

ASME B30.4-2020
(Revision of ASME B30.4-2015)

Portal and Pedestal Cranes

**Safety Standard for Cableways,
Cranes, Derricks, Hoists, Hooks, Jacks,
and Slings**

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

This American National Standard, Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings, has been developed under the procedures accredited by the American National Standards Institute (ANSI). This Standard had its beginning in December 1916, when an eight-page “Code of Safety Standards for Cranes,” prepared by the American Society of Mechanical Engineers (ASME) Committee on the Protection of Industrial Workers, was presented at the annual meeting of the ASME.

Meetings and discussions regarding safety on cranes, derricks, and hoists were held from 1920 to 1925 involving the ASME Safety Code Correlating Committee, the Association of Iron and Steel Electrical Engineers, the American Museum of Safety, the American Engineering Standards Committee (AESC) [later changed to American Standards Association (ASA), then to the United States of America Standards Institute (USASI), and finally to ANSI], Department of Labor — State of New Jersey, Department of Labor and Industry — State of Pennsylvania, and the Locomotive Crane Manufacturers Association. On June 11, 1925, the AESC approved the ASME Safety Code Correlating Committee’s recommendation and authorized the project with the U.S. Department of the Navy, Bureau of Yards and Docks, and ASME as sponsors.

In March 1926, invitations were issued to 50 organizations to appoint representatives to a Sectional Committee. The call for organization of this Sectional Committee was sent out October 2, 1926, and the Committee was organized on November 4, 1926, with 57 members representing 29 national organizations.

Commencing June 1, 1927, and using the eight-page Code published by ASME in 1916 as a basis, the Sectional Committee developed the “Safety Code for Cranes, Derricks, and Hoists.” The early drafts of this safety code included requirements for jacks, but due to inputs and comments on those drafts, the Sectional Committee decided in 1938 to make the requirements for jacks a separate code. In January 1943, ASA B30.2-1943 was published, addressing a multitude of equipment types, and in August 1943, ASA B30.1-1943 was published, addressing only jacks. Both documents were reaffirmed in 1952 and widely accepted as safety standards.

Due to changes in design, advancement in techniques, and general interest of labor and industry in safety, the Sectional Committee, under the joint sponsorship of ASME and the Bureau of Yards and Docks (now the Naval Facilities Engineering Command), was reorganized on January 31, 1962, with 39 members representing 27 national organizations. The new Committee changed the format of ASA B30.2-1943 so that the multitude of equipment types it addressed could be published in separate volumes that could completely cover the construction, installation, inspection, testing, maintenance, and operation of each type of equipment that was included in the scope of ASA B30.2. This format change resulted in B30.3, B30.5, B30.6, B30.11, and B30.16 being initially published as “Revisions” of B30.2, with the remainder of the B30 volumes being published as totally new volumes. ASA changed its name to USASI in 1966 and to ANSI in 1969, which resulted in B30 volumes from 1943 to 1968 being designated as ASA B30, USAS B30, or ANSI B30, depending on their date of publication. In 1982, the Committee was reorganized as an Accredited Organization Committee operating under procedures developed by ASME and accredited by ANSI.

This Standard presents a coordinated set of rules that may serve as a guide to government and other regulatory bodies and municipal authorities responsible for the guarding and inspection of the equipment falling within its scope. The suggestions leading to accident prevention are given both as mandatory and advisory provisions; compliance with both types may be required by employers of their employees. In case of practical difficulties, new developments, or unnecessary hardship, the administrative or regulatory authority may grant variances from the literal requirements or permit the use of other devices or methods, but only when it is clearly evident that an equivalent degree of protection is thereby secured. To secure uniform application and interpretation of this Standard, administrative or regulatory authorities are urged to consult the B30 Committee, in accordance with the format described in [Section IX](#) of the B30 Standard Introduction, before rendering decisions on disputed points.

Safety codes and standards are intended to enhance public safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

B30.4 has been in existence since 1943. New editions were published in 1973 and 1981 under the title Portal, Tower, and Pillar Cranes. The 1990, 1996, and 2003 editions were published under the title Portal, Tower, and Pedestal Cranes. For the 2010 edition, B30.4 removed all references to tower cranes and revised the title to Portal and Pedestal Cranes. All requirements for tower cranes were incorporated into B30.3-2009. The 2015 edition contained technical and editorial

revisions, including the addition of responsibilities of personnel, personnel competence, and translations. In this 2020 edition, many changes were made throughout each chapter, including the scope and references to B30.30, Ropes.

