Briefing Note 14 - Winter 2014/15

The Metropolitan Glasgow Strategic Drainage Partnership

The Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is a collaborative venture between Glasgow City Council, the Scottish Environment Protection Agency (SEPA), Scottish Water, Scottish Enterprise, Clyde Gateway, South Lanarkshire Council, Scottish Canals, Renfrewshire Council, East Dunbartonshire Council and Network Rail. The MGSDP Vision is to transform how the city region thinks about and manages rainfall to end uncontrolled flooding and improve water quality. This vision will be realised through partnership working shaped by the MGSDP Guiding Principles.

Games Village SuDS

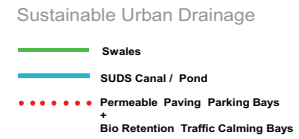
Aerial image of southern area of Games Village site showing SuDS pond and linear water feature

Set in Dalmarnock in Glasgow's East End, the purpose-built, low carbon Athletes Village is at the heart of one of Europe's largest regeneration areas. The 33 hectares site was home to 6500 athletes and team officials for the duration of the Glasgow 2014 Commonwealth Games.

Low-cost heating and hot water for the entire site is provided by a combined heat and power plant (CHP). A number of properties also benefit from solar panels / water heaters. The sustainable drainage systems (SuDS) elements of the overall site include swales (shallow, vegetated channels designed to capture, convey, filter and infiltrate runoff), permeable paving, bio-retention bays (gravel filled storage sumps designed to attenuate flows and allow for a degree of treatment / filtration), highway rain-gardens and a linear water feature / pond.

Where residential parking is provided, the parking bays feature permeable paving to capture and slow down run-off from hardstanding and roof areas. Flows from the permeable paving are then conveyed to bio-retention bays to provide a level of treatment and attenuate flows, before being conveyed on to the linear water feature. Run-off from the roads for the site is captured via swales and raingardens, then also conveyed to the linear water feature.

The linear water feature has been designed as a 'deep' swale and is intended to retain a permanent depth of water along 50% of its total length outwith major rainfall events to provide an attractive water feature in addition to its surface water management function.



Main SuDS elements for the overall site.
Image courtesy of RMJM Architects

The linear water feature discharges to a SuDS pond, which is also designed to retain a permanent minimum depth of water, and also provide additional volume of storage during heavy rainfall, prior to discharging to the local watercourse (River Clyde).

The primary function of the combined SuDS elements is to slow down the rate of discharge to the river, thereby reducing flood risk and allowing for an improvement in the quality of the water that is being discharged. Secondary benefits are the provision of an attractive water feature, bio-amenity provision and the reduction of flows to the local combined sewer.

Highway Runoff Raingarden and Bio-retention Bays

As part of the legacy of the Games, the site is in the process of being retrofitted and developed by Glasgow City Council with City Legacy, a private-sector consortium, to create a total of 300 homes for sale, and 400 for social rent through three housing associations. The first residents took residency in February 2015. In addition, a 120 bed care home will also be located at the site, and a new community centre will be built opposite the site.

Permeable Paving Parking Bays

The Games Village, both for Glasgow 2014 and legacy use, is an exemplar of the delivery of the MGSDP Vision "*to transform how the city region thinks about and manages rainfall to end uncontrolled flooding and improve water quality*" and Objectives of flood risk reduction, river water quality improvement, enabling economic development, habitat improvement and integrated investment planning.

SuDS Pond (foreground) and Linear Water Feature (background)

The Games Village has won numerous planning, regeneration, environmental and architecture awards, including the top prize at the 2014 Scottish Awards for Quality in Planning, and The RICS Best Regeneration of the Year 2014.

Glasgow Appoints UK's First Chief Resilience Officer

Glasgow City Council has appointed Alastair Brown as Chief Resilience Officer (CRO), a new position created to lead city-wide resilience building efforts to help prepare for, withstand and bounce back from catastrophic events and chronic stresses.

As Chief Resilience Officer, Alastair will oversee the development and implementation of a resilience plan for the city. In Glasgow, challenges include extreme weather such as storms and flooding caused by climate change; securing sustainable and affordable energy supplies amid increasing pressure on the national grid and tackling poverty.

