**Revision Batch 2019.1.001**

CF1R-ADD-01

* A14 – revised field name and added enumerated value
  + “**Fenestration Exceptions**”
  + Add “**Installing storage water heater ≤ 55 gal**”
* E02 – revised column header and pseudo code
  + “**Insulation** R-value”
  + <<**User select from list: \*R-0; \*R-4; \*R-5; \*R-7; \*R-8; \*R-10 vertical; \*R-10 vertical and R-7 horizontal; or \*NA; If E01 = ‘Heated slab’ or A09 = 16, then ‘NA’ not allowed Note: Either R-value or U-factor is required, not both**>>
* E03 – revised column header and pseudo code
  + “**Insulation** U-factor”
  + If E01 = ‘Heated slab’ or A09 = 16, then require User Input: DecimalNonnegative; else allow NA **Note: Either R-value or U-factor is required, not both**>>
* E04 – modified pseudo code
  + <<**If E02 = NA, then value = NA; elseif A09 = 16 and E01 = “Slab on grade”, then value = R-7; Else if A09 = 1-15, then value = NA; elseif A09 = 1-2, 11, 13-14, or 16 and E01 = “Concrete raised”, then value = R-8; elseif A09 = 3-10 and E01 = “Concrete raised”, then value = R-0; elseif A09 = 12 or 15 and E01 = “Concrete raised”, then value = R-4; elseif A09 = 1-15 and E01 = “Heated slab”, then R-value = R-5; elseif A09 = 16 and E01 = “Heated slab”, user selects from \*R-10 vertical, or \*R-10 vertical and R-7 horizontal**>>
* E05 – modified pseudo code
  + <<**If E03 = NA, then value = NA; elseif A09 = 16 and E01 = “Slab on grade”, then value = 0.58; Else if A09 = 1-15, then value = NA; elseif A09 = 1-2, 11, 13-14, or 16 and B02 = “Concrete raised”, then value = 0.092; elseif A09 = 3-10 and B02 = “Concrete raised”, then value = 0.269 if A09 = 12 or 15 and B02 = “Concrete raised”, then value = 0.138; elseif E01 = “Heated slab”, then value = NA Note: Range check, value in E03 must be less than or equal to E05 in order to comply**>>
* F01 – revised pseudo code
  + << if No ~~or NA~~ is selected, display ‘Do NOT PROCEED’>>
* F02 – revised pseudo code
  + <<if **F01 = NA, require** user Input: Text; **Else optional input**>>
* G07 – revised pseudo code
  + <<… DecimalNonnegative **(x.xx, value must be > 0 and < 1)** value from the CRRC directory…>>
* G08 – revised pseudo code
  + <<… DecimalNonnegative **(x.xx, value must be > 0 and < 1)**>>
* G09 – revised pseudo code
  + <<… DecimalNonnegative **(x.xx, value must be > 0 and < 1)**>>
* H06 – revised pseudo code
  + <<**if A14 = Installing storage water heater ≤ 55 gal, then value = 0.24; else value =** 0.30>>
* I21 – revised pseudo code
  + <<If I02 contains fixed or operable window and if all associated values listed in column I09 are less than or equal to **H06** then enter the largest value from list…>>
* L14 – revised pseudo code
  + <<if ~~A11~~ **L02** = ~~Multifamily with central water heating~~ **Central**, then value = **Multifamily:** Recirculation ~~with temperature modulation and monitoring~~ demand control; Elseif ~~A11~~ **L02** ≠ **Central** ~~Single Family or Multifamily~~ and if L03 = 1 or 3, then…>>
* Section N – new table

|  |  |  |
| --- | --- | --- |
| **N. IAQ Fan Information** | | |
| <<If A13= one of the items in the following list:  \*ADU Addition < 300 ft2  \*ADU Addition > 300 to < 400 ft2  \*ADU Addition > 400 to < 700 ft2  \*ADU Addition > 700 to < 1000 ft2 then display this section,  else display the standard “The Section Does Not Apply” message>> | | |
| 01 | 02 | 03 |
| Fan Name | IAQ Type | Comments |
| <<user input text>> | <<User pick from list:  \*\*Supply  \*\*Exhaust; or  \*\*Balanced; or  \*\*Balanced – ERV; or  \*\*Balanced – HRV; or  \*\*Central Fan Integrated (CFI); or  \*\*Central Ventilation System – Supply; or  \*\*Central Ventilation System – Exhaust; or  \*\*Central Ventilation System – Balanced>> | <<user input text>> |
|  |  |  |

