

Item 20-16 Proposal to modify Figure 3B-24 (adding two additional turn-lane arrow details), modify Figure 3C-4 to 3C-14, and replacing Figure 3C-2 with Figure 3C-2 (CA), revise sections 3B.20, 3C.01, and 3C.06

Recommendation: Revise the CA MUTCD figures and the text to include additional details for turn lane arrows and lane use arrow pavement markings options for roundabout approaches.

Requesting Agencies/Sponsor: Caltrans/Monica Kress-Wooster, CTCDC member

Background: Roundabout are adopted more frequently in California. Roundabouts are becoming an increasingly utilized form of intersection design and control in California highway systems. Figure 3C-2 in the CA MUTCD does not provide the detailed dimensions for a fish-hook arrow. To address the need for improved guidelines for marking roundabout, Caltrans has developed new pavement marking details for fish-hook arrows to be used as lane-use arrow pavement marking options for roundabout approaches on Figure 3C-2(CA). The new details proposed should be useful to practitioners designing pavement markings at single and multi-lane roundabouts. If used on approaches to a roundabout, fish-hook arrows may be used to help provide additional guidance with an oval symbolizing the central island for the innermost travel lane and without an oval for all other lanes approaching a roundabout. Minor revisions are proposed to the language in Sections 3C.01 and 3C.06 to reflect these changes. Additionally, minor revisions are proposed from Figure 3C-4 to 3C-14 by adding/ updating the fish-hook arrows to the existing Figure.

In addition to proposing pavement marking details for roundabouts (fish-hook arrows), Caltrans is proposing additional pavement marking arrow details to be added to Figure 3B-24 (CA) for turn-lanes. Minor revision is proposed to the language in Sections 3B-20 to reflect the change.

Proposed Policy Changes

Note: **Red** text is proposed text.

Black ~~strike through~~ text is the text that is not applicable in California

Blue text is the existing California revision

Section 3B.20 Pavement Word, Symbol, and Arrow Markings

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Option:

⁰²Word, symbol, and arrow markings, including those contained in the “Standard Highway Signs and Markings” book (see Section 1A.11), may be used as determined by engineering judgment to supplement signs and/or to provide additional emphasis for regulatory, warning, or guidance messages. Among the word, symbol, and arrow markings that may be used are the following:

A. Regulatory:

1. STOP
2. YIELD
3. RIGHT (LEFT, **U**) TURN ONLY
4. 25 MPH
5. Lane-use and wrong-way arrows
6. Diamond symbol for HOV lanes
7. Other preferential lane word markings

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CHAPTER 3C. ROUNDABOUT MARKINGS

Section 3C.01 General

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⁰⁴Figure 3C-1 provides an example of the pavement markings for approach and circulatory roadways at a roundabout. Figure ~~3C-2~~ **3C-2(CA)** shows the options that are available for lane-use pavement marking arrows on approaches to roundabouts. Figures 3C-3 through 3C-14 illustrate examples of markings for roundabouts of various geometric and lane-use configurations.

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Section 3C.06 Word, Symbol, and Arrow Pavement Markings for Roundabouts

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Guidance:

04 Within the circulatory roadway of multi-lane roundabouts, normal lane-use arrows (see Section 3B.20 and Figure ~~3B-24~~ 3B-24(CA)) should be used.

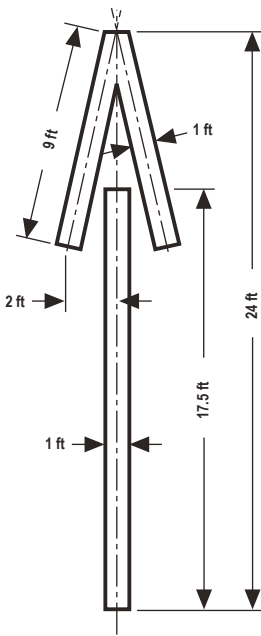
05 On multi-lane approaches with double left-turn and/or double right-turn lanes, lane-use arrows as shown in Figures 3C-7 and 3C-8 should be used.

Option:

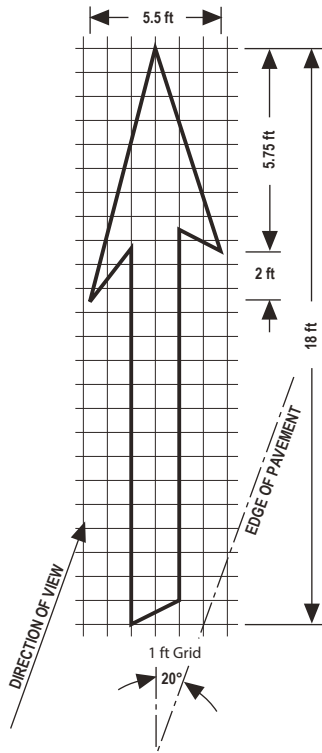
06 If used on approaches to a roundabout, lane-use arrows ~~may be either normal or should be-~~ (fish-hook arrows ~~only~~), either with or without an oval symbolizing the central island, as shown in Figure ~~3C-2-3C-2-~~(CA).

07 Ovals with the arrows should only be used for left lane and single lane approaches to the roundabout.

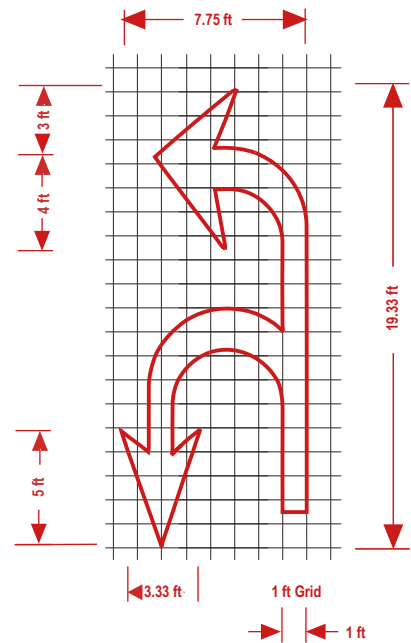
Figure 3B-24 (CA). Examples of Standard Arrows for Pavement Markings (Sheet 2 of 8)



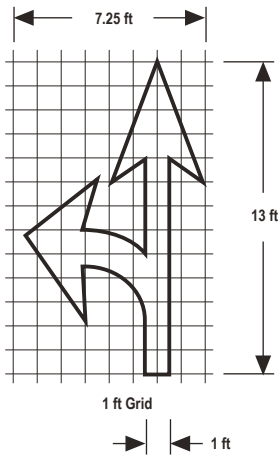
TYPE V ARROW



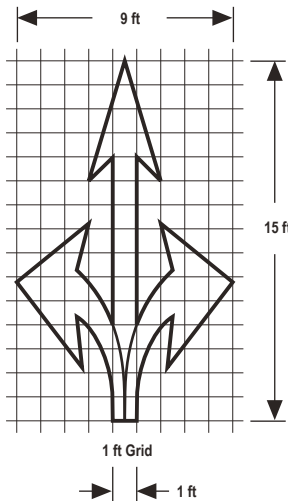
TYPE VI ARROW
RIGHT LANE DROP ARROW
(FOR LEFT LANE,
USE MIRROR IMAGE)



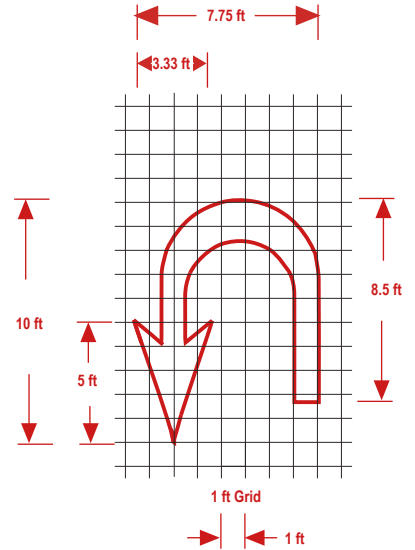
TYPE IX ARROW



TYPE VII (L) ARROW
(FOR TYPE (R) ARROW, USE MIRROR IMAGE)



TYPE VIII ARROW



TYPE X ARROW

NOT TO SCALE

NOTE: The design details for various arrows are also shown in Department of Transportation's Standard Plans.

