

Patch Release Note

Release Date : Feb. 26, 2021

Product Ver. : Civil 2021 (v1.2)



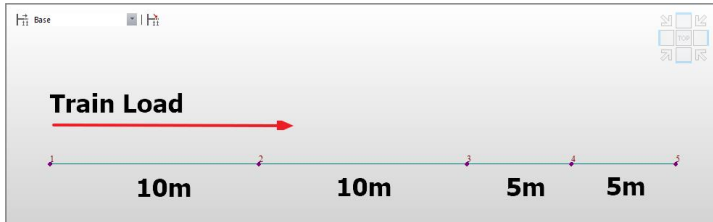
DESIGN OF CIVIL STRUCTURES

Integrated Solution System for Bridge and Civil Engineering

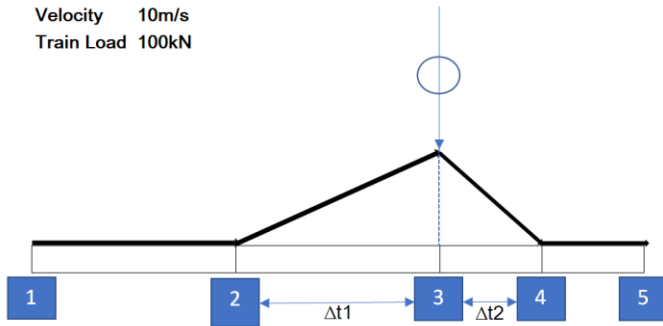
1. [Civil] Automatic Generation of Moving Train Loads

- Time-history function is modified for the nodes which have different distances before and after the node.
- The function is also modified for the first node and the last node.

