# TECHNICAL NOTE

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| PROJECT | Tribeca Plot B & C<br>St Pancras Way, London, NW1 0QG | CLIENT | Reef Group | |
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| TITLE | Stormwater Drainage design philosophy | REFERENCE | 22094-SWD-TN-03 | P02 |

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| P02 | Update for submission to discharge planning Condition 23 | 14/09/2023 | AMG | TC | TC |

## 1 Introduction

1.1 Water Environment was commissioned by Reef Group to provide a summary of the design philosophy for the stormwater drainage associated with the residential part of the development at Tribeca, St Pancras Way, London, NW1 0QG.

1.2 Planning permission (2021/2671/P) for redevelopment of the site was granted in November 2022, and the permission makes specific reference to the Flood Risk Assessment and SUDS Strategy Rev C 2018, prepared by Water Environment Limited on behalf of GD Partnership Ltd.

1.3 The summary is intended to provide a brief roadmap of the main decisions made in the preparation of the site stormwater drainage with particular reference to the requirements the Canal and River Trust and the Lead Local Flood Authority (LLFA), The London Borough of Camden (LBC).

1.4 The development is comprised of three plots, Plot A, Plot B and Plot C. Plot A is currently under construction. This design philosophy document refers to Plots B and C.

## 2 Planning and design history

2.1 Water Environment first got involved in this project in 2017 and prepared the Flood Risk Assessment and Sustainable Drainage Strategy (FRA and SuDS) report for the site, Plots A – C.

2.2 As outlined in the FRA and SuDS strategy, a drainage CCTV survey was carried out by Drainage Technical Services Ltd in April 2017 and confirmed that the stormwater drainage from the existing developed site, including the canal-side drainage, all discharges to the combined sewer network in St Pancras Way.

2.3 The existing (pre-developed) site runoff was calculated to be 101 l/s, 247 l/s and 322 l/s for the 1 year, 30 year and 100 year events respectively.

2.4 The discharge rates proposed in the FRA and SuDS strategy for each of the plots reflected the 50% reduction in pre-development runoff rates, as per London Plan Policy 5.13.

2.5 Plot B accounts for approximately 22% of the total site area, and therefore accounts for an existing (pre-development) discharge rate of 71.4 l/s. Consequently the maximum allowable proposed discharge rate for Plot B, as reflected in Planning Condition 23, is 35.7 l/s.

2.6 Plot C accounts for approximately 63% of the total site area, and therefore accounts for an existing discharge rate of 202.2 l/s. Consequently the maximum allowable proposed discharge rate from Plot , as reflected in Planning Condition 23, is 101.1 l/s.

2.7 Thames Water and the Canal and River Trust were consulted in order to agree discharge rates into each respective asset.

2.8 A legal agreement has subsequently been negotiated between the current site owners (and successors in title) and the Canal and River Trust for discharge of clean stormwater into the canal for the lifetime of the development at attenuated rates. The agreement incorporates improvements to a downstream weir structure, as well as consent for the re-use of existing direct-discharge vertical downpipes into the canal. Downstream weir improvements (to be procured by the CRT) will ensure that there are no increased water levels in the canal. Re-use of the existing drop-outfalls rather than an underwater outfall reduces the complexity of the construction, inspection and future maintenance for all parties.

2.9 The rate of discharge to the public sewer is yet to be confirmed with Thames Water but the rates proposed, which will be outlined in the following Stormwater Drainage network, is below the rates indicated in the Planning Application (2021/2671/P), as approved, and set out in Planning Condition 23 for Plot B and for Plot C. This results in a more-than 85% reduction of peak stormwater flow rate to 40.7 li/s for Plot B and Plot C, compared to the pre-developed rate of 273.7 li/s. Discharge of the roof areas to the canal rather than the public sewer also results in a more-than 73% reduction in the total volume of stormwater discharging to the combined Thames Water sewer when compared to the pre-developed state.

