

City Airport Development Programme (CADP1)

Condition 66: Non Return Water Valve and Sustainable Urban Drainage





May 2018

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Figure 3-3 Typical Airside Attenuation Tank Detail

Project Glossary of Abbreviations

Project Glossary of Abbreviations		
Acronym	Meaning	
CADP	City Airport Development Programme	
ETE	East Terminal Extension	
KGV	King George V	
UES	Updated Environmental Statement	
WEC	Western Energy Centre	
WSY	Western Service Yard	
WTE	West Terminal Extension	
SuDS	Sustainable Drainage Systems	

1. Introduction

- 1.1.1. The City Airport Development Programme (CADP1) planning application (13/01228/FUL) was granted planning permission by the Secretaries of State for Communities and Local Government and Transport in July 2016 following an appeal and public inquiry which was held in March/April 2016.
- 1.1.2. On 5th January 2017, the London Borough of Newham (LBN) approved some minor nonmaterial design changes to the appearance of the western and southern elevations of the Western Terminal Extension (WTE). A further non-material amendment (17/02865/NONMAT) to the Planning Permission was approved on 27 September 2017 for minor amendments to the terminal buildings and associated service yard, East Pier, forecourt and decked car park. The approved minor amendments have been incorporated into the details provided to satisfy this condition.
- 1.1.3. Condition 66 requires that

"No Phase of the development shall be commenced until details of the following have been submitted to the Local Planning Authority for approval in writing:

- how a non-return water valve or other sustainable device will be incorporated into the waste water system within the Phase of the Development; and
- how storm flows will be attenuated or regulated into the receiving public network through on or off-site storage.

Each Phase of the development shall be implemented in accordance with the approved details and they shall be retained thereafter.

Reason: To sustainably safeguard the waste and storm water system."

1.1.4. The Airport submitted a Construction Phasing Plan to LBN pursuant to Condition 4 of the CADP1 permission in February 2017. It was proposed to build out CADP1 as a single uninterrupted period of construction over 5 years split into two distinct phases. Consistent with terminology used in the Updated Environmental Statement (UES), the two phases were referred to as the 'Interim Works' and the 'Completed Works' – each delivering different parts of the CADP infrastructure. The Interim Works would be delivered first and would be immediately followed by the Completed Works. This Construction Phasing Plan was approved by LBN in March 2017 (ref. 17/00500/AOD) and the details pursuant to Condition 69 for the 'Interim Works' were also approved at the same time (ref. 17/00778/AOD).

Scope of Accelerated Construction Plan

- 1.1.5. Ahead of the commencement of construction of CADP1, the Airport's Delivery Partner has identified a number of programme efficiencies and improvements to the 5 year build which could reduce the duration of the construction programme by approximately one year (12 months) and deliver the full CADP1 infrastructure in an accelerated single phase. This is hereafter referred to as the *Accelerated Construction Phasing Plan*.
- 1.1.6. The improved Accelerated Construction Phasing Plan comprises a construction programme likely to be 4 years (48 months), compared to 5 years (60 months) under the previously approved Construction Phasing Plan (March 2017), and 5 years and 2 months (62 months) under the 2015 Accelerated Construction Programme which was assessed in the UES.
- 1.1.7. Thames Water and the Environment Agency were previously consulted on the approved details under PCC66 for the Interim Works and raised no objections. They were also consulted on this application prior to formal submission and similarly raised no concerns. Refer to Appendix B.
- 1.1.8. This submission seeks approval of the Surface Water Drainage Scheme pursuant to Condition 66 for all of the approved CADP1 infrastructure to be delivered by the new Accelerated Construction Plan as summarised below:
 - Proposed landside drainage attenuation and flow restriction devices for the Western Service Yard, Forecourt and Dockside areas as presented in Section 3.2 of this report.
 - Proposed airside drainage attenuation and flow restriction devices for the airfield as presented in Section 3.3 of this report.
- 1.1.9. The following drawings have been submitted under separate cover for Condition 69 and are relevant to this report:

Originator	Drawing title	Drawing Number	Status
TPS	Drainage Scheme Catchment Areas	A400-TPS-C-00-L00-DR-GA- 864-205	Refer to Condition 69 Report
TPS	Proposed Drainage Layout Sheet 1	A400-TPS-C-00-L00-DR-GA- 864-206	Refer to Condition 69 Report
TPS	Proposed Drainage Layout Sheet 2	A400-TPS-C-00-L00-DR-GA- 864-207	Refer to Condition 69 Report
TPS	Proposed Drainage Layout Sheet 3	A400-TPS-C-00-L00-DR-GA- 864-208	Refer to Condition 69 Report
TPS	Proposed Drainage Layout Sheet 4	A400-TPS-C-00-L00-DR-GA- 864-209	Refer to Condition 69 Report
TPS	Proposed Drainage Longitudinal Sections Sheet 1	A400-TPS-C-00-XXX-DR-SE- 864-201	Refer to Condition 69 Report

TPS	Proposed Drainage Longitudinal Sections Sheet 2	A400-TPS-C-00-XXX-DR-SE- 864-202	Refer to Condition 69 Report
TPS	Proposed Drainage Longitudinal Sections Sheet 3	A400-TPS-C-00-XXX-DR-SE- 864-203	Refer to Condition 69 Report
TPS	Proposed Drainage Longitudinal Sections Sheet 4	A400-TPS-C-00-XXX-DR-SE- 864-204	Refer to Condition 69 Report
TPS	Proposed Drainage Longitudinal Sections Sheet 5	A400-TPS-C-00-XXX-DR-SE- 864-205	Refer to Condition 69 Report
TPS	Proposed Drainage Longitudinal Sections Sheet 6	A400-TPS-C-00-XXX-DR-SE- 864-206	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 1	A400-TPS-C-00-XXX-DR-DE- 864-001	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 2	A400-TPS-C-00-XXX-DR-DE- 864-002	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 3	A400-TPS-C-00-XXX-DR-DE- 864-003	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 4	A400-TPS-C-00-XXX-DR-DE- 864-004	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 5	A400-TPS-C-00-XXX-DR-DE- 864-005	Refer to Condition 69 Report
TPS	Airfield Drainage Details – Sheet 6	A400-TPS-C-00-XXX-DR-DE- 864-006	Refer to Condition 69 Report
TPS	Drainage Scheme MicroDrainage Network	A400-TPS-C-00-L00-DR-GA- 864-210	Refer to Condition 69 Report
TPS	Existing Surface Water Drainage	A400-TPS-C-00-L00-DR-GA- 864-211	Refer to Condition 69 Report
Atkins	Typical Landside Attenuation Tank Detail	-	Refer to Condition 69 Report

Atkins	Typical Oil Separator Detail	-	Refer to Condition 69 Report
Atkins	Stage 3 Western Service Yard Proposed Surface Water Drainage Sheet 1 of 2	A400-ATK-C-30-XXX-XX-DR- GA-864-101	Refer to Condition 69 Report
Atkins	Stage 3 Western Service Yard Proposed Surface Water Drainage Sheet 2 of 2	A400-ATK-C-30-XXX-XX-DR- GA-864-102	Refer to Condition 69 Report
Atkins	Stage 3 Ultimate Forecourt Proposed Surface Water Drainage Sheet 1 of 4	A400-ATK-C-36-XXX-XX-DR- GA-864-101	Refer to Condition 69 Report
Atkins	Stage 3 Ultimate Forecourt Proposed Surface Water Drainage Sheet 2 of 4	A400-ATK-C-36-XXX-XX-DR- GA-864-102	Refer to Condition 69 Report
Atkins	Stage 3 Ultimate Forecourt Proposed Surface Water Drainage Sheet 3 of 4	A400-ATK-C-36-XXX-XX-DR- GA-864-103	Refer to Condition 69 Report
Atkins	Stage 3 Ultimate Forecourt Proposed Surface Water Drainage Sheet 4 of 4	A400-ATK-C-36-XXX-XX-DR- GA-864-104	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (1 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-101	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (2 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-102	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (3 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-103	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (4 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-104	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (5 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-105	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (6 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-106	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (7 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-107	Refer to Condition 69 Report

Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (8 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-108	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (9 of 12)	A400-ATK-C-40-XXX-DR-XX- GA-864-109	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (10 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-110	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (11 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-111	Refer to Condition 69 Report
Atkins	Stage 3 Dockside Proposed Surface Water Drainage Layout (12 of 12)	A400-ATK-C-40-XXX-XX-DR- GA-864-112	Refer to Condition 69 Report

2. CADP1 Non-Return Valves or Other Sustainable Devices

2.1. Landside

2.1.1. No non-return valves are proposed landside as part of CADP1. See Section 3.2 below for details of the attenuation and regulation of storm flows.

2.2. Airside

2.2.1. No non-return valves are proposed airside as part of the CADP1. See Section 3.3 below for details of the attenuation and regulation of storm flows.

3. CADP1 Attenuation Tanks and Regulation of Storm Flows

3.1. General

3.1.1. For hydraulic calculations associated with proposed storm water drainage supporting CADP1 please see the Approval of Details application under separate cover for Condition 69. This report only incudes details for approval with respect to attenuation tanks and regulation of storm flows.

3.2. Landside

Design Criteria

- 3.2.1. Most of the proposed landside drainage has been developed to scheme design and will be developed further at detailed design.
- 3.2.2. The landside attenuation tanks are proposed to be cellular storage structures. Key design components of this structure includes:
 - A cellular porosity of 95%;
 - Cover of at least 500mm should be provided at all points above the tank.
- 3.2.3. The product comes in both regular and heavy duty forms. It is proposed to use the heavy duty products to accommodate post-development traffic and construction vehicle loading.
- 3.2.4. A drawing of a typical landside attenuation tank detail is shown in Figure 3-1 overleaf. This has been submited for approval under separate cover for Condition 69.
- 3.2.5. The landside tanks have been modelled using MicroDrainage to ensure that it is sufficient to prevent flooding for a 1 in 30 year return period flood event (+20% Climate Change). The key design components of this solution include:
 - Cover levels and invert levels have been based on the available information for existing surface water sewers and the proposed development levels;
 - Vortex control devices have been used to limit the flow rate from the landside attenuation tanks.
- 3.2.6. Oil Separators have also been incorporated to treat fuel spillages in large car parking areas as well as the WSY. It is proposed to use a full retention class 1 separator in the WSY due to heavy goods vehicle parking and manouvering. For large car parking areas by-pass class 1 separators are proposed. A drawing of a typical oil separator detail is shown in Figure 3-2 overleaf. This has been submitted for approval under separate cover for Condition 69.

City Airport Development Programme (CADP1) Condition 66: Non Return Water Valve and Sustainable Urban Drainage





Western Service Yard, West Terminal Extension and Western Energy Centre

- 3.2.7. Drawing A400-ATK-C-30-XXX-XX-DR-GA-864-101 and *-102, submitted for approval under separate cover for Condition 69, provides details of the proposed drainage network to serve the WSY, WTE and WEC.
- 3.2.8. A full retention class 1 separator, in line with BS EN 858 parts 1 and 2, is proposed in the WSY, to treat fuel spillages and mitigate the effects of a spillage on the water quality before discharge into the wider network.
- 3.2.9. A tank is proposed to attenuate flows and has been modelled using MicroDrainage to ensure that it is sufficient to prevent flooding for a 1 in 30 year return period flood event (+20% Climate Change). This is proposed to to have a volume of circa 150m³.
- 3.2.10. A vortex control device is then proposed to limit flows discharging from the WSY to 23.05 l/s.

