

Frequently asked questions

Ouse Washes Section 10 works – Flood Barrier

May 2020

Why do we need a barrier at Welney Wash Road?

As part of the Section 10 bank raising work undertaken to comply with the Reservoirs Act 1975, we must deploy a robust barrier on the Welney Wash Road where it intersects the Middle Level Barrier Bank.

The Welney Wash Road crosses the Ouse Washes Flood Storage Reservoir and creates a low point in the Middle Level Barrier Bank. This low point increases the flood risk to the local community and the chance of a breach in the bank if water levels were to overtop it.

Historically, when the Washes is flooded and the water level at Welney reached a predetermined level, we created a temporary flood barrier across it using large sand bags. The last time we created such a barrier was in the winter of 2012/13.

Installing large sand bags is costly in terms of labour and waste (we cannot reuse them). We have sourced a **demountable barrier option** that will provide the robust flood protection solution and will be bespoke to Welney which we will store at our Ely depot.

What will we be doing?

To accommodate this demountable flood barrier, when needed, we will build a short textured concrete support wall either side of the road for the temporary barrier to join. We will also install a concrete slab across the road for the barrier to be attached to whilst it’s in use.

This is a really vital part of our long-term investment in refurbishing and maintaining the Ouse Washes Flood Storage Reservoir and protecting surrounding properties.

We have agreed the detailed design of the demountable barrier, abutment walls and foundation with the Reservoir Engineer and the Norfolk County Council highways team.

When will we do the work?

Our assented working window for this project, agreed with Natural England, is between 15 July and 31 October each year.

At the moment we are planning to do the demountable flood barrier works during the summer of 2021.

Following a detailed investigation, there are utilities located in the road where we need to build the foundation and walls. We have liaised with the utility companies to agree what work needs to be done. Our start date currently depends on the timescales that the utility companies need to complete any enabling works ahead of our construction.

We want to make sure we do this work at a time that limits the impact on the local community and road users. We will be working with the local community to identify the most appropriate time of year to close the road for the construction works.

However, there are times of the year when we are unable to carry out this work, including the middle of winter.

How long will it take to do the barrier work?

The works will take approximately 14 weeks to construct which includes:

* 8 weeks approximately to construct the walls and this work will take place using traffic lights.
* 6-8 weeks to construct the road slab and we will need to close the road to do this.

Before we start the barrier works we will apply for the road closure to Norfolk County Council, which can take up to 12 weeks for approval.

Before the road closure is removed, we will install the barrier as a trial and training exercise and to provide an opportunity for the local community to see it in action.

We will provide more details of these arrangements in due course once the contractor has produced the Traffic Management Plan.

Why is a road closure necessary?

A road closure is necessary due to the excavation depth and the number of services buried under the road.

We need to build the formwork/temporary mould, install the reinforcement, cast the concrete and wait for it to set which can take up to 28 days. We will need all the available road space to do this.

Why will the concrete slab take 28 days to set?

Concrete is a mix of water, sand, aggregates (gravel size stones) and cement. When mixed together these four materials form a pourable mix. Chemical reactions start occurring which lead to the mix getting harder and harder over time and ultimately result in the concrete becoming strong enough to bear loads.

The ratios at which each of the four materials is added to the mix determines the final strength of the concrete, which is normally measured after 28 days.

We have designed the concrete mix for the slab to maximise the likelihood of it reaching strength within 7 days. However due to the unpredictability of the weather conditions, we cannot guarantee the 7-day target.

Can the concrete slab be made off site and installed using a crane?

The concrete slab of the demountable barrier will span across the road.

The slab will weigh in excess of 30 tonnes. The reach of the crane required would mean extensive temporary modifications to the road.

Due to the the size of the crane required a road closure would still be needed. Additionally, we would have to modify the road to take the loadings of the crane and slab which would be equal to the amount of time it will take to build the slab on site.

Can you cast the concrete slab in two sections to keep one lane open?

There isn’t enough road width to cast the slab in two sections and it would not allow enough space for a safe working area. Similarly, to the above question we would need extensive temporary road modifications. .

Will traffic run on the concrete slab or will it have asphalt over it?

The concrete slab has a width of 2.2m in the direction of the traffic, however only 0.4m will be exposed to the traffic with the remaining 1.8m sitting below the asphalt at 0.15m depth.

Will the services under the concrete slab be accessible in case of emergency?

The concrete foundation will sit above an existing telecoms cable and a drinking water pipe. We have made provisions in the design to allow access to these services after the construction of the foundation by installing ducts around the cable/pipe that will allow the utility companies to pull them out either side of the concrete foundation if necessary.

Can you work at night and bridge over the day for traffic to get through?

When programming the work we considered many options, including working for 24-hour shifts and only at night. The 24-hour shifts would not work, particularly as the night-shift would create noise from breaking the asphalt.

The noise and lighting equipment we need for night working would be disruptive. We would disturb wildlife by lights and noise; lights needed for operating at night and noise generated from operators communicating, breaking the asphalt and running generator for powering tower lights.

We considered a bridging option, but the excavation would be too wide to span with a bridging plate.

Can you work on the barrier construction when the road is already flooded and impassable?

We considered this, but there are more disadvantages than there are advantages:

* The road doesn’t always flood in the winter so it’s very difficult to plan for.
* We only have a fairly short warning when the road is going to flood compared to the amount of time the contractor needs to obtain the appropriate consents and mobilise equipment, labour and materials. Additionally, they are not on site during the winter and their resources will take longer to deploy from working elsewhere on other projects.
* The flood may recede before the work is finished.
* The works may take longer as the days are shorter (fewer daylight hours).
* When the temperature is colder it affects how quickly the concrete cures (it takes longer).
* We would need to gain assent in advance from Natural England to do the works in the winter, including using artificial lighting.
* Formal road closure needs 12 weeks advanced notice.
* It would be dangerous for the contractors to be working when the water levels are high in the Washes.

What are the benefits of the demountable barrier at Welney?

* Stronger, reliable, stable and a more robust method of flood protection.
* Easier and quicker to deploy than sand bags – it will only take approximately 45 minutes to install.
* Solely for use at Welney.
* Acceptable to the Reservoir Engineer.
* No risk of running out of sand bags in flood conditions.
* No waste.

We engaged early with Norfolk County Council Highways department and the West Norfolk & Kings Lynn Emergency Planner to successfully obtain their agreement to this method.

Why are we not using sandbags anymore?

* They cannot be reused resulting in a lot of waste that we need to dispose of.
* They take a long time to install – using up valuable resources who could be working elsewhere.
* They are cumbersome to install; they are heavy and they require lifting operations and manual handling.
* They are not kept in storage ready for use – we would have to pre order them and if the circumstances change we wouldn’t be using them.