





Riding the Bike to a Future Energy Code,



Photo http://thecityfix.com/blog/capital-bikeshare-expansion-stunted-in-the-national-mall/

Agenda

- What "Riding the Bike" is
- Framework of Energy and Green Codes
- Implementation
- Leadership
- DCs Successes
- Replicating Success



Photo http://thecityfix.com/blog/capital-bikeshare-expansion-stunted-in-the-national-mall/

"Riding the Bike"

- Metaphor for Governance
 - Vision
 - Framework
 - "Rubber meeting the Road"



"Riding the Bike"

- Metaphor for Governance
 - Leadership
 - Laws/ Code

• Enforcement



https://www.washingtonian.com/2014/09/24/muriel-bowser-is-no-adrian-fenty/

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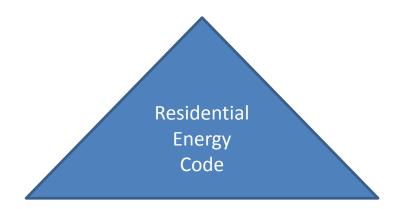


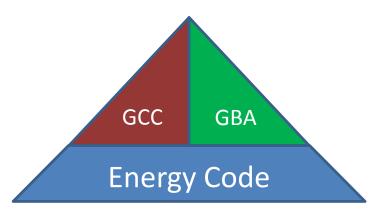
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DCRA's Green Building Division

The Division Enforces:

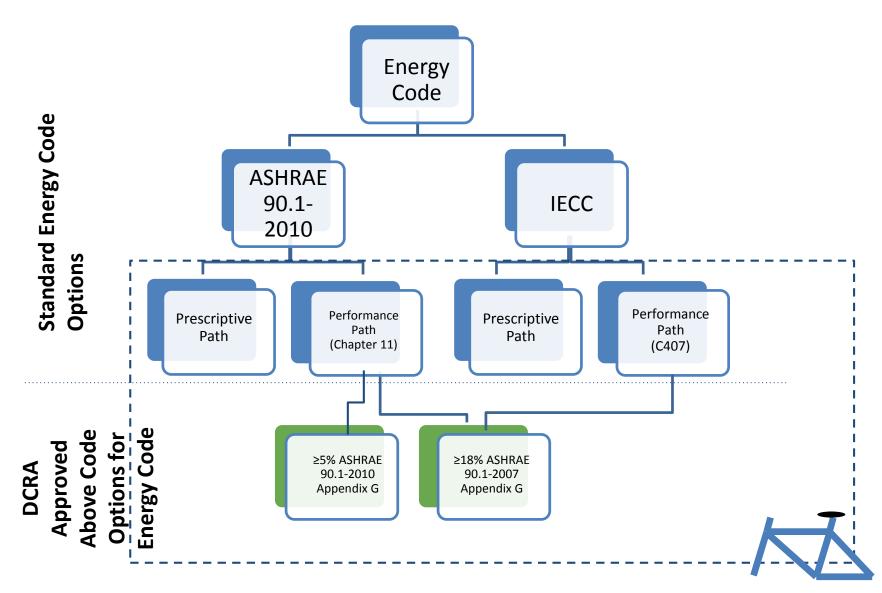
- Energy Conservation Code
- Green Construction Code
- Green Building Act

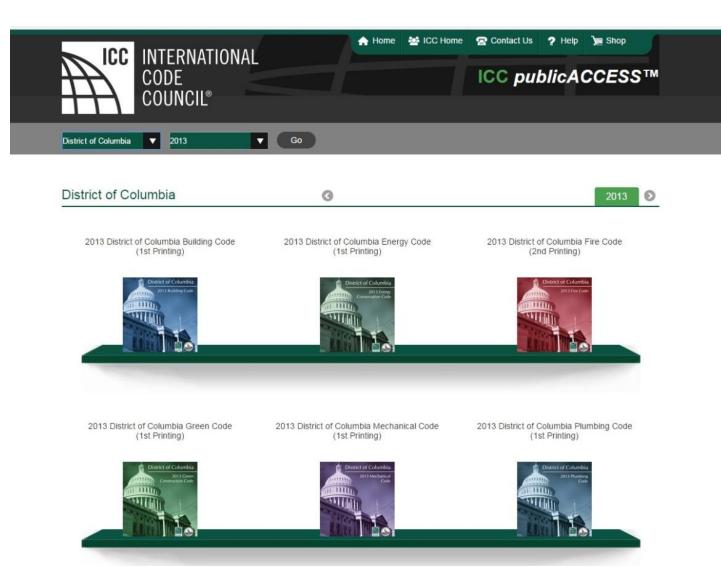






Commercial Energy Code Pathways





https://www.buildgreendc.org/educationalresources/





Applicability

- The GCC is applicable to multifamily and commercial projects
 ≥ 10,000sf that are not subject to the Green Building Act.
- The GCC is applicable to the entire scope of work.

