

Summary

Three LIDAR scans were performed on the two, 211' long structural plate arch culverts under Raytown Road. The first was performed on October 9, 2017, the second on March 5, 2018 and third on June 11, 2018. The purpose was to detect if any deflection is occurring on the culverts over time. LIDAR, or *light detection and ranging*, is a surveying method that measures distances to objects by emitting pulsed laser light. The return time of the laser to the LIDAR unit and the measured wavelengths can be used to make a digital 3-D image of the environment.

The first two scans were taken on days with similar temperatures and weather, partly cloudy and around 50 degrees Fahrenheit. The third scan was taken on a hot and humid morning 90 degree day. Water flow of the stream into the culverts were similar by visual inspection, but no precise measurements were taken. The first two scans were taken in the afternoon. The June scan was completed in the morning. For each date of data collection, eight scans were taken from similar locations. Results are as follows:

- South Culvert, East Side – The comparison of LIDAR scans indicates there is approximately 1" of deflection from the October 2017 to June 2018. This deflection was found at the top of the culvert which is moving down over time.
- North Culvert, East Side – The comparison of LIDAR scans indicates there is approximately 7" of deflection from October 2017 to June 2018. This deflection was found at the top of the culvert which is moving down over time.
- North Culvert, West Side – The comparison of LIDAR scans indicates minimal deflection from October 2017 to June 2018. The data suggests a ½" deflection downwards at the top of the culvert but this is close to the tolerance of the LIDAR scan.
- South Culvert, West Side – The comparison of LIDAR scans indicates minimal deflection from October 2017 to June 2018. The data suggests a ½" deflection downwards at the top of the culvert but this is close to the tolerance of the LIDAR scan.

Images from the LIDAR scans can be seen on the following page.

Pink Points = October 2017 Scans
 Blue Points = June 2018 Scans



SOUTH PIPE

NORTH PIPE

EAST SIDE OF RAYTOWN ROAD, LOOKING WEST



NORTH PIPE

SOUTH PIPE

WEST SIDE OF RAYTOWN ROAD, LOOKING EAST

RAYTOWN ROAD
 CULVERT
 SHEET 1 OF 1

FIGURE 3

RAYTOWN ROAD
 4,000' NORTH OF HIGH GROVE
 ROADWAY STA. 52+00

| DATE | DESCRIPTION |
|------|-------------|
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CITY OF
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 816-316-1800



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 REV. 1

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Detailed
 Checked

Note: This drawing is not to scale. Follow dimensions. Sheet No. of