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COMPARISON OF TABLE BEARING CAPACITY FOR DIFFERENT TYPES OF FOUNDATION SOILS / ROCKS

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ABSTRACT

The aim of the publication was to compare the suitability of foundation soils on the basis of table (standard empirical) bearing capacity. Four basic groups of foundation soils were compared, which are fine-grained soils, sandy soils, gravelly soils and rocky soils. The scientific motivation for this comparison is that visualizing the difference between the suitability and unsuitability of a particular foundation soil / rock is one of the fundamental problems in engineering geology. Quantifying and visualizing the differences is very important for understanding the significance of different geological settings. Of all the foundation soil classes evaluated, the R1 rock soil group with a simple compressive strength greater than 150 MPa and a discontinuity distance greater than 600 mm achieves the highest table bearing capacity of 8 000 kPa. In contrast, the lowest table bearing capacity is achieved by the class of fine-grained foundation soils (F8) of clays with extremely high plasticity and soft consistency, where the value of this class is only 40 kPa.

Keywords: Fine-grained soils; Gravelly soils; Rock mass; Sandy soils; Table bearing capacity.

1 INTRODUCTION

The aim of the publication is to evaluate the suitability of foundation soils on the basis of table (standard empirical) bearing capacity. The suitability of foundation soils is only limited to the approximate table bearing capacity which does not consider the thickness and position of a particular layer relative to the building. The table bearing capacity is a characteristic which is given in tabular form in the standard ČSN 73 1001 [1], which is unfortunately no longer valid. Compared to this old standard, there is also a new valid standard ČSN EN 1997-1 [2], which however does not provide the table bearing capacity for individual classes of foundation soils. So, for this article the first, older standard ČSN 73 1001 [1] is more suitable. If we compare these two standards, there is a comparison using classification triangles which have analogous parameters in their corners.

The aim of this publication is to compare the classes of foundation soils with each other not only on the basis of the values of the table bearing capacity in kPa, but especially on the basis of the percentages given in the pie charts. Only this method allows all values to be clearly compared with each other and to visualise the comparison using this tool. The importance of this evaluation is very important for engineering geology, because we can see the different groups graphically at one moment. This method is natural to human perception and also allows this publication to be used not only scientifically but also didactically. The importance of this evaluation is obvious, as engineering geologists and geotechnical engineers are constantly comparing individual environments with each other. When evaluating foundation soils the view of their suitability or unsuitability is multifactorial. The evaluation of the table bearing capacity using classes of foundation soils takes into account certain sub-parameters that are part of this evaluation.

Two types of evaluation are mentioned in the article. One evaluation will evaluate the table bearing capacity separately in each grain size class (fine-grained soils, sandy soils, gravelly soils) separately. The second evaluation

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is more comprehensive because it considers the table bearing capacity for all grain size classes of foundation soils with rocks mass [3, 4, 5, 6] that have the highest table bearing capacity values.

2 TABLE BEARING CAPACITY OF EACH GRAIN SIZE CATEGORY BY COMPARISON WITH THE MAXIMUM VALUE

In this Section we will evaluate the table bearing capacity separately in each grain size class (fine-grained soils, sandy soils, gravelly soils). The rocks mass will not be included in this Section as it is covered in the following one. It has the highest values of table bearing capacity and against it we will compare all other grain size classes of foundation soils.

2.1 Table bearing capacity of fine-grained soils

The maximum value of table bearing capacity within the fine-grained foundation soil group [7, 8, 9] has a foundation soil class F1 (MG) of gravely loam in the hard consistency state (Fig. 1). The reasons are threefold, as the addition of gravel improves the physical mechanical properties of this foundation soil and at the same time the clay (dust) has more suitable physical mechanical properties than clays. Furthermore, the hard consistency state has better physical mechanical properties than the other consistency states (soft, rigid, firm). It should be noted that the slurry mud consistency has not been evaluated within the standard. The combination of these three factors has resulted in the table bearing capacity for this class of foundation soil being the highest. This is a value of 500 kPa (100 %). The other remaining classes will be compared against this value.

The first comparison plane in the evaluation of the table bearing capacity of fine-grained soils will be the consistency states. Here, the condition is such that the most suitable table bearing capacity is hard consistency (Fig. 1d), where the lowest value is for foundation soil class F8 (CH, CV, CE) clay of high plasticity, clay of very high plasticity, clay of very extremely high plasticity with 300 kPa, which is 60 % compared to the maximum value of table bearing capacity within fine-grained soils. This means that within the hard consistency the difference between the least suitable and the most suitable foundation soil class is 40 %.

The second consistency state in terms of the suitability of the foundation soil based on the table bearing capacity is the firm consistency state (Fig. 1c), where the lowest value is foundation soil class F8 (CH, CV, CE) with 160 kPa, which represents 32 %. From this, it can be seen that within the firm consistency, the difference between the least suitable and the most suitable foundation soil class is 68 %.

The third consistency state in terms of the suitability of the foundation soil based on the table bearing capacity is the rigid consistency state (Fig. 1b), where the lowest value is again foundation soil class F8 (CH, CV, CE) with 80 kPa, which represents 16 %. From this we can deduce that within the rigid consistency the difference between the least suitable and the most suitable foundation soil class is 84 %.

The fourth consistency state in terms of the suitability of the foundation soil based on the table bearing capacity is the soft consistency state (Fig. 1a), where the lowest value is again the foundation soil class F8 (CH, CV, CE) with 40 kPa, which represents 8 %. This means that within the soft consistency, the difference between the least suitable and the most suitable foundation soil class is 92 %.

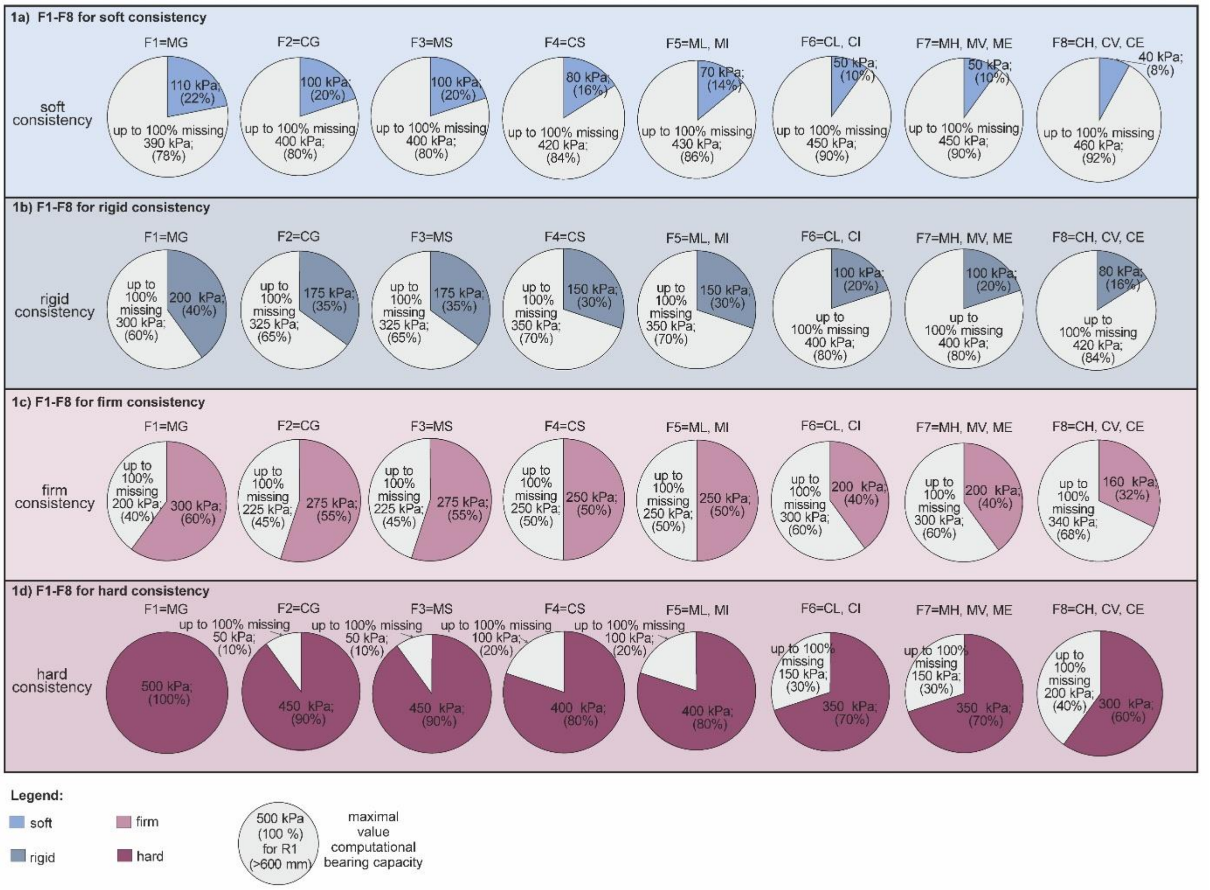

Figure 1. *Graph of table bearing capacity of fine-grained soils (F) at a foundation depth of 0.8–1.5 m for base width ≤ 3 m;* ***1a)*** *for soft consistency,* ***1b)*** *for rigid consistency,* ***1c)*** *for firm consistency,* ***1d)*** *for hard consistency*

The second comparison plane in the evaluation of the table bearing capacity of fine-grained soils will be ***the foundation soil classes (F1–F8)*** (Fig. 2). Here, the situation is that the most suitable table bearing capacity is the F1 (MG) foundation soil class (Figure 2a), where the soft consistency of the foundation soil has the lowest value with a value of 110 kPa, which represents 22 %. This means that within the F1 (MG) foundation soil class, the difference between the least suitable and the most suitable foundation soil class is 78 % compared to the maximum value of table bearing capacity within the fine-grained soils.

The second and third classes of foundation soils in terms of foundation soil suitability based on table bearing capacity are foundation soil classes F2 (CG) gravely clay (Fig. 2b) and F3 (MS) sandy loam (Fig. 2c), where the two foundation soil classes have the lowest value for soft consistency foundation soils with a value of 100 kPa, which is 20 % compared to the maximum table bearing capacity value within fine-grained soils. This shows that within the foundation soil classes F2 (CG) and F3 (MS) the difference between the least suitable and most suitable foundation soil class is 80 %.

