IgCC & HIGH PERFORMANCE DESIGN

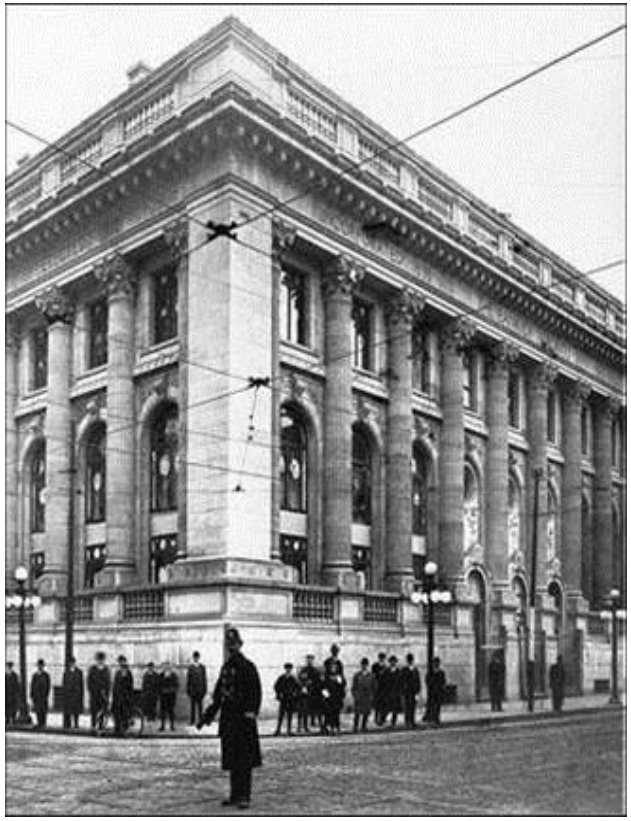
WHAT IS HIGH PERFORMANCE DESIGN

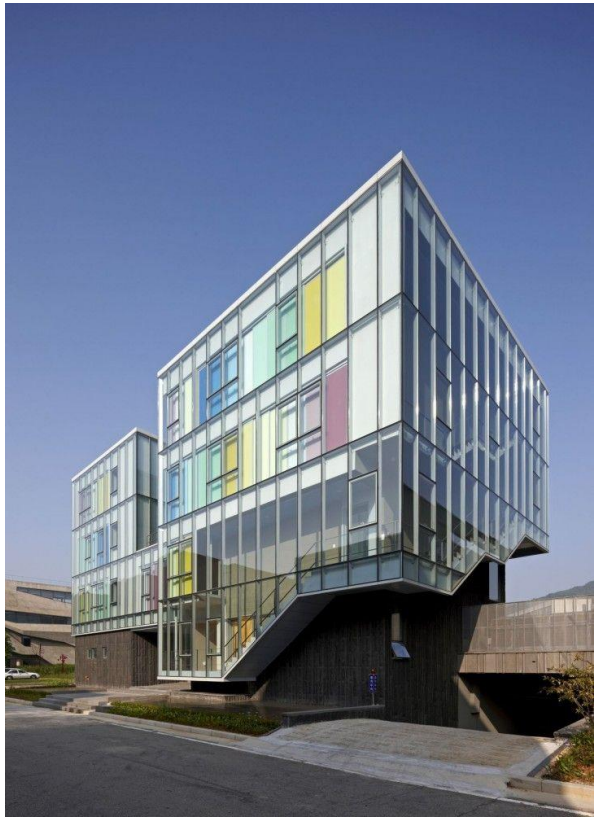
Cars Used to be Simple

Not Anymore

WHAT IS HIGH PERFORMANCE DESIGN

Buildings Used to be Simple





Buildings Are Now More Complicated

WHAT IS HIGH PERFORMANCE DESIGN

Technology Has Changed How We Live Work & Learn

Technology Has Given Us More Tools To Create and Operate Buildings – But Is This A Good Thing?

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE BUILDINGS ARE

"Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability"

WHAT IS HIGH PERFORMANCE DESIGN

WHAT IS HIGH PERFORMANCE DESIGN

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE BUILDINGS ARE INTEGRATED

Many Building Elements Interact To Achieve Energy Efficiency, Comfort And High Performance

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE BUILDINGS ARE INTEGRATED

Building Elements:

- **Building Envelope**
- **Walls**
- **Roof**
- **Openings (*windows, doors, skylights*)**

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE BUILDINGS ARE INTEGRATED

Building Systems:

- **Mechanical** for heating, cooling, and air quality
- **Electrical** for light and power
- **Plumbing** for moving water and waste
- **Conveyance** for moving people
- **Communications** for audio, video and data

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE BUILDINGS ARE INTEGRATED

All Of These Elements And Systems Need To Be Efficient, Economical, Durable, And Maintainable

In Order To Provide Comfort And Well-being To Building Occupants

WHAT IS HIGH PERFORMANCE DESIGN

TRADITIONAL BUILDINGS WERE SIMPLE

WHAT IS HIGH PERFORMANCE DESIGN

TRADITIONAL BUILDINGS WERE SIMPLE

- Opening Windows For Fresh Air And Cooling
- Pulling Down Blinds To Control Sunlight
- Closing Drapes To Keep In Heat
- Turning Lights On And Off At The Fixture
- Putting On A Sweater When It Is Cold

