

### III ZAŁĄCZNIKI

- Załącznik nr 1      Współrzędne (układ 2000) projektowanych ostróg na kmH 0,0÷2,0  
Załącznik nr 2      Wyciąg z obliczeń statycznych dla odcinka kmH 0,0÷2,0

**Załącznik nr 1**

Współrzędne (układ 2000) projektowanych ostróg na kmH 0,0÷2,0

## Załącznik nr 1

Współrzędne projektowanych ostróg - kmH 0,0±2,0

Nr ostrogi	Nr punktu	Układ 2000	
		X	Y
1	istniejąca ostroga nr 1 przeznaczona do pozostawienia		
2	istniejąca ostroga nr 2 przeznaczona do pozostawienia		
3	istniejąca ostroga nr 3 przeznaczona do pozostawienia		
4	istniejąca ostroga nr 4 przeznaczona do pozostawienia		
5	istniejąca ostroga nr 5 przeznaczona do pozostawienia		
6	6A	6 073 438,88	6 527 647,86
	6B	6 073 521,56	6 527 704,11
7	7A	6 073 385,50	6 527 721,74
	7B	6 073 468,77	6 527 777,11
8	8A	6 073 335,97	6 527 801,85
	8B	6 073 421,41	6 527 853,81
9	9A	6 073 288,61	6 527 878,28
	9B	6 073 374,05	6 527 930,24
10	10A	6 073 241,95	6 527 955,23
	10B	6 073 327,39	6 528 007,19
11	11A	6 073 198,82	6 528 034,35
	11B	6 073 284,26	6 528 086,31
12	12A	6 073 152,81	6 528 111,70
	12B	6 073 238,25	6 528 163,66
13	13A	6 073 107,14	6 528 189,27
	13B	6 073 192,58	6 528 241,23
14	14A	6 073 059,56	6 528 269,08
	14B	6 073 146,49	6 528 318,51
15	15A	6 073 012,86	6 528 346,06
	15B	6 073 099,79	6 528 395,49
16	16A	6 072 967,21	6 528 423,64
	16B	6 073 054,14	6 528 473,07
17	17A	6 072 918,97	6 528 499,74
	17B	6 073 005,90	6 528 549,17
18	18A	6 072 873,60	6 528 577,47
	18B	6 072 960,53	6 528 626,90
19	19A	6 072 828,55	6 528 655,41
	19B	6 072 915,41	6 528 704,94
20	20A	6 072 783,37	6 528 733,26
	20B	6 072 870,30	6 528 782,68
21	21A	6 072 739,63	6 528 811,91
	21B	6 072 826,55	6 528 861,34
22	22A	6 072 697,02	6 528 891,21
	22B	6 072 783,95	6 528 940,65

## Załącznik nr 2

Wyciąg z obliczeń statycznych dla odcinka kmH 0,0÷2,0

## Obliczenia obciążeń od lodu działających na projektowane pale ostróg

### Grubość pokrywy lodowej

$$h_o = m_1 * m_2 * h_1$$

największe grubości lodu stałego [h]	$h_1 = 0,45$ m	(Rozewie)
współczynnik stopnienia lodu [ $m_1$ ]	$m_1 = 1$ m	(lód stały)
wsp. spiętrzenia kry lodowej [ $m_2$ ]	$m_2 = 1$ m	

$$h_o = 0,45 \text{ m} \quad \text{-obliczeniowa grubość pokrywy lodowej}$$

### Obliczeniowa wytrzymałość lodu na ściskanie $R_s$ i na zginanie $R_z$

$$R_{sc} = 350 \text{ kPa}$$

$$R_z = 0,50 R_s = 175 \text{ kPa} \quad (\text{akwen otwarty})$$

$$R_{KR} = k R_{sc} = 875 \text{ kPa}$$

współczynnik korekcyjny	dla $b_k/h_o = 0,67$	$k = 2,5$
długość pionowej ściany czołowej		$b_k = 0,3 \text{ m}$

### Współczynniki bezpieczeństwa

$$Y_f = 1,3$$

$$Y_n = Y_{n1} * Y_{n2}$$

$$Y_{n1} = 0,9$$

$$Y_{n2} = 0,9$$

$$Y_n = 0,81$$

$$Y = Y_f * Y_n = 1,05$$

### a/ Oddziaływanie lodu pływającego na morskie konstrukcje hydrotechniczne

$$H_k = m_3 * b_k * h_o * k * R_{sc}$$

$$\text{wsp. kształtu } [m_3] \quad m_3 = 0,9 \quad [-]$$

$$H_{1k}^{(1)} = 106,31 \text{ kN} \quad (\text{char})$$
$$H_1 = 111,95 \text{ kN} \quad (\text{oblicz})$$

### b/ Oddziaływanie poziome od parcia stałej pokrywy lodowej na morskie budowle hydrotechniczne

$$q_{1k} = 150 * h_1 * k_r$$

$$k_r = 0,8 \quad \text{współczynnik wpływu rozmiarów pokrywy lodowej}$$

$$q_{1k} = 54,00 \text{ [kN/m]} \quad (\text{char})$$

$$q_1 = 56,86 \text{ [kN/m]} \quad (\text{oblicz})$$

### c/ Oddziaływanie przymarzniętej pokrywy lodowej na pale pojedyncze

$$Q_{1pk} = k_p * h_1^{2,5} * R_{zg}$$

$$k_p = 0,23 \quad \text{wsp. wpływu zależny od stosunku śred. pala do gr. lodu stałego}$$