(alterations and new)





Green Construction Code Alternatives

- LEED
- ASHRAE 189.1-2011
- Enterprise Green
 Communities
- ICC-700 with ENERGY STAR





Green Construction Code Key Measures

- Automatic
 Daylighting Control
- Construction Waste Management
- Indoor Air Quality
- Commissioning
- 15 Electives (new construction)
- Hot water pipe line length





Green Building Act

- The GBA is applicable Publicly financed buildings including multifamily
- Requires LEED/ EGC
- Commercial projects ≥ 50,000sf





Green Building Act

GBA Establishes
 Green Fund for the
 Green Building
 Program

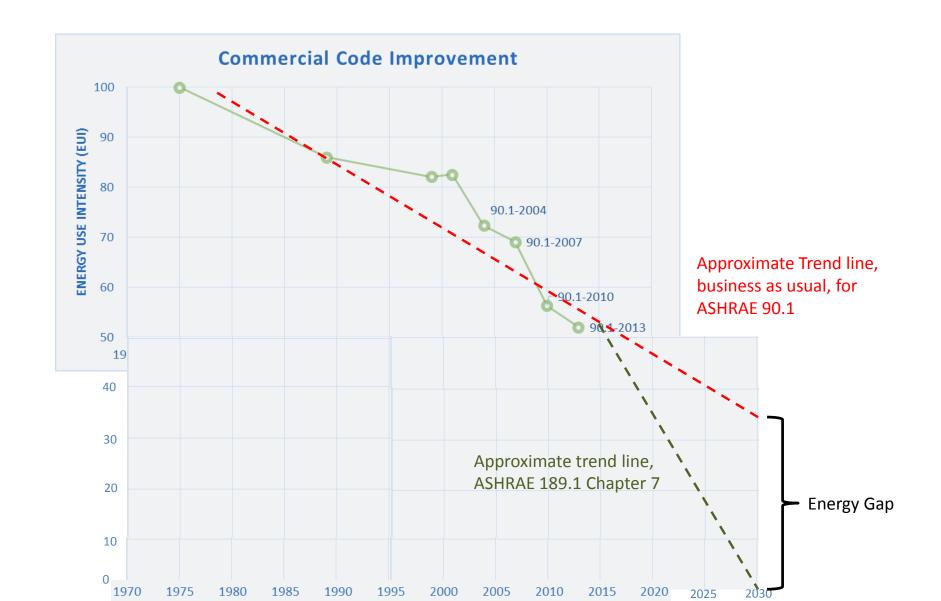
- \$0.002 per square foot new construction
- 0. 13% construction value for renovations
- Green Building Advisory Council



