FEA NX Webinar Series

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Crack Analysis of RC Piers

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3. Analysis
4. Experiment and Comparison
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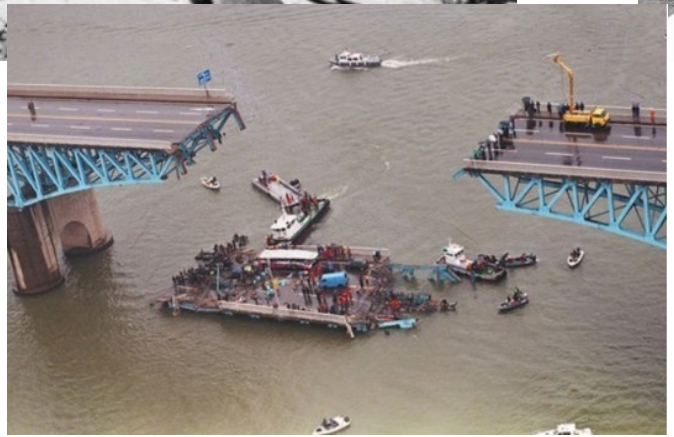
Typical Engineering Problems

Typical Engineering Problems



Modeling- Tendon and Reinforcement

1) **Tendon**

1D-Tendon element,

define prestressing parameters and directly add the stiffness of the steel bars to the parent element without manually considering node coupling.

2) **Reinforcement**

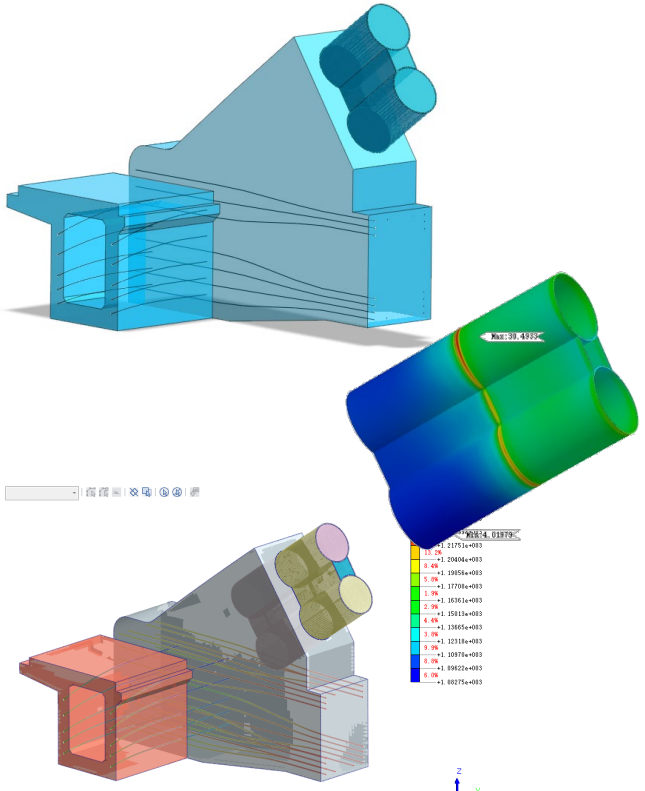
Embedded Truss element,

directly add the stiffness of steel bars to the parent element without manually considering node coupling.

