Napredno modeliranje u programu Stratigrafija

Program: Stratigrafija

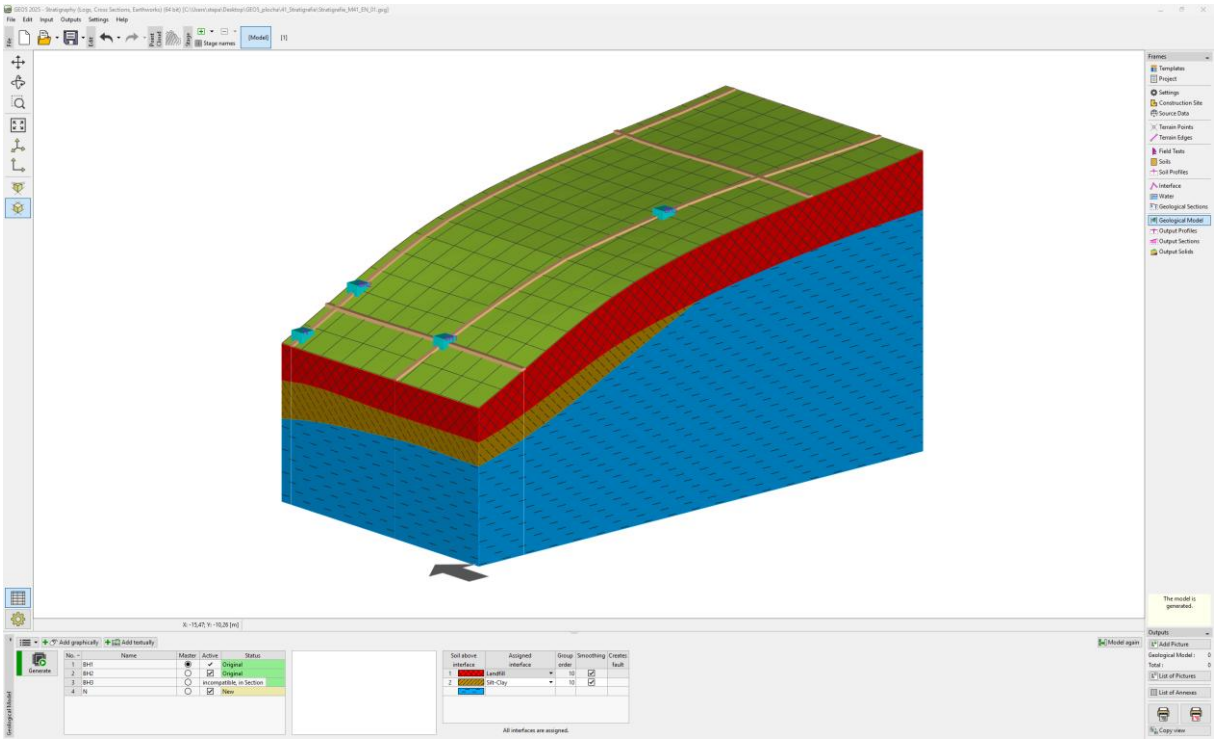
Datoteka: Demo_manual_41.gsg

U ovom inženjerskom priručniku pokazat ćemo neke napredne mogućnosti modelirnaja. Proći ćemo:

- Izradu geološkog rasjeda
- Modifikacija modela promjenom rasporeda generiranja slojeva
- Modifikacija modela koristeći novi geološki presjek

Zadatak:

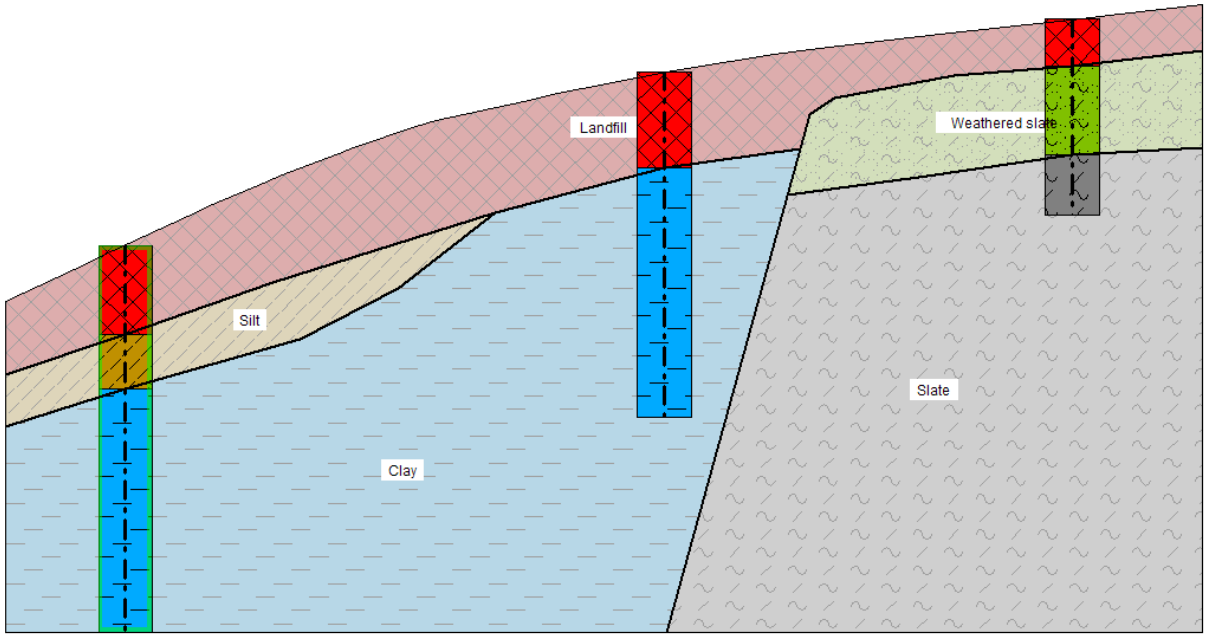
Primjer se temelji na geološkom modelu iz prethodnog inženjerskog priručnika Br. 40 – Osnovni tijek rada u programu Stratigrafija.



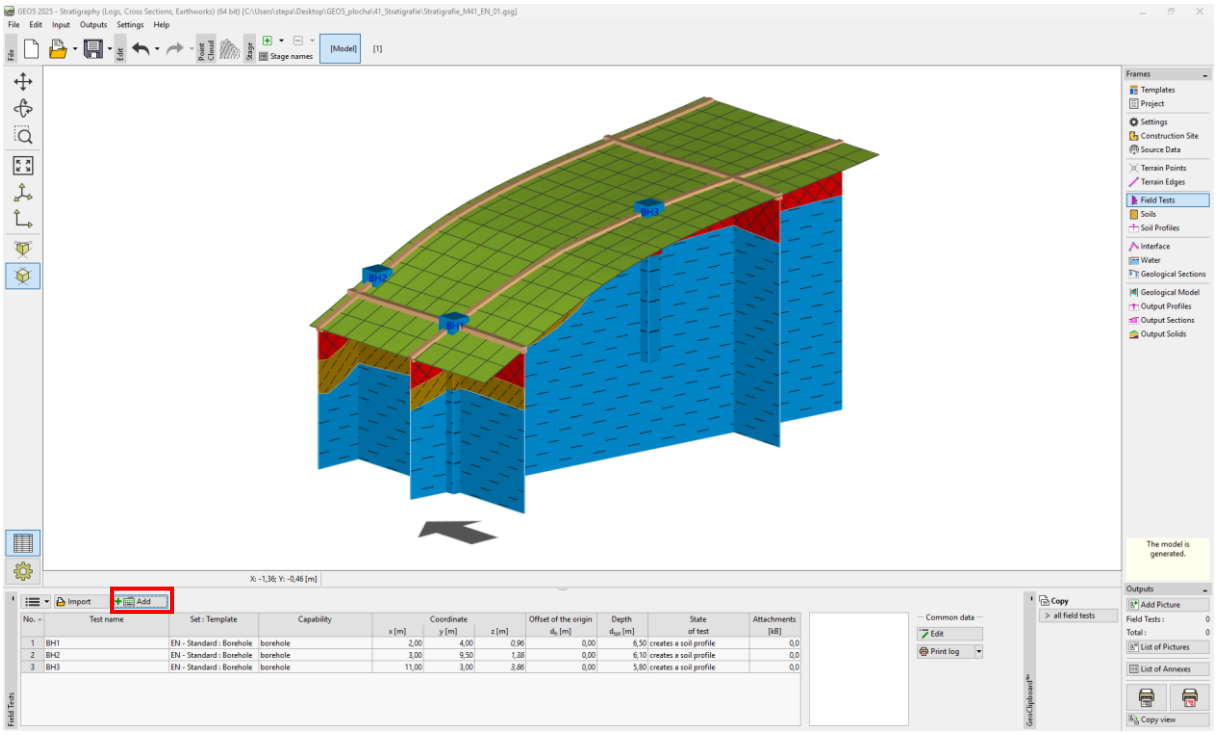
Tijekom dodatnog geološkog ispitivanja, bušotina C1 je izvršena na koordinati [18,4]. Bušotina je pronašla sloj zapunjenja 0.8 m debljine, zatim 1.5 m debljine sloj škriljaca oslabljenih vremenskim uvjetima, te je završila na jačoj podlozi od škriljaca. Zadatak je prilagoditi model kako bi uzeo u obzir nove informacije slojeva i da odgovara našoj ideji geologije u promatranom području.

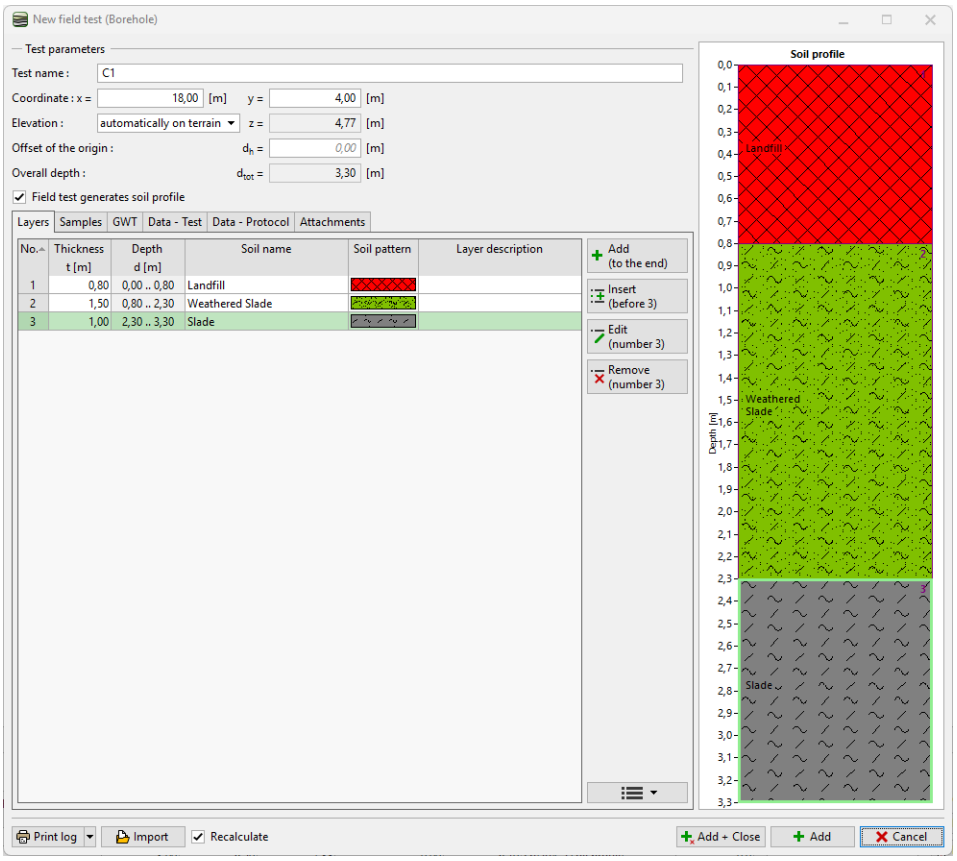
Rješenje:

Podložna stijena je pronađena na vrhu kosine. Pretpostavit ćemo da se proteže ravno prema dolje. Ovo se najbolje može modelirati rasjedima.



