

Forth Replacement Crossing

project update

November 2014



Ever-changing perspective:

A view across the Forth showing the floating sheerleg crane delivering one of two temporary steel platforms to the North Tower (see p3 for details)



Technical Focus

There's a huge amount of activity going on out on the new bridge's three towers. We take a look at the operations underway this autumn.

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Community Liaison

A run down of some recent community events which the Queensferry Crossing team has been pleased to be involved with.

Page 4

Q&A Article

With new stretches of connecting roads rapidly appearing on the south side of the Forth, learn more about what is involved.

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Forth Crossing Bridge Constructors

HOCHTIEF Solutions
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DRAGADOS
Morrison Construction

It's all happening out there!

Civil engineering rarely gets better than this. All the various technical operations involved in the construction of the new Queensferry Crossing have been working at full capacity in recent months with great results.



Carlo Germani and David Climie

This effort is set to continue in the months ahead as we continue to focus on taking the Project forward on schedule and below budget.

In recent weeks, whether on the towers, the road deck, the viaducts or the connecting roads, members of the public cannot fail to have spotted the significant progress being made on-site. Perhaps the most obvious developments have been out at the towers which, at over 60 metres (200ft) above sea level, have now risen to well above road deck height. This milestone marked the point where we could start building out horizontally from the towers. So, at the Centre Tower in recent weeks, the temporary steel supports and first road deck segments have been successfully installed using a giant, yellow sheerleg crane (incidentally, one of the largest floating cranes in Europe). Blue erection traveller 'cranes', which will lift subsequent deck segments into place, have also been put in place. These operations went exceptionally smoothly thanks to the team's careful and detailed advance planning. Similar developments on the North and South Towers are in progress and will be completed in the next few weeks.

Turn to page 3 for full details of how these operations were carried out and what to expect in the months ahead. The upward progression of the towers over the past year and more has gone extremely well and it is particularly exciting now to see the beginnings of horizontal activity as well.

Turning to the viaducts which will carry traffic to and from the new bridge, on the south shore further successful launches of the southern approach viaduct have taken place while progress on the supporting piers is moving ahead strongly. The two steel box girder structures, which will form the north and southbound carriageways of the viaduct, make an impressive sight high above the water. On the northside, the north approach viaduct abutment is nearing completion, while the first of the two supporting piers, N2, is now complete. Work on the steel viaduct structures themselves will start on schedule by the end of the year.

Elsewhere, significant progress is being made on the connecting roads. On the southside, the new Queensferry motorway junction roundabout was partially opened to A904 traffic in September. The structural steel for the new B800 road bridge over the motorway has arrived on-site with installation scheduled for early November. On the new stretch of M90 motorway south of South Queensferry, foundations work is complete and embankment work is on-going. November will see the erection of new information gantries on the M90 (formerly M9 Spur) and the A90 coming out of Edinburgh. To the north, we have taken delivery of the enormous structural steel elements which, in the months ahead, will be lifted into position to form the new Ferrytoll motorway viaduct. Also at Ferrytoll, drivers passing through the roundabout beneath the A90 will have noticed the recent placing of concrete ground retaining vertical panels which mark the start of construction on the new Ferrytoll gyratory which will be situated to the north of the existing roundabout. Nearby, the realigned B981 coming out of North Queensferry will open to traffic in mid November, joining King Malcolm Drive at its junction with Ferrytoll Road.

So, it really is full steam ahead on all fronts. Every member of the Project team remains focused on safety, quality and excellence in everything we do.

