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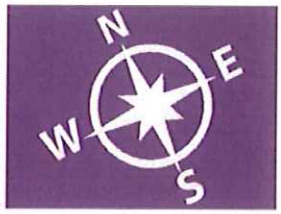

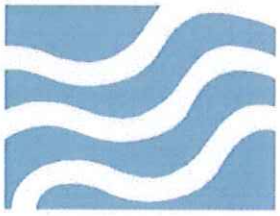

LAIGHILLS PARK INSPECTION

NOVEMBER 2013

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more than **civil** engineers

LAIGHILLS PARK INSPECTION

November 2013

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Laighills Park Inspection

1.0 Introduction

Laighills Park is a neighbourhood park serving the community of Dunblane and its visitors. The park contains a mix of mown and naturalised grass/tree areas. Within the park there are football pitches, pavilion, childrens play area, skatepark, disused public toilet building, countryside footpath network and a water course.

The Glasgow to Aberdeen railway line runs through the park, and the River Allan meanders around the south, west and north boundaries of the site. The Scouring Burn runs through the park and flows into Allan Water at the south boundary.

2.0 Scope

Millard Consulting have been commissioned to carry out an inspection of the park infrastructure and to report on its condition, providing recommendations for repair/remedial work where required. We are also to provide an appraisal of the existing access vehicular bridge adjacent to the pavilion and provide a report on improvement required. A Plan of the following sections is included in Appendix A.

3.0 Inspection Report

3.1 Main Access Road

3.1.1 From Entrance at Haining to Footbridge over Allan Water (access from Auchinlay Road)

From the access point on Haining there are double yellow lines covering accesses to the first two houses. The road is kerbed on the south channel. This section of road may be included on Stirling Council's list of public roads. The surfacing is however continuous with the remainder of the road down to the park. From visual inspection there does not appear to be any major structural issues with the access, there are however numerous patch and track reinstatements in the surfacing along the route. The surface drains to the south channel, by either gully and/or direct run off.

Photograph 1

A small soft spot is evident at the end of the double yellow lines. This may be connected to the water supply to the adjacent house.
A stone retaining wall extends down the north side of the access to the railway bridge. The wall has been repaired in the past. The surfacing at the foot of the wall has been eroded. It is assumed water coming down and also through the wall has gotten below the surfacing at the interface, weakening the material and causing it to break up.

Photograph 2

On the opposite side from the stone retaining wall the road is also retained by mass concrete wall, with a handrail on top. No kerb upstand in this location, therefore water flows directly over the retaining wall to the grass slope.

Photograph 3

The road passes below a railway bridge, this point also being the low point of the access, then rises towards the footbridge over Allan Water. The north side has a low stone dyke retaining wall to the rock garden, again there are similar problem with water at the interface between the two although not to the same extent as before. The south channel is formed by a concrete coping stone on top of a retaining wall next to the Allan Water. The surfacing is similar to the previous section with numerous areas of patching and reinstatement.

Photograph 4

Photograph 5

Recommendation

- Without further engineering investigation/assessment, it is our opinion that the surface would benefit from complete replacment and reshaping to crossfall from north to south, ie

towards Allan Water. The poor seal along the north channel between surfacing and retaining walls has resulted in a breakdown of the bituminous materials and shall only worsen. A kerbline should be installed in front of these stone retaining walls to allow the surfacing to seal properly against a smooth flat surface. A concrete infill can be laid between kerb and wall. This will allow any water to flow over the surface of the concrete onto the road. Reshaping crossfall shall promote the water to flow to the south channel where it is drained by existing gullies or direct run-off. The drainage system should be regularly cleaned to prevent future maintenance problems. Any soft spots should be completed removed and reconstructed.

3.1.2 From Footbridge to existing Timber Bridge

This access is in poor condition, most likely due to standing water. Water also runs from the adjacent slope across the road towards the river. The low point shown in Photograph 6 between the bridge and the footbridge access has become eroded and now holds water. The bituminous surface is in poor condition. This section of road would benefit from kerbing both sides, a ditch or trench to prevent water and silt run-off from the slope and an outlet for drainage. The foundation of the access would appear to be firm, with no soft spots becoming visible at the surface. The bituminous surfacing however requires replacement. It should also be thick enough to cope with light goods vehicles and maintenance vehicles.

