

PLANT TO PAVER, THE TRANSPORT OF ASPHALT

In the construction of any new road that has an asphalt surface, the surfacing will be produced at an asphalt plant that might be some distance away from the actual road. It is only on a few larger contracts that the mobile plant would be erected next to the road to supply the asphalt to the specific project.



As in any production process the continuous flow of material is crucial for a high production rate. This is then also the case with paving operations, where the paver has to be supplied with a constant stream of hot asphalt, not only for production considerations, but also to ensure a better final product. The reason for this is that if there is a constant flow of material, a smoother final surface is produced due to the paver that is running with less stop-start sequences that negatively affect the smoother finish on the road.

It is in the light of the above-mentioned facts that a study was undertaken on the Old Barn project on the N3, to evaluate what steps could be taken to achieve a consistent rate of delivery from the plant to the paver. Much Asphalt was the supplier of the asphalt to this project and the asphalt plant is located in Benoni, approximately 40km from the plant.

This project entailed the milling of existing deteriorated wearing course asphalt on marked out sections of the N3 national route. The work was done on both the north- as well as the southbound lanes. The majority of the work being carried out is in the left lane, where the heavy vehicles drive in the slower lane, and where the biggest deterioration has occurred.

The work for each day would start off with each section being cordoned off for the diversion of traffic. A typical day on site starts out at 7h30, and the construction team must be off the road by 16h00 in the afternoon, otherwise lane-closure penalties apply. No work was allowed to be carried out on public holidays or school holidays as well as the days preceding the holidays, due to the increased amount of traffic on this route that have to be accommodated.

The study started with an analysis of the weighbridge tickets for a specific day, which was summarized and represented graphically. This would give an indication of the time the vehicles took to travel to site, as well as the time spend on site. All this information would be sorted and graphs drawn up and certain calculations done to determine average production rates and standing time on site. An example of a typical daily summary sheet is shown below:

