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Resilience and Flood Risk

Serpentine Park – Flood Risk Assessment

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Version 1.0
RAB: 1393L

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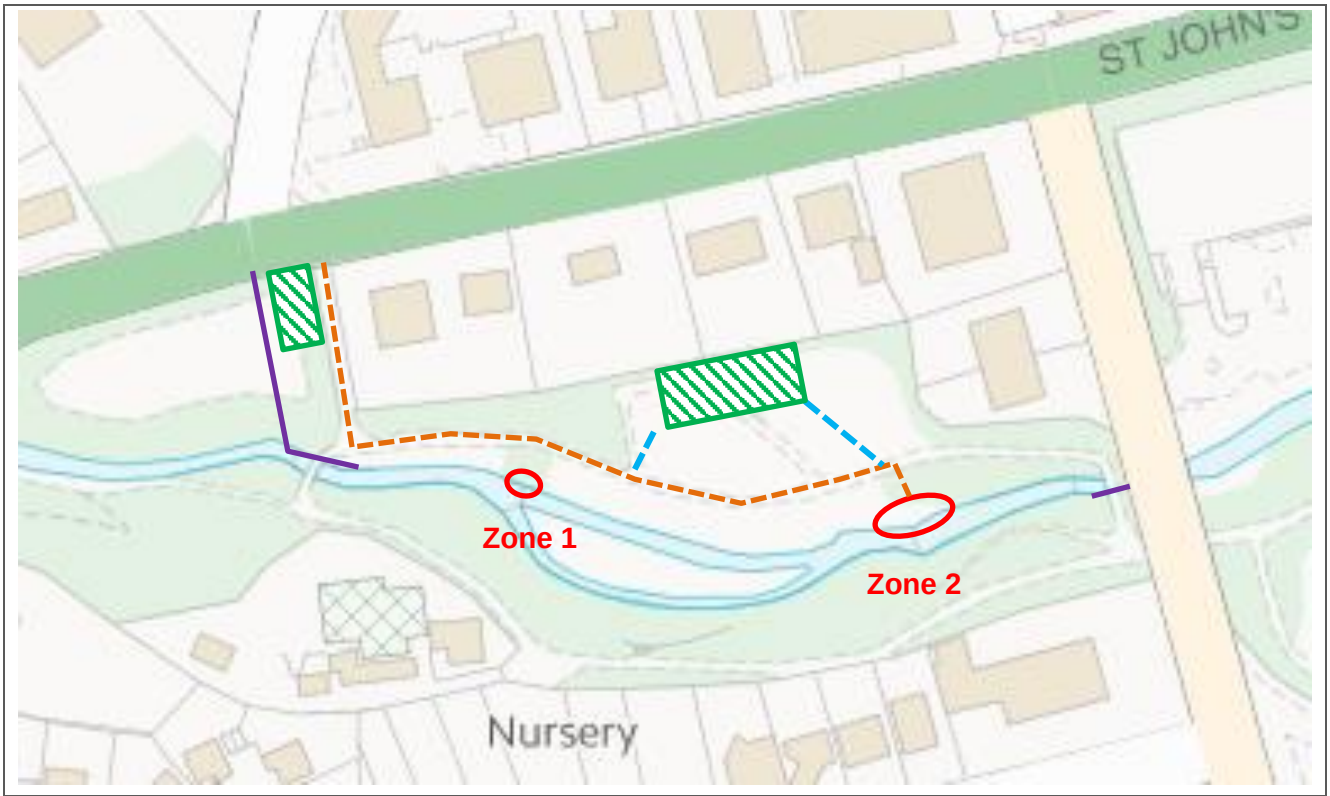
1.0 Site details

The sites are located on River Wye, Serpentine Park, Burlington Road, Buxton SK17 9AR.

The Ordnance Survey reference for the site is 405318, 373300.

Flood Risk Activity Permit Ref: EPR/MB3353PY (Granted)

TABLE 1 - SITE LAYOUT, STORAGE AREAS AND ACCESS ARRANGEMENTS



Works site area

Material, waste, welfare and plant store.

Vehicle access route to site

Grass protection routes from store to site

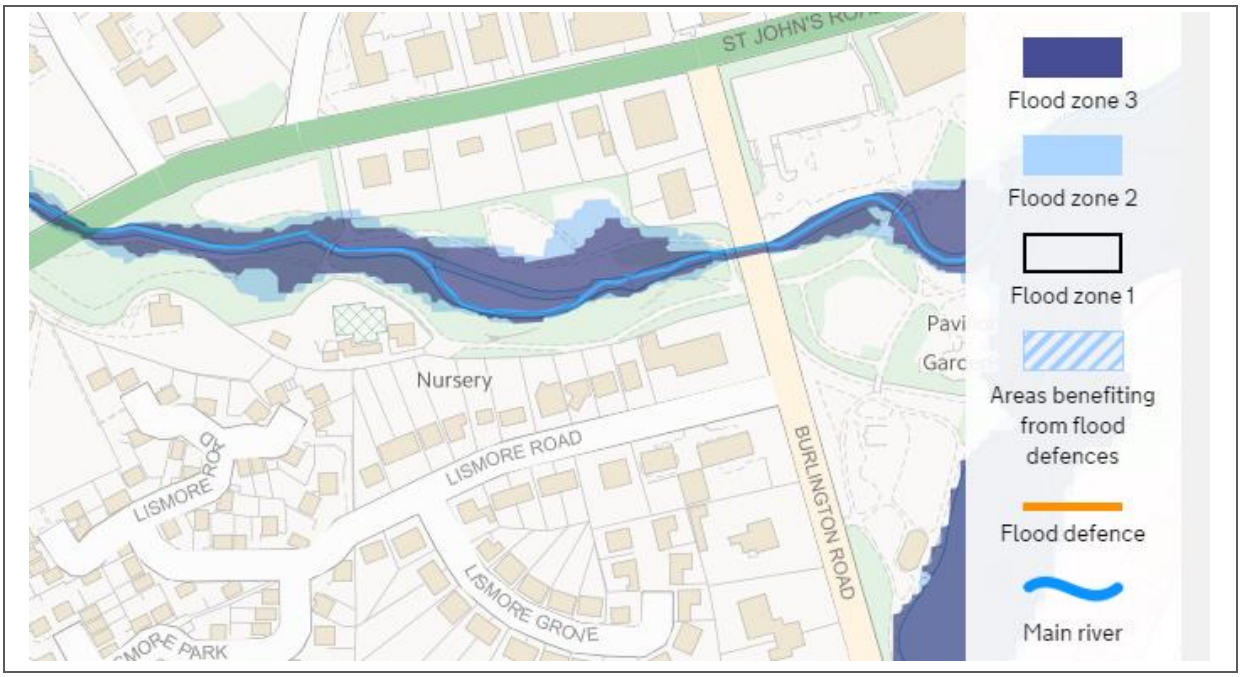
Heras fencing to close off footpaths to public

