Tamar Crossings Newsletter

No. 11 September 2023

Tamar Crossings

Inside...

Welcome to the 11th edition of Tamar Crossings

This edition of the newsletter again covers a wide variety of subjects. As usual there are some 'behind the scenes' technical and operational topics that reflect the nature of the assets that we maintain and the service that we provide. There are also articles related to careers, including work experience and apprenticeships, and covering a 'careers in engineering' open day for Year 10 female students. Our work and this career theme are connected by a look at the wide variety of roles that women currently play delivering our service.

Learning about careers in engineering

We were delighted to host this year's 'Women in STEM Day' at the *Bridging the Tamar* Visitor and Learning Centre in June.

Organised by our Learning Centre in partnership with YMCA Plymouth, the event was organised as part of this year's International Women in Engineering Day activities. Celebrated around the world on 23 June to honour women in the field of engineering, the Day focused on raising the profile of women who are changing the field of engineering one degree at a time.

Having the responsibility for managing both the Tamar Bridge and the Torpoint Ferry, we particularly recognise the importance of encouraging more women to consider careers in STEM subjects. Originally designed around a Science, Technology, Engineering, Art and Mathematics (STEAM) theme, the Learning Centre aims to encourage more young people to consider future careers in these sectors.

Around 300 young women from local schools and colleges, including Sir John Hunt, UTC Plymouth, Eggbuckland, All Saints, Tor Bridge, Discovery College and Marine Academy, took part in the Engineering Her Future event to learn about careers in engineering from a range of businesses, educational organisations and training providers.

As well as Tamar Crossings, these included Volker-Stevin Ltd, AECOM, Cormac, Babcock International, the Institution of Civil Engineers, Focus Training, City College Plymouth and Cornwall College.

The students also heard from guest speakers Sarah Jane McGlade from XEIAD, Samantha Jackman from Boost Innovations and Beverly Urbans from AECOM, as well as staff from Babcock. They also had the opportunity to tour our iconic bridge, and take part in engineering challenges and activities.

We are keen to hear what you would like to see in future editions so please let us know at trisha.hewitt@tamarcrossings.org.uk

@tamarcrossing tamarcrossings www.tamarcrossings.org.uk

14 year old Vee Simpson from Tor Bridge High was just one of the young women inspired by the event to think about a career in engineering. **"I've learnt a lot of different things about engineering that I never knew before"** said Vee. **"I'm now thinking I want to do this as a job."**

It was great to see so many young people at Tamar Crossings. We were also very pleased to welcome members of the Joint Committee to the event, including one of our Joint Chairs, Councillor Martin Worth, and Cornwall Councillor Armand Toms.

As the comments from Vee show, many young people are not aware of the incredible range of jobs available in engineering and other STEM subjects. We are delighted that Vee is now thinking about a career in engineering and hope that the Day encouraged other young women to follow her example.

Tamar Crossings was represented on the day by employees in a variety of roles which feature engineering, technology and maths. They were able to give a first hand account of the benefits and challenges of working in an engineering/technical related job, and in particular at Tamar Crossings. They were also able to relate their own experiences of work to the young women and answer questions about what attracted them to work in a STEM-related post.

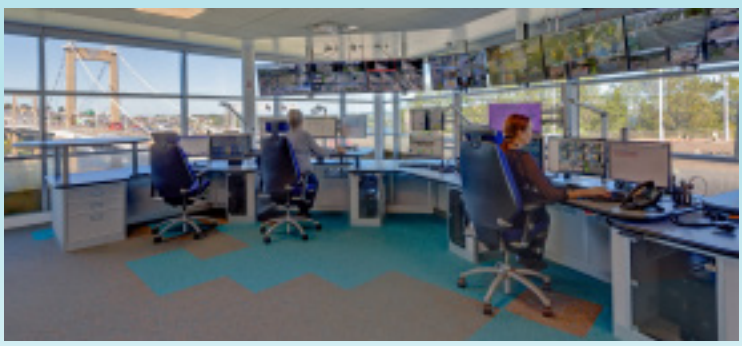
Working at Tamar Crossings

We currently have 26 women working in a variety of roles within Tamar Crossings
These include Mechanical Assistant, Control Room Assistant, Control Room Relief, Bridge Supervisor, Customer Services Assistants, Support Services Assistant, Ferry Crew Cleaner/Relief, Ferry Collector Storekeeper, HR Adviser, Assistant Operations Manager, HR Manager, Customer Services Manager, and Visitor Experience Manager.