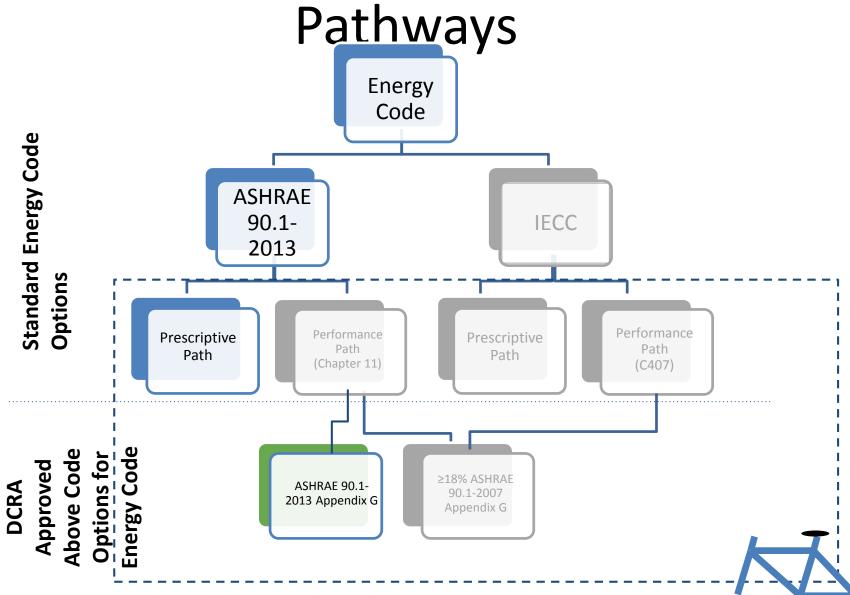
Source: https://clipartxtras.com



The Energy Code Gap



Future Commercial Energy Code



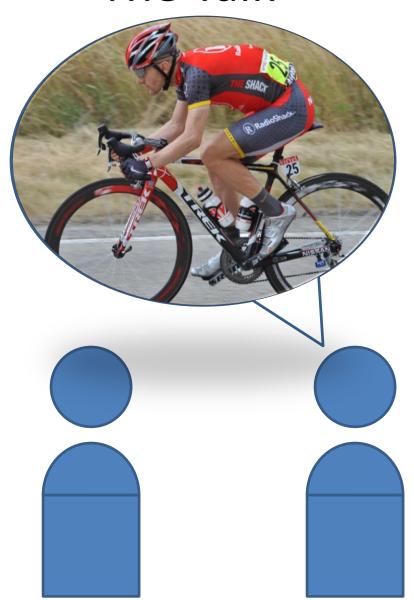
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The Talk



Reality



http://thelincolnite.co.uk/2014/01/thieves-steal-bike-wheels-lincoln/

"The only law that exists is the one that is enforced."

DCRA's Green Building Division

- Operate within DCRA's Building Department
- Conduct design review, plan review, inspections, certificate of occupancy
- Collaborate with the community to further the efforts to build a more sustainable DC.
- We are educators and a green technical assistance resource







WELCOME TO THE GREEN BUILDING DIVISION AT THE THE DEPARTMENT OF CONSUMER AND REGULATORY AFFAIRS (DCRA). THE GOAL OF THIS WEBSITE IS TO IMPROVE COMPLIANCE WITH THE DISTRICT'S GREEN BUILDING CODES AND LAWS THROUGH GREEN BUILDING TRAININGS, EDUCATIONAL RESOURCES AND INTERACTIVE TOOLS. IF YOU HAVE ANY SUGGESTIONS, PLEASE EMAIL US AT GREEN.BUILDING@DC.GOV.









Kaiser's Daily Activities

- Review ~ 6 plans a day on Green and Energy topics in digital plan review
- Field Phone Calls/ Questions
- Be present for walk-in hours
- Attend pre-review meetings
- Conduct Quality Assurance on Third Party Plan Reviews
- Develop Trainings
- Help Develop new code





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The Building Process



Design Team

- **Owner**
- **Architect**
- **Engineering**
- **Trades Design**
- Other



- GC
- **Trades**
- Other

Inspections

- **DCRA**
- 3rd Party



Tools: In drawing set an Energy Code Table of Contents

DCRA Energy Verification Sheet

Single Family & Low-Rise Residential

Version 1.2_2015

The Energy Verification Sheet (EVS) is a communication tool between the code official and the project team. It was developed by the District Department of Consumer and Regulatory Affairs (DCRA) based on the Department of Energy's Score and Store spreadsheets and adapted to the 2013 DC Energy Conservation Code (ECC). In design, it serves as an Energy Code checklist, during plan review it points the reviewes the location in the drawings where the ECC is addressed, and in the field it is used by the Inspector to understand what is required of the project. Planse note, this Energy Verification Sheet does not replace the ECC, but references to where the ECC is being compiled within the drawings, specifications or other demands that have been submitted to DCRA. If you have questions about how to fill out the EVS, please visit our website at www.bulldgreendc.org or email us at green.org is at <a href="https://green.org and <a href="https://green.org and <a href="https://green.org and <a href="https://green.org and <a href="https://green.org are an advantaged on the project. Planse of the project of th

