Pascua Lama, Argentina

Jack up of a roof section for the stockpile building

Data project sheet

Project:	Jack up of a roof section for the stockpile building of 105mx67m per section (1st of 3)
Project location:	Pascua Lama at the Chilean, Argentine border in the Andes mountains
Equipment:	Four Mega Jack Towers 5x2.5 meters, with 20.000t capacity in total, 22 jacking beams high, jacking height 30 meters in total, eight 200t strand jacks, ten 90t hydraulic skid shoes
Challenges:	4200m altitude, low air pressure of 0.6 bar, temperature between -40°C +30 °C, wind speeds up to 150km/h, earth quake area
Weights:	1,500t per section

ALE-NL-210-I887-Pascua Lama-Megajack

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New building method

ALE was contracted by Fluor Techint, to jack up roof sections for the stock pile building in the Pascua Lama mine at the Chilean Argentina border in the Andes mountain range. Since the stockpile roof is at 4200 meters altitude, environmental conditions are harsh. The traditional way of building, is to raise these buildings girder by girder.

Fluor Techint came up with an innovative idea. All girders were pre-assembled into 40 ton heavy truss section near San Juan in the valley at normal altitude and normal environmental conditions. These pre-assembled truss sections were transported up to the mine. In the mine the complete roof is assembled at a low elevation on temporary building supports. After the assembly is complete, the complete roof sections, 3 in total, are jacked up, one by one, creating one big building of 90 by 210 meters.

Figure 1.
Mine location.

Figure 2.
Example of a stockpile building

Figure 3.
Complete truss sections are transported to the mine

Complexity of the job

The complete roof is build at temporary supports. The connection of the main girder and side girders is pinned. After completion of the assembling works the complete construction will be jacked up. After the jack up, this connection is fastened by bolts. At the lower position of the side girders the connection is pinned.

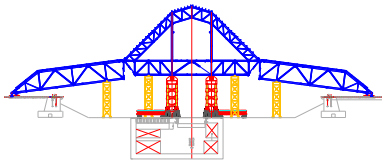

Figure 4. Before the jack up. The roof is assembly at temporary supports.

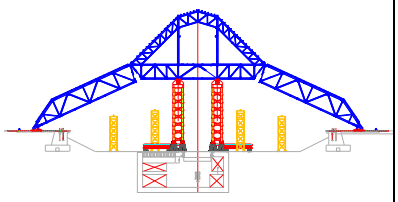

Figure 5. During the jack up. The side girders move inwards.

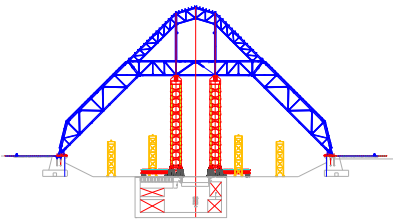

Figure 6. Roof after the jack up. The connections are fixated.

Due to the pinned construction the end of the side girders is supported by the hydraulic skidding system at 5 positions at each side. During the jack up the side girders are supported by the skidding system. The skidding system allows the side girders to move inwards.

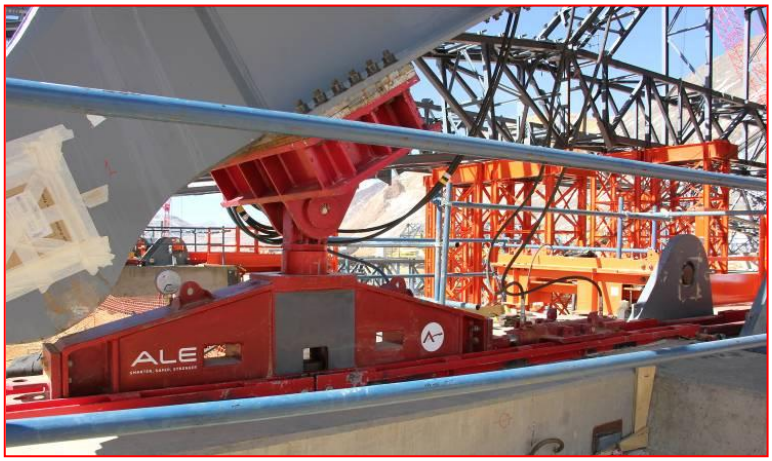

Figure 7.
ALE's 90t hydraulic skidding system.

Figure 8.
The support at the outside of the side girder. At the concrete skid lane, skid tracks will be installed. The hole is used to make the connection of the roof in its final position with the foundation

Because of the location of the mine, wind speeds can build up to speeds of 150 km/hr. In combination with a relatively light roof with a large area, additional precautions had to be taken. At each side of the stockpile building four 200 ton strand jacks are installed cross wise, to withstand the forces that could occur when wind would pick up. When the roof is jacked up to the required height, the strand jacks were tensioned.