$$Q_{1k} = 40,75 \text{ [kN]} \quad (\text{char})$$

$$Q_1 = 42,91 \text{ [kN]} \quad (\text{oblicz})$$

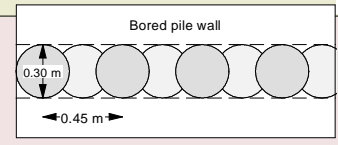
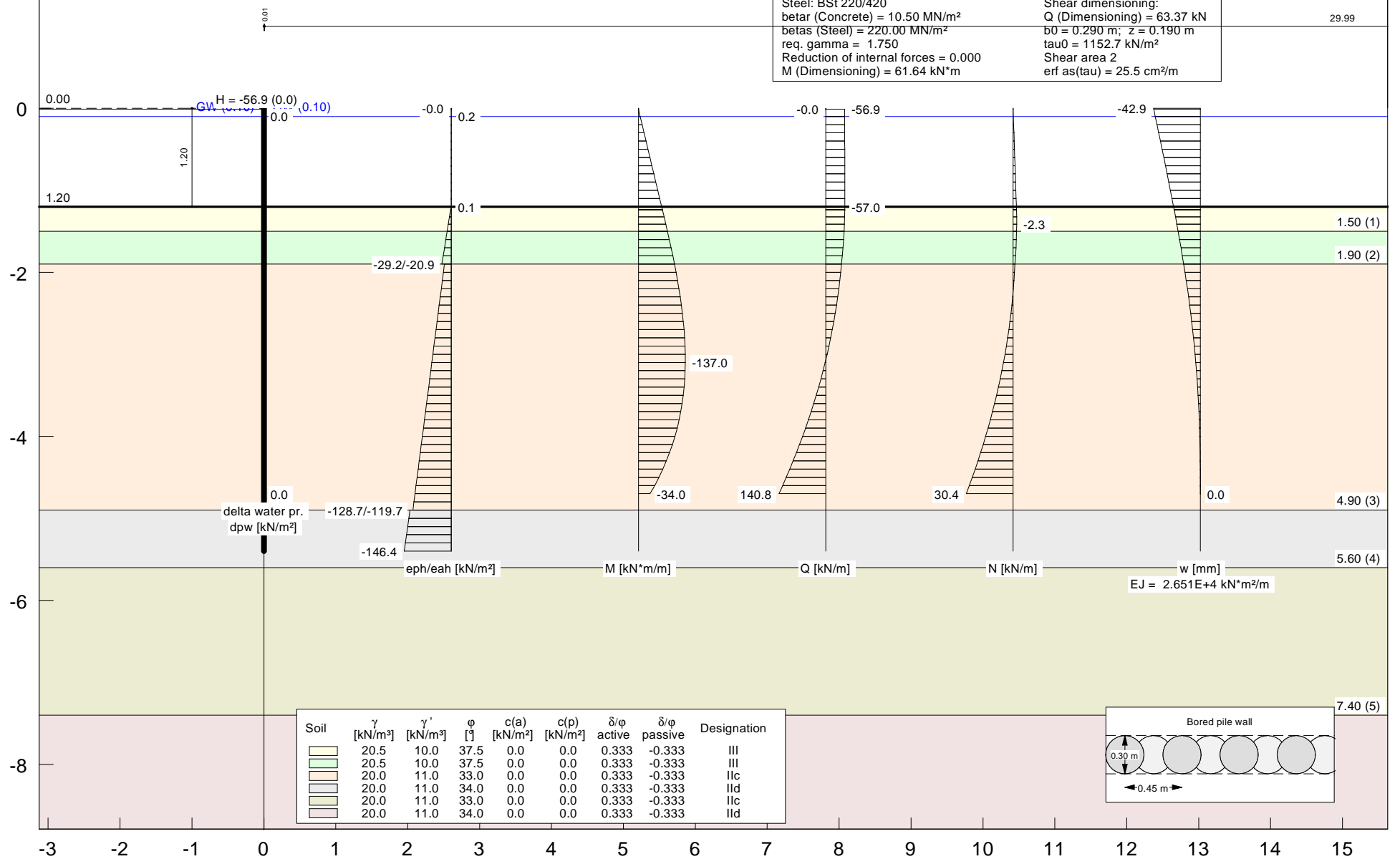
Ostroga 6-16 - Profil II - Hdop=1,2m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.20 m Required length = 5.40 m  
 Sum V > 0 (met) /  $\eta = 1.48$

Design values:  
 Analysis Bored pile wall  
 E = 3000.00 kN/cm<sup>2</sup>  
 I = 88357.29 cm<sup>4</sup>/m  
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BSt 220/420  
 betar (Concrete) = 10.50 MN/m<sup>2</sup>  
 betas (Steel) = 220.00 MN/m<sup>2</sup>  
 req. gamma = 1.750  
 Reduction of internal forces = 0.000  
 M (Dimensioning) = 61.64 kN\*m

N (Dimensioning) = 2.80 kN  
 Pile centres = 0.450 m  
 Pile diameter = 0.300 m  
 Diameter (steel) = 0.285 m  
 erf  $\mu = 6.756$  %  
 req. As = 47.8 cm<sup>2</sup>  
 Shear dimensioning:  
 Q (Dimensioning) = 63.37 kN  
 b0 = 0.290 m; z = 0.190 m  
 tau0 = 1152.7 kN/m<sup>2</sup>  
 Shear area 2  
 erf as(tau) = 25.5 cm<sup>2</sup>/m

29.99

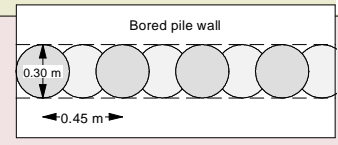
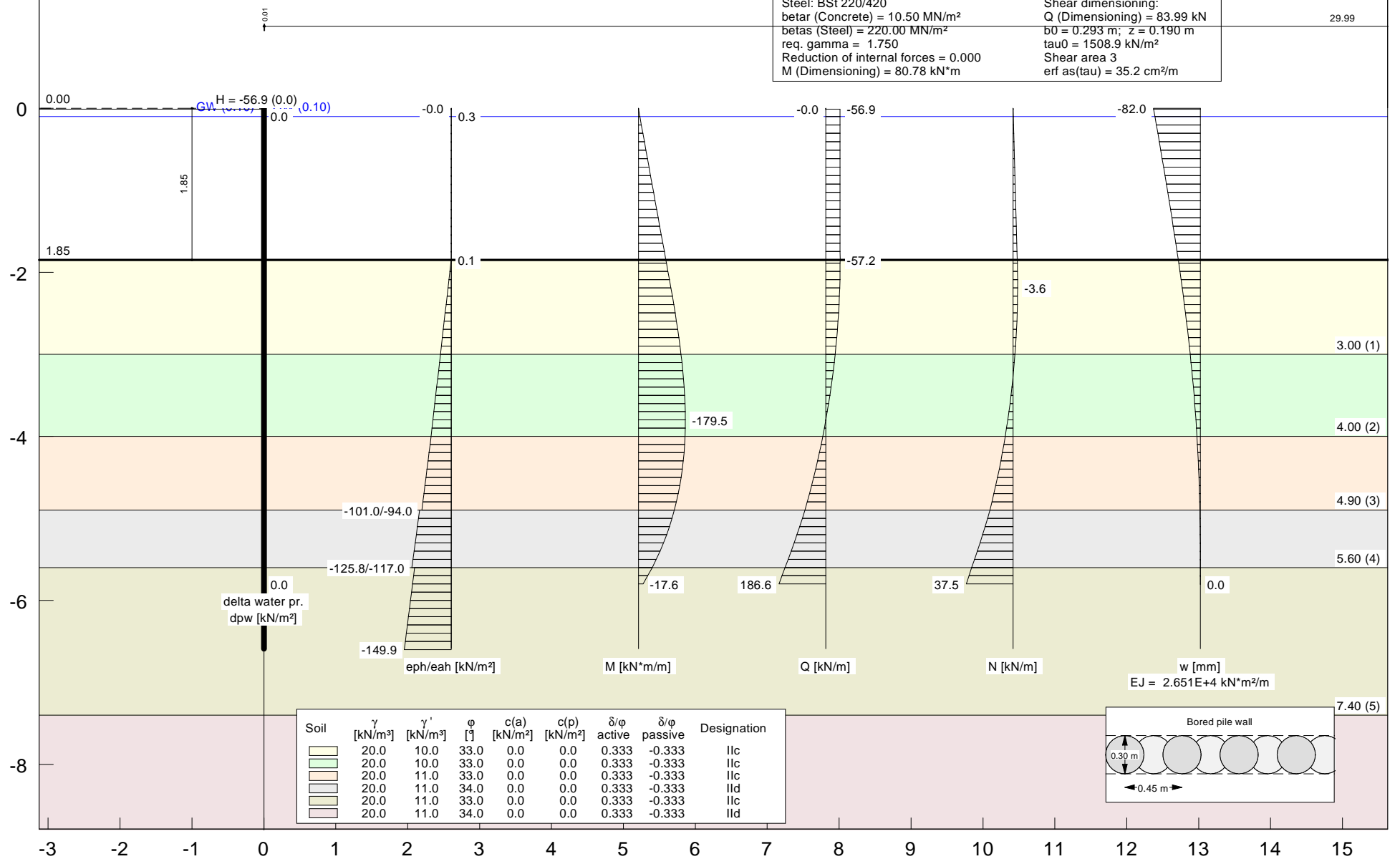


