Preparing Input Data Sheets

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INTRODUCTION

An input data sheet is essential for slope stability and/or displacement analyses. The input data sheet can be made via the following two ways:

(1) Making an input data sheet using a text editor (discussed in this series).

(2) Making an input data sheet via the guided input procedure (discussed in Series 14).

15.1 MAKING INPUT DATA SHEETS USING TEXT EDITOR

Table 15.1.1 provides a comprehensive example of an input data sheet, complete with detailed explanations for each entry. Please note that the content in the "**Remarks**" column is included solely for tutorial purposes and should be omitted in actual input sheets. This table presents the full set of 27 valid commands recognized by **SLOPE-ffdm 2.0**, with each command clearly indicated in bold for emphasis.

For all tables and examples referenced throughout this documentation, numeric values are presented with **SI unit**. The applicable units are defined globally using the **unit** command, as specified within **Table 15.1.1**. For a detailed explanation of the unit command and its implementation, refer to **Section 14.5 of Series 14**.

Table 15.1.1 Example of input data sheet (a complete list of **27** commands)

Commands and input data	Remarks
project	This command is **mandatory** and must be placed at the beginning of the input data file.
Slope stability for Chi-Chi earthquake site 1	The project title should consist of **alphanumeric characters only**, with **no commas (,)** placed **within or at the end** of the title.
Output (optional)	This command and its associated output file path are **optional**. If specified, place the **Output** command **immediately following** the project title.
C:\Users\user\Desktop\ slope_1_output.txt (optional)	Full **file path and name** for the analysis result output file.

event	A project may contain **multiple events**. Each must begin with the command **event**.
1	Denotes Event No. **1**.
Pre-rainfall condition with low ground water condition	Event titles should use **alphanumeric characters only**, without **commas within or at the end**.
unit	This command is **mandatory**. It can appear **anywhere after the event declaration**, but placing it **at the beginning of each event** is strongly recommended.
1	**Unit specification:** **1:** SI unit **2:** Imperial unit **3:** Matric unit. **(SI unit is used in this data sheet example)**
slope profile	This command is **mandatory** and must appear immediately after commands '**event**' and '**unit**' (and their data).
4	Specifies the **number of coordinate points** (= **4** in this example) defining the slope surface.
-20.00, -03.00	x- and y-coord. for point No. 1. **Note:** Point 1 represents the **downstream end (toe)** of the slope. In the graphic window, the primary slope **faces toward the left-hand side**.
00.00, 00.00	x- and y-coord. for point No. 2 (with increasing x-coord. from point 1)
03.00, 06.00	x- and y-coord. for point No. 3.
15.00, 06.00	x- and y-coord. for point No. 4.
soil profile	This command is **mandatory** and must immediately follow **slope profile** and its data.
2	Specify **2** soil strata in total.
18.00, 2	Unit weight (= **18.00** kN/m^3), Topmost (layer No. 1): Defined by **2** points on its lower boundary.
-20.00, -05.00	x- and y-coord. for point No. 1 (left-most).
15.00, -05.00	x- and y-coord. for point No. 2.
20.0, 3	Unit weight (= **20.0** kN/m^3), Soil layer No. 2: Defined by **3** points on its lower boundary.
-20.00, -05.00	x- and y-coord. for point No. 1 (left-most).
5.00, -04.00	x- and y-coord. for point No. 2.
15.00, -03.00	x- and y-coord. for point No. 3.

