Pre-accepted Geotechnical Programme

(List in ascending order of Program Reference)

Program Reference	Program	Version	Valid Till	Remarks
G0001	OASYS FREW	5.14	1998-05-23	
G0002	FLAC		1998-05-23	
G0003	SIGMA/W	2.0	1998-05-24	
G0004	DIPS	3.12	1998-06-25	
G0005	PILED/G		1998-07-09	
G0006	SEEP/G		1998-09-24	
G0007	SLOPE/G	3.0	1998-09-25	
G0008	SWEDGE	1.0	2001-09-27	
G0009	SLOPE	8.23	2013-01-20	
G0010	UNWEDGE	2.01	1998-11-13	
G0011	FLAC	3.3	2010-08-06	
G0012	SLOPE/W	2.06	1998-11-30	
G0013	PCSTABL5M		1998-12-26	
G0014	SLOPE/W	3.03	1999-02-05	
G0015	GALENA	2.0	2003-03-27	
G0016	SPENN3.BAS	1.0	2020-08-30	
G0017	PLAXIS	5.0	1999-03-24	
G0018	JANBU.BAS	1.0	2020-10-22	
G0019	FNDUBC1.BAS	1.0	2020-10-22	
G0020	RWALL1.BAS	1.0	2020-10-22	
G0021	SEEP/W	3	1999-08-27	
G0022	OASYS STAWAL	2.11	1999-09-09	
G0023	OASYS SLOPE	3.9	1999-09-09	
G0024	STABL/G		2009-04-03	Slope Stability Analysis (for use of Simplified Bishop and Simplified Janbu Methods Only)
G0025	OASYS SEEP	2.6	1999-09-09	
G0026	OASYS VDISP	5.5	1999-09-09	
G0027	OASYS GRETA	4.29	1999-11-01	
G0028	OASYS FREW	7.4	1999-11-01	
G0029	OASYS FREW	5.7	1999-11-01	
G0030	OASYS WELL	0.1H	1999-11-12	
G0031	OASYS SAFE	8.66	2006-08-06	
G0032	WALLAP	4.05	1999-12-22	
G0033	SWEDGE	1.12	2000-01-27	
G0034	UNIBEAR	1.0	2000-03-24	
G0035	RIDO	4.0	2000-03-25	
G0036	DIPS	3.0	2000-04-02	
G0037	TALREN	2.3	2000-04-03	
G0038	FLAC	3.3	2000-05-01	
G0039	SEEP/W	4.0	2000-05-15	
G0040	KZERO	2	2017-03-30	
G0041	DIANA	5.0	2013-10-21	
G0042	STABL5	5.2	2003-08-08	
G0043	OASYS SLOPE	3.7	2006-09-18	
G0044	OASYS SEEP	2.2	2006-09-18	
G0045	DIPS	4.0	2000-06-16	
G0046	SWEDGE	1.1	2000-06-16	
G0047	STAWAL	9/91	2000-09-29	
G0048	OASYS SLOPE	3.5	2004-01-28	
G0049	SLOPE/W	3.05	2005-02-07	
G0050	OASYS FREW	5.11	2006-09-18	
G0051	SLOPE/W	3	2006-09-18	
G0052	PMWIN (MODFLOW)		2000-09-29	
G0053	STED	6.54i	2000-11-19	