Ostroga 6-16 - Profil II - Hdop=1,85m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.74 m Required length = 6.59 m  
 Sum  $V > 0$  (met) /  $\eta = 1.61$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 req. gamma = 1.750  
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) =  $80.78 \text{ kN} \cdot \text{m}$   
 $N$  (Dimensioning) =  $1.92 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 9.038 \%$   
 req.  $A_s = 63.9 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $83.99 \text{ kN}$   
 $b0 = 0.293 \text{ m}$ ;  $z = 0.190 \text{ m}$   
 $\text{tau}0 = 1508.9 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf as}(\text{tau}) = 35.2 \text{ cm}^2/\text{m}$

29.99

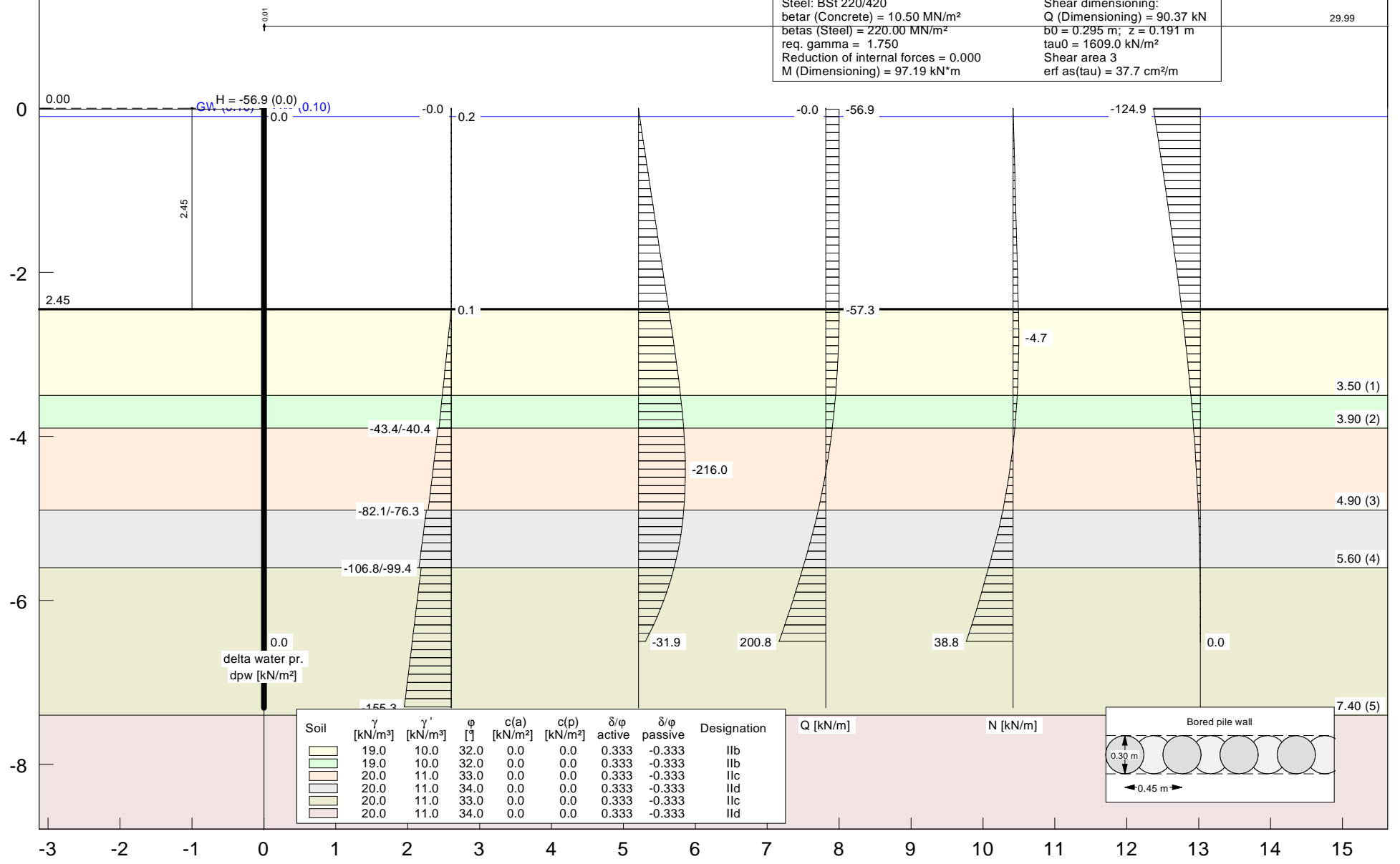


Ostroga 6-16 - Profil II - Hdop=2,45m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{k(a)}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{k(pgh)}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.86 m Required length = 7.31 m  
 Sum  $V > 0$  (met) /  $\eta = 1.69$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BST 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 $\text{Reduction of internal forces} = 0.000$   
 $M$  (Dimensioning) =  $97.19 \text{ kN} \cdot \text{m}$   
 $N$  (Dimensioning) =  $1.21 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 11.029 \%$   
 $\text{req. } A_s = 78.0 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $90.37 \text{ kN}$   
 $b_0 = 0.295 \text{ m}$ ;  $z = 0.191 \text{ m}$   
 $\text{tau}_0 = 1609.0 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 37.7 \text{ cm}^2/\text{m}$