mohr-coulomb	This command is mandatory and defines the strength parameters for each soil stratum.
2	Specifies **2** layers (must match the number in **soil profile**)
5.0, 30.0, 3.0	Layer 1(topmost): Cohesion= **5.0** kPa, φ=**30.0**° at 1.0 atm, Δφ= **3.0**° (Δφ: decrease of φ per log cycle increase of confining stress)
10.0, 35.0, 5.0	Cohesion=**10.0** kPa, φ=**35.0**° at 1.0 atm, Δφ= **5.0**° for layer 2
failure surface	This command is mandatory and specifies parameters for generating trial failure surfaces via circular slip analysis.
1	Type of analysis= **1** in this case (for types of analyses 2- 8, refer to **Section 15.2**).
5.0, 10.0	x-coord. (= **5.0**) and y-coord. (=**10.0**) of the lower-left corner of the grids defining centers of trial circles.
10, 5	Number of grid divisions for the center of circles in x- (= **10**) and y- (= **5**) directions.
2.0, 1.0	Grid spacing between center points: **2.0** m in x- direction; **1.0** m in y-direction.
0.5, 1.5	Trial circle parameters: Radius increment= **0.5** m, Minimum failure mass size= **1.5** m (used to eliminate impractically small failure surfaces)
thrust height function	This command is required when using **R. Janbu's** method (i.e., when Type of analysis= 5, 6A, 6B, 7, 8).
1	Specifies Thrust Height Function **Type 1.** Type 1: interslice force acts at 1/3 of interslice height Type 2: User-defined polyline (see **Section 15.3**)
Interslice function	This command is mandatory when using Spencer's method, applicable for analysis types 5, 6A, 6B, 7, 8. In types 1, 2, 3 analyses, this function is automatically set as Function Type 1: *f(x)*= 1.0.
1	Specifies Interslice Function **Type 1**. Type 1: *f*(x)= 1, representing a uniform inter-slice inclination angle across the entire soil mass. Type 2: *f*(x) varies with a half-sine distribution. Type 3: User-defined polyline (see **Section 15.4**)
slice	This command is mandatory. Defines the discretization of the slope mass into vertical slices.
0.5	Specifies a slice width of **0.5** m for vertical slicing of the sliding mass.

safety factor	This command is mandatory. Defines numerical tolerances for iterative factor of safety (F_s)and virtual boundary conditions
0.001	Allowable error for F_s of **0.1%**.
0.01	Allowable error for virtual boundary force is **0.01** kN.
0.1	Allowable error for virtual boundary moment is **0.1** kN-m.
displacement	This command is required when displacement analysis is performed. Defines tolerances and input parameters for compatibility calculations.
0.01	Allowable error of displacement convergence is **1%**.
10	Dilatancy angle (ψ= **10°**) is used in displacement compatibility function.
hyperbolic soil	This command is required when displacement analysis is performed.
2	Total number of soil layers (this number must equate that specified in '**soil profile**' command.
150, 0.3, 0.90	1st layer (topmost): K = **150**, n = **0.3**, R_f= **0.90**.
100, 0.5, 0.85	2nd layer: K= **100**, n = 0.5, R_f= **0.85**.
residual	This command is required when post-peak stress-displacement is considered in a displacement analysis
31.0, 5.0	Internal friction angle at peak state, φ_{res}= **31.0°**. Peak-to-Residual displacement ratio (Δ_{ratio}) = **5.0**. (See **Series 11**)
water table	This command is used to consider porewater pressures in the analysis.
1	The Type-**1** 'water table' is specified. Types of **'water table':** 1: piezometric line 2: porewater pressure ratio, 3: submerged condition 4: hydrostatic pressure, 5: phreatic line (For input details, see **Section 15.5**).
seismic coefficient	This command is used when a pseudo-static analysis is performed.
0.2, 0.1	Horizontal seismic coefficient (k_h= **0.2**) and vertical seismic coefficient (k_v= **0.1**), respectively.
tension crack	This command is used to impose a tension crack at the crest of a slip surface.

