



WINNER

**Bardon
Concrete**

Supporting Industry Awards -

BRMCA Excellence in Customer Service Award 2008 – Queen Street Network Rail, Glasgow

BRMCA is delighted to present Bardon Concrete the 2008 BRMCA Excellence in Customer Service Award for its outstanding level of engagement and client service offered to Edmund Nuttall at the Queen Street contract in Glasgow.

Bardon Concrete was approached by Edmund Nuttall to ask if it would be able to supply services to a critical element of the Queen Street Network Rail contract, which required essential repairs over the Christmas period, specifically on Christmas Day 2007. Following numerous meetings with Bardon Concrete and Edmund Nuttall's staff, it was agreed to undertake supplies on the understanding that this critical contract had to be completed on Christmas Day, with guaranteed completion and standard train services resumed by 7am on Boxing Day.

Early consultation was the key to the success for this project and both Edmund Nuttall and Bardon Concrete entered into negotiations to agree and clarify the remit in an open and co-operative manner.

Bardon Concrete's technical department worked closely with the Edmund Nuttall management and design teams to ensure that the most suitable concrete design was used in terms of consistency/workability, high early strength and ultimate strength. The performance criterion of the concrete was paramount and far outweighed the design strength requirements in terms of 28-day compressive strength.

After much consideration, both parties agreed to use Bardon's high early-strength, micro-silica concrete 'Diamondcrete', which would achieve the high initial strengths critical to completing the contract on time.

Placement techniques were also carefully considered as the requirements were far from standard, which when coupled with the use of specialist concrete, provided the team with challenging decisions.

As with all railway possession works, detailed planning and numerous site visits were required to refine the actual method of discharge and delivery of concrete into the tunnel and specialist 'road rail' plant was mobilised to assist in this operation.

The concrete was delivered to site and discharged onto a conveyor, which in turn filled a 3m³ rail-mounted small

truck mixer. This then discharged the concrete into the tunnel. Specialist monitoring systems were also used that required a significant technical presence on-site, in addition to the production and site teams.

At early ages of concrete structures, strength monitoring is important to determine the structure's readiness for service.

Hence, a temperature match curing (TMC) system was used to monitor the early strength development of the concrete and provide an accurate indication of strength within the in-situ concrete. This process can be briefly described as follows:

When concrete is cast, heat liberated by the hydrating cement causes a rise in concrete temperature. The larger the mass of concrete, the greater the rise in temperature, with a consequent increase in the rate of strength development.

Cubes stored alongside the mass concrete will also exhibit a rise in temperature, but to a much lesser degree. Hence, generally speaking, at any time during the early age of the concrete, the strength developed by the test cube will be less than that developed by the mass concrete and so will provide an underestimation of the latter's strength.

The TMC system ensures that the temperature experienced by the reference cubes matches that of the structure and so the strength developed by the cubes will increase at the same rate as that of the mass concrete.

During the continuous supply throughout the hours of Christmas Day and into the early hours of Boxing Day, management and staff from both Bardon Concrete and Edmund Nuttall were on hand to monitor the strength gain and crush the cubes until the required strength was achieved. The concrete was placed and the strength confirmed within the extremely tight works schedule.

Keith Roman of Edmund Nuttall confirms that the company considered Bardon Concrete's approach to its unusual request to be nothing short of "excellent" and goes on to say that Bardon Concrete had supplied, "Excellent service throughout the year as well as to this particular element of the contract."

BRMCA considered the combination of outstanding service, difficult site conditions/restrictions, coupled with working over the Christmas period to be clearly worthy of the prestigious 'Excellence in Customer Service Award' and would like to congratulate Bardon Concrete. ■

"BRMCA considered the combination of outstanding service, difficult site conditions/restrictions, coupled with working over the Christmas period to be clearly worthy of the award."

Figures 1-3: The concrete was delivered to site and discharged onto a conveyor, which filled a 3m³ rail-mounted small truck mixer.

(Photos: Bardon Concrete.)

