

Attachment B LANL Existing Building Code (LEBC)

Revision 10 Summary (complete history at end of document):

2021 IEBC update. Material on 304.3.1–2 revised for same and ESM Ch. 5 Section II r12. Other changes throughout.

1. Purpose/Scope: This mandatory Attachment contains LANL amendments to the *International Existing Building Code (IEBC)*; it addresses repairs, alterations, changes of occupancy, additions, demolition, and historic and relocated buildings. Both the IEBC and this document contain other requirements for non-building system repairs and alterations.
2. When altering systems outside the LANL IBC Program defined by IBC-GEN tables (*GEN-1 and -2*), (e.g., certain process or programmatic equipment unlike traditional building systems), see ESM [Chapter 1](#) Z10 regarding Code or Record for direction on possible need to upgrade to current expectations.
3. Adoption: Comply with the 2021 IEBC and its Appendices A and B.¹ New Mexico amendments (NMAC [14.7.7](#)) that strengthen the IEBC are also required (see ESM Ch 1 Section Z10 Subsection Codes and Standards).
 - a. When making a building or system modification, follow the most stringent requirements of existing building requirements between IEBC, IFC, NFPA 101 Life Safety Code, and New Mexico and LANL (herein) amendments to same.
 - b. *The IEBC is online for LANL at <https://int.lanl.gov/library/find-materials/standards.shtml> (NOTE: Many users will only need some of the first 16 chapters, not the long appendices, and can stop printing at about page 108 of the ~331-page file).*

Interpretations (Approved): Those from the ICC are here:
https://www3.iccsafe.org/cs/Codes_List.cfm

Any LANL sitewide interpretations will be on the Chapter 16 or other relevant chapter webpage; they are incorporated into the ESM chapters upon next revision and removed from website.
4. RP 8: When altering buildings that are SDC-D, the over-30% replacement value rule of ICSSC [RP 8](#) Section 2.1(c) applies in addition to IEBC; see ESM [Ch. 5](#) Section I.
5. The LBO has the authority to require upgrade of any or all of a system to current code on a case-by-case basis (regardless of percentage) when safety is a concern.
6. Under very limited circumstances defined herein (at 301.1 below), the “codes of record” can be applied to later modifications, replacements, or rehabilitation projects when justifiable. See also ESM Chapter 1 Section Z10 regarding Code of Record. (*Guidance: For complex situations, the justification should follow the methodology and documentation process in AP-341-515, System Adequacy Analysis*).

¹ IEBC was adopted by New Mexico effective July 1, 2004; State law is required to be followed by LANL; a LANL multi-disciplinary team determined that it was appropriate for LANL (ref EMRef-37 -- IEBC Meeting Minutes of 11-10-2004) (Note: EMref refers to a Standards Program internal filing system for hard-to-find references.).

7. In addition to the global program amendments in IBC-GEN and its Att A LBC, amendments to the IEBC for LANL are as follows (based on 2021 edition):