2.0, 1.0	Crack depth (= **2.0** m) and crack water height (= **1.0** m) from the bottom of the tension crack.
surcharge	To apply surcharge loads on the slope surface (the load can be a uniform, non-uniform, or inclined load).
2	Total number of surcharges applied on the slope surface
10.0, 5.0	Vertical load intensity at **starting** (a smaller x-coord. at left-hand-side) and **ending** (a larger x-coord. at right-hand-side) points, respectively (in this example, surcharge No.1 is a **nonuniform** surcharge with **trapezoidal shape**).
0.0, 0.0	Horizontal load intensity at **starting** and **ending** points, respectively (in this example, surcharge No.1 has no horizontal component, therefore, it is a **vertical surcharge**).
5.0, 10.0	**Starting x-coord**., **Ending x-coord**. for surcharge No. 1 (surcharge No.1 spans over a horizontal distance of **5.0 m**).
20.0, 20.0	Vertical load intensity at starting (smaller x-coord. or left-hand-side) and ending (larger x-coord. or right-hand-side) points, respectively (in this example, surcharge No.2 is a **uniform surcharge**).
10.0, 10.0	Horizontal load intensity at starting and **ending** points, respectively (in this example, surcharge No. 2 is an **inclined uniform load with 45° from horizontal**).
15.0, 25.0	Starting x-coord., ending x-coord. for surcharge No. 2 (Surcharge No.2 spans over 25.0- 15.0= **10.0** m).
cohesion profile	To define a soil layer with **depth-varying cohesion**—either in terms of effective stress cohesion (c') or undrained shear strength (c_u) - use this command and the following parameters.
1	Total layers with variable c' or c_u along the depth (= **1** in this example; this number is not larger than total number of soil strata specified in **'soil profile'** command).
1	**Soil layer No. 1** is designated as having a cohesion profile.
15.0, 10.0	An initial cohesion at zero depth c_0= 15.0 kPa with a gradient of dc= 10.0 kPa/m (cohesion increases linearly at a rate of 10.0 kPa per meter from the zero-depth reference line.
2	Point count defining the zero-depth reference line (= **2**). (Typically, a horizontal line representing the original sedimentation surface).
-20.0, 6.0	x- and y-coords. for the **starting point** of reference line for the cohesion profile No. 1.

15.0, 6.0	x- and y-coords. for the **ending point** of reference line for the cohesion profile No. 1.
facing	To specify physical and mechanical properties of a facing structure.
1	The type - **1** facing is specified. **Types of facings:** **1:** gravity-type facing **2:** modular block facing (See **Section 10.6**) **3:** gabion facing (See **Section 10.6**).
25.0, 5.0, 0.0	Unit weight of facing (= **25.0** kN/m^3), vertical and horizontal concentrated loads at facing top (= **5.0, 0.0** kN, respectively).
0.0, 26.0	Facing back-face adhesion (= **0.0 kPa**), friction angle (= 26.0°).
20.0, 30.0	Facing base adherence (= **20.0 kPa**), friction angle (= **30.0°**).
-0.5, -1.0	x- and y-coords. of point No. 1 defining the facing body. (No.1 is the **heel** of facing; **Clockwise** rotation to get point **Nos. 2, 3 and 4**; Regardless of the shape, a facing is always defined with 4 points).
-4.5, -1.0	x- and y-coords. of point No. 2 defining the facing body.
2.0, 6.0	x- and y-coords. of point No. 3 defining the facing body.
3.0, 6.0	x- and y-coords. of point No. 4 defining the facing body.
anchor	Activates the use of pre-stressed ground anchors in the analysis.
2	Specifies the total number of anchors across the 2-D slope section (in this case, **2** anchors)
1	Indicates that **Type-1 anchor mechanism** is applied to these anchors. **Types of anchor mechanisms:** **0:** show graphics of anchor (Effects of anchor are not considered in the analysis) **1:** Simulating anchor forces using surcharges (**Surcharge** command is mandatory) **2:** Considering concentrated forces at slice base. **3:** Considering distributed stresses from the grouted zone
0.3, 0.45	RC girder depth= **0.3** m; width= **0.45** m
1, 300, 20.0, 32.0, 3.251, 4.339, 2.5, 3.0 0.25, 7.0, 20.0	Layer No.= **1** (lowmost); Pre-stress= **300** kN/anchor; Dip angle= **20°**; Free tendon length= **32.0** m; Anchor head x-coord= **3.251** m; y-coord= **4.339** m; Anchor space in X-direction= **2.5** m; In Y-direction= **3.0** m. Diameter of grouted zone= **0.25** m; Length of grouted zone= **7.0** m; Stress distribution angle= **20.0°**.