29.99



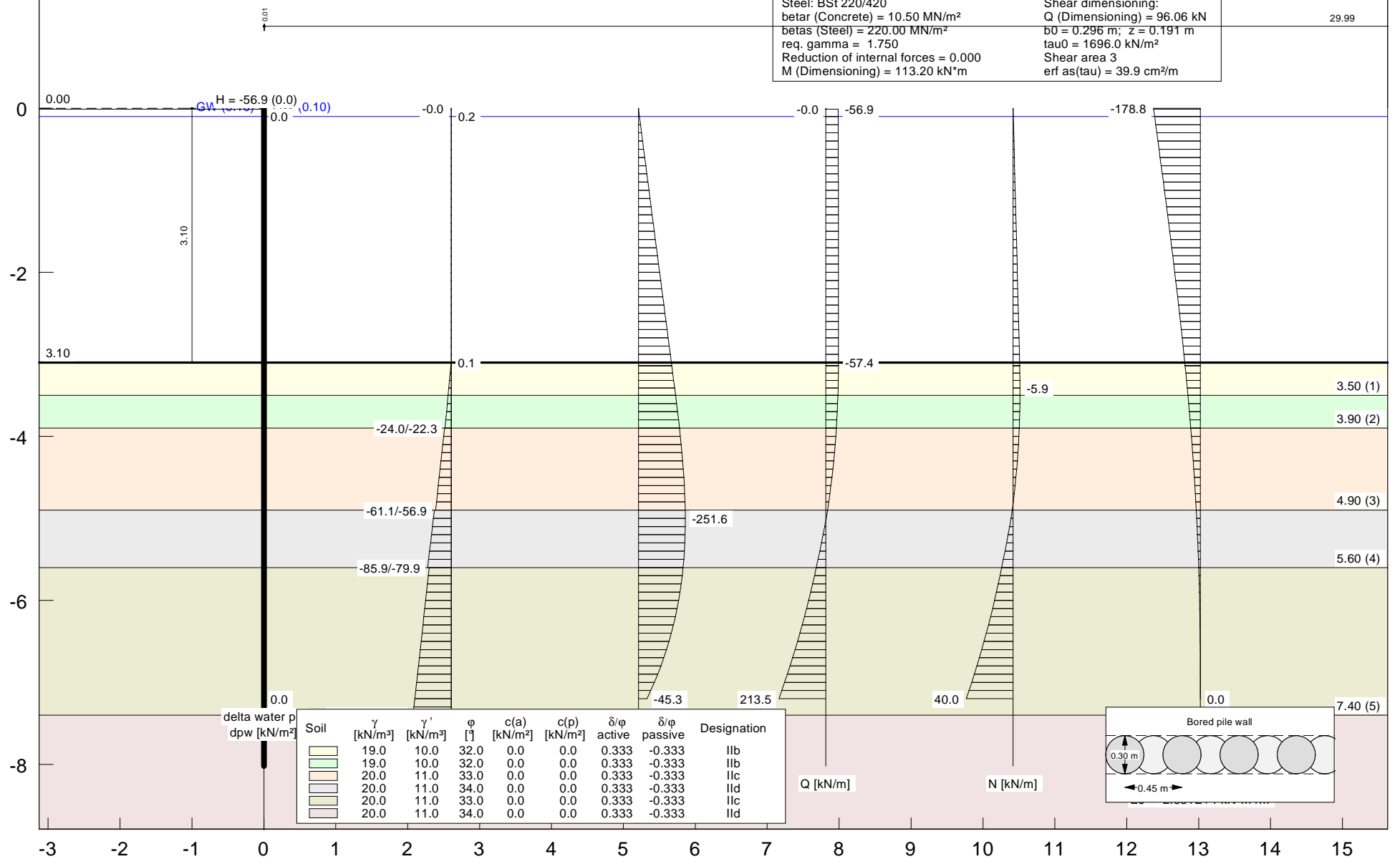


Ostroga 6-16 - Profil II - Hdop=3,10m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.92 m Required length = 8.02 m  
 Sum  $V > 0$  (met) /  $\eta = 1.73$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 req. gamma = 1.750  
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) =  $113.20 \text{ kN}^*\text{m}$   
 $N$  (Dimensioning) =  $0.84 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 erf  $\mu = 12.998 \%$   
 req.  $As = 91.9 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $96.06 \text{ kN}$   
 $b0 = 0.296 \text{ m}$ ;  $z = 0.191 \text{ m}$   
 $\text{tau}0 = 1696.0 \text{ kN/m}^2$   
 Shear area 3  
 erf  $as(\text{tau}) = 39.9 \text{ cm}^2/\text{m}$

