

Paste backfill solution

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WEBSITE:

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**PROJECTS WITHIN PROJECTS**

From the beginning, Three Sisters Development Corporation engaged Golder Paste Technology, a subsidiary of Golder Associates, to deal with the engineering, environmental and site design issues. The envisioned project was complex – mine mitigation and soil stabilization had to be done prior to any infrastructure development. With a commitment to being environmentally responsible, the solution had to minimize the impact on the natural surroundings, including wildlife corridors.

In 2003, Golder Paste Technology began a project to provide an engineering solution for the placement of thickened mine tailings or paste as underground backfill. Essentially, their task was to mitigate the mine tunnels below which would stabilize the earth for the condo/home development to be built above. In the planning of the mitigation, it was essential that no virgin materials be used – the old mine tailings and other loamy materials at the site would be diverted from landfill, mixed with cement and water to form a paste to fill the tunnels. One problem with such a highly specialized mix design, what kind of machinery could ensure a consistent and successful blend?

Enter LPR Concrete. Utilizing their fleet of ProAll Reimer Mixers, LPR has done some incredibly specialized and unique projects in Western Canada. In addition to their Reimers, LPR owns three Ready-Mixed plants with associated drum mixers for delivery. Larry Hooper, one of the partners at LPR states:

“Reimers are made for this type of work: a high production, remote project that would have been difficult, if not impossible, for transit mixers to accomplish...We wouldn't have been interested in this project if we didn't have a fleet of Reimers... It would have involved the use of a portable batch plant equipped with conveyors to handle the material and 8 to 10 transit mixers. The logistics of moving the trucks safely around the site would have been problematic and much slower, not to mention very hard on our assets from a maintenance / useful life perspective”.

Three Sisters Development Corporation had a vision for the old coal mine site on the mountainside overlooking the town of Canmore, Alberta. The Three Sisters Mountains, situated above Canmore, is one of the most photographed vistas in the Rockies. The breath-taking views and pristine wilderness surroundings would become the catalysts for a plan to develop luxury condominiums and exclusive vacation homes. Canmore is a wonderland for outdoor enthusiasts. This project would need to be a showcase in sustainability in order to gain acceptance from the community well-known for its earthy, environmentally-responsible ethos.

PROVING IT

LPR started working with Golder to develop a system that would allow 500 to 700 cubic meters of material per day to be pumped underground. According to Hooper,

“Reimer Mixers can easily be modified or reconfigured to adapt to a required need or specification and we knew there would be modifications required to our mixer. We needed to do a proof-of-concept with Golder so that we would know exactly what changes to make to a standard site setup and mixer configuration”.

LPR was chosen as the supplier because of their ability to adapt and design modifications to their mobile volumetric concrete mixers, along with their willingness to invest in the required equipment to ensure success for the mitigation project.

The mix turned out to be a flow-able, ‘lean’ paste that needed about four times more water than a regular concrete mix design. The loamy, low-strength mix required a specially-designed water system to work with a large, detached water tank. Once they got the Reimer up the mountainside, they would have to leave the mixer in a stationary location where materials could be regularly loaded. Moving heavy machinery around the site posed safety issues and the process was continuous for each mine shaft.



The LPR Team consisted of a specially trained three-man crew and one Reimer volumetric mixer. The team was mixing up to 700 cubic meters per day and delivering it to a pump that pushed the paste underground. Golder Paste Technology would monitor the underground injection of the paste using down-hole cameras, pressure transducers and computerized logging to guarantee that the site was suitable for construction of roads, services and housing. Hooper commented:



“Golder was impressed with our team and we have worked on a number of projects in Western Canada with them since.”

AND THE WINNER IS...

The Three Sisters Development Corporation won the Canadian Urban Institute’s “Brownie” award for excellence in sustainable design and technological innovation for this project. Brownfield projects refer to for example, mines, quarries and industrial properties that cannot be developed or redeveloped without remediation work to deal with stabilization and contamination issues.

Project Statistics

- 1 Reimer volumetric mixer
- Free-standing water tank with automated feed
- Continuously charged
- Low impact on the environment
- No product waste
- Yield: +85 meters 3/hour
- Manpower: 3 man team
- Clean-Up: minimal

Be prepared to be creative, adaptable and patient. The margins on a project like this are much greater than standard retail concrete supply. Using 1 mixer for 4 months on this project generated more net profit than a fleet of 4 mixers making and delivering concrete in a competitive concrete market for an entire year.



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