

High Performance Attributes-Metrics-Standards Matrix							
Date: 11/2/2011							
		Building Types Covered: Office		Building Systems Covered: Envelope/Enclosure			
HPBC Attribute	EISA Attribute	Sub Attribute	Performance Benchmark	Metrics		Performance Standards	
				Qualitative	Quantitative		
		Seismic Resistance	Baseline	<i>Extent of Damage and Continuity of Operations from a Design Basis Earthquake (10% Probability of Exceedance in 50 Years)</i>	<i>Glass Hazard and Envelope Deformation Corresponding to Seismic Building Interstory Drift</i>	IBC-2009 ASCE 7-05 ASCE 41-06 NEHRP Recommended Provisions for Seismic Regulations FEMA E-74 ASTM E 2026	
			Life Safety/Code Compliant			IBC-2009 ASCE 7-05 ASCE 41-06 NEHRP Recommended Provisions for Seismic Regulations FEMA E-74 ASTM E 2026	
			Reduced Damage			IBC-2009 ASCE 7-05 ASCE 41 NEHRP Recommended Provisions for Seismic Regulations FEMA E-74 ASTM E 2026	
			Continued Operations			IBC-2009 ASCE 7-05 ASCE 41-06 NEHRP Recommended Provisions for Seismic Regulations FEMA E-74 ASTM E 2026	
		Flood Resistance	Calculation Baseline	<i>Level of Damage / Continuity of Operations</i>	<i>Building Envelope Response to Floodwater Depth, Velocity, and Duration.</i>	IBC-2009 ASCE 7-05 ASCE 24-05 NFPA 5000	
			Life Safety/Code Compliant			IBC-2009 ASCE 7-05 ASCE 24-05 NFPA 5000	
			Reduced Damage			IBC-2009 ASCE 7-05 ASCE 24-05 NFPA 5000	
			Continued Operations			IBC-2009 ASCE 7-05 ASCE 24-05 NFPA 5000	
							IBC-2009 ASCE 7-05 ASTM E 330 ASTM E 1300 ASTM E 1996/1886

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				Qualitative	Quantitative	
Security/ Safety	Wind Resistance	Life Safety/Code Compliant	Level of Damage / Continuity of Operations	Glass Hazard and Envelope Deflection	IBC-2009	ASCE 7-05 ASTM E 330 ASTM E 1300 ASTM E 1996/1886
					ASCE 7-05	
					ASTM E 330	
		IBC-2009			Reduced Damage	
		ASCE 7-05				
		ASTM E 330				
	IBC-2009	Continued Operations				
	ASCE 7-05					
	ASTM E 330					
	External Fire Resistance	Calculation Baseline Code Compliant	Extent of Damage	Measurement of Allowable Impact	Ignition: NFPA 259	NFPA 285 ASTM E108 ASTM E2707
					Flame propagation resistance: NFPA 285	
					Ignition and flame spread on roof coverings: ASTM E108	
Ignition: NFPA 259		Reduced Damage				
Flame propagation resistance: NFPA 285						
Ignition and flame spread on roof coverings: ASTM E108						
Insulation: ASTM E119/NFPA 251	Continued Operations					
Collapse: ASTM E119/NFPA 251						
Ignition: NFPA 259						
Blast Protection	Failure	Level of Damage / Continuity of Operations	Glass Hazard & End Rotations / Ductility	UFC 4-010-01	PDC-TR 06-08 ISC Physical Security Criteria for Federal Facilities	
				PDC-TR 06-08		
				ISC Physical Security Criteria for Federal Facilities		
	UFC 4-010-01			Major Damage		
	PDC-TR 06-08					
	ISC Physical Security Criteria for Federal Facilities					
UFC 4-010-01	Medium Damage					
PDC-TR 06-08						
ISC Physical Security Criteria for Federal Facilities						
UFC 4-010-01	Minor Damage					
PDC-TR 06-08						
ISC Physical Security Criteria for Federal Facilities						
Ballistic Protection	No Protection	Weapon Capable of Resisting	No. of shots, weight, caliber and velocity of round	None		
				UL 752		
				UL 752		
				UL 752		
	Life Safety					
	Reduced Damage					
	Continued Operations					

