

The background of the slide features a complex network of interconnected nodes and lines, resembling a molecular or digital mesh. The nodes are small circles, and the lines are thin, creating a web-like structure. The color gradient transitions from a vibrant green on the left to a warm orange and red on the right.

GTS NX

New eXperience of Geo-Technical analysis System

Slope Stability Check

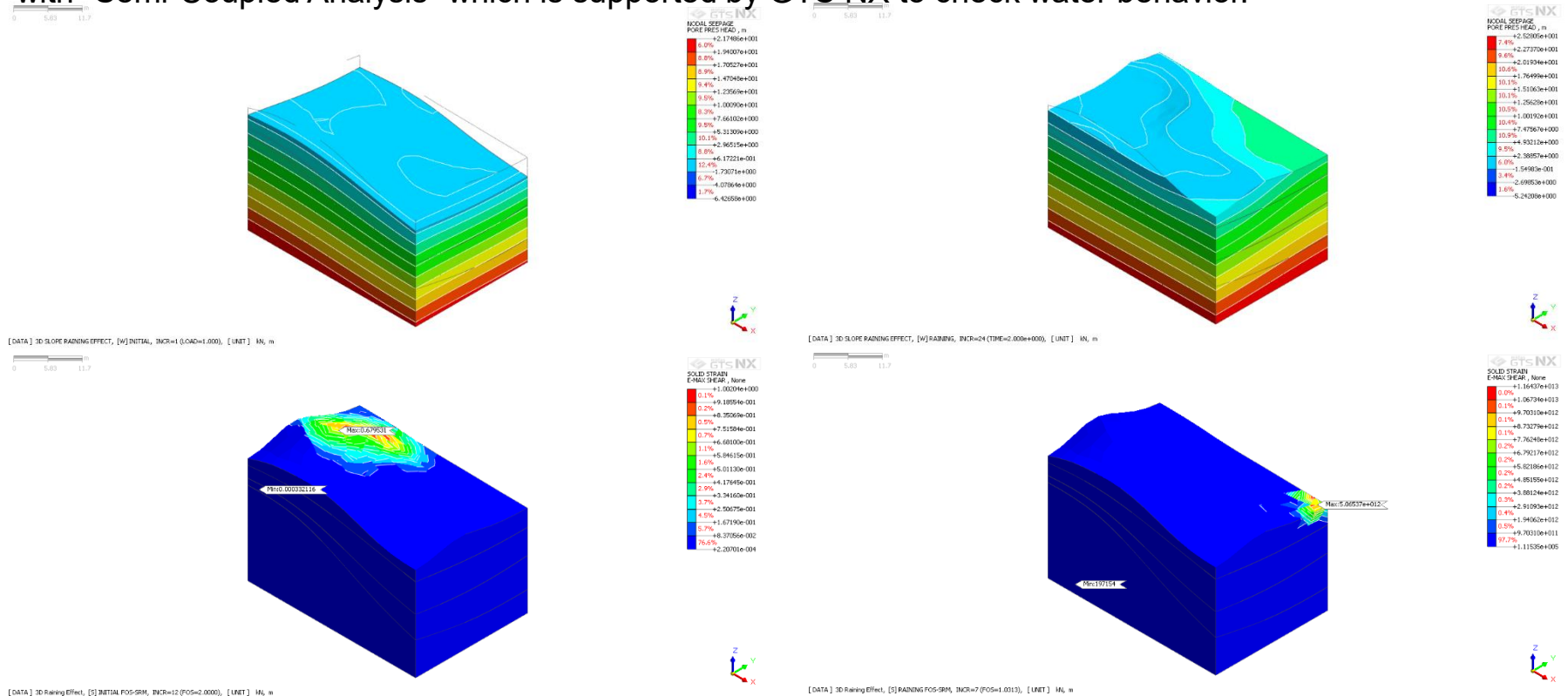
Basic Course Session 2

MIDAS

Modeling and Analysis Summary

The model is consisted of slope on the ground surface and water level below first of soil layer.

Tutorial is aiming on performing the analysis to check F.O.S considering raining effect and see the water level increasement using transient function to define the duration of raining. This tutorial will be carried out with “Semi-Coupled Analysis” which is supported by GTS NX to check water behavior.