WHAT IS HIGH PERFORMANCE DESIGN

TRADITIONAL BUILDINGS WERE SIMPLE

Technology Changed All That

WHAT IS HIGH PERFORMANCE DESIGN

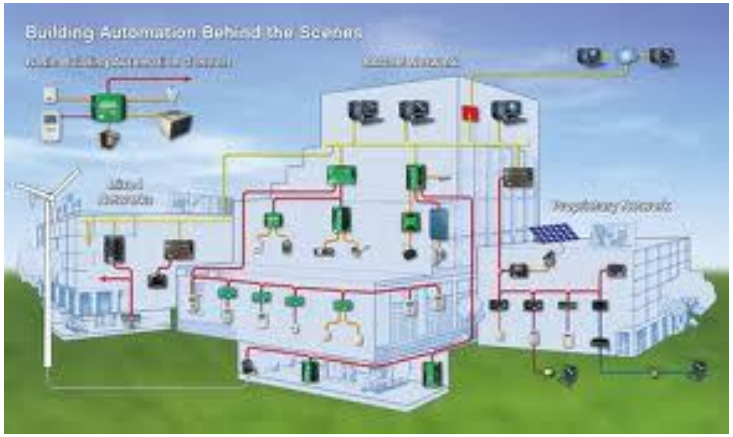
BUILDINGS TODAY ARE MORE COMPLEX

- ***They Use More Energy***
- ***Systems are More Complicated***
- ***It Takes More Technology To Operate Them***
- ***Buildings Consume More Resources***

WHAT IS HIGH PERFORMANCE DESIGN

BUILDINGS TODAY ARE MORE COMPLEX

Building Automation Systems Are Now Sophisticated Web-based Control Systems That Monitor Building Performance In Real Time And Automatically Make Adjustments To Building Systems Based On A Set Of Desired Conditions



WHAT IS HIGH PERFORMANCE DESIGN

BUILDINGS TODAY ARE MORE COMPLEX

The Best new control systems are designed to learn building user patterns and be able to predict them

WHAT IS HIGH PERFORMANCE DESIGN

BUILDINGS TODAY ARE MORE COMPLEX

Someday Technology Might Be Good Enough To Rival The Human Brain

But Don't Count On it

HIGH PERFORMANCE DESIGN PROCESS

Good High Performance Buildings Are Designed Using An Integrated Design Process

This Process Takes Into Account Requirements And Issues Related To The Building's Design, Construction, Operations And Its Relationship To Community And Environment

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE DESIGN PROCESS

Design Issues:

Program, Budget, Occupant Type, User Patterns, Energy Consumption, Site Features, Environmental Concerns, The Community At Large, Existing Infrastructure, Location, Code, Regulations And Laws, Covenants And Restrictions, Life Cycle Of Materials And Systems, Durability, Maintainability, Operational Complexity, Material Availability, Weather, Climate Change, Toxicity, Cultural Values, Politics, Public Opinion, Aesthetics, Constructability, Environmental Impact, Adaptability, Resilience

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE DESIGN PROCESS

How Did We Deal With This In The Past?

Program, Budget, Occupant Type, User Patterns, Energy Consumption, Site Features, Environmental Concerns, The Community At Large, Existing Infrastructure, Location, Code, Regulations And Laws, Covenants And Restrictions, Life Cycle Of Materials And Systems, Durability, Maintainability, Operational Complexity, Material Availability, Weather, Climate Change, Toxicity, Cultural Values, Politics, Public Opinion, Aesthetics, Constructability, Environmental Impact, Adaptability, Resilience

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE DESIGN PROCESS

How Did We Deal With This In The Past?

Tradition, Convention, Intuition, Or We Simply Ignored It

Program, Budget, Occupant Type, User Patterns, Energy Consumption, Site Features, Environmental Concerns, The Community At Large, Existing Infrastructure, Location, Code, Regulations And Laws, Covenants And Restrictions, Life Cycle Of Materials And Systems, Durability, Maintainability, Operational Complexity, Material Availability, Weather, Climate Change, Toxicity, Cultural Values, Political Public Opinion, Aesthetics, Constructability, Environmental Impact, Adaptability, Resilience

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE RESULTS

It's A Balancing Act

Cost with Quality

Convention with Innovation

Complexity with Common Sense

Regulations with Reason

Demand with Conservation

Schedule with Deadlines

Deliberation with Haste

Cost with Benefit

Comfort with Efficiency

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE RESULTS

Can This Be Achieved Through Code?

or do we simply hope for the best?

WHAT IS HIGH PERFORMANCE DESIGN

HIGH PERFORMANCE RESULTS

Can This Be Achieved Through Code?