Figure 3C-2. Lane-Use Arrow Pavement Marking Option for Roundabout Approaches

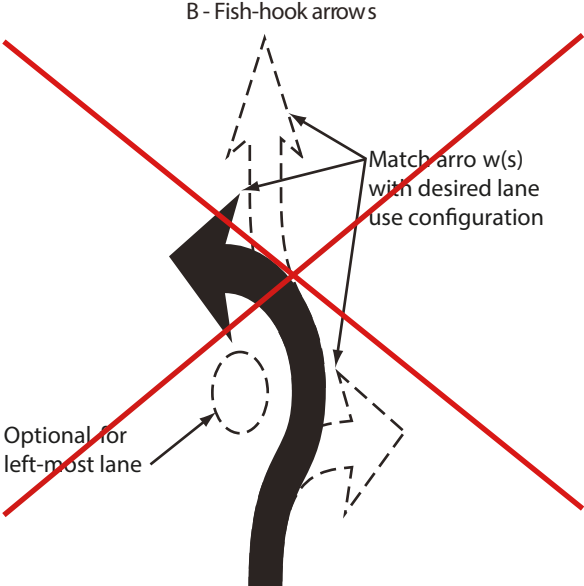
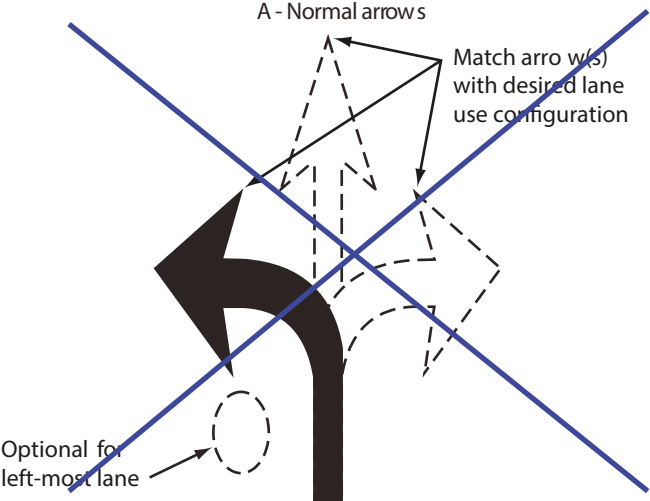
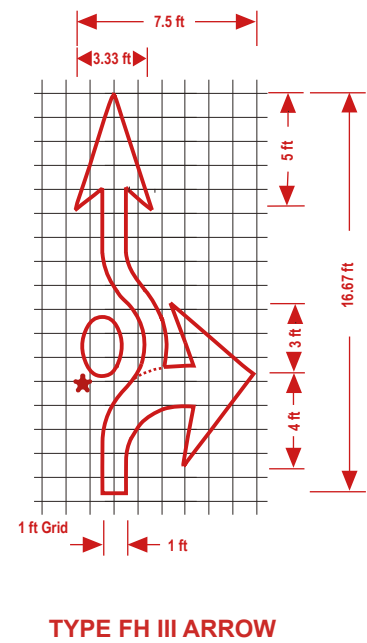
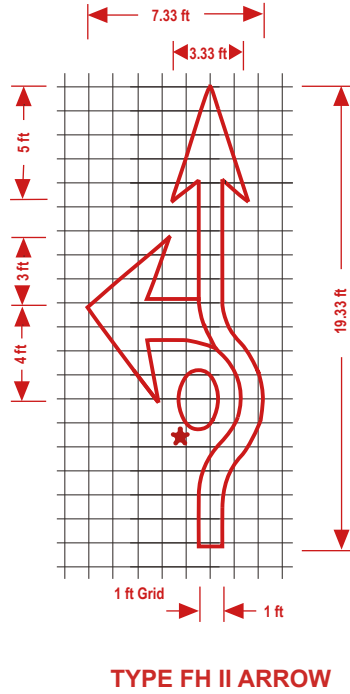
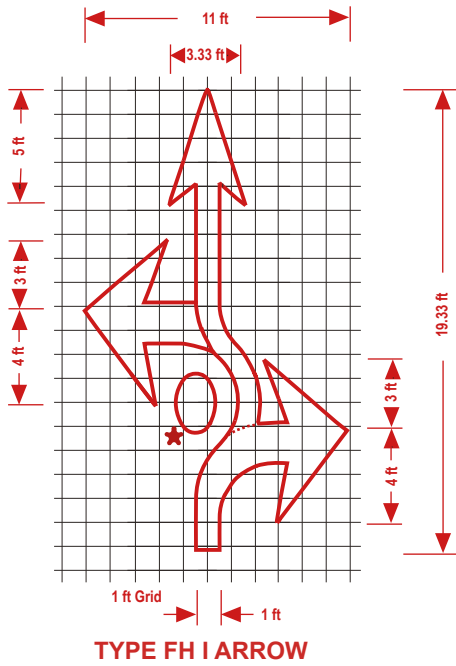
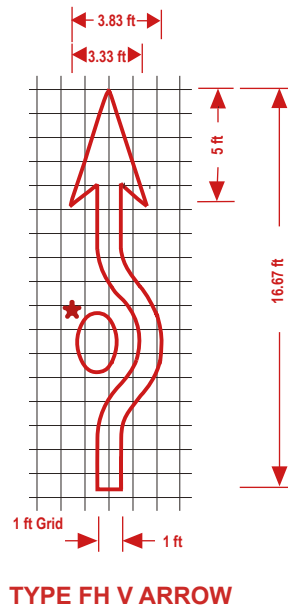
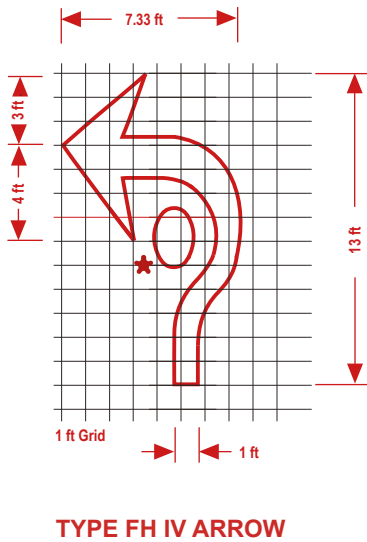


Figure 3C-2 (CA). Lane - Use Arrow Pavement Marking Option for Roundabout Approaches

A- Optional Lane Use Circular Arrows



B- Mandatory Lane Use Circular Arrows



★ Ovals with the arrows should only be used for left lane and single lane approaches to the roundabout.

NOT TO SCALE

NOTE: The design details for various arrows are also shown in Department of Transportation's Standard Plans.

