

# City Energy Code Baseline and Response

An Update on the Progress of Energy Verification Sheets - March 2016



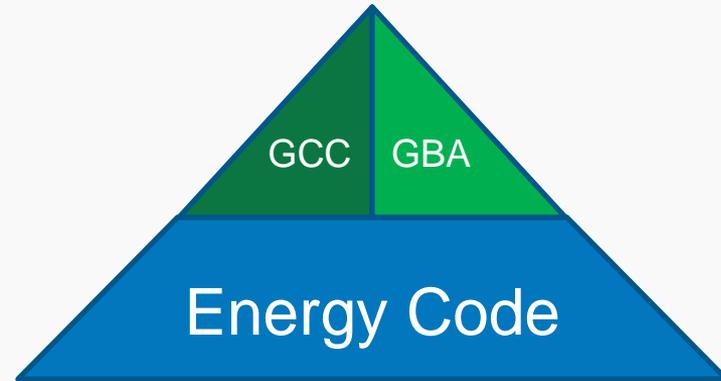
# Who We Are

- Local Building Department in Washington DC
- Green Building Division
- Been in operation for 3 years
- Engineers, HERS Raters, Home Builders, Architects, Home Performance Professionals

# What We Do

Verify Plans, Inspect, and Administrate Quality Assurance

- Energy Code (2012)
- Green Building Act (GBA)
- Green Construction Code (GCC)

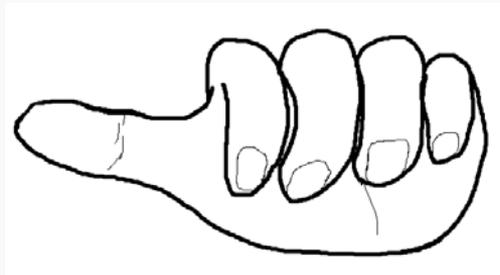


# How we are Funded

- Fee on permits
- The Green Fund roughly generated \$1.5M - 1.7M annually
- Money is spent on research papers, professional trainings, staff, educational tools at DCRA and other agencies

# City Energy Code Baseline

- City Energy Compliance Baseline Summer 2014
- Envelope, Mechanical Inspection, Electrical Compliance, Documentation issues
- Results showed our city was pretty mediocre compliance



# Response to Energy Code Baseline

- Creation of Energy Verification Sheets (EVS)
- EVS Sheets improve documentation, educate, transfer knowledge
- Based on DOE's Store and Score
- Table of Contents to the Energy Code Compliance
- Supplements COMCheck and RESCheck

# 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 reviewer to the location in the drawings where the ECC is addressed, and in the field it is used by the inspector to document what is required of the project. Please note, this Energy Verification Sheet does not replace the ECC, but references to where the ECC is being complied with in the drawings, specifications or other documents that have been submitted to DCRA. If you have questions about how to fill out the EVS, please visit our website at [www.bulldoggreeds.org](http://www.bulldoggreeds.org), or email us at [greenbulldog@dc.gov](mailto:greenbulldog@dc.gov).

Address:

Compliance Approach Used:  Prescriptive  Performance

Project Type:  New Building  Addition  Level 3 Alteration

2013 DC Energy Code	Final Inspections	Prescriptive Code Value	DWG Page	Additional Notes
302.1, 403.6	Heating and Cooling equipment is sized per ACCA Manual S based on loads calculated per ACCA Manual J	-		MR
2013 DC Energy Code	Foundation Inspections	Prescriptive Code Value	DWG Page	Additional Notes
402.1.1	Slab Insulation R-value, Perimeter Insulation extending downward from the top of the slab surface	Unheated R-10 Heated R-15		
402.1.1	Slab Insulation depth.	2 feet		
402.1.1	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	Conditioned basement wall Insulation installed per manufacturer's instructions.	-		
402.2.6	Conditioned basement wall Insulation depth of bulkhead or distance from top of wall.	10 ft or to basic floor		
402.2.10	Unvented crawlspace wall Insulation R-value	Continuous R-10 Cavity: R-13		
303.2	Unvented crawlspace Insulation installed per manufacturer's instructions	-		
402.2.10	Unvented crawlspace continuous vapor retarder installed over exposed earth. Joints overlapped by 6 in., and sealed, extending at least 6 in. up and attached to the wall.	Continuous R-10 Cavity: R-13		
402.2.10	Unvented crawlspace wall Insulation depth of bulkhead or distance from top of wall.	To finished grade +24 in., vert. & / or horiz.		
303.2.1	A protective covering is installed to protect exposed exterior Insulation and extends a minimum of 6 in. below grade.	-		
403.6	Snow and Icemanagement system controls installed.	-		