Last revision date: 28/2/2019

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
G0054	SEEP/W	4.02	2000-12-01	
G0055	WALLAP	4.07	2001-01-25	
G0056	ReWaRD	2.03	2001-02-26	
G0057	ReActiv	1.05	2001-02-26	
G0058	GWALL	2.41	2013-01-20	
G0059	OASYS SLOPE	4.12	2013-10-07	
G0060	OASYS STAWAL	3.5	2013-08-17	
G0061	OASYS SAFE	11.4	2013-08-17	
G0062	OASYS VDISP	6.5	2007-07-12	
G0063	OASYS SEEP	3.9	2013-01-20	
G0064	ROCKFAL3	1.0	2001-05-21	
G0065	OASYS SLOPE	4.9	2001-05-14	
G0066	OASYS FREW	8.8	2020-01-04	
G0067	OASYS VDISP	6.4	2001-05-21	
G0068	BMCOLPY/G		2001-09-11	
G0069	OASYS PILE	2.4	2010-12-05	
G0070	OASYS GRETA	5.4	2013-08-17	
G0071	OASYS PILSET	3.4	2013-08-17	
G0072	JANBU	1.0	2001-06-03	
G0073	JANBU	1.0	2001-06-03	
G0074	BEFON	1.0	2001-09-24	
G0075	SAGE CRISP	3.02	2001-06-18	
G0076	CWD	1.0	2001-07-07	
G0077	FEWAND	1.02	2001-07-07	
G0078	GWALL	2.4	2001-07-19	
G0079	DIPS	3.11	2001-07-21	
G0080	WALLAP	3.4	2001-08-10	
G0081	OASYS STAWAL	2.9	2001-08-13	
G0082	GOLDPIT	1.21D	2001-08-18	
G0083	COLOB	98.5	2004-11-14	
G0084	RWALL	98.5	2004-11-14	
G0085	JANBU		2017-03-30	
G0086	JANBU	1.0	2001-09-20	
G0087	SIGMA/W	3.0	2001-10-04	
G0088	WALLAP	4.10	2012-08-05	
G0089	TALREN	3.2	2001-10-08	
G0090	OASYS FREW	8.11	2008-02-03	
G0091	SLOPE/W	4.01	2001-11-24	
G0092	SEEP/W	4.2	2017-02-19	Solving 2-D seepage analysis for solving steady seepage and transient seepage
G0093	OASYS VDISP	5.3	2001-11-26	
G0094	SABLE	98.5	2004-11-14	
G0095	FADSPABW		2020-11-05	
G0096	SHEETPILE/2	2.4	2002-01-14	
G0097	SLSTABBM	0.0	2002-06-10	
G0098	OASYS FREW	5.10	2000-11-23	
G0099	OASYS FREW	8.9	2005-12-19	
G0100	PAROI2	4.6 HK	2006-01-26	
G0101	PCSTABL5M	1.87	2021-08-23	
G0102	OASYS CLOG	2.4	2002-12-08	
G0103	UNWEDGE	2.3	2006-07-03	
G0104	SLOPE/W	4.21	2022-02-27	The acceptance of the program is subject to the following restrictions: (a) The program is used only for slope stability analysis using the limit equilibrium method of

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				Bishop's Simplified, Janbu's Simplified, or Morgenstern-Price; (b) Janbu's Simplified method should not be used for deep seated failure and tie-back loads analysis; and (c) Pseudo-static earthquake analysis, block slip analysis, bearing capacity analysis and probability analysis are excluded.
G0105	SOCKET	1.0	2020-12-26	
G0106	KaKp	1.0	2020-12-26	
G0107	SIGMA/W	4	2003-06-25	
G0108	Q_ALL	1.0	2020-12-26	
G0109	FLAC	3.4	2019-05-17	For the application in excavation & retaining structure only
G0110	CHANNEL	1.0	2012-05-06	
G0111	CESAR-LCPC	3.2.1	2003-08-29	
G0112	GSTABL7	1.14	2003-10-08	
G0113	RIDO	4.01	2019-04-07	
G0114	SLOPE/W	4.22	2015-07-09	- for analysis by Bishop Simplified and Morgenstern-Price method only - excluding applications in solving bearing capacity and seismic loading
G0115	SLOPE 2000	1.6	2007-08-16	
G0116	OASYS VDISP	17.7.2	2017-05-20	
G0117	OASYS SLOPE	17.7.2	2011-03-05	
G0119	SLOPE/W	4.24	2008-04-27	- excluding application in solving bearing capacity, seismic loading and block failure problem
G0120	DIPS	3.12	2012-03-12	
G0121	DIPS	5.0	2020-02-26	
G0122	TUNSET	3.7	2008-05-25	
G0123	SLOPE/W	5.0	2008-07-18	Only Janbu Simplified, Bishop, Spencer and Morgenstern-Price should be used. The use of the program in solving bearing capacity and seismic loading are excluded
G0124	PLAXIS	7.2	2005-09-01	
G0125	SLOPE-STABILITY	7.99	2005-10-20	
G0126	DEBRIFLO	1.02	2016-10-01	
G0127	SEEP/W	5	2009-04-09	
G0128	Oasys FREW	17.8	2019-07-05	- Applied in the design of excavation and lateral support works by conventional approach, such as those described in GEO Publication 1/90 - Only SAFE model method can be used in this version of program.
G0129	CONSOLID	1.0	2020-12-26	
G0130	Oasys SEEP	3.10	2009-11-29	
G0131	TUNSET	17	2006-11-10	
G0132	Processing Modflow (PMWIN)	5.1.5	2007-04-29	
G0133	PLAXIS	8.2	2022-02-17	Only Mohr-Coulomb model should be used
G0134	OASYS FREW (Modified C580 Approach)	18.1	2013-01-17	Notes for FREW users - for Use with Modified C580 Approach Based on the findings of the verification exercise and back analyses of past case histories of excavation, users are reminded of the following: 1. Horizontal soil pressure coefficients. Users are reminded that the Ka and Kp values applied in FREW should be in the horizontal direction. When

