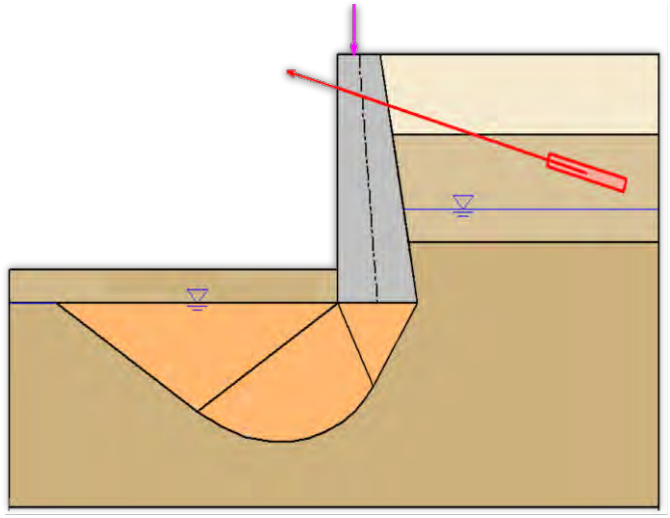
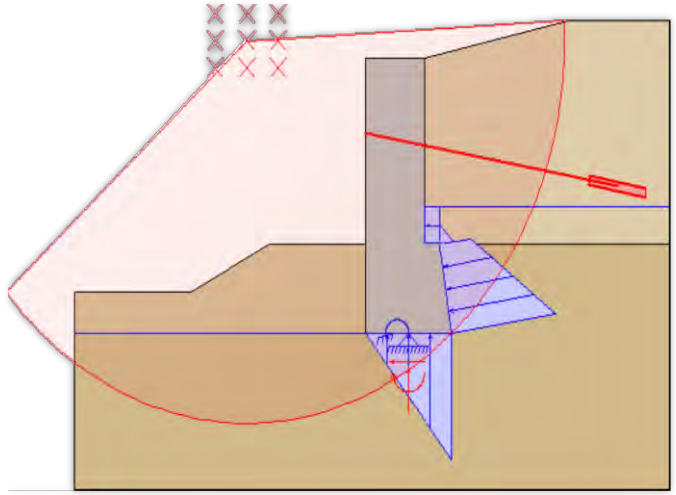
