



# AMERICAN NATIONAL STANDARD

*ANSI/ASSE A10.16 – 2009 (R2016)*  
*Safety Requirements for*  
*Tunnels, Shafts and Caissons*

*American National Standard*  
*for Construction and Demolition Operations*

ANSI/ASSE A10.16 – 2009 (R2016)



AMERICAN SOCIETY OF  
SAFETY ENGINEERS

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**ANSI/ASSE A10.16 – 2009 (R2016)**

**American National Standard  
Construction and Demolition Operations**

**Safety Requirements for  
Tunnels, Shafts and Caissons**

Secretariat

**American Society of Safety Engineers**  
520 N. Northwest Highway  
Park Ridge, Illinois 60068

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**American National Standards Institute, Inc.**

## **American National Standard**

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**Foreword** (This Foreword is not a part of American National Standard A10.16-2009 (R2016).)

This standard is one of a series of safety standards that have been formulated by the Accredited Standards Committee on Safety in Construction and Demolition Operations, A10. It is expected that the standards in the A10 series will find a major application in industry, serving as a guide to contractors, labor, and equipment manufacturers. For the convenience of users, a list of existing and proposed standards in the A10 series for Safety Requirements in Construction and Demolition Operations follows.

- A10.1 Pre-Project & Pre-Task Safety & Health Planning
- A10.2 Safety, Health and Environmental Training (under development)
- A10.3 Powder-Actuated Fastening Systems
- A10.4 Personnel Hoists and Employee Elevators
- A10.5 Material Hoists
- A10.6 Demolition Operations
- A10.7 Transportation, Storage, Handling and Use of Commercial Explosives and Blasting Agents
- A10.8 Scaffolding
- A10.9 Concrete and Masonry Construction
- A10.10 Temporary and Portable Space Heating Devices
- A10.11 Personnel Nets
- A10.12 Excavation
- A10.13 Steel Erection
- A10.15 Dredging
- A10.16 Tunnels, Shafts and Caissons
- A10.17 Safe Operating Practices for Hot Mix Asphalt (HMA) Construction
- A10.18 Temporary Roof and Floor Holes, Wall Openings, Stairways and Other Unprotected Edges
- A10.19 Pile Installation and Extraction Operations
- A10.20 Ceramic Tile, Terrazzo, and Marble Work
- A10.21 Safe Construction and Demolition of Wind Generation/Turbine Facilities (under development)
- A10.22 Rope-Guided and Non-Guided Workers' Hoists
- A10.23 Safety Requirements for the Installation of Drilled Shafts
- A10.24 Roofing – Safety Requirements for Low-Sloped Roofs
- A10.25 Sanitation in Construction
- A10.26 Emergency Procedures for Construction Sites
- A10.27 Hot Mix Asphalt Facilities
- A10.28 Work Platforms Suspended from Cranes or Derricks
- A10.29 Aerial Platforms in Construction (under development)
- A10.31 Digger-Derricks
- A10.32 Personal Fall Protection Used in Construction and Demolition Operations
- A10.33 Safety and Health Program Requirements for Multi-Employer Projects
- A10.34 Public Protection
- A10.37 Debris Nets
- A10.38 Basic Elements of a Program to Provide a Safe and Healthful Work Environment
- A10.39 Construction Safety and Health Audit Program
- A10.40 Reduction of Musculoskeletal Problems in Construction
- A10.42 Rigging Qualifications and Responsibilities in the Construction Industry
- A10.43 Confined Spaces in Construction and Demolition Operations
- A10.44 Lockout/Tagout in Construction
- A10.46 Hearing Loss Prevention
- A10.47 Highway Construction Safety
- A10.48 Communication Structures
- A10.49 Control of Health Hazards

One purpose of these standards is to serve as guides to governmental authorities having jurisdiction over subjects within the scope of the A10 Committee standards. If these standards are adopted for governmental use, the reference of other national codes or standards in individual volumes may be changed to refer to the corresponding regulations.

*Revisions:* The A10 Committee welcomes proposals for revisions to this standard. Revisions are made to the standard periodically (usually five years from the date of the standard) to incorporate changes that appear necessary or desirable, as demonstrated by experience gained from the application of the standard. Proposals should be as specific as possible, citing the relevant section number(s), the proposed wording and the reason for the proposal. Pertinent documentation would enable the A10 Committee to process the changes in a more-timely manner.

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## AMERICAN NATIONAL STANDARD A10.16 SAFETY REQUIREMENTS FOR TUNNELS, SHAFTS AND CAISSONS

### 1. GENERAL

**1.1 Scope.** This standard establishes safety requirements pertaining to the construction of tunnels, shafts and caissons. The requirements set forth in this standard cover environmental control; related facilities; fire prevention; hoisting; haulage; and electrical, drilling and blasting, and compressed air work. This standard is not intended for application to mining or quarrying operations.

**1.2 Purpose.** The purpose of this standard is to establish reasonable and practical safety requirements and practices for the construction of tunnels, shafts and caissons.

**1.3 Exceptions.** The enforcing authority may grant an exception to the literal requirements of this standard or may permit alternative methods if compliance with these requirements presents a greater hazard or significant hardship, is impractical or involves other extenuating circumstances.

### 2. REFERENCED STANDARDS

**2.1 Related American National Standards.** The following American National Standards are referred to, supplement or are related to this document. All provisions of the referenced standards that are applicable to demolition operations shall be observed. When the following American National Standards are superseded by a revision approved by the American National Standards Institute, the revision shall apply:

ANSI/ASSE A10.33, *Safety and Health Program Requirements for Multi-Employer Projects*

ANSI/ASSE A10.38, *Basic Elements of an Employer's Program to Provide a Safety and Healthful Work Environment*

ANSI/ASSE A10.9, *Concrete and Masonry Work Safety Requirements*

ANSI/ASSE A10.12, *Safety Requirements for Excavation*

ANSI/ASSE A10.18, *Safety Requirements for Temporary Floors, Holes, Wall Openings, Stairways and Other Unprotected Edges in Construction and Demolition Operations*

ANSI/ALI A14.1, *Safety Requirements for Wooden Ladders*

ANSI/ALI A14.2, *Safety Requirements for Portable Metal Ladders*

ANSI/ALI A14.3, *Safety Requirements for Fixed Ladders*

ANSI/ALI A14.4, *Safety Requirements for Job-Made Wooden Ladders*

ANSI/ALI A14.5, *Safety Requirements for Portable Reinforced Plastic Ladders*

ANSI/NFPA 30, *Flammable and Combustible Liquids Code*

ANSI/NFPA 70, *National Electrical Code*

ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*

ANSI/ISEA Z89.1, *Industrial Head Protection*

ANSI/LIA Z136.1, *American National Standard for Safe Use of Lasers*