Appendix 14.1 sisting Hydroloc

ung humonited and a second sec Photos of the Existing Hydrology Features









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This appendix contains photographs undertaken on 22nd July 2019 of the following watercourse Leois County Council Planma Authority, Viewing Purposes Only crossing structures:

Existing Crossing over the Forrest Upper Stream - EXC1

Crossing is located along the access road between proposed turbines T2 and T3. Crossing structure is 1000 mm concrete pipe.



Viewpoint on the culvert looking upstream



Viewpoint on the culvert looking downstream



Viewpoint of looking upstream towards the culvert

Forest Upper Stream

Crossing over the Forest Upper Stream located at Local road L20951. Crossing structure is 300 mm concrete pipe.

No images available. A sketch is provided instead.

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Sketch Description 1 (Chem Sternart 1.4.50 0 cleap Trick & Keed chassel 1 heren

Crossing over the Forrest Upper Stream located at road L20951 - Sketch

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White (W) Hill Stream Crossing 1

Laois County Count

Crossing structure is culvert box 2.0 m wide and 1.6m high.



Viewpoint on the culvert looking downstream



Viewpoint on the culvert looking upstream



Viewpoint of looking upstream towards the culvert

White (W) Hill Stream Crossing 2

Laois County Coi

Crossing is located along the local road L20978. Crossing structure is culvert box 2.0 m wide and 1.6m high.



Viewpoint of looking downstream towards the culvert



Viewpoint of looking upstream towards the culvert

ng Purposes only

Unnamed Stream Crossing

Crossing structure is combination of 600 mm diameter concrete pipe and 2.8 m wide and 1.8 m high arc bridge.



Viewpoint on the bridge looking upstream



Viewpoint of looking upstream towards the bridge

58es Only

Cottoner's Brooke Stream Crossing

Crossing structure is arc bridge 2.6 m high and 3.0m wide.



Viewpoint on the bridge looking downstream

Additional images were unable to be taken due to vegetation causing an obstruction.

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Appendix 14.2 sk Assessment ~

Assi Assi Authority Council Planning Authority Council Planning Authority Flood Risk Assessment Calculation









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This appendix contains the output from Pipe Flow Advisor. Pipe Flow Advisor software was used to determine water elevation in pipes and culverts and to calculate the capacity of each.

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Existing Crossing over the Forrest Upper Stream - EXC1

The structure crossing over the Forrest Upper Stream is a 1000 mm diameter concrete pipe. According to the Table 14.6 provided in EIAR the flow for 1 in 100 years storm event is 0.6 m^3 /s. The bore capacity of the existing culvert EXC1 is 1.694 m^3 /s. It is proposed to replace EXC1 with bottomless culvert due to requirements for road widening at this location. The proposed reconstructed culvert is $1.0m \log_1 1m \log_1 m \log_2 1m \log_2 m \log_2$



Full pipe capacity

3

zs



Preliminary design of a bottomless culvert at the location of EXC1

Forest Upper Stream

The structure crossing over Forrest Upper stream is a 300 mm concrete pipe. Pre development flow, according to the Table 14.7 of EAIR is $3.08 \text{ m}^3/\text{s}$. The concrete pipe does not have enough capacity to convey pre-development flows.



White (W) Hill Stream Crossing 1

ROIS

The structure crossing over White Hill (W) stream is a box culvert 2.0 m wide and 1.6 m high.



Water depth – post-development

White (W) Hill Stream Crossing 2

ROIS

The structure crossing over White Hill (W) stream is a box culvert 2.0 m wide and 1.6 m high.



Water depth - post-development

White Hill (W) Stream Crossing 3

The structure crossing over the White Hill (W) stream is a combination of a 600m diameter concrete pipe and an arch bridge 2.8 m wide and 1.8 h high. During light rain, when flows are low, water flows through the concrete pipe. Flow through the arch bridge occurs when flows in the channel exceeds capacity of the pipe.

The capacity of the existing concrete pipe is approximately 0.5 m3/s. In this exercise the calculation is simplified by not taking into account surcharging of the pipe when capacity is exceeded. That way a more conservative approach is taken. It is also assumed flow through arch bridge is equal to flow through a culvert box. This assumption can only be relevant if flows are not surcharged, the radius of the arch curve is high and the arch curve is not at the bottom of the bridge. Therefore the channel through the bridge is the same as a part full box culvert.

Flow through the arch bridge is calculated by subtracting the pipe capacity from the calculated design flow. Pre-development design flow is $2.42 \text{ m}^3/\text{s}$, and post-development design flow is $2.59 \text{ m}^3/\text{s}$.

Flow through the arch bridge for 1 in 100 years pre-development scenario is $1.92 \text{ m}^3/\text{s}$, and for post-development is $2.09 \text{ m}^3/\text{s}$.

Rect. tank Circular tank Cylinder Sphere Cone (frustrum) Rect. hopper Flow from We Pipe (part full) Pipe (full) Rect. tube (part full) Rect. tube (full) Rect. tube (full)	aire 🕅 Manning calculator
	channel 🛛 Vee channel
Pipe details • Metric C Imperial Results Manning's coefficient	
Length in metres	
Fluid cross section area 0.255176 m ² Wetted perimeter 1790.708 mm	Fluid velocity 1.949 m/s
Internal diameter ★ 570 mm ■ 142.500 mm Water flow rate	
Drop in metres	C Max. Flow Slope ratio (angle) 0.010000 (0.573*)
* dimensions in mm	6 🔒 🗃 🔌
Full pipe capacity	
CON	
015	



Cottoner's Brooke Stream Crossing

The Cottoner's Brook stream crossing structure is an arch bridge 3.0 m wide and 1.3 m high over the stream channel. It is assumed the flow through the arch bridge is equal to the flow through a box culvert. This assumption can only be relevant if flows are not surcharged, the radius of the arch curve is high and the arch curve is not at the bottom of the bridge. Therefore, the channel through the bridge is the same as a part full box culvert.



Water depth – post-development

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Appendix 14.3 g Pond, Silt Fer citt and Minorite Country Council Planning Authority Country Details on the Stilling Pond, Silt Fence and Silt









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	Арр Ву	Date	PROJECT	
APPLICATION	Н	11.12.19		
			DERNACART WINDFARM	
			SHEET	
			STILLING POND DETAILS SHEET 1 OF 2	

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	Арр Ву	Date	PROJECT
G APPLICATION	H	11.12.19	
			SHEET
			STILLING POND DETAILS SHEET 2 OF 2

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Rev.	Description
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	Арр Ву	Date	PROJECT
APPLICATION	Η	11.12.19	
			DERNACART WINDFARM
			SHEET
			SILT FENCE DETAILS

		Statki	aft			
Date	23.09.19	Project number P1892	Scale (@ A1-) 1:10			
Drawn by	CS	Drawing Number		Rev		
Checked by	EB	P1892-0400-0008				
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