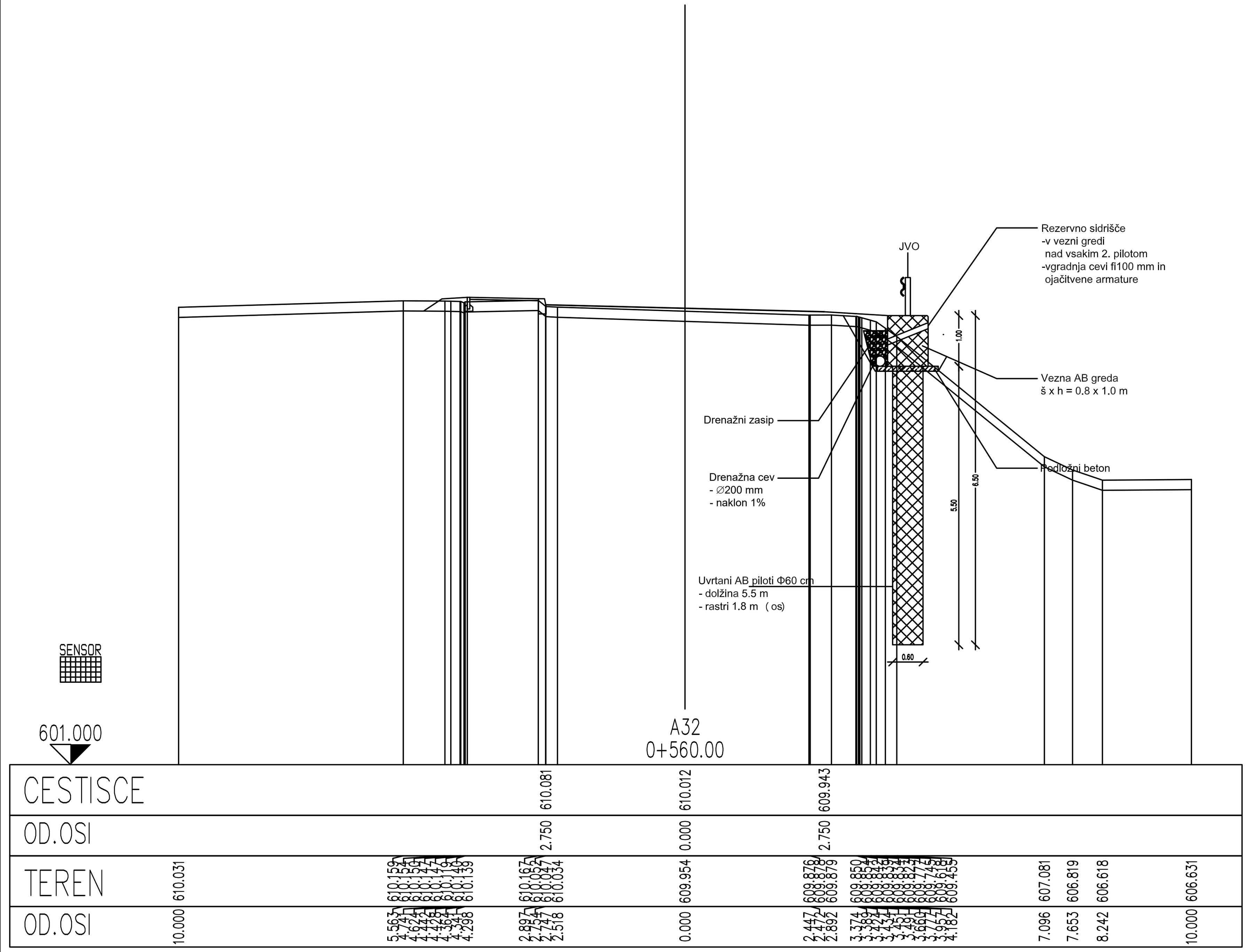
| BLAN d.o.o. Storitve v gradbeništvu in rudarstvu, Špeglova ulica 47, 3320 Velenje | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