Dodat ćemo C1 bušotinu u kartici “Field Tests”. (procedura prema EM Br. 40)

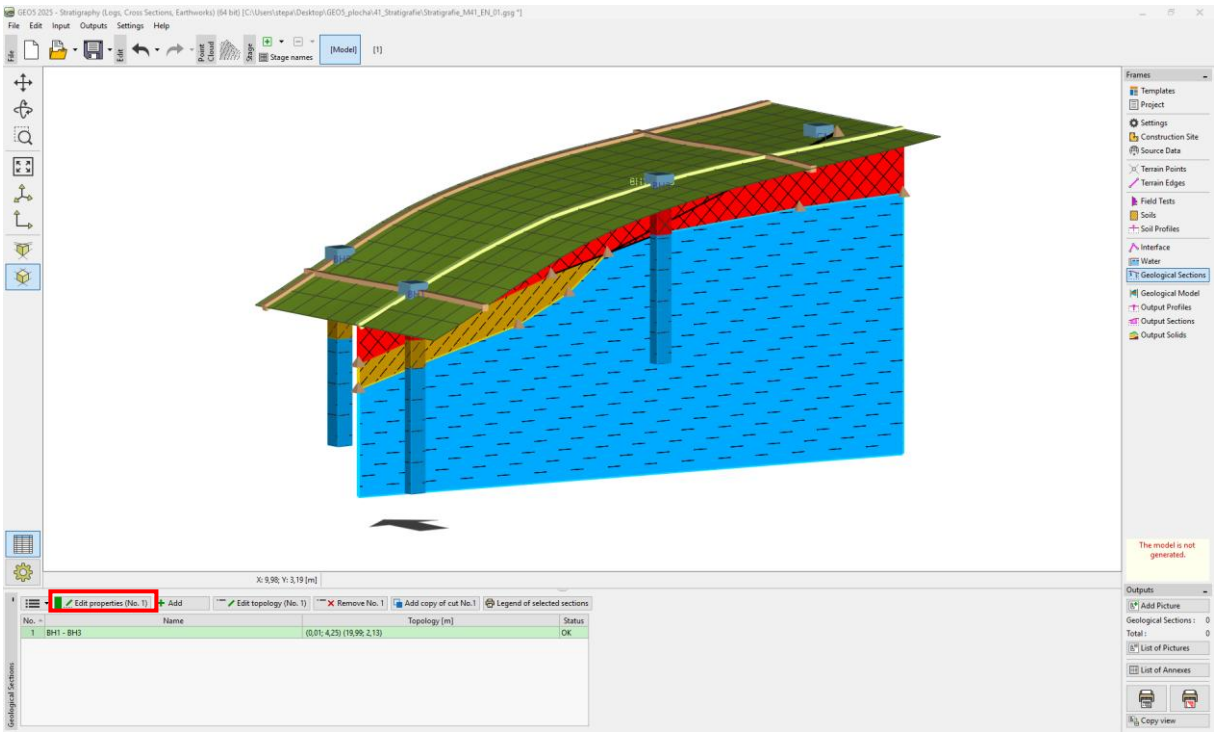



New field test (Borehole)
Test parameters
Test name : C1
Coordinate : x = 18,00 [m] y = 4,00 [m]
Elevation : automatically on terrain z = 4,77 [m]
Offset of the origin : d_h = 0,00 [m]
Overall depth : d_{tot} = 3,30 [m]
Field test generates soil profile
Layers
Samples
GWT
Data - Test
Data - Protocol
Attachments
No.
Thickness t [m]
Depth d [m]
Soil name
Soil pattern
Layer description
1 0,80 0,00 .. 0,80 Landfill
2 1,50 0,80 .. 2,30 Weathered Slade
3 1,00 2,30 .. 3,30 Slade
Add (to the end)
Insert (before 3)
Edit (number 3)
Remove (number 3)
Soil profile
Landfill
Weathered Slade
Slade
Depth [m]
Print log
Import
Recalculate
Add + Close
Add
Cancel

Zatim idemo u karticu “Soils” i kopiramo tla iz terenskih ispitivanja klikom na tipku “Adopt from field tests”.

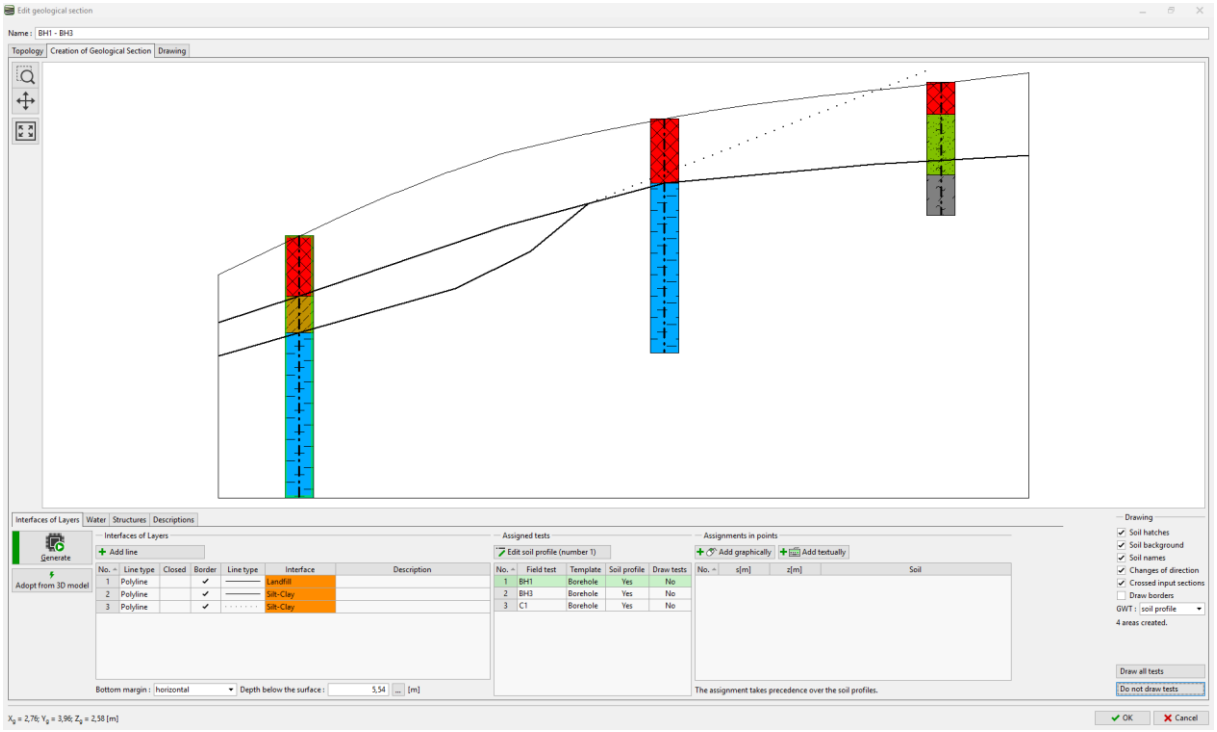
Zatim idemo u karticu “Earth profiles” gdje se profil tla C1 automatski generira.

Nakon toga, u kartici “Geological section” modificiramo uneseni geološki presjek BH1-BH3. Otvorite presjek klikom na tipku “Edit properties”.

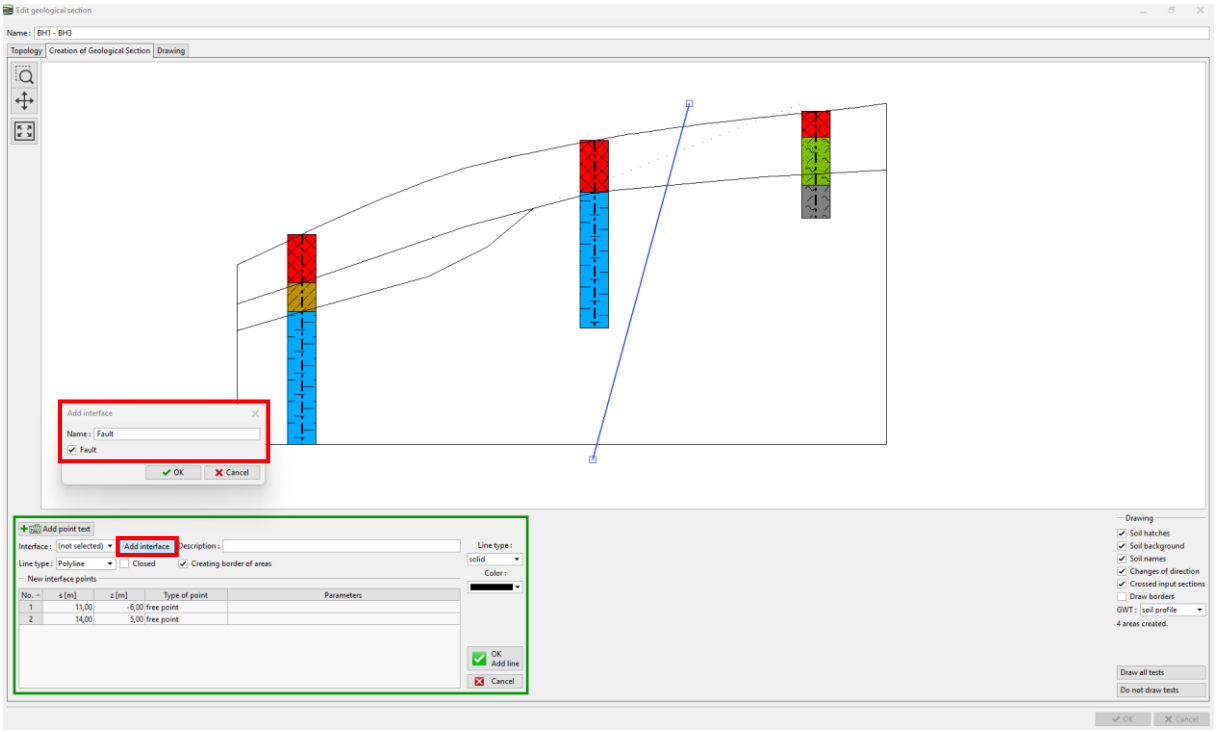


Dodat ćemo bušotinu C1 geološkom presjeku u kartici “Topology” klikom na tipku “Add”.

