



Fiona Fryer,
Interim Principal Planner
& Planning Officer
Salford City Council

Our Ref: 70032760/ob/CP_ds

17 July 2020

ISSUED BY EMAIL ONLY

Dear Fiona,

Land East of Boothstown Technical Support – Drainage and flood Risk

Further to recent correspondence between the Environment Agency and Salford City Council regarding the East Boothstown project we understand that some additional explanation and clarification support with respect to assessing current potential fluvial flood risk to the proposed development site.

The comments are outlined in the e-mail from yourselves (James Shuttleworth) to Peel Holdings dated 8 July 2020.

As you are aware WSP undertook to provide evidence for the GMSF allocations in 2017, WSP prepared a desk-based study of flood risk and drainage constraints and opportunities at the site (GM Allocation 31). This was updated more recently in 2020 to include new evidence from the draft SFRA (being prepared by JBA) and discussions with the RHS regarding their new works to the site immediately to the east.

The revised (and yet to be published) modelling data, prepared by JBA as part of their work to update the SFRA, now indicates that the site is located in a combination of flood risk zones, including a more significant extent of Flood Zone 3. This is more comparable to an extreme version of the Environment Agency's Surface Water flood risk mapping (publically available). As suggested in recent discussions between yourselves and both Manchester and Salford Councils therefore requires investigation.

In order to provide a response within the current planning timeframes we have prepared the statements below which we trust assist in reviewing the site. As a result, the comments in this letter are based on a high level assessment and would be subject to more detailed modelling and review of the site including full topographical and hydrological studies. We have made these comments on the assumption that the draft SFRA modelling as presented is a reasonable representation of the anticipated flood risk on this site.

The key items raised include:

“Key messages and issues that need addressing are:

- A) *Concern about the proposal to provide compensatory storage on the far side of the canal and the complex hydraulics involved.*
- B) *Concern about approach to fluvial flooding deeper than 50mm*
- C) *Concern about SUDS being placed in areas of fluvial flood risk*

Approach and Methodology

In addition to reviewing the flood risk and suggesting any mitigation, to respond to the points raised, WSP has considered four main sources of potential impact. These are outlined in the main GM Allocation 31 report on flood risk (Ref. No. 70032760-GMALLOCATION31), but are summarised below:

- The route and flow of the Shaw Brook through the site;
- The out of bank flood risk for the majority of extreme events (deeper than 50mm);
- The out of bank flood risk for the extreme modelled events (deeper than 50mm plus shallower than 50mm); and
- The required attenuation volumes required for any new development.

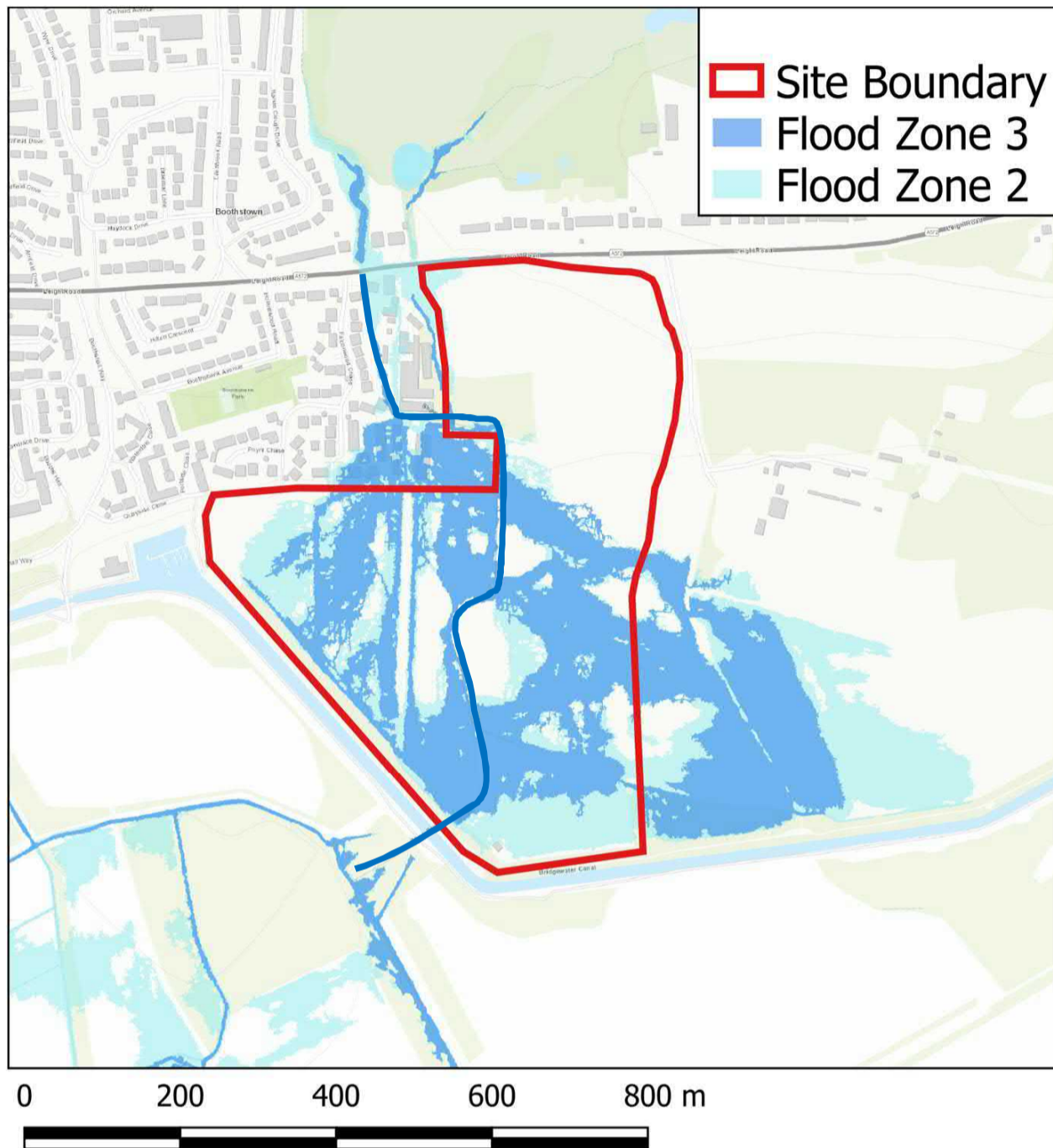
Route and flow of the Shaw Brook through the site

