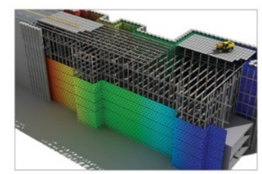
Release Notes

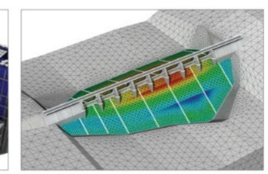
Release Date: September 2020

Product Version: GTSNX 2020(v1.1)

GTS NX

Geo-Technical analysis System New eXperience





Integrated Solver Optimized for the next generation 64-bit platform

Finite Element Solutions for Geotechnical Engineering

MIDAS

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Integrated Solver Optimized for the next generation 64-bit platform

Finite Element Solutions for Geotechnical Engineering

MIDAS

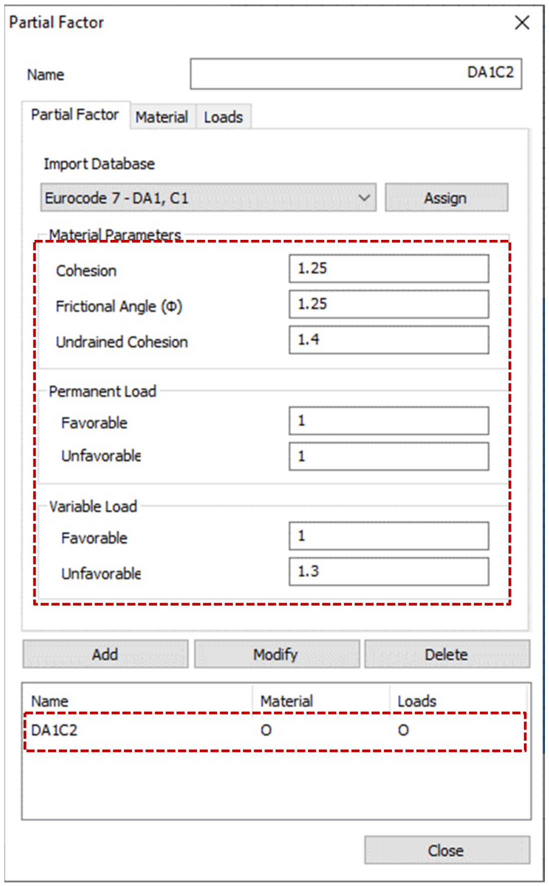
1. Analysis

1.1 Partial Factor based on Euro Code(2D Only)

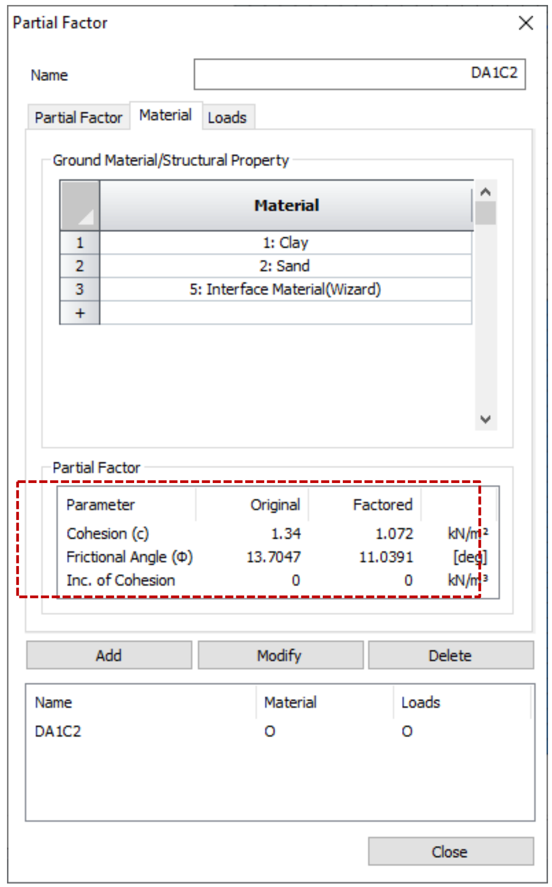
- Partial factor which is derived from Euro Code (EN1997-1 Annex A) can be applied on the 2D model.

(Partial factor will be considered to materials which is containing the cohesion and friction angle and construction stage analysis with stress type)

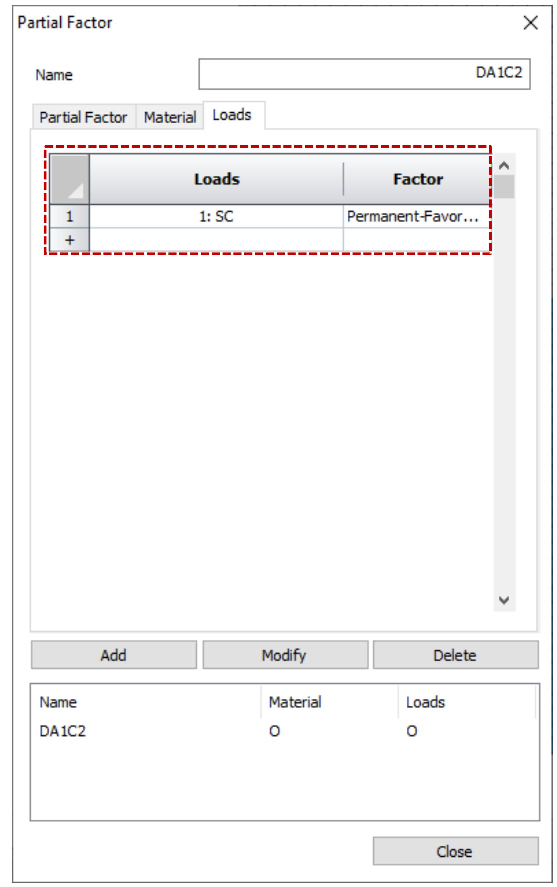
- **Static/Slope Analysis > Construction Stage > Partial Factor**



[Partial Factor – Partial Factor]



[Partial Factor – Material]



[Partial Factor – Loads]

1. Analysis

1.1 Partial Factor based on Euro Code(2D Only)

- Partial factor which is derived from Euro Code (EN1997-1 Annex A) can be applied on the 2D model.

(Partial factor will be considered to materials which is containing the cohesion and friction angle and construction stage analysis with stress type)

- **Static/Slope Analysis > Construction Stage > Partial Factor**
  - **Partial FactorImport database: Values of partial factor for permanent load / variable load / soil materials can be defined from database or those values can be defined as user define. it will be indicated on the partial factor window whether apply the factors for load and soil materials.**
  - **Material needs to be selected under this tab. It can be compared between original and factored properties from partial factor window.**
  - **Factor will apply to selected load set.**

Values of Partial Factor	Permanent		Variable		Soil		
	Fav.	Unfav.	Fav.	Unfav.	Effective Cohesion (c)	tan Φ′	Undrained Strength (su)
Eurocode 7 - DA1, C1	1.000	1.350	1.000	1.500	1.000	1.000	1.000
Eurocode 7 - DA1, C2	1.000	1.000	1.000	1.300	1.250	1.250	1.400
Eurocode 7 - DA2	1.000	1.350	1.000	1.500	1.000	1.000	1.000
Eurocode 7 - DA3	1.000	1.350	1.000	1.500	1.250	1.250	1.400

- DA1, C1: Partial factor will apply to load only.
- DA1, C2: Partial factor will apply to load and soil material.
- DA2: DA2 is similar with DA1, C1. But, the factors for pile and footing are different.
- DA3: DA3 is similar with DA1, C2. But, the factor for load (Unfavorable under Variable) is different.

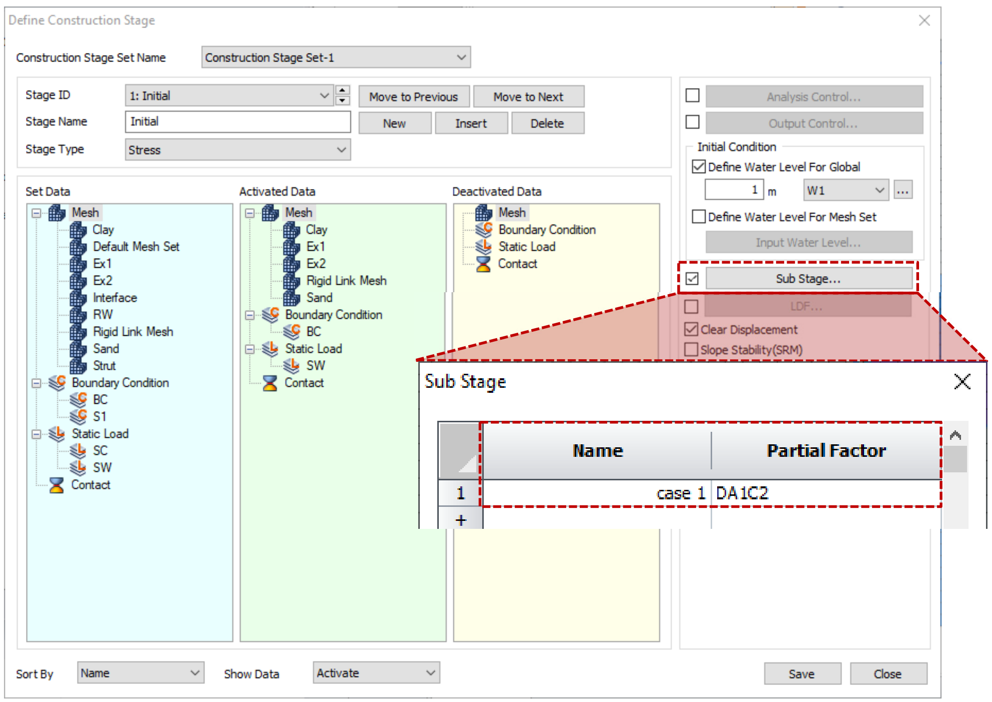
1. Analysis

1.1 Partial Factor based on Euro Code(2D Only)

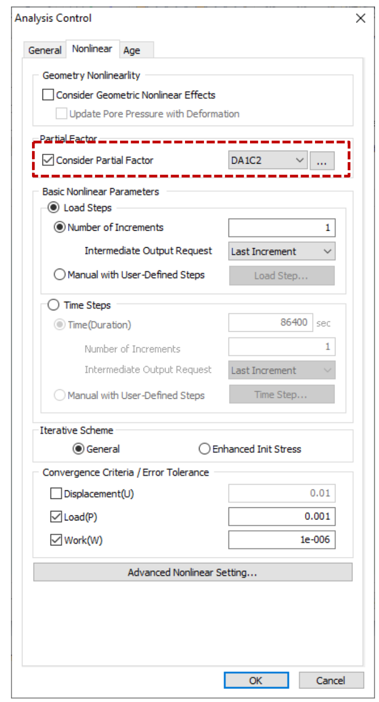
- Partial factor which is derived from Euro Code (EN1997-1 Annex A) can be applied on the 2D model.

