

CASE STUDY

SINGLE OPTION DEVELOPMENT



Taffs Well Overbridge

The £100m Taffs Well Depot project is one of the key packages of work that form the Transport for Wales core valley lines (CVL) transformation programme. The project, jointly funded by Welsh Government and ERDF, will maintain and stable 36 of the new Metro vehicles while being the base for 400 train crew, 35 Metro vehicle maintenance staff and the South Wales Metro integrated control centre employing 52 staff.

The site is situated approximately 9km north-west of Cardiff City Centre and immediately adjacent to Taffs Well rail station. The site area is 3.6 hectares and formerly consisted of multiple car parks, roads and building structures used for a mix of industrial and commercial purposes.

The rail depot will be connected to the mainline by a twin line portal under Ffordd Bleddyn Road; this element of works is critical to the depot and the CVL programme as a whole and is the subject of this case study. It has overcome many challenges during design including unforeseen ground conditions and buried services.

The design has undergone significant value engineering prior to being finalised and progressing successfully through the stage-gate. These results were achieved by close collaborative working between Transport for Wales (TfW), Amey Infrastructure Wales (AIW), Amey Consulting (AC) and Alun Griffiths Construction (AGC). AGC contributed via an early contractor involvement (ECI) contract, allowing them to input on the feasibility and constructability of the design.

PROJECT DETAILS

Client: Transport for Wales

Agent: Amey Infrastructure Wales

Contractor: Alun Griffiths Contractors Ltd

Designer: Amey Consulting

Total Project Value: £6.4 Million

Duration of this phase: 2018-2021



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What is an Exemplar project?

An 'Exemplar' is defined as 'something worthy of being imitated or copied' and this is exactly what we continue to seek to achieve with this programme.

Exemplars are intended to offer good practical examples of how to achieve Best Value Sustainable Construction solutions. An Exemplar considers all aspects of sustainability, including economic, social and environmental, demonstrating that the scheme is well rounded and has incorporated best practice and collaboration.

Our approach to Exemplar has been updated to reflect the Wellbeing of Future Generations Act

and to provide greater value as well as inviting a programme approach to the process. It is anticipated that embarking on the Exemplar process will, in itself, lead to higher value being obtained from a project.

Case studies are normally prepared at 3 Key Stages; Design stage, Construction phase and Post-occupation, but we have recently added a Pre-design phase to our programme.

Addressing these phases ensures that lessons learnt can be demonstrated throughout the development of a project.

What was delivered

The designer, Amey, delivered a comprehensive package of designs that spanned the highways, structural and geotechnical elements of the project. These designs utilised key information about the site which was obtained by Alun Griffiths during their ECI phase.