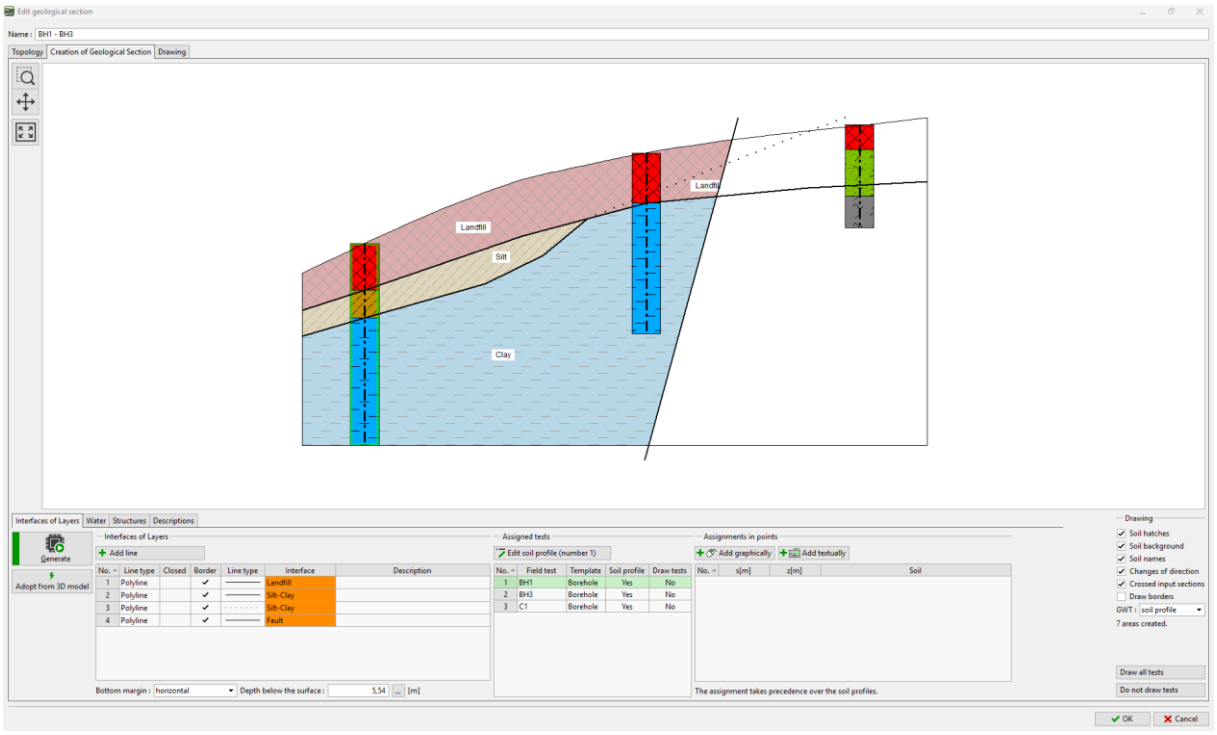
Prelazimo u karticu “Creation of Geological Section”. Bušotina je sad prikazana u geološkom presjeku.



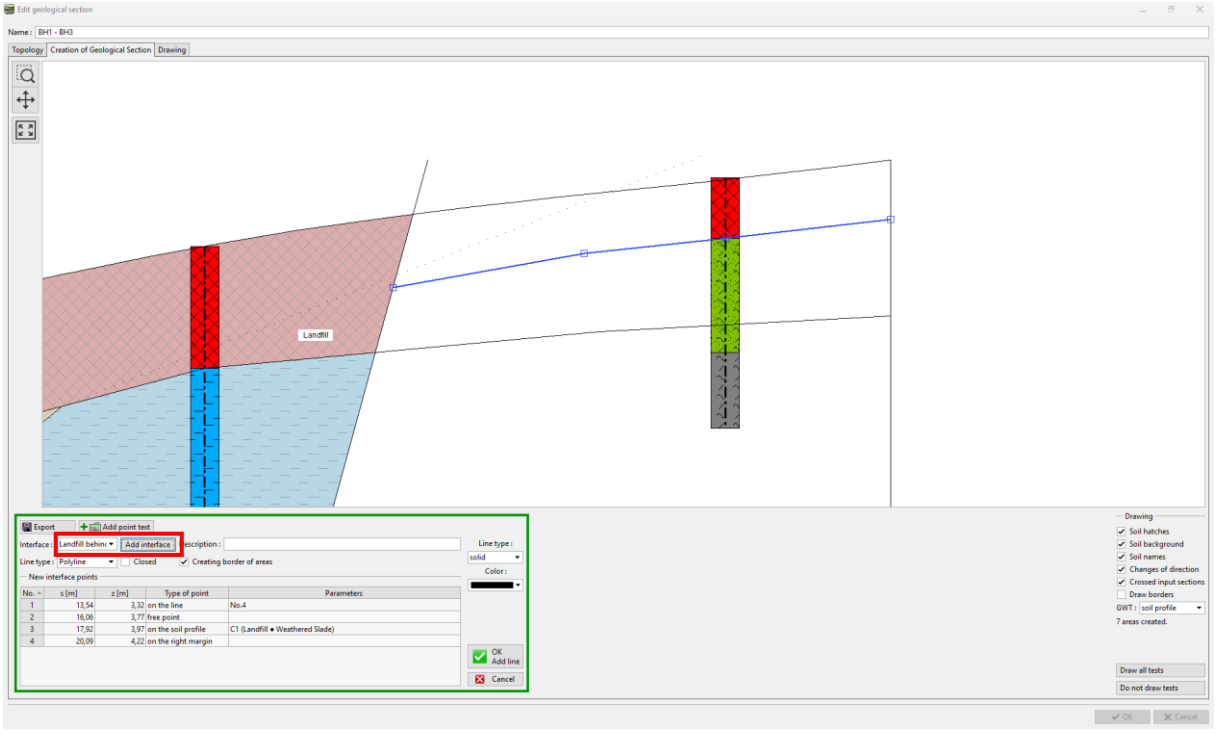
Unijet ćemo rasjed – dodajte novu granicu i uključite opciju “Fault”.



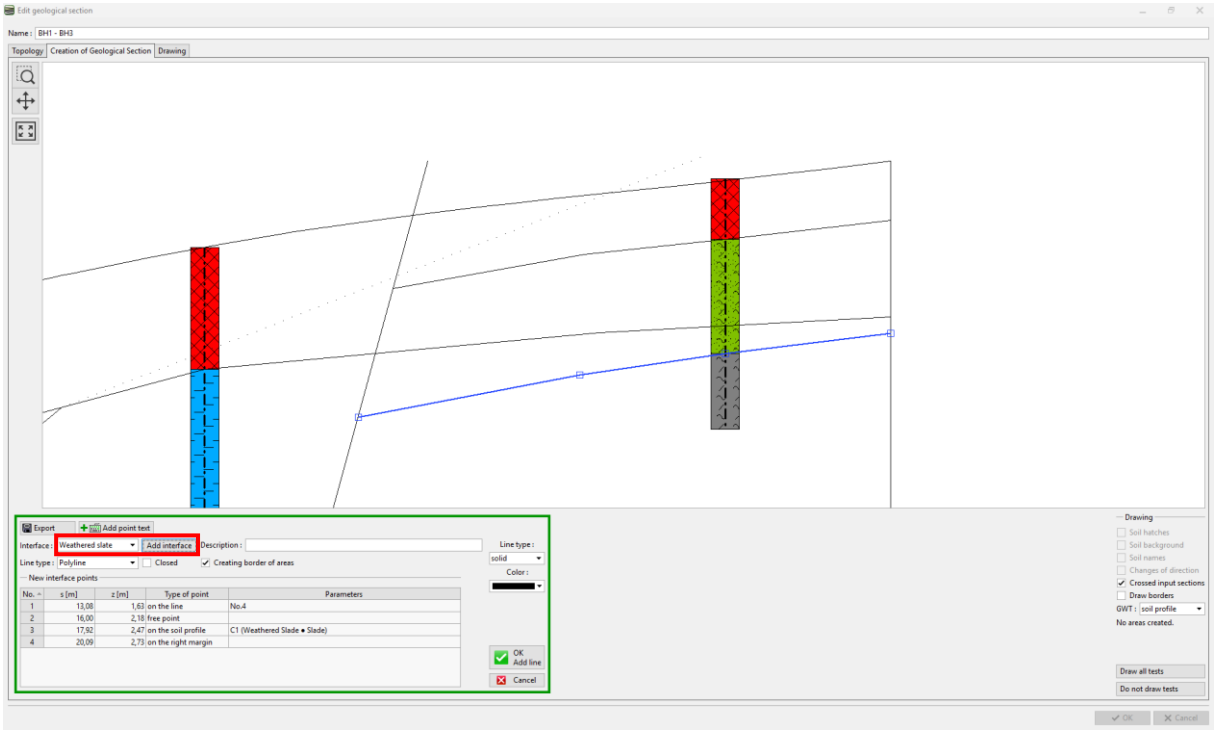
Nakon generiranja presjeka, dodijeljena su samo tla koja se nalaze lijevo od rasjeda.



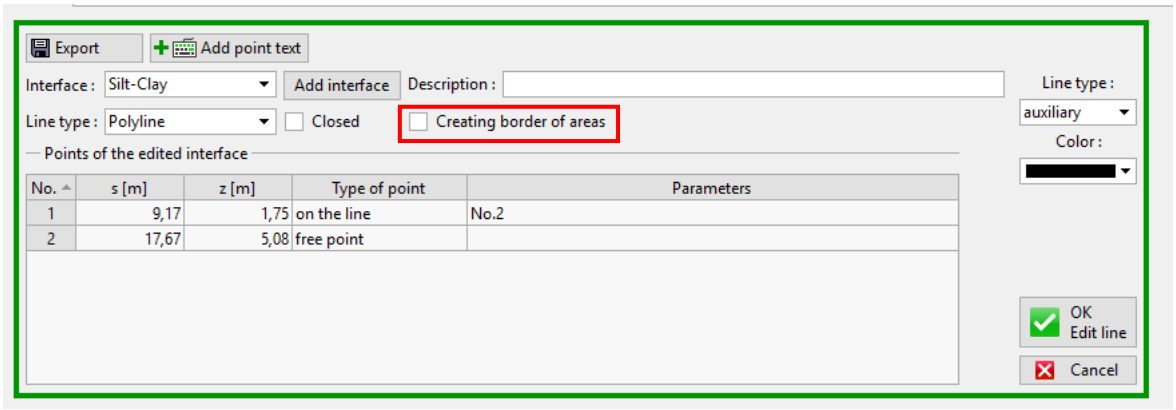
Unosimo granicu iza rasjeda i dodjeljujemo mu novu granicu (Zapunjenje iza rasjeda)



