

CIVIL DESIGN
PROFESSIONALS
INNOVATIVE ENGINEERING SOLUTIONS

DESIGN CALCULATIONS

Seven Bramley Lane
Dobbs Ferry, New York

(PROJECT # 22-0690)

SUBMITTED BY:

Tim Hatten

April 17, 2023



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF NEW YORK. THE CALCULATIONS MODEL WORST CASE CONDITIONS AND COVER ALL OF THE PROPOSED MODULAR BLOCK WALLS FOR THIS SPECIFIC PROJECT.

DATE:

4/17/23

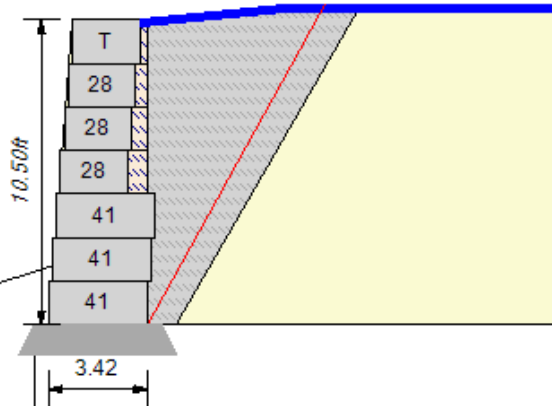
MICHAEL R. JOHNSON, P.E. LICENSE NO. 078676

REVIEWER: _____	APPROVED: ☐ _____
COMPANY: _____	APPROVED AS NOTED: ☐ _____
DATE: _____	RESUBMIT: ☐ _____

COMMENTS AND/OR APPROVAL OF CALCULATIONS BY A PROFESSIONAL ENGINEER SHALL BE PROVIDED TO CDP PRIOR TO CONSTRUCTION.

Civil Design Professionals

Project: Seven Bramley Lane
 Location: Dobbs Ferry, New York
 Designer: TPH
 Date: 4/14/2023
 Section: 10.5
 Design Method: NCMA_09_3rd_Ed, Include Vert. Force
 Design Unit: Redi-Rock



SOIL PARAMETERS	ϕ	coh	γ
Select Soil:	40 deg	0psf	120pcf
Retained Soil:	32 deg	0psf	120pcf
Foundation Soil:	32 deg	0psf	120pcf
Leveling Pad:	40 deg	0psf	135pcf
Crushed Stone Lvlng Pad			

GEOMETRY

Design Height:	10.50ft	Live Load:	50psf
Wall Batter/Tilt:	5.20/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	2.00ft	Live Load Width:	50ft
Leveling Pad Depth:	1.00ft		
Slope Angle:	6.0 deg	Dead Load:	0.0ft
Slope Length:	5.0ft	Dead Load Offset:	0.0ft
Slope Toe Offset:	0.0ft	Dead Load Width:	0.00ft
Leveling Pad Width:	4.42ft	D.L. Embedment:	0ft
Vert δ on Single Dpth		Toe Slope Angle:	18.00
		Toe Slope Length:	15.00
		Toe Slope Bench:	0.00
Select Fill Offset:	1.00ft		
Select Fill Angle:	60.00 deg.		

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY

Sliding:	1.50	Overturning:	1.50
Bearing:	2.00		

RESULTS

FoS Sliding: 2.48 (fnd) FoS Overturning: 2.09
 Bearing: 1660.32 FoS Bearing: 7.42

Name	Elev.[dpth]	ka	Pa	Paq	(Pp)	PaT	FSsl	FoS OT	%D/H
T	9.00[1.50]	0.212	29	16		45	251.62	21.94	156%
28	7.50[3.00]	0.176	95	26		121	92.20	9.74	78%
28	6.00[4.50]	0.176	213	40		253	45.92	5.39	52%
28	4.50[6.00]	0.176	379	53		432	27.88	3.43	39%
41	3.00[7.50]	0.212	715	71		786	17.56	3.70	46%
41	1.50[9.00]	0.212	1030	89		1119	12.91	2.70	38%
41	0.00[10.50]	0.212	1399	106		1506	3.12	2.09	33%
LvlngPd					976		2.48		