CF1R-ALT-01

* A06 – Revised schema (correct in pseudo code)
  + *DwellingUnitsWithAdditionsCount 🡪 DwellingUnitsWithAlterationsCount*
* A14 – revised pseudo code
  + << if Climate Zone listed in A09 equals 1-9 or 16 ~~and~~ **or** project scope in A13 doesn’t includes selection Roof Replacement >50% then equals N/A…>>
* J14 – revised pseudo code
  + <<if ~~A11~~ **J02** = ~~Multifamily with central water heating~~ **Central**, then value = **Multifamily:** Recirculation ~~with temperature modulation and monitoring~~ demand control; Elseif ~~A11~~ **J02** ≠ **Central** ~~Single Family or Multifamily~~ and if J03 = 1 or 3, then…>>

CF1R-ALT-02

* Section E and F – revised static text
  + -Compliance: Fan Efficacy ≤ 0.58 W/cfm **for non-gas furnaces and 0.45 W/cfm for gas furnaces** and System Airflow ≥ 350 cfm/ton.

CF1R-ENV-04

* A01 – added new row
  + **“Tag/ID”**
  + **<<reference from CF1R>>**
* B02 – revised pseudo code
  + <<**if B01 = Yes, then** user input: numeric **(x.xx, value must be > 0 and < 1); else display NA**>>
* B03 – revised pseudo code
  + <<**if B01 = No, then** user input: numeric **(x.xx, value must be > 0 and < 1); else display NA**>>
* B04 – revised pseudo code
  + <<**if B01 = No, then user input: numeric (x.xx, value must be > 0 and < 1); else display NA**>>
* B05 – revised pseudo code
  + <<user input: numeric **(x.xx, value must be > 0 and < 1)**>>
* C01 – revised pseudo code
  + <<**user input: numeric (xxx, value must be > 0 and <= 100)**>>

CF1R-ENV-06

* A05 – revised column header
  + “**Mass** Thickness (Inches)”
* B05 – added new column
  + **“Exterior or Interior Insulation?”**
  + **<<user select from list: \*Exterior; or \*Interior>>**
* B08 – revised pseudo code
  + <<**if B05 = Exterior, then user input: number (Decimal1PlaceNonnegative); else value = NA**>>
* B09 – revised pseudo code
  + <<**if B05 = Interior, then user input: number (Decimal1PlaceNonnegative); else value = NA**>>
* C03 – revised pseudo code
  + <<**if B08 = NA, then value = 0; else reference value from B08**>>
* C04 – revised pseudo code
  + <<**if B09 = NA, then value = 0; else reference value from B09**>>