The fourth class of foundation soil in terms of foundation soil suitability based on table bearing capacity is foundation soil class F4 (CS) sandy clay (Fig. 2d), where the soft consistency of the foundation soil has the lowest value with a value of 80 kPa, which represents 16 % of the maximum value within all classes F1–F8. This means that within the F4 (CS) foundation soil class, the difference between the least suitable and most suitable foundation soil class is 84 %.

The fifth class of foundation soil in terms of foundation soil suitability based on the table bearing capacity is foundation soil class F5 (ML, MI) loam of low plasticity and loam of medium plasticity (Fig. 2e), where the soft consistency of the foundation soil has the lowest value with a value of 70 kPa, which represents 14 %. From this we can deduce that within foundation soil class F5 (ML, MI), the difference between the least suitable and the most suitable foundation soil class is 86 %.

The sixth and seventh classes of foundation soil in terms of foundation soil suitability based on table bearing capacity are foundation soil classes F6 (CL, CI) clay of low plasticity and clay od medium plasticity (Fig. 2f) and F7 (MH, MV, ME) loam of high plasticity, loam of very high plasticity and loam of extremely high plasticity (Fig. 2g), where the lowest value is for both foundation classes for soft consistency foundation soils with a value of 50 kPa, which is 10 %. This shows that within the foundation soil classes F6 (CL, CI) and F7 (MH, MV, ME) the difference between the least suitable and most suitable foundation soil class is 90 %.

The eighth and final class of foundation soil in terms of foundation soil suitability based on table bearing capacity is foundation soil class F8 (CH, CV, CE) clay of high plasticity, clay of very high plasticity, clay of very extremely high plasticity (Fig. 2h), where the soft consistency of the foundation soil has the lowest value with a value of 40 kPa, which represents 8 %. This means that within foundation soil class F8 (CH, CV, CE), the difference between the least suitable and the most suitable foundation soil class is 92 %.

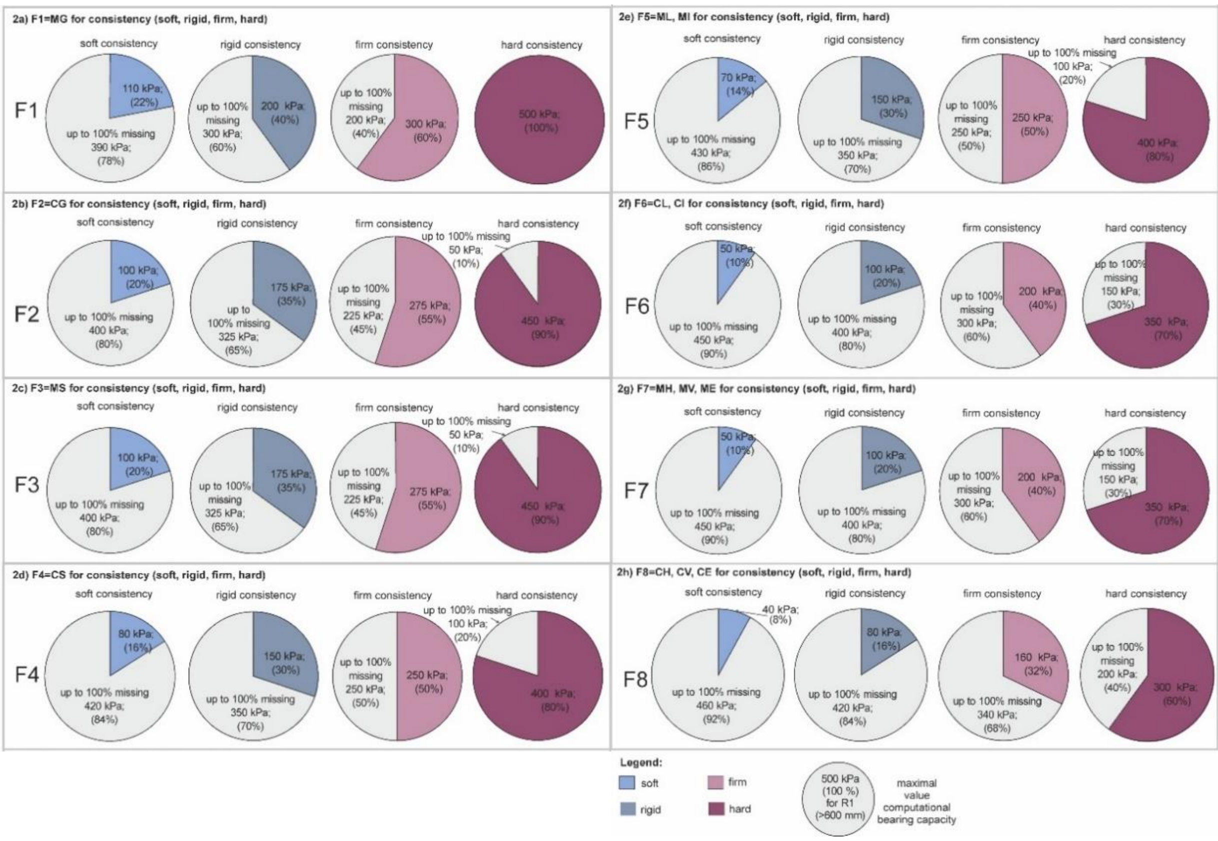

__Figure 2.__ Graph of table bearing capacity of fine-grained soils (F) at a foundation depth of 0.8–1.5 m for a base width ≤ 3 m; __2a)__ F1=MG for consistency (soft, rigid, firm, hard), __2b)__ F2=CG for consistency (soft, rigid, firm, hard), __2c)__ F3=MS for consistency (soft, rigid, firm, hard), __2d)__ F4=CS for consistency (soft, rigid, firm, hard), __2e)__ F5=ML, MI for consistency (soft, rigid, firm, hard), __2f)__ F6=CL, CI for consistency (soft, rigid, firm, hard), __2g)__ F7=MH, MV, ME for consistency (soft, rigid, firm, hard), __2h)__ F8=CH, CV, CE for consistency (soft, rigid, firm, hard)

2.2 Table bearing capacity of sandy soils

The maximum value of table bearing capacity within the group of foundation soils of sandy soils [10, 11, 12] has the foundation soil group S1 (SW) well-graded sand with dense density index for a foundation width of 3 m (Fig. 3). There are several reasons why this is the case. Well-grained sand has better physical and mechanical properties than other classes of foundation soil that are badly graded or contain admixtures of fine-grained soils, clay, etc. Well-grained sand has a higher shear strength and a higher bulk density, and therefore a higher table bearing capacity, than the remaining classes of foundation soils in this group, in the order (badly-grained sand, sand with

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admixture of fine-grained soil, loamy sand and clayey sand). In addition, the dense density index condition has better physical and mechanical properties than the medium dense density index condition. That is, when comparing the dense density index and medium dense density index, it is clear that the dense density index has lower porosity and consequently higher shear strength than the medium dense density index. At the same time, it has a higher value of bulk density and bulk gravity compared to the medium dense density index. These basic properties influence the higher values of the table bearing capacity. It is important to note that the loose, very loose and very dense density index have not been evaluated within the standard. The combination of these factors has resulted in the highest table bearing capacity for this class of foundation soil. This is a value of 800 kPa (100 %). The other remaining classes will be compared against this value. This means that, when comparing dense and medium dense density index, it is clear that the dense density index has a lower porosity and consequently a higher shear strength than the medium dense density index. At the same time, it has a higher value of bulk density and bulk gravity compared to the medium dense density index. These basic properties influence the higher values of the table bearing capacity.

The first comparison plane in the evaluation of the table bearing capacity of sandy soils will be ***the base widths (0.5 m, 1 m, 3 m, 6 m)***. Here, the situation is such that, in terms of both density index and consistency of the foundation soil, a base width of 3 m has the most appropriate table bearing capacity (Fig. 3c). The lowest value in terms of density index is foundation soil class S3 (S–F) with 260 kPa of medium dense density index, which represents a 32.5 % contribution compared to the maximum value within the sandy soils. This means that in terms of density index within a base width of 3 metres, the difference between the least suitable and most suitable class of foundation soil is 67.5 %. In terms of the consistency state, the lowest value of table bearing capacity is foundation soil class S5 (SC) for both firm and rigid consistency states equally with a value of 225 kPa, which is 28.1 %. This means that in terms of the consistency state within a base width of 3 m, the difference between the least suitable and the most suitable foundation soil class is 71.9 %.

The second base width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 6 m (Fig. 3d), where the lowest value in terms of density index is foundation soil class S3 (S–F) with 211 kPa of medium dense density index, which is 26.4 %. This means that in terms of density index within a base width of 6m, the difference between the least suitable and most suitable foundation soil class is 73.6 %. In terms of consistency, the lowest value of table bearing capacity is foundation soil class S5 (SC) for both firm and rigid consistency, with a value of 175 kPa, representing 21.9 %. This implies that in terms of consistency within a base width of 6 m the difference between the least suitable and most suitable foundation soil class is 78.1 %.

The third base width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 1 m (Fig. 3b), where the lowest value in terms of density index is foundation soil class S3 (S–F) with 179 kPa of medium dense density index, which represents 22.3 %. This means that in terms of density index within a base width of 1 m, the difference between the least suitable and most suitable foundation soil class is 77.7 %. In terms of the consistency state, the lowest value of table bearing capacity is foundation soil class S5 (SC) for both firm and rigid consistency states equally, again with a value of 175 kPa, which represents 21.9 %. This means that in terms of the consistency state within a base width of 1 m, the difference between the least suitable and the most suitable foundation soil class is 78.1 %.

The fourth base width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 0.5 m (Fig. 3a), where the lowest value in terms of density index is foundation soil class S3 (S–F) with 146 kPa of medium dense density index, which represents 18.3 %. This means that in terms of density index within a base width of 0.5 m, the difference between the least suitable and most suitable foundation soil class is 81.7 %. In terms of consistency, the lowest value of table bearing capacity is foundation soil class S5 (SC) for both the firm and rigid consistency conditions with a value of 125 kPa, which is 15.6 %. From this, it can be seen that in terms of the consistency state within a base width of 0.5 m, the difference between the least suitable and the most suitable foundation soil class is 84.4 %.