2, 400, 20.0, 32.0, 4.541, 7.339, 2.5, 3.0 0.25, 7.0, 20.0	Layer No.= **2**; Pre-stress= **400** kN/anchor; Dip angle= **20°**; Free tendon length= **32.0** m; Anchor head x-coord= **4.541** m; y-coord= **7.339** m; Anchor space in x-direction= **2.5** m; y-direction= **3.0** m. Diameter of grouted zone= **0.25** m; Length of grouted zone= **7.0** m; Stress distribution angle= **20.0°**.
reinforcement	Enables the definition of reinforcing layers in the analysis.
3	Total number of reinforcing layers defined (= **3**)
0.0, 25.0 100.0, 2.0, 1.2, 1.1 0.0, 4.0, 0.5, 1.5 1, 0.0, 0.9	For layer No. 1 (the lowermost layer): Interface adhesion (= **0.0** kPa), interface friction angle (= **25.0°**). Ultimate strength, $T_{ultimate}$ (= **100.0** kN/m), RF_{creep}= **2.0**, $RF_{install}$= **1.2**, RF_{other}= **1.1**. *RF: reduction factor Dip angle (= **0.0°**), full length of embedment (= **4.0** m), starting x-coord. (= 0.5 m), starting y-coord. (= **1.5** m). Pullout model ID (= **1**), length of embedment in facing (= **0.0** m), connection strength factor (= **0.9**, i.e., connection strength $T_{connect}$= 0.9* $T_{allowable}$). $T_{allowable}$: Input **factored tensile strength** of reinforcement in limit-equilibrium analysis
0.0, 25.0, 100.0 0.0, 4.0, 0.6, 2.0 1, 0.0, 0.9	For layer No. 2, use the same data structure as Layer 1. Completely different reinforcement properties and configurations can be defined for different layers. Starting x-coord. (= **0.6** m), starting y-coord. (= **2.0** m) for Layer 2.
0.0, 25.0, 100.0 0.0, 4.0, 0.7, 2.5 1, 0.0, 0.9	For layer No. 3 (the topmost layer), use the same data structure as Layers 1 and 2. Starting x-coord. (= **0.7** m); Starting y-coord. (= **2.5** m) for Layer 3.
hyperbolic pullout	Activates the input of pullout model parameters for **reinforcing materials** in displacement-based analysis.
1	Specifies the number of distinct hyperbolic pullout models used (in this example, **1 model** is defined).
150.0, 1.0, 10.0, 30.0, 20.0, 0.3, 0.8	Tie-break strength (= **150.0** kN/m), effective pullout length (=**1.0** m), interface adhesion (= **10.0** kPa), interface friction angle (= **30.0°**), initial stiffness number, K (= **20.0**), pressure dependency exponent, n (= **0.3**), asymptote factor R_f (= **0.8**).
pause	Temporarily halts execution after an event, allowing time to **review or inspect** analytical results for a certain event. Useful for event-by-event analysis.

continue	Signals the **end of an event's input**, ensuring the model proceeds to the next event in sequence. Required after each event except the **final one**.
end	Terminates the program. Any input lines following this command will be **ignored**. Should be placed after all events and commands to finalize the dataset.

15.2 DETAILS OF COMMAND '**failure surface**'

In this section, the '**failure surface**' command is described in detail. There are a total of 8 sub-commands for choosing various types of analyses (i.e., Type-1, 2, 3, 4, 5, 6, 7 and 8), as described via examples of input sheets in Table 15.2.1- 15.2.8.

Table 15.2.1 Type-1 of command '**failure surface**'

failure surface	
1	Type of analysis= **1** in this case (for types of analyses 2- 8, refer to **Section 15.2**).
05.0, 10.00	x-coord. (= **5.0**) and y-coord. (=**10.0**) of the lower-left corner of the grids defining centers of trial circles.
10, 5	Number of grid divisions for the center of circles in x- (= **10**) and y- (= **5**) directions.
2.00, 1.00	Grid spacing between center points: **2.0** m in x- direction; **1.0** m in y-direction.
0.5, 1.50	Trial circle parameters: Radius increment= **0.5** m, Minimum failure mass size= **1.5** m (used to eliminate impractically small failure surfaces)

Table 15.2.2 Type-2 of command '**failure surface**'

failure surface	
2	Type of analysis= **2** (passing-a-specific-point analysis).
05.00, 10.00	x-coord. (= **5.0**) and y-coord. (=**10.0**) of the lower-left corner of the grids defining centers of trial circles.
10, 5	Number of grid divisions for the center of circles in x- (= **10**) and y- (= **5**) directions.

