

CA TITLE 24 (2016)
STAND ALONE SOLUTIONS

COMMERCIAL SPACES BY CODE DESIGN GUIDE



Commercial energy codes are the foundation for a lighting control design specification. Every three years, the CA Title 24 energy code changes and these changes become the new required minimum standard design for buildings in California. Legrand® is an expert in Code Compliant Education and Training. The Wattstopper® product line leads the way in simple, flexible, and scalable code compliant, energy efficient lighting controls solutions.

Code compliance is often seen as a hindrance to business with added cost and changes in on-hand inventory needs. The code compliance team at Legrand see changes in code compliance as an opportunity for innovations and improved energy efficiency. The Wattstopper CA Title 24 (2016) Commercial Spaces by Code Design Guide provides designers and contractors with tools and design recommendations for common commercial spaces. Working together as partners, we can educate and simplify code compliant solutions for distribution and designers.

Download Legrand's code compliance tools and resources at
<https://legrand.us/codesolutions>

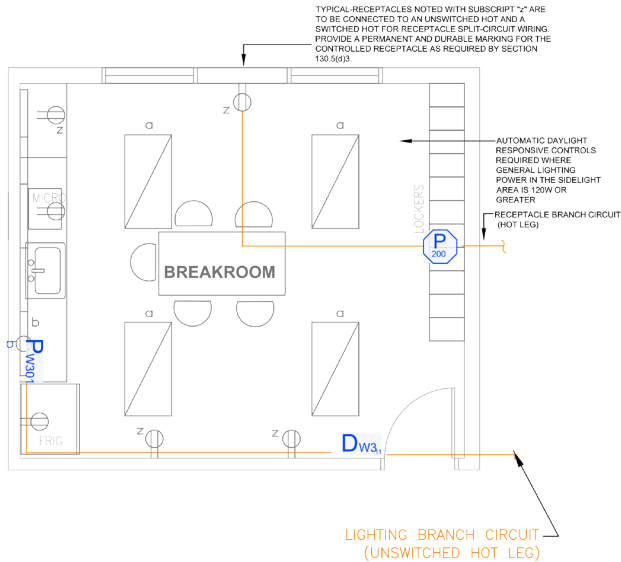
CONTENTS

- Breakroom/Kitchen
- Classroom
- Conference Room
- Large Private Office
- Multi-Stall Restroom
- Private Restroom
- Small Conference Room
- Small Office

designed to be better.™



CA Title 24 (2016) Compliant Space ≥100Ft², Bldg <10,000Ft², Dimming with Line Voltage Wallbox Product



SEQUENCE OF OPERATION

1. Lighting (a) auto On to 50% illumination and controlled receptacles auto On when occupancy detected.
2. Manual On/Off/Dim multi-level control of general lighting (a) with wall switch occupancy sensor.
3. Manual On/Off control of under cabinet lighting (b) with wall switch occupancy sensor.
4. Auto off all lighting and controlled receptacles within 15 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- A ceiling or corner mount occupancy sensor with power pack and low voltage switch can be used instead of the wall switch occupancy sensor for larger rooms or to achieve a more specific area of occupancy detection coverage.
- When lighting power in the primary sidelight area is 120 W or greater, it must have automatic daylight responsive controls installed for all general lighting in that area.
- Receptacle control can be designed using either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/ diagnostic functions are available using Wattstopper Digital Lighting Management networked products.