(Partial factor will be considered to materials which is containing the cohesion and friction angle and construction stage analysis with stress type)

- **Static/Slope Analysis > Construction Stage > Stage Set > Define Con...**
- **Analysis > Analysis Case > General > Analysis Control > Nonlinear**



[Define Construction Stage]



[Analysis Control]

- Partial factor can be defined under analysis control and it will be applied to every construction stage. But, User needs to define partial factor for sub-stage manually.
- EX) PF1 (Partial Factor 1) is applied from analysis control, PF2 (Partial Factor 2) is applied from sub-stage.

Stage 1 (PF1)

↓→ **Stage 1_1 (PF2)**

Stage 2 (PF1)

Properties under PF1: Original Properties x PF1

Properties under PF2: Original Properties x PF2

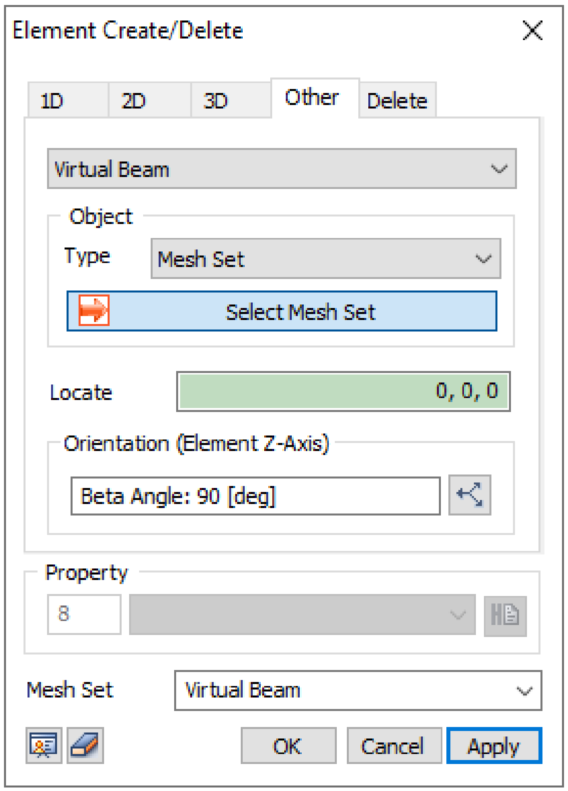
- Partial factor will be defined with construction stage analysis which is containing the stress analysis and this construction stage can make sub-stage.
- Sub-stage will be defined with stage name and partial factor which is created in partial factor function. The name of sub-stage will be specified with “name of construction stage_name of sub-stage”.

1. Analysis

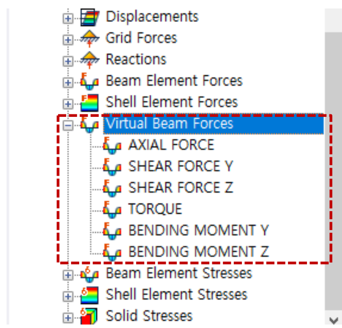
1.2 Virtual Beam

- It is creating the virtual beam from 2D/3D element and will be expressed with diagram for the result of virtual beam. Force can be found from virtual beam force after analysis with activating the mesh set of virtual beam under construction stage.
- 3D plane will be created on the normal direction of created virtual beam and force will be got from Local Direction force Sum of element which is on the same plane.

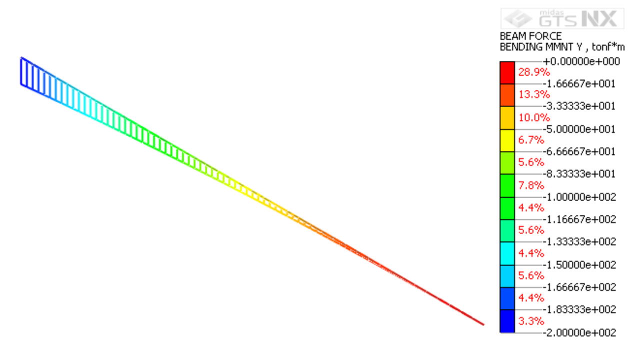
- **Mesh > Element > Create > Other > Virtual Beam**



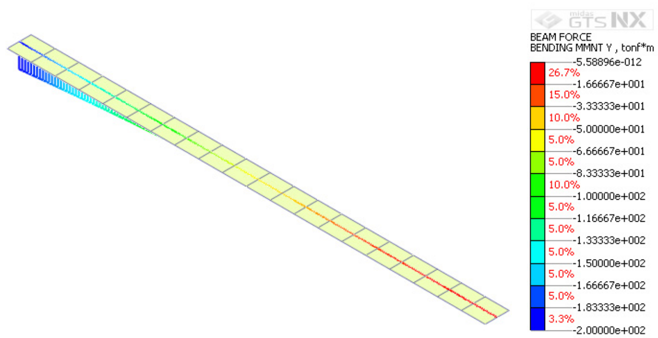
[Virtual Beam Creation]



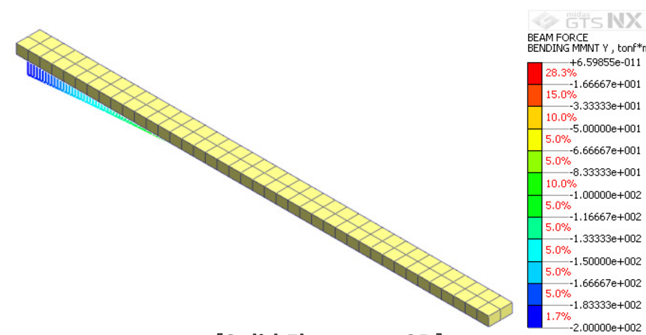
[Result of Virtual Beam]



[Beam Element -1D]



[Shell Element – 2D]



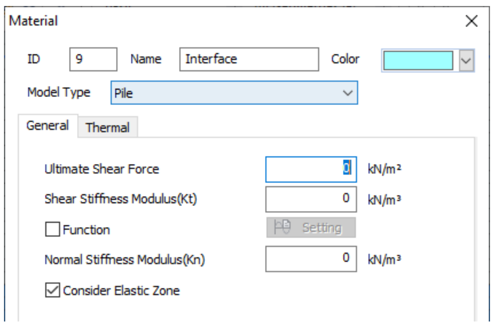
[Solid Element – 3D]

1. Analysis

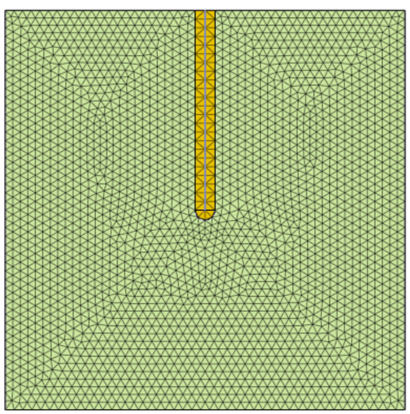
1.3 Considering Elastic Zone from Pile Element

- It is considering the elastic zone which is using the pile interface on the 1D beam element from 2D/3D model.
- There is plasticity without considering the elastic zone and will be occurred huge deformation. So, elastic zone will prevent to occur the plasticity in the area considering diameter of pile.

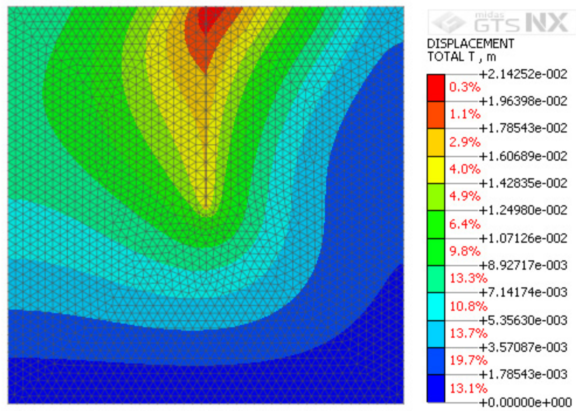
- **Mesh > Prop./Csys./Func. > Material > Create > Interface and Pile > Pile**



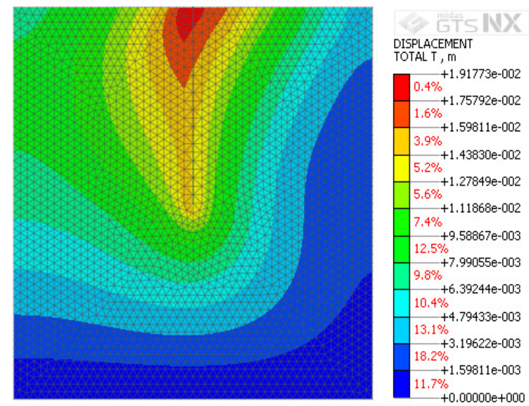
[Consider Elastic Zone]



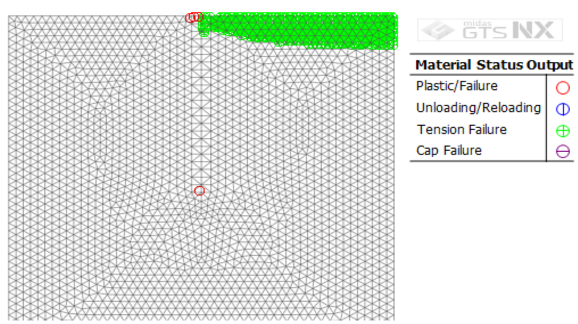
[Test Model]



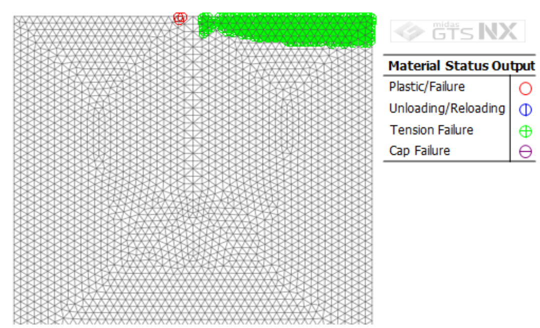
[Total Direction without Elastic Zone]



[Total Direction with Elastic Zone]



[Plastic Area without Elastic Zone]



