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RE: Additional Information Response in relation to Planning Reference SD22A/0345 at Weston Airport, Leixlip, Dublin, W23 XHF8:

Item 2(i) and 2(ii)

Item 3(i), 3(ii) and 3(iii)

Item 4

INTRODUCTION

This additional information response document has been prepared by Cronin & Sutton Consulting Engineers (CS Consulting) on behalf of the applicant Weston Aviation Academy Ltd. in relation to Planning Reference SD22A/0345 at Weston Airport, Backweston Park, Leixlip, Dublin.

This document addresses engineering related items of the request for additional information issued on the 21st of October 2022 by South Dublin County Council (SDCC) in respect of the above development application.

This response is supplemented by the following accompanying documentation:

- Drawing **W012L-CSC-ZZ-XX-DR-C-0003** (Drainage Layout)
- **Appendix A** - Water Quality Assessment for SuDS Developments
- **Appendix B** – Water Demand Calculations and Wastewater Discharge Calculations

ITEM 2 OF THE REQUEST FOR ADDITIONAL INFORMATION

(i) The Applicant is required to submit a drawing in plan and cross sectional views clearly showing proposed Sustainable Drainage Systems (SuDS) features for the development. SuDs features which may be suitable include but are not limited to Permeable paving, Green roofs, Grasscrete, Rain gardens, Planter boxes, Tree pits and other such SuDS. In designing the SuDS features the Applicant should have regard to the Sustainable Drainage Systems Explanatory Design Guide, a copy of which is available on the South Dublin County Council website. (ii) The Applicant shall submit a report and a drawing clearly showing how surface water up to and including the 1:100 (1%) year critical storm with climate change allowance will be attenuated on site to pre-developed greenfield run off rates or alternatively via infiltration to ground in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) Volume 2- New Development requirements.

IN RESPONSE TO ITEM 2 OF THE AI REQUEST:

(i) Please refer to CS Consulting drawing **W012L-CSC-ZZ-XX-DR-C-0003** Proposed Drainage Layout which demonstrates the proposed drainage plan and SuDS elements within the design. As part of the design, kerbs and pavements will be added to the existing car park. The design will utilise the new kerbs and existing gradients of the carpark to direct rainfall to the proposed SuDS and landscape features. The bioretention areas and SuDS tree pits have been proposed in the new landscaped areas and will intercept and infiltrate surface water run-off from the car park. In addition, rainwater butts will be installed on any new and existing rainwater down pipes on the Terminal Building. This SuDS proposal fully complies with SDCC SUDS Explanatory Design and Evaluation Guide and Greater Dublin Strategic Drainage Study (GDSDS) V2. The following Interception Storage volumes can be achieved.

- Interception required by bio retention areas and tree pits = 4450m² (car park hardstand area) x 0.005m (first 5mm of rainfall) =22m³ (interception storage required).
- Total area of bio retention/tree pits = 275m² (area of SuDS features in carpark) x 0.080m (80mm pooling depth) =22m³ (interception provided).

(ii) The proposed building extension amounts to an increase of 313m2 GFA most of which is contained within the footprint of the existing terminal building. The proposed extension outside the perimeter of the existing building will replace existing hard standing. Therefore, there will be no increase in impermeable surface area and consequently no increase in surface water flows. However, to reduce surface water flows, it is proposed to introduce water butts on each of the 9 No rainwater pipes to the terminal building (existing and proposed). The reduction in parking, along with the introduction of 450m2 (275m2 for new tree pits/bio-retention areas and 125m2 for new landscaping) of soft

landscaping and Suds features will result in a further reduction of 6% of hardstanding. The existing car park on the site will have minimal works carried out except for the introduction of soft landscaping areas, kerbing and pedestrian footpaths as noted above. This has presented the opportunity to provide an improvement to the current storm water design by providing bioretention and tree pits in the soft landscaping. This will significantly reduce surface water volumes discharging through the existing outfall pipe, through infiltration and interception, and vastly improve the water quality discharging from the site. As a result, the surface water discharge from the development will be reduced and water quality improved without the need for major civil works. Please see **Appendix A** for water quality assessment simple index approach for the site.

ITEM 3 OF THE REQUEST FOR ADDITIONAL INFORMATION

The Applicant is requested to provide documentary evidence of the following: (i) Submission of a pre-connection enquiry to Irish Water for the water services infrastructure for the proposed development. (ii) Submission of a pre-connection enquiry to Irish Water for the wastewater infrastructure for the proposed development. (iii) Obtain a letter of confirmation of feasibility for the wastewater infrastructure for the proposed development.

