



**Department of
Transportation**

transportation.ohio.gov

DISTRICT 3 ROUNDABOUT REFERENCE PACKET

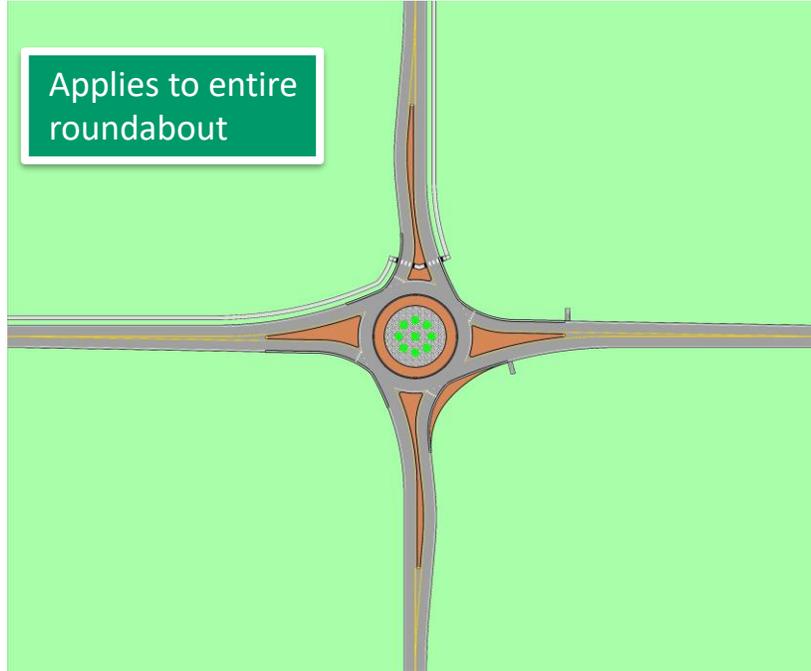
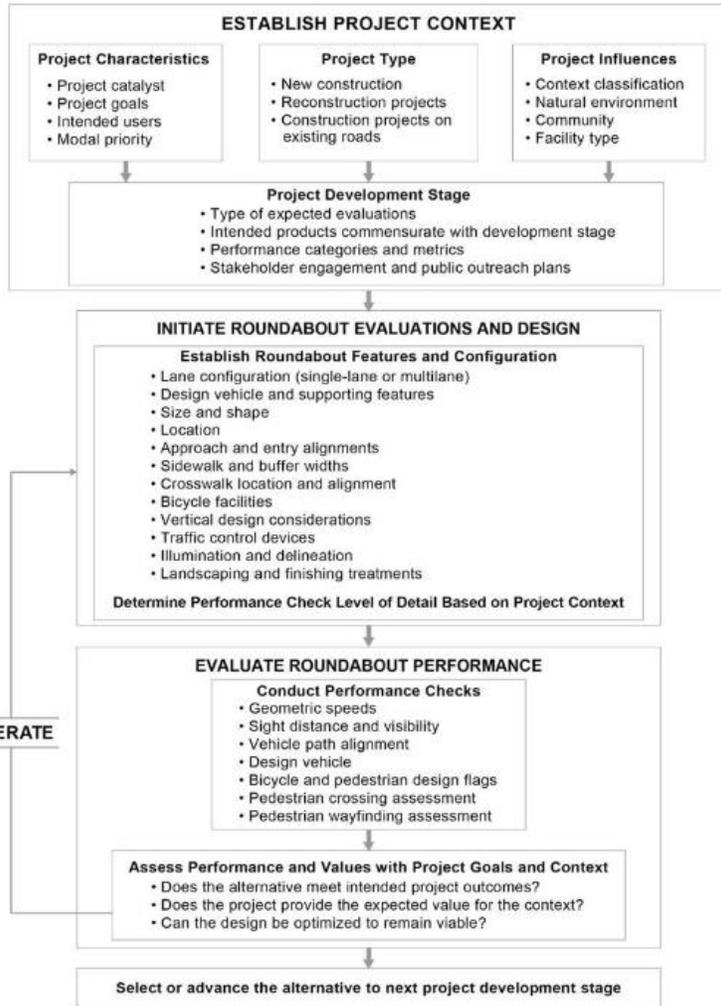
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GEOMETRIC DESIGN METHOD

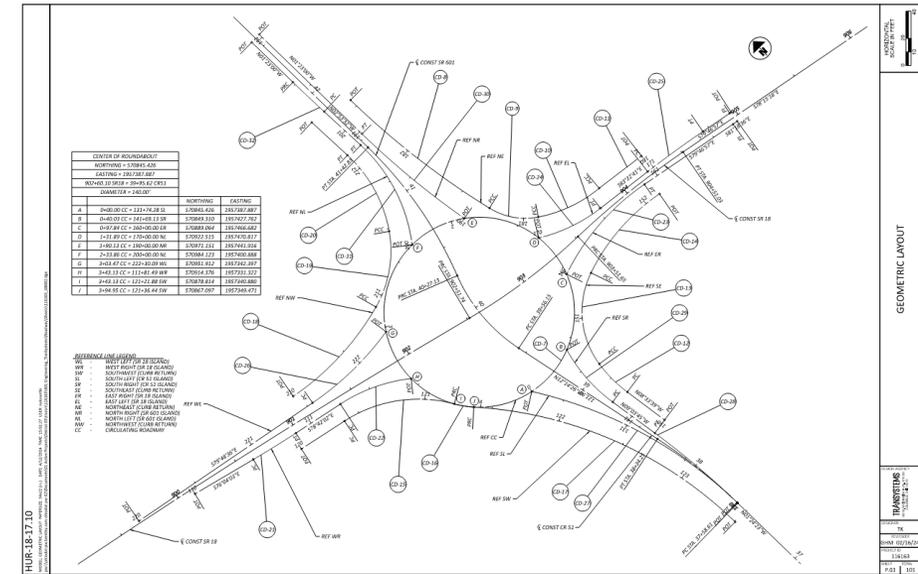
Roundabout Design Process



Supplemental Plan Items *

- Completed performance check evaluation form (Location and Design Manual, Volume 1, Figure 403-2)
- * To be provided with plans at first design submittal (Feasibility Study, AER, Geometric Submittal, Stage 1, etc.) and when any design changes warrant re-running performance checks

Plan Details



- By Stage 2, provide geometric layout sheet(s) in plans showing:
 - Curve data (radius, length, PI, delta, begin of curve northing/easting, end of curve northing/easting, etc.) for all roundabout curves for both sides of splitter island and exterior curbing (at edge of pavement)
 - Station equations where all baselines meet Inscribed Circle (ICD) baseline
 - Diameter and northing/easting of center of ICD
- Provide one proposed profile per baseline for each side of splitter island and at ICD

GEOMETRIC DESIGN METHOD

Design References

- NCHRP 1043 Chapters 9 and 10
- Location and Design Manual, Volume 1, Section 403

Designer Notes

- District preference is to use radial/tapered approaches (*NCHRP 1043 Exhibit 10.107*) as opposed to chicane approaches (*Location and Design Manual, Volume 1, Section 403.4.1*)
- Where existing intersection is heavily skewed or has offset intersections, evaluate the use of a non-circular roundabout shape (oval, peanut, etc.) versus re-aligning the minor roadways to achieve acceptable phi angle and roundabout performance checks
- Provide smallest roundabout size to adequately accommodate design vehicle and fastest path analysis. Check intersection sight distance of roundabout when developing roundabout geometry. For information regarding ICD size and roundabout performance checks, refer to Location and Design Manual, Volume 1, Section 403 and “Design and Check Vehicle” section in the D3 roundabout design reference packet.
- When developing roundabout geometry, consider the existing site including utilities, drainage patterns, existing topography/grade, and how project will meet into any existing superelevated curves near project tie-ins
- When pedestrian facilities aren’t present or planned, District preference is to **not** include island walkways or curb ramps
- Plan stationing
 - Avoid overlapping station ranges for all roundabout baselines
 - Set separate construction baseline from R/W centerline but match the stationing
- Recently constructed District 3 roundabout examples:
 - SR-601 at SR-18
 - SR-511 at US-20