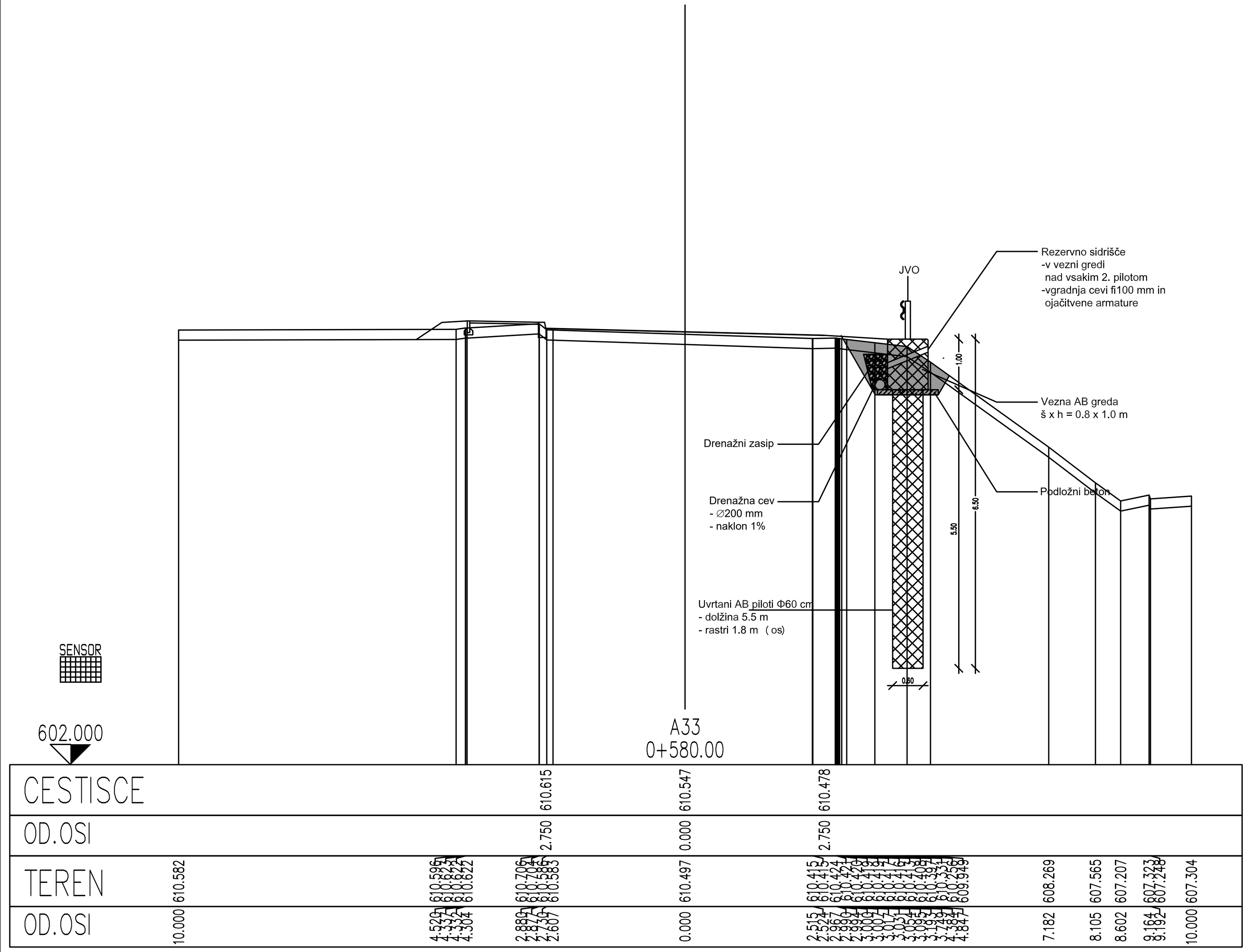
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|---|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Pilotna stena PS1 - profiil | del risbe: | | | |