29.99



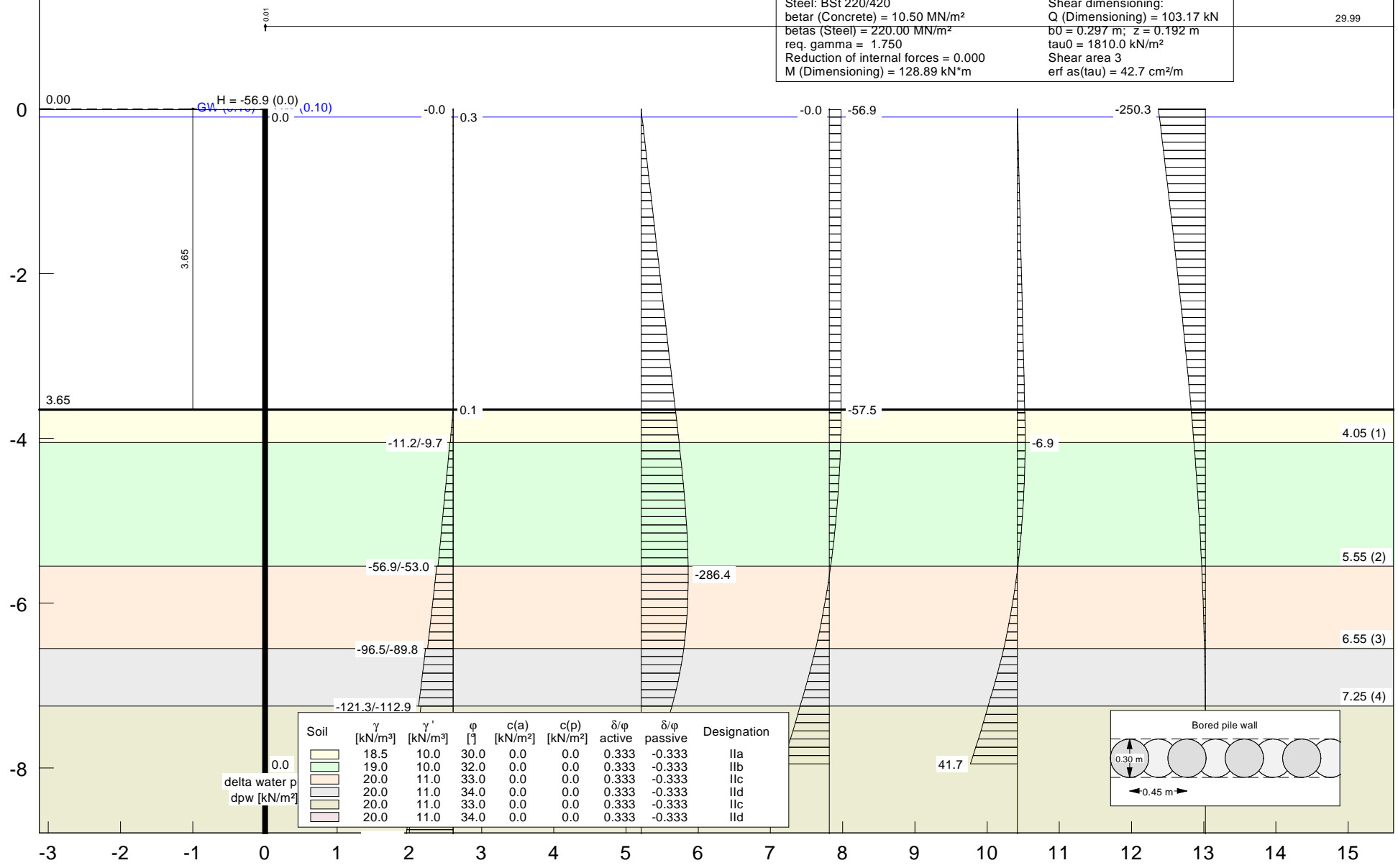
Ostroga 6-16 - Profil II - Hdop=3,65m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 5.16 m Required length = 8.81 m  
 Sum  $V > 0$  (met) /  $\eta = 1.79$

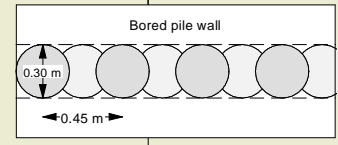
Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BST 220/420  
 $\text{betar (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) =  $128.89 \text{ kN}^*\text{m}$

$N$  (Dimensioning) =  $0.20 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 14.937 \%$   
 $\text{req. } A_s = 105.6 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $103.17 \text{ kN}$   
 $b_0 = 0.297 \text{ m}$ ;  $z = 0.192 \text{ m}$   
 $\text{tau}0 = 1810.0 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 42.7 \text{ cm}^2/\text{m}$

29.99



Soil	$\gamma$ [kN/m <sup>3</sup> ]	$\gamma'$ [kN/m <sup>3</sup> ]	$\phi$ [°]	$c(a)$ [kN/m <sup>2</sup> ]	$c(p)$ [kN/m <sup>2</sup> ]	$\delta/\phi$ active	$\delta/\phi$ passive	Designation
Soil 1	18.5	10.0	30.0	0.0	0.0	0.333	-0.333	Ila
Soil 2	19.0	10.0	32.0	0.0	0.0	0.333	-0.333	Ilb
Soil 3	20.0	11.0	33.0	0.0	0.0	0.333	-0.333	Ilc
Soil 4	20.0	11.0	34.0	0.0	0.0	0.333	-0.333	Ild
Soil 5	20.0	11.0	33.0	0.0	0.0	0.333	-0.333	Ilc
Soil 6	20.0	11.0	34.0	0.0	0.0	0.333	-0.333	Ild



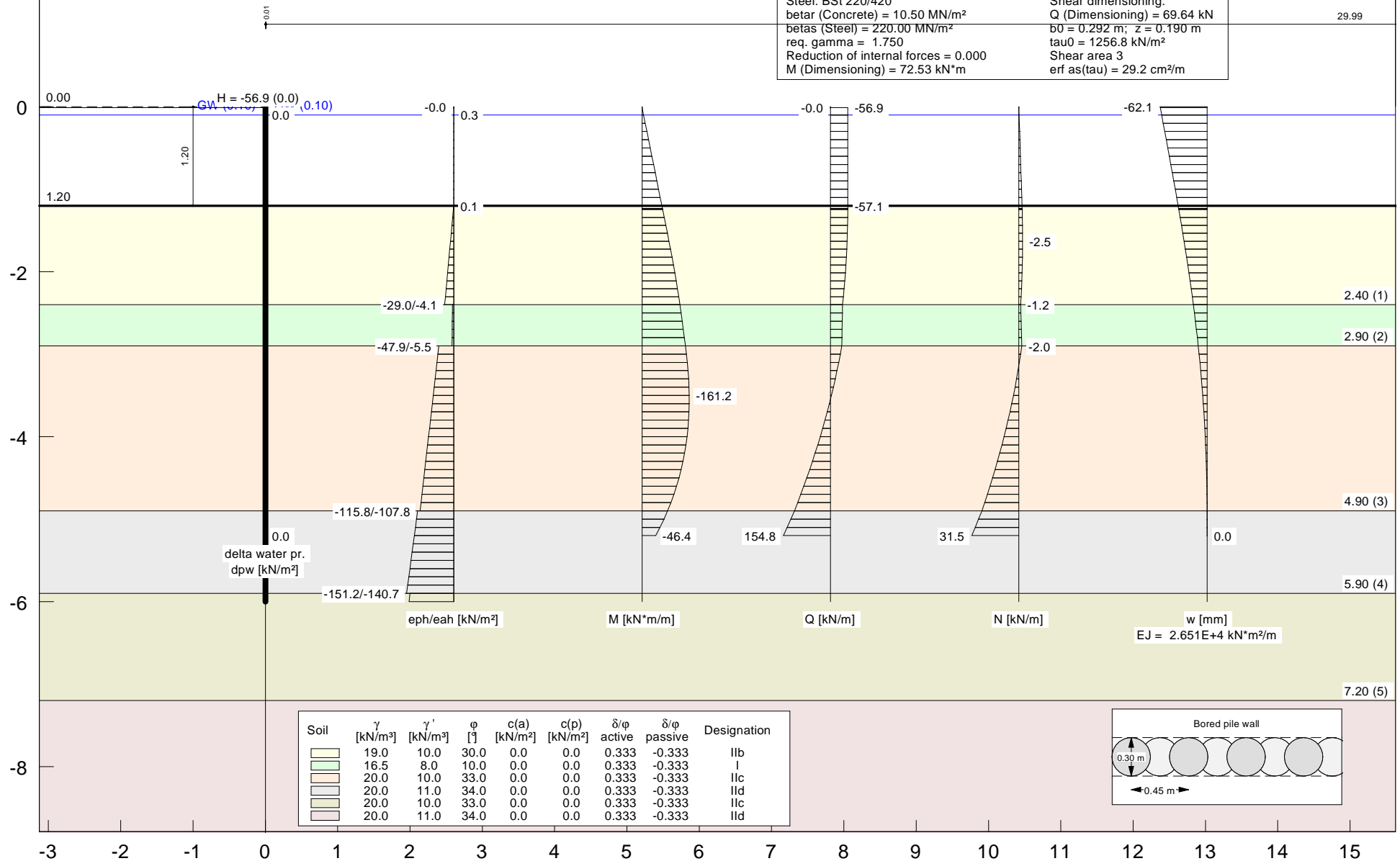
Ostroga 17-22 i 23-36 - Profil III - Hdop=1,2m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.80 m Required length = 6.00 m  
 Sum  $V > 0$  (met) /  $\eta = 1.65$

