

**RED MTN. FWY. LEVEE @ McKELLIPS RD.
FCD GAGE ID# 79807**

STATION DESCRIPTION

LOCATION - The gage is located at the Red Mountain Freeway and McKellips Road in Mesa. Latitude 33° 27' 03.9" North; Longitude 111° 40' 03.9" West. Located in S07 T1N R7E, in the Buckhorn 7.5-minute quadrangle.

ESTABLISHMENT - The gage was installed June 23, 2008.

DRAINAGE AREA – 25.7 mi², at this location.

GAGE - The gage is a pressure transducer type instrument. The PT diaphragm is at gage height 0.31 feet, levels of March 1, 2018. The PT is located on the south side of McKellips 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. The elevation of zero gage height is 1,570.22 feet NAVD 1988.

HISTORY – Gaging established on June 23, 2008 at a newly constructed culvert under McKellips 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-6638 is an FCDMC brass cap located between the two culverts. It is at elevation 5.838 feet gage height and 1,576.055 feet NAVD88, levels of March 1, 2018.

RM-1 is a rebar located near the right wingwall of the left culvert. It is at elevation 10.316 feet gage height and 1,580.533 feet NAVD88, levels of March 1, 2018.

RM-2 is a chiseled 'X' on the concrete at the transducer location. It is at elevation 0.069 feet gage height and 1,570.286 feet NAVD88, levels of March 1, 2018.

RM-3 is a chiseled 'X' at the end of left wingwall of left culvert. It is at elevation 7.553 feet gage height and 1,577.770 feet NAVD88, levels of March 1, 2018.

RM-4 is a chiseled 'X' on top of the headwall of the left culvert. It is at elevation 15.835 feet gage height and 1,586.052 feet NAVD88, levels of March 1, 2018.

RM-5 is a chiseled 'X' on top of the headwall of the right culvert. It is at elevation 19.903 feet gage height and 1,590.120 feet NAVD88, levels of March 1, 2018.

RP-1 is a bolt in the left wall of the left culvert that secures the transducer gage. It is elevation 4.414 feet gage height and 1,574.631 feet NAVD88, levels of March 1, 2018.

RP-2 is the TBM set in the February 2009 RTK survey. The reference is a rebar located about 20 feet west of the station tube. Elevation 23.10 feet gage height, and 1,593.29 feet NAVD 1988, levels of February 26, 2009.

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

There are two 14' by 16' wide culverts that pass water under McKellips Road northward to the principal outlet. The west culvert is lower at elevation 0.0 feet gage height. The east culvert is at elevation 4.16 feet gage height. The west culvert is 258 feet in length and the east culvert is 273 feet in length. Slopes in the culverts are very mild, especially the west culvert where the slope is 0.0007 feet/foot.

Above 12.78 feet gage height, water will spill over the levee onto the Red Mountain Freeway SR202L. This is verified with the RTK survey of February 2009.

The culverts will be the control at about 5 feet and above. Otherwise the lower culvert acts as an open channel. The levee will act as a long weir when water overtops it.

RATING - The current rating is Rating #1, dated June 23, 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 Spook Hill 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 about 0.0 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. ADOT then to monitor and make road closures.

UPDATED - June 10, 2022
S. D. Waters