CF1R-NCB-01

* A14 – revised field name and added enumerated value
  + “**Fenestration Exceptions**”
  + Add “**Installing storage water heater ≤ 55 gal**”
* E02 – revised pseudo code
  + <<**User select from list: \*R-0; \*R-4; \*R-5; \*R-7; \*R-8; \*R-10 vertical; \*R-10 vertical and R-7 horizontal; or \*NA; If E01 = ‘Heated slab’ or A09 = 16, then ‘NA’ not allowed Note: Either R-value or U-factor is required, not both**>>
* E03 – revised pseudo code
  + <<**If E01 = ‘Heated slab’ or A09 = 16, then require** User Input: DecimalNonnegative; else allow NA **Note: Either R-value or U-factor is required, not both**>>
* E04 – revised pseudo code
  + <<**If E02 = NA, then value = NA; else**If A09 = 16 and E01 = …>>
* E05 – revised pseudo code
  + <<**If E03 = NA, then value = NA; else**If A09 = 16 and E01 = “slab on grade”, then value = **0.58**… **Note: Range check, the value in E03 must be less than or equal to E05 in order to comply**>>
* G07 - revised pseudo code
  + <<if G04 = ‘Not in an applicable climate zone’ then result = NA; Elseif the user knows what they are installing, the user enters the DecimalNonnegative value from the CRRC Directory **(x.xx, value must be > 0 and < 1)**; Else allow user to enter NA>>
* G08 – revised pseudo code
  + <<if G04 = ‘Not in an applicable climate zone’ then result = NA; Else User Input: DecimalNonnegative **(x.xx, value must be > 0 and < 1)**>>
* G09 – revised pseudo code
  + <<if G04 = ‘Not in an applicable climate zone’ then result = NA; Else User Input: DecimalNonnegative **(x.xx, value must be > 0 and < 1)**>>
* G10 – revised pseudo code
  + <<if **G04~~3~~** ≠ ‘SRI’, then result is NA; Else user enters value from CRRC Directory or from a completed SRI Worksheet>>
* I03 – revised pseudo code
  + <<**if A14 = Installing storage water heater ≤ 55 gal, then value = 0.24; else** value = 0.30>>
* J21 – revised pseudo code
  + <<If J02 = fixed or operable window, and if all associated values listed in column J09 are less than or equal to **I03**, then enter the largest single value from list…>>
* K09 – revised pseudo code
  + **if K08 = Ductless, then value = No ducts, else** if F01 = C, then value = Conditioned Space; Else **if F01 = Option B, then** user selects from list: Conditioned space, **~~No ducts,~~** Ducts located in multiple places, Outdoor locations, Unconditioned attic, Unconditioned crawl space, Unconditioned garage>>
* Section L – revised pseudo code
  + <<if A09 = 8 – 14 **and A11 = Single Family,** show Table L; else display the “section does not apply” message **(if A11 = Multi Family or Multi Family with central water heating, do not show table)**>>
* L07 – Revised header and pseudo code
  + Minimum Attic Vent Free Area (in2) (~~Required~~ **Total** Airflow Rate x 0.192)
  + <<calculated field: [(column L0**3**~~1~~)\* 0.192]>>
* M07 – revised schema (pseudo code correct)
  + "CalculationsAndRules">If A11\_ResidentialLowriseBuildingType != MultiFamilyCentralWH then If M03\_WaterHeatingSystemOption == ~~Option1InstantaneousGas~~**Option2CompactDrainRecovery55Gal** user input allowed LTE 55 gallons; Else If M03\_WaterHeatingSystemOption == Option3StorageGT55Gal user input allowed GT 55 gallons; Else result = N/A stored in NotApplicableMessage; Else If A11\_ResidentialLowriseBuildingType == MultiFamilyCentralWH user input.</xsd:documentation>
* M11 – revised pseudo code
  + <<if A09 is 1-9 and M03 = ‘A’, then value = 0.20; if A09 is 1-9 and M03 = ‘B’, then value = 0.15; if A09 is 10-16 and M03 = ‘A’, then value = 0.35; if A09 is 10-16 and M03 = ‘B’, then value = 0.30, **else value = N/A**>>
* M14 – revised pseudo code
  + <<if ~~A11~~ **M02** = ~~Multifamily with central water heating~~ **Central**, then value = **Multifamily:** Recirculation ~~with temperature modulation and monitoring~~ demand control; Elseif ~~A11~~ **M02** ≠ **Central** ~~Single Family or Multifamily~~ and if M03 = 1 or 3, then…>>
* O05 – revised pseudo code
  + <<~~autofilled from~~ **sum of** M12>>
* Section P – new table

|  |  |  |
| --- | --- | --- |
| **P. IAQ Fan Information** | | |
| 01 | 02 | 03 |
| Fan Name | IAQ Type | Comments |
| <<user input text>> | <<User pick from list:  \*\*Supply  \*\*Exhaust; or  \*\*Balanced; or  \*\*Balanced – ERV; or  \*\*Balanced – HRV; or  \*\*Central Fan Integrated (CFI); or  \*\*Central Ventilation System – Supply; or  \*\*Central Ventilation System – Exhaust; or  \*\*Central Ventilation System – Balanced>> | <<user input text>> |
|  |  |  |