Photograph 6

Recommendation

- Kerbing to both sides with 125mm upstand. Bullnose kerbing to be installed at the interface with the bridge
- Gravel filter strip between slope and kerb – create fall in trench towards bridge
- New surfacing 100mm thick (2 layers - overlay) in crossfall toward slope and filter drain
- Form drainage outfall to the burn

3.1.3 West of the existing Bridge

This access has been previously kerbed and surfaced. The surfacing suffers from surface water flowing down from the playpark area and access tracks. The water appears to flow down to the bridge where it collects and finds its own way to the burn/river.

This has caused a build up of mud/silt/gravel along the channels and across the entire surface. There is a slabbed footway along the edge of the existing disused building. This is also in poor condition with many cracked slabs. There does not appear to be a drainage system installed to collect and dispose of surface water.

Photograph 7

Recommendation

- New kerbing to both sides. Flush kerb to the north for direct surface water run-off, 125mm upstand along the footway, maintain dropped pedestrian access. Bullnose kerbing should be installed at the interface with the bridge
- New filter drain or swale along the north verge with outfall to the burn
- New surfacing 100mm thick (2 layers), plane off existing surfacing, replace at existing levels
- Replace slabbed footway
- A drainage system should be installed to the west to protect the accesss from silt/run-off from the higher level tracks (see item 5).

3.1.4 Bridge Over Scouring Burn Adjacent to Pavilion Building

There is a small bridge over Scouring Burn close to where it flows into Allan Water. The span of the bridge is just under 4.0m and is just over 3.5 metres wide. The bridge does not have any barriers or handrails. The deck consists of timber sleepers, estimated to each be 200mm

wide x 120mm deep. There is batten fixed to the top of the sleepers at each side. There is a steel support member under the deck at each side. This is thought to be a steel angle section. We were not able to gain access to the soffit of the bridge.

Photograph 8 – The bridge viewed from upstream

Photograph 9 – The bridge viewed from upstream

The photographs taken upstream give a general indication of the approaches to the bridge which are generally poor. The run-off from the access drains into the burn at each side of the bridge. The ground on either side was found to be uneven with standing water noted.

Photograph 10 – Downstream View

Photograph 11 – Prop

As can be seen in photograph 11, an acrow prop has been used to support the downstream end of the bridge. We do not know how long the prop has been in place. However , it was noted that debris was building up behind the prop.

The timber sleepers that form the deck were found to be in poor condition. The deck was noted to move in places when a vehicle was driven over it. Some of the sleepers have split in places. Photographs 12/13 show the gaps between and condition of the sleepers

Photograph 12

Photograph 13

Photopraph 14 – Downstream edge of the deck

Photograph 15 – Condition of sleepers at point with road surface

It is in our opinion that the bridge has reached the end of its useful life and requires to be replaced. Consideration must be taken of the requirement to provide barriers/handrails. Although we are aware this will detract from the aesthetic feeling of a small walkway over a burn.

Recommendation

- A new bridge structure be constructed to replace the existing. The form of construction should be decided by the Client and Architect as it may be desirable to have a timber bridge or a timber deck on steel beams. We would be pleased to provide additional information if required.

3.1.4 Main Access Splits North and West

Once across the bridge and entering the park, the access road split 2 ways. Vehicle and pedestrian access continues ahead to the west and pedestrian only access heads north to higher ground. Both tracks create boundaries to the children's play area. The junction of the tracks in this area collects surface water. Water is directed towards the bridge. Erosion has dropped the surface level of the tracks, creating a dished uneven profile. The small area of planting (top centre of photograph) in the centre of the junction has been kerbed previously but is now in poor condition. This area could be better used to prevent water flowing from the grassed area over this junction.

Photograph 16

Recommendation

- New kerbing to landscaping
- Ditch or filter drain to be installed behind the landscaping – outfall to burn
- Kerbing of access road to be continued throughout this junction area
- Full reconstruction of track. Levels to avoid excavation if possible due to high level of rock. Further assessment of CBR% values for track foundation required. 100mm surfacing (2 layers)
- All surfaces shaped to fall to the north directing water to the burn and away from the pavilion

3.2 Access to West side of Children's Play Area

The existing track along the western boundary of the children's play area is in poor condition with a rutted, uneven and loose surface. By inspection the track is regularly used

by vehicles, which we assume are for park maintenance, especially to the higher level football pitch.