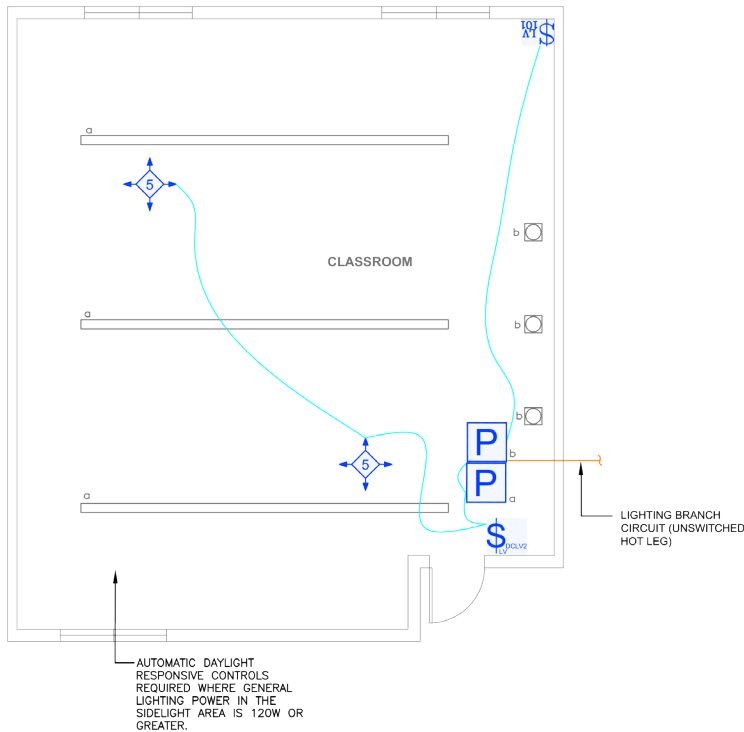
BILL OF MATERIALS

DW-311 (1)	0-10V Dimming, Dual Tech Wall Box Occupancy Sensor
PW-301 (1)	1-Relay Wallbox PIR Occupancy Sensor
BZ-200 (1)	Power Pack, Receptacle Rated

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(a)4	Separately Controlled Lighting
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls
130.5(d)	Receptacle Control

CA Title 24 (2016) Compliant Space $\geq 100\text{Ft}^2$, Bldg $< 10,000\text{Ft}^2$, Dimming with Analog Product



SEQUENCE OF OPERATION

1. Manual On/Off and multi-level control of general lighting (a) with wall switch.
2. Manual control On/Off white board lighting (b) with wall switch.
3. Auto off all lighting within 20 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- When lighting power in the primary sidelight area is 120 W or greater, it must have automatic daylight responsive controls installed for all general lighting in that area.
- Although not required by code (Title 24 130.5(d)), automatic receptacle can be designed with either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/ diagnostic functions are available using Wattstopper Digital Lighting Management networked products.
- To integrate occupancy detection control with the HVAC system, use a DT-300 occupancy sensor with isolated relay.

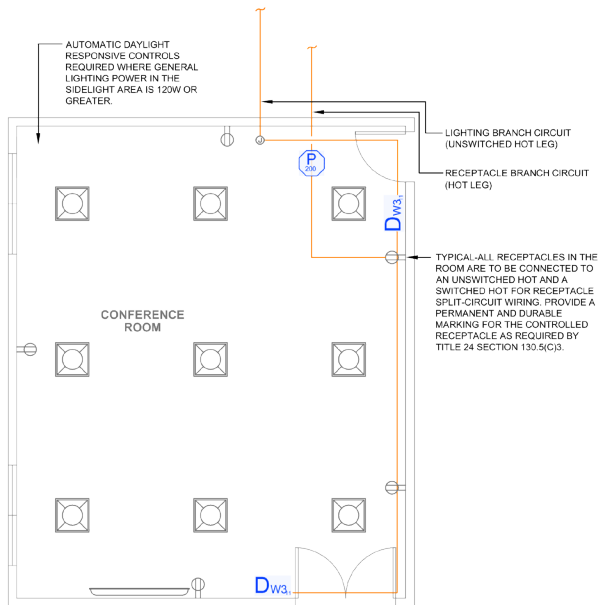
BILL OF MATERIALS

BZ-150 (2)	Power Pack
DT-305 (2)	Ceiling Mount Dual Tech Occupancy Sensor
DCLV2 (1)	Low Voltage, 0-10V Dimming Wall Switch
LVSW-101 (1)	1-Button Wall Switch

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(a)4	Separately Controlled Lighting
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls

CA Title 24 (2016) Compliant Space $\geq 100\text{Ft}^2$, Bldg $< 10,000\text{Ft}^2$, Dimming with Line Voltage Wallbox Product



SEQUENCE OF OPERATION

1. Lighting auto On to 50% illumination and controlled receptacles auto On when occupancy detected.
2. Manual On/Off/Dim multi-level control lighting at wall switch occupancy sensor.
3. Auto off all lighting and controlled receptacles within 15 minutes of occupants leaving.

