

## BATHEASTON COMPENSATORY FLOOD STORAGE

### NOTE OF CLARIFICATION FOLLOWING DISCUSSION ON 1<sup>ST</sup> FEBRUARY 2012

*There was some confusion in relation to the upstream compensatory capacity, particularly how it relates to existing flood storage. The following note is prepared to clarify the explanation given at the hearings.*

#### **The Phase 1 Report**

1. The existing AODs for non-park and ride part of the Batheaston site (“the Original Site”) are shown on figure 5.3 at p11 of WYG phase 1 CD4/FR35. All the white land and the land up to 20.49m AOD floods at the 1 in 2 year flood level (sourced from EA model). By excavating down to 20.49m AOD across that Original Site maximum additional potential storage capacity (at flood events above 1 in 2 years and up to and including 1 in 100 years plus CC) of 61,500m<sup>3</sup> is created. That does not assume or cause any loss of existing flood storage.

#### **Additional Plan**

2. To assist understanding of how capacity would be used, we attach a cross-section. The Original Site’s lateral extent is from the river to the (approximate) line X – Y<sup>1</sup>. The green line represents the existing ground levels (ground below that line is obviously not currently available for flood storage). Leaving some existing ground in place at “A” will ensure the area between “A” and “X-Y” is not inundated below a 1 in 2 year event and is available for that event (and events above). This is the area shown in yellow on the cross-sections.
3. If additional capacity for that event is required one can excavate below the 1 in 2 year level to the 19.49 level (which is the current lowest part of the existing site). That area is shown in pink.
4. Thus the Original Site will deliver additional capacity without removing any existing flood storage (61,500 plus the pink).
5. Depending on detailed modelling and detailed capacity requirements at different flood events, further strips of existing ground at higher contours could be retained to “reserve” capacity for higher flood events. See for example “B” which would ensure that the excavated area beyond “B” would only be released at the appropriate flood event. These retained areas of existing ground would not result in any loss of existing flood storage capacity. All of these will be subject, of course, to design development and testing based on volume requirements in different flood events.
6. Measures will need to be designed in to “A” and “B” to allow the land to drain when the flood level in the Avon recedes. As a matter of basic hydraulics, the water will

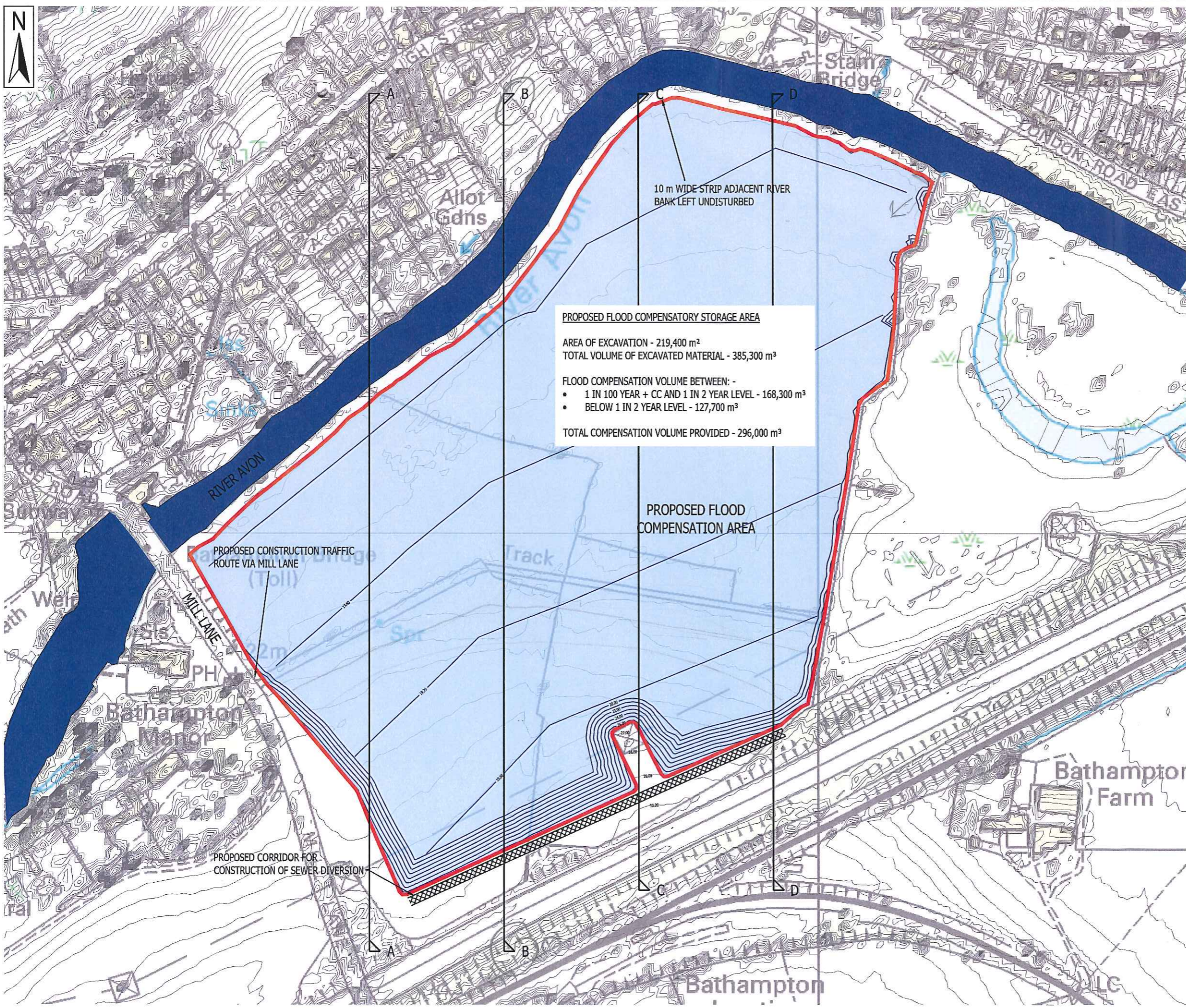
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<sup>1</sup> This is provided for illustrative purposes only and obviously the precise position of X-Y varies with the line of the P&R boundary.