IN RESPONSE TO ITEM 3 OF THE AI REQUEST:

The site has the benefit of existing foul connections. The site is private and under the control of the applicant and it is not proposed to have the development taken in charge in the future. It is not considered necessary to provide a Pre-Connection enquiry to Irish Water due to the very small increases in flows and the fact that no new connections or upgrades are proposed. Please refer to CS Consulting water demand and foul discharge calculations below which show the minimal increases in existing flows from the Terminal Building with the proposed works.

(i) There is a net office floor area increase of 16% from 1535sq.m to 1787sq.m with the proposals in the Terminal Building. Using a flow rate of 100l/person/day (Industrial - Office with canteen) based on Irish Waters Code Of Practice and an occupancy of 1 person per 7.5sq.m. of floor space the following demand rates can be obtained.

Existing Water:	Average Demand	= 0.237 l/s
	Peak Demand:	= 1.184 l/s
Proposed Water and existing:	Average Demand	= 0.276 l/s
	Peak Demand	= 1.379 l/s

The above calculations equate to an increase of 16% in water demand between existing and proposed flows from the Terminal Building. If the water demand from the total existing development including the airport hangar was considered, then this percentage increase would be much smaller.

(i) There is a net office floor area increase of 16% from 1535sq.m to 1787sq.m with the proposals in the Terminal Building. Using a flow rate of 100l/person/day (Industrial - Office with canteen) based on Irish Waters Code Of Practice and an occupancy of 1 person per 7.5sq.m. of floor space the following wastewater discharge rates can be obtained.

Existing Foul:	Average Discharge	= 0.237 l/s
	Peak Discharge	= 1.066 l/s
Proposed Foul and existing:	Average Discharge	= 0.276 l/s
	Peak Discharge	= 1.241 l/s

The above calculations equate to an increase of 16% wastewater discharge between existing and proposed flows from the Terminal Building. If the water demand from the total existing development including the airport hangar was considered, then this percentage increase would be much smaller.

(iii) The existing infrastructural connections are considered to be more than adequate to service the small water and wastewater flow rate increases generated from the proposals and a letter of confirmation of feasibility will not be sought. Please see **Appendix B** for water and wastewater calculations.

ITEM 4 OF THE REQUEST FOR ADDITIONAL INFORMATION

The Applicant is requested to submit a Green Infrastructure Plan drawing demonstrating how the proposed development will contribute to the protection or enhancement of Green Infrastructure in the County through the provision of green infrastructure elements and the protection of any existing Green Infrastructure assets and enhancement of same. In preparing the Green Infrastructure Plan, the Applicant should have regard to the relevant Sections, Policies and Objectives of the South Dublin County Development Plan 2022-2028, including, but not limited to Chapter 4, Policy GI1, GI1 Objective 4, GI2 Objective 4 and Section 12.4.2 of the Development Plan.

IN RESPONSE TO ITEM 4 OF THE AI REQUEST:

Please refer to CS Consulting drawing **W012L-CSC-ZZ-XX-DR-V-0003** Proposed Drainage Layout which highlights the proposed new green landscape areas which have been incorporated into the new drainage and SuDS design. To allow SuDS elements to be included into the existing site it is necessary to transform existing hardstanding areas into green landscaped elements. An area of approximately 450sq.m of existing hardstanding will be changed to new green landscape areas of

which 275m2 will be bio-retention areas and tree pits. A Water Quality Assessment tool developed by HR Wallingford, CIRIA and The Scottish Environment Protection Agency was adopted to aid in the selection process of the SuDS features proposed, which are appropriate for use in this type of site. Please see **Appendix A** for the results of the simple index assessment method. The proposal has provided SuDS features such as tree pits and bioretention areas which contribute to the urban greening factor. Amenity has been provided throughout, through the usefulness and multi-functionality of SuDS features into the drainage and landscape design. Infiltration will be maximised using bioretention and tree pit areas and landscape planting. This proposal has taken full regard to policies and objectives in the South Dublin County Council Development Plan 2022-2028. Please refer to Arup's submission on this item also.

Owen Sullivan

Managing Director

for Cronin & Sutton Consulting

Appendix A

Water Quality Assessment For SuDS Developments

SIMPLE INDEX APPROACH: TOOL

1. The steps set out in the tool should be applied for each inflow or 'runoff area' (ie each impermeable surface area separately discharging to a SuDS component).

