

Master Thesis

Planning of a Roundabout in the municipality of Rackwitz including extended Cycling routing

Submitted to
Faculty of Automotive Engineering of
Westsächsische Hochschule Zwickau – University of Applied Sciences
for the degree of

Master of Science

Submitted by: cand. Eng.

Thomas, Amalu
Road Traffic Engineering

Born on: 22.06.1995.

Issued by:

Prof. Stephanie Schmidt

First Supervisor:

Prof. Dr.-Ing. Elena Queck

Second Supervisor:

Dipl.-Ing. Michael Müller

Company:

Planungsbüro Hanke, Machern

Company Supervisor:

Stefan Tauchnitz

Abstract

This research investigates the Leipzigerstraße and Gießereistraße intersection in Rackwitz to enhance safety and sustainable transportation. The study analyzes existing designs that experience accidents and proposes a design plan of mini roundabout to improve safety while using the guideline Anlage von Kreisverkehren. In this project, the roundabout is planned according to the currently valid guidelines from phase 2 of the HOAI (Fee Structure for Architects and Engineers). Rainwater management strategies and traffic quality of the roundabout are considered. Additionally, cyclist-friendly paths connecting Rackwitz and Zschölkau are developed in line by using guideline ERA. The proposed roundabout design and elevated cycle paths are identified as effective solutions to enhance safety and support eco-friendly transportation. By adhering to established guidelines and prioritizing safety, this research contributes to creating a secure and sustainable urban transportation network.

KEYWORDS:

Traffic accidents and traffic quality, Site plane of roundabout, Vertical projection, Explanatory report

Self-Declaration

I certify that I have written this paper independently and have not used any auxiliary materials other than those specified. Text passages, images, tables, etc. taken verbatim or in analogy from other sources are cited with an indication of their origin.

I assure you that this work has not been submitted to any other examination authority.

Zwickau, 27.08.2023

.....

Amalu Thomas

List of Abbreviation

AC	Asphalt binder layer
B	Stress
BA	Lane width of the circle exit
BK	Load Class
BlmSchV	Device and Machine Noise Protection Ordinance
Bk	Width of the circular ring
BZ	Lane width of the circular access road
c	Concrete
cm	Centimeter
D	Outside diameter
D1	Inner diameter
DTV	Daily Traffic Volume
DWD	Deutscher Wetterdienst
EKL	Entwurfsklassen für Landstraßen
ERA	Empfehlungen für Radverkehrsanlagen
Ev2	Deformation moduli
f	Lane factor
f	Lane width factor
f	Slope factor
F2, F3	Frost sensitivity
fA	Axis factor
FGSV	Forschungsgesellschaft für Straßen- und Verkehrswesen
Fz	Average annual growth factor of heavy traffic
H	Hour
H	Vertical Projection
HK	Cup radius
HW	Cup radius
HOAI	Honorarordnung für Architekten und Ingenieure
Km	Kilometer
L	Length
Lfz	Length of Vehicle

LOS	Level of Service
LSG	Landscape protection area
m	Meter
p	Average annual increase in heavy traffic
qBm	Gem load spectrum quotient
qs	Flow
RA	Corner rounding radius of the circle exit
RAL	Richtlinie für die Anlage von Landstraßen
RAPIS	The spatial planning information system of the Free State of Saxony
RASt	Richtlinie für die Anlage von Stadtstraßen
RIN	Richtlinie für integrierte Netzgestaltung
RSt0 12	Richtlinien für die Standardisierung des Oberbaus von Verkehrsflächen
RZ	Corner rounding radius of the circular approach
s	Longitudinal Gradient
S	Schmalstrich
SMA	Stone Mastic Asphalt
SOW	Road surface water
StVO	Straßenverkehrs-Ordnung
T	Tangent Length
VA	Vehicle Actuated
VwV-StVO	Verwaltungsvorschrift zur Straßenverkehrs-Ordnung