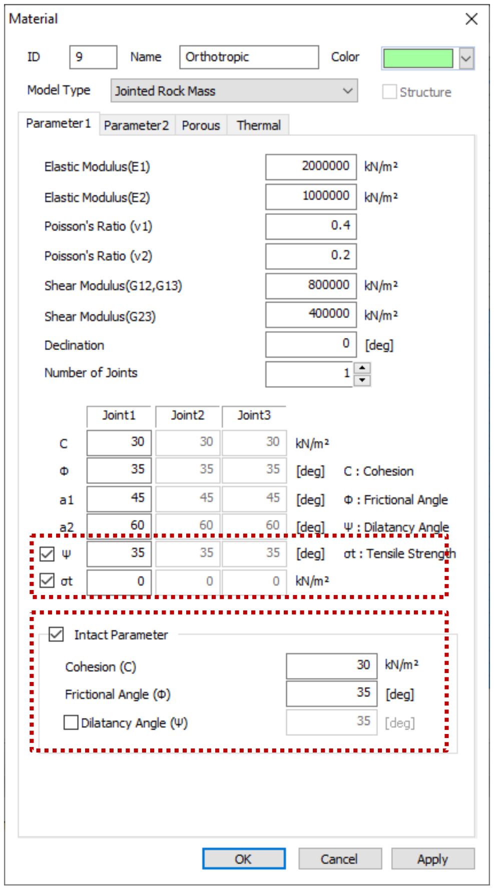
[Plastic Area with Elastic Zone]

1. Analysis

1.4 Improvement of Jointed Rock Mass

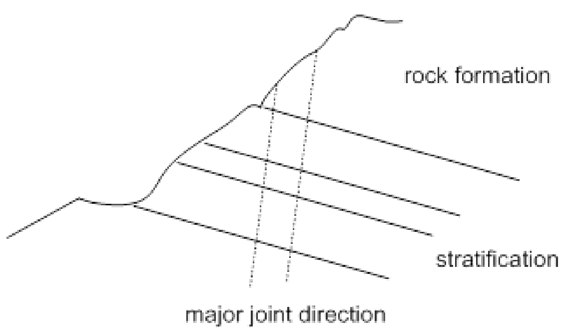
- The dilatancy angle and tensile strength have added to each joint. Also, Failure criteria of Mohr-Coulomb can be applied on intact.

- **Mesh > Prop./Csys./Func. > Material > Create > Orthotropic > Jointed Rock Mass**

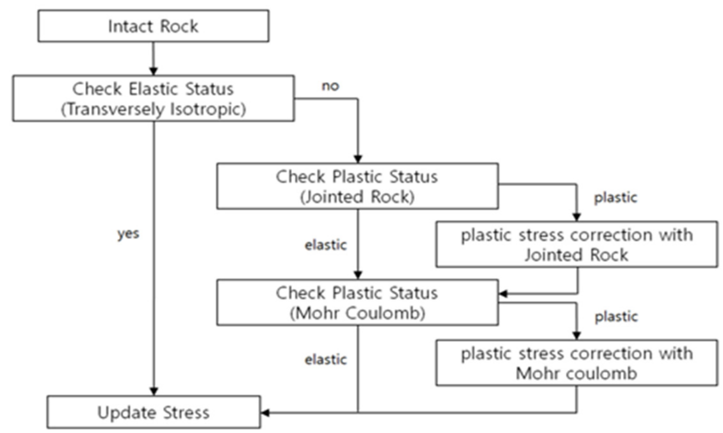


[Properties for Joined Rock Mass]

- Elastic modulus, Poisson's Ratio, Cohesion, Frictional angle, Dilatancy angle and Tensile Strength are same as Mohr-Coulomb model.
- Method of definition for dip direction, dip degree and declination is same as Transversely Isotropic model. But, in this jointed rock mass model can define three joints and elastic anisotropic behavior will be defined by alpha 1 and alpha2 from joint1. Joint2 and Joint3 will define plastic failure only.



[Jointed Rock Mass]



[Flowchart for Analysis]

[intact parameter]

- - If it is check off the intact parameter. it will be same as previous Jointed Rock Mass model.
- - If it is check on the intact parameter. It needs to define cohesion, friction angle and dilatancy angle.

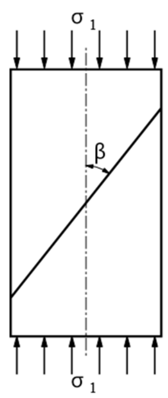
1. Analysis

1.4 Improvement of Jointed Rock Mass

- The dilatancy angle and tensile strength have added to each joint. Also, Failure criteria of Mohr-Coulomb can be applied on intact.

Reference

- Jaeger's(1960) analytical solution for the effect of a single joint plane of weakness



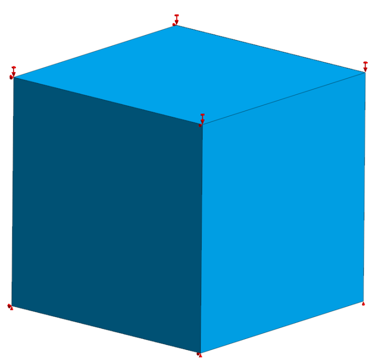
- Maximum stress from uniaxial compressive test, σ_c

$$\sigma_c = \begin{cases} \min\{2c\sqrt{N_\phi}, \dfrac{2c_j}{(1-\tan\phi_j \tan\beta)\sin 2\beta}\} & \text{if } (1-\tan\phi_j\tan\beta) > 0 \\ 2c\sqrt{N_\phi} & \text{if } (1-\tan\phi_j\tan\beta) < 0 \end{cases}$$

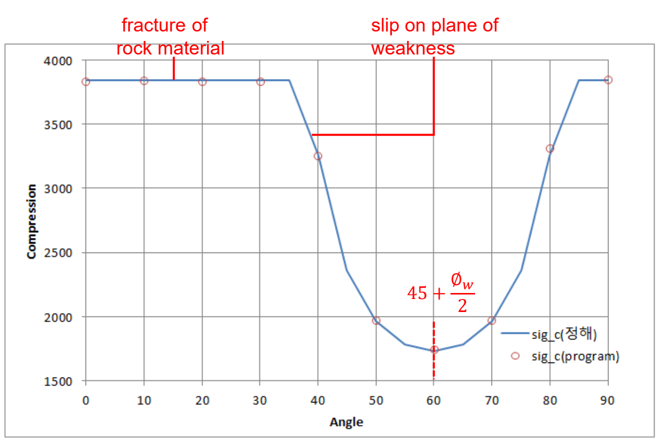
- $N_\emptyset = \dfrac{1+\sin\emptyset}{1-\sin\emptyset}$

c : Cohesion, c_j : Cohesion of joint, $\emptyset_j$: Frinctioin angle of joint

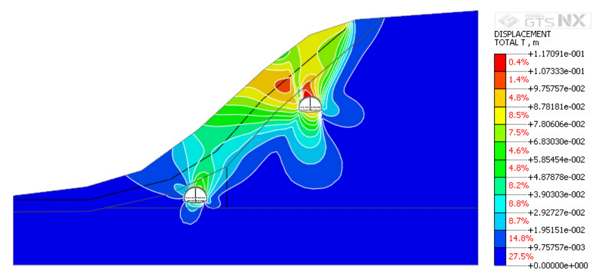
β : Inclination of discontinuity surface to principal stress



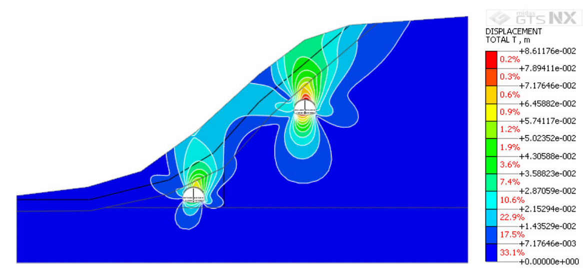
[Unit Model]



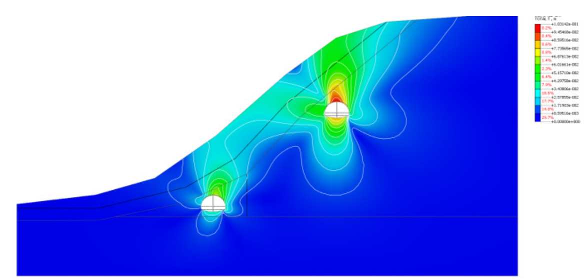
[Pressure stress based on inclination of discontinuity surface]



[Mohr-Coulomb Model]



[Jointed Rock Model]



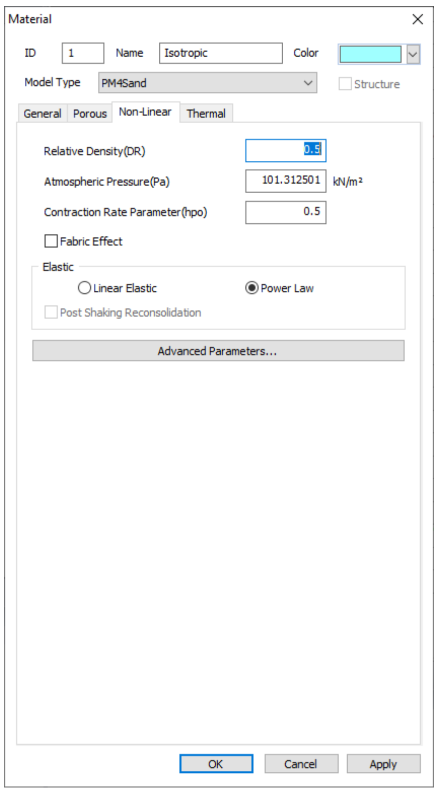
[Jointed Rock Model with Intact parameter]

1. Analysis

1.5 PM4Sand

- It is developed to scheme the liquefaction using plastic theory based on effective stress. It is expanded to analysis with non-linear implicit based on the material model which is applied to liquefaction scheme using explicit method.
- Elastic: It is nonlinear elastic behavior changing the elastic modulus with effective pressure(P) under Elastic zone. It needs to be selected with linear elastic or power law.