Complance	Approach Used: Pr	escriptive	□ Perf	formance	
Project Typ	e: • New Bullding • A	ddition De		vel 3 Alteration	
2013 DC Energy Code	Final Inspections	Prescriptive Code Value	DWG Page	Additional Notes	
302.1, 403.6 MR	Heating and Cooling equipment is sized per ACCA Manual S based on loads calculated per ACCA Manual J	-			
2013 DC Energy Code	Foundation Inspections	Prescriptive Code Value	DWG Page	Additional Notes	
402.1.1 SR	State Insulation R-value. Perimeter insulation extending downward from the top of the state surface	Unheated R-10 Heated R-15			
402.1.1 SR	1.1 SR Slab Insulation depth.				
402.1.1 SR	Conditioned basement wall insulation R-value. Where internal insulation is used, verification to occur during insulation inspection	Continuous R-10 Cavity: R-13			
303.2 I	Conditioned basement wall Insulation Installed per manufacturer Instructions.				
402.2.8 SR	Conditioned basement wall Insulation depth of burst or distance from top of wall.	10 ft or to bsmt. floor			
402.2.10 SR	Unvented crawispace wall Insulation R-value	Continuous: R-10 Cavity: R-13			
303.2	Unvented crawlspace installed per manufacturer's instructions	-			
402.2.10 SR	Unvented crawlspace continuous vapor retarder installed over exposed earth, joints overlapped by 6 in. and sealed, extending at lest 6 in. up and attached to the wall.	Continuous R-10 Cavity: R-13			
402.2.10 SR	Unwented crawispace wall Insulation depth of burial or distance from top of wall	To finished grade +24 In. vert. & / or hortz.			
303.2.1 S	A protective covering is installed to protect exposed exterior insulation and extends a minimum of 6 in. below grade.	-			
403.8 ER	Snow and ice-melting system controls installed.	-			
2013 DC Energy Code	Framing/ Rough-In Inspection	Presoriptive Code Value	DWG Page	Additional Notes	
402.1.1, 402.3.4 SR	Door U-factor	U-0.35			
402.1.1, 402.3.1, 402.3.3 SR	Glazing U-factor (Area weighted average, show proof of average if any u-value is less than 0.35)	U-0.35			
402.1.1, 402.3.2, 402.3.3,	Glazing SHGC value (Area weighted average)	SHGC: 0.4			

2013 DC Energy Code	Framing/ Rough-In Inspection	Prescriptive Code Value	DWG Page	Additional Notes	
303.1.3 I	U-factors of fenestration products are determined in accordance with the NFRC or the default table values.	-			
402.1.1, 402.3.3, 402.3.6 SR	Skylight U-factor	U-0.55 (15 square foot exemption)			
402.1.1, 402.3.3, 402.3.6 SR	Skylight SHGC	SHGC: 0.30 (0.5 max w/ tradeoff. 15ft ² exempt			
303.1.3 I	SHGC values were determined in accordance with the NFRC or the default table values.				
402.1.1 SR	Mass wall exterior insulation R-value.	R-13 Interior R-8 Exterior			
303.2	Mass wall exterior insulation installed per manufacturer's instructions.				
402.3.5	Fenestration in thermally isolated sunrooms has a max. U-factor of 0.45. All other sunroom	Not isolated 0.35			
SR	fenestration must meet code requirements.	Isolated:0.45			
402.3.5	Skylights in thermally isolated sunrooms has a max. U factor of 0.7. All other sunroom skylights	Not Isolated 9.55			
SR	must meet code requirements.	isolated:0.7			
402.4.1.2 SR	Additions, alterations, renovations and replair shall be completed in accordance with Table 402.4.1.1.	Not isolated 0.55 Isolated:0.7			
402.4.1.1 I	Air and Thermal Barrier Installed per Manufacturer's Instructions.				
402.4.3 I	Fenestration is listed and labeled as meeting AAMA/ WDMA/CSA 101/LS. 2/A440 or does not exceed code limits per NFRC 460.	0.3 CFM/H²			
402.4.4 E	IC-rated recessed lighting fixtures sealed at housing/interior finish and labeled to indicate ≤ 2.0 CFM leakage at 75 Pa.				
403.2.1 MR	Supply Ducts In attic are insulated to ≥ R-8. All other ducts in unconditioned spaces or outside the building envelope are ≥ R-6.	Attle: R-8 Other: R-6			
403.2.2 MR	All joints and seams of air ducts, air-handlers, and filter boxes are sealed.	-			
403.2.3 MR	Building cavities are not used as ducts or plenums.	-			
403.3 MR	HVAC piping carrying fluids > 105°F or fluids < 55°F are Insulated to ≥ R-3.	HVAC Pipe ≥ R-3			
403.3.1 Protection of insulation on HVAC piping.					
403.4.2 MR	Hot water pipes are insulated to ≥ R-3.				
403.5 MR	Auto / gravity dampers install on all intakes/ exhausts.	-			