Forecourt

- 3.2.11. Drawings A400-ATK-C-36-XXX-XX-DR-GA-864-101 to *-104, submitted for approval under separate cover for Condition 69, provide details of the proposed drainage network to serve the proposed forecourt area.
- 3.2.12. A by-pass class 1 separator, in line with BS EN 858 parts 1 and 2, is proposed in the forecourt.
- 3.2.13. A tank is proposed to attenuate flows and has been modelled using MicroDrainage to ensure that it is sufficient to prevent flooding for a 1 in 30 year return period flood event (+20% Climate Change). This is proposed to have a volume of circa 1220m³.
- 3.2.14. A vortex control device is then proposed to limit flows discharging from the proposed forecourt to 12 l/s.

Dockside Sub-catchment 1

- 3.2.15. Drawings A400-ATK-C-40-XXX-XX-DR-GA-864-101 to *-103, submitted for approval under separate cover for Condition 69, provide details of the proposed drainage network to serve the dockside sub-catchment 1 area.
- 3.2.16. A by-pass separator, in line with BS EN 858 parts 1 and 2, is proposed in the dockside subcatchment 1 area.
- 3.2.17. The landside tank is proposed to attenuate flows and has been modelled using Micro Drainage to ensure that it is sufficient to prevent flooding for a 1 in 30 year return period flood event (+20% Climate Change). This is proposed to have a volume of circa 900m³. Considering the location beneath a deck an alternative attenuation structure may be proposed, i.e. culvert, oversized pipe etc, subject to structural assessment and maintenance requirements. As the design is developed and the finished levels are finalised the attenuation sizes may be increased to mitigate the flood risk. The attenuation will not exceed the 1000m³ size estimated in the approved UES.
- 3.2.18. A vortex control device is proposed to limit flows from the area to 10.6l/s.

Dockside Sub-catchment 2

3.2.19. Drawings A400-ATK-C-40-XXX-XX-DR-GA-864-104 to *-112, submitted for approval under separate cover for Condition 69, provide details of the proposed drainage network to serve the Dockside Sub-catchment 2 areas.

- 3.2.20. By-pass separators, in line with BS EN 858 parts 1 and 2, are proposed in the dockside subcatchment 2 area.
- 3.2.21. 6 tanks are proposed to attenuate flows and has been modelled using MicroDrainage to ensure that it is sufficient to prevent flooding for a 1 in 30 year return period flood event (+20% Climate Change). These are proposed to have a volume of 2000m³ in total. As the design is developed and the finished levels are finalised the attenuation sizes may be increased to mitigate the flood risk. The attenuation will not exceed the 2500m³ size estimated in the approved UES.
- 3.2.22. A vortex control device is proposed to limit flows from the area to 27.7l/s.

3.3. Airside

- 3.3.1. Flow attenuation through onsite storage and other sustainable devices are proposed in the airside drainage network for the CADP1 development. This includes the following:
 - A restricted outflow is proposed from the airside development. This is achieved using a pumped outfall at a rate of 300l/s in the CADP1 development.
 - An attenuation tank is proposed airside to store water in storms up to and including 1:30 year return period. The proposed solution is a reinforced concrete box culvert with a storage volume of 1,115m³.
 - An oil separator is proposed airside to remove oil and fuels from the surface water runoff. The separator will be a full retention class 1 in line with BS EN 858 parts 1 and 2.
- 3.3.2. The drainage schemes for the proposed airside catchments are shown in more detail on the following drawings submited for approval under separate cover for Condition 69:
 - A400-TPS-C-00-L00-DR-GA-864-205: Drainage Scheme Catchment Areas
 - A400-TPS-C-00-L00-DR-GA-864-206: Airfield Proposed Drainage Layout Sheet 1
 - A400-TPS-C-00-L00-DR-GA-864-207: Airfield Proposed Drainage Layout Sheet 2
 - A400-TPS-C-00-L00-DR-GA-864-208: Airfield Proposed Drainage Layout Sheet 3
 - A400-TPS-C-00-L00-DR-GA-864-209: Airfield Proposed Drainage Layout Sheet 4
 - A400-TPS-C-00-XXX-DR-DE-864-001: Airfield Drainage Details Sheet 1
 - A400-TPS-C-00-XXX-DR-DE-864-002: Airfield Drainage Details Sheet 2
 - A400-TPS-C-00-XXX-DR-DE-864-003: Airfield Drainage Details Sheet 3
 - A400-TPS-C-00-XXX-DR-DE-864-004: Airfield Drainage Details Sheet 4
 - A400-TPS-C-00-XXX-DR-DE-864-005: Airfield Drainage Details Sheet 5
 - A400-TPS-C-00-XXX-DR-DE-864-006: Airfield Drainage Details Sheet 6
- 3.3.3. A typical airside attenuation tank is shown in Figure 3-3.