Photograph 17 – Looking back towards pavilion

Photograph 18 - View northwards to pitch access

Recommendation

- Flush kerbing installed to both sides of the track
- Full reconstruction of track. Further assessment of CBR% values for track foundation required. 100mm surfacing (2 layers)
- Alternative construction using crushed stone, sealed with whin dust could be used with shorter design life

- Ditch or swale along the boundary with the play area, feeding down to the burn to prevent water run-off to lower level riverside path (informal)

3.3 Access to upper level football pitch

The track leading to the upper level football pitch is in poor condition with a rutted, uneven loose surface. The track may have been constructed in crushed stone. The majority being washed out by surface water. This track acts as a water channel. No offlet /outlets are present. The vertical gradient is also very steep for vehicular access. The steepness may pose difficulties to any new construction proposed.

Photograph 19

Photograph 20 – Top of access track

The area directly at the top of the access track has become very muddy from vehicular use. No path has been created at this point.

Recommendations

- Reconstruct track using type 1 sub-base material, sealed with whin dust
- Lay timber edging to both sides as a restraint to type 1 material
- Create regular offlet drainage to existing vegetation
- Given the steepness of the access and narrow width, this work may only be possible by manual labour
- The top area of the track should have a hardstanding area to prevent rutting through the clayey topsoil

3.4 Westbound Path along Allan Water to Low Level Football Pitch

Continuing west from the access road, a well worn dirt track forms the first section of a pedestrian route along Allan Water to the low level football pitch. The initial section lies between the slope to the playpark and Allan Water. The toe of the slope has slipped in various locations. It appears to have slipped sometime ago as the ground is covered in grass, with little evidence of fresh movement. The surface of the path itself is hard packed, worn soil with many exposed stones. Exposed rock is also visible. The exposed stone and rock create a slightly uneven surface with little or no loose materials.

Photograph 21

Photograph 22

The worn path ends as the path reaches the flat area between the playpark and football pitch, where the entire area is covered by grass with an open aspect to Allan Water.

Photograph 23

Progressing around the pitch the path continues in grass. The chestnut pale fence between the pitch and path is in very poor condition, but poses no risk to pedestrians.

Photograph 24

Photograph 25

The route appears to terminate at the north west corner beyond the football pitch as it heads into the trees/bushes.

Recommendations

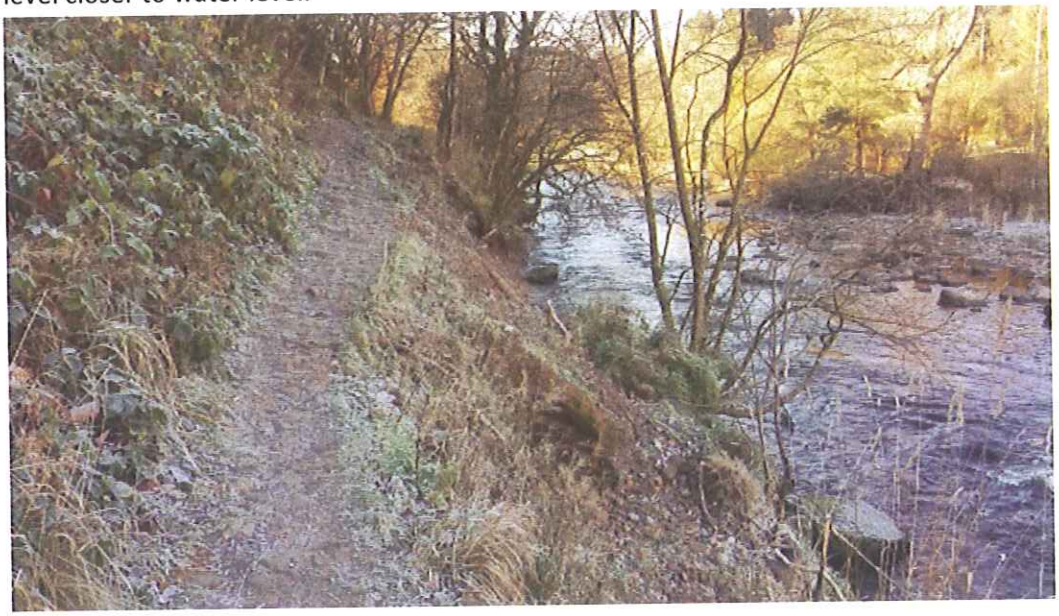
- The initial worn section of path could be improved. A path of timber edging infilled with sub-base material, sealed topped with fine gravel or whin dust would create a smooth even path.
- The raising of the path level will also help reduce the slope and more importantly the movement at the toe of the slope.
- The areas of slope that have slipped should be either regraded to reduce the gradient, or, small retaining walls constructed using natural materials.

