

**C360 Crossrail Intermediate Shafts and Headhouses
Limmo Peninsula Site, Lower Lea, Canning Town, London, E16 1DN, UK
Costain-Skanska Joint Venture (CSJV) and Crossrail**

BIG Biodiversity Challenge Award Category: *Small Scale Enhancement*

Project overview

This project comprises the construction of an intermediate shaft and headhouse at Limmo Peninsula. The shaft is part of the wider Crossrail scheme and will provide access to the running tunnels for firefighting, emergency access/egress and general maintenance. A green mound was incorporated as part of the final shaft design.

What were the biodiversity conditions on site, prior to the enhancement?

The site is approximately 3.5ha. When the site was taken over by C360 from the previous contractor, the majority was covered in hardstanding to a depth of 1.5-2m. There was a small area (<5% of total site area) along the western boundary of the site which contained mixed vegetation as well as Japanese Knotweed and Giant Hogweed.

What were the reasons behind this project ?

The Limmo Peninsula site is located in an urban environment providing very limited natural habitats. The green mound was a accumulation of Crossrail and CSJVs principles to continuously push for sustainable improvements in construction as well as targets to achieve no net loss and achieve a CEEQUAL score of 'excellent'.



Completed green mound.



Positioning lytag into mound shape.

What were the biodiversity measures taken?

The biodiversity measure taken at the Limmo Peninsula site was the creation of a grassland mound which covers the headhouse of the shaft.

The mound was backfilled with approximately 11,000 tonnes of Lytag which is a lightweight aggregate manufactured from pulverised fuel ash. This a by-product from coal power stations and presents a very low impact to the environment. Imported soil was then emplaced on top and sown with a wildflower meadow mix. The turf is made up of UK native wildflowers (75%) and grasses (25%) and comprises of 39 different species of flora.

This project aligns with the London Borough of Newhams built environment habitat action plan which states that new developments are designed to benefit wildlife. The project also increases ‘native meadow flowers’ which is one of the key species. The built environment habitat action plan states that ‘colourful displays of wildflowers are seldom seen in open spaces across the Borough given the intensive mowing of many grassed areas.

The grassland mound recycles CO₂ into O₂. It locks up airborne pollutants which improves air quality and generates a healthy micro-climate around the building for colonisation by neighbouring flora and fauna. The mass on the green structure has sound-absorbing properties to create dramatic dB reductions, provides aesthetic benefits including adding natural colour to the local area and encourages the public to understand wildlife value.

The project is easily replicable and long term management has been considered.

The maintenance requirements of the mound are very low, as once it is fully established, it does not need watering and only requires trimming once a year in mid-October.



Different stages of the mounds construction.



Flowering of mound

Further information

The grassland mound comprises a drainage layer above a waterproof layer. Pre-seeded turf mats containing foliage, growth media and principle root zone were installed on top.

As the lytag is a very lightweight aggregate and the Limmo site is very exposed, C360 faced issues with wind blowing the lytag around. We overcame this issue by simply spraying a light layer of water over the lytag to weigh it down.

The lessons learnt have been shared amongst Crossrail, Costain, Skanska and the wider business to support current and future projects. The lessons learnt from a previous wildflower mound installed at a separate project site were taken on board at the Limmo site. The C360 project comprises of 5 separate sites which are all at various stages. At our Stepney Green site, we intend to replace all trees lost with priority species from London Borough of Tower Hamlets Biodiversity Action Plan along with additional areas of wildflower grassland, swales and shrubs.

The design of this grassland mound is fully replicable across any size site. The low maintenance requirements are included in the operations and maintenance manual for the future operators.

Project Team

- Client – Crossrail
- Principal Contractor - Costain-Skanska Joint Venture (CSJV)

What was the motivation for carrying out the enhancement?

Since C360 took over the site, there has been a vast amount of high rise residential development in the surrounding area with balconies that overlook our site. The lack of natural green landscapes for these residents is very noticeable and anything that we were able to do to enhance their view can only be beneficial.



Different stages of the mound's construction



View of mound from road.