2.00, 1.00	Grid spacing between center points: **2.0** m in x- direction; **1.0** m in y-direction.
2.0	Minimum size of failure mass= **2.0** m.
-0.5, -1.0, 25.0	Passing-through a point of x-coord. (= **-0.5 m**), y-coord. (= **-1.0** m) and with a radius of **25.0** m.

Table 15.2.3 Type-3 of command '**failure surface**'

failure surface	
3	Type of analysis= **3** (Single circular surface analysis)
1.0, 10.0, 30.0	x-coord. of circle center (= **1.0 m**), y-coord. (= **10.0** m) and a radius of **30.0** m.

Table 15.2.4 Type-4 of command '**failure surface**'

failure surface	
4	Type analysis= **4** (**Multi-wedge** failure surface).
3	Soil wedge number (= **3**; a **maximum of 3** is strongly recommanded).
0.5	Inter-wedge soil strength factor $f_{inter\text{-}wedge}$(= **0.5**) $f_{inter\text{-}wedge}$: inter-wedge (interface of wedge 1-2) strength / peak soil strength.
5.0, 15.0, 1.0	For wedge **point 1 (the topmost point):** Starting x-coord. (= **5.0** m), ending x-coord. (= **15.0** m), trial-and-error searching interval (= **1.0** m).
3.0, 10.0, 1.0	For **wedge point 2**: Starting **x-coord**. (= **3.0** m), ending x-coord. (= **10.0** m), interval (= **1.0** m).
0.0, 5.0, 0.5	For **wedge point 2:** Starting **y-coord**. (= 0.0 m), ending y-coord. (= 5.0 m), interval (= **0.5** m).
0.0, -1.0, 4.0, 0.5	For **wedge point 3** (at facing **back-face** or **slope surface**): Starting x-coord. (= **0.0** m), starting y-coord. (= **-1.0** m), ending y-coord. (= **4.0** m), interval in y-direction (= **0.5** m).

Table 15.2.5 Type-5 of command '**failure surface**'

failure surface	
5	Type of analysis= **5** (**trial-and-error log spiral** surface).
-20.0, -5.0, 0.3	Downstream surface boundary, min. x-coord. (= **-20.0** m), max. x-coord. (= **-5.0** m), interval (= **0.3** m)
5.0, 15.0, 0.2	Upstream boundary, min. x-coord. (= **5.0** m), max. x-coord. (= **15.0** m), searching interval (= **0.2** m).
1.0	Min. failure mass size (= **1.0** m), neglecting the failure mass with width (or length) smaller than **1.0** m.

Table 15.2.6 Type-6A of command '**failure surface**'

failure surface	
6	Type of analysis= **6** (Single log-spiral or polyline surface analysis **depending on the next input number**).
1	= **1**: **Type-6A** failure surface (**Log-spiral surface**) = **2**: **Type-6B** surface (**Polyline surface;** See **Table 15.2.7**)
0.0, -1.0	Downstream boundary at x-coord. (= **0.0** m), y-coord. (= **-1.0** m)
5.2, 6.0	Upstream boundary at x-coord. (= **5.2** m), y-coord. (= **6.0** m)

Table 15.2.7 Type-6B of command '**failure surface**'

failure surface	
6	Type of analysis= **6** (one log spiral surface or one polyline surface depending on the next input number).
2	Type of surface= **2**; this is **Type-6B** (a **polyline** surface).
2	Surface ID = 1: above-facing surface, =**2**: on-facing surface, =**3**: below-facing surface.
1	Cut-through facing block No. (for a **gravity facing, this value is always 1**). Block No. 1 is the **topmost** one.
4	In this example, count of points defining the polyline surface is **4**.
-0.5, -1.0	Point No. 1: x-coord (= **-0.5** m), y-coord (= **-1.0** m)

