



《民用机场飞机荷载桥梁设计与评定技术指南》

GUIDE FOR DESIGN AND EVALUATION OF CIVIL AIRPORT AIRCRAFT LOAD BRIDGES

中国民用航空局机场司

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一、编制背景(Compilation Background)

中国目前已有247个运输机场，共拥有70余座滑行道桥梁。北京首都机场5号滑行道桥服役龄期已达28年。在此之前，这些滑行道桥梁的设计与评定缺少相应的规范。

At present, there exist 247 transport airports and more than 70 taxiway bridges in China. Beijing Capital Airport No. 5 Taxiway Bridge has been in service for 28 years. In the past, the design and evaluation of these taxiway bridges still lack corresponding specifications.





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一、编制背景(Compilation Background)

在目前的国际航空标准体系中，缺少对滑行道桥设计的详细规定。自运营开始，滑行道桥服役性能退化的问题不可避免，目前也缺少相应的检测评定方法。中国民航局组织对滑行道桥的设计和安全评定进行研究，从而建立相应的设计和技术状况评定方法及荷载试验方法。

本标准体系的建立改变了过去飞机荷载桥梁参考高速公路桥梁设计与评定的情况，填补了飞机荷载桥梁方面的技术标准空白，为机场滑行道桥梁的设计与安全运营提供重要的技术保障。

In the current international aviation standard system, there is a lack of detailed regulations on the design of taxiway bridge. Since the beginning of operation, the problem of performance degradation in service of the taxiway bridge is inevitable, and there is also a lack of corresponding detection and evaluation approaches at present. CAAC studies the design and safety assessment of the taxiway bridge to establish the corresponding design and technical condition assessment methods and load test methods.

The compilation of this code system has altered the situation that the design and evaluation of aircraft load bridge adopt the standard system of highway bridges in the past. Meanwhile, this design and guide can fill the technical gap and provide important technical support for the design and operation of the airport taxiway bridges.



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一、编制背景(Compilation Background)

编制
团队Team





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二、设计指南(design guide)

指南 目标

Guide Objective

指南目标: 设计指南主要目的是统一滑行道桥的关键设计技术指标, 规范滑行道桥设计。

Guide Objective: The main purpose of the design guide is to unify the key design technical indexes of taxiway bridges and standardize the design of taxiway bridges.





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二、设计指南(design guide)

章节 划分

Chapter Construction

滑行道桥梁设计指南共分七章。 The design guide of taxiway bridge is divided into seven chapters.

- 1 总则 (**General Provisions**)
- 2 术语和符号 (**Terms and Symbols**)
- 3 基本规定 (**Basic Regulations**)
- 4 作用与作用组合 (**Load and Load Combination**)
- 5 总体设计 (**Overall Design**)
- 6 结构设计 (**Structural Design**)
- 7 桥面系和安全设施 (**Deck system and Safety facilities**)





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三、评定指南(evaluation guide)

指南
目标

指南目标：技术状况评定指南主要目的是全面描述桥梁各部件的缺陷，科学地评价桥梁技术状态。

Guide Objective: The main purpose of the technical condition evaluation guide is to comprehensively describe the defects of the bridge components and scientifically evaluate the technical condition of the bridge.

Guide Objective





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三、评定指南(evaluation guide)

滑行道桥梁技术状况评定指南共分五章，三个附录。

The technical condition evaluation guide of taxiway bridge is divided into five chapters and three appendices.

- 1 总则 (**General Provisions**)
- 2 术语和符号 (**Terms and Symbols**)
- 3 基本规定 (**Basic Regulations**)
- 4 滑行道桥梁的检测 (**Taxiway bridge inspection**)
- 5 滑行道桥梁技术状况评定 (**Evaluation of taxiway bridge technical condition**)
- 附录A: 桥梁构件编号规则 (**Appendix A : Code for Numbering Bridge Members**)
- 附录B: 桥梁检查评定记录表 (**Appendix B: Bridge Inspection Assessment Record Form**)
- 附录C: 桥梁评定报告文本格式 (**Appendix C : Text format of bridge evaluation report**)

章节
划分

Chapter
Construction





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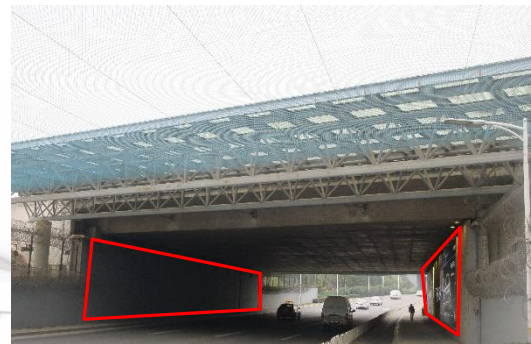
三、评定指南(evaluation guide)

检测
方法

检测方法：外观检查通过目视进行，可配合使用一些检测仪器。

Inspection method: Appearance inspection by visual inspection can be used in conjunction with some testing instruments.

