STATE OF WISCONSIN
Department of Safety and Professional Services
1400 East Washington Avenue
Madison WI 53703

Governor Scott Walker **Secretary Dave Ross**

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BUILDING CODE COUNCIL MEETING
Room 121A, 1400 East Washington Avenue, Madison
Contact: Dan Smith (608) 261-4463
March 1, 2016

The following agenda describes the issues that the Council plans to consider at the meeting. At the time of the meeting, items may be removed from the agenda. Please consult the resulting meeting minutes for a description of the recommendations of the Council.

AGENDA

9:00 A.M.

CALL TO ORDER – ROLL CALL

A. Adoption of Agenda (1)

B. Approval of Minutes of February 15, 2016 (2)

C. Department Update

D. Presentation Regarding Door Barricades (3-7)
- **1)** Josh Kolo Presentation
- **2)** Council Discussion

E. Discussion Regarding Ventilation in Schools (8-11)
- **1)** Joe Ray Letter
- **2)** Council Discussion

F. Significant Changes to the IFGC Chapters 1-8 and Appendices (12-16)
- **1)** Code Revisions
- **2)** Wisconsin Considerations

G. Significant Changes to the IECC Chapters 1-6 and Appendices as time allows (17-47)
- **1)** Code Revisions
- **2)** Wisconsin Considerations

H. Public Comments

I. Future Business

J. Adjournment

COMMERCIAL BUILDING CODE COUNCIL
MEETING MINUTES
February 15, 2016

PRESENT: Hunter Bohne, David Enigl *(arrived at 9:00 a.m.)*, Steven Klessig *(arrived at 8:36 a.m.)* Samuel Lawrence, Michael Mamayek, Irina Ragozin *(excused at 12:00 p.m.)*, Corey Rockweiler, Peter Scheuerman

EXCUSED: Kevin Bierce, Steven Howard

STAFF: Dan Smith, Rules Coordinator; Robert Schlaeger, Policy Director; Jason Hansen, Building Plan Reviewer; Robin Zentner, Field Operations Section Chief; Randy Dahmen, Building Plan Reviewer; and Kimberly Wood, Program Assistant Supervisor-Advanced

CALL TO ORDER

Michael Mamayek, Chair, called the meeting to order at 8:34 a.m. A quorum of six (6) members was confirmed.

ADOPTION OF AGENDA

MOTION: Hunter Bohne moved, seconded by Corey Rockweiler, to adopt the agenda as published. Motion carried unanimously.

APPROVAL OF MINUTES

MOTION: Hunter Bohne moved, seconded by Samuel Lawrence, to approve the minutes of January 5, 2016 as published. Motion carried unanimously.

(Irina Ragozin was excused at 12:00 p.m.)

The Council recessed the meeting at 12:00 p.m. and reconvened at 1:00 p.m. to conduct the Q & A with UW Commercial Building Code Refresher Attendees.

ADJOURNMENT

The meeting adjourned at 1:57 p.m.

From: dsps@wisconsin.gov
To: DSPS PracticeFAQ1
Subject: Door Barricade
Date: Monday, November 30, 2015 4:20:20 PM
Attachments: rhinoware pdf.pdf

Board: Commercial Building Code Council
First Name: State Rep. Scott
Last Name: Krug
Address Line 1: 1551 Kingswood Trail
City: Nekoosa
State: WI
Zip: 54457
Phone Number: 7154592267
Email: scott.krug@gmail.com

November 16, 2015 State Representative Scott Krug Room 207 North State Capitol P.O. Box 8952 Madison, WI 53708 Rep.Krug@legis.wisconsin.gov Dear State Representative Krug, I am writing today, on behalf of the Nekoosa School District, and in my capacity as the City of Nekoosa Assistant Police Chief and School Resource Officer, to request that Wisconsin ss.1008.1.9 be amended to allow for the installation of door barricades. With numerous recent active shooter incidents in our nation's schools, one of my top priorities is to ensure the safety of our students and staff. Toward that effort we are training our staff in ALICE (Alert, Lockdown, Inform, Counter and Escape) procedures. The Lockdown component of this training advises staff to barricade doorways with heavy objects, a strategy that has been proven to impede intruders and reduce the number of casualties. My concern is that this strategy also creates an impediment to law enforcement and other rescue personnel. In further researching this subject, I found two companies that produce door barricades for the purpose of increasing school safety. I am particularly interested in the Rhinoware® (information attached) because of its ease of operation. Not only can it be activated quickly, a special tool is provided that allows for disengagement from the outside. This tool would be provided to rescue personnel and school administration. I have personally inspected one of these devices as has the school district's Board of Education and administration. After a unanimous endorsement, and prior to ordering the product, I consulted with several other officials, including the Nekoosa Fire Chief and City of Nekoosa Building Inspector. It was at that point I was advised that the installation of the door barricade would not be allowed under current law. It is my firm belief that this device has the potential to save numerous lives in the event of an armed intruder. It provides both a quick option to secure a classroom and an option for police and other rescue personnel to enter the room in the event of an emergency. I am seeking your help in enabling the Nekoosa School District to proceed with this potential life-saving safety measure. Thank you in advance for your time and attention to this matter. I would be happy to discuss this further or provide additional information upon request. I can be reached by telephone at (715)572-1600 or by email at jkolo@nekoosawi.com. Sincerely, Josh Kolo Josh Kolo, Nekoosa Police Department Assistant Chief/School Resource Officer

Brute Force Meets Brute Force

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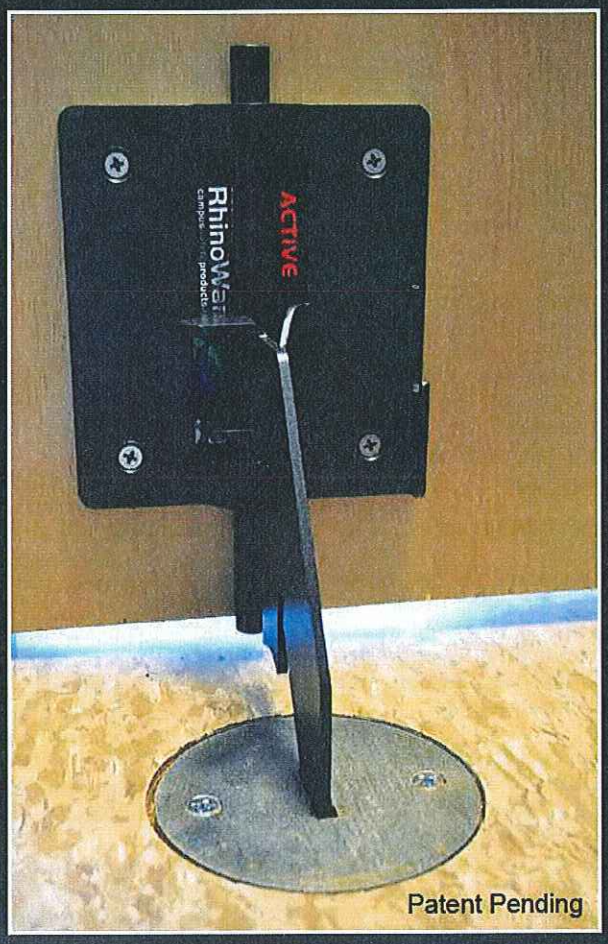
CAMPUS SAFETY PRODUCTS

- Specifically developed using the mindset of an Active Shooter
- Winner of the 2015 Security Products Magazine ***Gold Govie Award*** for Outstanding Government Security Products
- Recommended for any room which can be made a safe room: Classrooms, offices, conference rooms, bathrooms, assembly areas, even custodial closets
- Engages in just one second – A kindergartner can engage even while under severe duress
- **RhinoWare**™ Unlock Key allows first responders to quickly and easily gain access to a room barricaded with **RhinoWare**™ Door Barricade
- Works on inward-, outward-, and free-swinging doors
- Works on doors with or without a door knob
- Cannot be circumvented by cutting main power – ***The last line of defense***
- Once engaged, can withstand several tons of direct sustained force



RhinoWare™ Door Barricade is an all-in-one unit constructed of cold rolled American steel, made and constructed in the USA.

Its incredible strength and resistance is due to its unique design. Installation is quick and easy. The units have an ultra-durable powder coat finish and can be ordered in a wide variety of colors.

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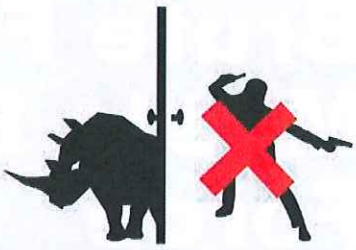
Security Products' GOVIES
2015 Government Security Awards

RhinoWare™

There's nothing stronger

RhinoWare™
DOOR BARRICADE



The Situation

According to Department of Homeland Security (DHS) guidelines on how to respond to an active shooter scenario, the very first things to be done are to (1) implement lockdown procedures, (2) minimize the target profile, and (3) wait for law enforcement to neutralize the situation.

In most cases today, the only way to barricade an office or classroom door is, per DHS guidelines, with "heavy furniture". In cases like this, seconds count and lives are at stake. Barricading a door with heavy furniture can take a minute or more. In an active shooter scenario, this is unacceptable.

Time and Distance

In an active shooter scenario, protocols are put in place to allow for enough time for law enforcement to arrive onsite and to create distance between the perpetrator and innocent children, faculty, staff, and authorized visitors.

According to DHS research, the average duration of an active shooter incident is 12.5 minutes, while the average time from the onset of such an event and the arrival of law enforcement is 18 minutes.
Though law enforcement agencies tirelessly train to reduce response time, it is incumbent upon school administrators to proactively implement security measures and procedures that can quickly and effectively execute LOCKDOWN within seconds, not minutes.

"Lockdown and secure educational facilities within seconds of the onset of an active shooter incident."

The Solution

RhinoWare™ Door Barricade is a substantial, yet simple mechanism which can secure and fortify an entryway door to withstand thousands of pounds of direct, sustained force. Easily engaged, a classroom can be effectively locked down, even if the door cannot be locked by conventional means.

A race to pile furniture against doors to create a barricade is a time consuming process and difficult for one teacher to do alone. This urgent and noisy activity can only increase the feeling of danger and fear in a lock down situation. RhinoWare™ Door Barricade can be activated quickly and without disruption in a few seconds by a single teacher, student, or staff member. This can bring calm and control to a situation for both students and teachers.

Once RhinoWare™ Door Barricade is fully executed, children and adults are safe, while the perpetrator is isolated and vulnerable to apprehension by law enforcement.

