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Nota di contenuto	Cover -- Half Title -- Title Page -- Copyright Page -- Contents -- Bridge Demolition Subcommittee -- Blue-Ribbon Panel Reviewers -- Preface -- Acknowledgments -- Disclaimer -- Chapter 1 : Bridge Demolition Engineering -- 1.1 Need for an Engineered Demolition Plan -- 1.2 Defining Roles and Responsibilities -- 1.3 Choosing the Right Demolition Method -- 1.3.1 Partial versus Complete Demolition -- 1.4 Engineering Analysis Considerations -- 1.5 Ensuring Public Safety -- Chapter 2 : Manuals and Specifications for Demolition -- 2.1 Introduction -- 2.2 Design Codes -- 2.2.1 American Association of State Highway and Transportation Officials -- 2.2.1.1 AASHTO Load and Resistance Factor Design Bridge Design Specifications. The AASHTO LRFD Bridge Design Specification is intended for the permanent design of highway structures -- however, this document provides imperative guidance for evaluati -- 2.2.1.2 AASHTO Manual for Bridge Evaluation. The AASHTO Manual for Bridge Evaluation (MBE) provides guidance on evaluating existing structures. Although the MBE usually references the AASHTO Bridge Design Specifications for specific analysis, i -- 2.2.1.3 AASHTO Load and Resistance Factor Design Bridge Construction Specifications. AASHTO ' s LRFD Bridge Construction Specifications provides limited requirements for bridge demolition. Although the specification requires the submittal of demo -- 2.2.1.4 AASHTO Guide Design Specifications for Bridge Temporary Works. The AASHTO Guide Design Specifications for Bridge Temporary Works provides guidelines for the design and construction of falsework, formwork, and temporary retaining structure. 2.2.1.5 Application of AASHTO Design Codes for Demolition. No specific load factors or live load distribution factors are prescribed for demolition equipment, nor load combinations that are required by code. It is often permissible to analyze const -- 2.2.2 American Institute of Steel Construction, Steel Construction Manual -- 2.2.3 American Concrete Institute, ACI 318 -- 2.2.4 American Railway Engineering and Maintenance-of-Way Association -- 2.2.5 Bridge Construction Guides -- 2.2.5.1 AASHTO Guide Specifications for Wind Loads on Bridges during Construction. This guide specification is intended for the construction of bridges before the deck is in place. The same approach to wind loads can be used for bridge demolition -- 2.2.5.2 Federal Highway Administration Engineering for Structural Stability in Bridge Construction. This document (FHWA 2015) is targeted at evaluating bridges for stability during construction but also addresses demolition activities and provide -- 2.2.5.3 Wisconsin Department of Transportation Development of a Bridge Construction Live Load Analysis Guide. This guide (Garlich and Miller 2011) was developed for the analysis of construction loads on permanent bridge structures, including ne -- 2.2.6 State-Specific Specifications -- 2.2.7 Railroad Agency Specifications -- 2.2.8 Current and Existing Research -- 2.3 Appendix: Owner-Referenced Specifications and Standards -- References -- Chapter 3 : Equipment and Tools for Bridge Demolition -- 3.1 Introduction -- 3.2 Removal Equipment -- 3.2.1 Excavators -- 3.2.1.1 Second and Third Member Attachments. 3.2.1.2 Excavator Tool Attachments Used for Demolition. Excavator tool attachments are chosen for the type of operation that will be

performed. Although most tool attachments are commercially available, custom tool attachments may be used. An overv -- 3.2.2 Cranes -- 3.2.3 Rigging for Demolition -- 3.2.3.1 Rigging Elements -- 3.2.3.2 Rigging Design. The minimum rated capacity of rigging members should be clearly stated on the demolition plans. Several different factors should be considered when developing a rigging system. These factors include -- 3.2.4 Typical Support Equipment -- 3.3 Cutting Equipment -- 3.3.1 Concrete Cutting -- 3.3.2 Steel Cutting -- 3.3.3 Pile Cutters -- 3.4 Protection/Material Management Systems -- 3.4.1 Modular Barges -- 3.4.2 Fencing and Netting -- 3.4.3 Protective Shielding -- 3.4.4 Railroad Track Protection -- 3.5 Temporary Bracing/Shoring Systems -- 3.6 Heavy Lift Equipment -- 3.6.1 Strand Jacks -- 3.6.2 Self-Propelled Modular Transporters -- 3.6.3 Span Float-Out Barges -- References -- Chapter 4 : Loads -- 4.1 Dead Loads -- 4.1.1 Introduction -- 4.1.2 Determination of Dead Load -- 4.1.3 Lifted Loads -- 4.2 General Live Loads -- 4.2.1 Introduction -- 4.2.2 Uniform Distributed Loads -- 4.2.3 Material Storage and Shielding -- 4.3 Removal Equipment Loads -- 4.3.1 Introduction -- 4.3.2 Excavators -- 4.3.2.1 Overview. Excavators are mounted either on tracks or wheels. The manufacturer specifications often report ground-bearing data as the total weight of the machine divided by the total ground contact area. This does not accurately reflect the l.
