



MARK
PHILLIPS

Christmas and New Year at Westbury saw the station and its associated routes closed for 12 days to carry out some long-awaited major works in one fell swoop. The main work was the reballasting and renewal of 12 switch and crossing units, along with associated plain line, to resolve some track quality and maintenance issues. At the same time, the Westbury station platforms were modified to accommodate the new rolling stock being progressively introduced on Great Western services.

Westbury station lies on the main route from Paddington to the West Country. Whilst many of the faster Great Western services to Plymouth and/or Penzance bypass the station itself by using the avoiding lines, about half the services do call at Westbury.

There are interchange possibilities with services between Cardiff/Bristol and Southampton and, eastwards along the coast, services to Weymouth, and there is also a developing service to Swindon.

In addition, there is heavy freight traffic from the stone quarries in Somerset. All of this makes Westbury a busy railway node.

Train service arrangements

Planning the alternative provision of services throughout the 12-day Christmas closure was, therefore, something to which careful consideration had to be given. For inter-city stopping services between London and the West Country,

nearby Frome was deployed as the alternative calling point to Westbury. It is quite a rarity nowadays for Frome to be privileged with such trains!

Frome also became the starting point for Weymouth services. The Bristol to Southampton trains had to be terminated at Trowbridge and Warminster, either side of Westbury, with a replacement bus connection in between. Trains to Swindon were replaced completely by a bus alternative.

To prepare rail travellers for all this, a carefully thought out publicity campaign was mounted by Network Rail's communications team, in association with the affected train companies. Advance warnings of the altered transport arrangements were prefaced by explanations of the longer-term benefits to accrue from the project works. Some of these warnings included letters to season ticket holders, use of social media, on-



train and station announcements, press releases to local media and the holding of local awareness sessions.

Project scope

One of the primary drivers for the project was the need to address the condition of the track layout at the north end of Westbury station, which provides routes to and from three platform lines and two non-platform lines towards Trowbridge and towards the main line to Newbury, Reading and Paddington. The existing layout, dating from the early 1980s, was in 113lb rail on timber bearers and was becoming difficult to maintain, with some evidence of cyclic top, and as a consequence there had been temporary speed restrictions in place for some time.

Proposals for the renewal and reballasting of the whole layout had been reviewed since early 2015 and three »



Westbury North JUNCTION RENEWAL



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alternative variants were evaluated. The option selected and approved in February 2018 was to carry out a more or less like-for-like renewal in terms of the facilities and layout, using NR56V rail on concrete bearers.

The designed scheme did take the opportunity to shorten the overall length of one crossover, which, whilst lowering the design speed through it from 40mph to 30mph, had the benefit of avoiding bearers interlaced with another unit, as in the previous layout.

Apart from that, and the realignment of some curves was necessary in conjunction with short sections of plain line renewal, there was little change to the layout. However, gauging checks had shown the need for minor modifications to the end sections of the platforms, which was achieved by adjustment of 170 metres of coping slabs.

To have carried out this renewal of the overall layout in piecemeal fashion would have required several weekend possessions, still involving complete closure of all routes through Westbury and with the necessary revised passenger arrangements as described previously. Also, it would not have been easily possible to create the new layout in its improved design form, with repositioned switches and a shortened crossover, without elaborate staging and a temporary loss of facilities between each weekend possession. Therefore, the scheme lent itself ideally to the "blockbuster" approach of an all-in-one extended closure.

Having determined the economic benefits of the long possession for the trackwork, it was evident to Network Rail that the opportunity could be taken to prepare the way for the platform extensions needed to accommodate the new fleet of Class 802 IET (intercity express) trains being introduced.

The platform extensions at the south end of the island Platforms 2 and 3 required the rearrangement of signalling, telecoms and

power supply infrastructure, the relocation of three signals and the removal of a foot crossing. This work is continuing, but use was made of the major possession over Christmas and the New Year to carry out much of the preparatory civils work for the platform extensions.

Implementation and resourcing

Just to the north of Westbury North junction, there is an area of unused railway land, in the triangle between three routes, which was ideal for both the delivery of materials and pre-fabrication of the switch and crossing units. This was used to great advantage from September 2018 and in the weeks leading up to the Christmas closure.

The trackworks were the responsibility of the S & C South Alliance, a partnership of Network Rail, Colas and AECOM, with the latter carrying out the design being carried. The subcontractors for plant were AP Webb and Readypower.