- **Mesh > Prop./CSys./Func. > Material > Create > Isotropic > PM4Sand**



[PM4Sand]

- Poisson's ratio will not be changed with pressure and volume modulus of elasticity will be calculated as below (Isotropic is maintained),

$$G = G_o p_A \left(\frac{p}{p_A}\right)^{1/2}\left(1 - C_{SR,o}\left(\frac{M}{M^b}\right)^{m_{SR}}\right) \qquad K = \frac{2(1+\nu)}{3(1-2\nu)}G$$

- Fabric Effect: Considering the effect of shaking particles

$$C_{k\alpha} = 1 + \frac{C_{K\alpha f}}{1+\left(2.5\left\langle\left(\boldsymbol{\alpha}-\boldsymbol{\alpha}_{in}^{true}\right):\mathbf{n}\right\rangle\right)^2} C_{pzp2} C_{zpk1} \qquad G = G_o p_A \left(\frac{p}{p_A}\right)^{1/2}\left(1 - C_{SR,o}\left(\frac{M}{M^b}\right)^{m_{SR}}\right)\left(\frac{1+\frac{z_{cum}}{z_{\max}}}{1+\frac{z_{cum}}{z_{\max}}C_{GD}}\right)$$

- Post Shaking Reconsolidation: PM4Sand model is considering the reconsolidation after seismic based on nonlinear elastic. But it needs to be used the cyclic load after heavy seismic

$$G_{post-shaking} = F_{sed} G \qquad K_{post-shaking} = F_{sed} K$$

$$F_{sed} = F_{sed,\min} + \left(1 - F_{sed,\min}\right)\left(\frac{p}{20 p_{sed}}\right)^2 \le 1 \qquad p_{sed} = p_{sed,o}\left(\frac{z_{cum}}{z_{cum}+z_{\max}}\right)\left\langle 1 - \frac{M^{cur}}{M^d}\right\rangle^{0.25}$$

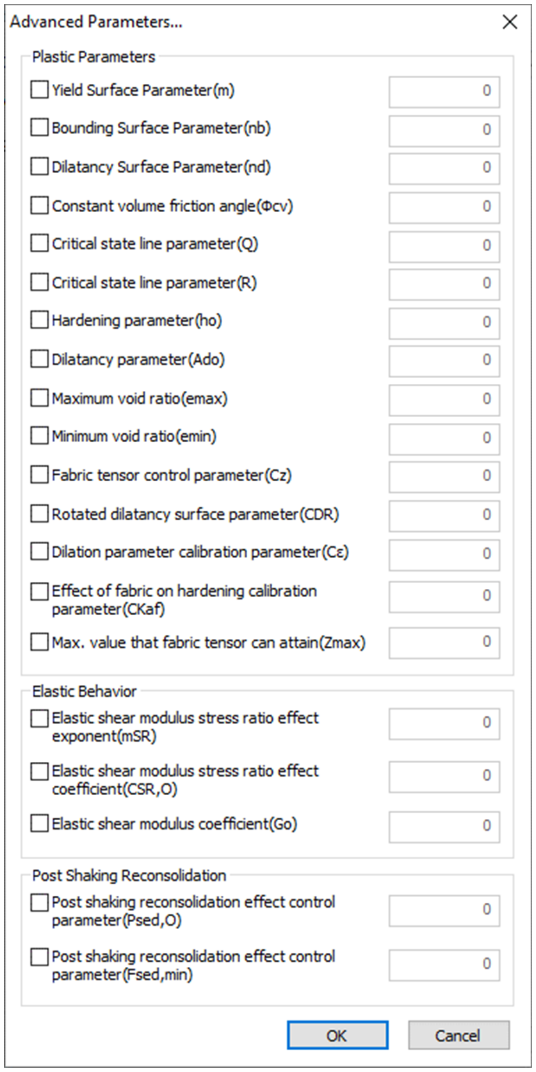
Parameter	Contents	Description
Dr	Relative Density	$D_R = \sqrt{\frac{(N_1)_{60}}{C_d}}$, C_d=46 $D_R = 0.465\left(\frac{q_{c1N}}{C_{dq}}\right)^{0.264} - 1.063$, C_{dq}=0.9
Pa	Atmospheric Pressure	101.3kPa
hpo	Contraction Rate Parameter	-

Boulanger, R.W., Ziotopoulou, K. (2017). PM4sand (version 3.1): A sand plasticity model for earthquake engineering applications. Report No. UCD/CGM-17/01, March, Boulanger_Ziotopoulou_PM4Sand_V31_CGM-17-01_2017.pdf, 112pp.

[PM4Sand 모델에 대한 참고문헌]

1. Analysis

1.5 PM4Sand



[Advanced Parameters]

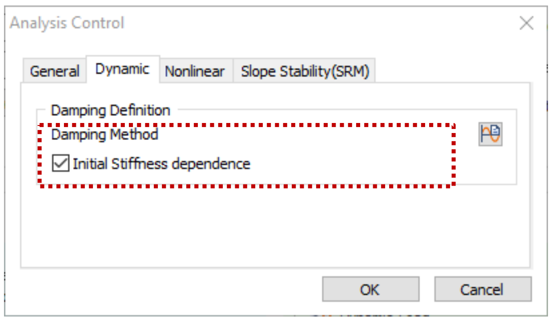
Parameter	Content	Description
Plastic Parameters		
m	Yield Surface Parameter	Default : 0.01
n^b/n^d	Bounding/Dilatancy Surface Parameter	$M^b = M\exp(-n^b\xi_R)$ $M^d = M\exp(n^d\xi_R)$
Φ_{cv}	Constant Volume Friction Angle	$M = 2\sin(\phi_{cv})$
Q, R	Critical State Line Parameter	$\xi_R = R/\{Q - \ln(100p/p_A)\} - D_R$
h_0	Hardening Parameter	$h_0 = \min\{(0.25 + D_R)/2, 0.3\}$
Ad_0	Dilatancy Parameter	Recommendation : 1.2~1.5
e_{max} / e_{min}	Maximum/Minimum Void Ratio	Default : 0.8 / 0.5
Fabric Effect Parameters		
Cz	Fabric Tensor Control Parameter	Default : 250
CDR	Rotated Dilatancy Surface Parameter	$D_{rot} = A_d \cdot \frac{\langle -\boldsymbol{z} : \boldsymbol{n} \rangle}{\sqrt{2} z_{max}} \cdot \frac{(\alpha^{dR} - \alpha) : \boldsymbol{n}}{C_{DR}}$
Cε	Dilation Parameter Calibration Parameter	$D_R < 35, 5,\ 35 \le D_R \le 75, 5 \rightarrow 1$linearly decrease
Ckaf	Effect of Fabric on Hardening Calibration Parameter	$C_{K\alpha f} = 5 + 220 \cdot (D_{Ro} - 0.26)^3 \in [4.0; 35.0]$
Zmax	Max. Value that Fabric Tensor can Attain	$z_{max} = 0.70 \cdot \exp(-6.1 \cdot \xi_{Ro}) \le 20$
Elastic Behavior		
m_{SR}	Elastic Shear Modulus Stress Ratio Effect Exponent	$G = G_o p_A \left(\frac{p}{p_A}\right)^{1/2} \left(1 - C_{SR,o}\left(\frac{M}{M^b}\right)^{m_{SR}}\right)$
$C_{SR,O}$	Elastic Shear Modulus Stress Ratio Effect Coefficient	
G_0	Elastic Shear Modulus Coefficient	
Post Shaking Reconsolidation		
$P_{sed,O}$ / $F_{sed,min}$	Post Shaking Reconsolidation Effect Control Parameter	$F_{sed,min} = 0.04,\ P_{sed,o} = -P_{atm}/5$

1. Analysis

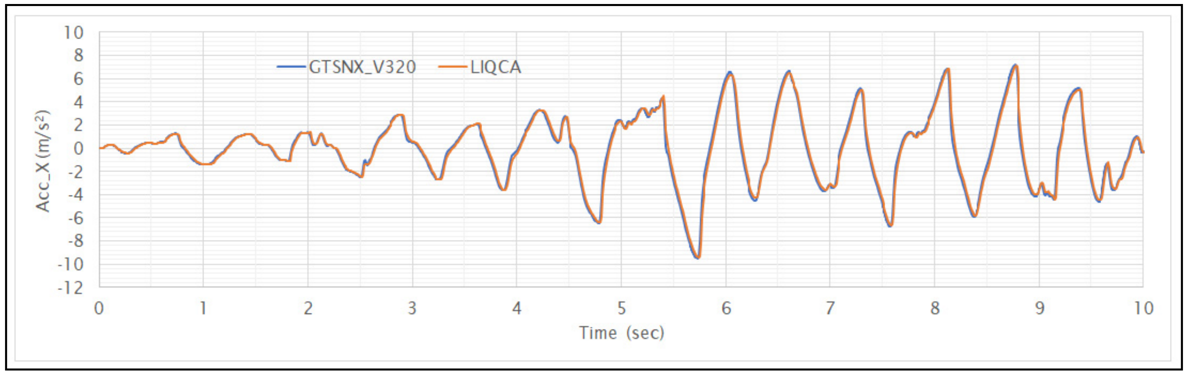
1.6 Rayleigh Damping Stiffness

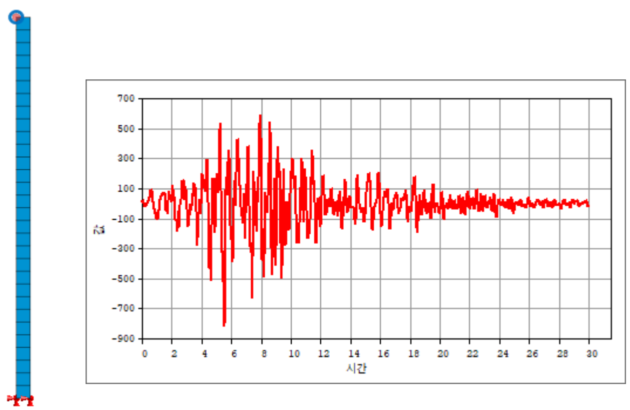
- It has added initial stiffness dependence method for Rayleigh damping process from damping force calculation.

- **Static/Slope Analysis > Construction Stage > Stage Set > Stress-Nonlinear Time History > Stage Type : Nonlinear Time History > Analysis Control > Dynamic**
- **Analysis > General > Nonlinear Time History > Analysis Control > Dynamic**
- **Analysis > General > Nonlinear Time History+SRM > Analysis Control > Dynamic**

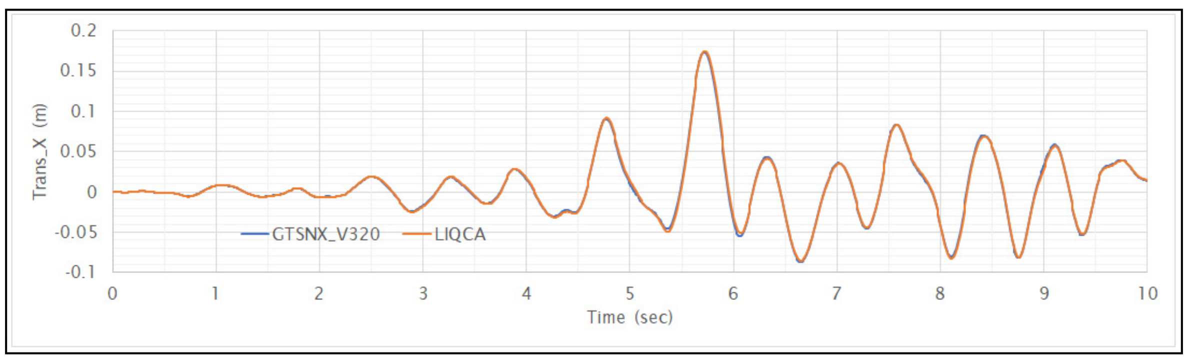


[Damping Definition]





[Unit Test]