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				opting for the "User Specified" option in FREW, user should use Geoguide 1 Figures 18 & 19 to obtain horizontal earth pressure coefficients, resolve the active (Ka) and passive (Kp) pressure coefficients from the charts, and then input their corresponding horizontal components (i.e. Kah and Kph) into FREW. When opting for the "Calculated" option, FREW will compute the earth pressure coefficients based on the method given in the manual (User Manual Section 2.1.3.2 refers). 2. Surcharge application. When the surcharge is expected to appear after the wall installation, the surcharge values should be applied in stage 1 instead of stage 0 of the FREW analysis. Users are reminded that the purpose of stage 0 is to model the existing ground condition prior to any construction works. Surcharge value applied in stage 0 corresponds to the situation where the loading is present at the existing ground condition, and FREW will reset the wall deformation to zero prior to the stage 1 analysis. 3. Surcharge modeling. It is recommended to use UDL surcharge instead of strip load surcharge if the surcharge is widespread across the site. Users are reminded that application of strip load surcharge will only modify the active pressure limit of the underlying soil; whereas the application of UDL surcharge will modify both active and passive pressure limits of the underlying soil (User Manual Section 3.4.5 refers). 4. Model Type mode. Users should note that the verification of FREW has been carried out using the SAFE model. 5. Wall/Soil interface. When the SAFE mode is adopted, users have the option to choose between "fixed" or "free" wall/soil interface in the analysis in order to obtain realistic results for the design situation. Where the soil is fixed to the wall and the anticipated vertical movement of the wall relative to the soil is small, such as in a SLS analysis, the "fixed" option should be used. Users may consider using the "free" option in the following situations: When analyzing the behaviour of a wall where the soil will move vertically against the wall and/or the results are close to non-convergence in the FREW analysis; or where limited wall friction is available. Users are reminded that the choice of the wall/soil interface option is related to the modeling of the relative soil/wall movement in the vertical direction, and this should not be confused with the choice of Ka or Kp values that correspond to the wall friction available. Users should obtain the correct Ka and Kp values for FREW inputs by considering the

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				available wall friction. 6. Sensitivity of results to wall embedment depth. When analysing an excavation problem using the CIRIA Report No. C580 method, users should check the sensitivity of the wall behaviour to the wall embedment depth. The wall behaviour in terms of stability is normally represented by the computed structural forces (bending moments/shear forces/ strut loads) in the ULS analysis but the maximum wall deflection is also important in defining the state when there is a rapid increase in wall deflection for a small reduction in the embedment depth. Based on this sensitivity analysis, the wall embedment depth can be selected to achieve an economic design that is sufficiently conservative and robust.
G0135	SLOPE 2000	1.7	2009-03-09	The above acceptance is subject to the following restriction: 1. Pile anchorage simulation is not allowed. 2. Sarma's, Wedge, Lowe Karafiath analysis and 3D analysis options are not allowed. 3. Davis method on bond load calculation for soil nail is not allowed. 4. Combined bond load from soil friction and rock bond for soil nail is not allowed.
G0136	CRSP	4.0	2019-06-26	
G0137	UNWEDGE	3.0	2021-02-05	- This program is applicable to the analysis of wedge failure around excavations constructed in hard rock, where discontinuities are persistent, and where stress induced failure does not occur. - Probabilistic analysis is not included. - Modelling of zero water pressure condition using Swellex and Split-Set bolts and Barton-Bandis strength criterion are not included.
G0138	SLOPE/W	6.20	2009-11-06	
G0139	DIPS	5.1	2020-01-18	
G0140	SWEDGE	4.0	2017-07-30	
G0141	OASYS TUNSET	18.1	2013-10-19	- For analysis of tunneling problem by Attewell, Boscardin and Mair et al methods only and - User specified i/h ratio not allowed.
G0142	SLOPE/W	6.21	2022-02-17	- The FOS of the cohesive and frictional component of strength are assumed equal for all soils involved. - The FOS is assumed to be same for all slices. - When excessively steep surface are used or when a strong material overlies a very weak material, SLOPE/W may have difficulties in obtaining a convergent solution.
G0143	SEEP/W	2007	2020-11-26	
G0144	OASYS SLOPE	18.2	2014-12-01	-The program uses the method of slices and variety of established methods for calculating inter-slice forces such as Fellenius or Swedish slip circle analysis, the Bishop horizontal or constant inclined inter-slice forces method and Janbu method. - Each slice in the inclined inter-slice force methods is in equilibrium both vertically and horizontally
G0145	SLOPE/W	5.20	2018-06-14	1. Only Bishop Simplified, Janbu Simplified, and Morgenstern & Price method are allowed to use

