Caring for local marine life

Liam Soden, FCBC's Ecological Clerk of Works, explains the measures being taken to protect all forms of life in the waters of the Forth Estuary.

Care for the environment is absolutely central to the Forth Replacement Crossing project. Everybody involved is committed to the rigorous conditions laid out in the contract we have with the Scottish Government and as set out in the Forth Crossing Act Environmental Statement. Our goal is to ensure that the new Queensferry Crossing sets new benchmarks for world class environmental care in large scale construction projects. So what are the particular challenges involved?

Chief amongst them is the fact that the area of the Forth where we are working features a number of designated environmental protection sites. Firstly, we have a Ramsar site (named after the Ramsar Convention on Wetlands of International Importance) which is an internationally designated area for the protection of migrating and wading birds. Also in relation to birdlife, the Firth of Forth and Forth Islands Special Protection Areas (SPA) are designated under European legislation. Bird species common in the area include redshank, bartailed godwit and curlews as well as a wide variety of tern species such as Common, Arctic and Sandwich.

Next, there are two Sites of Special Scientific Interest (SSSI), the Firth of Forth SSSI within the estuary and St Margaret's Marsh on the north shore. Finally, upstream there is the River Teith Special Area of Conservation (SAC) which flows into the Forth. This is an important breeding ground for three species of migrating fish: Atlantic salmon, river and sea lamprey.

Our job is to make sure all construction activities are carried out without harm to these nationally and internationally important environmental protection sites and the protected species found in them.

There is also a range of protected species found in the estuary which include some


Pilot whales


Grey seal

of the larger marine mammals commonly found in UK waters. These fall into two categories: firstly, the ***pinnipeds*** (or fin-footed mammals) such as the grey seal and the common seal (also known as the harbour seal). Then we have the ***cetaceans*** (from the Latin word for whale) which include dolphins, porpoises and whales themselves. White-beaked and common dolphins have been known in the area from time to time. Porpoises are common, if extremely shy, visiting the area to feed on fish and squid.

In the summer of 2012, a pod of 22 Pilot Whales hit the news headlines when they beached themselves on the Fife coast. Unfortunately, most died – despite the efforts of local people – but nine were saved and promptly made their way upstream under the Forth Bridges in search of their favourite food, squid.

This highlights another factor to our environmental protection work – the requirement to safeguard the benthic (or seabed) habitat which provides an important ecosystem for the benthic invertebrate species including ***crustaceans*** (such as crab and lobster) and ***polychaetes*** (such as Annelid worms) and ***echinoderms*** (such as sea urchins and sea cucumbers), species which themselves are a vital part of the food chain for the mammals mentioned above.

The construction activities likely to have the biggest potential impact on wildlife are the rock blasting and piling necessary for the construction of the various foundation elements. The blasting is complete now and the piling is well underway with minimal impact on marine wildlife ensured to date. A Marine Mammal Observer (MMO) working offshore in a boat is responsible for actively monitoring the movements of all marine mammals in the area. If any mammals are identified within a 1km radius of the blasting and piling works within 15 minutes of the start of works, then the works are delayed by 20 minutes or until such time as the creatures concerned have moved off. In fact, this has happened on several occasions, most commonly with seals being found in the vicinity of Beamer Rock which is the site of the new bridge's Central Tower.

This monitoring is made possible by using state-of-the-art Passive Acoustic Monitoring (PAM) equipment. A hydrophone, lowered into the water from a boat, employs acoustic echo location signals (similar to a whale's) to locate the position of any wildlife in the water. Last year, this equipment, specially designed for FCBC, quickly picked up the presence of the pilot whales mentioned above and closely monitored their movements upstream and, a few days later, downstream.

We are also employing a fish deterrent. Boat-mounted sonar equipment sends out a signal which deters both shoals and individual fish from coming within 500m of our works.


Arctic tern

In addition to liaising closely at all times with Transport Scotland and their advisors, Jacobs Arup, our environmental team also meets regularly with a wide variety of local bodies such as local authorities, Scottish Natural Heritage (SNH), Historic Scotland and Marine Scotland to keep them briefed on our activities and what is happening out on the water.

