TITLE: Wellhouse Crescent Flooding
Surface Water Management Opportunities Workshop 1

LOCATION: Microsoft Teams Meeting (due to Covid-19 Pandemic)

DATE: Friday 23rd Apr 2021 Time: 10.00am- 1.00pm

Notes of Meeting

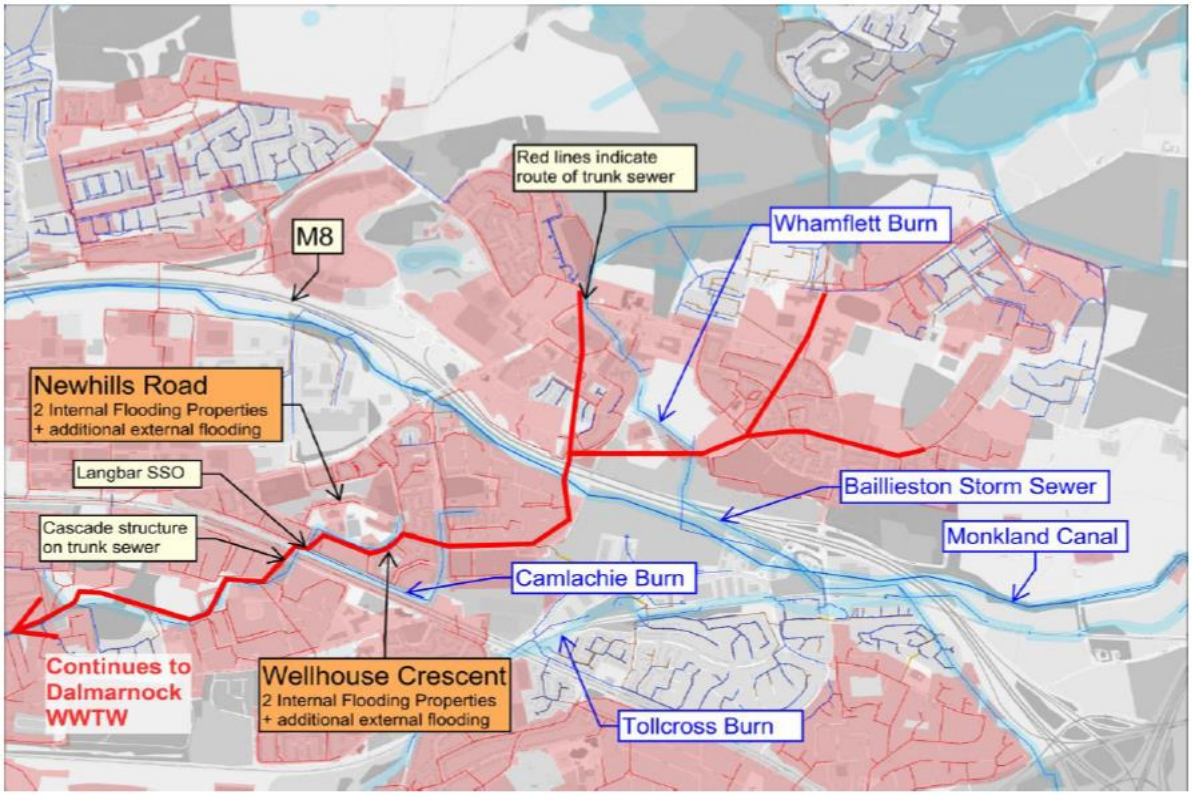
Present:

Alex Hogg (AH)	Wellhouse Housing Association
Simon Metcalfe (SM)	Wellhouse Housing Association Development Consultant
Bryan McMahon (BM)	Easthall Park Housing Association Maintenance Manager
Nick Dangerfield (ND)	Calvay Housing Association Director
David Faichney (DF)	Scottish Government Policy Development Manager
Seamus Connolly (SC)	Glasgow City Council Parks Manager
David Hay (DH)	Glasgow City Council Engineering Group Manager
James Murray (JM)	Glasgow City Council MGSDP Manager
Mic Ralph (MR)	Glasgow City Council Transport and Planning Manager
Emma Thomson (ET)	Glasgow City Council Transport and Planning
Neil Beveridge (NB)	Scottish Water Value & Benefits Team
Kieran Downey (KD)	Scottish Water Flooding Manager
Glen Hunter (GH)	Scottish Water Development Services Team Manager
Martin Hagen (MH)	Scottish Water Intervention Manager
Arshid Karim (AK)	Scottish Water Catchment Planner
Annelies McMillan (AM)	Scottish Water Flood Risk Management Team Planner
George Rattray (GR)	Scottish Water Flooding Investigation Team Engineer
Grant Vanson (GV)	Scottish Water Flood Risk Management Team Lead
David Winter (DW)	Scottish Water Wastewater Service Strategy Team Lead
Stephen Friend (SF)	M2 Catchment Planner
Lee Haywood (LH)	M2 Civil Engineer
Richard McGowan (RMcG)	M2 Project Principal
Michael McWhinnie (MM)	M2 Design Lead
Ricky Mitchell (RMit)	M2 Project Technical Lead (Newhills Road Project)
Wayne Potter (WP)	M2 Senior Hydraulic Modeller

Introduction

SF welcomed everyone to the meeting and outlined the overall objective to progress Surface Water Management (SWM) opportunities to reduce flooding around Wellhouse Crescent. We are looking to establish what can be implemented; what can be developed further and what are the benefits/blockers.