The IgCC Aims To Do That

HIGH PERFORMANCE BY DESIGN

HIGH PERFORMANCE RESULTS

HIGH PERFORMANCE BY DESIGN

BACKGROUND

3 Major Drivers Of The New Design:

- **New Ways of Working**
  - More collaborative
  - More Hoteling and less dedicated office space
- **High Churn Rate**
  - More adaptable work spaces
  - Quick Change over capability
  - Driven by Facilities Management
- **Wanted a Green Building**
  - A general goal with no specific performance criteria attached

HIGH PERFORMANCE BY DESIGN

DESIGN

- 2-Story Building; 50,000sf/floor
- Full Basement
- Open Floor plan; no enclosed offices at exterior walls
- Demountable interior partitions; mostly glazed
- 2 building cores per floor containing mechanical chases, exit stairs, toilets, kitchenettes and other fixed spaces
- Internal stairs serve as both exit and communicating stairs; (1½ hour rated glazed storefront enclosure)

HIGH PERFORMANCE BY DESIGN

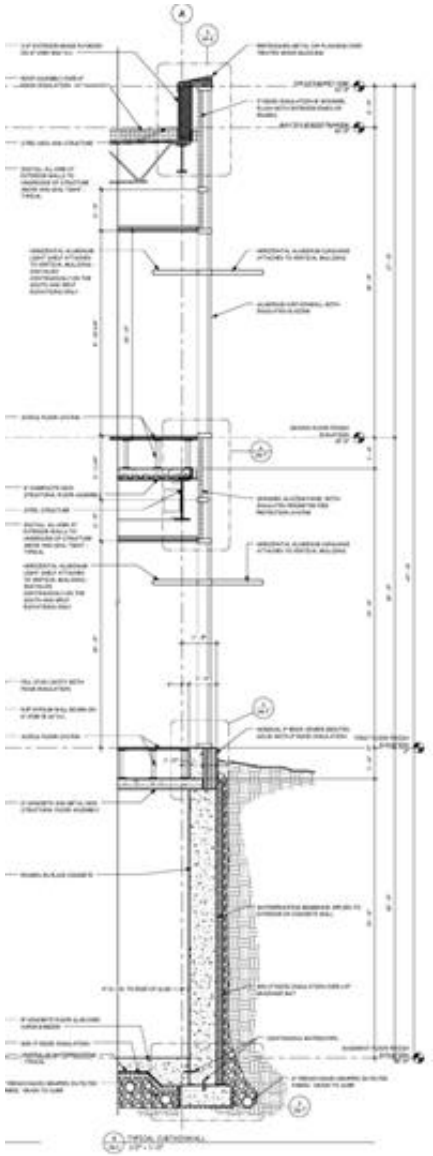
DESIGN

- Steel framed building
- Roof structurally designed to accept a green roof or photo voltaic system
- Full basement containing all mechanical equipment; no rooftop equipment
- Chilled water system provides heating and cooling
- Raised floor air delivery system
- Ceiling plane carefully designed with distinct zone for lighting, return air, sprinklers, and fire detection

HIGH PERFORMANCE BY DESIGN

DESIGN

- Quadruple-glazed glass curtain wall (R-7); with Double thermally broken frame
- Solid wall system (R-36); with rain-screen cavity system for water management and spray foam insulation
- Roof system (R-42); 6” of rigid poly-iso insulation with a membrane roof
- Weather barrier of exterior wall system protected by 2” rigid insulation