CF2R-ENV-01

* + Section B – static text
    - 01 ~~For new construction, installed window U-factor and SHGC values should be equal to or less than that listed on the CF1R~~. **The U-factor of the installed windows for new construction and existing buildings must be equal to or less than those listed on the CF1R.**
    - 02 ~~For existing buildings the U-factor and SHGC values should be the same or better than the required Energy Commission prescriptive requirements.~~ **The SHGC of the installed windows for new construction and existing buildings must be equal to or less than those listed on the CF1R in climate zones 2, 4 and 8-15. For climate zones 1, 3, 5 and 16 there is no SHGC requirement.**
    - 03 Temporary labels ~~should~~ **are** not **to** be removed until verified by the building inspector.

CF2R-ENV-03

* + C05 – revised pseudo code
    - <<~~if parent = CF1R-PRF, then pull from CF1R; else NA~~ **user input, text, maximum 28 characters**>>
  + C06 – revised pseudo code
    - <<~~if parent = CF1R-PRF, then pull from CF1R; else NA~~ **user input, text, maximum 28 characters**>>

CF2R-ENV-04

* A01 – revised schema
  + Add a display term for *CeilingCathedral*
* A05 – revised pseudo code
  + <<**if A04 = Unventilated, then value = NA; else** **u**~~U~~ser pick from list: \*1/150, or \*1/300>>
* F03 – revised static text
  + “…Department of Consumer Affairs, Bureau of **Electronic and Appliance Repair,** Home Furnishings and Thermal Insulation,…”
  + Section H. – revised pseudo code
    - “…Elseif parent CF1R = PRF and **L08\_CoolRoofToBeInstalled = false, then report section header and standard “This section does not apply” message**”
  + H10 – revised pseudo code
    - “User input from CF1R **proposed Note: NA allowed if CF1R = NA**>>
* H11 – revised pseudo code
  + <<User input from CF1R proposed **Note: NA allowed if CF1R = NA**>>
* H12 – revised pseudo code
  + <<User input from CF1R proposed **Note: NA allowed if CF1R = NA**>>
  + Section I. – revised pseudo code
    - “…Elseif parent CF1R = PRF and **L08\_CoolRoofToBeInstalled = false, then report section header and standard “This section does not apply” message**”

CF2R-MCH-01a

* + B03 & B04 – revised pseudo code
    - Added new options
  + C12 – Revised schema (correct in pseudo code)
    - Missing Central Fan Ventilation Cooling fan Efficacy field in schema
  + D02 – revised pseudo code
    - <<user input, text, 15 characters maximum;

Require each entry to be unique in this dwelling unit **i.e. unique within the scope of this instance of the MCH-01**>>

* D04 – D06 & D08 – revised pseudo code
  + Edited options
* Section E header in pseudo code – added new system option triggers
* E03 & E04
* Section F header in pseudo code– added new system option triggers
* Section G header in pseudo code – added new system option triggers
* G03 – G06 & G10
* Section H header in pseudo code – added new system option triggers
* Section I header in pseudo code – added new system option triggers
* Section J header in pseudo code – added new triggers
* J03
* J12 – 14
* Section K header in pseudo code – added new triggers
* M04 – M09

CF2R-MCH-01b

* B01 – revise pseudo code
  + <<reference values from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required>>;

~~do not allow duplicate system names to be used for this dwelling unit>>~~

* B02 – revised pseudo code
  + <<reference values from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>

~~Require each entry to be unique in this dwelling unit i.e. unique within the scope of this instance of the MCH-01 do not allow duplicate system descriptions to be used for this dwelling unit>>~~

* C03
* C05 – C07
* C11
* C12 – new column
* Section F – table replaced with new table
* Section G header in pseudo code – added new system option triggers
* G03 – revised pseudo code
  + Added new options
* G13
* G14 & G15 – new columns
* J05 – J09