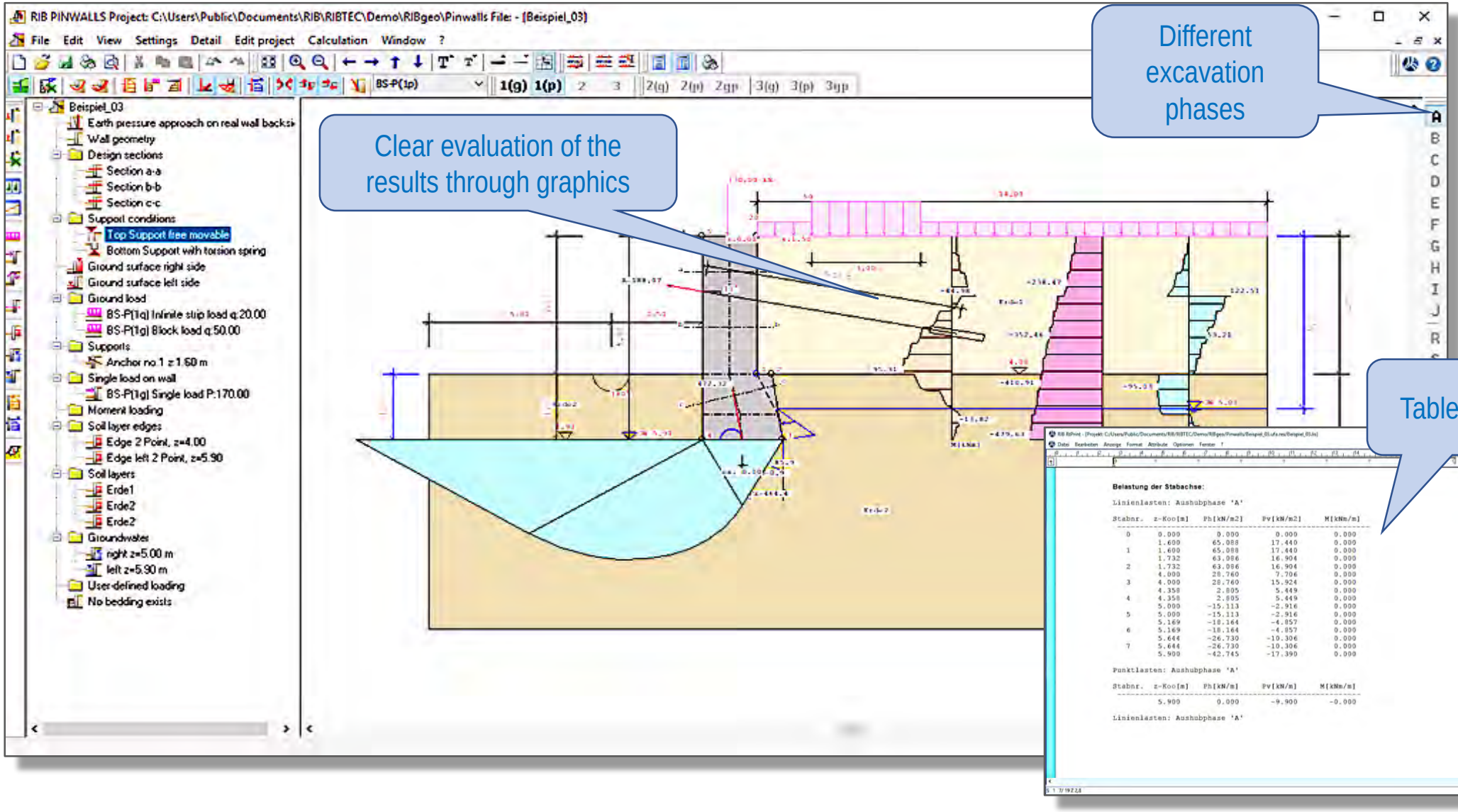
PINWALLS - Analysis and Design of Underpinning Walls

