Mandatory Requirements (as applicable)

Mandatory requirements compiled by US Department of Energy and Pacific Northwest National Laboratory. Adopted with permission

Topic	Section	Component	Description	Yes	N/A	Ex
Air Leakage	5.4.3.1	Envelope	Continuous air barrier is wrapped, sealed, caulked, gasketed, and/or taped in an approved manner, except in semiheated spaces and in climate zones 1-6.	☐	☐	☐
Air Leakage	5.4.3.2	Envelope	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	☐	☐	☐
Air Leakage	5.4.3.4	Envelope	Vestibules are installed where building entrances separate conditioned space from the exterior, and meet exterior envelope requirements. Doors have self-closing devices, and are >=7 ft apart.	☐	☐	☐
Air Leakage	5.4.3.1	Envelope	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	☐	☐	☐
Fenestration	5.8.2.1	Envelope	Fenestration products rated in accordance with NFRC.	☐	☐	☐
Fenestration	5.8.2.2	Envelope	Fenestration products are certified as to performance labels or certificates provided.	☐	☐	☐
Fenestration	5.8.2.3,5.5.3.6	Envelope	U-factor of opaque doors associated with the building thermal envelope meets requirements.	☐	☐	☐
Insulation	5.8.1.2	Envelope	Below-grade wall insulation installed per manufacturer's instructions.	☐	☐	☐
Insulation	5.8.1.2	Envelope	Slab edge insulation installed per manufacturer's instructions.	☐	☐	☐
Insulation	5.8.1.7.3	Envelope	Insulation in contact with the ground has <=0.3% water absorption rate per ASTM C272.	☐	☐	☐
Insulation	6.4.4.1.5	Envelope	Bottom surface of floor structures incorporating radiant heating insulated to >=R-3.5.	☐	☐	☐
Insulation	5.5.3.1	Envelope	Roof R-value. For some ceiling systems, verification may need to occur during Framing Inspection.	☐	☐	☐
Insulation	5.8.1.2,5.8.1.3	Envelope	Roof insulation installed per manufacturer's instructions. Blown or poured loose-fill insulation is installed only where the roof slope is <=3 in 12.	☐	☐	☐
Insulation	5.5.3.1	Envelope	Skylight curbs are insulated to the level of roofs with insulation above deck or R-5.	☐	☐	☐
Insulation	5.5.3.1.1	Envelope	High-albedo roofs satisfy one of the following: Solar reflectance >= 0.55 and thermal emittance >= 0.75, Solar reflectance index >= 64.0, or increased insulation (assembly <= U-0.03 or >= R-33.0 insulation).	☐	☐	☐
Insulation	5.8.1.2	Envelope	Above-grade wall insulation installed per manufacturer's instructions.	☐	☐	☐
Insulation	5.8.1.2	Envelope	Floor insulation installed per manufacturer's instructions.	☐	☐	☐
Insulation	5.8.1.1	Envelope	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.	☐	☐	☐
Insulation	5.8.1.4	Envelope	Eaves are baffled to deflect air to above the insulation.	☐	☐	☐
Insulation	5.8.1.5	Envelope	Insulation is installed in substantial contact with the inside surface separating conditioned space from unconditional space.	☐	☐	☐
Insulation	5.8.1.6	Envelope	Recessed equipment installed in building envelope assemblies does not compress the adjacent insulation.	☐	☐	☐