LEBC	<p>CHAPTER 1 SCOPE AND ADMINISTRATION</p> <p>101.1. Title. These regulations shall be known as the LANL Existing Building Code.</p> <p>101.4.1 Buildings not previously occupied. Add: Once there is occupancy (partial or full) or it has gone operational, then repairs, alterations, additions etc. follow the IEBC edition required by ESM.</p> <p>101.6 Appendices. Delete and substitute: IEBC Appendices A and B are adopted.</p> <p>101.7 Correction of violations of other codes. Deleted.</p> <p>102.5 Partial invalidity. Deleted.</p> <p>103 – CODE COMPLIANCE AGENCY. See IBC-GEN</p> <p>104 - DUTIES AND POWERS OF THE CODE OFFICIAL. Also see this chapter.</p> <p>105 - PERMITS. See this ESM chapter.</p> <p>106 - CONSTRUCTION DOCUMENTS. Also see IBC-GEN</p> <p>107 - TEMPORARY STRUCTURES AND USES. Also see IBC-GEN.</p> <p>108 - FEES. Deleted.</p> <p>109 - INSPECTIONS. Also see this ESM chapter.</p>
LEBC	<p>110 - CERTIFICATE OF OCCUPANCY. Also see IBC-GEN.</p> <p>111 - SERVICE UTILITIES. See App A of IBC-GEN</p> <p>112 - MEANS OF APPEALS. See App A of IBC-GEN.</p> <p>113 - VIOLATIONS. See App A of IBC-GEN.</p> <p>114 - STOP WORK ORDER. See App A of IBC-GEN.</p> <p>115 - UNSAFE STRUCTURES AND EQUIPMENT. See App A of IBC-GEN.</p> <p>116 - EMERGENCY MEASURES. Deleted.</p> <p>117 - DEMOLITION. Deleted.</p>
	<p>CHAPTER 2 DEFINITIONS</p> <p>202. General definitions. IEBC terms shall be interpreted identically to the IBC amendments in IBC-GEN App. A.</p>
LEBC	<p>CHAPTER 3 PROVISIONS FOR ALL COMPLIANCE METHODS</p> <p>301.3 Alteration, addition or change of occupancy — Exception on code of record (COR):</p> <p>COR for Electrical, Fuel Gas, Mechanical, Plumbing system installations. The LBO is the approver. Hazardous means the project may not increase the hazard (risk) to people. Furthermore, the LBO cannot let a hazard like a significant structural or fire code noncompliance go unresolved by a project. Also, the approach shall not lessen health, accessibility, life- and fire-safety, or structural requirements (104.10, Modifications). Beyond this, the LBO may allow certain alterations to only meet code of record.</p>
LEBC	<p>Overall LANL Policy on IEBC Provisions for Code of Record</p> <p>For any project, the LBO may allow use of code of record for any alteration except when structural alterations per 301.3 Exception 3 are involved. IEBC Chapter 5 may only be used when building is substantially fire code compliant and when changes do not increase the hazard. However, the LBO cannot let a hazard like a significant structural or fire code noncompliance go unresolved by a project affecting that location. Beyond this, the LBO may allow certain alterations to only meet the code of record within the restrictions set forth in the IEBC (including the concept that the alteration cannot weaken the building or make the building or system less conforming to code).</p>

LEBC	<p>The LBO may do this on an individual project basis in writing, and has also designated the following scope as automatically approved – i.e., the following alterations are considered “minor” and automatically approved to follow code of record where and how allowed by the IEBC as noted above:²</p> <p><u>Building Structural, Structures, and Nonstructural Components</u> In an existing facility, unless the building is undergoing structural alteration, anchorage may be designed to the horizontal loading requirements of the building’s code of record, but no less than 0.1 x the weight of the component—with the anchorage itself designed to current ESM Ch. 5. Other situations only as approved by LBO. See also 304.3.1 below.</p> <p><u>Building Non-Structural (e.g., floor plan, finishes)</u> As approved by LBO. Add Repair-related clarification at 401.2: The <u>work shall not make the building less conforming</u> to the building, plumbing, mechanical, electrical or fire codes of the jurisdiction, or to alternative materials, design, and methods of construction, or to any previously approved plans, modifications, alternative methods, or compliance alternatives, than it was before the repair was undertaken.</p>
LEBC	<p><u>Fire</u>³</p> <ol style="list-style-type: none"> 1. Either (a) reconfiguration of existing sprinkler systems to accommodate changes to locations of walls or other systems and obstructions or (b) the installation of a limited number of sprinkler heads to correct an existing deficiency: Where the existing system lacks seismic protection, follow current NFPA 13 but seismic protection is not required for the system. 2. Extending sprinkler protection to a new area (i.e., addition or extension to existing building space w/o sprinklers as a Level 2 Alteration), only the new portion must comply with the requirements for new construction; however, the installation of seismic separation assemblies is likely required unless the original is updated seismically. New spaces or use with a severe fire hazard (e.g., high-pile storage and change in occupancy to Group H) will require seismically updating the original system back to the system riser, unless approved otherwise by the LANL Fire Marshal.⁴ <p><u>Mechanical/Plumbing/Piping/Fuel Gas</u></p> <ol style="list-style-type: none"> 1. For existing mechanical components being modified but with no increase in weight or center-of-gravity and not being removed/re-anchored, structural anchorage need not meet current ESM Chapter 5 requirements. 2. New piping/tubing shall meet all current requirements except for small additions to existing systems (on the order of 9 additional sprinkler heads worth of piping or less) that may omit sway bracing and flexible joints to existing system. <p><u>Electrical</u></p> <ol style="list-style-type: none"> 1. For existing electrical components being modified but not removed/re-anchored,

² Once LANL has more experience with code of record, we may allow that Code of Record be used when approved by the LBO (in consultation with a structural POC if applicable)

³ These are consistent with NM and ESM Ch 1 Z10 threshold for PE involvement in fire design. Beyond this limit, full ESM requirements must be met (e.g., sway bracing and flexible joints between new and old work).