David Climie

Transport Scotland Project Director

Carlo Germani

FCBC Project Director



Worth Celebrating

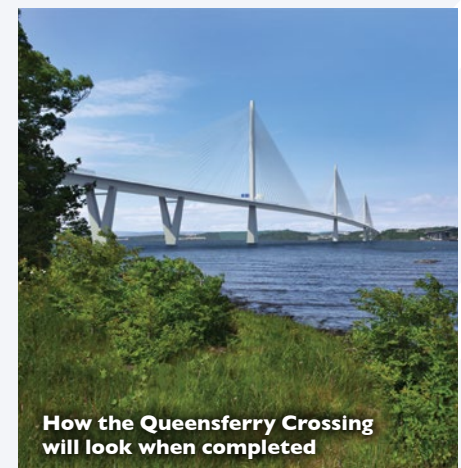
The 50th anniversary of the opening of the Forth Road Bridge was celebrated in style with a variety of local events in September. Here, the North Tower of the new Queensferry Crossing is dwarfed by the spectacular fireworks display launched from its next door neighbour on 13th September.



Carlo Germani & David Climie brief Nicola Sturgeon

Nicola Sturgeon site visit

Bridge going up, cost going down: Deputy First Minister, Nicola Sturgeon MSP, visiting the Queensferry Crossing site on October 6 to announce a further reduction of £50 million in the project budget. The overall budget for the project is now £1.35 to £1.4 billion.



How the Queensferry Crossing will look when completed

Milestones galore as Queensferry Crossing takes shape

More photos on page 5

Now is perhaps the busiest time of all out at the bridge's three towers as we begin to build horizontally as well as vertically. Dramatic – highly visible – developments are happening almost weekly out in the middle of the Forth Estuary. Here, **Carson Carney**, FCBC Cable Stayed Bridge Department Manager, explains some of the critical operations now taking place before our eyes.

We are at a crucial stage in the construction of the Queensferry Crossing. Right now, many of FCBC's frontline technical departments, all 'spotlighted' individually in previous issues of the Project Update, are working together closely to co-ordinate construction activity out on the water. The Towers and Cable Stayed Bridge teams are being supported by the skills and expertise of colleagues in the Temporary Works, Concrete Batching, Marine Logistics and Surveying departments. In every sense, it is a real team effort out there.

During the summer, the three towers reached above road deck height (64m or 210ft), roughly one third of their final height when complete. All involved in reaching this milestone are to be congratulated for an operation which has gone smoothly and efficiently. Here are some pretty impressive statistics from the Towers team:

- Over 14,000m³ (55% of total) of tower concrete successfully poured
- 4,400 tonnes (64% of total) of steel reinforcement for concrete sections installed
- 15,000m² or 50% of total concrete area now poured, equivalent to 3 football pitches

Reaching that height was the trigger for the start of construction work to prepare for the installation of the first deck segments. In the past few weeks, a huge amount of temporary and permanent steelwork has been installed on the towers, totalling 7,200 tonnes. The first elements to be erected were the large, triangular falsework "legs" on either side of the towers. On top of



them now sit temporary steel platforms which, in turn, support the first pieces of permanent steel – the first deck segments themselves – which were lifted into place in October. A significant milestone for all of us. On the Centre Tower, the first four deck segments are attached directly to the towers by means of a complicated "power joint". Next year, subsequent deck segments will be held in place by one of the new bridge's signature features – the all-important steel stay cables.

These major lifting operations were made possible by the giant yellow sheerleg crane which many people will have seen sailing to and fro between the towers and FCBC's marine yard in Rosyth Docks. This crane has a maximum lifting capacity of 480 tonnes in its current configuration. In all, we have had to lift 30 separate pieces of steel falsework and deck segments into position ranging in weight from 120 to 415 tonnes.

Once the first deck segments were fixed in place, the next operation was to lift up the 175 tonne, blue "erection travellers" which are fixed to the segments. These specially designed hoists – two on each tower – use a strand jack system to lift the individual deck segments into position. It is similar in nature to the strand jack system we are using to launch out the north and south approach viaducts on each shore (see May 2014 Project Update). As each new deck segment is fitted, the erection traveller will move along to the front edge, ready to lift its neighbouring segment.

The big question in all these operations is "will it fit?". In all our advance planning and design work, as well as the fabrication of

the various steel components and the long series of concrete pours on the towers, we have been working to the tightest possible tolerances. It is good to take this opportunity to pay tribute to everybody involved on a job well done – and even better to be able to report that, to date, the operations have gone extremely well with each section fitting in precisely.