Shaw Brook flows in a southerly direction through the site prior to passing through a “discharge well”, beneath the Bridgewater Canal, exiting the site via the southern boundary.

Shaw Brook is partially culverted within the site to allow access to the surrounding fields and this has been included in the recent modelling, but survey information suggests that some of the JBA modelling assumptions have been conservative on the state and size of the culverts. This has a direct impact on calculating the out of bank threshold and hence the volumes and areas impacted. As stated above, this note is considering the state as currently shown. More detailed modelling and survey work will need to be undertaken to verify the site conditions. **Figure 1** below is the recent modelling supplied by JBA as considered to date and within this note.

It is noted that the out of bank element spills out of Shaw Brook quite high in the system. This equates to the location of existing culverts (i.e restrictions to the Shaw Brook flow). These are also highlighted on the topographical plan contained as **Appendix A**. In general, once overtopped the flows follow the topography of the site and in many cases re-enters Shaw Brook further to the south.

Figure 1- Extract from JBA modelling (SFRA draft flood mapping - JBA 2019)
(WSP annotated with route of Shaw Brook)



POINT A

Concern about the proposal to provide compensatory storage on the far side of the canal and the complex hydraulics involved.

WSP has worked up the proposal shown on the recently issued masterplan following discussions with Peel, their project design team and the Canal operators. This was to confirm if there were any major concerns regarding constructing a second culvert crossing or creating a new wetland habitat to the south of the canal. The structural implications, construction methods and approving process were all considered.

The overall conclusion was that this option was possible including other considerations such as that of the land ownership (Peel etc), as well as geotechnical and ecological impacts. The latter offering the opportunity to enhance habitat and preserve/expand the Peat soils in that area. Hence, this second culvert and southern attenuation being fed by surface water from the site was offered for consideration.

All of the above aspects would be looked at during the detailed stage in conjunction with the hydraulic flood modelling to determine the best combination of drainage features to achieve the most multi-benefit solution.

In terms of locating the compensatory storage within the site, this can be accommodated within areas to the north of the canal and outside those required for the development surface water attenuation areas. The resultant amendment to the plan previously issued is shown in **Appendix B**. The compensation storage, calculated on an initial conservative estimate that the 4.4ha of land shown impacted by this shallow water is fully flooded to a depth of 50mm (less in most cases) gives a flood volume of 2,200m³, is located immediately upstream of the existing culvert.

It should be noted that this compensation is for the shallow extreme events of less than 50mm (approximating to the Flood Zone 2 extents) and could also be accommodated in smaller localised areas throughout the development including areas further north and within informal open space areas within the development parcels and along roads within the carriageway cross section.