3.5 Countryside Path – West boundary

3.5.1 The path continues northwards along the bank of Allan Water on the Parks western boundary. The path is a hard packed, worn track, benched into the hillside, its width approximately 1.8 – 2m in places. The slope to Allan Water being relatively steep.

Photograph 26

The path narrows to less than 1m abruptly due to a land slip for a length of approximately 25m, where a section of the bank has fallen away. At this location the slope becomes even steeper and poses risk to the safety of pedestrians. There is little room for two people to pass each other without danger of falling. Beyond this slipped section, the path lowers in level closer to water level.



Photograph 27

The path quickly becomes very rough and uneven as it progresses to the bend in the river, no more than single file width available with numerous tripping hazards and trees blocking the path.

Photograph 28

Photograph 29

Photograph 30

There is an obvious route to take as the tracks are visible. Fluctuating water levels in the river may have had an effect on the path causing deep rutting, exposed pebbles and boulders, and washing out of materials.
The path follows the bend of the river from west to east where it doubles back on itself through an area of Giant Hogweed.

Photograph 31

3.5.2 This section is relatively flat and in good condition. It is perhaps a relatively new track worn out by pedestrians avoiding the now dangerous route around the bend of the river. As the path heads back westwards it meets the original track with some steps created using boulders. It would appear that this has now become the common route to take avoiding the original route along the river bank, although the Giant Hogweed may pose a safety risk during the growing season.

Photograph 32

3.5.3 There does not appear to be a route to take any further going along the river bank. The area is overgrown and steeply sloping. The only exit is a path that climbs uphill becoming steep and very narrow, posing a high health and safety risk.

Photograph 33

The narrowest part is around a tight bend on the edge of the hill, with a very steep drop off the side, the path is nothing more than a worn track.

Photograph 34

Photograph 35

The path stops at a relatively flat area on top of the hill. The area forms a junction with other routes and is the highest point of all the routes.

Recommendations – 3.5.1

- One option to consider should be to close this section of path due to the danger posed by the narrowing path at the section where the slope has slipped.
- The alternative option would be to construct a retaining wall of gabion baskets with fence on top for the entire length to protect the slope and widen the path. Further engineering assessment will be required.

- A new gravel path is required to follow the route of Allan Water, some clearance of scrub and trees will be required. This section, around the bend in the river could potentially be closed off and an alternative route taken (item 9.2).

Recommendations – 3.5.2

- Create a formal stepped access to its junction with path from item 9.1 or regrade the ground to tie in better
- Treat the Giant Hogweed problem to eradicate.

Recommendations – 3.5.3

- In its current state we would not encourage use of this route, the path is dangerous and should be closed
- Widen the path going uphill at the bend by benching further into the hillside to move the path a safer distance from the edge of the slope.
- Erect a fence to prevent falls over the edge
- A retaining wall will be required for the benching of the path

3.6 High Point to Eastern Ridge

3.6.1 From the high point looking east, the worn path can be clearly seen to the point it breaks through the ridge and continues to the footbridge over by the railway line. There is a very steep decent down to the flat plateau from this direction.

Photograph 36

The path passes by a very steep bank down to the river. Major erosion has caused the topsoil to slip from the slope exposing loose sands and gravels. The slope falls directly to the river with no river bank remaining. Further erosion is highly likely. Any preventative measures will be costly and practically difficult. The erosion is starting to create a dangerous overhang. The path itself is set back from the eroded edge a safe distance in its current state. There is evidence that there was fencing along the edge before the landslip.

