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Dockets: 21-BSTD-04 & 19-HERS-01

CalCERTS, Inc. working with the California Energy Commission suggests the following solution to remedy issues with the certificates of compliance documentation needed for alteration/change-outs for the low-rise multifamily projects under the 2022 Building Energy Efficiency Code.

CalCERTS recommends the Commission adopt a form similar to the CEC-CF1R-ALT-02 for projects needing a prescriptive pathway for compliance.

A sample of what this form could look like is included below, as well as sample pseudo code. To integrate into the low-rise multifamily compliance process, the form would be recognized as the LMCC-MCH-01b.

Adoption of this form would address the regulatory advisory issued by the Commission on November 18, 2022, and would help industry stakeholders have a pathway forward for project registration and compliance.

Thank you,

The CalCERTS Operations Team

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SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF COMPLIANCE

Note: This table completed by HERS Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

A. General Information

LMCC-MCH-01b is applicable to multiple space conditioning systems contained within a single dwelling unit.

01	Project Name:		02	Date Prepared:	
03	Project Location:		04	Building Type:	
05	CA City:		06	Dwelling Unit Name:	
07	Zip Code:		08	Dwelling Unit CFA (ft^2):	
09	Climate Zone:		10	Number of Space Conditioning (SC) Systems in this Dwelling Unit:	

B. Space Conditioning (SC) System Information

01	02	03	04	05	06	07	08	09	10
SC System ID/Name	SC System Description of Area Served	CFA served by this SC System (ft^2):	Is the SC system a ducted system?	Installing a refrigerant containing component?	Installing new SC system components?	Installing more than 25 feet of ducts?	Installing entirely new duct system?	Installing entirely new SC system?	Alteration Type:

ALTERATIONS TO SPACE CONDITIONING SYSTEMS

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C. Extension of Existing Duct System, Greater Than 25 Feet (Section 150.2(b)1Diib)

01	02	03
SC System ID/Name	SC System Description of Area Served	Required New Duct R-Value

Required Documentation:
LMCI-MCH-01-E - Space Conditioning Systems
-Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R-6 (CZ 3, 5-7and R-8 (CZ1,2,4, 8-16).
LMCI & LMCV-MCH-20-H – Duct Leakage Test
-Leakage rate compliance: less than or equal to 10%, or less than or equal to 7% leakage to outside, or seal all accessible leaks
Exceptions:
Existing duct systems constructed, insulated, or sealed with asbestos are exempt from MCH-20 duct leakage testing requirements

D. Altered Space Conditioning System (Sections 150.2(b)1E and F)

01	02	03	04	05	06	07	08	09	10	10b	11	12	13
SC System ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2/CEER	Required Thermostat Type	New or Replaced Duct Length	New Du R-Valu

Required Documentation:
LMCI-MCH-01-E - Space Conditioning Systems
-Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R-6 (CZ3, 5-7) and R-8 (CZ1,2,4, 8-16)
LMCI & LMCV-MCH-20-H – Duct Leakage Test required when heating or cooling components are installed in ducted systems, or when more than 25 ft of duct length is replaced.
-Leakage rate compliance: less than or equal to 10%, or less than or equal to 7% leakage to outside, or seal all accessible leaks.
LMCI & LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).
LMCI & LMCV-MCH-23 Airflow Rate greater than or equal to 300 CFM/ton required when MCH-25 is required.
Exceptions:
-Duct systems registered with HERS provider as previously sealed are exempt from MCH-20 Duct Leakage Testing requirements.
-Heating-only systems and Air Handler/Furnace changes do not require verification of Air Flow MCH-23, or Refrigerant Charge MCH-25.
-Existing duct systems constructed, insulated, or sealed with asbestos are exempt from MCH-20 Duct Leakage Testing requirements.

ALTERATIONS TO SPACE CONDITIONING SYSTEMS

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)

01	02	03	04	05	06	07	08	09	10	10b	11	12
SC System Identification or ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2/CEER	Required Thermostat Type	New D R-Valu

Required Documentation:

LMCI-MCH-01-E - Space Conditioning Systems

-Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R-6 (CZ3,5-7) and R-8 (CZ1,2,4, 8-16)

LMCI & LMCV-MCH-20-H Duct Leakage Test required.

-Leakage rate compliance: less than or equal to 5 percent.

LMCI & LMCV-MCH-22 Fan Efficacy

LMCI & LMCV-MCH-23 Airflow Rate

-Compliance: Fan Efficacy less than or equal to 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow greater than or equal to 350 cfm/ton.

-Alternative Compliance: LMCI & LMCV-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.

LMCI & LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).

Exceptions:

Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.

Note:

An "entirely new or complete replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage

ALTERATIONS TO SPACE CONDITIONING SYSTEMS

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)

01	02	03	04	05	06	07	08	09	10	10b	11	12
SC System ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2/CEER	Required Thermostat Type	New D R-Valu

Required Documentation:
LMCI-MCH-01-E - Space Conditioning Systems
-Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R-6 (CZ3, 5-7) and R-8 (CZ1,2,4, 8-16)
LMCI & LMCV-MCH-20-H Duct Leakage Test required.
-Leakage rate compliance: less than or equal to 5 percent.
LMCI & LMCV-MCH-22 Fan Efficacy
LMCI & LMCV-MCH-23 Airflow Rate
-Compliance: Fan Efficacy less than or equal to 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow greater than or equal to 350 cfm/ton.
- Alternative Compliance: LMCI & LMCV-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.
LMCI & LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).
Exceptions:
Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.
Note:
An "entirely new or complete replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage

ALTERATIONS TO SPACE CONDITIONING SYSTEMS

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

Documentation Author's Declaration Statement	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

Responsible Person's Declaration Statement

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I understand that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections.
6. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

LMCC-MCH-01b-E User Instructions

Minimum requirements for prescriptive HVAC alteration compliance can be found in Building Energy Efficiency Standards Section 150.2(b)1C.

Completing these forms will require that you have the 2022 Reference Appendices for the 2022 Building Energy Efficiency Standards.

When the term LMCC is used, it is referencing the LMCC-MCH-01b.

Instructions for sections with column numbers and row numbers are given separately.

If any part of the alteration does not comply with the prescriptive requirements, prescriptive compliance fails and the performance compliance approach must be used.

A. General Information

1. Project Name: Enter a unique project identifier such as the house number and street name or example: "Jones' Furnace Change out."
2. Date Prepared: Enter the date of document preparation.
3. Project Location: Enter the legal street address of property or other applicable identifying information.
4. Building Type: This field will automatically default to Single Family.
5. CA City: This field will reference the same field on that document for consistency. If not, enter the legal city/town of property.
6. Dwelling Unit Name: Enter a unique dwelling unit name or any other identifying name that would readily distinguish this dwelling unit from others in this project.
7. Zip Code: Enter the 5-digit zip code for the project location (used to determine climate zone).
8. Dwelling Unit CFA (ft^2): E the conditioned floor area in ft^2 of the project. If multiple systems are being affected, a CFA value will be assigned to each system in Section B. Those must sum to this total for the project. For projects NOT involving all systems in the dwelling, this is the CFA of only the portion of the dwelling unit affected.
9. Climate Zone: Select the correct climate zone for the project. From the Reference Appendices, Joint Appendix, JA2.1.1.
10. Number of Space Conditioning (SC) Systems in this Dwelling Unit: Enter the number of space conditioning systems in the dwelling unit.

B. Space Conditioning (SC) System Information (Section 150.2(b)1C)

1. SC System Identification or Name: Enter a unique identifier for this system that will readily distinguish it from other systems in the dwelling unit, such as "HVAC1," "upstairs system," etc. It is recommended to mark the system with this identifier using a permanent marker for ease of identification in the field. For single-system dwelling units, enter a simple name such as "HVAC."
2. SC System Description of Area Served: Enter a unique description of the portion of dwelling unit served by this system, such as "entire second floor," "bedroom wing," etc. For single-system dwelling units, enter a simple description such as "entire house."
3. CFA served by this SC System (ft^2): Enter the CFA served by this system.
4. Is the altered or installed system a ducted system? Select "**YES"** if the system has a central air handler (package or split) that is connected to one or more supply air outlets via ducting of any shape or material. Select "**NO**" for nonducted systems such as ductless mini-splits, through-the-wall systems, package terminal air conditioners, etc.
5. Altering or installing a refrigerant containing component? Select "**YES**" if the project includes installing or replacing a component that contains refrigerant; otherwise select "**NO**." Refrigerant containing components include compressors, condensing coils, evaporator coils, refrigerant metering devices or refrigerating lines.
6. Installing new components? Select "**YES"** if new HVAC components such as a packaged unit, condensing unit, cooling/heating coil, or air-handling unit (e.g., furnace), etc. are being installed in the system; otherwise select "**NO**."
7. Installing more than 25 linear feet of new or replacement ducts? Select "**YES**" if the project involves installing more than 25 linear feet of new or replacement ducts; otherwise select "**NO**."
8. Is the entire duct system accessible for sealing and is more than 75 percent of the duct system new or replaced? Select "**YES**" when, upon completion of the project, more than 75 percent of the ducts will be new ducts and/or replaced ducts, AND if at any time during the project all of the ducts are accessible for duct sealing; otherwise select "**NO**." "Accessible" is defined in the Reference Appendices, Joint Appendix, JA1.
9. Are all of the system's components and ducts new (entirely new system) or replaced? Select "**YES**" if the duct system meets the definition of an "Entirely New or Replacement Duct System" and all of the heating and cooling components (furnace, condenser, coil, etc.) are all new or replaced; otherwise select "**NO**."
10. Alteration Type: This field is calculated automatically based on the information entered in previous fields. Alteration types are defined in the Reference Appendices, Joint Appendix, JA1. The alteration type will determine which of the following sections are required by this document.