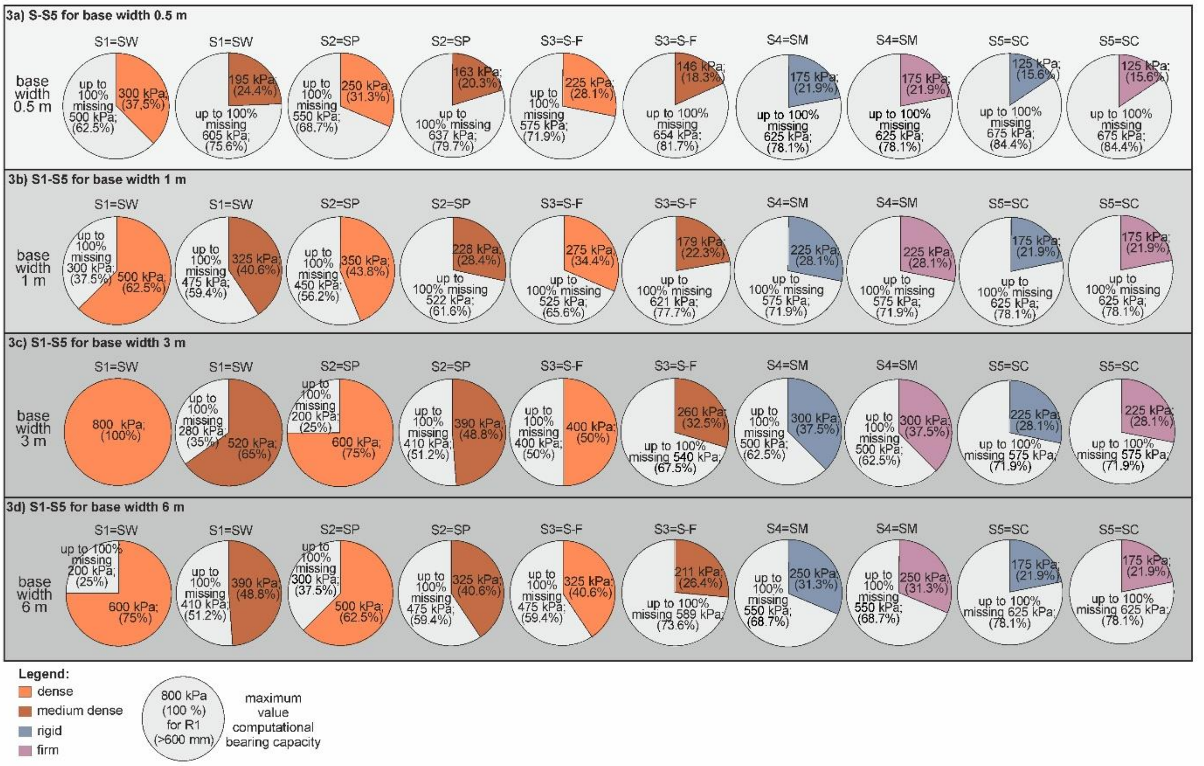

Figure 3. *Graph of table bearing capacity of sandy soils (S) at a foundation depth of 1 m;* ***3a)*** *S1–S5 for a base width of 0.5 m,* ***3b)*** *S1–S5 for a base width of 1 m,* ***3c)*** *S1–S5 for a base width of 3 m, 3d) S1–S5 for a base width of 6 m*

The second comparison plane in the evaluation of the table bearing capacity of sandy soils will be ***the foundation soil classes (S1–S5)*** (Fig. 4). Here, the situation is that the most suitable table bearing capacity in terms of density index is the S1 (SW) foundation soil class (Fig. 4a), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5 m with a value of 195 kPa, which represents a 24.4 % contribution compared to the maximum value within the sandy soils. This means that within the S1 (SW) foundation soil class the difference between the least suitable and most suitable foundation soil class is 75.6 %.

The second class of foundation soil in terms of the suitability of the foundation soil in terms of density index based on the table bearing capacity is the S2 (SP) class of foundation soil (Fig. 4b), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5 m with a value of 163 kPa, which represents 20.3 %. This means that within the S2 (SP) foundation soil class, the difference between the least suitable and the most suitable foundation soil class is 79.7 %.

The third class of foundation soil in terms of foundation soil suitability in terms of relative ease based on table bearing capacity is foundation soil class S3 (S–F) (Fig. 4c), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5 m with a value of 146 kPa, which represents 18.3 %. This means that within foundation soil class S3 (S–F), the difference between the least suitable and most suitable foundation soil class is 81.7 %.

The S4 (SM) foundation soil class has the most suitable table bearing capacity in terms of consistency (Fig. 4d), where it has the lowest value for both firm and rigid foundation soil consistency for a base width of 0.5 m with a value of 175 kPa, which represents 21.9 %. From this it can be deduced that within the S4 (SM) foundation soil class the difference between the least suitable and the most suitable foundation soil class is 78.1 %.

The second class of foundation soil in terms of the suitability of the foundation soil within the consistency state based on the table bearing capacity is the S5 (SC) class of foundation soil (Fig. 4e), where the lowest value is for both the firm and rigid consistency state of the foundation soil for a base width of 0.5 m with a value of 125 kPa, which represents 15.6 %. From this it can be deduced that within foundation soil class S5 (SC) the difference between the least suitable and most suitable foundation soil class is 84.4 %.

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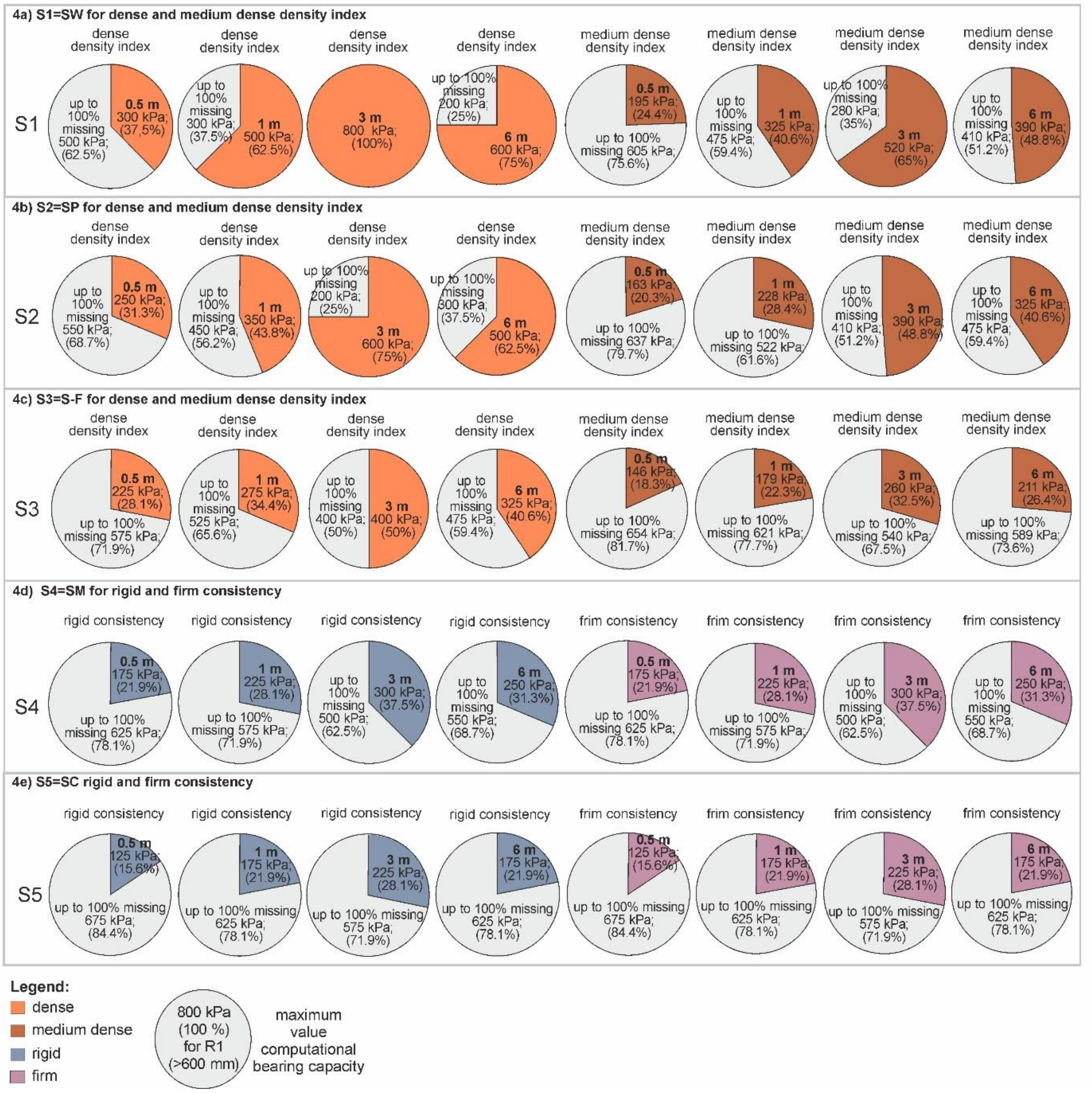

Figure 4. *Graph of table bearing capacity of sandy soils (S) at a foundation depth of 1 m;*
4a) *S1=SW for dense and medium dense density index,* ***4b)*** *S2=SP for dense and medium dense density index,* ***4c)*** *S3=S–F for dense and medium dense density index,* ***4d)*** *S4=SM for rigid and firm consistency,* ***4e)*** *S5=SC for rigid and firm consistency*

2.3 Table bearing capacity of gravel soils

The maximum table bearing capacity value within the gravel foundation soil group [13, 14, 15,16] has a foundation soil class of G1 (GW) well-graded gravel with a dense density index for a base width of 3 metres (Fig. 5). There are several reasons why this statement is true. Well-grained gravel has better physical and mechanical properties than other classes of foundation soils that are badly graded or contain admixtures of fine-grained soils, clay, etc. Well-grained gravel has a higher shear strength and a higher bulk density and therefore a higher table bearing capacity than the remaining classes of foundation soils in this group, in the order (badly-grained gravel, gravel with admixture of fine-grained soil, loamy gravel and clayey gravel). In addition, the dense density index condition has better physical and mechanical properties than the medium dense density index condition. That is, when comparing the dense density index and medium dense density index, it is clear that the dense density index has

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lower porosity and consequently higher shear strength than the medium dense density index. At the same time, it has a higher value of bulk density and bulk gravity compared to the medium dense density index. These basic properties influence the higher values of the table bearing capacity. The combination of these factors has resulted in the highest table bearing capacity for this class of foundation soil. This is a value of 1 000 kPa (100 %). The other remaining classes will be compared against this value. This means that, when comparing the dense density index and medium dense density index, it is clear that the dense density index has a lower porosity and consequently a higher shear strength than the medium dense density index. At the same time, it has a higher value of bulk density and bulk gravity compared to the medium dense density index. These basic properties influence the higher values of the table bearing capacity.