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				2. The following applications are excluded - Use of partial factor for slope stability analysis - Bearing capacity analyses - Pseudo-static earthquake analyses - Active and passive pressures - Block failure - Analyses allowing passive mode - Probabilistic analyses - Hoek-Brown failure criterion for modeling shear strength of soil or rock - Unsaturated shear strength - Analyses using SLOPE/W finite element stress method - Auto-Locate (or Auto-Search) for critical slip surfaces will produce results for indication only - SHANSEP model for soft soils
G0146	SLOPE/W	2007	2021-01-16	1. Only Bishop Simplified, Janbu Simplified, Morgenstern & Price and Spender methods are allowed to use 2. The following applications are excluded - Use of partial factor for slope stability analysis - Bearing capacity analyses - Pseudo-static earthquake analyses - Active and passive pressures - Block failure - Analyses allowing passive mode - Probabilistic analyses - Hoek-Brown failure criterion for modeling shear strength of soil or rock - Unsaturated shear strength - Analyses using SLOPE/W finite element stress method - Auto-Locate (or Auto-Search) for critical slip surface will produce results for indication only - SHANSEP model for soft soils
G0147	OASYS FREW	18.1	2021-09-06	Global Factor Approach Restrictions: - Applied in the design of excavation and lateral support works by conventional approach, such as those described in GEO Publication 1/90 - Only SAFE model method can be in this version of program
G0148	DAN-W	Release 9	2015-07-29	Only Voellmy rheological model may be used
G0149	PAROI 2	4.9e	2018-11-12	Global Factor Approach
G0150	UDEC	4.0	2017-01-19	Only ground excavation and rock reinforcement in tunnel and cavern works are allowed to use
G0151	DAN-W	Release 9	2015-07-29	Only frictional rheological model may be used
G0152	PIES	4	2013-03-22	
G0153	PLAXIS 3D Foundation	2.2	2019-11-24	Global Factor Approach for ELS Works
G0154	PLAXIS (Modified C580 Approach)	9.0	2020-06-22	Notes on the use of PLAXIS for the limit state partial factor method based on CIRIA Report No.C580 Based on the findings of the verification exercise and back analyses of past case histories of excavation, users are reminded of the following : 1. Hydraulic boundary condition. The

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				groundwater pressure distribution assumption in the modeling and the related program setting can have a major influence on the computed results. The assumption should be compatible with the permeability of the various soil/rock layers in the ground and the hydraulic boundary conditions, which should be assessed using field permeability tests, typical permeability values or pumping tests, and piezometric monitoring data. 2. Check on capacity of structural elements. A structural check should be carried out after the analyses. If the structural check indicates the capacity of any of the structural elements being exceeded, the analyses should be repeated for a revised design with stronger structural elements using higher stiffness values. 3. Wall/Soil interface. Use of an unrealistically low strength such as zero strength at the interface will likely result in numerical instability (e.g. non-convergence) or unreasonably large wall deflections. Therefore, the wall/soil interface ratio Rinter should not be set to zero. It is suggested that the users adopt a Rinter value of not less than 0.1 times the soil shear strength in the analysis. 4. Effects of mesh size on accuracy of results. The mesh/element size to be adopted in the analysis should be suitably fine so that further refinement of the mesh/element size would not generate a significant change in the required wall embedment depth. A finer mesh/element size may also be required at the areas of stress concentration or zones of large deformation gradient. The variation of the mesh/element size over the computation domain should be optimized to avoid numerical instability (e.g. non-convergence) and to achieve adequate calculation accuracy. 5. Wall embedment depth and large strains. When analyzing an excavation problem using the limit state partial factor method based on CIRIA Report No. C580 to obtain the design wall embedment depth, users should check the sensitivity of the wall behaviour to the wall embedment depth. There could be a rapid increase in the maximum wall deflection/strut loads upon a small reduction in the wall embedment depth, reflecting the sensitivity of the design to small variations in wall embedment. Hence a suitable value of design wall embedment depth should be selected to take into account the results of sensitivity analysis and the construction tolerance that can be achieved under the construction control and supervision regime imposed. 6. Selection of Soil Models. Users should not use effective stress shear strength parameters (phi' & c')