HIGH PERFORMANCE BY DESIGN

DESIGN

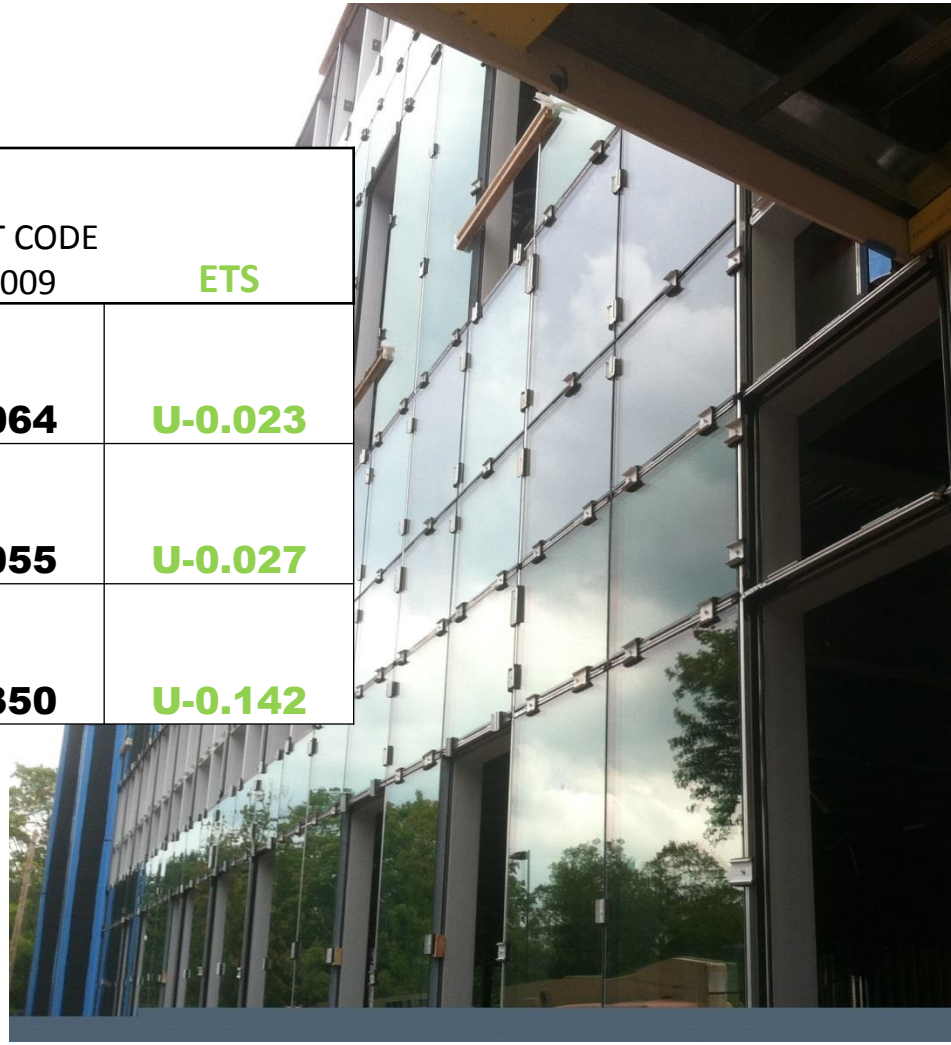
64%

51%

59%

more efficient

	CURRENT CODE IECC-2009	ETS
WALLS	**U-0.064**	**U-0.023**
ROOF	**U-0.055**	**U-0.027**
GLAZING	**U-0.350**	**U-0.142**



HIGH PERFORMANCE BY DESIGN

ENERGY

16%
energy use

21%
energy cost

Primary Energy Sources:
Electricity And Natural Gas

Proposed Energy Use Index (EUIp): 185.88 KBtu/sf

Baseline Energy Use Index (EUI): 221.25 KBtu/sf

zEPI: 47.88 < 51 (IgCC Minimum Requirement)

Does Not Meet Enhanced Energy Performance Requirements of 46 or Less

Emissions Associated With The Proposed Design: 3,025 eMT CO2

HIGH PERFORMANCE BY DESIGN

WATER

33%

more efficient

FEATURES

- **High Efficiency Urinals; 0.125 GPF**
- **EPA Dual-Flush Toilets; 1.6/1.1 GPF**
- **Low Flow Lavatory Faucets; 0.5 GPM**
- **Low Flow Shower Heads: 1.5 GPM**
- **Low Flow Kitchen Sink Faucets; 1.2 GPM**
- **No Permanent Irrigation System**

	CURRENT CODE	IgCC	ETS	
Urinal	**1.0**	**0.5**	0.125	GPF
Toilets	**1.6**	**1.6**	1.6/1.1	GPF
Lav Faucet	**0.5**	**0.5**	0.5	GPM
Shower Head	**2.5**	**2.0**	1.5	GPM
Kitchen Faucet	**2.2**	**2.2**	1.2	GPM

HIGH PERFORMANCE BY DESIGN

MATERIALS

RECYCLED & RECYCLABLE MATERIALS

- Fly-ash, Steel, Metal Studs, HM Doors & Frames, Aluminum Curtainwall & Storefront, Ceiling Tiles, Carpet, Toilet Compartments

BIO-BASED MATERIAL

- Wood Blocking, Wood Panels, Wood Doors, Cabinetry, Custom Millwork, Furniture Systems

INDIGENOUS MATERIALS

- Base Course Aggregate, Topsoil, Plants & Landscape Material, Concrete, CMU, Structural Steel, Metal Deck

LAMPS

- All Fluorescent Lamps < 6ml Mercury (1.8, 1.3)
- Balance of Lamps; LED

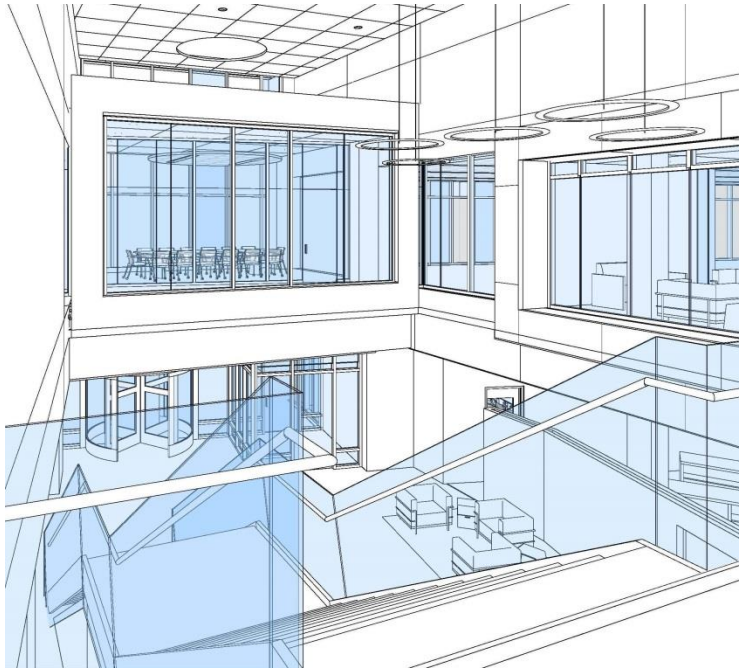
HIGH PERFORMANCE BY DESIGN

OPERATIONS

- **Building Temperatures** set 2° higher in cooling mode and 2° lower in heating mode due to comfort factor of high R-value glazing
- **Workstations** all have individual comfort controls & task lighting
- **BAS System** actively monitors performance campus-wide
- **M&V** protocols provides continuous performance updates
- **Green Cleaning** program in place

