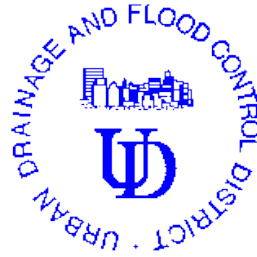


# Urban Drainage and Flood Control District



## E-19 Surveys



Bridge Gage  
ALERT ID: 4423  
LID: BGEC2

**HDR Engineering, Inc.**  
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## Introduction

HDR Engineering Inc. was contracted by the Urban Drainage and Flood Control District to survey and provide information about various flood warning stream gage sites in a manner consistent with National Weather Service E-19 procedures. On October 12, 1999, five stream gages and one ungaged site were surveyed by HDR personnel in the Boulder Creek and South Boulder Creek basins. This report is a summary of the work done and information gathered for the Bridge gage on Boulder Creek. Included in this report are elevations of selected ground points near the site, estimates of stages likely to cause flood damage and descriptions of historic floods and other available high water information.

## Site

The stream gage is located on Boulder Creek on along Highway 119 near mile marker 39.1, approximately 1.5 miles upstream of Boulder. The ALERT ID number for this Gage is 4423 while the National Weather Service LID is BGEC2 and is referred to as Bridge. There is one home downstream of the bridge in the left overbank of the stream. Potential flooding at this gage site itself would be minor consisting of over topping the bikepaths along the stream and possible inundation of Highway 119 at very high stages. The primary area of flooding potential is in the City of Boulder approximately 1.5 miles downstream. Figure 1 shows a general location map of the site.