Catchment Overview



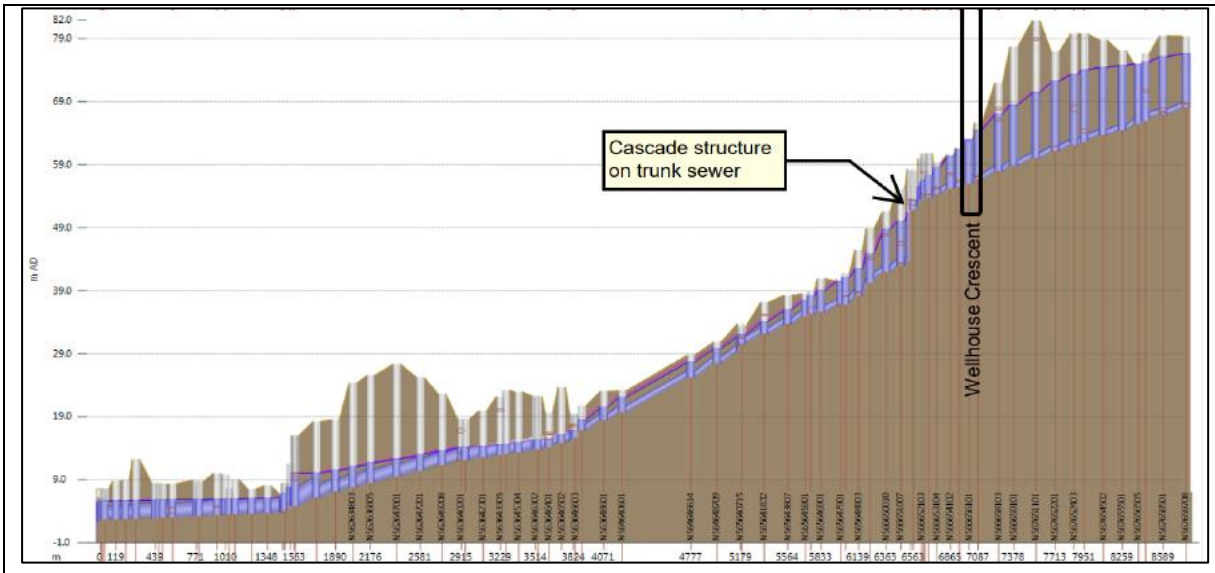
MM provided an overview of the catchment.

2 No. internal flooding properties in Wellhouse Crescent. 2 No. internal flooding flooding properties in Newhills Road. Also number of external flooding areas.

Main waterbodies are Camlachie Burn; Tollcross Burn, Whamflet Burn, Baillieston Storm Sewer; Monklands Canal.

Trunk sewer from area goes all the way to Dalmarnock Waste Water Treatment Works (WWTW). Cascade structure on trunk sewer with drop of about 8m in level. Cascade creates a break point in the catchment. It has been found that removing flow downstream of the cascade has very little benefit on flooding around Wellhouse Crescent. Focus for any surface water removal is therefore in the catchment upstream of the cascade.

DF asked if the cascade is causing a restriction. KD answered that cascade is used to take energy out of flows where there is a large change in level. WP explained that cascade provides some control on the flows but if we were to pass forward more flow from the cascade it would result in more flooding issues downstream. DF noted the cascade is effectively creating two separate catchments.



DW asked if there was flooding other than sewer flooding. AK noted that there is an overflow from the surface water system into the combined sewer at Langbar Crescent. GR noted there is also overland flow due to the topography. KD noted the majority of flooding comes from manholes on the combined sewer at Wellhouse Crescent. KD noted if the combined sewer is removed from the hydraulic model then there is very little residual flooding i.e sewer flooding is the main problem.

DW asked what kind of hydraulic model was being used. SF confirmed that it was a 1D model. KD noted that model was developed as part of the Catchment Study for the area. AK noted that the model was also reverified last year with flow survey information.

ND noted any increased flow to the Camlachie Burn would cause issues for Calvay Housing Association. They were recently refused permission to progress a new development as it would contribute 4 l/s into the Camlachie Burn. ND understands the main issue with the Camlachie Burn occur downstream of both Wellhouse and Calvay and putting a large scale rain-garden type feature at Barlanark Park may be worth picking up again. ND noted that Calvay Housing Association may be able to contribute to a rain-garden initiative. ND also highlighted a large space just south of Edinburgh Road which could be considered too and is believed to be owned by Calvay Housing Association.