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				to model undrained behaviour. Also, the users should note that PLAXIS may not give appropriate pore water pressure distributions in an undrained analysis unless an appropriately sophisticated soil model is adopted. Reference should be made to the report of the Committee of Inquiry on the Nicoll Highway collapse for advice on selection of appropriate soil models for soil-structure interaction analysis. 7. Requirement for convergence. Excavation is an unloading problem. Hence, the PLAXIS calculation for ELS works is a load-controlled analysis. Users may use the default setting where the "Arc-length control" function for iteration of calculation is activated. Under special circumstances of large shear strains and significant plasticity developing in the mesh elements, the users may deactivate the "Arc-length control" function to force the analysis to solve to convergence (see PLAXIS Reference Manual under Iterative Procedure Control Parameters). In such a case, the users must check whether the shear strains generated in the mesh indicate development of a global failure mechanism. If the analysis has predicted a global failure mechanism, the users should re-activate the "Arc-length control" function and re-run the analysis. If there is no convergence, then the wall embedment depth should be increased.
G0155	PLAXIS	9.02	2016-12-09	Stage excavation with props or anchors by global factor approach and steady state seepage flow analysis, all on Mohr-Coulomb soil model only.
G0156	WALLAP	4.10	2013-07-25	1. Only the Bending Moment and Displacement type of analysis with the wall and soil modelled by sub-grade reaction is allowed. 2. The use of the program should be in compliance with the technical recommendations stipulated in paragraph 4 of Appendix A of the Circular Latter " Design of Excavation and Lateral Support Works by the Limit State Partial Factor Method Extension of the Trial Period" issued by this Department dated 18 January 2007.
G0157	PLAXIS 3D Tunnel	2.4	2013-11-29	1. The assessment of tunneling on existing structures should include back analysis of previous tunneling in nearby site for program calibration. 2. The tunnel linings dismantling model should include substantial soil cover and adequate ground improvement for ground stabilization. 3. Only linear elastic perfectly plastic Mohr Coulomb constitutive model is allowed. 4. Only steady-state seepage flow analyses is allowed.
G0158	WALLAP	5.04	2014-04-19	Global Factor Approach The feature of seismic loading, thermal stress of struts, wedge stability, yield moment of wall and FOS calculation using BSC Piling Handbook method are excluded.
G0159	DAN-W	Release 10	2020-06-04	The analysis of post-failure debris motion with normal elements only

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
G0160	WALLAP	5.04	2018-05-17	Global Factor Approach - The features of seismic loading, wedge stability and FOS calculation using BSC Piling Handbook method are excluded
G0161	PLAXIS	2010	2014-08-31	- Restricted to stage excavation with props or anchors by global factor approach and steady state seepage flow analysis, all on Mohr-Coulomb soil model only.
G0162	VALDEZ	5.0	2017-12-18	- The program is developed specifically for the design of reinforced earth wall in compliance of Geoguide 6 for Hong Kong; and - Global slope stability checks should be carried out by another program.
G0163	RocFall	4.0	2019-06-23	
G0164	OASYS FREW	19.0	2021-07-30	- Applied in the design of excavation and lateral support works by conventional approach, such as those described in GEO Publication 1/90. - Only SAFE model method can be used in this version of program.
G0165	OASYS XDISP	19.2	2018-04-23	The application of BUILDING DAMAGE ASSESSMENT function is excluded from this application
G0166	TALREN 4	2.0.3	2018-05-12	- Only Simplified Bishop's Method and Modified Fellenius Method are used in analysis - Only tensile strength of soil nails/slope reinforcing strips are allowed in the slope stability analysis
G0167	OASYS SLOPE	19.0	2021-07-16	- The Partial Factor Analysis function is excluded, and - Fellenius Method should not be used
G0168	OASYS FREW	19.0	2018-12-27	- Modified C580 Approach - The new stability check feature is excluded
G0169	PLAXIS 2D	2011	2021-11-27	- Restricted to stage excavation with props or anchors by global factor approach and steady state seepage flow analysis, all on Mohr-Coulomb soil model only. - Notes on PLAXIS (Version 2011) for Excavation and Lateral Support and Steady-State Analysis: 1. Hydraulic boundary condition and seepage analysis 1.1. The groundwater pressure distribution assumptions and related program settings are important in obtaining reliable results. Such assumptions should be based on the permeability of the in-situ soil/rock layers and hydraulic boundary conditions. Field permeability tests, typical permeability values or pumping tests and piezometric monitoring data should be used to justify these assumptions. 1.2. When the design required the use of free surface velocity or extreme velocity from the Plaxis analysis, the meshes of the interested areas should be refined to assure result accuracy. User should follow guideline 4.1 on “Effects of mesh size on accuracy of results”. 2. Check on capacity of structural elements 2.1. PLAXIS does not carry out design check of structural elements used in the model. Users