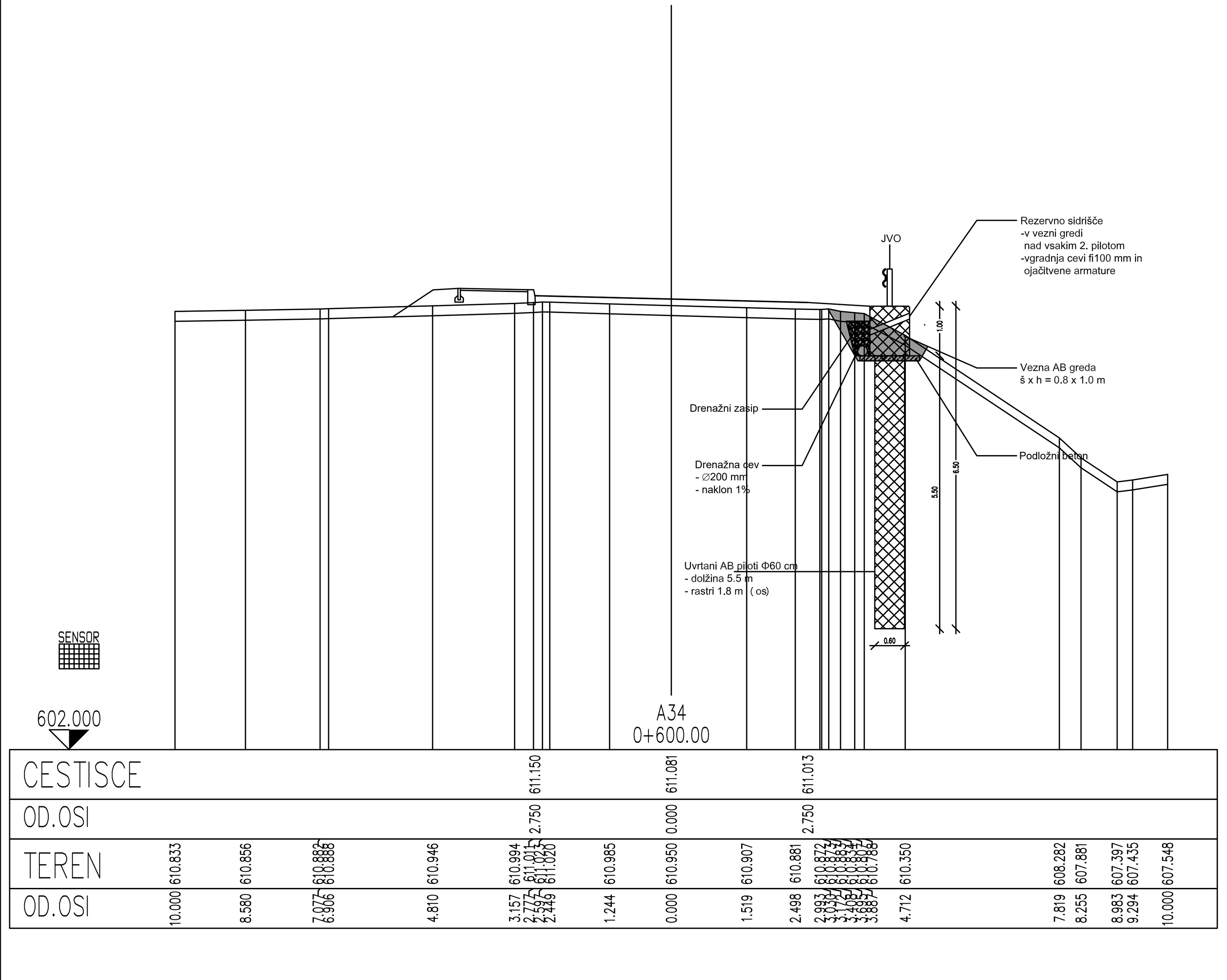
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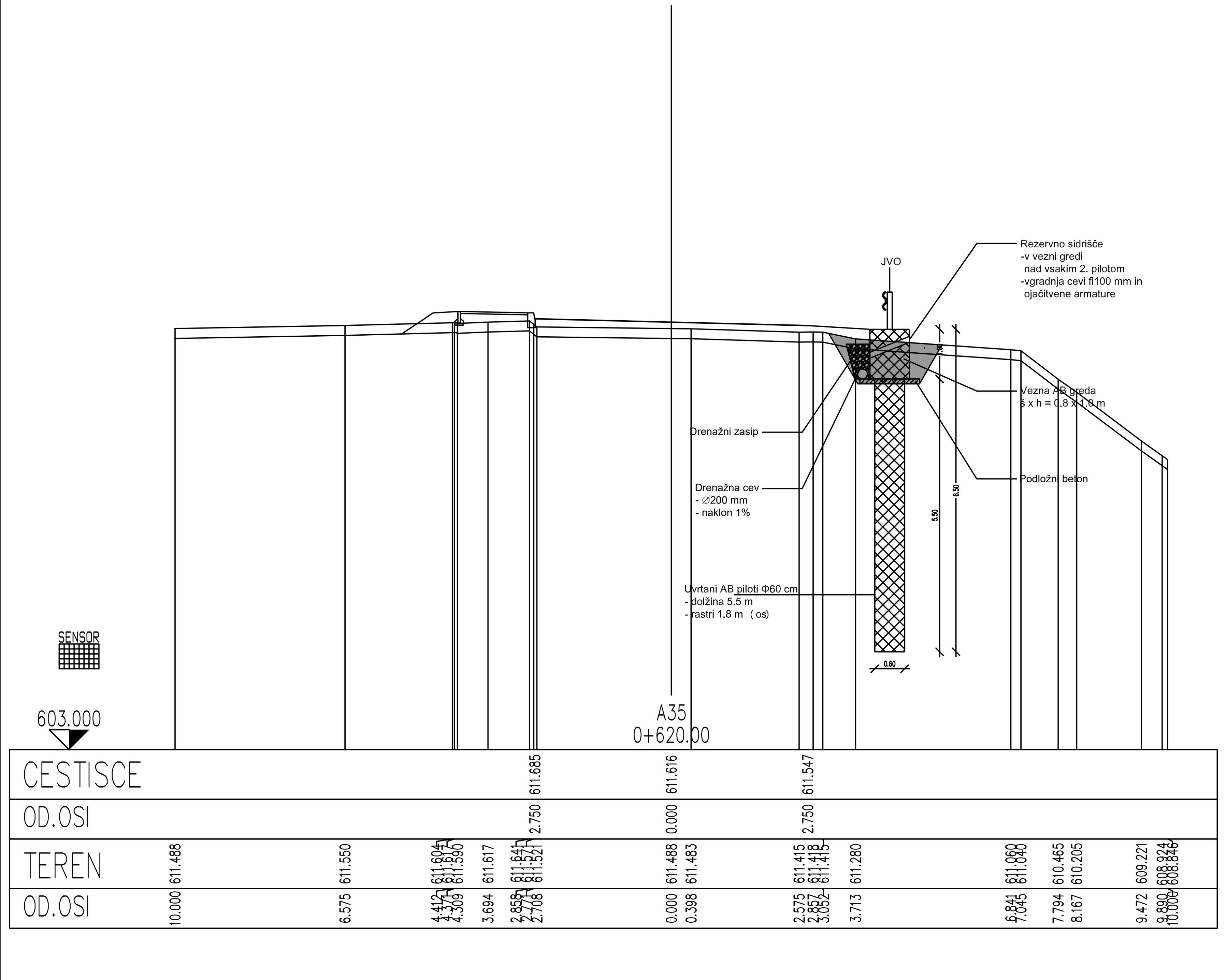
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| št. risbe: | G.10 | avtor risbe: | Blan d.o.o. |
| | | ident.št.risbe: | |




