

## Bureau of Design Engineering Computing Management Division

### BRADD

No. 033  
February 29, 2012

### ABLRFD Input Files: AWB Water Levels

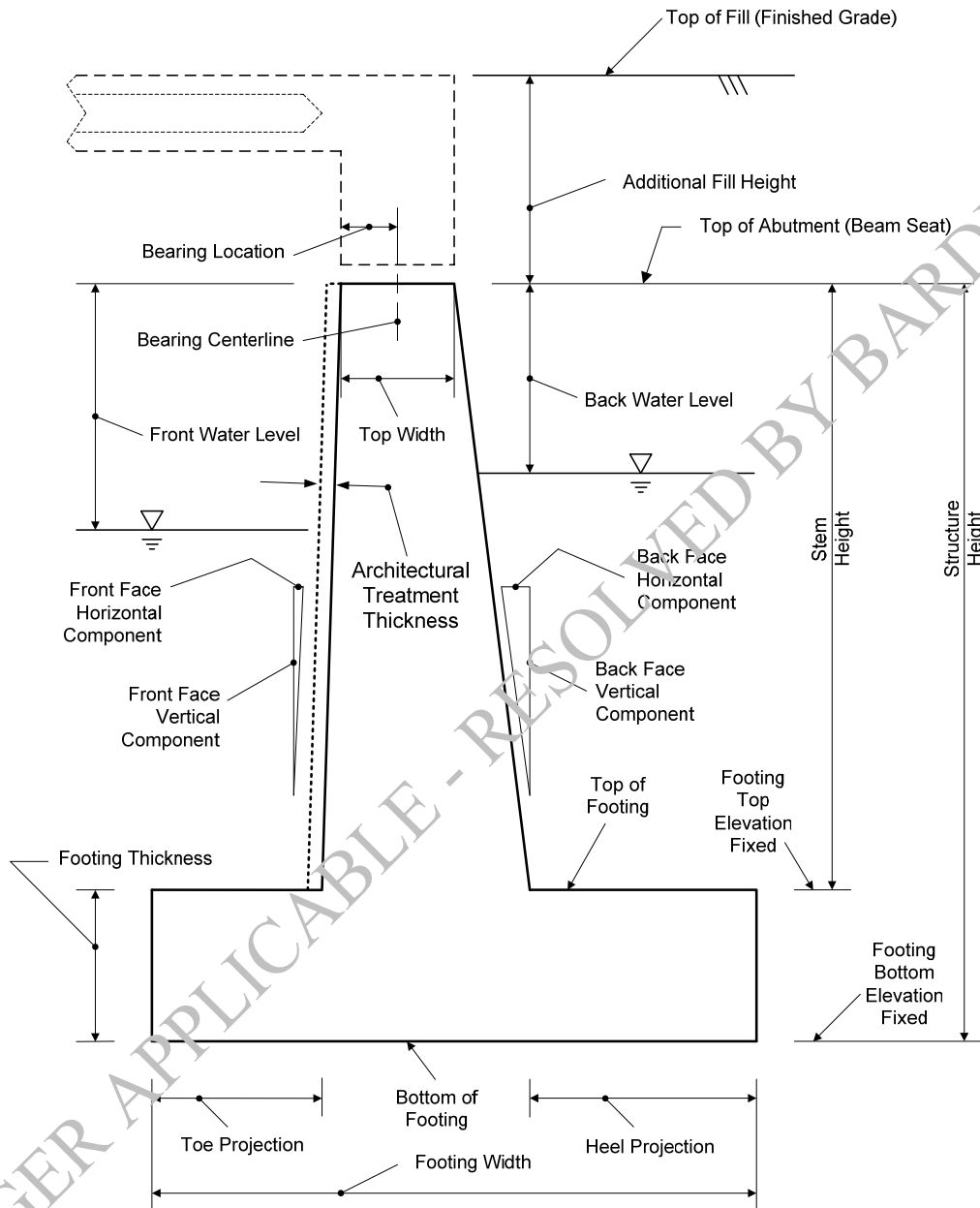
A minor operational issue has been discovered since the latest release of the BRADD program (version 3.1.6.0, November 2011). This issue affects the computation of a BRADD generated value used in the ABLRFD input design and analysis files. The issue, its symptoms and any workarounds are listed below.

#### Problem Statement:

For Wall abutments the values given in the Wall abutment input files (both design and analysis) on the AWB card for Front and Back Water Levels are incorrect. The Front and Back Water Level values given should be smaller by the "Additional Fill Height" dimension which is shown in the ABLRFD Users Manual, Figure 5.8-1 (See Figure 1 below).

This issue was introduced during development of version 3.1.6.0. A change was made to account for an issue with ABLRFD version 1.10.0.0 and the water levels on the RWL card (ABREV314). This version of ABLRFD cannot correctly handle a value of DEFAULT in either of the water levels on the RWL card. As a workaround to this ABLRFD issue, BRADD replaced the DEFAULT Front Water Level Elevation (see Figure 2, below) with an elevation 3 feet below the Bottom of the Footing, when a "Bottom" Datum Elevation is specified, or 3 feet below the Top of the Footing less the Minimum Footing Thickness, when a "Top" Datum Elevation is specified. BRADD also replaced the DEFAULT Back Water Level Elevation with an elevation 3 feet above the value used for the Front Water Level Elevation.

Note: This problem affects both the design and analysis input files for Wall abutments.



**Figure 1 - From ABLRFD UM - Figure 5.8-1**

A Abutment ← → Data has been reviewed

**Abutment-1 Left Wingwall Dimensions**

506'	Design Section Wall Elevation-Left Wingwall Panel 1
0.0	Horizontal Component of Backfill - Left Wingwall Panel 1
0.0	Vertical Component of Backfill-Left Wingwall Panel 1
506'	Design Section Top Embankment-Left Wingwall Panel 1
DEFAULT FEET	Front Water Level Elevation-Left Wingwall Panel 1
DEFAULT FEET	Back Water Level Elevation-Left Wingwall Panel 1
150.0 PCF	Density of Architectural Treatment-Left Wingwall
0"	Architectural Treatment Thickness-Left Wingwall

**Figure 2 - Wingwall Dimensions Input Menu**

When BRADD calculates these elevations to workaround the ABLRFD issue, output appears in the Substructure controller log file (ASUBS\_C.OLG) as in the example shown below.

```
**** NOTE: With ABLRFD version 1.10.0.0, DEFAULT values cannot be used
for front & back water level elevation under the wingwall
footings. Base of footing elevation and 3 foot below will be
used in the RWL card for wwl1.
```

```
The water level elevations are set to:
Front: 13 feet or 488'.
Back: 15 feet or 491'.
```

**Problem Workaround:**

The workaround for the AWB water level problem is to artificially raise the water table values on the input menus (Abutment-# Wall Abutment Dimensions). The user will need to increase the front and back water table elevation by the "Additional Fill Height" dimension. After the first run of the Wall abutment design, the value for "Additional Fill Height" can be found in the ABLRFD abutment output file ("Sub\_Abut\_Design.out") in the table "ABUTMENT WITHOUT BACKWALL". The user should take this value and calculate revised water level elevations to input into BRADD.

**Problem Resolution:**

A fix for this problem will be available in the next version of BRADD - version 3.1.7.0.

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Please direct any questions to:

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NO LONGER APPLICABLE - RESOLVED BY BRADD v3.2.0.0