Location: Trevenson Road and Dudnance Lane Implementation Plan areas (TRIP & DLIP), and Barncoose / Tolskithy

Context:

The Camborne Pool Redruth (CPR) area is served by a combined sewer network that in many places is operating at or near to capacity. In addition, the sewage treatment works is already at capacity and as a result, all future development cannot contribute additional flows to the system without first either reinforcing the existing network and replacing the sewage treatment works or, removing surface water flows to increase capacity.

To ensure that development of the CPR area is not constrained, work has been undertaken to determine where and how surface water can be removed from the combined sewer system. This work is now contained within a document called the Surface Water Management Plan (SWMP).

This data sheet provides the developer with the criteria needed to meet the principles of the SWMP for the CPR area and to assist their development through the planning process with respect to drainage. Early consultation with the relevant statutory authorities is the best way to approach development in the CPR area to ensure that all parties understand what is required to deliver a successful project.

Table DS 3.0: Development plots within the CPR area classified as within DLIP, TRIP or Barncoose / Tolskithy, associated sewer capacity status, and permissible discharge to the SSWS.

Development plot reference from Area Action Plan (2007):	Sub-catchment:	Sewer Capacity status (relevant if discharge / overflow is to sewer):	Maximum permissible surface water flow contribution to Strategic Surface Water System in the 100yr return period:
07a	4	Surcharged – Attenuate surface water flows.	34.8l/s
5	4	Capacity – discuss requirements with EA / SWW / CCC.	454.1l/s
H3	4	Capacity – discuss requirements with EA / SWW / CCC.	626.1l/s
H4	4	Surcharged – Attenuate surface water flows.	413.2l/s
H11	4	Capacity – discuss requirements with EA / SWW / CCC.	195.9l/s
H14	4	Flood risk – Attenuate surface water flows.	115.3l/s
R4	4	Capacity – discuss requirements with EA / SWW / CCC.	124.7l/s

Development plot reference from Area Action Plan (2007):	Sub-catchment:	Sewer Capacity status (relevant if discharge / overflow is to sewer):	Maximum permissible surface water flow contribution to Strategic Surface Water System in the 100yr return period:
P6	4	Capacity – discuss requirements with EA / SWW / CCC.	108.3l/s
R5a	4	Flood risk – Attenuate surface water flows.	879.7l/s (split west and east of the Red River; west = 436.1l/s, and east = 443.6l/s.
S10	4	Capacity – discuss requirements with EA / SWW / CCC.	298.2l/s
01	5	Surcharged – Attenuate surface water flows.	137.7l/s
07b	5	Surcharged – Attenuate surface water flows.	176.3l/s
4a	5	Flood risk – Attenuate surface water flows.	366.9l/s
4b	5	Surcharged – Attenuate surface water flows.	296.3l/s
7a	5	Surcharged – Attenuate surface water flows.	127.4l/s
7b	5	Flood risk – Attenuate surface water flows.	23.6l/s
E1	5	Flood risk – Attenuate surface water flows.	1000l/s
J7 / J12	5	Surcharged – Attenuate surface water flows.	176.9l/s
J8	5	Surcharged – Attenuate surface water flows.	276.4l/s
P2	5	Surcharged – Attenuate surface water flows.	413.5l/s
P3	5	Flood risk – Attenuate surface water flows.	12.7l/s
P8	5	Capacity – discuss requirements with EA / SWW / CCC.	392.4l/s
R2	5	Capacity – discuss requirements with EA / SWW / CCC.	280.4l/s
R5b	5	Flood risk – Attenuate surface water flows.	254.9l/s
S9	5	Capacity – discuss	259.1l/s

Development plot reference from Area Action Plan (2007):	Sub-catchment:	Sewer Capacity status (relevant if discharge / overflow is to sewer):	Maximum permissible surface water flow contribution to Strategic Surface Water System in the 100yr return period:
		requirements with EA / SWW / CCC.	
S11	5	Capacity – discuss requirements with EA / SWW / CCC.	715.9l/s
02	6	No sewer	349l/s
03	6	No sewer	578.8l/s
04	6	Surcharged – Attenuate surface water flows.	134.9l/s
05	6	Capacity – discuss requirements with EA / SWW / CCC.	142.7l/s
06	6	Capacity – discuss requirements with EA / SWW / CCC.	68.1l/s
J3	6	Surcharged – Attenuate surface water flows.	730.5l/s

The principles of the SWMP:

The SWMP's primary aim is to reduce surface water from entering the combined sewer system to increase capacity for foul flows and reduce the regularity of Combined Sewer Overflows (CSOs) discharging to watercourses.

The SWMP's proposal to resolve this issue is to implement a Strategic Surface Water drainage System (SSWS). The accepted approach (EA Drainage Guidance for Cornwall) is to impose source control requirements on each development plot, but the SSWS provides a means for multiple plots to connect to a common system reducing the amount of work any one development has to undertake to successfully drain their plot; this approach has been endorsed by the EA.