Working in estuarine waters brings many challenges not found on land-based construction projects. FCBC has a team of five environmental specialists with experience of working on large infrastructure projects on land and water. We are proud to be fulfilling the stringent environmental requirements of the contract whilst, at the same time, helping to ensure the smooth running of the construction works.

FCBC's test laboratory is vital to the project

The project to build the Queensferry Crossing has a dedicated, on-site testing laboratory. Here, **Jim Woods**, FCBC Deputy Laboratory Manager, explains the importance of the work carried out by the laboratory team.

Q What's the purpose of the FCBC lab?

A Essentially, the work we do is to ensure that the materials employed in the permanent works – whether excavated on-site and then re-cycled or delivered from off-site – is suitable for the specific purpose it is intended for.

Q What sort of materials are we talking about?

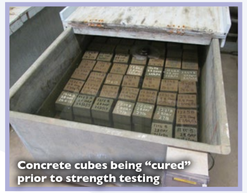
A Well, for a start, there's soil. For example, thousands of tonnes of soil are being removed during the connecting road excavations currently underway from Echline to Dundas on the south side. Most of it is intended for re-use somewhere else on the site – to form embankments, say, or noise reduction bunds within the permanent roadworks. However, before it can be recycled in this way, we test it to make sure it is fit for purpose. Too much or too little moisture and the soil will not compact properly.

Q Concrete is a major feature on any road and bridge project. Do you also test concrete?

A We certainly do. We test the concrete being produced by the FCBC batching plant situated in Rosyth docks. Currently, we are using underwater concrete in and around the caissons and cofferdams; this type of concrete will be used to create the concrete plugs which connect the bedrock to the structural concrete in the tower and pier foundations. Other grades of concrete are being used in the reinforced concrete elements of the various pier foundations on dry land as well as on new bridges in the Ferrytoll area and the new Queensferry Junction on the south side. In due course, different grades of concrete will be produced to form the reinforced foundations for the bridge's three towers, the towers themselves, the piers carrying the road viaducts to and from the bridge and, eventually, the road surface foundations.

Q How do you go about testing concrete?

A We are testing for "workability". That is, how fluid is the concrete and how suitable it is for the task it is being used for. We make up small cubes from fresh concrete and carry out strength tests by crushing them. The cubes are left to harden or "cure" in water for 28 days before being crushed to determine their compressive strength – as measured in Newtons per millimetre squared. The lab is accredited to UKAS (UK Accreditation Service) which obliges us to record all results for regulatory inspection. The underwater concrete for the foundations is being tested every 50 cubic metres. The amount of concrete for this operation will total in the region of 33,000 cubic metres, so you can see that a lot of testing is involved!


Concrete cubes being "cured" prior to strength testing

Q Do you use specialist equipment?

A The most specialist equipment we use is in the measuring and recording of the data produced in the tests we carry out every day. Later on in the project, we will be employing a Falling Weight Deflectometer which will assess the strength of the final, black-topped road surfaces being used on the bridge, the viaducts and the approach roads. This machine is one of very few in the country and is "leading edge" in its capabilities, so we are looking forward to using it.

Q What gives you most satisfaction?

A I suppose it's knowing that what we do enables our colleagues out there on the construction site to get it right first time, every time. We help ensure that the project can proceed on time without any delays being caused by inferior materials being used.

Contacting the FRC team

There are a number of ways you can contact us to ask questions, provide comments, make a complaint or find out more about the Forth Replacement Crossing project:

Call the dedicated 24 hour Project Hotline **0800 078 6910**

Email the team **enquiries@forthreplacementcrossing.info**

Log on to the project website at **www.forthreplacementcrossing.info**

Or drop into the **Contact & Education Centre**
Adjacent Forth Road Bridge Administration Office,
South Queensferry, Edinburgh EH30 9SE

Opening times
Mon-Fri: 0900-1730, Sat: 1000-1600

Forth Replacement Crossing

project update

July 2013

Public decides name of bridge (see page 3)

Good progress and a new name!