C. Extension of Existing Duct System, Greater Than 25 Feet (Section 150.2(b)1Diib)

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Required New Duct R-value: This field is automatically calculated based on the climate zone selected in Section A. It represents the minimum R-value required. The installed R-value shown on the installation certificate (LMCI) must meet or exceed this value.

D. Altered Space Conditioning System (Sections 150.2(b)1E and F)

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: Select the most appropriate heating system components from the list that are being added or replaced as part of this project. You can select multiple choices if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.

6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum efficiency value.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components: User chooses as many as are applicable: Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on LMCC-MCH-01b selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements of Section 150.0(i) is required to be installed as part of this project.
12. New or Replaced Duct Length: Select the descriptor that describes the amount of duct, at the completion of the project that is added or replaced as part of this project.
13. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: Select the most appropriate heating system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.
6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components: User chooses as many as that are applicable: Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements is required to be installed as part of this project.
12. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: This field is automatically filled.
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.
6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components (user chooses as many as that are applicable): Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (LMCI). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements is required to be installed as part of this project.
12. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

A. General Information
<<Static Text - see the top>>.

01	Project Name:	<< user input text>>	02	Date Prepared:	<< user input date format; pick from enumerated list>>
03	Project Location:	<< user input text: Street address or alternate applicable description of location >>	04	Building Type:	< default to Single Family; >>
05	CA City:	<< user input text: a city name>>	06	Dwelling Unit Name:	<< user input text>>
07	Zip Code:	<< user input text: pick from enumerated list>>	08	Dwelling Unit CFA (ft^2)	<< user input integer; xxxxx; >>
09	Climate Zone:	<< user input text: pick from enumerated list>>	10	Number of space conditioning (SC) systems in this dwelling unit.	<< user input: integer, xx>>

B. Space Conditioning (SC) System Information
<< require one row of data to be entered in this table for each of the quantity of space conditioning systems entered in A10>>

01	02	03	04	05	06	07	08	09	10
SC System ID/Name	SC System Description of Area Served	CFA served by this SC System (ft^2):	Is the SC system a ducted system?	Installing a refrigerant containing component?	Installing new SC system components?	Installing more than 25 feet of ducts?	Installing entirely new duct system?	Installing entirely new SC system?	Alteration Type:
<<user input: text, max 20 characters do not allow duplicate system names to be used for this dwelling unit>>	<<user input: text, max 20 characters do not allow duplicate descriptions to be used for this dwelling unit (for this MCH-01)>>	<<numeric; xxxx; require the sum of the CFA values entered in this column to be equal to the value for CFA entered in A08>>	user pick from list: "yes"; or "no">>	user pick from list: "yes"; or "no">>	user pick from list: "yes"; or "no">>	user pick from list: "yes"; or "no">>	user pick from list: "yes"; or "no">>	user pick from list: "yes"; or "no">>	<< Calculated field: determine the correct result for "alteration type" for entry in this field by the user responses in B04, B05 , B06, B07, B08, B09 and use of "Logic Table for Determining Alteration Type and HERS Verification Requirements" (inserted below this section); constrain user input for fields B04-B09 to allow only the available combinations of responses given in the Logic Table in rows a through t; alteration types are: *Extension of Existing Duct System (Section C); *Altered Space Conditioning System (Section D); *Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E) *Entirely New or Complete Replacement Space Conditioning System (Section F) * No Alteration Performed >>

Logic Table for Determining Alteration Type and HERS Verification Requirements (this table not shown on the completed document)

	1	2	3	4	5	6	7	8	9
	Is the altered or installed system a ducted system?	Altering or installing a refrigerant containing component?	Installing new components? (packaged unit, or condensing unit, or cooling/heating coil, or air-handling unit, etc)	Installing more than 25 linear feet of new or replacement ducts?	Is the entire duct system accessible for sealing, and is more than 75% of the duct system new or replaced?	Are all of the system's components and ducts new or replaced? (entirely new system)	alteration type	HERS	notes
a	no	yes	no	no	no	no	Altered space conditioning system	RC	e.g. alteration to refrigerant containing component - mini-split or packaged AC
b	no	yes	yes	no	no	no	Altered space conditioning system	RC	e.g. changeout mini-split system component
c	yes	no	yes	no	no	no	Altered space conditioning system	DctLk	e.g. new ducted hydronic fan coil unit or furnace
d	yes	no	yes	yes	no	no	Altered space conditioning system	DctLk	e.g. new furnace + duct alteration
e	yes	yes	no	no	no	no	Altered space conditioning system	RC	e.g. alteration to a refrigerant containing component - split system
f	yes	yes	yes	no	no	no	Altered space conditioning system	RC + DctLk	e.g. changeout refrigerant containing components
g	yes	yes	yes	yes	no	no	Altered space conditioning system	RC + DctLk	e.g. changeout refrigerant containing component + altered ducts
h	yes	yes	no	yes	no	no	Altered space conditioning system	RC + DctLk	e.g. alteration to refrigerant containing component + altered ducts
i	yes	no	no	yes	yes	no	Entirely new duct system with or without Equipment Changeout	DctLk + FE/AF or Tbl150.0-C,D	e.g. new duct system without equipment changeout
j	yes	no	yes	yes	yes	no	Entirely new duct system with or without Equipment Changeout	DctLk + FE/AF or Tbl150.0-C,D	e.g. new furnace + new duct system
k	yes	yes	no	yes	yes	no	Entirely new duct system with or without Equipment Changeout	RC + DctLk + FE/AF or Tbl150.0-C,D	e.g. alteration to a refrigerant containing component + new duct system
l	yes	yes	yes	yes	yes	no	Entirely new duct system with or without Equipment Changeout	RC + DctLk + FE/AF or Tbl150.0-C,D	e.g. changeout refrigerant containing component + new duct system

m	no	no	yes	no	no	yes	Entirely new space conditioning system	none	e.g. entirely new ductless hydronic heating system (boiler heating only); or new wall heater
n	no	yes	yes	no	no	yes	Entirely new space conditioning system	RC	e.g. new mini-split (weigh-in); or new room packaged AC (factory charged)
o	yes	no	yes	yes	yes	yes	Entirely new space conditioning system	DctLk	e.g. new ducted hydronic heating system, or other new ducted heating-only system
p	yes	yes	yes	yes	yes	yes	Entirely new space conditioning system	RC + DctLk + FE/AF or Tbl150.0-C,D	e.g. new split system
q	yes	no	no	yes	no	no	Extension of an existing duct system	DctLk	e.g. altered ducts
r	no	no	no	no	no	no	System is exempt from the alteration requirements	none	no alteration performed
s	yes	no	no	no	no	no	System is exempt from the alteration requirements	none	no alteration performed
t	yes	yes	yes	no	yes	yes	Entirely new space conditioning system	RC + DctLk + FE/AF or Tbl150.0-C,D	e.g. new ducted system that has less than 25 ft of ducts
u	no	no	yes	no	no	no	Altered space conditioning system	none	e.g. new ducted hydronic fan coil unit or new hydronic heating boiler

Nomenclature:
RC = Refrigerant Charge Verification (MCH-25) applicable in CZ 2, 8-15
DctLk = Duct Leakage Test (MCH-20)
FE/AF or Tbl150.0-C,D - Fan Efficacy and Airflow Rate verification (MCH-22; MCH-23) or alternative compliance: (MCH-28)

C. Extension of Existing Duct System, Greater Than 25 Feet (Section 150.2(b)1Diib)

<<if there are no Alteration Types in column B10 equal to "Extension of Existing Duct System (Section C)" then display the "section does not apply" message, else require one row of data to be entered in this table for each SC System of alteration type in column B10 equal to: "Extension of Existing Duct System (Section C)"

01	02	03
SC System ID/Name	SC System Description of Area Served	Required New Duct R-Value
<< auto filled from B01 >>	<< auto filled from B02 >>	<<calculated field: if A09= CZ3, 5-7, then value = "R-6."; else if A09=CZ 1, 2, 4, 8-16 then value = "R-8."