BILL OF MATERIALS

DW-311 (2)	0-10V Dimming, Dual Tech Wall Box Occupancy Sensor
BZ-200 (1)	Power Pack, Receptacle Rated

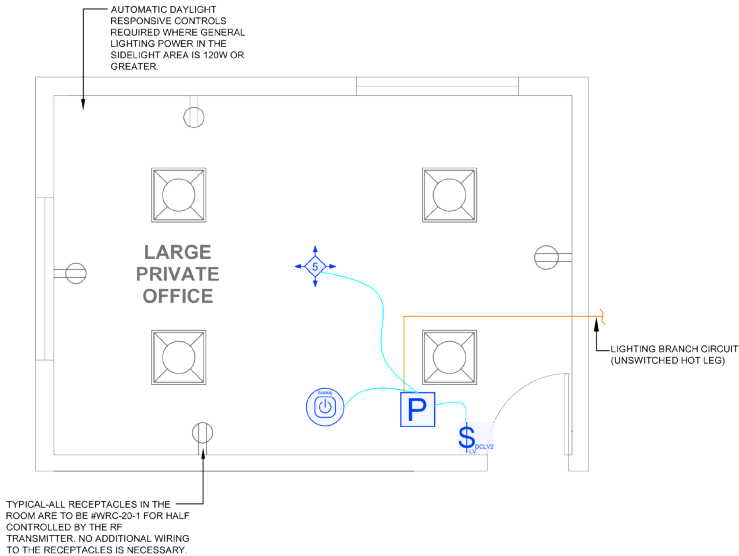
DESIGN CONSIDERATIONS

- A ceiling or corner mount occupancy sensor with power pack and low voltage switch can be used instead of the wall switch occupancy sensor for larger rooms or to achieve a more specific area of occupancy detection coverage.
- When lighting power in the primary sidelight area is 120 W or greater, it must have automatic daylight responsive controls installed for all general lighting in that area.
- Receptacle control can be designed using either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/ diagnostic functions are available using Wattstopper Digital Lighting Management networked products.

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls
130.5(d)	Receptacle Control

CA Title 24 (2016) Compliant Space $\geq 100\text{Ft}^2$, Bldg $< 10,000\text{Ft}^2$, Dimming with Analog Product



SEQUENCE OF OPERATION

1. Lighting auto On to 50% illumination and controlled receptacles auto On when occupancy detected.
2. Manual On/Off/Dim multi-level control of lighting with wall switch.
3. Auto off all lighting and controlled receptacles within 20 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- When lighting power in the primary sidelight area is 120 W or greater, it must have automatic daylight responsive controls installed for all general lighting in that area.
- If detection coverage is sufficient, a wall box occupancy sensor, such as a DW-311 or PW-311 can be used and also provide dimming control.
- Receptacle control can be designed using either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/ diagnostic functions are available using Wattstopper Digital Lighting Management networked products.
- To integrate occupancy detection control with the HVAC system, use a DT-300 occupancy sensor with isolated relay.

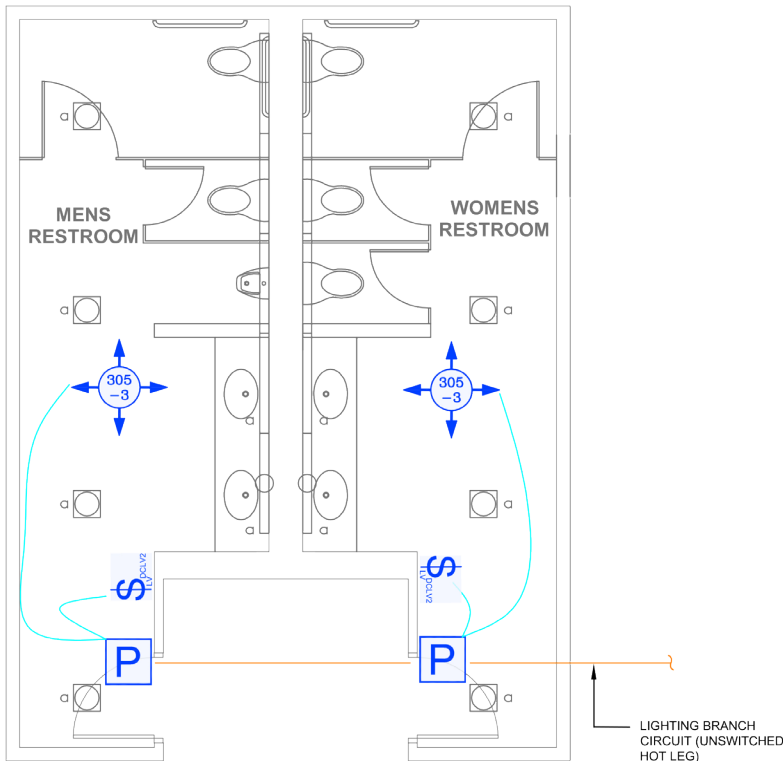
BILL OF MATERIALS

BZ-150 (1)	Power Pack
DT-305 (1)	Ceiling Mount Dual Tech Occupancy Sensor
DCLV2 (1)	Low Voltage, 0-10V Dimming Wall Switch
WRC-TX (1)	Plug Load RF Transmitter
WRC-20-1 (4)	Plug Load Half Controlled Receptacle