Figure 3C-4. Example of Markings for a Two-Lane Roundabout with One- and Two-Lane Approaches (Sheet 1 of 2)

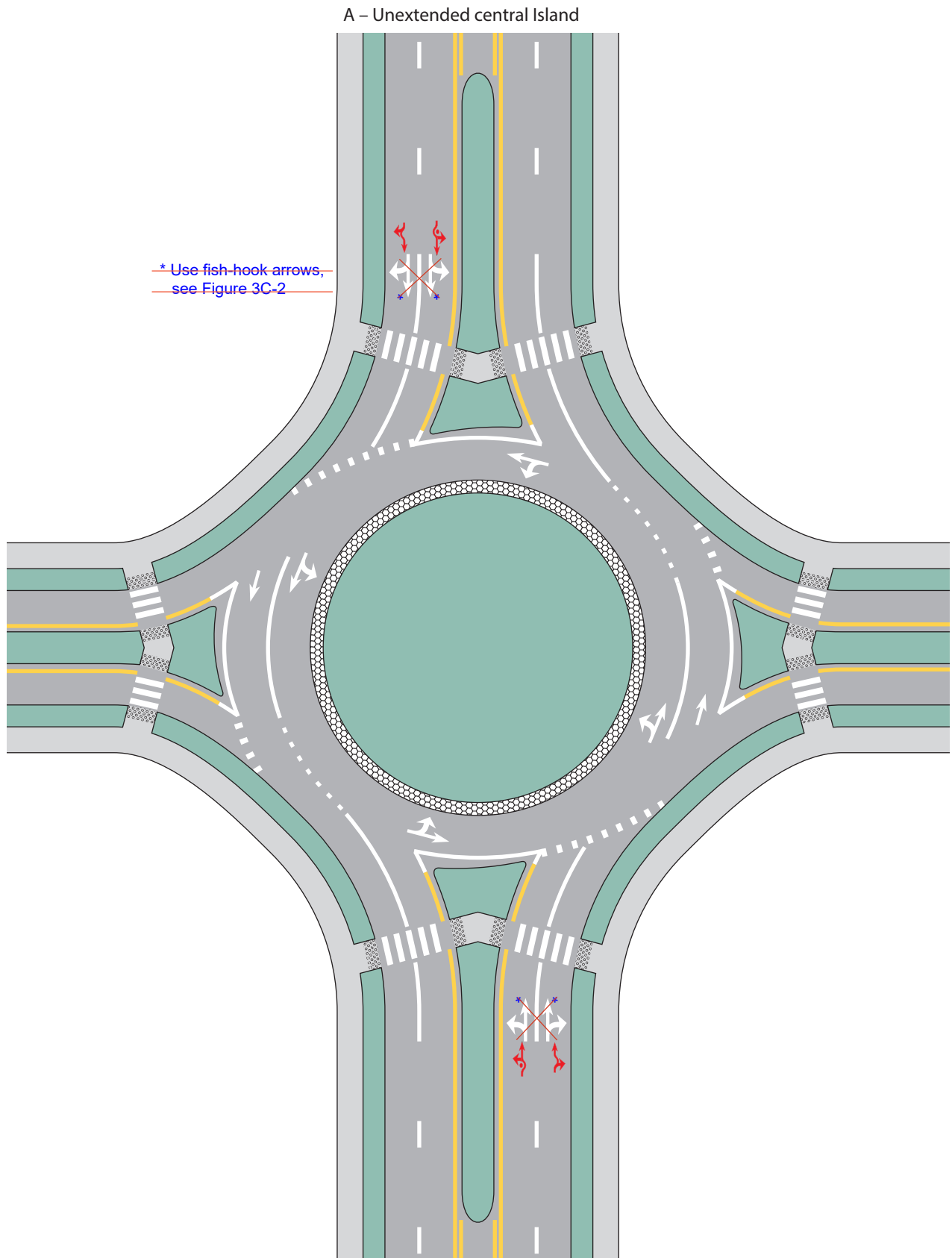
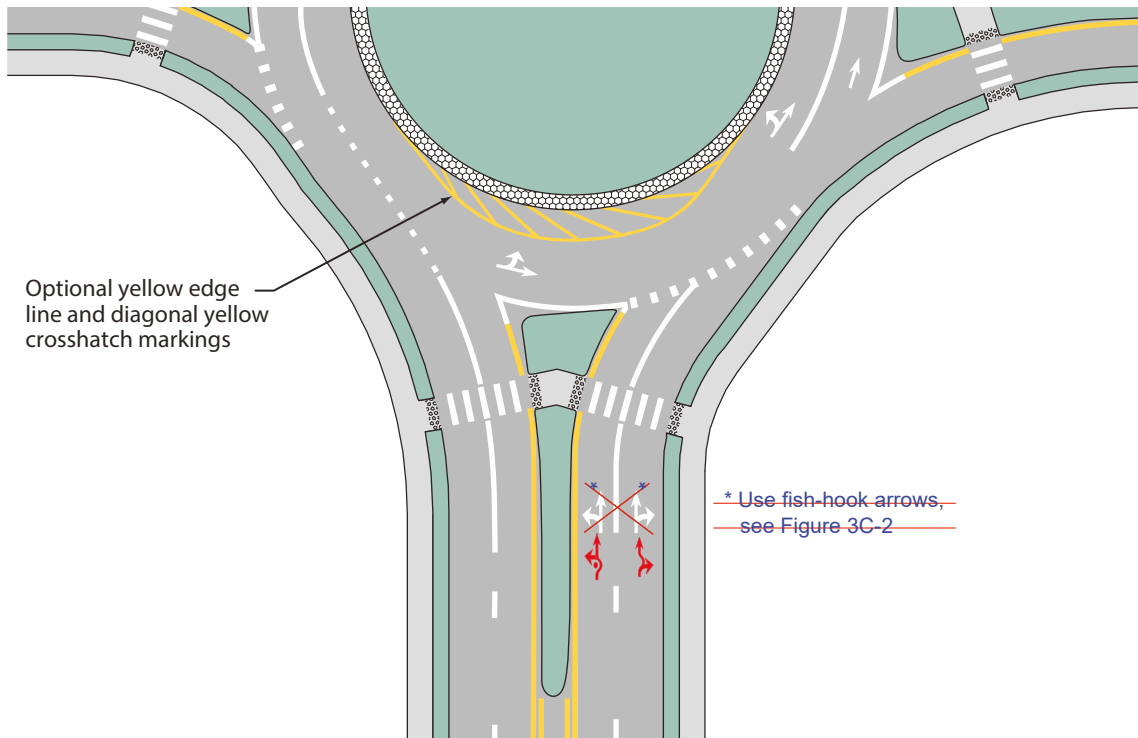


Figure 3C-4. Example of Markings for a Two-Lane Roundabout with One- and Two-Lane Approaches (Sheet 2 of 2)