only drain out when the river level is below the height of the stored water behind the earthworks. Obviously design development will address the control of these flows so as to ensure the *basic criteria* that flood levels elsewhere are not made worse by the scheme.

### **Land previously considered for East of Bath Park and Ride Site**

7. This has an additional area of approximately 9 hectares. This land is predominantly currently FZ1.
8. This land can be excavated to a considerable depth - see for example section B – B. The additional maximum capacity in the 1 in 100 year event is shown in blue.
9. The total volume of the blue, pink and yellow is 296,000m<sup>3</sup> (obviously retained earth to create the cells will reduce this capacity). How that capacity is brought into use and at what flood event will depend on the modelling and volume requirements. Existing ground levels can be left in place to create separate cells as and where required to ensure capacity is released at the appropriate flood event without any loss of existing flood storage capacity.
10. This sort of arrangement does not get “blocked” by e.g. trees during the flood event because the water can simply bypass any debris on the earthworks given the length of those earthworks. Any blockages will be during drainage not during inundation.
11. The whole site is contained by its own topography (so no outflow to surrounding areas away from the river) except to the east which land is below the 1 in 2 year event. Nothing proposed here will impact on flows from that land to the east across the site. Any earthworks required will blend with the existing contours on the area to the east. Therefore where flood water can currently *flow* across the site and surrounding land it will still be able to do so.
12. Consequently, the Council is justified in its confidence that major capacity (details to be worked up – volumes, timing, flood events, earth work designs, modelling) at the appropriate time in the flood cycle can be appropriately provided here. There is no reason to doubt this can work in principle and provide major compensatory storage - how major will need to be worked up. Properly designed and taking sufficient volume of water at the correct point in the flood cycle (ie at the right time), this scheme will be able to replace substantial flood capacity lost down-stream as a result of development under the CS. Whether it can completely mitigate all CS development downstream will be the subject of detailed modelling and testing (which is on-going). It will be designed and delivered in a way which does not increase flood risk to surrounding land or uses or further downstream.



**PROPOSED FLOOD COMPENSATORY STORAGE AREA**

AREA OF EXCAVATION - 219,400 m<sup>2</sup>  
 TOTAL VOLUME OF EXCAVATED MATERIAL - 385,300 m<sup>3</sup>

FLOOD COMPENSATION VOLUME BETWEEN: -

- 1 IN 100 YEAR + CC AND 1 IN 2 YEAR LEVEL - 168,300 m<sup>3</sup>
- BELOW 1 IN 2 YEAR LEVEL - 127,700 m<sup>3</sup>

TOTAL COMPENSATION VOLUME PROVIDED - 296,000 m<sup>3</sup>

- GENERAL NOTES**
1. DO NOT SCALE. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
  2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT CONTRACT DRAWINGS AND DOCUMENTS.
  3. THE CONTRACTOR SHOULD SITE CHECK ALL EXISTING DIMENSIONS SHOWN. ANY DISCREPANCIES ON THIS DRAWING IDENTIFIED BY THE CONTRACTOR SHOULD BE BROUGHT TO THE ATTENTION OF THE EMPLOYER PRIOR TO CONSTRUCTION ON SITE.
  4. ALL LEVELS ARE IN METRES (A.O.D.)