	Point No. 1 is the **downstream boundary** of slip surface.
3.0, 1.0	Point No. 2 : x-coord (= **3.0** m), y-coord (= **1. 0** m).
5.0, 3.0	Point No. 3 (= **5.0** m), y-coord (= **3. 0** m).
8.0, 6.0	Point No. 4 (= **8.0** m), y-coord (= 6.0 m).

Table 15.2.8 Type-7 of command '**failure surface**'

failure surface	
7	Type of analysis= 7 (trial-and-error compound failure) '**compound failure**' is a composition of a part of circular surface with linear segments of a weak layer.
2, 1	Soil layer number for the weak layer (= **2**); Weak layer ID= **1** ID= 1: above-facing and exposed weak layer. ID= 2: above-facing and non-exposed weak layer.. ID= 3: on-facing weak layer ID= 4: below-facing and exposed weak layer. ID=5: below-facing and non-exposed weak layer. '**exposed**' means the weak layer exposed to the slope surface.
05.00, 10.00	x-coord. (=**0.5** m) and y-coord. (=**10.0** m) of the left-down corner of the grid for trial-and-error circle centers.
10, 5	Number of rotation centers in x-direction (= **10**) and y-direction (= **5**).
2.00, 1.00	Spaces of rotation center in x-direction (= **2.0** m) and y-direction (= **1.0** m).
0.5, 1.50	Increment of radius for trial-and-error circles (= **0.5** m), minimum size of failure mass (= **1.50** m) to exclude the trial-and-error surface with a size smaller than 1.50 m.

Table 15.2.8 Type-8 of command '**failure surface**'

failure surface	
8	Type of analysis= **8** (**Single compound failure** analysis).

2, 3	Soil layer No. for the weak layer (= **2**), weak layer ID (= **3**). ID= 1: above-facing and exposed weak layer. ID= 2: above-facing and non-exposed weak layer.. ID= 3: on-facing weak layer ID= 4: below-facing and exposed weak layer. ID=5: below-facing and non-exposed weak layer. '**exposed**' means the weak layer exposed to the slope surface
1.0, 10.0, 30.2	A rotation center with x-coord. (= **1.0** m), y-coord. (= **10.0** m). and a circle with a radius of 30.2 m.

15.3 DETAILS OF COMMAND '**thrust height function**'

The '**thrust height function'** command is required when applying the rigorous Janbu's method, which corresponds to **Type-5 through Type-8** analyses. Omitting this command in any of these analysis types will result in an error message, causing the program to abort automatically.

Table 15.3.1 Type-1 of command '**thrust height function**'

thrust height function	
1	Type of thrust height function (= **1**), i.e., the inter-slice thrust acts at 1/3 of interslice height.

Table 15.3.2 Type-2 of command '**thrust height function**'

thrust height function	
2	Type of thrust height function (= **2**), i.e., manually defined polyline
4	Total number of points defining the polyline (= **4**).
0.0, 0.2	Point No. 1: x-coord. (= **0.0** m), y-coord. (= **0.2** m). x-coord.: relative horizontal location in soil mass (= **0.0:** toe of slip surface; = **1.0:** crest of slip surface) y-coord. : relative thrust height

	(= 0.2: 20% of height of slice interface)
0.25, 0.3	Point No. 2: x-coord (= **0.25** m), y-coord (= **0.3** m).
0.50, 0.25	Point No .3: x-coord (= **0.50** m), y-coord (= **0.25** m).
1.00, 0.20	Point No. 4: x-coord (=**1.00** m), y-coord (= **0.20** m).

15.4 DETAILS OF COMMAND ‘**interslice function**’

The '**interslice function**' command is required when performing Spencer’s method, which applies to all analysis types **except Type-4**. If this command is omitted during applicable analyses, the program will automatically display an error message and terminate execution.

