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|----------------------|----------------------|--------------------|-------------------------|-------------------------|
| MJ Civil Engineering | <b>Project:</b>      | 40 Sweetwater Park |                         | <b>By:</b> MAJ          |
|                      | <b>Calculation:</b>  | Gabion Wall Design |                         |                         |
|                      | <b>Sheet Number:</b> | 1                  | <b>Date:</b> 14.06.2025 | <b>Approved:</b><br>JAJ |

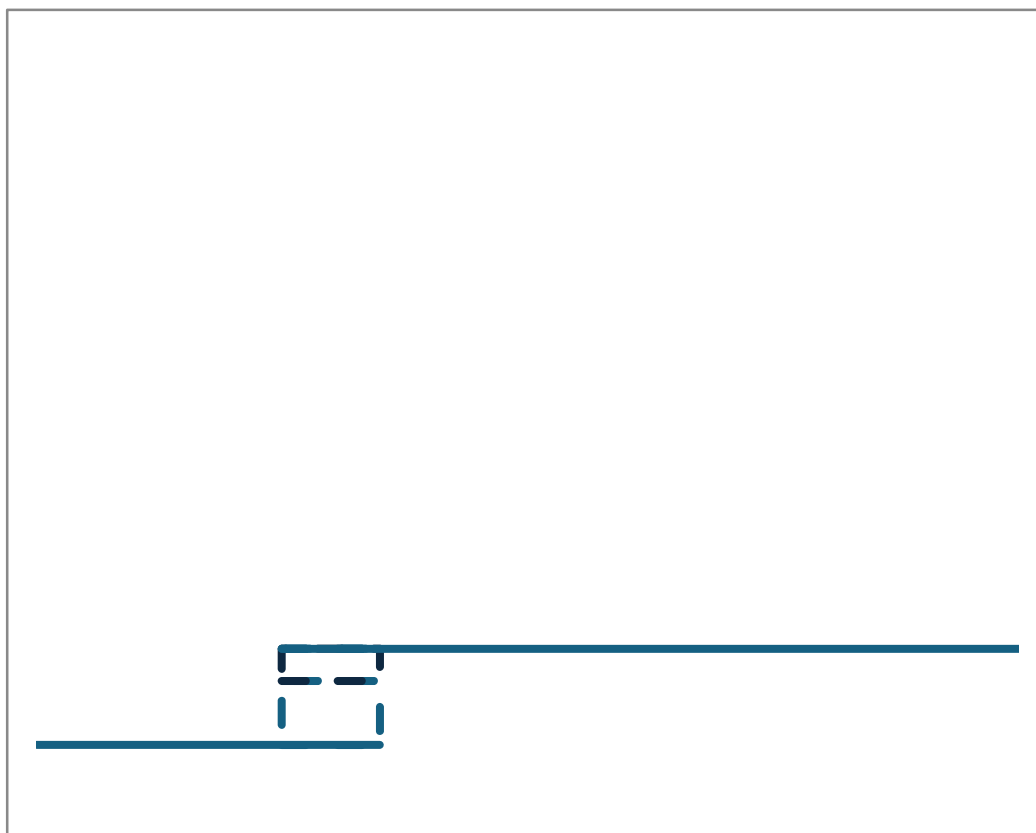
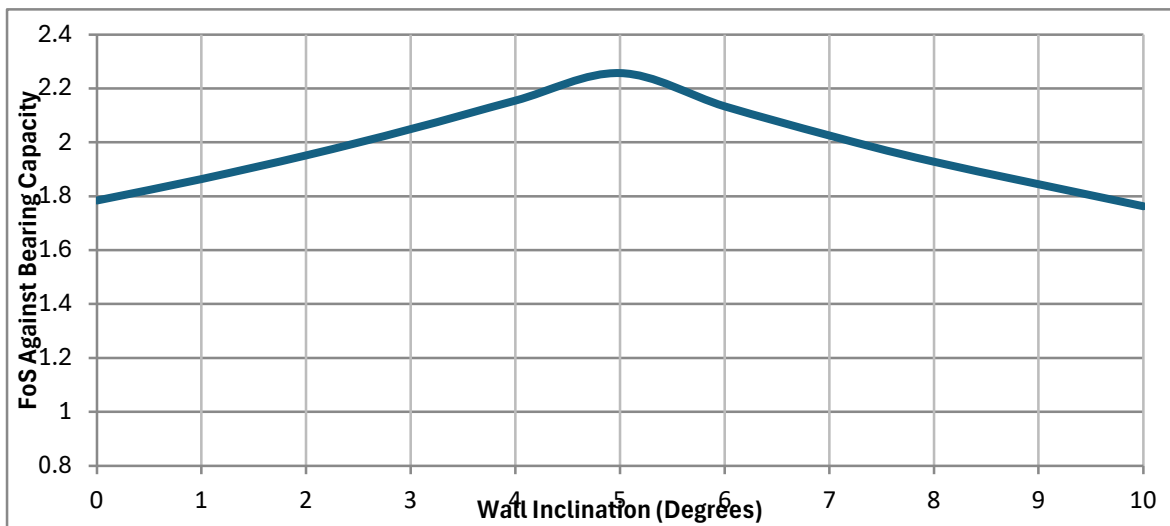
| <u>Gabion Wall Geometry</u> |                          |     |         |
|-----------------------------|--------------------------|-----|---------|
| Gabion Level 1              | Width                    | 1   | m       |
|                             | Height                   | 1   | m       |
| Gabion Level 2              | Width                    | 1   | m       |
|                             | Height                   | 0.5 | m       |
| Gabion Level 3              | Step Between Level 1 & 2 | 0   | m       |
|                             | Width                    | 1   | m       |
|                             | Height                   | 0   | m       |
| Gabion Level 4              | Step Between Level 2 & 3 | 0   | m       |
|                             | Width                    | 0   | m       |
|                             | Height                   | 0   | m       |
| Gabion Level 5              | Step Between Level 3 & 4 | 0   | m       |
|                             | Width                    |     | m       |
|                             | Height                   |     | m       |
| Gabion Level 6              | Step Between Level 4 & 5 |     | m       |
|                             | Width                    |     | m       |
|                             | Height                   |     | m       |
| Gabion Level 7              | Step Between Level 5 & 6 |     | m       |
|                             | Width                    |     | m       |
|                             | Height                   |     | m       |
| Gabion Level 8              | Step Between Level 6 & 7 |     | m       |
|                             | Width                    |     | m       |
|                             | Height                   |     | m       |
| Gabion Level 9              | Step Between Level 7 & 8 |     | m       |
|                             | Width                    |     | m       |
|                             | Height                   |     | m       |
| Wall Inclination            |                          | 6   | Degrees |
| Slope of Retained Material  |                          | 0   | Degrees |