Mechanical Assistant Vanda Bardgett works on the Torpoint Ferry.
"Being a woman working in the engine room on the ferry is exciting as I am faced with a variety of challenges, which requires me to think methodically and use my problem solving skills" she said.

Control Room Assistant Jade Marshall is delighted to be working at the Tamar Bridge.
"The Tamar Bridge was iconic for me growing up. So as soon as an opportunity became available, I went for it. With a degree in Computing, the use of information and technology that are in front of me daily are beyond fulfilling. Operating CCTV cameras, troubleshooting any technical problems within the plaza, whilst also using my skills and knowledge to introduce new approaches with technology rather than more traditional methods of pen and paper."

Juliet Francombe is a Supervisor on the Tamar Bridge.
"Working within the Bridge Control room team as a Control Room Assistant and now a Bridge Supervisor I have learned so much about the structure, how it was built, the engineering behind the strengthening and widening project, kerb replacement, resurfacing, the undertaking of all maintenance requirements, and the many safety processes that need to be considered. No two days are the same, and there are always so many factors to consider!"



Refitting PLYM

PLYM returned to Torpoint in June following the successful completion of its five yearly refit at A & P Falmouth.

The Torpoint Ferry is believed to be the world's biggest and busiest chain ferry operation and is the UK's busiest inland waterway ferry crossing – delivering up to 204 crossings each day.

Tamar Crossings operate the ferries 24 hours a day, 365 days a year, in all weathers. This includes severe storms and gale force winds, which have often forced the temporary closure of other ferry services in the past.

Achieving this requires a significant planned maintenance programme. While the majority of maintenance is carried out while the vessels are afloat during off peak periods, some maintenance activities and surveys have to be carried out during refits in dry dock conditions.

PLYM is the first of the ferries to undergo a refit during this five-year cycle. TAMAR's next refit is scheduled to take place in April 2024, and LYNHER's in April 2025.

PLYM's refit included a number of key elements, including:

- Installing new power management and IT systems
- Removal of prows for repairs and upgrades to hydraulic systems
- A survey of the underwater hull to ensure it's material state - this is a statutory requirement and satisfactory completion is required to allow the issue of a Chain Ferry Certificate by the regulatory authority, the Maritime and Coastguard Agency
- Replacing systems and equipment that had reached end of life, including chainwheel drive couplings and bearings, together with propulsion motor electronic drive components
- Repainting the vessel both above and below the waterline.

Once PLYM returned to Torpoint and the towing gear had been removed, staff from Tamar Crossings and A&P Falmouth spent the next few days preparing the vessel for service.

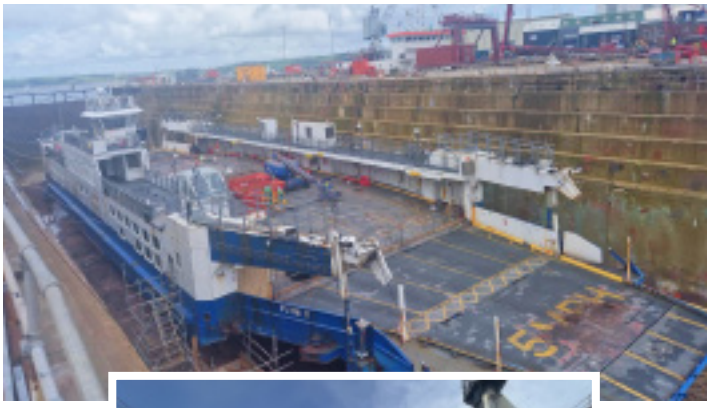
This included reconnecting the ferry to the chains, restoring the lifesaving and firefighting equipment and seating, and carrying out engineering trials of the upgraded chain drive system. Once this work had been completed, the ferry returned to service on 26 June.