Table 15.4.1 Type-1 of command ‘**interslice function**’

interslice function	
1	interslice function= **1**: **constant inclination** of inter-slice thrusts.

Table 15.4.2 Type-2 of command ‘**interslice function**’

interslice function	
2	Interslice function = **2**: a **half-sine function**.

Table 15.4.3 Type-3 of command **‘interslice function**’

interslice function	
3	Interslice function = **3**: manually defined polyline.
4	Point count defining the polyline.
0.0, 1.0	Point No. 1: x-coord (= 0.0), y-coord (= 1.0). x-coord. is the relative horizontal location in soil mass (x= 0.0 is the toe; = 1.0 is the crest of soil mass) y-coord. is the relative inclination factor of inter-slice thrusts. (y= 0.0 is a horizontal inter-slice thrust; y= 1.0: upper limit of inclination angle possibly obtained in computations)
0.25, 0.7	Point No. 2: x-coord (= 0.25), y-coord (= 0.7)
0.50, 0.4	Point No .3: x-coord (= 0.5), y-coord (= 0.4)
1.00, 0.2	Point No. 4: x-coord (=1.0), y-coord (= 0.2)

15.5 DETAILS OF COMMAND '**water table**'

There are 5 models for the '**water table**' command considering various types of porewater pressures and hydro-static loads in the analysis, as described in-detail in **Table 15.5.1** through **15.5.5**.

Table 15.5.1 Input data sheets for mode-1 of command '**water table**'

water table	
1	Porewater type= **1**: piezometric line.
3	Total number of points defining piezometric line (= **3**).
0.0, 0.0	Point No. 1: x-coord (= **0.0**), y-coord (= **0.0**).
5.0, 3.0	Point No. 2: x-coord (= **5.0**), y-coord (= **3.0**).
15.0, 6.0	Point No. 3: x-coord (= **15.0**), y-coord (= **6.0**).

Table 15.5.2 Input data sheets for mode-2 of command '**water table**'

water table	
2	Porewater type= **2**: porewater pressure ratio.
0.2	Porewater pressure ratio (= **0.2**).

Table 15.5.3 Input data sheets for mode-3 of command '**water table**'

water table	
3	Porewater type= **3**: submerged condition.
2	Total number of points defining static water table (= **2**).
20.0, 5.0	Point No. 1: x-coord (=**-20.0**), y-coord (= **5.0**).
15.0, 5.0	Point No. 2: x-coord (= **15.0**), y-coord (= **5.0**).

Table 15.5.4 Input data sheets for mode-4 of command '**water table**'

water table	
4	Porewater type= **4**: hydrostatic condition.
2	Total number of points defining static water table (= **2**).
20.0, 5.0	Point No. 1: x-coord (=**-20.0**), y-coord (= **5.0**).
15.0, 5.0	Point No. 2: x-coord (= **15.0**), y-coord (= **5.0**).

Table 15.5.5 Input data sheets for mode-5 of command ‘**water table**’

water table	
5	Porewater type= **5**: phreatic line.
3	Total number of points defining phreatic line (= **3**).
0.0, 0.0	Point No. 1: x-coord (= **0.0** m), y-coord (= **0.0** m).
5.0, 3.0	Point No. 2: x-coord (= **5.0** m), y-coord (= **3.0** m).
15.0, 6.0	Point No. 3: x-coord (= **15.0** m), y-coord (= **6.0** m).

15.6 DETAILS OF COMMAND ‘**facing**’

There are 3 types of facings, namely, the **gravity facing** (**Type-1**), the **model block facing** (**Type-2**) and the **stacked gabion facing** (**Type-3**), requiring various input parameters as described in detail in Tables 15.6.1- 15.6.3. In general, Type-2 and Type-3 share identical input formats.