Completed Photos

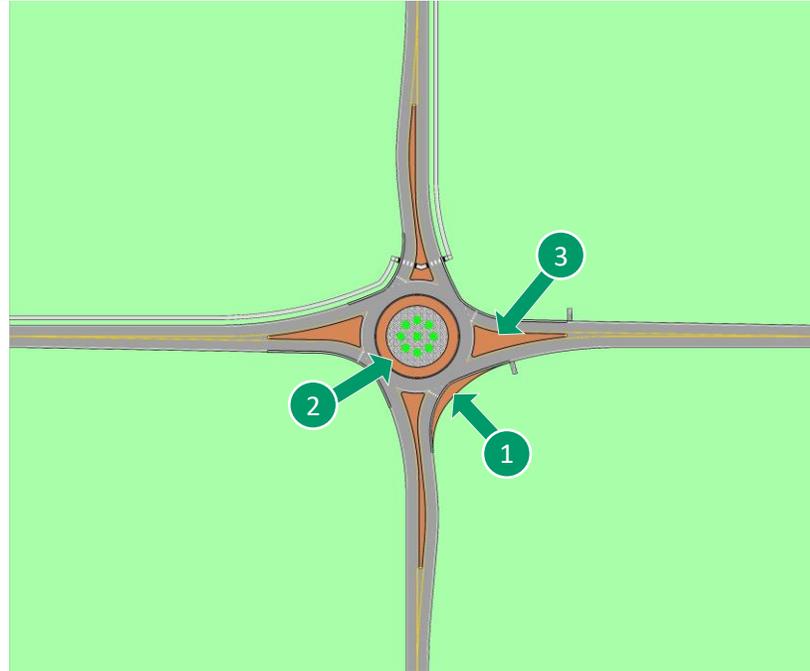


DESIGN AND CHECK VEHICLES

Application

Plan Details

- 1 Addition of Blister Island for Truck Turns**
Application: Add blister islands where design vehicle trailer off-tracks from pavement. Design roundabout such that truck cab stays within roadway pavement. See blister island section for more information.
- 2 Set Limits of Central Island - Landscaping and Truck Apron**
Application: Set truck apron width to accommodate design vehicle trailer. On Oversized/Overweight vehicle routes, central island may need to be mostly mountable. See Center Truck Apron section for more information
- 3 Set Limits of Splitter Island**
Application: Typically set splitter island 1' from edge line, but consider increasing offset of splitter island to edge line at single lane approaches where truck swept path encroaches into splitter island:



Supplemental Plan Items *

- Truck swept path analysis document, showing proposed roundabout design with truck turn movements shown using AutoTurn software

* To be provided with plans at first design submittal (Feasibility Study, AER, Geometric Submittal, Stage 1, etc.) and when any design changes warrant re-running performance checks



DESIGN AND CHECK VEHICLES

Design References

- Location and Design Manual, Volume 1, Sections 401.9, 403.4.4, 403.5.1
- NCHRP 1043 section 9.7.1

Designer Notes

- Design vehicle cab should stay on roadway pavement and not encroach onto any mountable features or truck apron(s)
- District preference is design vehicle: WB-62 design vehicle. Check vehicle(s): WB-67 plus:
 - Oversize/Overweight Vehicle: Per project scope. Contact D3 for design vehicle template
 - Farm equipment (from Location and Design Manual, Volume 1, Section 403): Any rural routes
 - Other unique check vehicles: Per project scope
- For clarity on the truck swept path exhibits, place conflicting truck movements on separate sheets. Swept path exhibits should show curb, splitter islands, driveways, light poles, signs and any other proposed or existing (to remain) vertical features
- Except at splitter island nose and as otherwise noted in the splitter island section of this roundabout reference packet, splitter islands should not be mountable, especially where pedestrian crossings are planned.
- Where noted in scope, extend truck apron to accommodate oversized/overweight vehicles:



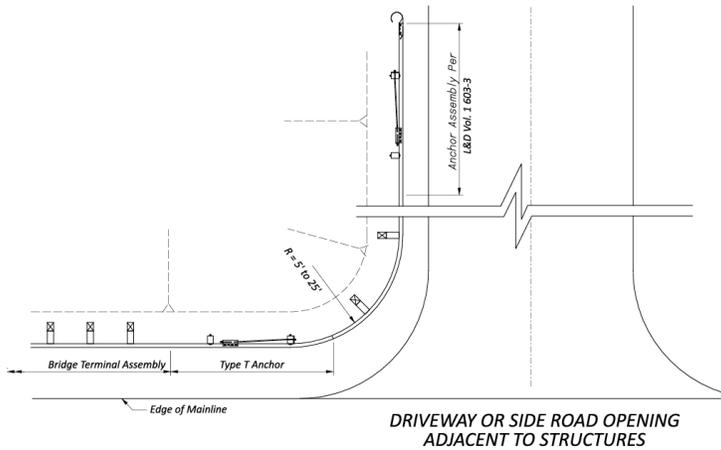
Completed Photos



CLEAR ZONE AND HORIZONTAL OFFSETS

Application

- 1 **MGS-4.3**
Application: Guardrail breaks at driveways



Applies to entire project

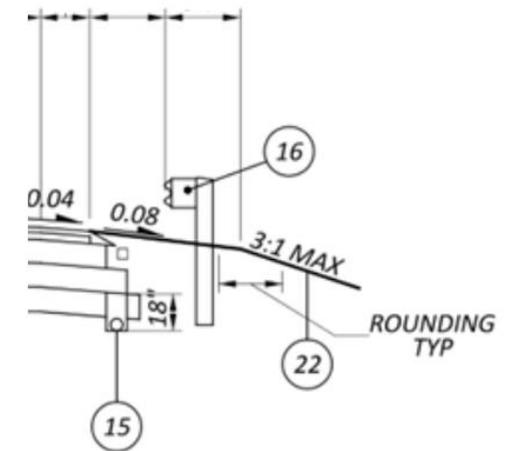


Plan Notes

- Any pertinent sample plan notes for guardrail type and anchor assemblies from Location and Design Manual, Volume 1, Appendix B shall be included in the construction plans

Plan Details

- Guardrail: All pertinent MGS-series [ODOT SCDS](#)
- Lighting: See lighting section of the D3 roundabout reference design packet
- Signing: See signing section of the D3 roundabout reference design packet
- Show guardrail location and offset from shoulder or back of curb to face of guardrail in typical sections:



CLEAR ZONE AND HORIZONTAL OFFSETS

Design References

- Location and Design Manual, Volume 1, sections 301.2, 403.7.2, 601.1, 602.1, 905.3.3

Designer Notes

- Confirm guardrail, signs, light poles and any other fixed features are not impacted by the design and check vehicle turning movements under normal operation
- Clear zone at roundabout, refer to Location and Design Manual, Volume 1, section 600.1
- Guardrail placement:
 - Without curb present: place as far back as allowable per Location and Design Manual, Volume 1, Figure 301-3
 - With curb: place per Location and Design Manual, Volume 1, section 602.1.5
 - Check that guardrail placement does not impede sight distance
- Light pole placement: 8' minimum, 10' preferred, not in a ditch, and 15' minimum from overhead electric. See lighting section of the D3 roundabout reference design packet for more information.
- Set central mound slopes and landscaping to meet Location and Design Manual, Volume 1, section 905.3.3. Central island to be mountable where needed for Oversized/Overweight vehicles (see the design and check vehicle section of D3 roundabout reference packet)
- Grading preference (in order of most preferred to least):
 1. Safety grading (no guardrail)
 2. Common grading (4:1 foreslope and 3:1 backslope, no guardrail)
 3. Barrier grading (2:1 foreslope and backslope, guardrail)
 4. Retaining wall (evaluate cost of wall versus R/W acquisition)

Completed Photos

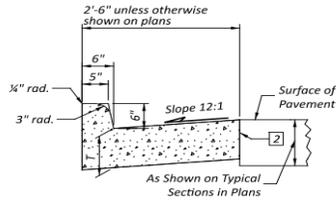


EXTERIOR CURBING

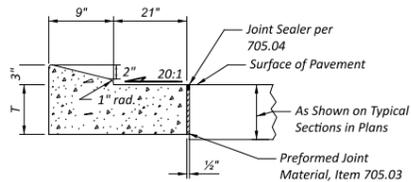
Application

Plan Details

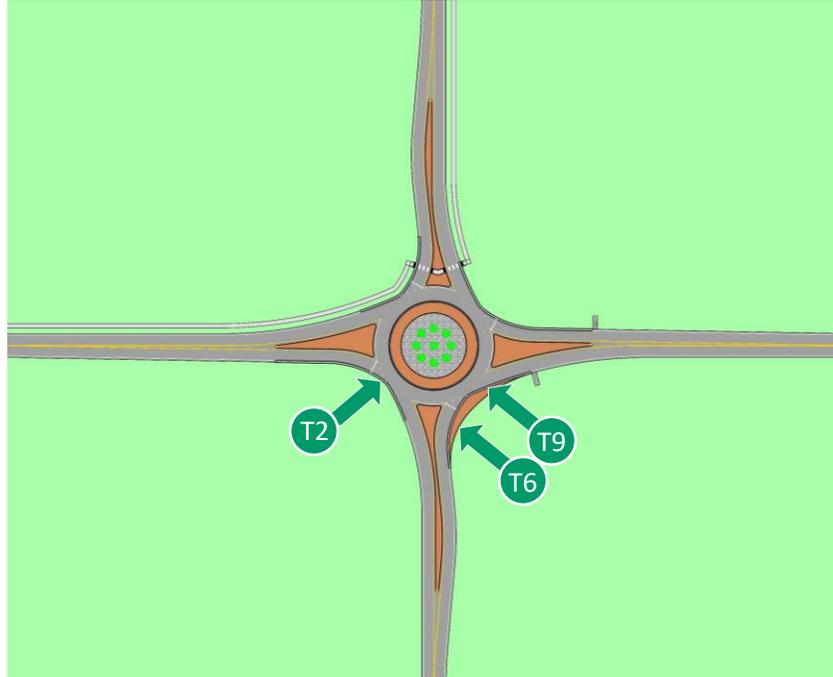
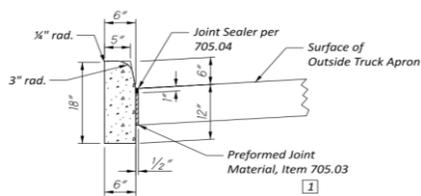
- T2** Item 609 – Combination Curb and Gutter, Type 2
Application: exterior non-mountable curbing