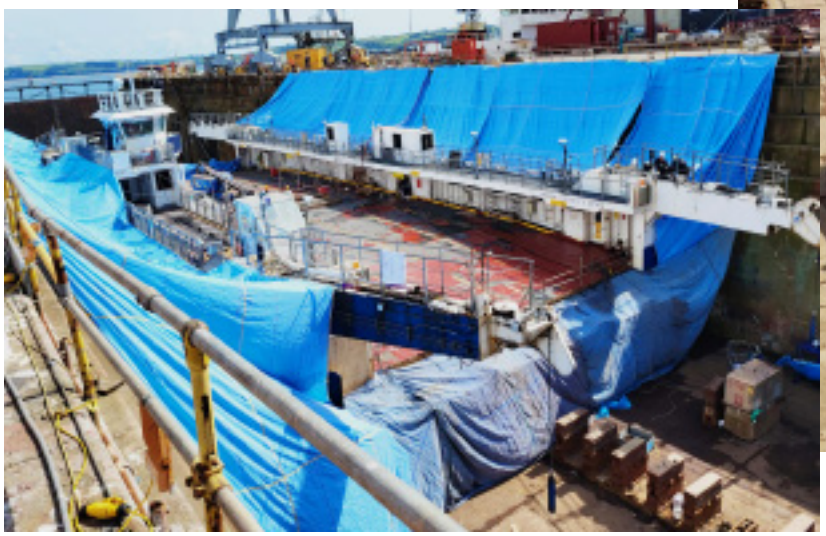
Refits also provide an opportunity for Lloyds Register to complete the five-yearly dock survey to certify that the ferry is in a satisfactory condition for continued operation.

Refits are essential to maximise the life of the ferries and ensure that we continue to provide a safe and reliable service.

This refit was a very complex project and we are pleased that the works were completed on schedule.

We would like to thank customers for their patience during the period of two ferry operation. Staff at the ferry worked hard to minimise disruption to service, and any defect repairs were carried out as quickly as possible.

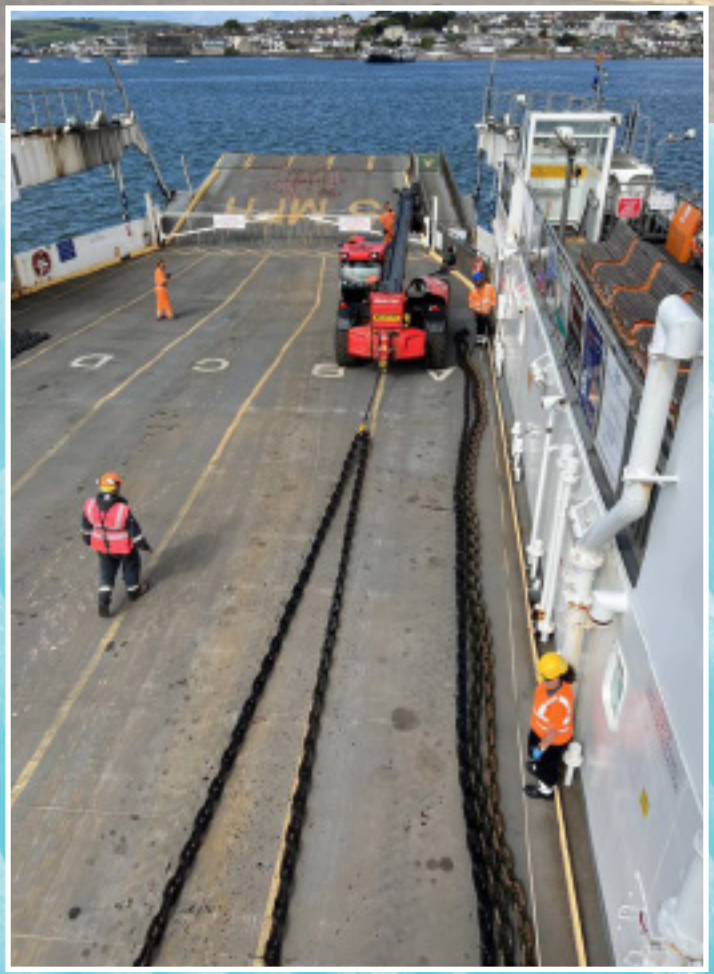




Replacing the chains

Ferry chains usually need to be replaced every three years and, where possible, we try to match these works with the refit programme to avoid damaging the newly recoated deck surfaces where the chain has to be handled. Both main chains on PLYM were replaced before she left Torpoint for her refit.

Changing main chains is a major engineering exercise - each chain is over 650 metres long and weighs 23 tonnes - and involves the ferry itself being used to pick up the old chain and feed in the new chain. Part of the process is 'pulling slack' - getting the right amount of slack and tension into the chain so that it will match operational requirements. The whole process typically takes 2-3 days depending on tide timings.



Starting up the ferries

While one ferry runs continually throughout the night, the other two are moored in deep water away from the slipways before being brought back into service at 6.40am and at 6.50am to provide a three-ferry service for the start of ‘rush hour’ period.