The first comparison plane in the evaluation of the table bearing capacity of the gravel soils will be ***the base widths (0.5 m, 1 m, 3 m, 6 m)***. Here, the situation is such that a base width of 3 m has the best table bearing capacity in terms of both density index and consistency of the foundation soil (Fig. 5c). The lowest value in terms of density index is for foundation soil class G3 (G–F) with 455 kPa of medium dense density index, which is 45.5 %. This means that in terms of density index within a base width of 3 metres, the difference between the least suitable and most suitable class of foundation soil is 54.5 % proportion compared to the maximum value within the gravel soils. In terms of the consistency state, the lowest value of table bearing capacity is the G5 (GC) class of foundation soil for both the firm and rigid consistency states with a value of 250 kPa, which represents 25 %. This means that in terms of consistency within a base width of 3 metres, the difference between the least suitable and the most suitable class of foundation soil is 75 %.

The second foundation width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 6 m (Fig. 5d), where the lowest value in terms of density index is foundation soil class G3 (G–F) with 325 kPa of medium dense density index, which represents 32.5 %. This means that in terms of density index within a base width of 6 metres, the difference between the least suitable and most suitable foundation soil class is 67.5 %. In terms of consistency, the lowest value of table bearing capacity is foundation soil class G5 (GC) for both firm and rigid consistency, with a value of 200 kPa, which represents 20 %. From this it can be seen that in terms of consistency within a base width of 6 metres the difference between the least suitable and the most suitable class of foundation soil is 80 %.

The third base width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 1 m (Fig. 5b), where the lowest value in terms of density index is foundation soil class G3 (G–F) with 293 kPa of medium density index, which represents 29.3 %. This means that in terms of density index within a base width of 1 m, the difference between the least suitable and most suitable foundation soil class is 70.7 %. In terms of consistency, the lowest value of table bearing capacity is foundation soil class G5 (GC) for both firm and rigid consistency, again with a value of 200 kPa, which is 20 %. This means that in terms of consistency within a base width of 1 m, the difference between the least suitable and the most suitable class of foundation soil is 80 %.

The fourth base width in terms of the suitability of the foundation soil based on the table bearing capacity is a base width of 0.5 m (Fig. 5a), where the lowest value in terms of density index is foundation soil class G3 (G–F) with 195 kPa of medium density index, which represents 19.5 %. This means that in terms of density index within a base width of 0.5 m, the difference between the least suitable and most suitable foundation soil class is 80.5 %. In terms of consistency, the lowest value of the table bearing capacity is foundation soil class G5 (GC) for both firm and rigid consistency, with a value of 150 kPa, which is 15 %. This implies that, in terms of consistency within a base width of 0.5 m, the difference between the least suitable and the most suitable foundation soil class is 85 %.

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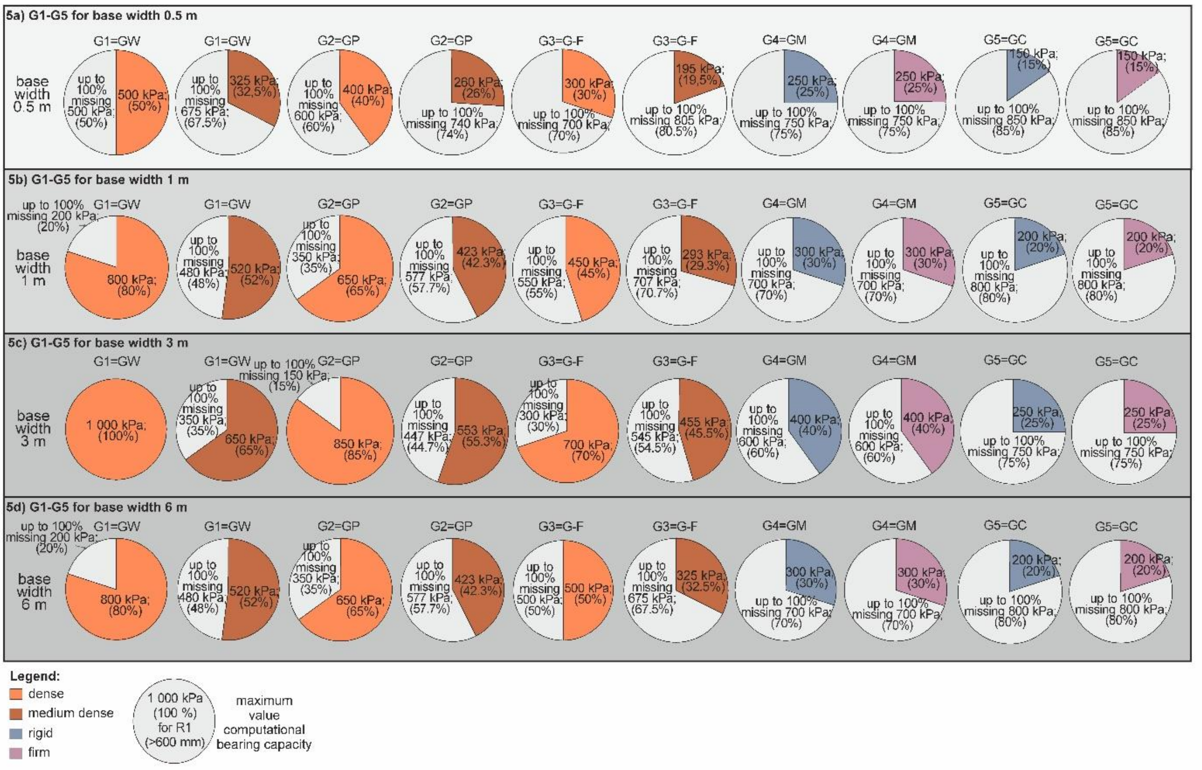

Figure 5. *Graph of table bearing capacity of gravelly soils (G) at a foundation depth of 1 m;* ***5a)*** *G1–G5 for a base width of 0.5 m,* ***5b)*** *G1–G5 for a base width of 1 m,* ***5c)*** *G1–G5 for a base width of 3 m,* ***5d)*** *G1–G5 for a base width of 6 m*

The second comparison plane in the evaluation of the table bearing capacity of gravel soils will be ***the foundation soil classes (G1–G5)*** (Fig. 6). Here, the situation is that the most suitable table bearing capacity in terms of density index is the G1 (GW) foundation soil class (Fig. 6a), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5 m with a value of 325 kPa, which represents 32.5 %. This means that within the foundation soil class G1 (GW), the difference between the least suitable and the most suitable foundation soil class is 67.5 %.

The second class of foundation soils in terms of the suitability of foundation soils in terms of density index based on the table bearing capacity is the G2 (GP) class of foundation soils (Fig. 6b), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5m with a value of 260 kPa, which represents a 26 % contribution compared to the maximum value within the gravel soils. This means that within the G2 (GP) foundation soil class the difference between the least suitable and most suitable foundation soil class is 74 %.

The third class of foundation soil in terms of the suitability of the foundation soil in terms of density index based on the table bearing capacity is foundation soil class G3 (G–F) (Fig. 6c), where the lowest value is the medium dense bearing foundation soil density for a base width of 0.5 m with a value of 195 kPa, which represents 19.5 %. This means that within the foundation soil class G3 (G–F), the difference between the least suitable and the most suitable foundation soil class is 80.5 %.

The most suitable table bearing capacity in terms of consistency state is the G4 (SM) foundation soil class (Fig. 6d), where the lowest value for both the firm and rigid consistency state of the foundation soil is for a base width of 0.5 m with a value of 250 kPa, which represents 25 %. From this it can be deduced that within the G4 (GM) foundation soil class the difference between the least suitable and the most suitable foundation soil class is 75 %.

The second class of foundation soil in terms of the suitability of the foundation soil within the consistency state based on the table bearing capacity is the G5 (GC) class of foundation soil (Fig. 6e), where the lowest value has the same value for both the firm and rigid consistency state of the foundation soil for a base width of 0.5 m with a value of 150 kPa, which is 15 %. From this, it can be deduced that within the foundation soil class G5 (GC), the difference between the least suitable and the most suitable foundation soil class is 85%.