- T9** Item 609 – Combination Curb and Gutter, Type 9, As Per Plan
Application: exterior mountable for outside truck apron

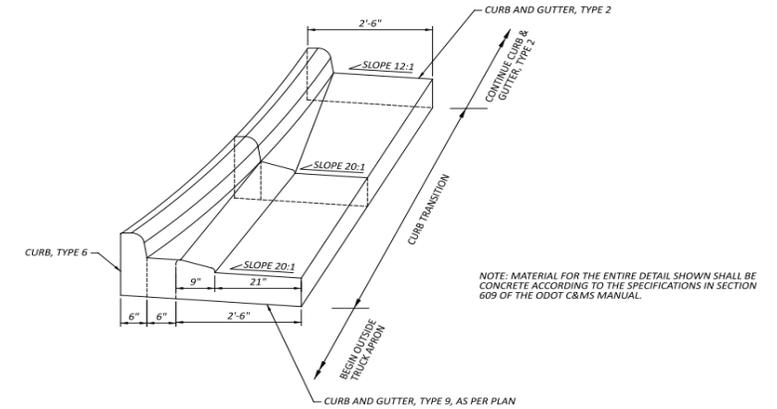


- T6** Item 609 – Curb, Type 6
Application: back of outside truck apron

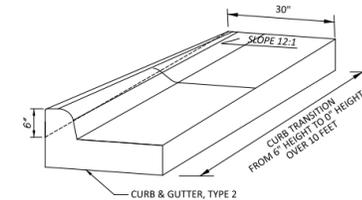


Plan Notes

- Follow SCD's and C&MS
- Item 609 – Combination Curb and Gutter, Type 9, As Per Plan: This item shall be in accordance with SCD BP-5.1 and the ODOT C&MS, with modifications to the gutter width and slope as shown in the detail on this sheet.



C OUTSIDE TRUCK APRON CURB TRANSITION DETAIL



A CURB AND GUTTER TRANSITION
NOT TO SCALE

EXTERIOR CURBING

Design References

Location and Design Manual, Volume 1, Section 403.6.10 - Curbing: Roundabout Curbing
SCD BP-5.1: https://www.dot.state.oh.us/SCDs/Roadway/BP-5.1_2025-01-17.pdf

Designer Notes

- Preference to accommodate truck over-tracking to the outside of the roundabout with outside truck aprons (“blister islands”). Agricultural equipment over-tracking is accommodated to the inside by providing a sloped splitter island nose as described in the SPLITTER ISLAND section.
- Exterior curb limits
 - Approaching the roundabout
 - With approaching chicaned curves: begin outside curb and gutter at the beginning of the entry radius.
 - With radial approach: Begin outside curb and gutter at the beginning of the splitter island.
 - Exiting the roundabout
 - End outside curb and gutter 20 feet from the exit of the circulatory roadway OR to the crosswalk, whichever is further.
 - The approach and trailing ends of curbs should be tapered from the curb height to 0” over 10 feet per Section 305.4.1 of the L&D Vol. 1 and the detail below.
 - Longitudinal slopes: The longitudinal slope of outside curbs should have a 0.5% minimum slope to convey runoff.

Completed Photos



US 250 and Faultless Dr, Ashland County, Ohio (Source: Google Maps Streetview)

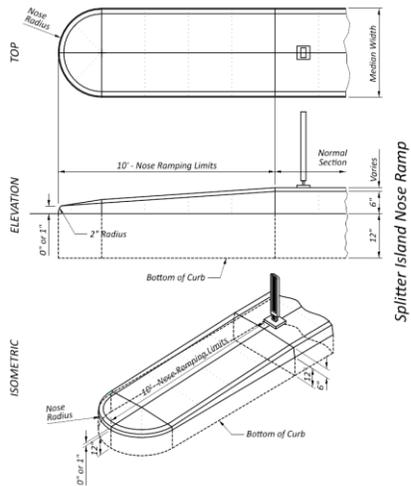


US 250 and Faultless Dr, Ashland County, Ohio (Source: Google Maps Streetview)

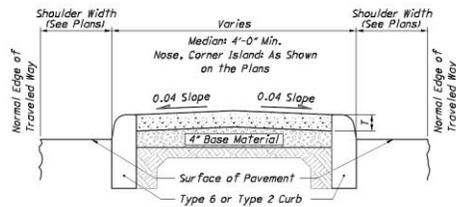
SPLITTER ISLANDS

Application

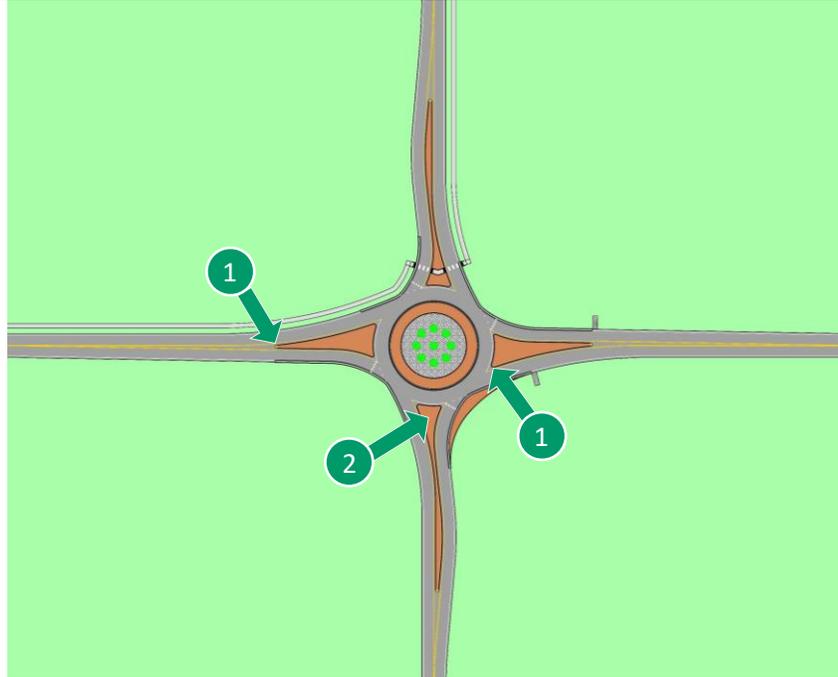
- 1 **RM-3.1 Modified with 1" height**
 Application: splitter island nose and corners at circulating roadway



- 2 **Concrete Median/Corners with Curb**
 Application: all splitter islands



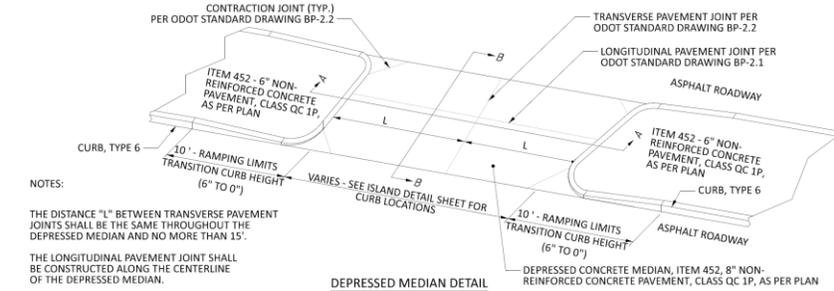
CONCRETE MEDIANS/CORNERS WITH CURB



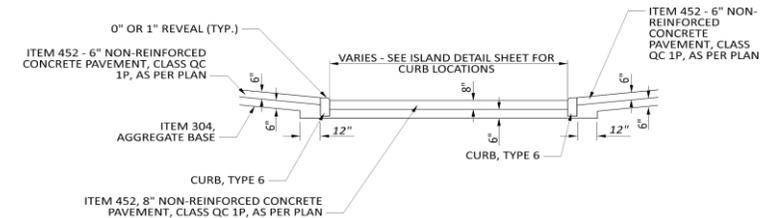
Plan Notes

- Item 452 – 6" Non-Reinforced Concrete Pavement, Class QC 1P, As Per Plan (see following page)
- Item 620 – Delineator, Misc.: High Intensity Retro-Reflective Island Bullnose Marker (see following page)

Plan Details

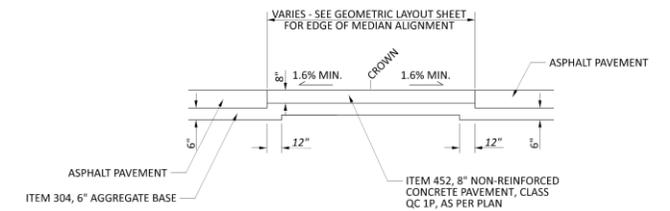


DEPRESSED MEDIAN DETAIL



SECTION A-A, DEPRESSED MEDIAN CROSS SECTION
 NOT TO SCALE

SECTION A-A, DEPRESSED MEDIAN CROSS SECTION
 NOT TO SCALE



SECTION B-B, DEPRESSED MEDIAN CROSS SECTION
 NOT TO SCALE

SPLITTER ISLANDS

Plan Notes

Item 452 – 6” Non-Reinforced Concrete Pavement, Class QC 1P, As Per Plan:

This work shall consist of constructing concrete including a stain coloring for the roundabout truck apron and splitter islands

Materials:

- A. Concrete shall be in accordance with the plans and section 452 of the ODOT Standard Specifications. Do not comply with the requirements of 451.14. Concrete shall be class QC 1P.
- B. The concrete color shall be “Brick Red” as manufactured by Bomanite or approved equal; Phone 303-369-1115, E-mail info@Bomanite.com or www.Bomanite.com.
- C. Colored concrete will be an integral coloring application, with coloring additives mixed in accordance with manufacturer’s instructions. Mix until color additives are uniformly dispersed throughout mixture. Color shall be uniform throughout concrete.
- D. Curing compound for colored concrete: Curing compound shall comply with ASTM C309 and be approved by additive manufacturer for use with colored concrete. Provide JS clear coat sealer or approved equal on all surfaces.
- E. Admixtures: Do not use calcium chloride admixtures.