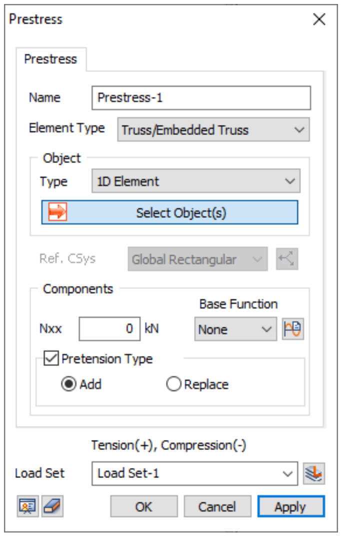
[Comparing the history result depending the time]

1. Analysis

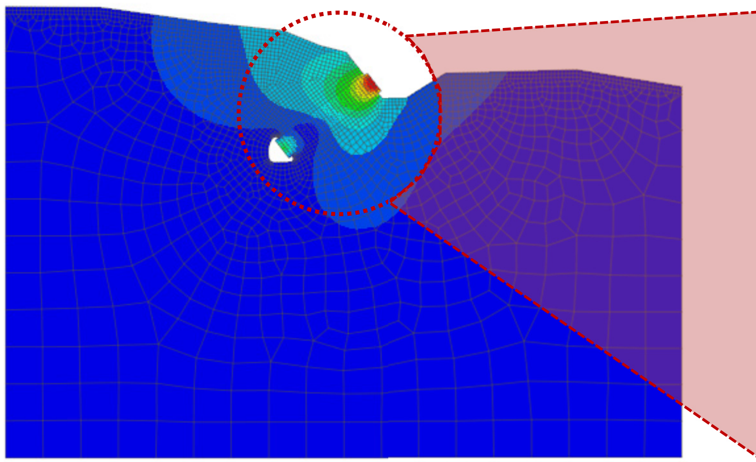
1.7 Pretension Type(Multi-Stage Prestressing)

- For Prestress > Pretension type, the load can be added or replaced under construction stage.
- In case of pretension will analysis with external force. Previously, It is working with only add fucntion under the activation step. But, User can add or replace the pretension from this newer version.

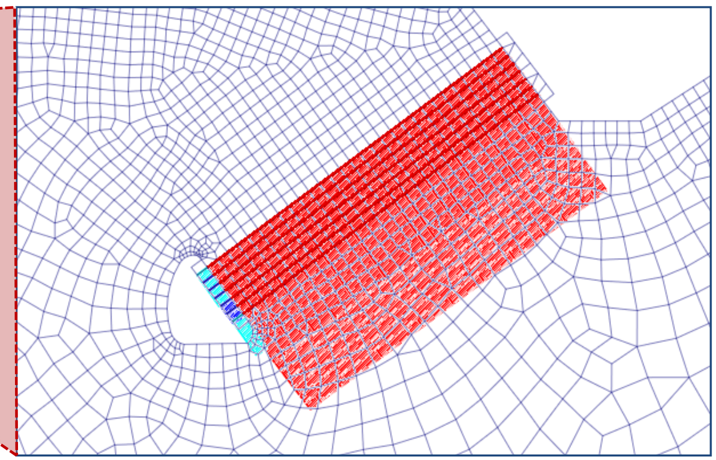
- **Static/Slope Analysis > Load > Prestress > Pretension Type**



[Pretension]



[Total Displacement with Anchor pretension]



[Axial Force with Anchor pretension]

1.8 Improvement of Mode Combination with Sign

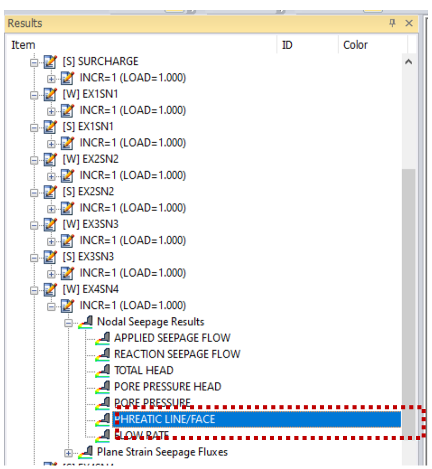
- It has added the expression of sign for user convenience about the result from each ingredient.
- Option 1. Principal mode from each direction
- Option 2. Maximum mode (Absolute value)

2. Pre/Post Processing

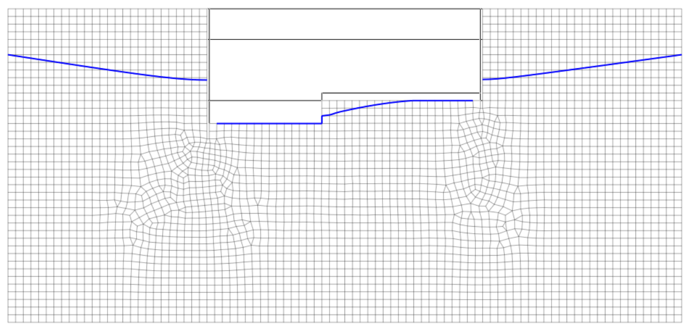
2.1 Phreatic Line/Face

- It can be verified phreatic line and face from seepage analysis result and check this result with others.

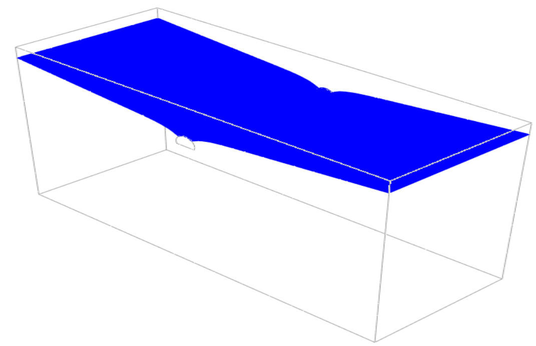
- **Worktree > Results > Nodal Seepage Results > PHREATIC LINE/FACE**



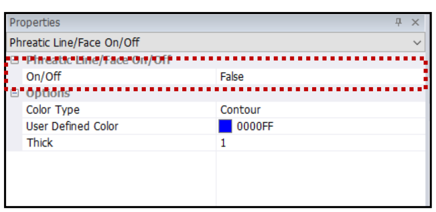
[From Result Tree]



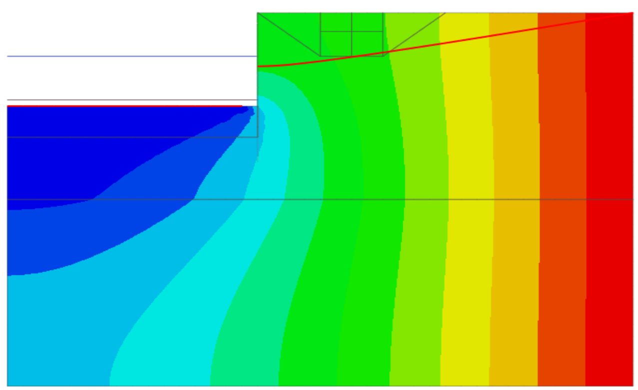
[Phreatic Line (2D)]



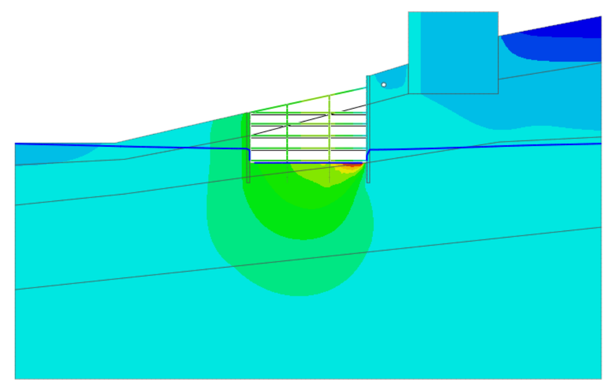
[Phreatic Face (3D)]



[From Property Window]



[Total Head & Phreatic Line (Seepage Analysis)]



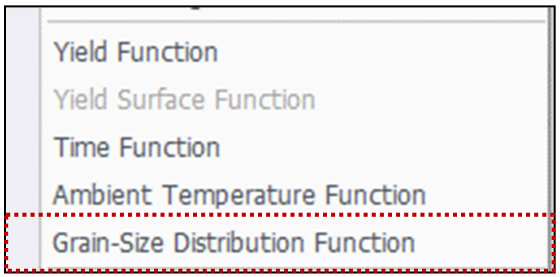
[Displacement & Phreatic Line (Fully Coupled Anlaysis)]

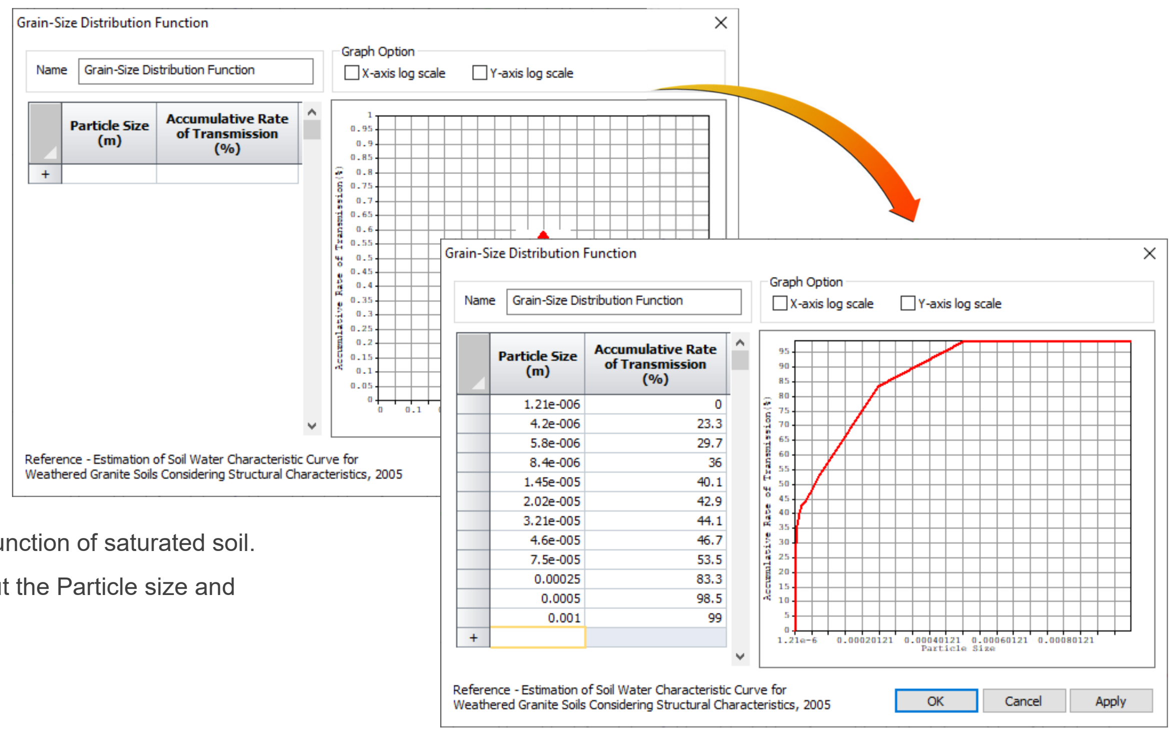
2. Pre/Post Processing

2.2 Estimate Unsaturated Property

- The properties of saturated soil are inputted by test data and it is hard to conduct the test in real project due to the time and cost. From the newer version, the curve can be made by void ration, specific gravity, density and reference grain distribution from curve of grain distribution.