GR noted Wellhouse Crescent / Langbar Rd has experienced flooding for 40-50 years. The properties and some of these residents recall the historic flooding when the properties were 1960/70's tenements. The area was redeveloped in the 1990's and lower access thresholds have resulted in more properties at risk from internal flooding.

Opportunity Mapping

MM talked through the standard optioneering process adopted with three tiers of potential options. **Tier 1** - Do Nothing; Systems Optimisation; Flow Transfer; Isolation; Low Cost Modifications. **Tier 2** - Separation / Surface Water Management (Blue Green Solutions). **Tier 3** – CSO; Upsizing / New Sewers; Storage (Grey Solutions).

MM explained that Opportunity Mapping was undertaken to identify potential locations for Surface Water Management. The study area was split into four zones. Zone 1 - New SuDS infrastructure upstream of Camlachie Burn. Zone 2 - Barlanark Surface Water Management Plan (SWMP). Zone 3 - Retrofit SuDS in areas where connection to existing surface water infrastructure is more challenging. Zone 4 - Provide new strategic routes to manage runoff from greenfield developments.

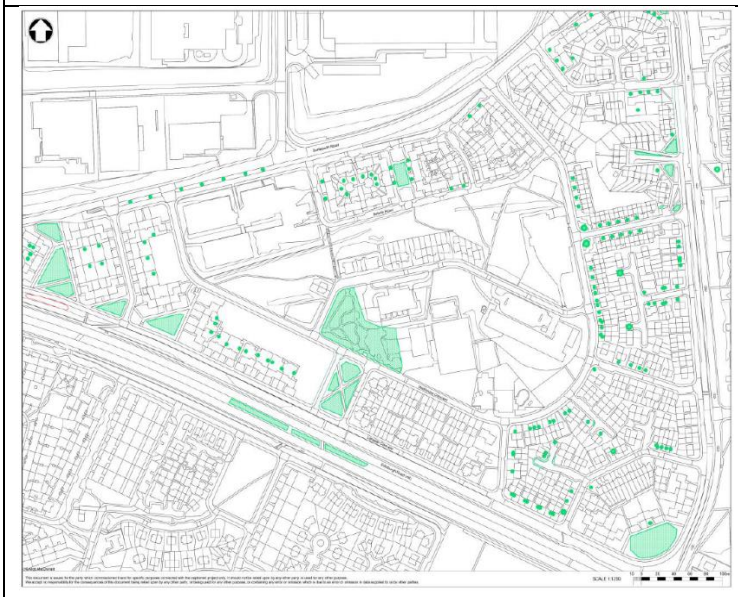
Initial findings from opportunity mapping identified that Wellhouse and Easthall Park Housing Associations areas had the greatest potential to make an impact on reducing sewer flooding.

DF noted that results in presentation focussed on M10 and M30 storms and pointed out that any solutions would also need to look at increased sized storm events to deal with changing conditions. WP confirmed that modelling allows for both catchment creep and climate change. DW also asked if we should be looking at M200. SF noted that M10 and M30 had been used in presentation to demonstrate the issues and that detailed design would consider any necessary Council design requirements such as M200.

JM noted we are talking about moving surface water out of the combined sewer and asked where it would be taken to. Particularly as some watercourses such as the Camlachie Burn have existing issues. MM said that at this stage we are looking to identify where it would be possible to either remove or slow down entry of surface water into the combined sewer and that existing water courses would be considered where appropriate. SF noted we are looking at the issue holistically to both reduce flows in the combined sewer and minimise flood risk in watercourses. RMcG noted that we are looking to slow down rainwater and mimic natural water runoff.

MM talked through opportunities identified and these are summarised on the following pages.

Rain Gardens (property/ non-property)



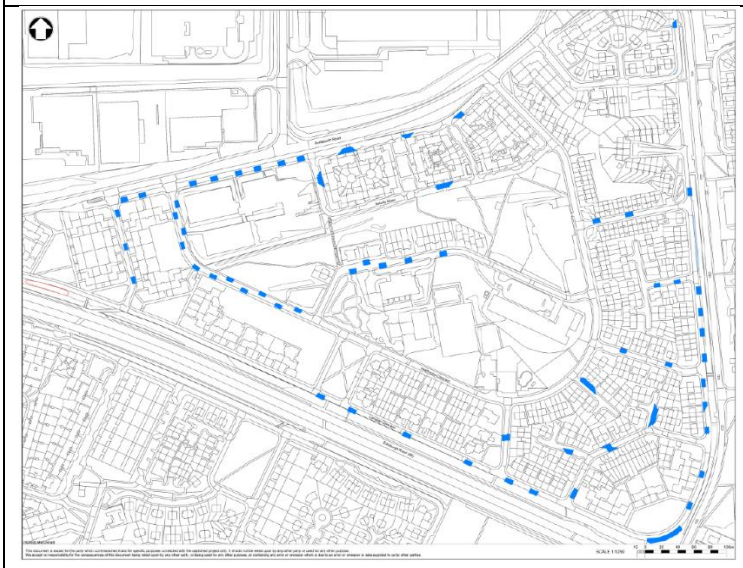
MM described that rain gardens being considered at a property level (individual households) and at non property level (communal areas). NB noted that they provided benefits in helping to reduce flooding and could also provide aesthetic benefits.