Construction Requirements:

- A. Prepare subgrade and install colored concrete in accordance with the plans and section 452 of the ODOT Standard Specifications, except as noted herein.
- B. Finish: Colored concrete shall have a broomed finish. Pull broom across freshly floated concrete to produce texture indicated in straight lines perpendicular to main line of traffic. Do not dampen brooms. Roundabout truck aprons have a light broom finish.
- C. Curing: Apply curing compound for colored concrete in accordance with the manufacturer's instructions. Apply compound at consistent time for each pour to maintain close color consistency.
- D. Protect adjacent finished surfaces from splatters.
- E. Do not add water to concrete at job site. Fog or spray surface with water or put in pumps or onto tools or brooms.
- F. Do not apply color additives meant for integral coloring to surface of concrete.

Payment will include the cost of furnishing and placing all of materials, finishing, and testing.

Item 620 – Delineator, Misc.: High Intensity Retro-Reflective Island Bullnose Marker:

The contractor shall use a high intensity retro-reflective island surface mounted bullnose marker, with a minimum of 224 square inches of solid yellow reflective sheeting on each side with a range of 28 inches to 42 inches in height. The marker shall lay flat to the pavement when driven over and rebound to perpendicular. Distribution of said product shall come from one of the following distributors: Qwick Kurb Inc (L104 Air Maker), National Traffic Signs Inc (42 HIGHVIS-W-SM-DS), and Flexstake Inc. (SM 700 Series).

Payment shall be at the unit price bid, each, for item 620 - Delineator, Misc.: High Intensity Retro-Reflective Island Bullnose Marker. This item shall include all labor, materials, equipment, and all pertinent items needed to perform the above work.



SPLITTER ISLANDS

Design References

Location and Design Manual, Volume 1, Section 403.6.9 – Splitter Islands
SCD RM-3.1: https://www.dot.state.oh.us/SCDs/Roadway/RM-3.1_2018-07-20.pdf

Designer Notes

- Agricultural equipment over-tracking is accommodated to the inside by providing a sloped splitter island nose and corners as shown on the first page of this section. Where applicable, depressed median edges should be sloped as well. Truck over-tracking is accommodated to the outside of the roundabout with outside truck aprons (“blister islands”) as described in the EXTERIOR CURBING section.
- Splitter islands shall utilize Item 609 – Curb, Type 6 and Item 452 – 6” Non-reinforced Concrete Pavement. They shall be a red color with a broomed finish.
- Delineation to be provided using Item 620 – Delineator, As Per Plan (Type D).
- Depressions for drive access are acceptable if alternative access is not feasible. When used, a depressed median island should follow the details prescribed on the previous page.
- Where pedestrian facilities are present or anticipated in the future, the minimum splitter island width at the crosswalk location shall be six feet.

Completed Photos



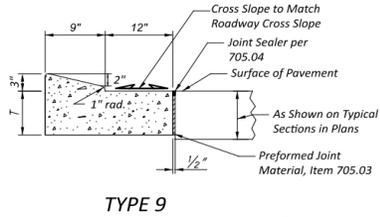
SR 18 and SR 601, Huron County, Ohio (Source: Google Maps Streetview)

TRUCK APRONS/BLISTER ISLANDS

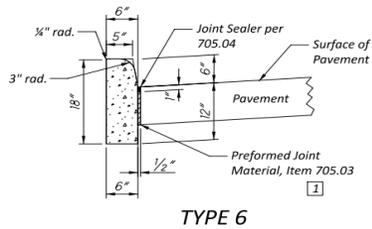
Application

Plan Details

- T9 Item 609 – Combination Curb and Gutter, Type 9
Application: interior mountable curbing

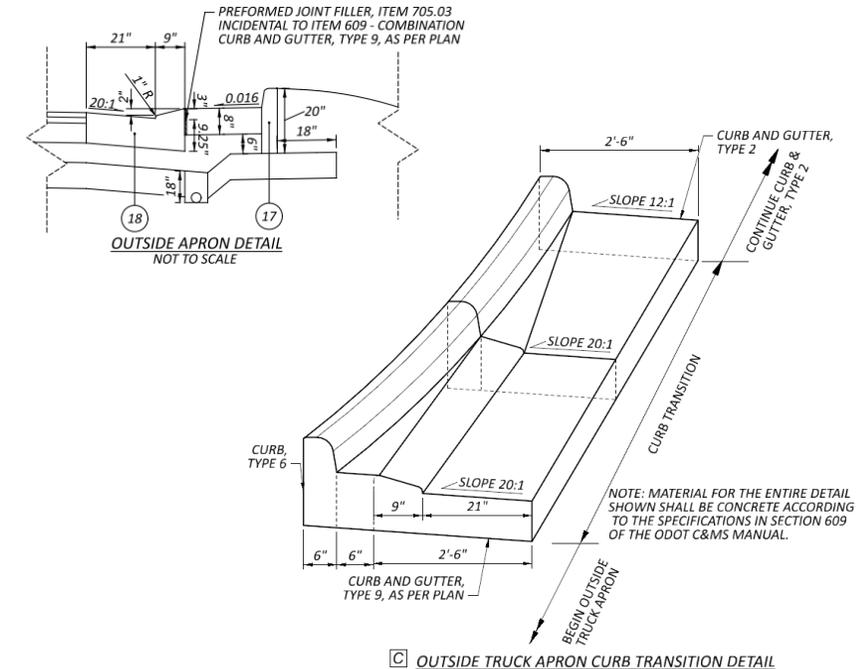
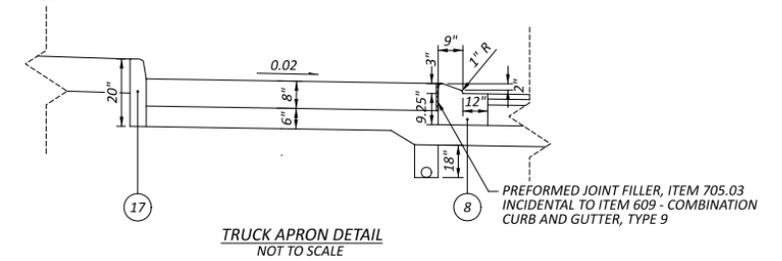


- T6 Item 609 – Combination Curb and Gutter, Type 6
Application: behind center truck apron and outside truck aprons ("blister islands")



Plan Notes

- Item 452 – 8" Non-Reinforced Concrete Pavement, Class QC 1P, As Per Plan (see following page)



TRUCK APRONS/BLISTER ISLANDS

Plan Notes

Item 452 – 8” Non-Reinforced Concrete Pavement, Class QC 1P, As Per Plan:

This work shall consist of constructing concrete including a stain coloring for the roundabout truck apron and splitter islands

Materials:

- A. Concrete shall be in accordance with the plans and section 452 of the ODOT Standard Specifications. Do not comply with the requirements of 451.14. Concrete shall be class QC 1P.
- B. The concrete color shall be “Brick Red” as manufactured by Bomanite or approved equal; Phone 303-369-1115, E-mail info@Bomanite.com or www.Bomanite.com.
- C. Colored concrete will be an integral coloring application, with coloring additives mixed in accordance with manufacturer’s instructions. Mix until color additives are uniformly dispersed throughout mixture. Color shall be uniform throughout concrete.
- D. Curing compound for colored concrete: Curing compound shall comply with ASTM C309 and be approved by additive manufacturer for use with colored concrete. Provide JS clear coat sealer or approved equal on all surfaces.
- E. Admixtures: Do not use calcium chloride admixtures.

Construction Requirements:

- A. Prepare subgrade and install colored concrete in accordance with the plans and section 452 of the ODOT Standard Specifications, except as noted herein.
- B. Finish: Colored concrete shall have a broomed finish. Pull broom across freshly floated concrete to produce texture indicated in straight lines perpendicular to main line of traffic. Do not dampen brooms. Roundabout truck aprons have a light broom finish.
- C. Curing: Apply curing compound for colored concrete in accordance with the manufacturer's instructions. Apply compound at consistent time for each pour to maintain close color consistency.
- D. Protect adjacent finished surfaces from splatters.
- E. Do not add water to concrete at job site. Fog or spray surface with water or put in pumps or onto tools or brooms.
- F. Do not apply color additives meant for integral coloring to surface of concrete.