So, now we know! It's official – the Forth Replacement Crossing will be called the Queensferry Crossing. It is a very suitable name and we think people will enjoy using it when traffic starts to flow across the new bridge in late 2016. Many thanks to everyone who participated in suggesting names and who voted on the final shortlist selected by the panel.

David Climie and Carlo Germani

Now that the three foundation caissons (North Tower, South Tower and SI pier) are in position and the Central Tower cofferdam is complete, we have reached the stage where we can begin handing over to the Towers team. The process to pour the concrete plugs inside the caissons is now underway. Then we will start building upwards. Local residents and passing motorists will have noticed the yellow Central Tower crane now in position above Beamer Rock. Over the course of the next couple of years, the crane (and its two sister cranes for the North and South towers) will grow to a remarkable height of over 220 metres as they play their vital part in constructing the bridge's three towers, the highest of which will be 207m.

Elsewhere, work on the connecting roads is continuing well. In itself, this work is a £110 million contract, a significant proportion of the entire contract cost and, by any standards, a major roads project. The steel box sections for the North and South Approach Viaducts will start to arrive this summer for final preparation, assembly and fitting out. Meanwhile in June, the two of us were in China inspecting the progress being made on the main cable-stayed bridge deck steelwork. There is a growing feeling of excitement amongst the whole team as work on the bridge's superstructure begins to gather pace.

Care for the environment lies at the heart of everything we do on the Forth Replacement Crossing project. In this issue (page 5), we highlight the steps being taken to monitor and protect all forms of marine wildlife out in the waters of the Forth. We also take a look (page 6) at the important work done in our on-site Testing Laboratory.

In May, we were delighted to win a coveted Gold award at the annual Considerate Constructors Award scheme. See page 3 for more details on what this means and how it reflects the work we are putting in to make sure this project is seen as a benchmark for how to manage major infrastructure construction projects.

David Climie
Transport Scotland
Project Director

Carlo Germani
FCBC
Project Director

Carlo Germani with Bill and Eileen Runciman and their beautiful pots

Clay pots from the seabed

FCBC recently asked Bill Runciman, a Rosyth-based amateur potter who came on a site tour with his local Rotary Club, if he could make some pots from the seabed clay dredged up during the foundation excavations. The excellent results of Bill's work are now on display in the FRC's Project Office Reception. We are extremely grateful to Bill and his wife, Eileen, who was responsible for the glazing of the pots. Bill and Eileen have gifted the four pots to the FRC project for permanent display during the lifetime of the project. At the end of the project, they will be moved to the the Contact & Education Centre (CEC) on the south shore.

CEC Open Days

Over 700 people took the opportunity to visit the Contact & Education Centre (CEC) when doors were opened to the public for two Fridays and two Saturdays in April. Due to the success of these events, further Open Days have been arranged for one Friday and one Saturday of each month between July and September where members of the public can have the opportunity to visit the exhibition space to view information boards and scale models, view the on-going works, hear about how we are building the FRC and ask staff questions about the project.

The Open Days will be held between 10am and 4pm on: 19th and 20th July; 16th and 17th August; and 27th and 28th September. A presentation will be provided hourly from 10.30 onwards on each day. Put the dates in your diary!

Members of the public viewing the CEC exhibition

Entrance to the FRC Project Office

Prestigious national awards for FRC companies

FCBC and Sisk RoadBridge won national recognition in the latest Considerate Constructors Scheme awards ceremony held in April. FCBC received a Gold award for its handling of the works on the Principal Contract, that is the new bridge itself and its approach roads, while the Sisk RoadBridge consortium won a Bronze award on the upgrading of Junction 1a of the M9 motorway. Both awards are for the companies' performances in 2012.