Looking to the period ahead, the next



operation is to weld together the initial four deck segments then cast the reinforced concrete deck on top. Despite logistical challenges, this is done in situ to save weight when lifting the segments into place. Subsequent segments will have the concrete deck installed in FCBC's shore-based Fabrication Yard (see August 2014 Project Update) prior to being shipped out to the towers and jacked up. Each pre-cast section will weigh typically 720 tonnes, an indication not just of the capacity of the erection travellers but also of the overall mass of the bridge we are building.

As for the cables, we will have to wait a few months yet before we start to see them being installed. The towers have to be double their current height before the first cable anchor boxes can be fixed in position. So, 2015 will be all about continuing the vertical as well as the horizontal progress.

Space here does not allow for more than a just few photographs. If members of the public are interested in seeing more, then a number of time-lapse films are available on YouTube which are well worth watching. Go to www.youtube.com and search for "Queensferry Crossing".



FRC Contact & Education Centre

The Forth Replacement Crossing Contact & Education Centre (CEC) in South Queensferry has had a busy time in recent months with a number of successful events and visits.

The Project Exhibition was open every Saturday from March until October and proved popular, attracting interest from a range of visitors. The Exhibition will be open again in March 2015. A presentation series, launched earlier this year, was also well attended. Professionals from across the project team provided in-depth talks once a month on a number of areas related to the construction works. These technical presentations will also re-commence in March 2015 – watch out for the adverts. In all, we estimate over 8,000 have visited the Project Exhibition.

A Family Day was held at the CEC in August, attracting over 400 people in what was a fun and exciting day for staff and visitors. As well as a range of bridge building activities, project staff arranged guided walks across the west walkway of the Forth Road Bridge to view construction progress on the Queensferry Crossing. The CEC hosted the 2014 Forth Road Bridge Tower Top walkers during July and August, allowing visitors to view the Project Exhibition with friends and family.

A range of groups from across the country, and internationally, continue to enjoy talks and site visits. Over 60 members of the Institution of Civil Engineers visited the project in August for a presentation and tour of the Marine Yard, North Abutment and South Approach Viaduct.

The wider Outreach and Education Programme continues to go from strength to strength and we have been inundated with bookings for school visits. Over 4000 pupils from across Scotland have now visited the CEC to undertake science, technology, engineering and mathematics related activities and find out more about the construction of the Queensferry Crossing.

Overall, the CEC has welcomed over 15,000 visitors since it opened in 2013 and, as interest in the Project continues to grow and construction progresses, we will continue to expand the ways in which we can communicate and promote the construction progress.



Concentrating on bridge building exercises during August's Family Day

HELPING GOOD CAUSES

South Queensferry Scout Group

FCBC have helped South Queensferry Scout Group transform a bleak, windswept space at the back of their Port Edgar HQ



into a welcoming area for outdoor activities. With materials donated by FCBC, a 50-seater campfire circle has been built so Scouts can safely enjoy traditional skills of fire lighting and backwoods cooking. Eight outdoor benches have been made and FCBC also donated a custom made steel fire basket, complete with gantry for holding cooking pots over the fire, which is the centrepiece of the campfire circle. In this spectacular setting overlooking the new Queensferry Crossing, Scouts of all ages can get together around the fire and hone their camp cooking skills whilst enjoying a good sing-song.

The campfire circle has become a focal point for outdoor events enjoyed by the 110-strong Scout Group, local community youth groups and members of the public who hire the Scout Hall. Group Scout Leader, David Brown, said "Thanks to FCBC we now have a brilliant outdoor space. Our Scouts, and also our international visitors, will have happy memories around the campfire which will be a great facility for many years to come."