4.3.2.2 Load Development. Developing load effects from excavators is complicated because of the various moving parts. The weight of the boom, stick, attachment, supported load, body, and counterweight all rotate as the machine swings, resulting in -- 4.3.2.3 Track Pressure Development. The methods described for developing excavator track pressures treat the tracks like spread footings, similar to how crane manufacturers develop track pressures for crawler cranes. Track pressures are either trap -- 4.3.3 Cranes -- 4.3.4 Miscellaneous Equipment -- 4.3.4.1 Overview. Contractors usually require additional pieces of miscellaneous equipment to facilitate demolition operations. Examples of common support equipment used in demolition are listed subsequently. Refer to Chapter 3 "Equipment and Tools -- 4.3.4.2 Wheel Contact Area. Wheel contact area for rubber-tired equipment may also need to be calculated for analysis. AASHTO specifies a 10×20in. (254×508mm) contact area for typical trucks. The manufacturer ' s specified contact area should -- 4.3.5 Dynamic Load Allowance -- 4.4 Miscellaneous Loads -- 4.4.1 Snow and Ice Loads -- 4.4.2 Wind -- 4.4.3 Incidental or Minimum Lateral Loading -- 4.4.4 Locked-In Forces -- References -- Chapter 5 : Demolition with Explosives -- 5.1 Introduction -- 5.2 Roles for the Project Team -- 5.2.1 General Contractor -- 5.2.2 Explosives Contractor/Explosives Engineer -- 5.2.3 Construction Engineer -- 5.3 Motives for Selecting Explosives Demolition -- 5.4 Preparation for Explosives Demolition -- 5.4.1 Substructure Removal Preparation.
5.4.1.1 Pier Implosion/Explosion Overview. Pier removal with explosives is typically justified only in special circumstances. Large concrete piers may be collapsed on themselves (implosion) and steel frame piers can be brought down with external-sha -- 5.4.1.2 Protection of Surrounding Structures. Protection measures are project dependent but may be required for surrounding structures, wildlife, and any potential observers. Flying debris protection can be provided by steel-braided blast mats and/ -- 5.4.2 Superstructure Removal Preparation -- 5.4.2.1 Drop Zone Considerations. Drop zone is defined as the area directly below the bridge where the debris material is expected to land after the explosives are set off. Drop zones

	may contain items that are sensitive to falling debris, such as u -- 5.4.2.2 Pier Protection from Falling Debris. It is rare for piers to remain in service after a superstructure has been removed with explosives. However, in this case, the explosive charge locations in the superstructure should be located and oriente -- 5.4.2.3 Removal of Structures for Weight Reduction. Weight reduction prior to dropping a span has many benefits. If the total weight of the dropped structure is reduced, lighter equipment may be used for final removal/processing, which could reduce -- 5.4.2.4 Precutting Existing Structures. Linear-shaped charges are commonly used for the explosive removal of existing steel structures. Prior to setting the shaped charges, a partial precutting of the structural members is often required to both fa -- 5.4.2.5 Miscellaneous Nonstructural Preparations. Other preparatory work that should be considered when performing explosives demolition may include the following: -- 5.5 Structural Engineering Considerations -- 5.5.1 Deck/Floor System Removal. 5.5.2 Main Load-Carrying Members with Precuts.
Sommario/riassunto	Bridge Demolition Engineering: Best Practices, MOP 157, proposes consistent industry standards by setting minimum expectations for what should be included in a safe and effective demolition plan, indicating that a bridge coming out of service need not be held to the same design standards as a permanent structure.