Ground

[unit : kN, m]

Name	Fill	SVI	SV	SIV
Material	Isotropic	Isotropic	Isotropic	Isotropic
Model Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
General				
Elastic Modulus (E) [kN/m ²]	10,000	16,666	83,333	250,000
Poisson's Ratio (v)	0.3	0.3	0.3	0.3
Unit Weight (γ) [kN/m ³]	17	20	21	22
Ko	0.5	0.7	0.7	0.7
Porous				
Unit Weight (Saturated) [kN/m ³]	18	21	22	23
Drainage Parameters	Drained	Drained	Drained	Drained
Non-Linear				
Cohesion (c) [kN/m ²]	1	1	5	15
Frictional Angle (Φ) [deg]	30	30	32	34

The background of the slide features a complex network of interconnected nodes and lines, resembling a mesh or a molecular structure. The nodes are small dark circles, and the lines are thin, light-colored. The overall color scheme transitions from a vibrant green on the left to a warm orange and red on the right, with a yellowish center. The network pattern is more dense on the left and becomes sparser towards the right.

GTS NX

New eXperience of Geo-Technical analysis System

Define Analysis Stage

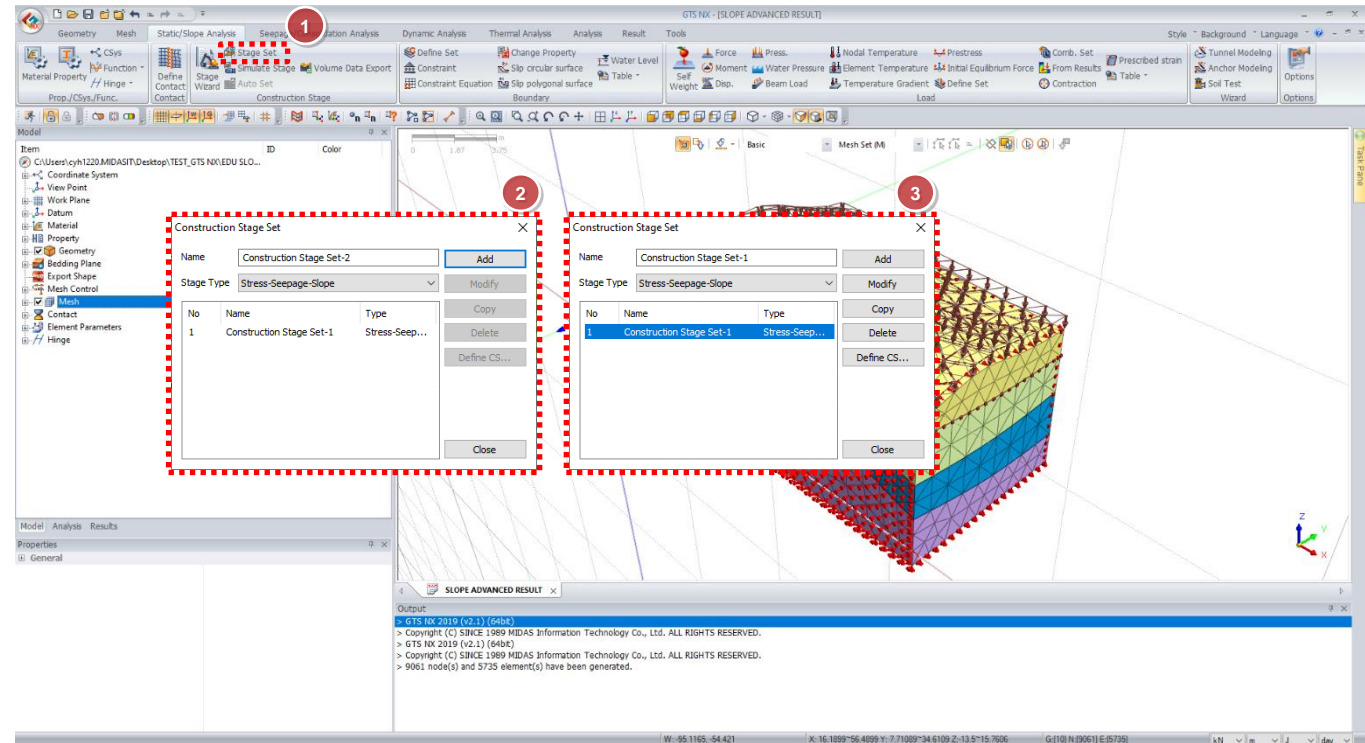
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07 Define Analysis Stage

Define stage type

Procedure

- 1 Click "Stage Set"
- 2 Stage Type
"Stress-Seepage-Slope"
Click "Add"
- 3 Select created stage set
Click "Define CS..."