Photograph 37

Photograph 38

Photograph 39

The path moves away from the river, heading through the gap in the ridge towards the footbridge, all paths in this area are grass tracks.

Photograph 40

Photograph 41

Recommendations

- We would not encourage the use of this path, new fencing should be erected to close this area off given the extent of erosion and landslip that has occurred. An alternative route is easily available through the flat area. A new route shall also remove the steep section to the high point.
- Any remedial work will require extensive engineering investigation. The solutions will be costly given the extent of the problem

3.7 Pedestrian Access East side of play area (North from Section 5)

3.7.1 This path links the main access road by foot to the footbridge over the rail line further to the North. This section appears to be formally constructed, being even and solid in appearance. The path is narrow which may have happened over time. As with other pathways, it acts as a water channel down to the main access due to lack of offlet drainage and dished profile. It also collectsrun-off from the play park area, rather than letting it flow down the adjacent slope to the burn. This path seems well used.

Photograph 42 – looking back towards Allan Water

Recommendations

- Lay timber edging and infill with type 1 sub base material, raising level to remove the dished profile, finish with gravel or whin dust.
- Alternatively construct a formal footpath in bituminous material with precast concrete edging kerbs
- Create offlet drainage to the adjacent slope
- Little excavation required
- Increase width of path to 1.8m

3.8 Countryside Path heading North to Footbridge over Railway

3.8.1 As the path heads north, leaving the play park area it becomes a more informal and well worn countryside path/track. There is a section heading north to the footbridge on a steep incline that has been eroded by surface water. The remainder of previous attempts at repairs are visible. The damage to the path is a danger to the public.

Photograph 43

Photograph 44

Recommendations

- The eroded section of path should be up filled with type 1 sub-base material to remove tripping hazards.
- Consideration should be given to the creation of low steps in this area
- Steps could be created using timber edging, timber sleepers for steps and filled with type 1 material
- Drainage offlets should be provided uphill from this area to protect it from further erosion

3.9 Footbridge Crossing

3.9.1 The area at the top of the access steps to the footbridge is badly worn, albeit not in a dangerous condition. Some boulders protruding from the worn ground could potentially become tripping hazards

Photograph 45

Recommendations

- Provide a hardstanding area at the top of the steps in type 1 sub base material
- Alternatively , extend the slabs at the top of the steps to create a more formal area

3.10 Countryside paths to BMX track area

3.10.1 Once across the bridge there are no formal footpaths. All paths are worn tracks or grass surfaces. The grass track leading to the BMX track area is relatively smooth and even. We would not recommend any work in this location to maintain the countryside appeal of the area

Photograph 46

Photograph 47

Photograph 48

3.11 BMX Track Area North to Housing Estate Link Path

3.11.1 The grass track from the BMX heads northwards through a wooded area. The grass path becomes worn to a narrow dirt track below the tree canopy, badly rutted in places. The track becomes very narrow with steep sides.

Photograph 49

The steep side consists of scrub and trees dropping away to a lower level. There is only room for single file movements.

Photograph 50

At the lower level the track again becomes a grassed path, smooth and flat, until it reaches the bottom of the slope up to the housing development.

Photograph 51

3.11.2 At the slope some informal steps have been created using random flat stones. The actual slope up to the housing estate level is very steep creating a difficult route for pedestrians. The track forms a rutted channel down the slope.

Photograph 52

Photograph 53

Once up at the level of the house plot a formal path has been constructed, albeit now in relatively poor condition but with no real problems.

Photograph 54

Beyond the housing estate to the north east a work track continues through the surrounding woodland river corridor.

Photograph 55

Recommendations 3.11.1

- Create a new gravel path through the woodland, widening the path to move away from the steep slope through the trees.
- Slope protection work is required to prevent further movement.

Recommendations 3.11.2

- Create a stepped access to the housing estate level as the slope is extremely steep.
- Alternatively take the path on an alternative route to the woodland section across the slope (3.11.1)

3.12 BMX area Southwards to Scouring Burn

3.12.1 This a natural worn out grass track down to the burn. There is a signpost at the bottom of the path directing users northwards along this route. No recommendations are given as this path is in good condition for a countryside type path.

