

Envelope Professional Task List

Job Designation	Knowledge Area	Subject Area	Task
1.1	Building Science (Fundamentals) This Section is Inclusive For All Designations	Basic Terms & Definitions (to comprehend and use)	Airflow in buildings/ducts: CFM, CFM50, CFM25, ACHn, ACH50, FPM
1.2			Effective leakage area
1.3			Area weighted R-Value
1.4			Baseload
1.5			British thermal unit (Btu)
1.6			Condensation
1.7			Sones
1.8			Pressure differential
1.9			Temperature differential
1.10			Efficiency
1.11			Watt-hour
1.12			R and U Value
1.13			Ton of refrigeration
1.14			Total equivalent length
1.15			Dehumidification / Humidification
1.16			Inches of Water Column (iwc)
1.17			Pascal (Pa)
1.18			Hydrostatic pressure
1.19			Natural ventilation
1.20			Mechanical ventilation
1.21			Net free area
1.22			Equipment efficiency descriptors
1.23			Permeability and perm rating
1.24			Vapor barriers/retarders
1.25			Building ventilation
1.26			IAQ (indoor air quality)
1.27			IEQ (indoor environmental quality)

1.28			Psychrometrics
1.29			Vented/Unvented combustion appliance
1.30	Building Science (Intermediate) continued	Principles of Energy, Air & Moisture	Thermodynamics: conduction, convection, radiation, ΔT
1.31			Factors that affect insulation performance
1.32			Wind-driven house pressurization/depressurization
1.33			Natural and Mechanical driving forces of infiltration/exfiltration as well as pressurization/depressurization
1.34			Heat gain/loss
1.35			BTU content of fuels
1.36			Moisture transport mechanisms
1.37			Principles of combustion
1.38	Building Science (Intermediate) continued	Combustion Science	Combustion analysis: oxygen, flue-gas temperature, carbon monoxide
1.39			Carbon Monoxide (CO) testing of combustion appliances
1.40			Basics of: Combustion appliance venting, draft, and combustion air
1.41			Open combustion safety issues: Combustion air, draft, depressurization, spillage, backdrafting,
1.42			Effect of duct leakage on depressurization of CAZ
2.1	Envelope Systems and Interaction with Other Building Systems (Intermediate)	Building Components	Duct configurations and components
2.2			Hydronic distribution configurations and components
2.3			Structural components of residential construction
2.4			Thermal boundaries and insulation applications
2.5			Electrical components and safety considerations
2.6			Fuel delivery systems and safety considerations
2.7			Bulk water management components: weather-resistant barrier, drainage, plumbing gutters sumps etc)
2.8			Vapor barriers, weather-resistant barriers
2.9			Radiant barrier principles and installations
2.10			Understand/recognize heat and energy recovery ventilators
2.11			Understand fenestration types and characteristics
2.12			Understand issues involved with basements, crawlspaces, slabs, attics, attached garages, interstitial cavities, and bypasses

2.13			Understand issues involved with interstitial building cavities and unconditioned zones, such as attics and attached garages.
2.14			Understand issues involved with ventilation equipment
2.15			Understand basic heating equipment components controls and operation
2.16			Understand basic cooling equipment components controls and operation
2.17			Understand basic DHW equipment components controls and operation
2.18			Identify common mechanical safety controls
2.19			Identify insulation types and R-Values
2.20			Understand various mechanical ventilation equipment and strategies
2.21	Envelope Systems and Interaction with Other Building Systems (Intermediate) continued	Conservation Strategies	Appropriate insulation applications based on existing conditions
2.22			Opportunity for ENERGY STAR lighting and appliances
2.23			Identify duct sealing opportunities and applications
2.24			Understand importance of air leakage control and remediation procedures
2.25			Understand importance of air leakage control in conjunction with insulation performance/ improvements
2.26			Blower door-guided air sealing techniques
2.27			Understand proper insulation installation procedures
2.28			Appropriate applications for sealed crawlspaces basements and attics
2.29			Appropriate applications for fenestration upgrades including modification or replacement
2.30	Envelope Systems and Interaction with Other Building Systems (Intermediate) continued	Comprehensive Building Assessment Process	Understand/recognize need for conducting appropriate diagnostic procedures
2.31			Interaction between mechanical systems envelope systems and occupant behavior
2.32			Understand basic mathematics & science
2.33	Envelope Systems and Interaction with Other Building Systems (Intermediate) continued	Design Considerations	Appropriate insulation applications based on existing conditions
2.34			Understand/recognize building locations where non-flammable materials must be used
2.35			Understand/recognize building locations where opportunities for retrofit materials and processes are needed to correct problems and/or enhance performance
2.36			Understand climate specific concerns