- KEY**
- PROPOSED COMPENSATORY STORAGE AREA
  - AREA OF EXCAVATION
  - 21.00— PROPOSED CONTOURS AT 1.0 m INTERVALS

**DRAFT ISSUE**

Rev	Description	By	Chk	App	Date

Client  
 BATH AND NORTH EAST SOMERSET COUNCIL

NEWSTEAD COURT, LITTLE OAK DRIVE  
 SHERWOOD BUSINESS PARK  
 ANNESLEY, NOTTINGHAMSHIRE  
 NG15 0DR



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Project:  
 BATH COMPENSATORY STORAGE STUDY

Drawing Title:  
 SITE AT BATHEASTON  
 COMPENSATORY STORAGE PLAN (INCL PARK & RIDE AREA)  
 STORAGE OPTION BELOW 1 IN 2 YEAR FLOOD LEVEL

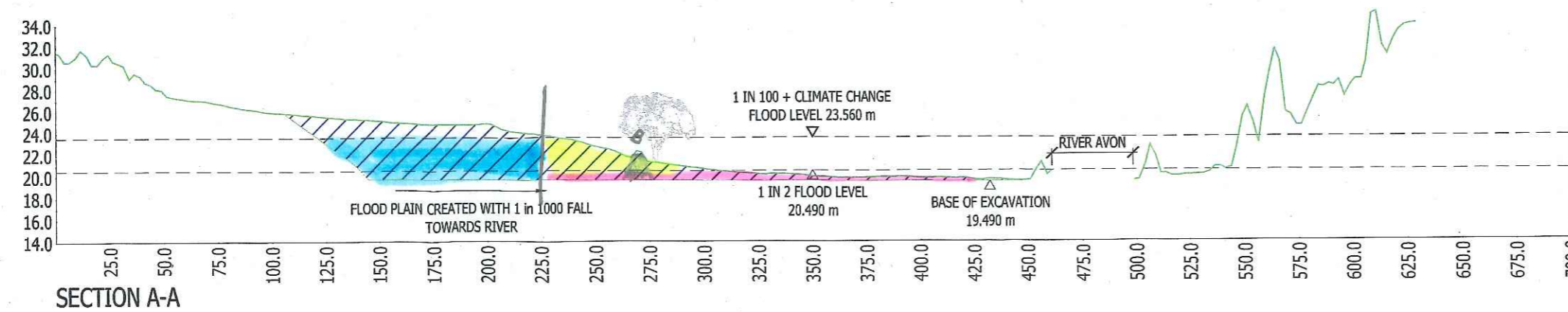
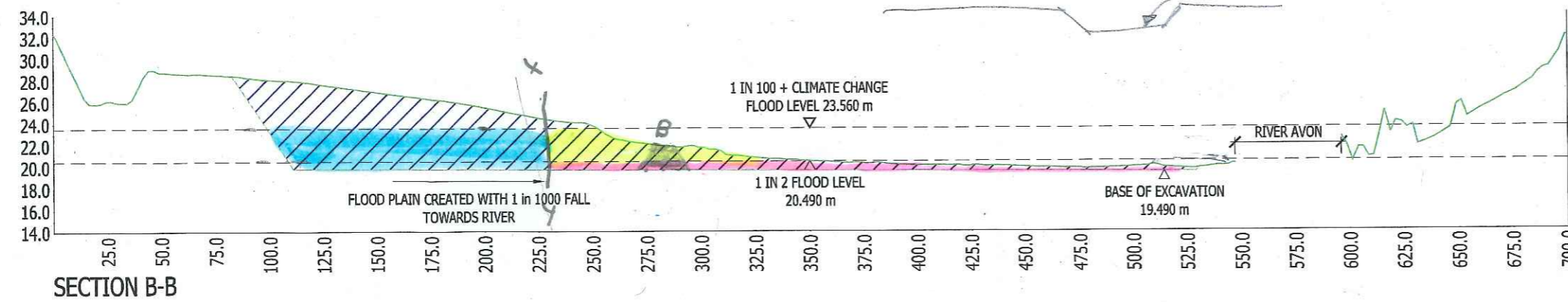
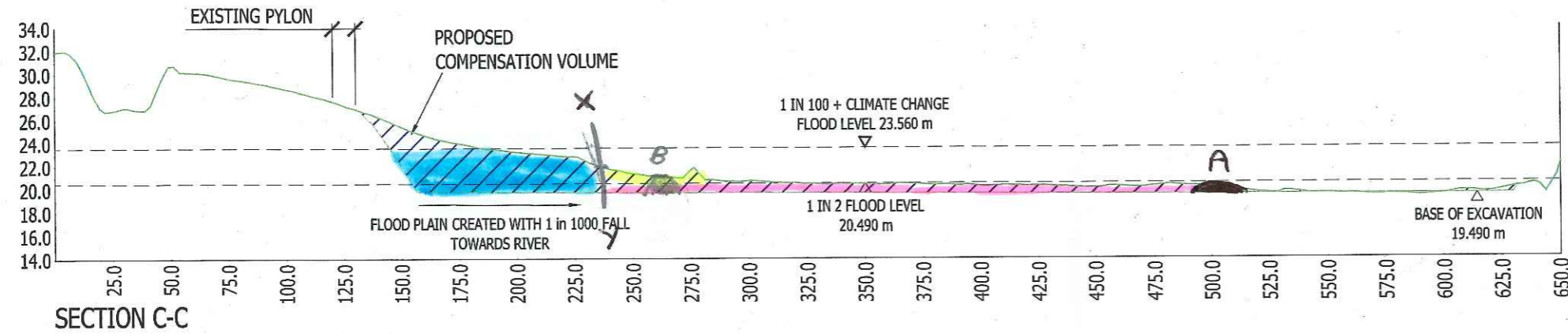
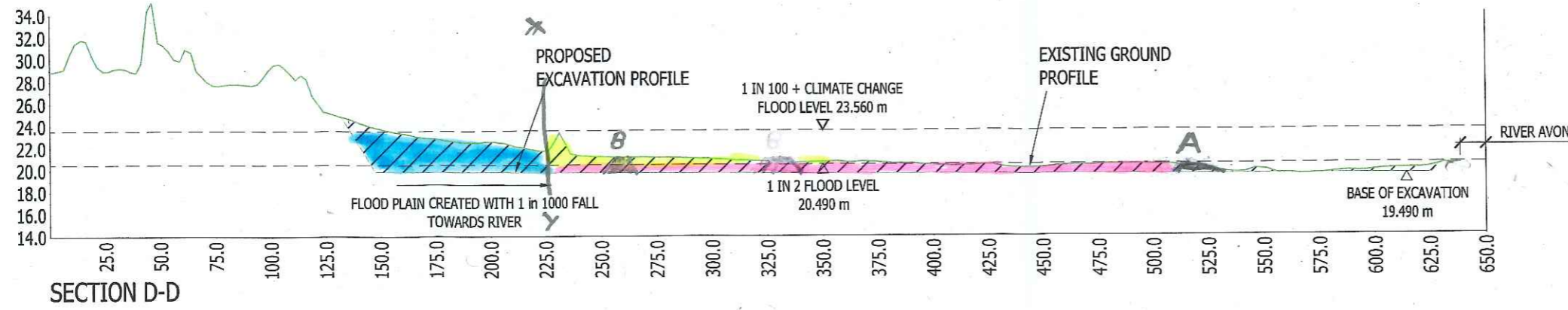
Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
N.T.S	L Aldridge	24.01.12	R Winn	24.01.12	S Morgan	24.01.12
Project No.	Office	Type	Drawing No.	Revision		
A067660	51	C&S	025			

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**KEY**

- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- /// PROPOSED COMPENSATORY STORAGE



SECTION A-A

**FLOOD COMPENSATION SECTIONS**

(SCALE: 1:2500 Horiz, 1:500 Vert)

**DRAFT ISSUE**

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Client: BATH AND NORTH EAST SOMERSET COUNCIL

NEWSTEAD COURT, LITTLE OAK DRIVE  
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ANNESLEY, NOTTINGHAMSHIRE  
NG15 0DR



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Project: BATH COMPENSATORY STORAGE STUDY

Drawing Title:  
SITE AT BATHEASTON  
COMPENSATORY STORAGE SECTIONS (INCL PARK & RIDE AREA)  
STORAGE OPTION BELOW 1 IN 2 YEAR FLOOD LEVEL

Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
1:2500	L Aldridge	24.01.12	R Winn	24.01.12	S Morgan	24.01.12
Project No.	Office	Type	Drawing No.	Revision		
A067660	51	C&S	026			