CF2R-MCH-01c

* B06 & B07
* B10
* C04 & C05 – revised pseudo code
  + Added new options
* C11 – revised pseudo code
  + Added new options
* Section D header in pseudo code – added new system option triggers
* D03 & D04
* Section E header in pseudo code – added new system option triggers
* E03 & E04
* Section F header in pseudo code– added new system option triggers
* F03, F05 – F06
* F10 – new column
* Section G header in pseudo code – added new system option triggers
* Section H header in pseudo code – added new system option triggers
* H07 & H08
* Section I header in pseudo code – added new system option triggers
* I03
* I11 & I12
* I13 & I14 – new columns
* L04 – L08

CF2R-MCH-01d

* B03 & B04 – revised pseudo code
  + Added new options
* D04 – D06 – revised pseudo code
  + Added new options
* D08
* D11 – deleted column
* D13 – new column
* Section F header in pseudo code– added new system option triggers
* F03 – F04
* Section G header in pseudo code – added new system option triggers
* Section H header in pseudo code – added new system option triggers
* H03 – H06
* H10 – deleted column
* Section I header in pseudo code – added new system option triggers
* Section J header in pseudo code – added new system option triggers
* Section K – completely revised section
* Section L header in pseudo code – added new triggers
* L03 & L13
* L14 & L15 – new columns
* O04 – O10

CF2R/CF3R-MCH-20 b

* A03 – revised static text
  + Indoor Unit Name **or Description of Area Served**
* A09 – new row
  + **Is the system type Small Duct High Velocity (SDHV)?**
  + **<<if the system type on the MCH-01= one of the following two:**

**\*small duct high velocity AC**

**\*small duct high velocity HP**

**then value=yes;**

**else value=no>>**

CF2R -MCH-20 a,c,d,e

* A03 – revised static text
  + Indoor Unit Name **or Description of Area Served**
* A09 – new row
  + **Is the system type Small Duct High Velocity (SDHV)?**
  + **<<if the system type on the MCH-01= one of the following two:**

**\*small duct high velocity AC**

**\*small duct high velocity HP**

**then value=yes;**

**else value=no>>**

* B10 – revised pseudo code
* <<calculated field: numeric xxx:

if AHUAirflowMethod= CoolingSystemMethod **and A09 = no,**

then AHUAirflow=CondenserNomCoolCapacityTon\*400\* LeakageFactor;

**elseif AHUAirflowMethod = CoolingSystemMethod and A09=yes,**

**then value=CondenserNomCoolCapacityTon \*250\*LeakageFactor; …>>**

CF3R -MCH-20 a,c,d,e

* A03 – revised static text (CF3R-MCH-20c only – add this field which is missing in the schema)
  + Indoor Unit Name **or Description of Area Served**
* A08 – CF3R-MCH-20c only – add this field which is missing in the schema
* A09 – new row
  + **Is the system type Small Duct High Velocity (SDHV)?**
  + **<<if the system type on the MCH-01= one of the following two:**

**\*small duct high velocity AC**

**\*small duct high velocity HP**

**then value=yes;**

**else value=no>>**

* B10 – revised pseudo code
* <<calculated field: numeric xxx:

**elseif AHUAirflowMethod= DefaultAirflowMethod then**

**AHUAirflow=ZonedCondFloorArea\*0.5\* LeakageFactor;**

if AHUAirflowMethod= CoolingSystemMethod **and A09 = no,**

then AHUAirflow=CondenserNomCoolCapacityTon\*400\* LeakageFactor;

**elseif AHUAirflowMethod = CoolingSystemMethod and A09=yes,**

**then value=CondenserNomCoolCapacityTon \*250\*LeakageFactor; …>>**

CF2R/CF3R-MCH-21

* + A03 – new row
    - **Indoor Unit Name or Description of Area Served**
    - **<<Text referenced from MCH-01>>**
  + Section E – revised pseudo code
    - <<This table only shown if A07 **or A08** indicates the table is applicable, else display the "section does not apply" message >>

CF2R/CF3R-MCH-22 – pseudo code

* + A03 – new row
    - **Indoor Unit Name or Description of Area Served**
    - **<<auto filled text: referenced from CF2R/3R-MCH23>>**
  + A11
    - Use *CFVCS\_Type* instead of *CentralFanVentilationCooling*
  + B02 – revised pseudo code
    - **<<calculated field:**