Uvrtani piloti
Armaturno jeklo: B 500 B
Beton: C25/30, XC2, PV-II, D32, S3
Krovni sloj betona: 8 cm
Prekrivanje spiralne armature: min. 60 cm
Sidranje vzdolžne armature: min. 60 cm

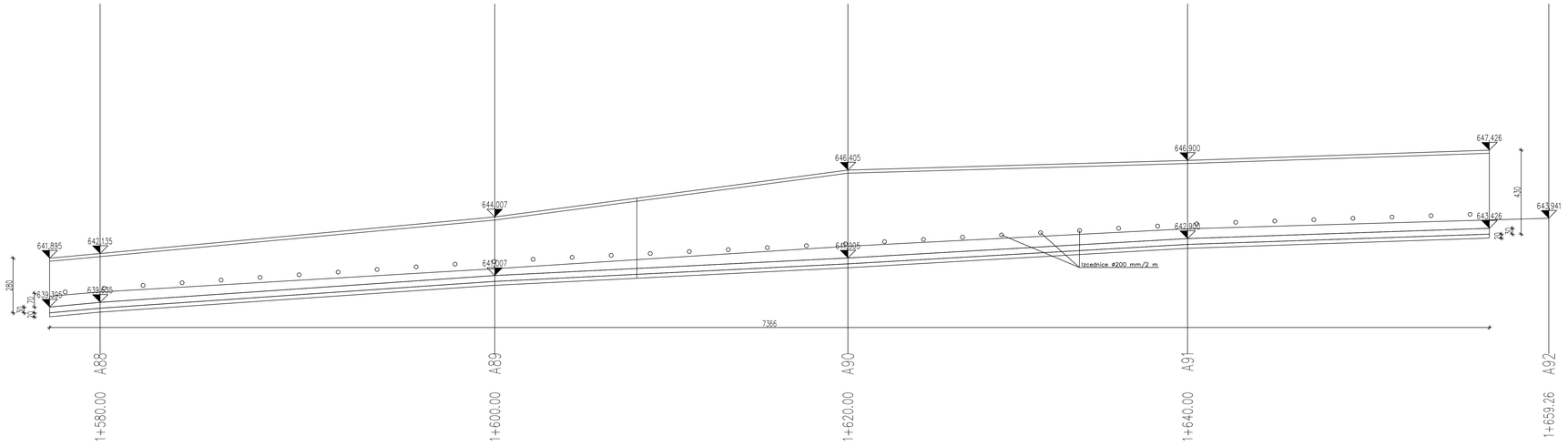
Vezna greda
Armaturno jeklo: B 500 B
Beton-stena: C30/37, XD3, XF4, PV-II, D32, S3
Krovni sloj betona: 5 cm
Prekrivanje vzdolžne armature: min. 60 cm

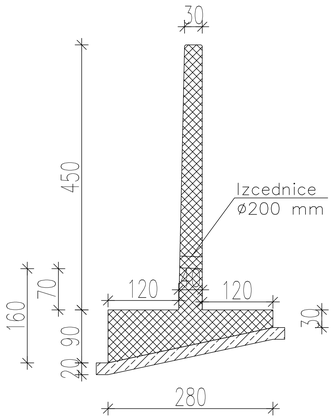
| BLAN d.o.o. Storitve v gradbeništvu in rudarstvu, Špeglova ulica 47, 3320 Velenje | NAZIV | IME IN PRIIMEK | IDENT.ŠT. IZS | PODPIS |
|---|---|---|---|---|
| | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

