

# Continuous pour

**DATE:**

March 24, 2020

**WEBSITE:**

vmmb.org



PTC Construction is one of very few companies in North America that construct grain terminals using slip forms. The logistics' schedule for this type of work is massive. Managing concrete delivery and training crews, installing rebar, placing bulkheads and operating 24/7 until the pour is finished. Once a slip form pour starts it cannot stop. All elements of the supply chain need to keep working. Everything from mechanical or electrical failures, mixer travel times to bad weather needs to be planned for. One hiccup and the whole job becomes more complex.

The concrete supplier for this project was LPR Concrete, based in East/Central Alberta. With 50 years of combined experience with mobile volumetric mixers, the ownership group targets projects that present unique concrete supply challenges and offers contractors solutions and services that this mixing system can provide. Not only does LPR provide volumetric mixing solutions for contractors, it also proves to be a more profitable part of their business. When asked to bid on the concrete delivery for a new grain terminal complex using a slip form to construct the grain terminal and traditional forming for bases and pads, LPR knew they could provide a unique solution for PTC Construction. Rather than putting

a portable batch plant on site where it would sit idle in between pours, LPR pitched the benefits of using mobile mixers.

**COMPLEX PROJECT**

Concrete pours for the entire project were scheduled intermittently over a number of months, culminating in a continuous, eight-day slip form pour for the terminal itself. When there was no pour scheduled, the Reimers could be driven off to be used at other locations. This left only a loader, cement silo and raw materials at the site. When concrete was scheduled, three or four mixers could be driven to the site, charged and would produce up to 600 m<sup>3</sup> a day. Once the slip form pour started, two Reimers were continually charged for 192 hours, with a third Reimer standing ready as back-up.

LPR could show that with very few assets on-site and a unique ability to deal with changes in temperature that volumetric mixers were the best way to go. During the eight-day slip form pour which occurred at the end of October, temperatures ranged from -10°C to +6°C.

## Project

**192-Hour Pour:** No Rejected Loads

Inland Grain Terminal Complex, Gleichen, Alberta

**Developer:** PTC Construction

**Concrete Provider:** LPR Concrete

- 3-4 volumetric mixers on-site
- Total complex used 6000 m<sup>3</sup> of concrete
- Terminal base 1000 m<sup>3</sup>; 30 MPA
- Slip Form employed 2 full-time mixers producing continuously for 192 hours
- Poured at 12 m<sup>3</sup>/hr
- 1800 m<sup>3</sup>; 40 m high
- 32 MPA

Hot water was used and steamed sand was available to ensure that the concrete maintained a constant temperature. There is huge advantage to the contractor in not having to plan for whatever could go wrong at the batch plant, or dealing with delays in transit mixers getting to the site. Larry Hooper, one of the partners in LPR Concrete states:

*“Each Reimer is virtually its own batch plant, so we had triple redundancy on-site which is much easier to manage than a ready-mix plant 60 kilometers away.”*

## REDUCING RISK

Because of the nature of slip form construction, long supply lines can become a logistical nightmare. At one point in the pour a pump clogged. This shut down the pour for approximately 3 hours. Paterson commented:

*“If a traditional ready-mix operation had been employed, there would have been a lot of rejected loads and wasted concrete with transit mixers having to waiting for several hours. The nearest Ready-Mix operation is over 45 minutes away, which would mean we would be tying up a lot of resources and assets in order to complete this pour. Not to mention all the back-up and redundancy that would be required at the batch plant. Once we start pouring we must continue, so spare parts, back-up generators would all have to be on-site and capable of being deployed immediately if there was a problem. With the Reimers, we could simply stop production until the clog was fixed and then start right back up again.”*

*“The Reimers have been a real success story for this project; we’ve had continuous control over the mix and have never had a rejected load.”*

– Justin Paterson, Project Engineer/Manager

## LOWERING COSTS

Delivery from a traditional batch plant would have at least two batchmen and one or two quality control people on-site. Additionally, it would have tied up six trucks and drivers (two mixers on-site at all times; 1.5 hours travel time to and from the batch plant to the site) for over a week. Instead with the Reimers, three men worked the night shift and four men worked the day shift. The 32MPA mix design was engineer-specified, each load was slump and air tested. During the pour, cylinders were taken every 50 meters. Because the concrete is mixed fresh on site, changes to the mix design to comply with the specification could easily be done at that particular moment – something that couldn't possibly be done using a traditional batch plant. Hooper elaborates:

*“If we had troubles with the concrete we’d have to phone over to the batch plant for remediation, then depending on the timing, there could have been one or two trucks on-site to be discharged, another truck on its way that could mean a lot of rejected concrete before the batchman could remedy the mix.”*



CONCRETE DELIVERY RESOURCES: 8-DAY SLIP FORM POUR

|                 | DRUM MIXERS / STATIC BATCH PLANT                   |                   | MOBILE VOLUMETRIC MIXERS               |                  |
|-----------------|--|-------------------|--|------------------|
|                 | Pump trucks and operators                          |                   | Pump trucks and operators              |                  |
| <b>Manpower</b> | 2 Batch Men  | 192               | 4 day shift (Operators, QC, Loaders)   | 288              |
|                 | 2 QC   | 192               | 3 night shift (Operators, QC, Loaders) | 384              |
|                 | 12 Drivers   | 1152              |  |                  |
|                 | <b>16 Men</b>                                      | <b>1536 Hours</b> | <b>7 Men</b>                           | <b>672 Hours</b> |
| <b>Assets</b>   | 6 Transit Mixers                                   |                   | 3 Reimer Mixers (double redundancy)    |                  |
|                 | 1 Batch Plant (with hot water system)              |                   | 1 Wheel Loader                         |                  |
|                 | 1 Wheel Loader                                     |                   | 2-50 Tonne Cement Silos                |                  |
|                 | 1 Standby Generator                                |                   | 10,000 Gallon Water Tank               |                  |
|                 | 1 Alternative Batch Plant (redundancy requirement) |                   | 3,000 Gallon Heated Water Tank         |                  |



VMMB MEMBERS



FOR MORE INFORMATION, VISIT [VMMB.ORG](http://VMMB.ORG)  
 © NRMCA, 2020. All rights reserved.  
 FORM 1001 - 03/2020