Column Descriptions:

ka: active earth pressure coefficient

Pa: active earth pressure

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

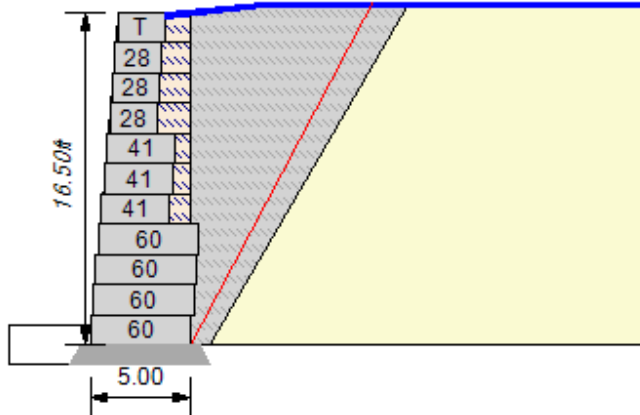
FSsl(lvl Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.

Civil Design Professionals

Project: Seven Bramley Lane
 Location: Dobbs Ferry, New York
 Designer: TPH
 Date: 4/14/2023
 Section: 16.5
 Design Method: NCMA_09_3rd_Ed, Include Vert. Force
 Design Unit: Redi-Rock

SOIL PARAMETERS	ϕ	coh	γ
Select Soil:	40 deg	0psf	120pcf
Retained Soil:	32 deg	0psf	120pcf
Foundation Soil:	32 deg	0psf	120pcf
Leveling Pad:	40 deg	0psf	135pcf
Crushed Stone Lvlng Pad			



GEOMETRY

Design Height:	16.50ft	Live Load:	50psf
Wall Batter/Tilt:	5.20/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	1.00ft	Live Load Width:	50ft
Leveling Pad Depth:	1.00ft		
Slope Angle:	6.0 deg	Dead Load:	0.0ft
Slope Length:	5.0ft	Dead Load Offset:	0.0ft
Slope Toe Offset:	0.0ft	Dead Load Width:	0.00ft
Leveling Pad Width:	6.00ft	D.L. Embedment:	0ft

Vert δ on Single Dpth

Select Fill Offset:	1.00ft
Select Fill Angle:	60.00 deg.

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY

Sliding:	1.50	Overturning:	1.50
Bearing:	2.00		

RESULTS

FoS Sliding: 2.30 (fnd) FoS Overturning: 1.94
 Bearing: 2922.34 FoS Bearing: 3.54

Name	Elev.[dpth]	ka	Pa	Paq	(Pp)	PaT	FSsl	FoS OT	%D/H
T	15.00[1.50]	0.212	29	16		45	251.62	22.41	156%
28	13.50[3.00]	0.176	95	26		121	92.11	9.69	78%
28	12.00[4.50]	0.176	213	40		253	45.92	5.52	52%
28	10.50[6.00]	0.176	379	53		432	27.91	3.57	39%
41	9.00[7.50]	0.212	715	71		786	17.56	3.81	46%
41	7.50[9.00]	0.212	1030	89		1119	12.91	2.79	38%
41	6.00[10.50]	0.212	1399	106		1506	10.03	2.17	33%
60	4.50[12.00]	0.212	1829	102		1931	9.23	3.32	42%
60	3.00[13.50]	0.211	2305	118		2423	7.74	2.71	37%
60	1.50[15.00]	0.210	2836	134		2970	6.63	2.27	33%
60	0.00[16.50]	0.209	3421	151		3572	2.50	1.94	30%
LvlngPd					586		2.30		

Column Descriptions:

ka: active earth pressure coefficient

Pa: active earth pressure

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(lvl Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.