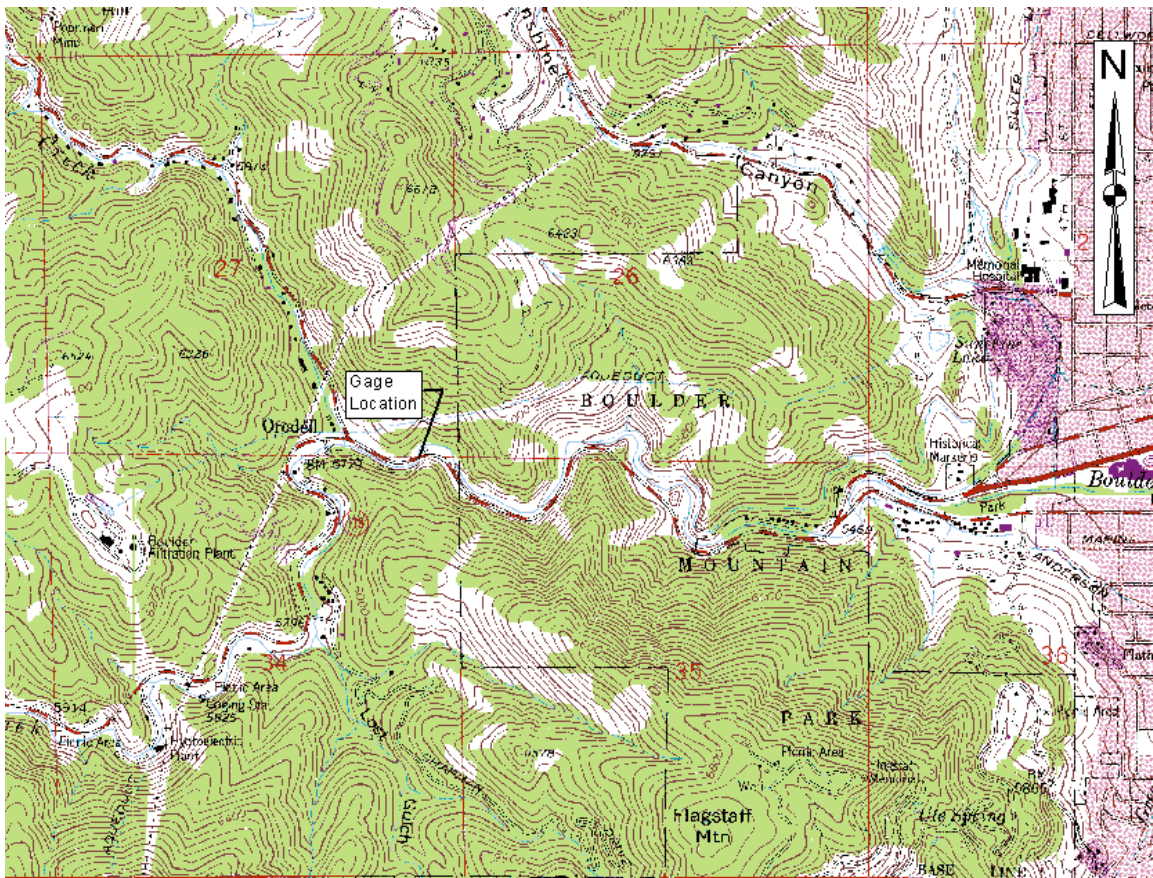
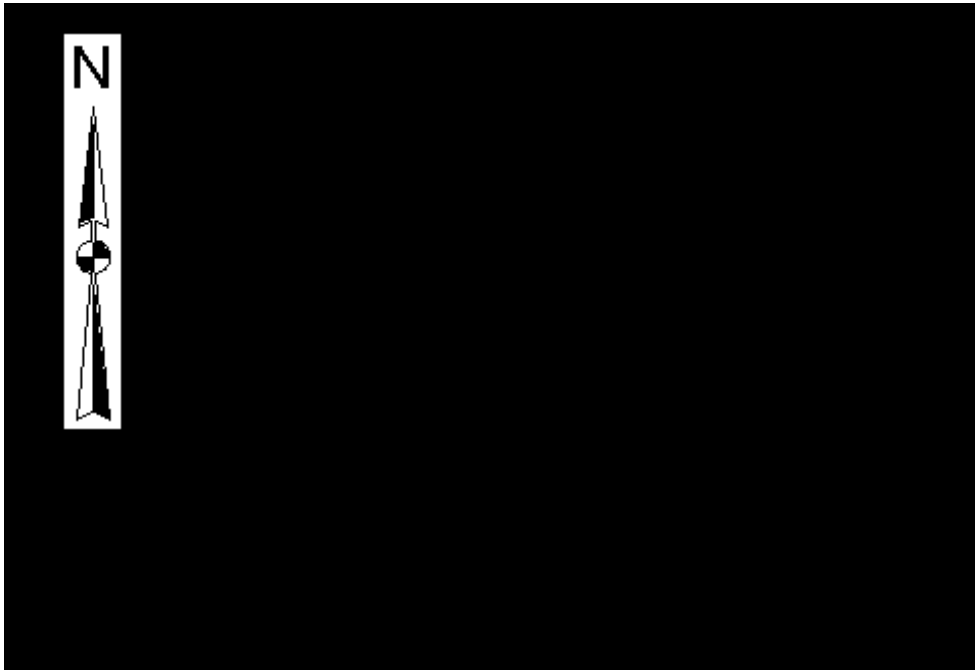


Figure – 1 Location Map

## **Surveyed locations**

The bridge at the location of the gage is a three span concrete structure. Ground elevations along the right overbank were surveyed along with several critical elevations of the bridge itself. In addition the abutment corners of the bridge were surveyed, along with water surface elevations of the stream upstream to estimate the channel slope along this reach. Figure 2 shows locations of the surveyed points in the vicinity of the gage. The top of the riprap protecting the abutments of the bridge is at stage 4.85 while the top of the abutments themselves are at stage 9.0. The bikepath will be overtopped at stage 11. Water will begin to overtop the highway at stage 22 while the low chord of the bridge is at stage 20.3. Based on several spot elevations of the water surface, the estimated channel energy slope is 2.4 percent.