Appointing a CRO is an essential element of Glasgow's resilience building partnership with 100 Resilient Cities - pioneered by the Rockefeller Foundation. Alastair will lead a six to nine month effort to develop a roadmap to resilience for Glasgow, bringing together stakeholders from across government, business and communities. He will receive personnel and technical support provided by 100RC and use resilience building tools from private, public, and non-government sector organisations partnered with 100RC.

Further details are available on the GCC website **here**

New Surface Water Flood Forecasting Tool Benefits Glasgow and the Commonwealth Games

With thousands of athletes and around 1 million spectators in Glasgow for the 2014 Commonwealth Games, organisers and a host of Scottish and UK government emergency responders put enormous effort into resilience planning to help Glasgow 2014 go smoothly, and that included SEPA's Flood Unit.

When considering events that needed resilience planning, one of the natural hazards identified was flooding. Flood forecasting and warning is one of SEPA's key operational duties so along with partners, a risk-based surface water flood forecasting project was developed and launched in Glasgow, in time for the Games.

The modelling and prediction challenges
Surface water flooding is caused by convective rainfall which is heavy, intense and usually short lived. Forecasting this type of event is a challenging area of hydrometeorology due to the difficulties in predicting exactly where the heaviest rain is likely to fall. Although it is possible to say 'a band of heavy thunderstorms is expected across the central belt this afternoon' in reality some areas will see heavy rainfall and others will remain dry and sunny all day.

For this reason the best approach is to use a probabilistic forecast, which means running a series of equally likely rainfall scenarios, known as an ensemble. If several of the scenarios have heavy rain in the same place, then there is a higher probability of flooding in this area. Another way in which the area of concern can be narrowed down is by looking at what types of places (receptors) are at risk of flooding. For example, in rural areas, although there may be heavy rain, there is unlikely to be widespread disruption. However, if the rain falls over a densely populated urban area, then the risk of disruption to transport networks, properties and people will be more significant.

Forecasting in action
During the Commonwealth Games in Glasgow, the model ran eight times a day and was used to provide a bespoke surface water flood risk forecast, which we believe to be the first in the UK with a 24 hour lead time.

Surface water flood risk is based on two components; the probability of an event occurring, which comes from the rainfall ensemble and the effects of the event. The Scottish Flood Forecasting Service and the Met Office use a risk matrix to represent this, showing that as the probability and effects increase so does the overall risk. A guidance document based on this was produced, which identified the overall flood risk for Glasgow for the next 24 hour period.

Delivery of the guidance document gave those involved in resilience planning for the Games and responders the latest and most accurate information, enabling them to consider appropriate actions to minimise the effects of potential flooding and reduce recovery time.

The weather during the Games was largely fine. However there were occasions when the additional surface water

guidance provided a real benefit to the organisers and responders. Improving capabilities for surface water flood forecasting is one of the core strategic aims of SEPA's Flood Warning Strategy for 2012 – 2016 and the experience of using the new forecasting tool this summer will help improve surface water forecasting for other areas of Scotland in the future.

Changes to Reservoir Safety Regulation

Reservoir safety in Scotland is currently regulated under the Reservoirs Act 1975 by local authorities. Under the 1975 Act all reservoirs receive the same level of monitoring and inspection regardless of the consequences of an uncontrolled release of water from the reservoir. In the greater MGSDP area there are a number of reservoirs for a variety of purposes including drinking water and flood storage.

To modernise the regulation of reservoir safety, and introduce a proportionate regulatory regime based on the consequences of an uncontrolled release of water, the Scottish Government introduced the Reservoirs (Scotland) Act 2011. One of the key changes that will be introduced is a change in regulatory body, from Scotland's 32 local authorities to SEPA as a single national regulatory body to provide greater consistency in the application and enforcement of the regulation. From 1 April 2015, Reservoir Managers will be required to register their reservoir with SEPA. This will be free of charge for the first six months. To support Reservoir managers currently regulated under the 1974 legislation SEPA will re-supply the information already held in pre-populated, hard copy registration forms. These forms should be completed by reservoir managers and returned to SEPA.

SEPA is working closely with local authorities, and the reservoir industry to implement the new legislation in a phased approach which is fit for purpose and understood by those who need to use it. Until SEPA takes over full regulatory duties, anticipated to begin in 2016, local authorities will remain the regulatory body. Four briefing notes have been developed which detail the key changes being introduced and offer further information on how the 2011 Act will be implemented, available **here** on the SEPA website.