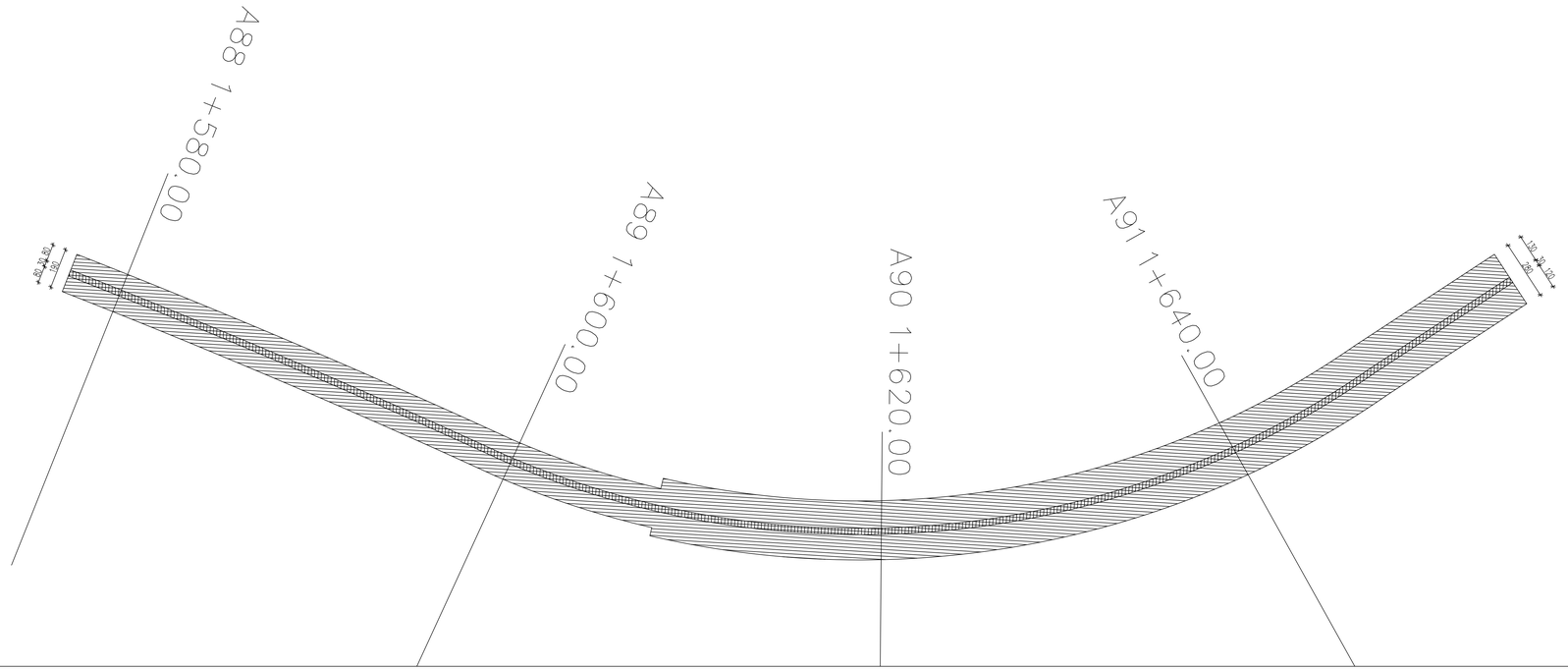
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| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Pilotna stena PS2 - profiil | del risbe: | | | |

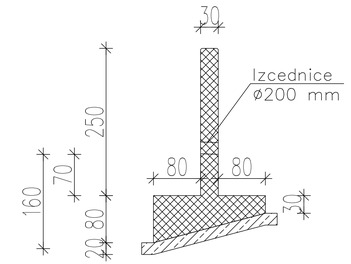
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| | | | |

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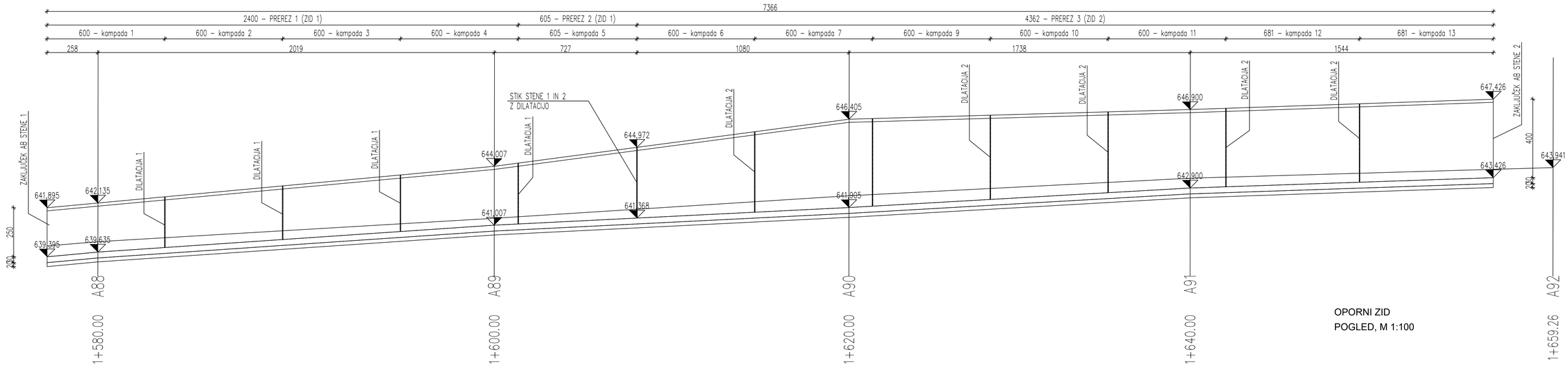


