

RED MTN. FWY. LEVEE AT BROWN ROAD
FCD GAGE ID# 81507

STATION DESCRIPTION

LOCATION - The gage is located at the Red Mountain Freeway and Brown Road in Mesa. Latitude 33° 26' 11.4" North; Longitude 111° 38' 52.8" West. Located in S16 T1N R7E, in the Buckhorn 7.5-minute quadrangle.

ESTABLISHMENT - The gage was installed June 4, 2008.

DRAINAGE AREA – 13.6 mi², at the outlet.

GAGE - The gage is a pressure transducer type instrument. The PT diaphragm is at elevation 0.32 feet gage height, levels of March 1, 2018. The PT is located on the south side of Brown Road on the left side of the west culvert.

There is no crest-stage gage at this site.

There is no staff gage at this site.

ZERO GAGE HEIGHT – Zero gage height is at the center of the lower culvert. Elevation of zero gage height is 1,571.53 feet NAVD88.

HISTORY – Gaging established on June 4, 2008 at a newly constructed culvert under Brown Road. No previous gaging history at this location. Due to history of standing water, this site has been converted to a volume/capacity gage site, and this change was made effective to the installation date.

REFERENCE MARKS

BM-6693 is an FCDMC brass cap located near the station tube on top of the left culvert. It is at elevation 22.324 feet gage height and 1,593.849 feet NAVD88, levels of March 1, 2018.

RM-1 is a rebar located near the right side of the left culvert wingwall. It is at elevation 12.108 feet gage height and 1,583.633 feet NAVD88, levels of March 1, 2018.

RM-2 is a chiseled 'X' on the lip of a grated outlet located southwest of the left culvert. It is at elevation 4.128 feet gage height and 1,575.653 feet NAVD88, levels of March 1, 2018.

RM-3 is a chiseled 'X' on the headwall of the upstream left culvert. Elevation 15.797 feet gage height and 1,587.322 feet NAVD88, levels of March 1, 2018.

RM-4 is a chiseled 'X' on the headwall of the upstream right culvert. It is at elevation 19.852 feet gage height and 1,591.377 feet NAVD88, levels of March 1, 2018.

RP-1 is a bolt securing the transducer conduit. It is at elevation 4.180 feet gage height, levels of March 1, 2018.

RP-2 is the TBM established with the RTK survey of February 23, 2009. It is a rebar located about 20 feet west of the station tube. Elevation 22.55 feet gage height, or 1,594.10 feet NAVD88, levels of February 26, 2009.

CHANNEL AND CONTROL – The site doesn't really convey water as much as it is measure of level at this location. Flow is controlled by the main outlet at north end of the structure.

There are two 14' high by 16' wide culverts that pass water under Brown Road northward to the principal outlet. The west culvert is lower at elevation 0.0 feet gage height. The east culvert is at elevation 4.0 feet gage height. The west culvert is 240 feet in length and the east culvert is 225 feet in length. Slopes in the culverts are very mild, especially the west culvert where the slope is 0.00058 feet/feet.

Above 13.47 feet gage height, water will spill over the levee onto the Red Mountain Freeway SR202L. Elevation verified by RTK survey of February 2009. The lowest top of levee elevation in this reach is 1585.00 feet NAVD88.

The principal outlet and spillway north of McDowell Road is the control when a pool forms. Before a level pool forms low amounts of water will flow through each culvert at low velocity.

RATING - The current rating is Rating #1, dated June 4, 2008. The rating was developed using Manning equation for flows through the culverts. Flow over the levee was modeled using the weir equation.

The volumetric rating is the current rating, (#3) for Spookhill FRS gage ID# 74707.

DISCHARGE MEASUREMENTS - Direct measurements would be difficult to obtain except for low stages, and even then, it is difficult due to standing water. Discharge measurements could be made in the outlet channel north of the dam outlet.

POINT OF ZERO FLOW - The PZF is at 0.00 feet gage height.

FLOODS – There was a large impoundment, about 10% capacity, just after installation of this gage on July 10, 2008.

REGULATION – The road crossings and the levee regulate flows downstream. Inflow from the Signal Butte Floodway is regulated by Signal Butte FRS.

DIVERSIONS - None known

ACCURACY - Fair

JUSTIFICATION - Monitor levels for potential freeway closure by ADOT.

UPDATED - February 8, 2024
D E Gardner