RhinoWare™ Door Barricade satisfies the three objectives mentioned in DHS ALICE guidelines: It locks down classrooms, offices, and any other rooms where innocents can seek shelter from harm; it quickly and effectively minimizes the target profile; it maximizes safety while waiting for law enforcement to arrive.

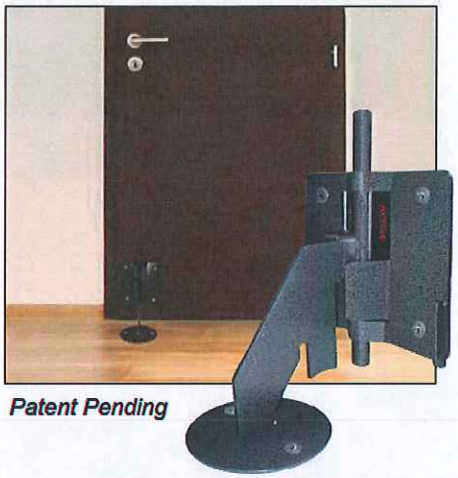
For peace of mind at school

Lockdown and secure educational facilities within seconds of the onset of an active shooter incident.

RhinoWare™ Door Barricade is as simple as sliding a locking plate into secured floor and door plates. A few seconds and one action can turn a normal entry door into a barricaded door that can withstand tremendous direct force.

Once installed, the RhinoWare™ Door Barricade remains securely in place at the bottom of the entry door - ready for use at any time. Slide the locking plate in to lock – pull up and reset onto the door plate to unlock – so simple yet extremely effective. RhinoWare™ Door Barricade is manufactured and assembled in America. RhinoWare™ Door Barricade is constructed using the world's best American steel, and can provide protection for many years.

The children or students are not constantly reminded of security issues (as may be the case if multiple or highly visible door locks were installed) because the RhinoWare™ Door Barricade device is installed at floor level and doesn't need to be engaged during normal day-to-day activities. This low-visibility combined with the highest level of protection is unbeatable for classroom and office environments.



Patent Pending

Private schools, school systems, colleges, and universities around the country are already experiencing peace of mind, knowing that RhinoWare™ Door Barricade provides not only protection, but CREATES TIME enough for help to arrive and DISTANCE from those wishing to do harm.

RhinoWare™

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Ohio school safety policy should be barricaded from politics

Posted by Ken Trump on March 7, 2015

A highly emotional controversy is spreading across Ohio over classroom door barricades. Advocates are touting these devices as a way to lock out potential school shooters.

They are ignoring the very real dangers created if these barricades are used improperly or fall into the wrong hands.

- Imagine that your daughter is forced into an empty high school classroom, the door is barricaded by another student and she is sexually assaulted.

- Or perhaps your son is held hostage with his middle school class. A disturbed classmate with a weapon uses the barricade on the classroom door to hold authorities at bay.

- Or maybe a non-custodial parent or disgruntled former employee with a grudge creates a commotion, and starts a fire in an elementary school. He then barricades the door to a class full of students.

Over the past few weeks, a battle has ensued in Ohio over whether state building codes should be changed to allow schools to use security barricades on classroom doors. In the Southwest Licking Local School District, parents raised $30,000 to buy barricades as part of an active shooter defense plan. But local building authorities and the State Board of Building Appeals both rejected the idea for safety reasons. That triggered outcries from parents. Two state senators are now calling for legislation to allow the use of barricade devices in schools.

State Commerce administrators have called for the Board of Building Standards to research the issue, consult with educators, safety experts and the public, and make recommendations on whether changes are needed.

State lawmakers would be wise to hold off on knee-jerk legislation, and let professional standards, best practices, and facts come from professionals who understand the greatest risks to school security on a day-to-day basis.

In litigation and other post-incident analysis, we often examine issues with an eye toward whether incidents were ***foreseeable***, if preventative steps taken were ***reasonable***, if the response was proper, and/or other factors unique to each case. In the education and school safety community, administrators and security professionals strive to balance reasonable risk reduction measures with the realities of operating child-centered, education-driven facilities that typically function as community centers in their neighborhoods.

Experienced school security experts tend to agree that effectively locked down classroom doors have not been breached by active shooters in the vast majority of preK-12 incidents over the years. Many threatening situations have been averted and/or had a positive outcome by following long-established best practices such as, but not limited to:

- Quickly locking down classrooms, getting students away from windows, turning off lights, keeping students quiet, etc.
- Diversifying lockdown drills so they are conducted at different times such as during lunch periods, upon student arrival in the morning, between class change, near dismissal, etc.
- Having plans for controlled evacuations at the direction of school and public safety leaders
- Providing first responders with updated floor plans and blueprints as a tactical resource
- Facilitating police active shooter rapid deployment training in school facilities

While we encourage schools to include active shooters in their planning, most experts also emphasize an all-hazards approach, and planning for day-to-day security issues. While reasonable measures should be taken for active shooter planning, other security risks must also be factored into school safety policy and practice decisions.

This is especially the case when people start talking about changing state building and fire laws and codes. It is here that the words “foreseeable” and “reasonable” come into play. There are reasonable day-to-day supervision and security realities. And it is not hard to foresee the misuse of barricade devices. A security product “solution” could unintentionally lead to a student or teacher’s security nightmare.

Right now, anxious parents are contacting Ohio legislators, who may be tempted to make politically inspired changes in state laws. We hope they are also listening to safety experts and the Board of Building Standards about the pros and cons of current practices and proposed changes. Kids’ lives and personal safety depend upon it.

Ken Trump

National School Safety and Security Services

From: Joe Ray
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(608) 756-4892
joepray2@outlook.com

January 1, 2016

K12, Public Education Issues,
School Safety and Energy Management

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My introduction is as follows: I have an honorable discharge from the U.S. Navy, and a Bachelors of Science Degree from U.W. Stevens Point. I was a supervisor for three large, private corporations for four years. I was the school district Facilities Manager, and School District Safety Coordinator at the Kimberly school District for nine and a half years. I was the School District Facilities Manager at the Fort Atkinson school district for twenty-one years. I wrote school district facilities, and school district facilities, safety columns for the Wisconsin Association of School Board Member's magazine " Wisconsin School News". I am now retired.
I presented my K-12 Public Education Facilities and Safety concerns to the Wisconsin Assembly, and the Wisconsin Senate, Education Committees. I presented my issues to the legislature, at the request from the chairman of the Senate Education Committee, Senator John Lehman, for a "Joint Legislative, council study". The study was approved, and was titled under "School safety". The study was scheduled, and preceded. I testified not knowing the main topic of concern was the problem of "school bullying", and not knowing, on my part, the committee consisted of biased school district leaders. Regardless, I testified, and my topics where later very briefly discussed in committee, with out my attendance, and my topics where dismissed, with very minimal discussion.
It goes back to the primary concern. **Our School District Administrators, receive no training in school district facilities oversight management, including the District physical learning environment safety program. The Wisconsin Department of Public Education has not developed the needed curriculum, to enable the Wisconsin Schools of Education to instruct our school administrators for their administrative license, in these two subjects. The result is fifty percent of our K12 public school building infrastructure has become obsolete (forty years old and older), non efficient, costly, and as to be discussed, unhealthy, thus unsafe school facilities. This statement is not intended for the costly replacement of these obsolete school buildings, but the assessment for eventual modernization of these obsolete mechanical systems. The savings from needed energy efficiency updates will aid significantly with these efforts.**

K12 Public Education Issues
School District Safety and Liability Issues

Safety programs, and liability Insurance associated with the cost of accidents are costly. Absentees both teachers and students are a loss for our purpose of education of students. Safety issues are numerous, and have complicated government regulations. Wisconsin school district administrators need to understand the complexity of many school district facilities safety issues. An example of a major area of concern is "Indoor Air Quality", in both our older buildings, with obsolete mechanical ventilation systems, and including newer school buildings; both older and newer, with required but questionable compliance of Wisconsin ventilation codes. The Association of Heating, Ventilation, Air Conditioning, and Refrigeration Engineers has recommended increasing ventilation from 7.5 up to 20 cubic feet per minute per occupant. In my 31 years as a school district facilities manager of two districts, I have no knowledge of a government official inspection of any of my school buildings for existing ventilation code compliance. In addition most people do not know that ventilation air in our Wisconsin school buildings are designed to recycle the contaminated mixed return air back with fresh air to the class rooms through multizone systems serving numerous class rooms. I purchased a carbon dioxide graph recorder. I would cover the face of the graph so it could not be misinterpreted. I also locked the chain securing the recorder so the recorder could not be relocated, and I explained to the classroom teacher what I was doing. The graph would go up, and top out, at the top of the graph, when the classroom was occupied, and go down, and bottom out, when the classroom was not occupied. This method would give a realistic indication of Indoor Air Quality, in occupied classrooms by measuring the breath of CO2 as the graph indicated. Our Wisconsin Schools have Asbestos issues, another reason for not recycling classroom air, by mixing it with incoming fresh air. We can use heat exchangers, which separates, and exhausts, contaminated air while temperature conditioning fresh in coming supply air.

Our school facilities employees have a very difficult time to properly clean our school district climate control systems, with limited and tight, down time schedules. We need to clean these systems when school is in session, during the unoccupied times, not just in the summer, when school is not in session. Our climate control systems do not have cleaning solution discharge drainage. They are enclosed systems with, occupancy requirements. The recommended technology for these cleaning systems is being used now, in the Dairy Industry (CIP, Cleaning in place).

Wisconsin has been the national center for whopping cough, and the Centers for Disease Control, has identified three types of bird flu, with no cure at this time. (see the last statement at the end)
A pandemic may not be predictable, it is important to prepare now. The modern, prevailing engineering available can help avoid a statewide, and / or national

disaster. New technology to provide clean air is powerful ultraviolet lighting in the C band, placed in ventilation ducts to destroy all living DNA. This will leave no opportunity for deadly mutations to survive. This ultraviolet lighting technology has been successful in cleaning swim pool water. Another, additional possibility is to commission a review with a ventilation engineer to bypass and exhaust all return air, and use only fresh out door air ventilation, most important when a major pandemic or a sever illness becomes active.

A major area of concern is the communication break down between the design engineer, the architect, the school district facilities manager, the school district administration and the school district Board of Education member or members assigned to the new building, or renovation project. This is a total communication break down, a cause for a lack of efficiency, and safety, for new school building construction, and older school building renovation. The project design engineer should be hired by the school district, not by the Architect. The engineer needs to be responsible to the owner's representatives. The design engineer can and should collaborate with the Architect, with the knowledge and approval of the owner.