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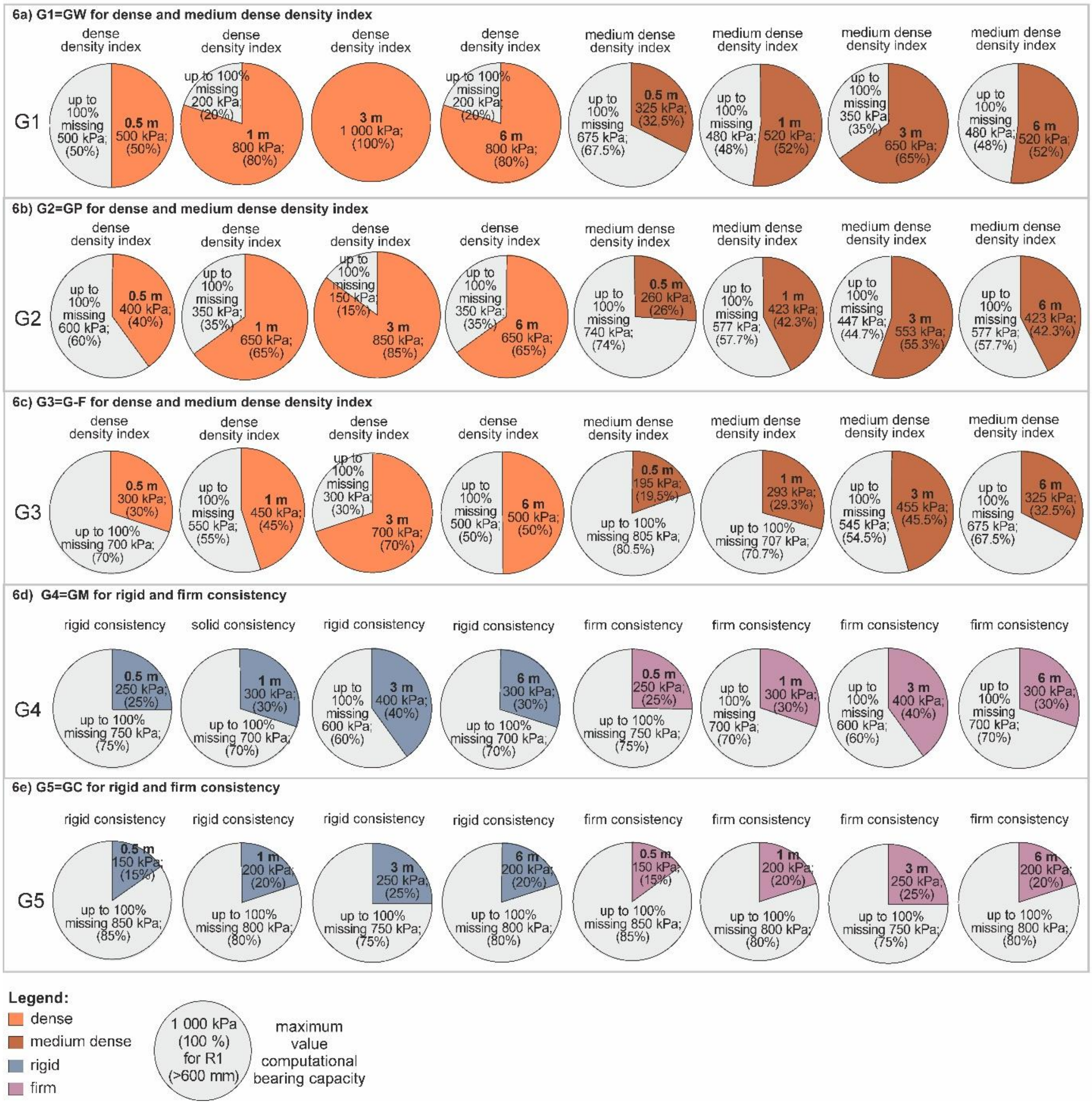

Figure 6. *Graph of table bearing capacity of gravelly soils (G) at a foundation depth of 1 m;* ***6a)*** *G1=GW for dense and medium dense density index,* ***6b)*** *G2=GP for dense and medium dense density index,* ***6c)*** *G3=G–F for dense and medium dense density index,* ***6d)*** *G4=GM for rigid and firm consistency,* ***6e)*** *G5=GC for rigid and firm consistency*

3 EVALUATION OF THE TABLE BEARING CAPACITY OF ALL GRAIN SIZE GROUPS OF ROCK MASS SOILS BY COMPARISON WITH THE MAXIMUM VALUE FOUND IN ALL FOUNDATION SOILS / ROCKS

This Section compares the table bearing capacity for all grain size groups of rock mass soils, as this group achieves the highest values for this parameter. The largest maximum value within the rock mass soils group in terms of table bearing capacity is reported for the rock mass class R1 (simple compressive strength greater than 150 MPa) and at the same time the discontinuity distance is greater than 600 mm. Specifically, this value is 8 000 kPa (100 %). All grain size groups will be compared against this value.

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3.1 Table bearing capacity of rocks mass

The largest maximum value within all classes of foundation rocks in terms of table bearing capacity is reported for the rock mass class R1 (Fig. 7) (simple compressive strength greater than 150 MPa) and at the same time the distance of discontinuities is greater than 600 mm. Specifically, this value is 8 000 kPa (100 %). The other remaining classes will be compared against this value.

Within this group we will have two levels of comparison. The first plane of comparison is the rock mass class according to the simple compressive strength and the second plane of comparison is the distance of discontinuities.

The first comparative plane in the evaluation of the table bearing capacity of the rocks mass will be ***the foundation rock classes (R1–R6)*** (Fig. 7). Here, the situation is that the most suitable table bearing capacity is the R1 class of foundation rock (Fig. 7a) (simple compressive strength 150–250 MPa), where the lowest value applies for a discontinuity distance of less than 60 millimetres with a value of 2 500 kPa, which represents a 31 % contribution compared to the maximum value. This means that within the R1 foundation rock class the difference between the least suitable and the most suitable foundation soil class is 69 %.

The second class of foundation rock in terms of the suitability of the foundation soil on the basis of the table bearing capacity is foundation rock class R2 (Fig. 7b) (simple compressive strength 50–150 MPa), where the lowest value applies for a discontinuity distance of less than 60 millimetres with a value of 1,200 kPa, which represents 15 %. This means that within the R2 foundation soil class, the difference between the least suitable and the most suitable foundation rock class is 85 %.

The third class of foundation rock in terms of the suitability of the foundation rock on the basis of the table bearing capacity is the foundation rock class R3 (Fig. 7c) (simple compressive strength 15–50 MPa), where the lowest value applies for a discontinuity distance of less than 60 millimetres with a value of 500 kPa, which represents 6.3 %. From this it can be seen that within the R3 foundation rock class, the difference between the least suitable and the most suitable foundation rock class is 93.7 %.

The fourth class of foundation rock in terms of the suitability of the foundation rock on the basis of the table bearing capacity is foundation rock class R4 (Fig. 7d) (simple compressive strength 5–15 MPa), where the lowest value applies for a discontinuity distance of less than 60 millimetres with a value of 250 kPa, which represents 3.1%. From this it can be seen that within the R4 foundation rock class the difference between the least suitable and the most suitable foundation rock class is 96.9 %.

The fifth class of foundation rock in terms of the suitability of the foundation rock on the basis of the table bearing capacity is the R5 class of foundation rock (Fig. 7e) (simple compressive strength 1.5–5 MPa), where the lowest value applies for a discontinuity distance of less than 60 millimetres with a value of 200 kPa, which represents 2.5 %. Hence, within the R5 foundation rock class, the difference between the least suitable and the most suitable foundation rock class is 97.5 %.

The sixth class of foundation rock in terms of foundation soil suitability based on the table bearing capacity is foundation rock class R6 (Fig. 7f) (simple compressive strength 0.5-1.5 MPa), where the lowest value is for a discontinuity distance of less than 60 millimetres with a value of 150 kPa, which represents 1.9 %. This shows that within foundation rock class R6, the difference between the least suitable and the most suitable foundation rock class is 98.1 %.

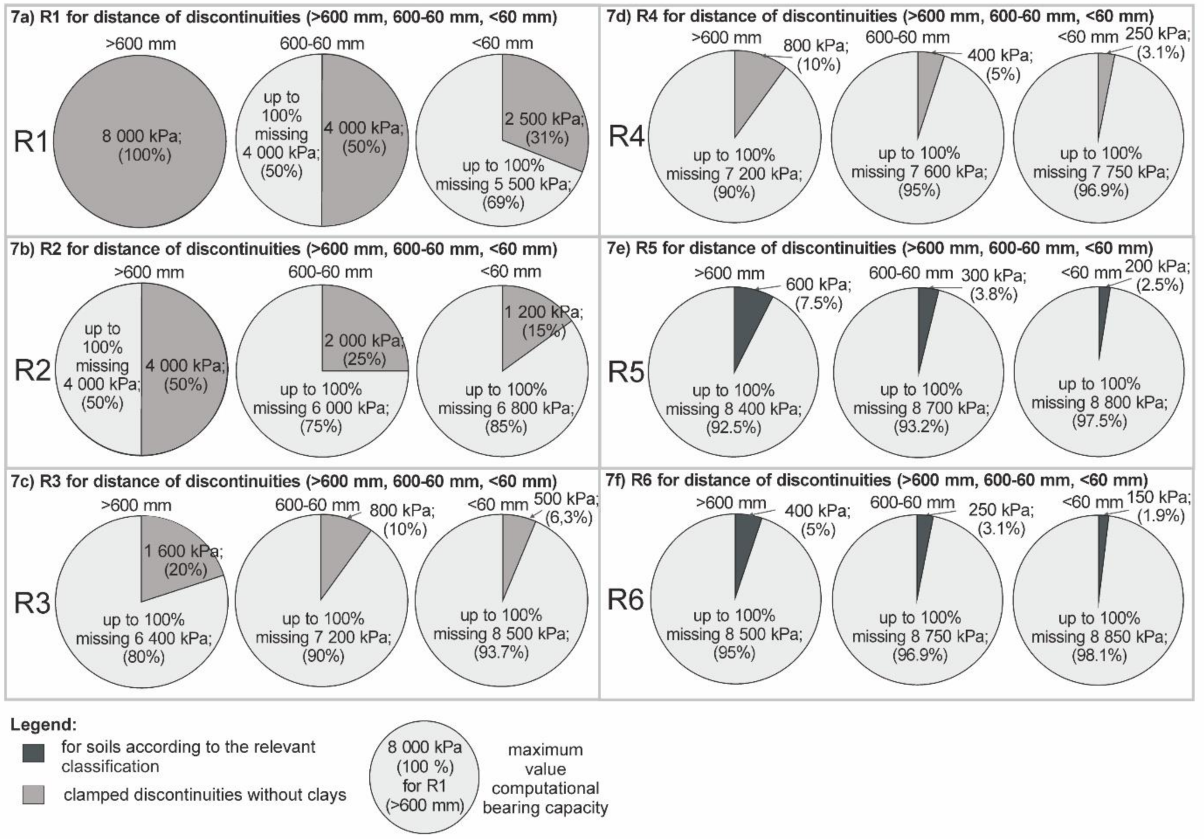

Figure 7. *Graph of table bearing capacity of the rock mass (R) according to the mean density of discontinuities (distance mm);* ***7a)*** *R1 for discontinuity distance (>600 mm, 600–60 mm, <60 mm),* ***7b)*** *R2 for discontinuity distance (>600 mm, 600–60 mm, <60 mm),* ***7c)*** *R3 for discontinuity distance (>600 mm, 600–60 mm, <60 mm),* ***7d)*** *R4 for discontinuity distance (>600 mm, 600–60 mm, <60 mm),* ***7e)*** *R5 for discontinuity distance (>600 mm, 600-60 mm, <60 mm),* ***7f)*** *R6 for discontinuity distance (>600 mm, 600–60 mm, <60 mm)*

The second comparative plane in the evaluation of the table bearing capacity of the rocks mass will be ***the discontinuity distances*** (Fig. 8). Here, the situation is that the most appropriate table bearing capacity is a discontinuity distance greater than 600 millimetres (Fig. 8a), where the lowest value is for the R6 (0.5–1.5 MPa simple compressive strength) class of foundation rock, with a value of 400 kPa, representing 5 %. This means that within a discontinuity distance greater than 600 millimetres, the difference between the least suitable and the most suitable foundation rock class is 95 %.