HIGH PERFORMANCE BY DESIGN

OPERATIONS



- **Demountable Partitions** allow for quick and cost effective space reconfiguration
- **Raised Floor System** provides easy access to power and data
- **Displacement Ventilation** reduces the spread of dust and particulate matter
- **LED Fixtures** specified for 2-story atrium significantly reduces re-lamping costs

HIGH PERFORMANCE BY DESIGN

PRODUCTIVITY & WELL-BEING

- **Open Floor Plan** promotes a collaborative work environment
- **Natural Light & Views** supports productivity and well-being
- **Individual Controls** allows employees to adjust their personal work environment

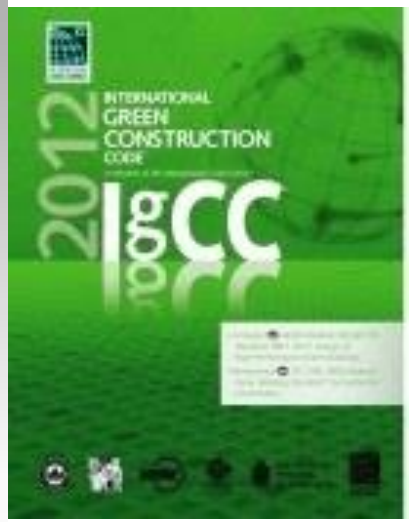
HIGH PERFORMANCE BY DESIGN

RESILIENCE

- **Sited** to minimize flood hazard
- **Thermal Envelope** is well-detailed to prevent moisture intrusion
- **Emergency Power** provided at a campus level to for both critical and non-critical continuous operation
- **BAS System** provides continuous monitoring and feedback
- **Extensive Daylighting** allows the space to be functional during periods of power outages

IgCC AN OVERVIEW

BACKGROUND



IgCC Was Introduced In 2010 and Issued In 2012

The Code Has Been Adopted Statewide In Florida, Maryland, North Carolina, And Oregon

It Has Been Adopted By Local Governments In Arizona, Colorado, New Hampshire, And Washington State

IgCC AN OVERVIEW

INTENT

IgCC Is An Overlay Code That Provides Clear Guidance For The Design Of High Performance Green Buildings

The Code *Does Not Replace Existing Codes*

It Does Not Contain The Life Safety Requirements Found In Other Codes

The Code Provides A Comprehensive Set Of Requirements For Designing And Constructing Buildings That Will Have Reduced Negative Impact On The Natural Environment

IgCC AN OVERVIEW

INTENT

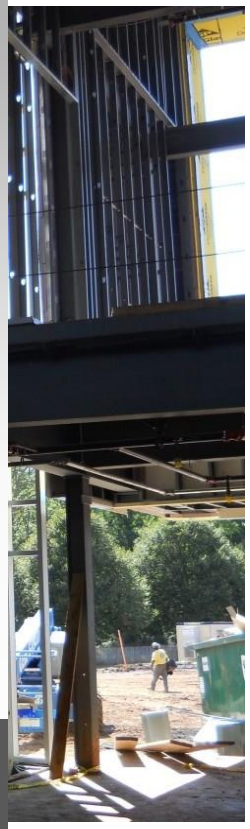
IgCC Was Created With The Intent To Be Administered By Code Officials And Adopted By Governmental Authorities At Any Level

The Code Is Intended To Be A Tool To Drive Green Building Beyond The Market Segment That Has Been Created By Voluntary Rating Systems

The Code Builds On The Early Success Of The LEED Rating System And Responds To The Desire By Some Governmental Authorities To Incorporate Green Building Requirements Into Code

IgCC AN OVERVIEW

INTENT



IgCC Is Designed To Be A Tool To Drive The Construction Of Buildings Which Exceed The Already Stringent Minimum Requirements Of Code

The Code Allows Jurisdictions To Tailor The Code To Address Environmental Concerns That May Be Of Local Or Regional Importance

It Allows The Code To Respond To Environmentally Related Political Agendas

IgCC AN OVERVIEW

INTENT

IgCC Provides Jurisdictions With A Document Which Allows Them To Specify Enhanced Building Performance In Areas Of Local Concern, Such As;

- *Land Use & Development*
- *Material Resource Conservation*
- *Energy Conservation & Efficiency*
- *Earth Atmospheric Quality*
- *Water Conservation*
- *Indoor Environmental Quality & Comfort*

IgCC AN OVERVIEW

ORGANIZATION

IgCC Is Composed Primarily Of Mandatory Requirements Which The Jurisdiction Selects For Local Enforcement

The Code Includes A Relatively Small Number Of Owner/Designer Choices That Are Project Electives

Jurisdictions Can Specify The Number Of Mandatory And Elective Requirements That Suites Their Needs