JM noted that GCC support the principle of rain gardens and have implemented in similar situations elsewhere. GCC do not however own all the areas being considered. JM mentioned that there will be complexities when we look at the detailed design but GCC support in principle.

SM noted there are obvious incentives for Wellhouse Housing Association to get involved. They would contribute to solving existing problem of flooding experienced by tenants and would help in the development of vacant land to provide more housing. SM noted that to implement in existing houses then would need to know maintenance requirement and would require tenant approval. IN principle Wellhouse Housing Association are supportive.

DF noted that Scottish Government are working with Housing Associations across the country to achieve Net Zero Homes and in adapting to the future. Rain gardens will help housing associations meet their climate change targets in the future as this is something that the Scottish Government are looking to promote.

Roadside Retrofit Measures



MM described different roadside retrofit measures such as bioretention area/swales to capture runoff and also tree pits.

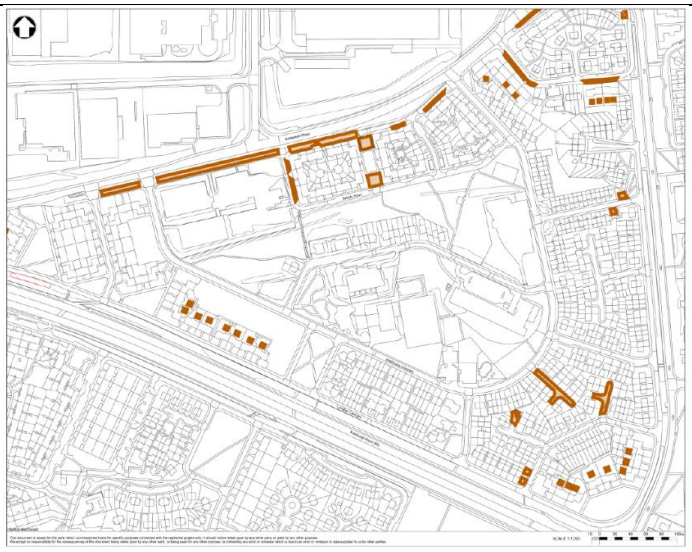
JM noted that in Wellhouse Crescent there is an existing surface water drain that takes road drainage to the Camlachie Burn. There is opportunity to use these measures to slow down runoff and reduce contaminants getting to the Camlachie Burn.

DH provide some feedback on lessons learned by GCC on the Southside Housing Association. Loss of on street parking is a big issue for residents and so are any measures that prevent residents from putting in off street parking/driveways. Key to consult with customers particularly those directly impacted. ND noted that both Wellhouse and Calvay Housing Associations produce quarterly newsletters that could be used to help with any consultation.

ET noted that GCC Transport Planning do not currently retrofit these measures but focus is on getting them implemented on new builds. ET also noted that utilities can be challenging and will impact on details and cost. JM will update his roads colleagues at GCC with discussions from this meeting.

ND highlighted the success that Calvay Housing Association had with a "20s Plenty" campaign and suggested that roadside retrofit could also be combined with/used as speed reduction measures. SM noted that traffic calming on Wellhouse Crescent would be a good thing.

Permeable Surfaces



MM described that increased subbases or geocelluar can be used as attenuation storage in conjunction with permeable surfaces. Some areas identified which are currently parking areas.

NB asked if there is an opportunity to provide additional parking or areas of benefit to the community. MM replied that there is opportunity to create recreational areas such as play areas on existing hardstanding.

JM noted that GCC do not accept permeable surfaces for adopted roads. ET noted that permeable surfaces such as block paving are more onerous to maintain and GCC do not have funding available to maintain them. These were trialled at the Commonwealth Games Village but were not a success and were later removed.

DF noted that in the public domain, councils do not install permeable surfaces whilst in the private domain we are trying to encourage customers to have permeable surfaces for their driveways. DF thinks we need to communicate with customers where permeable surfaces are possible and why we would not use in main roads. KD thinks we need to start looking at adopting permeable surfaces in the public domain and lead by example.

KD enquired whether we could use Grasscrete or other permeable surfaces rather than block paving. Need to work out what surfaces we can utilise going forward. ET noted that Grasscrete is typically used for low trafficked parking areas and not adopted roads.