2013 DC Energy Code	Insulation Inspections	Prescriptive Code Value	DWG Page	Additional Notes
303.1	All Installed Insulation labeled or Installed R-values provided.	Code value	rage	
402.1.1, 402.2.6 SR	Floor Insulation R-value	Wood: R-19 Steel: R-19+6		
303.2, 402.2.7 SR	Floor insulation installed per mnfr instructions, and substantial contact with underside of floor.			
402.1.1, 402.2.5 402.2.6 SR	Wall insulation R-value. If a mass wall with ½ insulation on the wall exterior, ext insulation applies.	Wood:R-20 or R-13+5 Mass: R-13 Int. R-8 Ext. Steel:R19+8		
402.1.1 SR	Mass wall exterior insulation R-value.	R-13 Interior R-8 Exterior		
402.2.12 S	Walls of thermally isolated surrooms have a min. R-13. All other surrooms must meet code requirements.	Isolated;R13		
302.2 I	Sunroom walls insulation installed per manufacturer's instructions.	-		
402.2.12 S	Ceilings of thermally isolated sunrooms have min. R-24. Al other sunroom cellings must meet code requirements	Isolated: R-24		
302.2 I	Sunroom celling insulation installed per manufacturer's instructions.	-		
2013 DC Energy Code	Final Inspections	Prescriptive Code Value	DWG Page	Additional Notes
402,2,1 402,2,6 SR	Celling insulation R-value	Wood: R-49 Steet U-0.026		
303.1.1.1 303.2 I	Celling Insulation Installed per mnfrs Instructions, Blown Ins.			
	marked every 300ft ²			
402.2.3 SR	marked every 300ft ² Baffle over air permeable insulation adjacent to soffit and eave vents.	-		
402.2.3 SR	marked every 300ft ² Baffle over alr permeable insulation adjacent to soffit and eave vents. Attic access hatch and door insulation ≥ R-value of adjacent assembly.	≤R-value of adjacent assembly		
402.2.3 SR 402.2.4 SR	marked every 300ft* Baffle over aft permeable Insulation adjacent to soffit and eave vents. Attic access hatch and door Insulation 2 R-value of adjacent assembly. Blower door test @ 30 Pa≤5 Air Changes per Hour. Applies to Level 3, Out Rehab, New	adjacent		
402.2.4 SR 402.2.4 SR 402.4.1.2	marked every 300ft* Baffle over aft permeable Insulation adjacent to soffit and ever verits. Attle access hatch and door insulation 2 R-vatue of adjacent assembly. Blever door test (§ 30 Pp.55 A): Blever door test (§ 30 Pp.55 A): Changes per Hour. Applies to Level 3, Out Rehab, New Wood burning freplaces have tight fitting the dampers and outdoor al- for combassips.	adjacent assembly		
402.2.3 SR 402.2.4 SR 402.4.1.2	marked every 2000* Baffle over aft permeable Insulation adjacent to soffit and ever vents. Attic access hatch and door Insulation 2 R-value of adjacent assembly. Blower door test @ 50 Pa 55 Air Changes per Hour. Applies to Level 3, Out Rehab, New Wood burning firepiaces have tight fitting flue dampers and outdoor ak	adjacent assembly		
402.2.3 SR 402.2.4 SR 402.2.1 2 402.4.1.2 1 402.4.1.2	marked every 2001* Balfile over at promisible Insulation selpicent to selfilf and eave venits. Altile access harb and door Insulation 2 R-value of adjacent assembly. Blower door test @ 50 PS 25 Air Changes per Hour. Applies to Leed 3. Get Rehalb, New Wood burning New Wood burning New Wood burning New Leed Selfiel Selfiel Selfiel CFBA/100 ff* with sin-handler Insulation. Air Annafer leakage designed by mfr. st 22% of aberlow.	adjacent assembly ACH50SS.0		
402.2.3 SR 402.2.4 SR 402.4.1.2 1 402.4.1.2 1 403.2.2 1 403.2.2.1 1 403.6	marked every 300H* Balfile over at promisible Insulation selpicent to selfilf and eave venits. Altile access harb and door Insulation 2E value of selpicent assembly. Blower door test @ 50 FPSS Air Changes per Hour. Applies to Lead 3. Out fishalb, New Wood burning fireplaces have tight fitting the dempers and eutdoor at CFBA100 ff* with sin-handler Insulation 4. Air Annaler leakage designed by mf*, at 22% of abd-low. HYJG equipment type and capacity selp reproductive per one capacity in the company of the company of the company HYJG equipment type and capacity selp reproductive to select the company HYJG equipment type and capacity select selection of the company HYJG equipment type and capacity selections.	adjacent assembly ACH50S5.0		
402.2.3 SR 402.2.4 SR 402.4.1.2 I 402.4.1.2 I 403.2.2 I 403.2.2 I 403.2.2 I 403.0.6 I	marked every 300H* Balfile over at promisible Insulation selpicent to selfilf and eave venits. Altile access hatch and door Insulation 2 R-value of adjacent assembly. Blower door test @ 50 Ps 25 Air Changes per Hour. Applies to Lead 3. Out fishalb, New Wood burning fireplaces have tight fitting the dempers and eutdoor at CFBA100 ff* with sin-handler Insulation 6. Air Annafer leakage designed by mir. at 22% of ad-dow. HYAC equipment type and capacity as per palms. Frogrammable thermosatas Frogrammable thermosatas restaled on the strategie of the strategi	adjacent assembly ACH50S5.0 S8 CFM/ 100 ft ^c		
402.2.3 SR 402.2.4 SR 402.4.1.2 1 402.4.1.2 1 403.2.2.1 1 403.2.2.1 1 403.2.1.1	marked every 300H* Baffle over at permanible Insulation selpicent to selfit and eave vents. Altis access harb and door Insulation 2 R-value of adjacent assembly. Blower door test @ 50 Ps S Air Changes per Nour. Applies to Level 3, Gut Rahala, New Wood burning fireplaces have tight fitting thus dampers and outdoor at for combooking. CFR4/100 ft* with air-handler Insulation. Air handler leakage designed by mfr, at 22% of aberflow. HVAC equipment type and capacity or programmable thermostats bestelled on forced af runnice Heat page theremostate heatailed on heat pumps.	adjacent assembly ACH50S5.0 S8 CFM/ 100 ft ^c		
402.2.3 SR 402.2.4 SR 402.4.1.2 1 402.4.1.2 1 403.2.2.1 1 403.2.2.1 1 403.2.2.1 MR 403.1.2	marked every 300P* Saffle over at premarkle Insulation selpicent to selfit and eave verits. Allika scoss sharkh and door Insulation 2 R-value of adjacent assembly. Storm of the Saffle of Saffle of Saffle Saffle over the Saffle of Saffle Saffle of Saffle Saffle over the Saffle Saffl	adjacent assembly ACH50S5.0		



