

## **UNMC/NEBRASKA MEDICINE PROJECT DESIGN CRITERIA AND RESOURCES**

UNMC and Nebraska Medicine share a medical center campus in midtown Omaha which includes underlying state-owned property (owned by UNMC) and privately-owned property (owned by CRHS and Nebraska Medicine). On privately-owned property, UNMC is not the AHJ, however UNMC/Nebraska Medicine design guidelines and applicable standards shall be complied with. Additionally, in all clinical health care spaces, compliance with CMS, TJC, and FGI guidelines, in addition to City of Omaha and HHS standards, is mandatory. Further discussion is needed during the early concept design stages of each project is needed to clarify the project criteria.

1. **INTERNATIONAL CODE COUNCIL (ICC)**

- *International Building Code (IBC), 2012 edition (per State Statute 71-6403)*
- *International Existing Building Code (IEBC), 2012 edition (per State Statute 71-6403)*
- *International Energy Conservation Code (IECC), 2009 edition (per State Statute 81-1611)*
- *International Fire Code (IFC), 2012 edition (as referenced by the IBC)*
- *International Mechanical Code (IMC), 2012 edition (as referenced by the IBC)*
- *International Plumbing Code (IPC), 2012 edition (as referenced by the IBC)*
- *International Fuel Gas Code (IFGC), 2012 edition (as referenced by the IBC)*
- *International Green Construction Code (IgCC), 2012 edition (as referenced by the IBC)*

2. **INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)**

*Uniform Plumbing Code (UPC), 2009 edition (as published by the International Association of Plumbing and Mechanical Officials (IAPMO); see State Statute 18-132 - verify with UNMC for proper application)*

3. **ACCESSIBILITY STANDARDS**

- *2010 ADA Standards for Accessible Design (as published in the Federal Register September 15, 2010 and adopted by Nebraska State Fire Marshal on March 15, 2012)*
- *ICC/ANSI A117.1-2009, Accessible and Usable Buildings and Facilities (see IBC-2012, Chapter 11)*

4. **NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)**

*See Nebraska Administrative Code, Title 153, Chapter 1, for complete list of NFPA codes and standards. UNMC follows the 2012 edition of NFPA 101, "Life Safety Code" and all referenced NFPA codes and standards. As of 2018, the Nebraska State Fire Marshal still performs inspections in accordance with the 2000 edition of NFPA 101. Edit list of applicable NFPA documents as appropriate.*

- *NFPA 1-2012, Fire Code*
- *NFPA 10-2010, Portable Fire Extinguishers*
- *NFPA 13-2013, Sprinkler Systems*
- *NFPA 14-2010, Standpipe and Hose Systems*
- *NFPA 30-2012, Flammable and Combustible Liquids Code*
- *NFPA 45-2011, Fire Protection for Laboratories Using Chemicals*
- *NFPA 54-2012, National Fuel Gas Code (as amended by Nebraska Administrative Code)*
- *NFPA 55-2013, Compressed Gases and Cryogenic Fluids*
- *NFPA 70-2017, National Electrical Code (per State Statute 81-2101)*
- *NFPA 72-2013, National Fire Alarm and Signaling Code*
- *NFPA 75-2013, Protection of Information Technology Equipment*

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- NFPA 77-2007, *Static Electricity*
- NFPA 80-2013, *Fire Doors and Other Opening Protectives*
- NFPA 90A-2012, *Air-Conditioning and Ventilating Systems*
- NFPA 90B-2012, *Warm Air Heating and Air-Conditioning Systems*
- NFPA 91-2010, *Exhaust Systems for Air Conveying of Gases, etc.*
- NFPA 92-2012, *Smoke-Control Systems (replaces NFPA 92A and 92B)*
- NFPA 96-2011, *Ventilation Control and Fire Protection of Commercial Cooking Operations*
- NFPA 99-2012, *Health Care Facilities Code*
- NFPA 101-2012, *Life Safety Code*
- NFPA 101A-2013, *Guide to Alternative Approaches to Life Safety*
- NFPA 110-2013, *Emergency and Standby Power Systems*
- NFPA 150-2013, *Fire and Life Safety in Animal Housing Facilities*
- NFPA 220-2012, *Standard on Types of Building Construction*
- NFPA 211-2010, *Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*
- NFPA 221-2012, *High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls*
- NFPA 286-2011, *Wall and Ceiling Interior Finish*
- NFPA 780-2011, *Installation of Lightning Protection Systems*

