

## 5.2.22 STUDY AREA 22 – NW 16<sup>TH</sup> LANE

This study area is an isolated right-of-way area with heavy flooding problem just north of Copans Road between Powerline Road and Andrews Avenue. This study area mainly consists of industrial and commercial properties with only one City roadway (NW 16<sup>th</sup> Lane) with significant impervious ground coverage, which can limit the infiltration of stormwater runoff into the ground surface. As shown in the City Stormwater Atlas, there is existing drainage facilities located along NW 16<sup>th</sup> Lane according to City staff, which does not provide adequate flood protection to the right of way areas based on past observations during rainfall events. The topography of the study area along with the model schematics are displayed on Figure 5-22A at the end of this section. According to the topography, the lowest elevations within the study area are located along NW 16<sup>th</sup> Lane where stormwater runoff collects from the entire study area.

The existing conditions stormwater model was used to evaluate the flooding under the existing conditions during a 5-year, 24-hour design storm event with 7.8 inches of rainfall. The study area is defined by the sub-basin NW\_017\_01 within the stormwater model. Based on the results of the stormwater model, the extent of the expected flooding within the study area is displayed on Figure 5-22B at the end of this section. According to the model results, the majority of NW 16<sup>th</sup> Lane displays flooding greater than two inches. Due to the lower ground surface elevations relative to the surrounding areas, NW 16<sup>th</sup> Lane has collects stormwater runoff which flows from surrounding private property.

The system improvement alternatives that were investigated for this study area consist of replacing the existing drainage infrastructure along NW 16<sup>th</sup> Lane with new additional exfiltration trench, which are summarized further below. The installation of a new closed exfiltration trench along NW 16<sup>th</sup> Lane should be effective at alleviating the flooding problems due to the high elevation in the project area of approximately 11.2 feet NAVD. The installation of drainage wells, new dry retention areas, stormwater pumps stations, or upsized outfall pipes were not feasible options for this study area are were not considered during the analysis of alternatives.

### **Alternative 1: Exfiltration Trench**

The stormwater model was used to conduct a simulation of the installation of new exfiltration trench along NW 16<sup>th</sup> Lane which is not currently served by an existing stormwater system. The purpose of this system improvement alternative is to provide additional storage and infiltration capacity to alleviate the existing flooding issues quicker. Under Alternative 1, the proposed construction includes a total of 910 LF of exfiltration trench along NW 16<sup>th</sup> Lane. The installation of new exfiltration systems within the study area will help draw down any flooding after rainfall events. The estimated design and construction costs for this exfiltration trench alternative are approximately \$436,000.

CMA conducted an analysis with the stormwater model of Alternative 1 to estimate the maximum potential reduction in peak flood stage and flood duration due to an exfiltration trench system within this study area. During the evaluation of Alternative 1, the design parameters for the proposed exfiltration trench are assumed within the stormwater model to be as follows:

- Trench Width: 4 feet
- Trench Height: 4 feet
- Perforated pipe diameter: 18-inch
- Hydraulic conductivity:  $9.8 \times 10^{-4}$  CFS/ft<sup>2</sup>-ft head

Based on our analysis with the stormwater model, the reduction in peak flood stage under Alternative 1 is summarized within Table 5.22.1 below. The model results show minimal to no reductions in peak flood stages under Alternative 1.

