

### Drainage Background for PSP

#### Drainage Issues and Development Response

A range of drainage constraints impact the development of the Berwick Waterways precinct. These are presented graphically on the attached plan. The Hallam Valley Contour Drain (HVCD) runs adjacent to the south west boundaries of the site. Drainage from the site discharges to the HVCD via a syphon outlet at the north western corner of the precinct.

The drainage constraints include:

- **HVCD Capacity**  
The capacity of the Hallam Valley Contour Drain and flood risk to adjacent lands.  
  
The HVCD has capacity constraints which place the PSP area and the lands to the west at risk from major flood events. A bund currently provides limited protection to the PSP area (less than 1 in 20 year flood protection)  
  
Augmentation of the bund would provide protection for the PSP area but would exacerbate the risk for the lands to the west if raised above the 1 in 100 year flood level. Therefore additional capacity is required within the existing HVCD corridor.
- **Flood Level**  
The 1 in 100 year flood level has been determined as 18.15m AHD with a minimum prescribed building floor level of 18.75m AHD (providing for 600mm freeboard). Much of the site sits below this level and extensive site filling is required to achieve the desired lot levels.
- **Flood Storage**  
The site presently provides flood storage capacity by virtue of its syphon outlet to the HVCD. For the 1 in 100 year event this is 42,750m<sup>3</sup> of storage. For the 1 in 100 year event plus 600mm freeboard, the storage volume is 356,750m<sup>3</sup>. Creation of additional substitute flood storage is required to enable the development to occur and maintain this level of freeboard. The total additional storage requirement has been calculated at 129,000m<sup>3</sup>. This is equivalent to 1000m<sup>3</sup> for each Hectare of the 85.47ha site to be developed. This would increase to 176,000m<sup>3</sup> if the O'Sheas Road Drain is connected to the site which would increase the required storage to 1600m<sup>3</sup> per hectare of the site developed.
- **Drainage Scheme**  
Current drainage schemes for the region do not contemplate development of the PSP area. A drainage scheme is to be put in place by Melbourne Water to give effect to the development solution. The scheme will be funded by the development project and its implementation will be a development responsibility.

These issues must be addressed before any development proceeds or managed in a manner integrated with the site development to ensure adequate levels of flood protection during development and upon completion.

### **Staging**

As this indicates there are major items of infrastructure that are required to be constructed to enable the development of the precinct. This is particularly so with respect to drainage works where development will not be permitted unless the required drainage and flood protection standards as set out in this plan are satisfied.

Development is to commence at the north eastern corner of the precinct and move in a westerly direction. The activity Centre development can also proceed at this time.

Thereafter the development front will shift to the south and move progressively north as indicated on the staging plan.

### **Implementation**

A development solution for the Berwick Waterways precinct has been difficult to achieve. While complex and capital intensive, the drainage issues are resolvable. The key issue in implementing a development solution has been the need for coordination and co-operation among land owners in the precinct. The PSP establishes a framework for development, however; it will not be implementable without a co-ordinated and co-operative approach.

A Land Owner Group has committed to a joint venture under the banner of the Berwick Waterways Land Owner's Co Pty Ltd to ensure that co-ordination and co-operation is achieved.

### **Section 173 Agreement**

With respect to drainage, before any development is undertaken in the precinct, an agreement under Section 173 of the planning and Environment Act must be entered into between the Responsible Authority, Melbourne Water and the Berwick Waterways Land Owner's Co Pty Ltd. This agreement will provide:

- The scope of the drainage works
- The staging of implementation
- Funding of drainage works
- Securing land required for drainage purposes and land payments
- Reservation of development opportunity for flood protection works undertaken
- Reimbursement of scheme contributions for works undertaken

### **Scope of Drainage Works**

As discussed above it is necessary for the drainage works to be completed before development is undertaken or to be implemented in an integrated manner with the development works. For the sake of clarity the section 173 Agreement contemplated above will provide for delivery of the full scope of works set out below.

The scope of works includes:

- Augmentation and relocation of the HVCD Bund to create additional capacity in the HVCD corridor and provide flood protection to the adjacent lands.
- Construction of interconnected Flood Storage capacity of 176,000m<sup>3</sup> to the satisfaction of Melbourne Water.
- Site filling and earthworks to achieve minimum finished floor levels in new dwellings of 18.75m AHD.

### **Integrated Scheme Development**

To ensure drainage scheme construction is to be integrated with the project development the following staging elements will be key approval criteria:

1. Phase 1
  - a. The HVCD bund remains in its existing location
  - b. Sections of the bund below the 1 in 100 year flood level are raised to that level and no higher. Any development undertaken to achieve minimum flood levels for new dwellings of 18.75m AHD
  - c. Flood Storage capacity of 1000m<sup>3</sup> to be created for each hectare of land (or part thereof) developed.
  - d. Maintain minimum flood storage capacity in the precinct equal to 42,750m<sup>3</sup> plus 1000m<sup>3</sup> for every hectare of land developed.
2. Phase 2
  - a. The HVCD bund is shifted east so that the top of the bund is located within the Berwick Waterway PSP area and is raised to provide 600mm freeboard to the 1 in 100 year flood level. (The timing for this work will be dictated by the availability of flood storage capacity in the precinct ie once 1(c) can no longer be satisfied).
  - b. Demonstration of sufficient capacity in the HVCD corridor such that the properties to the west in Montebello Boulevard enjoy at least equivalent flood protection to the present time.
  - c. Maintain minimum flood storage capacity in the precinct equal to 42,750m<sup>3</sup> plus 1,000m<sup>3</sup> for each hectare developed.
3. Phase 3
  - a. Further augmentation of the HVCD by Melbourne Water.

### **Subsequent Development Applications**

Development applications for Properties marked with an "X" will be required to:

- Demonstrate the ability and provide 1000m<sup>3</sup> of flood storage capacity for each hectare of land to be developed in a location in accordance with the Berwick Waterways Urban Structure Plan and to the satisfaction of Melbourne Water and the City of Casey. Such capacity must be provided downstream and must be free draining and capable of emptying within a timeframe sufficient to provide capacity for subsequent flood events

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- Provide a drainage plan demonstrating the ability for storm water flows to be conveyed to the outfall. Any temporary outfall is to be provided to the satisfaction of Melbourne Water and the City of Casey.
- Pay drainage scheme contributions prior to the certification of a plan of subdivision or lodge security for drainage works to be undertaken.

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