



TxDOT Superheavy Bridge Report Requirements

Bridge Division

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Chapter 1: Introduction

The purpose of this document is to describe the format and minimum required content of Superheavy engineering reports. Additionally, this document specifies criteria used to determine which bridges on a Superheavy route must be analyzed thoroughly, provides acceptable methods of analysis to be used, specifies minimum load factors to be applied in the analysis, and provides guidance on other aspects related to the structural evaluation of the bridges on the route. These reports are generally prepared by third-party engineers that are pre-approved by TxDOT Bridge Division for overweight route analysis. The third party engineers are usually hired by the commercial mover to analyze bridges on a route provided by the Motor Carrier Division.

Chapter 2: Report Format

2.1 Header

- 2.1.1 Date
- 2.1.2 Engineering Firm Name and Texas Registration Number
- 2.1.3 Address the Report to "TxDOT Bridge Division-Superheavy Permit Review"
- 2.1.4 Motor Carrier Division (MCD) File Code
- 2.1.5 Start and End Route Cities (or State Lines)
- 2.1.6 Transport Firm Name
- 2.1.7 Load Description (include the quantity of loads)
- 2.1.8 Load Gross Weight
- 2.1.9 Load Maximum Width and Length
- 2.1.10 Axle Spacing and Loading

2.2 Summary of Analysis Procedure

2.3 Analysis Results

2.4 Restrictions

2.5 Vehicle Weights

2.6 Seal, Sign, and Date by approved engineer

Chapter 3: Summary of Analysis Procedure

3.1 Types of Bridges Analyzed

- 3.1.1 Critical continuous and cantilever I-beam and plate girder bridges
- 3.1.2 Critical continuous reinforced concrete bridges
- 3.1.3 Critical continuous for live load prestressed concrete girder bridges
- 3.1.4 Critical prestressed concrete U-beam bridges
- 3.1.5 Critical continuous flat slab bridges including inflection points
- 3.1.6 Any other bridge deemed necessary

3.2 Analytics

- 3.2.1 A plot of the vehicle on the TxDOT Superheavy Load-Length Graph. See Appendix A for TxDOT Superheavy Load-Length Graph.
- 3.2.2 The type of analysis used from the AASHTO Manual for Bridge Evaluation – Load and Resistance Factor Rating (LRFR), Load Factor Rating (LFD) or Allowable Stress Rating (ASD) edition indicated in the Bridge Inspection Manual.
- 3.2.3 For LRFR and LFD, the minimum factor of 1.3 must be used for both Dead and Live Loads.
- 3.2.4 Assume all structures have a wearing surface thickness of 3", unless thickness is verified. For LRFR and LFD use a factor of 1.5 applied to the wearing surface.

- 3.2.5 If the thickness of the wearing surface is verified, the verified thickness (or absence of wearing surface) must be used in the analysis.
- 3.2.6 Indicate the structural analysis method used (eg. Finite Element Method, Line Girder Analysis, etc.)
- 3.3 Special Cases
 - 3.3.1 Bridges with a condition rating less than 5
 - 3.3.2 Suspension, cable stayed and segmental bridges
 - 3.3.3 Revised live load distribution factors
 - 3.3.4 Substructures and/or foundations typically associated with H15 loading
 - 3.3.5 Tightly grouped axles
- 3.4 Foundation Analysis
 - 3.4.1 Bridges with a scour rating less than 4
 - 3.4.2 Bridges identified as having settlement issues
 - 3.4.3 Extremely large load configurations that severely overload a given foundation element
 - 3.4.4 Foundation Capacities
 - 3.4.4.1 Structures Identified as Scour Critical
 - 3.4.4.1.1 Calculate remaining (taking into account scour reduction) pile/drilled shaft capacity (including a factor of safety of 2) x 2.0, compared to factored foundation demand (1.3 Dead + 1.5 Wearing Surface + 1.3 Live). This is done on each foundation element individually, not applied as an average load/capacity to all foundations.
 - 3.4.4.2 Structures Identified as Non-Scour Critical
 - 3.4.4.2.1 Option 1: Calculate pile/drilled shaft capacity (including a factor of safety of 2) x 2.0, compared to factored foundation demand (1.3 Dead + 1.5 Wearing Surface + 1.3 Live).
 - 3.4.4.2.2 Option 2: Use design foundation loads (listed on plans or pile driving records) x 1.5, compared to factored foundation demand (1.3 Dead + 1.5 Wearing Surface + 1.3 Live). All elements at given substructure (bent or abutment) can be assumed to have identical capacities; however, foundation demands must be calculated on an individual basis.

Chapter 4: Analysis Results

- 4 Analysis (actual calculations are not required in the report) (use sequence numbers from the bridge list)
 - 4.1 Report rating factors with vehicle free to be positioned anywhere on structure.
 - 4.1.1 In cases with restrictions on vehicle position, report rating factors for both cases :
 - 4.1.1.1 Vehicle free to be positioned anywhere (or justification for restriction)
 - 4.1.1.2 Vehicle positioned as specified
 - 4.2 Report superstructure flexure rating factors for all selected bridges. For calculating capacity, follow the AASHTO Manual for Bridge Evaluation edition indicated in the Bridge Inspection Manual.
 - 4.3 For steel structures, limit flexure capacity to the yield moment.
 - 4.4 Report superstructure shear rating factors for certain selected bridges. For calculating capacity, follow the AASHTO Manual for Bridge Evaluation edition indicated in the Bridge Inspection Manual.
 - 4.5 Report substructure flexure or shear rating factors for certain selected bridges if components are identified as potentially controlling.
 - 4.6 Report foundation loads and capacities when the load induces large forces in foundation elements.

Chapter 5: Restrictions

- 5 Restrictions (In addition to showing restrictions in the report, provide a separate text file of the restrictions for use by the Motor Carrier Division in preparation of the permit.)
 - 5.1 General Restrictions for bridges not listed in the Special Restrictions and consistent with assumptions used in determining the rating factors
 - 5.1.1 Vehicle location on bridges
 - 5.1.2 Maximum smooth speed on bridges
 - 5.1.3 Prohibition on stopping, starting and gear changing on bridges unless required for safety reasons
 - 5.1.4 While a span of a bridge is supporting any part of the vehicle, there shall be no other vehicle on that span or adjacent span.
 - 5.2 Special Restrictions, include:
 - 5.2.1 Bridge sequence number
 - 5.2.2 Reason for restriction
 - 5.2.3 Maximum vehicle speed allowed for that bridge
 - 5.2.4 Special location on bridge or other restriction. Provide loading diagram as required for clarification.
 - 5.2.5 Specific transport vehicle adjustments (extended axles, crabbing, etc.)

Chapter 6: Vehicle Weights

- 6.1 Recommendations for weighing vehicle
 - 6.1.1 Recommended weight verification method
- 6.2 Recommendations for weight tolerances
 - 6.2.1 Variation on individual axles
 - 6.2.2 Gross vehicle weight

Appendix A:
TxDOT Superheavy Load-Length Graph

