

APPENDIX E

North Main Street at De Soto, Missouri Interior Drainage

1.0 Background and Issues

During the nonstructural assessment conducted at De Soto, Missouri, the commercial structure located at 1800 North Main Street (Mueller Motor Co.) were investigated as part of the study. During the investigation, the owner of the structure and the business owner (small motor repair shop) discussed their concerns regarding flooding. At this location, Joachim Creek is on the far side of the Union Pacific Railroad embankment which is located between North Main Street and the Creek. Figure 1 shows the structure from across North Main Street. The area behind the structure, in the background, is elevated with a significant amount of residential development (houses and streets) extending to the west.



Figure 1
View of 1800 North Main Street, De Soto, MO

A portion of this residential development is shown in Figure 2. While there are many rooftops, driveways, and paved streets, there appears to be no storm water drainage system to collect and convey all of the runoff from the subdivision into Joachim Creek. According to the structure and business owners, runoff is conveyed overland, as depicted in Figure 2 with the “red” arrows, and impacts the structure during intense rainfall events. Additionally, some runoff near the southern side of this subdivision is collected by a storm water system and conveyed through and discharged out of a 36-inch corrugated plastic pipe between North Main Street and the railroad embankment, as shown in Figure 3. A concrete box culvert, located beneath the railroad embankment conveys flows from North Main Street area into Joachim Creek. The box culvert is shown on Figure 3 as the “red” circle and dashed line running beneath the embankment to Joachim Creek.

According to the owners, the interior drainage from the subdivision which is conveyed through the 36-inch pipe is directed at the box culvert, which is approximately 30-inch by 30-inch with vegetation located at the culvert entrance. During intense rainfall events, the discharge from the 36-inch pipe will back-up at the box

culvert, ponding water and eventually spreading across North Main Street to the structure. The situation is exacerbated as additional runoff from the subdivision flows overland in the vicinity of the structure.



Figure 2
Aerial View of Subdivision and Overland Flow near 1800 North Main Street



Figure 3
View of Storm Water Drain Outlet and Box Culvert Entrance near 1800 North Main Street

It was also reported that on occasion, as Joachim Creek begins to flood, water from the creek will back through the box culvert and begin ponding in the vicinity of North Main Street. No flap gate or slide gate were identified at the box culvert to prevent Joachim Creek from flowing through the culvert during flood events.

The owners were adamant that the discharge of storm water from the subdivision combined with overland runoff in the vicinity of the structures was resulting in increased flood risk for their structures which was their primary concern. The storm water discharge is apparently exceeding the capacity of the box culvert to adequately convey flows into Joachim Creek. Their second concern was that Joachim Creek appeared to reach flood stage more frequently than it had in the past, and that some of the flows were being conveyed back through the box culvert, unimpeded, toward North Main Street and their structures.

2.0 Potential Recommendations

Flooding in the vicinity of 1800 North Main Street appears to have three sources of origination: 1) from Joachim Creek during high stages; 2) interior drainage from subdivision where runoff is collected, conveyed and discharged through a storm water system at the railroad embankment; and 3) overland runoff from the subdivision to the backside of the structures. Depending upon the origin of the flood waters, the information provided in Table 1 could be relevant in managing the flood risk.

TABLE 1
Recommendations Regarding Flooding in the Vicinity of 1800 N Main Street

Flood Source	Recommendation
Joachim Creek	Requires analysis of installation of flap gate or slide gate on outlet of concrete box culvert.
Storm Water System	Interior drainage issue. Requires analysis of system capacity at railroad box culvert.
Overland Flow	Interior drainage issue. Requires analysis of redirecting runoff into storm water system.

In addition to this flood assessment, the commercial structure located at 1800 North Main Street has been incorporated into the nonstructural assessment for Joachim Creek at De Soto and includes potential techniques for implementation to reduce future flood damages.