This Volume of the Standard, which was approved by the B30 Committee and by ASME, was approved by ANSI and designated as an American National Standard on July 16, 2020.

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Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

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B30 STANDARD INTRODUCTION

(20)

SECTION I: SCOPE

The ASME B30 Standard contains provisions that apply to the construction, installation, operation, inspection, testing, maintenance, and use of cranes and other lifting and material-movement-related equipment. For the convenience of the reader, the Standard has been divided into separate volumes. Each volume has been written under the direction of the ASME B30 Standards Committee and has successfully completed a consensus approval process under the general auspices of the American National Standards Institute (ANSI).

As of the date of issuance of this Volume, the B30 Standard comprises the following volumes:

- B30.1 Jacks, Industrial Rollers, Air Casters, and Hydraulic Gantries
- B30.2 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)
- B30.3 Tower Cranes
- B30.4 Portal and Pedestal Cranes
- B30.5 Mobile and Locomotive Cranes
- B30.6 Derricks
- B30.7 Winches
- B30.8 Floating Cranes and Floating Derricks
- B30.9 Slings
- B30.10 Hooks
- B30.11 Monorails and Underhung Cranes (withdrawn 2018 — requirements found in latest revision of B30.17)
- B30.12 Handling Loads Suspended From Rotorcraft
- B30.13 Storage/Retrieval (S/R) Machines and Associated Equipment
- B30.14 Side Boom Tractors
- B30.15 Mobile Hydraulic Cranes (withdrawn 1982 — requirements found in latest revision of B30.5)
- B30.16 Overhead Underhung and Stationary Hoists
- B30.17 Cranes and Monorails (With Underhung Trolley or Bridge)
- B30.18 Stacker Cranes (Top or Under Running Bridge, Multiple Girder With Top or Under Running Trolley Hoist)
- B30.19 Cableways
- B30.20 Below-the-Hook Lifting Devices
- B30.21 Lever Hoists
- B30.22 Articulating Boom Cranes
- B30.23 Personnel Lifting Systems
- B30.24 Container Cranes
- B30.25 Scrap and Material Handlers
- B30.26 Rigging Hardware
- B30.27 Material Placement Systems
- B30.28 Balance Lifting Units
- B30.29 Self-Erecting Tower Cranes
- B30.30 Ropes
- B30.31 Self-Propelled, Towed, or Remote-Controlled Hydraulic Platform Transporters¹
- B30.32 Unmanned Aircraft Systems (UAS) Used in Inspection, Testing, Maintenance, and Lifting Operations¹

SECTION II: SCOPE EXCLUSIONS

Any exclusion of, or limitations applicable to, the equipment, requirements, recommendations, or operations contained in this Standard are established in the affected volume's scope.

SECTION III: PURPOSE

The B30 Standard is intended to

- (a) prevent or minimize injury to workers, and otherwise provide for the protection of life, limb, and property by prescribing safety requirements
- (b) provide direction to manufacturers, owners, employers, users, and others concerned with, or responsible for, its application
- (c) guide governments and other regulatory bodies in the development, promulgation, and enforcement of appropriate safety directives

SECTION IV: USE BY REGULATORY AGENCIES

These volumes may be adopted in whole or in part for governmental or regulatory use. If adopted for governmental use, the references to other national codes and standards in the specific volumes may be changed to refer to the corresponding regulations of the governmental authorities.

¹This volume is currently in the development process.

SECTION V: EFFECTIVE DATE

(a) *Effective Date.* The effective date of this Volume of the B30 Standard shall be 1 yr after its date of issuance. Construction, installation, inspection, testing, maintenance, and operation of equipment manufactured and facilities constructed after the effective date of this Volume shall conform to the mandatory requirements of this Volume.

(b) *Existing Installations.* Equipment manufactured and facilities constructed prior to the effective date of this Volume of the B30 Standard shall be subject to the inspection, testing, maintenance, and operation requirements of this Standard after the effective date.

It is not the intent of this Volume of the B30 Standard to require retrofitting of existing equipment. However, when an item is being modified, its performance requirements shall be reviewed relative to the requirements within the current volume. The need to meet the current requirements shall be evaluated by a qualified person selected by the owner (user). Recommended changes shall be made by the owner (user) within 1 yr.