- **Mesh > Prop./CSys/Func. > Function > Grain-Size Distribution Function**





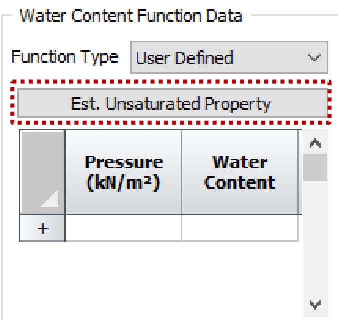
- Grain-size distribution function needs to be defined before input the function of saturated soil.
- Curve of grain-size distribution will be created automatically after input the Particle size and
- Accumulative Rate of Transmission(Data from the test).

2. Pre/Post Processing

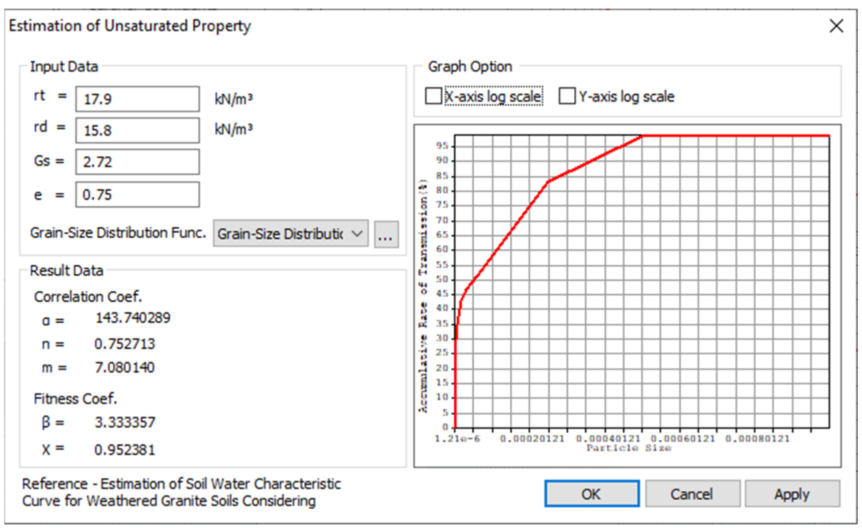
2.2 Estimate Unsaturated Property

- The properties of saturated soil are inputted by test data and it is hard to conduct the test in real project due to the time and cost. From the newer version, the curve can be made by void ration, specific gravity, density and reference grain distribution from curve of grain distribution.

- **Mesh > Prop./CSys/Func. > Function > Unsaturated Property Function**



- Soil-water characteristic curve can be made by grain-size distribution curve, selecting the estimation of unsaturated property from user define of moisture content data.



[Estimation of Unsaturated Property]

※ Volumetric water content will be calculated as follow,

$$\theta_{vi} = \chi \sum_{j=1}^{j=1} \frac{V_{pj}}{V_b}; \quad i = 1,2 \ldots . n,$$

$V_{vi} = \left(\frac{W_i}{\rho_s}\right) e$; V_{vi}: Particle Size, W_i : Rate of Transmission,

ρ_s : Particle Density, e : Void Ratio

Matric Suction,

$$\psi_i = 2r\cos\emptyset/\rho_w g r_i$$

$r_i = R_i\,[4en_i^{(1-\xi)}/6]^{1/2}$; Radius of Void,

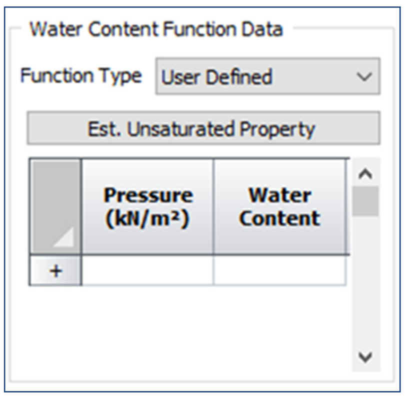
$\xi = \beta/\log(D_t)$; $D_t \geq 100\mu m$, $\beta/\log(100)$; $D_t < 100\mu m$

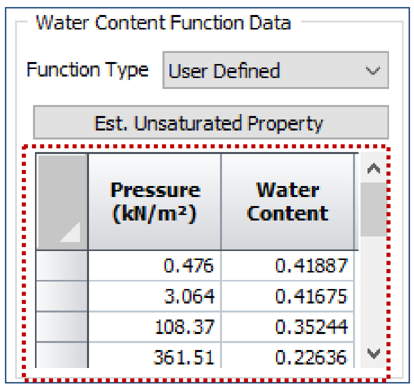
2. Pre/Post Processing

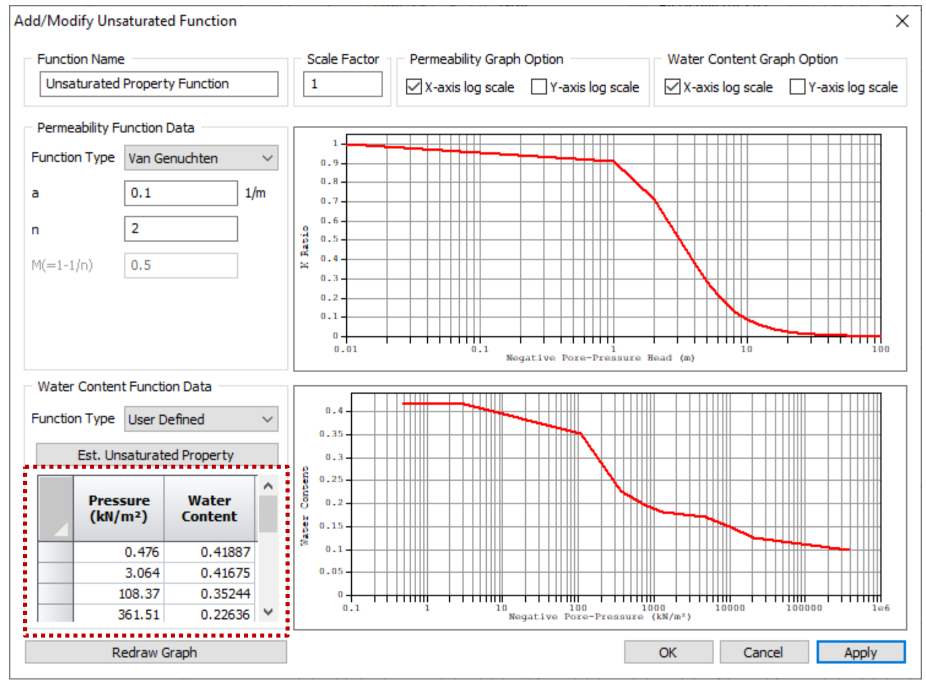
2.2 Estimate Unsaturated Property

- The properties of saturated soil are inputted by test data and it is hard to conduct the test in real project due to the time and cost. From the newer version, the curve can be made by void ration, specific gravity, density and reference grain distribution from curve of grain distribution.

- **Mesh > Prop./CSys/Func. > Function > Unsaturated Property Function**







[Estimation of Unsaturated Property]

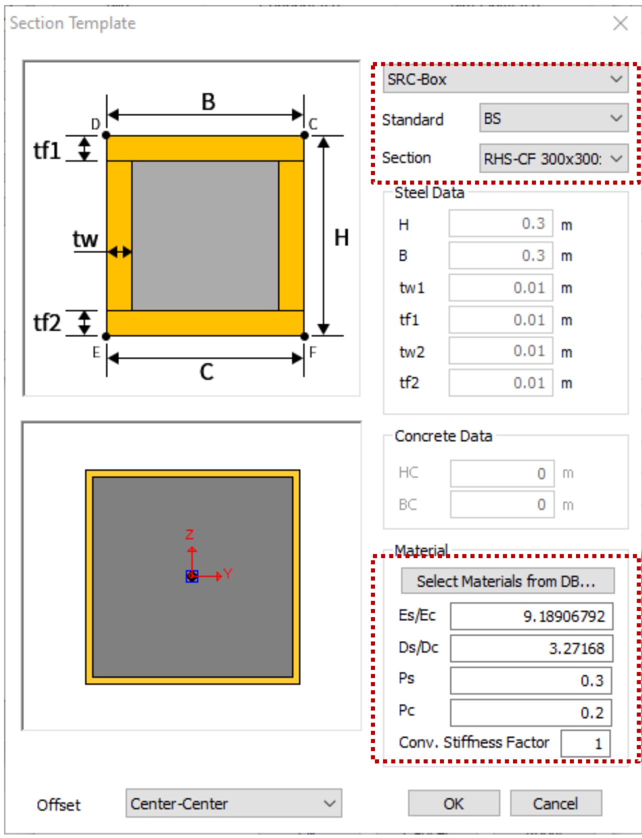
- This function is referring to "Estimation of Soil Water Characteristic Curve for Weathered Granite Soils Considering Structural Characteristics, Lee, Hyeji (KAIST), 2005". It is getting the grain distribution based on the equation of grain distribution curve, correction factor is applied to Arya and Paris model to estimate the saturation curve for weathered granite soils.

2. Pre/Post Processing

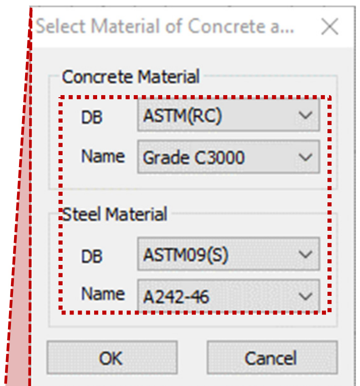
2.3 SRC Section DB

- SRC(Steel Reinforced Concrete) can be defined under 1D element(truss, beam, embedded truss, embedded beam).