Our school administrators need to be brought up to date, with required training for every group of administrator, and resulting in the total education training for every District Superintendent, and District Business Administrator. One group could be the School District Administrators, along with the Business Administrators. The next group could be the school principals, with the third group being the associate principals. Each group trained in separate areas, each for what they need to know. It is important to keep in mind this training is needed to confirm our administrators are completely trained to be a key for a successful school district facilities efficiency, and safety program. The optimal will be to have District Safety Program Training available making every school district administrator a viable part of the school district safety program.

Wisconsin School District's second largest cost after salaries wages and benefits, is energy consumption, however, energy consumption has not been tracked or even managed. If you want to determine the efficiency of the operation of your car; you determine the miles per gallon of fuel, per miles driven. School Building heating ventilation and air conditioning efficiency is determined by tracking annual, BTU's per Square Foot of school energy consumption for each building's space. The power companies have the "Annual BTU'S", for each school building. This public, information is kept private and secret," but can be calculated anyway, and the school district business administrator has the school building area measurements information, needed for insurance purposes.

Our two thousand, one hundred, multimillion-dollar, Wisconsin school buildings, servicing ninety thousand students and many school district employee professionals do not have this information made available. We

cannot even compare the success or failure of school district's statewide energy consumption because this information is not available, thus not compared. In addition in 2007, I had contacted the Departments of Education in Minnesota, Iowa, Illinois, Indiana, and Michigan, they do not track, and compare their school building energy consumption either. This failure may be a national failure to track energy consumption. In 1979 the facility specialist for the Wisconsin DPI, stated a Wisconsin school building using 90 K, BTU's per square foot, had one-year paybacks, It had energy saving opportunities, if implemented, would save the implementation costs within one year, and every year after. I was one of a few, if any, school facilities managers who tracked the energy consumption for all of the Fort Atkinson School buildings for 22 years. The energy consumption for one building exceeded, a costly and wastful139, 000.00 BTU's per Square feet of building space. In addition I have found my new high school, occupied in 1998, was not as energy efficient, as it should have, or could have been. "Focus on Energy" has reported on this topic, and had found many of our new Wisconsin school buildings are not energy efficient. We need to wonder, or even ask, why has this huge waste of taxpayer dollars problem lasted this way so long?

For the safety of our present and future Wisconsin students (90, 000, every year, or one million when private school students are added, Including the many employees working in our schools, we need to cure the ignorance. The state law for ventilation air standard was made in 1914. Our engineering needs to catch up, before we have a disaster, such as the pandemic of 1918.

I ask the committee to not disregard this presented information, please, check it out, it is very important. Yes it will take time, however, it will be time well spent. It is suggested to discuss this information with Tony Evers the state superintendent of schools, with the Department of Public Education, and Dr. Tammy Huth PhD the DPI Director of Curriculum. Discuss the medical issues with the Centers for Disease control. Discuss the engineering side with ASHRAE, the engineering group. Try to find out why the professional educators, including Tony Evers of the DPI are against much if not all this information. Our K12 education school district administrators are the highest paid professionals in local, and state wide K12 education. If they are against accepting, these issues, of rational responsibility, do they want the public to decide for them?

1600 Clifton Rd.
Atlanta Ga. 30333

ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
1791 Tullie Circle, NE
Atlantia, Georgia 30329-2305

Summary of 2012 and 2015 IFGC Changes[a] Significant[b] in Wisconsin[c] and Comparison With Wisconsin's Requirements[d]

IFGC Code Sections	Description			Comments
	SPS 365 Section	2012 IFGC Changes	2015 IFGC Changes	
	Topic	DIS Recommendations		
CHAPTER 1 - SCOPE AND ADMINISTRATION				
CHAPTER 2 - DEFINITIONS				
202, 401.9, 401.10, 404.1	Identification, Testing and Certification	Each section of pipe and each fitting utilized in a gas system requires the identification of the manufacturer.		
CHAPTER 3 - GENERAL REGULATIONS				
304.1	Combustion Air for Appliances with Power Burners		This change clarifies that the prescriptive combustion air provisions of Section 304 do not apply to appliances having power burners.	
304.10 701.2 (IMC)		Referenced sections require motorized dampers to be used on outside air intakes. Manual dampers are not allowed. Barometric dampers are considered by industry to be automatic Include WI amendment to state that barometric dampers are not recognized for use in a combustion air intake duct.		109
307.6	Condensate Pumps		Condensate pumps located in uninhabitable spaces and used with condensing fuel-fired appliances and cooling equipment must be connected to the appliance or equipment served by the pump to prevent water damage in the event of pump failure.	
308.1	Clearance to Combustible Materials	It has been clarified that gypsum board is to be considered a combustible material for the purpose of required clearances, including those provisions of Section 308 addressing reductions in required clearances.		

IFGC Code Sections	SPS 365 Topic	2012 IFGC Changes DIS Recommendations	2015 IFGC Changes	Comments
310.1.1	Electrical Bonding of Corrugated Stainless Steel Tubing		Text has been added to address the allowable length of the bonding jumper wire and the methods of making the bonding connections.	
CHAPTER 4 - GAS PIPING INSTALLATIONS				
	SPS 365.0400	The Division would prefer to retain the most recent version of NFPA 54 so as to complement its use already adopted in SPS chapters 323 & 340 Modify code to address adoption of NFPA 54 to updated code.		94
402.2	Maximum Gas Demand for Pipe Sizing		Table 402.2 and the reference to it have been deleted as a result of the code requiring the actual maximum input rating of the appliances to be known and used for sizing purposes.	
403.6	Plastic Pipe, Tubing and Fittings		PVC and CPVC pipe are expressly prohibited materials for supplying fuel gas.	
403.10.4	Drilled and Tapped Metallic Pipe Fittings		The code now expressly prohibits the practice of drilling and tapping pipe fittings in the field except where performed in accordance with five criteria that strictly limit such practice.	
404.2	CSST Piping Systems	CSST piping systems shall be installed in accordance with their listing and the manufacturer's installation instructions.		
404.5	Fittings in Concealed Locations		This section retains its basic intent, while being completely reorganized to clarify the correct application. Threaded elbows, tees and couplings are now specifically approved for concealed locations as the code always intended. The code now provides the applicable referenced standards for fittings that are listed for concealed locations.	
404.7	Protection of Concealed Piping against Physical Damage		The section on protection of piping has been completely rewritten to address more than just bored holes and notches in structural members. It now addresses piping parallel to framing members and piping within framing members. The new text requires that the protection extend well beyond the edge of members that	

IFGC Code Sections	SPS 365 Topic	2012 IFGC Changes DIS Recommendations	2015 IFGC Changes	Comments
			are bored or notched.	
404.18	Prohibited Devices	Excess flow valves and similar devices are now permitted to be placed in gas piping systems that have been sized to accommodate the pressure drop.		
404.18	Pipe Cleaning		The code now specifically prohibits the practice of using fuel gas as a medium for flushing foreign matter and debris from fuel-supply piping.	
408.4	Sediment Traps	An illustration of a sediment trap is now included within the IFGC in order to clarify the intent of the provisions.		
410.2	Medium-Pressure Regulators		Line regulators installed in rigid piping must have a union installed to allow removal of the regulator.	
410.4	Excess Flow Valves	An excess flow valve must now be listed, sized, and installed in accordance with the manufacturer's instructions.		
410.5 202	Flashback Arrestor Check Valve	A combination flashback arrestor and backflow check valve is now required on any fuel gas system used with oxygen in any hot work operation.		
411.1	Connecting Portable Outdoor Appliances		Where portable gas appliances are used outdoors, such as gas grills and patio heaters, the options for connecting to the gas distribution system are practically limited to gas hoses designed for the purpose. Such hoses must comply with ANSI Z21.54.	
411.1.1	Connectors for Commercial Cooking Appliances		Specific installation requirements have been added for the safe installation of ANSI Z21.69 connectors for commercial cooking appliances. The options to connect the cooking appliance with semirigid tubing or rigid pipe have been removed.	
CHAPTER 5 - CHIMNEYS AND VENTS				

IFGC Code Sections	SPS 365 Topic	2012 IFGC Changes DIS Recommendations	2015 IFGC Changes	Comments
502.7.1	Door Clearance to Vent Terminals		Coverage has been added to address the condition where a door could impact or come too close to an appliance vent terminal.	
503.4.1	Plastic Piping for Appliance Vents		The approval of plastic pipe for venting appliances is no longer a responsibility of the code official; instead, that responsibility rests with the appliance manufacturer and the appliance listing agency.	
503.6.9.3	Sizing of Plastic Pipe Vents		The code previously spoke only of vents that are defined as listed and labeled factory-made products. The code is no longer silent on the sizing of vents that do not fall under the definition of "vent."	
503.8	Venting System Termination Location		Text has been added to address the location of sidewall vent terminals with respect to adjoining buildings. Previous editions of the code were silent on this subject, and the appliance manufacturer's instructions are typically silent as well.	
CHAPTER 6 - SPECIFIC APPLIANCES				
614.5	Dryer Exhaust Duct Power Ventilators		New text recognizes the use of dryer exhaust duct power ventilators (DEDPVs) for installations that exceed the allowable exhaust duct length for clothes dryers.	
618.4	Prohibited Sources	Return air may be taken from a garage provided with a dedicated forced-air system.		
621	**SPS 365.0621**	Delete the word "portable", and replace with "room heater", ventless fire places are not portable and should not be allowed.…language shall complement existing SPS 364.0801.		
623.2	Prohibited Location of Commercial Cooking Appliances		The code has been clarified so that it would not inadvertently prohibit the installation of cooking appliances that are listed as both commercial and domestic appliances.	
CHAPTER 7 - GASEOUS HYDROGEN SYSTEMS				

IFGC Code Sections	SPS 365	2012 IFGC Changes	2015 IFGC Changes	Comments
	Topic	DIS Recommendations		
CHAPTER 8 - REFERENCED STANDARDS				
APPENDICES				
Appendix A				
Appendix B				
Appendix C				
Appendix D				

a. Published sources:
2009 *International Fuel Gas Code*® – International Code Council® (ICC)
2012 *International Fuel Gas Code* – International Code Council
2015 *International Fuel Gas Code* – International Code Council
Significant Changes to the International Plumbing Code, International Mechanical Code and International Fuel Gas Code, 2012 Edition – International Code Council
Significant Changes to the International Plumbing Code, International Mechanical Code and International Fuel Gas Code, 2015 Edition – International Code Council

b. Various ICC code section number references in SPS 365 will be updated where code section numbering has changed, but these modifications are not referenced here.

c. Changes that are not addressed because they do not apply in Wisconsin include the changes for all of chapter 1 Administration.

d. Chapter SPS 361 & 365 of the *Wisconsin Administrative Code* (Register, December 2011)