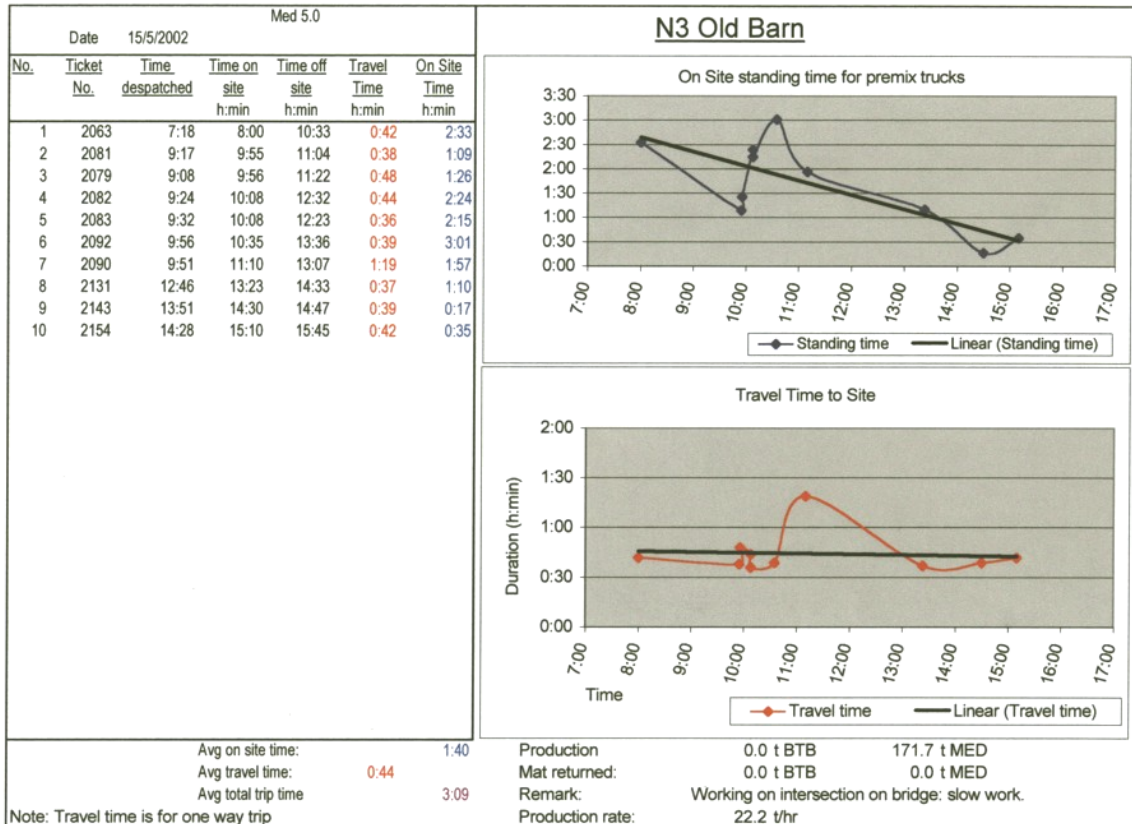


Fig. 1 – A Typical daily summary sheet

This was done for every day that production took place on the project. At the end of the project these results were analyzed to see if there was any typical trends pertaining to the type of work being carried out or any occurrences that took place. The vehicle logsheets were used as a method of verification of the data that was gathered. A time study was also undertaken on a few days to verify some of the results.

There were some definite trends that were identifiable:

- On a normal production day the standing time on site would decrease as the day progresses. This would mean that the first vehicles delivering asphalt on site would spend a longer amount of time on site, than they would on the return trip to the paver. This can be explained due to the paving process taking time to start-up, and the production team getting into the flow of the process. This was the case when there were no other delays or problems experienced.
- If the paver was moved or work was carried out on different sections, there would be a second “start-up” phase and an extension of the time the vehicles spend on site.

The timely delivery of the asphalt to the site, and a high production rate depended on a variety of factors. The following were identified:

- The distance traveled to the specific point on the contract. The easy access to the site as well as the route taken by the trucks determined the time they traveled to site.
- The amount of vehicles delivering asphalt to the specific project.
- The type of work that was carried out; if work was done on an intersection the production rate would be lower than working on straight sections.
- Any breakdowns experienced by the asphalt plant, the transporter trucks or paving equipment would cause a delay in the process.

It is interesting to note that it was determined that there would normally be a correct number of vehicles for a specific type of work being carried out, and that the demands would vary from day to day with the amount of work carried out and the type of operation being performed. There is no fixed amount of vehicles that would cater for all occasions. The obvious assumption would be to have as many vehicles as possible assigned to the project. This is not the case. If a project would be flooded with vehicles, there is a risk of the asphalt becoming cold before it is paved due to the vehicles spending an excessive amount of time on site, and standing time is created by not sending the vehicles at an interval. Additionally to that, there is the higher risk that in the case of a paver breakdown or work stoppage, the amount of material that have to be returned to the plant will be a lot larger – with cost implications and disputes flowing from that.

The asphalt plant operator actually has quite a predicament on his hands. He will typically be supplying asphalt to various contacts, and also various compositions of mixtures. The crux of the matter is that most contractors would like to receive their asphalt as early as possible in the day to start their production. For the asphalt producing plant it is not so easy. Orders are placed the previous afternoon at 16h00, and only confirmed the next morning. From the time of confirming the order, each customer expects his work to receive priority and be on site as soon as possible. Fortunately if a plant is equipped with proper hot-storage facilities, it enables the plant to start producing the typical asphalt mixes in advance and store them for dispatching as and when required. There is a limited time that the asphalt can be stored to ensure the temperature does not drop too low, so even in this practice there is a risk involved for the manufacturing plant.

As in all production processes the importance of planning could not be underestimated. Proper information constitutes planning on valid facts. The more accurate the information relating to the needs from the paving contractor is in

terms of tonnage required, time required and the rate at which it is required, the better the planning at the plant can be executed.

It was found that the only information that would normally be received by the plant would be the tonnage required, and no consideration was given to the type of work that was carried out. This would result in cases where work would be done on intersections and bridge-decks that the amount of vehicles assigned to the project would be too high. These vehicles could well be used better elsewhere. The plant would claim standing time charges for the trucks standing at the paver, waiting to discharge and return to the plant. As with any construction claim for additional payment, this is never a preferred way to do business and can damage a relationship between the customer and the client.

In the end it all comes down to communication and an open relationship between the supplier and his client. In the past a practice has developed whereby the paving foremen “inflate” their orders for the following day, to ensure that they receive the proper quantity of material they expect, and then just simply canceling the balance of the order that they never required from the beginning.

It is practices like this that doesn't bode well for relationships between the asphalt supplier and the paver. The reality is that work being carried out unproductively by either the paving team or wastage on the part of the asphalt plant is not desirable. In the long term this pushes up the prices that clients have to pay for their products.

A conscious effort should be made to improve the relationship between the asphalt plant and the construction team, to ensure openness and honesty that would benefit all in the long term. It does not only take technology, but the right people behind the technology to make any process successful.

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