1. CONSTRUCTION EQUIPMENT ON STRUCTURES [107] (Revised 9-21-23)

Description: Requirements associated with the operation of equipment on structures.

Definition. The following definition applies to this special provision:

Equipment. Any vehicle or machine weighing more than 5000 pounds.

Construction Requirements. Do not use bridges as work platforms, work bridges, or to support or move equipment without the Project Manager's written approval.

For bridges having no posted load restrictions and no removal of deck concrete (not milled), provide a full engineering submittal for approval for all equipment utilizing outriggers on the structure and for any equipment not already approved under one of the following conditions:

Legal Loads. A vehicle that is a legal load as defined by Section 61-10 MCA.

Pre-Approved Equipment. The equipment is currently listed on MDT’s [Approved Construction Equipment List (ACEL)](https://www.mdt.mt.gov/business/contracting/acel.aspx) and will be operated according to any conditions stated in the ACEL.

For bridges with a posted load restriction or if bridge deck concrete is partially milled or removed, submit a full engineering submittal for approval for any of the following cases:

Equipment weight exceeds 25 tons.

Vehicle weight and configuration does not satisfy the posted load restriction.

More than one piece of equipment will be simultaneously located on a span.

Concrete removal results in significant debonding of the top mat of deck reinforcing steel. The Project Manager, in conjunction with the Bridge Bureau, will determine if significant debonding is present.

Repairs to bridge beams or truss members are specified in the contract and repairs are not complete.

Equipment outriggers will be used.

Full engineering submittal requirements. Submit an engineering analysis and report performed by a Professional Engineer registered in Montana.

Engineering analysis. Clearly describe loading conditions and assumptions and provide calculations. Investigate an envelope within which the equipment may function without damaging the structure or endangering workers or the public. MDT proposes the following topics, at a minimum. Provide additional information when necessary.

Load Cases.

Minimum suggested live load vehicles are Type 3 and Type 3S2 trucks in live load combinations from AASHTO "Manual for Condition Evaluation of Bridges."

Consider all loads on the bridge including axle loads, outriggers, equipment dynamic forces, and wind forces on the load, the boom, and the equipment. Consider deflection and secondary force effects. Include traffic live load if the structure will carry traffic during equipment operations.

Investigate different loading combinations for all configurations. Include the distribution of dead load and changing center-of-gravity of the equipment with and without load at different boom extensions, rotations, and elevations.

Structural Effects. Identify critical members. Determine any conditions under which the equipment cannot safely operate.

* + - 1. Written Report. Provide a report containing a narrative summarizing the results of the analysis. Describe special measures necessary to protect the structure through all phases of the equipment's positioning and use. Include drawings as necessary and indicate any minimum equipment clearances to relevant portions of the structure and to traffic flow. Estimate the work's duration.

Method of Measurement. Work associated with this provision is not measured for payment.

Basis of Payment. Include all costs associated with the requirements of this provision in the lump sum bid for Structure Analysis. Exception: If a full engineering analysis is required as a result of top mat debonding alone (none of the other criteria listed under C.2 are met) then it will be considered extra work and considered for time extension under 108.07.5.