SECTION VI: REQUIREMENTS AND RECOMMENDATIONS

Requirements of this Standard are characterized by use of the word *shall*. Recommendations of this Standard are characterized by the word *should*.

SECTION VII: USE OF MEASUREMENT UNITS

This Standard contains SI (metric) units as well as U.S. Customary units. The values stated in U.S. Customary units are to be regarded as the standard. The SI units are a direct (soft) conversion from the U.S. Customary units.

SECTION VIII: REQUESTS FOR REVISION

The B30 Standards Committee will consider requests for revision of any of the volumes within the B30 Standard. Such requests should be directed to

Secretary, B30 Standards Committee
ASME Standards and Certification
Two Park Avenue
New York, NY 10016-5990

Requests should be in the following format:

Volume: Cite the designation and title of the volume.
Edition: Cite the applicable edition of the volume.
Subject: Cite the applicable paragraph number(s) and the relevant heading(s).
Request: Indicate the suggested revision.
Rationale: State the rationale for the suggested revision.

Upon receipt by the Secretary, the request will be forwarded to the relevant B30 Subcommittee for consideration and action. Correspondence will be provided to the requester defining the actions undertaken by the B30 Standards Committee.

SECTION IX: REQUESTS FOR INTERPRETATION

The B30 Standards Committee will render an interpretation of the provisions of the B30 Standard. An Interpretation Submittal Form is available on ASME's website at <http://cstools.asme.org/Interpretation/Interpretation-Form.cfm>.

Phrase the question as a request for an interpretation of a specific provision suitable for general understanding and use, not as a request for approval of a proprietary design or situation. Plans or drawings that explain the question may be submitted to clarify the question. However, they should not contain any proprietary names or information. Read carefully the note addressing the types of requests that the B30 Standards Committee can and cannot consider.

Upon submittal, the request will be forwarded to the relevant B30 Subcommittee for a draft response, which will then be subject to approval by the B30 Standards Committee prior to its formal issuance. The B30 Standards Committee may rewrite the question for the sake of clarity.

Interpretations to the B30 Standard will be available online at <https://cstools.asme.org/Interpretation/SearchInterpretation.cfm>.

SECTION X: ADDITIONAL GUIDANCE

The equipment covered by the B30 Standard is subject to hazards that cannot be abated by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential to have personnel involved in the use and operation of equipment who are competent, careful, physically and mentally qualified, and trained in the proper operation of the equipment and the handling of loads. Serious hazards include, but are not limited to, improper or inadequate maintenance, overloading, dropping or slipping of the load, obstructing the free passage of the load, and using equipment for a purpose for which it was not intended or designed.

The B30 Standards Committee fully realizes the importance of proper design factors, minimum or maximum dimensions, and other limiting criteria of wire rope or chain and their fastenings, sheaves, sprockets, drums, and similar equipment covered by the Standard, all of which are closely connected with safety. Sizes, strengths, and similar criteria are dependent on many different factors, often varying with the installation and uses. These factors depend on

- (a) the condition of the equipment or material
- (b) the loads

(c) the acceleration or speed of the ropes, chains, sheaves, sprockets, or drums

(d) the type of attachments

(e) the number, size, and arrangement of sheaves or other parts

(f) environmental conditions causing corrosion or wear

(g) many variables that must be considered in each individual case

The requirements and recommendations provided in the volumes must be interpreted accordingly, and judgment used in determining their application.

ASME B30.4-2020

SUMMARY OF CHANGES

Following approval by the ASME B30 Committee and ASME, and after public review, ASME B30.4-2020 was approved by the American National Standards Institute on July 16, 2020.

