

MJ Civil Engineering	Project:	40 Sweetwater Park		By: MAJ
	Calculation:	2.8m Effective Retaining Gabion Wall Design		
	Sheet Number:	1	Date: 08.09.2025	Approved: JAJ

Gabion Wall Geometry

Gabion Level 1	Width	2	m
	Height	0.8	m
Gabion Level 2	Width	1.5	m
	Height	1	m
	Step Between Level 1 & 2	0	m
Gabion Level 3	Width	1	m
	Height	1	m
	Step Between Level 2 & 3	0	m
Gabion Level 4	Width	0	m
	Height	0	m
	Step Between Level 3 & 4	0	m
Gabion Level 5	Width		m
	Height		m
	Step Between Level 4 & 5		m
Gabion Level 6	Width		m
	Height		m
	Step Between Level 5 & 6		m
Gabion Level 7	Width		m
	Height		m
	Step Between Level 6 & 7		m
Gabion Level 8	Width		m
	Height		m
	Step Between Level 7 & 8		m
Gabion Level 9	Width		m
	Height		m
	Step Between Level 8 & 9		m
Wall Inclination		0	Degrees
Slope of Retained Material		0	Degrees

Other Details

Unit Weight of Gabions	18.00	kN/m ³
Friction Angle Between Gabions	35	Degrees
Loading - Variable Surcharge	5.00	kN/m ²
Soil Characteristic Effective Shearing Resistance Angle	34	Degrees
Soil Characteristic Saturated Density	18.00	kN/m ³
Coefficient for Wall Friction	0.75	
Wall Friction Angle	35	Degrees
Characteristic Base Friction Angle	34	Degrees
Bearing Capacity of Underlying Soil	100	kN/m ²

MJ Civil Engineering	Project:	40 Sweetwater Park			By:MAJ
	Calculation:	Gabion Wall Design			
	Sheet Number:	2	Date:08.09.2025	Approved: JAJ	
Results					
Pressures @ Base					
Total Unfactored Overturning Force			22.62	kN/m	
Total Unfactored Restoring Force			139.01	kN/m	
Eccentricity			0.15	Reaction Within Middle Third of Base	
Pressure at Toe			99.70	kN/m ²	
Pressure at Heel			37.44	kN/m ²	
Factor of Safety			1.00		
Allowable Factor of Safety			1.00	Pass	
Design Approach 1					
Partial Factors on Actions - Section A.3.1 - Combination 1					
Action Factor Set - A1					
Permanent unfavourable action			1.35		
Permanent favourable action			1.00		
Variable unfavourable action			1.50		
Variable favourable action			0.00		
Partial factors for soil parameters - Section A.3.2 - Combination 1					
Soil Factor Set - M1					
Angle of Shearing Resistance			1.00		
Weight Density			1.00		
Whole Structure					
Overturning Moment	40.26kN	Overturning Resistance	115.9kN		
Factor of Safety	2.88	Allowable FoS	1.00	Pass	
Sliding Force	39.56kN	Sliding Resistance	79.04kN		
Factor of Safety	2.00	Allowable FoS	1.00	Pass	
Check Overturning & Sliding Between Courses 1 & 2					
Overturning Moment	16.14kN	Overturning Resistance	52.66kN		
Factor of Safety	3.26	Allowable FoS	1.00	Pass	
Sliding Force	21.65kN	Sliding Resistance	47.9kN		
Factor of Safety	2.21	Allowable FoS	1.00	Pass	
Check Overturning & Sliding Between Courses 2 & 3					
Overturning Moment	2.55kN	Overturning Resistance	14.54kN		
Factor of Safety	5.70	Allowable FoS	1.00	Pass	
Sliding Force	6.42kN	Sliding Resistance	26.3kN		
Factor of Safety	2.87	Allowable FoS	1.00	Pass	
Check Overturning & Sliding Between Courses 3 & 4					
Overturning Moment		Overturning Resistance			
Factor of Safety		Allowable FoS	1.00		
Sliding Force		Sliding Resistance			
Factor of Safety		Allowable FoS	1.00		
Check Overturning & Sliding Between Courses 4 & 5					
Overturning Moment		Overturning Resistance			
Factor of Safety		Allowable FoS	1.00		
Sliding Force		Sliding Resistance			
Factor of Safety		Allowable FoS	1.00		
Check Overturning & Sliding Between Courses 5 & 6					
Overturning Moment		Overturning Resistance			
Factor of Safety		Allowable FoS	1.00		

