A Closer Look Inspection Service
2015 IECC Commercial DFW area handout

C104.2 Required inspections

104.2.1 Footings and Foundations (Insulation requirements)
104.2.2 Framing and Rough-in (Insulation, Air sealing Fenestration)
104.2.3 Plumbing (Insulation, Controls, Heat traps)
104.2.4 Mechanical HVAC equipment sizing, Controls, Damper Leakage)
104.2.5 Electrical Rough-in (Lighting components and controls)
104.2.6 Final

C401.2 New Construction and high rise residential will comply with 1 of the following;

401.2.1 ASHRAE 90.1
401.2.2 C402 (Building Envelope), 403 (Mechanical), 404 (Water Heating) and 405(Lighting) and 1 of Additional Options in 406
401.2.3 402.4 (Air Leakage), 403.2 (HVAC Efficiency), 404 (Water Heating), 405.2 (Light Controls), 405.3 (Emergency Exits), 405.4 Interior Lighting Requirements, 405.6 (Exterior Lighting) and 405.7 (Individual Metering - To achieve 15% or better in efficiency, C407 (Performance Path)

C402.1 Building Envelope general requirements

1. Opaque portions meet R value requirements or performance path
2. Three year Solar reflective Index 64 ASTM E 1980 or
   Three year Solar Reflectance of .55 and Thermal Emittance of .75 ASTM C 1549
3. Fenestration per C402.4
4. Air Leakage at 75 Pa at < .4 cfm/ft2 includes intakes, exhaust openings, stairways, shafts, loading docks and vestibules

402.1.4.1 Steel Stud wall assemblies new correction factor for reducing insulation R value (.35 - .55%) depending on stud depth and spacing

Table C402.1.3 Insulation values in Zone 3 (Prescriptive)

Roof Deck R-25 ci Under Roof R19 + R11 LS Attic R-38
No drop ceiling insulation allowed
Mass Wall R-7.6 Commercial / Residential R-9.5 Metal Bld R13 + R6.5 ci
Metal Framed R-13 +R-7.5 ci Wood framed R-13 + R-3.8ci or R-20
Floor Insulation R - 30 Opaque non swing doors R – 4.75

402.2.3 Mass walls include walls that weight not less than 35 psf
Have a heat capacity exceeding 7 Btu/sqft

© *Copyright 2016* *A Closer Look Inspection Service* *940-891-3803*
www.DallasEnergyInspection.com *www.DallasGreenBuilding.biz*

A Closer Look Inspection Service

2015 IECC Commercial DFW area handout

402.3 Fenestration Inspections (Prescriptive)

Fixed Fenestration		U - .46	
Operable Fenestration		U - .60	
Entrance door		U - .77	
Projection Factor = Horizontal awning distance / Vertical glass height			
Orientation		SEW	North
Results	PF , .2	.25	.33
	PF .2 ≤ .50	.30	.37
	PF ≥ .50	.40	.40
Skylight	3% max	U - .55	SHGC .35

402.4.1 30% limit of gross wall area for all fenestration

402.4.1.1 40% limit with daylight responsive lighting controls with restrictions

402.4.2 In enclosed area >2,500 sqft with ceiling height >15 feet under a roof with location limitations shall have a Day Lighting zone covering not less that 50% of the floor area

402.5 Air Leakage Inspections (Mandatory)

402.5 Continuous air barrier (inside or outside) unless meets the Building pressure test @ 75 Pa - Use specific materials list in 402.5.1.2.1

402.5.1.1 Air barrier penetrations (caulk, gaskets or tape)
Wall top plate penetrations sealed on all walls
Seal Bottom plate to foundation / vertical Wall intersections on exterior walls Seal around Windows & Doors & all Building envelope penetrations Seal or gasket Doors / Windows / Fixtures / Junction boxes for outlets & switches

402.5.6 Conditioned loading dock weather seals

402.5.7 Vestibule required for entry openings to > 3000 sqft area or revolving door
Air Curtain with 6.56 f/s velocity with manual or automatic controls that operate with opening / closing of the door.