**Figure – 2 Surveyed Points**

## **Site photographs**

Several digital photographs were taken of the site and several panorama views were created based on the site photographs. Figure 3 shows Boulder Creek at the gage location looking downstream. Figure 4 shows Boulder Creek at the gage location looking upstream. Figure 5 shows the downstream face of the bridge. Figure 6 shows the gage location.



**Figure – 3 Looking Downstream**



**Figure – 4 Looking Upstream**



**Figure – 5 Downstream face of bridge**



**Figure – 6 Gage Location**

## Historic records

There is limited information available for this gage. The location has been recently converted to a pressure transducer with an ALERT transmitter.

## Flood warning template

The graphics template was created based on the surveyed information, historic records, another information supplied by the Urban Drainage and Flood Control District and the National Weather Service. The graphics template is compatible with the flood warning system and has been created and installed on the District's WebServer. This template is named 4423web.tpt and is located in the appropriate directory in the District's WebServer. Figure 7 shows the graphics template online from the WebServer.

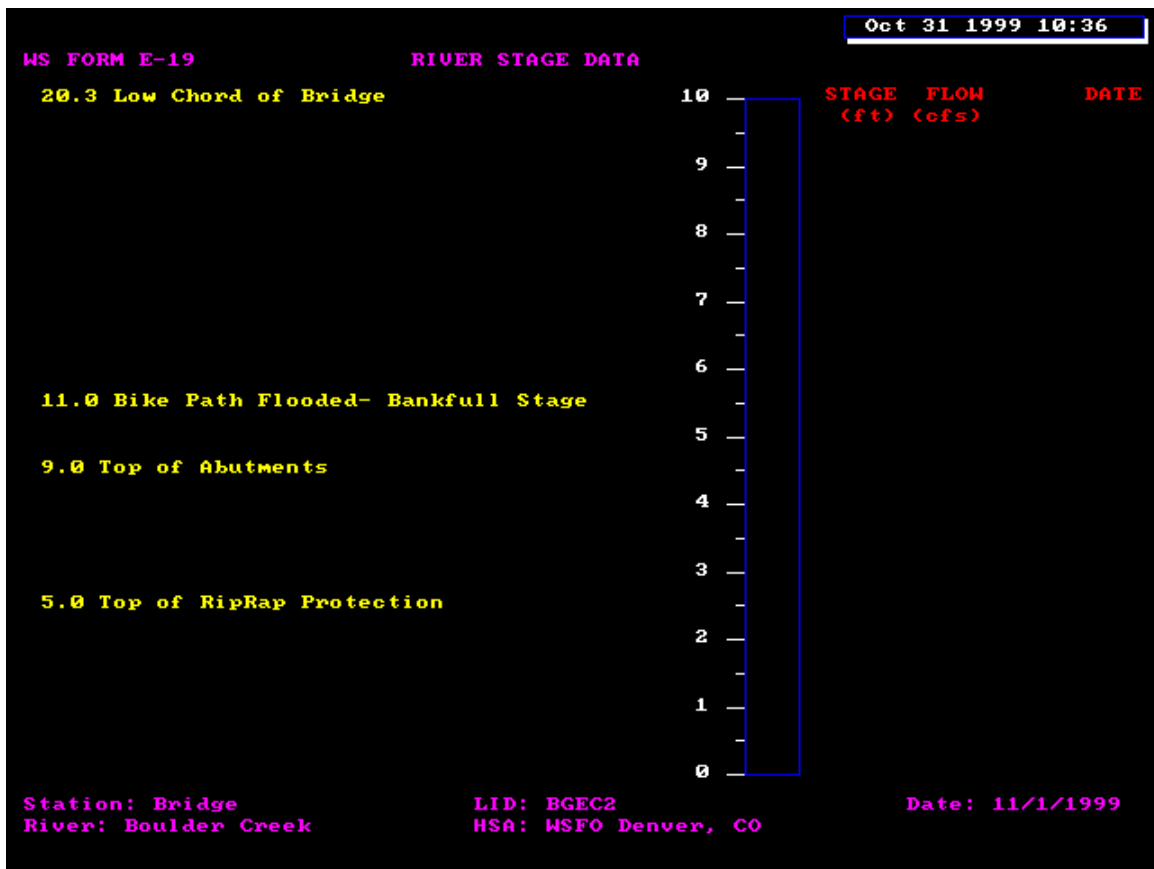


Figure – 7 Graphic Template



**APPENDIX**  
**Surveyed Data Points**

**Bridge Gage**

| ID   | X        | Y       | Distance | Station (ft) | Z LABEL                |       |
|------|----------|---------|----------|--------------|------------------------|-------|
| 900  | -3048.78 | 3048.78 |          | 0.00         | 16.76 INST             |       |
| 901  | -3057.51 | 3048.78 | 8.73     | 28.63        | 14.9 BS                |       |
| 1000 | -3090.57 | 3034.28 | 36.10    | 147.04       | 23.47 BENCHMARK        |       |