ENACTMENT

Jurisdictions Enact Legislation To Adopt The International Green Construction Code, 2012 Edition, Including Specific Appendix Chapters

IgCC AN OVERVIEW

REQUIREMENTS

TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION

Section	Section Title or Description and Directives	Jurisdictional Requirements	
	CHAPTER 1. SCOPE		
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (town-houses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	☐ Yes	☐ No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	☐ Yes	☐ No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	☐ Yes	☐ No
	CHAPTER 4. SITE DEVELOPMENT AND LAND USE		
402.2.1	Flood hazard area preservation, general	☐ Yes	☐ No
402.2.2	Flood hazard area preservation, specific	☐ Yes	☐ No
402.3	Surface water protection	☐ Yes	☐ No
402.5	Conservation area	☐ Yes	☐ No
402.7	Agricultural land	☐ Yes	☐ No
402.8	Greenfield sites	☐ Yes	☐ No
407.4.1	High-occupancy vehicle parking	☐ Yes	☐ No
407.4.2	Low-emission, hybrid and electric vehicle parking	☐ Yes	☐ No
409.1	Light pollution control	☐ Yes	☐ No
	CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY		
503.1	Minimum percentage of waste material diverted from landfills	☐ 50% ☐ 65% ☐ 75%	
	CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO_2e EMISSION REDUCTION		
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	☐ Yes	☐ No
	CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY		
702.7	Municipal reclaimed water	☐ Yes	☐ No
	CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT		
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	☐ Yes	☐ No
807.1	Sound transmission and sound levels	☐ Yes	☐ No
	CHAPTER 10. EXISTING BUILDINGS		
1007.2	Evaluation of existing buildings	☐ Yes	☐ No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO_2e emissions reporting	☐ Yes	☐ No

Jurisdictions Determine What Provisions Of Code Are Mandatory, And Where Applicable, The Level Of Compliance Required

REQUIREMENTS

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Table 302.1 – Requirements Determined By The Jurisdiction

The Primary Means By Which A Jurisdiction Can Customize The Code To Address Specific Geographic or Political Priorities.

These Mandatory Requirements Establish The Stringency Of The Code.

APPENDICES

Jurisdictions Elect To Adopt Any Of The Four Appendices:

- Appendix A: Project Electives
- Appendix B: Radon Mitigation
- Appendix C: Optional Ordinance
- Appendix D: Enforcement Procedures

Appendix A: Project Electives Allows A Jurisdiction To Require Higher Levels Of Environmental Performance Using A Flexible Format

IgCC SUPPORTS HIGH PERFORMANCE

Chapters Four Through Nine Of The Code Compliment And Reinforce Key Attributes Of High Performance Buildings

ORGANIZATION

- **Chapter 4:** Site Development and Land Use
- **Chapter 5:** Material Resource Conservation and Efficiency
- **Chapter 6:** Energy Conservation, Efficiency, and CO2*e* Emission Reduction
- **Chapter 7:** Water Resource Conservation, Quality and Efficiency
- **Chapter 8:** Indoor Environmental Quality and Comfort
- **Chapter 9:** Commissioning, Operation and Maintenance

CHAPTER 4

Chapter 4 Site Development and Land Use Addresses:

- Preservation Of Natural Resources
- Stormwater Management
- Landscape Irrigation and Outdoor Fountains
- Management of Vegetation, Soils, And Erosion Control
- Building Site Waste Management
- Transportation Impact
- Heat Island Mitigation
- Site Lighting

CHAPTER 5

Chapter 5 Material Resource Conservation And Efficiency Addresses:

- Construction Waste Management
- Waste Management And Recycling
- Material Selection
- Lamps
- Building Envelope Moisture Control

CHAPTER 6

Chapter 6 Energy Conservation, Efficiency, And CO2*e* Emission Reduction Addresses:

- Modeled Performance Pathway Requirements
- Energy Metering, Monitoring, and Reporting
- Automated Demand-Response Infrastructure
- Building Envelope Systems
- Building Mechanical Systems
- Building Service Water Heating Systems
- Building Electrical Power And Lighting Systems
- Specific Appliances And Equipment
- Building Renewable Energy Systems
- Energy Systems Commissioning And Completion

CHAPTER 7

Chapter 7 Water Resource Conservation And Efficiency Addresses:

- Fixtures, Fittings, Equipment, And Appliances
- HVAC Systems And Equipment
- Water Treatment Devices And Equipment
- Metering
- Non-potable Water Requirements
- Rainwater Collection And Distribution Systems
- Gray Water Systems
- Reclaimed Water Systems

CHAPTER 8

Chapter 8 Indoor Environmental Quality And Comfort Addresses:

- HVAC Systems
- Specific Indoor Air Quality And Pollutant Control Measures
- Prohibited Materials
- Material Emissions And Pollutant Control
- Acoustics
- Daylighting

IgCC SUPPORTS HIGH PERFORMANCE

CHAPTER 9

Chapter 9 Commissioning, Operation, And Maintenance Addresses:

- **Commissioning**
- **Building Operations And Maintenance**

Chapter 10: **Addresses Existing Buildings**

Chapter 11: **Addresses Existing Building Site Development**

Chapter 12: **Is Referenced Standards**

IgCC SUPPORTS HIGH PERFORMANCE

LAND USE & DEVELOPMENT

CHAPTER 4

Prevents Development In Areas Of Flood Hazard (durability, resiliency)

Protects Existing Bodies Of Water, Wetlands, Parklands, Conservation Areas, And Agricultural Land (resource conservation)

Mandates Stormwater Management (resource conservation)

Reduces Water Used For Irrigation (resource conservation)

Protects Soils From Erosion (resource conservation)

Promotes Alternative Transportation (energy conservation, well-being, resiliency)

Reduces Heat Island Effect (energy conservation)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

MATERIAL RESOURCES

CHAPTER 5

Requires Management of Construction Waste And Recycling (resource conservation)

Requires Consideration of Materials' Environmental Attributes (energy conservation, resource conservation, durability)

Limits The Amount Of Mercury In Fluorescent Lamps (well-being)

Requires Preventative Measures For Moisture Intrusion (durability, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

ENERGY

CHAPTER 6

Buildings Must Achieve Specified Minimum Levels Of Energy Performance (energy conservation)

Requires Energy Modeling To Predict Performance (energy conservation)

Requires Building Systems Metering, Monitoring, And Reporting (energy conservation, resiliency, function-specific operability)

Contains Provisions For Demand Response Infrastructure (energy conservation, resiliency)

Contains Requirements for The Building Thermal Envelope (energy conservation, durability, resiliency)

Contains Enhanced Requirements For Building Mechanical Systems Service Water Heating Systems (energy conservation, durability, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

ENERGY

CHAPTER 6

Contains Enhanced Requirements For Building Electrical Power & Lighting Systems (energy conservation, durability, resiliency)

Contains Requirements For Building Renewable Energy Systems (energy conservation, resiliency)

Requires Building Energy Systems Commissioning (energy conservation, durability, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

WATER

CHAPTER 7

Governs The Performance Of Water Consuming Fixtures, Fittings, And Appliances (energy conservation, resource conservation, resiliency)

Governs The Performance Of Water Consuming HVAC Systems (energy conservation, resource conservation, resiliency)

Requires Metering Of Water Systems (resource conservation, function-specific operability)

Contains Requirements For Rainwater Collection And Distribution Systems (resource conservation, resiliency)

Governs The Use Of Reclaimed And Gray Water Systems (resource conservation, well-being, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

INDOOR ENVIRONMENTAL QUALITY

CHAPTER 8

Requires A Plan To Manage Indoor Air Quality During Construction (durability, well-being)

Protects Building Occupants From Indoor Pollutants Sources (well-being)

Prohibits Certain Materials (well-being)

Limits Chemical Emissions From Building Materials (well-being)

Requires Minimum Levels Of Acoustical Performance (productivity, well-being)

Promotes Daylighting Strategies (energy conservation, productivity, well-being, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

IgCC SUPPORTS HIGH PERFORMANCE

BUILDING OPERATION

CHAPTER 9

Requires Building Energy Systems Commissioning (energy conservation, durability, resiliency)

Requires The Building Owner To Have A Complete Set Of Building Documents (energy conservation, durability, security, function-specific operability)

Requires The Building Owner To Have A Complete Set Of Operating Manuals And Maintenance Documents (energy conservation, durability, security, function-specific operability)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

LEED SUPPORTS HIGH PERFORMANCE

LEED

The LEED Rating System Is The Preferred National And International System For Measuring The Environmental Performance Of New And Existing Buildings

LEED SUPPORTS HIGH PERFORMANCE

LEED Is Organized Under Six Broad Categories Of Environmental Performance

ORGANIZATION

- Sustainable Sites
- Water Efficiency
- Energy And Atmosphere
- Materials And Resources
- Indoor Environmental Quality
- Innovation In Design & Regional Priorities

LEED SUPPORTS HIGH PERFORMANCE

SUSTAINABLE SITES

- **Requires Protection Of Soils From Erosion** (resource conservation)
- **Protects Existing Bodies Of Water, Wetlands, Parklands, Conservation Areas, And Agricultural Land** (resource conservation)
- **Promotes Rehabilitation Of Degrading Land** (resource conservation, well-being)
- **Promotes Alternative Transportation** (energy conservation, well-being, resiliency)
- **Encourages Biodiversity And Open Space** (resource conservation, resiliency)
- **Encourages Stormwater Management** (resource conservation, resiliency)
- **Encourages Reductions In Heat Island Effect** (energy conservation)

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LEED SUPPORTS HIGH PERFORMANCE

WATER EFFICIENCY

Requires Minimum Levels Of Water Efficiency (resource conservation)

Encourages Strategies For Reduced Use Of Potable Water For Irrigation (resource conservation, resiliency)

Encourages Innovative Approaches To Wastewater Management (resource conservation, well-being, resiliency)

Promotes Reductions in Process Water Use (resource conservation)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

LEED SUPPORTS HIGH PERFORMANCE

ENERGY EFFICIENCY

Requires Building Energy Systems Commissioning (energy conservation, durability, resiliency, function-specific operability)

Requires Minimum Levels Of Energy Efficiency (energy conservation)

