Jointing Concrete Roundabouts

A. General Information

Roundabouts are an increasingly popular intersection type due to their traffic flow and safety characteristics. When using concrete for the roundabout, it is critical to develop a workable jointing plan to make sure the joint layout will be constructed properly. The jointing plan is the key by which the joints will be correctly located. Because concrete jointing is sometimes used for lane delineation, it is important to recognize the impact of the jointing plan on drivers who are unfamiliar with the operation of roundabouts.

The jointing plan should avoid the following:

- Slabs less than 2 feet wide
- Slabs greater than 15 feet wide
- Angles less than 60 degrees
- Creation of interior corners
- Creation of odd shapes

B. Types of Jointing Patterns

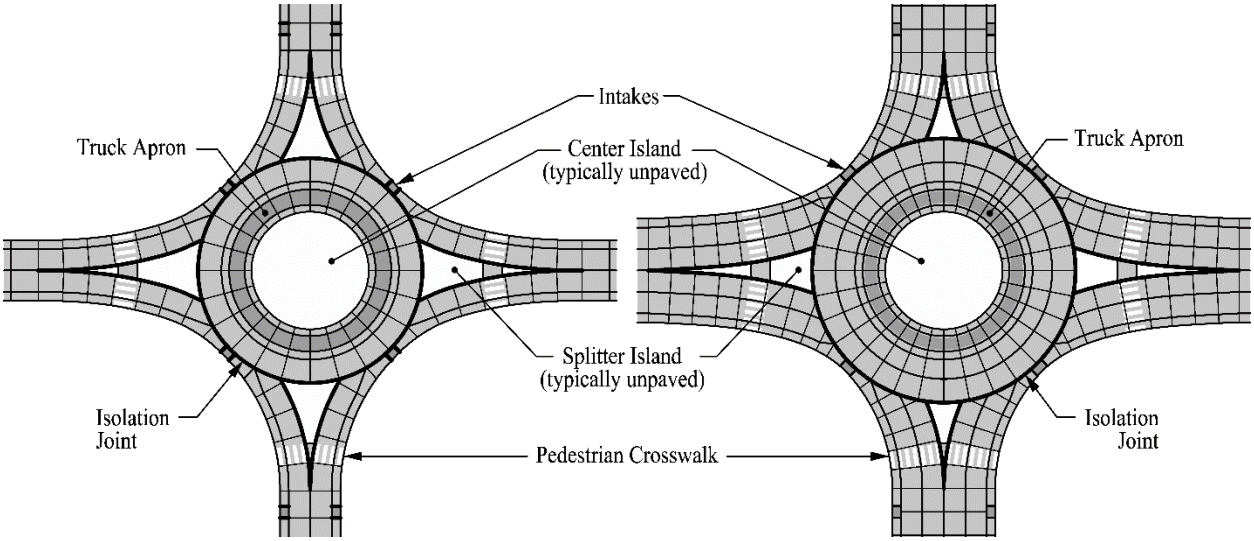
There are three general types of overall jointing plans, including isolation, pave-through, and pinwheel. Very early in the design process, the type of jointing plan needs to be selected because of the impact the jointing plan has on the overall design. It is important to note that, in general, the joints in the circular portion should radiate from the center and the joints in the legs should be perpendicular to the circle. The apron paving must be isolated from the vehicle lane paving. If the inner circle is paved, provide an isolation joint between it and the truck apron. Jointing on the inner circle should also radiate from the center point but care is needed to prevent the creation of small slabs. The construction staging required for the project will influence selection of the jointing type. The designer should understand that once the contract is let, the successful contractor may request modification in the jointing plan to better fit the contractor's equipment and processes. The designer should closely evaluate any requests for change in the jointing plan in order to ensure that the original objectives are maintained. The same types of joints are used for roundabouts as for any other concrete pavements and the same rules for construction apply.

The type of jointing pattern to be used is dependent on the project staging and if a specific directional movement(s) is to be emphasized. The jointing plans for double lane, single lane, and mini-roundabouts follow the same philosophy. Since the total inscribed circle for mini-roundabouts is paved, the jointing pattern will most often follow the isolated circle type, but pave through can also be used. Pinwheel jointing is generally not used for single lane and mini-roundabouts. Splitter islands for some mini-roundabouts may be formed by painted lines so the jointing pattern is not impacted.

Because all approach legs of a roundabout are under yield control, the targeted street grade in the pedestrian crossing area should be 1.5%, with a maximum of 2%, unless a determination is made that it is technically infeasible. See Section 12A-2.

