



## Coupled Study on Support Conformability and Overlying Structure of Fully Mechanized Face and Large Mining Height

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**Abstract:** Taking the 12401 fully mechanized face of Shangwan colliery in Inner Mongolia as research object, the hydraulic support working resistances during small and big periodic weighting of large mining height were deduced and calculated. Separation development of stope roof overburden was simulated by 3DEC, supporting intensity with subsided or horizontal displacement was studied by FLAC3D. Research showed that hydraulic support reasonable working resistances during small and big periodic weighting of large mining height were respective 10442KN and 17064KN. Roof overburden of large mining height was destroyed up to surface because main and inferior key strata were existed and broken. As long as supporting intensity was more than 1.2MPa, horizontal displacement of coal wall was gradually decreasing with increasing supporting intensity.

**Key words:** large mining height, small periodic weighting, big periodic weighting, stope overburden separation, coal rib spalling

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### References

- Chen, Y.M., Xu, D.P., 2013. FLAC/FLAC3D Foundation and Engineering Example (2nd Edition). *China Water Resources and Hydropower Publishing House*, Beijing.
- Feng, Q., Liu, W.W., Fu, S.G., et al., 2017. Analytical solution for deformation and internal force of hard roof in stope based on elastic foundation beam. *Journal of Mining and Safety Engineering*, 34(02):342–347.
- Qian, M.G., Shi, P.W., Xu, J.L., 2010. Ground pressure and strata control. *China University of Mining and Technology Press*, Xuzhou.
- Wang, H., Gao Y.T., Jin, A.B., et al., 2014. Determination of stiffness parameters of jointed rock masses with 3DEC simulations. *Chinese Journal of rock mechanics and engineering*, 33(S1):2894–2900.
- Yan, S.H., Yu, L., Liu Q.M., 2017. Formation and application of “combined short cantilever rock beams – articulated rock beams” in fully mechanized top-coal caving face. *China coal industry publishing house*, Beijing.

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