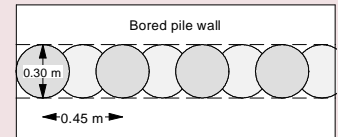
Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 $M$  (Dimensioning) =  $72.53 \text{ kN} \cdot \text{m}$

$N$  (Dimensioning) =  $1.63 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 8.047 \%$   
 $\text{req. } A_s = 56.9 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $69.64 \text{ kN}$   
 $b_0 = 0.292 \text{ m}$ ;  $z = 0.190 \text{ m}$   
 $\text{tau}_0 = 1256.8 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 29.2 \text{ cm}^2/\text{m}$

29.99



7.20 (5)

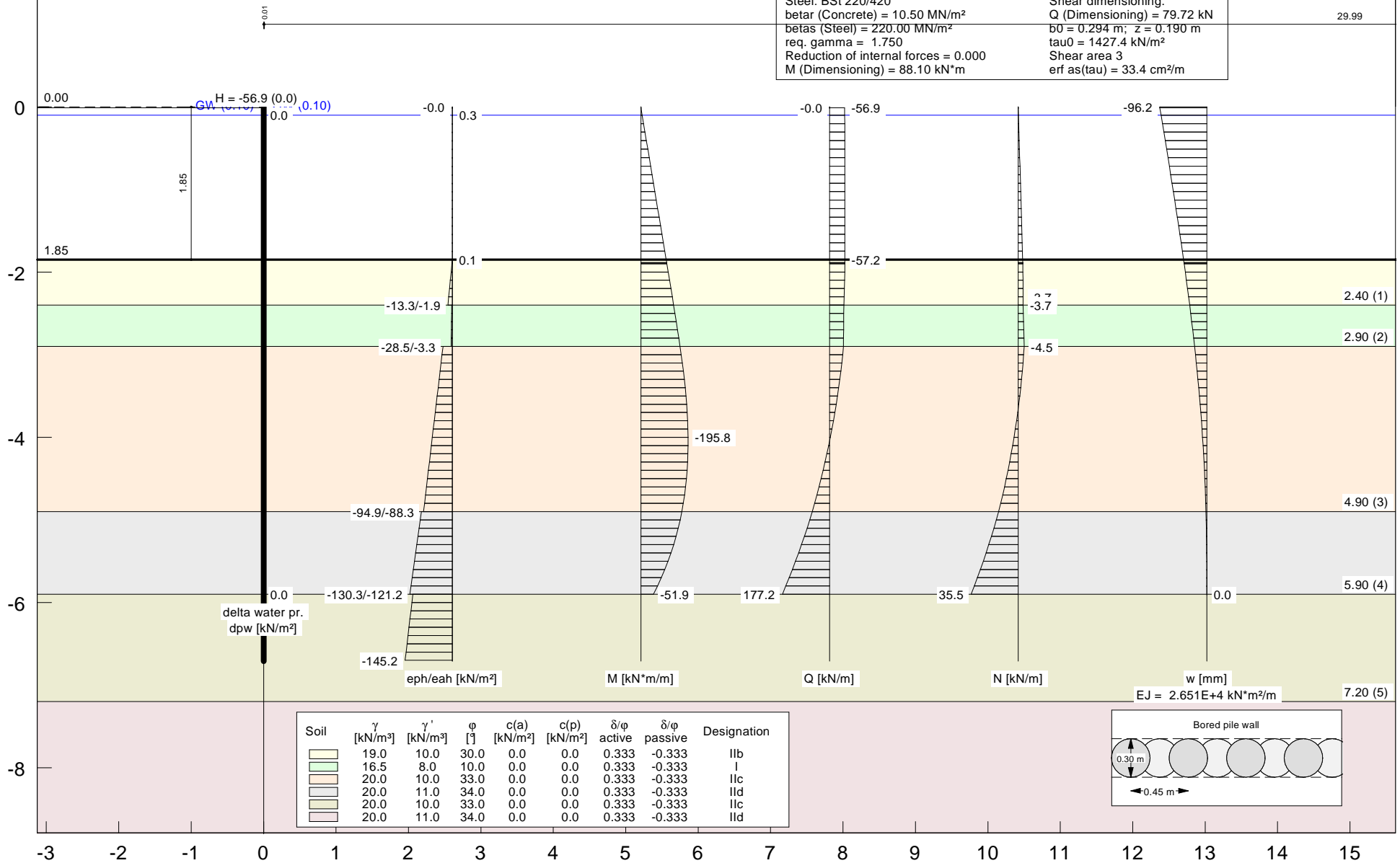


Ostroga 17-22 i 23-26 - Profil III - Hdop=1,85m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpg}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.86 m Required length = 6.71 m  
 Sum  $V > 0$  (met) /  $\eta = 1.68$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 $\text{Reduction of internal forces} = 0.000$   
 $M$  (Dimensioning) =  $88.10 \text{ kN} \cdot \text{m}$   
 $N$  (Dimensioning) =  $1.44 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 9.919 \%$   
 $\text{req. } A_s = 70.1 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $79.72 \text{ kN}$   
 $b_0 = 0.294 \text{ m}$ ;  $z = 0.190 \text{ m}$   
 $\text{tau}0 = 1427.4 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 33.4 \text{ cm}^2/\text{m}$

