

4.3 Final Roundabout Design

4.3.1 Roundabout Geometry

Figure 4-4 below shows a detailed drawing of the roundabout geometry. The lane widths are 12 feet, the truck apron is 50 feet, the inner island is 28.2 feet in diameter, and the entire diameter of the roundabout is 175 feet. The pavement section includes a 3-inch AC special mix and a 4-inch class 2 aggregate base. See Appendices F-1 through F-6 for the typical roadway cross sections and profile views.

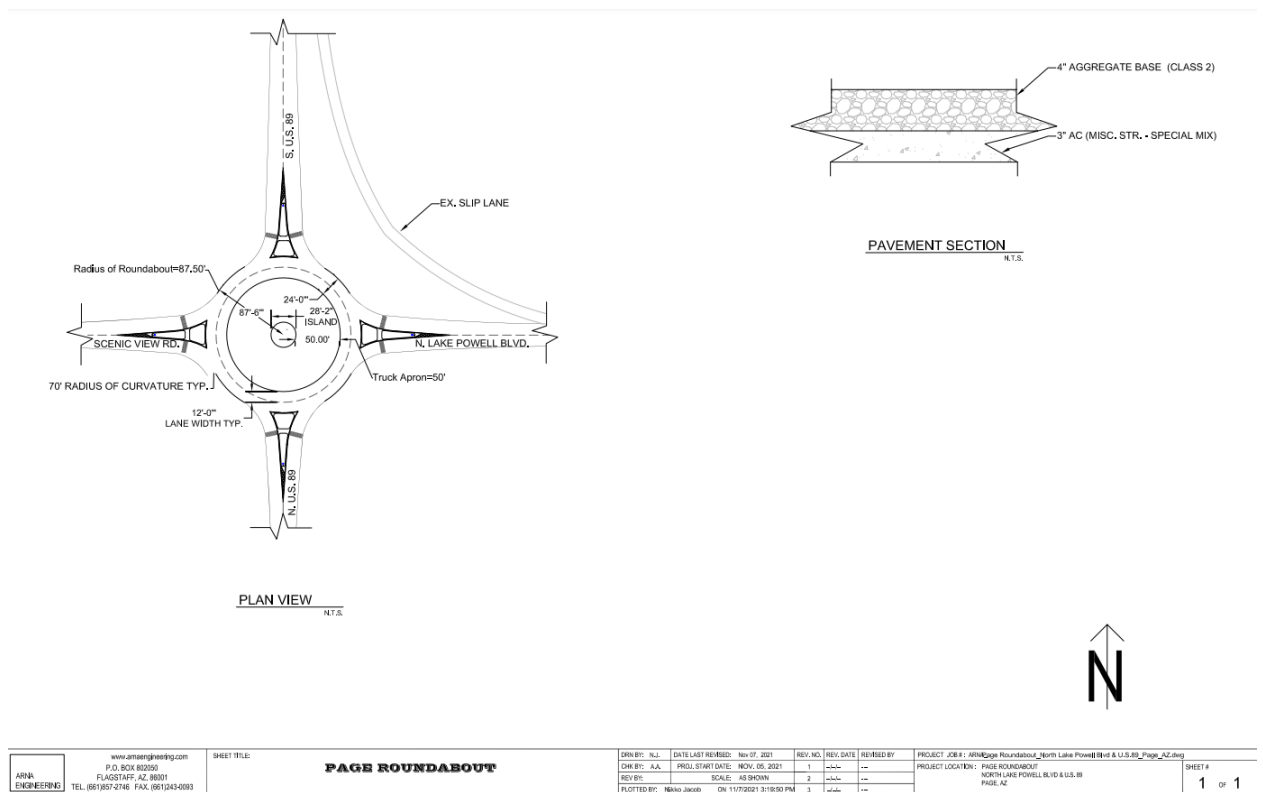


Figure 4-4: Roundabout Plan View

4.3.2 Stopping Sight Distance

Stopping sight distance (SSD) is defined as the necessary distance required on a roadway for the driver to perceive and react to an object in the roadway and to brake to a complete stop before hitting that object [20]. Roundabout SSD is calculated differently than intersection SSD. There are several assumed values that are used to determine the SSD. Equation 4-1 below from the National Cooperative Highway Research Program [20] was used to calculate the SSD for each approach where the perception-reaction time is

assumed to be 2.5 seconds and driver acceleration is assumed to be 11.2 feet per second squared. Table 4-5 shows the required SSD for each approach of the roundabout.

Equation 4-1: Roundabout SSD

$$d = (1.468)(t)(V) + 1.087 \left(\frac{V^2}{a} \right)$$

d = stopping sight distance (ft)
t = perception – reaction time (s)
V = initial speed (mph)
a = driver acceleration $\left(\frac{ft}{s^2} \right)$

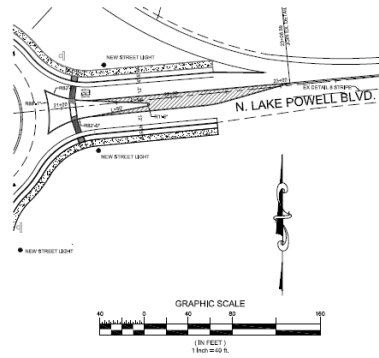
Table 4-5 Stopping Sight Distance

Approach	t (s)	a $\left(\frac{ft}{s^2} \right)$	V (mph)	d (ft)
NB US 89	2.5	11.2	65	648.60
SB US 89	2.5	11.2	65	648.60
WB N Lake Powell Blvd	2.5	11.2	40	302.09
EB Scenic View Rd	2.5	11.2	40	302.09

This information is used in the design for spacing signage the correct distance away in the plan set. Since the stopping sight distance is 648.60 feet for the US 89 approaches, the signage will be placed approximately 1000 feet away from the entrance of the roundabout. Signage for the minor approaches will be placed approximately 500 feet away from the entrance of the roundabout.

4.3.3 Pedestrian and Bicycle Considerations

The pedestrian and bicycle considerations below in Figure 4-5 are considered for future development when they are needed. They are unnecessary at the moment but due to future urban development and increased traffic volumes, cross walks and bike lanes are considered for the overall layout. The basic layout for pedestrian and bicycle considerations includee a 6-foot sidewalk, 5-foot planter, and a 4-foot bike lane.



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Figure 4-5: Pedestrian & Bicycle Considerations