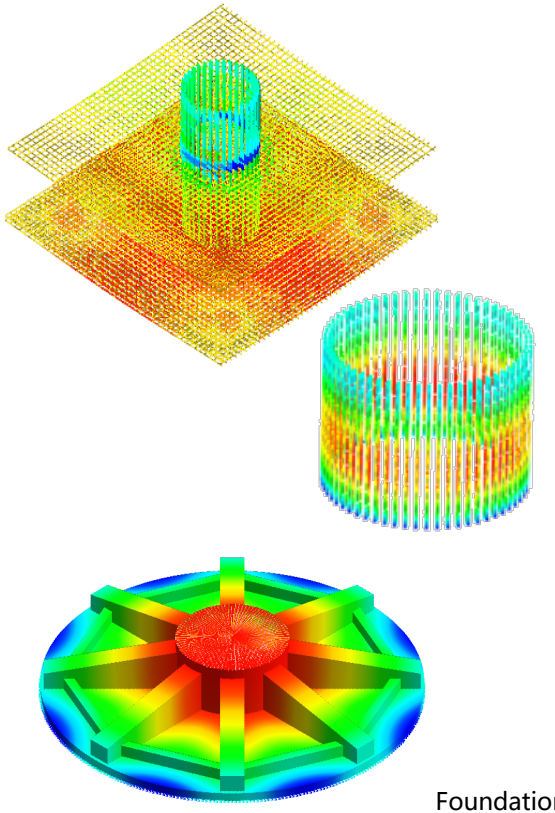
3) **Reinforcement**

Truss element,

manual consideration of node coupling is required, and interface elements can be added to consider the bond slip between steel bars and concrete.