2.0 Site description

A breach in the left bank upstream wall has created an overland bypass channel around the weir, which over time has caused further wash out, creating a deep channel. The water re-joins the River Wye by passing through and over the downstream left-hand wall. The same effect was seen further upstream,

however to a lesser extent. Both sites are water compatible as the sole function is the bank of the River Wye.

TABLE 2 - FLOOD RISK OVER THE SITE ACCORDING TO THE ENVIRONMENT AGENCY FLOOD MAP



3.0 Development proposal

Zone 1 as identified on the topographic survey. Dumpy bags will be lowered into the channel in a line to allow for dry working conditions on the LH bank. The bags will stretch from 3m upstream of the weir, diverting flow to the secondary RH channel. A pump may be required to maintain a dry work environment. An assessment will be made on the existing stone wall as to weather is requires rebuilding or re-pointing. A trench behind the bank wall will be excavated by JCB 3CX (or similar), approximately 4m in length, 1.1m in breadth and 1.15m in depth, sides battered to 45 degrees. 200mm of compacted clean Type 1 will be used as a foundation. Followed by 2 stage concrete pour to form the retaining wall and type 3 will be used as backfill. Once the concrete has cured the topsoil will be replaced and reseeded.

Zone 2 as identified on the topographic survey. Dumpy bags and over pumping will be used to dam off the river 20m upstream and downstream of the weir to allow for dry working conditions on the LH bank and for weir and stone wall inspection below the water level. An assessment will be made on the existing stone wall as to weather is requires rebuilding or re-pointing. The silt bank on the RH bank will be excavated to increase capacity in the channel and the waste is to be taken away from site and disposed of appropriately. The temporary sandbags will be removed by hand and disposed of in land-fill. A trench behind the bank wall will be excavated by JCB 3CX (or similar). The trench will be approximately 12m in length, 4m upstream of the weir and 8m downstream. The excavation sides will be battered back at 45 degrees to avoid collapse. The concrete will be poured in a number of stages. The concrete gravity retaining wall will be a 2m high downstream and 1.2m high upstream of the weir. Once the concrete has cured the topsoil will be replaced and reseeded.

Downstream of the proposed wall the ground will be re-contoured to formalize the out of bank river flow during flood events allowing water to be channelled back into the river. A geo-textile mesh will be pinned on the re-contoured land to provide necessary reinforcement to prevent erosion when in use. The stone wall

will be lowered and reinforced at the point of lowest ground to allow flow back into the river. The toe of the wall will also be reinforced.

4.0 Flood risk

The works will be undertaken within flood zone 3 as all work takes place on the bank of the River Wye. The compound and storage areas will be in flood zone one as shown in Table 1. As a result of the work there will be not change from the existing, the work is only designed to reinforce the LH bank wall from the dry side. There will not be any alteration to the alignment of the river bank as a result of the project. There will no raising of ground levels as a result of the works. Therefore, with the project being a repair to the existing structures that are in place with no external alteration flood risk will not alter from existing.

The Environment Agency guidance document 'Flood risk assessments: climate change allowances' was released in February 2016 and included statistical increases in peak fluvial flows by river basin district and allowance categories based on epochs and development vulnerability classification. Referring to the NPPF PPG, the development is classified as 'water compatible' and has an expected lifetime of 100 years; therefore, given the site is within the Humber Catchment, the 'central' (+20%) allowance category applies. However, with the project being a repair to the existing structures that are in place with no external alteration flood risk will not alter from existing.

The Environment Agency's reservoir flood map shows no evidence for this type of flooding at the site and there are no canals in the vicinity to pose a flood risk to the site.

With the site being so close to the River Wye, groundwater is expected to essentially match river levels, therefore fluvial flood levels will be used to assess risk in this report. Groundwater flooding is not considered to be the primary risk to the site.

The site owner has no prior knowledge of sewer flooding at the park.

On completion of the work the site will be recovered with topsoil and reseeded, therefore there will not be an increase in the impermeable area.

5.0 Conclusion

As a result of the repair to the bank of the River Wye in Serpentine Park flood risk will not alter as the repair will reinstate the structures that were previously in place and reinforce the structures that have not yet failed. In addition, the Flood Risk Activity Permit for this project has been granted by the Environment Agency.