If you thought that starting a ferry and bringing it into service (a process also known as “flashing up”) was like starting your car and then immediately driving away, then think again.

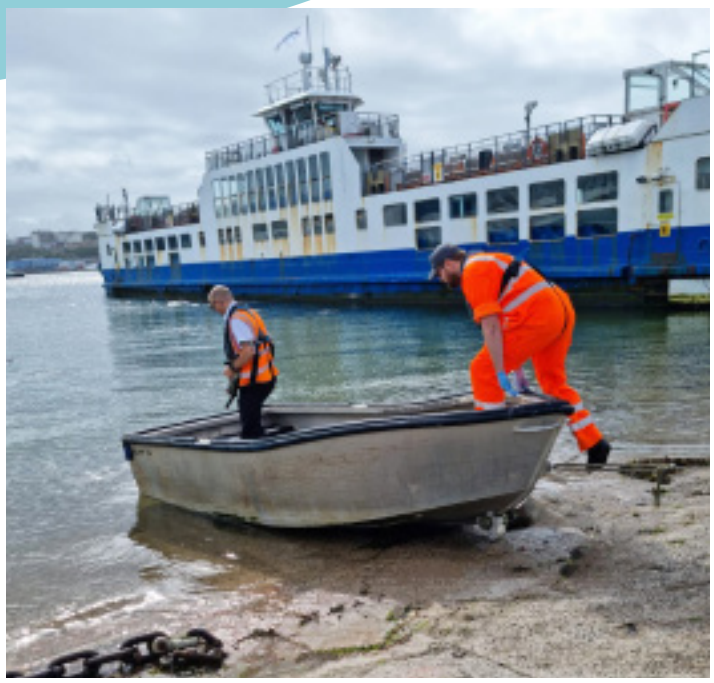
This is a very complex operation which begins with two crew members having to use a tender to reach the ferry moored in deep water before carrying out a number of checks and processes to make sure the ferry is safe to run.

In reality the process actually begins the previous night, when the ferry controller positions the ferry for overnight mooring using GPS to ensure it does not run aground or interfere with night ferry transits.When the vessel is moored up, a running line is connected to the vessel. This running line is conencted to a tender secured on the slipway.

Having begun their shifts at 6am, the two crews (one for each of the ‘moored’ ferries) get ready to bring their ferries into service.

After two crew members have donned life jackets and safety equipment and checked with the controller and Torpoint tower supervisor, untie the rope from the boat and put it into the water. The controller and mechanic are then pulled out to the ferry by the two crew members on the slipway running line. The controller and mechanic board the ferry, while the remaining crew monitor the position of the transfer boat to ensure boat lines and ropes are kept clear of the ferry and chains.

Once on board the mechanic checks, inspects and clears any fault alarms. They then open the watertight door and 25 valves, before checking the maintenance logs. After more checks – including oil, water levels and pressures and around 30 pumps - they start one of the three diesel generators, and other multiple systems, and the drive motors.



Following a quick radio check with the controller, they release the storm brakes, finalise the drive system start up and monitor running parameters before confirming that everything is working as expected.

At the same time the controller is checking the emergency signals, and the UHF and VHF radios, and confirming radio contact with the King’s Harbourmaster.

After checking the control cab systems and equipment, and speaking with the mechanic, the controller takes control of the ferry’s systems and, working with the crew on the slipway, brings the ferry into the slipway.

Once the ferry is on the slipway, the tender is detached from the ferry and the ropes tied to bollards so that it's tender is ready for the next shutdown process at the end of the day.

Following further safety checks on the prow wires, prow hydraulics, fire safety equipment, and the overall condition of the ferry, the controller liaises with the Torpoint tower to confirm that the ferry is ready for service.

If no problems are detected, the start-up process usually takes around 30 minutes to complete, with the second ferry ready for service at 6.40am and the third ferry leaving Torpoint after picking up its first passengers at 6.50am.

Maintaining the Tamar Bridge

Ensuring that the Tamar Bridge is properly maintained and safe for the 45,000 plus vehicles which use it every day is a huge undertaking

As the famous “painting the Forth Bridge” saying goes, no sooner has one major task been completed, then it is time to start on the next one!

With 7,200 kerb units secured in place by 28,000 steel bolts, 1,340 metres of main suspension cable, two 76 metre high concrete towers, a main deck and two side spans which require 68,000 square metres of paint…
there is always something to do.