▪ **Load > Dynamic Loads > Train Load Generator**



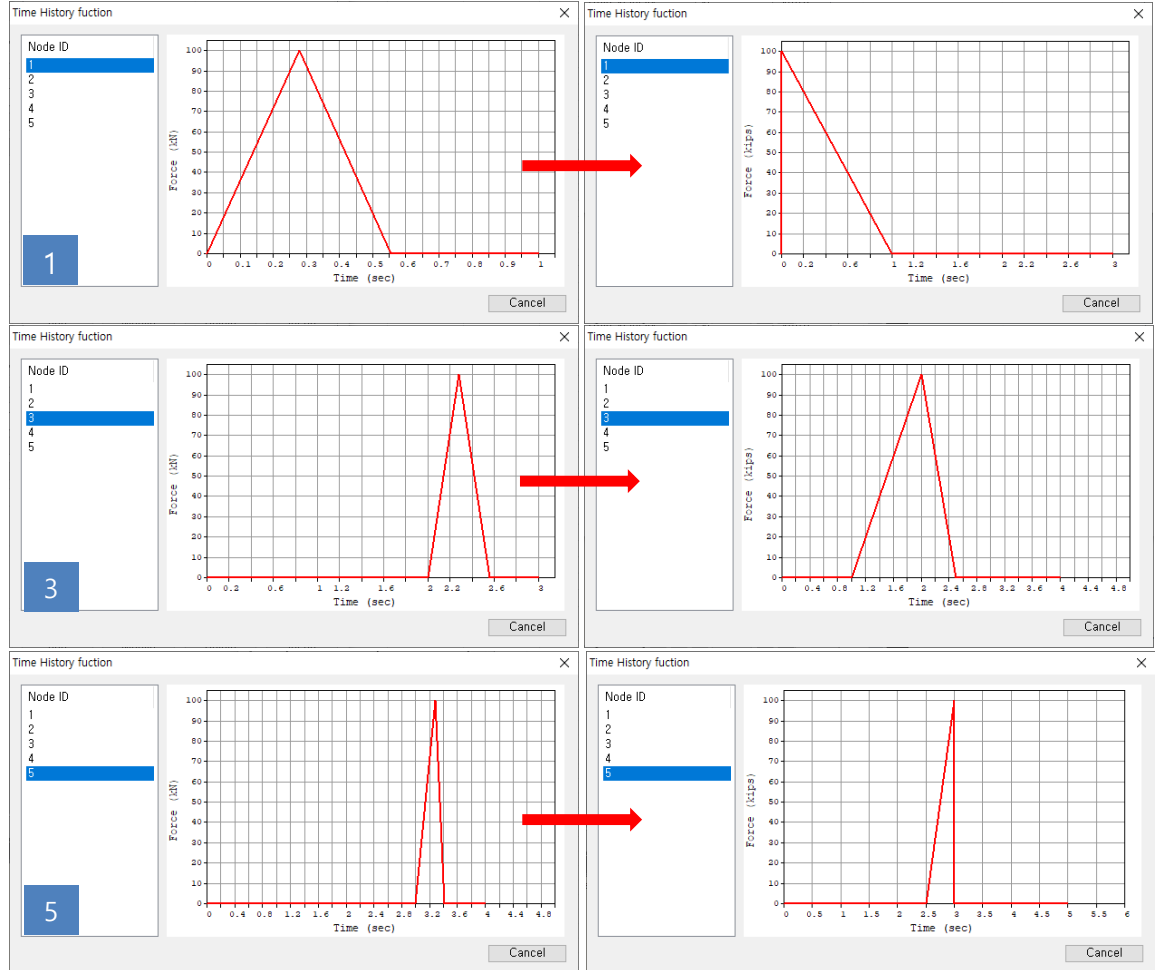
Velocity 10m/s
Train Load 100kN



$\Delta t1 = (\text{distance between node 2 to 3}) / (\text{velocity})$

$\Delta t2 = (\text{distance between node 3 to 4}) / (\text{velocity})$

Generation of time-history function



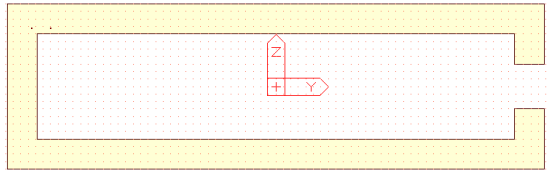
Civil 2021 v1.1

Civil 2021 v1.2

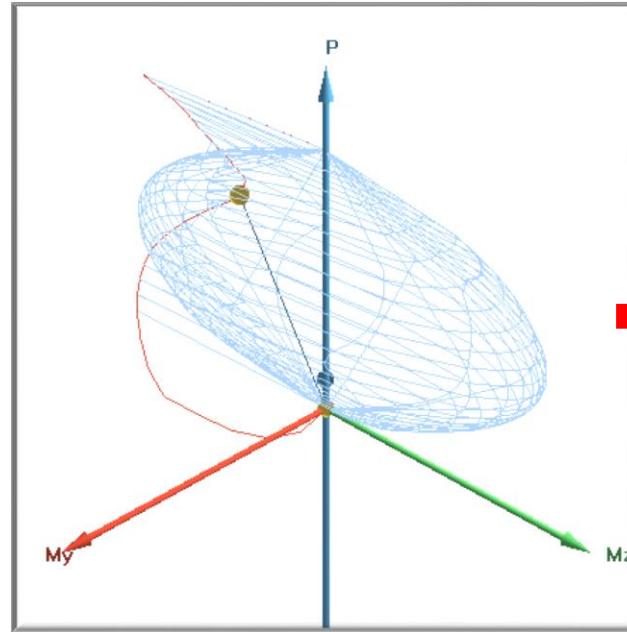
2. [GSD] 3D P-M Curve bug fix

- The program has fixed 3D P-M Curve and ratio that generated incorrely for the section below.