Photograph 56

3.13 Countryside path along Scouring Burn to Eastern Park Access

3.13.1 This is a worn pedestrian track heading east along the route of the Scouring Burn. No formal construction has taken place. In some areas the path is very low lying close to the burn, causing flooding issues. Part of the Burn closest to the path has been eroded, creating an overhang that has recently suffered from minor collapse.

Photograph 57

Photograph 58

Photograph 59

Photograph 60

The track ends where it meets a formal access path with bridge over the burn.

Recommendations

- To maintain access to the parks at times of high water level we would recommend raising the level of the paths in the wet areas. The area shown in photographs 59 and 60 is between the north east boundary with the housing estate and the scouring burn. To raise this level some works will be required to the banks of the burn. To minimise groundworks and resultant flooding to other areas, a raised timber deck may be the best solution. This will allow the area to flood below the deck. There is little or no room to divert the path.

- Where the burn is eroding the banks close to the path, a form of protection should be constructed such as gabion baskets. This will also provide stability to the path

3.14 Pedestrian Access Steps

3.14.1 There is a stepped access to the park from Balmyle Grove. The boundary wall en route to the steps has collapsed and requires rebuilding. The steps themselves are in need of refreshing. The steps are slippery in the wet/damp, and are relatively steep. The flat areas require infilled.

Photograph 61

Photograph 62

Recommendation

- We would recommend complete replacement of the steps and handrails in similar materials. It may be worthwhile reducing the rise of each step to make them safer.

3.15 Eastern Access Points

3.15.1 Access from Laighill Place

The footpath from Laighill Place has been recenty constructed in bituminous materials and is in good condition. A handrail is provided due to the steep gradient. The path leads to a new bridge over the scouring burn into the landscaped areas associated with the housing estate to the north east of the park.

Photograph 63

Photograph 64

Crossing the bridge the path splits three ways. North to the housing estate via a newly constructed path, west into Laighills Park meeting the track from item 17 via an old bituminous path in fair condition, and east along a newly constructed raised timber walkway.

Westwards into the park there is another path to take which crosses an old concrete bridge over the burn. The concrete is in poor condition, broken in places, and scoured at it edges with the path. This path is also of old bituminous construction and joins the track from item 3.13.1. These sections of path are under the tree canopy, and at the time of inspection were covered in leaves. The surfacing looks old but is not in disrepair.