Insulation	5.8.1.7	Envelope	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection.	☐ ☐ ☐
Insulation	5.8.1.7.1	Envelope	Attics and mechanical rooms have insulation protected where adjacent to attic or equipment access.	☐ ☐ ☐
Insulation	5.8.1.7.2	Envelope	Foundation vents do not interfere with insulation.	☐ ☐ ☐
Insulation	5.8.1.8	Envelope	Insulation intended to meet the roof insulation requirements cannot be installed on top of a suspended ceiling. Mark this requirement compliant if insulation is installed accordingly.	☐ ☐ ☐
Plan Review	4.2.2,5.4.3.1.1,5.7	Envelope	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐ ☐ ☐
Controls	9.4.1.7	Exterior Lighting	Automatic lighting controls for exterior lighting installed.	☐ ☐ ☐
Plan Review	9.7	Exterior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ ☐ ☐
Wattage	9.4.3	Exterior Lighting	Exterior grounds lighting over 100 W provides >60 lm/W unless on motion sensor or fixture is exempt from scope of code or from external LPD.	☐ ☐ ☐
Wattage	9.4.3	Exterior Lighting	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐ ☐ ☐
Controls	9.4.1.1	Interior Lighting	Automatic controls to shut off all building lighting installed in buildings >5,000 ft2.	☐ ☐ ☐
Controls	9.4.1.2	Interior Lighting	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	☐ ☐ ☐
Controls	9.4.1.3	Interior Lighting	Parking garage lighting is equipped with required lighting controls and daylight transition zone lighting.	☐ ☐ ☐
Controls	9.4.1.4	Interior Lighting	Primary sidelighted areas >=250 ft2 are equipped with required lighting controls.	☐ ☐ ☐
Controls	9.4.1.5	Interior Lighting	Enclosed spaces with daylight area under skylights and rooftop monitors >900 ft2 are equipped with required lighting controls.	☐ ☐ ☐
Controls	9.4.1.6	Interior Lighting	Separate lighting control devices for specific uses installed per approved lighting plans.	☐ ☐ ☐
Plan Review	4.2.2,9.4.4,9.7	Interior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ ☐ ☐
Post Construction	8.7.1	Interior Lighting	Furnished as-built drawings for electric power systems within 30 days of system acceptance.	☐ ☐ ☐
Post Construction	8.7.2	Interior Lighting	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐ ☐ ☐
Wattage	9.4.2	Interior Lighting	Exit signs do not exceed 5 watts per face.	☐ ☐ ☐
Wattage	9.6.2	Interior Lighting	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐ ☐ ☐

Wattage	9.6.3	Interior Lighting	Where space LPD requirements are adjusted based on room cavity ratios, dimensions are consistent with approved plans.	☐	☐	☐
Wattage	9.2.2.3	Interior Lighting	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐	☐	☐
Controls	10.4.3	Mechanical	Elevators are designed with the proper lighting, ventilation power, and standby mode.	☐	☐	☐
HVAC	6.4.3.8	Mechanical	Freeze protection and snow/ice melting system sensors for future connection to controls.	☐	☐	☐
HVAC	6.4.1.4,6.4.1.5	Mechanical	HVAC equipment efficiency verified. Non-NAECA HVAC equipment labeled as meeting 90.1.	☐	☐	☐
HVAC	6.4.3.4.1	Mechanical	Stair and elevator shaft vents have motorized dampers that automatically close.	☐	☐	☐
HVAC	6.4.3.4.2,6.4.3.4.3	Mechanical	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.	☐	☐	☐
HVAC	6.4.3.4.5	Mechanical	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐	☐	☐
HVAC	6.4.3.4.4	Mechanical	Ventilation fans >0.75 hp have automatic controls to shut off fan when not required.	☐	☐	☐
HVAC	6.4.3.9	Mechanical	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐	☐	☐
HVAC	6.4.4.1.1	Mechanical	Insulation exposed to weather protected from damage. Insulation outside of the conditioned space and associated with cooling systems is vapor retardant.	☐	☐	☐
HVAC	6.4.4.1.2	Mechanical	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	☐	☐	☐
HVAC	6.4.4.1.3	Mechanical	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	☐	☐	☐
HVAC	6.4.4.1.4	Mechanical	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐	☐	☐
HVAC	6.4.4.2.1	Mechanical	Ducts and plenums sealed based on static pressure and location.	☐	☐	☐
HVAC	6.5.2.3	Mechanical	Dehumidification controls provided to prevent reheating, recooling, mixing of hot and cold airstreams or concurrent heating and cooling of the same airstream.	☐	☐	☐
HVAC	6.5.4.1	Mechanical	HVAC pumping systems >10 hp designed for variable fluid flow.	☐	☐	☐
HVAC	6.5.6.1	Mechanical	Exhaust air energy recovery on systems meeting Table 6.5.6.1.	☐	☐	☐
HVAC	6.5.7.1.1	Mechanical	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.	☐	☐	☐
HVAC	6.5.7.1.5	Mechanical	Approved field test used to evaluate design air flow rates and demonstrate proper capture and containment of kitchen exhaust systems.	☐	☐	☐
HVAC	6.5.7.2	Mechanical	Fume hoods exhaust systems >=15,000 cfm have VAV hood exhaust and supply systems, direct make-up air or heat recovery.	☐	☐	☐
HVAC	6.5.8.1	Mechanical	Unenclosed spaces that are heated use only radiant heat.	☐	☐	☐
HVAC	6.4.3.1.2	Mechanical	Thermostatic controls have a 5 °F deadband.	☐	☐	☐
HVAC	6.4.3.2	Mechanical	Temperature controls have setpoint overlap restrictions.	☐	☐	☐

