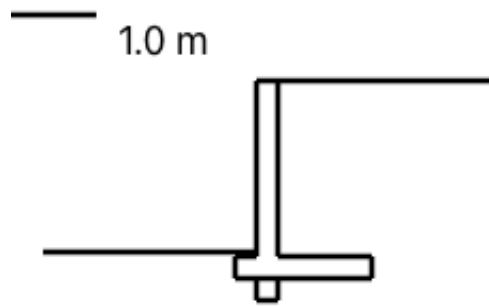
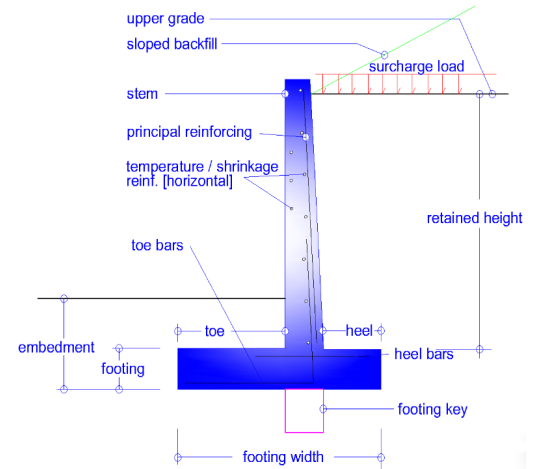


name : ΑΝΑΛΥΣΗ 1
 section : 1.1.1
 date : 29/Nov/2022
 author : ΑΠΟΣΤΟΛΟΣ ΑΘΑΝΑΣΙΟΥ
 client : ΑΠΟΣΤΟΛΟΣ ΑΘΑΝΑΣΙΟΥ

Input data

retained height (m) =	2.00	surcharge (kN/m ²) =	5.00
stem - top (m) =	0.25	seismic acc. (g) =	0.16
stem - base (m) =	0.25	γ soil (kN/m ³) =	18.00
toe (m) =	0.25	φ soil (deg) =	20.00
heel (m) =	1.10	c soil (kN/m ²) =	8.00
footing (m) =	0.25	fck (MPa) =	25.00
embedment (m) =	0.30	fyk (MPa) =	500.00
footing key (m) =	0.25	γ wall (kN/m ³) =	25.00
water table =	NO		
sloped backfill (deg) =	0		
friction : soil/structure [2/3 φ] (deg) =	NO		



Δεν έχει εκπονηθεί γεωτεχνική μελέτη.
 Δε λαμβάνεται υπόψιν η υδροστατική πίεση.

Partial Factors

	EQU	STR/GEO [A1 + M1]	ASD & SEISMIC
actions	permanent unfavourable	1.10	1.35
	permanent favourable	0.90	1.00
	variable unfavourable	1.50	1.50
	variable favourable	0.00	0.00
soil parametrs	soil friction [φ]	1.25	1.00
	cohesion [c]	1.25	1.00

A. OVERTURNING

A1. ASD & SEISMIC

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	22.50	0.56	12.69
back fill	39.60	1.05	41.58
W surcharge	5.50	1.05	5.77
total	67.60		
F passive	4.51	0.18	0.83
F surcharge	5.50	1.12	6.19
F active	4.22	0.33	1.38
Wall (seismic)	2.40	0.75	1.80
F active (seismic)	4.56	1.50	6.85
surcharge (seismic)	0.59	1.05	0.62
soil/heel (seismic)	4.22	1.25	5.28
F water pressure	0.00	0.75	0.00

MO = 7.57
 MO seismic = 22.12
 Ka = 0.49
 Kp = 2.04
 Kae = 0.58

ASD
 e = 0.06
 pressure [left] = 55.36
 pressure [right] = 34.78
SEISMIC
 e = 0.26
 pressure [left] = 89.45
 pressure [right] = 0.69

Safety Factor Overturning = 8.04
Safety Factor Overturning (seismic) = 2.75



A2. EC7 [EQU]

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	20.25	0.56	11.42
back fill	35.64	1.05	37.42
W surcharge	4.95	1.05	5.20
total	60.84		
F passive	6.40	0.18	1.18
F surcharge	9.49	1.12	10.67
F active	7.09	0.33	2.32
F water pressure	0.00	0.75	0.00

MO = 12.99
 Ka = 0.56
 Kp = 1.78
 Kae = 0.66

e = 0.13
 pressure [left] = 55.89
 pressure [right] = 20.16

Safety Factor Overturning = 4.25

A3. EC7 [STR/GEO - A1+M1]

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	22.50	0.56	12.69
back fill	39.60	1.05	41.58
W surcharge	5.50	1.05	5.77
total	67.60		
F passive	4.51	0.18	0.83
F surcharge	8.26	1.12	9.29
F active	5.70	0.33	1.86
F water pressure	0.00	0.75	0.00

MO = 11.15
 Ka = 0.49
 Kp = 2.04
 Kae = 0.58

e = 0.08
 pressure [left] = 54.41
 pressure [right] = 30.09

Safety Factor Overturning = 5.46

B. SLIDING

B1. ASD & SEISMIC

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	22.50	0.56	12.69
back fill	39.60	1.05	41.58
W surcharge	5.50	1.05	5.77
total	67.60		
F passive	4.51	0.18	0.83
F surcharge	5.50	1.12	6.19
F active	4.22	0.33	1.38
WALL (seismic)	2.40	0.75	1.80
F active (seismic)	4.56	1.50	6.85
surcharge (seismic)	0.59	1.05	0.62
soil/heel (seismic)	4.22	1.25	5.28
F water pressure	0.00	0.75	0.00