| <u>Other Details</u>                                    |  |       |                   |
|---------------------------------------------------------|--|-------|-------------------|
| Unit Weight of Gabions                                  |  | 18.00 | kN/m <sup>3</sup> |
| Friction Angle Between Gabions                          |  | 35    | Degrees           |
| Loading - Variable Surcharge                            |  | 5.00  | kN/m <sup>2</sup> |
| Soil Characteristic Effective Shearing Resistance Angle |  | 34    | Degrees           |
| Soil Characteristic Saturated Density                   |  | 18.00 | kN/m <sup>3</sup> |
| 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 <sup>2</sup> |

|                                                                            |                                 |                        |                                      |      |
|----------------------------------------------------------------------------|---------------------------------|------------------------|--------------------------------------|------|
| MJ Civil Engineering                                                       | Project: 40 Sweetwater Park     |                        | By:MAJ                               |      |
|                                                                            | Calculation: Gabion Wall Design |                        | Approved:                            |      |
|                                                                            | Sheet Number:                   | 2                      | Date:14.06.2025                      | JAJ  |
| <b>Results</b>                                                             |                                 |                        |                                      |      |
| <b>Pressures @ Base</b>                                                    |                                 |                        |                                      |      |
| Total Unfactored Overturning Force                                         |                                 | 4.25                   | kN/m                                 |      |
| Total Unfactored Restoring Force                                           |                                 | 26.80                  | kN/m                                 |      |
| Eccentricity                                                               |                                 | -0.01                  | Reaction Within Middle Third of Base |      |
| Pressure at Toe                                                            |                                 | 41.60                  | kN/m <sup>2</sup>                    |      |
| Pressure at Heel                                                           |                                 | 46.86                  | kN/m <sup>2</sup>                    |      |
| Factor of Safety                                                           |                                 | 2.13                   |                                      |      |
| Allowable Factor of Safety                                                 |                                 | 1.00                   | Pass                                 |      |
| <b>Design Approach 1</b>                                                   |                                 |                        |                                      |      |
| <b>Partial Factors on Actions - Section A.3.1 - Combination 1</b>          |                                 |                        |                                      |      |
| <b>Action Factor Set - A1</b>                                              |                                 |                        |                                      |      |
| Permanent unfavourable action                                              |                                 | 1.35                   |                                      |      |
| Permanent favourable action                                                |                                 | 1.00                   |                                      |      |
| Variable unfavourable action                                               |                                 | 1.50                   |                                      |      |
| Variable favourable action                                                 |                                 | 0.00                   |                                      |      |
| <b>Partial factors for soil parameters - Section A.3.2 - Combination 1</b> |                                 |                        |                                      |      |
| <b>Soil Factor Set - M1</b>                                                |                                 |                        |                                      |      |
| Angle of Shearing Resistance                                               |                                 | 1.00                   |                                      |      |
| Weight Density                                                             |                                 | 1.00                   |                                      |      |
| <b>Whole Structure</b>                                                     |                                 |                        |                                      |      |
| Overturning Moment                                                         | 7.12kN                          | Overturning Resistance | 22.78kN                              |      |
| Factor of Safety                                                           | 3.20                            | Allowable FoS          | 1.00                                 | Pass |
| Sliding Force                                                              | 10.22kN                         | Sliding Resistance     | 25.9kN                               |      |
| Factor of Safety                                                           | 2.53                            | Allowable FoS          | 1.00                                 | Pass |
| <b>Check Overturning &amp; Sliding Between Courses 1 &amp; 2</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         | 0.28kN                          | Overturning Resistance | 8.51kN                               |      |
| Factor of Safety                                                           | 30.60                           | Allowable FoS          | 1.00                                 | Pass |
| Sliding Force                                                              | 0.36kN                          | Sliding Resistance     | 10.3kN                               |      |
| Factor of Safety                                                           | 28.69                           | Allowable FoS          | 1.00                                 | Pass |
| <b>Check Overturning &amp; Sliding Between Courses 2 &amp; 3</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 3 &amp; 4</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 4 &amp; 5</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 5 &amp; 6</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 6 &amp; 7</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 7 &amp; 8</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| <b>Check Overturning &amp; Sliding Between Courses 8 &amp; 9</b>           |                                 |                        |                                      |      |
| Overturning Moment                                                         |                                 | Overturning Resistance |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |
| Sliding Force                                                              |                                 | Sliding Resistance     |                                      |      |
| Factor of Safety                                                           |                                 | Allowable FoS          | 1.00                                 |      |