2013 DC Energy Code	Framing/ Rough-in Inspection	Prescriptive Code Value	DWG Page	Additional Notes
402.1.1, 402.2.4	Door U-factor	U-0.35		
402.1.1, 402.2.1, 402.2.3	Ceiling U-factor (Area weighted average, show proof of average if any window is less than 6.35)	U-0.35		

2013 DC Energy Code	Framing/ Rough-in Inspection	Prescriptive Code Value	DWG Page	Additional Notes
303.1.3	U-factors of fenestration products are determined in accordance with the NFRC or the default table values.	-		
402.1.1, 402.2.3, 402.2.6	SkyLight U-factor	U-0.25 (15 square foot exemption)		
402.1.1, 402.2.3, 402.2.6	SkyLight SHGC	SHGC ≤ 0.20 (0.5 max w/ tradeoff, 15% exempt)		
303.1.3	SHGC values were determined in accordance with the NFRC or the default table values.	-		
402.1.1	Mass wall exterior Insulation R-value.	R-13 Interior R-4 Exterior		
303.2	Mass wall exterior Insulation installed per manufacturer's instructions.	-		
402.2.5	Fenestration in thermally isolated sunrooms has a max. U-factor of 0.45. All other sunroom fenestration must meet code requirements.	Not Isolated 0.35 Isolated 0.45		
402.2.5	Skylights in thermally isolated sunrooms has a max. U-factor of 0.7. All other sunroom skylights must meet code requirements.	Not Isolated 0.55 Isolated 0.7		
402.4.1.2	Additions, alterations, renovations and repairs shall be completed in accordance with Table 402.4.1.1.	Not Isolated 0.35 Isolated 0.7		
402.4.1.1	Air and Thermal Barrier installed per Manufacturer's Instructions.	-		
402.4.3	Fenestration is tested and labeled as meeting AAMA/WDMA/CSA 1014S.2/A440 or does not exceed code limits per NFRC 400.	6.3 CFM/ft²		
402.4.4	Created recessed lighting fixtures sealed at housing/interior finish and labeled to indicate ≤ 2.0 CFM leakage at 75 Pa.	-		
403.2.1	Supply Ducts in attic are insulated to a R-6. All other ducts in unconditioned spaces or outside the building envelope are ≥ R-6.	Attic: R-6 Other: R-6		
403.2.2	All joints and seams of air ducts, elbows, and filter boxes are sealed.	-		
403.2.3	Building cavities are not used as ducts or plenums.	-		
403.3	HVAC piping carrying fluids > 105°F or fluids < 55°F are insulated to a R-6.	HVAC Pipe ≥ R-3		
403.3.1	Protection of Insulation on HVAC piping.	-		

2013 DC Energy Code	Insulation Inspections	Prescriptive Code Value	DWG Page	Additional Notes
303.1	All installed Insulation labeled or installed R-values provided.	-		
402.1.1, 402.2.6	Floor Insulation R-value	Wood: R-9 Steel: R-19-6		
303.2, 402.2.7	Floor Insulation installed per mfr instructions, and substantial contact with underside of floor.	-		
402.1.1, 402.2.5, 402.2.6	Wall Insulation R-value. If a mass wall with Insulation on the wall exterior, ext Insulation applies.	Wood: R-20 or R-13+5 Mass: R-13 BL, R-8 Ext, Steel: R-19-6		
402.1.1	Mass wall exterior Insulation R-value.	R-13 Interior R-4 Exterior		
402.2.12	Walls of thermally isolated sunrooms have a min. R-13. All other sunrooms must meet code requirements.	Isolated: R-13		
302.2	Sunroom wall Insulation installed per manufacturer's instructions.	-		
402.2.12	Ceilings of thermally isolated sunrooms have min. R-24. All other sunroom ceilings must meet code requirements.	Isolated: R-24		
302.2	Sunroom ceiling 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	Ceiling Insulation R-value	Wood: R-10 Steel: U-0.28		
303.1.1, 303.2	Ceiling Insulation installed per mfr instructions, blown ins., marked every 200ft	-		
402.2.3	Batts over air permeable Insulation adjacent to soffit and save vents.	-		
402.2.4	Attic access hatch and door assembly ≥ R-value of adjacent assembly.	-		
402.4.1.2	Blower door test @ 50 Pa ± 5 Air Changes per Hour. Applies to Level 3, Gut Rehab, New	ACH50 ≤ 5.0		
402.4.1.2	Wood burning appliances have tight fitting flue dampers and outdoor air	-		
403.2.2	Total Duct leakage test ≥ 3 CFM/100 ft² with air-handler installed.	≥ 3 CFM/100 ft²		
403.2.2.1	Air-handler leakage designed by mfr. at 2% of air-flow.	-		
403.6	HVAC equipment type and capacity as per plans.	-		
403.1.1	Programmable thermostats installed on forced air furnace	-		
403.1.2	Heat pump thermostat installed on heat pumps	-		
403.1.2	Circulating hot water systems have	-		