07 Define Analysis Stage

Initial Stage

Procedure

Stage Name "[W] INITIAL"
Stage Type "Steady-State"

<Activate>

Every mesh set of ground
BC
INITIAL

<Deactivate>

-

Click "Save"

Click "New"

Define Construction Stage

Construction Stage Set Name: Construction Stage Set-1

Stage ID: 1: INITIAL Move to Previous Move to Next

Stage Name: [W] INITIAL New Insert Delete

Stage Type: Steady-State

Set Data	Activated Data	Deactivated Data
<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">Auto-Mesh(3D)Auto-Mesh(3D)-1Auto-Mesh(3D)-2Auto-Mesh(3D)-3Default Mesh SetBoundary Condition<ul style="list-style-type: none">BCINITIALRAININGContact	<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">Auto-Mesh(3D)Auto-Mesh(3D)-1Auto-Mesh(3D)-2Auto-Mesh(3D)-3Boundary Condition<ul style="list-style-type: none">BCINITIALContact	<ul style="list-style-type: none">MeshBoundary ConditionContact

Sort By: Name Show Data Activate

Save Close

07 Define Analysis Stage

Initial Stage

Procedure

Stage Name “[S] INITIAL FOS”
Stage Type “Stress”

<Activate>
SW

<Deactivate>
-

Check on “Slope Stability(SRM)”

Click “Save”

Click “New”

Define Construction Stage

Construction Stage Set Name: Construction Stage Set-1

Stage ID: 2: [S] INITIAL FOS Move to Previous Move to Next

Stage Name: [S] INITIAL FOS New Insert Delete

Stage Type: Stress

Set Data	Activated Data	Deactivated Data
<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">Auto-Mesh(3D)Auto-Mesh(3D)-1Auto-Mesh(3D)-2Auto-Mesh(3D)-3Default Mesh SetBoundary Condition<ul style="list-style-type: none">BCINITIALRAININGStatic Load<ul style="list-style-type: none">Static LoadSW<ul style="list-style-type: none">SWContact<ul style="list-style-type: none">Contact	<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">MeshBoundary Condition<ul style="list-style-type: none">Boundary ConditionStatic Load<ul style="list-style-type: none">Static LoadSW<ul style="list-style-type: none">SWContact<ul style="list-style-type: none">Contact	<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">MeshBoundary Condition<ul style="list-style-type: none">Boundary ConditionStatic Load<ul style="list-style-type: none">Static LoadContact<ul style="list-style-type: none">Contact

Sort By: Name Show Data Activate

Save Close

☐ Analysis Control...
☐ Output Control...
☐ LDF...
☐ Clear Displacement
☒ Slope Stability(SRM)

07 Define Analysis Stage

Initial Stage

Procedure

Stage Name "[W] RAINING"
Stage Type "Steady-State"

<Activate>
RAINING

<Deactivate>
INITIAL

- 1 Click "Time Step"
Duration: 2 day
Step Number: 24
Check on "Save Result"
Click "Generate Step"
Click "OK"

Click "Save"

Click "New"

Define Construction Stage

Construction Stage Set Name: Construction Stage Set-1

Stage ID: 3: [W] RAINING Move to Previous Move to Next

Stage Name: [W] RAINING New In **1** Delete

Stage Type: Transient Time Step...

Set Data

- Mesh
 - Auto-Mesh(3D)
 - Auto-Mesh(3D)-1
 - Auto-Mesh(3D)-2
 - Auto-Mesh(3D)-3
 - Default Mesh Set
- Boundary Condition
 - BC
 - INITIAL
 - RAINING
- Contact

Activated Data

- Mesh
- Boundary Condition
 - RAINING
- Contact

Deactivated Data

- Mesh
- Boundary Condition
 - INITIAL
- Contact

Sort By: Name Show Data Activate

Save Close

Time Step

Duration: 2 day

☒ User Defined Step

☐ User

Time: 0 day (Example: 1, 3, 7, 14)