|                                                                            |                                        |                        |                         |      |
|----------------------------------------------------------------------------|----------------------------------------|------------------------|-------------------------|------|
| MJ Civil Engineering                                                       | <b>Project:</b> 40 Sweetwater Park     |                        | <b>By:</b> MAJ          |      |
|                                                                            | <b>Calculation:</b> Gabion Wall Design |                        | <b>Approved:</b>        |      |
|                                                                            | <b>Sheet Number:</b>                   | 3                      | <b>Date:</b> 14.06.2025 | JAJ  |
| <b>Design Approach 1</b>                                                   |                                        |                        |                         |      |
| <b>Partial Factors on Actions - Section A.3.1 - Combination 2</b>          |                                        |                        |                         |      |
| <b>Action Factor Set - A2</b>                                              |                                        |                        |                         |      |
| Permanent unfavourable action                                              |                                        |                        | 1.00                    |      |
| Permanent favourable action                                                |                                        |                        | 1.00                    |      |
| Variable unfavourable action                                               |                                        |                        | 1.30                    |      |
| Variable favourable action                                                 |                                        |                        | 0.00                    |      |
| <b>Partial factors for soil parameters - Section A.3.2 - Combination 2</b> |                                        |                        |                         |      |
| <b>Soil Factor Set - M2</b>                                                |                                        |                        |                         |      |
| Angle of Shearing Resistance                                               |                                        |                        | 1.25                    |      |
| Weight Density                                                             |                                        |                        | 1.00                    |      |
| <b>Whole Structure</b>                                                     |                                        |                        |                         |      |
| Overturning Moment                                                         | 6.78kN                                 | Overturning Resistance | 23.05kN                 |      |
| Factor of Safety                                                           | 3.40                                   | Allowable FoS          | 1.00                    | Pass |
| Sliding Force                                                              | 9.28kN                                 | Sliding Resistance     | 20.87kN                 |      |
| Factor of Safety                                                           | 2.25                                   | Allowable FoS          | 1.00                    | Pass |
| <b>Check Overturning &amp; Sliding Between Courses 1 &amp; 2</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         | 0.35kN                                 | Overturning Resistance | 8.31kN                  |      |
| Factor of Safety                                                           | 23.71                                  | Allowable FoS          | 1.00                    | Pass |
| Sliding Force                                                              | 2.32kN                                 | Sliding Resistance     | 14.29kN                 |      |
| Factor of Safety                                                           | 9.89                                   | Allowable FoS          | 1.00                    | Pass |
| <b>Check Overturning &amp; Sliding Between Courses 2 &amp; 3</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 3 &amp; 4</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 4 &amp; 5</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 5 &amp; 6</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 6 &amp; 7</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 7 &amp; 8</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| <b>Check Overturning &amp; Sliding Between Courses 8 &amp; 9</b>           |                                        |                        |                         |      |
| Overturning Moment                                                         |                                        | Overturning Resistance |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |
| Sliding Force                                                              |                                        | Sliding Resistance     |                         |      |
| Factor of Safety                                                           |                                        | Allowable FoS          | 1.00                    |      |



### Results Sumamry

Eccentricity                      Reaction within Middle Third of Base  
 Bearing Capacity FoS                      **2.13**

|                      |              |              |
|----------------------|--------------|--------------|
| Combintion 1         | Overturning  | Sliding      |
| Whole Structure      | <b>3.20</b>  | <b>2.53</b>  |
| Between Levels 1 & 2 | <b>30.60</b> | <b>28.69</b> |

|                      |              |             |
|----------------------|--------------|-------------|
| Combintion 2         | Overturning  | Sliding     |
| Whole Structure      | <b>3.40</b>  | <b>2.25</b> |
| Between Levels 1 & 2 | <b>23.71</b> | <b>9.89</b> |