Prepared by Dan Smith
File Reference: SPS 365/Summary 2012 & 2015 IFGC changes

Summary of 2012 and 2015 IECC Changes[a] Significant[b] in Wisconsin[c] and Comparison With Wisconsin's Requirements[d]

IECC / ASHRAE 90.1 Code Sections	Description			Comments
	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes DIS Recommendations / Editorial Clarifications	2015 IECC / 2013 ASHRAE 90.1 Changes	
P A R T 1 - I E C C				
C H A P T E R 1 - S C O P E A N D A D M I N I S T R A T I O N				
2012 IECC Table of Contents	SPS 363 numbering is based on the older page numbering of the IECC; *the new chapter designations with the C or R prefix will need to be incorporated into SPS 363 to maintain a connection to the appropriate provisions in the IECC*	The 2012 IECC was completely reorganized and renumbered for an easier and more user friendly format; the code has been broken into two separate parts for Commercial Energy Efficiency and Residential Commercial Efficiency		Residential chapters apply to multi-family dwellings
	Renumber: **SPS 363.001**	SPS 363.0010		
	Renumber: **SPS 363.002**	SPS 363.0020		
	Amend: **SPS 363.002**	**Application. (1)** MIXED OCCUPANCY. Where a building includes both residential and commercial occupancies, each occupancy shall be separately considered and meet the applicable provisions of IECC ~~chapter 4~~ Residential Provisions for residential or IECC ~~chapter 5~~ Commercial Provisions for commercial.		
C101.2 R101.2	SPS 363.0101 states "Except for IECC 101.5.2, the requirements in IECC sections 101 and 103 to 109 are not included as part of this chapter"; additional administrative requirements regarding commissioning occur elsewhere in the 2015 edition of the IECC; *the SPS 363.0101 statement*	Modifies the scope of the code to include the building site and associated systems and equipment; clarifies that the IECC is not limited to a structure shell and its contents		Should the expanded scope of IECC be included in SPS 363.001?

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
	may need to address these changes			
	Amend: **SPS 363.0100 Note:**	**Note:** The sections in this chapter are generally numbered to correspond to the numbering used in the IECC, with a 0 to the right of the decimal point referring to the Commercial Provisions and a 5 to the right of the decimal point referring to the Residential Provisions of the IECC, i.e., s. SPS 363.0101 refers to section IECC ~~101~~ C101 and s. SPS 363.5101 refers to section IECC R101.		
	Amend: **SPS 363.0101**	~~Except for IECC 101.5.2, the~~ The requirements in IECC sections ~~101 and 103 to 109~~ C101, and C103 to C109 are not included as part of this chapter.		The low-energy building exemption has been moved to C402.1.1 and R402.1, Exception
	Create **SPS 363.5101**	The requirements in IECC sections R101, and R103 to R109 are not included as part of this chapter.		
C101.3 R101.3		Modifies the intent statement from "effective use of energy" to "effective use and conservation over the useful life of each building"	Removes the word "effective" from the intent statement	
CHAPTER 2 - DEFINITIONS				
Section 202 New		Definitions which are new to the 2012 IECC and their applicable sections are: C Building Commissioning C Building Entrance C,R Building Site C Coefficient of Performance (COP) – Cooling C Coefficient of Performance (COP) – Heating C,R Continuous Air Barrier C,R Demand Recirculation Water System C,R [B] Dwelling Unit C Dynamic Glazing C Enclosed Space C Equipment Room C Fenestration Product, Field Fabricated C,R Fenestration Product, Site Built C Furnace Electricity Ratio C General Lighting C Integrated Part Load Value (IPLV)		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		C Nonstandard Part Load Value (NPLV) C On-site Renewable Energy C,R [B] Sleeping Unit C,R Visible Transmittance (VT) R Whole House Mechanical Ventilation System		
Section 202 Modified		Definitions which are modified in the 2012 IECC and their applicable sections are: C,R Residential Building C,R Skylight		
	Amend: **SPS 363.0202 (2)**	SUBSTITUTIONS. Substitute the following definition for the corresponding definition listed in IECC section ~~202~~ C202: "Approved" has the meaning given in s. SPS 362.0202 (2).		
	Create: **SPS 363.5202**	SUBSTITUTIONS. Substitute the following definition for the corresponding definition listed in IECC section R202: "Approved" has the meaning given in s. SPS 362.0202 (2).		
202	Application of "daylight zone"	Add former amendment from 2006 IECC Comm 63.0505(1)(b) Alternative. The daylit (daylight) area (zone) shall be as calculated using a method acceptable to the department". This allows single fixtures whose placement is odd for control situations to be placed with lighting controls more appropriate to its location. Location of single fixtures that may visually not seem appropriate for daylight zone controls, can be more appropriately grouped for control purposes, without the need for petition for variance		Amend 363.0202 Daylight zone adjacent to vertical fenestration, "method acceptable to the department" 3
Section 202 C402.2.2.1		Clarifies that the provisions include multiple definitions of "Above-Grade Wall" for the commercial requirements, the alternate definition in C402.2.2.1 pertains only to walls covered by section C402.2.3		ASHRAE 90.1 uses a third definition for "above grade wall"
CHAPTER 3 - GENERAL REQUIREMENTS				
302	SPS 364.0403(5)(d)2.d.	IECC 302 references 75°F as the indoor design temperature, while SPS 364.0403(5)(d)2.d. references 78°F. Modify WI amendment to compliment wording of the IMC		SPS 364.0403 minimum 75° F cooling 13
	Amend: **SPS 363.0302**	**Exterior design conditions.** These are department rules in addition to the requirements in IECC section ~~302~~ C302: The exterior design temperatures used for heating and cooling load calculations shall be as specified under Table 363.0302.		
	Create: **SPS 363.5302**	**Exterior design conditions.** These are department rules in addition to the requirements in IECC section R302: The exterior design temperatures used for heating and cooling load calculations shall be as specified under Table 363.0302.		
	Amend: **SPS 363.0303**	**Materials, systems and equipment.** These are department rules in addition to the requirements in IECC section ~~303~~ C303.		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
	Create: **SPS 363.5303** Copy (1) and (2) from 363.0303	**Materials, systems and equipment.** These are department rules in addition to the requirements in IECC section R303.		
Tables C303.1.3(3), R303.1.3(3)		Adds Visual Transmittance (VT) values to Table 102.1.3(3); VT is the ratio of visible light entering the space through the fenestration product assembly to the incident visible light, it includes the effects of glazing material and frame, and is expressed as a number between 0 and 1; a "0" is opaque, a "1" is totally transparent"		VT is one of the factors used when calculating the performance of "dynamic glazing" in a commercial building for compliance with C402.3.3
PART 2 - IECC - COMMERCIAL ENERGY				
CHAPTER C4 - COMMERCIAL ENERGY EFFICIENCY				
C401.1		Modifies the format to more clearly show the three options for compliance, [1] following ANSI/ASHRAE/IESNA 90.1, [2], a prescriptive path, and [3] a performance path**; the prescriptive path** follows requirements for building envelope in C402, mechanical systems in C403, service water heating in C404, and electrical and lighting in C405, with a requirement for meeting efficiency requirements for either HVAC in C406.2, lighting in C406.3, or on-site renewable energy in C406.4**; the performance path** follows the requirements of C407, along with C402.4, C403.2, C404, C405.2, C405.3, C405.4, C405.6, and C405.7, and must have an energy cost equal to or less than 85 percent of the standard reference building		Numbering of SPS 363 will have to change to adapt to the new format in the IECC For example: Use SPS 363.0405 to modify C405 Use SPS 363.5405 to modify R405
	Renumber and amend **SPS 363.0501**	**SPS 363.0401 General application.** This is a department rule in addition to the requirements in IECC section ~~501.2~~ R401.2: All of the following rules shall apply regardless of whether the IECC chapter ~~5~~ 4 [CE] or ASHRAE 90.1 standard is used to determine compliance: **(1)** Section ~~SPS 363.0503~~ SPS 363.0403 (1) relating to design loads. **(2)** Sections ~~SPS 363.0503~~ SPS 363.0403 ~~(3) and~~ (4) relating to economizers. **(3)** Section ~~SPS 363.0505~~ SPS 363.0405 relating to lighting systems.		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		(4) IECC section ~~505.2.2.1~~ C405.2.2.2 relating to dual switching.		
C401.2.1		Adds a new section with requirements for additions, alterations, and repairs of existing buildings to either follow ANSI/ASHRAE/IESNA 90.1 or the prescriptive requirements of the IECC without the added efficiency requirements of C406		
Section C402		Focuses more on building envelope where the previous commercial section focused more on mechanical, lighting, and service water heating systems; **new sections include:** ▪ roof solar reflectance and thermal emittance ▪ insulation of radiant heating systems ▪ increased vertical fenestration with daylighting controls ▪ increased skylighting with daylighting controls ▪ minimum skylight daylight fenestration area ▪ haze factor ▪ dynamic glazing ▪ air barrier construction ▪ air barrier compliance options ▪ materials ▪ assemblies ▪ building test, air barrier penetrations ▪ building test, air leakage of fenestration **revised sections include:** ▪ specific insulation requirements ▪ opaque thermal envelope requirements ▪ building envelope requirements, fenestration ▪ maximum fenestration area ▪ vestibules ▪ outdoor air intakes and exhausts ▪ recessed lighting		
C402.1.1	SPS 363.002 exempts			

	glazed structures from the requirements of the energy code; similar language is now found in IECC C402.1.1, where greenhouses have been added to the list of building types exempt from the thermal envelope provisions of the IECC; *the SPS 363.002 statement should be reviewed*			
C402.2		Modifies thermal performance values and adds provisions for the installation of continuous insulation		(prescriptive)
C402.2.1.1		Adds a new section that addresses the amount of solar heat reflected and radiated from low sloped roofs in Climate Zones 1, 2, and 3		NA
C402.2.6		Modifies requirements for slabs on grade by adding a new minimum prescriptive protection requirement for insulation extending away from the building, and by adding a new exception for perimeter insulation with slab on grade floors greater than 24 inches below the finished exterior grade		
C402.2.8		Adds a requirement for insulation of all radiant heated floor slabs and radiant panels designed for sensible heating of internal space		
C402.3		Modifies the building envelope requirements: fenestration table C402.3 with a major overhaul and supplements it with a table for SHGC adjustment multipliers, C405.2.2.3.2		(prescriptive)
C402.3.1		Modifies the baseline maximum for vertical fenestration from 40 percent to 30 percent, but up to 10 percent can be added with the use of automatic daylighting controls; the baseline maximum of 3 percent for skylights can be		Skylights are now required over certain large spaces for specific uses, but Climate Zones 6-8 are exempt