☒ Step

Step Number: 24

☒ Save Result ☐ Log Scale

Generate Step

Step	Time (day)	Save Step
1	0.0833	<input checked="" type="checkbox"/>
2	0.1667	<input checked="" type="checkbox"/>
3	0.2500	<input checked="" type="checkbox"/>
4	0.3333	<input checked="" type="checkbox"/>
5	0.4167	<input checked="" type="checkbox"/>
6	0.5000	<input checked="" type="checkbox"/>
7	0.5833	<input checked="" type="checkbox"/>
8	0.6667	<input checked="" type="checkbox"/>

☐ Auto Time Step

Initial Time Step

☒ Auto 0 day

Max. Pore Pressure Changes per Step: 1 kN/m²

Ratio of Max Time Step to Initial: 5

Save Step: Last Increment

OK Close

07 Define Analysis Stage

Initial Stage

Procedure

Stage Name "[W] RAINING FOS"
Stage Type "Stress"

<Activate>

-

<Deactivate>

-

Check on "Slope Stability(SRM)"

Click "Save"

Click "Close"

Define Construction Stage

Construction Stage Set Name: Construction Stage Set-1

Stage ID: 4: [S] RAINING FOS Move to Previous Move to Next

Stage Name: [S] RAINING FOS New Insert Delete

Stage Type: Stress

Set Data	Activated Data	Deactivated Data
<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">Auto-Mesh(3D)Auto-Mesh(3D)-1Auto-Mesh(3D)-2Auto-Mesh(3D)-3Default Mesh SetBoundary Condition<ul style="list-style-type: none">BCINITIALRAININGStatic Load<ul style="list-style-type: none">Static LoadSW<ul style="list-style-type: none">SWContact<ul style="list-style-type: none">Contact	<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">MeshBoundary Condition<ul style="list-style-type: none">Boundary ConditionStatic Load<ul style="list-style-type: none">Static LoadContact<ul style="list-style-type: none">Contact	<ul style="list-style-type: none">Mesh<ul style="list-style-type: none">MeshBoundary Condition<ul style="list-style-type: none">Boundary ConditionStatic Load<ul style="list-style-type: none">Static LoadContact<ul style="list-style-type: none">Contact

Sort By: Name Show Data Activate

Save Close

☐ Analysis Control...
☐ Output Control...
☐ LDF...
☐ Clear Displacement
☒ Slope Stability(SRM)

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New eXperience of Geo-Technical analysis System

