Tērauda rāmju darbības modelēšana elastīgā un plastiskā stadijā

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ANALYSIS OF BASE FIXED STEEL FRAME BY PLASTIC METHOD

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Dimensionējot elementus elastīgā darba stadijā statiski nenoteicamu tērauda portālrāmju nestspējas kapacitāte netiek pilnībā izmantota. Šajā pētījumā prezentēta tērauda elementu darbības analīze plastiskā stadijā, kas dod iespēju samazināt materiāla patēriņu par 4-10%.

Pētījumā analizētie iespējamie rāmja darbības modeļi plastiskajam šarnīram veidojoties rīģeļa laiduma vidū vai dzegas mezglos

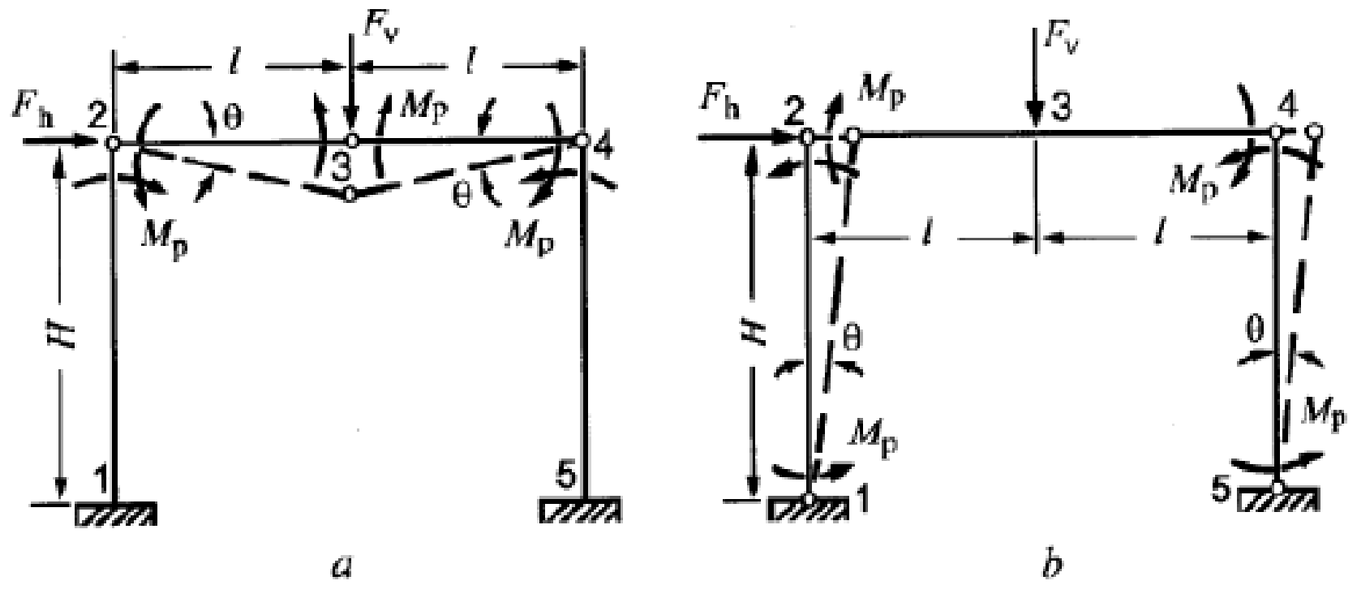

Figure 2. Mechanism method analysis: beam-type (*a*) and panel-type (*b*)

CONCLUSIONS

The investigation shows that the ultimate load of the base fixed rigid portal frame depends on the frame geometry and the combination of gravity and wind load. It is determined that for high frame and large lateral load, the load carrying capacity is established by the combined mechanism but in the case of the small lateral load by the beam-type mechanism. Depending on the height to span ratio either the mid span plastic hinge, or the two corner plastic hinges, form first.

By using FEM analysis it is determined that for the frame with $k = 1$ and $c_w = 0.6$ the load carrying capacity is established by the combined mechanism because after the formation of the plastic moments in three cross sections the redistribution of moments takes place. The structure remains stable until the base plastic hinge occurs that results in steel savings of 4-10%.

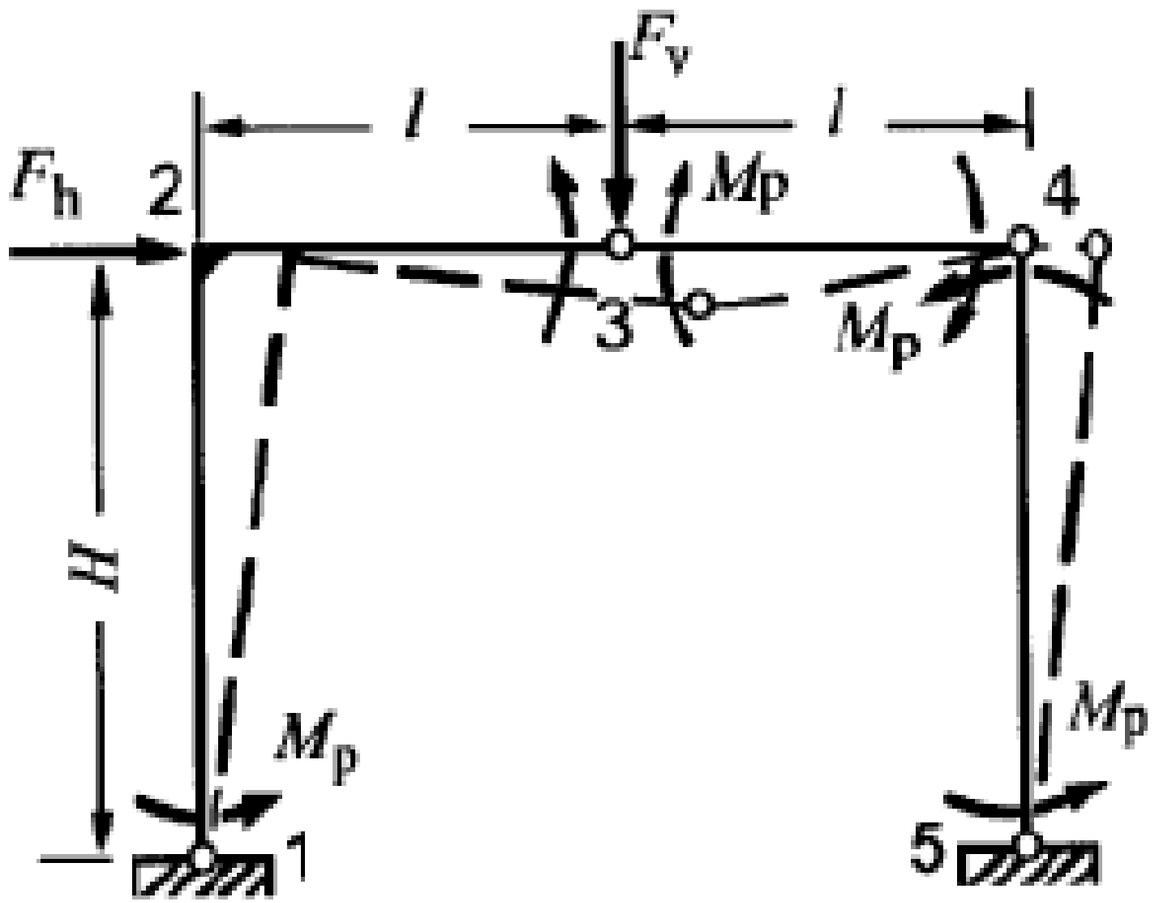

Figure 3. Combined mechanism