# Response to Energy Code Baseline

## DCRA Energy Verification Sheet

Single Family & Low-Rise Residential

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The Energy Verification Sheet is required by the DCRA. If you have a project that is subject to the DCRA, the Energy Code is addressed, replace the ECC, by the DCRA. If you have

Address:

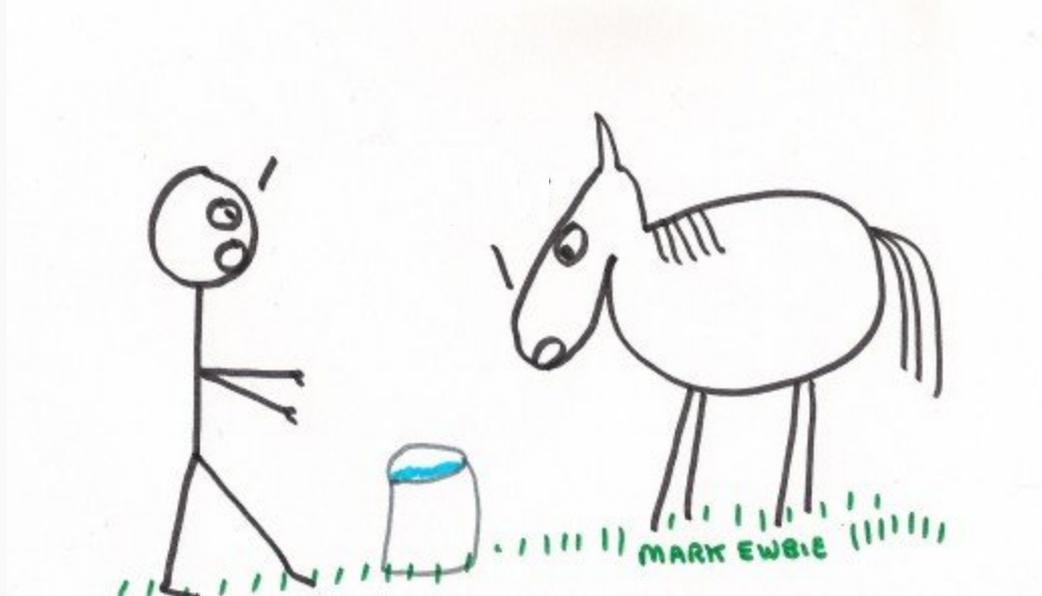
Compliance Approach Used:  Prescriptive  Performance

Project Type:  New Building  Addition  Level 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	Slab Insulation R-value. Perimeter Insulation extending downward from the top of the slab surface	Unheated R=10 Heated R=15		
402.1.1 SR	Slab Insulation depth.	2 feet		
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.	.		

2013 DC Energy Code	Framing/ Rough-in Inspection	Prescriptive Code Value
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 <sup>2</sup> 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=6 Exterior
303.2 I	Mass wall exterior insulation installed per manufacturer's instructions.	.
402.3.5 I	Fenestration in thermally isolated sunrooms has a max. U-factor of	Not Isolated 0.35

# Response to Energy Code Baseline



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# Learning Experiences from EVS

- Takes effort to enforce the EVS
- Most effective with new construction buildings
- Residential designers have lowest initial EVS usage rate
- Start the integrated design process
- Engineers seem to be the ones responsible for EVS completion

# Other Best Practices

- Exemptions to Manual Js if a multi-capacity compressor
- New monthly trainings on the energy code
- Weekly workshops after a project has achieved a Hold For Comments.
- Picking up the phone
- Open Office Hour during each business day for walk-in
- Tracking architectural and engineering teams with grades on each project.

# DC Green Building Division

Thanks!

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