Analysis Case

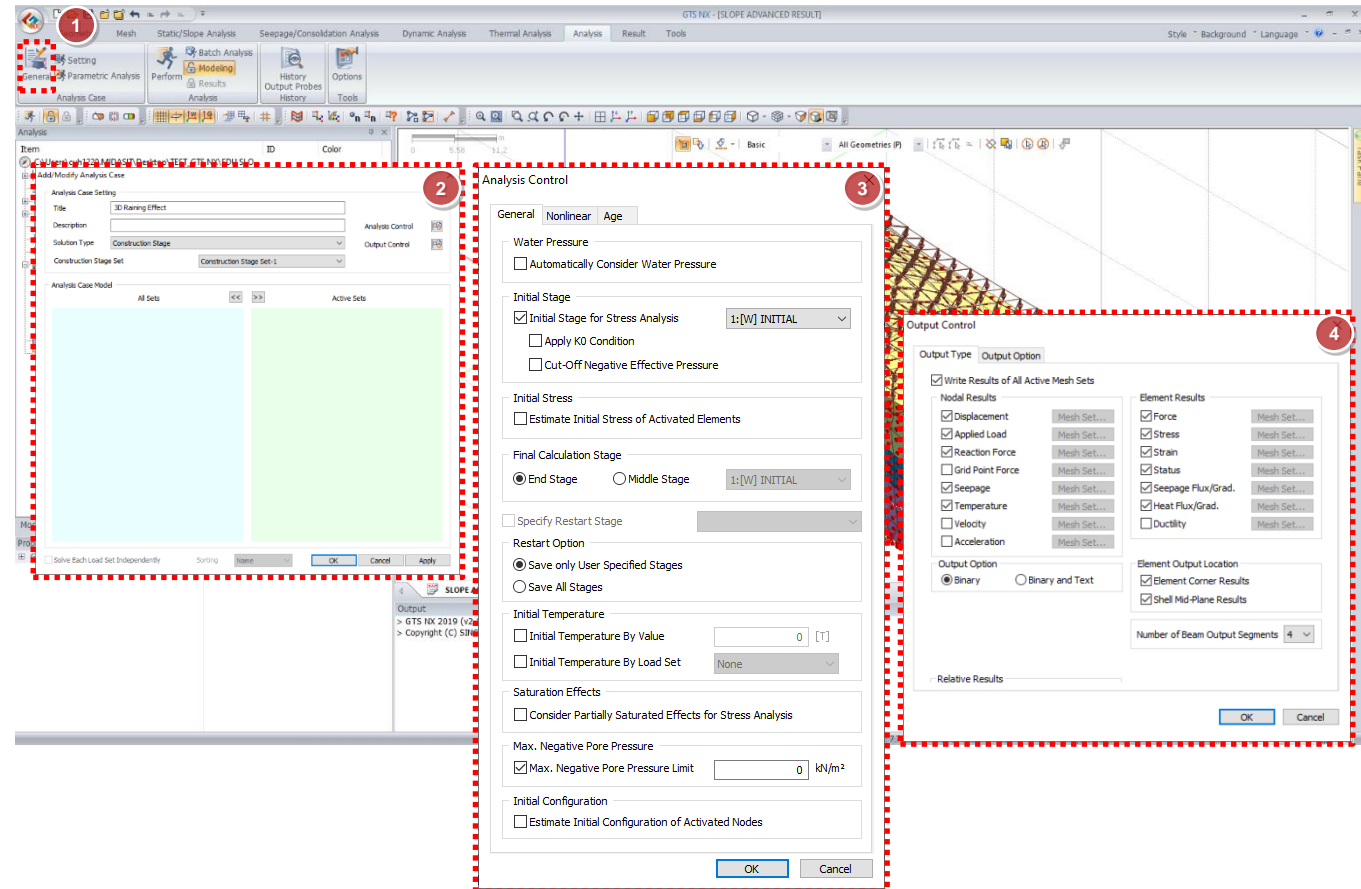
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08 Analysis Case

Define stage type

Procedure

- 1 Click "General"
 - 2 Title: 3D Raining Effect
Construction Stage Set:
Construction Stage Set-1
Click "Analysis Control"
 - 3 General tab
Check on "Initial Stage for..."
Click "OK"
 - 4 Click "Output Control"
Check on "Strain"
Click "OK"
- Click "OK"