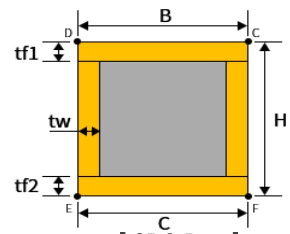
- **Mesh > Prop.Csys/Func. > Property > Create > 1D > Beam > Section**



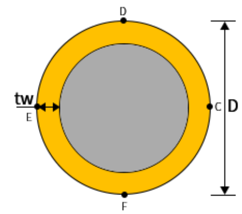
[Section Template]



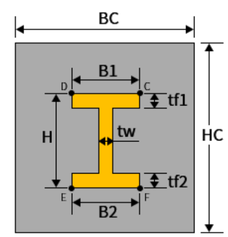
[Material Property]



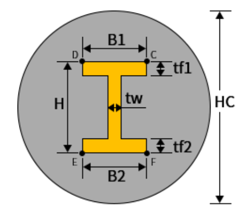
[SRC-Box]



[SRC-Pipe]



[Rect-HBeam]



[Circle-HBeam]

- Steel Data: Input the parameter of steel section or selecting the section from database.
- Concrete Data: Input the outer dimensions of section for steel concrete
- Material: Select the material for SRC or input the parameters. The parameters will be inputted automatically selecting the database from [Select Material from DB…].
- Es/Ec: Elastic ratio between steel and concrete
- Ds/Dc: Deadweight ratio between steel and concrete
- Ps: Poisson's ratio of steel
- Pc: Poisson's ratio of concrete
- Conv. Stiffness Factor: Stiffness reduction factor of concrete (default=1.0) for SRC section

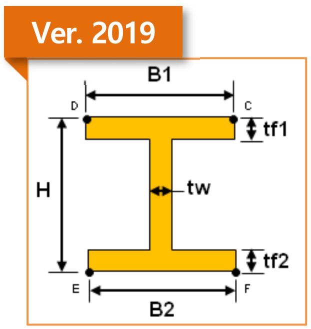
2. Pre/Post Processing

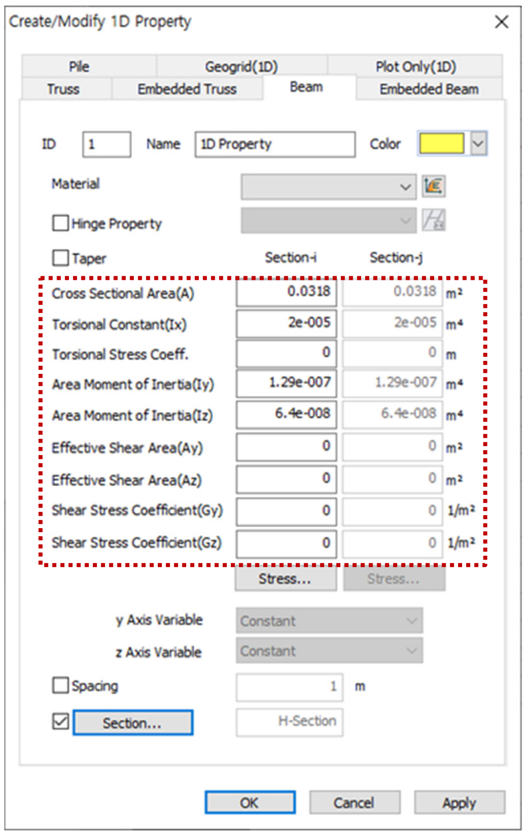
2.4 Automatically Calculation of H Section

- It is calculating the torsional stress coefficient, effective shear area and shear stress coefficient automatically from selecting the database of H section, r1/r2 can be inputted additionally.

- **Mesh > Prop.Csys/Func. > Property > Create > 1D > Beam > Section**

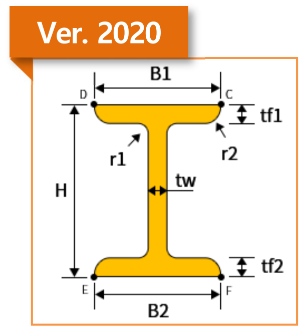
Ver. 2019

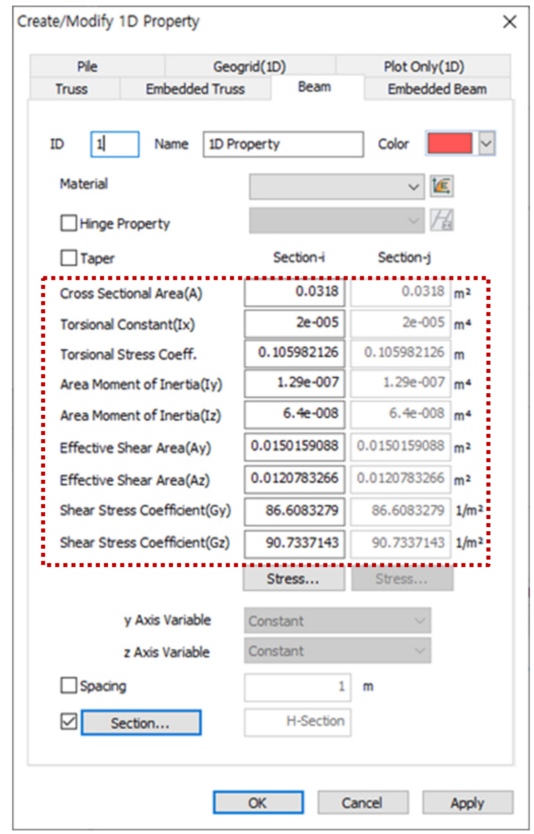




[H Section from GTS NX 2019]

Ver. 2020





[H Section from GTS NX 2020]

2. Pre/Post Processing

2.5 Control the Artificial Earthquake

- Random Seed can apply to get same artificial earthquake.

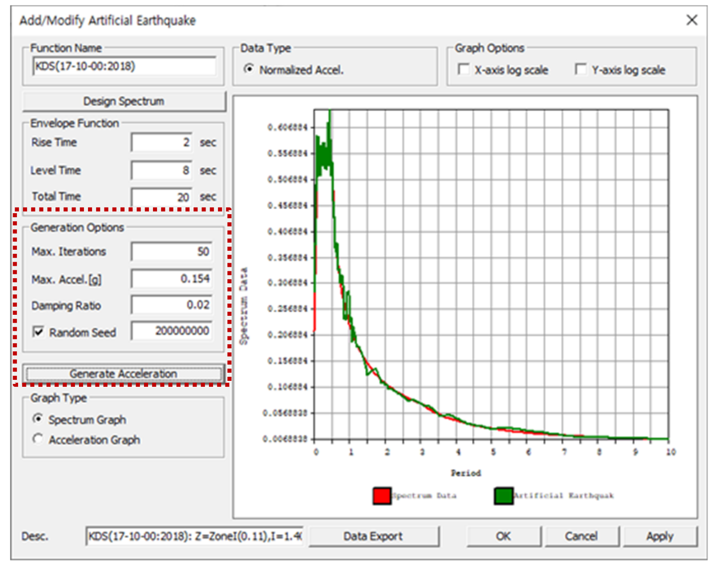
- **Dynamic Analysis > Tools > Artificial Earthquake**

Envelope Function: It will be calculated acceleration time history using below equation to make the acceleration time history equivalent response spectrum.

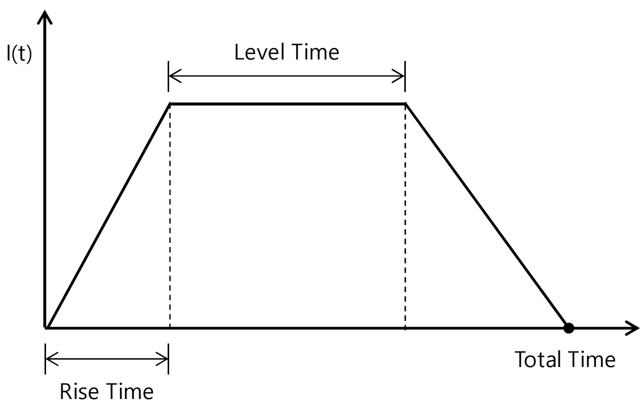
$$z(t) = I(t)\sum_{n=1}^{N} A_n \cos(\omega_n t + \phi_n)$$

ωn = Frequency, An = Amplitude, Φn = Phase Angle, I(t) = Envelope Fucntion

Envelope function will be multiplying to steady stage motion for transient of real seismic and this function can be divided to trapezoidal, compound and exponential. Acceleration time history will be almost same value from start to end without this envelope function.



[Add/Modify Artificial Earthquake]



[Envelope Funtion]

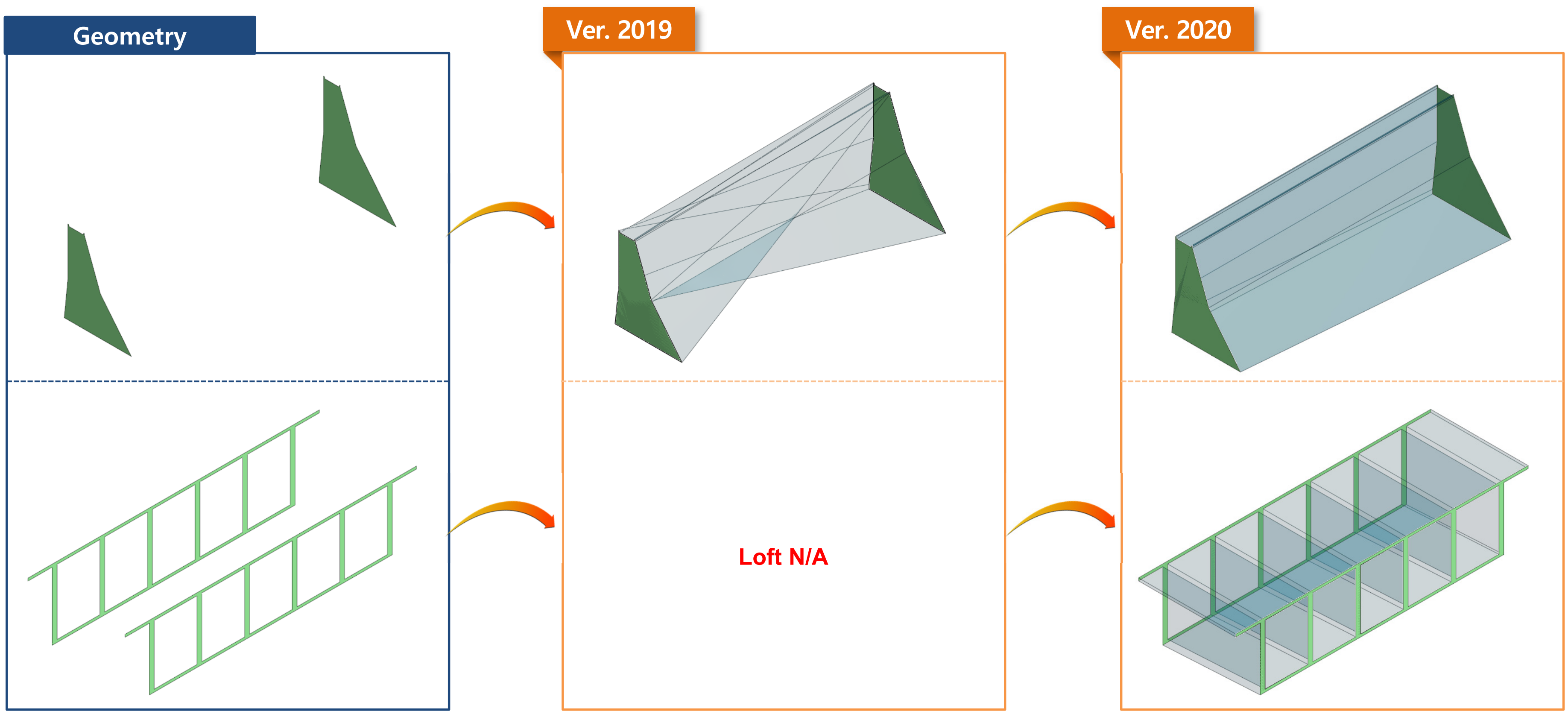
- Max. Iterations: The number of maximum iterations work to make the match between the result of response spectrum and imputed response spectrum of artificial earthquake.
- Max. Acceleration: To define the maximum earthquake acceleration of artificial earthquake.
- Damping Ratio: To define the damping ratio for calculating of response spectrum from artificial earthquake.
- Random Seed: To define the random seed for calculating the response spectrum from artificial earthquake(Artificial positive value).
- Generate Acceleration: To generate the acceleration data from response spectrum data.
- Spectrum Graph: To verify the data of acceleration based on spectrum data.
- Acceleration Graph: To verify the graph based on the acceleration data.