FCBC Charity Fundraising Concert – Dunfermline Abbey



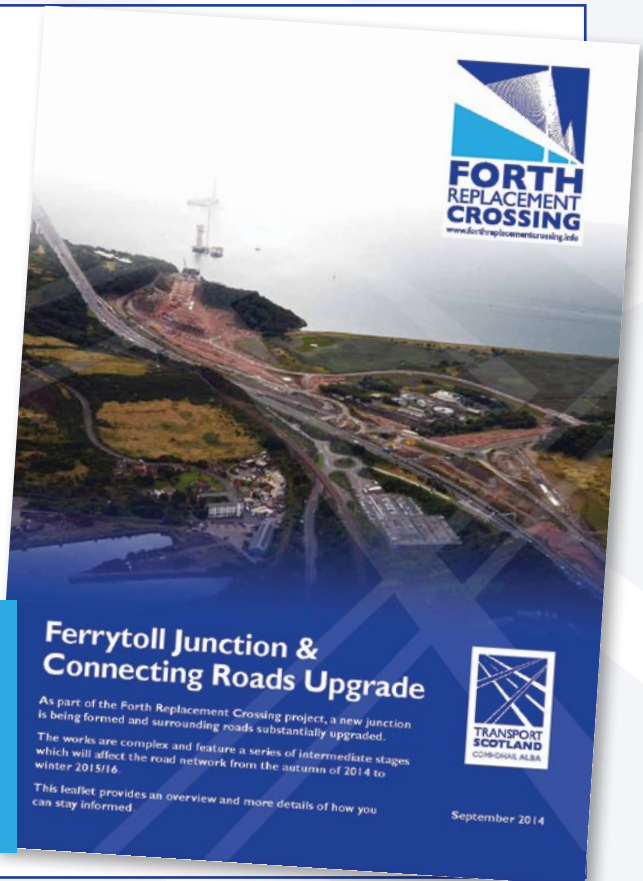
On 1st November, FCBC were delighted to sponsor a charity fundraising choral concert in the magnificent Dunfermline Abbey featuring the Borders based Andante Chamber Choir. A total of £650 for two excellent local charities: Queensferry Churches' Care in the Community provides a range of services, advice and information to older people, people with dementia and carers across rural west Edinburgh. Home-Start Dunfermline is one of 300 Home-Start schemes across Scotland and the UK providing personalised, one-to-one advice for young families experiencing difficulties including mental health issues, substance abuse, family breakdown and illness or disability.

Many thanks to all who contributed to the success of the occasion.

Public Information Sessions

A series of information sessions were held in late September and early October on the various works required to upgrade Ferrytoll Junction and surrounding roads as part of the project. Nearly 400 people came to drop-in sessions in Inverkeithing, North Queensferry, Rosyth and the Contact and Education Centre in South Queensferry. An information leaflet had earlier been dropped to around 26,000 residents and businesses in the surrounding areas. You can stay up to date on the latest works by visiting www.frc-ferrytoll.info.

You're once again cordially invited to find out more about progress across the project at the next annual Public Information Sessions in January 2015. The 90-minute sessions will be held at the Contact and Education Centre at 3pm and 7pm on Tuesday January 27 and Wednesday January 28. In addition, an open day will be held at the same venue on Saturday 31st January between 10am and 4pm.

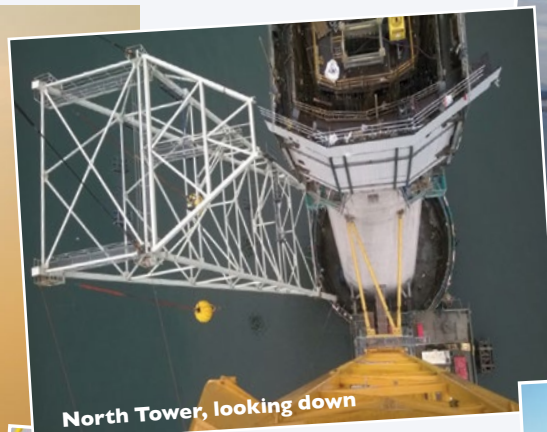


Technical Focus

Continued from page 3, more recent construction photos from the towers...