Table 15.6.1 Input data sheets for mode-1 of command ‘**facing**’

facing	
1	Facing type **1** is for gravity facings.
25.0, 5.0, 0.0	Unit weight of facing (= **25.0** kN/m^3), vertical (= **5.0** kN) and horizontal (= **0.0** kN) concentrated loads (in terms of Forces) at facing top, respectively.
0.0, 26.0	Facing back-face adhesion (= **0.0** kPa), friction angle (= **26.0°**).
20.0, 30.0	Facing base adherence (= **20.0** kPa), friction angle (= **30.0**°).
-0.5, -1.0	x- and y-coords. of point No. 1 defining the facing body (**Point. 1 is the heel** of facing; Clockwise for points 2, 3, 4). *All types of facing body are described using 4 points.
-4.5, -1.0	x- and y-coords. of point 2 defining the body.
2.0, 6.0	x- and y-coords. of point 3 defining the body.
3.0, 6.0	x- and y-coords. of point 4 defining the body.

Table 15.6.2 Input data sheets for mode-2 of command '**facing**'

facing	
2	Facing type **2** is the modular block facing.
25.0, 5.0, 0.0	Unit weight of facing (=**25.0** kN/m^3), vertical (= **5.0** kN) and horizontal (= **0.0** kN) concentrated loads at facing top, respectively.
0.0, 26.0	Facing back-face adhesion (= **0.0** kPa), friction angle (= **26.0**°).
20.0, 30.0	Facing base adherence (= **20.0** kPa), friction angle (= **30.0**°).
0.0, 25.0	Facing block-reinforcement connection (or interface) adhesion (= **0.0** kPa), friction angle (= **25.0**°).
10.0, 25.0	Facing block-block interface adhesion (= **10.0** kPa), friction angle (= **25.0**°).
-0.5, -1.0	x- and y-coords. of point 1 defining the body (**Point 1 is the heel** of facing; Clockwise for points 2, 3, 4). *All types of facing body are described using 4 points.
-4.5, -1.0	x- and y-coords. of point 2 defining the facing body.
2.0, 6.0	x- and y-coords. of point 3 defining the facing body.
3.0, 6.0	x- and y-coords. of point 4 defining the facing body.
100, 0.3, 0.85	Displacement-analysis-related parameters for **facing blocks**: K (=**100**), n (= **0.3**), R_f (= **0.85**). In the case of no displacement analysis, input K= 0, n= 0, R_f= 0.
20.0, 5.0	Residual facing block-block interface friction angle (= **20**°), residual-to-peak displacement ratio (= **5.0**). In the case of **no displacement analysis** or **no consideration of post-peak behavior**, these two parameters are 0.0.

Table 15.6.3 Input data sheets for mode-3 of command '**facing**'

facing	
3	Facing type **3** is the stacked gabion facing.
25.0, 5.0, 0.0	Unit weight of facing (=**25.0** kN/m^3), vertical (= **5.0** kN) and horizontal (= **0.0** kN) concentrated loads at facing top, respectively.
0.0, 26.0	Facing back-face adhesion (= **0.0** kPa), friction angle (= **26.0**°).
20.0, 30.0	Facing base adherence (= **20.0** kPa), friction angle (= **30.0**°).
0.0, 25.0	Facing block-reinforcement connection adhesion (= 0.0 kPa), friction angle (= **25**°).
10.0, 22.0	Facing block-block adhesion (= **10.0** kPa), friction angle (= **22.0**°).
-0.5, -1.0	x- and y-coords. of point 1 defining the facing body (**Point 1 is the heel** of facing; Clockwise for No. 2, 3, 4). *All types of facing body are described using 4 points.
-4.5, -1.0	x- and y-coords. of point 2 defining the body.
2.0, 6.0	x- and y-coords. of point 3 defining the body.
3.0, 6.0	x- and y-coords. of point 4 defining the body.
100, 0.3, 0.85	Displacement-analysis-related hyperbolic parameters for facing block interfaces: K (=**100**), n (= **0.3**), R_f (= **0.85**). In the case of no displacement analysis, input K= 0, n= 0, R_f= 0.
20.0, 5.0	Residual facing gabion-gabion interface friction angle (=**20**°), residual-to-peak displacement ratio (= **5.0**). In the case of **no displacement analysis or no consideration of post-peak behavior**, these two parameters are 0.0.