

Description

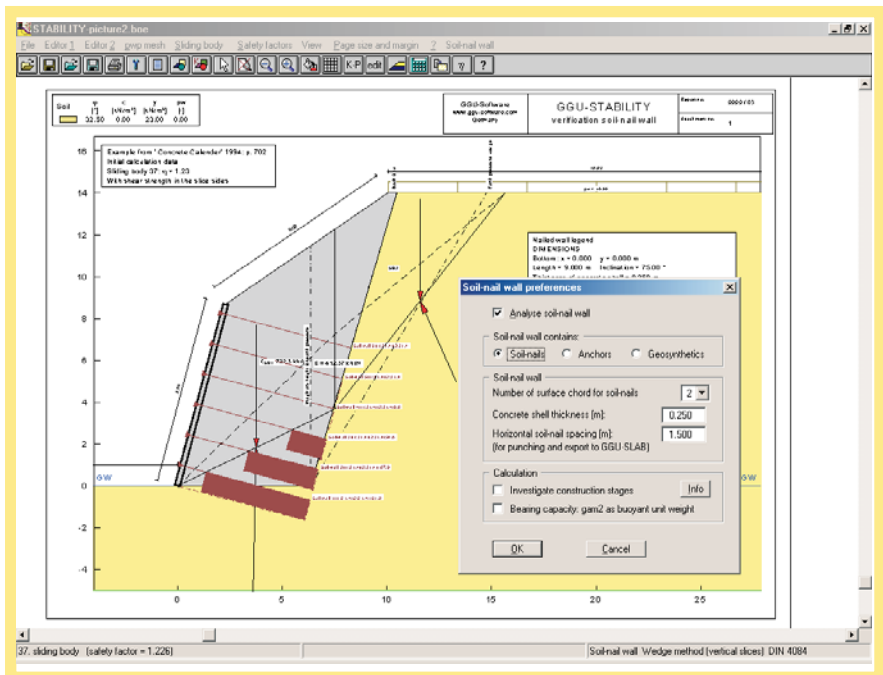
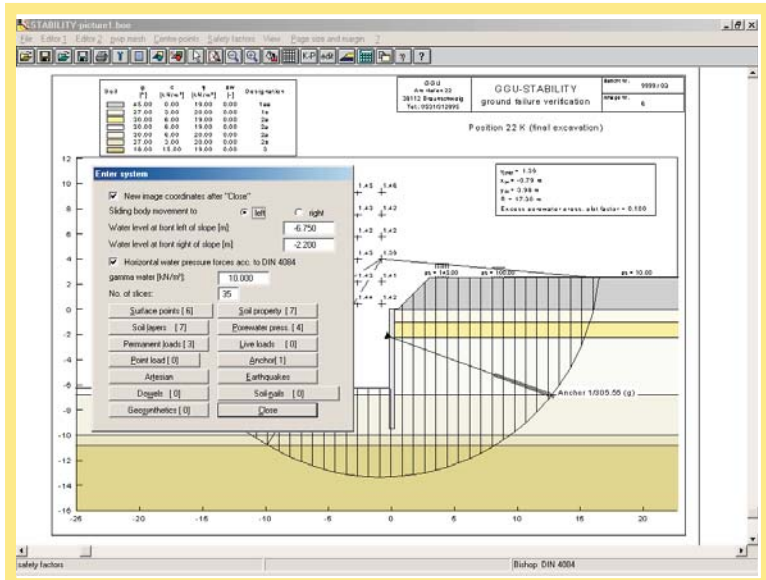
GGU-STABILITY - slope stability analysis and analysis of soil nailing and reinforced earth walls to DIN 4084 and DIN 4084 (new).

Nailing can consist of:

- Anchors
- Soil nails
- Geosynthetics (reinforced earth)

Capabilities:

- Choice of analysis using global safety factors (DIN 4084) or partial safety factors (DIN 4084 new, DIN 1054 new)
- Verification of inner stability after Janbu, using the general wedge method or the vertical slice method
- General stability to DIN 4084 (Bishop)
- Sliding safety to DIN 1054
- Safety against overturning
- Safety against bearing capacity failure to DIN 4017
- Bending dimensioning of the concrete shell to DIN 1045 as solid slab (continuous reinforcement) via interface to the GGU-SLAB program
- Bending dimensioning of the concrete shell to DIN 1045 as a horizontally continuous face-plate for a single nail or "isolated face-plate" for a single nail
- Punching verification to DIN 1045
- Determination of the maximal "nail forces"
- Graphics oriented and tabular input/editing of system geometry and system data
- Automatic generation of nail grids or manual input
- Consideration of horizontal and vertical seismic acceleration
- Input of porewater pressures via a porewater pressure line or porewater pressure mesh
- Interface to the GGU-SS FLOW2D program (groundwater flow modelling)
- Variable visualisation of safety factors, e.g. as colour-filled contours
- User-defined design of output sheet



- Copying of screen sections, e.g. for transferring to a word processor
- MiniCAD system for additional annotation of graphics

Report no. 9999 / 03
Attachment no. 1

GGU-STABILITY
verification soil-nail wall

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Initial calculation data
Sliding body 20: $\eta = 1.75$

Soil	ϕ [°]	c [kN/m ²]	γ [kN/m ³]	pw [c]	Designation
Orange	23.50	0.00	19.50	0.00	backfilling
Yellow	26.00	0.00	21.00	0.00	gypsum, weathered
White	32.50	25.00	22.00	0.00	gypsum, weathered

OVERTURNING SAFETY FACTOR
Eccentricity soil-nail wall = -1.066 m
Allow. eccentricity = 1.028 m = b/6
Eccentricity > b/6 but the wall will rotate backwards
BEARING CAPACITY SAFETY FACTOR for level surface
c = 25.0 kN/m²
 $\gamma_s = 22.0$ kN/m³
 η (foundation failure) = 11.94
PUNCHING VERIFICATION
Earth pressure (w/o c) = 165.74 kN/m
cal Q = 66.05 kN
Width = height (soil-nail plate) = 0.25 m
Concrete: B 25 / Steel: BSt 500/550
Effective height = 0.160 m
Current $\tau = 297.36$ kN/m²
No shear reinforcement needed

SLIDING SAFETY FACTOR
 η (slip) = 14.85

BASE DATA
H = earth pressure (with c) = 58.24 kN/m
Inclination of back face = 69.74 °
Earth pressure redn due to inclination of back face = 0.567
V = 1134.82 kN/m
Moments around mid-point of wall base:
M (from H forces) = 135.90 kN*m/m
M (from V forces) = -1582.89 kN*m/m
b = 6.17 m
 $\phi = 32.5$ °

DIMENSIONS
Bottom: x = 0.000 m
Length = 6.699 m
Inclination = 80.15 °
Thickness of concrete shell = 0.160 m
Horizontal soil-nail spacing = 1.500 m

Section 1a - 1a
nailed shotcrete shell next to built-up area