<<Static Text - see the top>>

D. Altered Space Conditioning System (Sections 150.2(b)1E and F)

<<**if** there are no Alteration Types in column B10 equal to "Altered Space Conditioning System (Section D)" then display the "section does not apply" message; **else** require one row of data in this table for ea
SC System of alteration type in column B10 equal to: "Altered Space Conditioning System (Section D)">>

01	02	03	04	05	06	07	08	09	10	10b	11	12	1
SC System ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEE R2	Cooling Minimum Efficiency Value EER/EER2/ CEER	Required Thermostat Type	New or Replaced Duct Length	Ne Du R Val

<<auto filled from B01 >>	<< auto filled from B02 >>	<<user pick one from list: *central gas furnace; *central split HP; *central packaged HP; *central large packaged HP; *ductless mini-split HP; *room HP; *boiler; *hydronic; *combined hydronic; *hydronic+forced air; *combined hydronic+forced air; *hydronic HP, *hydronic HP+forced air; *gas wall furnace; *gas space heater; *electric; *non-air-source heat pump; *Wood Heat; * no heating; *Small duct high velocity HP; *Ductless VRF HP; *Packaged gas furnace; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *VCHP-ducted; *VCHP-ductless; *VCHP-ducted+ductless; *ducted mini-split HP; *SPVHP; *PTHP>>	<< user pick as many as are applicable from list: *gas furnace AHU; *fancoil AHU; *outdoor condensing unit; *indoor coil; *boiler; *TXV or EXV; *compressor; *refrigerant lineset; *no heating component altered>>	<< if D04= no heating component altered, then value =n/a, else user pick from list: *AFUE; *HSPF; *HSPF2; *COP>>	<< if D04= no heating component altered, then value =n/a, else user enter numeric value xx.x; default minimum value for AFUE= 80; or default minimum value for HSPF= 8.0; or default minimum value for HSPF2=6.7allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<user pick one from list: *central split AC; *central split HP; *central packaged AC ; *central packaged HP; * central large packaged AC ; *central large packaged HP; *ductless mini-split AC; *ductless mini-split HP; *gas absorption AC; *room AC; *room HP; *hydronic HP; *hydronic HP+forced air *evaporative – direct; *evaporative – indirect; *evaporative – indirect/direct; *evaporatively cooled condenser; *Ice Storage AC; *non-air-source heat pump; *non-air-cooled air conditioner; *no cooling *Small duct high velocity HP; *Small duct high velocity AC; *Ductless VRF HP; *Ductless VRF AC; *multisplit AC-ducted; *multisplit AC-ductless; *multisplit AC-ducted+ductless; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *VCHP-ducted; *VCHP-ductless; *VCHP-ducted+ductless; *ducted mini-split AC; *ducted mini-split HP; *SPVAC; *SPVHP; *PTAC; *PTHP>>	<<user pick as many as are applicable from list: *outdoor condensing unit; *indoor fancoil AHU; *indoor coil; *TXV or EXV; *Compressor; *refrigerant lineset; *no cooling component altered>>	<< if D08= no cooling component altered, then value =n/a, else user input. Allowed value = (1) EER/SEER, (2) EER2/SEER2, (3) CEER, (4) EER, or (5) EER2. >>	<< if D08= no cooling component altered, then value =n/a, else user enter value: xx.x; default minimum value for EER/SEER= 14;or default minimum value for EER2/SEER2=13.4 allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<if D08 = no cooling component altered, then value = N/A; else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7 ; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7; allow user to overwrite default value, but flag non-default values and report in project status notes field>>	<< setback>>	<< calculated field: if B04=no, then display N/A; else user pick from list: *≤25ft; *>25ft; *N/A-no ducts replaced>>	<<ca ated field B04= then displ N/A; elsei D12= A, th displ N/A; elsif A09= CZ3, 7, th "R-6 else A09= 1, 2, 8- 16th "R-8

<<Static Text - see the top>>

E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)

<<if there are no Alteration Types in column B10 equal to "Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E)" then display the "section does not apply" message; else require one row of data in this table for each SC System of alteration type in column B10 equal to: "Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E)">>

01	02	03	04	05	06	07	08	09	10	10b	11	12
SC System Identification or ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2 /CEER	Required Thermostat Type	New Duct R-Value
<< auto filled from B01 >>	<< auto filled from B02 >>	<<user pick one from list: *central gas furnace; *central split HP; *central packaged HP; *central large packaged HP *ductless split HP; *room HP; *boiler; *hydronic; *combined hydronic; *hydronic+forced air; *combined hydronic+forced air; *hydronic HP, *hydronic HP+forced air; *gas wall furnace; *gas space heater; *electric * no heating; *Wood Heat; *Packaged gas furnace; *non-air-source HP; *Small duct high velocity HP; *Ductless VRF HP; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *ducted mini-split HP; *SPVHP; *PTHP >>	<< user pick as many as are applicable from list: *gas furnace AHU; *fancoil AHU; *outdoor condensing unit; *indoor coil; *boiler; *TXV or EXV; *compressor; *refrigerant lineset; *no heating component altered>>	<<if E04= no heating component altered, then value =n/a, else user pick from list: *AFUE; *HSPF; *HSPF2; *COP>>	<< if E04= no heating component altered, then value =n/a, elseuser enter value: xx.x; default minimum value for AFUE= 80; or default minimum value for HSPF= 8.0; or default minimum value for HSPF2=6.7; allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<user pick one from list: *central split AC; *central split HP *central packaged AC ; *central packaged HP *central large packaged AC ; *central large packaged HP *ductless split AC; *ductless split HP; *gas absorption AC *room AC; *room HP; *hydronic HP, *hydronic HP+forced air; *evaporative - direct; *evaporative – indirect; *evaporative - indirectdirect *evaporatively cooled condenser; *Ice Storage AC; *no cooling; *Ductless VRF HP; *Ductless VRF AC; *multisplit AC-ducted; *multisplit AC-ductless; *multisplit AC-ducted+ductless; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *non-air-source heat pump; *non-air-cooled air conditioner; *Small duct high velocity HP; *Small duct high velocity AC; *ducted mini-split AC; *ducted mini-split HP; *SPVAC; *SPVHP; *PTAC; *PTHP>>	<<user pick as many as are applicable from list: *outdoor condensing unit, *indoor fancoil AHU, *indoor coil, *TXV or EXV, *Compressor, *refrigerant lineset, *no cooling component altered>>	<< if E08= no cooling component altered, then value =n/a, else user input. Allowed value = (1) EER/SEER, (2) EER2/SEER2, (3) CEER, (4) EER, or (5) EER2.>>	<< if E08= no cooling component altered, then value =n/a else user enter value: xx.x; default minimum value for EEER/SEER=14; or default minimum value for EER2/SEER2=13.4; allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<if E08 = no cooling component altered, then value = N/A; else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7; allow user to overwrite default value, but flag non-default values and report in project status notes field>>	<<setback>>	<<calculate field: if A09 CZ3, 5-7, then "R-6." else if A09=CZ 1, 2 4, 8-16then "R-8."

<<Static Text - see the top>>

F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)

<<if there are no Alteration Types in column B10 equal to "Entirely New or Complete Replacement Space Conditioning System (Section F)" then display the "section does not apply" message; else require one row of data in this table for each SC System of alteration type in column B10 equal to: "Entirely New or Complete Replacement Space Conditioning System (Section F)">>

01	02	03	04	05	06	07	08	09	10	10b	11	12
SC System ID/Name	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2 /CEER	Required Thermostat Type	New Duct R-Value