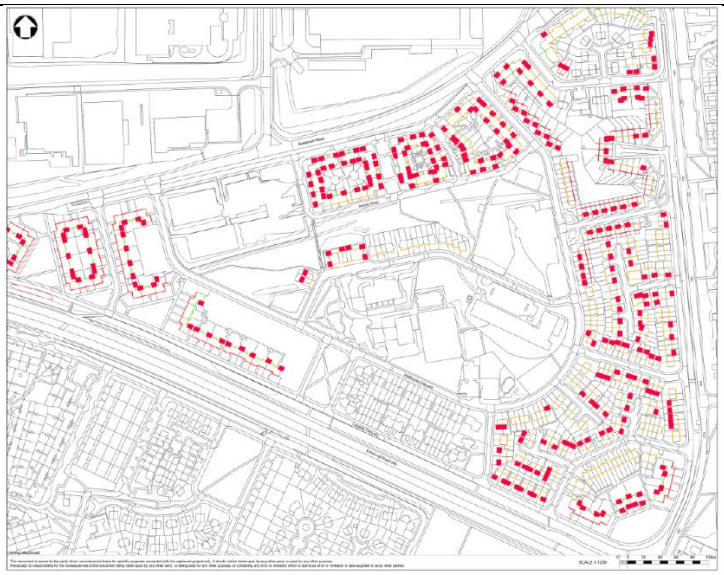
KD thinks funding may be in the wrong place as current system does not encourage use of permeable surfaces. This should be considered by the government going forward when looking at the bigger picture.

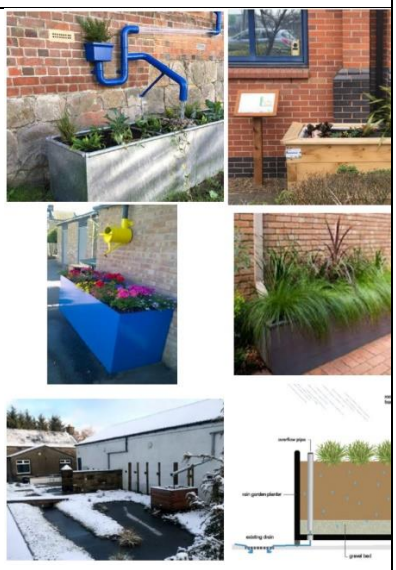
DW noted that in general roads account for 40% of flow and problem. Thinks that need to pick up road runoff but do not necessarily need to use permeable paving. Could use roads differently i.e. for conveying flow or for storing flow.

MM noted that macro-pervious pavements can be utilised in places. This is where flow is routed to roadside drains that then store flow beneath the road.

DH noted that in particular cases GCC have worked with Scottish Water to use roads for conveyancing/storage to reduce flooding. DH also noted that GCC have a statutory duty to drain the roads and keep them free from water for certain return periods. This is based on roads legislation that was prepared in 1968. This legislation may need to be revised if we are to use roads for conveyancing/storage.

SuDS planter units



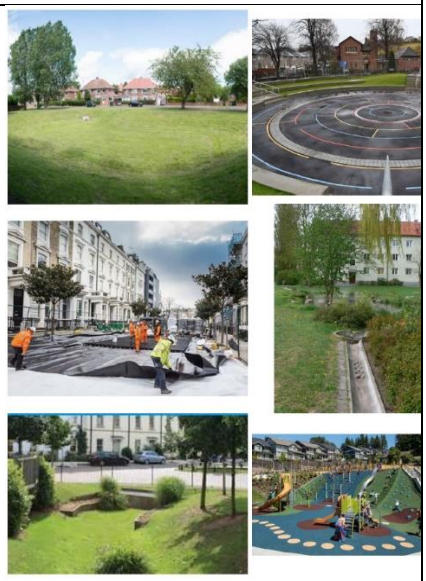


MM provided an overview. Disconnect roof downpipes and take to rain gardens/SUDS planters which provide storage. These help to slow down runoff aby attenuating the flows and can also remove any contaminants in the flow. Utilisation depends on property type; size of garden; location of downpipes. Required engagement with residents.

DH highlighted that we would need to check that downpipes convey roof drainage only, as in some cases these have been found to convey foul drainage also. MM noted we have good information on downpipes in the areas we are looking at from surveys and record drawings from housing associations.

JM noted that the complexity will be in the detail and each will be site specific. GCC installed some together with Southside Housing Association at Queensland Gardens in Cardonald.

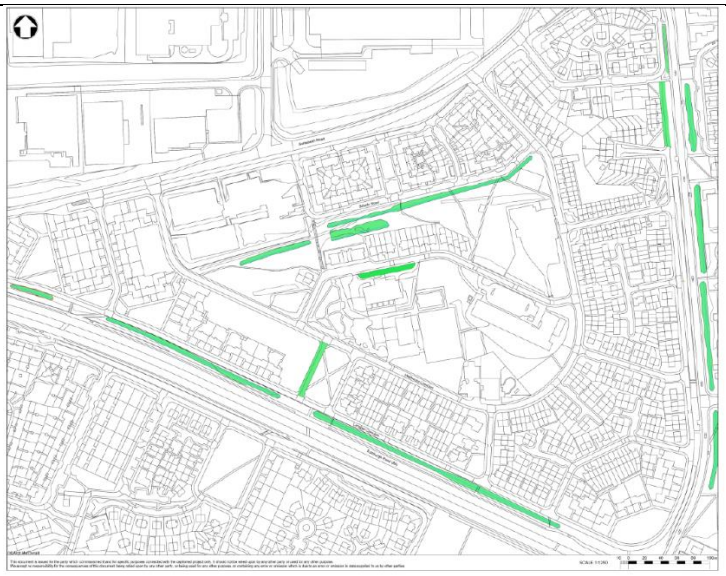
Detention Basins



MM outline the different types. Generally large depressions or small depressions. These are generally used to provide offline storage. Have the potential to be used as amenity areas. Opportunity to incorporate in new developments and can be used as a wider drainage strategy.