B – Central island extended by pavement markings



C – Central island extended by a truck apron

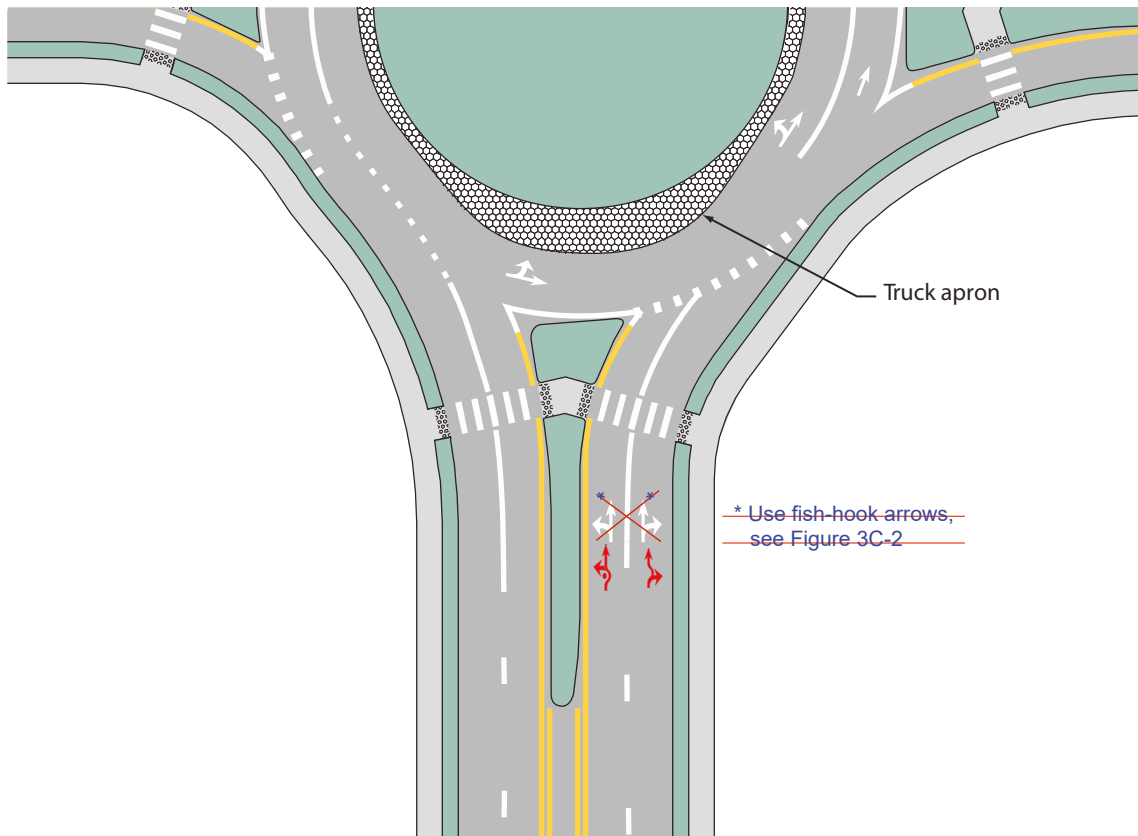


Figure 3C-5. Example of Markings for a Two-Lane Roundabout with One-Lane Exits

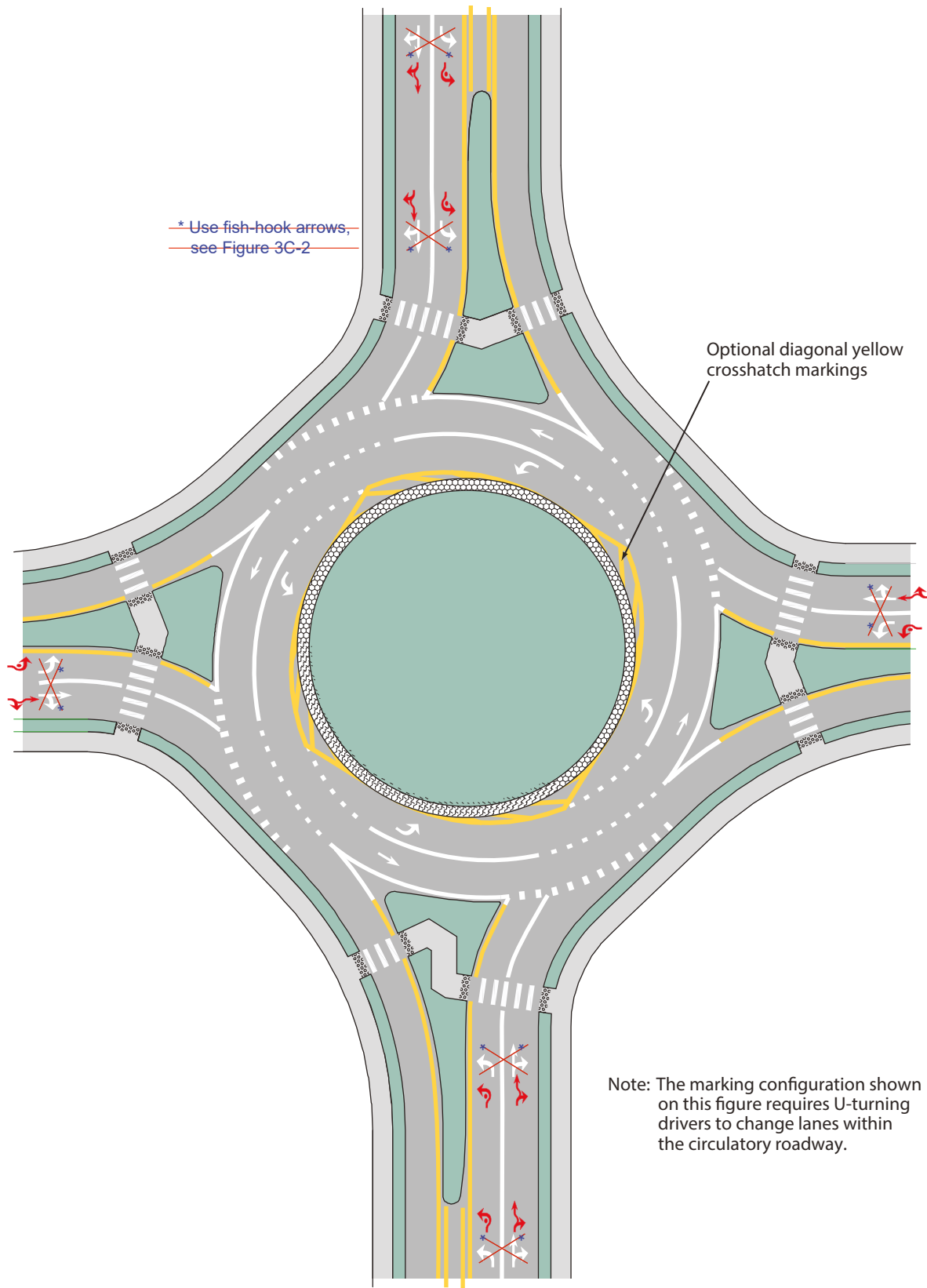