29.99



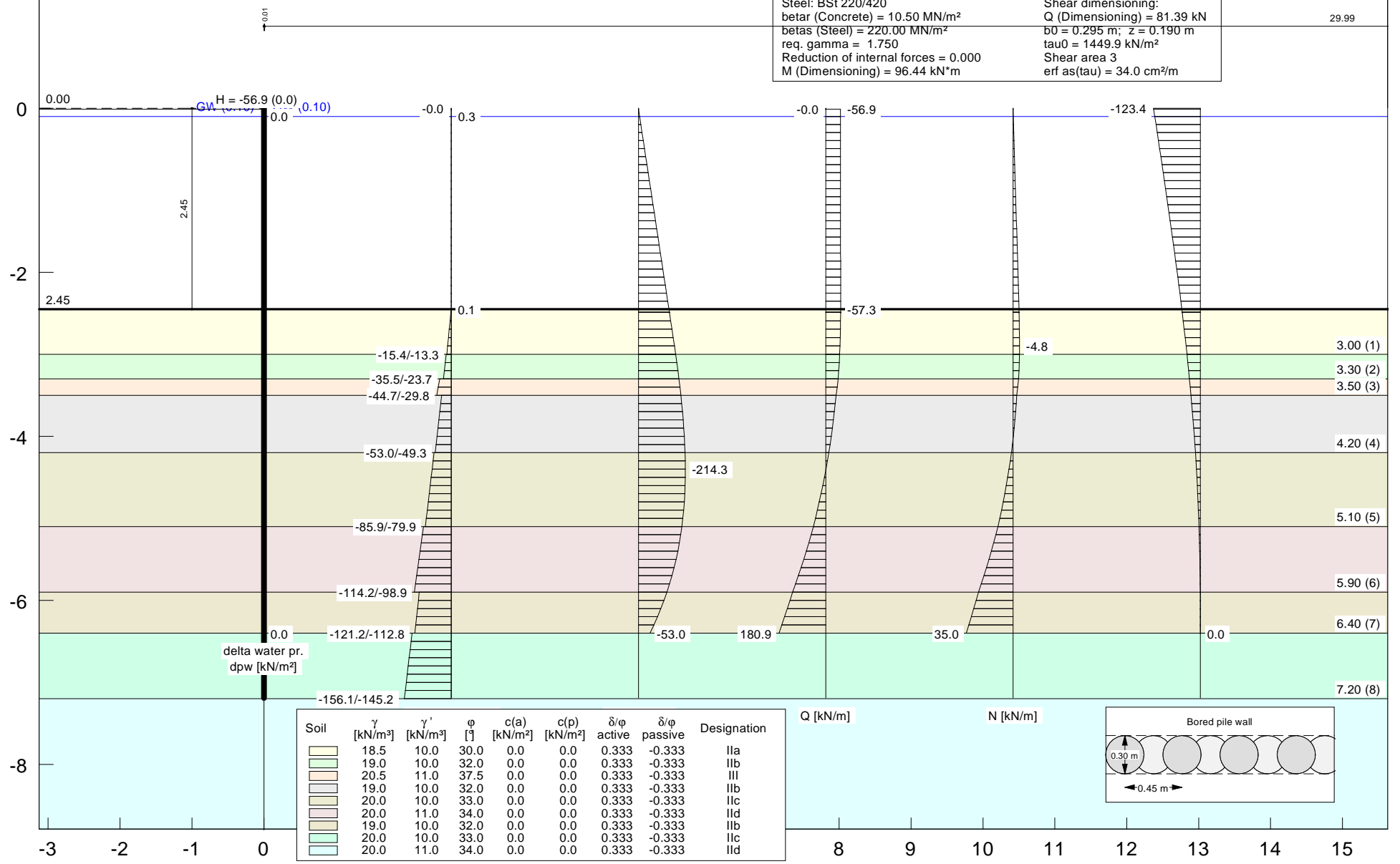
Ostroga 17-22 i 23-26 - Profil III - Hdop=2,45m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpg}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 4.74 m Required length = 7.19 m  
 Sum  $V > 0$  (met) /  $\eta = 1.60$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) =  $96.44 \text{ kN}\cdot\text{m}$

$N$  (Dimensioning) =  $1.38 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 10.937 \%$   
 $\text{req. } A_s = 77.3 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $81.39 \text{ kN}$   
 $b_0 = 0.295 \text{ m}$ ;  $z = 0.190 \text{ m}$   
 $\text{tau}_0 = 1449.9 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 34.0 \text{ cm}^2/\text{m}$