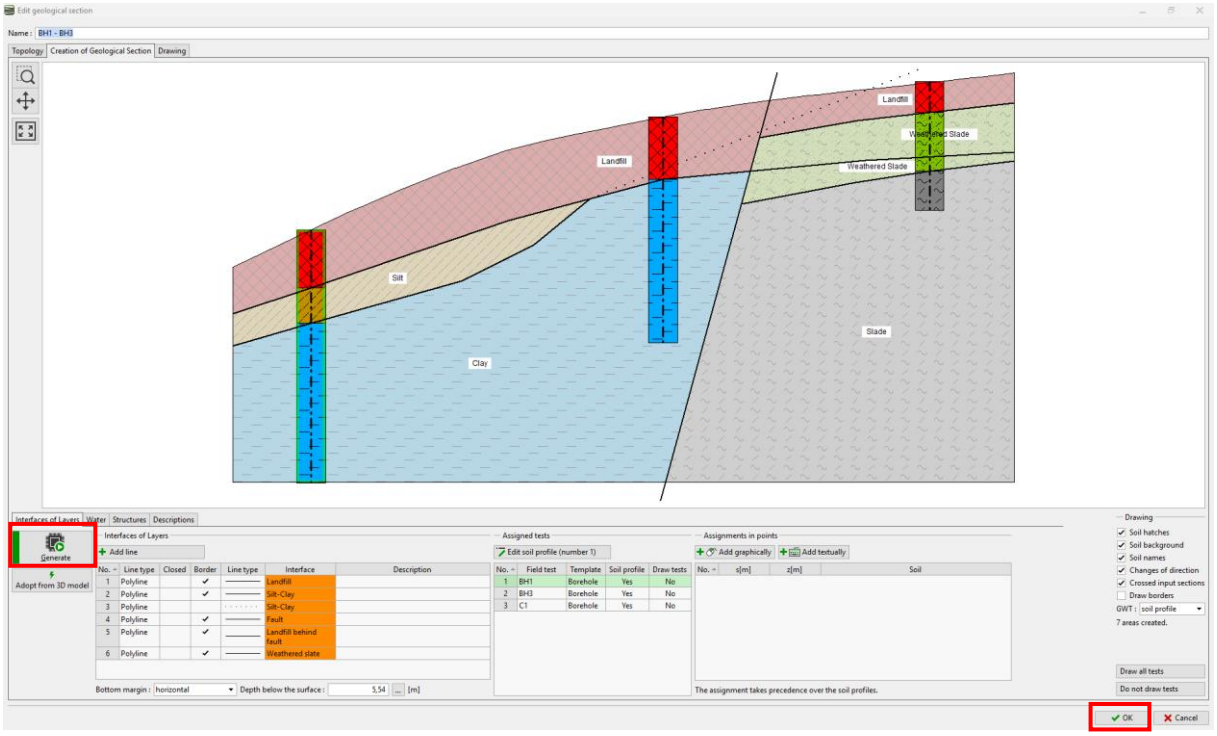
Nakon toga unosimo pretpostavljenu lokaciju vremenski oslabljenih škriljaca i dodajemo granicu “Weathered slate”.



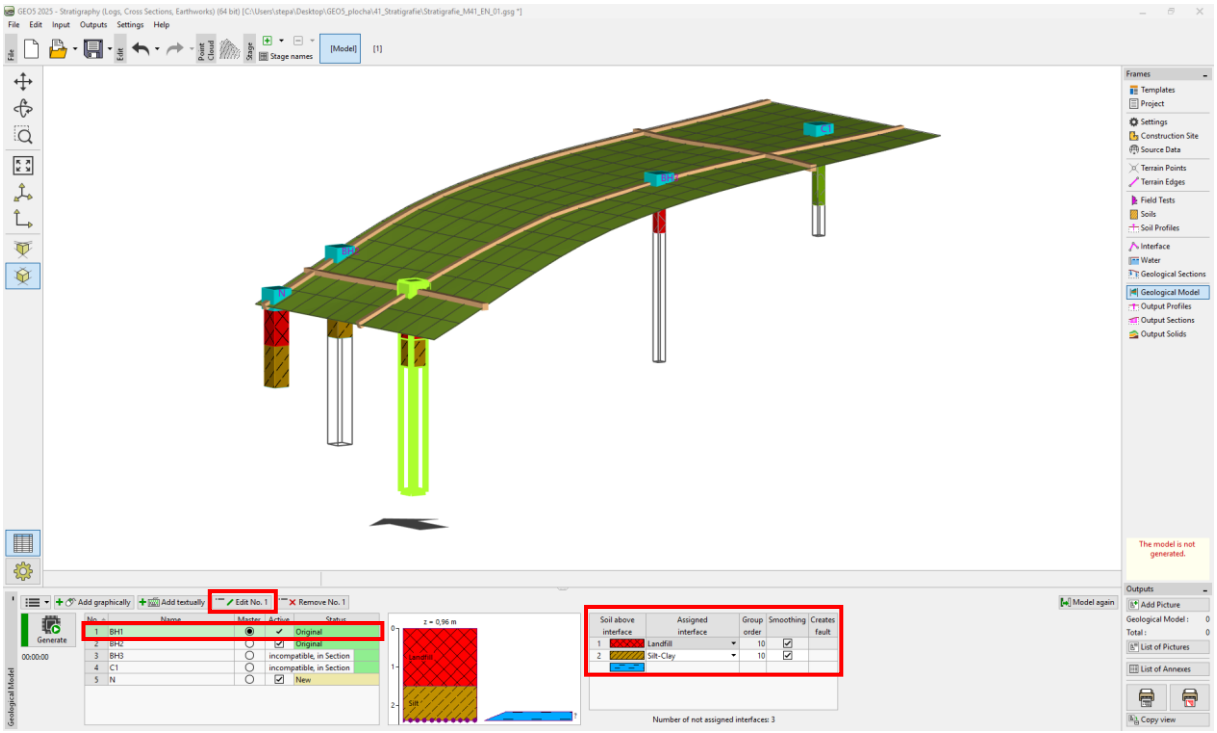
Također je neophodno označiti pomoćnu granicu Br.3, stavka “Creating border of areas” ne smije biti označena.



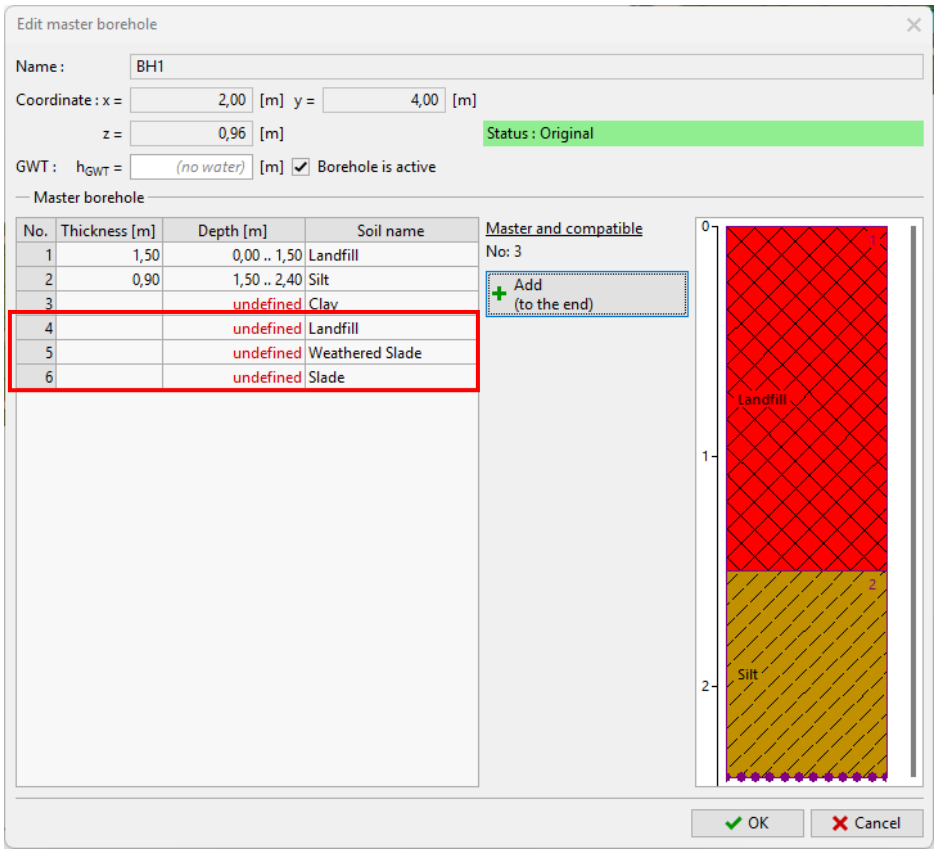
This completes the section. Although the landfill interface divides the weathered slate layer, the model generation will not be affected by it. Generirajte presjek i dodajte ga modelu klikom na tipku “OK”.


Edit geological section
Name : BH1 - BH3
Topology
Creation of Geological Section
Drawing
Landfill
Weathered Slade
Landfill
Weathered Slade
Silt
Clay
Slade
Interfaces of Layers
Water
Structures
Descriptions
Generate
Adopt from 3D model
Interfaces of Layers
Add line
No. Line type Closed Border Line type Interface Description
1 Polyline Landfill
2 Polyline Silt-Clay
3 Polyline Silt-Clay
4 Polyline Fault
5 Polyline Landfill behind fault
6 Polyline Weathered slate
Assigned tests
Edit soil profile (number 1)
No. Field test Template Soil profile Draw tests
1 BH1 Borehole Yes No
2 BH3 Borehole Yes No
3 C1 Borehole Yes No
Assignments in points
Add graphically
Add textually
No. s[m] z[m] Soil
The assignment takes precedence over the soil profiles.
Bottom margin : horizontal
Depth below the surface : 5,54 [m]
Drawing
Soil hatches
Soil background
Soil names
Changes of direction
Crossed input sections
Draw borders
GWT : soil profile
7 areas created.
Draw all tests
Do not draw tests
OK
Cancel

Idemo u karticu “Geological model”. Broj tla i granica između tla ostaje isti kao u prethodnom primjeru. Potrebno je dodati nova tla glavnoj bušotini. Broj tla i njihovih slojeva je uvijek definira putem glavne bušotine.