<< auto filled from B01 >>	<< auto filled from B02 >>	<<user pick one from list: *central gas furnace; *central split HP; *central packaged HP *central large packaged HP *ductless split HP; *room HP; *boiler; *hydronic; *hydronic+forced air; *combined hydronic+forced air; *hydronic HP, *hydronic HP+forced air; *combined hydronic; *gas wall furnace; *gas space heater; *electric * no heating; *Wood Heat; *Packaged gas furnace; *non-air-source HP; *Small duct high velocity HP; *Ductless VRF HP; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *ducted mini-split HP; *SPVHP; *PTHP >>	<< calculated field: **if** F03= no heating; **then** textvalue= no heating component altered; **else** value=entirely new heating system>>	<< if F04= no heating component altered, then value =n/a; else user pick from list: *AFUE; *HSPF; *HSPF2; *COP>>	<<if F04= no heating component altered, then value =n/a; else user enter value: xx.x; default minimum value for AFUE= 80; or default minimum value for HSPF= 8.0; or default minimum values for HSPF2=6.7; allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<user pick one from list: *central split AC; *central split HP *central packaged AC ; *central packaged HP *central large packaged AC; *central large packaged HP *ductless split AC; *ductless split HP; *gas absorption AC *room AC; *room HP; *hydronic HP, *hydronic HP+forced air; *evaporative – direct; *evaporative – indirect; *evaporative – indirectdirect; *evaporatively cooled condenser; *Ice Storage AC; *no cooling; *Ductless VRF HP; *Ductless VRF AC; *multisplit AC-ducted; *multisplit AC-ductless; *multisplit AC-ducted+ductless; *multisplit HP-ducted; *multisplit HP-ductless; *multisplit HP-ducted+ductless; *non-air-source heat pump; *non-air-cooled air conditioner; *Small duct high velocity HP; *Small duct high velocity AC; *ducted mini-split AC; *ducted mini-split HP; *SPVAC; *SPVHP; *PTAC; *PTHP >>	<< calculated field: if F07=no cooling; then value= no cooling component altered; else value= entirely new cooling system>>	<< **if** F08= no cooling component altered, **then** value =n/a, **else** user input. Allowed value = (1) EER/SEER, (2) EER2/SEER2, (3) CEER, (4) EER, or (5) EER2.>>	<< if F08= no cooling component altered, then value =n/a, else user enter numeric value: xx.x; default minimum value for EER/SEER=14; or default minimum value for EER2/SEER2= 13.4; allow user to overwrite default value, but flag non-default values and report in project status notes field >>	<<if F08=no cooling component altered, then value = N/A; else user enter numeric value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum for EER2 and EER2/SEER2= 11.2; or default minimum value for CEER=8.7; allow user to overwrite default value, but flag non-default values and report in project status notes field>>	< setback>>	<<calculated field: **if** B04=no, ther display text value= N/A; **elsif** A09= CZ 3, 5-7 **then value=** "R-6."; **else** if A09=CZ 2, 4, 8-16 **then** value= "R-8."
	<<Static Text - see the top>>											

```
<?xml version="1.0" encoding="UTF-8"?>

<xsd:schema attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="http://www.lmonte.com/besm/LMCCMCH01bE" version="2022.0.000"
xmlns="http://www.lmonte.com/besm/LMCCMCH01bE" xmlns:altova="http://www.altova.com/xml-
schema-extensions" xmlns:bld="http://www.lmonte.com/besm/bld"
xmlns:com="http://www.lmonte.com/besm/com" xmlns:comp="http://www.lmonte.com/besm/comp"
xmlns:d="http://www.lmonte.com/besm/d" xmlns:dtyp="http://www.lmonte.com/besm/dtyp"
xmlns:env="http://www.lmonte.com/besm/env" xmlns:hvac="http://www.lmonte.com/besm/hvac"
xmlns:lit="http://www.lmonte.com/besm/lit" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:import namespace="http://www.lmonte.com/besm/bld"
schemaLocation="../base/ResBuilding.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/com"
schemaLocation="../base/ResCommon.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/comp"
schemaLocation="../base/ResCompliance.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/dtyp"
schemaLocation="../base/DataTypes.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/env"
schemaLocation="../base/ResEnvelope.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/hvac"
schemaLocation="../base/ResHvac.xsd"/>

  <xsd:import namespace="http://www.lmonte.com/besm/lit"
schemaLocation="../base/ResLighting.xsd"/>

  <xsd:complexType name="LMCCMCH01bE">

    <xsd:annotation>

      <xsd:documentation>Alterations to Space Conditioning Systems</xsd:documentation>

    </xsd:annotation>

    <xsd:sequence>

      <xsd:element name="Section_A" minOccurs="1" maxOccurs="1">

        <xsd:annotation>

          <xsd:documentation source="FieldText">General Information</xsd:documentation>

          <xsd:documentation source="MinOccurs">This section is required.</xsd:documentation>

        </xsd:annotation>

        <xsd:complexType>
```

```
        <xsd:sequence>
          <xsd:element name="A_BeginNote1" minOccurs="0">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Begin Note 1</xsd:documentation>
              <xsd:documentation source="AdditionalRequirements">LMCC-MCH-01b is applicable to multiple space conditioning systems contained within a single dwelling unit.</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
          <xsd:element name="A01_ProjectName" type="com:ProjectName">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Project Name</xsd:documentation>
              <xsd:documentation source="CalculationsAndRules">User input</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
          <xsd:element name="A02_ComplianceApplicationDate" type="comp:ComplianceApplicationDate">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Date Prepared</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
          <xsd:element name="A03_StreetAddress" type="com:StreetAddress">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Project Location</xsd:documentation>
              <xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
          <xsd:element name="A04_ResidentialLowriseBuildingType">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Building Type</xsd:documentation>
```

<xsd:documentation source="CalculationsAndRules">default to LowRiseMultiFamily</xsd:documentation>
</xsd:annotation>
<xsd:simpleType>
<xsd:restriction base="com:ResidentialLowriseBuildingType">
<xsd:enumeration value="LowRiseMultiFamily"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="A05_City" type="com:City">
<xsd:annotation>
<xsd:documentation source="FieldText">CA City</xsd:documentation>
<xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="A06_DwellingUnitName" type="com:DwellingUnitName">
<xsd:annotation>
<xsd:documentation source="FieldText">Dwelling Unit Name</xsd:documentation>
<xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="A07_Zipcode" type="dtyp:Zipcode">
<xsd:annotation>
<xsd:documentation source="FieldText">Zip Code</xsd:documentation>
<xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="A08_DwellingUnitConditionedFloorArea" type="com:DwellingUnitConditionedFloorArea">

<xsd:annotation>

<xsd:documentation source="FieldText">Dwelling Unit Conditioned Floor Area (ft<d:sup>2</d:sup>)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">User input integer xxxxx</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="A09_ClimateZone" type="com:ClimateZone">

<xsd:annotation>

<xsd:documentation source="FieldText">Climate Zone</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="A10_ResidentialDwellingUnitSpaceConditioningCount" type="hvac:ResidentialDwellingUnitSpaceConditioningCount">

<xsd:annotation>

<xsd:documentation source="FieldText">Number of Space Conditioning (SC) Systems in this Dwelling Unit:</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">User Input</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="Section_B" minOccurs="1">

<xsd:annotation>

<xsd:documentation source="FieldText">Space Conditioning (SC) System Information</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Require one row of data to be entered for each space conditioning system included in the ResidentialDwellingUnitSpaceConditioningCount entered in Section A</xsd:documentation>

```
      <xsd:documentation source="MinOccurs">This section is required.</xsd:documentation>
    </xsd:annotation>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="TableConditioning">
          <xsd:annotation>
            <xsd:documentation source="FieldText"/>
          </xsd:annotation>
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Row" minOccurs="1" maxOccurs="unbounded">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="B01_ResidentialSpaceConditioningSystemName"
type="hvac:ResidentialSpaceConditioningSystemName">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">SC System ID or
Name</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">User input text; max 20
characters Do not allow duplicate system names to be used for this dwelling unit</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                    <xsd:element name="B02_ResidentialHvacSystemAreaServed"
type="hvac:ResidentialHvacSystemAreaServed">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">SC System Location or Area
Served</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">User input text; max 20
characters Do not allow duplicate descriptions to be used for this dwelling unit</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
```

<xsd:element name="B03_ResidentialHvacSystemConditionedArea" type="hvac:ResidentialHvacSystemConditionedArea">

<xsd:annotation>

<xsd:documentation source="FieldText">CFA served by this SC System (ft<d:sup>2</d:sup>)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">The sum of all ResidentialHvacSystemConditionedArea values entered in this column must be equal to the value for ResidentialDwellingUnitConditionedFloorArea entered in Section A</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B04_DuctedSystem" type="comp:DuctedSystem">

<xsd:annotation>

<xsd:documentation source="FieldText">Is the SC system a ducted system?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B05_IncludesComponentWithRefrigerant" type="comp:IncludesComponentWithRefrigerant">

<xsd:annotation>

<xsd:documentation source="FieldText">Installing a refrigerant containing component?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B06_InstallingNewComponents" type="comp:InstallingNewComponents">

<xsd:annotation>

<xsd:documentation source="FieldText">Installing new SC system components?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B07_Installing25PlusLinearFeetDucts" type="comp:Installing25PlusLinearFeetDucts">

<xsd:annotation>

<xsd:documentation source="FieldText">Installing more than 25 feet of ducts?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B08_DuctSystemAllAccessibleForSealingWithPlus75PercentNewReplaced" type="comp:DuctSystemAllAccessibleForSealingWithPlus75PercentNewReplaced">

<xsd:annotation>

<xsd:documentation source="FieldText">Installing entirely new duct system?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B09_AllNewOrReplacedHvacSystem" type="comp:AllNewOrReplacedHvacSystem">

<xsd:annotation>

<xsd:documentation source="FieldText">Installing entirely new SC system?</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Display Yes and No to represent Boolean values True and False</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="B10_ResidentialHvacAlterationType" type="hvac:ResidentialHvacAlterationType">