POINT B

Concern about approach to fluvial flooding deeper than 50mm

The plan in **Appendix B** has also been annotated to show suggested options for the main fluvial flood water attenuation volumes and pathways for all the events highlighted on the modelling.

The current shown masterplan indicates areas that cross the potential flood areas and flow pathways as shown on the mapping, this is illustrated below in the overlay plan contained as **Appendix C**. The strategy is to utilise the proposed green-blue infrastructure on site, including the existing Shaw Brook corridor to incorporate the flow pathways and provide the varied habitat and landscaping opportunities that this can offer.

It is also proposed that the existing 450mm/600mm diameter surface water drain currently crossing the site from the RHS site is de-culverted to provide additional storage as well as introducing a new “watercourse” to the system that assists in addressing some of the surcharging issues that this drain currently experiences.

Overall we have estimated that an area of approximately 4.18 ha of the current development parcels may experience some level of flooding from the majority of the out of bank flood events. It also has to be considered that we cannot double account storage within the site and any areas where proposed development surface water attenuation. In terms of attenuation identified as located within these potential flood areas, we have estimated these at 2,271 m² (0.227 ha). This then equates to a total area of 4.41 ha.

The greenspace in and around the current masterplan, located to the south and down gradient of the overland flood sources, (not currently used for any other form of attenuation) is approximately 4.50 ha. This is shown in dark pink on the plan in **Appendix B** and does not include any incidental greenspace within the development parcels.



As part of the scheme, we propose enhancements to the Shaw Brook corridor that will enable the area to be utilised for extreme event storage. This area would be linked by the swale network to other green spaces to create flow pathways and storage opportunities as well as provide a means to protect the new development areas.

These pathways would be used as the main flood exceedance routes in combination with the internal road networks through the parcels. This is also illustrated on the plan contained in **Appendix B**. There is also the potential to retain some of the minor field drains (particularly to the east) that flow north to south and incorporate these within the development parcels.

POINT C

Concern about SUDS being placed in areas of fluvial flood risk

Hopefully the above demonstrates that the scheme is not reliant on a double accounting of flood storage from the various sources. The comments contained in this note are related to the modelling as currently shown and it is anticipated that more detailed modelling will clarify the extents and reductions may be demonstrated. In addition, the introduction of the development will change a significant part of the contributing catchment and the runoff of this will be removed from the overland flood flow and controlled within the development surface water drainage networks.

Although it is demonstrated on the attached plans that the areas for all sources of attenuation and compensation can be provided in terms of plan areas, further work will be required to develop the detailed levels strategy for the site and the development as a whole as the masterplan progresses and inputs from all disciplines are incorporated.

We trust that this addressed the comments to a degree that is applicable for this level of the process. Please do not hesitate to contact me should there be any further elements that you wish to discuss.