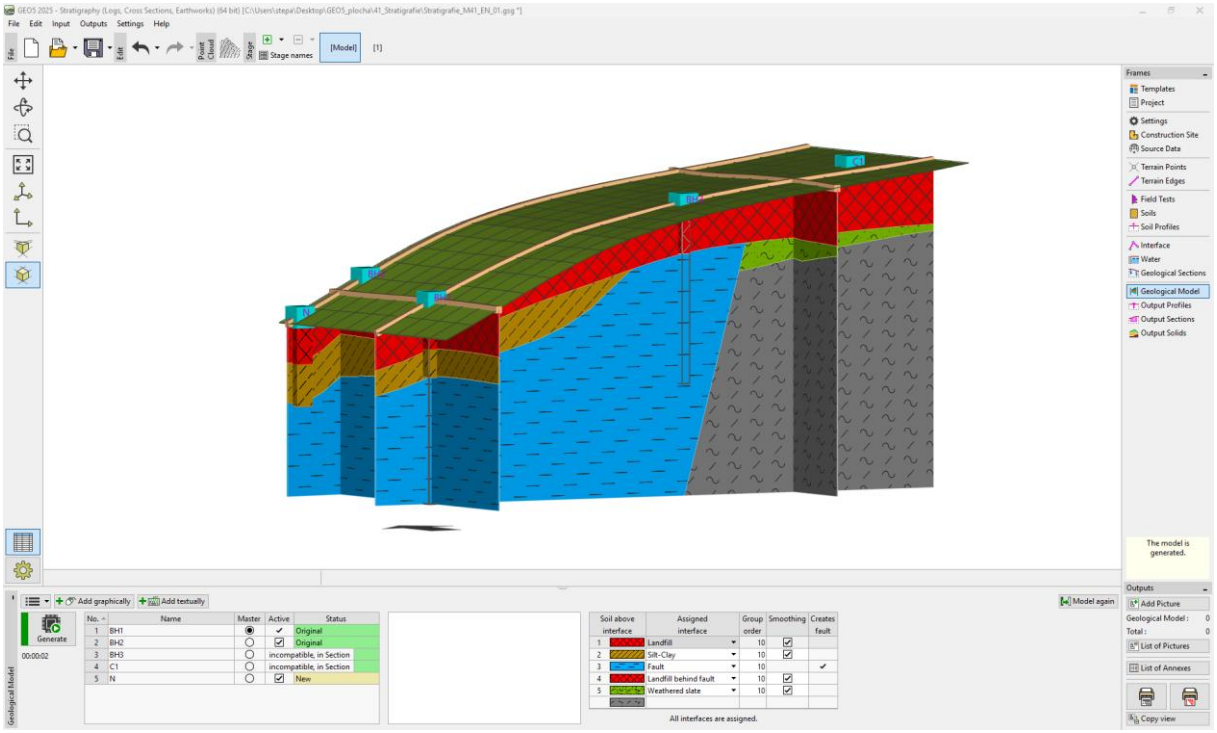
Otvorit ćemo prozor za uređivanje glavne bušotine i dodati novo tlo iza rasjeda (od vrha do dna) klikom na tipku “Add (to the end)” button. Kako ne znamo poziciju granice sloja u bušotini (ili ako nema uopće granice), ostavit ćemo vrstu lokacije kao “undefined”



Tablica slojeva se sad promijenitla. Dodijelit ćemo granicu rasjeda i granice ostalih tla iza rasjeda.

	Soil above interface	Assigned interface	Group order	Smoothing	Creates fault
1		Landfill	10	☑	
2		Silt-Clay	10	☑	
3		Fault	10		✓
4		Landfill behind fault	10	☑	
5		Weathered slate	10	☑	

Nakon generiranja modela možemo vidjeti da sloj zapunjenja prolazi kroz rasjed te da model nije ispravno generiran. To se događa zbog poretka prema kojem su slojevi generirani. Slojevi se generiraju od vrha prema dnu. To znači da se granica zapunjenja generira prva, zatim muljevita glina i tek nakon toga rasjed. Zbog toga je prerezan granicama koje su se ranije generirale.

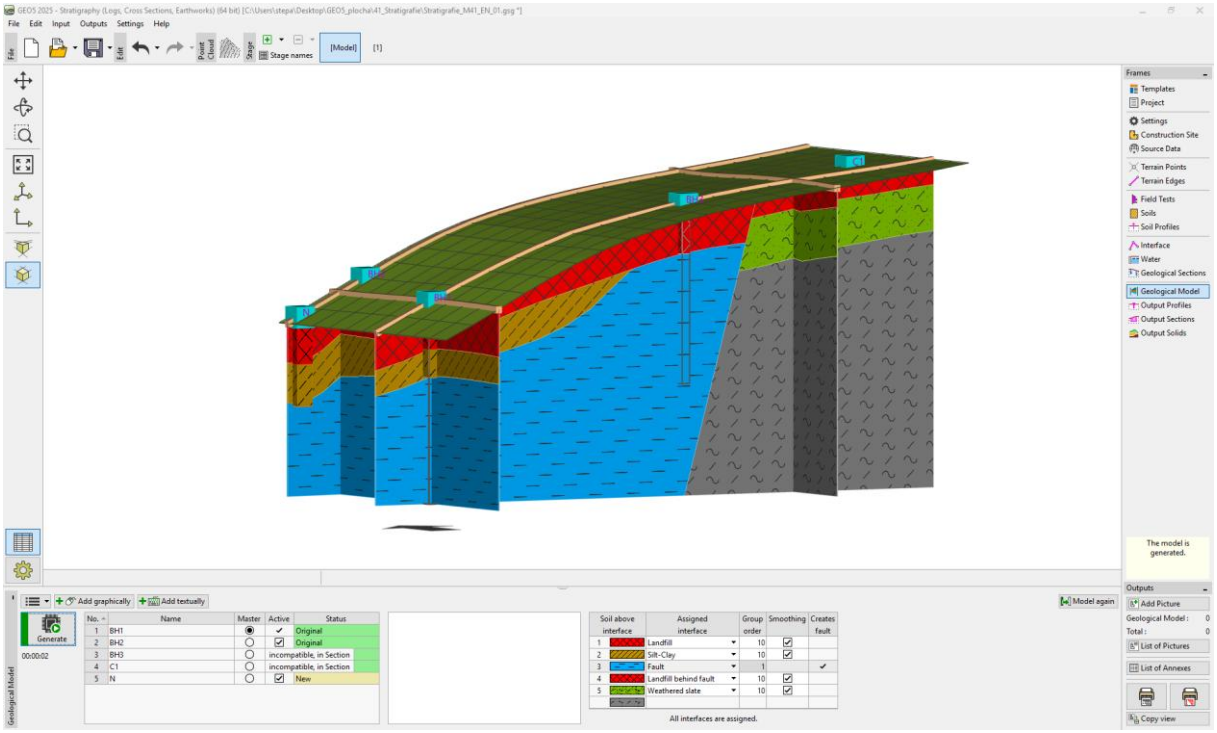

GEO5 2025 - Stratigraphy (Logs, Cross Sections, Earthworks) (64 bit) [C:\Users\stepa\Desktop\GEO5_plocha\41_Stratigrafie\Stratigrafie_M41_EN_01.gsg *]
File Edit Input Outputs Settings Help
[Model]
[1]
Frames
Templates
Project
Settings
Construction Site
Source Data
Terrain Points
Terrain Edges
Field Tests
Soils
Soil Profiles
Interface
Water
Geological Sections
Geological Model
Output Profiles
Output Sections
Output Solids
The model is generated.
Outputs
Add Picture
Geological Model : 0
Total : 0
List of Pictures
List of Annexes
Copy view
Add graphically
Add textually
Model again
Generate
00:00:02
No. Name Master Active Status
1 BH1 Original
2 BH2 Original
3 BH3 incompatible, in Section
4 C1 incompatible, in Section
5 N New
Soil above interface
Assigned interface
Group order
Smoothing
Creates fault
1 Landfill 10
2 Silt-Clay 10
3 Fault 10
4 Landfill behind fault 10
5 Weathered slate 10
All interfaces are assigned.
Geological Model

Zato ćemo promijeniti redoslijed generiranja slojeva. Najprije ćemo generirati rasjed koji će podijeliti model na dva područja.

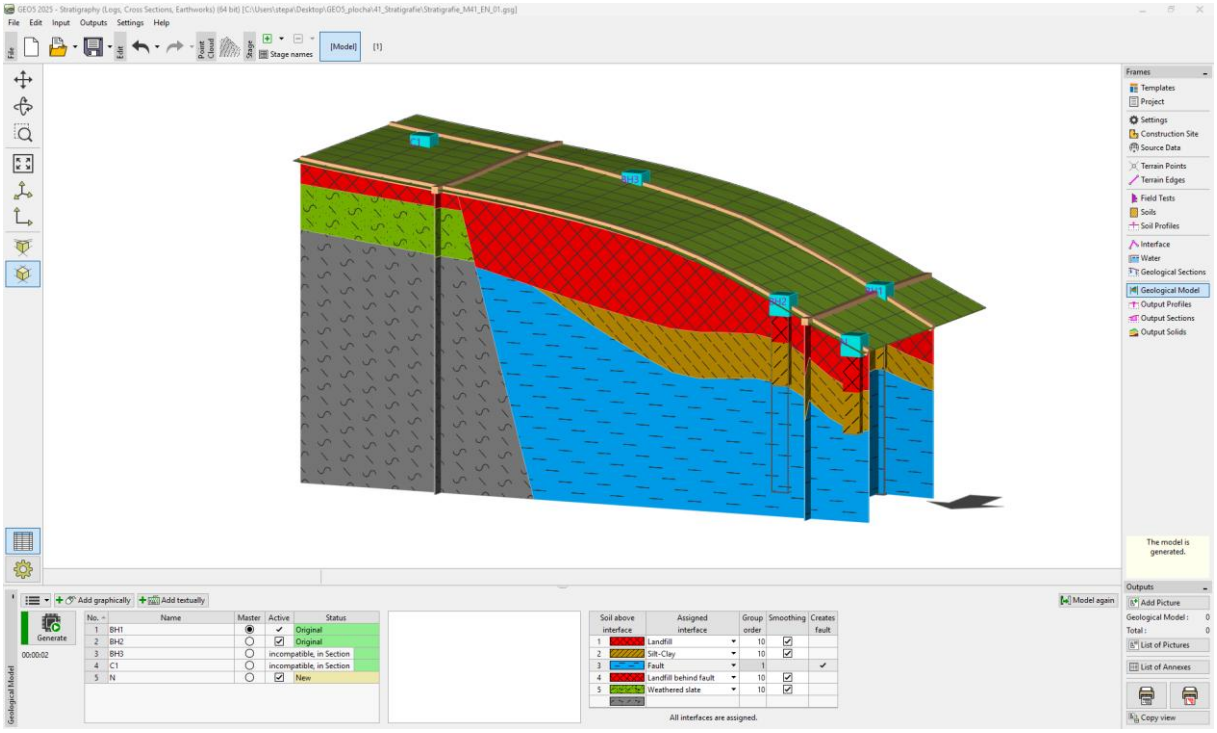
	Soil above interface	Assigned interface	Group order	Smoothing	Creates fault
1		Landfill	10	☑	
2		Silt-Clay	10	☑	
3		Fault	1		✓
4		Landfill behind fault	10	☑	
5		Weathered slate	10	☑	

All interfaces are assigned.