<xsd:annotation>

<xsd:documentation source="FieldText">Alteration Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Provide controls for user input to either 1) determine the correct result for alteration type for entry in this field by prompting the user to respond with any data input needed for use of the logic in Logic Table for Determining Alteration Type and HERS Verification Requirements which is provided in the Residential Compliance Documents workbook. Constrain user input for fields B04-B09 to allow only the available combinations of responses given in the Logic Table in rows a through s; or 2) allow the user to pick an alteration type from ResidentialHvacAlterationType values. For choice DuctSystemExistingExtended display text: Extension of Existing Duct System (Section C); For choice SpaceConditioningSystemAltered display text: Altered Space Conditioning System (Section D); For choice DuctSystemEntirelyNewReplacement display text: Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E); For choice SpaceConditioningSystemEntirelyNewReplacement display text: Entirely New or Complete Replacement Space Conditioning System (Section F); For choice NoAlterationsPerformed display text: No Alteration Performed</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="Section_C" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Extension of Existing Duct System, Greater Than 25 Feet (Section150.2(b)1Diib)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">This Section is applicable only if one or more systems in section B has ResidentialHvacAlterationType == DuctSystemExistingExtended; Require

one row of data to be entered for each of these systems that satisfy this requirement.</xsd:documentation>

<xsd:documentation source="MinOccurs">If this section doesn't apply, display only the section FieldText and the statement 'This section does not apply to this project.'</xsd:documentation>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="TableDuct">

<xsd:annotation>

<xsd:documentation source="FieldText"/>

</xsd:annotation>

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<xsd:element name="Row" minOccurs="1" maxOccurs="unbounded">

<xsd:complexType>

<xsd:sequence>

<xsd:element name="C01_ResidentialSpaceConditioningSystemName" type="hvac:ResidentialSpaceConditioningSystemName">

<xsd:annotation>

<xsd:documentation source="FieldText">System ID/ Name</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Autofilled from B01 with first applicable system</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="C02_ResidentialHvacSystemAreaServed" type="hvac:ResidentialHvacSystemAreaServed">

<xsd:annotation>

<xsd:documentation source="FieldText">SC System Description of Area Served</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Auto-filled from B02</xsd:documentation>

```
                    </xsd:annotation>
                  </xsd:element>
                  <xsd:element name="C03_DuctRValueLimit" type="hvac:DuctRValueLimit">
                    <xsd:annotation>
                      <xsd:documentation source="FieldText">Required New Duct R-
Value</xsd:documentation>
                      <xsd:documentation source="CalculationsAndRules">Calculation  If
A09_ClimateZone == 3, 5, 6 Or 7
result = R6;
Else If A09_ClimateZone == 1, 2, 4 Or InRange (8, 16)
result = R8
End If</xsd:documentation>
                    </xsd:annotation>
                  </xsd:element>
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="CEndNote1" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation source="FieldText">
            <d:u>Required Documentation:</d:u>
          </xsd:documentation>
          <xsd:documentation source="AdditionalRequirements">
            <d:u>Required Documentation: </d:u>
            <d:line1/> LMCI-MCH-01-E - Space Conditioning Systems
            <d:line1/> - Duct insulation requirement for the new portions of supply-air and return-air
ducts or plenums: R6 (CZ 3, 5-7) and R8 (CZ 1, 2, 4, 8-16)
```

<d:line1/> LMCI and LMCV-MCH-20-H Duct Leakage Test

<d:line1/> - Leakage rate compliance: less than or equal to 10%, or less than or equal to 7% leakage to outside, or seal all accessible leaks

<d:line1/>

<d:u>Exceptions:</d:u>

<d:line1/> Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 duct leakage testing requirements</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="Section_D" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Altered Space Conditioning System (Sections 150.2(b)1E and F)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">This Section is applicable only if one or more systems in section B has ResidentialHvacAlterationType == SpaceConditioningSystemAltered; Require one row of data to be entered for each of system that has ResidentialHvacAlterationType == SpaceConditioningSystemAltered</xsd:documentation>

<xsd:documentation source="MinOccurs">If this section doesn't apply, display only the section FieldText and the statement 'This section does not apply to this project.'</xsd:documentation>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="TableConditioningAltered">

<xsd:annotation>

<xsd:documentation source="FieldText"/>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="Row" minOccurs="1" maxOccurs="unbounded">

<xsd:complexType>

<xsd:sequence>

<xsd:element name="D01_ResidentialSpaceConditioningSystemName" type="hvac:ResidentialSpaceConditioningSystemName">

<xsd:annotation>

<xsd:documentation source="FieldText">System ID/ Name</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Autofilled from B01</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D02_ResidentialHvacSystemAreaServed" type="hvac:ResidentialHvacSystemAreaServed">

<xsd:annotation>

<xsd:documentation source="FieldText">SC System Description of Area Served</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Auto-filled from B02</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D03_ResidentialHeatingSystemType" type="hvac:ResidentialHeatingSystemType">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating System Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">User selects from list: CentralGasFurnace, CentralSplitHP, CentralPackagedHP, CentralLargePackagedHP, DuctlessSplitHP (display term Ductless mini-split HP), RoomHP, Boiler, Hydronic, CombinedHydronic, HydronicForcedAir, CombinedHydronicForcedAir, HydronicHP, HydronicHP_ForcedAir, GasPackagedFurnace, GasWallFurnace , GasSpaceHeater, Electric, NonAirSourceHP, WoodHeat, SmallDuctHighVelocityHP, DuctedMultiSplitHP, DuctlessMultiSplitHP, DuctedDuctlessMultiSplitHP, DuctlessVRF_HP, VCHP_IndoorUnitDucted, VCHP_IndoorUnitDuctedAndDuctless, VCHP_IndoorUnitDuctless, DuctedMiniSplitHP, PTHP, SPVHP and NoHeating.</xsd:documentation>

```
            </xsd:annotation>
          </xsd:element>
          <xsd:element name="D04_ResidentialHvacHeatingComponentType"
type="hvac:ResidentialHvacHeatingComponentType" maxOccurs="unbounded">
            <xsd:annotation>
              <xsd:documentation source="FieldText">Altered Heating
Components</xsd:documentation>
              <xsd:documentation source="CalculationsAndRules">Choices for
ResidentialHvacHeatiingComponentType: AllNewHeatingComponents, Boiler, Compressor, FancoilAHU,
GasFurnaceAHU, IndoorCoil, NoHeatingComponentsAltered, OutdoorCondensingUnit,
RefrigerantLineset, TXV_EXV</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
          <xsd:choice maxOccurs="1">
            <xsd:element name="D05_EfficiencyType">
              <xsd:annotation>
                <xsd:documentation source="FieldText">Heating Efficiency
Type</xsd:documentation>
                <xsd:documentation source="CalculationsAndRules">If
ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in
the NotApplicableMessage; Else choices are AFUE, COP, HSPF, HSPF2</xsd:documentation>
              </xsd:annotation>
              <xsd:simpleType>
                <xsd:restriction base="hvac:EfficiencyType">
                  <xsd:enumeration value="AFUE"/>
                  <xsd:enumeration value="COP"/>
                  <xsd:enumeration value="HSPF"/>
                  <xsd:enumeration value="HSPF2"/>
                </xsd:restriction>
              </xsd:simpleType>
            </xsd:element>
```

<xsd:element name="D05_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage; Else choices are AFUE, COP, HSPF.</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="D06_EfficiencyMinimumValueAFUE" type="hvac:EfficiencyMinimumValueAFUE">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage, Else If D05_EfficiencyType == AFUE default minimum result = 80 with display term 80 percent ; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D06_EfficiencyMinimumValueCOP" type="hvac:EfficiencyMinimumValueCOP">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage, Else If D05_EfficiencyType == COP user input numeric.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D06_EfficiencyMinimumValueHSPF" type="hvac:EfficiencyMinimumValueHSPF">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage, Else If D05_EfficiencyType == HSPF default minimum result = 8.0; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D06_EfficiencyMinimumValueHSPF2" type="hvac:EfficiencyMinimumValueHSPF2">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,

Else If D05_EfficiencyType == HSPF2 default minimum result = 6.7;

Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D06_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,</xsd:documentation>

```
                </xsd:annotation>
              </xsd:element>
            </xsd:choice>
            <xsd:element name="D07_ResidentialCoolingSystemType"
type="hvac:ResidentialCoolingSystemType">
              <xsd:annotation>
                <xsd:documentation source="FieldText">Cooling System
Type</xsd:documentation>
                <xsd:documentation source="CalculationsAndRules">Choices for
ResidentialCoolingSystemType:  list:

CentralLargePackagedAC, CentralLargePackagedHP, CentralPackagedAC, CentralPackagedHP,
CentralSplitAC, CentralSplitHP, DuctedMultiSplitAC, DuctedMultiSplitHP, DuctlessMultiSplitAC,
DuctlessMultiSplitHP, DuctedDuctlessMultiSplitAC, DuctedDuctlessMultiSplitHP, DuctlessSplitAC (display
term Ductless mini-split AC) , DuctlessSplitHP (display term Ductless mini-split HP), DuctlessVRF_AC,
DuctlessVRF_HP, EvaporativeDirect, EvaporativeIndirect, EvaporativeIndirectDirect,
EvaporativelyCooledCondenser, GasAbsorptionAC, HydronicHP, HydronicHP_ForcedAir, IceStorageAC,
NoCooling, NonAirCooledAC, NonAirSourceHP, RoomAC, RoomHP, SmallDuctHighVelocityHP,
SmallDuctHighVelocityAC, VCHP_IndoorUnitDucted, VCHP_IndoorUnitDuctedAndDuctless,
VCHP_IndoorUnitDuctless. DuctedMiniSplitAC, DuctedMiniSplitHP,  PTAC, PTHP, SPVAC,
SPVHP</xsd:documentation>
              </xsd:annotation>
            </xsd:element>
            <xsd:element name="D08_ResidentialHvacCoolingComponentType"
type="hvac:ResidentialHvacCoolingComponentType" maxOccurs="unbounded">
              <xsd:annotation>
                <xsd:documentation source="FieldText">Altered Cooling
Components</xsd:documentation>
                <xsd:documentation source="CalculationsAndRules">Choices for
ResidentialHvacCoolingComponentType: AllNewCoolingComponents,  Compressor, FancoilAHU,
IndoorCoil, NoCoolingComponentsAltered, OutdoorCondensingUnit, RefrigerantLineset,
TXV_EXV</xsd:documentation>
              </xsd:annotation>
            </xsd:element>
            <xsd:choice maxOccurs="1">
              <xsd:element name="D09_EfficiencyType">
```

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If ResidentialHvacCoolingComponentType == NoCoolingComponentsAltered then result = N/A stored in the NotApplicableMessage; Else choices are EER, EER2, EERSEER, EER2SEER2, CEER.</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:EfficiencyType">

<xsd:enumeration value="CEER"/>

<xsd:enumeration value="EER"/>

<xsd:enumeration value="EER2"/>

<xsd:enumeration value="EERSEER"/>

<xsd:enumeration value="EER2SEER2"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:element name="D09_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If ResidentialHvacCoolingComponentType == NoCoolingComponentsAltered then result = N/A stored in the NotApplicableMessage; Else choices are EER, EER2, SEER, SEER2, CEER.</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="D10_EfficiencyMinimumValueSEER" type="hvac:EfficiencyMinimumValueSEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D10_EfficiencyMinimumValueSEER2" type="hvac:EfficiencyMinimumValueSEER2">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D10_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="D10b_EfficiencyMinimumValueEER" type="hvac:EfficiencyMinimumValueEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D10b_EfficiencyMinimumValueEER2" type="hvac:EfficiencyMinimumValueEER2">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If D08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

```
                    </xsd:element>
                    <xsd:element name="D10b_EfficiencyMinimumValueCEER"
type="hvac:EfficiencyMinimumValueCEER">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">Cooling Minimum Efficiency Value
EER/EER2/CEER</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">If D08 = no cooling
component altered, then value = N/A;
                          Else user enter value: xx.x; default minimum value for EER and
EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for
CEER=8.7;
                          Allow user to overwrite default value, but flag non-default values and report
in project status notes field;</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                    <xsd:element name="D10b_NotApplicableMessage"
type="comp:NotApplicableMessage">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">Cooling Minimum Efficiency Value
EER/EER2/CEER</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">If D08 = no cooling
component altered, then value = N/A;
                          Else user enter value: xx.x; default minimum value for EER and
EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for
CEER=8.7;
                          Allow user to overwrite default value, but flag non-default values and report
in project status notes field;</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                  </xsd:choice>
                  <xsd:element name="D11_ThermostatType" type="hvac:ThermostatType"
fixed="SetbackThermostat">
                    <xsd:annotation>
```

<xsd:documentation source="FieldText">Required Thermostat Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Result = SetbackThermostat</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="D12_DuctExtendedLengthRange" type="comp:DuctExtendedLengthRange">

<xsd:annotation>

<xsd:documentation source="FieldText">New or Replaced Duct Length</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Calculated field: if B04 DuctedSystem = false, then result = N/A stored in NotApplicableMessage;

Else allow user to select from choices: GT25Ft, LTE25Ft, NoDuctsReplaced stored in DuctExtendedLengthRange

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D12_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">New or Replaced Duct Length</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Calculated field: if B04 DuctedSystem = false, then result = N/A stored in NotApplicableMessage;

Else allow user to select from choices: GT25Ft, LTE25Ft, NoDuctsReplaced stored in DuctExtendedLengthRange

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="D13_DuctRValueLimit" type="hvac:DuctRValueLimit">

<xsd:annotation>

<xsd:documentation source="FieldText">New Duct R-Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If B04 DuctedSystem == false Or D12_NotAppicableMessage == N/A, then result = N/A stored in NotApplicableMessage

Else If A09_ClimateZone == 3, 5, 6 Or 7

result = R6.

Else If A09_ClimateZone == 1, 2, 4 Or InRange(8, 16)

result = R8

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="D13_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">New Duct R-Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If B04 DuctedSystem == false Or DuctExtendedLengthRange == N/A, then result = N/A stored in NotApplicableMessage Else If A09_ClimateZone == InclusiveRange(1,10), 12 Or 13 result = R6. Else result = R8</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="DEndNote1" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Required Documentation:</xsd:documentation>

<xsd:documentation source="AdditionalRequirements">

<d:u>Required Documentation:</d:u>

<d:line1/> LMCI-MCH-01-E - Space Conditioning Systems

<d:line1/> - Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 3, 5-7) and R8 (CZ 1, 2, 4, 8-16)

<d:line1/> LMCI and LMCV-MCH-20-H - Duct Leakage Test required when heating or cooling components are installed in ducted systems, or when more than 25 ft of duct length is replaced

<d:line1/> -Leakage rate compliance: less than or equal to 10% or less than or equal to 7% leakage to outside, or seal all accessible leaks.

<d:line1/> LMCI and LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).

<d:line1/> LMCI and LMCV-MCH-23 Airflow Rate greater than or equal to 300 CFM per ton required when MCH-25 is required.

<d:line1/>

<d:u>Exceptions:</d:u>

<d:line1/>- Duct systems registered with HERS provider as previously sealed are exempt from MCH-20 Duct Leakage Testing requirements.

<d:line1/> - Heating-only systems and Air Handler Furnace changes do not require verification of Air Flow MCH-23, or Refrigerant Charge MCH-25.

<d:line1/> -Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 Duct Leakage Testing requirements.</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="Section_E" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">This Section is applicable only if one or more systems in section B has ResidentialHvacAlterationType == DuctSystemEntirelyNewReplacement; Require one row of data to be entered for each system with ResidentialHvacAlterationType == DuctSystemEntirelyNewReplacement.</xsd:documentation>

<xsd:documentation source="MinOccurs">If this section doesn't apply, display only the section FieldText and the statement 'This section does not apply to this project.'</xsd:documentation>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="TableDuctNew">

<xsd:annotation>

<xsd:documentation source="FieldText"/>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="Row" minOccurs="1" maxOccurs="unbounded">

<xsd:complexType>

<xsd:sequence>

<xsd:element name="E01_ResidentialSpaceConditioningSystemName" type="hvac:ResidentialSpaceConditioningSystemName">

<xsd:annotation>

<xsd:documentation source="FieldText">System ID/ Name</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Autofilled from B01</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E02_ResidentialHvacSystemAreaServed" type="hvac:ResidentialHvacSystemAreaServed">

<xsd:annotation>

<xsd:documentation source="FieldText">SC System Description of Area Served</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Auto-filled from B02</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E03_ResidentialHeatingSystemType" type="hvac:ResidentialHeatingSystemType">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating System Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">User selects from list: CentralGasFurnace, CentralSplitHP, CentralPackagedHP, CentralLargePackagedHP, DuctlessSplitHP (display term Ductless mini-split HP) RoomHP, Boiler, Hydronic, CombinedHydronic, HydronicForcedAir, CombinedHydronicForcedAir, HydronicHP, HydronicHP_ForcedAir, GasPackagedFurnace, GasWallFurnace , GasSpaceHeater, Electric, NoHeating, PTHP, SPVHP, NonAirSourceHP, WoodHeat, SmallDuctHighVelocityHP, DuctedMultiSplitHP, DuctlessMultiSplitHP, DuctedDuctlessMultiSplitHP, DuctlessVRF_HP, DuctedMiniSplitHP,</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E04_ResidentialHvacHeatingComponentType" type="hvac:ResidentialHvacHeatingComponentType" maxOccurs="unbounded">

<xsd:annotation>

<xsd:documentation source="FieldText">Altered Heating Component</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Choices same as those listed in D04; User should select all components from list that have been altered in this project.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="E05_EfficiencyType">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType

== NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage; Else choices are AFUE, COP, HSPF, HSPF2</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:EfficiencyType">

<xsd:enumeration value="AFUE"/>

<xsd:enumeration value="COP"/>

<xsd:enumeration value="HSPF"/>

<xsd:enumeration value="HSPF2"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:element name="E05_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType

== NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage; Else choices are AFUE, COP, HSPF, HSPF2</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="E06_EfficiencyMinimumValueAFUE" type="hvac:EfficiencyMinimumValueAFUE">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage, Else If E05_EfficiencyType == AFUE default minimum result = 80 with display term 80 percent ; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E06_EfficiencyMinimumValueCOP" type="hvac:EfficiencyMinimumValueCOP">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,

Else If E05_EfficiencyType == COP user input numeric.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E06_EfficiencyMinimumValueHSPF" type="hvac:EfficiencyMinimumValueHSPF">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,

Else If E05_EfficiencyType == HSPF default minimum result = 8.0; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E06_EfficiencyMinimumValueHSPF2" type="hvac:EfficiencyMinimumValueHSPF2">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,

Else If E05_EfficiencyType == HSPF2 default minimum result = 6.7; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E06_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then result = N/A stored in the NotApplicableMessage,

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:element name="E07_ResidentialCoolingSystemType" type="hvac:ResidentialCoolingSystemType">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling System Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Choices for ResidentialCoolingSystemType: list:

CentralLargePackagedAC, CentralLargePackagedHP, CentralPackagedAC, CentralPackagedHP, CentralSplitAC, CentralSplitHP, DuctlessSplitAC (display term Ductless mini-split AC) , DuctlessSplitHP (display term Ductless mini-split HP), EvaporativeDirect, EvaporativeIndirect, EvaporativeIndirectDirect, EvaporativelyCooledCondenser, GasAbsorptionAC, HydronicHP, HydronicHP_ForcedAir, IceStorageAC, NoCooling, RoomAC, RoomHP, PTAC, PTHP, SPVAC, SPVHP, NonAirCooledAC, NonAirSourceHP, SmallDuctHighVelocityHP, SmallDuctHighVelocityAC, DuctlessVRF_AC, DuctlessVRF_HP, DuctedMultiSplitAC, DuctedMultiSplitHP, DuctlessMultiSplitAC, DuctlessMultiSplitHP, DuctedDuctlessMultiSplitAC, DuctedDuctlessMultiSplitHP, DuctedMiniSplitAC, DuctedMiniSplitHP,</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E08_ResidentialHvacCoolingComponentType" type="hvac:ResidentialHvacCoolingComponentType" maxOccurs="unbounded">

<xsd:annotation>

<xsd:documentation source="FieldText">Altered Cooling Component</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Choices same as those listed in D08; User should select all components from list that have been altered in this project.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="E09_EfficiencyType">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If ResidentialHvacCoolingComponentType == NoCoolingComponentsAltered then result is N/A stored in the NotApplicableMessage; Else choices are EER, EER2, SEER, SEER2, CEER.</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:EfficiencyType">

<xsd:enumeration value="CEER"/>

<xsd:enumeration value="EER"/>

<xsd:enumeration value="EER2"/>

<xsd:enumeration value="EERSEER"/>

<xsd:enumeration value="EER2SEER2"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:element name="E09_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If ResidentialHvacCoolingComponentType == NoCoolingComponentsAltered then result is N/A stored in the NotApplicableMessage; Else choices are EER, EER2, EERSEER, EER2SEER2, CEER.</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="E10_EfficiencyMinimumValueSEER" type="hvac:EfficiencyMinimumValueSEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E10_EfficiencyMinimumValueSEER2" type="hvac:EfficiencyMinimumValueSEER2">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E10_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="E10b_EfficiencyMinimumValueEER" type="hvac:EfficiencyMinimumValueEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E10b_EfficiencyMinimumValueEER2" type="hvac:EfficiencyMinimumValueEER2">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E10b_EfficiencyMinimumValueCEER" type="hvac:EfficiencyMinimumValueCEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E10b_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If E08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:element name="E11_ThermostatType" type="hvac:ThermostatType" fixed="SetbackThermostat">

<xsd:annotation>

<xsd:documentation source="FieldText">Required Thermostat Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Result = SetbackThermostat</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="E12_DuctRValueLimit" type="hvac:DuctRValueLimit">

<xsd:annotation>

<xsd:documentation source="FieldText">New Duct R-Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If A09_ClimateZone == 3, 5, 6 Or 7

result = R6.

Else If A09_ClimateZone == 1, 2, 4 Or InRange(8, 16)

result = R8

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="EEndNote1" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Required Documentation:</xsd:documentation>

<xsd:documentation source="AdditionalRequirements">

<d:u>Required Documentation:</d:u>

<d:line1/> LMCI-MCH-01-E - Space Conditioning Systems

<d:line1/> - Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 3, 5-7) and R8 (CZ 1, 2, 4, 8-16)

<d:line1/> LMCI and LMCV-MCH-20-H Duct Leakage Test required

<d:line1/> - Leakage rate compliance: les than or equal to 5 percent.

<d:line1/> LMCI and LMCV-MCH-22 Fan Efficacy

<d:line1/> LMCI and LMCV-MCH-23 Airflow Rate

<d:line1/> - Compliance: Fan Efficacy less than or equal to 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow greater than or equal to 350 cfm per ton.

<d:line1/> - Alternative Compliance: LMCI and LMCV-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.

<d:line1/> LMCI and LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).

<d:line1/>

<d:u>Exceptions:</d:u>

<d:line1/> Heating-only systems are exempt from the 0.58 W per cfm and 350 cfm per ton requirements.

<d:line1/>

<d:u>Note:</d:u> An "entirely new or complete replacement duct system" means at least 75% of the duct system is new duct material, and up to 25% may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

<xsd:element name="Section_F" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">This Section is applicable only if one or more systems in section B has ResidentialHvacAlterationType == SpaceConditioningSystemEntirelyNewReplacement; Require one row of data to be entered for each system with ResidentialHvacAlterationType == SpaceConditioningSystemEntirelyNewReplacement.</xsd:documentation>

<xsd:documentation source="MinOccurs">If this section doesn't apply, display only the section FieldText and the statement 'This section does not apply to this project.'</xsd:documentation>

</xsd:annotation>

<xsd:complexType>

<xsd:sequence>

<xsd:element name="TableConditioningNew">

<xsd:annotation>

<xsd:documentation source="FieldText"/>

```
        </xsd:annotation>
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="Row" minOccurs="1" maxOccurs="unbounded">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="F01_ResidentialSpaceConditioningSystemName"
type="hvac:ResidentialSpaceConditioningSystemName">
                    <xsd:annotation>
                      <xsd:documentation source="FieldText">System ID/
Name</xsd:documentation>
                      <xsd:documentation source="CalculationsAndRules">Autofilled from B01 with
first applicable system</xsd:documentation>
                    </xsd:annotation>
                  </xsd:element>
                  <xsd:element name="F02_ResidentialHvacSystemAreaServed"
type="hvac:ResidentialHvacSystemAreaServed">
                    <xsd:annotation>
                      <xsd:documentation source="FieldText">SC System Description of Area
Served</xsd:documentation>
                      <xsd:documentation source="CalculationsAndRules">Auto-filled from
B02</xsd:documentation>
                    </xsd:annotation>
                  </xsd:element>
                  <xsd:element name="F03_ResidentialHeatingSystemType"
type="hvac:ResidentialHeatingSystemType">
                    <xsd:annotation>
                      <xsd:documentation source="FieldText">Heating System
Type</xsd:documentation>
                      <xsd:documentation source="CalculationsAndRules">User selects from list:
CentralGasFurnace, CentralSplitHP, CentralPackagedHP, CentralLargePackagedHP, DuctlessSplitHP
(display term Ductless mini-split HP),  RoomHP, Boiler, Hydronic, CombinedHydronic, HydronicForcedAir,
CombinedHydronicForcedAir, HydronicHP,  HydronicHP_ForcedAir, GasPackagedFurnace,
```

GasWallFurnace , GasSpaceHeater, Electric, NoHeating, PTHP, SPVHP, NonAirSourceHP, WoodHeat, SmallDuctHighVelocityHP, DuctedMultiSplitHP, DuctlessMultiSplitHP, DuctedDuctlessMultiSplitHP, DuctlessVRF_HP, DuctedMiniSplitHP,</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F04_ResidentialHvacHeatingComponentType">

<xsd:annotation>

<xsd:documentation source="FieldText">Altered Heating Component</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Calculated field: If F03 == NoHeating, then result is NoHeatingComponentsAltered, Else the result = AllNewHeatingComponents</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:ResidentialHvacHeatingComponentType">

<xsd:enumeration value="AllNewHeatingComponents"/>

<xsd:enumeration value="NoHeatingComponentsAltered"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="F05_EfficiencyType">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04 == NoHeatingComponentsAltered result = N/A stored in the NotApplicableMessage, Else user selects from choices AFUE, COP, HSPF, HSPF2</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:EfficiencyType">

<xsd:enumeration value="AFUE"/>

<xsd:enumeration value="COP"/>

<xsd:enumeration value="HSPF"/>

<xsd:enumeration value="HSPF2"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:element name="F05_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04 == NoHeatingComponentsAltered result = N/A stored in the NotApplicableMessage, Else user selects from choices AFUE, COP, HSPF, HSPF2</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="F06_EfficiencyMinimumValueAFUE" type="hvac:EfficiencyMinimumValueAFUE">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then

result = N/A stored in the NotApplicableMessage,

Else If F05_EfficiencyType == AFUE

default minimum result = 80 with display term 80 percent ; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F06_EfficiencyMinimumValueCOP" type="hvac:EfficiencyMinimumValueCOP">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then

result = N/A stored in the NotApplicableMessage,

Else If F05_EfficiencyType == COP

user input numeric.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F06_EfficiencyMinimumValueHSPF" type="hvac:EfficiencyMinimumValueHSPF">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then

result = N/A stored in the NotApplicableMessage,

Else If F05_EfficiencyType == HSPF

default minimum result = 8.0; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F06_EfficiencyMinimumValueHSPF2" type="hvac:EfficiencyMinimumValueHSPF2">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then

result = N/A stored in the NotApplicableMessage,

Else If F05_EfficiencyType == HSPF2

default minimum result = 6.70; Allow user to overwrite the default minimum value but, flag it as a non-default value and report it in project status notes field.