2.37			Understand indoor environment considerations for the environmentally sensitive
2.38			Understand impact of building orientation
2.39			Understand impact of landscape drainage and site grading
2.40			Understand impact of shading on loads
2.41			Awareness for solar gain reduction in cooling climate
2.42			Awareness for solar gain opportunities in heating climate
2.43			Appropriate applications for sealed crawlspaces basements and attics
2.44			Determine basement air-sealing strategy dependant on the
2.45			Interpretation and application of blower door test results
3.1	Measurement and Verification of Building Performance (Intermediate)	Applied Diagnostics & Troubleshooting	Application of measured air leakage test results
3.2			Process and calculate information from blower door test results
3.3			Understand building shell/envelope leakage as a function of pressure difference and the size of holes in the air barrier
3.4			Apply fundamental construction mathematics and unit conversions
3.5			Calculate building tightness levels (minimum ventilation requirements)
3.6			Ventilation calculations and strategies
3.7			Proper methods for identifying / testing fuel leaks
3.8			Combustion Appliance Zone (CAZ): depressurization, spillage, draft, Carbon Monoxide (ambient and flue)
3.9			Carbon Monoxide (CO) evaluation: ambient
3.10			Blower door setup, accurate measurement and interpretation of results
3.11			Duct leakage testing (total leakage and leakage to outside): setup, accurate measurement and interpretation of results
3.12			Pressure pan testing
3.13			Basic pressure diagnostic procedures including understanding "With Reference To" (WRT)
3.14			Recognize contributing factors to comfort problems
3.15			Inspect for areas containing moisture or bulk water in undesirable locations
3.16			Understand and inspect for basic electrical safety
4.1	BPI National Standards and Project Specifications	Installation Safety and Specification	Understand applicability content and intent of BPI National Standards
4.2			Recognize need for a professional local/state/national codes evaluation

4.3			Understand hazards associated with knob & tube wiring and be able to determine if it is live using basic electrical inspection techniques
4.4			Address attic ventilation requirements
4.5			Be able to specify materials and processes needed for building performance projects
5.1	Optimizing the Installation, Operation, and Maintenance of Envelope Systems	Installation Safety and Specification	Recognize need for airsealing measures and their impact on other building systems
5.2			Recognize need for mechanical equipment improvements
5.3			Understand blower door use for identifying critical air sealing areas
5.4			Apply blower door test results and Building Tightness Limit (minimum ventilation requirements) in development of improvement strategies
5.5			Understand needs for protective shielding and baffling for the preparation of insulation installation
5.6			Verify installed airflow rates of ventilation devices
5.7			Apply appropriate strategies for alignment of insulation and air barrier
5.8			Working knowledge of various types of insulation and air sealing techniques and materials
5.9			Methods for determining if dense packing procedure has reached appropriate density
5.10			Blown: Air pressure to material ratio manufacturers recommended density to achieve the R-value
5.11			Using combustion safety testing results for appropriate actions
6.1	Professional Ethics, Conduct & Communications (Fundamentals) continued	Conservation Strategies	Present options for comprehensive conservation strategies that are consistent with sound building science practices
6.2			Understand the implications of building performance improvements on occupants and other building systems/components
6.3			Understand the importance of coordinating air-sealing work with insulation work
6.4			Understand the impact of installed actions on cost benefit analysis guidance
6.5	Professional Ethics, Conduct & Communications (Fundamentals) continued	Professional Conduct and Work Ethics	Elements of effective oral communication with customer
6.6			Elements of a documentation system
6.7			Elements of effective written communication with customer
6.8			Understand the role of and basic elements of a quality management system
6.9	Professional Ethics, Conduct & Communications (Fundamentals) continued	Personal Safety & Work Practices	Locations in which to identify indoor air quality issues
6.10			Material Safety Data Sheets
6.11			Federal/State/Local Requirements (EPA OSHA)

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Isolation procedures for pollutants
Practice building science within your limits of professional competency
Precautions when working around chemical biological and other potential hazards
Understand the roles and responsibilities of the envelope professional