403.1 Mechanical Systems Inspections (Mandatory)

HVAC Systems

403.2.1 Manual J provided according to ASHRAE/ACCA standard 183 *

403.2.2 Equipment Sizing output capacity – for one of two function systems

403.2.3 Tables for minimum HVAC system efficiency requirements

403.2.4.3 Programmable Setback thermostat

403.2.4.7 Economizer fault Detection & Diagnosis sensors and controls

403.2.6.2 Enclosed parking garage ventilation controls

403.2.9 HVAC Ducts R – 6 Unconditioned areas R – 8 Exterior
Duct sealed with mastic

A Closer Look Inspection Service
2015 IECC Commercial DFW area handout

Table 403.2.1 Refrigerant line insulation according to size and ΔT

403.2.15 **Walk in Coolers / Freezers**

1. Automatic closing doors
2. Method to minimize infiltration through doors
3. Walk in Coolers R-25 insulation Walk in Freezers R-32 insulation
4. Walk in Freezers R-28 floor insulation
5. Evaporator fans, 1 hp use electronically communicated motors, brushless direct current motor or 3 phase motors
6. Condenser fan motor < 1 hp use electronically communicated motors, split capacitor type motor or 3 phase motors

403.3 Economizers (Prescriptive) required unless cooling unit have <54,000 Btu or other exceptions or HVAC is 15% more efficient

403.3.1 Economizer integrated with mechanical cooling system

Water Heating Systems (Mandatory)

404.2 Performance efficiency Electric .93 - .97 EF Gas .67 - 80% E

404.3/4 360 degree Heat trap installed or internal heat trap or 1" insulation for 1st 8 feet

404.5.1 Pipe Insulation 1" or R -2 Circulating systems – Hot supply

Interior Lighting (Mandatory)

405.2.1 Occupant sensors in Classrooms, meeting rooms, copy rooms, lounges, break rooms, private offices, restrooms, storage closets, janitor closets, locker rooms, other spaces < 300 sqft and warehouses

405.2.1.1 Occupant sensors (other than warehouse) will have automatic shutoff controls within 30 minutes. Manual controls to turn on no more that 50% of lighting power. Full on controls for corridors, stairways, restrooms, entrance area and lobbies.

405.2.1.2 Occupant sensors in warehouses will reduce power by > 50% when areas are unoccupied in each aisleway independently

405.2.2 Timed switches required for all areas not controlled by occupant sensor with exceptions for sleeping units, patient care spaces, areas where safety is an issue, continuous operation areas and classrooms.

© Copyright 2016 A Closer Look Inspection Service 940-891-3803
www.DallasEnergyInspection.com www.DallasGreenBuilding.biz

405.2.2.1 Timed switches functions have a 7 day clock, different 7 day types, holiday shutoff, program backup and manual over ride switch that will turn lights on for no more that 2 hours and cover areas < 5000 sqft. Exceptions for malls, arcades, auditoriums, single tenant retail spaces, industrial facilities and arenas. Other exemptions include areas with single luminary , 100 watts, spaces that use less than .6 watts / sqft, corridors, equipment rooms, public lobbies and electrical / mechanical rooms.

405.2.2.2 Light reduction controls – Manual controls that allows occupant to reduce lighting in reasonable pattern by controlling all lamps, alternate rows of lamps, switching middle lamps or switching each lamp. Light reduction controls not required for daylight zones with daylight responsive controls.

405.2.3 Daylight zone controls required in areas with more than 150 watts of general lighting within sidelight or top light daylight zones with exceptions for health care facilities, dwelling and sleeping units and 1st floor of Group A-2 and Group M occupancies.

405.2.3.1 Daylight Responsive control functions – Toplight zone operate independently from sidelight controls. Controls can only be operated by authorized personnel. Offices, classrooms, laboratories and reading rooms will reduce lighting to less than 15% or completely shutting the lights off. Lights in quadrant zones (NEWS) will operate on different controls if more than 150 watts.

405.2.3.2 Sidelight daylight zones include the distance into the building equal to the top of the window to the nearest full height wall and laterally from the edge of the window + 2 feet or the nearest full height wall. Rooftop monitors will extend laterally the same distance as the height from the floor to the bottom of the monitor or nearest obstruction that is 0.7 time the height of the ceiling and laterally .25 times the height of the ceiling or 0.7 times the height to the nearest obstruction providing that the rooftop monitor is >24 sqft.

405.2.3.2 Toplight daylight zones include the distance to the nearest obstruction that is 0.7 time the height of the ceiling or 0.7 times the height of the ceiling.