ASME B30.4-2020 includes the following changes identified by a margin note, **(20)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
ix	B30 Standard Introduction	Updated
1	Chapter 4-0	Title revised
1	Section 4-0.1	Revised
1	4-0.2.1	Definition of <i>luffing crane</i> deleted
1	4-0.2.2	<p>(1) Definitions of <i>accessory</i>; <i>axis of rotation</i>; <i>boom</i>; <i>boom point</i>; <i>brake</i>; <i>buffer/bumper</i>; <i>cab</i>; <i>counterweight</i>; <i>crane, standby</i>; <i>drum</i>; <i>jib</i>; <i>load block, lower</i>; <i>maximum operating wind speed</i>; <i>out-of-service</i>; <i>parking track</i>; <i>pedestal</i>; <i>radius</i>; <i>rail clamp</i>; <i>rope</i>; <i>service, heavy</i>; <i>service, light</i>; <i>service, normal</i>; <i>shall</i>; <i>should</i>; <i>switch, limit</i>; <i>truck, travel</i>; <i>two-blocking</i>; and <i>weathervaning</i> revised</p> <p>(2) Definitions of <i>level luffing boom</i>; <i>luffing boom</i>; <i>pintle/kingpost</i>; and <i>superstructure</i> added</p> <p>(3) Definitions of <i>administrative or regulatory authority</i>; <i>bogie</i>; <i>braking means</i>; <i>dynamic loading</i>; <i>flange point</i>; <i>gage, track</i>; <i>high strength (traction) bolts</i>; <i>load, working</i>; <i>minimum breaking force</i>; <i>pawl (dog)</i>; <i>permanent installation</i>; <i>pitch diameter</i>; <i>rotation resistant rope</i>; <i>standing rope (pendant)</i>; <i>structural competence</i>; <i>tower</i>; <i>traction</i>; and <i>trolley, load</i> deleted.</p>
6	Chapter 4-1	<p>(1) In Section 4-1.1, paras. 4-1.1.1.(g), 4-1.1.1.(j), and 4-1.1.2(g) revised, and para. 4-1.1.3 deleted</p> <p>(2) Section 4-1.2 added and subsequent Sections through former Section 4-1.14 redesignated</p> <p>(3) In Section 4-1.3 (formerly 4-1.2), paras. 4-1.3.1(c), 4-1.3.2(a), 4-1.3.2(b), 4-1.3.3(a), 4-1.3.3(e), 4-1.3.4(b)(2), and 4-1.3.6 revised</p> <p>(4) In Section 4-1.4 (formerly 4-1.3), paras. 4-1.4.1(a), 4-1.4.5, and 4-1.4.6 revised</p> <p>(5) In Section 4-1.5 (formerly 4-1.4), paras. 4-1.5.1(d), 4-1.5.2, 4-1.5.3(a) through 4-1.5.3(c), 4-1.5.4, and 4-1.5.5 revised</p> <p>(6) Section 4-1.6 (formerly 4-1.5) revised in its entirety</p> <p>(7) In Section 4-1.7 (formerly 4-1.6), subpara. 4-1.7.2(b) revised</p> <p>(8) In Section 4-1.8 (formerly 4-1.7), subpara. 4-1.8.1(a) revised</p> <p>(9) In Section 4-1.9 (formerly 4-1.8), subpara. (b) revised</p> <p>(10) Section 4-1.10 (formerly 4-1.9) revised in its entirety</p> <p>(11) In Section 4-1.11 (formerly 4-1.10), subparagraphs. (a)(2), (b)(2), and (b)(4) revised; and subpara. (b)(5) deleted and subsequent subparagraphs redesignated</p> <p>(12) Section 4-1.12 (formerly 4-1.11) revised in its entirety</p>

<i>Page</i>	<i>Location</i>	<i>Change</i>
		(13) Section 4-1.13 (formerly 4-1.12) revised in its entirety, and former Figure 4-1.12-1 deleted
		(14) In Section 4-1.15 (formerly 4-1.14), subparas. 4-1.15.1(a), 4-1.15.1(b), 4-1.15.2(a), and 4-1.15.2(b) revised; and subpara. 4-1.15.2(c) added
		(15) Former Section 4-1.15 deleted
		(16) In Section 4-1.16, subparas. (d) and (h) revised
		(17) In Section 4-1.17, subparas. 4-1.17.1(e), 4-1.17.2(a), and 4-1.17.2(c) revised
		(18) In Section 4-1.18, paras. 4-1.18.1(b) and 4-1.18.6 revised; and para. 4-1.18.9 added
14	4-2.1.1	Revised
14	4-2.1.2	Subparagraph (b)(2) revised
14	4-2.1.3	(1) Revised (2) Subparagraph (i) deleted: former subparas. (j) and (k) redesignated (3) Subparagraph (k) added
14	4-2.1.4	(1) Subparagraphs (a), (b), and (d) through (f) revised (2) Subparagraph (g) added
15	4-2.1.5	Subparagraphs (a) and (b) revised
15	4-2.3.1	Revised in its entirety
15	4-2.3.2	Revised
16	4-2.3.3	Added and subsequent paragraphs redesignated
16	4-2.3.4	Former para. 4-2.3.3, redesignated and revised
16	4-2.4.2	Subparagraph (a)(7) added
16	4-2.4.4	Revised
16	4-2.4.5	Revised in its entirety
18	4-3.1.2	Subparagraph (a) revised
19	4-3.1.3	Subparagraphs (f) and (g) added
19	4-3.1.3.1.2	Revised
20	4-3.1.3.2.2	Subparagraph (c)(1) revised
20	4-3.1.3.3.1	Subparagraph (o) deleted and remaining subparagraphs redesignated
21	4-3.1.3.4	Revised
21	4-3.1.3.5	Added
21	4-3.2.1	Revised
23	4-3.2.3	Added
23	Section 4-3.3	(1) Paragraph 4-3.3.3 revised and subpara. (d) added (2) Paragraph 4-3.3.5 revised (3) Paragraph 4-3.3.6 revised (4) Paragraph 4-3.3.7 deleted and subsequent paragraph redesignated
25	4-3.4.2	(1) Revised in its entirety (2) Figure 4-3.4.2.1 and Table 4-3.4.2-1 deleted