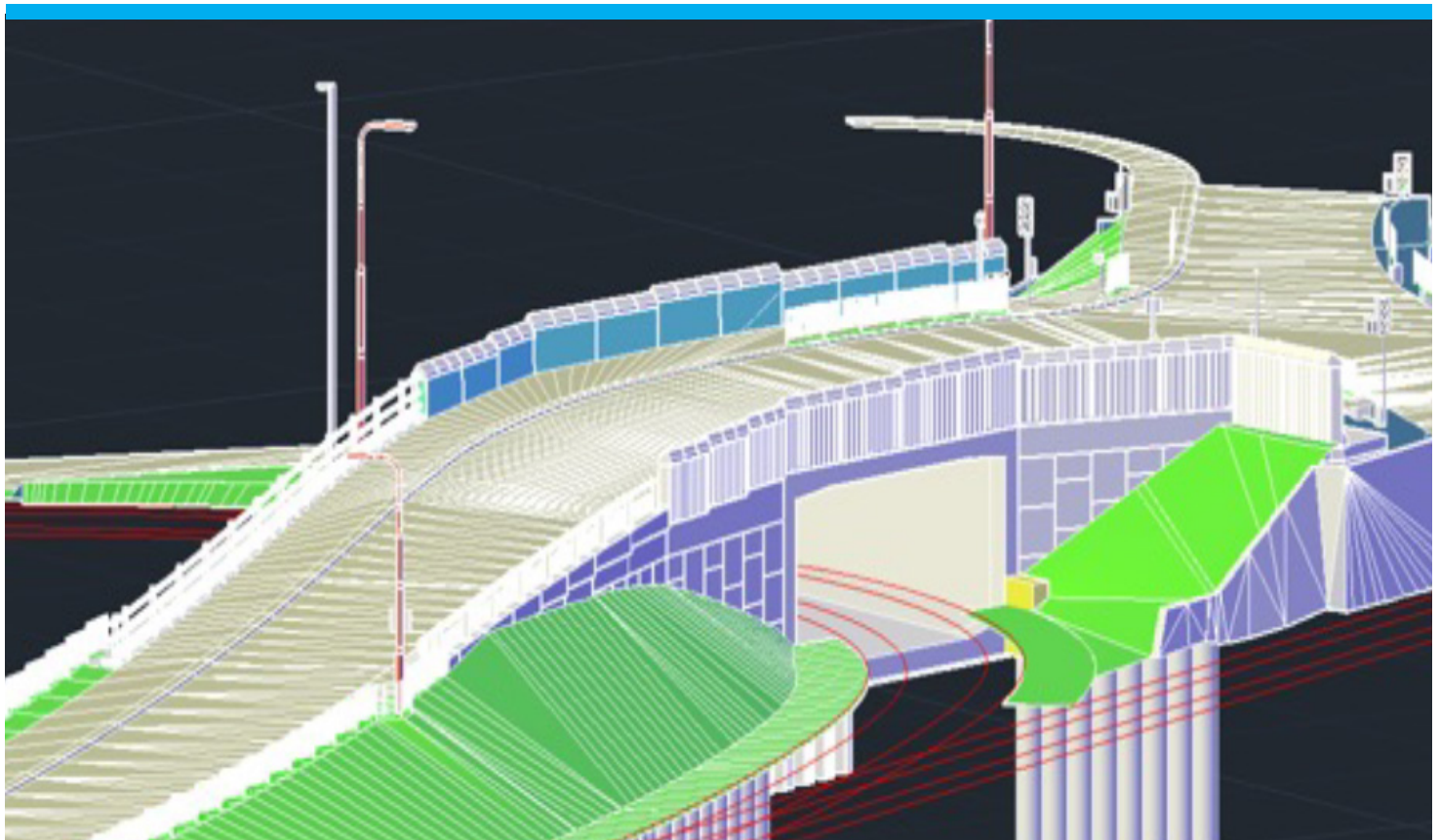
The highways package covered the new road alignments to allow for the road to be raised to allow for rail access underneath. The installation of two new roundabout junctions to allow for access into the new depot and to improve traffic flow in the area were planned.

The structural design package detailed the construction of the bridge and portal along with the ancillary structures including the new retaining wall. It also includes many improvements and modifications of existing structures to facilitate the widening of the footpaths and highways such as improved parapets and barriers.

The geotechnical designs fed into the other two designs ensuring their stability and longevity.

The Ffordd Bleddyn bridge is a critical path item for the Taffs Well Depot programme as it allows for mainline, track and utilities to enter the depot site. AGC and AIW are working together to shorten the construction programme to reduce the requirements for road closures to limit the disruption to the local residents and take pressure off the overall programme.

The plan is to use the project construction to deliver benefits back to the local community and secure jobs locally for the duration of the works.



What will make this Project Exemplar?

ECI - Since the start of the project TfW has made good use of their ECI framework to get AGC involved in providing constructability and building experience that was used to influence the design. ECI also meant that there was a work force on site allowing surveys to be undertaken during the design phase to inform the design and allowed enabling works to commence as the designs were made available, allowing the construction programme to be accelerated.

Community engagement -AGC has carried out a significant amount of engagement with the local community and alongside TfW Stakeholder Managers have ensured that the local community have been kept well informed about the works. Letter drops as well as a significant advertisement campaign were key aspects to notify residents and potential users about the disruption likely to be caused by the works. Frequent engagement with local community councillors on site was another key feature.

Improved active travel - This scheme makes significant improvements to the Taff Trail, a popular commuting and leisure cycle path. The improvements make it easier for cyclists to traverse this section of the route by widening the pathways and ensuring the right of way on the crossing. The widening of the footways also makes it safer for both cyclists and pedestrians to use it at the same time, while also improving access for those with mobility aids and pushchairs.

Use of alternative energy - During this ECI phase AGC explored the use of renewable energy sources on site, including using a combination of solar, wind and hydrogen-powered systems for their site security needs. The use of hybrid cameras instead of those powered by diesel alone has meant that there has been a saving save of £100 a week in diesel as well as reducing carbon emissions by 400kg of CO2 a week. As Taffs Well is one of the first sites to start construction this should act as a model for future TfW sites.

Environmental considerations: Re-using waste material

AGC used 555m³ of waste material from the previous phase as filler to help build up the hard standing required on-site for office cabins and the haul road. Also, some of the removed material was transported to another Alun Griffiths site to be used to build their site up to level, again saving it from going to landfill.

The material that is being reused and crushed was from the Demolition Phase of the site and Phase 1 of Ground Remediation for the CVL Integrated Control Centre. Both of these phases created a large number of arisings and rubble that was then stockpiled on site.