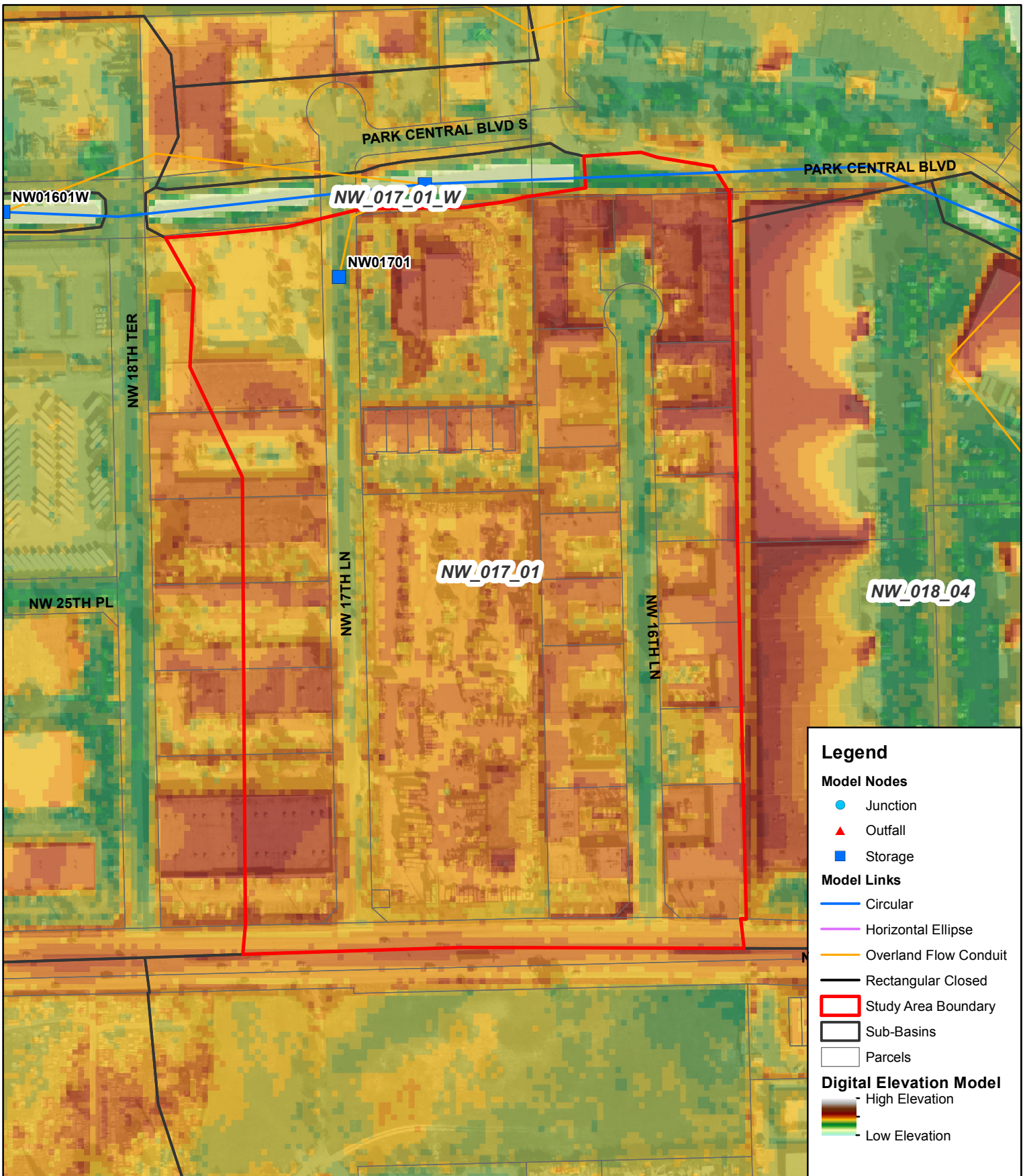
<b>Table 5.22.1 – Alternative 1 Peak Stage Summary</b>					
<b>Nodes</b>	<b>Existing Conditions</b>			<b>Alternative 1</b>	
	<b>Peak Stage (feet)</b>	<b>Ground Elevation (feet)</b>	<b>Flood Depth (feet)</b>	<b>Peak Stage (feet)</b>	<b>Peak Reduction (feet)</b>
NW01701	12.07	11.2	0.87	12.12	+0.05
NW01701W	11.43	N/A	N/A	11.47	-0.05

Based on our analysis with the stormwater model, the reduction in flood duration under Alternative 1 is summarized within Table 5.22.2 below. The model results show minimal to no reductions in flood duration under Alternative 1.

<b>Table 5.22.2 – Alternative 1 Flood Duration Reduction</b>				
<b>Nodes</b>	<b>Reference Roadway Elevation (feet, NAVD)</b>	<b>Flood Duration (hours)</b>		
		<b>Existing Conditions</b>	<b>Alternative 1</b>	<b>Reduction (%)</b>
NW01701	11.36	> 40	> 40	0

### **Alternative Comparison**

Although Alternative 1 does not provide any reduction in peak flood stage or flood duration within the study area, it will reduce extent of the existing flooding within the isolated right-of-way area of NW 16<sup>th</sup> Lane. Although Alternative 1 does not provide enough additional flood protection to meet the level of service criteria for NW 16<sup>th</sup> Lane, it does help alleviate the nuisance flooding within the right-of-way area. According to the City Stormwater Atlas, there is existing drainage infrastructure located along NW 16<sup>th</sup> Lane, which is not performing adequately based on past observations by City staff. Prior to any drainage improvements along NW 16<sup>th</sup> Lane, the City should conduct a video inspection of all existing drainage pipe and structures to confirm whether any additional maintenance could alleviate the flooding issues. Based on the assumption that additional maintenance and/or repairs would not improve the flooding issues, CMA recommends the replacement the existing drainage infrastructure within the public right of way for NW 16<sup>th</sup> Lane with new additional exfiltration trench, which will provide additional storage and infiltration capacity for stormwater runoff. For the recommended stormwater improvements for this study area, CMA has prepared a conceptual layout, which is enclosed within Appendix A-1 and a preliminary cost estimate, which is enclosed within Appendix A-2.



**Figure 5-22A**  
**NW 16th Lane**  
**Existing Topography & Model Schematics**







**Figure 5-22B**  
**NW 16th Lane**  
**Potential Flooding Depth**