- Consideration of different excavation stages and retreating construction stages with system modifications
- Consideration of different water levels in front of and behind the wall
- clearly arranged and complete result output including graphics and preview functions
- Interface with CAD systems to transfer the wall geometry

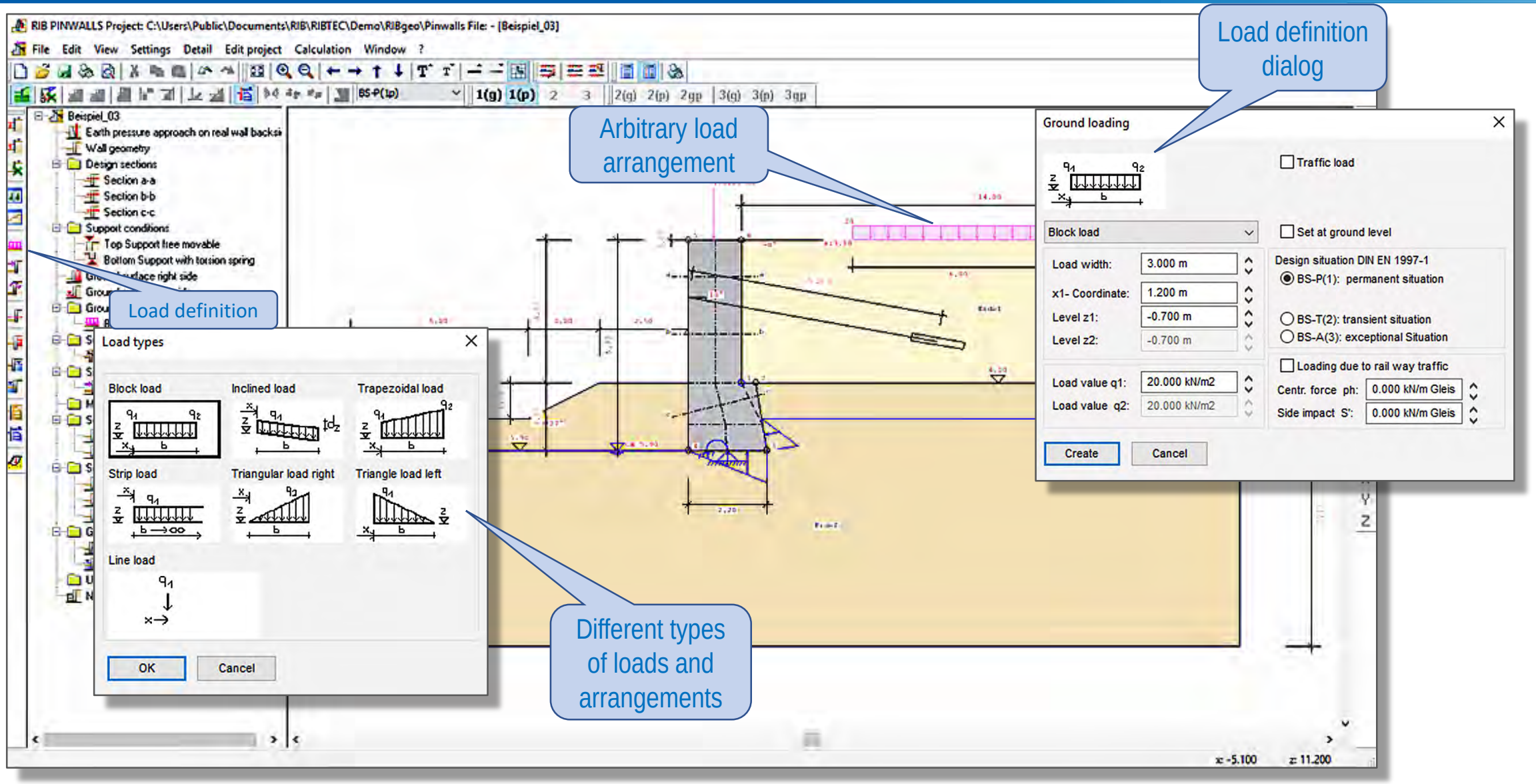




Work environment with overview at a glance

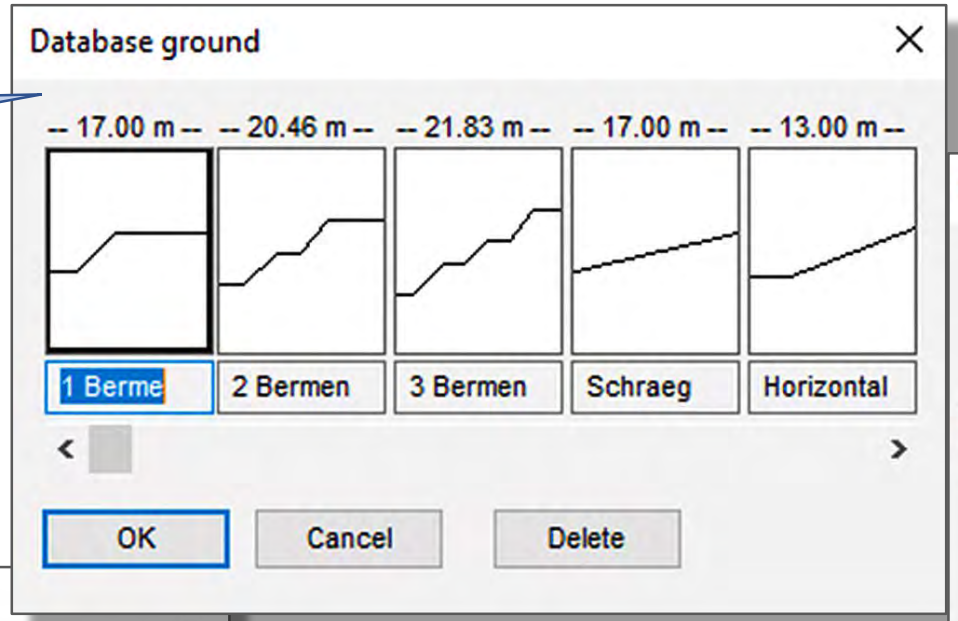


Versatile options for system and load input

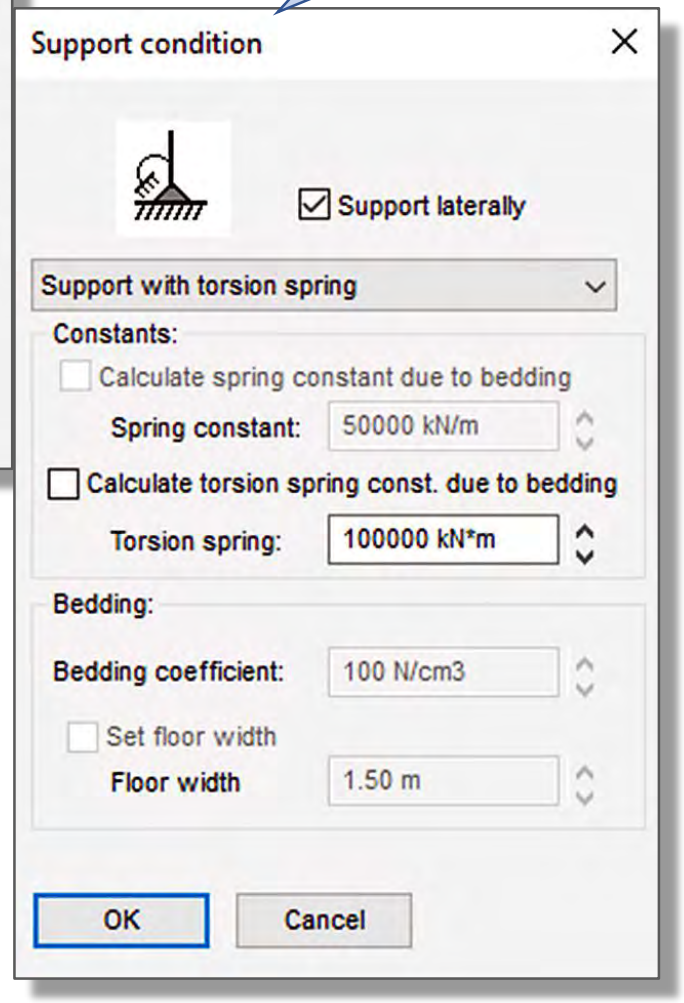


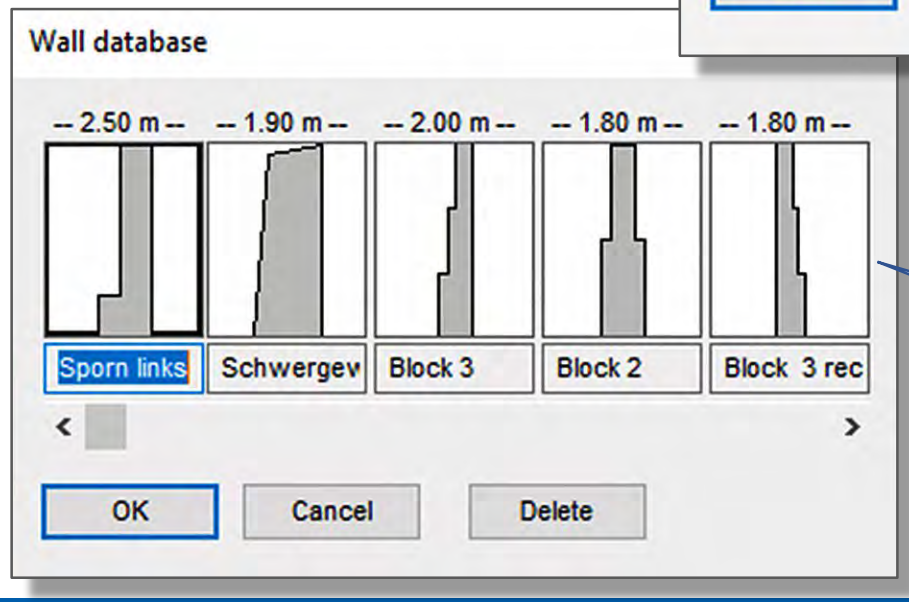
Optimum program functions for underpinning