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F06_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Heating Minimum Efficiency Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F04_ResidentialHvacHeatiingComponentType == NoHeatingComponentsAltered then

result = N/A stored in the NotApplicableMessage

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:element name="F07_ResidentialCoolingSystemType" type="hvac:ResidentialCoolingSystemType">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling System Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Choices for ResidentialCoolingSystemType: list:

CentralLargePackagedAC, CentralLargePackagedHP, CentralPackagedAC, CentralPackagedHP, CentralSplitAC, CentralSplitHP, DuctlessSplitAC (display term Ductless mini-split AC) , DuctlessSplitHP (display term Ductless mini-split HP), EvaporativeDirect, EvaporativeIndirect, EvaporativeIndirectDirect, EvaporativelyCooledCondenser, GasAbsorptionAC, HydronicHP, HydronicHP_ForcedAir, IceStorageAC, NoCooling, RoomAC, RoomHP, NonAirCooledAC, NonAirSourceHP, SmallDuctHighVelocityHP,

SmallDuctHighVelocityAC, DuctlessVRF_AC, DuctlessVRF_HP, DuctedMultiSplitAC, DuctedMultiSplitHP, DuctlessMultiSplitAC, DuctlessMultiSplitHP, DuctedDuctlessMultiSplitAC, DuctedDuctlessMultiSplitHP, DuctedMiniSplitAC, DuctedMiniSplitHP, SPVAC, SPVHP, PTAC, PTHP.</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F08_ResidentialHvacCoolingComponentType">

<xsd:annotation>

<xsd:documentation source="FieldText">Altered Cooling Component</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Calculated field: If ResidentialCoolingSystemType == NoCooling then result = NoCoolingComponentsAltered Else

result = AllNewCoolingComponents,</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:ResidentialHvacCoolingComponentType">

<xsd:enumeration value="AllNewCoolingComponents"/>

<xsd:enumeration value="NoCoolingComponentsAltered"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="F09_EfficiencyType">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 ResidentialHvacCoolingComponentType == NoCoolingComponents, then result = N/A stored in NotApplicableMessage, Else choices are SEER, SEER2, EER, EER2, CEER</xsd:documentation>

</xsd:annotation>

<xsd:simpleType>

<xsd:restriction base="hvac:EfficiencyType">

<xsd:enumeration value="CEER"/>

<xsd:enumeration value="EER"/>

<xsd:enumeration value="EER2"/>

<xsd:enumeration value="EERSEER"/>

<xsd:enumeration value="EER2SEER2"/>

</xsd:restriction>

</xsd:simpleType>

</xsd:element>

<xsd:element name="F09_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Efficiency Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 ResidentialHvacCoolingComponentType == NoCoolingComponents, then result = N/A stored in NotApplicableMessage, Else choices are EERSEER, EER2SEER2, EER, EER2, CEER</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:choice maxOccurs="1">

<xsd:element name="F10_EfficiencyMinimumValueSEER" type="hvac:EfficiencyMinimumValueSEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value SEER/SEER2</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08= no cooling component altered, then value =N/A;

Else user enter value: xx.x; default minimum value for EER/SEER=14;or default minimum value for EER2/SEER2=13.4;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

```
                    </xsd:element>
                    <xsd:element name="F10_EfficiencyMinimumValueSEER2"
type="hvac:EfficiencyMinimumValueSEER2">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">Cooling Minimum Efficiency Value
SEER/SEER2</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">If F08= no cooling
component altered, then value =N/A;
                          Else user enter value:  xx.x;  default minimum value for EER/SEER=14;or
default minimum value for EER2/SEER2=13.4;
                          Allow user to overwrite default value, but flag non-default values and report
in project status notes field;</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                    <xsd:element name="F10_NotApplicableMessage"
type="comp:NotApplicableMessage">
                      <xsd:annotation>
                        <xsd:documentation source="FieldText">Cooling Minimum Efficiency Value
SEER/SEER2</xsd:documentation>
                        <xsd:documentation source="CalculationsAndRules">If F08= no cooling
component altered, then value =N/A;
                          Else user enter value:  xx.x;  default minimum value for EER/SEER=14;or
default minimum value for EER2/SEER2=13.4;
                          Allow user to overwrite default value, but flag non-default values and report
in project status notes field;</xsd:documentation>
                      </xsd:annotation>
                    </xsd:element>
                  </xsd:choice>
                  <xsd:choice maxOccurs="1">
                    <xsd:element name="F10b_EfficiencyMinimumValueEER"
type="hvac:EfficiencyMinimumValueEER">
                      <xsd:annotation>
```

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F10b_EfficiencyMinimumValueEER2" type="hvac:EfficiencyMinimumValueEER2">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F10b_EfficiencyMinimumValueCEER" type="hvac:EfficiencyMinimumValueCEER">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F10b_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">Cooling Minimum Efficiency Value EER/EER2/CEER</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If F08 = no cooling component altered, then value = N/A;

Else user enter value: xx.x; default minimum value for EER and EER/SEER=11.7; or default minimum value for EER2 and EER2/SEER2=11.2; or default minimum value for CEER=8.7;

Allow user to overwrite default value, but flag non-default values and report in project status notes field;</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

<xsd:element name="F11_ThermostatType" type="hvac:ThermostatType" fixed="SetbackThermostat">

<xsd:annotation>

<xsd:documentation source="FieldText">Required Thermostat Type</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">Result = SetbackThermostat</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:choice maxOccurs="1">

<xsd:element name="F12_DuctRValueLimit" type="hvac:DuctRValueLimit">

<xsd:annotation>

<xsd:documentation source="FieldText">New Duct R-Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If B04_DuctedSystem== false. result is N/A stored in NotApplicableMessage

Else If A09_ClimateZone == 3, 5, 6 Or 7, then

result = R6.

Else If A09_ClimateZone == 1,2, 4 Or InRange(8, 16)

result = R8

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

<xsd:element name="F12_NotApplicableMessage" type="comp:NotApplicableMessage">

<xsd:annotation>

<xsd:documentation source="FieldText">New Duct R-Value</xsd:documentation>

<xsd:documentation source="CalculationsAndRules">If B04-DuctedSystem== false.

result is N/A

End If</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:choice>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

</xsd:sequence>

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<xsd:element name="FEndNote1" minOccurs="0">

<xsd:annotation>

<xsd:documentation source="FieldText">Required Documentation:</xsd:documentation>

<xsd:documentation source="AdditionalRequirements">

<d:u>Required Documentation:</d:u>

<d:line1/> LMCI-MCH-01-E - Space Conditioning Systems

<d:line1/> - Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 3, 5-7) and R8 (CZ 1, 2, 4, 8-16)

<d:line1/> LMCI and LMCV-MCH-20-H Duct Leakage Test required

<d:line1/> - Leakage rate compliance: less than or equal to 5 percent.

<d:line1/> LMCI and LMCV-MCH-22 Fan Efficacy

<d:line1/> LMCI and LMCV-MCH-23 Airflow Rate Verification

<d:line1/> - Compliance: Fan Efficacy less than or equal to 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow greater than or equal to 350 cfm per ton.

<d:line1/> - Alternative Compliance: LMCI and LMCV-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.

<d:line1/> LMCI and LMCV-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).

<d:line1/>

<d:u>Exceptions:</d:u>

<d:line1/> Heating-only systems are exempt from the 0.58 W per cfm and 350 cfm per ton requirements.

<d:line1/>

<d:u>Note:</d:u> An "entirely new or replacement duct system" means at least 75% of the duct system is new duct material, and up to 25% may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage</xsd:documentation>

</xsd:annotation>

</xsd:element>

</xsd:sequence>

</xsd:complexType>

</xsd:element>

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OF COMPLIANCE"/>
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              <xsd:element name="Footer" type="comp:Footer"/>
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LMCCMCH01bE compliance report.</xsd:documentation>
    </xsd:annotation>
  </xsd:element>
</xsd:schema>
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