The CCS awards celebrate companies who have implemented the highest standards of consideration towards the neighbourhood and general public, the workforce and the environment. An independent panel reviews hundreds of companies each year based on their performance against the Code of Considerate Practice. Only the highest scoring 10% are selected to receive a Bronze, Silver or Gold Award which are highly prized within the construction industry.

Commenting on FCBC's success, Carlo Germani, FCBC Project Director, said: "We are absolutely delighted to have won Gold at our first attempt. This reflects the efforts being made by the whole team to ensure that we meet the very high standards we have set ourselves on the FRC project in minimising the impact our activities have on neighbours, our workforce and the environment. We plan to build on this success as we move forward with the works on this fantastic project."

It's the Queensferry Crossing!

First Minister, Alex Salmond MSP, was on site on 26th June to announce the result of the Name the Bridge public vote.

37,000 people voted for their favourite name from a shortlist of five chosen by an independent panel from over 7,600 suggestions submitted by the public. Mr Salmond said "The Queensferry Crossing is the country's biggest and most significant transport infrastructure project for decades and I'm delighted that the naming process has enabled so many thousands of people to get involved and rightly feel a sense of ownership for a bridge that will serve Scotland and its economy for many years to come."

An artist's impression of the new Queensferry Crossing

The proud prize-winners of the Painting Competition

Schools painting competition winners accounced

Results of the FCBC's hotly contested Schools Painting Competition were announced at an awards ceremony in the FRC's main project office in March.

The prizes took the form of donations (ranging from £500 to £100) from FCBC to the schools represented by the winning artists. The winning entry was painted by Aimee Middleton from Dalmeny PS, South Queensferry. Second prize went to Zoey Donaghue from Donaldson's School, Linlithgow. Third prize went to Declan Morgan from St John's PS, Rosyth. Fourth prize went to Fern Potter from St Serf's PS, High Valleyfield and fifth prize was won by Clare Donnelly from Springfield PS, Linlithgow. Commendations went to pupils from Blackness PS (near Linlithgow), Dalmeny PS and Springfield PS.

Aimee Middleton with her winning entry

The theme of the competition was "The Forth Replacement Crossing in the Making". A total of seven schools took part and an amazing 250 entries were received.

FCBC's Sally Chambers was delighted with the response from schools. "The standard of entries was extremely high, making the judging all the more difficult. The children and their teachers really entered into the spirit of the competition reflecting the interest amongst local people – and especially schoolchildren – in the new bridge. Our thanks go to everyone for their enthusiasm and, of course, their artistic skills!"

The winning entries have been turned into posters which are now on public display around the Forth Replacement Crossing construction site and in FCBC's offices.

Contact the Community Liaison Team

If you would like to speak to the Community Liaison team – perhaps you have an idea for a new community initiative or would like us to come and give a presentation on the latest developments – please see the contact details on the back page.

www.forthreplacementcrossing.info

Pupils build their own cable-stayed bridges

In April, local primary school pupils were given the chance to build their own cable-stayed bridges. FCBC's Community Liaison team, in conjunction with the Institution of Civil Engineers (ICE), were running a "Bridges to Schools" week for primary school children. The event, intended to give participants an insight into the challenges of civil engineering while having some fun along the way, was well attended and thoroughly enjoyed by pupils and teachers alike!

Six local schools and one school from the Borders attended the event over the course of the week. Over 200 pupils from Primary 5, 6 and 7, dressed in hard hats and high visibility vests, participated in the construction of a 12 metre long model of a cable-stayed bridge, supervised by volunteer civil engineers. Pupils learned all about bridges – the new Forth Replacement Crossing in particular – as well as health and safety, teamwork and civil engineering in general.

This is the second year FCBC and ICE have hosted the "Bridges to Schools" event, but the first time it has been held in the new FRC Contact & Education Centre in South Queensferry from where pupils and teachers enjoyed spectacular views of the existing road and rail bridges. The exhibition space provided a perfect platform for some lively discussion about the construction of the new bridge – -now, of course, to be known as the Queensferry Crossing.

Pupils enjoying their bridge building group task