Yours sincerely

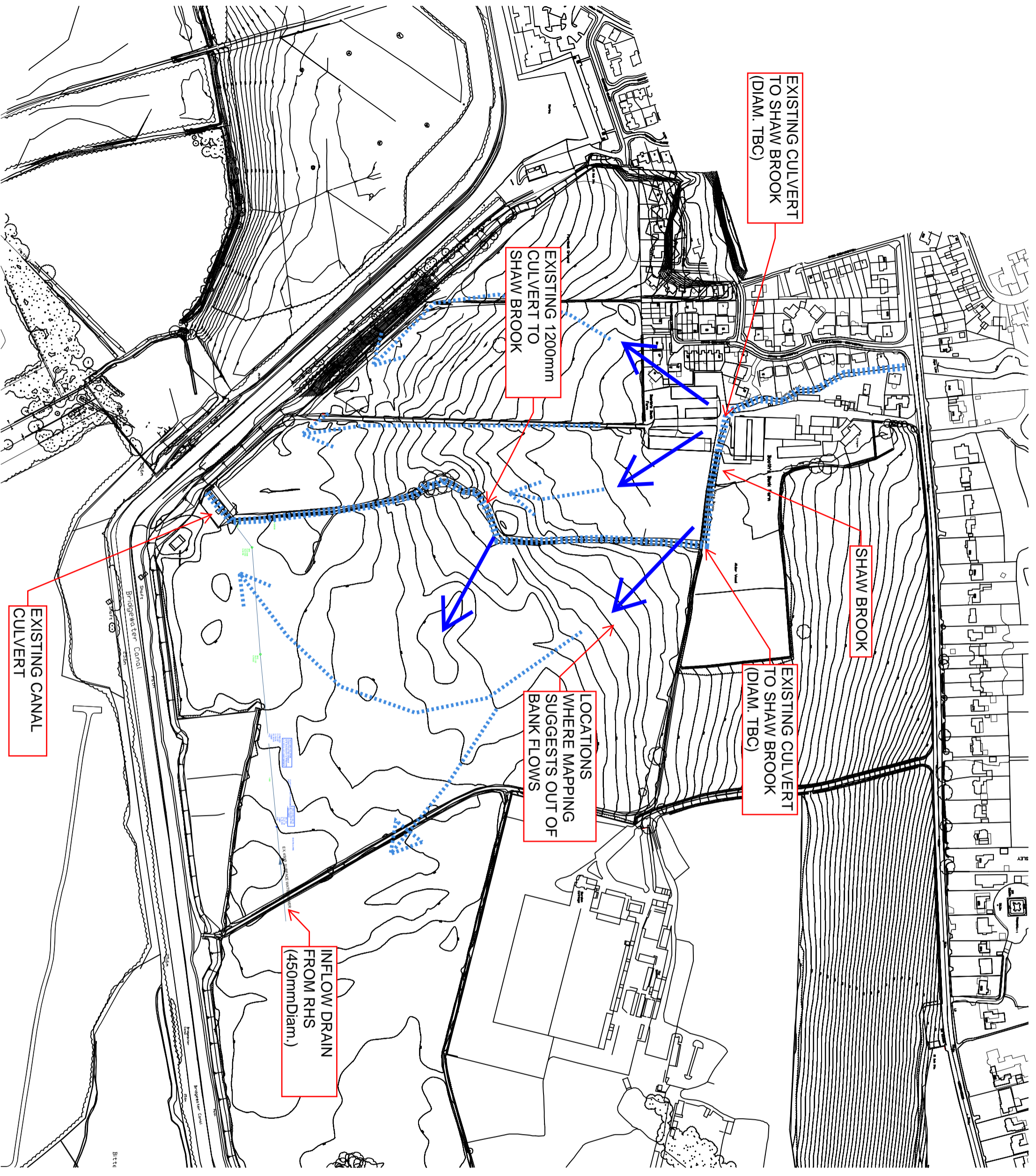
A handwritten signature in blue ink, appearing to read 'Chris Patmore'.

Chris Patmore
Technical Director



APPENDIX A

TOPOGRAPHICAL SURVEY – EXISTING DRAINAGE FEATURES



WSP
SK 001 P01
TOPOGRAPHICAL SURVEY
EXISTING DRAINAGE FEATURES
 Date: 15/07/2020



APPENDIX B

PROPOSED DRAINAGE STRATEGY (ALL SOURCES)
(DRAWING 32760-FFD-002)

372500

373000

373500

374000

401000

400500

400000



KEY:

- Site Boundary
- 1% AEP Depth >50mm
- Developable Land
- Attenuation Basin
- Surface Water Flood Compensation
- Pipe Swale Network
- Conveyance Swale
- Statutory Main Rivers (Environment Agency)
- Existing Drain to Be Daylighted
- Existing Culvert Under Canal
- Proposed Extreme Event Attenuation
- ➔ Proposed Exceedance Flow Routes

A	16/07/20	GL	FIRST ISSUE	CP	CP
REV	DATE	DRW	DESCRIPTION	CHK	APP

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CLIENT:
PEEL

ARCHITECT:
-

PROJECT:
LAND EAST OF BOOTHSTOWN

TITLE:
**DRAINAGE STRATEGY
ATTENUATING FLUVIAL FLOOD
DEPTHS >50mm**

DRAWN:	CHECKED:	APPROVED:
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QGIS FILE: 32760-FFD-002.ggz	SCALE @A3: 1:5000	DATE: 16/07/20
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PROJECT No: 70032760	DRAWING No: 32760-FFD-002	REV: A
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APPENDIX C

PROPOSED DRAINAGE STRATEGY (ALL SOURCES) SHOWING EXISTING EXTREME FLOOD
(DRAWING 32760-FFD-001)

372500

373000

373500

374000

401000

400500

400000



- KEY:**
- Site Boundary
 - 1% AEP Depth >50mm
 - Developable Land
 - Attenuation Basin
 - Surface Water Flood Compensation
 - Pipe Swale Network
 - Conveyance Swale
 - Statutory Main Rivers (Environment Agency)
 - Existing Drain to Be Daylighted
 - Existing Culvert Under Canal

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PROJECT:
LAND EAST OF BOOTHSTOWN

TITLE:
**DRAINAGE STRATEGY
ATTENUATING FLUVIAL FLOOD
DEPTHS >50mm**

DRAWN: CHECKED: APPROVED:

QGIS FILE: SCALE @A3: DATE:
32760-FFD-001.ggz 1:5000 16/07/20

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