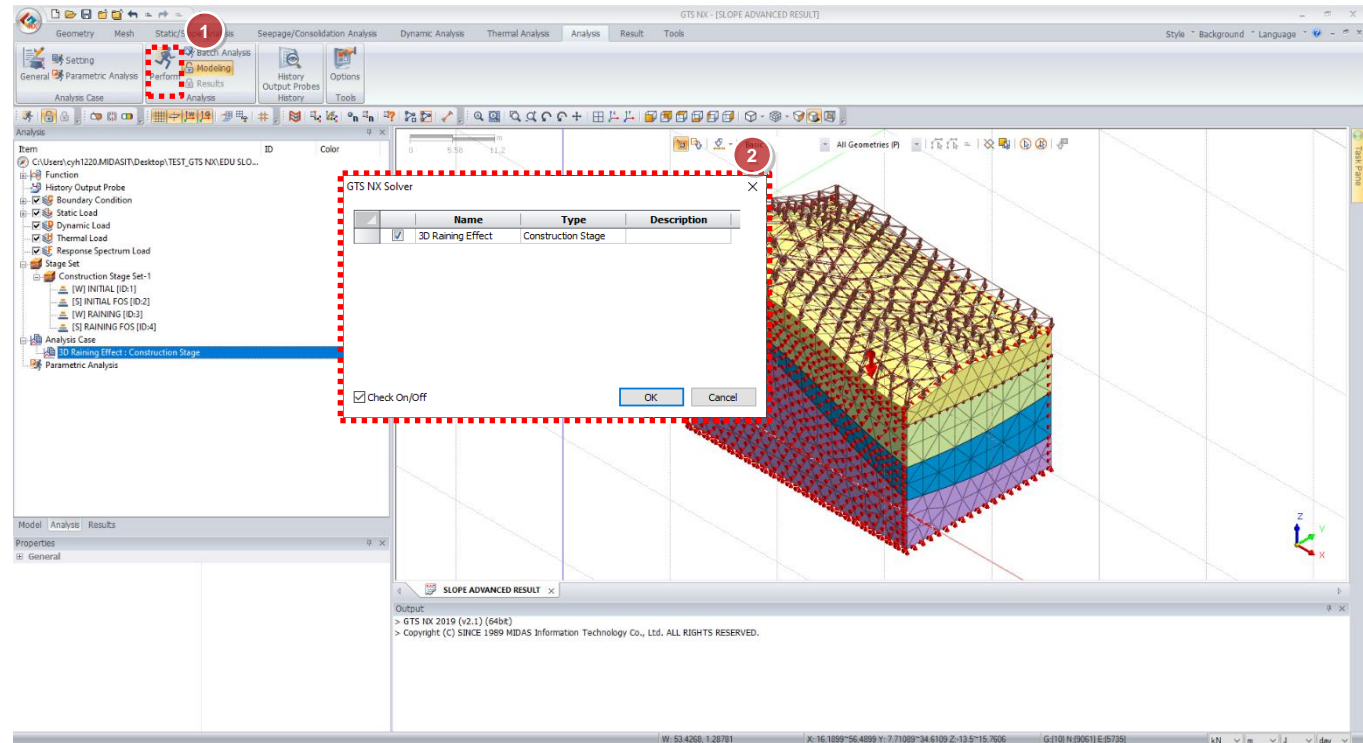


08 Analysis Case

Perform the analysis

Procedure

- 1 Click "Perform"
- 2 Check on 3D Raining Effect
Click "OK"



The background of the slide features a complex network of thin, dark lines connecting numerous small, dark circular nodes. This network is overlaid on a color gradient that transitions from a light green on the left to a bright yellow in the center, and finally to a deep orange-red on the right. The overall effect is a sense of interconnectedness and digital technology.

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New eXperience of Geo-Technical analysis System

Result Checking

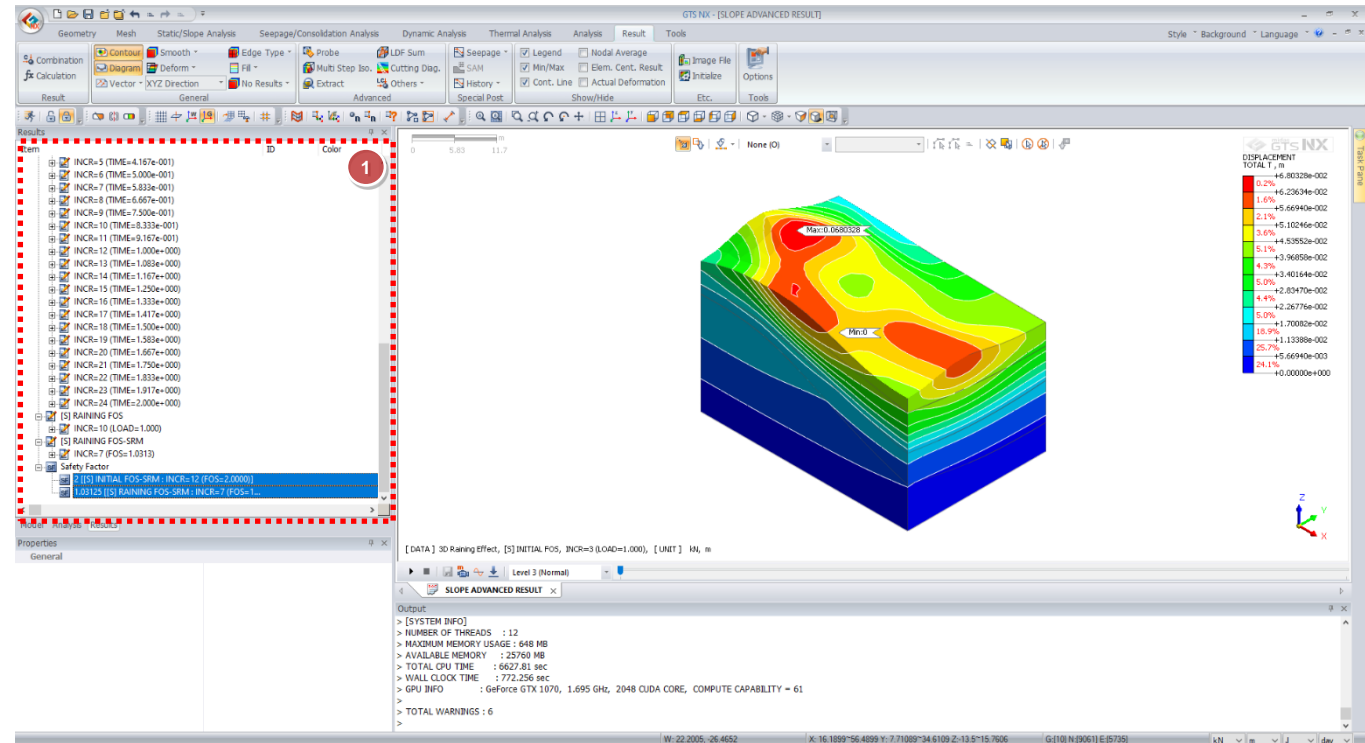
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09 Result Checking