		increased to 5 percent with daylighting controls; and skylights are now required over large spaces exceeding 10,000 square feet with certain uses, but Climate Zones 6-8 are exempt from this requirement		
C402.3.3		Modifies the method of determining the maximum U-factor and solar heat gain coefficient (SHGC) by no longer allowing for an area-weighted projection factor; each area with a different projection factor will be required to be evaluated separately		
C402.3.3.1-4		Modifies provisions by providing additional variables to allow increased design flexibility for adjusting the SHGC		
C402.4.1		Adds requirements for air-barriers with new prescriptive and/or measurable mandatory requirements		
C402.4.7		Modifies vestibule requirements by requiring vestibules for doors adjacent to revolving doors, and by exempting doors used only by employees from needing a vestibule		
	Renumber and amend: **SPS 363.0503**	**SPS 363.0403 Building mechanical systems.** **(1)** CALCULATION OF HEATING AND COOLING LOADS. The following wording is a department requirement in addition to the requirements in IECC section ~~503.2.1~~ C403.2.1: Design heating and cooling loads shall be determined in accordance with s. SPS 363.0302 and Table 363.0302. **(2)** EQUIPMENT AND SYSTEM SIZING. Substitute the following wording for the requirements and the exceptions in IECC section ~~503.2.2~~ C403.2.2: Heating and cooling equipment and systems shall be sized to provide the minimum space and system loads calculated in accordance with s. SPS 363.0302. **(3)** HVAC SYSTEM COMPLETION. The requirements in IECC sections ~~503.2.9~~ C403.2.11 is not included as part of this chapter. **(4)** ECONOMIZERS ~~SIMPLE HVAC SYSTEMS~~. Substitute the following wording for the requirements in IECC section ~~503.3.1 the first paragraph~~ C403.3 and Table ~~503.3.1 (1)~~ C403.3.3(1): Supply air economizers shall be provided on the following cooling systems: (a) Package roof top units > 33,000 Btu/h. (b) All other cooling systems > 54,000 Btu/h. ~~**(5)** ECONOMIZERS COMPLEX HVAC SYSTEMS. Substitute the following wording for the requirements, but not the exceptions, in IECC section 503.4.1: Supply air economizers shall be provided on cooling systems as described under sub. (4). Economizers shall be capable of~~	

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		~~operating at 100 percent outside air, even if additional mechanical cooling is required to meet the cooling load of the building.~~ ~~(6)~~ **(5)** CLIMATE ZONES ~~3 AND 4~~ 5 THROUGH 8. Substitute the following wording for the requirements in IECC section ~~503.4.3.3.2.2~~ C403.4.2.3.2.2: For climate Zones 5 through 8 as indicated in Figure ~~301.1~~ C301.1 and Table ~~301.1~~ C301.1, if an open−circuit cooling tower is used, then a separate heat exchanger shall be required to isolate the cooling tower from the heat pump loop, and heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop and providing an automatic valve to stop the flow of fluid.		
C403.2.2		Limits sizing of equipment Request committee to review since past advice & practice via previous committees was to allow oversizing to address pick-up loads in factories, warehouses, offices, etc. Review language and acceptable options		97
C403.2.3 C403.2.3.2 Tables C403.2.3 (1-9)		Modifies the equipment performance requirements; adds a new column "Heating Section Type" which differentiates electric resistance equipment from other types; additional equipment types (through-the-wall, air-cooled) have been added; new tables have been added for heat rejection and heat transfer equipment; SEER requirements have been improved; and some equipment efficiencies have improved		
C403.2.4.3.3		Adds a requirement for all HVAC systems to be capable of automatically adjusting the daily start time in order to bring the space that is controlled up to temperature immediately prior to scheduled occupancy		
C403.2.5.1		Modifies the threshold for Demand Control Ventilation (DCV) from average occupant load of 40 people/1,000 square feet to 25 people/1,000 square feet; adds an exception for process loads		
C403.2.6		Modifies energy recovery ventilation system requirements by adding a new table which replaces a single fixed trigger point of 5,000 cfm and 70 percent outdoor air, and provides a comprehensive and scalable energy recovery requirement based on the climate zone and percentage of outdoor air at full design flow		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		rate		
C403.2.8		Modifies piping insulation by expanding and clarifying exceptions for smaller strainers, control valves and balancing valves, as well as direct buried piping that conveys fluids at or below 60 degrees Fahrenheit; provides a scalable table which bases insulation thickness on fluid operating temperature range and insulation conductivity		
C403.2.8.1		Adds a requirement for protecting insulation exposed to the elements, but prohibits the utilization of adhesive tape as the protective measure		
C403.2.11	SPS 363.0503 removes IECC 503.2.9 (2009) and its subsections from the code; the IECC commissioning and completion requirements are much stricter now; in the 2015 edition of the IECC, this is now section C403.2.11 and references section C408, which deals with commissioning; *the SPS 361 regulations regarding completion may need to be revised in order to address the commissioning aspects of the current code*			
C403.3.1, Table C403.3.1 (1)	The IECC 2009 requirements for economizers were made more strict by SPS 363.0503; they were made stricter yet in IECC 2012 and in 2015	Modifies the provisions regarding economizers, making requirements more comprehensive than previous editions of the IECC		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
	the IECC continued this trend; *SPS 363.0503 (4) and (5) should be revisited in light of these modifications*			
C403.3.1 (2015) C503.3.1 (2009)	SPS 363.0503 (4)	Challenges by designers have pointed out that a zone (see Definition in IMC 202) within an enclosed area could be treated differently when attempting to apply this section Add language that defines a zone as an enclosed room or space, or that the application of this section is specific to the enclosed area via walls, ceilings, windows, doors, skylights, etc. served by the cooling system(s).		Clarify definition of Zone as related to economizer requirements 52
C403.4.1.3, C403.4.1.4		Adds a requirement for economizers to be integrated with the associated mechanical cooling system, operate even when additional cooling is required, and provide no-to-minimal impact on the heating system		
C403.4.2		Modifies variable air volume (VAV) controls by reducing minimum motor sizes and allowing vane axial fans with variable pitch blades; and specifies the location(s) for static pressure sensors		
C403.4.3.2.2	SPS 363.0503 (6) removes closed-circuit cooling towers from this requirement; this paragraph is now found at C403.4.2.3.2.2			
C404	SPS 363.0504 removes sections of the IECC 2009 related to service water heating dealing with temperature controls, heat traps, and pool covers; the latter two may still be appropriate, but the referenced section on temperature controls is not in the 2015 IECC			
	Renumber and amend	~~SPS 363.0504~~ **SPS 363.0404 Service water heating. ~~(1)~~** ~~TEMPERATURE CONTROLS. The~~		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
	SPS 363.0504	~~requirements in IECC section 504.3 are not included as part of this chapter.~~ ~~(2)~~ **(1)** HEAT TRAPS. The requirements in IECC section ~~504.4~~ C404.3 are not included as part of this chapter. ~~(3)~~ **(2)** POOL COVERS. The requirements in IECC section ~~504.7.3~~ C404.9.3 are not included as part of this chapter.		
	Create **363.0504 (3)**	**SPS 363.0504 (3)** COMMISSIONING. The requirements in IECC section C404.11 are not included as part of this chapter.		?
C404.5		Modifies pipe insulation requirements for automatic circulating hot water and heat traced systems by addressing heat traced systems as an individual item and clarifying insulation requirements for non-circulating systems; modifies the control section to clarify that manually controlled circulating systems are required to stop pumping when there is limited hot water demand		
C404.7		Modifies requirements for pools by excluding temporary and above ground spas from the scope of the regulations, raising the benchmark percentage for site recovered energy, and setting the criteria for energy use calculations**;** revises the section title to include in-ground permanently installed spas		
C404.9 (2015) 504.7.2 (2009)		This section requires that time switches be installed in pools. Rules issued by DHS mandate that pump operation occur continuously, 24 hrs/day, 365 days per year.		Amend this section such that the requirements is eliminated 85
C405.1		Modifies from 50 percent to 75 percent the amount of line voltage fixtures required to have high efficacy bulbs		(mandatory)
C405.2.1.2		Modifies lighting reduction controls by limiting the size of exempted single luminaires and by exempting electrical and mechanical rooms		
C405.2.2		Deletes the section on automatic lighting shutoff and adds this section on additional lighting controls which includes automatic daylighting controls**;** and provides exceptions for sleeping rooms, spaces for patient care, spaces where automatic shutoff would		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		endanger safety or security, and lighting intended for continuous operation		
C405.2.2.1		Modifies requirements for automatic controls by eliminating the 5,000 square feet threshold, and making reductions in the allowable maximum override control area**;** exempts emergency egress lighting and lighting controlled by occupancy sensors from this requirement		
C405.2.2.2		Adds requirements for occupancy sensors in classrooms, conference rooms, restrooms, private offices, and all areas 300 square feet or less enclosed by floor to ceiling height partitions		
C405.2.2.2.1	SPS 363.0505 (1) (a) 2. References IECC 505.2.2.1, which now pertains to C405.2.2.2.1, *this chapter has changed enough that SPS 0505 should be reviewed; additionally, the definitions and provisions regarding daylight zones and daylighting have change and been expanded considerably since 2009*			
C405	SPS 363.0505 (2) references IECC section 505.5.1.4 (2009), which has no equivalent section in the 2015 IECC			
	Renumber and amend **SPS 363.0505**	**SPS 363.0405 Lighting systems**. (1) CONTROLS. These are department rules in addition to the requirements in IECC section ~~505~~ C405: (a) *General*. Except as provided in par. (b), daylight zones in any interior enclosed space greater than 250 square feet and a lighting density more than 0.6 W/ft2 shall have at least one control that meets all of the following requirements:		Only reference to track lighting in C405.4.1

