Lapal Canal – Selly Oak Park

Flood Risk Assessment and Drainage – Supplementary statement

Lapal Canal Trust

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Version 5

0. Summary.

This report is a professional overview following concerns expressed by local residents of the flood risk and the concerns of the Environment Agency that silt could contaminate the Borne Brook.

The plans of the Lapal Canal Trust to remove accumulated soil will reduce flood risk by providing more capacity for Park runoff water.

The existing drain system includes a silt trap which is currently being maintained by a member of the Lapal Canal Trust.

If there is any temporary contamination of the water then the drain water flow will be closed while any contamination removed.

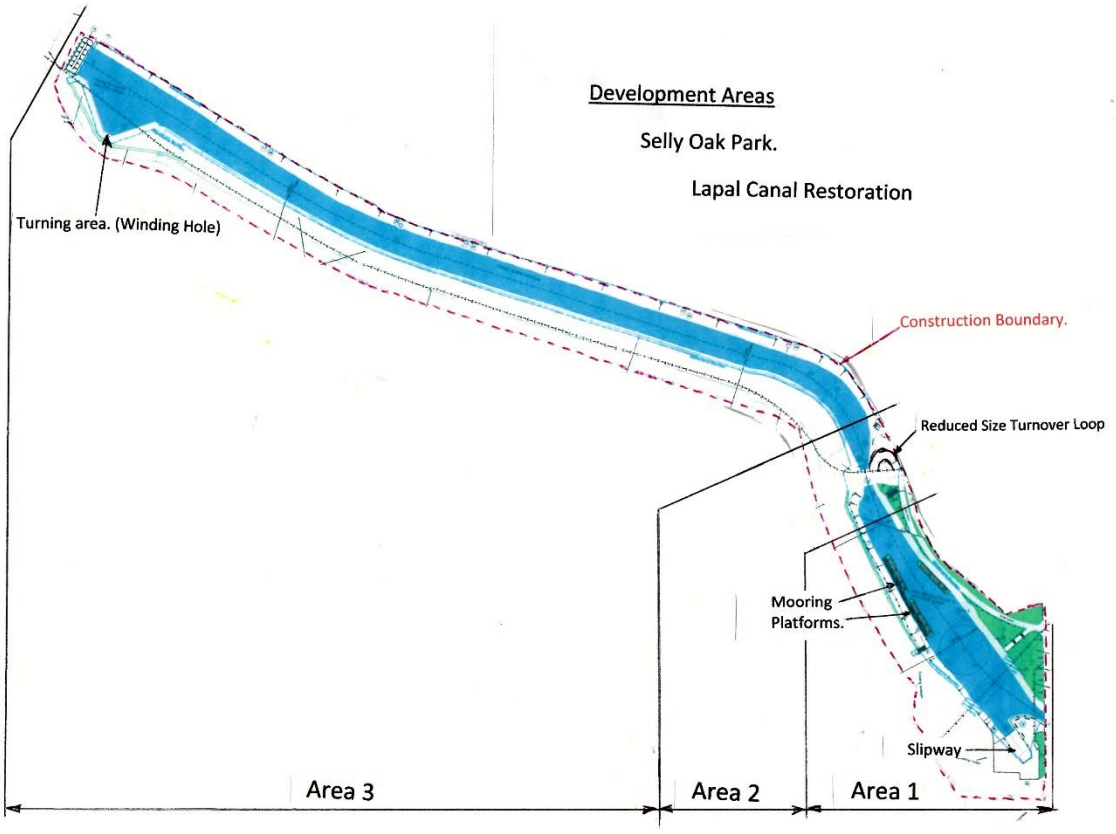
1. Introduction

This report has been commissioned by the Lapal Canal Trust to support a planning application for the restoration of the Dudley No 2 Canal ("The Lapal Canal") through Selly Oak Park. This length of canal was closed to navigation in the 1950's but survives largely intact through the park. Originally connected to the Worcester and Birmingham Canal at Selly Oak Junction, the length subject to this application is now separated from that canal by the Battery Park Development, which is making provision for reinstatement of the canal on a new line through the site. The medium term objective therefore is to reopen the canal through Selly Oak Park and link to the national canal network via the Worcester and Birmingham Canal. The long term objective is to link the restored length to the rest of the Dudley No. 2 canal at Hawne Basin, Halesowen.

1.1 The Lapal Canal at Selly Oak Park

The canal through the park is drained and normally dry, although some water accumulates following heavy rain. Shortly after closure, the then British Transport Commission sealed off the Dudley No.2 Canal to ensure leakage did not affect the Worcester and Birmingham Canal. This also had the effect of preventing water flow in the other direction with the result that a heavy rainstorm shortly afterwards caused the canal to over flow its banks and flood the residential area to the north. This led to the canal being drained and the current drainage arrangement being installed. Whilst the drain has limited capacity, the dry canal can store a considerable quantity of water in the event of heavy rain; this water can then drain away slowly without overloading the watercourses that the drain feeds into.