F.O.S. (Factor of Safety) considering raining effect

Procedure

- 1 You can check factor of safety from results window.

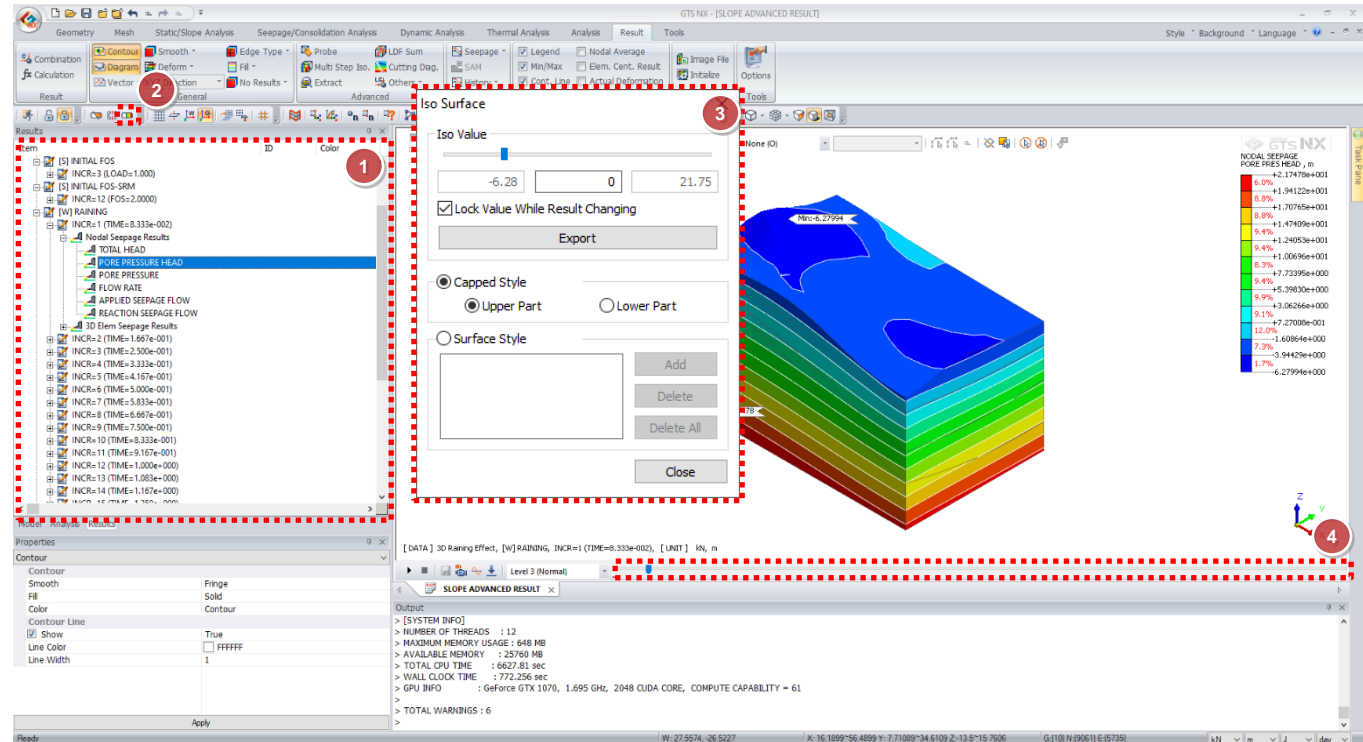


09 Result Checking

Water level increasement

Procedure

- 1 Select "pore pressure head" from any seepage analysis step.
- 2 Click "Iso Value Surface"
- 3 "0" value on the middle
Check on "Lock Value..."
- 4 Move to other stage using stage bar and check water level.

