Work Type Definition and Submittal Requirements
17.2 High Demand/Volume (>1500) Roundabouts

Work Type Definition

Pages 1-3 detail the work type definition. In order to become *pre-qualified* for this work type, please see the "Work Type Submittal Requirements" on pages 4-6.

I. Description

Refer to FHWA's definition of "Roundabout"

Roundabout design includes but is not limited to: Intersection Control Evaluation (ICE), R/W, geometric design, drainage, curb and pavement design, pedestrian and bicycle considerations, lighting, signing, landscaping, and construction staging.

Roundabout training includes but is not limited to: providing educational presentations to MnDOT employees and external customers; provide training for MnDOT employees in the use of RODEL software and the process of designing roundabouts.

High Demand/Volume Roundabout projects are categorized by level as follows:

A. Level 1 projects include the design of low volume roundabouts, including, but not limited to, the following:

1. ICE reports must be completed for any proposed roundabout intersection.
2. All layouts that include roundabouts are to be Level 1 layouts and subject to the approval of MnDOT's State Design Engineer.
3. RODEL software will be used for roundabout design.
4. Analyze specific system wide planning impacts related to the use of one or more roundabouts on the project corridor. This analysis should include issues related to access management, coordinated signal systems, freight movement, land use, and community character.
5. Design operational characteristics and provide alternative concept layouts [must use RODEL software and MnDOT approved appropriate software programs to perform a corridor or system evaluation, intersection control analysis (traffic signal, roundabout, 4-way stop control), and crash analysis]. In addition, assemble or review supporting documentation of alternatives, dual lane entry, bypass lane.
6. Design geometrics and provide improvement recommendations (i.e. the six geometric parameters defined in using the RODEL software; fastest speed paths and design speed, approach grades, site specific location of roundabout, number of entry lanes at each leg, dual lane entry, bypass lanes, right-of-way impacts, intersection sight distance, and entry curvature among other design criteria).
7. Design roundabout preliminary layout and/or plan preparation: preliminary construction limits, typical sections, plan and profile sheets, cross-sections, drainage, pavement marking, signing, lighting, traffic control, work zone and staging plans, bicycle and pedestrian accommodations, landscaping, and provide improvement recommendations where appropriate.

B. Level 2 Projects include providing low volume roundabout technical support and training, including but not limited to:
   1. RODEL software will be used for roundabout evaluation.
   2. Review and analyze specific system wide planning impacts related to the use of one or more roundabouts on the project corridor. This review should include issues related to access management, coordinated signal systems, freight movement, land use, and community character.
   3. Review geometric design concepts and provide improvement recommendations (i.e. the six geometric parameters defined in using the RODEL software; fastest speed paths and design speed, approach grades, site specific location of roundabout, number of entry lanes at each leg, dual lane entry, bypass lanes, right-of-way impacts, intersection sight distance, and entry curvature among other design criteria).
   4. Review operational characteristics and provide improvement recommendations [must use RODEL software and MnDOT approved appropriate software programs to perform a corridor or system evaluation, intersection control analysis (traffic signal, roundabout, 4-way stop control), and crash analysis]. In addition, assemble or review supporting documentation of alternatives, dual lane entry, bypass lane.
   5. Review roundabout preliminary layout and/or plan preparation: preliminary construction limits, typical sections, plan and profile sheets, cross-sections, drainage, pavement markings, signing, lighting, traffic control, work zone and staging plans, bicycle and pedestrian accommodations, landscaping, and provide improvement recommendations where appropriate.
   6. Provide educational presentations to MnDOT employees and external customers.
   7. Provide training to MnDOT and external customers in use of RODEL software and designing roundabouts.

Note: Pre-qualification in work type 17.2 High Demand/Volume (≥ 1500 DHV) Roundabouts Level 1 includes pre-qualification for 17.1 Level 1. Pre-qualification in work type 17.2 High Demand/Volume (≥ 1500 DHV) Roundabouts Level 2 includes pre-qualification for 17.1 Level 2.

II. Standards and Specifications

Standards and specifications required for a project under this work type may include the following:

A. All deliverables must include a documented Quality Assurance/Quality Control (QA/QC) plan with each review and submittal to address comments from previous reviews, i.e. 30%, 60%, 90%, and 100% reviews.

B. The layouts must meet the form and content requirements listed in the Highway Project Development Process (HPDP) Handbook.

C. The layout must consider the various inputs during the development process, and incorporate where appropriate, and must also include a history that documents the development process and the design influences and decisions.

D. Relevant design and traffic manuals, including but not limited to:
   1. "Roundabouts: An Informational Guide", published by the FHWA
   2. MnDOT Road Design Manual
   3. MnDOT Traffic Engineering Manual,
   4. Other relevant MnDOT design and traffic manuals, (i.e. CADD Standards, Standard Plates, Standard Plans, MUTCD, etc.).

III. Provided by MnDOT

Information to be supplied by MnDOT for a project under this work type may include the following:

A. All project specific documents and studies including but not necessarily limited to:
   1. Traffic data: ADT, AADT, existing turning-movement counts, percent heavy vehicles, future projections and DHV.
   2. Base mapping: topography, right-of-way, property lines, as-let plans.
   3. System consideration: planned and programmed improvement projects, etc.

IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project will be project specific and may include, but not be limited to, the following:

A. Preliminary Report - identifying issues concerning Right-of-Way (R/W), utilities, environmental mitigation, potential historical or archaeological impacts, pedestrian and bicycle requirements, potential impact to threatened and endangered species, drainage issues, geometric concerns, etc;
B. Intersection Control Evaluation (ICE);
C. Concept Sketches;
D. Preliminary Geometric Layout including Preliminary Construction Limits;
E. Final Plans produced using MnDOT's Level 2 CADD Standards
F. (http://www.dot.state.mn.us/caes/cadd), (e.g. 30%, 60%, 90%, and 100%);
G. Design documentation and calculations;
H. Recommendations for modifying final design plans of roundabouts;
I. Presentation materials and/or visualizations for public meetings;
J. Training materials; and
K. Review/Provide Recommendations for updating MnDOT Roundabout Guidelines

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Work Type Submittal Requirements

A consultant firm becomes pre-qualified based on the qualifications of the personnel that are employed by the firm and by meeting the demonstrated CADD requirements.

Key Personnel Requirements	
Minimum Number of Staff:	• At least two professionals for Level 1 projects. One of the professional engineers is required to perform independent checks of data, calculations, and reports of the other. • At least one professional for Level 2 projects is required to provide Roundabout Technical Support and/or Training. • Other professional and technical personnel with engineering training, experience, knowledge, and expertise in the appropriate areas necessary to do the project in accordance with AASHTO, FHWA and MnDOT design policies, procedures, practices and standards. • For Level 1, partnering with a "Roundabout Technical Support & Training" consultant may be required for certain low demand roundabouts. *Note: Pre-qualification in work type 17.2 High Demand/Volume (≥ 1500 DHV) Roundabouts Level 1 includes pre-qualification for 17.1 Level 1. Pre-qualification in work type 17.2 High Demand/Volume (≥ 1500 DHV) Roundabouts Level 2 includes pre-qualification for 17.1 Level 2.*
Professional Certification/Licensure:	Level 1 Professionals must be Minnesota Board Licensed professional civil engineers. Level 2 Professionals must be licensed professional civil engineers.
Work Type Submittal Requirements*	
I. Resume and Relevant Project Experience Form (Form PQ1) ***Submit in Word format***	A. Complete Parts 1, 1A, 2 and 3 of Form PQ1 **Part 1:** Fill out general information and names of personnel **Part 1A:** For any Level of pre-qualification, provide all roundabout projects completed in the last 5 years (specifying DHV) for each professional for which pre-qualification is sought. If there are too many to list, list all those in Minnesota and also those which demonstrate complexity. For Level 1, the professional(s) must have engineering experience, knowledge, and expertise in the appropriate areas necessary to do the project in accordance with

	American Association of State Highway & Transportation Officials (AASHTO), Federal Highway Administration (FHWA) and MnDOT design policies, procedures, practices and standards, and must have prior experience using RODEL software. Satisfactory experience must be demonstrated on a minimum of 3 High Demand/Volume roundabouts that have been designed in the last 5 years. For Level 2, the professional(s) must have engineering training (minimum of Bachelor Degree in Civil Engineering), experience, knowledge, and expertise in the appropriate areas necessary to do the project in accordance with American Association of State Highway & Transportation Officials (AASHTO), Federal Highway Administration (FHWA) and MnDOT design policies, procedures, practices and standards, and must have prior experience using RODEL software. Satisfactory experience must be demonstrated on a minimum of 10 projects which include High Demand/Volume roundabouts that have been designed and constructed in the last 5 years. **Part 2:** Project Examples listed must correlate to those described below in "Project Example Requirements." **Part 3:** Not applicable for this work type
II. Project Example Requirements ***Submit in PDF format***	A. For Level 1 pre-qualification, project examples must be provided for 3 High Demand/Volume roundabouts that have been designed in the last 5 years. The three project examples must consist of consist of a preliminary geometric layout as well as accompanying preliminary profile grades or final design geometry and profile information. The examples will be rated for technical integrity and format. B. For Level 2 pre-qualification, project examples must be provided for 3 projects which include High Demand/Volume roundabouts that have been designed and constructed in the last 5 years. The three project examples must consist of consist of a preliminary geometric layout as well as accompanying preliminary profile grades or final design geometry and profile information, training handouts, and roundabout design review

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	recommendations. The examples will be rated for technical integrity and format.
III. Proof of Professional Certification/Licensure ***Submit in PDF format***	A. Provide a current copy of the applicable Professional Certification/ Licensure
IV. CADD Requirements ***Submit in PDF format***	A. For Level 1 pre-qualification, complete, sign and notarize form indicating the firm is capable of using MnDOT's Level 2 CADD Standards which can be found at: www.dot.state.mn.us/consult/prequal/documents/cadd2.doc

***Work Type Submittal Instructions:**

Create a CD or flash drive that includes the following individual files or folders in this order:

I. Resume and Relevant Project Experience Form (Form PQ1)
II. Project Example Requirements (this should be a folder that includes individual files clearly named according to Part 2 of the PQ1)
III. Proof of Professional Certification/Licensure
IV. CADD Requirements

Each file should be saved in the format identified above.
Submit 5 copies of the CD or flash drive.