Interesting fact: The quantity of paint required to coat the steel structure of the bridge would cover approximately 10 football pitches

The team responsible for carrying out the engineering and maintenance is the Tamar Crossings engineering team: Engineering Manager Richard Cole, Assistant Engineering Manager Steve Rimmer and Bridge Inspector and Maintenance supervisor Piotr Helm.

During the last few months the engineering team have completed a range of planned inspections on the bridge structure. These have included the formal quarterly bridge structure inspection, bridge access gantries and runway beams inspections and a condition survey of the bridge coatings/paint systems.

In addition to these, further special inspections on other critical bridge elements have also been carried out. These have included the bridge cables, bridge tower top saddles, rockers/pendles and a rope access inspection of selected vertical hanger cables.

The team also recently completed the overnight annual survey of the bridge – essentially a detailed physical check of the bridge structure to record a significant number of key dimensions and levels. All of the dimensions are compared to historic survey records, going back over 20 years, so that long term changes or trends can be identified that might indicate an issue or defect within the bridge structure.

The overnight survey is carried out every year in July when the bridge is least affected by weather, wind and vehicle loading and ideally when air and steel temperatures are as close to 15 degrees Celsius as possible. As the bridge expands and contracts with temperature variations, corrections are made to the survey measurements dependent on the actual temperature recorded at the time the measurements were taken.

Interesting Fact: The bridge steel deck and truss expand and contract approximately +/-6mm per 1 degree C of temperature change.

Regular maintenance painting has also been ongoing, with the fine weather throughout spring ensuring good progress and production.

A range of other improvements have been implemented around the structure. These have included replacement anti-climb prevention measures on the outsides of the north and south cantilever parapets, new access arrangements at either end of the bridge structure to improve safety and efficiency as well as other structural repairs to walkways and other areas of the bridge structure.

The engineering team have also supported a variety of projects at the Torpoint ferries including works to the retaining sea walls at Rendel Park and structural repair works to the Plym chain gantries.

Upcoming projects during 2023

Design development work has been completed for two upcoming critical projects – the temporary repairs to the supplementary cable supports at the top of the Saltash tower and the rocker/pendle remedial work, also at Saltash.

Both projects require some significant steel fabrication work, which is being carried out off site by one of our contractors. We expect site works to be carried out in the coming weeks. However, due to the location and nature of the works, these are very unlikely to have any impact on people using the bridge.

Spotlight on ferry engineering apprentice Liam Wright

Earlier this year 26 year-old Liam Wright successfully completed his Engineering apprenticeship (Electro-mechanical) with Tamar Crossings.

Born in Plymouth, Liam had done a number of different jobs in the city before joining the organisation as an apprentice in October 2020.

“After obtaining Level 2 and Level 3 qualifications in plumbing and electrical engineering at college, I worked for a number of local companies, including Devonport Dockyard” said Liam.

“After deciding I wanted to move on in my career, I began looking for other jobs. However, whilst my qualifications had given me theoretical knowledge, I kept being told by some potential employers that I did not have the practical experience they were looking for, while others said I had too many qualifications for an apprenticeship.”

Luckily for Liam Tamar Crossings was advertising for apprentices and, having viewed his background and knowledge as a positive, offered him a place as an electrical apprentice based at the Torpoint Ferry.

Within a few weeks the role was expanded to include mechanical engineering and Liam was on his way.

The impact of the COVID pandemic meant that while Liam began working at the ferries in 2020, the college course did not begin until March 2021.

After spending a day at week at college in Plymouth learning about the theory of engineering and other topics, including the strength of materials and how different electrical systems work, Liam spent the remaining four days of each week working on the ferries.

This provided the opportunity to get hands-on experience in carrying out both planned and reactive maintenance activities, including repairing and replacing the sheaves, changing drive units and overhauling and servicing the powerful generators.

“No two days are ever the same” said Liam.
“Sometimes you will be doing routine maintenance on a ferry during its off-peak time, when suddenly there is a major problem with one of the other two ferries. It is then all hands to the pump while the issue is identified and we all work together to develop a solution.

Liam became a fully qualified member of the ferry engineering team earlier this year. With support from the Technical Manager and other members of the organisation, he is now looking at adding to his engineering qualifications by taking a Level 4 NVQ Extended Diploma in Engineering Manufacture.

Everyone at Tamar Crossings is very proud of Liam’s achievements. He is a much valued member of staff and we look forward to seeing his career progress in the future.