2. The supporting 'Design Conditions' stated by the tool must be fully considered and implemented in all cases.

3. Relevant design examples are included in the SuDS Manual Appendix C.

4. Each of the steps below are part of the process set out in the flowchart on Sheet 3.

5. Sheet 4 summarises the selections made below and indicates the acceptability of the proposed SuDS components.

	DROP DOWN LIST — RELEVANT INPUTS NEED TO BE SELECTED FROM THESE LISTS, FOR EACH STEP
	USER ENTRY — USER ENTRY CELLS ARE ONLY REQUIRED WHERE INDICATED BY THE TOOL

STEP 1: Determine the Pollution Hazard Index for the runoff area discharging to the proposed SuDS scheme

This step requires the user to select the appropriate land use type for the area from which the runoff is occurring

If the land use varies across the 'runoff area', either:

- use the land use type with the highest Pollution Hazard Index

- apply the approach for each of the land use types to determine whether the proposed SuDS design is sufficient for all. If it is not, consider collecting more hazardous runoff separately and providing additional treatment.

If the generic land use types suggested are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in the row below the drop down lists.

		Pollution Hazard Indices				DESIGN CONDITIONS	
	Runoff Area Land Use Description	Pollution Hazard	Total Suspended Solids	Metals	Hydrocarbons	1	2
Select land use type from the drop down list (or 'Other' if none applicable): →							
	Non-residential parking with infrequent change (e.g. schools, offices, < 300 traffic movements a day)	Low	0.5	0.4	0.4		
If the generic land use types in the drop down list above are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in this row:							
	Landuse Pollution Hazard Index	Low	0.5	0.4	0.4		

STEP 2A: Determine the Pollution Mitigation Index for the proposed SuDS components

This step requires the user to select the proposed SuDS components that will be used to treat runoff - before it is discharged to a receiving surface waterbody or downstream infiltration component

If the runoff is discharged directly to an infiltration component, without upstream treatment, select 'None' for each of the 3 SuDS components and move to Step 2B

This step should be applied to evaluate the water quality protection provided by proposed SuDS components for discharges to receiving surface waters or downstream infiltration components (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

If you have fewer than 3 components, select 'None' for the components that are not required

If the proposed component is bespoke and/or a proprietary treatment product and not generically described by the suggested components, then 'Proprietary treatment system' or 'User defined indices' should be selected and a description of the component and agreed user defined indices should be entered in the rows below the drop down lists

		Pollution Mitigation Indices			DESIGN CONDITIONS		
	SuDS Component Description	Total Suspended Solids	Metals	Hydrocarbons	1	2	3
Select SuDS Component 1 (i.e. the upstream SuDS component) from the drop down list: →	None						
Select SuDS Component 2 (i.e. the second SuDS component in a series) from the drop down list: →	None						
Select SuDS Component 3 (i.e. the third SuDS component in a series) from the drop down list: →	None						
If the proposed SuDS components are bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary treatment system' or 'User defined indices' and enter component descriptions and agreed user defined indices in these rows:							
	Aggregated Surface Water Pollution Mitigation Index	0	0	0			

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

Is the runoff now discharged to an infiltration component?

Yes ? Go to Step 2B
No ? Go to Step 2C

STEP 2B: Determine the Pollution Mitigation Index for the proposed Groundwater Protection

This step requires the user to select the type of groundwater protection that is either part of the SuDS component or that lies between the component and the groundwater

This step should be applied where a SuDS component is specifically designed to infiltrate runoff (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

'Groundwater protection' describes the proposed depth of soil or other material through which runoff will flow between the runoff surface and the underlying groundwater.

Where the discharge is to surface waters and risks to groundwater need not be considered, select 'None'

If the proposed groundwater protection is bespoke and/or a proprietary product and not generically described by the suggested measures, then a description of the protection and agreed user defined indices should be entered in the row below the drop down list

		Pollution Mitigation Indices			DESIGN CONDITIONS			
		Total Suspended Solids	Metals	Hydrocarbons	1	2	3	4
Select type of groundwater protection from the drop down list: →	Bioretention component underlain by 300 mm minimum depth of soils with good contamination attenuation potential	0.5	0.5	0.5	All designs must include a minimum of 1 m unsaturated depth of subsoil or aquifer material between the infiltration surface and the maximum likely groundwater level. Infiltration components should always be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate lined zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events	The underlying soils must provide good contaminant attenuation potential (eg as recommended in Scifter 2008 (a) and (b) / Scott Wilson (2010) or other appropriate guidance). Alternative depth and soil combinations must provide equivalent protection to the underlying groundwater		
If the proposed groundwater protection is bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary product' or 'User defined indices' and enter a description of the protection and agreed user defined indices in this row:								
	Groundwater Protection Pollution Mitigation Index	0.5	0.5	0.5				