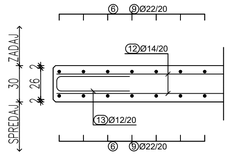




| | | | | | |
|---|---|---|---|---|---|
| **BLAN d.o.o.** Storitve v gradbeništvu in rudarstvu Špeglova ulica 47 3320 Velenje | NAZIV | IME IN PRIIMEK: | | IDENT.ŠT. IZS | PODPIS |
| | OVP: | | | | |
| | OP: | Andrej Blažič | | RG 0119 | |
| | obdelal: | | | | |
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:100 | datum: | Junij 2026 |
| opis risbe: | Oporni zid - tloris in vzdolžni pogled | del risbe: | | | |
| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | | |
| št. risbe: | G.12 | avtor risbe: | Blan d.o.o. | | |
| | | ident.št.risbe: | | | |

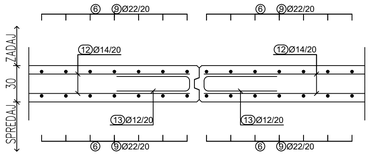



OPORNI ZID
POGLED, M 1:100

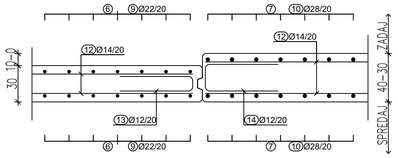
ZAKLJUČEK AB ZIDU 1, M 1:25



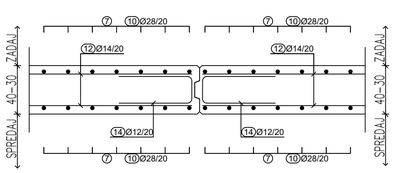

DILATACIJA AB ZIDU 1, M 1:25



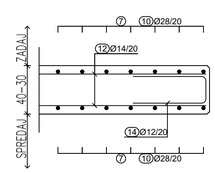

STIK ZIDU 1 IN 2 Z DILATACIJO, M 1:25



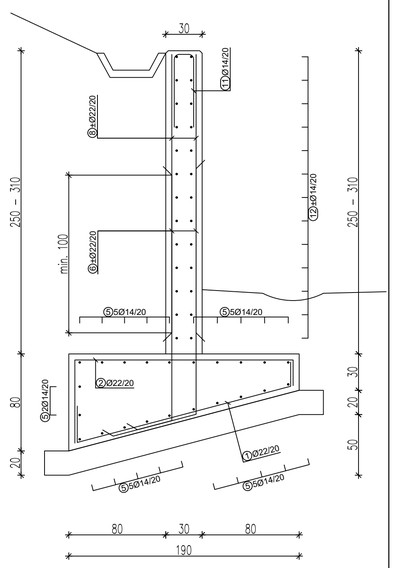

DILATACIJA AB ZIDU 2, M 1:25



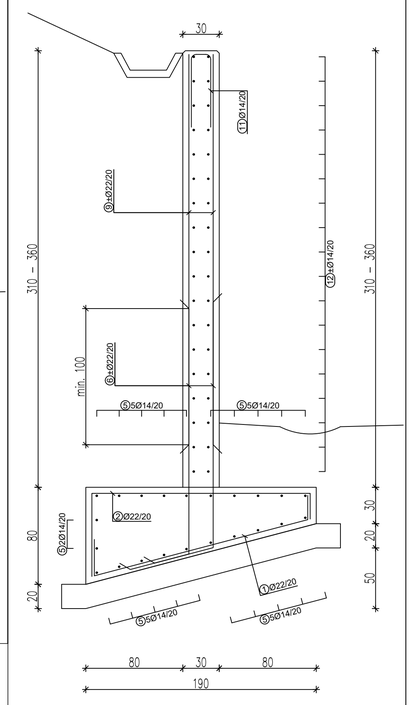

ZAKLJUČEK AB ZIDU 2, M 1:25



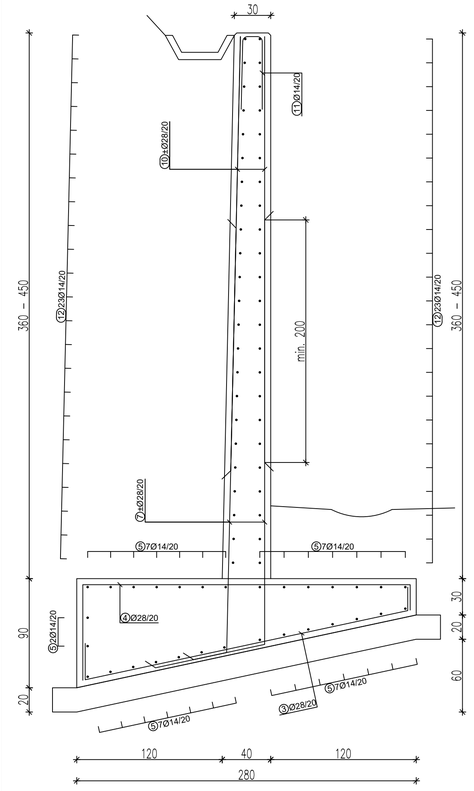

| Palice - izvleček | | | |
|---|---|---|---|
| Ø [mm] | lgn [m] | Teža enote [kg/m'] | Teža [kg] |
| S 500-B | | | |
| 12 | 630.56 | 0.92 | 580.12 |
| 14 | 5798.00 | 1.25 | 7259.10 |
| 22 | 2280.00 | 3.06 | 6972.24 |
| 28 | 4730.00 | 4.96 | 23441.88 |
| Skupaj (S 500-B) | | | 38253.33 |
| Skupaj | | | 38253.33 |