The SSWS will take the form of grass swales (to meet an agreed performance specification) adjacent to pedestrian / cycle routes linking to attenuation ponds to control the surface water flows. The route of the SSWS is termed as a 'blue corridor' as the SSWS may retain water for hydraulic, as well as aesthetic and other uses. The developer will need to allow for the SSWS to be constructed through their plot in-line with the plans shown in the SWMP.

It is the intention that the SSWS will be owned and operated by a collaboration of bodies lead by Cornwall County Council to be known as the Strategic Drainage Group (SDG). Each developer wishing to discharge into the SSWS will need to meet the criteria set out within this data sheet and also contained within the SWMP. Consent to discharge will only be granted if the SDG is satisfied with the developer's submission. The SDG will also have the ability to inspect the installation of the developer's surface water drainage during construction to ensure it meets the approved drawings.

Due to the CPR area having a significant history of mining it was decided that introducing more surface water into the ground should be avoided. This was due to the existing problems with contamination leaching out from the mines through the adit system (the mine's drainage systems) and polluting the downstream watercourses. **Where it can be proved by the developer that infiltration of surface water will not result in mobilisation of ground contaminants on their plot, or problems caused by additional ground water draining into existing mine workings then this constraint may be negotiable.**

Surface attenuation and conveyance of flows is preferred to sub-surface approaches, e.g. soft engineered solutions such as ponds, swales, or wetland areas as opposed to over-sized pipes, or box culvert tanks etc. **It will be expected that the developer will apply surface solutions and only in exceptional circumstances supplement these with sub-surface solutions if constrained.**

Design criteria:

In the DLIP, TRIP and Barncoose / Tolskithy areas surface water drainage will need to be designed in line with the requirements set out in the SWMP as summarised below;

Permissible surface water flow rate from developments: Permissible flow rates from each development plot have been calculated and are included in Table DS 3.0 above. These flow rates are based upon 3x the existing calculated flow generated by the development plots. For Greenfield (undeveloped) plots 3x the existing Greenfield runoff will be permitted, which is also shown in the above table. Other reference documents that will assist with the design include the SUDS Manual (produced by CIRIA document number C697), and Sewers for Adoption 6th Edition (produced by WRc).

Critical storm for design of SSWS: The SSWS will need to accommodate up to the 100 year return period critical storm event plus an allowance of 30% for climate change. Exceedance flow routing will also need to be considered and mapped with mitigation proposed where necessary i.e. if the overland exceedance flow passes a school or populated area.

Route and footprint of SSWS: The routes that the SSWS takes can be viewed on the plans appended to the SWMP. Indicative sizes of ponds have also been provided, along with a suggestion for the size of swale and overall footprint taken by the SSWS (approximately 20m width which includes 7m easements either side).

Crossing points of SSWS: The SSWS will require crossing points similar to those shown in the best practice examples to the rear of this data sheet, which allow pedestrians / cyclists to safely cross the feature during flood events while also not restricting the hydraulic capacity of the system.

Interface with SSWS: Connection to the SSWS will only be granted if the developer can prove that they will discharge at no greater rate than in table DS 3.0, and they show that they have installed adequate flow, silt and pollution control mechanisms upstream.

Discharge to sewers: Any surface water flow to be discharged to a sewer will need to be discussed with the owner of that system and subsequent consent to discharge granted. The owner of the sewer network could be South West Water, Cornwall County Council, or a third party.

Best Practice examples:

Below are a couple of examples of best practice methods of SUDS solutions and an option for a typical cross section for the SSWS (for all options see SWMP);

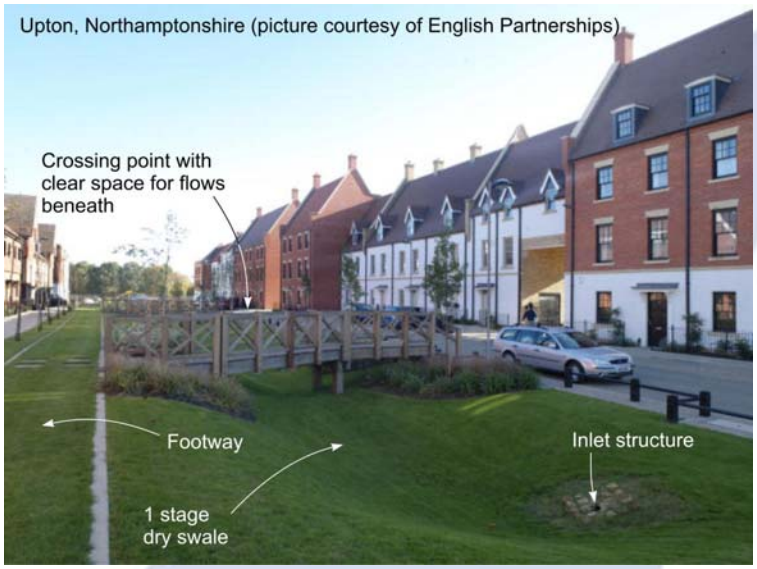

Figure DS 3.0: Dry Swale used For conveyance of storm water and attenuation.