The second discontinuity spacing in terms of the suitability of the foundation rock based on the table bearing capacity is the discontinuity spacing between 600 and 60 millimetres (Fig. 8b), where the lowest value is for foundation rock class R6 (simple compressive strength 0.5–1.5 MPa) with a value of 250 kPa, which represents 3.1 %. Hence, within a discontinuity distance greater than 600 millimetres, the difference between the least suitable and the most suitable foundation rock class is 96.9 %.

The third discontinuity spacing in terms of the suitability of the foundation rock based on the table bearing capacity is a discontinuity spacing of less than 60 millimetres (Fig. 8c), where the lowest value is for foundation rock class R6 (simple compressive strength 0.5–1.5 MPa) with a value of 150 kPa, which represents 1.9 %. This means that within a discontinuity distance greater than 600 millimetres, the difference between the least suitable and the most suitable foundation rock class is 98.1 %.

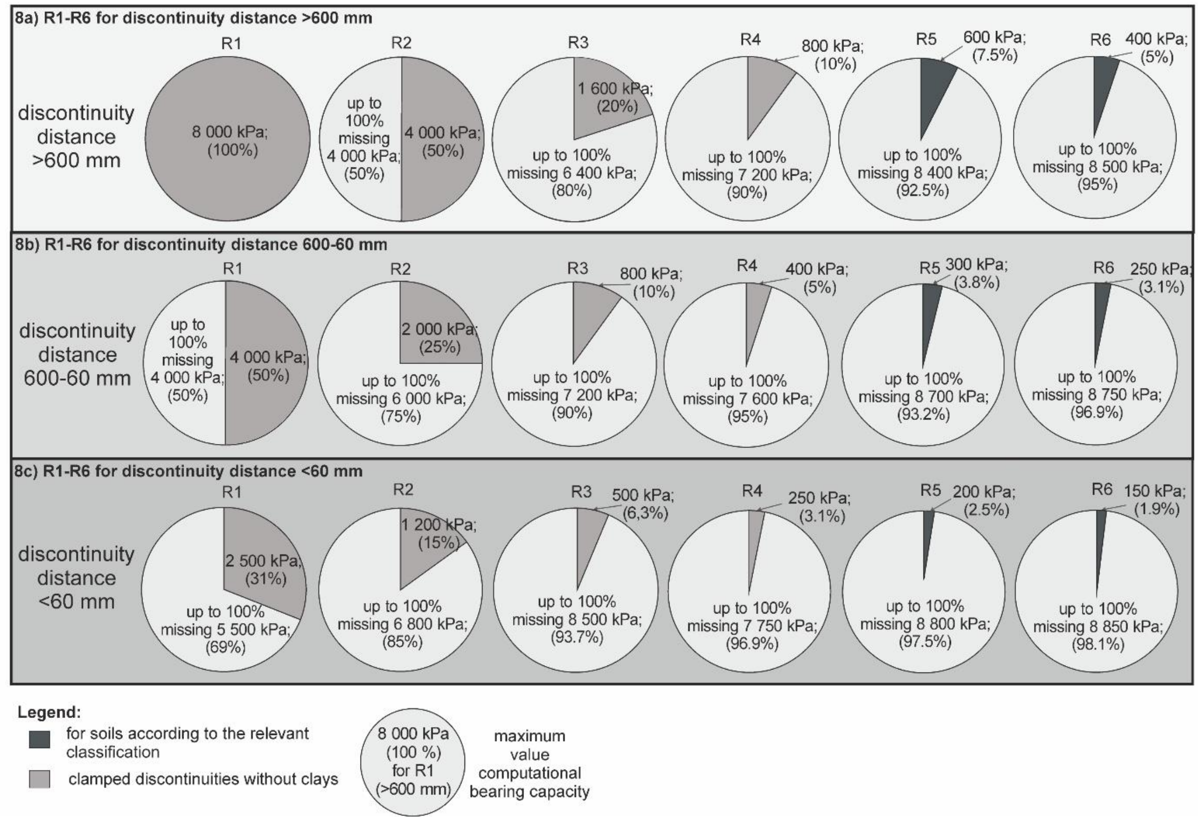

Figure 8. *Graph of table bearing capacity of the rock mass (R) according to the mean density of discontinuities (distance mm);* ***8a)*** *R1–R6 for discontinuity distance >600 mm,* ***8b)*** *R1–R6 for discontinuity distance 600–60 mm,* ***8c)*** *R1–R6 for discontinuity distance <60 mm*

3.2 Table bearing capacity of fine-grained soils

The highest value of table bearing capacity within the fine-grained foundation soil group (Fig. 9) is the F1 foundation soil class (MG) of gravely loam in the hard consistency state. This is a value of 500 kPa, which is 6.3 % relative to the value of 8 000 kPa (100 %) reported as the maximum value within the rock mass group.

The first comparison plane in the evaluation of the table bearing capacity of fine-grained soils will be ***the foundation soil classes*** (F1–F8) (Fig. 9). Here, the situation is that the most suitable table bearing capacity is the F1 (MG) foundation soil class (Fig. 9-a1), which has the highest sum of table bearing capacities within all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all consistency states (soft, rigid, firm, hard) is 1 110 kPa, which is 14 %. This means that the difference between the most suitable class of foundation soils for fine-grained soils F1 (MG) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 86 %.

The second and third classes of foundation soils in terms of foundation soil suitability based on table bearing capacity are foundation soil classes F2 (CG) (Fig. 9-a2) and F3 (MS) (Fig. 9-a3), which have the second highest sum of table bearing capacities across all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all consistency states (soft, rigid, firm, hard) is 1,000 kPa, which is 12.5 %. This means that the difference between the foundation soil classes of fine-grained soils F2 (CG), F3 (MS) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 87.5 %.

The fourth foundation soil classes in terms of foundation soil suitability based on table bearing capacity is foundation soil class F4 (CS) (Fig. 9-a4), which has the third highest sum of table bearing capacities across all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all consistency states (soft, rigid, firm, hard) is 880 kPa, which is 11 %. This means that the difference between the fine-grained foundation

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soil class F4 (CS) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 89 %.

The fifth foundation soil class in terms of foundation soil suitability based on table bearing capacity is foundation soil class F5 (ML, MI) (Fig. 9-a5), which has the fourth highest sum of table bearing capacities across all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all the consistency states (soft, rigid, firm, hard) is 870 kPa, which is 10.9 %. From this it can be deduced that the difference between the fine-grained foundation soil class F5 (ML, MI) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 89.1 %.

The sixth and seventh foundation soil classes in terms of foundation soil suitability based on table bearing capacity are foundation soil classes F6 (CL, CI) (Fig. 9-a6) and F7 (MH, MV, ME) (Fig. 9-a7), which have the fifth highest sum of table bearing capacities across all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all consistency states (soft, rigid, firm, hard) is 700 kPa, which is 8.8 %. This means that the difference between the fine-grained foundation soil classes F6 (CL, CI), F7 (MH, MV, ME) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 91.2 %.

The least suitable foundation soil class in terms of foundation soil suitability based on table bearing capacity is foundation soil class F8 (CH, CV, CE) (Figure 9-a8), which has the lowest sum of table bearing capacities across all foundation soil classes (F1–F8). The sum of the table bearing capacities after summing all consistency states (soft, rigid, firm, hard) is 580 kPa, which is 7.3 %. From this it can be deduced that the difference between the F8 (CH, CV, CE) fine-grained foundation soil class and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 92.7 %.

The second comparison plane in the evaluation of the table bearing capacity of fine-grained soils will be ***the consistency states*** (Fig. 9). Here, the condition is such that the hard consistency (Fig. 9-b4), which has the highest sum of table bearing capacities across all consistency states (soft, rigid, firm, hard), has the best table bearing capacity. The sum of the table bearing capacities for the hard consistency of the foundation soil after summing all foundation soil classes (F1–F8) is 3 200 kPa, which is 40.1 %. This means that the difference between the most appropriate sum of the hard consistencies of the fine-grained foundation soil and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 59.9 %.

The second consistency state in terms of foundation soil suitability based on table bearing capacity is the firm consistency state (Fig. 9-b3), which has the second highest sum of table bearing capacities across all consistency states (soft, rigid, firm, hard). The sum of the table bearing capacities for the firm consistency of the foundation soil after summing all foundation soil classes (F1–F8) is 1 910 kPa, which is 23.8 %. From this it can be deduced that the difference between the sum of the consistencies of the firm consistency of the fine-grained foundation soils and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 76.2 %.

The third consistency state in terms of foundation soil suitability based on table bearing capacity is the stiff consistency state (Fig. 9-b2), which has the third highest sum of table bearing capacities across all consistency states (soft, rigid, firm, hard). The sum of the table bearing capacities for the rigid consistency of the foundation soil after summing all foundation soil classes (F1–F8) is 1 130 kPa, which is 14.3 %. This means that the difference between the sum of the consistency of the rigid consistency of the fine-grained foundation soils and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 85.7 %.

The fourth consistency state in terms of foundation soil suitability based on table bearing capacity is the soft consistency state (Fig. 9-b1), which has the lowest sum of table bearing capacities across all consistency states (soft, rigid, firm, hard). The sum of the table bearing capacities for the soft consistency foundation soil after summing all foundation soil classes (F1–F8) is 600 kPa, which is 7.6 %. This means that the difference between the sum of the soft consistencies of the fine-grained foundation soils and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 92.4 %.