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Chapter 4-0

Scope, Definitions, Personnel Competence, Translations, and References

(20)

(20) SECTION 4-0.1: SCOPE OF B30.4

Volume B30.4 includes provisions that apply to the construction, installation, operation, inspection, testing, and maintenance of electric motor or internal-combustion engine-powered portal and pedestal cranes that adjust operating radius by means of a boom luffing mechanism, that may be mounted on a fixed or traveling base, and to any variation thereof that retains the same fundamental characteristics.

This Volume applies only to portal and pedestal cranes having a luffing boom and utilizing a drum and rope for load hoisting. The requirements for tower cranes (refer to ASME B30.3), telescopic boom cranes, twin boom container handling cranes, and articulating boom cranes are not included in this Volume.

SECTION 4-0.2: DEFINITIONS

(20) 4-0.2.1 Types of Cranes

pedestal crane: a crane consisting of a rotating superstructure with operating machinery and boom, all of which is mounted on a pedestal (see [Figure 4-0.2.1-1](#)).

portal crane: a crane consisting of a rotating superstructure with operating machinery and boom, all of which is mounted on a gantry structure, usually with a portal opening between the gantry columns or legs for traffic to pass beneath the crane. The crane may be fixed or on a traveling base (see [Figures 4-0.2.1-2](#) and [4-0.2.1-3](#)).

(20) 4-0.2.2 General

accessory: a secondary part or assembly of parts that contributes to the overall function and usefulness of the crane.

alteration (modification): any change in the original equipment manufacturer's design configuration of the crane that pertains to load-supporting components, load-positioning components, and other components that affect the safe load-carrying capability of the crane (e.g., counterweights, holding valves), including operational aids, limit devices, and other safety equipment.

axis of rotation: the vertical axis around which the superstructure rotates.

boom: a member used for supporting the hoisting tackle, with its outer end supported by ropes, chains, rods, or hydraulic cylinder(s).

boom point: the outward end of the boom.

boom stop: a device or structure designed to limit boom travel to its highest allowable position.

brake: a device, other than a motor, used for retarding or stopping motion by means of friction or power.

bumper: an energy-absorbing device for reducing impact when a moving boom or crane reaches the end of its permitted travel. This is also known as a buffer.

cab: the operator's compartment on the crane.

clutch: a means for engagement or disengagement of power.

counterweight: weight used to supplement the weight of the crane in providing stability for lifting loads; it rotates with the superstructure.

drum: the cylindrical member around which the rope is wound for lifting or lowering the load or boom.

gantry: a movable structural frame consisting of columns and bracing capable of supporting a crane with its working and dynamic loads.

heavy service: service that involves operating at 85% to 100% of rated load or in excess of 10 lift cycles per hour as a regular specified procedure.

in-service: the condition of a crane ready for or engaged in work; an operator is at the controls.

jib: an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom.

level luffing boom: a type of luffing boom arrangement where the load stays at a constant elevation during luffing of the boom.

light service: service that involves irregular operation with loads generally about one-half or less of the rated load

limit switch: a device that is actuated by the motion of a part of a power-driven machine or equipment to alter or disconnect the electric, hydraulic, or pneumatic circuit associated with the machine or equipment.