405.2.4 Specific application controls – Display and accent lighting controlled by dedicated control that is independent of other lighting controls. Hotel and motel sleeping units will have a master control capable of turning off installed luminaries and switched outlets within 20 minutes after all occupants leave the room.

405.2.5 Exterior Lighting will be automatically shut off at dawn / dusk lighting and at set opening and closing times except for life safety issues on building façade and landscape lighting. Otherwise the controls will reduce lighting by not less than 30% from midnight to 6 AM, 1 hour after closing and before opening or during a period of inactivity of not more that 15 minutes.

405.4 Interior lighting density tables Building Area or Space by Space
See table on next page

Exterior Lighting (Mandatory)

405.5.1 Power is the sum of all areas + additional individual allowances. Exemptions for transportation lighting, advertising signage, theatrical, athletic, temporary industrial production theme elements highlight lighting for monuments and landmark structures.

405.5.5 Individual Lighting Allowances for Exterior tables

405.5.7 Transformers Mandatory – 97.7% + efficiency requirement depending on 2 phase / 3 phase and KVA

405.5.8 Electric Motors Mandatory – 77 % + efficiency requirement depending on # of poles and open / enclosed motors

405.5.7 Transformers Mandatory – 97.7% + efficiency requirement

405.9 Elevator / Escalator / Moving Sidewalk – Elevator Cab lighting must be > 35 lumens / watt Vent fan efficiency is > 0.33 watts /cfm
Escalator moving sidewalk have multiple speed configurations to reduce speed when not in use. Escalator must have regenerative drive.

C406 **Additional Efficiency Options**

406.2 10% Improved HVAC efficiency

406.3 10% Reduced Lighting Density

406.4 Enhance Lighting Controls – Continuous dimming, individual address luminaries, no more than 8 luminaries controlled together in a daylight zone, individual user control of general illumination in office areas, digital occupancy sensors & functionality test.

406.5 Onsite Renewable .5watt/sqft or 3% energy saving of total building

406.6 Dedicated outdoor air system (independent ventilation system)

406.7 10% Reduced service water heating (waste water recovery or solar water heating meeting 60% of building requirements

© Copyright 2016 A Closer Look Inspection Service 940-891-3803
www.DallasEnergyInspection.com www.DallasGreenBuilding.biz

A Closer Look Inspection Service

2015 IECC Commercial DFW area handout

Table 405.2 Interior lighting Power requirements

Automotive facility	0.8
Convention Center	1.01
Courthouse	1.01
Dining: Bar lounge/leisure	1.01
Dining: Cafeteria/fast food	0.9
Dining: Family	0.95
Dormitory	0.57
Exercise center	0.84
Fire Station	0.67
Gymnasium	0.94
Heath Care clinic	0.9
Hospital	1.05
Hotel / Motel	0.87
Library	1.19
Manufacturing facility	1.17
Motion Picture theater	0.76
Multifamily	0.51
Museum	1.02
Office	0.82
Parking Garage	0.21
Penitentiary	0.81
Performing arts theater	1.39
Police Station	0.87
Post Office	0.87
Religious building	1.0
Retail	1.26
School / University	0.87
Sports arena	0.91
Town Hall	0.89
Transportation	0.70
Warehouse	0.66
Workshop	1.19

Table 406.3 Reduced Interior lighting Power requirements

Automotive facility	0.72
Convention Center	0.91
Courthouse	0.91
Dining: Bar lounge/leisure	0.91
Dining: Cafeteria/fast food	0.81
Dining: Family	0.86
Dormitory	0.51
Exercise center	0.76
Fire Station	0.60
Gymnasium	0.85
Heath Care clinic	0.81
Hospital	0.95
Hotel / Motel	0.78
Library	1.05
Manufacturing facility	1.05
Motion Picture theater	0.68
Multifamily	0.46
Museum	0.92
Office	0.74
Parking Garage	0.19
Penitentiary	0.73
Performing arts theater	1.26
Police Station	0.78
Post Office	0.78
Religious building	0.90
Retail	1.13
School / University	0.78
Sports arena	0.82
Town Hall	0.80
Transportation	0.63
Warehouse	0.59
Workshop	1.07

501.2.1 Existing Buildings -Additions, alterations and repairs Only required to make comply that which you touch.

© Copyright 2016 A Closer Look Inspection Service 940-891-3803
www.DallasEnergyInspection.com www.DallasGreenBuilding.biz