		1. Controls only luminaires in the daylight zones. 2. Controls at least 50% of the lamps or luminaires in the daylight zone, in a manner described in IECC section ~~505.2.2.1~~ C405.2.2.2. (b) *Exceptions*. The requirements of this subsection do not apply to any of the following: 1. Daylight zones where the effective aperture of glazing is equal or less than 0.1 for vertical glazing and 0.01 for horizontal glazing. 2. Daylight zones where existing adjacent structures or natural objects obstruct daylight to the extent that effective use of daylighting is not feasible. ~~(2) LINE-VOLTAGE LIGHTING TRACK AND PLUG-IN BUSWAY~~ BUSWAY. ~~Substitute the following for the requirements in IECC section 505.5.1.4 C405: The wattage of line-voltage lighting track and plug-in busway which allows the addition or relocation of luminaires without altering the wiring of the system shall be the volt-ampere rating of the branch circuit feeding the luminaries or an integral current limiter controlling the luminaires, or the higher of the maximum relamping rated wattage of all of the luminaires included in the system, listed on a permanent factory installed label, or 30 W/linear foot.~~		Renumber section accordingly if (2) is eliminaed
C405.2.2.3		Modifies provisions related to daylight zones, which are areas likely to have sufficient sunlight for compliance with IBC minimum lighting requirements during the day		
C405.2.2.3.2		Adds requirements for automatic daylighting controls to give the user a choice between continuous dimming or stepped dimming		
C405.2.3		Adds additional specific application controls in addition to those for hotel sleeping rooms, and lighting equipment for sale or for lighting demonstrations by including**:** ▪ display and accent lighting ▪ lighting in cases used for display ▪ supplemental task lighting ▪ lighting for non-visual applications		
C405.5.2		Modifies the provisions by providing two methods of demonstrating compliance with the total interior lighting power allowance; the Building Area Method, and the Space by Space Method		
Table C405.5.2.1		Modifies the Interior Lighting Power Allowances: Building Area Method by removing the additional power allowance for specific merchandizing categories and moves		

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		them to the Space by Space Method (Table C405.5.2(2)		
Table C405.5.2 (2)		Adds the Space by Space Method of compliance with Interior Lighting Power Allowance determination and includes the additional power allowance for specific merchandizing categories, which were formally only applicable to the Building Area Method of compliance		
C406		This section requires that one (1) efficiency option be met. The Dept. does not require the submittal of lighting plans, thus review is in question. Additionally, water service is addressed by the plumbing group, and not the building code group. Add language that requires that the specific efficiency project option chosen is clearly addressed on the building/HVAC plans, with appropriate justification of code compliance included. IECC 2015 has requirements that are not spelled out on submitted plans. Not able to track. No lighting submittal makes it difficult to track option selected.		50
C406.1		Adds a new section with additional efficiency package options; where the prescriptive compliance path is followed; at least one of these options is required in addition to all other code requirements; they are described in C406.2, C406.3, and C406.4		
C406.1		Direct Comcheck for use under prescriptive requirements instead of Total Building Performance so that the program may be used prescriptively with C406.1 -the additional efficiency requirements Failure to do so will require that bldg design will be required to meet the prescriptive requirement only. This allows for greater flexibility.		Creates code flexibility for design 102
	Renumber and amend SPS 363.0506	~~**SPS 363.0506**~~ **SPS 363.0407. Total building performance.** This is a department informational note to be used under IECC section ~~506~~ C407: **Note:** ComCheck is a computer program that may be used only for determining building envelope or lighting compliance. The ComCheck computer program may be downloaded at~~:~~ http:/www.energycodes.gov/.		
C406.2		Adds an efficiency option to continue to use off site generated energy and to increase the HVAC efficiency		
C406.3		Adds an efficiency option to use an efficient lighting system for the entire building as the additional energy efficiency package		

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C406.4		Adds an efficiency option to provide on-site renewable energy that is equivalent to or greater than: 75 Btu or 0.50 watts per square foot of conditioned floor area, or three percent of the energy used in the building for non-process loads		
C407.3		Modifies performance based compliance methodology by keeping the requirements the same, but requiring buildings to achieve 15 percent greater energy efficiency, since C401.2 states that "*The building energy cost shall be equal to or less than 85 percent of the standard reference design building*"		
C408.1		Adds a section for building system commissioning which allows performance and efficiencies to be verified, giving a reasonable idea of how a well maintained building will perform		
C408.2		Adds requirements for the **registered design professional** to: ▪ provide evidence of commissioning and compliance ▪ indicate provisions for commissioning and completion in construction documents ▪ provide copies of documents to owner, and if requested, to code official ▪ provide written commissioning plan		
C408.2.2		Modifies requirements for balancing both air and hydronic systems in a manner intended to minimize throttling losses		
C408.2.3		Adds requirements for testing of mechanical equipment, controls, and economizers prior to a final inspection		
C408.2.4		Adds requirements for the registered design professional or approved agency to complete and certify a preliminary report of the commissioning test procedures itemizing: ▪ uncorrected deficiencies ▪ deferred tests		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		▪ conditions for performing deferred tests		
C408.2.5		Modifies documentation requirements by removing the mechanical contractor as the responsible party; and spelling out that documentation include: ▪ drawings ▪ manuals ▪ system balancing report ▪ final commissioning report		
C408.3		Adds functional lighting control testing as part of the commissioning process with the design professional responsible for identifying the party who will do the testing, the plan reviewer is responsible to see that the party is named, and the inspector has a contact to assure compliance prior to approving occupancy		
C403.2.4.2 (2015) 503.2.4.3 (2009)		ASHRAE 90.1 exempts radiant floor and ceiling heating systems from requiring setback controls because the mass/heat capacity of these building systems. This exception should be incorporated into the IECC because requiring the use of such setback controls is inappropriate for such systems. Add language exempting the need for setback controls for radiant floor & ceiling heating systems. Provides recognition of system limitations, and limited energy savings		32
C503.1 exc.7 C503.6		Two referenced sections list different percentages of luminaire replacement (ie. 50% vs 10%) Dept. to define which is to be applicable for code use		104
C600	SPS 363.0900 adds 1 NCMA standard and 4 ASTM standards, one of which is now also cited in the IECC			
	Renumber and amend: **SPS 363.0900**	~~**SPS 363.0900**~~ **SPS 363.0600 Referenced standards.** This is a department rule in addition to the requirements in IECC chapter ~~6~~ 6 [CE]: The following standards are hereby incorporated by reference into this code: **(1)** ASTM ~~C177–04~~ C177-13, Test method for steady−state heat flux measurements and thermal transmission properties by means of the guarded−hot−plate apparatus. **(2)** ASTM ~~C335–05~~ C335/C335M-10e1, Test method for steady state heat transfer properties of horizontal pipe insulation. **(3)** ASTM ~~C518–04~~ C518-15, Test Method for steady−state thermal transmission properties by		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		means of the heat flow meter apparatus. ~~(4) ASTM C1363–05, Test method for thermal performance of materials and envelope assemblies by means of a hot box apparatus.~~ ~~(5)~~ (4) National Concrete Masonry Association (NCMA) Evaluation Procedures of Integrally Insulated Concrete Masonry Walls, January 1, 1999.		
PART 3 - IECC - RESIDENTIAL ENERGY				
CHAPTER R4 - RESIDENTIAL ENERGY EFFICIENCY				
	Renumber and amend: **SPS 363.0401**	**SPS 363.5401 Certificate.** The requirements in IECC section ~~401.3~~ R401.3 are not included as part of this code.		
R402.1.1		Section references both the IRC and IBC for vapor retarder requirements Reference to the IRC for vapor retarder requirements should be stricken since this code is applicable to commercial buildings only Clarifies that IBC 1405.3 is to be used.		103
Table R402.1.1		Modifies the prescriptive insulation and fenestration requirements by component including requirements for continuous insulation at wood framed walls in Climate Zones 6 and 7	Renamed Table R402.1.2	!
Table R402.1.1		Modifies the footnotes for the table including: ▪ footnote ***a*** notes the reduction in R-value when batt insulation is compressed ▪ footnote ***b*** allows the exclusion of certain skylights from some SGHC requirements ▪ footnote ***h*** allows for consistent sheathing thickness while maintaining wall bracing ▪ footnote ***j*** regarding impact rated fenestration has been eliminated	Renamed Table R402.1.2	
Table R402.1.3		Modifies the prescriptive Equivalent U-factor table, an alternative to the R-value table, R402.1.1	Renamed Table R402.1.4	
R402.2.3		Adds requirements for eave baffles to maintain openings between soffit and eave vents and a vented attic space		
R402.2.6		Modifies the R-values significantly for steel framed walls to account for the conduction properties of the steel		
R402.2.12, R402.3.5		Modifies requirements for sunrooms by clarifying the wall separation provision and		