Figure 3C-6. Example of Markings for a Two-Lane Roundabout with Two-Lane Exits

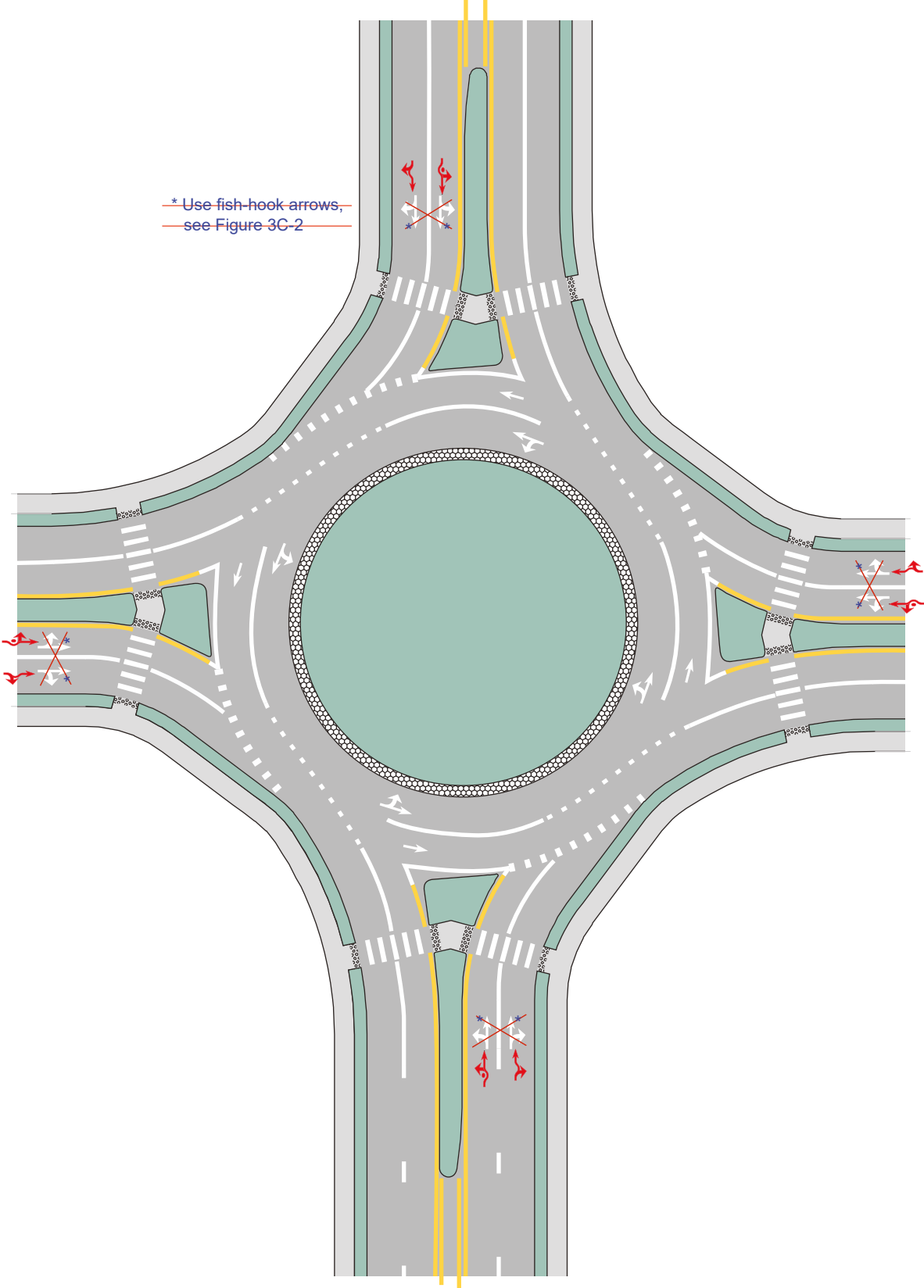


Figure 3C-7. Example of Markings for a Two-Lane Roundabout with a Double Left Turn

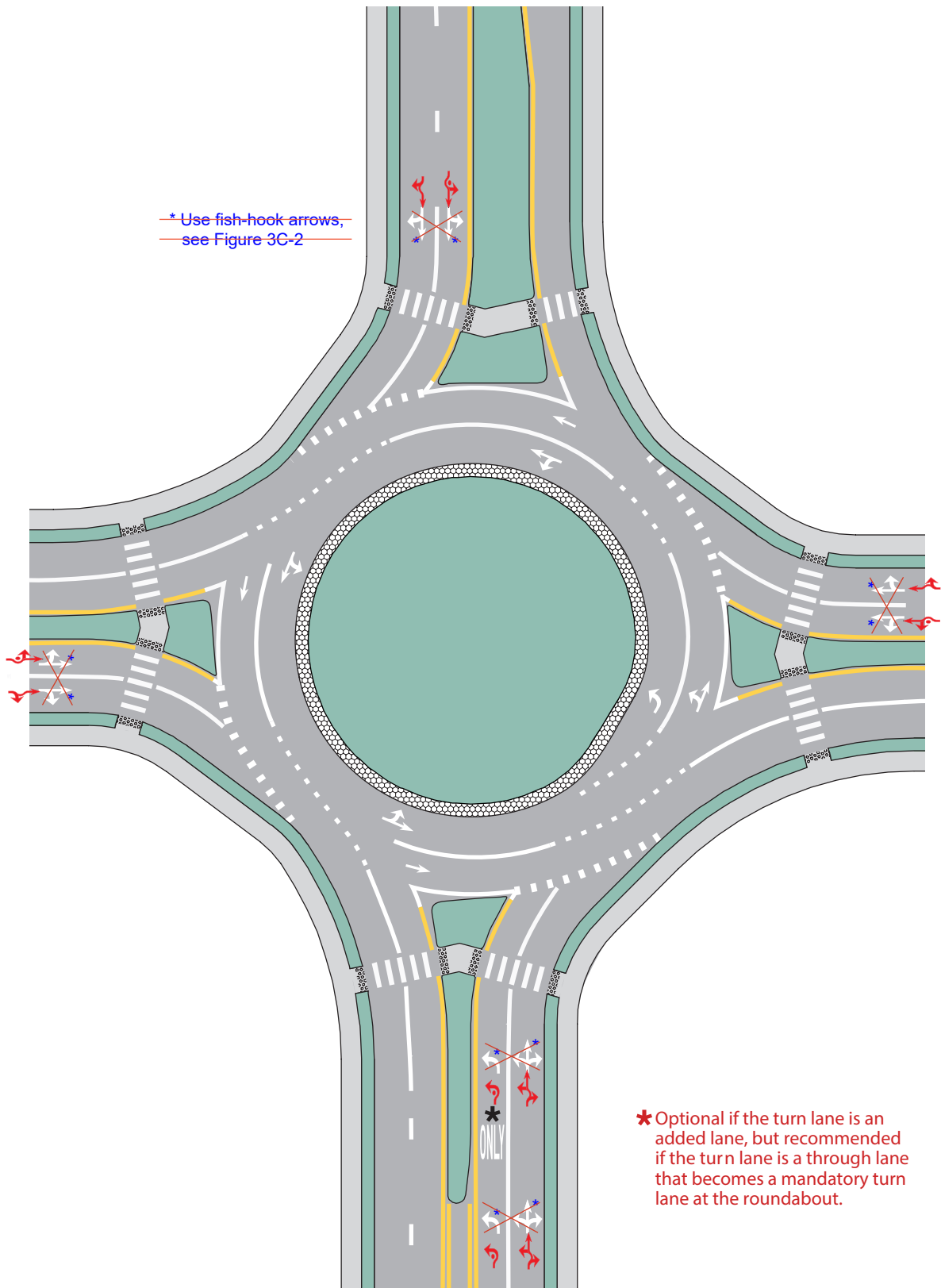


Figure 3C-8. Example of Markings for a Two-Lane Roundabout with a Double Right Turn