⁴ Consistent with the FP requirement of Section 803. Seismic update of the existing piping/sprinkler is voluntary per IEBC Sections 503.13 or 805.4

<p>LEBC</p>	<p>structural anchorage need not meet current ESM Chapter 5 requirements.</p> <p>2. For conduit, tray, and duct bank runs (must be under 100 amps⁵), sway bracing and flexible joints to existing system may be omitted.</p> <p>301.3.1 Prescriptive compliance method LANL Interpretation: Regarding IBC Chapter 5 (Prescriptive Compliance Method), for any project, if fire code deficiencies relative to the current fire codes (IBC, IFC, and NFPA 101) will remain after project completion, as determined by the Fire Marshal, then Chapter 5 cannot be used and Chapter 6-12 for work area compliance method must be used (also Chapter 13 as applicable).</p> <p>301.3.3 Performance compliance method. Deleted (see LEBC Ch 13 below)</p> <p>304.3 Seismic evaluation and design procedures. Add: For raised floors⁶:</p> <p>1. 304.3.3 The requirements of Sections 304.3.1 and 304.3.2 also apply when modifications are made to existing raised floors, or upon introduction of new computing equipment supported/anchored on existing raised floors (e.g., next generation of computing racks).</p> <p><u>304.3.1, Compliance with full seismic forces⁷</u> IBC Table 304.3.1:</p> <p>1. The BSE-1N hazard design spectrum shall be taken to be the same as that required by ESM Ch. 5 Sect. II (ref. para. 1.8.A in rev. 12) for the design of new structures (e.g., $S_{DS} = 0.55$ and $S_{D1} = 0.44$; $T_0 = 0.10$ s, $T_S = 0.80$ s, and $T_L = 6$ s).</p> <p>2. The BSE-2N hazard design spectrum shall be taken to be 3/2 (or 1.5 times) the BSE-1N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.83$ and $S_{D1} = 0.66$; $T_0 = 0.10$ s, $T_S = 0.80$ s, and $T_L = 6$ s.</p>
<p>LEBC</p>	<p><u>304.3.2, Compliance with reduced seismic forces</u> ASCE 41 / IBC Table 304.3.2:</p> <p>1. The BSE-1E hazard design spectrum shall be taken to be 3/4 (or 0.75 times) the BSE-1N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.41$ and $S_{D1} = 0.33$; $T_0 = 0.10$ s, $T_S = 0.80$ s, and $T_L = 6$ s.</p> <p>2. The BSE-2E hazard design spectrum shall be taken to be 3/4 (or 0.75 times) the BSE-2N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.62$ and $S_{D1} = 0.50$; $T_0 = 0.10$ s, $T_S = 0.80$ s, and $T_L = 6$ s.</p> <p><u>SDC-C Exception to 304.3.1 and 304.3.2</u> For structures that were originally designed using SDC C, the following hazard design spectra may be used. Subject to an approved variance, these spectra can also be used for structures that were originally designed using SDC D.⁸</p>

⁵ Was a trigger for when Electrical AHJ required design in ESM Ch 7 Section D5000 until Rev. 8 removed it.

⁶ Recommendations regarding the anchorage of raised computer room floors in existing LANL buildings (e.g., LDCC and SCC) in ES-DO-Memo-21-025 (4/12/21)

⁷ Refer to ASCE 41-17 Sections 2.4, 2.5, C2.4, and C2.5 for rationale/justification

⁸ The variance is only applicable if/when all conditions and provisions of ESM Ch. 5 Sect. II (r12 subsection 1.8.A.2) apply (i.e., other than the SDC being C originally), and the variance justification must include sufficient detail to allow the LBO to discern that this is so. The primary reason for limiting use of such variance for "SDC-D structures" is that the IBC exception for determining SDC -- the basis for LANL's SDC-C exception -- first appeared in the IBC (i.e., 2000), and ESM Ch. 5 adopted the IBC (2003 edition) in Feb 2004.