Centre Tower sunset



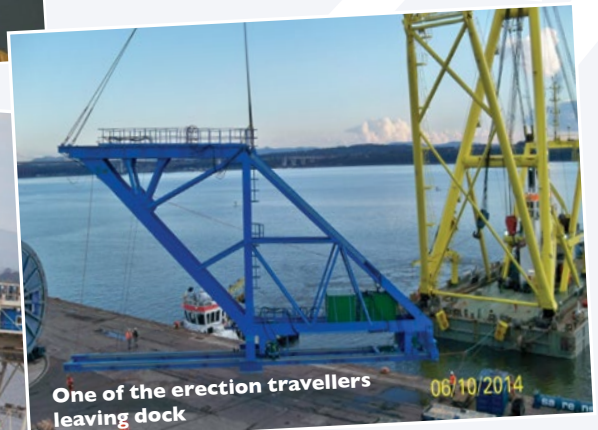
North Tower, looking down



"Delivery for North Tower!"



North Tower, installation of temporary platform



One of the erection travellers leaving dock

06/10/2014



Connecting the bridge to the world beyond

Public focus often falls – understandably – on the new Queensferry Crossing itself. But the works to connect the bridge to the existing roads network on either side of the Forth estuary are also vital components of the whole job. Here we speak to **Claire Duguid**, FCBC Senior Engineer Network Connections South.

Q First of all, tell us about your role within FCBC.

A I am based in the Network Connections South office outside South Queensferry. I help manage the various major road work schemes currently underway which are designed to allow traffic heading to and from the Queensferry Crossing, when completed, to connect easily and efficiently to the existing roads network in the area. In addition to safety on-site – our number one priority – my principal responsibilities revolve around planning: scheduling the works, managing the large number of sub-contractors on-site and ordering all the materials needed to complete the works. My aim is ensure that the works remain on schedule. So far, so good!

Q What are the main elements of the road works your team is working on?

A There are several, all quite visible to local residents and passing traffic. First of all, there is the new 4.3km stretch of new M90 motorway south of South Queensferry. This will connect the bridge to the existing M90 (formerly M9 Spur) and the A90 to Edinburgh. Then

there is the major new Queensferry motorway junction to the south of the bridge which comprises slip roads, a new gyratory roundabout carrying the A904 and realigned local roads including the junction of the A904 and B924 at Echline Corner. The south carriageway of the roundabout was opened to traffic in September. The north carriageway will open later this year. Another major element of the works is the realignment of the B800 road heading towards Kirkliston which involves the construction of a new road bridge over the existing A90.

Q What are the main challenges you face?

A We have a contractual obligation to keep traffic flowing at all times on all local roads. That means we are working in a 'live traffic' situation, so effective traffic management is vital to keep any disruption to traffic to an absolute minimum. Things are easier on the new stretch of motorway we are constructing since this is being built 'off-line' away from existing roads, so there is no danger of disrupting the travelling public. Another

big issue during the construction phase, especially as we approach winter, is the control of excess rainwater. We have installed a comprehensive pumping system to divert water away from the works to nearby drainage ponds on-site.

Weather is always an issue, just as it is right across the Project. Being based at ground level, we are less affected by wind than our colleagues on the viaducts, towers and road decks. There are always significant logistical challenges such as managing all the personnel on-site – making sure the right people are in the right place at the right time – and that they have the right supply of materials to allow them to do their job. Finally, safety on-site is a top priority. Obligatory daily safety briefings for all personnel are helping us contribute to the excellent overall safety record the Project has to date.

Q What gives you the most satisfaction?

A Undoubtedly, it is seeing the progress being made as the new roads take shape day-by-day. The Forth Replacement Crossing is a fantastic project to be involved in and the entire roads team is proud of the part we are playing in its success to date.



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 9SF

Opening times

Mon-Thu: 0900-1700,

Fri: 0900-1600, Sat: 1000-1600



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