OPORNI ZID 1
PREREZ 1, M 1:25




OPORNI ZID 1
PREREZ 2, M 1:25

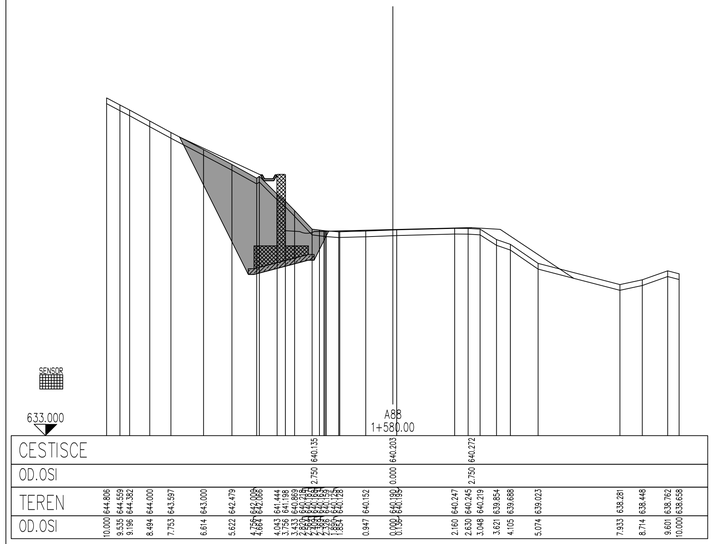


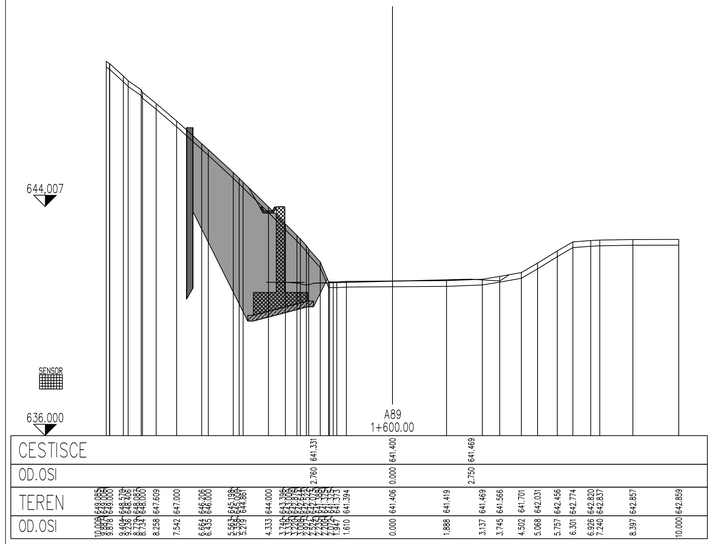

OPORNI ZID 2
PREREZ 3, M 1:25

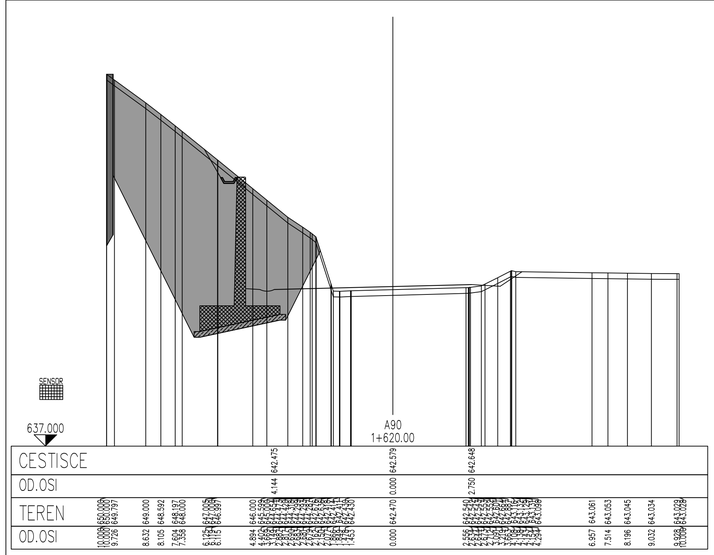
| Palice - specifikacija | | | | | | |
|---|---|---|---|---|---|---|
| ozn | oblika in mere [cm] | Ø | lg [m] | n [kos] | lgn [m] | |
| AB OPORNI ZID (1 kos) | | | | | | |
| 1 | 20, 185, 47, 179, 30 | 22 | 2.35 | 150 | 352.50 | |
| 2 | 180, 65, 20 | 22 | 2.65 | 150 | 397.50 | |
| 3 | 20, 275, 30, 269, 58 | 28 | 3.25 | 220 | 715.00 | |
| 4 | 270, 75, 20 | 28 | 3.65 | 220 | 803.00 | |
| 5 | 600 | 14 | 6.00 | 380 | 2280.00 | |
| 6 | 50, 200, 45, 13 | 22 | 2.50 | 300 | 750.00 | |
| 7 | 60, 350, 77, 20 | 28 | 4.30 | 440 | 1892.00 | |
| 8 | 250 | 22 | 2.50 | 240 | 600.00 | |
| 9 | 300 | 22 | 3.00 | 60 | 180.00 | |
| 10 | 300 | 28 | 3.00 | 440 | 1320.00 | |
| 11 | 60, 20, 60 | 14 | 1.40 | 370 | 518.00 | |
| 12 | 600 | 14 | 6.00 | 500 | 3000.00 | |
| 13 | 60, 15, 60 | 12 | 1.35 | 140 | 189.00 | |
| 14 | 60, a, 60<br>14 x :<br>a = 22, 22, 21, 21, 20, 20, 19, 19, 19, 18, 18,<br>17, 17, 16, 16, 15, 15, 14, 14, 13, 13, 13, 12 | 12 | *1.37 | 14 x 23 | 441.56 | |