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	Security	External CBR Protection	No Protection	<i>Extent of Vulnerability</i>	<i>Measurement of allowable impact</i>	ISC-2009 (ref 12), ASHRAE 29-2009 (ref 13), NRC-2007 (ref 14), ASHRAE 90.1-2004 (ref 19) ASHRAE 52.2-2007(ref 32), AMCA-500-D-07 (ref 35).
			High Vulnerability			ISC-2009 (ref 12), ASHRAE 29-2009 (ref 13), NRC-2007 (ref 14), ASHRAE 90.1-2010 (ref 20) ASHRAE 52.2-2007(ref 32), ASHRAE 145.2-2010 (ref 33), AMCA-500-D-07 (ref 35).
			Moderate Vulnerability			ISC-2009 (ref 12), ASHRAE 29-2009 (ref 13), NRC-2007 (ref 14), ASHRAE 189.1-2009 (ref 36) ASHRAE 50% AEDG (ref 21) ASHRAE 52.2-2007(ref 32), ASHRAE 145.2-2010 (ref 33), AMCA-500-D-07 (ref 35).
			Low Vulnerability			ISC-2009 (ref 12), ASHRAE 29-2009 (ref 13), NRC-2007 (ref 14), ASHRAE 189.1-2009 (ref 36) ASHRAE 50% AEDG (ref 21) ASHRAE 52.2-2007(ref 32), ASHRAE 145.2-2010 (ref 33), AMCA-500-D-07 (ref 35).
	Energy Conservation	Thermal Transfer	Baseline	<i>extent of transfer</i>	<i>Whole building energy consumption attributable to the Envelope (Kbtu/SF/Year) and U Value for System type</i>	ASHRAE 90.1 - 2004
			Improved Performance			ASHRAE 90.1 - 2010
			Enhanced Performance			Envelope: ASHRAE 189.1 - 2010 Whole building: ASHRAE 90.1 2004 AEDG -50%
			HighPerformance			Envelope: Passive House Whole building: ZNEB as defined by EISA 2007 or ASHRAE 90.1 2004 AEDG - 60%
		Air Tightness	Baseline	<i>extent of leakage/tightness</i>	Cubic Feet/Minute/Square Foot of Enclosure Area at 1.57 psf (75 Pa)	Envelope: ASTM E 273, ASTM E 783, ASTM E1186 Whole building: ASTM E 779, ASTM C1060, ASTM E1186
			Standard			
			Baseline			ASHRAE 90.1 - 2004, no daylighting requirement
			Improved Performance			ASHRAE 90.1 - 2010, both sidelighting and toplighting daylighting requirements

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Sustainability	Sustainability	Daylighting	Enhanced Performance	<i>extent of daylighting</i>	Reduction in Total building energy use kBtu/SF/Year	LEED EA credit 1 points in addition to ASHRAE 90.1 - 2010, both sidelighting and toplighting daylighting requirements
			HighPerformance			LEED EA credit 1 points in addition to ASHRAE 90.1 - 2010, both sidelighting and toplighting daylighting requirements
		Natural Ventilation	Baseline	<i>extent of natural ventilation</i>	Reduction in Total building energy use kBtu/SF/Year	No available standard
			Improved Performance			
			Enhanced Performance			
		Renewable Energy - Solar	Baseline	<i>extent of solar power generated</i>	Reduction in Total building energy use kBtu/SF/Year	ASHRAE 90.1 - 2004
	Improved Performance		ASHRAE 90.1 - 2010			
	Enhanced Performance		ASHRAE 50% AEDG - 2011			
	Environment	Environmental Footprint	N/A	CO <sub>2</sub> annual production		EISA-2007 - Definition of ZNEB
		Acoustic Transmission	Baseline	<i>extent of sound level allowed</i>	Noise Criteria (NC) Composite Outdoor to Indoor Transmission Class (OITCc)	N/A
	Standard		ASTM E1332-10A			
	Quiet		ASTM E1332-10A			
	Very Quiet		ASTM E1332-10A			
	Durability	Water Penetration	Baseline	<i>Baseline</i>	PSF from Pressure Test	Opaque walls, doors and fenestration: ASTM E 331 static water test in the lab, ASTM E1105 in the field, AAMA 501.1 dynamic testing and AAMA 501.2 for diagnostic work
			Standard	<i>good</i>		
			Tight +	<i>better</i>		
			Tight +++	<i>best</i>		
		Water Vapor Migration	Baseline	<i>pass/fail</i>	% Relative Humidity	ASHRAE 160
Standard						
Tight +						
Building Service Life		Baseline	<i>Class of service</i>	Years of Service Life	Professional judgement, no citable standard	
		Improved Service				
		Enhanced Service				
Exterior Wall Service Life		Baseline	<i>Class of service</i>	Years of Service Life	Professional judgement, no citable standard	
		Improved Service				
	Enhanced Service					
Fenestration Service Life	Baseline	<i>Class of service</i>	Years of Service Life	Moisture Resistance Index, Werner Lichtenburger, Glass Magazine, June 2005		
	Improved Service					
	Enhanced Service					
Roof System Service Life	Baseline	<i>Class of service</i>	Years of Service Life	Professional judgement, no citable standard		
	Improved Service					
	Enhanced Service					
		High Service				