

# DoWCoP bulletin

CL:AIRE's DoWCoP bulletins describe applications of the CL:AIRE Definition of Waste: Development Industry Code of Practice. This bulletin describes the construction of the Chambers Wharf cofferdam by reuse of demolition material on the Site of Origin.

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## Implementing the Waste Hierarchy at the Thames Tideway Chambers Wharf site

### Introduction

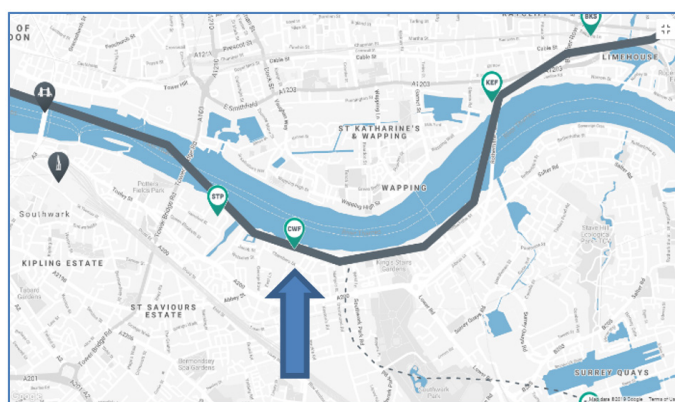
Through the application of the CL:AIRE Definition of Waste: Development Industry Code of Practice (DoWCoP) the Thames Tideway Tunnel project (Tideway), working with the Environment Agency, was able to reduce waste arisings and disposal costs associated with jetty demolition and cofferdam construction activities at the Chambers Wharf. Associated with this were a number of significant environmental benefits.

The Tideway project is part of a number of infrastructure upgrades to London's sewerage system to cope with the demands of the city well into the 22<sup>nd</sup> century. The tunnel will reduce storm overflows of sewage into the tidal River Thames which currently receives millions of tonnes every year. The tunnel is a 7.2 metre diameter, 25 kilometre long interception, storage and transfer tunnel running up to 65 metres below the river. The tunnel starts in west London and generally follows the route of the River Thames to Limehouse, where it then continues north-east to Abbey Mills Pumping Station near Stratford. There it will be connected to the Lee Tunnel, which will transfer the sewage to Beckton Sewage Treatment Works.

### The Environment Agency's Role

Since 2015 the Environment Agency's embedded Tideway team has been working closely with Tideway and their main works contractors to influence designs and ensure the best environmental outcomes are obtained during construction as well as deal with the extensive programme of approvals and consents required to deliver the project over the construction period.

Construction started in 2015. Since then marine works, riverwall strengthening and shaft construction have been ongoing at many Tideway sites. Tunnelling began in summer 2018. The Tunnel will become operational and start to intercept sewage overflows by 2023. There is then a period of commissioning when it will be tested and fully integrated into the network



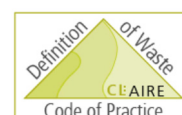
Chambers Wharf Bermondsey: location and aerial view (February 2019)

### Chambers Wharf

Chambers Wharf is the drive site for the Main Tunnel Boring Machine (TBM) for the East Section of the Tideway Tunnel. The drop shaft at Chambers Wharf will also receive the Greenwich connection tunnel TBM and the TBM arriving from the Central Section. The temporary works at this site included the construction of a cofferdam structure into the tidal Thames to increase the size of the site. At 8,400 m<sup>2</sup>, this temporary new land surface at Bermondsey is considerably larger than the football pitch at Wembley.

For more information on the DoWCoP, please visit: [www.claire.co.uk/projects-and-initiatives/dow-cop](http://www.claire.co.uk/projects-and-initiatives/dow-cop)

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As part of the cofferdam construction works, the existing 2,100 m<sup>2</sup> jetty had to be demolished and 110,000 tonnes of dredged ballast was backfilled into the cofferdam to transform it into a working platform. The old jetty comprised concrete (decking, piles and river wall parapet), steel (framework and rebar) and timber (fenders). The concrete, under the usual waste regulatory regimes, would have been transported off site to a permitted waste facility. Transportation of the waste concrete would have required up to 183 wagon movements from the site.

At Chambers Wharf an alternative, more sustainable process was followed. The DoWCoP Site of Origin scenario (i.e. reuse of materials on the site from which they were excavated) was applied and a Material Management Plan developed by the site team to reuse concrete arisings from the jetty, resulting in a 1,650 m<sup>3</sup> reduction of waste material removed from site, reduction of infill and wider environmental benefit related to energy use, emissions, air quality and noise.

## DoWCoP

Since 2008, the Environment Agency and Natural Resources Wales have agreed to take account of the DoWCoP in deciding whether to regulate materials as waste. The DoWCoP provides a framework for excavated material arising from remediation and land development projects, which if followed, the Environment Agency has agreed will not require waste regulatory controls. Reuse of materials in this way is key to implementation of the waste hierarchy.