### *Stormwater drainage strategy*

2.10 This document should be read in conjunction with drawing 22094-SWD-DP-01-P05.

2.11 The philosophy of the stormwater drainage design for Plots B and C, as shown in drawing 22094-SWD-DP-01 remain consistent with the strategy as submitted at planning, specifically:

- the use of a green/blue roof to capture and attenuate direct rainfall on the roof and discharge it to the canal at a controlled rate;
- external pedestrian areas adjacent to the canal, above the level of the canal, will discharge directly to the canal, unattenuated;
- external pedestrian areas adjacent to the building, but below the level of the canal will discharge at attenuated rates to the public sewer in St Pancreas Way;
- external pedestrian areas within the adopted boundary of the public highway will discharge directly to the public sewer. These external areas will feature impermeable paving collected via a series of channel drains which will discharge to the attenuation tanks.
- Discharge to the public sewer will be via a new S106 connections (Water Industry Act, 1991), in the north-western corner of the Plot B site and in the south-western corner of the Plot C site.

### *Plot B proposed SuDS infrastructure*

2.12 Plot B roof includes approximately 1270sqm of blue room area, with 0.9m wide, 0.2m deep stone perimeter with 30% voids providing additional storage and a green roof area of approximately 332sqm.

There are 3 outlets proposed from the roof at its low-points (maximum deflection), discharging at a total of up to 3.0 l/s for up to and including the 100 year + 40% climate change event.

2.13 These outlets will connect to a linear drain crossing the canal-side pathway. The linear drains junction perpendicularly into a proposed linear drain running alongside the canal capping beam, out-falling into the existing drop-outlets in the canal capping beam.

2.14 The canal-side hard standing area slopes towards the canal, draining to the linear drain running alongside the canal capping beam, out-falling unattenuated into the existing drop-outlets in the canal capping beam. The discharge rate from the canal-side hard standing area is 17.5 l/s.

2.15 The hard standing area north-west and west of Plot B runoff to proposed linear drains, discharging unattenuated to the public sewer at a rate of 14.4 l/s. The new connection to the public sewer will require a section 106 application to be submitted to Thames Water.

2.16 The total stormwater discharging from the Plot B site for up to and including the 100 year + 40% climate change event is 34.9 l/s, this is less than the 35.7 l/s stipulated in the planning condition.

2.17 The stormwater discharging to the public sewer at 14.4 l/s represents a 79% reduction in discharge rate from the site when compared to the existing situation.

*Plot C proposed SuDS infrastructure*

2.18 Plot C1 roof includes 0.2m deep, approximately 207 sqm of blue roof area, with 0.9m wide, 0.2m deep stone perimeter with 30% voids providing additional storage. There are 2 outlets proposed from the roof at its low-points (maximum deflection), discharging at a total of up to 14.0 l/s for up to and including the 100 year + 40% climate change event. These roof outlets connect to the 225mm pipe running through Plot C1, ultimately connecting to the box-culvert storage and distribution chamber under the canal-side hard standing area.

2.19 Plot C2 roof includes 0.2m deep, 435sqm of blue roof area, with 0.9m wide, 0.2m deep stone perimeter with 30% voids providing additional storage and a green roof area of approximately 128sqm. There are 2 outlets proposed from the roof at its low-points (maximum deflection), discharging at a total of up to 2 l/s for up to and including the 100 year + 40% climate change event. These roof outlets connect to the box-culvert storage and distribution chamber under the canal-side hard standing area.

2.20 Plot C3 roof, 11$^{th}$ floor, includes 0.2m deep, 950sqm area of blue roof area, with 0.9m wide, 0.2m deep stone perimeter with 30% voids providing additional storage and a green roof area of approximately 126sqm. There are 3 outlets proposed from the roof at its low-points (maximum deflection), discharging at a total of up to 3.0 l/s for up to and including the 100 year + 40% climate change event.

2.21 Plot C3 roof, 8$^{th}$ floor, includes 0.2m deep, 690sqm area of blue roof with an area, with 0.9m wide, 0.2m deep stone perimeter with 30% voids providing additional storage and a green roof area of approximately 100sqm. There are 2 outlets proposed from the roof at its low-points (maximum deflection), discharging at a total of up to 3.7 l/s for up to and including the 100 year + 40% climate change event.

2.22 The canal-side hard standing area slopes towards the canal, draining to the linear drain running alongside the canal capping beam, out-falling unattenuated into the existing drop-outlets in the canal capping beam. The discharge rate from the canal-side hard standing area is 20.8 l/s.