Tools: Online Compliance Table of Contents

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10	Ŧ	Cha _l =	Code Citation =	Status =	Plan Pages 🙃	Compliance Notes = (Optional)	Review Notes =	Inspection =			
11		4	401.2 Predesign site inventory	Applicab *	CIV002, L1.00, Geotechnical Re	eport		PlanRev			
12		4	405.1.4 Soil reuse and restoration.	Applicab *	CIV004,CIV005			PlanRev			
13		4	405.1.4.1 Preparation.	Applicab *	CIV003,CIV004,CIV005			PlanRev			
14		4	405.1.4.2 Restoration.	Applicab *	L1.00, L6.01, L6.02			PlanRev			
15		4	405.1.5 Engineered growing media.	Applicab *	L1.00, L6.01, L6.02			PlanRev			
16		4	405.1.6 Documentation.	Applicab *	Spec 018113			Final-CoO			
17		4	405.2 Invasive plant species.	Applicab *	L1.00, L2.01, L2.02			PlanRev			
18		4	405.3 Native plant landscaping	Applicab *	L1.00, L2.01, L2.02			PlanRev			
19		4	406.1 Building site waste management	Applicab *	spec 017419	added spec		Rough-in			
20		4	406.3 Verification: Site Waste Management	Applicab *	spec 017419	added spec		Rough-in			
21		4	408.2 Site hardscape.	Applicab *	L6.01	LANDSCAPE		Final-CoO			
22		4	408.2.1 Site hardscape materials.	Applicab *	L6.01	LANDSCAPE		PlanRev			
23		4	408.2.2 Shading by structures.	Not Appl 🔻				PlanRev			
24		4	408.2.3 Shading by trees.	Applicab *	L2.01, L2.02			Final-CoO			
25		4	408.2.4 Pervious and permeable pavement.	Applicab *	CIV020			Final-CoO			
26		4	409.2 Exterior: Uplight.	Applicab *	E0401	All scheduled exterior fixtu	res have U0 rating.	Final-CoO			
27	l	4	409.3 Exterior: Light trespass and glare	Applicab ▼	E0105/E0401	No fixtures' backlight is oriented toward building. Therefore only Table 409.3(2) is applicable. All fixtures are mounted such that 0.5hm <ahref="https: "="" 10.25="" doi.org="">HID</ahref="https:>		PlanRev			
28	т.	5	502.1.2 Construction phase moisture control.	Applicab *	Specification 018113	added spec		Rough-in			
29		5	503.1 Construction waste management	Flagged F	Specification 017419	added spec		Rough-in			
30		5		Applicab *	Specification 017419	added spec		Final-CoO			
31		5	505.1 Material selection and properties.	Applicab *	Specification 018113	added spec		PlanRev			
32		5	505.1.1 Whole building life cycle assessment					PlanRev			
33		5	505.2 Material selection.	Applicab *	Specification 018113	added spec		PlanRev			
		-	JOJ.2 Waterial Selection.	Applican	5,555	acces spee					