Inspection method





三、评定指南(evaluation guide)

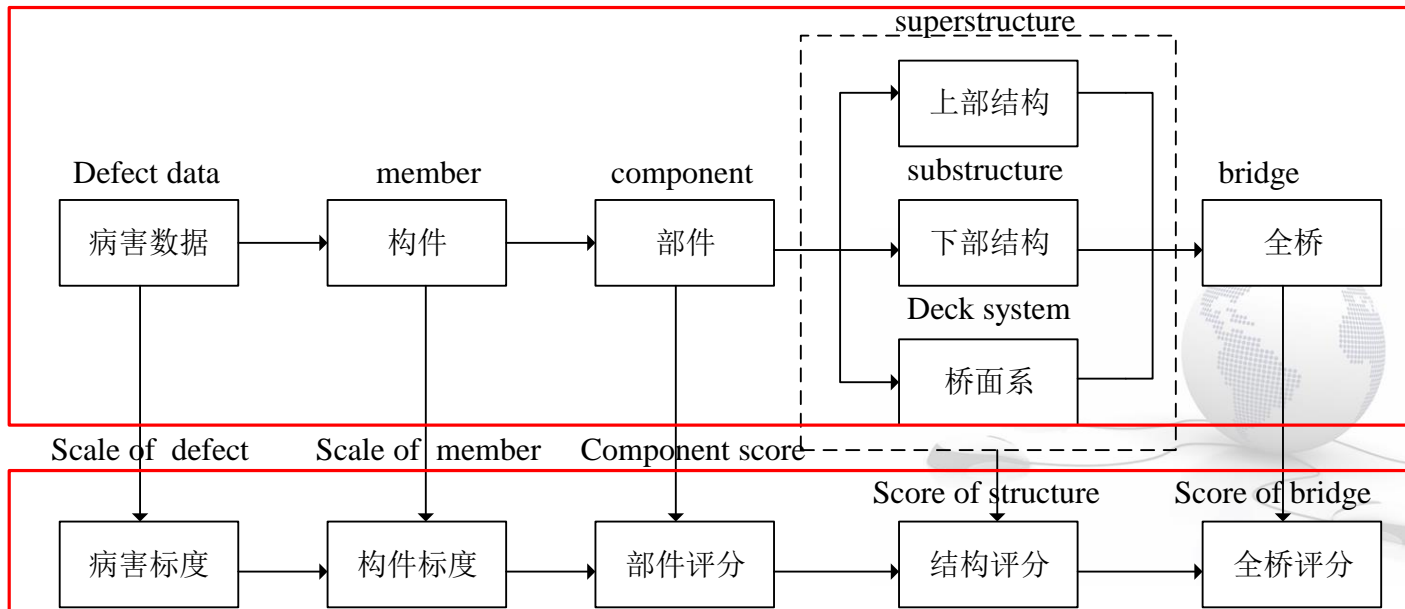
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计算流程: 桥梁技术状况采用分层综合评定与单项指标控制相结合的方法。

Calculation process: the method of layered comprehensive evaluation and single index control is adopted for bridge technical condition.

计算
流程

Calculation
process



四、荷载试验指南 (Load test guide)

指南目标
Guide
Objective

滑行道桥荷载试验主要通过加载试验，记录桥梁在荷载作用下的结构反应，为桥梁承载能力评定提供科学依据和支持。

Load test of taxiway bridge mainly records the structural response of the bridge under load through loading test, which provides scientific basis and support for the evaluation of the bearing capacity of the bridge.





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四、荷载试验指南 (Load test guide)

滑行道桥梁荷载试验指南共分六章，三个附录。

The taxiway bridge load test guide is divided into six chapters and three appendices.

- 1 总则(**General Provisions**)
- 2 术语和符号(**Terms and Symbols**)
- 3 基本规定(**Basic Regulations**)
- 4 测设设备与技术要求(**Measuring Equipment and Technical Requirements**)
- 5 滑行道桥荷载试验(**Load Test of Taxiway Bridge**)
- 6 试验报告编制(**Preparation of Test Report**)
- 附录A 荷载试验所用飞机参数表(**Appendix A Aircraft Parameter Table for Load Test**)
- 附录B 试验过程混凝土裂缝情况(**Appendix B Test Process Concrete Cracks**)
- 附录C 试验报告格式(**Appendix C Test Report Format**)

章节
划分

Chapter
Construction



四、荷载试验指南 (Load test guide)

滑行道桥荷载试验法 Load Test Method for Taxiway Bridge

该指南针对机场滑行道桥梁建立了两类荷载试验方法，即：**静力加载试验法和准静态回归外推试验法**。静力加载试验法有两种方式，一种是**砝码加载**，另一种是**飞机静止加载**；准静态回归外推试验法是**飞机低速度滑行加载**。

This guide establishes two load test methods for airport taxiway Bridges, namely, **static loading test method** and **quasi-static regression extrapolation test method**.