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls
130.5(d)	Receptacle Control

CA Title 24 (2016) Compliant Space ≥100Ft², Bldg <10,000Ft², Dimming with Analog Product



SEQUENCE OF OPERATION

1. For each restroom independently, lighting auto On to 50% illumination when occupancy detected.
2. Manual On/Off/Dim multi-level control of lighting with wall switch.
3. Auto Off lighting for each restroom independently within 20 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- Time scheduling, demand response and remote programming/ diagnostic functions are available using Wattstopper Digital Lighting Management networked products.
- To integrate occupancy detection control with the HVAC or exhaust system, use a UT-300 occupancy sensor with isolated relay.

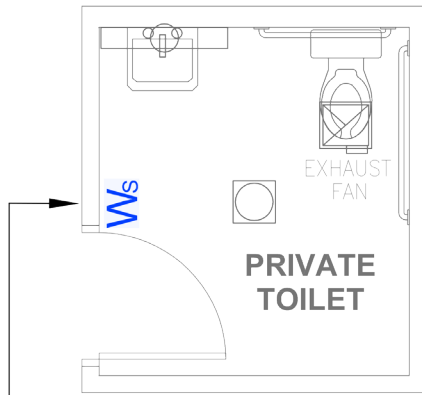
BILL OF MATERIALS

BZ-150 (2)	Power Pack
UT-305 (2)	Ceiling Mount Ultrasonic Occupancy Sensor
DCLV2 (2)	Low Voltage, 0-10V Dimming Wall Switch

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls

CA Title 24 (2016) Compliant Space <100Ft², Bldg <10,000Ft², On/Off Switching with Line Voltage Wallbox Product



OCCUPANCY WALL SWITCH TO CONTROL LIGHTS AND EXHAUST FAN ON/OFF.

SEQUENCE OF OPERATION

1. Lighting and fan are manually controlled On/Off with occupancy sensor switch.
2. Lighting and fan will auto Off within 15 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- Demand Response, time scheduling and remote programming functions may be enabled by using DLM product with LMBC-300 Network Bridge connectivity for this space.

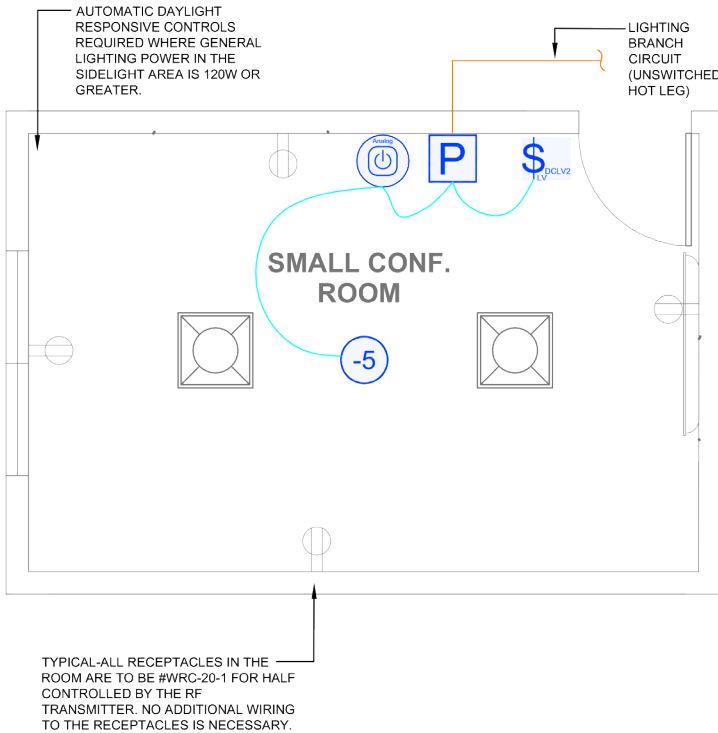
BILL OF MATERIALS

WS-301 (1)	Wallbox PIR Occupancy Sensor
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CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls

CA Title 24 (2016) Compliant Space >100Ft², Bldg <10,000Ft², Dimming with Analog Product



SEQUENCE OF OPERATION

1. Lighting auto On to 50% illumination and controlled receptacles auto On when occupancy detected.
2. Manual On/Off/Dim control of lighting with wall switch.
3. Auto off all lighting and controlled receptacles within 20 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- When lighting power in the primary sidelight area is 120 W or greater, it must have automatic daylight responsive controls installed for all general lighting in that area.
- If detection coverage is sufficient, a wall box occupancy sensor, such as a DW-311 or PW-311 can be used and also provide dimming control.
- Receptacle control can be designed using either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/diagnostic functions are available using Wattstopper Digital Lighting Management networked products.
- To integrate occupancy detection control with the HVAC system, use a CI-300 occupancy sensor with isolated relay.

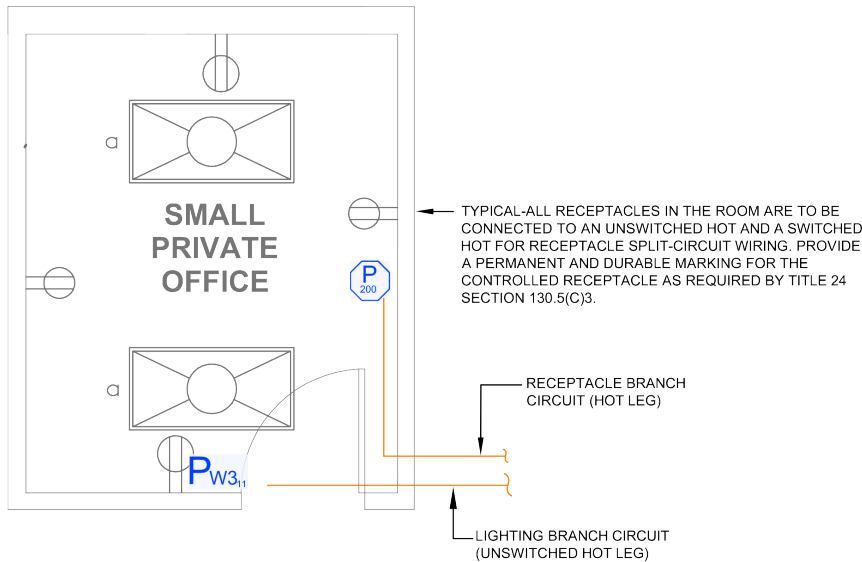
BILL OF MATERIALS

BZ-150 (1)	Power Pack
CI-305 (1)	Ceiling Mount PIR Occupancy Sensor
DCLV2 (1)	Low Voltage, 0-10V Dimming Wall Switch
WRC-TX (1)	Plug Load RF Transmitter
WRC-20-1 (4)	Plug Load Half Controlled Receptacle

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls
130.5(d)	Receptacle Control

CA Title 24 (2016) Compliant Space >100Ft², Bldg <10,000Ft², Dimming with Line Voltage Wallbox Product



SEQUENCE OF OPERATION

1. Lighting auto On to 50% illumination and controlled receptacles auto On when occupancy detected.
2. Manual On/Off/Dim multi-level control of lighting with wall switch occupancy sensor.
3. Auto off all lighting and controlled receptacles within 15 minutes of occupants leaving.

DESIGN CONSIDERATIONS

- A ceiling or corner mount occupancy sensor with power pack and low voltage switch can be used instead of the wall switch occupancy sensor for larger rooms or to achieve a more specific area of occupancy detection coverage.
- Receptacle control can be designed using either an RF transmitter with receptacle RF receivers, or can be hardwired to receptacles using a receptacle rated Power Pack.
- Time scheduling, demand response and remote programming/diagnostic functions are available using Wattstopper Digital Lighting Management networked products.

BILL OF MATERIALS

PW-311 (1)	0-10V Dimming, PIR Wall Box Occupancy Sensor
BZ-200 (1)	Power Pack, Receptacle Rated

CODE REQUIREMENTS

130.1(a)1-3	Area Controls
130.1(b)	Multi-Level Controls and Uniformity
130.1(c)5	Occupancy Sensor Shut-Off Controls
130.5(d)	Receptacle Control