	<ol style="list-style-type: none"> 1. BSE-1N: The BSE-1N hazard design spectrum shall be constructed using the following acceleration and period values:⁹ $S_{DS} = 0.49$ and $S_{D1} = 0.23$; $T_0 = 0.10$ s, $T_S = 0.48$ s, and $T_L = 6$ s. 2. BSE-2N: The BSE-2N hazard design spectrum shall be taken to be 1.5 times the BSE-1N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.74$ and $S_{D1} = 0.35$; $T_0 = 0.10$ s, $T_S = 0.48$ s, and $T_L = 6$ s. 3. BSE-1E: The BSE-1E hazard design spectrum shall be taken to be 0.75 times the BSE-1N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.37$ and $S_{D1} = 0.18$; $T_0 = 0.10$ s, $T_S = 0.48$ s, and $T_L = 6$ s. 4. The BSE-2E hazard design spectrum shall be taken to be 3/4 (or 0.75 times) the BSE-2N hazard design spectrum, which will result in the following acceleration and period values: $S_{DS} = 0.55$ and $S_{D1} = 0.26$; $T_0 = 0.10$ s, $T_S = 0.48$ s, and $T_L = 6$ s. <p>306.7.1 Alterations affecting an area containing a primary function Exception 1 clarification: The 20% max accessible cost limit is installation, not design cost.</p> <p>CHAPTER 11 ADDITIONS 1103.2 Lateral force-resisting systems. Add "Structurally independent additions may be SDC C or D without regard to SDC of existing structure."</p> <p>CHAPTER 13 PERFORMANCE COMPLIANCE METHODS Deleted, to be used only with prior approval of LBO and subsequent approval of calculations and outcome.¹⁰</p> <p>CHAPTER 15 CONSTRUCTION SAFEGUARDS The methods described and others as specified by LANL are required for areas resembling urban or campus, including all of TA-3 and within the TA-55 fence. For other areas, including those resembling rural/industrial, requirements may be reduced by LANL ES&H based on the analysis of construction hazards.</p>
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RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	10/27/06	Initial issue. Requirements formerly in Ch 1 Section Z10.	Tobin Oruch, <i>CENG-OFF</i>	Kirk Christensen, <i>CENG-OFF</i>
1	6/19/07	Added NM Bldg Code. Org changes.	Tobin Oruch, <i>CENG-OFF</i>	Kirk Christensen, <i>CENG-OFF</i>

⁹ These seismic design parameters can be found on page 20 of CAL-99-MULT-651 under "Site Class D." This calculation is the source of the SDC-C exception in ESM Ch. 5 Sect. II (r11, para. 1.8.A.2).

¹⁰ Deletion recommended by ENG-DECS (now ES-EPD) C/S/A Team 7/11/05; see EMRef-50. There was some disagreement about when LANL began to comply with the UBC, a decision necessary for use of this method.

LANL Engineering Standards Manual STD-342-100 Ch. 16, Building Code Program**Section IBC-GEN –General Building Code Requirements**

Rev. 10, 3/22/2023

Attachment B – LANL Existing Building Code (LEBC)

2	7/21/08	Update for 2006 IEBC, other minor changes.	Tobin Oruch, <i>CENG-OFF</i>	Kirk Christensen, <i>CENG-OFF</i>
3	9/15/09	Excluded Supplements; added provisions for minor work similar to code of record under IEBC Ch 3 Prescriptive Compliance Method.	Tobin Oruch, <i>CENG-OFF</i>	Gary Read, <i>CENG-OFF</i>
4	8/25/10	Very minor clarifications.	Tobin Oruch, <i>CENG-OFF</i>	Larry Goen, <i>CENG-OFF</i>
5	6/20/11	2009 IEBC adoption.	Tobin Oruch, <i>CENG-OFF</i>	Larry Goen, <i>CENG-OFF</i>
6	9/24/13	Minor clarification on fixture count for Level 2.	Tobin Oruch, <i>ES-DO</i>	Larry Goen, <i>ES-DO</i>
7	3/30/15	2015 IEBC adoption.	Tobin Oruch, <i>ES-DO</i>	Larry Goen, <i>ES-DO</i>
8	10/6/16	Added anchorage to code of record allowances at 301.1.	Tobin Oruch, <i>ES-DO</i>	Larry Goen, <i>ES-DO</i>
9	3/24/21	Section 301.1 updated for new seismic spectra and SDC C allowance in ESM Ch 5 Sect. II r11.	Tobin Oruch, <i>ES-FE</i>	Jim Streit, <i>ES-DO</i>
10	3/22/23	2021 IEBC update. Material on 304.3.1–2 revised for same and ESM Ch. 5 Section II r12. Other changes throughout.	Tobin Oruch, <i>ES-FE</i>	Michael Richardson, <i>ES-DO</i>