Figure 3-3 Typical Airside Attenuation Tank Detail

4. Summary

- 4.1.1. As set out in Condition 66, this report has provided the details associated with the attenuation and regulation of storm water flows, to be implemented as part of the proposed drainage network to serve CADP1 and seeks approval of the relevant details.
- 4.1.2. For further details on the drainage strategy, calculations and schemes used reference should be made to the Pre-commencement Condition 69 report.

Appendices

Appendix A.

A.1. CADP1 Extent

A400-TPS-C-00-L00-DR-GA-100-201	City Airport Development Programme Extent of Works
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Appendix B.

B.1. Thames Water Correspondence

From: Sent: To: Subject: Devcon Team <devcon.team@thameswater.co.uk> 23 March 2018 14:53 Tim Halley RE: REF. 37717 - CADP1 Conditions 66 & 69 (email 1)

Hi Tim,

I have run the information that you sent us past the Asset Planner and he has agreed that the details would be acceptable.

Regards

Margaret Keen Developer Services - Planner 0203 577 9948 (Ext: 89948) margaret.keen@thameswater.co.uk

Thames Water Utilities Ltd, Maple Lodge STW, Denham Way, Rickmansworth, Hertfordshire WD3 9SQ



From: Tim Halley [mailto:Tim.Halley@londoncityairport.com]
Sent: 21 March 2018 17:09
To: Devcon Team
Cc: Oscar Wong
Subject: REF. 37717 - CADP1 Conditions 66 & 69 (email 1)
Importance: High

FAO Margaret Keen London City Airport Development Programme (CADP1) Your Ref. 37717

Dear Margaret,

Further to our discussion just now, please find attached for review and comment draft drainage schemes to satisfy condition 66 (non-return valve) and 69 (sustainable drainage scheme) of the CADP planning permission.

As discussed, details under conditions 66 & 69 were previously approved by London Borough of Newham in May 2017 (ref. 17/00778/AOD) for the first of two phases approved under CADP Condition 4 (the Interim Works). Prior to submitting that application, the Thames Water (Nick Ayling) reviewed and confirmed no objections to the details (see email below and Thames Water Ref. 37717).

We are now taking forward the drainage details under conditions 66 & 69 for the full CADP build alongside a new phasing plan to build CADP in a quicker single phase without the need to build the interim drainage scheme serving the first phase. Prior to submission of the application to London Borough of Newham, I would like to ensure that

there are similarly no objections from Thames Water on the current details being provided. The attached draft is consistent with the Drainage Strategy approved as part of the planning permission and the proposed flow rates all remain the same. However, as confirmed previously, reductions of 63% were reliant on unrestricted flows at the site. It has since been found that some restricted flows are already in place and hence the % reductions are 44% and not 63%. All other aspects of the scheme remain the same.

I would be grateful if you could confirm receipt and whether we could hold a call next week to address any queries on the attached prior to formal submission.

I will need to send over the appendices in subsequent emails due to file sizes, happy to also send a link or disk if that would help?

Kind regards,

Tim Halley Head of Planning

Phone: 07899985381

Email:Tim.Halley@londoncityairport.comWebsite:www.londoncityairport.com



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Thames Water Limited (company number 2366623) and Thames Water Utilities Limited (company number 2366661)

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