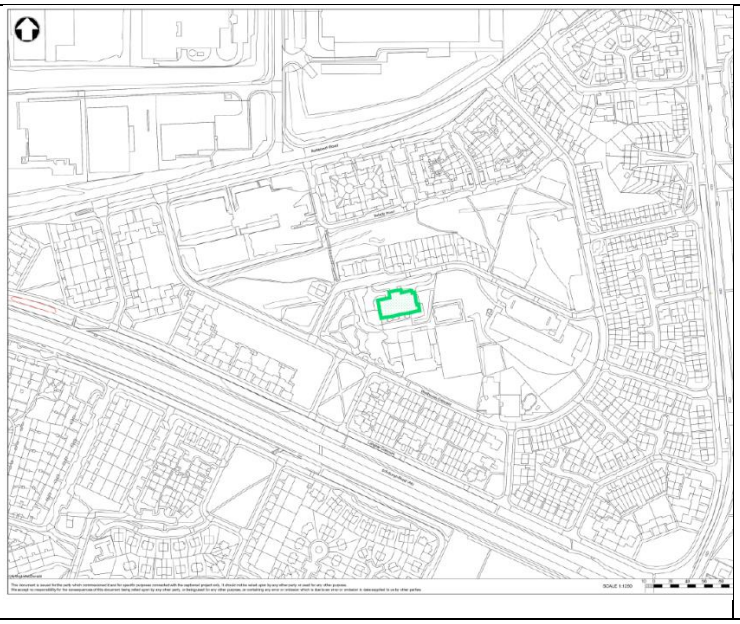
JM noted that topography dictates the locations and that for new developments we should be looking to incorporate runoff from existing areas. JM noted that we need to engage with customers about any change of use particularly where there is a volume of water storage. Different customers have a different perceived risk around storage of water and what is acceptable. Sometimes areas identified for detention basins are used by locals for specific purposes that are not always evident e.g. used for playing football. Communications with customers will help highlight these.

Swales



MM provided an overview of swales and how they can be provided with or without intermediate flow controls/dams depending on topography. Quite a few areas with large grass verges which could potentially be used for swales.

Green Roof Retrofits



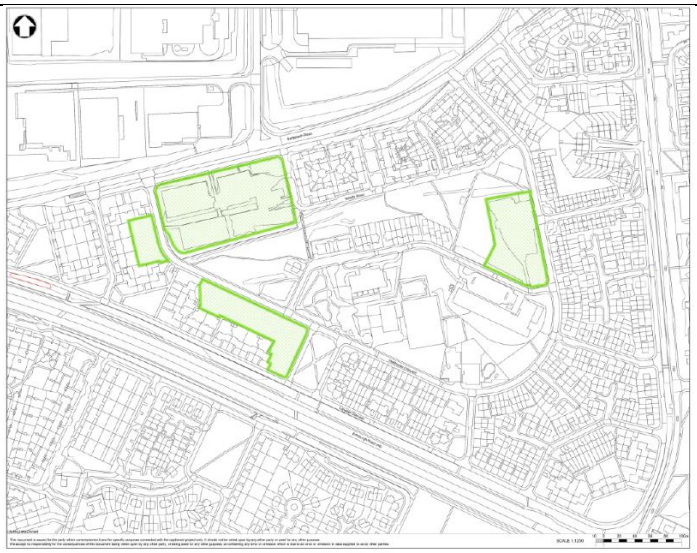
MM provide overview. Best benefit of flatter roofs. Loading needs to be considered for retrofit. Perform better during summer months when drier. This would be useful for Wellhouse Crescent where flooding more likely to occur in summer months. Potential opportunity for green roofs at Newhills Secondary School.

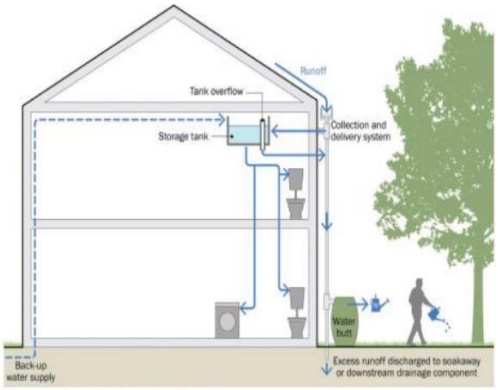
NB asked if retrofitting green roofs was expensive or had structural implications. MM replied that green roofs generally added an additional 1 to 3kN/m^2 of loading. ARC/M2 have compiled a cost database where construction only cost is in the region of £150/m^2.