| 1001 | -3083.70 | 3029.77 | 8.22     | 174.00       | 9.12 RTUPBRIGABUT      |       |
| 1002 | -3091.90 | 3023.73 | 10.18    | 207.40       | 9.12 RTABUT            |       |
| 1003 | -3089.96 | 3025.18 | 2.42     | 215.35       | 9 RTDSABUT - GH = 9'   |       |
| 1004 | -3088.19 | 3023.33 | 2.56     | 223.74       | 1.66 H2OELEV           |       |
| 1005 | -3084.41 | 3029.17 | 6.96     | 246.56       | 2.25 BOTTOMOFABUT      |       |
| 1006 | -3092.13 | 3026.69 | 8.11     | 273.16       | 10.95 CENTERBIKEPATH   |       |
| 1007 | -3081.02 | 3036.37 | 14.74    | 321.49       | 11.73 CENTERBIKEPATH   |       |
| 1008 | -3068.49 | 3043.80 | 14.57    | 369.27       | 12.59 CENTERBIKEPATH   |       |
| 1009 | -3039.42 | 3045.28 | 29.11    | 464.74       | 17.63 CNTBIKEPATH2MILE | Slope |
| 1010 | -3032.66 | 3030.49 | 16.26    | 518.08       | 6.01 H2OELEV           | 2.37% |
| 1011 | -3115.89 | 3015.89 | 84.50    | 795.25       | 8.08 LOWBIKEENTBDCYDR  |       |
| 1012 | -3089.38 | 3034.00 | 32.11    | 900.55       | 23.59 RTENDBRIDGE      |       |
| 1013 | -3062.28 | 3022.04 | 29.62    | 997.71       | 26.1 LFTENDBRIDGE      |       |
| 1014 | -3093.77 | 3037.56 | 35.11    | 1112.86      | 22.04 OVERFLOWSTHW     |       |
| 1015 | -3070.30 | 3024.44 | 26.89    | 1201.05      | 9.09 LFTUPSTREAMABUT   |       |
| 1016 | -3078.44 | 3018.51 | 10.07    | 1234.09      | 9.08 LFTDSABUT         |       |
| 1017 | -3082.88 | 3019.38 | 4.52     | 1248.93      | 4.64 TOPOFWALLGAGELOC  |       |
| 1018 | -3083.87 | 3019.06 | 1.04     | 1252.34      | 3.48 TOPOFWALLCONTROL  |       |
| 1019 | -3084.20 | 3017.63 | 1.47     | 1257.15      | 4.65 TOPOFWALLCONTROL  |       |
| 1020 | -3080.88 | 3020.00 | 4.08     | 1270.53      | 4.62 TOPOFWALLCONTROL  |       |
| 1021 | -3075.95 | 3020.56 | 4.96     | 1286.81      | 4.85 TOPRIPRARPROTCAB  |       |