四、荷载试验指南 (Load test guide)

试验流程 Test Process

■ 滑行道桥荷载试验 Load Test of Taxiway Bridge

准备阶段

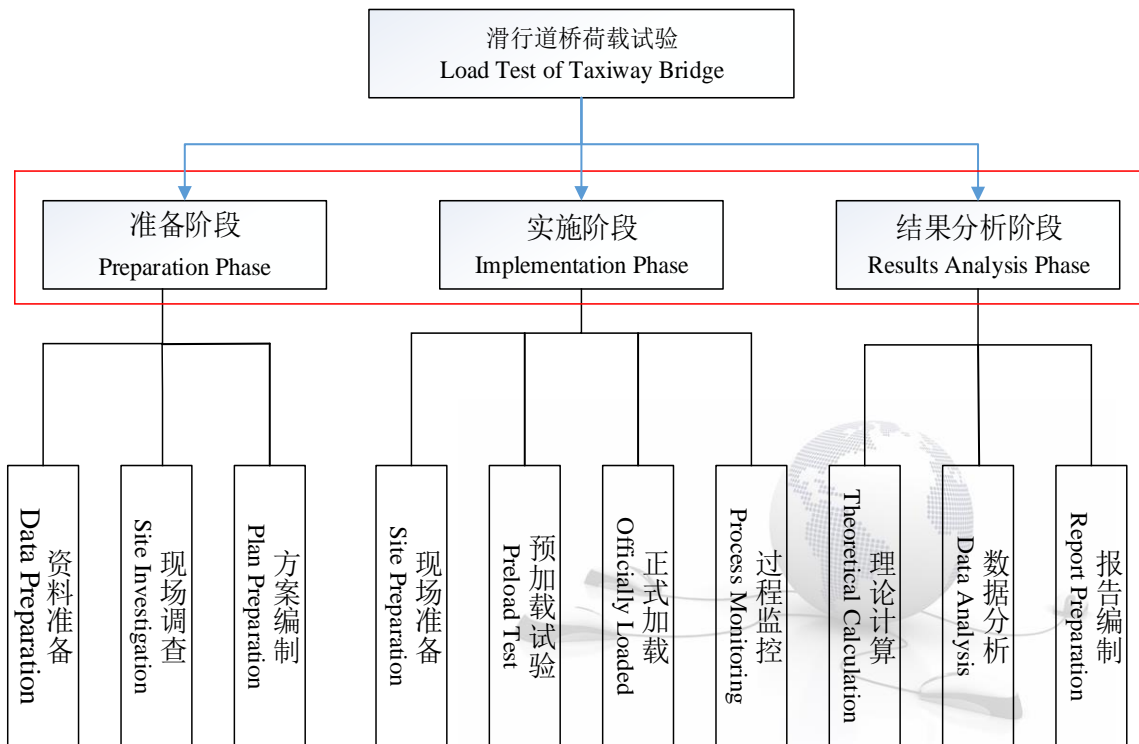
Preparation Stage

实施阶段

Implementation Phase

结果分析

Result Analysis



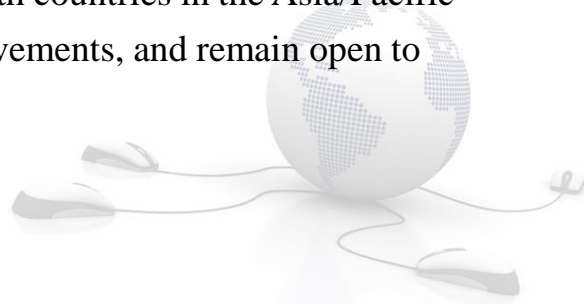


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五、近期工作

在上述三部标准的基础上，中国民航局正在继续推进“民用机场跑道桥安全性设计与评定”研究，最终将形成完整的飞机荷载桥梁（滑行道桥和跑道桥）标准体系。中国民航局计划将机场滑行道桥设计指南、技术状况评定指南和荷载试验指南译成英文标准，并与亚太地区国家分享。下一步，中国民航局也将继续分享相关的研究和实践成果，对完善指南的建议保持开放态度。

CAAC is advancing the further research and standard compilation of “Civil Airport Taxiway Bridge Safety Design and Evaluation”. CAAC will translate the airport taxiway bridge design guidelines, technical condition assessment guidelines and load test guidelines into English and share them with countries in the Asia/Pacific region. China will also continue to share relevant research and practical achievements, and remain open to suggestions for improving the guidelines.





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六、建议 (Advice)

- 呼吁亚太地区国家和组织对大型多跑道机场滑行道桥梁的安全性给予足够关注，中国也非常乐于将我们的相关研究成果和经验分享给亚太地区各成员国。

Attention from countries and organizations in the Asia/Pacific region to the safety of taxiway bridges at large multi-runway airports will be fully appreciated. China is also willing to share our research achievements and experience with other member countries in the Asia/Pacific region.

- 建议AOP/SG/5与会专家支持将该提案提交ICAO，推动将机场飞机荷载桥梁相关技术标准予以立项。届时，中国将积极会同各国参与这些标准的研究、制定，为全球机场的规划设计与安全运行做出贡献。

It is recommended that AOP/SG/5 participating experts support to submit the proposal to ICAO and promote the approval of the technical standards related to the airport aircraft load bridge. By then, China will take an active part in the research and formulation of these standards with other countries and contribute to the safe operation of taxiway bridges at major airports around the world.



Thank you for your listening !
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