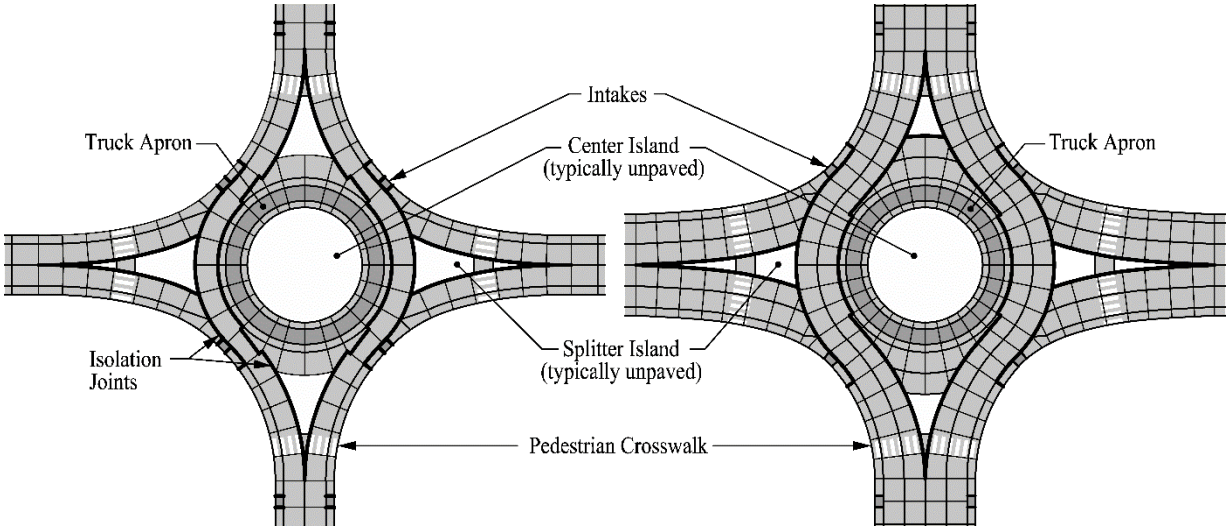
1. **Isolated Circle Jointing:** This jointing type is particularly useful on large roundabouts. All joints within the circle radiate out through the center point of the circle. Longitudinal and transverse joints within the legs of the roundabout connect to the nearest joint in the circle. See Figure 5G-6.01.

Figure 5G-6.01: Isolated Circle Jointing



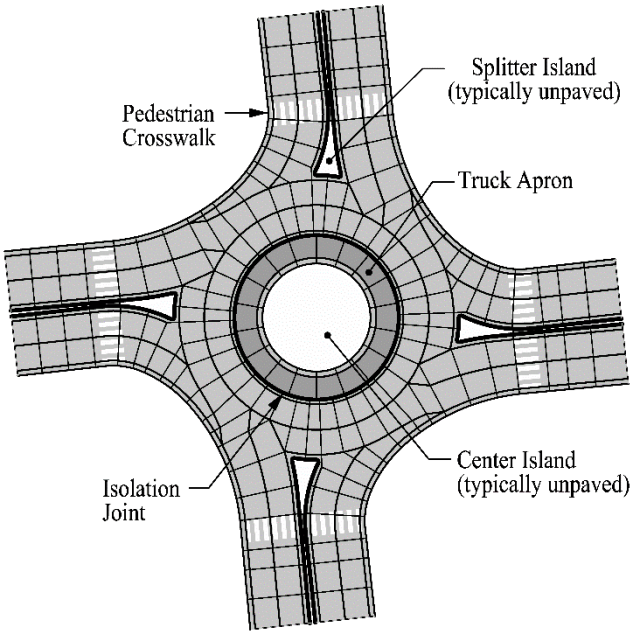
2. **Pave Through:** This jointing pattern is useful when faster construction under traffic conditions is needed. It is also used when directional assistance from the jointing plan will enhance vehicle operations. The first step is to pick the legs that are to be paved through. Generally, these would be the highest volume movements. Being able to use a slipform paver to speed construction requires the designer to make sure curvature, cross slopes, and longitudinal slopes are set so the paver may be used. Joints on the legs of the roundabout should be set perpendicular to the longitudinal direction of the leg and set to radiate from the center of the circle as the paving passes through the circle. The other two legs should provide for transverse joints perpendicular to the curbs or edge of the slab and the longitudinal joint should connect to the nearest joint on the pave through legs. See Figure 5G-6.02.

Figure 5G-6.02: Pave Through Jointing



3. **Pinwheel:** This jointing type is sometimes called spiral jointing. It is a combination of the isolation and pave through types. Emphasis is provided for each exiting leg of the roundabout. The jointing for the exit legs is set as for the major pave through legs. The jointing for entering legs is set similarly to the lesser legs of the pave through option. Joints within the circle are set to radiate from the center and the others are perpendicular. See Figure 5G-6.03.

Figure 5G-6.03: Pinwheel Jointing



C. Jointing Layout Steps

1. Draw all pavement edge and back of curb lines in a plan view. Draw locations of all manholes, intakes, and water valves so the joints can intersect with them.

2. Draw all lane lines as applicable on the legs and in the circular portion. If isolating the circle from the legs, do not extend the lane lines into the circle. If using the pave through method, determine which roadway will be paved through. Take precaution not to exceed maximum longitudinal width.

3. In the circle, add transverse joints radiating out from the center of the circle. Make sure that the largest dimension of a pie-shaped slab is smaller than the maximum recommended and the smallest dimension is not less than 2 feet. Extend these joints through the curb or edge of pavement.

4. Add transverse joints on the legs at all locations where a width change occurs such as at the nose of median islands, the beginnings and ends of curves, tapers, tangents, and curb returns. Extend these joints through the curb or edge of pavement.

5. Add transverse joints beyond and between those added in Step 4. Space joints out evenly to make sure that the maximum joint spacing is not exceeded.

6. Make adjustments for in-pavement objects and to eliminate odd shapes and small triangular slabs.