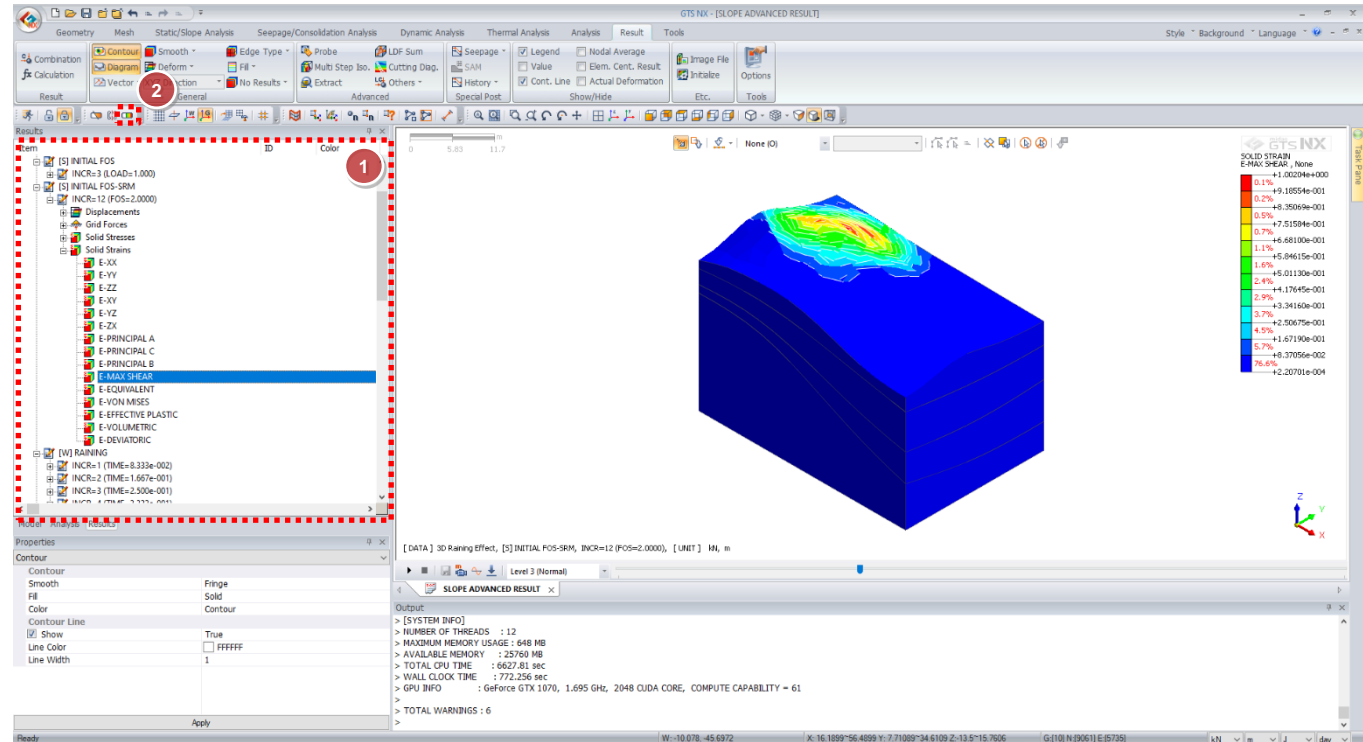


09 Result Checking

Water level increasement

Procedure

- 1 Select "E-MAX SHEAR" from Solid Strains tree to see the failure condition under SRM stage.



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GTS NX

New eXperience of Geo-Technical analysis System

Thank you!

The MIDAS logo is located in the bottom right corner. It consists of the word "MIDAS" in a bold, white, sans-serif font. Above the letters "I" and "D" is a white, stylized arc that resembles a bridge or a structural element, which is part of the company's branding.

MIDAS