JM has discussed with the Education Department around schools and the possibilities for green roofs. Some newer schools have been built with green roofs but no schools have had green roofs retrofitted as yet. There would be an opportunity to pursue this further. Also opportunity to look at drainage from sports pitches. Could either look to attenuate the outlet flow or reconstruct pitches to provide storage below. Reconstructing pitches would be more difficult and expensive. Newhills Secondary provides support needs and this would need to be taken into consideration if any construction works are proposed there.

DH noted that many schools have retrofitted solar panels which add roof loading and that this was possible. In principle it should be possible to accommodate additional loading from grass roofs.

Rainwater harvesting (new developments)





MM suggested this was a way of reducing flow into the combined sewer. Generally gravity fed systems with water used for house toilets etc. Could also use a pumped system to take flows to a header tank. MM provide example that 50m2 of roof could provide 3m3 of rainfall in a 60mm/hr storm. This would reduce flow into the combined sewer and reduce the consumption of potable water which consumes energy to produce.

JM noted there could be potential to use smart technology and sensors to ensure storage capacity was available prior to any forecasted storms. DH noted that the Forth and Clyde Canal is going to use smart technology to control storage available and that the same technology could potentially be adopted.

Discussion

MM shared a scoring matrix for discussion and to get a general consensus on what items to investigate further.

Surface water management measures can provide benefits such as Placemaking. Collaborative working to resolve flooding. Creation of amenities. Communication and feedback with customers/stakeholders is essential.

DF thinks rain gardens provide a great opportunity to involve everyone. People will have opportunity to positively contribute and become engaged. JM noted there will be some people who would not want to engage.

JM noted water quality benefit from taking road runoff through detention basins or swales.

JM noted that we need to communicate with customers/stakeholders for the location of larger items such as detention basins to understand how the community use the areas at present e.g. informal football pitches. Also need to understand communities perceived risk of stored water in detention basins so this can be encompassed in the design.

JM noted we will need to engage with GCC Education Department around green roofs on Newhills Secondary.

JM thinks that rainwater harvesting has potential benefits. It will also provide a new level of complexity that no one has experience of and will require someone to be ultimately tasked with managing.

JM thinks permeable surfaces requires a review of local authorities statutory functions with regard to maintenance. Potential for impermeable surfaces with storage provided below road.

JM highlighted that people can become very passionate about parking particularly anything that affects parking outside their homes.

JM highlighted the need for communication particularly with regard to construction and disruption. Past experience has found that uncovering utilities can significantly increase construction times and hence disruption.

DF noted we need to consider the future to ensure that new developments do not cancel out any benefits we implement. This need to highlight any negative impacts from new developments. DF highlighted the "Water-resilient places - surface water management and blue-green infrastructure: policy framework" that outlines how surface water is currently managed in Scotland and sets out a vision for the future. This can be found at: https://www.gov.scot/publications/water-resilient-places-policy-framework-surface-water-management-blue-green-infrastructure/

SF asked if there was anything that could be done to progress discussions around permeable surfaces being used for adoptable roads. ET noted that it was not something she would be able to change. JM will catch up with roads colleagues following this meeting and get any feedback.

SM noted that from a housing association perspective we need to understand all the implications (both positive and negative) and engage with local residents. SM confident that Wellhouse Housing Association will welcome being involved and that this will need their director to be engaged.

RMit asked if there were any examples of speaking to residents and which measures are considered acceptable. DF noted there is an ongoing consultation around blue green infrastructure that Scottish Water have initiated with customers in Prestwick and Bridge of Weir. It is not clear if the findings of this are available for sharing at this time. DF noted there are a number of bodies involved in engagement with customers around these measures such as Scottish Federation of Housing Associations; Citizens Advice; Southside Housing Association; NatureScot.

Given concerns around ownership and maintenance of rain gardens / planters in gardens, RMit asked if there would be an option to disconnect roof drainage completely and route to the roads where it could be picked up via surface water sewer or storage crates etc in the road. This would mean temporary construction within property boundary but once complete no tenant / landlord maintenance issues. KD thought this would be physically possible but sounded like a much more costly solution with lower overall benefits and wouldn't be as 'green' and low carbon.

SF noted we should look to develop a communication plan. JM noted that graphics/examples would be good as would on site examples. KD agreed it would be good to have a demonstration site. WP suggested that Newhills Secondary could potentially be used to install and provide examples for SUDS planters. DF noted there are good examples across Scotland of primary schools having raingardens. Double hit of getting raingardens in and getting next generation educated on the

issues.

NB noted that both Wellhouse and Easthall Park Housing Associations have newsletters that could potentially be used as a vehicle for communication. SM noted that pilot installations would be a good way forward and he was sure that Wellhouse Housing Association would be interested in supporting this.

KD noted we should be looking to identify any quick wins i.e. implementations we could do easily/ quickly that would contribute to addressing our flooding problem and also demonstrate the approach.

SF asked if DF could give an overview from a Scottish Government perspective.