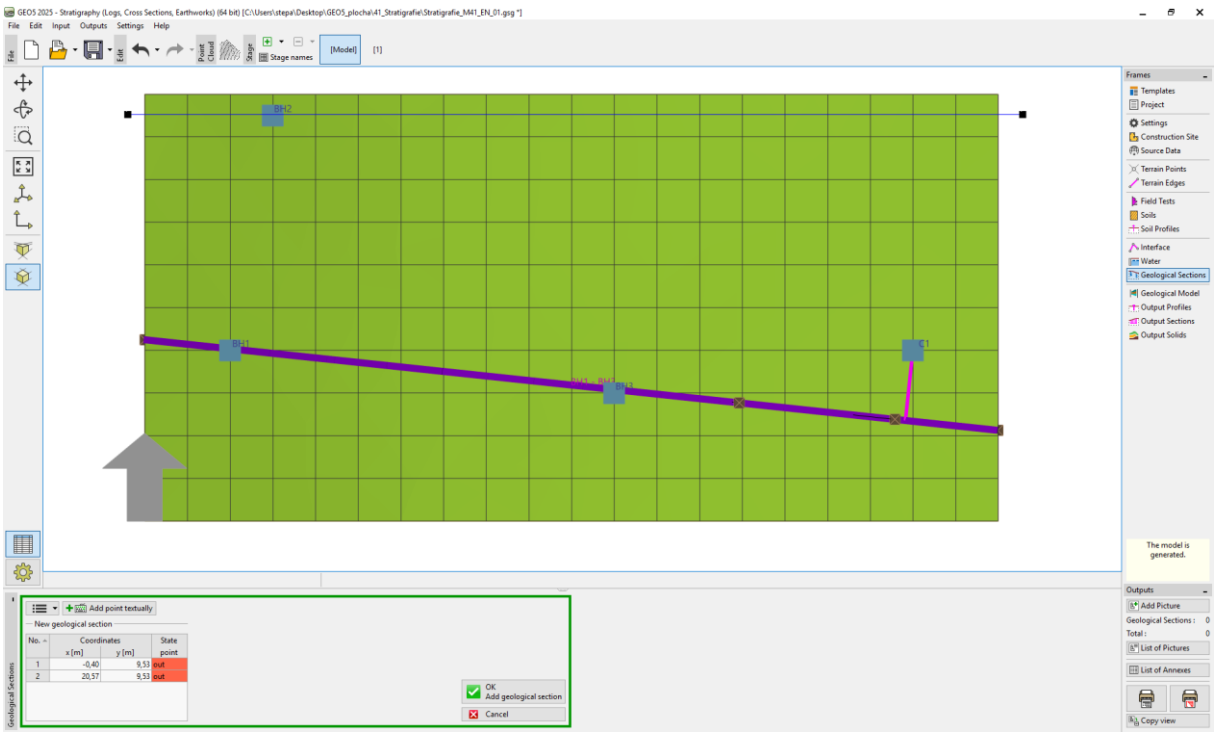
Nakon generiranja, model je ispravno izrađen

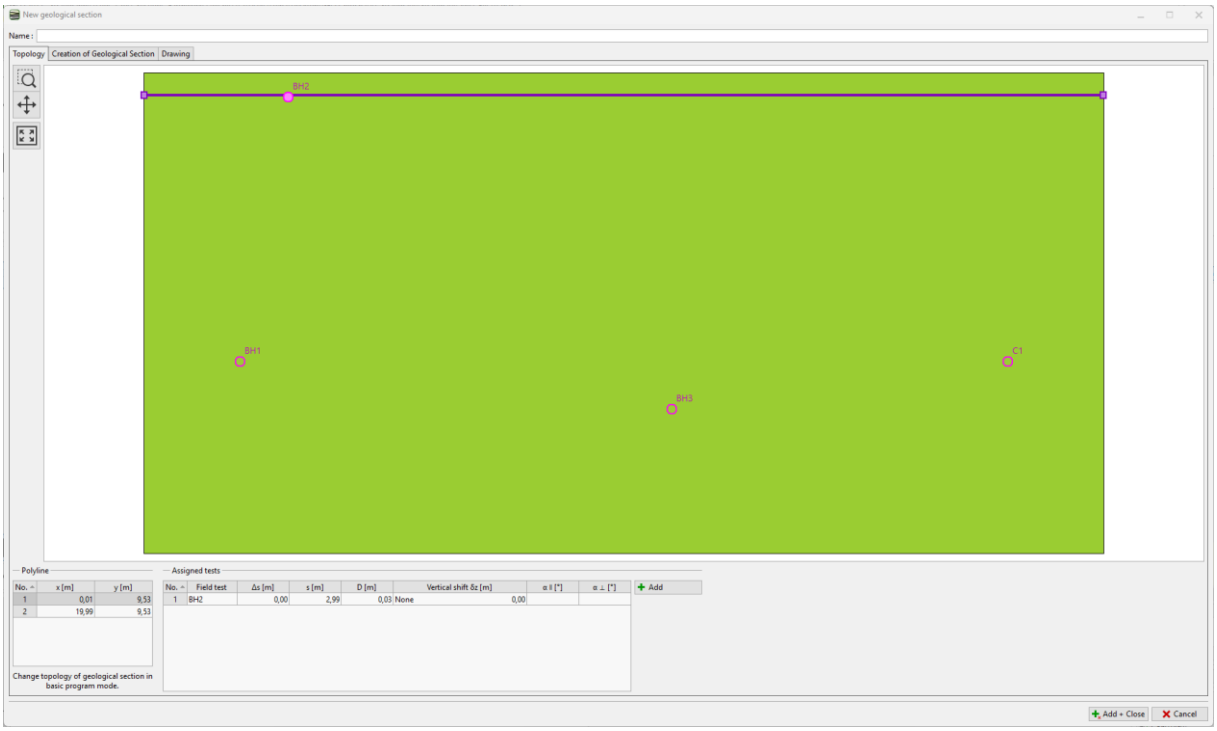


Također ćemo pogledati model i s druge strane.

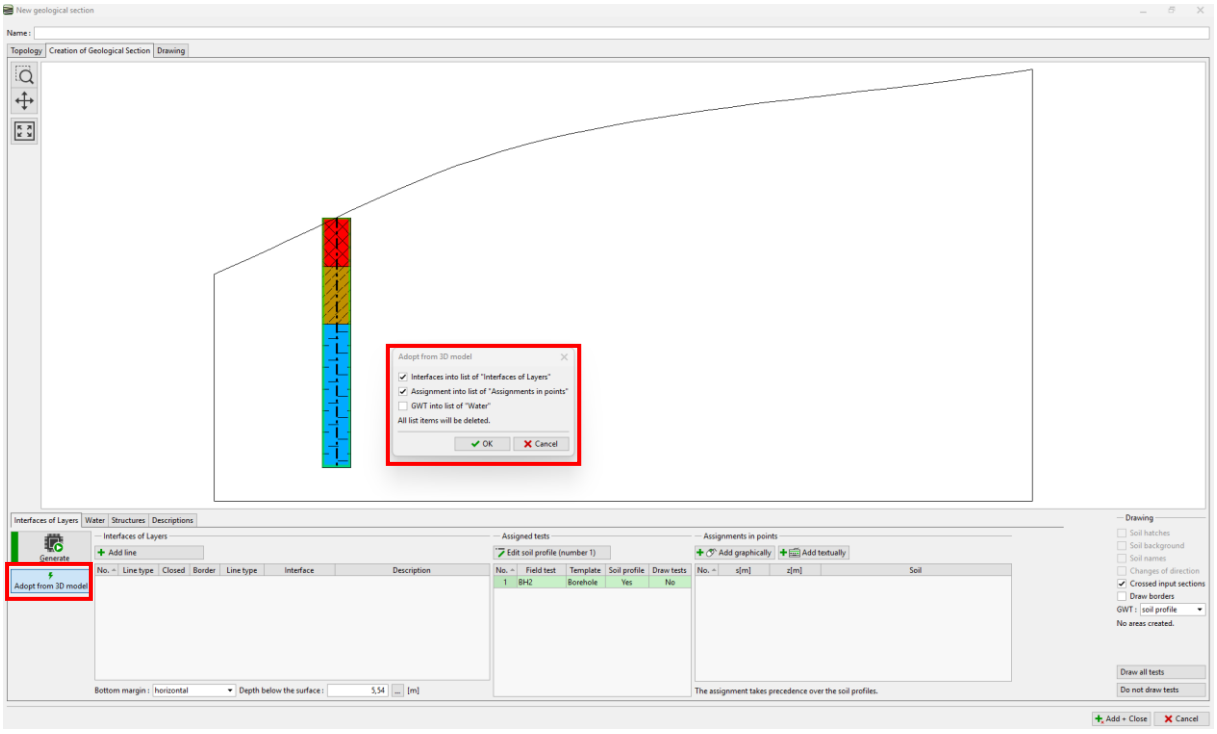


Odlučili smo modificirati model da bolje odgovara našim zahtjevima. Prilagodit ćemo ga dodavanjem novog geološkog presjeka. Dodat ćemo novi presjek u blizini editirane regije, preferirajući da prolazi kroz bušotinu BH2.