HVAC	6.4.3.3.1	Mechanical	HVAC systems equipped with at least one automatic shutdown control.	☐	☐	☐
HVAC	6.4.3.3.2	Mechanical	Setback controls allow automatic restart and temporary operation as required for maintenance.	☐	☐	☐
HVAC	6.4.3.7	Mechanical	When humidification and dehumidification are provided to a zone, simultaneous operation is prohibited.	☐	☐	☐
HVAC	6.7.2.4	Mechanical	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐	☐	☐
Other Equipment	10.4.1	Mechanical	Electric motors meet requirements where applicable.	☐	☐	☐
Plan Review	4.2.2,6.4.4.2.1,6.7.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐	☐	☐
Plan Review	4.2.2,7.7.1,10.4.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed. Hot water system sized per manufacturer's sizing guide.	☐	☐	☐
Plan Review	6.7.2.4	Mechanical	Detailed instructions for HVAC systems commissioning included on the plans or specifications for projects >=50,000 ft2.	☐	☐	☐
Post Construction	6.7.2.1	Mechanical	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐	☐	☐
Post Construction	6.7.2.2	Mechanical	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐	☐	☐
Post Construction	6.7.2.3	Mechanical	An air and/or hydronic system balancing report is provided for HVAC systems serving zones >5,000 ft2 of conditioned area.	☐	☐	☐
SYSTEM_SPECIFIC	7.4.4.1	Mechanical	Temperature controls installed on service water heating systems (<=120ºF to maximum temperature for intended use).	☐	☐	☐
SYSTEM_SPECIFIC	7.4.4.2	Mechanical	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐	☐	☐
SYSTEM_SPECIFIC	7.4.6	Mechanical	Heat traps installed on non-circulating storage water tanks.	☐	☐	☐
SYSTEM_SPECIFIC	6.4.1.5.2	Mechanical	PTAC and PTHP with sleeves 16 in. by 42 in. labeled for replacement only.	☐	☐	☐
SYSTEM_SPECIFIC	6.4.3.10	Mechanical	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >= 110,000 Btu/h has variable airflow controls.	☐	☐	☐
SYSTEM_SPECIFIC	6.4.4.2.2	Mechanical	Ductwork operating >3 in. water column requires air leakage testing.	☐	☐	☐
SYSTEM_SPECIFIC	6.5.1,6.5.1.1,6.5.1.3	Mechanical	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐	☐	☐
SYSTEM_SPECIFIC	6.5.1,6.5.1.2,6.5.1.3	Mechanical	Water economizers provided where required, meet the requirements for design capacity, maximum pressure drop and integrated economizer control.	☐	☐	☐
SYSTEM_SPECIFIC	6.5.1.4	Mechanical	Economizer operation will not increase heating energy use during normal operation.	☐	☐	☐
SYSTEM_SPECIFIC	6.5.2.1	Mechanical	Zone controls can limit simultaneous heating and cooling and sequence heating and cooling to each zone.	☐	☐	☐
SYSTEM_SPECIFIC	6.5.2.2.1	Mechanical	Three-pipe hydronic systems using a common return for hot and chilled water are not used.	☐	☐	☐

