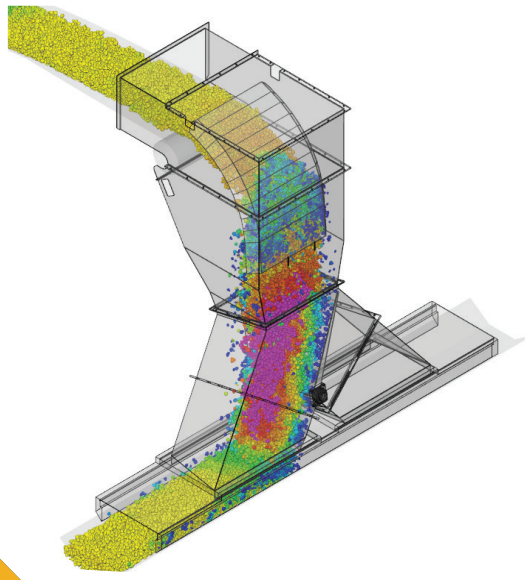
FRASER-LEVER
engineered advantage



CASE STUDY:

DISCRETE ELEMENT MODELLING (DEM)

Client:
Queensland Bulk Handling (QBH)

Location:
Port of Brisbane

Mineral Type:
Coal

Services Provided
- Mechanical Design
- Materials Handling
- DEM Analysis

Situation:

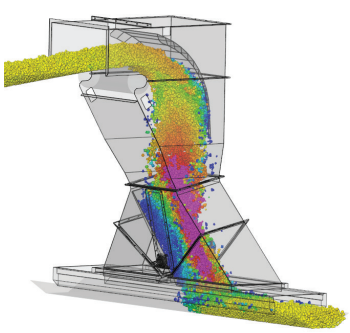
Lever was approached to design a replacement transfer chute to deliver material from a conveyor to a reversible receiving belt below.

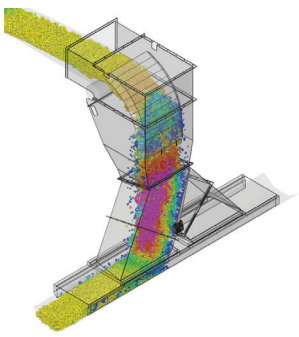
Challenge:

The existing transfer chute design consisted of a drop chute which dropped material, in free fall, directly on the receiving belt resulting in belt tracking and premature belt wear. To reduce maintenance costs, it was requested that the new chute be designed to better direct the flow of material to the receiving belt.

Solution:

Using classical hand calculations, Lever engineers developed a concept transfer chute model. The new chute was designed with a diverter gate to direct the material in the travel direction of the receiving belt. The performance of the chute was then analysed using discrete element modelling (DEM) to simulate an accurate flow of material through the concept chute and confidently progress to a more detailed design. By simulating "worst case" conditions using different material properties (i.e. coefficient of friction, coefficient of restitution, etc.), Lever engineers were able to identify any regions where material flow might stagnate, or sub-optimal material trajectories might occur and modify the chute geometry accordingly.





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