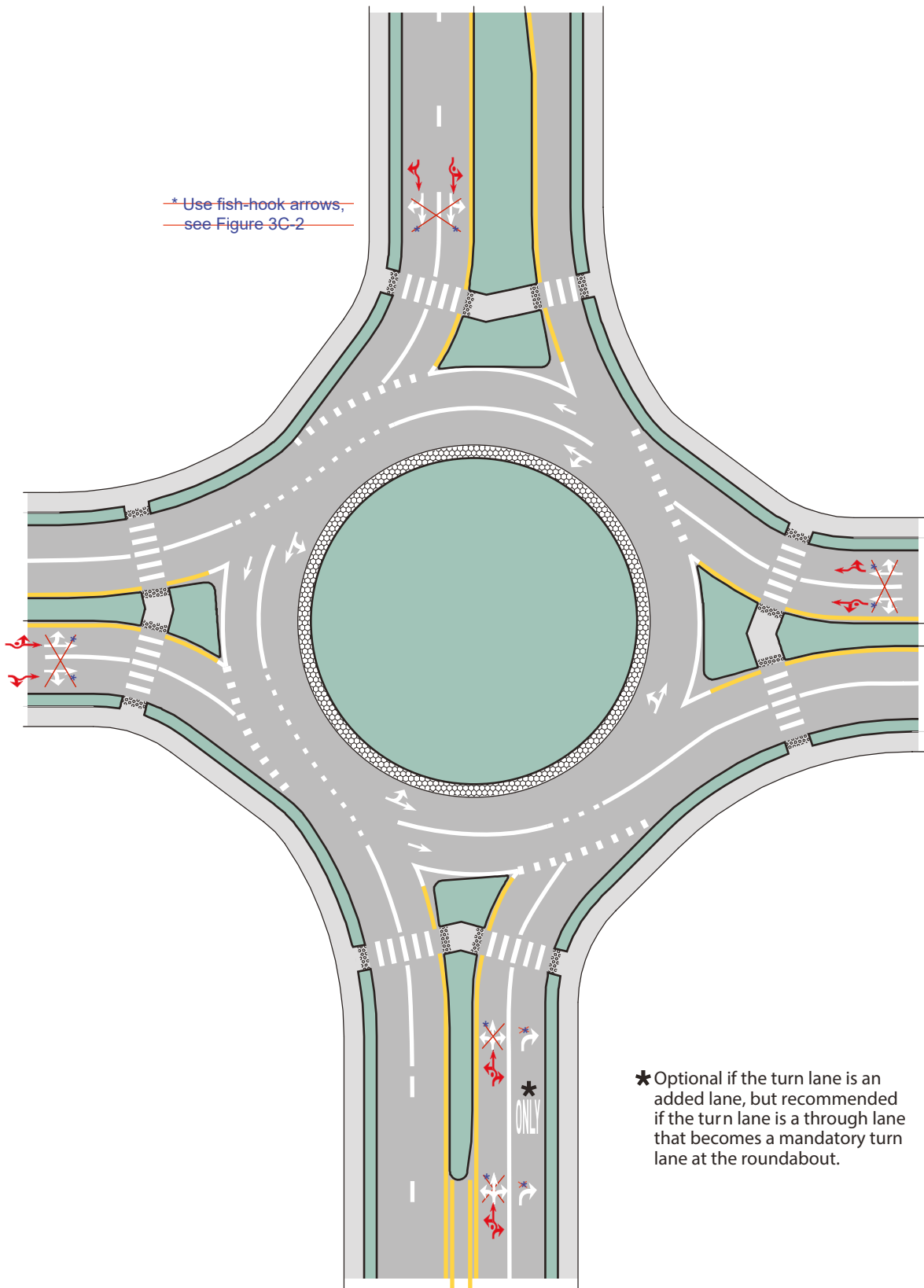


Figure 3C-9. Example of Markings for a Two-Lane Roundabout with Consecutive Double Left Turns

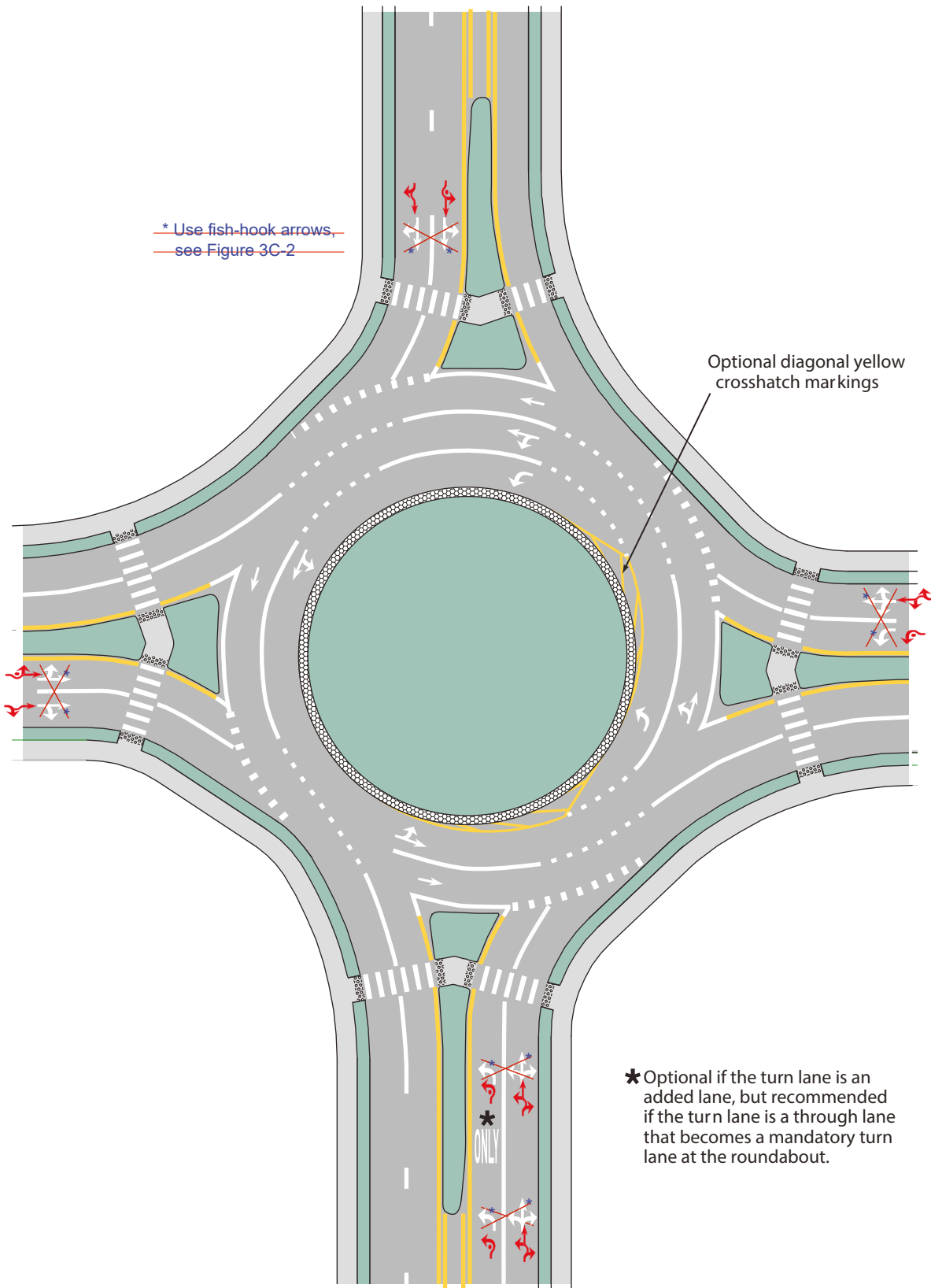


Figure 3C-10. Example of Markings for a Three-Lane Roundabout with Two- and Three-Lane Approaches