Different ground surfaces



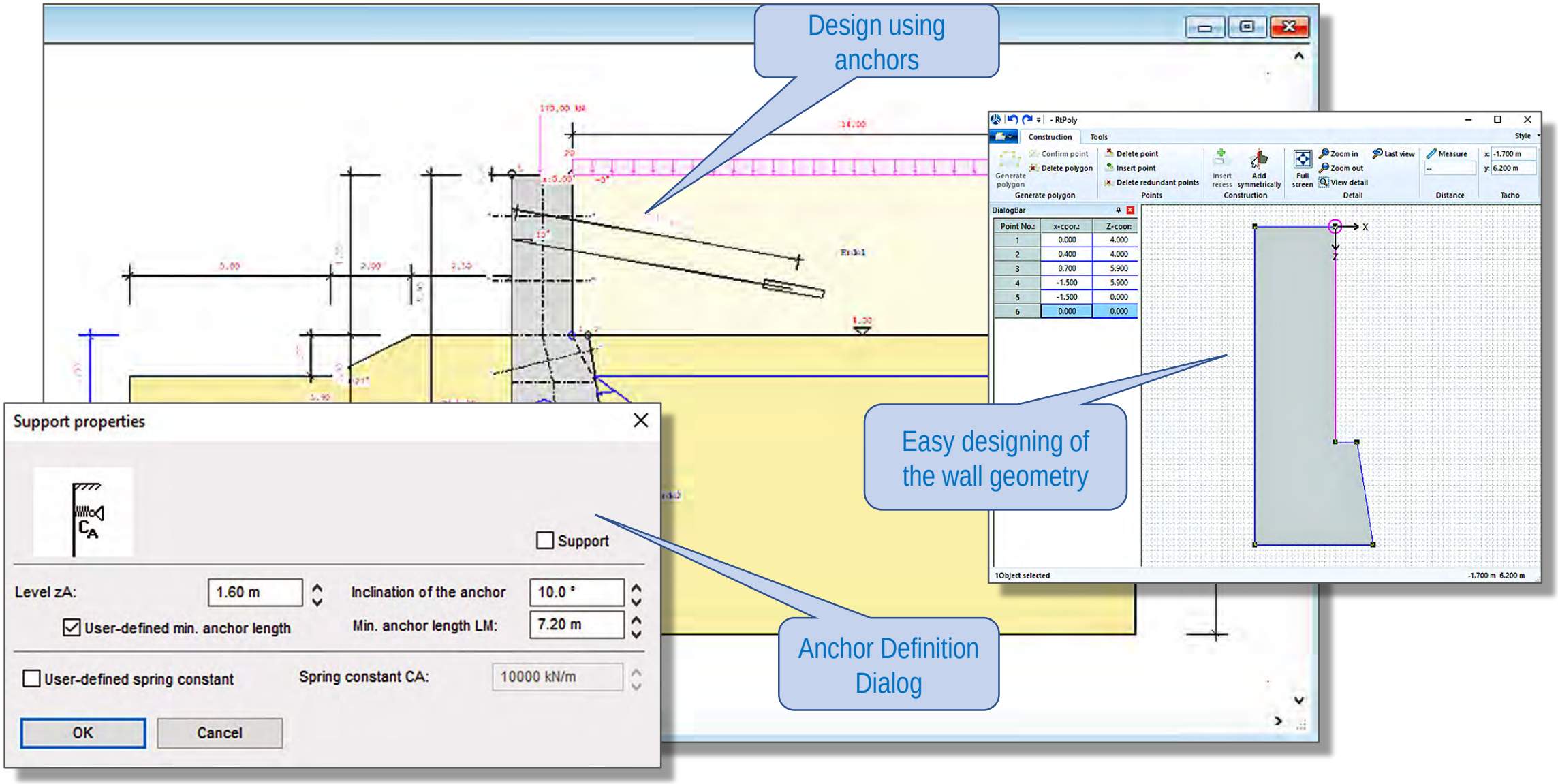
Different support types



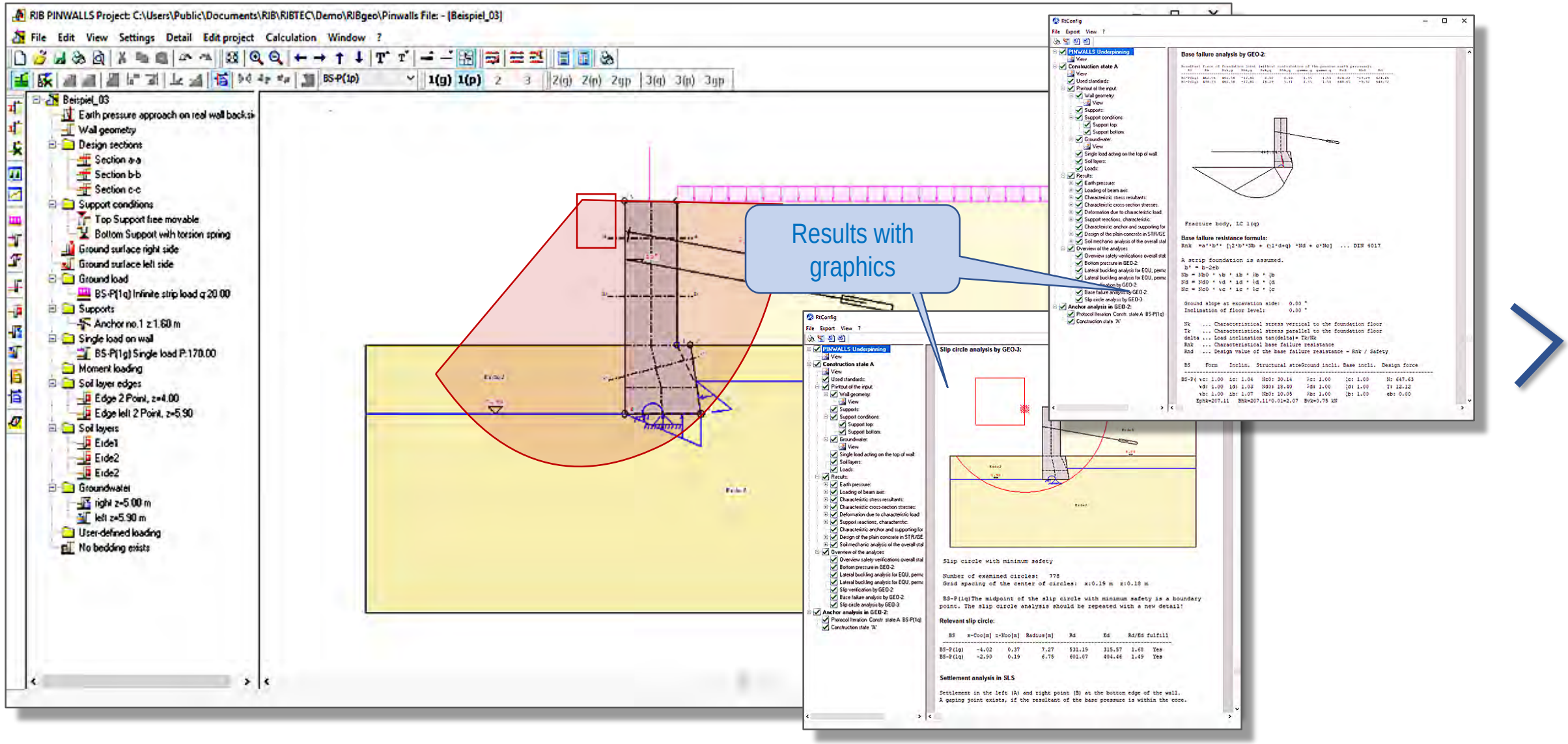


Different shapes of wall cross sections

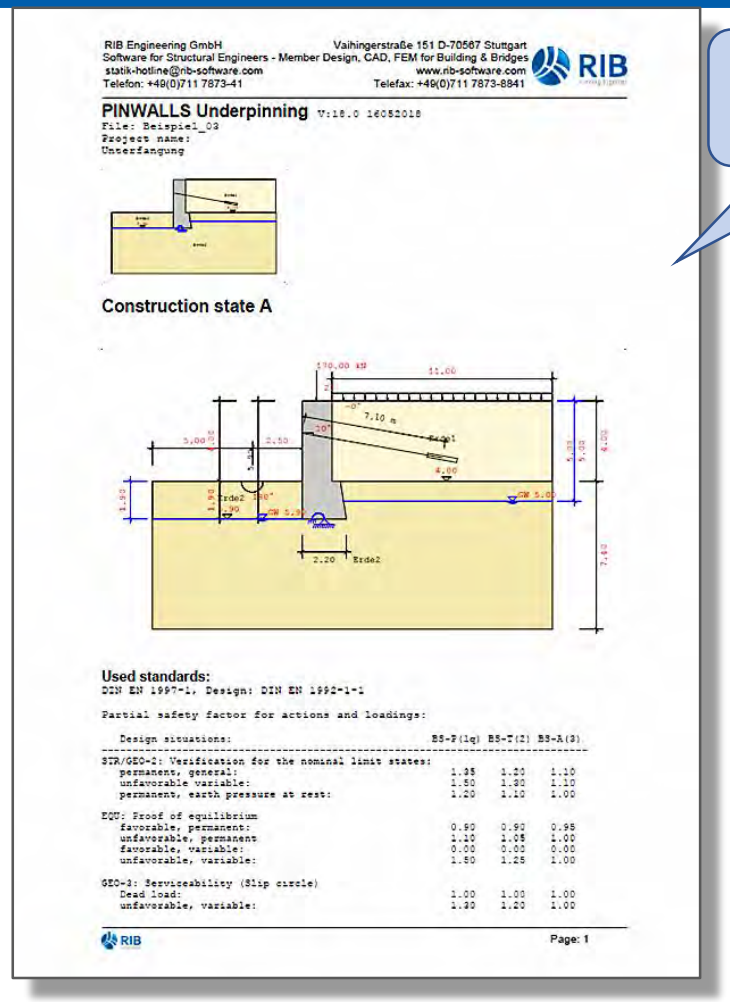
Construction of any wall geometry



Configurable and clear result output



Verifiable result list with graphics



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PINWALLS Underpinning V:18.0 16052018
File: Beispiel_03
Project name:
Unterfangung

Construction state A

Used standards:
DIN EN 1997-1, Design: DIN EN 1992-1-1

Partial safety factor for actions and loadings:

Design situations:	BS-P(1g)	BS-T(2)	BS-A(3)
STR/GEO-2: Verification for the nominal limit states:			
permanent, general:	1.35	1.20	1.10
unfavorable variable:	1.50	1.30	1.10
permanent, earth pressure at rest:	1.20	1.10	1.00
EQU: Proof of equilibrium			
favorable, permanent:	0.90	0.90	0.95
unfavorable, permanent	1.10	1.05	1.00
favorable, variable:	0.00	0.00	0.00
unfavorable, variable:	1.50	1.25	1.00
GEO-3: Serviceability (Slip circle)			
Dead load:	1.00	1.00	1.00
unfavorable, variable:	1.30	1.20	1.00

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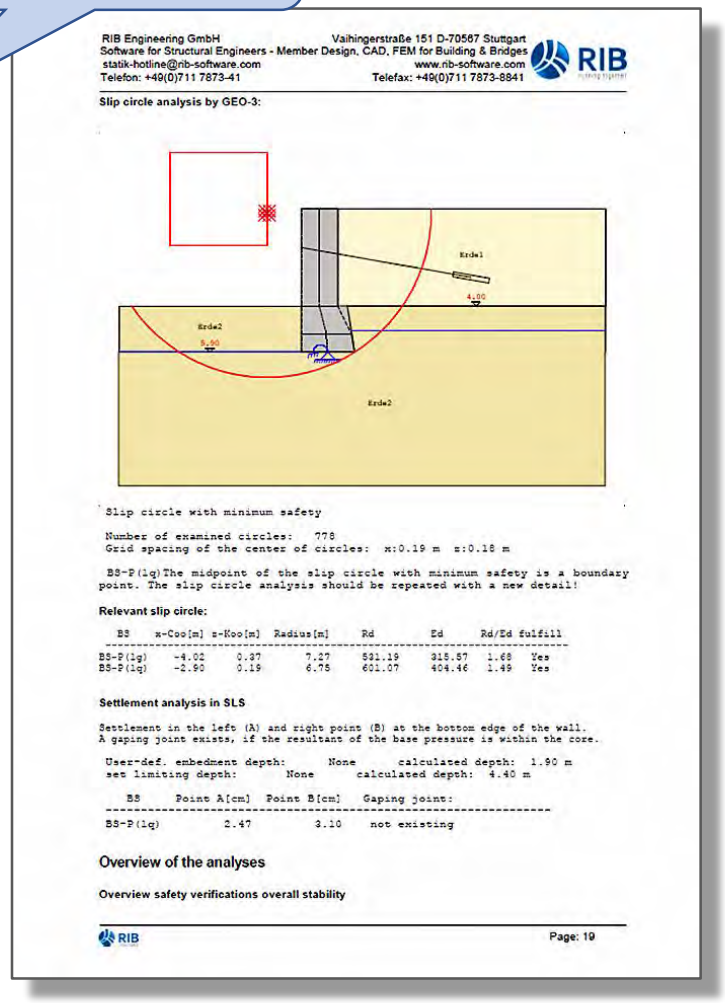
Clear Output of Results



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Slip circle analysis by GEO-3:

Slip circle with minimum safety

Number of examined circles: 778
Grid spacing of the center of circles: x:0.19 m z:0.18 m

BS-P(1g) The midpoint of the slip circle with minimum safety is a boundary point. The slip circle analysis should be repeated with a new detail!