2. Pre/Post Processing

2.6 Improvement of Loft Function

- It has improved the loft function with new method. Loft function can use to section with hole.
- (Previous method: direct loft between models, Newer version: lofting with center between models)

- **Geometry > Protrude > Loft**

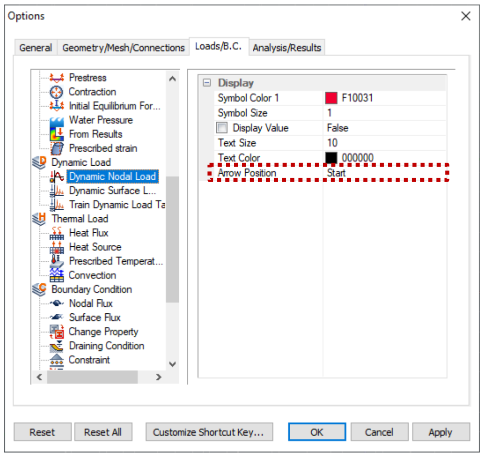


2. Pre/Post Processing

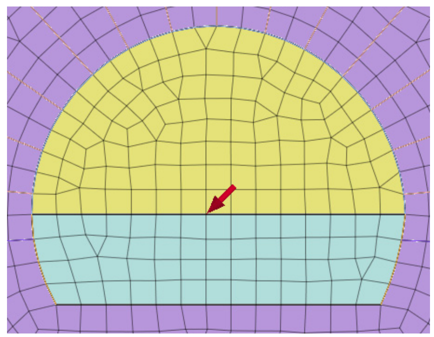
2.7 Label Location of Dynamic Nodal Load

- The location of arrow from dynamic nodal load can be controlled. It can select Start, Middle, End position.

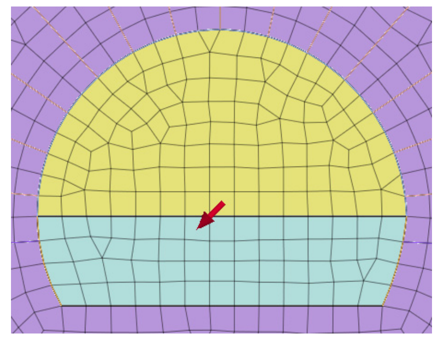
- **Tools > Options > Loads/B.C > Dynamic Nodal Load**



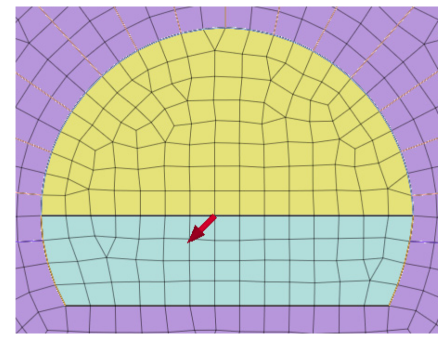
[Dynamic Nodal Load]



[Position: Start]



[Position: Middle]

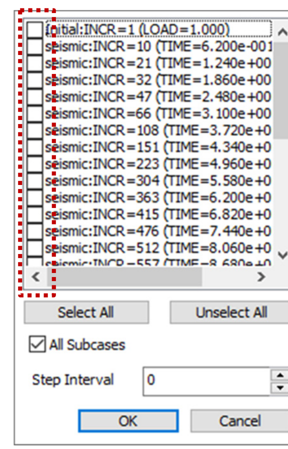


[Position: End]

2.8 Improvement of Stage Bar from Post

- If there are many subcase under post tree, the post function will work slowly so that it has improved.
- The subcase will check off as a default after analysis. It needs check on to see the stage result.

[Stage Bar]



[Subcase]

2. Pre/Post Processing

2.9 Improvement of Prescribe Strain(Volumetric Strain)

- Prescribe strain can be applying to linear static analysis, nonlinear static analysis, consolidation analysis and fully coupled analysis as well.
- There is no strain component of z direction so that it has eliminated.

2.10 Improvement of Applying LDF

- The error message has updated more correctly under stress-seepage analysis. The construction stage need to be constituted seepage analysis first under stress-seepage analysis. This stress-seepage analysis will be calculated pore pressure from seepage analysis to stress analysis.
- ex) step 1. Seepage or Stress > step 2. Stress(Deactivate mesh & LDF) > step 3. Seepage (about step 2) > Step 4. Stress ← Analysis N/A

> [Error] Cannot consider LDF in stress stage which has deactivated mesh followed by seepage analysis
> [Error] Failed to generate Construction Stage Data

- Step of LDF will be counted under stress stage only from stress-seepage analysis.

2.11 Words Amendment from Plastic Hardening Function

- Plastic Hardening Function and Frictional Angle Hardening Curve are similar so that it has unified.

1) Mesh > Prop./CSys./Func. > Function > Plastic Hardening Curve Deleted

2) Nonlinear tab from MMC model > Friction Angle at shear > Hardening Function > Name has changed from Plastic Hardening Function to Frictional Angle Hardening Curve.

3) Hardening Curve's table: Plastic Strain -> Equivalent Plastic Strain

2.12 The Output of 2D Equivalent Linear Analysis

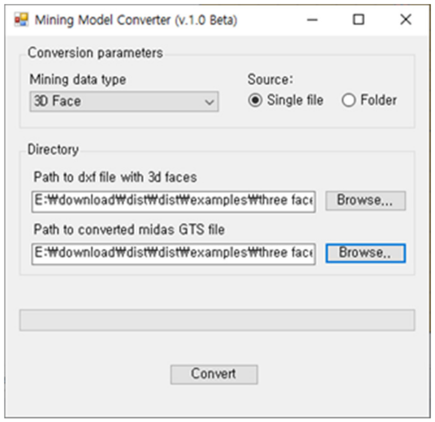
- In case of 1 from all output step and step will be provided the history graph without considering Intermediate output of time step from the 2D equivalent linear analysis
- History graph contains interval of step and time under selecting the frequency of history output probes.

2. Pre/Post Processing

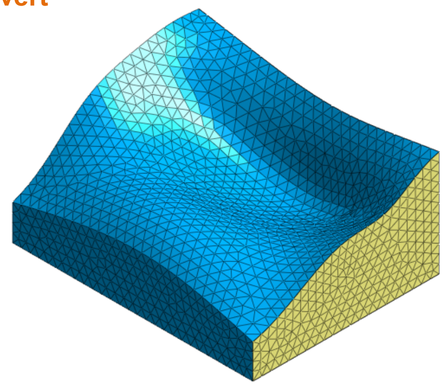
2.13 Mining Model Converter

- DataMine SW(MicroMine, Leapfrog, etc.) model file can be converting to GTS NX file.

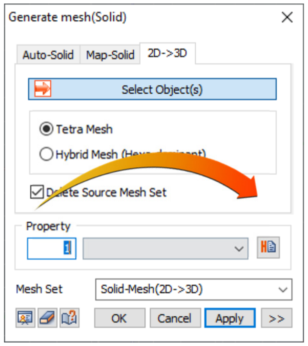
- **Main Menu > Import > Execute Mining Model Convert**

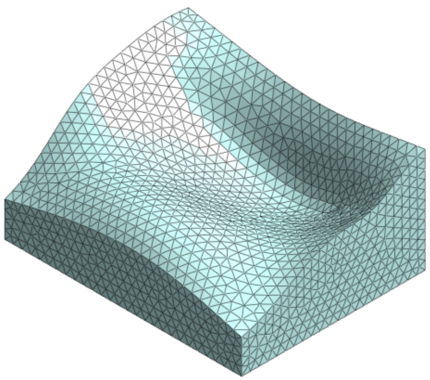


[3D Face]

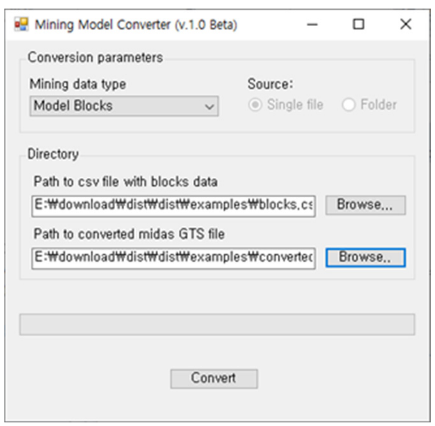


[3D Face Mesh]

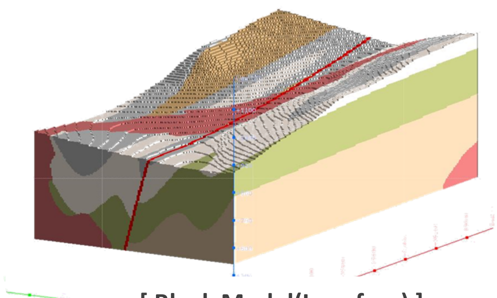




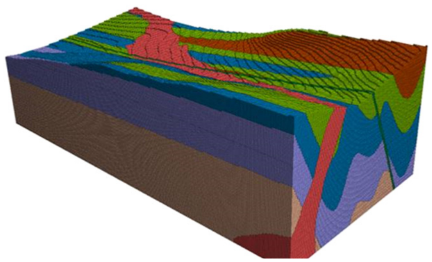
[3D Solid Mesh]



[Model Block]



[Block Model(Leapfrog)]



[Block Model(GTSNX)]

- Mining data type: Type can be selected from 3D Face and Model Blocks. 3D Face type can import dxf. file. Model Block type can import csv file.
- Directory: Directory for information of model file and define save folde.
- Convert: It is creating the GT NX file(fpn.) after converting. This converted file can be imported to GTS NX from Main Menu > Import > GTSNX Neutral Format.