DF noted that Scottish government is aware that the successful management of surface water in future depends on working across disciplines and budgets to implement solutions based on "place" that provide multiple benefits for communities including water resilience. Scottish Government's new policy framework encourages collaboration that focuses on outcomes and creating better places. Scottish Government's key aim is for organisations and communities to work together to find solutions that overcome organisational barriers. DF noted one of the biggest challenges is making sure we design for the future. Engineering in the future will be different from engineering in the past and we must ensure that we adapt. Blue green infrastructure needs to be embedded in all our designs as we engineer for the future. Our infrastructure needs to be water resilient. Simple concept that everyone needs to be involved, not just local authorities and Scottish Water. We need to reimagine our spaces and how we do things.

Scoring Matrix

The scoring matrix was compiled to capture discussion at the meeting.

Type of measure	Benefits	Issues to be overcome	Develop Further?
Rain gardens (property)	• Collaborative working with WHA, tenants and local public to resolve flooding issues • Biodiversity and ecology • Water quantity reduction to downstream drainage system • Water quality improvements	• Communication/ feedback with WHA and tenants critical to success • Maintenance responsibilities to be fully defined	Yes
Rain gardens (non-property)	• Amenity/ placemaking opportunities • Collaborative working with WHA, GCC and local public to resolve flooding issues • Biodiversity and ecology • Reduction in storm runoff to downstream drainage system • Water quality improvements • Education (community/ schools engagement)		Yes
Roadside retrofits (bioretention, tree pits)	• Traffic calming • Water quality improvements • Reduction in storm runoff to downstream drainage system • Asset performance (reduction in silt transferred to downstream drainage system) • Air quality & carbon reduction and sequestration (tree pits)	• Loss of resident parking • Coordination with existing utilities	Yes
Permeable surfaces	• Water quality improvements • Reduction in storm runoff to downstream drainage system • Potential for attenuation storage • Asset performance (reduction in silt transferred to downstream drainage system and gritting requirements) • Potential to integrate with water reuse (e.g. rainwater harvesting)	• Permeable surfaces not currently adoptable under GCC roads standards • Statutory function of roads with respect to level of service against surface flooding at odds with use of carriageway as areas for exceedance storage • Historic construction issues • Coordination with existing utilities	Yes, though noting current Statutory and adoption restrictions

Type of measure	Benefits	Issues to be overcome	Develop Further?
SuDS planters (property)	• Collaborative working with WHA, tenants and local public to resolve flooding issues • Biodiversity and ecology • Water quantity reduction to downstream drainage system • Water quality improvements	• Communication/ feedback with WHA and tenants critical to success • Maintenance responsibilities to be fully defined	Yes
Detention basins/ storage	• Amenity/ placemaking opportunities • Collaborative working with WHA, GCC and local public to resolve flooding issues	• Suitability of locations, including current usage of land to be considered • Impact on existing natural environment • Depth and frequency of storage where used as amenity spaces • Negative public perceptions related to provision and misuse of amenity spaces	Yes
Swales	• Biodiversity and ecology • Reduction in storm runoff to downstream drainage system • Water quality improvements • Asset performance (reduction in silt transferred to downstream drainage system)	• Coordination with existing utilities	Yes
Green roofs	• Biodiversity and ecology • Reduction in storm runoff to downstream drainage system (in particular during summer season) • Water quality improvements • Asset performance (life span of roof waterproofing measures)	• Engagement with GCC Education critical to further development • Additional factors to consider in terms of environmental factors at supported learning school • Structural assessment required to determine suitability for retrofit	Yes
Rainwater harvesting (new developments)	• Potential for active flood management through use of smart controls	• Complexity of system • Maintenance responsibilities to be fully defined	Yes

ACTION LOG:

Item	Action	Owner	Action Due
1	Complete table of potential SWM measures from meeting presentation and circulate for comment / acceptance.	SF / MM	30/4/21
2	Develop a plan for future meetings to discuss and agree the extent of the SWM measures to be designed. This meeting plan needs to consider the various SWM interventions and the particular stakeholders that need to be engaged with. Discuss and agree at meeting on 14th May. Also use this meeting to discuss 1 or more SWM measures to test the process.	SF/MM/AK/ MH/JM	14/5/21
3	Discuss content from this meeting with colleagues in Glasgow City Council maintenance.	JM	14/5/21
4	Identify any quick wins that could be progressed to make noticeable reduction in flooding impact.	SF/MM/AK/ MH/JM	14/5/21
5	In parallel to the other actions, develop a communication strategy and associated material (maximising use of existing info) for engaging with communities / customers / tenants with regard to the SWM measures being considered.	SF/MM/AK/ MH/JM/HA's	30/5/21 (strategy) 30/6/21 (material)
6	In parallel to the other actions, agree a number of pilot locations for SWM Raingardens / SUDS Planters with the Housing Associations. Design and Implement.	SF/MM/AK/ MH/HA's	30/5/21 (agree) 30/8/21 (implement)