MO = 7.57
 MO seismic = 22.12

Ka = 0.49
 Kp = 2.04
 Kae = 0.58

ASD

e = 0.06
 pressure [left] = 55.36
 pressure [right] = 34.78

SEISMIC

e = 0.26
 pressure [left] = 89.45
 pressure [right] = 0.69

Safety Factor Sliding = 3.00

Safety Factor Sliding (seismic) = 1.36



B2. EC7 [EQU]

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	20.25	0.56	11.42
back fill	35.64	1.05	37.42
W surcharge	4.95	1.05	5.20
total	60.84		
F passive	6.40	0.18	1.18
F surcharge	9.49	1.12	10.67
F active	7.09	0.33	2.32
F water pressure	0.00	0.75	0.00

MO =	12.99
Ka =	0.56
Kp =	1.78
Kae =	0.66
e =	0.13
pressure [left] =	55.89
pressure [right] =	20.16

Safety Factor Sliding = 1.46

B3. EC7 [STR/GEO - A1+M1]

LOAD	MAGNITUDE (kN)	DISTANCE (m)	BENDING MOMENT (kNm)
WALL	22.50	0.56	12.69
back fill	39.60	1.05	41.58
W surcharge	5.50	1.05	5.77
total	67.60		
F passive	4.51	0.18	0.83
F surcharge	8.26	1.12	9.29
F active	5.70	0.33	1.86
F water pressure	0.00	0.75	0.00

MO =	11.15
Ka =	0.49
Kp =	2.04
Kae =	0.58
e =	0.08
pressure [left] =	54.41
pressure [right] =	30.09

Safety Factor Sliding = 2.09

C. STRUCTURAL DESIGN

C1. STATIC LOADS & SEISMIC

LOAD	MAGNITUDE (kN)		DISTANCE (m)	BENDING MOMENT (kNm)	
	STATIC LOADS-SEISMIC	SEISMIC		STATIC LOADS-SEISMIC	SEISMIC
WALL	22.50	22.50	0.56	12.69	12.69
back fill	39.60	39.60	1.05	41.58	41.58
W surcharge	5.50	5.50	1.05	5.77	5.77
total	67.60	67.60			
F passive	4.51	4.51	0.18	0.83	0.83
F surcharge	8.26	5.50	1.12	9.29	6.19
F active	5.70	4.22	0.33	1.86	1.38
WALL (seismic)		2.40	0.75		1.80
F active (seismic)		4.56	1.50		6.85
F water pressure	0.00	0.00	0.75	0.00	0.00
surcharge (seismic)		0.59	1.05		0.62
soil/heel (seismic)		4.22	1.25		5.28

MO =	11.15
MO seismic =	22.12
Ka =	0.49
Kp =	2.04
Kae =	0.58

STATIC LOADS	
e =	0.08
pressure [left] =	54.41
pressure [right] =	30.09

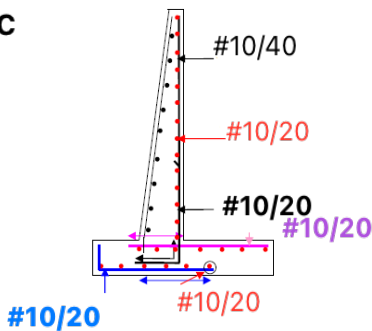
EC2 design. static loads	
stem AS =	127.55
stem AS min =	325.00
heel AS =	166.60
heel AS min =	325.00
toe AS =	24.95
toe AS min =	325.00

EC2 design. seismic loads	
stem AS =	256.80
heel AS =	205.01
toe AS =	40.71

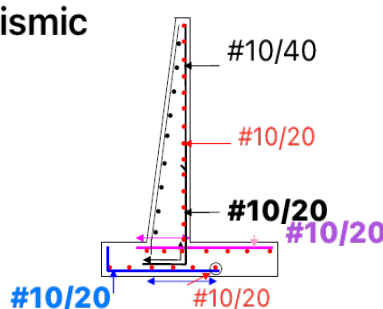
EC2 shear check. static loads	
Vsd =	13.96
Vrd =	158.39

EC2 shear check. seismic loads	
Vsd =	25.73
Vrd =	158.39

static



seismic



D. SLOPE STABILITY



D1. ASD & SEISMIC

Safety Factor Slope Stability [FELLENIOUS] =	1.66
Safety Factor Slope Stability [seismic] - [FELLENIOUS] =	1.33
Safety Factor Slope Stability [BISHOP - mod] =	1.80
Safety Factor Slope Stability [seismic] - [BISHOP - mod] =	1.41

D2. EC7 [EQU]

Safety Factor Slope Stability [FELLENIOUS] =	1.04
Safety Factor Slope Stability [BISHOP - mod] =	1.32

D3. EC7 [STR/GEO - A1+M1]

Safety Factor Slope Stability [FELLENIOUS] =	1.15
Safety Factor Slope Stability [BISHOP - mod] =	1.53



E. BEARING CAPACITY

E1. TERZAGHI

qu [kN/m² - kPa] - ASD =	189.95
qu [kN/m² - kPa] - SEISMIC =	176.73
qu [kN/m² - kPa] - EQU =	185.73
qu [kN/m² - kPa] STR/GEO =	188.91

E2. MEYERHOF

qu [kN/m² - kPa] - ASD =	240.93
qu [kN/m² - kPa] - SEISMIC =	205.35
qu [kN/m² - kPa] - EQU =	229.39
qu [kN/m² - kPa] STR/GEO =	238.07

E3. EC7

qu [kN/m² - kPa] - ASD =	219.78
qu [kN/m² - kPa] - SEISMIC =	196.92
qu [kN/m² - kPa] - EQU =	196.92
qu [kN/m² - kPa] STR/GEO =	218.10