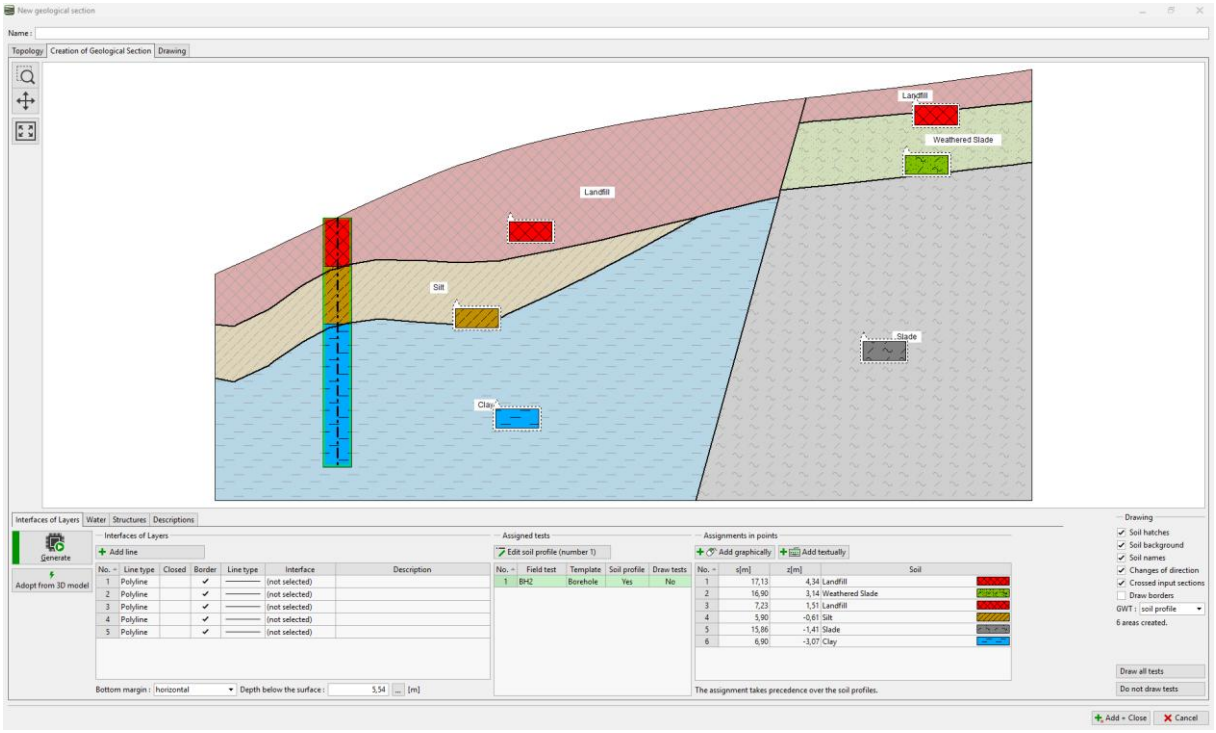




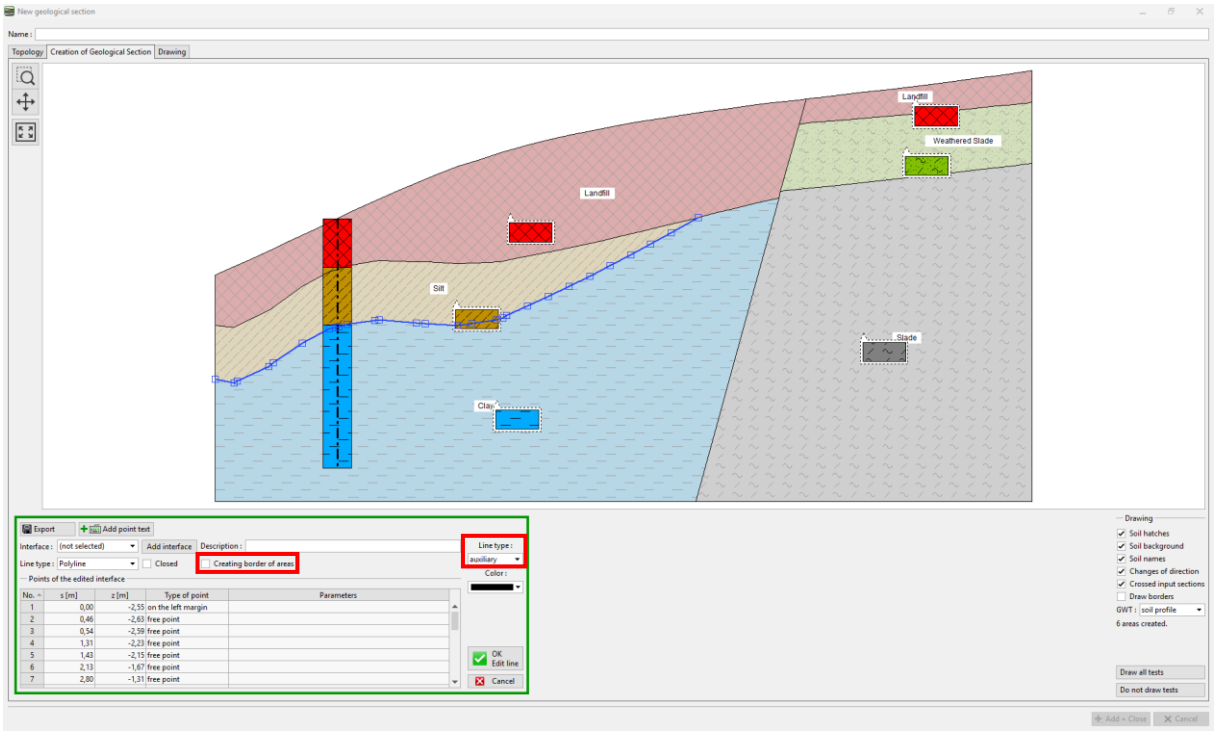
Prelazimo na uređivanje profila i koristimo tipku “Adopt from 3D model” kako bismo ga prebacili na geološki presjek.



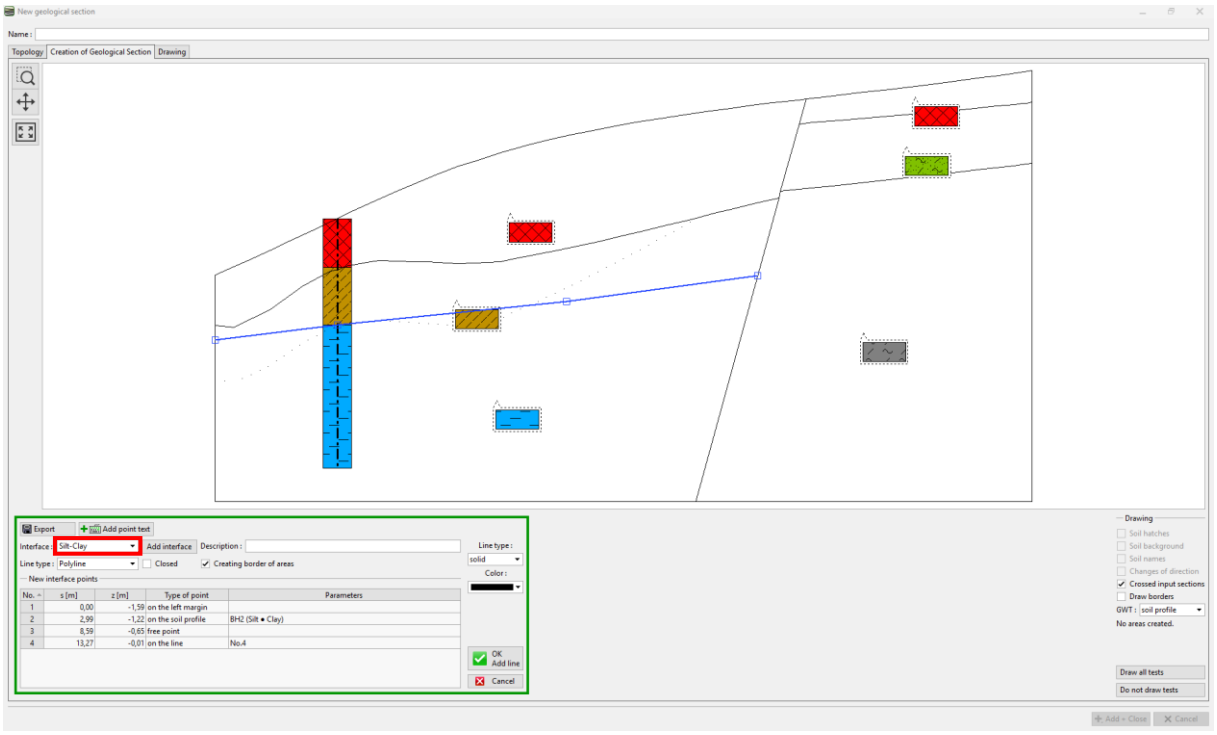
Tla su sad dodijeljena koristeći točke u svakom području. Granice nisu dodijeljene individualnim linijama tako da one ne stvaraju dodatne točke na granicama u 3D modelu.



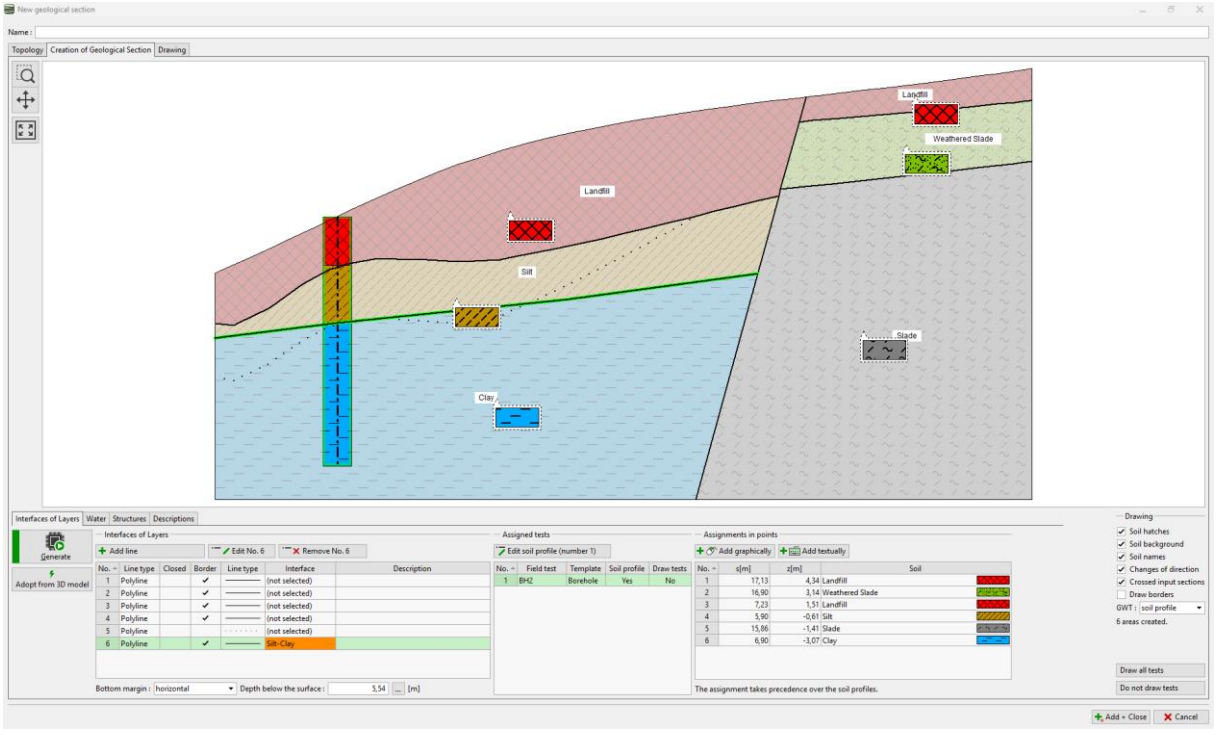
Prilagodit ćemo granicu između mulja i gline. Odaberite liniju, te ju označite kao sporednu (bit će prikazana točkasto) i isključite opciju “Creating border of areas”. Mogli smo tu liniju i obrisati, ali ju želimo vidjeti prilikom izrade nove.