First Phase of Carstairs Street Retrofit SuDS completed

Diagonal Walk SuDS looking North to the Clyde Gateway

Carstairs Street is located in the Dalmarnock area, in the East End of Glasgow. The Carstairs Street SuDS retrofit forms part of a wider programme of enhancements to the public realm, roads, footways and lighting across South Dalmarnock by Clyde Gateway. These works underpin the South Dalmarnock Integrated Urban Infrastructure Framework which was developed by Clyde Gateway in partnership with Glasgow City Council, SEPA and Scottish Water.

The framework promotes the redevelopment of the area over a 20 year period and is guided by an overall surface water management strategy. The phased implementation of proposals will bring about the transformation of an unsightly industrial road and incorporate an attractive and safe route for pedestrians and cyclists to establish the main link between the National Business District at Shawfield and Dalmarnock Transport Hub, supporting investment in the recently completed SMART Bridge.

The first element of the wider scheme, the 'Diagonal Walk', was delivered in Summer 2014 and comprises a swale, extensive landscaping of a previously vacant site and public realm improvements from the Clyde Gateway road to French Street, at the northern junction of Carstairs Street. Surface water from adjacent development plots will require one stage of treatment within the site curtilage before connecting into the new swale and on to a filter trench.

For the next phase of the project, the swale / filter trench will continue south along Carstairs Street, taking surface water from the footways and highway into the swale / filter trench. The filter trench drain will be oversized to provide capacity for surrounding development plots, although a stage of treatment will be required on plot, and will pass through a filtration manhole for a third stage of treatment before discharging into the River Clyde via a new, purpose built outfall. This will reduce surface water flows to the combined sewer network, thus helping deal with the effects of increased rainfall and climate change.

The first part of the scheme was delivered by funding from Glasgow City Council and Clyde Gateway whilst Carstairs Street has received funding from the Scottish Government and designs have been progressed taking account of feedback from Glasgow City Council and Scottish Water. The scheme contributes to the ongoing improvement to river water quality and the natural environment of the River Clyde and its tributaries.

Diagonal Walk SuDS looking South to French Street where the next phase will continue along Carstairs Street.

East Dunbartonshire Council and Network Rail join the MGSDP

The MGSDP is pleased to announce that both East Dunbartonshire Council and Network Rail have joined the partnership.

Raj Kumar, East Dunbartonshire Council Flood Risk Management Lead, said: “There is considerable hydraulic interaction across the shared boundary between East Dunbartonshire Council and Glasgow City Council, and we are delighted to join the MGSDP and engage in multi-agency strategy planning and delivery of MGSDP Vision and Objectives”.

David McGlone, Network Rail Senior Drainage Engineer, said “Network Rail assets and infrastructure are key to the smooth passage of goods, services and people in and around the MGSDP area. Collaborative working with the MGSDP partners will help to reduce risk to the rail network and ensure an integrated approach to the management and reduction of flood risk and impact”.

David Hay, Chair of the MGSDP Steering Group, welcomed both East Dunbartonshire Council and Network Rail to the MGSDP and said “Delivering the Vision of the MGSDP is a complex challenge and best tackled through an integrated, partnership approach, in line with the Flood Risk Management Act.
The MGSDP will only be strengthened through closer working and the sharing of ideas, knowledge and enthusiasm to set and deliver strategic and local objectives”.