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				must check the adequacy of these elements using relevant design codes accepted by Hong Kong authorities. If the design indicates stronger elements are required, the PLAXIS model must be revised and re-analysis accordingly. 3. Wall/Soil interface 3.1. The wall/soil interface ratio R_{inter} should not be unrealistically low to avoid numerical instability leading to non-convergence. The limiting values for R_{inter} should use values in Table 13 of Geoguide 1 (GEO, 1993). 4. Effects of mesh size on accuracy of results 4.1. The mesh/element size to be adopted in the analysis should be suitably fine so that further refinement of the mesh/element size would not generate a significant change in the analysis results. A finer mesh/element size may also be required at the areas of stress/flow concentration or zones of large deformation/hydraulic gradient. The variation of the mesh/element size over the computation domain should be optimized to avoid numerical instability (e.g. non-convergence) and to achieve adequate calculation accuracy. 5. Selection of Soil Models 5.1. User should not use effective stress shear strength parameters (Φ ' and c') to model undrained behavior. Users should note that the use of effective strength parameters in a linear elastic perfect plastic model such as Mohr-Coulomb cannot give correct pore water pressures in undrained analysis. 5.2. Reference should be made to the report of the Committee of Inquiry on the Nicoll Highway collapse for advice on selection of appropriate soil models for soil-structure interaction analysis. 6. Requirement for convergence 6.1. Excavation is an unloading problem. Hence, the PLAXIS calculation for ELS works is a load-controlled analysis. Users should use the default setting where the "Arc-length control" function for iteration of calculation is activated. Under special circumstances of large shear strains and significant plasticity developing in the mesh elements, the user may deactivate the "Arc-length control" function to force the analysis to solve to convergence (see PLAXIS Manual under Iterative Procedure Control Parameters). In such a case, the user must check whether the shear strains generated in the mesh indicate development of a global failure mechanism. If the analysis has predicted a global failure mechanism, the user should re-activate the "Arc-length control" function and re-run the

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				analysis. If there is no convergence, then the wall embedment depth should be increased.
G0170	WALLAP (Modified C580 Approach)	5.04	2016-01-09	- The stability analysis: wedge stability and FOS calculation is excluded, - Single pile analysis is excluded.
G0171	DIPS	6.0	2019-05-23	- The features / functions are excluded - Flexural topping, fold analysis, oriented core and rock mass classification
G0172	OASYS PILSET	19.1	2019-01-12	
G0173	SLOPE/W	2012	2016-03-06	1. Only Bishop Simplified, Janbu Simplified, Morgenstern & Price and Spender methods are allowed to use. 2. The following applications are excluded: - Use of partial factor for slope stability analysis - Bearing capacity analyses - Pseudo-static earthquake analyses - Active and passive pressures - Block failure - Analyses allowing passive mode - Hoek-Brown failure criterion for modeling shear strength of soil or rock - Unsaturated shear strength - Analyses using SLOPE/W finite element stress method - Auto-Locate (or Auto-Search) for critical slip surfaces will produce results for indication only - SHANSEP model for soft soils - Geotextile reinforcement, and - Pile wall
G0174	PLAXIS	2012	2020-07-25	Restricted to staged excavation with props or anchors by global factor approach and steady state seepage flow
G0175	OASYS FREW	19.2	2020-10-22	Global Factor Approach - The application of the program is confined in the analysis of excavation and lateral support works by conventional approach, such as those described in GEO Publication 1/90. - Only the SAFE model method can be used. - The stability check feature is excluded. - The seismic analysis to EC8 feature is excluded. - The integral bridge analysis is excluded. - The EC7 partial factor sets feature is excluded.
G0176	OASYS FREW	19.2	2020-10-22	Modified C580 Approach - The application of the program is confined to the analysis of excavation and lateral support works by the Limit State Partial Factor Method based on CIRIA Report No. C580. - Only the SAFE model method can be used. - The stability check feature is excluded. - The seismic analysis to EC8 feature is excluded. - The integral bridge analysis is excluded. - The EC7 partial factor sets feature is excluded.
G0177	PLAXIS	2D AE	2021-07-25	Restricted to staged excavation with props or anchors by global factor approach and steady state seepage flow.
G0178	OASYS PDISP	19.2	2021-07-25	- The application of non-linear soil stiffness feature is