29.99



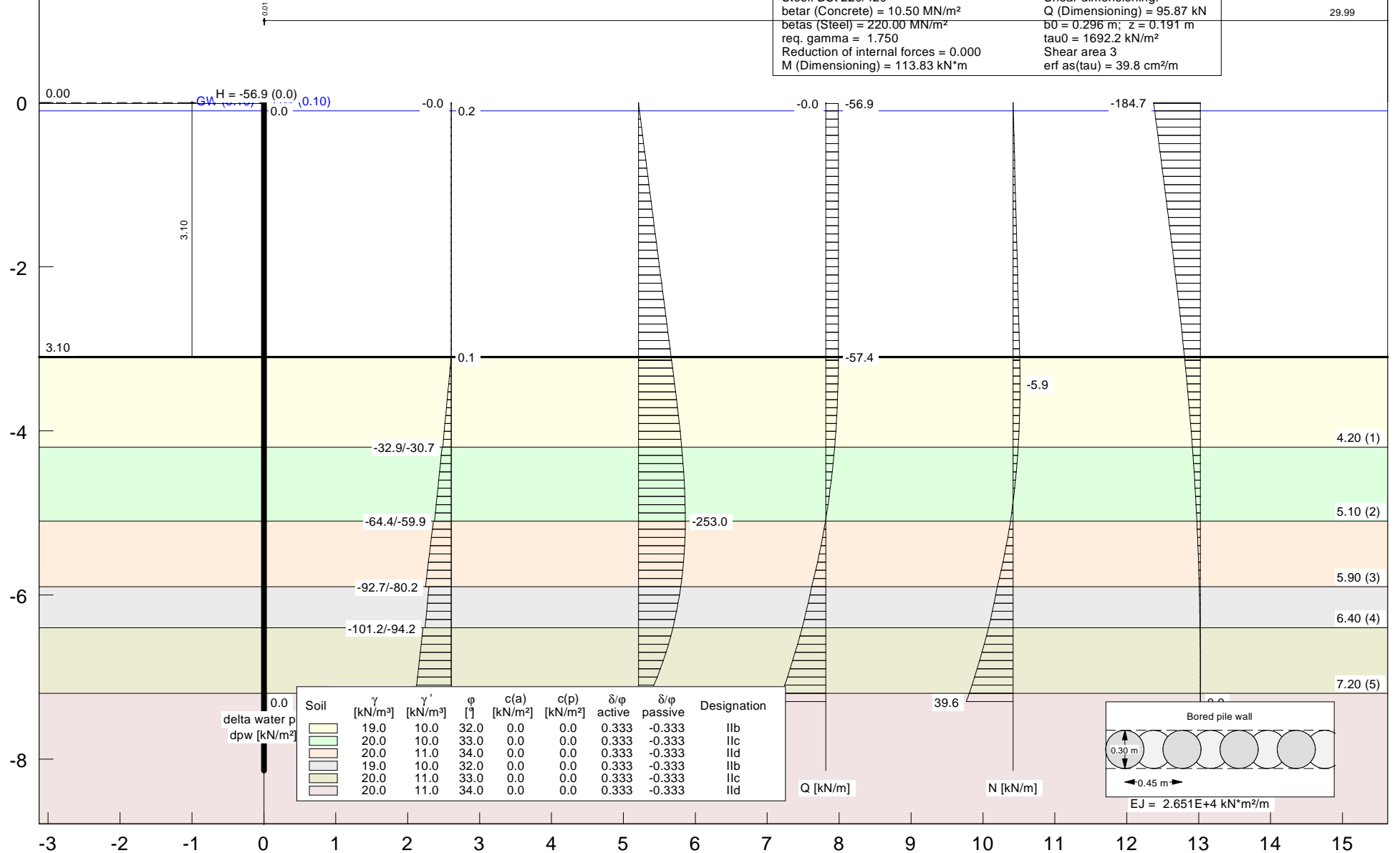
Ostroga 17-22 i 23-26 - Profil III - Hdop=3,1m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 5.04 m Required length = 8.14 m  
 Sum  $V > 0$  (met) /  $\eta = 1.83$

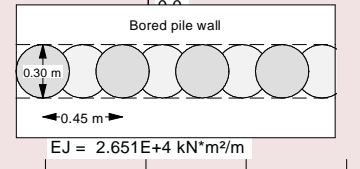
Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BSt 220/420  
 $\text{betas (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) = 113.83  $\text{kN}^*\text{m}$

$N$  (Dimensioning) = 0.98 kN  
 $\text{Pile centres} = 0.450 \text{ m}$   
 $\text{Pile diameter} = 0.300 \text{ m}$   
 $\text{Diameter (steel)} = 0.285 \text{ m}$   
 $\text{erf } \mu = 13.077 \%$   
 $\text{req. } A_s = 92.4 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) = 95.87 kN  
 $b_0 = 0.296 \text{ m}$ ;  $z = 0.191 \text{ m}$   
 $\text{tau}0 = 1692.2 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf as}(\text{tau}) = 39.8 \text{ cm}^2/\text{m}$

29.99



Soil	$\gamma$ [kN/m³]	$\gamma'$ [kN/m³]	$\phi$ [°]	$c(a)$ [kN/m²]	$c(p)$ [kN/m²]	$\delta/\phi$ active	$\delta/\phi$ passive	Designation
1	19.0	10.0	32.0	0.0	0.0	0.333	-0.333	IIb
2	20.0	10.0	33.0	0.0	0.0	0.333	-0.333	IIc
3	20.0	11.0	34.0	0.0	0.0	0.333	-0.333	IId
4	19.0	10.0	32.0	0.0	0.0	0.333	-0.333	IIb
5	20.0	11.0	33.0	0.0	0.0	0.333	-0.333	IIc
6	20.0	11.0	34.0	0.0	0.0	0.333	-0.333	IId



Ostroga 17-22 i 23-26- Profil III - Hdop=3,65m  
 Bored pile wall  
 Calculation basis:  
 No ep redistribution  
 Active ep according to: Mohr/Coulomb:  $Kac = 2 \cdot \sqrt{Ka}$   
 Passive ep according to: Mohr/Coulomb:  $kpch = 2 \cdot \sqrt{kpgh}$   
 Section length automatic  
 $\eta$  (passive) = 1.50

Embedment depth = 5.22 m Required length = 8.87 m  
 Sum  $V > 0$  (met) /  $\eta = 1.86$

Design values:  
 Analysis Bored pile wall  
 $E = 3000.00 \text{ kN/cm}^2$   
 $I = 88357.29 \text{ cm}^4/\text{m}$   
 Dimension acc. to DIN 1045 17.2.1, Para.(6)  
 Concrete: B 15  
 Steel: BST 220/420  
 $\text{betar (Concrete)} = 10.50 \text{ MN/m}^2$   
 $\text{betas (Steel)} = 220.00 \text{ MN/m}^2$   
 $\text{req. gamma} = 1.750$   
 Reduction of internal forces = 0.000  
 $M$  (Dimensioning) =  $127.45 \text{ kN}^*\text{m}$

$N$  (Dimensioning) =  $0.71 \text{ kN}$   
 Pile centres =  $0.450 \text{ m}$   
 Pile diameter =  $0.300 \text{ m}$   
 Diameter (steel) =  $0.285 \text{ m}$   
 $\text{erf } \mu = 14.760 \%$   
 $\text{req. } A_s = 104.3 \text{ cm}^2$   
 Shear dimensioning:  
 $Q$  (Dimensioning) =  $109.55 \text{ kN}$   
 $b_0 = 0.297 \text{ m}$ ;  $z = 0.192 \text{ m}$   
 $\text{tau}0 = 1923.1 \text{ kN/m}^2$   
 Shear area 3  
 $\text{erf } a_s(\text{tau}) = 45.4 \text{ cm}^2/\text{m}$

29.99