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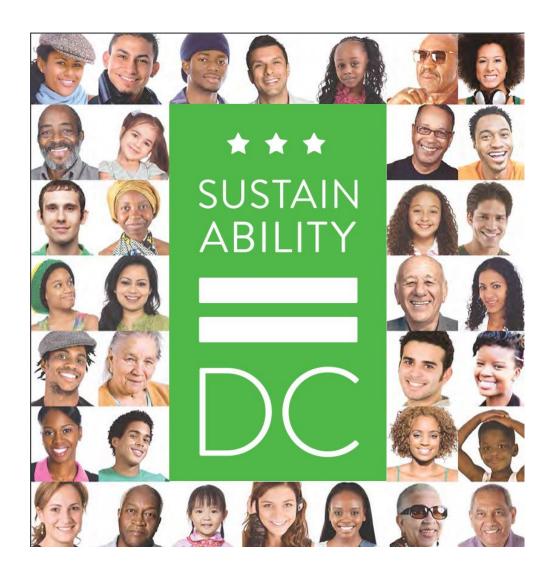
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Leadership – Goal Setting





Leadership – Goal Setting





Leadership – Goal Setting

2032 GOALS & TARGETS

CHALLENGES



JOBS & THE ECONOMY

GOALS

TARGETS

Grow and diversify DC's business sectors for sustained economic prosperity.

Develop 3 times as many small District-based businesses.

Expand the number and range of jobs available to District residents and ensure access to new jobs through appropriate skills training.

Cut citywide unemployment by 50% and increase by 5 times the number of jobs providing green goods and services.



HEALTH & WELLNESS

GOALS

TARGETS

Inspire healthy, active lifestyles for all residents, regardless of income, ability, or employment.

Cut the citywide obesity rate by 50%

Create safe environments that are conducive to healthy living.

Require all new housing projects in the District to meet "Healthy by Design" standards.



EQUITY & DIVERSITY

GOALS

TARGETS

Ensure that all school-age children in the District are educated in sustainability and prepared for a changing green economy.

Teach at least 50% of children in the District about sustainability concepts.

Ensure transparency in the District's sustainability agenda including future plans and past progress.

Expose 100% of District residents to Sustainable DC events and initiatives in their neighborhood.



CLIMATE & ENVIRONMENT

TARGETS

Minimize the generation of greenhouse gas emissions from all sources.

Reduce greenhouse gas emissions by 50%.

Advance physical adaptation and human preparedness to increase the District's resilience to future climate change.

Require all new building and major infrastructure projects to undergo climate change impact assessment as part of the regulatory planning process.



Setting Expectations

- We are working to make the District of Columbia the most sustainable city in the world
- Paris Climate Agreement





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DCRA FEATURED IN INSTITUTE FOR MARKET TRANSFORMATION BLOG



Meres, Ryan "District of Columbia's Building Department Achieves First-of-its-Kind Milestone" Institute for Market Transformation, March 14^{th,} 2017

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Leadership



Framework



Financing



Source: https://clipartxtras.com/

Implementation



When all assembled together you can....

Jump the Energy Code Gap!