		making it clear that these provisions do not apply to spaces that are not thermally isolated; requires the wall separating the conditioned space and the thermally isolated sunroom to meet exterior wall criteria of IECC 2012		
R402.4.1		Modifies building thermal envelope provisions by requiring testing and visual inspection; the code official is authorized to require an approved third party to inspect and verify compliance		Administration issues
R402.4.1.2		Modifies air leakage provisions by requiring inspection and testing while increasing tightness requirements; in most cases mechanical ventilation will be required in houses to meet the air tightness requirements		
R402.4.2		Modifies the requirement for gasketed doors at fireplaces by moving it from the text of the code to table R402.4.1.1; and adds a requirement for tight fitting flue dampers		
	Renumber and amend: **SPS 363.0403**	**SPS 363.5403 Systems. (1)** ELECTRICAL POWER AND LIGHTING. This is a department rule in addition to the requirements in IECC section ~~403~~ R403: In residential buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units. **(2)** DUCTS. Substitute the following wording for the requirements in IECC section ~~403.2.2~~ RR403.3.2: All ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with IMC section 603.9.		
R403.2	SPS 363 0403 (2) reads in part "all ducts, air handlers, and filter boxes shall be sealed, joints and seams shall comply with IMC section 603.9	Modifies requirements for duct construction and sealing by requiring joints and seams to comply with either the *International Mechanical Code* (IMC) or the *International Residential Code* (IRC), which includes: ▪ SMACNA HVAC duct construction standards ▪ NAIMA fibrous glass duct construction standards ▪ UL-181 listing for duct board construction ▪ UL-181b listing for flexible construction ▪ unlisted duct tape is prohibited		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		▪ exception for certain longitudinal seams		
R403.2		Modifies requirements for duct tightness and verification by compliance with provisions related to a post construction test and a rough-in test		
R403.3.1		Adds a requirement for protecting insulation exposed to the elements, but prohibits the utilization of adhesive tape as the protective measure		
R403.4		Modifies insulation requirements for service hot water systems by increasing the minimum R-value to R-3 and including a list of specific situations where insulation is required, detailed in table R403.4.2		
R403.5		Adds requirements for mechanical ventilation in any building that has less than five air changes per hour at 50 Pascals (5ACH/50)		(mandatory)
R403.5.1		Adds a simple efficiency requirement for various mechanical ventilation system fans in table R403.5.1		
R403.6		Modifies requirements for equipment sizing from a reference through the IRC to a direct reference requiring sizing of equipment per Air Conditioning Contractors of America (ACCA) Manual S based on loads calculated in accordance with ACCA Manual J or other approved method		(mandatory)
R403.9		Modifies requirements for pools by excluding temporary and above ground spas from the scope of the regulations, insulated pool covers are no longer required		(mandatory)
R403.10 (2015) 403.9.2 (2009)		This section requires that time switches be installed in pools. Rules issued by DHS mandate that pump operation occur continuously, 24 hrs/day, 365 days per year.		Amend this section such that the requirements is eliminated 85
R403.10.4 (2015) 403.9.3 (2009)	SPS 363.0504 (3)	This section req's a pool cover be installed for pools located within low rise residential bldgs < 3 stories above grade. SPS 363.0504(3) was created due to health issues from the field that chloramines would overwhelm people when the pool cover was removed, and cause them to go unconscious.		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		Amend this section such that the req't for a pool cover is eliminated just as has been previously done to IECC 504.7.3		86
R404.1		Modifies lighting equipment provisions by requiring that 75 percent of the lamps in permanently installed light fixtures contain only high efficacy lamps		(mandatory)
R405.3		Clarifies that the Commercial provisions require computer modeled performance 15 percent better than the standard reference design, the Residential provisions do not		
Table R405.5.2 (1)		Modifies the language of the table to clarify acceptable compliance methodology with the inclusion of technical details		
	Renumber and amend: **SPS 363.0405**	**SPS 363.5405 Calculation software tools.** This is a department informational note to be used under IECC section ~~405.6~~ R405.6:		
	Renumber and amend: **SPS 363.0405 Note:**	**SPS 363.5405 Note:** The federal Department of Energy has developed ~~REScheckTM~~ REScheck™, a computer program that may be used in demonstrating compliance for a residential building which has no more than 3 stories above grade and has 3 or more dwelling units. The REScheck program may be downloaded at http://www.energycodes.gov/. ~~When using the program, the applicable code must be defined as the "2009 IECC." The use of the "Wisconsin" option will apply requirements associated with a 1 or 2 family dwelling, which are more restrictive than those associated with low-rise multifamily buildings.~~ (new text)		
405.6	363.0405	RESCheck has multiple versions in use, for uniformity the dept recommends using the most recent version. 363.0405 Calculation software tools. Add: The most recent version of REScheck shall be used when demonstrating code compliance. This will provide uniformity for reviewers, submitters and users of energy standard to all be consistent and current with energy requirements. As this is utilized in the design stage, there should be minimal impact to construction cost. Software is free download.		Add to the Note: The most recent version of REScheck shall be used when demonstrating code compliance. 2
PART 4 - ASHRAE/IES 90.1				
THE BUILDING ENVELOPE				
4.2.4		Adds continuous air barriers to the list of required inspection items		
5.1.2		Adds language clarifying that the new requirement for the addition of skylights to certain spaces also applies to unconditioned spaces		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
5.4.3.1		Modifies provisions for sealing the building envelope by adding requirements for **design, installation,** and **materials** for the construction of a continuous air barrier for the entire building envelope		
5.4.3.2		Modifies air leakage criteria at fenestration and doors to more closely reflect current practice		
5.5.3.1		Modifies and expands the types of roofs shown by research to reduce the conduction loads through roofs into the conditioned space, allowing designers to select from a number of alternatives and reduce space loads, reducing energy use and cost		
5.5.3.4		Modifies the vestibule requirements for Climate Zone 4		NA
5.5.4.2.2		Adds skylight requirements in larger spaces with specific uses to promote daylighting energy savings, but Climate Zones 6-8 are exempt		NA
5.5.4.4.1		Adds a requirement that the minimum values for dynamic glazing be used to show compliance; in the envelope trade off rules found in Appendix C, the dynamic glazing must use the Standard values from C3.5 to show compliance; when dynamic glazing is used in the Appendix G models, the average values are to be used		
5.5.4.5		Adds a requirement that the area of south facing glass be equal to or larger than the area of east or west facing glass		
5.8.1.10		Adds a requirement for offsetting joints by staggering boards when multiple layers of insulation are used		
5.8.2		Adds Visible Transmittance (VT) to the list of rating and labeling requirements for fenestration products		
PART 5 - ASHRAE/IES 90.1				

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		H V A C		
6.4.1.1		Modifies the minimum equipment efficiencies tables by adding new equipment types and requiring compliance with the Standard for equipment used in buildings as defined by the new scope of the Standard		
6.4.1.2		Modifies provisions by introducing a new equation to adjust the performance of centrifugal chillers operating at non-standard conditions to show compliance with the Standard		
6.4.1.2.2		Modifies provisions related to positive displacement chillers that use glycol and other additives by requiring them to be tested with water at standard rating conditions		
6.4.2		Modifies heating and cooling load calculations by reference to ANSI/ASHRAE/ACCA Standard 183, *Peak Heating and Cooling Load Calculations in Buildings Except Low-Rise Residential Buildings*; and requires pump head calculation for the critical circuit		
6.4.3.4.3		Modifies provisions to separate the requirements for exhaust/relief dampers from ventilation intake dampers		
6.4.3.4.5		Adds an allowance for a reduction in ventilation in unconditioned garages and requires an automatic control that is capable of staging fans or modulating fan volume as required to maintain carbon monoxide contaminant levels		
6.4.3.10		Adds a requirement for variable air volume fan speed controls to be included in single zone units		
6.4.4.1.4		Adds a requirement for minimum insulation to be applied to the back of radiant heating panels		
6.4.4.1.5		Adds a requirement for minimum insulation		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		to be applied to the bottom of radiant heated floors		
6.4.4.2.1		Modifies provisions regarding duct sealing to require ducts and plenums with pressure class ratings to be constructed to seal Class A, and provides a definition for the seal class		
6.5.1		Modifies provisions so as to provide minimum fan cooling unit sizes for required economizers on computer rooms		
6.5.1	*SPS 363.0503 (4) and (5) should be revisited in light of these modifications*	Modifies the economizer table, requiring economizers to be installed in all units with 54,000 Btu/h or more of cooling in all but Climate Zone 1		
6.5.1.2		Adds requirements for water economizers in computer rooms		
6.5.1.3		Modifies provisions by removing all exceptions from the requirement for integrated economizer control		
6.5.2.1		Adds a control strategy for VAV reheat boxes and eliminates some exceptions from the section		
6.5.2.1.1		Adds a provision limiting the heating air temperature of reheat boxes when the supply and return grilles are both six feet above the floor		
6.5.3.3		Adds a requirement to use ASHRAE 62.1, Appendix A, to optimize the ventilation efficiency and reduce the outside air amount used with room loads below design		
6.5.3.4		Adds a requirement for supply air temperature automatic reset controls for multiple zone HVAC systems		
6.5.4.1		Modifies the pumping power requirements for HVAC systems		
6.5.4.4.2		Modifies provisions to include water cooled unitary air conditioners with hydronic heat pumps and require both to provide automatic valves that shut off when the compressor		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		does, and provide variable speed pumps		
6.5.4.5		Adds requirements to use a standard table for sizing HVAC piping in order to control pump energy		
6.5.5.3		Adds requirements limiting the power used in open cooling towers with centrifugal fans		
6.5.6.1		Modifies provisions by increasing the requirement for air energy recovery in most climate zones		
6.5.7.1		Modifies provisions for kitchen exhaust systems by modifying make-up air requirements to prevent short circuiting, by establishing maximum net exhaust flow rates for exhaust hoods, and by requiring exhaust system performance testing		
6.5.7.2		Modifies the equation for designing laboratory exhaust systems by integrating the alternative paths of compliance to allow each system to contribute to the energy savings		
PART 6 - ASHRAE/IES 90.1				
LIGHTING				
9.1.2		Modifies the provisions to clarify that alterations to the lighting system must comply with all of the section 9 requirements		
9.1.3		Modifies details of the calculations needed to determine the installed exterior lighting power density requirements		
9.2.2.3		Adds two additional exceptions to the lighting types which are not to be included in the installed lighting power calculation		
9.4.1		Modifies provisions by requiring bi-level lighting control and automatic shutdown in all buildings regardless of size, with exceptions: ▪ public corridors and stairwells ▪ restrooms ▪ primary building entrance areas and lobbies ▪ areas where manual-on operation would		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		endanger the safety or security of the room or building occupants		
9.4.1.3		Modifies provisions for lighting control in garages by requiring bi-level lighting control and daylighting controls		
9.4.1.4		Adds a requirement for multilevel daylighting controls for areas adjacent to sidelights		
9.4.1.5		Adds a requirement for multilevel daylighting controls for areas lit by skylights		
9.4.1.6		Modifies provisions to exclude bathroom lighting from being controlled by the master switch required in hotel/motel guest rooms and adds new control requirements for the bathroom lighting		
9.4.1.6		Adds requirements for occupancy lighting controls in building stairwells to dim lighting after occupants leave		
9.4.1.7		Modifies provisions to require controls for exterior lights to turn off the lights under daylight conditions; older versions of the code merely required that the controls were provided		
9.4.2		Deletes requirements for tandem wiring of light fixtures because of improvements in ballast design		
9.4.3		Modifies provisions to apply a five zone lighting power density approach, each with its own base site allowance, and provide allowances for varying site use classifications in different exterior lighting zones		
9.4.4		Deletes the requirement for minimum efficacy of exterior lamps over 100 watts		
9.4.4		Adds a requirement for functional testing of lighting control devices and control systems		
9.5.1		Modifies the lighting power densities used with the building area method of lighting power allowance calculation		
9.6.1		Modifies the Standard to set the lighting		

IECC/ASHRAE Code Sections	SPS 363	2012 IECC / 2010 ASHRAE 90.1 Changes	2015 IECC / 2013 ASHRAE 90.1 Changes	Comments
		power density by space function whether the function is separated by full height wall or not		
9.6.2		Modifies additional retail lighting provisions to reflect the use of modern lamp technology and adds a power allowance requirement to encourage the use of advanced lighting controls		
9.6.3		Adds an allowance for 20 percent more lighting power to be used in small rooms with high ceilings		
9.7		Adds provisions for submittals to the lighting section requiring the submittal of compliance documentation and supplemental information		Administration issues
PART 7 - ASHRAE/IES 90.1				
OTHER CHANGES				
1 Purpose and Scope		Modifies the purpose and scope of the Standard by adding building operation and maintenance, on-site renewable energy systems, and commercial systems to those for which the Standard may develop requirements		

3.2		Modifies provisions by adding multiple definitions, mostly related to daylighting, including:
		▪ Daylight area
		  ▪ Under skylights
		  ▪ Under rooftop monitors
		▪ Daylighted area
		▪ Dynamic glazing
		▪ Fenestration, field fabricated
		▪ Multi-level occupancy sensor
		▪ Multi-scene control
		▪ Primary sidelighted area
		▪ Secondary sidelighted area
		▪ Sidelighting effective aperture
		▪ Toplighting
		▪ Vegetative roof system
		▪ Visible transmittance (VT)		