Figure DS 3.1: Exeter Business Park (wet) attenuation pond with storage volume provided above permanent water level.

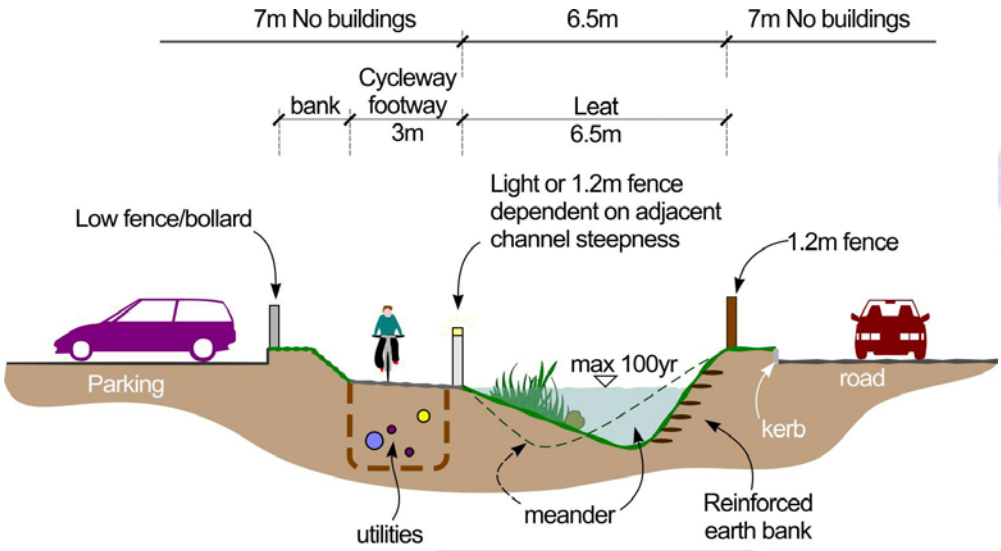

Figure DS 3.2: Conceptual cross section of SSWS swale – Option 3.

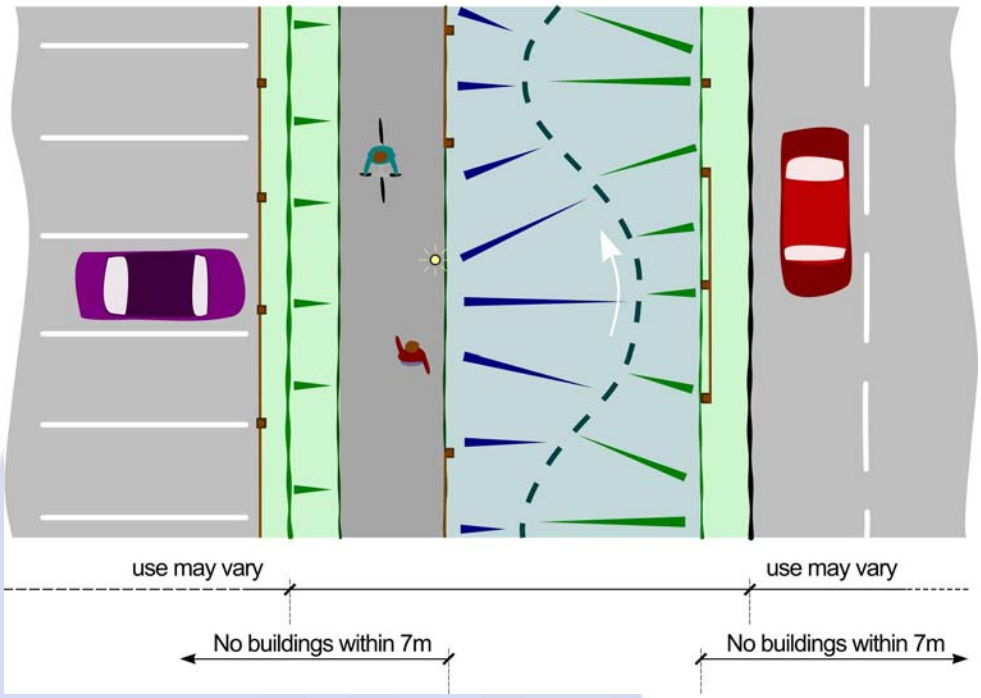

Figure DS 3.3: Conceptual plan view of SSWS swale – Option 3.