5. **ILLUMINATING ENGINEERING SOCIETY (IES)** - *IES Lighting Handbook (10th Edition)*

6. **AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)**

- ASME A17.1-2013, *Safety Code for Elevators and Escalators (per Nebraska Administrative Code, Title 230 - verify requirements with State Elevator Inspector)*
- ASME B20.1-1996, *Safety Standard for Conveyors and Related Equipment (including Addenda "G-1" and "G-2") (per Nebraska Administrative Code, Title 230 - verify requirements with State Elevator Inspector)*

7. **AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS (ASHRAE)**

- ASHRAE 55-2010, *Thermal Environmental Conditions for Human Occupancy (required by LEED v4)*
- ASHRAE 62-2010, *Ventilation for Acceptable Indoor Air Quality (required by LEED v4)*
- ASHRAE 90.1-2010, *Energy Standard for Buildings Except Low-Rise Residential Buildings (required by LEED v4)*
- ASHRAE 170-2013, *Ventilation for Health Care Facilities*
- ASHRAE 189.1-2014, *Standard for the Design of High Performance Green Buildings*

8. **UNDERWRITERS LABORATORIES (UL)**

- *Fire Resistance Directory - 2015 (3 Volumes)*
- UL 96A-2016, *Installation Requirements for Lightning Protection System*

9. **TELECOMMUNICATIONS INDUSTRY ASSOCIATION/ELECTRONIC INDUSTRIES ALLIANCE (TIA/EIA)**

- ANSI/TIA/EIA-568.1-D (2015), *Commercial Building Telecommunications Cabling Standard*
- ANSI/TIA/EIA-568.3-D (2016), *Optical Fiber Cabling and Components Standard*
- ANSI/TIA/EIA-569-D (2015), *Telecommunications Pathways and Spaces*
- ANSI/TIA/EIA-606-C (2017), *Administration Standard for the Telecommunications Infrastructure*
- ANSI/TIA-607-C (2015), *Telecommunications Bonding and Grounding (Earthing) for Customer Premises*

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**10. INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)**

- IEEE Std 493-2007 (“Gold Book”), *Design of Reliable Industrial and Commercial Power Systems*
- IEEE Std 519-2014, *Recommended Practice and Requirements for Harmonic Control in Electric Power Systems*
- IEEE Std 602-2007 (“White Book”), *Electric Systems in Health Care Facilities*
- IEEE Std 1100-2005 (“Emerald Book”), *Powering and Grounding Electronic Equipment*
- IEEE Std 3001.5-2013, *Recommended Practice for the Application of Power Distribution Apparatus in Industrial and Commercial Power Systems*
- IEEE Std 3001.11-2017, *Recommended Practice for Application of Controllers and Automation to Industrial and Commercial Power Systems*
- IEEE Std 3003.2-2014, *Recommended Practice for Equipment Grounding and Bonding in Industrial and Commercial Power Systems*
- IEEE Std 3004.5-2014, *Recommended Practice for the Application of Low-Voltage Circuit Breakers in Industrial and Commercial Power Systems*
- IEEE Std 3004.8-2016, *Recommended Practice for Motor Protection in Industrial and Commercial Power Systems*
- IEEE Std 3006.5-2014, *Recommended Practice for the Use of Probability Methods for Conducting a Reliability Analysis of Industrial and Commercial Power Systems*
- IEEE Std 3006.7-2013, *Recommended Practice for Determining Reliability of 7x24 Continuous Power Systems in Industrial and Commercial Power Systems*

**11. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)**

- ANSI C2-2017, *National Electrical Safety Code*
- ANSI Z358.1-2014, *Plumbed and Portable Eyewash Stations*
- ANSI Z9.5-2012, *Laboratory Ventilation*

**12. LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED)**

*LEED v4 for Building Design and Construction (as published by the U.S. Green Building Council, updated 01/05/2018) (see attached “University of Nebraska Medical Center - Sustainable Design Policy”; verify with UNMC FM&P on required level of LEED certification and allowable points.)*