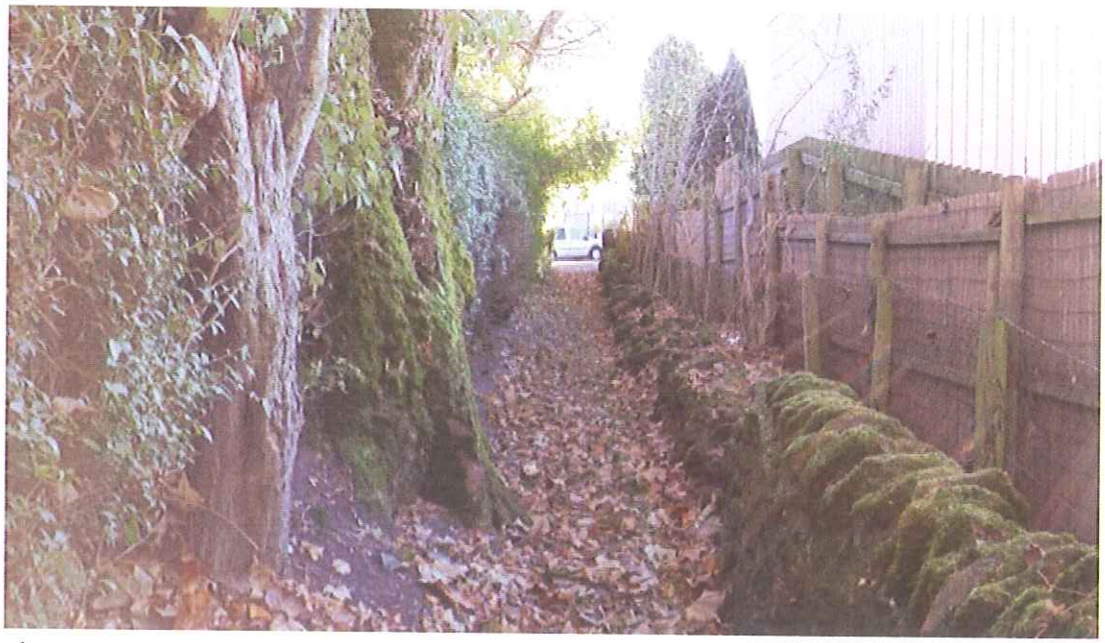
Photograph 65

Photograph 66

Photograph 67

3.15.2 Access from Ramoyle opposite Backcroft

This access can be classed as in poor condition. The path is very narrow bounded on one side by a low height old stone wall and trees/hedging on the other.



Photograph 68

The path is of bituminous construction, but in very poor condition. It is a very dark and damp route into the park. At the time of inspection the path was thick with fallen leaves. The path leads to the corridor of the Scouring Burn opening into an area of very rough uneven ground.

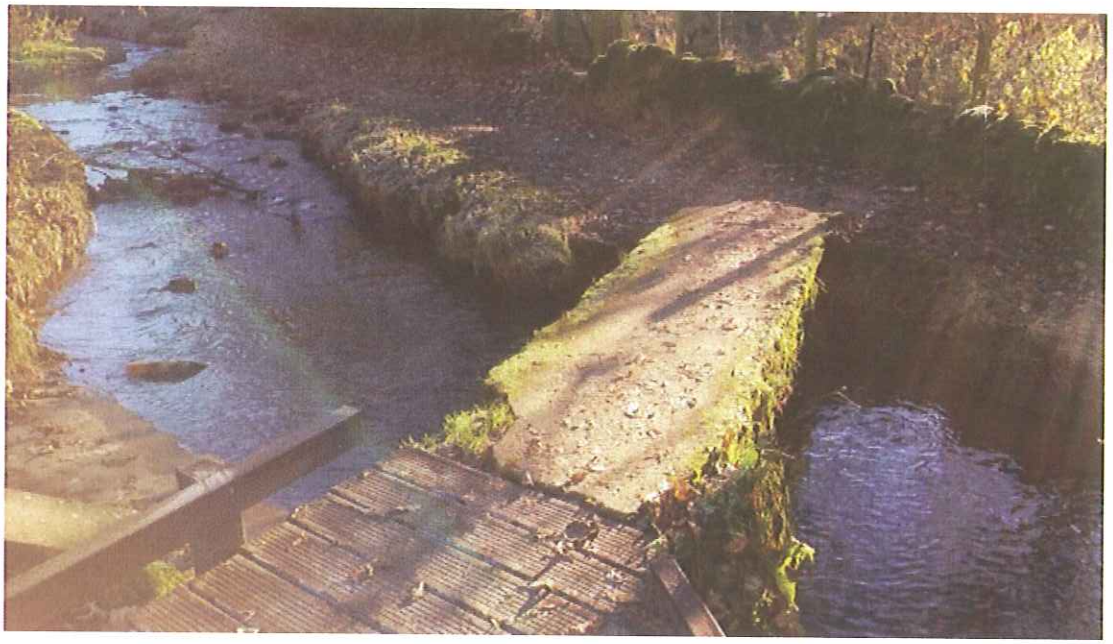
Photograph 69

Steps give access to the lower level path by the burn which is generally smooth and flat. The steps themselves are in poor condition and require replacement.

Photograph 70

Photograph 71

In order to cross the burn and join the raised timber deck in item 19.1 users must cross a narrow dilapidated concrete bridge. The bridge is in poor condition and requires replacement.



Photograph 72

Recommnedations

- 19.1 Remove the dilapidated concrete bridge and close the footpath linked to it. Direct users to cross the burn over the new bridge

- Infill the path from Ramoyle to the Scouring Burn with gravel, little else can be done in this location due to the close proximity of large trees and hedging. The rough area at the end of the path requires regrading to flatten off the uneven ground.
- The steps require maintenance, primarily to fill in the worn areas between the timber steps. May be beneficial at this time to replace the timber steps
- The concrete bridge requires replacement, including landing areas.

APPENDIX A