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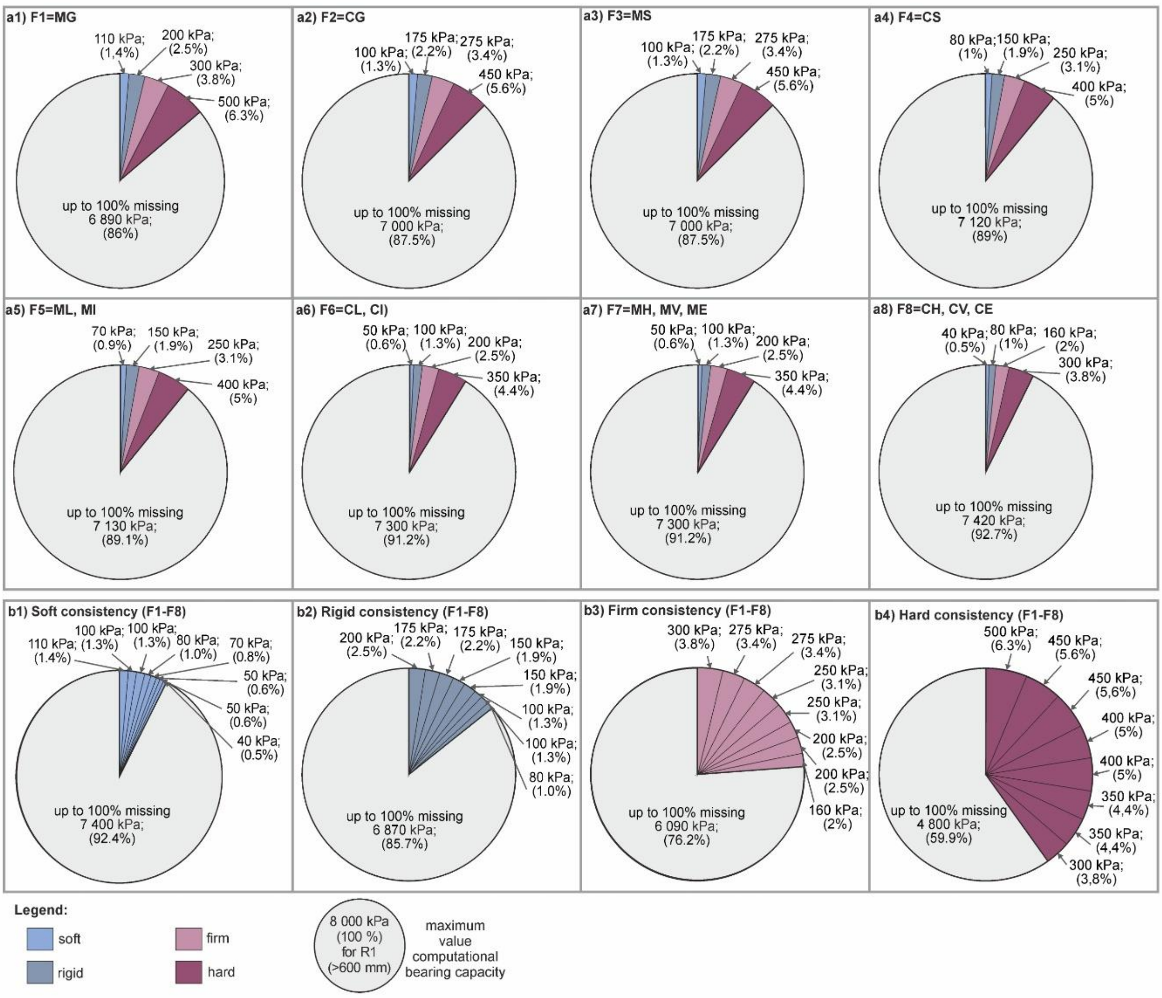

Figure 9. *Graph of table bearing capacity of fine-grained soils (F) at a foundation depth of 0.8–1.5 m for a base width ≤ 3 m;* ***a1)*** *F1=MG,* ***a2)*** *F2=CG,* ***a3)*** *F3=MS,* ***a4)*** *F4=CS,* ***a5)*** *F5=ML, MI,* ***a6)*** *F6=CL, CI),* ***a7)*** *F7=MH, MV, ME,* ***a8)*** *F8= CH, CV, CE,* ***b1)*** *Soft consistency (F1–F8),* ***b2)*** *Rigid consistency (F1–F8),* ***b3)*** *Firm consistency (F1–F8),* ***b4)*** *Hard consistency (F1–F8)*

3.3 Table bearing capacity of sandy soils

The highest value of the table bearing capacity within the sandy soil foundation soil group (Fig. 10) in terms of density index has a foundation soil class S1 (SW) of well-graded sand in a dense density index with a base width of 3 m. This is a value of 800 kPa, which is 10 % of the 8 000 kPa (100 %) value quoted as the maximum value within the rock mass group.

The highest value of the table bearing capacity within the sandy soil foundation soil group (Fig. 10) in terms of consistency state is the S4 (SM) class of loamy sand foundation soil in the rigid consistency state with a base width of 3 metres. This is a value of 300 kPa, which is 3.8 % relative to the value of 8 000 kPa (100 %) that is reported as the maximum value within the rock mass group.

The first comparison plane in the evaluation of the table bearing capacity of sandy soils will be ***the foundation soil classes (S1–S5)*** (Fig. 10). Here, the situation is that the most suitable table bearing capacity in terms of density index is the S1 (SW) foundation soil class (Fig. 10-a1), which has the highest sum of table bearing capacities within all foundation soil classes (S1–S5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 3 630 kPa, which is 45.5 %. This means that the difference between the

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most suitable sandy soil foundation class S1 (SW) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 54.5 %.

The second class of foundation soil in terms of foundation soil suitability in terms of density index based on table bearing capacity is foundation soil class S2 (SP) (Fig. 10-a2), which has the second highest sum of table bearing capacities across all foundation soil classes (S1–S5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 2 806 kPa, which is 35.1 %. This means that the difference between the sandy soil foundation class S2 (SP) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 64.9 %.

The third class of foundation soil in terms of foundation soil suitability in terms of density index based on table bearing capacity is foundation soil class S3 (S–F) (Fig. 10-a3), which has the third highest sum of table bearing capacities across all foundation soil classes (S1–S5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 2 021 kPa, which is 25.2 %. From this it can be deduced that the difference between the sandy soil foundation soil class S3 (S–F) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 74.8 %.

The most suitable table bearing capacity in terms of consistency states is the S4 (SM) foundation soil class (Fig. 10-a4), which has the fourth highest sum of table bearing capacities among all foundation soil classes (S1–S5). The sum of the table bearing capacities after adding all consistency states (rigid, firm) is 1 900 kPa, which is 24 %. This means that the difference between the most suitable sandy soil foundation soil class S4 (SM) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 76 %.

The second class of foundation soil in terms of foundation soil suitability within the consistency states based on table bearing capacity is the S5 (SC) class of foundation soil (Fig. 10-a5), which has the lowest sum of table bearing capacities within all foundation soil classes (S1–S5). The sum of the table bearing capacities after summing all consistency states (rigid, firm) is 1 400 kPa, which is 17.6 %. This means that the difference between the most suitable sandy soil foundation soil class S5 (SC) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 82.4 %.

The second comparison plane in the evaluation of the table bearing capacity of sandy soils will be ***the base widths (0.5 m, 1 m, 3 m, 6 m)*** (Fig. 10). Here, the situation is that in terms of both density index and consistency of the foundation soils, the base width of 3 m (Fig. 10-b3) has the most appropriate table bearing capacity, having the highest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the sandy soil foundation group. The sum of the table bearing capacities after summing all density index classes (dense, medium dense) and all consistency states (rigid, firm) is 4 020 kPa, which is 50.4 %. This means that the difference between the most suitable base width of the sandy soils of 3 metres and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 49.6 %.

The second base width in terms of foundation soil suitability based on table bearing capacity is the 6 m base width (Fig. 10-b4), which has the second highest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the sandy soil foundation soil group. The sum of the table bearing capacities after summing all density index classes (dense, medium dense) and all consistency states (rigid, firm) is 3 201 kPa, which is 40.3 %. This implies that the difference between the base width of the sandy soils of 6 m and the maximum value within the R1 rock group (simple compressive strength greater than 150 MPa) is 59.7 %.

The third base width in terms of foundation soil suitability based on table bearing capacity is the 1 m base width (Fig. 10-b2), which has the third highest sum of table bearing capacity across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the sandy soil foundation soil group. The sum of the table bearing capacities after summing all density index classes (dense, medium dense) and all consistency states (rigid, firm) is 2 657 kPa, which is 33.2 %. This implies that the difference between the 1 m foundation width of the sandy soils and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 66.8 %.

The fourth base width in terms of foundation soil suitability based on table bearing capacity is the 0.5 m back width (Fig. 10-b1), which has the lowest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the sandy soil foundation soil group. The sum of the table bearing capacities after summing all density index classes (dense, medium dense) and all consistency states (rigid, firm) is 1 879 kPa, which is 23.5 %. This implies that the difference between the 0.5 m soil base width of sandy soils and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 76.5 %.