**13. ADDITIONAL DESIGN RESOURCES FOR RESEARCH FACILITIES** *(edit list of design criteria as appropriate)*

- NIH Design Policy and Guidelines (Volume 2 -Research Laboratory and Volume 4 - Reference Materials).* National Institutes of Health. December,1999. *(Note - All Codes and Standards included in volume 4, section A.4 shall apply. Should a conflict occur between code requirements, the more stringent code requirements shall govern.)*
- Guide for the Care and Use of Laboratory Animals.* Institute of Laboratory Animal Resources, Commission on Life Sciences National Research Council. National Academy Press Washington, D.C.
- Laboratory Safety Monograph: A Supplement to the NIH Guidelines for Recombinant DNA Research.* National Institutes of Health. Washington, D.C.: U.S. Department of Health, Education, and Welfare.
- NIH Guidelines for the Laboratory Use of Chemical Carcinogens.* National Institutes of Health. NIH Pub. No. 81-2385. Washington, D.C.: U.S. Department of Health and Human Services.
- Biological Safety Manual for Research Involving Oncogenic Viruses.* National Cancer Institute. DHEW Pub. No. (NIH) 76-1165. Washington, D.C.: U.S. Department of Health, Education, and Welfare.
- National Cancer Institute Safety Standards for Research Involving Oncogenic Viruses.* National Cancer Institute. DHEW Pub. No. (NIH) 78-790. Washington, D.C.: U.S. Department of Health, Education, and Welfare.
- Biosafety in Microbiological and Biomedical Laboratories. 4<sup>th</sup> ed.* Centers for Disease Control and National Institutes of Health. HHS Pub. No. (CDC) 93-8395. Washington, D.C.: U.S. Department of Health and Human Services.

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- Biosafety in the Laboratory: Prudent Practices for Handling and Disposal of Infectious Materials.* Committee on Hazardous Biological Substances in the Laboratory, National Research Council. 1989. Washington, D.C.: National Academy Press.
- Design Criteria for Viral Oncology Research Facilities.* National Cancer Institute. DHEW Pub. No. (NIH)76-891. Washington, D.C.: U.S. Department of Health, Education, and Welfare.
- Design of Biomedical Research Facilities.* D. G. Fox, ed. 1981. Cancer Research Safety Monograph Series, Vol. 4. NIH Pub. No. 81-2305. Washington, D.C.: U.S. Department of Health and Human Services.
- Prudent Practices in the Laboratory: Handling and Disposal of Chemicals.* Committee on Prudent Practices for Handling, Storage, and Disposal of Chemicals in Laboratories, National Research Council 1995.
- Occupational Exposure to Hazardous Chemicals in Laboratories.* OSHA Regulation 1910.1450 (OSHA Standard - 29 CFR Part 1910, Subpart Z)

14. **ADDITIONAL DESIGN RESOURCES FOR HEALTH CARE FACILITIES** (*edit list of design criteria as appropriate*)

- The Joint Commission (TJC)*
- Centers for Medicare and Medicaid Services (CMS)*
- U.S. Department of Health & Human Services (HHS)*
- Facility Guidelines Institute (FGI)*
- National Institutes of Health (NIH)*
- The Nebraska Medical Center (TNMC)*

15. **REVIEWING AUTHORITIES**

- UNMC Review - Project documents shall be submitted for review and approval by UNMC Facilities Management and Planning department and the University's ADA Compliance Officer.
- Fire Marshal Review - Project documents shall be submitted for review and approval by the Nebraska State Fire Marshal's office as required by Title 156 of the Nebraska Administrative Code.
- State Inspector's Review - Project documents shall be submitted for review and comment by the State Electrical Inspector and State Elevator Inspector. Comments, if any, need to be brought to the attention of UNMC Facilities Management and Planning Department for further review and/or direction.
- 309 Task Force for Building Renewal - The State of Nebraska, Administrative Services (AS), 309 Task Force for Building Renewal – Policies & Procedures will be followed on all new construction and renovation projects, unless exceptions are specifically approved by UNMC. The 309 Task Force for Building Renewal strongly encourages the submission of plans and specifications at the 95% design stage even for non-309 funded projects.
- Insurance Carrier Review - Project documents and shop drawings of fire suppression and fire detection/alarm systems shall be submitted to UNMC's insurance carrier for information only.

16. **RISK AND QUALITY MANAGEMENT – PEER REVIEWS**

*To reduce the risk of building failures and improve the probability of excellent building performance over the life of the building, the following will be completed as appropriate)*

- Structural design peer reviews of each new building will be considered and conducted by an independent registered structural engineer.
- UNMC will arrange for a peer review of the exterior shell design concept and details of each new building to be conducted by a qualified firm specializing in forensic engineering or in conducting similar reviews. Field inspections by the same firm will be considered and conducted as needed.
- Benchmarking tours and surveys will be conducted as appropriate for new buildings, especially those of a technical or special purpose to determine and advance state-of-the-art design.