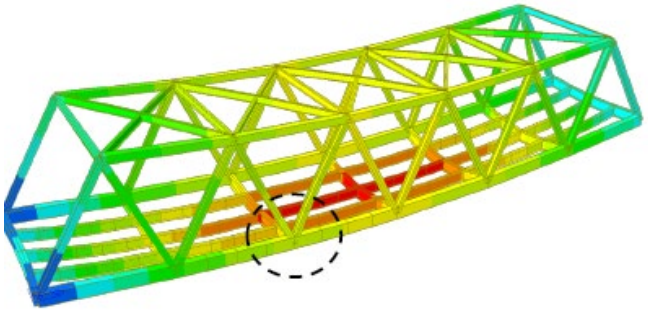


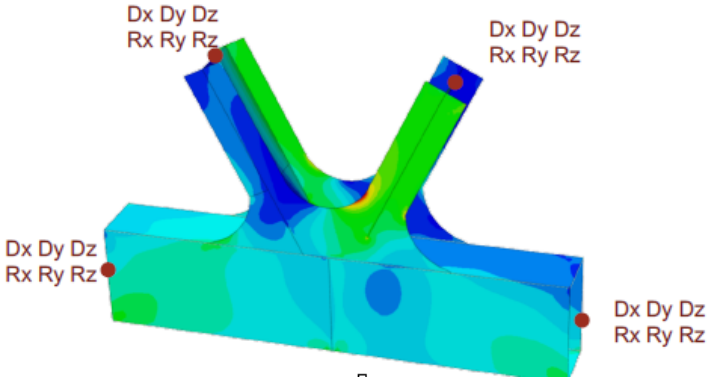
Arch footing



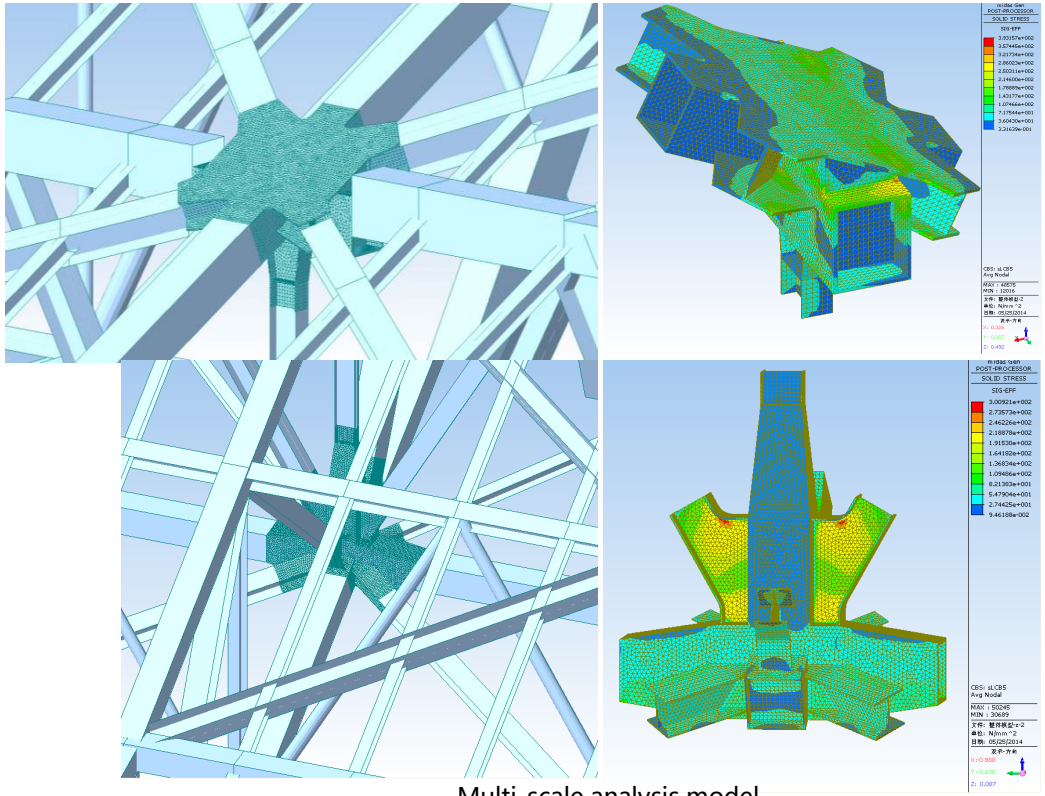
Foundation

Multi-scale Analysis



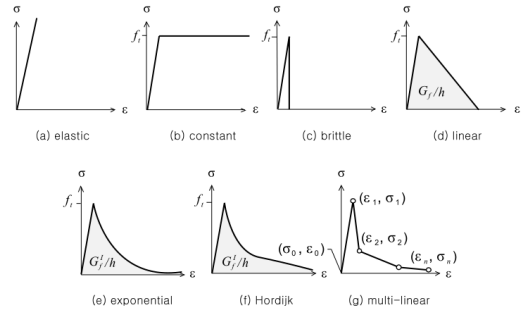


Local zone analysis model

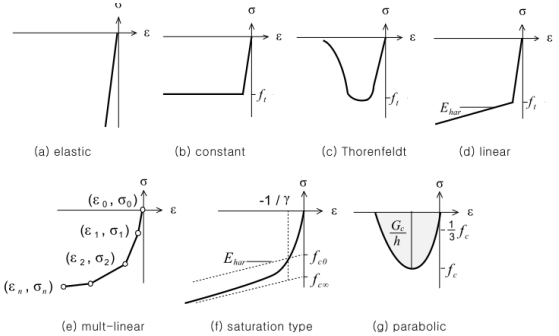


Multi-scale analysis model

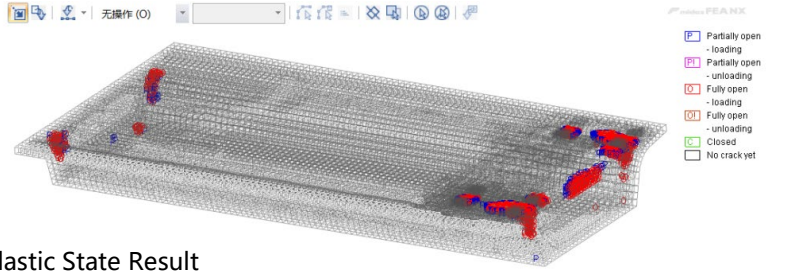
Non-linear Crack Analysis



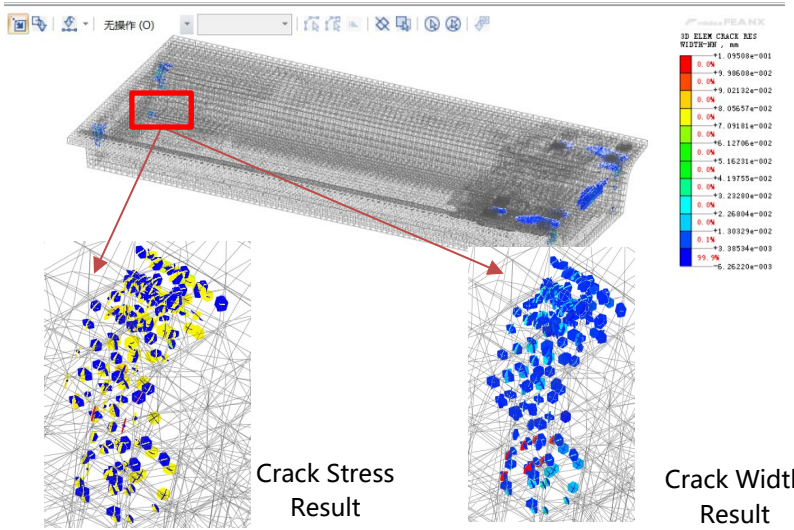
Tension Function



Compression Function



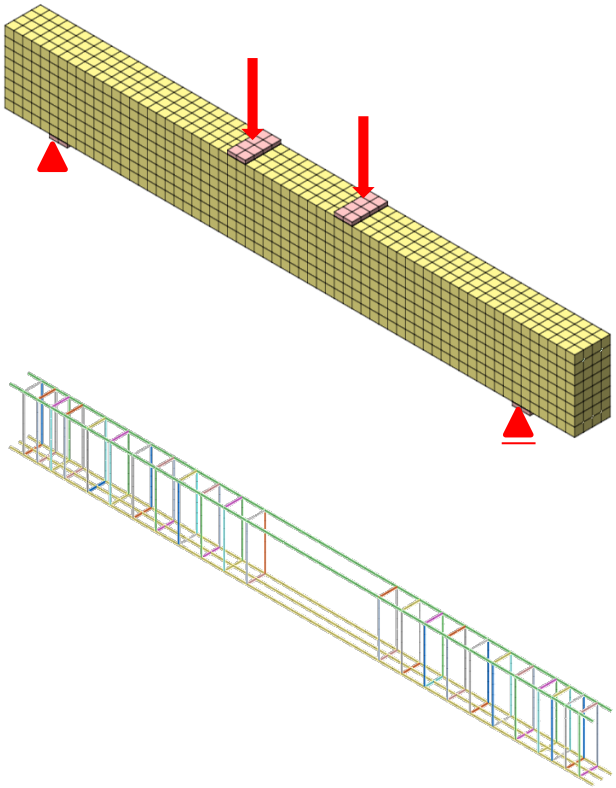
Plastic State Result



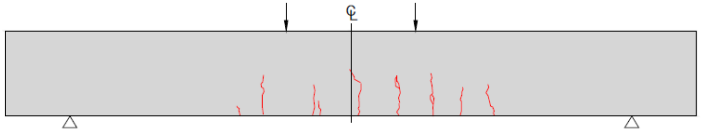
Crack Stress Result

Crack Width Result

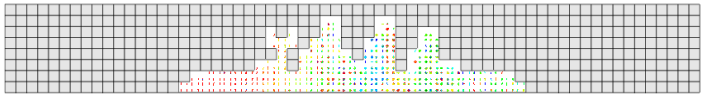