1.2 Restoration Proposal



The restoration that is subject to this proposal is planned in three stages: Harborne Wharf, at the eastern end of the site between Harborne Road Bridge and Selly Oak Park Bridge being area/phase 1, area/phase 2 would restore the area under the bridge and to the bend where the canal makes a turn west along the northern edge of the park, and phase 3 would complete the restoration through the park. These works would allow the canal to be rewatered. Even if the canal is not formally rewatered with a deliberate fill, once restored the canal will fill and empty with as rainfall alternates with natural losses – this is explored further later in this document.

Only area/phase 3 requires modification to the existing drainage arrangement, as the canal cannot be rewatered at this point if the drain remains in place. It is planned that the canal will not be rewatered until it is connected to the main canal network. However it will beneficial for the bottom of the canal to remain wet to prevent the clay lining drying out, and in any event the existing drain intake is above the restored canal bed level. This means that the canal will typically retain around 300mm of water except for when natural losses exceed rainfall. However as the height of the drain inlet isn't being altered this does not affect storage capacity

The approximate length of each area/phase is

Area/Phase 1 – 100m

Area/Phase 2 – 30m (including channel through bridge)

Area/Phase 3 – 320m

Once the length of canal through Selly Oak Park is connected to the Worcester and Birmingham canal then drainage and overflow largely cease to be an issue. The Worcester and Birmingham Canal at Selly Oak is part of the Birmingham Level – 78 kilometres of interconnected canal at one level forming one of the longest levels of canal in the UK. The impact of a storm event on Selly Oak Park on such a large body of water will be negligible, and the impact of a wider storm event would need to be considered over the whole level not just at Selly Oak Park.

2. Flood Risk

The existing situation has arisen since closure of the canal in the 1950's. The current position is that rain falling on Selly Oak Park will run into the canal bed within the park. The canal is not continuous either side of the park and will fill if the volume of rain is sufficient – the drain in the canal is sufficient to prevent the canal overfilling and flooding adjacent properties. In any event as this situation is historic there is no responsibility on any party to reduce the flood risk further. However, restoration works with removing soil will reduce the flood risk from a storm event over the park.

The Atkins report of September 2012 states that the catchment area from the park into the canal is approximately 11.25 hectares, and that the average rainfall (SAAR) is 766mm. Based on a run-off percentage of 75% this results in an annual average inflow into the canal of around 65,000 m^3. Clearly the rate of inflow varies on a day by day and seasonal basis but the report concludes that with a restored canal, isolated from the rest of the canal system, inflow will exceed loses by a factor of three to five.

At present the entire inflow is either lost through the canal bed or discharged via the existing drain – the fluctuations in rainfall mean that the canal sometimes holds some water. When the restored canal is connected to the main canal system this excess will flow to the Worcester and Birmingham Canal.

As the canal is restored in order to hold water upon completion, the canal will naturally fill because the rate of inflow will exceed the rate of natural loss (without the drain, it probably would now already). It is proposed to leave the drain in place to retain flood capacity. The drain will not completely drain the canal as the inlet is above bed level, but as the inlet point is not being altered the capacity of the canal will not be reduced: indeed because the canal bed will be slightly wider, and any high spots in the bed removed, flood storage capacity will be slightly increased.

2.1 Inflow/Outflow

The Atkins Report of 2012 contains a number of assumptions: these are

- The area of the park that drains to the canal is 11.25 hectares
- The average annual rainfall is 766mm
- The run off is 75% (i.e 25% of rainfall is absorbed by the ground and never reaches the canal)
- The annual average inflow to the canal is 65,000 cubic metres
- Losses through evaporation and the lining of the canal will be between 12,000 and 22,00o cubic metres
- The surface area of the canal is 5,150 square metres.

The Atkins report does not give a volume for the entire length of the canal, only that section at Harborne Wharf, however we have assumed that when the canal is full when there is an average depth of 1.2 metres over the surface area of 5150 m^2 giving a volume of 6,180m^3. Although the canal is not square in section 1.2 metres is a reasonable average immediately after excavation of the channel.

It should be noted that even if phases 1 and 2 were filled with water the surface area of phase 3 is around 3,500m^2 which gives a volume of 4,200m^3.

Based on the above figures the flow into the restored canal will exceed the losses by between 43,000 and 53,000 cubic metres per annum whilst the volume of the canal is 6,180 cubic metres. At this rate, on average, the empty canal will fill in between 6 and 7 weeks: In winter with heavy rainfall the canal will fill much faster and if there is a dry spell in summer then losses will exceed the rate of inflow and the canal will gradually empty. However, as long as the existing drainage arrangements are maintained the canal will not fill completely with water but will operate much as it does now.

The canal currently acts as an attenuation pond, with water being stored in storm events (and at other times) before draining away. Upon connection to the Worcester and Birmingham canal this function is no longer required. Until this connection is made, the restored length will remain unwatered and thus the existing storage capacity is retained. If area phase 1 and 2 were rewatered the storage capacity remaining would be around 4,200m3 which would absorb 50mm of rainfall in a single storm event.