A crusher was brought onto site and the material was crushed into a Type 6F2 specification. This is now being stored on-site ready to be used during future phases of work.

This has meant that not having to procure extra materials and not needing to transport the waste material for disposal has saved 2856 tonnes from landfill equating to 130 lorry loads.

With this project being one of the first sites to start construction this should act as a model for TfW's future projects and as an example for others to follow. It also demonstrated significant savings and reduced environmental impact over the project's life.

Community Engagement

Flood relief - During the aftermath of Storm Dennis in 2020 the contractors AGC stepped up to help the local community by providing manpower, skips and materials to assist the local community with the damage caused.

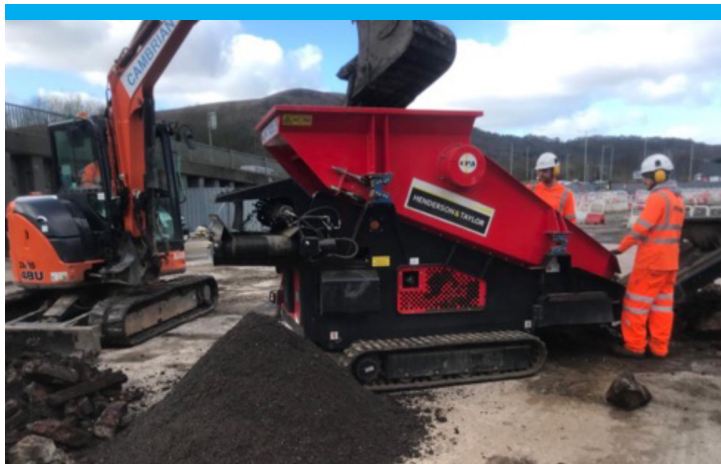
Sensory garden - During February 2020 storms Ciara and Dennis caused devastating floods that affected the communities that surrounded the South Wales Metro Project. Along with other works that took place to help clean up after the flood, delivery partner AGC continued to show that they are committed to supporting the local community by donating £2500 worth of timber to aid in the reconstruction of the sensory garden, after all the wooden furniture in the Taffs Well Memorial Park was completely washed away during the floods.

So far, a selection of items have been constructed by the Council's team with some of the benches and the raised flower bed now finished. As the weather improved more plans to construct larger items such as more benches and flower beds will take place. The hope is to have everything ready for the summer of 2021 for the residents to enjoy.

Transferrable Lessons Learned

As-builts - A major lesson that was learned during the design phase was the need to procure all relevant historical data and 'as-builts' before the start of the design. This was due to issues arising either from survey work or due to the findings of materials at a later stage of design that would have forced alterations that could have been avoided by being procured earlier.

Contractor engagement - The ECI approach has proved to be extremely beneficial. While this is something that TfW are encouraging companywide the project will stand as an example of effective ECI.



Value Engineering: Cardiff Road portal removal

The removal of the second portal into the depot from under Cardiff Rd was a major piece of value engineering resulting in a significant reduction in the planned programme and a budget saving of £2million.

Its development would have required extra highway works and the diversion of buried services and a public footpath. By removing this item of scope, the impact of road closures was also minimised by reducing the length of the programme.

A redesign exercise was undertaken for the remaining bridge portal to change it from the proposed box jack to a cut and cover design as the jacking slab added too much risk due to its proximity to the A470.

Well-Being of Future Generations Act

The Well-being of Future Generations Act provides the ambition, permission and legal obligation to improve our social, cultural, environmental and economic well-being.

The Act requires public bodies in Wales to think about the long-term impact of their decisions, to work better with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change. This project, as part of the CVL programme, will greatly encourage further usage of public transport. Furthermore, the project is being developed in a manner consistent with the aims of the Act.

CEWales has been commissioned by the FG Commissioner, in conjunction with CLAW, to develop a Project Directory framework which guides clients through the various phases of project delivery in relation to the requirements of the Act.

Pilot projects are being trialled for schools with the intention of rolling it out to all buildings and civils projects. The Act will increase in prominence within our Exemplar process going forward.



Health and Safety: Covid19

With the global pandemic restricting key areas of the project development, methods such as 'consistent temperature checks' and Covid questionnaires being issued to all site members, as well as a proactive approach to avoiding unnecessary contact meant that the risk of Covid cases on site were significantly reduced.

TfW Exemplar Programme

CEWales has set up an Exemplar programme with TfW. Three projects, at varying stages of development, are identified for inclusion in the programme each year.

In this first year the three projects are:

- **Bow Street Station** Construction phase
- **Taffs Well overbridge** Option development stage
- **Deeside Parkway** Option selection stage

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