In total, 11 road-rail vehicles supplied by AP Webb were in use for the removal of the old trackwork and ballast and for the relaying of the new track layout - three JCB JS175 excavator/cranes, two Terex Schaeff HR42 excavators for loose sleeper laying and lighter excavation, four Rail-Ability Railmax excavators for heavier digging and spoil loading (also capable

of lifting a 30ft concrete track panel) and two Cat D4 dozers. Altogether, these machines handled 9,300 tonnes of spoil.

In addition, a small mini-digger, not rail-mounted, was available for digging an undertrack crossing. A Kirow 1200 crane, supplied by Colas, handled 78 pre-fabricated switch and crossing sections. They also supplied two S&C tampers for the project.

Platform work at the northern end of the station, carried out by MECX, involved removal of existing coping stones, tactile strips and the macadam surface as the last 30 metres of the platform required lowering to enable falls to go to the centre of the platform rather than falling towards the track. This would prevent any issues with prams, wheelchairs and other wheeled objects running away towards the tracks.

The works entailed lowering the levels of the platform oversails and reducing the macadam levels. New dish drainage and carrier drainage, including new catchpit chambers, were installed and this was then connected to the existing track drainage. A new macadam platform surface was laid and the copers and tactiles re-bedded and re-pointed.

MECX also constructed three new signal bases at the south end of the station, where the ongoing signalling work is being carried out by Linbrooke. The necessary civils works associated with the alterations, such as the foot crossing, drainage works and an undertrack crossing, were undertaken by Chris Francis Contractors.

OSL was responsible for the signalling testing and commissioning. RES was the E&P supplier, MacRail Systems provided site access control and DB Schenker was responsible for engineering train movements within the sidings. »



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Labour was provided by McGinley, Ganymede and Vital. Patterns of three 9-hour shifts over each 24-hour period were established throughout, with some specialist staff working individual 10 or 12-hour shifts. Overall, whilst there were wide variations in the actual number of staff present on site at any time throughout the blockade, depending on the particular activities happening, the staffing averaged out at approximately 40 per shift.

Main possession

The possession commenced on schedule at 04:00 on Sunday 23 December 2018 and was scheduled to be handed back at 04:00 on Friday 4 January 2019.

Removal of the old trackwork and progressive reinstatement of the new was carried out in five stages, working broadly from east to west across the overall site. The new track layout, installed on bottom ballast, was completed on schedule by 23:15 hours on Friday 28 December.

Stage 6, the delivery of final top ballast and tamping of the site throughout, took place over the following 48 hours.

Everything ran according to the programme up until Stage 7 of the project. Stage 7, running from 19:00 hours on Sunday 30 December through to planned handback at 04:00 on Friday 4 January, comprised final welding and stressing, signalling testing and commissioning and handback procedures.

Within this overall period, nine hours had been allowed for handback and contingency and 48 hours was originally allowed for signalling testing. However,

a further review a few weeks prior to the blockade highlighted the project's challenges of carrying out the S&C renewal simultaneously, as there were a lot of point-locking and route-locking changes that would affect the S&C renewal side of the station, due to the changing track lengths and the fact that there are both main and draw-ahead routes into the platforms at Westbury.

An extended test period would be required to facilitate the signalling system at Westbury, which is a relay based system and so all testing had to take place on-site, as opposed to more modern software-based signalling systems that can be tested off-site on simulators before the commissioning. It was therefore decided to extend the testing to 72 hours.

Despite a detailed and fully checked design, the new signalling arrangements, as installed, would require thorough in-situ testing. Many possible combinations of train movements and train starting

positions would have to be exhaustively tested before every possible situation had been proven and test logged.

The welding and stressing throughout the site was completed on schedule by 19:00 on Monday 31 December, which left just the planned 72 hours of wheels-free access for the signalling testing.

Unfortunately, at the start of the shift on 31 December, an issue with the interlocking from a shunt signal was revealed. This was highlighted immediately to the AECOM design team to resolve; with a formal test log being issued on 2 January. It proved to be especially complicated to design a way out of the problem and, in the event, the whole of the remaining time allocated for the testing and handback was used up by the time a solution had been found.

So, at 19:00 on the Thursday, the new design was ready to be implemented, but, with a few extra snags encountered during this modified installation and with over 100 wires to be terminated, a 23-hour overrun resulted.

Appraisal

Sarah Fraser, project manager for Network Rail, commented that it had been a great disappointment for the project team to have experienced this overrun after such careful planning, which included "a generous time allocation" for the signalling testing and commissioning. She was obviously also very sorry for the disruption to passengers, with the temporary arrangements for services having to continue for another whole day.

However, overall, the team should be pleased and proud to have planned and renewed a complex track renewal, making excellent and economic use of the major closure opportunity, which will now bring improved reliability and maintainability for many years to come. ●