**University of Nebraska**  
**Sustainable Design Policy**  
(August 1, 2009)

In the interest of being good stewards of the environment, the University of Nebraska is implementing sustainable building goals and requirements into their design guidelines.

The goals and requirements being implemented are based on the Leadership in Energy and Environmental Design program for New Construction (LEED-NC) which is sponsored by the United States Green Building Council (USGBC). This program encompasses a holistic approach to sustainable design. The intents of the program are to provide a quantifiable rating system universal to the building industry and to transform the marketplace to become more sustainable.

Points towards achieving certification are obtained by meeting the requirements for various "credits." Credits will identify specific goals and requirements that pertain to all aspects of the design and construction of a project, ranging from recycled materials to energy efficiency to construction waste management. Strategies that meet these goals and requirements (as defined by each "credit") will benefit the university, occupant, community, and global environment in the following ways:

- Optimizing Energy Performance  
Projects that meet these goals and requirements will decrease building energy usage and provide tangible results for the university and our community through lower utility costs and reduced resource usage while meeting the environmental requirements of functions to be housed in the building.
- Indoor Environmental Quality and Health  
Projects that achieve a high indoor environmental quality will provide benefits to the university and moreover to occupants. It is widely accepted that high indoor environmental quality increases occupant productivity and mental health while reducing absenteeism. Occupant health is a high priority for learning institutions.
- Local/Regional Community  
Projects that meet these goals and requirements will benefit the University of Nebraska campus environments, and will directly affect the local and regional community of which the university is a member. These projects will reduce the load on our local municipality infrastructure. They will stimulate the local economy through increased demand for local resources and materials and new sustainable market development. These projects will also reduce the negative impact on our local environment as compared to a standard building.
- Global Environment  
Projects that meet these goals and requirements will use considerably less of our world's natural resources, create substantially less waste through construction and operation, and conserve our energy sources.

To obtain certification, the project must be registered with the USGBC and the proper documentation submitted per LEED requirements. Information on the current rating system requirements can be found at [www.usgbc.org](http://www.usgbc.org). The University of Nebraska may or may not pursue certifications per the LEED program depending upon the project, however, all new construction and major renovation projects (total project cost exceeds 15% of replacement value) will achieve a minimum number of

points to meet certified level. Individual projects may require meeting a higher number of LEED credits.

Certified Level

This category pertains to credits (goals and requirements) that have been determined attainable based on good practices. These credits shall be considered mandatory on all projects unless the University of Nebraska requests otherwise. The costs to implement strategies that meet all of these credits are anticipated to add minimally to the total construction budget and will vary per project. These additional costs will apply to associated construction cost for sustainable design features, consultant fees for additional documentation and research, and Commissioning. All minimal credits may provide a return on investment ranging from energy cost savings to increased productivity. It is possible to reduce the additional cost by beginning the implementation of strategies that meet these credits during the early stages of the project.

Desirable Level

This category pertains to credits (goals and requirements) that have been determined attainable with small additional effort beyond normal design and construction practices. These credits shall be achieved in the project at the request of the University of Nebraska or at the desire of the design team. In addition to the minimal credits, the costs to implement strategies that meet all of these credits are anticipated to add to the total construction budget and will vary per project. These additional costs would apply to associated construction cost for sustainable design features, consultant fees for additional documentation and research, and Commissioning. All minimal and desirable credits may provide a return on investment ranging from energy cost savings to increased productivity. It is possible to reduce the additional cost by beginning the implementation of strategies that meet these credits during the early stages of the project.

Optional Level

This category pertains to credits (goals and requirements) that have been determined attainable but optional upon project specific aspects. The costs to implement strategies that meet these credits are also optional upon project specific aspects. Strategies that meet these credits shall be considered on all projects and implemented at the request of the University of Nebraska or at the desire of the design team.

Advanced Level

This category pertains to credits (goals and requirements) that have been determined attainable for projects striving for a high level of LEED certification or exceptional sustainable design. Strategies that meet these credits shall be pursued only at the request of the University of Nebraska. In addition to the minimal, desirable, and optional credits, the costs to implement strategies that meet all of these credits are anticipated to add to the total construction budget and will vary per project. These additional costs would apply to associated construction cost for sustainable design features, consultant fees for additional documentation and research, and Commissioning. All recommended credits may provide a return on investment ranging from energy cost savings to increased productivity. It is possible to reduce the additional cost by beginning the implementation of strategies that meet these credits during the early stages of the project.