Payment will include the cost of furnishing and placing all of materials, finishing, and testing.



TRUCK APRONS/BLISTER ISLANDS

Design References

Location and Design Manual, Volume 1, Section 403.6.4 – Truck Apron
SCD BP-5.1: https://www.dot.state.oh.us/SCDs/Roadway/BP-5.1_2025-01-17.pdf

Designer Notes

- Preference to accommodate truck over-tracking to the outside of the roundabout with outside truck aprons (“blister islands”). Agricultural equipment over-tracking is accommodated to the inside by providing a sloped splitter island nose as described in the SPLITTER ISLAND section.
- Truck aprons shall utilize Item 452 – 8” non-reinforced pavement. They shall be a red color with a broomed finish.
- Item 609 – Curb, Type 9, As Per Plan (4” height) is preferred on the inside mountable edge of truck aprons.
- Item 609 – Curb, Type 6 curb is preferred on the outside non-mountable edge of truck aprons.

Completed Photos



US 20 and SR 511, Lorain County, Ohio (Source: Google Maps Streetview)

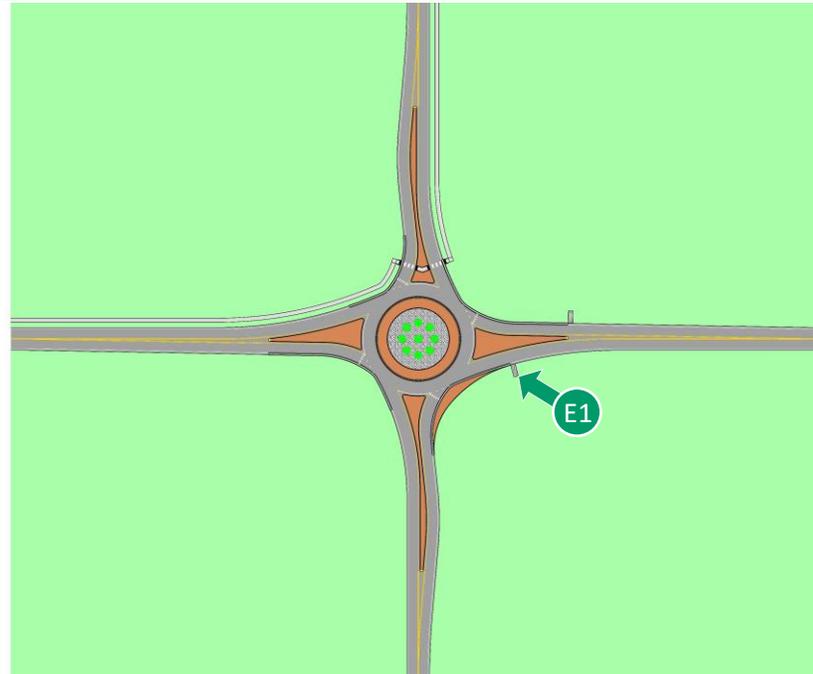
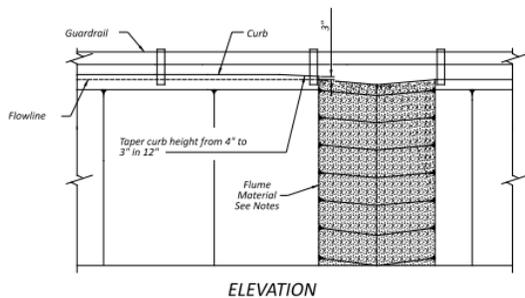
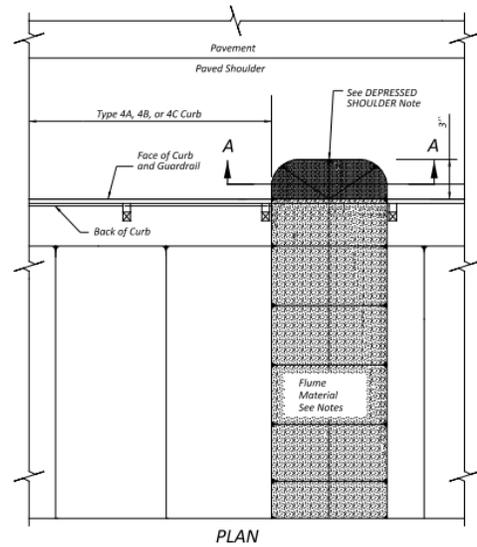


DRAINAGE

Application

Plan Notes

- E1 Item 601 – Tied Concrete Block Mat, Type 2
Application: at curb ends



- Follow SCD's and C&MS



DRAINAGE

Design References

SCD DM-4.1: https://www.dot.state.oh.us/SCDs/Hydraulic/DM/PDF/DM-4.1_2020-07-17.pdf
Location & Design Manual, Volume 2
Hydraulic Standard Construction Drawings

Designer Notes

- Provide inlet spacing and storm sewer calculations for catch basins placed within roundabout curb limits
- Provide an erosion control flume per SCD DM-4.1 at the termination of curb, regardless of the bypass flow from the upstream catch basin.
- Stormwater management methodology should be described in the project scope
- Catch basins and sags shall not be placed within the circulatory roadway
- Underdrains shall be included at the Type 6 curb on the inside of the circulatory roadway
- Vegetation Based BMPs are preferred to treat water quality where applicable
- Outside of the District 3 preferences outlined above, follow guidance in L&D Volume 2

Completed Photos

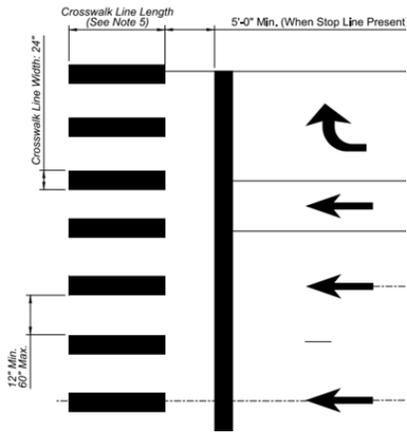


TRAFFIC CONTROL – PAVEMENT MARKINGS

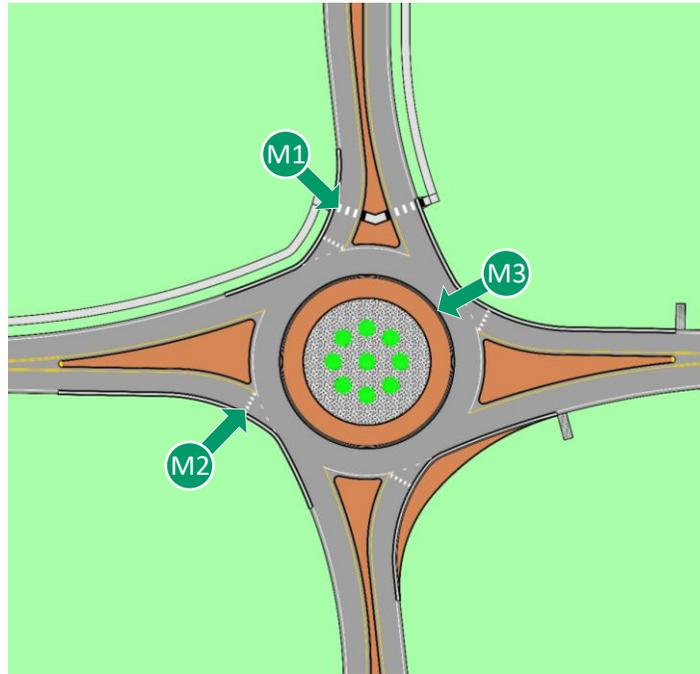
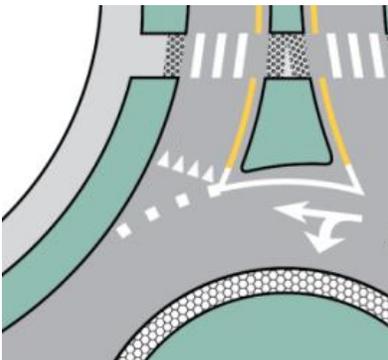
Application

Plan Details

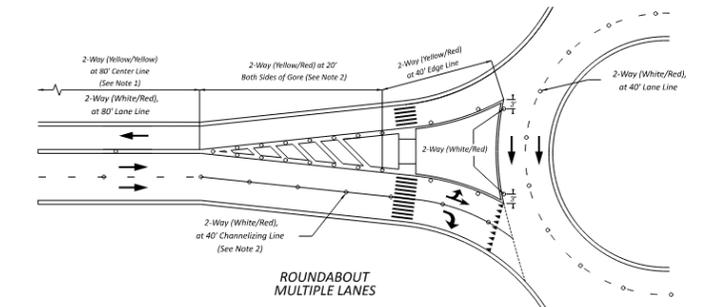
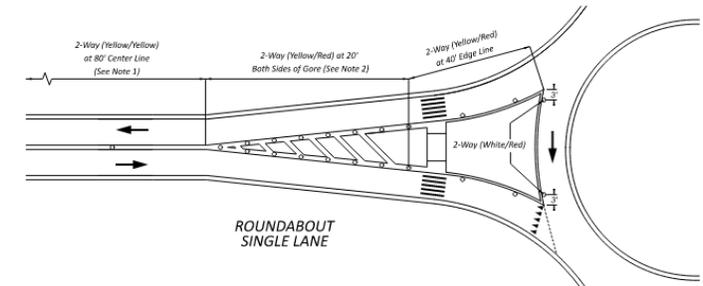
M1 HIGH VISIBILITY CROSSWALK DETAILS (LONGITUDINAL BARS)