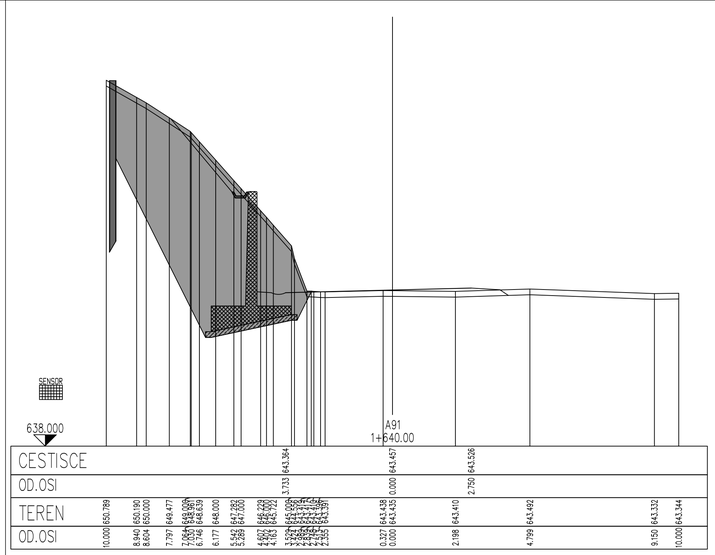
Armaturno jeklo: B 500 B
Beton-stena: C30/37, XD3, XF4, PV-II, D32, S3
Krovni sloj betona: 5 cm
Prekrivanje vzdolžne armature: min. 60 cm

| | | | | | |
|---|---|---|---|---|---|
| BLAN d.o.o. | NAZIV | IME IN PRIIMEK | | IDENT.ŠT. IZS | PODPIS |
| Storitve v gradbeništvu in rudarstvu<br>Špeglova ulica 47<br>3320 Velenje | OVP: | | | | |
| | OP: | Andrej Blažič | | RG 0119 | |
| | obdelal: | | | | |
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | | Št.proj.: | |
| | | | | Št.elab.: | GM 94/2026 |
| | | | | Šifra CC: | |
| faza: | PZI | merilo: | 1:250 | datum: | Junij 2026 |
| opis risbe: | Oporni zid - armaturni načrt | del risbe: | | | |
| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | | |
| št. risbe: | G.13 | avtor risbe: | Blan d.o.o. | | |
| | | ident.št.risbe: | | | |




Uvrtani piloti
Armaturno jeklo: B 500 B
Beton: C25/30, XC2, PV-II, D32, S3
Krovni sloj betona: 8 cm
Prekrivanje spiralne armature: min. 60 cm
Sidranje vzdolžne armature: min. 60 cm

Vezna greda
Armaturno jeklo: B 500 B
Beton-stena: C30/37, XD3, XF4, PV-II, D32, S3
Krovni sloj betona: 5 cm
Prekrivanje vzdolžne armature: min. 60 cm


BLAN d.o.o.
Storitve v gradbeništvu in rudarstvu
Špeglova ulica 47
3320 Velenje


| | NAZIV | IME IN PRIIMEK | IDENT.ST. IZS | PODPIS |
|---|---|---|---|---|
| | OVP: | | | |
| | OP: | Andrej Blažič | RG 0119 | |
| | obdelal: | | | |

| | | | | |
|---|---|---|---|---|
| objekt: | Sanacija LC 261071 Šentlenart-Zilc, III.faza | | Št.proj.: | |
| | | | Št.elab.: | GM 94/2026 |
| | | | Šifra CC: | |
| faza: | PZI | merilo: 1:250 | datum: | Junij 2026 |
| opis risbe: | Oporni zid - profili | del risbe: | | |

| | | | | |
|---|---|---|---|---|
| št. odseka: | arhivska št.: | faza/objekt: | šifra risbe: | |
| št. risbe: | G.14 | avtor risbe: | Blan d.o.o. | |
| | | ident.št.risbe: | | |