Requires Management Of Refrigerant Gasses (resource conservation, well-being, resiliency)

Encourages High Levels Of Energy Performance (energy conservation, resiliency)

Promotes The Installation Of Renewable Energy Systems (energy conservation, resource conservation, security, resiliency)

Encourages Measurement And Verification Of Building Energy Systems (energy conservation, durability, security, resiliency, function-specific operability)

Promotes The Use Of Green Power (resource conservation)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

LEED SUPPORTS HIGH PERFORMANCE

MATERIALS & RESOURCES

Requires Recycling (resource conservation)

Encourages Building Reuse (resource conservation)

Encourages Diverting Construction Waste From Landfills (resource conservation)

Requires Consideration of Materials' Environmental Attributes (energy conservation, resource conservation, durability)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

LEED SUPPORTS HIGH PERFORMANCE

INDOOR ENVIRONMENTAL QUALITY

Requires Minimum Levels Of Indoor Air Quality (well-being)

Requires Buildings To Be Smoke Free (well-being)

Requires Schools To Have Minimum Acoustic Performance (productivity, well-being)

Encourages Indoor Air Quality Management During Construction (durability, well-being)

Limits Chemical Emissions From Building Materials (well-being)

Encourages Control Of Indoor Pollutant Sources (durability, well-being)

Encourages Individualized Control Of The Indoor Environment (energy conservation, productivity, well being)

Promotes Daylighting Strategies (energy conservation, well-being, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

LEED SUPPORTS HIGH PERFORMANCE

INNOVATION & REGIONAL PRIORITIES

Recognizes Innovative Approaches To Building Design, Construction, And Operation (energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, function-specific operability)

Recognizes Innovative Use Of Products And Materials (energy conservation, resource conservation, durability, well-being, resiliency,)

Recognizes Exemplary Performance In Energy And Resource Use (energy conservation, resource conservation)

Encourages Owners/Designers To Focus On Regional Priority Issues (energy conservation, resource conservation, well-being, resiliency)

High Performance Buildings: Buildings that integrate and optimize on a lifecycle basis major high performance attributes including: energy conservation, resource conservation, durability, productivity, well-being, security, resiliency, and function-specific operability

RECAP

- Buildings Have Become More Complex
- They Use More Energy & Resources, And Have More Impact On The Environment
- Technology Places More Demands On Buildings, But Also Offers More Solutions To Enhance Building Performance
- Good High Performance Design Is The Integration Of A Number Of Diverse, And Often-times Competing Factors

RECAP

- High Performance Green Buildings Are A Growing Segment Of The Market
- Their Growth Has Been Driven By Voluntary Rating Systems Such As LEED
- Many Jurisdictions Are Interested In Adopting More Stringent Levels Of Energy Performance And Green Building Requirements
- They IgCC Is The Appropriate Vehicle For Incorporating High Performance Green Building Requirements Into The Code

RECAP

- The IgCC Is An Overlay Code
- It Give Jurisdictions Flexibility To Address Environmental Concerns That Maybe Of Local Or Regional Importance
- It Has Many Similarities With And Compliments Voluntary Rating Systems Such As LEED

The IgCC Is Organized By Chapters Similar to LEED:

SIMILARITIES

IgCC		LEED
Chapter 4:	Site Development and Land Use	Sustainable Sites
Chapter 5:	Material Resource Conservation and Efficiency	Materials & Resources
Chapter 6:	Energy Conservation, Efficiency, and CO2*e* Emission Reduction	Energy & Atmosphere
Chapter 7:	Water Resource Conservation, Quality and Efficiency	Water Efficiency
Chapter 8:	Indoor Environmental Quality and Comfort	Indoor Environmental Quality
Chapter 9:	Commissioning, Operation and Maintenance	

The IgCC Is Organized By Chapters Similar To LEED:

SIMILARITIES

- Both Mandate Certain Minimum Levels Of Performance
- Both Provide Elective Paths To Compliance
- Both Are Based On Accepted Standards (ASHRAE, ANSI, Etc.)
- Both Emphasize Building Design, Construction And Operations
- Both Promote High Performance Design

Both IgCC And LEED Promote Key Attributes Of High Performance Design:

SIMILARITIES

ENERGY CONSERVATION

RESOURCE CONSERVATION

DURABILITY

PRODUCTIVITY

WELL-BEING

SECURITY

RESILIENCY

FUNCTION-SPECIFIC OPERABILITY

The IgCC Is Designed To Be Code:

DIFFERENCES

- IgCC Is Designed To Enhance The Already Stringent Minimum Requirements Of Code – LEED Is Designed To Recognize The Top Twenty % Of Building Performance
- IgCC Currently Has More Stringent Energy Performance Requirements
- IgCC Is More Customizable To Local And Regional Concerns
- IgCC Can Achieve A More Significant Impact In The Marketplace Through Code Compliance Than Can Voluntary Rating Systems

ADOPTION

The IgCC Was Issued In 2012

The Code Has Been Adopted Statewide In Florida, Maryland, North Carolina, And Oregon

It Has Been Adopted By Local Governments In Arizona, Colorado, New Hampshire, And Washington State

The IgCC Works. Is It Right For You?

QUESTIONS?