Sliding Force	Sliding Resistance	
Factor of Safety	Allowable FoS	1.00
Check Overturning & Sliding Between Courses 6 & 7		
Overturning Moment	Overturning Resistance	
Factor of Safety	Allowable FoS	1.00
Sliding Force	Sliding Resistance	
Factor of Safety	Allowable FoS	1.00
Check Overturning & Sliding Between Courses 7 & 8		
Overturning Moment	Overturning Resistance	
Factor of Safety	Allowable FoS	1.00
Sliding Force	Sliding Resistance	
Factor of Safety	Allowable FoS	1.00
Check Overturning & Sliding Between Courses 8 & 9		
Overturning Moment	Overturning Resistance	
Factor of Safety	Allowable FoS	1.00
Sliding Force	Sliding Resistance	
Factor of Safety	Allowable FoS	1.00

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	Calculation:					
	Sheet Number:	3			Date:08.09.2025	Approved: JAJ
Design Approach 1						
Partial Factors on Actions - Section A.3.1 - Combination 2						
Action Factor Set - A2						
Permanent unfavourable action					1.00	
Permanent favourable action					1.00	
Variable unfavourable action					1.30	
Variable favourable action					0.00	
Partial factors for soil parameters - Section A.3.2 - Combination 2						
Soil Factor Set - M2						
Angle of Shearing Resistance					1.25	
Weight Density					1.00	
Whole Structure						
Overturning Moment		37.57kN	Overturning Resistance		117.19kN	
Factor of Safety		3.12	Allowable FoS		1.00	Pass
Sliding Force		36.51kN	Sliding Resistance		63.76kN	
Factor of Safety		1.75	Allowable FoS		1.00	Pass
Check Overturning & Sliding Between Courses 1 & 2						
Overturning Moment		15.25kN	Overturning Resistance		53.12kN	
Factor of Safety		3.48	Allowable FoS		1.00	Pass
Sliding Force		20.2kN	Sliding Resistance		68.87kN	
Factor of Safety		1.91	Allowable FoS		1.00	Pass
Check Overturning & Sliding Between Courses 2 & 3						
Overturning Moment		2.54kN	Overturning Resistance		14.54kN	
Factor of Safety		5.73	Allowable FoS		1.00	Pass
Sliding Force		6.29kN	Sliding Resistance		26.3kN	
Factor of Safety		2.34	Allowable FoS		1.00	Pass
Check Overturning & Sliding Between Courses 3 & 4						
Overturning Moment			Overturning Resistance			
Factor of Safety			Allowable FoS		1.00	
Sliding Force			Sliding Resistance			
Factor of Safety			Allowable FoS		1.00	
Check Overturning & Sliding Between Courses 4 & 5						
Overturning Moment			Overturning Resistance			
Factor of Safety			Allowable FoS		1.00	
Sliding Force			Sliding Resistance			
Factor of Safety			Allowable FoS		1.00	
Check Overturning & Sliding Between Courses 5 & 6						
Overturning Moment			Overturning Resistance			
Factor of Safety			Allowable FoS		1.00	
Sliding Force			Sliding Resistance			
Factor of Safety			Allowable FoS		1.00	
Check Overturning & Sliding Between Courses 6 & 7						
Overturning Moment			Overturning Resistance			
Factor of Safety			Allowable FoS		1.00	
Sliding Force			Sliding Resistance			
Factor of Safety			Allowable FoS		1.00	
Check Overturning & Sliding Between Courses 7 & 8						
Overturning Moment			Overturning Resistance			
Factor of Safety			Allowable FoS		1.00	

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