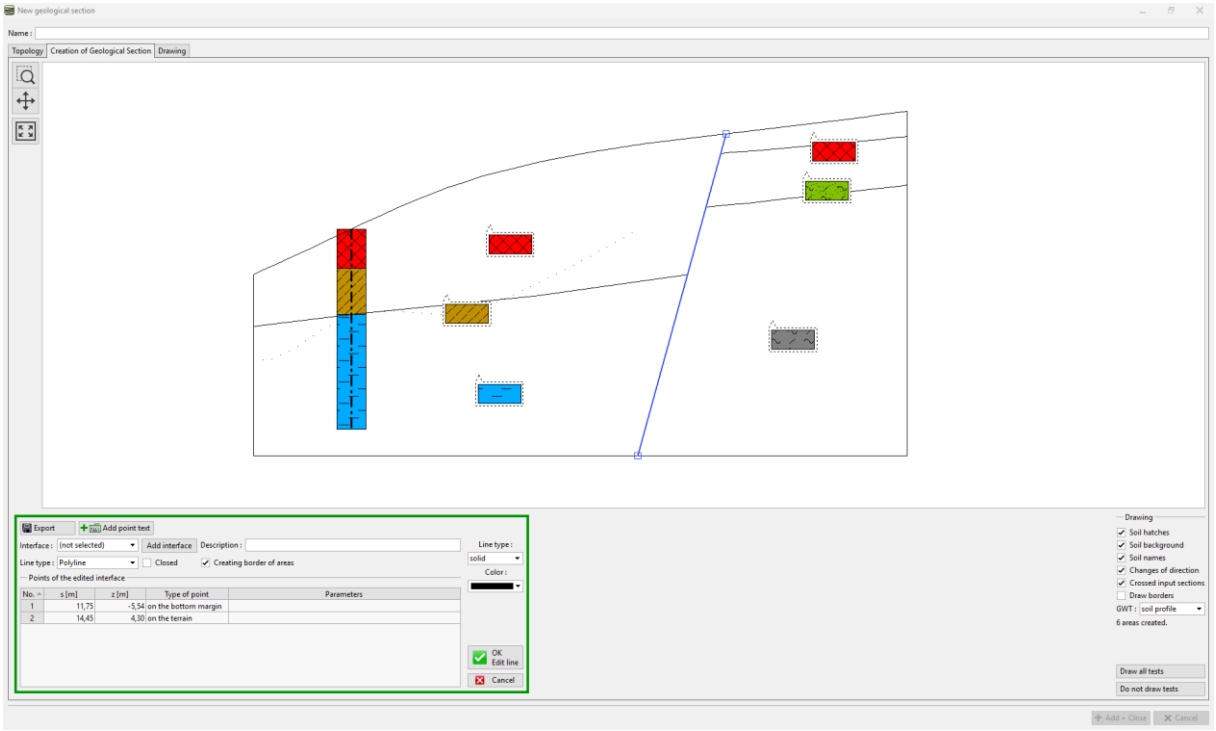
Unijet ćemo novi oblik granice i dodijeliti joj granicu “Silt-clay”



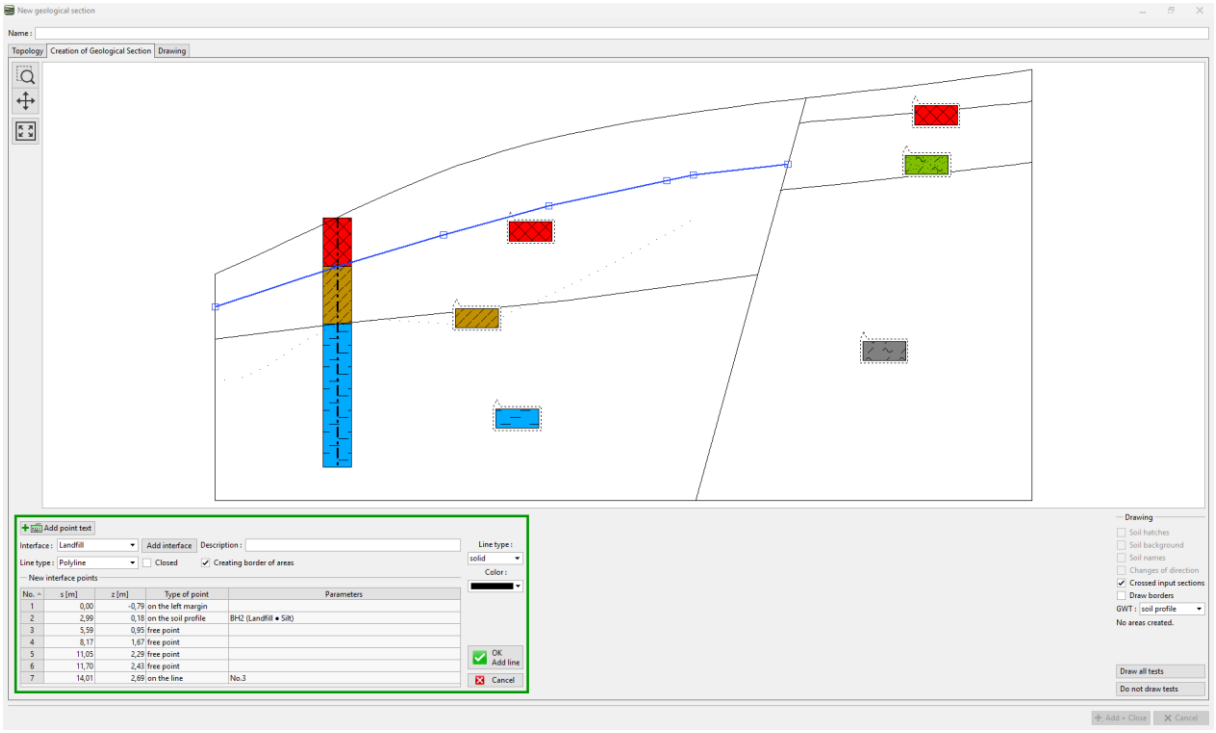
Nakon generiranja možemo vidjeti novo stvorena područja i originalni oblik granice.



Također ćemo prilagoditi i granicu zapunjenja. Ovaj put ćemo obrisati staru granicu i izraditi novu. Ovaj postupak je jednostavniji, ali ćemo izgubiti informacije o originalnom obliku. U tom slučaju, nakon brisanja granice, morat ćemo produljiti liniju koja stvara rasjed, kako bi područja bila zatvorena.

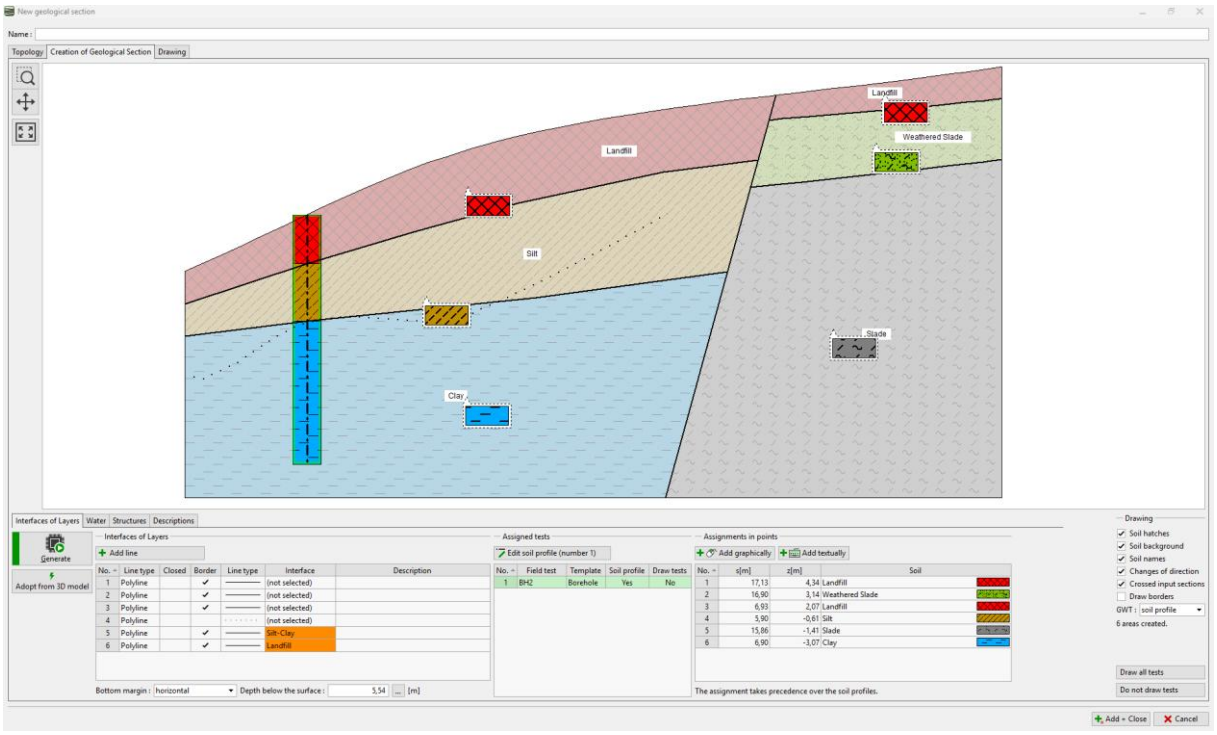


Dodat ćemo novu granicu zapunjenja.

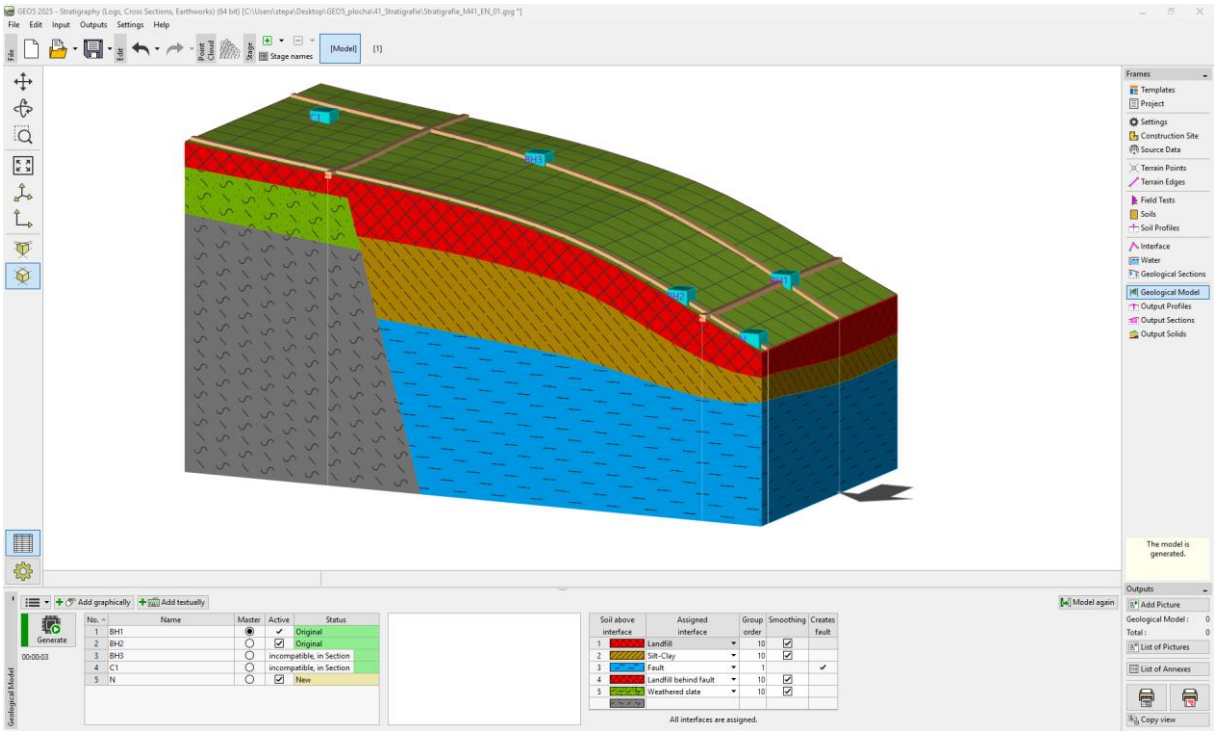


Napomena; Na 3D model utječu jedino točke koje su dodijeljene granicama. Ako želimo zadržati točkan oblik granice u 3D modelu, možda ćemo trebati modelirati granicu s više točaka – iako je presjek ravan.

Sad je presjek modificiran. Linije narančaste boje stvaraju granice i prilagođuju izgled 3D modela.



Sad ćemo generirati model. Nakon toga modifikacije su završene.



Napomena: Primjer s ovim zadatkom (Demo_manual_41.gsg) možete pronaći u Online examples.