8.4.2		Adds a requirement for the installation of		

		controls to turn off 50 percent of receptacles when the space is unoccupied		
10.4.2		Adds requirements addressing energy waste in service water pressure booster systems		
10.4.3		Modifies energy consumption in elevators by requiring more efficient lighting and fans and by requiring controls that turn the lighting and ventilation off when the elevators are not in use for an extended period of time		

a. Published sources:
2009 *International Energy Conservation Code*® – International Code Council® (ICC)
2012 *International Energy Conservation Code* – International Code Council
2015 *International Energy Conservation Code* – International Code Council
Significant Changes to the International Energy Conservation Code and ANSI/ASHRAE/IES Standard 90.1, IECC 2012 Edition, ANSI/ASHRAE/IES 2010 Edition – International Code Council
ANSI/ASHRAE Standard 90.1-2007 – American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ANSI/ASHRAE/IES Standard 90.1-2010 – American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ANSI/ASHRAE/IES Standard 90.1-2013 – American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

b. Various ICC code section number references in SPS 363 will be updated where code section numbering has changed, but these modifications are not referenced here.

c. Changes that are not addressed because they do not apply in Wisconsin include the changes for most of chapter 1 Administration

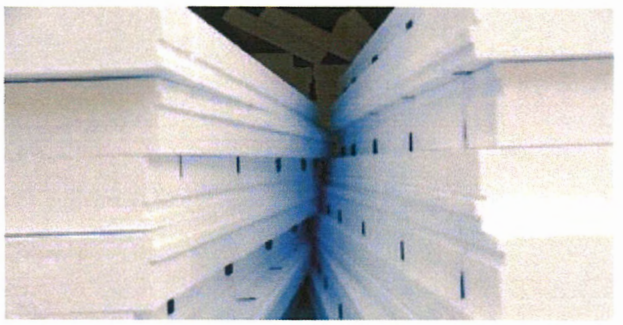
d. Chapters SPS 361 and 363 of the *Wisconsin Administrative Code* (Register, December 2011)

Prepared by Dan Smith
File Reference: SPS 363/Summary 2012 & 2015 IECC changes

TRENDING TODAY :: Analyzing Payback Of Roofing Insulation

Analyzing Payback Of Roofing Insulation

By Jason P. Wilen, AIA, CDT, RRO
From the January/February 2016 Issue



Model energy codes establish minimum requirements for thermal resistance of building envelopes. Thermal resistance is often measured in R-value, which is a measure of insulation's ability to resist heat traveling through it. The higher the R-value the better the thermal performance of the insulation is. Model energy codes are adopted by states or local jurisdictions and are sometimes left as-is or are modified by state or local building code agencies to reflect a jurisdiction's local conditions. The most often-adopted energy code in the U.S. is the International Energy Conservation Code (IECC), developed and published by the International Code Council (ICC)

The building envelope thermal requirements in the International Energy Conservation Code, 2012 Edition (IECC 2012) provide prescriptive minimum thermal insulation (R-value) requirements for building envelope components, including roof assemblies.

Comparing IECC 2012's values to those of the International Energy Conservation Code, 2009 Edition (IECC 2009) reveals minimum required R-values have increased from R-5 to R-10 depending on specific climate zones and building (roof) assembly configurations.

Similarly, comparing the new International Energy Conservation Code, 2015 Edition's (IECC 2015's) values to IECC 2012's Edition, IECC 2015 includes increases of an additional R-5 for some locations.

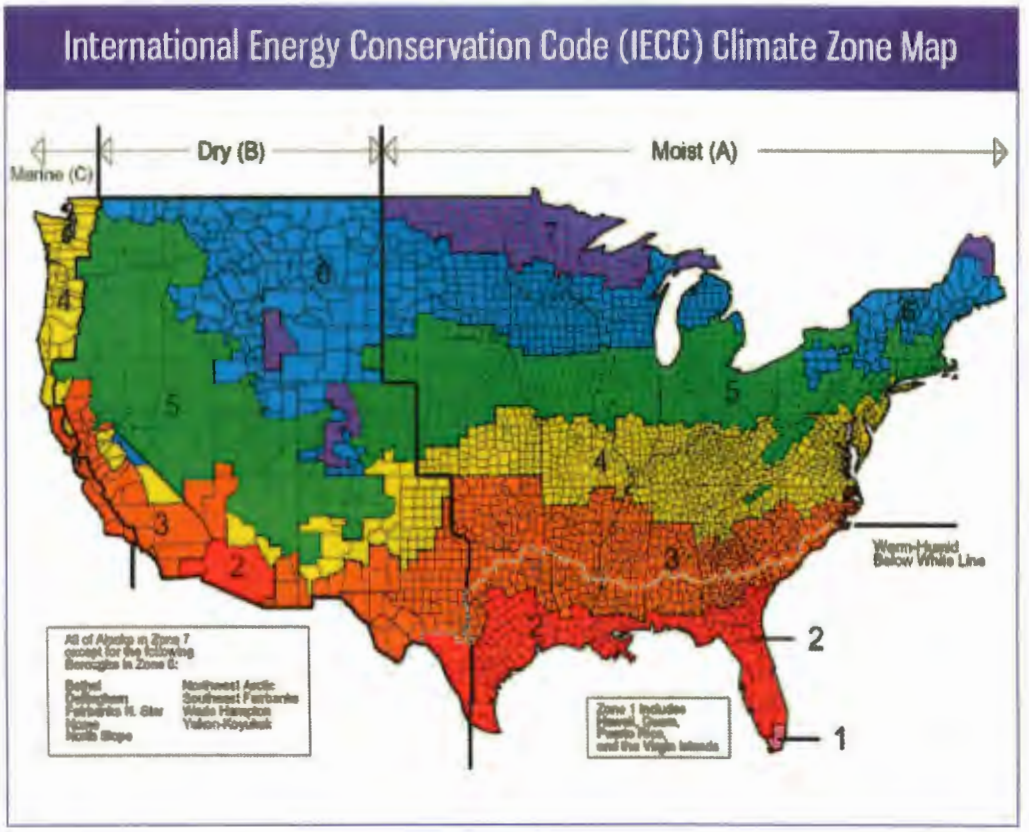
IECC 2015 was published in mid-2014 and was available to jurisdictions for adoption at that time. The IECC is published every three years, and many locations are still using earlier editions of IECC. If in doubt, facilities should check with their local building departments to find out which version of IECC is in effect in their area.

It is important to note the ICC doesn't thoroughly consider the cost implication of making its codes more stringent, such as increasing minimum R-value requirements.

A Sample Analysis

The National Roofing Contractors Association (NRCA) analyzed energy savings and cost paybacks of roof assembly R-value increases in 16 U.S. cities representative of the energy codes' eight U.S. climate zones *(see current map below, click to enlarge)*.

A



hypothetical project consisting of a roof assembly with insulation above deck on a 10,000 square foot single-story building was considered. Construction cost increases and corresponding theoretical energy savings information was developed by changing the hypothetical roof assembly in each city from R-10 to R-15; R-15 to R-20; R-20 to R-25; and R-25 to R-30. City-specific current energy costs (natural gas for heating and electricity for cooling) were used in the analysis. Cost payback length was determined by dividing the incremental increased cost for adding R-value by the calculated energy cost savings.

The analysis revealed that insulation increases from R-10 up to R-15 have the relatively shortest paybacks; these ranged from 12.4 years to 13.3 years. (A 2004 study conducted by The Roofing Industry Alliance for Progress revealed the average lifespan for a low-slope roof system in the U.S. is 17.4 years.)

Cost payback lengths vary by a city's climatic conditions and heating and cooling energy costs. For example, energy costs significantly vary between Boston and Denver, resulting in wide variances in cost paybacks even when comparing cities in the same climate zone.

Considering current heating and cooling costs, NRCA's analysis concludes R-value increases resulting in cost payback lengths approaching or beyond a roof assembly's anticipated life span are not financially justifiable to building owners. However, as heating and cooling energy costs increase, shorter cost payback lengths will occur and may better justify the current energy codes' high minimum R-value requirements.

Interested parties can determine theoretical heating and cooling costs (and savings) for roof assembly configurations in specific cities using NRCA's EnergyWise Roof Calculator (found at www.energywise.nrca.net). EnergyWise is a Web-based application that provides a graphical method of construction roof assemblies to evaluate thermal performance and estimated energy cost under normal operation conditions.

The application determines "Annual Energy Cost" values, which is useful when comparing the energy costs and savings associated with various roof assembly designs. This value should not be confused with the building owner's overall energy costs, which in most instances will be somewhat larger than the "Annual Energy cost" that is attributable to the roof assembly only.

For a detained financial analysis of the long-term costs and potential savings of an energy efficient roof system, it is prudent to consult an experienced accountant.

NRCA's Conclusions

NRCA considers a roof assembly's thermal performance to be an important attribute to overall performance. However, based on NRCA's analysis, in many instances the energy codes' current high minimum R-value requirements do not provide building owners and operators adequate energy cost savings to justify additional construction costs.

NRCA cautions against making representations of cost savings that can result from adding high insulation R-values.

NRCA recommends roof assembly designers provide designs that comply with the minimum requirements for the specific energy code applicable in the jurisdiction where a building is located.

Final Thoughts

As state and local jurisdictions consider updating their energy codes, facility executives and other stakeholders have an opportunity to contribute to the discussion. Generally, there is a public comment phase during the energy code update process. Meanwhile, an online resource from NRCA lists, by state, which energy codes have been adopted here.

In November 2014, the NRCA published an industry issue update for its members that analyzed energy savings and cost paybacks stemming from energy code mandated increases in R-values for low-slope roof assemblies.

These findings and NRCA's conclusions are summarized in a document that can be found online.

Also, because insulation is a significant component of roof systems, facility executives should consider asking their roof system designers to use cover boards between roof membranes and rigid roof insulation in their low-slope roof assemblies in order to protect insulation and to enhance overall system performance.

Wilen is director of technical services at the National Roofing Contractors Association (NRCA). He joined the NRCA staff in 2011 after 18 years with architectural, forensic, and roof consulting firms. Wilen holds a Bachelor of Architecture degree from the Illinois Institute of Technology, Chicago, and is a licensed architect in Illinois. Wilen is currently a member of two ASHRAE committees as well as being active with a number of ASTM International committees.

To share your thoughts on this topic, please visit the Comments section below.

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