

Surface Water Calculations; Reen Sizing

Herbert Road, Newport

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PROJECT: Housing Development, Herbert Road, Newport
TITLE: Surface Water Calculations; Reen Sizing
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Revision: A

Revision	Purpose	Written	Reviewed	Date
Original	Discharge of Planning Conditions (Phase 1 only)	TDJ	SRM	06/03/17
A	Information	TDJ	SRM	02/10/17

Signed



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1.0 INTRODUCTION

The Reen currently flow east to west across the full width of site, bounded by the Welsh Marches Railway Line to the east & its outfall to the River Usk to the west. It acts as an attenuation pond for a culvert/storm water drainage system serving part of the St Julian's area.

Reen analysis has been based upon size shown is SMA 1155090 – 551. It is formed of three sections, separated by two bridges & the site boundary;

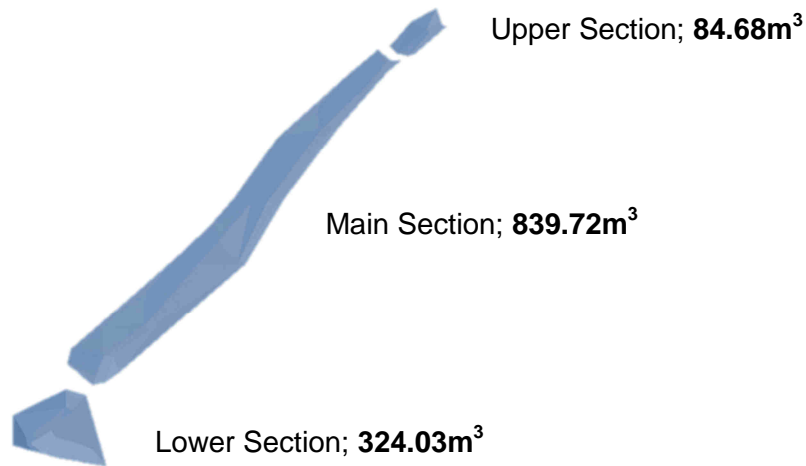
- Upper Section; existing culvert passes under the railway line, enters the site @ 331809, 189465, flows downstream to proposed road bridge.
- Main Section; passes under proposed road bridge @ 331764, 189460, flows downstream to existing footbridge.
- Lower Section; passes under existing foot bridge @ 331659, 189434, flows west then south to 575mm Ø outfall to Usk @ 331639, 189418

2.0 EXISTING VOLUME

Based upon the 3D topographical survey provided, volumes for the existing reen can be seen below.

	Upper Section	Main Section	Lower Section	Piped Outfall
Volume	84.68m ³	839.72m ³	324.03m ³	2.65m ³

EXISTING VOLUME (Cont..)



3.0 VOLUME CALCULATIONS FOR PROPOSED SCHEME

As part of a previous planning application for the site a Hydrological Study & Flood Consequence Assessment were completed by Waterman Transport & Development Limited.

The hydrological study of the existing watercourse & reen confirmed it drains a catchment area of 4.865ha. It also confirms that *'the conveyance capacity of this channel is sufficient to accommodate any waters backing up as a result of tide-lock' (based upon existing flows).*

It has been proposed to enlarge the reen to accommodate these existing flows & SW (Storm/Surface Water) discharge from the site during a tidal lock scenario, estimated as a 4hr period.

VOLUME CALCULATIONS FOR PROPOSED SCHEME (Cont...)

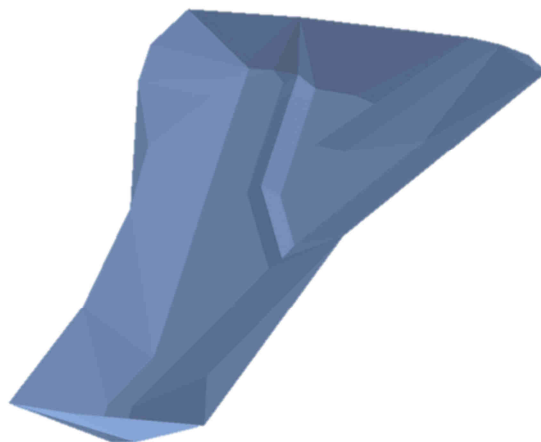
Based upon worst case, that a hightide/tidal lock scenario would co-inside with a storm event, the following volume was calculated;

	Area	Total Runoff Volume <i>(based upon 1:100yr + 30%, 4hr storm event)</i>
Impermeable Surfaces from proposed site layout (All Phases)	37617m ²	2835.2m³

The existing piped outfall has a volume of 2.65m³ and will be retained. Therefore the reen would need a total capacity (V_{min}) of 4086.28m³. This is a conservative estimate ignoring the following:

- Potential storage within the existing culvert/pipe upstream of the site.
- The flap may open during a high tide event & discharge to the Usk if the hydraulic/pressure head is greater in the Reen than the adjacent river.

PROPOSED SIZE; Main Section, $V_{max} = 4682.90m^3$



As $V_{max} > V_{min}$; Proposed Reen capacity is sufficient.