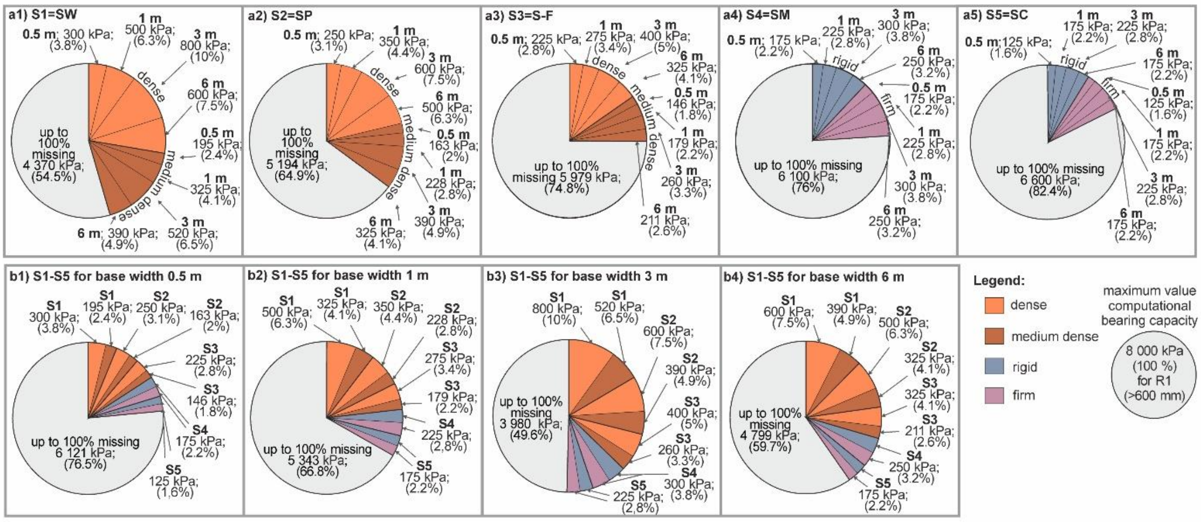

Figure 10. *Graph of table bearing capacity of sandy soils (S) at a foundation depth of 1 m;* ***a1)*** *S1=SW,* ***a2)*** *S2=SP,* ***a3)*** *S3=S–F,* ***a4)*** *S4=SM,* ***a5)*** *S5=SC,* ***b1)*** *S1–S5 for base width 0. 5 m,* ***b2)*** *S1–S5 for a base width of 1 m,* ***b3)*** *S1–S5 for a base width of 3 m,* ***b4)*** *S1–S5 for a base width of 6 m*

3.4 Table bearing capacity of gravel soils

The highest value of table bearing capacity within the gravel foundation soil group (Fig. 11) in terms of density index has a foundation soil class G1 (GW) of well-graded gravel in a dense density index with a base width of 3 m. This is a value of 1 000 kPa, which is 12.5 % relative to the value of 8 000 kPa (100 %) quoted as the maximum value within the rock mass group.

The highest value of the table bearing capacity within the gravelly soil foundation soil group (Fig. 11) in terms of consistency state is the G4 (GM) class of loamy gravel foundation soil in the rigid consistency state with a base width of 3 metres. This is a value of 400 kPa, which is 5 % relative to the value of 8 000 kPa (100 %) that is quoted as the maximum value within the rock group.

The first comparison plane in the evaluation of the table bearing capacity of gravel soils will be ***the foundation soil classes (G1–G5)*** (Fig. 11). Here, the situation is that the most suitable table bearing capacity in terms of density index is the G1 (GW) foundation soil class (Fig.11-a1), which has the highest sum of table bearing capacities within all foundation soil classes (G1–G5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 5 115 kPa, which is 64 %. This means that the difference between the most suitable gravelly soil (GW) foundation soil class and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 36 %.

The second class of foundation soil in terms of the suitability of the foundation soil in terms of density index based on table bearing capacity is the G2 (GP) class of foundation soil (Fig. 11-a2), which has the second highest sum of table bearing capacities across all foundation soil classes (G1–G5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 4 209 kPa, which is 52.6 %. This means that the difference between the gravelly soil foundation class G2 (GP) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 47.4 %.

The third class of foundation soil in terms of foundation soil suitability in terms of density index based on table bearing capacity is foundation soil class G3 (G–F) (Fig. 11-a3), which has the third highest sum of table bearing capacities across all foundation soil classes (G1–G5). The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) is 3 208 kPa, which is 40.4 %. From this it can be deduced that the difference between the gravelly soil foundation class G3 (G–F) and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 59.6 %.

The most suitable table bearing capacity in terms of consistency states is the G4 (GM) foundation soil class (Fig. 11-a4), which has the fourth highest sum of table bearing capacities within all foundation soil classes (G1–G5). The sum of the table bearing capacities after adding all consistency states (rigid, firm) is 2 500 kPa, which is

31.4 %. This means that the difference between the most suitable class of gravelly foundation soils G4 (GM) and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 68.6 %.

The second class of foundation soil in terms of foundation soil suitability within the consistency states based on table bearing capacity is the G5 (GC) class of foundation soil (Fig. 11-a1), which has the lowest sum of table bearing capacities within all foundation soil classes (G1-G5). The sum of the table bearing capacities after adding all consistency states (rigid, solid) is 1 600 kPa, which is 20 %. This means that the difference between the most appropriate gravelly soil class (GC) foundation soil class G5 and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 80 %.

The second comparison plane in the evaluation of the table bearing capacity of the gravel soils will be ***the base widths (0.5 m, 1 m, 3 m, 6 m)*** (Fig. 11). Here, the situation is that in terms of both the density index and consistency of the foundation soil, the base width of 3 m (Fig. 11-b3) has the most appropriate table bearing capacity and has the highest sum of table bearing capacities across the four base widths (0.5 m, 1 m, 3 m, 6 m) for the gravelly soil group of foundation soils. The sum of the table bearing capacities after summing all density index classes (dense, medium medium) and all consistency states (rigid, firm) is 5 508 kPa, which is 68.8 %. This means that the difference between the most suitable width of the gravelly soil base of 3 metres and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 31.2 %.

The second base width in terms of foundation soil suitability based on table bearing capacity is the 6 m base width (Fig. 11-b4), which has the second highest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the gravelly soil foundation group. The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) and all the consistency states (rigid, firm) is 4 218 kPa, which is 52.9 %. This shows that the difference between the 6 m base width of the gravelly soils and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 47.1 %.

The third base width in terms of foundation soil suitability based on table bearing capacity is the 1 m base width (Fig. 11-b2), which has the third highest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the gravelly soil foundation group. The sum of the table bearing capacities after summing all density index classes (dense, medium dense) and all consistency states (rigid, firm) is 4 139 kPa, which is 51.8 %. This implies that the difference between the base width of the gravel soils of 1 m and the maximum value within the R1 rock mass group (simple compressive strength greater than 150 MPa) is 48.2 %.

The fourth base width in terms of foundation soil suitability based on table bearing capacity is the 0.5 m base width (Fig. 11-b1), which has the lowest sum of table bearing capacities across all four base widths (0.5 m, 1 m, 3 m, 6 m) for the gravelly soil foundation group. The sum of the table bearing capacities after summing all the density index classes (dense, medium dense) and all the consistency states (rigid, firm) is 2 780 kPa, which is 34.9 %. This shows that the difference between the 0.5 m base width of the gravelly soils and the maximum value within the rock mass group R1 (simple compressive strength greater than 150 MPa) is 65.1 %.

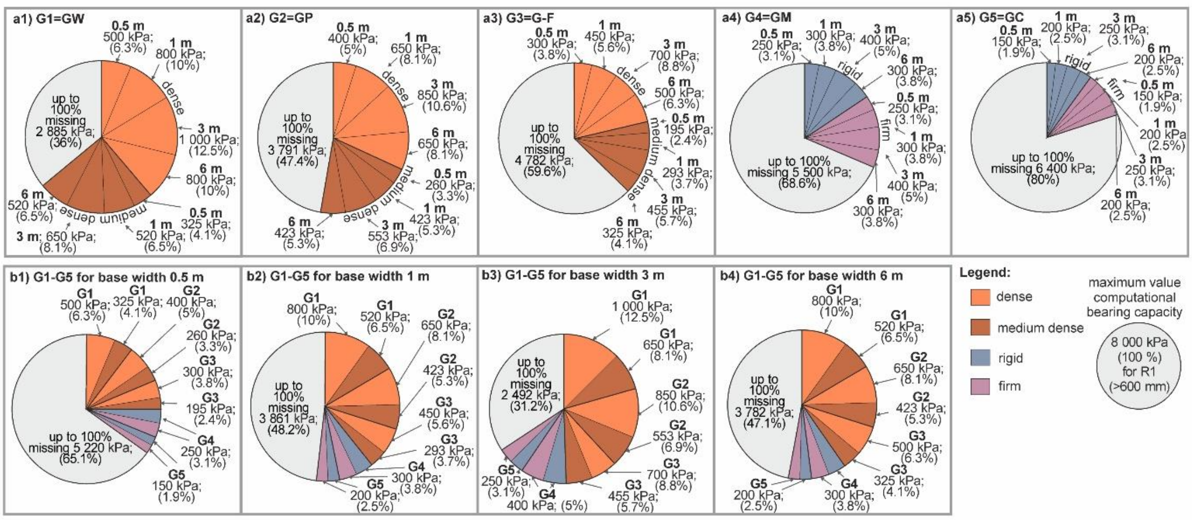

Figure 11. *Graph of table bearing capacity of gravelly soils (G) at a foundation depth of 1 m;* ***a1)*** *G1=GW,* ***a2)*** *G2=GP,* ***a3)*** *G3=G–F,* ***a4)*** *G4=GM,* ***a5)*** *G5=GC,* ***b1)*** *G1–G5 for base width 0. 5 m,* ***b2)*** *G1–G5 for base width 1 m,* ***b3)*** *G1–G5 for base width 3 m,* ***b4)*** *G1–G5 for base width 6 m*

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4 CONCLUSION

On the basis of the comparison, it was found that the largest maximum value within all foundation soil / rocks classes in terms of table (standard empirical) bearing capacity is given for the rock mass class R1 (simple compressive strength is greater than 150 MPa) and at the same time the distance of discontinuities is greater than 600 mm. It has been found that the highest table bearing capacity is achieved by rock mass when the discontinuity distance is greater than 600 mm before the discontinuity distance between 600 and 60 millimetres and the discontinuity distance is less than 60 millimetres.

When comparing the four basic groups of foundation soils (fine-grained soils, sandy soils, gravelly soils, rock mass soils), the second group in terms of the suitability of foundation soils on the basis of table bearing capacity is gravelly soils. For gravelly soils (G), at a foundation depth of 1 m, the maximum table bearing capacity value for the foundation soil class G1 (GW) is well-graded gravel with a dense density index for a base width of 3 m. Gravelly soils were found to have the highest table bearing capacity for a base width of 3 metres before 6 metres, 1 m and 0.5 m. The table bearing capacity for the dense density index reaches higher values than that of the medium dense density index.

The third group in terms of the suitability of foundation soils based on the table bearing capacity are sandy soils. There is an analogy between sandy and gravelly soils in terms of the properties that determine the table bearing capacity (density index, impurities), so the relationship given at the end of the previous paragraph also applies to this grain size class.

The least suitable group in terms of the suitability of foundation soils on the basis of table bearing capacity is fine-grained soils. As regards fine-grained soils (F), for a foundation depth of 0.8–1.5 m for a foundation width ≤ 3 m, the maximum value of the table bearing capacity is the foundation soil class F1 (MG) of gravely loam of hard consistency. The hard consistency has the best table bearing capacity over the firm, rigid and soft consistency.

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