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				excluded from this application. - The Legacy Mindlin Method and New Mindlin Method without Correction Factor features are excluded from this application.
G0179	phase²	8.0	2022-01-02	
G0180	SEEP/W 2012	8.14	2021-06-13	Solve steady state and transient seepage analyses for saturated and unsaturated porous material. The program is designed for 2-Dimensional (vertical section view) modelling. Axisymmetric & plan view modelling are not included in this application.
G0181	PLAXIS 3D	2013	2018-10-18	This application is restricted to the analysis of the stage construction of excavation and lateral support design for cantilever/ strutted shaft walls and associated strutting system under hydrostatic groundwater pressure condition, all on linear elastic Mohr Coulomb soil model only.
G0182	SLOPE/W 2012	8.15.5.11777	2019-09-26	
G0183	PLAXIS 2D	2016.0	2019-09-27	Restricted to staged excavation with props or anchors by global factor approach and steady-state groundwater seepage flow analysis.
G0184	PLAXIS 3D	2016	2020-01-15	This application is restricted to the analysis of the stage construction of excavation and lateral support design for cantilever/ strutted shaft walls and associated strutting system under hydrostatic groundwater pressure condition, all on linear elastic Mohr Coulomb soil model only.
G0185	SWEDGE	6.0	2020-05-04	Evaluation of geometry and stability of surface rock wedges 1. SWEDGE is an interactive program for analyzing and evaluating the geometry and stability of surface wedges in rock slopes based on 3D limit equilibrium approach 2. Wedges are defined by two intersecting discontinuity planes, the slope surface and an optional tension crack 3. Factor of safety approach is adopted with effect/presence of surcharge and water pressure along the intersecting joints for rock wedge stability analysis
G0186	LS-DYNA	8.0	2020-08-17	Restricted to the debris mobility assessment
G0187	PLAXIS 2D	2017	2020-09-04	- The application is confined to the area of the 2D finite element analysis of stage construction of excavation and lateral support works with props or anchors by global factor approach and steady-state groundwater seepage flow analysis, all on linear elastic Mohr-Coulomb soil model only.
G0188	PLAXIS 3D	2017	2020-11-09	- This application is restricted to the analysis of the stage construction of excavation and lateral support design for cantilever/ strutted shaft walls and associated strutting system under hydrostatic groundwater pressure condition, all on linear elastic Mohr Coulomb soil model only.
G0189	PLAXIS 2D	2018	2021-07-25	- The application is restricted to staged excavation with props or anchors by global factor approach and

Pre-accepted Geotechnical Programme

Program Reference	Program	Version	Valid Till	Remarks
				steady-state groundwater seepage flow analysis with application of the Mohr-Coulomb soil model and steady-state seepage flow only.
G0190	LS-DYNA	10.0	2021-12-23	- The area of application is restricted to the coupled analysis of interaction between rock/boulder/debris and debris-resisting barrier structures; - The steel-wire net of flexible debris-resisting barrier is modelled as an impermeable membrane; - Although the Arbitrary Lagrangian-Eulerian (ALE) can represent the hard inclusion in granular debris flow based on the back-analysis of the Illgraben case study in Switzerland, the designer should exercise his judgement whether the explicit modelling of boulder impact on the structures is required with consideration given to the abundance and size of boulders in the design scenarios. If necessary, sensitivity analysis should be undertaken to assess the design robustness; - Other assumptions/limitations shall also refer to the approved conditions for debris mobility assessment using LS-DYNA in 2016 by GEO