STEP 2C: Determine the Combined Pollution Mitigation Indices for the Runoff Area

This is an automatic step which combines the proposed SuDS Pollution Mitigation Indices with any Groundwater Protection Pollution Mitigation Indices

	Combined Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Combined Pollution Mitigation Indices for the Runoff Area	0.5	0.5	0.5

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

STEP 2D: Determine Sufficiency of Pollution Mitigation Indices for Selected SuDS Components

This is an automatic step which compares the Combined Pollution Mitigation Indices with the Land Use Hazard Indices, to determine whether the proposed components are sufficient to manage each pollutant category type

When the combined mitigation index exceeds the land use pollution hazard index, then the proposed components are considered sufficient in providing pollution risk mitigation.
In England and Wales, where the discharge is to designated surface waters or groundwater, an additional treatment component (ie over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance. Protected surface waters are those designated for drinking water abstraction. In England and Wales, protected groundwater resources are defined as Source Protection Zone 1. In Northern Ireland, a more precautionary approach may be required and this should be checked with the environmental regulator on a site by site basis.

	DESIGN CONDITIONS		
	Sufficiency of Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
	Sufficient	Sufficient	Sufficient

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Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see *Chapter 7 The SuDS design process*). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England

Appendix B

Water Demand Calculations and Wastewater Discharge Calculations

PROPOSED WATER DEMAND CALCULATIONS

According to Code of Practice for Water Infrastructure (2020):

Consumption rate	100	l/person/day
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	5	times
Floor Space	**1787**	sq.m

Note this is NET floor space

Water Demand = Dwelling x Persons per Dwelling x Consumption Rate

No. Person	238	unit
Consumption Rate	100	l/person/day
Water Demand	**23.83**	**m3/day**
Water Demand	**23827**	**l/day**

1 day	86400	s
Water Demand	0.276	l/s

Peak Water Demand = Water Demand Average x Peaking Factor

Average Peak Water Demand	**0.414**	**l/s**

Average Water Demand	**0.276**	**l/s**
Peak Water Demand - Pipe Network	**1.379**	**l/s**

PROPOSED FOUL WASTEWATER DISCHARGE CALCULATIONS
IW-CDS-5030-03 (Revision 2 – 2020)

Flow Rate	100	l/person/day
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	4.5	times
Floor Space	1787	sq.m

Note this is NET floor space

Wastewater Discharge = Dwelling x Dry weather flows

No. Person	238	unit
Dry weather flows	100	l/person/day
Wastewater Discharge	23.83	m3/day
Wastewater Discharge	23827	l/day

Peak Discharge = Wastewater Discharge x Peaking Factor

Average Discharge	0.276	l/s
Peak Discharge	1.241	l/s

1 day	86400	s
Water Demand	0.276	l/s

EXISITNG WATER DEMAND CALCULATIONS

According to Code of Practice for Water Infrastructure (2020):

Consumption rate	100	l/person/day
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	5	times
Floor Space	**1535**	sq.m

Note this is NET floor space

Water Demand = Dwelling x Persons per Dwelling x Consumption Rate

No. Person	205	unit
Consumption Rate	100	l/person/day
Water Demand	**20.47**	**m3/day**
Water Demand	**20467**	**l/day**

1 day	86400	s
Water Demand	0.237	l/s

Peak Water Demand = Water Demand Average x Peaking Factor

Average Peak Water Demand	**0.355**	**l/s**
Average Water Demand	**0.237**	**l/s**
Peak Water Demand - Pipe Network	**1.184**	**l/s**

EXISTING FOUL WASTEWATER DISCHARGE CALCULATIONS
IW-CDS-5030-03 (Revision 2 – 2020)

Flow Rate	100	l/person/day
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	4.5	times
Floor Space	1535	sq.m

Note this is NET floor space

Wastewater Discharge = Dwelling x Dry weather flows

No. Person	205	unit
Dry weather flows	100	l/person/day
Wastewater Discharge	20.47	m3/day
Wastewater Discharge	20467	l/day

Peak Discharge = Wastewater Discharge x Peaking Factor

Average Discharge	0.237	l/s
Peak Discharge	1.066	l/s

1 day	86400	s
Water Demand	0.237	l/s