Cases and Comparison



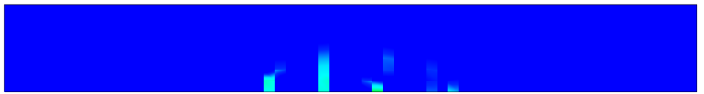
- Load 60kN



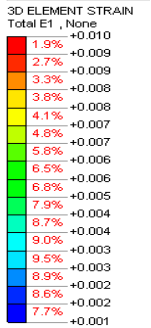
▲Crack diagram from experiment



▲Crack result from FEA NX

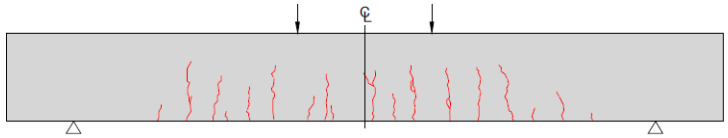


▲Major principal strain diagram

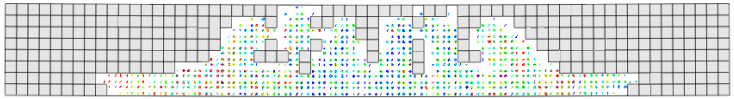


Experiment & FEA NX

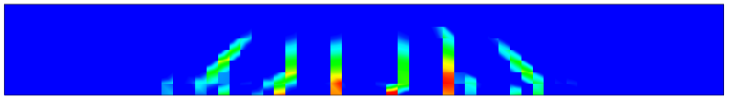
- Load 120kN



▲Crack diagram from experiment

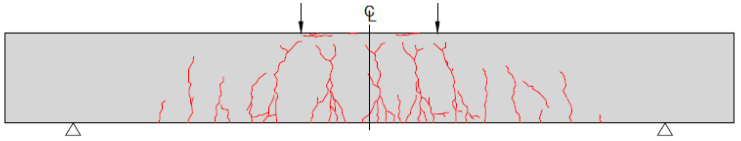


▲Crack result from FEA NX

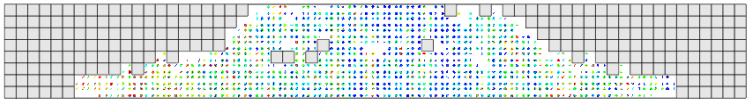


▲Major principal strain diagram

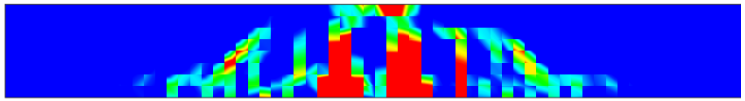
- Load 170kN



▲Crack diagram from experiment