Relevant slip circle:

BS	x-Koo[m]	z-Koo[m]	Radius[m]	Rd	Ed	Rd/Ed	fulfill
BS-P(1g)	-4.02	0.87	7.27	591.19	315.57	1.68	Yes
BS-P(1g)	-2.90	0.19	6.75	601.07	404.46	1.49	Yes

Settlement analysis in SLS

Settlement in the left (A) and right point (B) at the bottom edge of the wall.
A gaping joint exists, if the resultant of the base pressure is within the core.

User-def. embedment depth: None calculated depth: 1.90 m
set limiting depth: None calculated depth: 4.40 m

BS	Point A[cm]	Point B[cm]	Gaping joint:
BS-P(1g)	2.47	3.10	not existing

Overview of the analyses

Overview safety verifications overall stability

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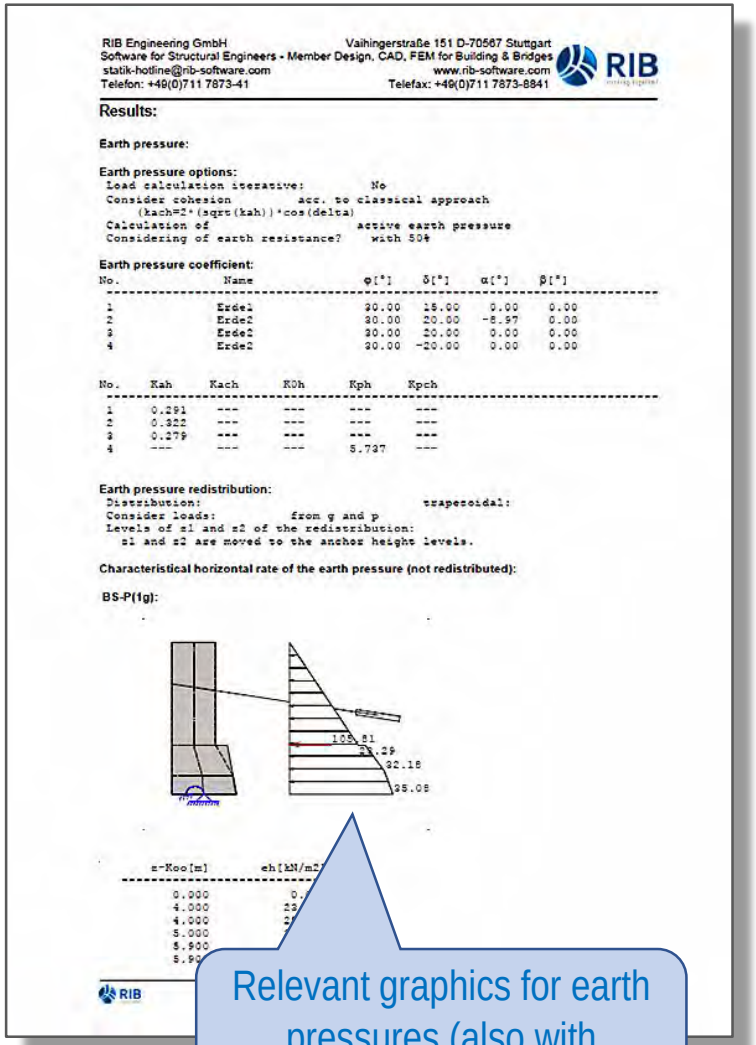

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Results:

Earth pressure:

Earth pressure options:
Load calculation iterative: No
Consider cohesion acc. to classical approach
(kach=2*(sqrt(kah))*cos(delta)
Calculation of active earth pressure
Considering of earth resistance? with 50%

Earth pressure coefficient:

No.	Name	φ[°]	δ[°]	α[°]	β[°]
1	Erde1	30.00	15.00	0.00	0.00
2	Erde2	30.00	20.00	-8.97	0.00
3	Erde2	30.00	20.00	0.00	0.00
4	Erde2	30.00	-20.00	0.00	0.00

No.	Kah	Kach	Kph	Kpch
1	0.291	---	---	---
2	0.322	---	---	---
3	0.279	---	---	---
4	---	---	5.737	---

Earth pressure redistribution:
Distribution: trapezoidal:
Consider loads: from g and p
Levels of z1 and z2 of the redistribution:
z1 and z2 are moved to the anchor height levels.

Characteristical horizontal rate of the earth pressure (not redistributed):

BS-P(1g):

z-Koo[m]	eh[kN/m²]
0.000	0.
4.000	23
4.000	2
5.000	
5.900	

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Relevant graphics for earth pressures (also with redistributions)