Colquhoun Park Flood Alleviation Scheme, Conon Avenue Bearsden

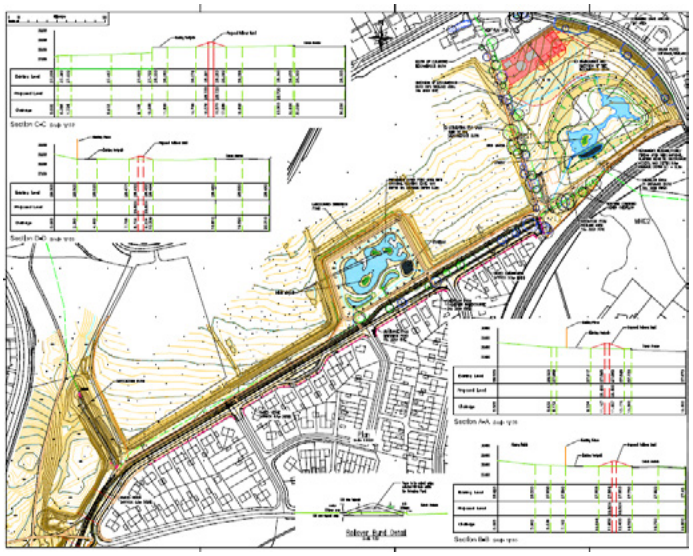
Colquhoun Park, in Bearsden in the North Western outskirts of Glasgow, consists of an open recreational area and parkland adjacent to Conon Avenue.
East Dunbartonshire Council (EDC) commissioned investigation and modelling works to determine the cause of flooding the Conon Avenue area.

This project included the identification of potential options to reduce flood risk to local residents in this area, and involved working closely with Scottish Water and Glasgow City Council due to the interactions between the local watercourse, surface water runoff and existing sewers.

Following the identification of a preferred option and conclusion of the detailed design, EDC promoted a planning application for the proposed Phase 1 works, and a subsequent construction contract, which includes the following elements:

- Diversion and daylighting of the Ledcameroch Burn culvert into a proposed wetland area within Colquhoun Park;
- Installation of an overflow to the wetland from the culverted St. Germain’s Burn;
- Upgrading and enhancement of the existing disused skating pond;
- New overspill arrangement to the disused skating pond to provide additional flood storage during peak flood events;
- Ground raising, creating bunding and landscaping;
- Relocating and providing a new play park

Construction works began in September 2014 and the project is scheduled to be completed early 2015.



Proposed Flood Alleviation Scheme

Aerial image October 2014, showing works progressing on site

Former Deputy First Minister Visits Key Scottish Water Project in Glasgow

The then Deputy First Minister Nicola Sturgeon made a visit to one of Scottish Water's key environmental improvement projects in Glasgow in late September 2014, to announce the company's £3.5bn planned investment programme across Scotland in its 2015-21 investment period.

Ms Sturgeon, who is now First Minister, made the announcement on a visit to the Clyde Place Unsatisfactory Intermittent Discharge (UID) project on the south bank of the River Clyde in the Tradeston area of Glasgow and was able to see how the £3.1m project is progressing.

The project involves the replacement of four small unscreened Combined Sewer Overflows (CSO's) with one new large screened CSO so that solids and debris can be retained within the sewer network and prevented from discharging into the Clyde.

Scottish Water is installing and replacing more than 350m of sewer pipe and installing new manholes while reconfiguring the sewer network to help best achieve this.

During her visit to the project, Ms Sturgeon met project managers and Scottish Water apprentices Courtney Mitchell, 17, from Crookston, Glasgow and Ross McCorrisken, 20, from Balloch, West Dunbartonshire, who are based at the company's Glasgow area offices at The Bridge in Stepps.

The project, which is expected to be completed by summer 2015, is part of a £250m, five-year programme of work, which was launched by Scottish Water and the former Deputy First Minister in February 2013.

Scottish Water's investment follows years of collaboration and studies by the MGSDP. The scheme of projects is the biggest investment in the Greater Glasgow area's waste water network in more than a century.

It will continue to improve river water quality and the natural environment of the River Clyde and its tributaries. It will also enable the Greater Glasgow area to continue to grow and develop, alleviate sewer flooding and deal with the effects of increased rainfall and climate change.

The First Minister Meets Scottish Water Apprentices

For additional information visit our website at www.mgsdp.org for more information on our work to deliver the MGSDP Vision.

Glasgow City Council — www.glasgow.gov.uk

Scottish Water, Always serving Scotland — www.scottishwater.co.uk

SEPA, Scottish Environment Protection Agency — www.sepa.org.uk

Clyde Gateway — www.clydegateway.com

Clydeplan, Glasgow and the Clyde Valley Strategic Development Planning Authority — www.clydeplan-sdpa.gov.uk

Scottish Canals — www.scottishcanals.co.uk

South Lanarkshire — www.southlanarkshire.gov.uk

Renfrewshire Council — www.renfrewshire.gov.uk

Network Rail — www.networkrail.co.uk

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