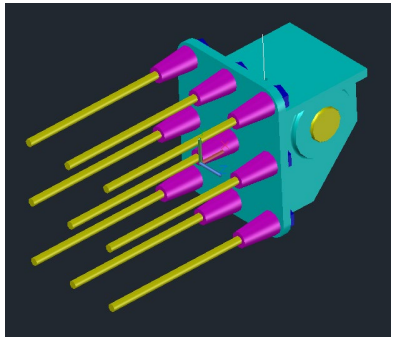


▲Crack result from FEA NX

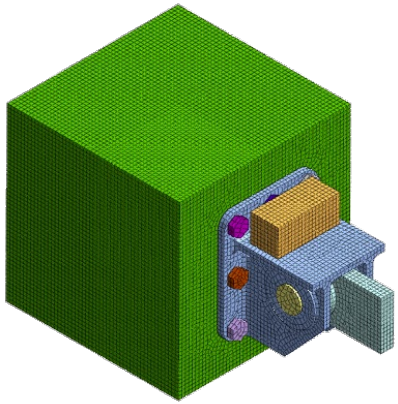


▲Major principal strain diagram

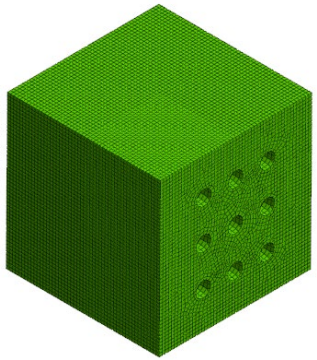
Analysis of embedment



Drawing

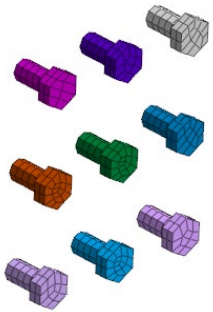


Geometry & Mesh

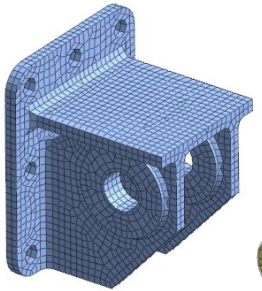


Concrete

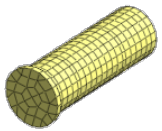
Steel Bar



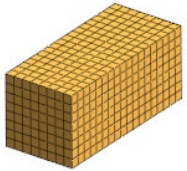
Bolt

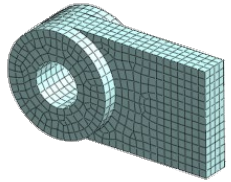


Steel Plate



Pin





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Demonstration

THANK YOU

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