M2 Roundabout Approach Markings – Sawtooth Yield and Dotted Line



M3 TC-65.11 Modified to remove optional RPMs around the central island of the roundabout Application: Raised Pavement Markings at roundabout approaches



Plan Notes

- Follow OMUTCD, SCD's and C&MS



TRAFFIC CONTROL – PAVEMENT MARKINGS

Design References

OMUTCD Part 3: Markings
SCD TC-65.11 https://www.dot.state.oh.us/SCDs/Traffic/TC-65.11_2025-01-17.pdf

Designer Notes

- Pavement Marking Material: Item 644 – Thermoplastic on asphalt pavement and Item 646 – Epoxy on concrete pavement
- Exclude the yellow edge line with raised pavement markings at the roundabout central island
- A white edge line shall be marked at the edge of pavement throughout the roundabout limits, regardless of the presence of curb
- Use high visibility, piano-style crosswalks where pedestrian accommodations are included
- Use Dotted Line, 12" at circulatory roadway entrances

Completed Photos



TRAFFIC CONTROL – SIGNING

Application

- ① **W2-6 (36x36) & W16-H8P (18x18)**
First sign approaching roundabout, both sides of the road



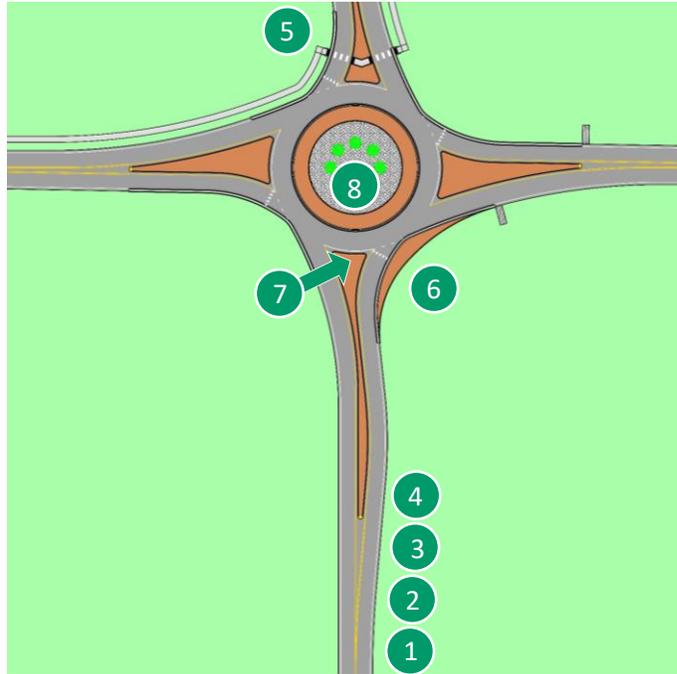
- ② **M2-1 (21x15) & Route Sign (Wx36)**
Minimum 400 feet upstream of roundabout, right side only



- ③ **W3-2 (36x36)**
Both sides of the road



- ④ **D1-# Destination sign**
Minimum 200 feet upstream of roundabout, right side only



Plan Notes

- Follow OMUTCD, SCD's and C&MS
- Item 630 – Signing, Misc.: 12" PVC Pipe
- Item 630 – Ground Mounted Support, No. 3, As Per Plan

Application

- ⑤ **W11-2 (36x36) & W16-7P (24x12)**
At crosswalk location, right side only



- ⑥ **R1-2 (36x36x36)**
At roundabout yield pavement marking, right side only. Include Item 630 – Sign Post Reflector



- ⑦ **Route Sign Assembly**
Centered at splitter island tail end



- ⑧ **R6-1 series (36x12)**
Located within center circle at entry points



TRAFFIC CONTROL - SIGNING

Design References

OMUTCD Part 2: Signs

Designer Notes

- No signs shall be placed in the splitter island, other than the route sign assembly at exits
- Use 36" for all applicable sign sizes
- Provide stations and offsets for all proposed signs. Offsets should be determined through OMUTCD guidance
- Mount signs within concrete splitter islands using a 12" conduit sleeve (Item 630 – Signing, Misc.: 12" PVC Pipe) and post support (Item 630 – Ground Mounted Sign Support, No. 3, As Per Plan)
- The preferred spacing between signs is 200 feet. Where necessary, a minimum of 100 feet between signs may be used
- Include RRFB's at pedestrian crossings only if specified in the project scope

Completed Photos



TRAFFIC CONTROL - SIGNING

Plan Notes

Item 630 – SIGNING, MISC.: 12” PVC PIPE

This item shall consist of supplying and installing a 12” PVC pipe on concrete surfaces where specified in the plans to support U-channel post assemblies. The 12” PVC sleeve shall be an item from the ODOT approved list. The conduit length shall be such that the conduit is flush with the concrete surface and extends through the splitter island concrete and aggregate base to subgrade base. The conduit shall be filled with Item 304 to allow for sign post placement and removal as needed.

Payment for this item shall be at the contract unit price bid per each number of complete units furnished and installed and will include all labor, materials and equipment necessary to install the PVC sleeve.

Item 630 – GROUND MOUNTED SUPPORT, NO. 3, AS PER PLAN

Ground mounted post supports shall be U-Channel design and per CMS 630.06 and SCD TC-41.20 with the following exceptions:

1. Drive a 60” long stub 42” to 46” into the ground, leaving 14” to 18” exposed above the finished surface.
2. Bolt upper sign post to stub.
 1. The upper sign post shall extend to the ground, overlapping the full exposed length of the installed stub.
 2. The upper post shall be spliced behind the stub post relative to the closest path of traffic, or relative to the most probable direction of impact as determined by the Engineer.
 3. Use four 5/16” steel zinc coated bolts and serrated flange hex lock nuts, spaced evenly, at minimum spacing of 4” to secure the upper sign post to the stub.
3. Care shall be exercised to drive and erect posts vertically plumb and erect signs so they are level when viewed from the roadway.
4. Place no more than two posts within the 7’ vehicle path unless located behind guardrail. See SCD TC-41.20.
5. Cost of splice connection and overlap of posts shall be incidental to the cost of each sign support.
6. For proposed sign posts placed in concrete islands or medians, a 12” diameter PVC conduit shall be placed vertically from the subgrade layer to the top of the concrete surface at the location of each sign installation. This conduit shall be filled with Item 304 and compacted to the satisfaction of the Engineer.

Unless specified otherwise in these plans, located ground mounted post supports as far from the edge of pavement, and on the far side of the ditch, as possible. Maintain a distance of 4’ from the edge of the Right of Way.

If ground conditions prevent installation as detailed above, notify the Engineer for direction.

All labor, equipment, materials, and incidentals needed to complete this work will be included in the contract bid price per foot for Item 630 – Ground Mounted Support, No. 3, As Per Plan.



LIGHTING

Design References

Location and Design Manual, Volume 1, Section 600
Traffic Engineering Manual Section 11
SCD HL-10.11: https://www.dot.state.oh.us/SCDs/Traffic/HL-10.11_2023-07-21.pdf

Completed Photos



Plan Notes

- Follow TEM, SCD's and C&MS
- Item 625 – APP Note
- Temporary Lighting

Designer Notes

- It is not necessary to follow the standard mounting height from ODOT SCD HL-10.11. Include Item 625 – Light Pole, Misc.: X Height Pole.
- The criteria for determining light pole offset should be weighed on a project-by-project basis:
 - District preference is 10 feet from the edge of traveled way. The minimum offset is 8 feet
 - Follow L&D Clear Zone criteria (Section 600.2)
 - If pole placement must be within the clear zone without a barrier, offset as if guardrail were in place using frangible base per AASHTO (TEM 1140-4.3.4.1)
 - Avoid placement within ditch bottoms
 - Maintain a minimum lateral distance of 15 feet from overhead electric lines
- Provide a Lighting Control Center (LCC) meeting the following requirements:
 - Provide a 4" plain concrete LCC workpad meeting 4' x 3', or larger if the length of the LCC exceeds 4'
 - Provide a 12" aggregate driveway to access the LCC at a minimum of 20' x 8'
 - The LCC shall be at least 20' from the face of curb, unless restricted by R/W
 - Place the LCC along a roundabout exit, if feasible
- Outside of the outlined District 3 preferences, follow guidance in L&D Section 600 and TEM Section 11



Plan Notes

Item 625 – Light Pole, Misc.: X Height Pole

This item shall meet the requirements of ODOT's 625 Construction and Material Specifications and Standard Construction Drawings listed on the title sheet of the plans, except that the mounting height shall be as detailed in the lighting plans and subsummary.