GSD > Interaction Curve > 3D P-M Curve and ratio

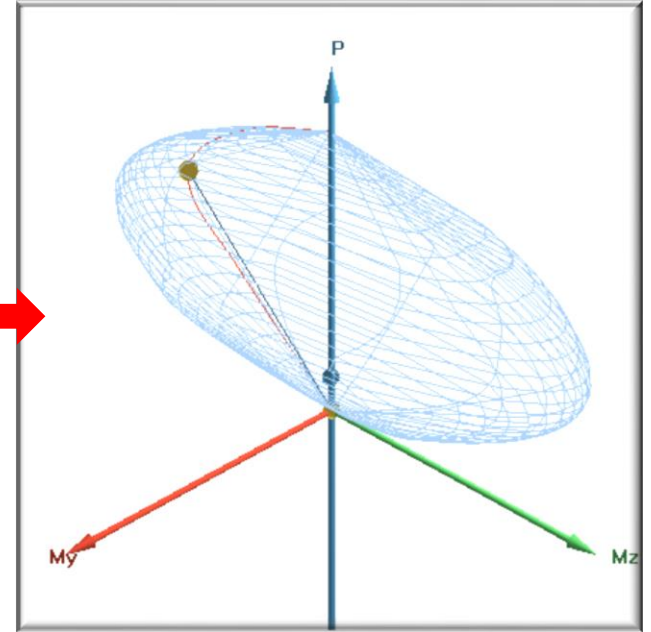


General Section



Load Combination Name	Ratio
	P-My/Mz
LC1	0.125

Civil 2021 v1.1



Load Combination Name	Ratio
	P-My/Mz
LC1	0.118

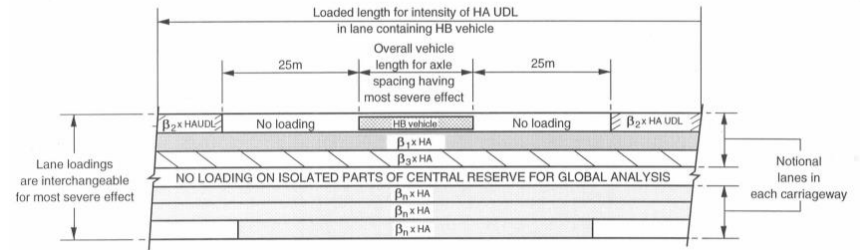
Civil 2021 v1.2

3. Bug fix lists

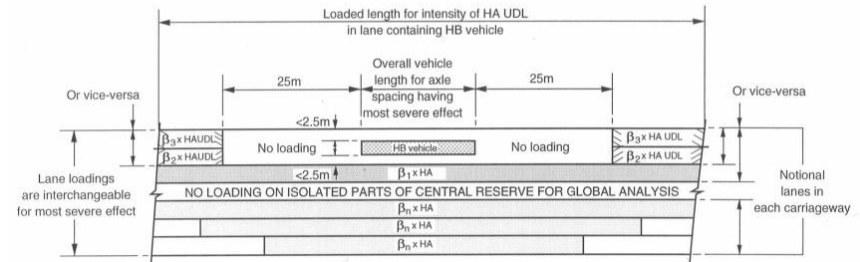
1. [Moving Load Analysis to BS]

- The program does not give the critical vehicle position for the maximum shear force of a beam element when both SOV-350 special vehicle and ALL model 2 are applied. This is happening when the bridge length is relatively short compared to the length of special vehicle.
- For the combined application of HB & HA vehicles, the code requires three cases (1), (2)-a, (2)-b to be checked in order to find a worst case. But, there was a problem that the case (1) is always included by the program regardless of the lane width. In this model, the lane width (2.5m) is less than the HB vehicle width (3m) and thus case (1) should not be included.

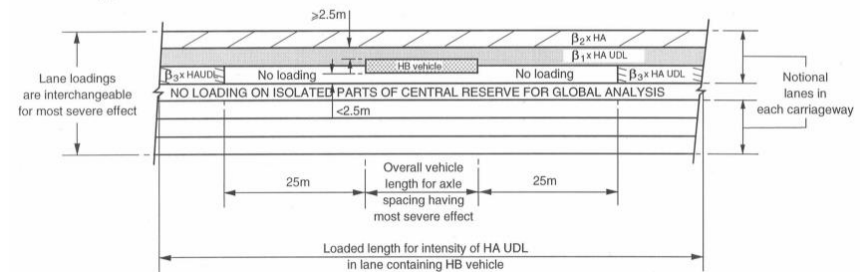
(1) HB vehicle within one notional lane



(2) HB vehicle straddling two notional lanes
(a)



(b)



3. Bug fix lists

2. [Moving load analysis to Australia]
 - When HLP-400 is applied, an error message came up because the sum of lane width of the two lanes ($3.2+3.2 = 6.4$ m) is less than minimum requirement which is set as two times the vehicle width ($2 \times 4 = 8$ m). However, it should work as it is. It is fixed so that the sum of the lane widths of two lanes should be larger than the width of HLP-400 vehicle.
3. [Analysis error in CEB FIP 2010] Relaxation loss results in composite general section are too high, and thus the tendon stresses are all zero
4. [Beam Stress (PSC)] The Beam Stress (PSC) for the moving load case has an error. Unlike the Beam Stress menu, the Beam Stress (PSC) menu calculate stresses using the concurrent forces. The concurrent forces are incorrect when Max/Min results of concurrent forces are close to zero.
5. [Steel Design to AASHTO LRFD 17]
 - For the I sections, there are some differences with the design report.
 1. Flexural strength about major axis:
 - The check ratio in the table is wrong.
 - The value of ' $f_{bu} + 1/3 f_l$ ' is wrong.
 2. Check Interaction of Combined Strength: The calculation of the combined ratio is wrong.
 3. In the comparison between Text and Graphical report, moment resistance about major axis does not match.
6. [Steel Composite Design to AASHTO] The program has an error to find the most critical load combination for the lateral torsional buckling check.
7. [Plate Beam (1D) Design to Eurocode] Design forces are not matching with plate forces for the moving load case when 'Average Nodal' is selected.
8. [PSC Design to AS 5100-5] The stress of unbonded tendon at the ultimate limit state is wrong.
9. [PSC Design & RC Design to Eurocode] The program is fixed so that $\alpha_{cc}=0.85$ is applied for shear design if Italy NA is selected.
10. [Time History Result Animation] Force Animation has an error to make the animation.
11. [Steel Composite Girder Bridge Wizard] When moving load data is defined for AASHTO, the model is not generated with an error message about centrifugal force.
12. [RS Function to IRC:SP:114-2018] When R value is 1, I value is always considered as 1 instead of the user-defined value. When R value is other than 1, I value is considered correctly.