SYSTEM_SPECIFIC	6.5.2.2.2	Mechanical	Two-pipe hydronic systems using a common distribution system have controls to allow a deadband >=15 ºF, allow operation in one mode for at least 4 hrs before changeover, and have rest controls to limit heating and cooling supply temperature to <=30 ºF.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.2.2.3	Mechanical	Hydronic heat pump systems connected to a common water loop meet heat rejection and heat addition requirements.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.2.4	Mechanical	Water economizer specified on hydronic cooling and humidification systems designed to maintain inside humidity at >35 ºF dewpoint if an economizer is required.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.1.1	Mechanical	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.1.2	Mechanical	HVAC fan motors not larger than allowable limits.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.2.1	Mechanical	VAV fan motors >=10 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.2.2	Mechanical	VAV fans have static pressure sensors positioned so setpoint <=1/3 total design pressure.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.2.3	Mechanical	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.3	Mechanical	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.3.4	Mechanical	Multiple zone HVAC systems have supply air temperature reset controls.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.4.2	Mechanical	Reduce flow in pumping systems >10 hp. to multiple chillers or boilers when others are shut down.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.4.3	Mechanical	Temperature reset by representative building loads in pumping systems >10 hp for chiller and boiler systems >300,000 Btu/h.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.4.4.1	Mechanical	Two-position automatic valve interlocked to shut off water flow when hydronic heat pump with pumping system >10 hp is off.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.4.4.2	Mechanical	Hydronic heat pumps and water-cooled unitary air conditioners with pump systems >5 hp have controls or devices to reduce pump motor demand.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.5.2	Mechanical	Fan systems with motors >=7.5 hp associated with heat rejection equipment to have capability to operate at 2/3 of full-speed and auto speed controls to control the leaving fluid temperature or condensing temp/pressure of heat rejection device.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.6.2	Mechanical	Condenser heat recovery system that can heat water to 85 ºF or provide 60% of peak heat rejection is installed for preheating of service hot water in 24/7 facility, water cooled systems reject >6 MMBtu, SHW load >=1 MMBtu.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.7.1.2	Mechanical	Conditioned supply air to space with a kitchen hood shall not exceed the greater of a) supply flow required to meet space heating or cooling, or b) hood exhaust flow minus the available air transfer from available spaces.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.7.1.3	Mechanical	Kitchen hoods with a total exhaust airflow rate >5000 cfm meet replacement air, ventilation system, or energy recovery requirements shown in Table 6.5.7.1.3.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.7.1.4	Mechanical	Kitchen hoods with a total exhaust airflow rate >5000 cfm meet replacement air, ventilation system, or energy recovery requirements.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.5.9	Mechanical	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐ ☐ ☐

SYSTEM_SPECIFIC	7.4.2	Mechanical	Service water heating equipment meets efficiency requirements.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.5.1	Mechanical	Combined space and water heating system not allowed unless standby loss less than calculated maximum. AHJ has approved or combined connected load <150 kBtu/h.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.5.2	Mechanical	Service water heating equipment used for space heating complies with the service water heating equipment requirements.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.4.3.1.1	Mechanical	Heating and cooling to each zone is controlled by a thermostat control.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.4.3.3.3	Mechanical	Systems with air capacity >10,000 cfm include optimum start controls.	☐ ☐ ☐
SYSTEM_SPECIFIC	6.4.3.5	Mechanical	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.4.3	Mechanical	Public lavatory faucet water temperature <=110°F.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.4.4	Mechanical	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.5.1	Mechanical	Pool heaters are equipped with on/off switch and no continuously burning pilot light.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.5.2	Mechanical	Pool covers are provided for heated pools and pools heated to >90°F have a cover >=R-12.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.5.3	Mechanical	Time switches are installed on all pool heaters and pumps.	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.3	Mechanical	All piping in circulating system insulated	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.3	Mechanical	First 8 ft of outlet piping is insulated	☐ ☐ ☐
SYSTEM_SPECIFIC	7.4.3	Mechanical	All heat traced or externally heated piping insulated	☐ ☐ ☐
Controls	8.4.2	Project	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	☐ ☐ ☐
Plan Review	4.2.2,8.4.1.1,8.4.1.2,8.	Project	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%.	☐ ☐ ☐