Welcoming work experience students to Tamar Crossings

We have been delighted to host work experience placements for four Year 10 students from local schools and colleges during the past few months.

The students spent time with managers and staff at both the Bridge and the Ferry, enabling them to explore and understand a bit more about both crossings and the work of the different departments in keeping the vital services going.

As well as being able to see some areas not normally accessible to the public, such as the bridge towers and the engine space at the ferries, the students also had the opportunity to spend time with our Learning Centre team discovering more about the history of the crossings, and with our ICT team.

“I really enjoyed my work experience” said Charlie Beaumont from Sir John Hunt School. “I didn’t realise how many different aspects there were to engineering and it is definitely a career that I will pursue. Also getting to go up on the bridge was really cool!”

“It was a great experience and I thoroughly enjoyed the history of Tamar Bridge and the mechanical side of the ferry” added Jimmy Chen from Coombe Dean School while Daniel Mahoney, also from Coombe Dean School said “I enjoyed learning about the history and structure of both the Torpoint Ferry and the Tamar Bridge.”

Providing work experience placements for local young people has also been a hugely positive experience for our staff, who have been able to gain a better understanding of what young people are looking for in respect of their employment and career opportunities.

Working with local suppliers and contractors

We are always pleased to work with local suppliers and contractors.

On the Tamar Bridge our current local contractors range from Ivybridge firm Paintel who are responsible for painting and other general maintenance works and Plympton based Underhill Engineering Ltd who carry out structural repairs and other fabrication works, to Cornish firm Tonkin Recovery who operate the free vehicle recovery service for vehicles stranded on the Bridge or in the Saltash Tunnel. Introduced to minimise congestion on the Bridge, the Light Recovery Vehicle (LRV) aims to reach vehicles and their occupants and recover them to a safe location within 30 minutes of breaking down and almost always beats that target.

Another local company which has worked on the Bridge is Saltash contractor P C Doney Electrics. Established by Percy Charles (PC) Doney in 1948, (the first electrical contractor to be officially registered in Cornwall), the family run business has seen three generations carrying out a range of electrical works on the iconic structure during the past 40 plus years.

Although not involved in the original construction of the Bridge, the firm won the contract to replace the giant aircraft warning lights on the top of the two 76 metre high concrete towers in the early 1980's.

"This was a very challenging job" explained Percy's son Malcolm who took over the firm when his father retired. "We were working at the very top of the towers with just belts and ropes holding us in place whilst fitting the new lights.

The firm returned to fit new, more modern, LED aircraft warning lights to the top of the towers 25 years ago. This time the main problem was finding the right size of brackets to fit the replacement lights to the towers.

"In the end a team from the Torpoint Ferries made the brackets and fitted them to the towers so we could replace the lights" said Malcolm.

More recently, with grandson Darren now in charge, the firm won the contract to upgrade the street lighting on the Bridge. This was a big job which involved replacing the lights with more energy efficient LED fittings.

"The old lights used approximately 21Kw every night" said Darren. "With the new LED lights installed the energy consumption is just 6Kw – significantly reducing carbon emissions and energy bills!"

The firm has also been involved in installing and managing much of the extensive network of electricity and communications cables which run underneath the bridge.

Tourism Award

The Bridging the Tamar Visitor and Learning Centre has achieved a Silver 'Green Tourism Award'.

Supported by Plymouth City Council, the Green Tourism Awards are an internationally recognised awards scheme which recognises the commitment of tourism businesses which are actively working to become more sustainable.

Announcing details of the award, the Green Tourism Assessor said "Bridging the Tamar Visitor and Learning Centre have done an excellent job in achieving the Green Tourism Silver award following on from their first Green Check Assessment."

Part of Tamar Crossings, the Centre celebrates the engineering significance of the Tamar Bridge and the Royal Albert Bridge whilst also recognising the environmental legacy of the Industrial Revolution.

The organisation has solar panels in place on the roof of its office buildings, and there are a variety of sustainable transport options to get to and from the Centre.

Receiving the plaque on behalf of the Learning Centre, Mary Olszewska, Visitor Experience Manager for Tamar Crossings, said "We joined the Green Tourism Scheme with support from Visit Plymouth, and are delighted to have been awarded a Silver Award."

We are partnering with organisations who care about the River Tamar and the wider environment of the bridges, and members of our team have received Carbon Literacy training. Recycling facilities are in place for visitors and staff."