In order to determine whether materials can be managed under the DoWCoP the following factors need to be met:

- i. Protection of human health and protection of the environment
- ii. Suitability for use, without further treatment
- iii. Certainty of use
- iv. Quantity of material

The above four factors are demonstrated using a Materials Management Plan which is reviewed and declared by an independent Qualified Person.

## Chambers Wharf Jetty Demolition

Environmental noise and traffic logistics are some of the more significant constraints at Chambers Wharf, as the site is surrounded by residential properties and only accessible by minor residential roads. Demolition and construction noise is monitored under a Section 61 legal agreement with the Local Authority, and there are strict controls on timings, plant allowed on site and number of vehicle movements.

Removal of all the jetty demolition material by road would have involved a significant number of vehicle movements, so an alternative solution was investigated. Reuse of the concrete demolition material as infill for the cofferdam significantly reduced the number of vehicle movements to and from the site during the demolition programme as well as minimising barge and material movements to site.

Working with the Environment Agency under the requirements of DoWCoP it was agreed that the arising concrete material was suitable for use as infill material for the new cofferdam. The jetty was demolished and the concrete arisings were reused at the site of production.

The jetty parapet wall was initially cored then cut with band saws prior to the concrete deck being munched to remove metal rebar using electromagnets and then segregated. The resulting steel and timber were removed by road. When broken out, the concrete material was produced in a manner that matches a Type 1C material, as outlined with the Highways Specification Series 600.

The concrete material was then temporarily stockpiled within the area it was broken out, for reuse as backfill in the cofferdam. All of the concrete material from the jetty (approximately 1,650 m<sup>3</sup>) was reused within the construction of the cofferdam and was placed between a top and bottom layer of imported 6A Material. The following testing was undertaken to assess material suitability:

- Bulk material test.
- Moisture content test.
- Particle Size Distribution test.
- Compaction test.

No chemical testing was required on the material. This was supported by the following rationale:

- No visual or olfactory contamination identified during the works investigation.
- Concrete is typically regarded (when a waste) as inert.
- The entire area was covered in hardstanding eliminating any contact it may have to potential human receptors and for any leaching to occur, relating to risk to ground and surface water.
- The concrete material will be removed by river and disposed of in a suitable permitted facility following the completion of the works.

All information relating to the placement of the material and the assessment of risk to human health and the environment is covered under the Materials Management Plan submitted in the declaration agreed with the Environment Agency.



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## The Benefits

There has been an assessment on the project of the associated benefits of the reduction in haulage vehicles used for jetty demolition.

| Aspect  | Associated Benefits        |
|---|----------------------------|
| Total volume of concrete reused   | 1,650 m <sup>3</sup>       |
| Reduction in carbon associated with reduced concrete disposal                     | 4,370 kgCO <sub>2</sub> e  |
| Reduced waste disposal costs  | Approx. £50,000            |
| Number of road journeys reduced   | 183                        |
| Reduction in haulage  | 4,758 miles                |
| Reduction in carbon associated with reduced road movements                        | 7,010 kgCO <sub>2</sub> e  |
| Number of barge journeys reduced for material supply                              | 3                          |
| Reduced need for aggregate savings  | Approx. £60 000            |
| Reduction in carbon associated with reduced barge movements                       | 150 kgCO <sub>2</sub> e    |
| Carbon associated with reduction in the use of aggregates in the cofferdam infill | 7,000 kgCO <sub>2</sub> e  |
| Total carbon savings  | 18,530 kgCO <sub>2</sub> e |

In addition, the DoWCoP process has an element of self-regulation by an independent third party and Qualified Person. A major benefit from a regulatory viewpoint is that this releases the Environment Agency resources to focus on higher risk activities. The requirements for this included 0.5-1 day collation of a materials management plan, 1 day third party review by a Qualified Person, the fees for DoWCoP application and preparation of the verification report. The cost for this came to approx. £3285.

## Conclusion

Construction of the Chambers Wharf cofferdam involved the successful application of the DoWCoP by reuse of demolition material on the Site of Origin at Chambers Wharf.

It involved input from the Environment Agency's embedded Tideway team, the local Environment Agency Land and Water (waste) team and an independent Qualified Person to review and declare.

Significant environmental, social and financial benefits have been demonstrated as part of the reuse of the material including:

- A reduction of 4,758 miles of haulage distance to a waste management facility.

- A total reduction of approx. 18,500 kgCO<sub>2</sub>e through reduced material use and haulage and disposal, as represented in the table above.
- Reduced use of primary aggregates by approx. 1,650 m<sup>3</sup>.
- Significant community and contract compliance benefits through a reduction of road movements to site, improving local noise impacts and air pollution.
- Improved local road safety with a reduction of 183 road movements from site.
- Savings of approx. £110,000 on disposal and aggregate costs.



Chambers Wharf: Jetty demolition and reuse in cofferdam construction (2017).