Figure 9.
A side view of the hydraulic skid, at the skid lane in action.

Figure 10.
The strand connection with the starter beams.

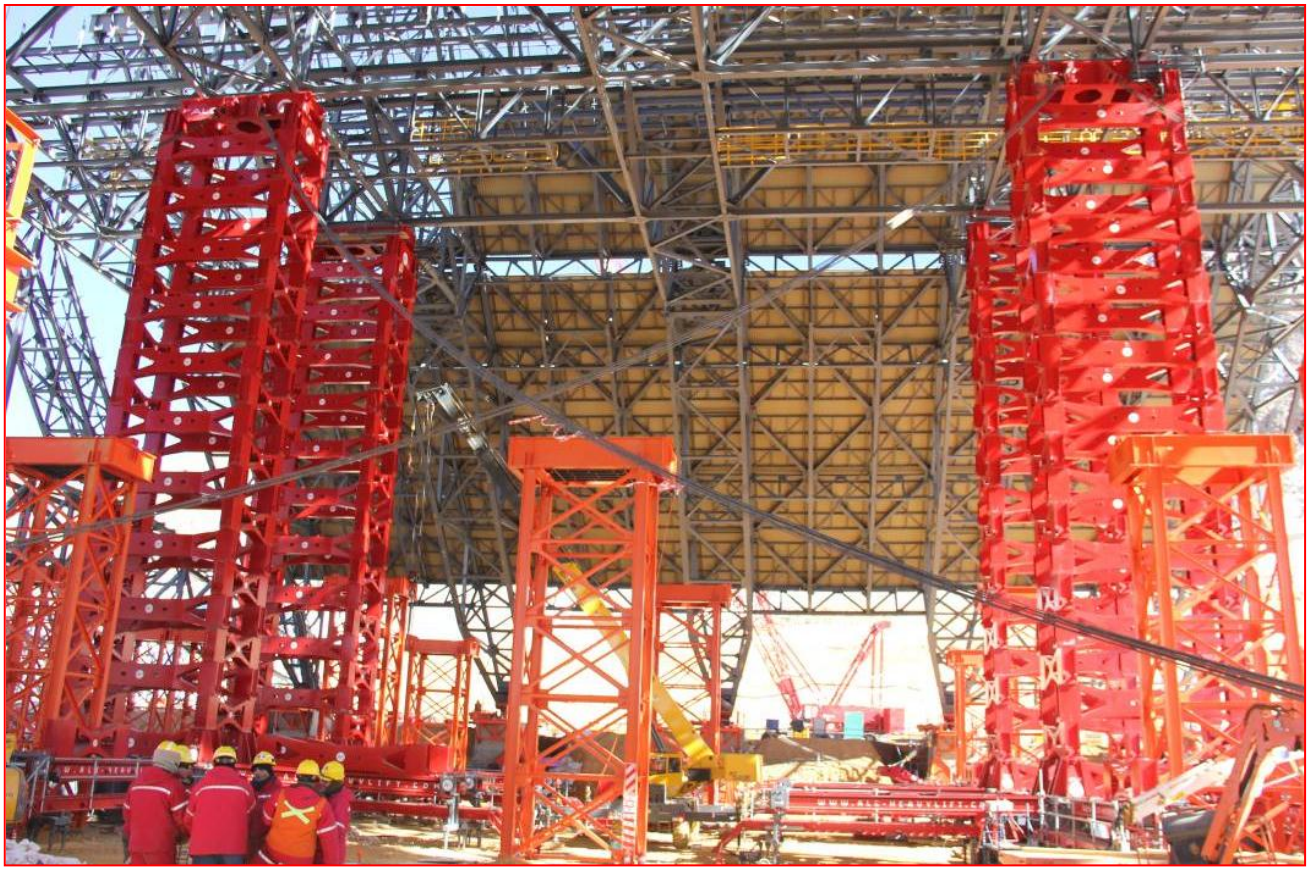

Figure 11.
In the middle the strands are visible, that take up the horizontal loads. As can be seen, they cross in the centre.

The jack up operation

After picking up the load, the total jack up operation, which consisted out of 22 layers of beams, was carried out in less than 6 hours. The skidding system, moved neatly inwards. The strand jack system was partially tensioned with some slack during jack up. The complete operation was carried out perfectly, the client was satisfied.

Figure 12.
Operator in action.

Figure 13.
Mega Jack towers at the final elevation of 30m high.

Figure 14.
The ALE crew in front of the just jacked up stockpile building roof.

Figure 15. The jacked up roof from the opposite direction.

Figure 16.
The stockpile building from a distance in final position.