Payment shall be made at the unit bid price for each Item 625 – Light pole, Misc.: X Height Pole and shall include all labor, materials and incidentals required to complete this work.

Designer Note: Replace the "X" value with the pole height specific to the project.

Temporary Lighting

Install all permanent lighting prior to opening the proposed facility to traffic. If the permanent lighting is unable to be completed prior to opening, supply temporary lighting meeting the photometric properties of the permanent lighting plan prior to opening the facility to traffic. A minimum of 14 days prior to the installation of any such temporary lighting, supply a temporary lighting plan to the Engineer for approval. This lighting plan must also be approved by the District Traffic Engineer. The contractor is prohibited from installing any such temporary lighting until the temporary lighting plan is approved by the Project and District Traffic Engineers.

At a minimum, the temporary lighting shall provide an average initial intensity of 0.8 foot-candles with an average-to-minimum uniformity not to exceed 3:1. The mounting height of temporary luminaires shall not be less than 30 feet and the minimum overhead conductor clearance shall be 20 feet. Temporary overhead construction shall not be less than grade "B" for strength requirements as defined by the National Electric Safety Code. Wood poles with overhead wiring may be used. However, temporary lighting shall meet Federal and State safety criteria. If breakaway poles are used to meet these criteria, then underground wiring shall be used. Reconditioned or used materials may be furnished for temporary lighting. When possible, the temporary lighting shall utilize a permanent power source (i.e. a power drop from an existing or proposed transmission or distribution electric line) rather than a temporary source (i.e. portable generators). Temporary sources of electricity may only be used when no permanent sources are available.

After the installation, inspection, and acceptance of the final permanent lighting, and when the temporary lighting is no longer needed, remove and properly dispose of the temporary lighting equipment and materials.

In accordance with C&MS 105, the contractor is also responsible for maintaining existing lighting prior to closure of the project area to traffic.

Payment for the above detailed temporary lighting and maintenance of traffic to install permanent lighting, if needed, will be considered incidental to the lump sum bid price for maintenance of traffic and will include all material, equipment, labor, and other incidentals needed to complete the work.



LANDSCAPING

Plan Notes

Item 203 – Granular Material, Type E, As Per Plan:

Supply and install granular material consisting of natural rounded gravel meeting the No. 4 gradation as outlined in CMS Table 703.01-1. Install 6" thickness of the granular material in a single lift, grading as appropriate to meet the final grades outlined in the plans. Densify and compact the granular material using a walk-behind vibratory plate compactor with a compactive effort between ½ and 2 tons. Perform at least two passes of the vibratory plate compactor. Compaction testing will not be performed on the No. 4 granular material.

Item 661 – Planting, Misc.: Weed Barrier:

This item includes the material, labor, and equipment necessary to install a woven or non-woven weed barrier in accordance with the notes on this sheet. The weed barrier shall be installed according to the manufacturer's recommendations and in all areas inside the center island of the roundabout.

NOTES:

1. NO SUBSTITUTIONS OF PLANT MATERIALS ALLOWED UNLESS APPROVED BY THE OWNER.
2. ALL PLANTS ARE TO MEET OR EXCEED AMERICAN STANDARDS FOR NURSERY STOCK, 1986 EDITION, AS SET FORTH BY AMERICAN ASSOCIATION OF NURSERYMEN.
3. PLANT MATERIAL TERMED DEAD OR UNSATISFACTORY AFTER ONE YEAR OF PLANTING SHALL BE REPLACED AT NO ADDITIONAL CHARGE BY LANDSCAPE CONTRACTOR.
4. PLANTING BEDS SHALL HAVE A MINIMUM OF 2' DEPTH OF TOPSOIL AND GROUND COVER AREAS ARE TO HAVE A MINIMUM OF 6" OF TOPSOIL.
5. THE LANDSCAPE CONTRACTOR SHALL OBTAIN AND PAY FOR PERMITS AND FEES THAT MAY BE REQUIRED FOR HIS/HER PORTION OF WORK.

Completed Photos



SR57 and SR 604, Wayne County, Ohio



SR57 and SR 604, Wayne County, Ohio

PLAN INCLUSIONS

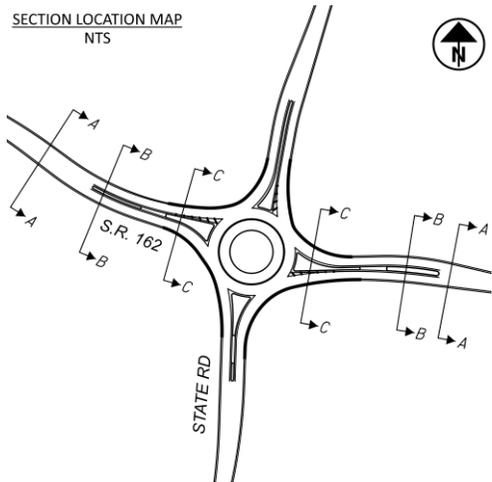
Plan Inclusions

- Sheet Index: For single projects with multiple roundabouts, group sheets specific to one intersection together similar to structures. General example is below:

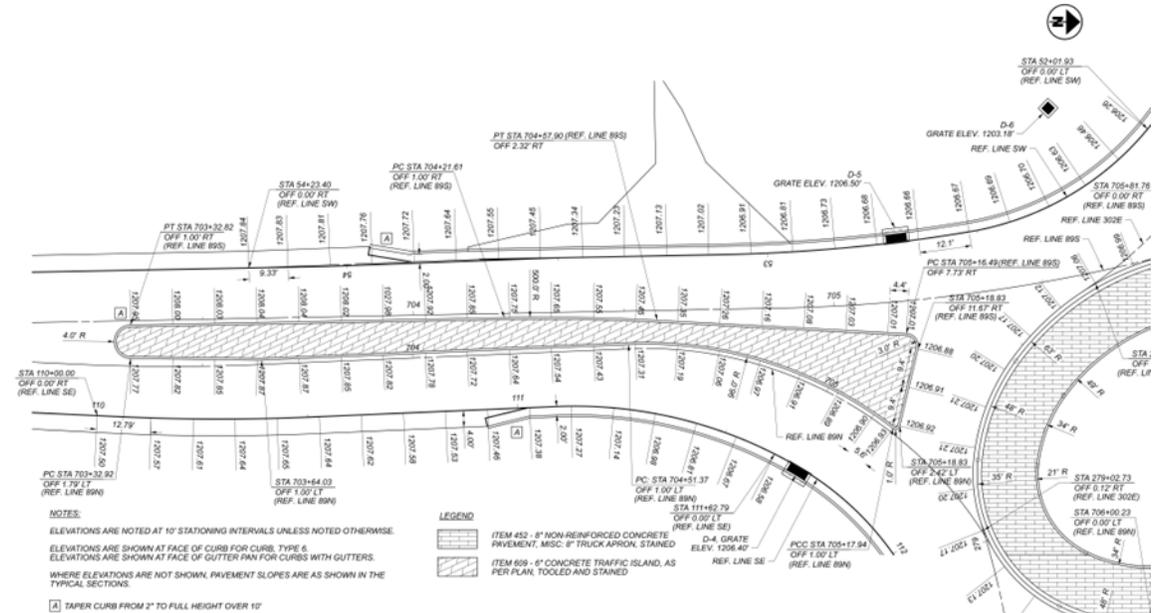
TITLE SHEET
 TYPICAL SECTIONS
 GENERAL NOTES
 MAINTENANCE OF TRAFFIC
 GENERAL SUMMARY
 ROUNDABOUT 1
 SPECIFIC SHEETS (GEOMETRIC LAYOUT, SUBSUMMARIES, PLAN AND PROFILE, ETC.)
 ROUNDABOUT 2
 SPECIFIC SHEETS (GEOMETRIC LAYOUT, SUBSUMMARIES, PLAN AND PROFILE, ETC.)
 GEOTECHNICAL PROFILE - ROADWAY

- Typical Sections
 - Pavement Buildup – use materials below unless otherwise specified in scope
 - Item 442 – Asphalt Concrete Surface Course, 12.5MM, Type A (446) PG76-22M
 - Item 442 – Asphalt Concrete Intermediate Course, 12.5MM, Type A (448) PG70-22M
 - Provide inset to show where sections apply.

SECTION LOCATION MAP
 NTS



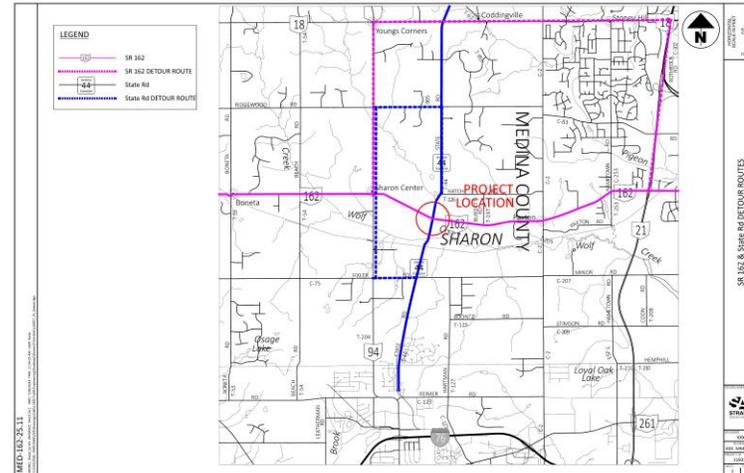
- Roundabout Details: Provide pavement elevations at face of curb along splitter islands. Provide station/offset callouts for geometric changes along splitter islands.