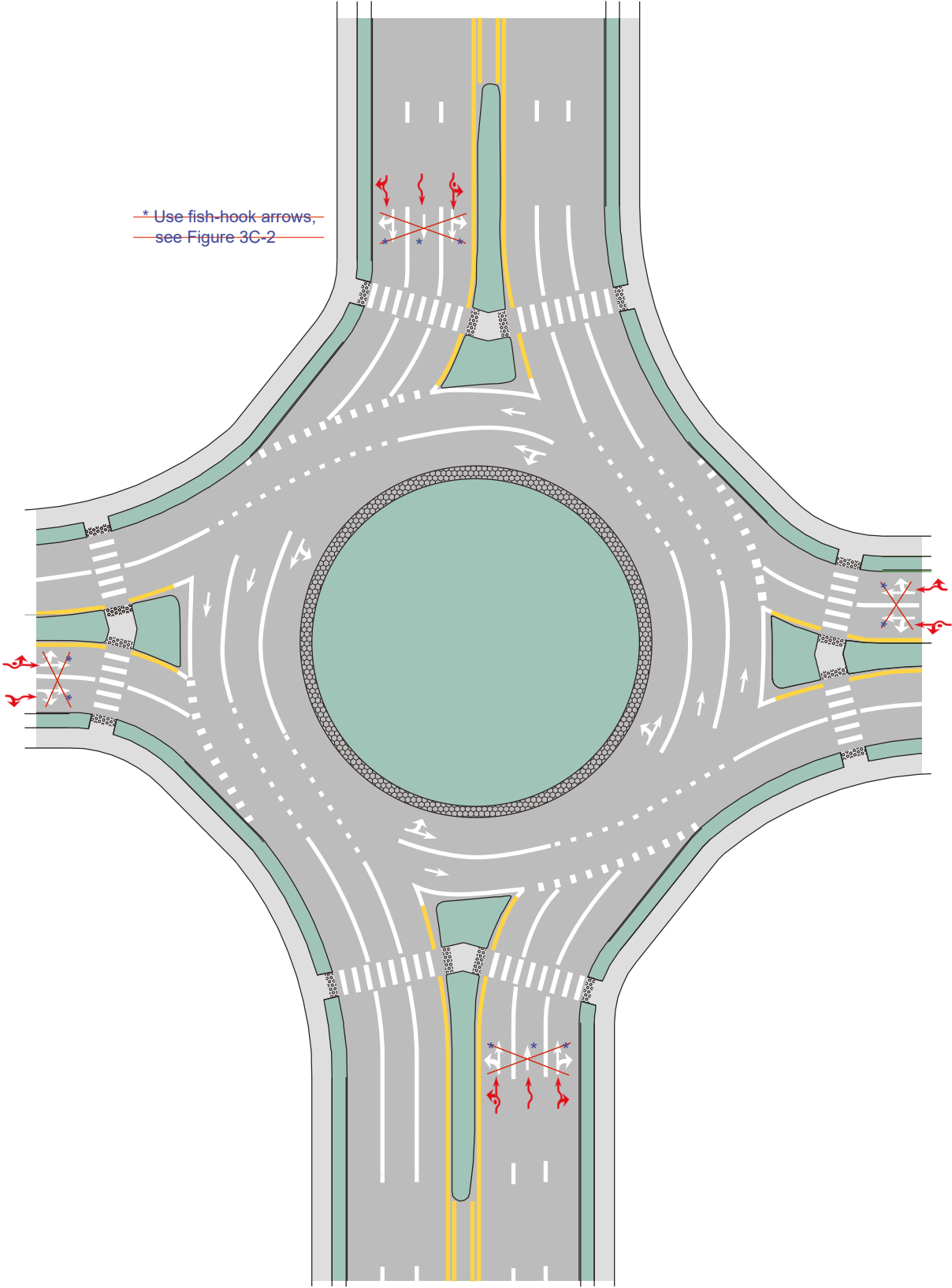


Figure 3C-11. Example of Markings for a Three-Lane Roundabout with Three-Lane Approaches

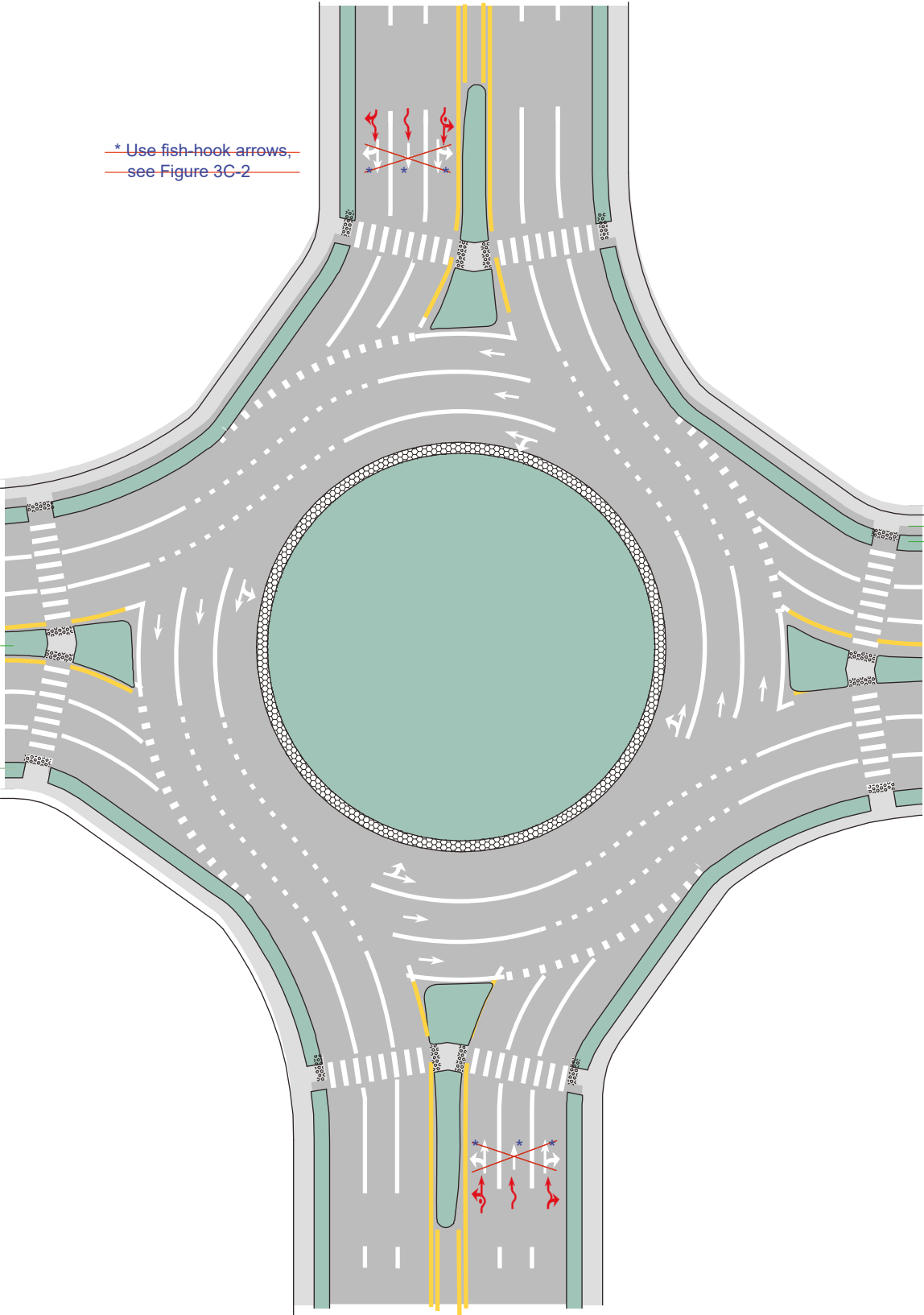


Figure 3C-12. Example of Markings for a Three-Lane Roundabout with Two-Lane Exits