This application and report does not cover the eventuality that the canal is rewatered for phase 1 and 2, but if connection were available to the Worcester and Birmingham Canal before Phase 3 is complete then rewatering phase 1 and 2 may be desirable. In this event then the option of a dam/crest weir allowing overflow FROM the unrestored phase 3 towards the main canal system may be considered.

2.2 Treatment of the drain point

Upon completion of the restoration, and connection to the Worcester and Birmingham Canal, it is arguable that no drain is needed at all: the Worcester and Birmingham Canal forms part of a level of canal over 70 kilometres long that already has provision for discharge of excess water. If there is a need to drain the canal through Selly Oak Park once the canal is reconnected then this could be achieved with a temporary dam and pumps. Thus, upon reconnection any drainage point could be permanently sealed off.

As an alternative, the existing drainage point could be modified to act as an overflow and possibly a drain for temporary drawdown of the canal. This is suggested in the Atkins report and would entail building a new overflow and sluice structure at the canal bank connecting to the existing pipe. Overflow should not be problematic (save that the restricted dimensions of the discharge pipe would limit its capacity) but the EA would need to be satisfied regarding draining the canal via this mechanism as the volume of water would be large related to the watercourse the pipe leads to. In addition, the existing drain point has silt traps: any new drain point fulfilling the same function would require these, which would be redundant when the canal becomes permanently watered.

Thus it is proposed that the existing drain point is maintained as long as possible, and that the last action before permanently rewatering the canal should be to break up the structure and seal the existing drain pipe.

2.3 Silt Trap

Concern has been raised that the restoration activity itself might result in sediment and other material being washed through the drain point into the discharge pipe and on into local watercourses. At present the drain has a silt trap, although there is no evidence this has been formally maintained since it was installed until the Lapal Canal Trust began clearing the silt trap on a regular basis in recent years.

The restoration works will result in the existing channel being enlarged and cleared of vegetation, this has the potential to lead to increased sediment load through:

- If heavy rain falls during the works then the newly disturbed soil is more susceptible to erosion, particularly where earth is stored or piled up ready for redistribution
- If working in the canal bed when water is present the water will inevitably carry a considerable silt load
- Upon completion of the works the canal bed will be barren in comparison with the existing situation and may be more prone to erosion. This situation will pertain until canal is rewatered.

At present the silt traps are proving effective as they are now being maintained: these silt traps will remain operational until the very last stage before the canal is fully rewatered. An increase in sediment in run-off from the canal bed will increase the rate at which these silt traps need cleaning but will not render them ineffective.

The existing drain and silt trap arrangement will be maintained until the completion of phase 3, when the final length of canal will be rewatered, at which point the structure will be removed and the drain blocked. The rewatered canal may have an overflow near this location, but this does not require a silt trap.

2.4 Other contaminants

Concern has been expressed regarding the possibility of other contaminants entering watercourses during the course of the works – presumably by being released into the canal and then discharged via the drain point. In the absence of further information it has to be assumed that such contaminants will not be caught by the silt trap and thus may be substances such as oil, diesel and petrol from machinery working on the project.

It isn't normally the remit of the planning system to deal with pollution control – the planning consent allows for works to be undertaken and has little scope to dictate HOW the works are achieved so long as they are deliverable.

The works will follow best site management practice when dealing with potential sintaminants. This will include there being a barrier or bund between any section of the canal being worked on and the drain inlet, such that if a contamination event occurs it will be contained in the worksite whilst clean-up operations are undertaken

3. Conclusion

The length of canal to be restored through Selly Oak Park is currently kept drained by a culvert and silt trap: this drain is sufficient to discharge the annual run off into the canal from the park. The canal acts as an attenuation pond, absorbing peak rainfall events and storing water when run off exceeds the capacity of the drain.

The intention is to restore this length of canal to navigation and to link it to the Worcester and Birmingham Canal via Battery Park. When connected to the Worcester and Birmingham Canal the length through Selly Oak Park will form part of a level in excess of 70 kilometres long. Storm events will be absorbed on such a long level and frequent overflow weirs ensure this level is maintained.

When the canal is completely rewatered the existing drain and silt traps will need to be sealed off and the structure removed as they would obstruct navigation. It is proposed that this will not be completed and the canal rewatered until the canal is able to be linked to the national canal network, thus the existing drain and silt traps can be used until the canal can drain to the Worcester and Birmingham Canal.

The restoration proposals do not entail filling the canal to any greater level than already occurs after heavy rainfall, and will slightly increase the storage capacity above existing inlet point, thus there is no increased flood risk.

During the works the existing silt traps will remain in use and be maintained to ensure there is no additional sediment load on any discharge from the canal. Best practice will be observed during the works to ensure no other contaminants enter any watercourse.

When the link to the Worcester to Birmingham canal is in place it will be feasible to rewater area 1 and 2 before area 3 is restored. In this event the drain should remain in place in area 3 and a dam/weir constructed which would allow excess water to drain into the restored section if the level in area 3 exceeds the crest height. This would be an improvement on the present flood risk situation as the potential for flood storage is limited only by the capacity of water to flow down the canal to the Birmingham Level.