SCOPE INCLUSIONS

Scope Inclusions

- Provide supplemental submittals, including Alternatives Evaluation and Preliminary Roundabout Geometrics, if scoped (see SUPPLEMENTAL SUBMITTALS section).
- Provide public involvement exhibits:
 - Layout on an aerial with shading for pavement, islands, and grading.
 - Detour map.
 - Truck turning movements if requested by District.
- Provide R/W staking:
 - During negotiations as requested. Discuss number of parcels with District.
 - All temporary and permanent parcels to be acquired at time of acquisition.



SUPPLEMENTAL SUBMITTALS

Alternatives Evaluation



- At time of scoping, roundabout has been identified as preferred intersection control
- Objective of alternatives evaluation is to brainstorm potential configurations to meet roundabout design principles with minimal impact to utilities, right-of-way, and cost
- Number of alternatives to be discussed with District at scoping
- Alternatives can vary size, shape, and location
- Certain design parameters should be evaluated for each alternative
 - Design and check vehicle turning movements
 - Fastest paths
- Deliverables include 2D layout on an aerial (survey not necessary) and comparison matrix
 - Comparison matrix to include categories such as geometrics, right-of-way, potential utility relocations, maintenance of traffic, environmental impacts, and cost, as relevant for each project.
- Alternatives presented and discussed with District in a meeting
 - Provide alternatives and comparison matrix min. one week in advance of meeting

ALTERNATIVE	SIZE & LOCATION	SAFETY	ROADWAY DESIGN ISSUES	MAINTENANCE OF TRAFFIC	RIGHT-OF-WAY IMPACTS	UTILITY IMPACTS	COST
Alternative 1 Circular Roundabout	- 140-foot ICD. - Center of roundabout shifted approximately 35 feet northeast to minimize impacts to southern properties.	- R1 fastest path entering speed is 29 mph. - All other fastest path entering speeds are below 25 mph.	- WB-62 design vehicle stays on the pavement and uses the inside and outside truck aprons for all movements. Some splitter islands are narrowed to minimize the outside truck apron width. - Outside truck aprons are within a few feet of the house at 4835 SR 545 and the barn at 4855 SR 545.	- Intersection will be closed during construction and traffic detoured.	- Permanent acquisition from four properties totaling 0.17 acres. - Temporary acquisition from 12 properties. - Reduces to setback at 4855 SR 545 from approximately 32 feet to approximately 25 feet. - Outside truck aprons come within feet of the house at 4835 SR 545 and the barn at 4855 SR 545, although the truck aprons remain within existing right-of-way at the nearest points.	- Conflicts with one power pole and four telecommunications poles. - No impacts to underground utilities or septic identified.	- Construction = \$2,766,000 - ROW = \$116,000 - Utility Relocation Costs = \$150,000 (Likely Not Reimbursable) - 1 power pole = \$50,000 - 4 telecommunications poles = \$100,000 PROJECT = \$2.88 million
Alternative 3 Elliptical Roundabout	- 187-foot outer dimension along the long axis and 120 feet along the short axis. - Center of roundabout shifted approximately 55 feet north to avoid excessively fast eastbound fastest path entering speed and avoid truck turning impacts to 4835 SR 545.	- R1 fastest path entering speed is 27 mph. - All other fastest path entering speeds are below 25 mph.	- WB-62 design vehicle stays on the pavement and uses the inside and outside truck aprons for all movements. - The irregular roundabout shape can also be less intuitive and less comfortable for drivers and more difficult for trucks to maneuver	- Intersection will be closed during construction and traffic detoured. - Much of the roundabout could be constructed while traffic is maintained on SR 96, reducing the duration of the traffic closure on SR 96.	- Permanent acquisition from 3 properties totaling 0.26 acres. - Temporary acquisition from 12 properties. - Does not reduce setbacks to any houses. - Reduces distance between traveled way and barn at 4855 SR 545 from approximately 18 feet to approximately 7 feet.	- Conflicts with two power pole and four telecommunications poles. - No impacts to underground utilities or septic identified.	- Construction = \$2,794,000 - ROW = \$105,100 - Utility Relocation Costs = \$200,000 (Likely Not Reimbursable) - 2 power poles = \$100,000 - 4 telecommunications poles = \$100,000 PROJECT = \$2.90 million
Alternative 4 4-Leg Roundabout with Realignment	- 130-foot ICD. - Center of roundabout shifted approximately 25 feet north to avoid impacts to southern properties.	- All fastest path entering speeds are below 25 mph. - The introduction of a stop control on Olivesburg-Fitchville Rd at SR 96 may increase the potential for failure to yield angle crashes, but traffic on SR 96 would be low speed and gaps should be easier to judge.	- WB-62 design vehicle stays on the pavement and uses the inside and outside truck aprons for all movements. - Requires drivers to navigate two intersections instead of one for some movements to and from Olivesburg-Fitchville Rd.	- Intersection will be closed during construction and traffic detoured.	- Permanent acquisition from 6 properties totaling 0.75 acres. - Temporary acquisition from 8 properties. - Reduces to setback at 4383 SR 545 from approximately 12 feet to approximately 6 feet. - Reduces the distance between the house at 4383 SR 545 and traveled way by approximately 50 percent.	- Conflicts with three power pole and four telecommunications poles. - No impacts to underground utilities or septic identified.	- Construction = \$2,586,000 - ROW = \$81,600 - Utility Relocation Costs = \$200,000 (Likely Not Reimbursable) - 3 power poles = \$150,000 - 4 telecommunications poles = \$100,000 PROJECT = \$2.67 million
Alternative 5 Peanut Roundabout	- Two 110-foot ICD's separated by 100 feet at the centers. - Center of roundabout shifted approximately 50 feet north and 40 feet west to avoid impacts to southern properties	- R1 and R5 speeds below 25 mph.	- WB-62 design vehicle stays on the pavement and uses the inside and outside truck aprons for all movements. - Peanut shape can be confusing for drivers. - The geometry may require truck trailers to traverse on and off the inside truck apron multiple times.	- Intersection will be closed during construction and traffic detoured. - Much of the roundabout could be constructed while traffic is maintained on SR 96, reducing the duration of the traffic closure on SR 96.	- Permanent acquisition from 4 properties totaling 0.36 acres. - Temporary acquisition from 11 properties. - Does not reduce setbacks to any houses.	- Conflicts with four power pole and five telecommunications poles. - No impacts to underground utilities or septic identified.	- Construction = \$2,908,000 - ROW = \$95,000 - Utility Relocation Costs = \$275,000 (Likely Not Reimbursable) - 4 power poles = \$200,000 - 3 telecommunications poles = \$75,000 PROJECT = \$3.00 million



SUPPLEMENTAL SUBMITTALS

Preliminary Roundabout Geometrics



- Follow guidance in L&D, Vol. 1 Section 403.4 and Figure 403-2
- In addition to design parameters listed in Figure 403-2, preliminary roundabout geometrics should include:
 - Exhibit(s) showing dimensions of entries, exits, circulatory roadway, truck apron, splitter island lengths, and inscribed circle diameter
 - Exhibit(s) showing R1 through R5 curves with corresponding speeds
 - Exhibit(s) showing radii of approach curve(s)
 - Turning movement templates for design and check vehicles
 - Front tires, rear tires, and vehicle body
- Deliverables include PDF of design parameter table and exhibits listed above
- Preliminary roundabout geometrics should be submitted to District
 - Allow 30 days for review

ROUNDBABOUT CRITICAL DESIGN PARAMETERS	403-2
	REFERENCE SECTION 403.7

Roundabout Critical Design Parameters
Project - County Route Section
PID

Design Parameters	Leg 1	Leg 2	Leg 3	Leg 4	Leg 5
Inscribed Circle Diameter, FT					
Entry Width, FT					
Entry Angle PHI φ, DEG					
Exit Width, FT					
Circulatory Roadway Width, FT					

Fastest Path Speed	Leg 1	Leg 2	Leg 3	Leg 4	Leg 5
R ₁ , Radius/Speed, FT/MPH					
R ₂ , Radius/Speed, FT/MPH					
R ₃ , Radius/Speed, FT/MPH					
R ₄ , Radius/Speed, FT/MPH					
R ₅ , Radius/Speed, FT/MPH					
R ₅ , Bypass Radius/Speed, FT/MPH					

Minimum Sight Parameters	Leg 1	Leg 2	Leg 3	Leg 4	Leg 5
Approach Design Speed, MPH					
Approach Stopping Sight Distance, FT/MPH					
Circulatory Stopping Sight Distance, FT/MPH					
Exit (Crosswalk) Stopping Sight Distance, FT/MPH					
Intersection Sight Distance, FT/MPH					

General	
Design Vehicle(s)	
Truck Apron Width, FT	

Designer: _____

Signature: _____

Date: _____

