

Demolition waste disposal at Devonport 9 Dock

Environmental Case Record



Location	Devonport Royal Dockyard, Plymouth
Client	Ministry of Defence
Designer	Babtie Group Ltd
Main Contractor	Carillion / DML Alliance

Technical Data

Contract Type	Dock refurbishment
Value	£60m

Principal Quantities

Excavation material	20,000 m ³
Demolition material	6000 m ³
Wagon journeys	17000

The Carillion/DML 9 Dock Alliance at Devonport Royal Dockyard have overcome the problem of the disposal of some 20,000m³ of mildly contaminated excavation demolition materials and have utilised it to improve the amenity of the dockyard.

The project involved the excavation of material in and around the existing 9 Dock which was indicated to be contaminated at levels generally between ICRCCL trigger and action thresholds. The obvious disposal route was to a local landfill site, registered to receive such material. On consideration of this, certain disadvantages were immediately apparent. There was every indication that the material was lightly contaminated, in the main, and was otherwise good engineering material. Disposal as waste would have involved the impact on the local community of up to 1700 wagon journeys through Plymouth, and would have depleted valuable landfill area better reserved for seriously contaminated material. This was clearly not the best environmental option. The 9Dock team were, however, very conscious that despite the overall area of the dockyard there was a critical shortage of suitable area for short term storage of materials not already allocated to the dockyards operational functions. They developed a scheme, therefore to construct a utility area within the dockyard for the current and future use of the dockyard. This utilised the excavated material in the construction of a waterside embankment which effectively joined existing embankments to create improved accessibility and increased useable space. There were, of course a number of issues surrounding the scheme to be addressed. Would the activity constitute a landfill site? Would it present a source of contamination of the nearby watercourse which flows to Sites of Special Scientific Interest? Would it affect the habitats of the local Special Protection Area, cause nuisance to local residents? Would it be aesthetically acceptable and would it be structurally stable? It was clearly necessary to satisfy the Ministry of Defence landowner, the Environment Agency and Plymouth City Council that the scheme was viable and environmentally sustainable in the long term and extensive consultation was undertaken with all these parties. The Environment Agency readily confirmed that direct use of the material in a work of construction was not disposal of waste as it did not fall out of the "cycle of utility", and thus did not attract landfill tax or formal exemption requirements. To control the levels of contamination permitted in the construction, and thereby its potential to cause local pollution, a regime of sample testing of the excavated material was developed with the Environment Agency. This was backed up with operative training in the recognition of and response to signs of contamination.

The design of the construction was based on Specifications for Highway Work to ensure a stable construction and included a capping of crushed concrete to contain the excavated material and provide a wearing course. The concrete was won from site demolition works and crushed on site, thereby recycling a further 6000m³ of otherwise waste material. As the material was contained and direct contact was prevented it was identified that the remaining pollution link between source and receptor was via surface water leaching. The team hoped to demonstrate directly by sample leachability testing that the leachate criteria in the Environment Agency Guidance on Disposal of Contaminated Soils were not exceeded. This was thwarted however by extreme variations in the results. Orders of magnitude of variation were experienced in tests from the same sample and within cross checks by different laboratories. The time constraints of the works required a practical solution to the situation in hand and did not allow for a full investigation of this effect, which may have implications for implementation of the EA guidelines generally. A regime based on total content was therefore established using ICRCCL trigger threshold levels as the basis, with agreed relaxations to reflect the elevated levels of metals which occur naturally in the locality. To improve the stability and aesthetics of the interface between existing ground and new construction at the waters edge a gabion wall was constructed, again using crushed concrete won from demolition. The waters edge includes strips of salt marsh which are part of a site of local interest and nature conservation which the wall was carefully positioned to preserve. During assessment of the area, Japanese Knotweed was identified. The scheme provided the opportunity to exterminate the local incursion of this invasive plant, initially with weedkiller and subsequently by burying the rootstock below survival depth. Planning consent was gained from Plymouth City Council, which included noise levels for the concrete crusher and selection of plant. Overall an economic saving has been made for the project, as well as generating further opportunity for creative recycling. The team has grasped this potential and made recycling 100% of excavated material a key project environmental target.