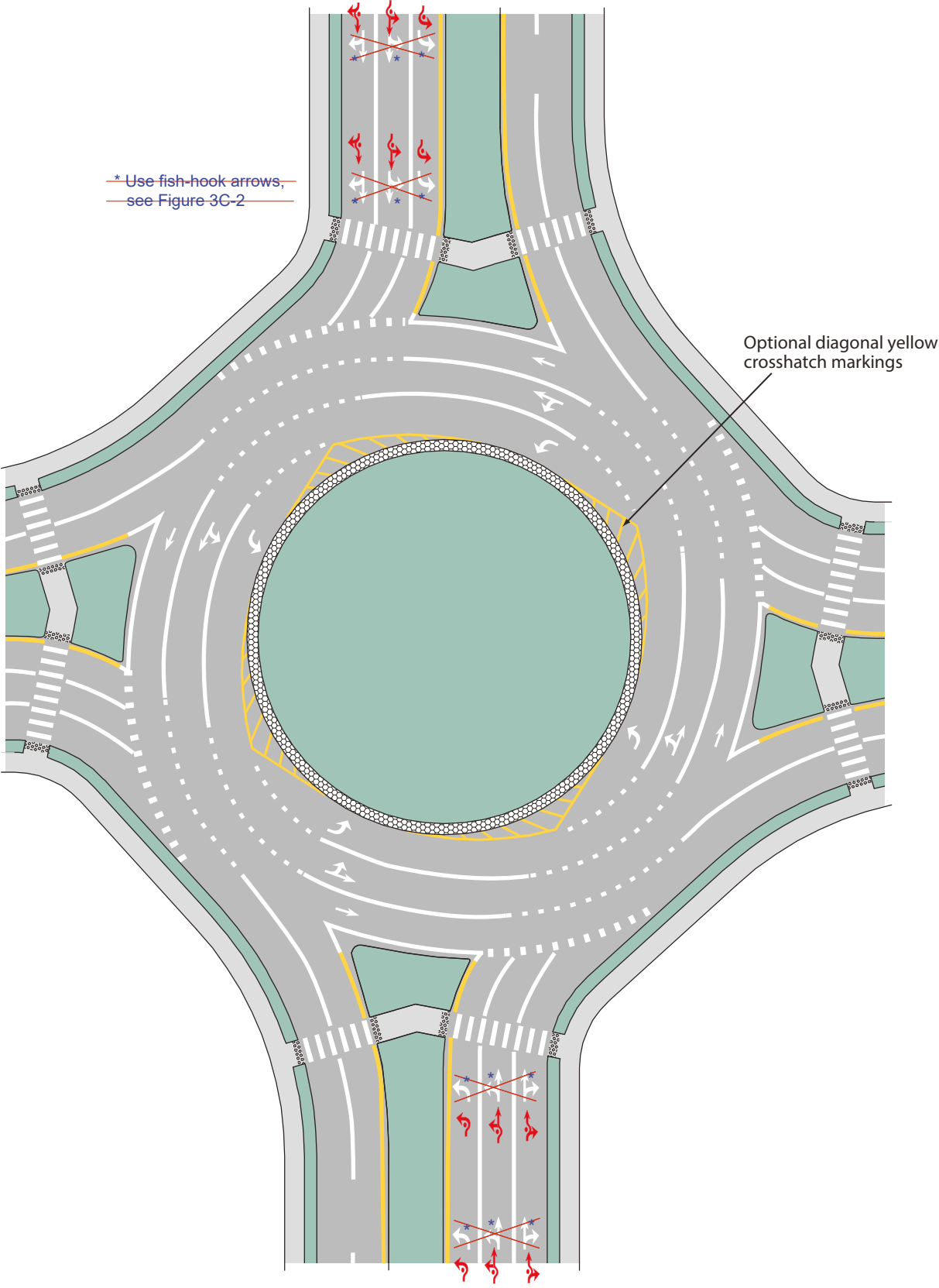


Figure 3C-13. Example of Markings for Two Linked Roundabouts

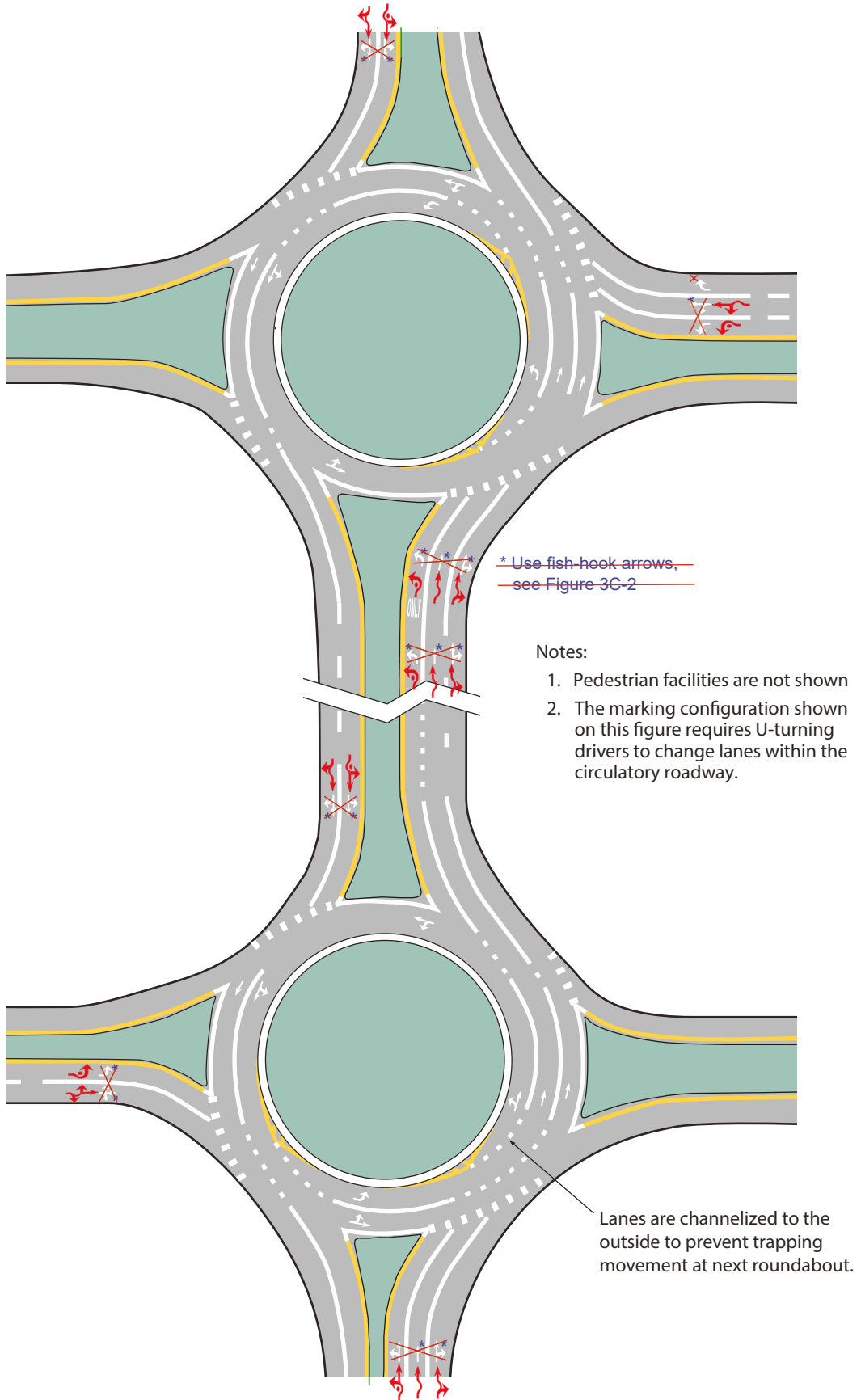


Figure 3C-14. Example of Markings for a Diamond Interchange with Two Circular-Shaped Roundabout Ramp Terminals