2.23 The box culvert storage and distribution chamber under the canal side area attenuates the outfalls from the roofs of Plot C1, Plot C2 and Plot C3 to 49.1 l/s. The outlet connects to 3 existing drop-outlets in the canal capping beam with 100mm pipes that restrict the flow to the required rate.

2.24 The total stormwater discharge from Plot C to the canal is 69.9l/s.

2.25 Plot C4 roof does not include any green or blue roof elements and connects directly to the crated storage under the hard standing open space between Plots B and C.

2.26 The hard standing areas between Plots B and C drain to linear drains, which outfall via sump outlets at intervals to either inspection chambers or directly to the crated storage. The hard standing area between Plot C1, C2 and C3 and the hard standing area between Plot B and Plot C1 drain to the upper crated storage area, approximately 215sqm of 0.4m deep crates. The stormwater runoff from this area is attenuated to 7.3 l/s and outfalls to the lower storage area between Plot B and Plot C3.

2.27 Most of the hard standing area between Plot B and Plot C3 connect into the lower crated storage area, approximately 125sqm of 0.4m deep crates which discharge at a maximum rate of 15 l/s. There is also provision to for 53m$^3$ of rainwater harvesting which must fill before the attenuation crates, in the form of 138m2 of crates and a rainwater harvesting pump is proposed to facilitate this. This rainwater will be used to water the green-landscaped spaces between Plots B and C and could be used to washdown the hard standing areas as per maintenance requirements, as well as low-level window washing. Plot C4 roof also connects to this crated storage area.

2.28 A small area of hard standing between Plot C4 and Plot C3 (Area 2, as noted on drawing 22094-SWD-DP-01), south of FC02, runs off into a linear drain which connects unattenuated to manhole SW06.

2.29 A small area of hard standing between Plot C4 and Plot B (Area 1, as noted on on drawing 22094-SWD-DP-01), runs off into a linear drain which connects unattenuated to manhole SW06.

2.30 The lower terrace roof area of Plot C3 in the south-western corner of the building connects directly to the ground floor linear drain. The small area of hard landscaping in that corner, within the site boundary, slopes towards the same linear drain. These areas discharge unattenuated into manhole SW06 at up to 8.9 l/s.

2.31 The peak stormwater rate discharging from the Plot B site to the public sewer via the proposed new demarcation manhole for events up to and including the 100 year + 40% climate change event is 14.4 l/s, which is less than the 22.6 l/s stipulated in Planning Condition 23 of Permission 2021/2671/P. The new connection to the public sewer will require a section 106 application to be submitted to Thames Water.

2.32 The peak stormwater rate discharging from the whole of Plot B for events up to and including the 100 year + 40% climate change event is 34.9 l/s, which is less than the 35.7 l/s stipulated in Planning Condition 23 of Permission 2021/2671/P. The new connection to the public sewer will require a section 106 application to be submitted to Thames Water.

2.33 The peak stormwater rate discharging from the Plot C site to the public sewer via the proposed new demarcation manhole for events up to and including the 100 year + 40% climate change event is 26.3 l/s, which is less than the 83.8 l/s stipulated in Planning Condition 23 of Permission 2021/2671/P. The new connection to the public sewer will require a section 106 application to be submitted to Thames Water.

2.34 The peak stormwater rate discharging from the whole of Plot C for events up to and including the 100 year + 40% climate change event is 96.2 l/s, which is less than the 101.1 l/s stipulated in Planning Condition 23 of Permission 2021/2671/P. The new connection to the public sewer will require a section 106 application to be submitted to Thames Water.

2.35 The proposals represent a more-than 50% reduction in peak stormwater runoff rate when compared to the pre-developed rate, and the improved configuration of the roof-level drainage has resulted in further significant reductions in discharge rate and volume to the public sewer when compared to the original proposals as set out in the approved Flood Risk Assessment and SuDS Strategy (FRA) dated 31/08/2017.

2.36 Whereas almost all of the existing (predevelopment) site drained unattenuated to the public combined sewer with a combined total area of Plot B and Plot C amounting to an area of approximately 9,690m$^2$, in the proposed site 7,110m$^2$ will be directed to the Regent's Canal, thus reducing the volume of

stormwater entering the public combined sewer by more than 73%, while the peak rate of discharge to the public sewer for the two plots will reduce by more than 85%.