**If MCH-23 variant = MCH-23a, then display version MCH-22a;**

**If MCH-23 variant = MCH-23b, then display version MCH-22b;**

**If MCH-23 variant = MCH-23e, then display version MCH-22c;**

**If MCH-23 variant = MCH-23f, then display version MCH-22d;**

**If MCH-23 variant = MCH-23c and A07 = ZonallyControlled and A06 = SingleSpeed, then display MCH-22b; Else display version MCH-22a;**

**If MCH-23 variant = MCH-23d and A12 = ‘Variable CFVCS’ or ‘Fixed CFVCS’, then display version MCH-22c; Else display version MCH-22a>>**

CF3R-MCH-22

* + Section A – revised pseudo code (Word doc only – schema correct)
    - <<auto filled text: referenced from CF**3**~~2~~R-MCH-23>>

CF2R/CF3R-MCH-23

* + A05 – revised static text
    - Nominal Cooling Capacity (tons) ~~of Condenser~~
* A05 – fully revised pseudo code
* A09 – revised schema (pseudo code correct)
  + Allow N/A as an option
  + A12 – pseudo code
    - <<Calculated Field: Referenced from MCH-01, **if MCH-01 variant is b or c, then display ‘Not a CFVCS’**, If B05 Central Fan Ventilation Cooling System Type = Variable, then display ‘Variable CFVCS’, ElseIf Type = Fixed, then display ‘Fixed CFVCS’, otherwise display ‘Not a CFVCS’>>
* D01 – revised pseudo code
  + Elseif parent is MCH-01a, and B1**0**~~1~~ ≠ D09, then value = 350

CF3R-MCH-23d

* + E03 – revised pseudo code (Word doc only – schema correct)
    - <<If A12 = ‘Fixed CFVCS’, then if **E**~~D~~02≥**E**~~D~~01, result = "System ventilation airflow rate complies"

ElseIf A12 = ‘Variable CFVCS’, then if **E**~~D~~02≤**E**~~D~~01, result = "System ventilation airflow rate complies"…

CF3R-MCH-23e & f

* A12 – revised pseudo code
  + …If B0**5**~~6~~ Central Fan Ventilation Cooling System Type = Variable, then display ‘Variable CFVCS’…
* E03/F03 – revised pseudo code (Word doc only – schema correct)
  + - <<If A12 = ‘Fixed CFVCS’, then if **E**~~D~~02≥**E**~~D~~01, result = "System ventilation airflow rate complies"

ElseIf A12 = ‘Variable CFVCS’, then if **E**~~D~~02≤**E**~~D~~01, result = "System ventilation airflow rate complies"…

* + - <<If A12 = ‘Fixed CFVCS’, then if ~~D~~**F**02≥**F**~~D~~01, result = "System ventilation airflow rate complies"

ElseIf A12 = ‘Variable CFVCS’, then if **F**~~D~~02≤**F**~~D~~01, result = "System ventilation airflow rate complies"

CF2R-MCH-24

* + D03 – new row
    - **ACH50**
    - **<<value = ((D02 \* 60) / Building volume from CF1R)>>**
  + F01 – revised pseudo code
    - <<… elseif A01 = required, then (value) =E01\*60/(Building Volume pulled from ~~MCH-27~~**CF1R**) and display text: “Enclosure Air Leakage Rate is (value) ACH50>>

CF2R/CF3R-MCH-25 a, b, e

* A01 – revised static text and schema
  + **Space Conditioning** System Identification or Name
  + *HvacSystemName* to *ResidentialSpaceConditioningSystemName*
* A02 – revised static text
  + **Space Conditioning** System Location or Area Served
* A12 – revised pseudo code
  + <<(reference data on MCH-01: MCH-01a section J field 12; or MCH-01b section G field ~~09~~**13**; or MCH-01c section I field 11, or MCH-01d section L field ~~11~~**13**)
* Section E – replaced table with new table

CF2R/CF3R-MCH-25 c

* A01 – revised static text and schema
  + **Space Conditioning** System Identification or Name
  + *HvacSystemName* to *ResidentialSpaceConditioningSystemName*
* A02 – revised static text
  + **Space Conditioning** System Location or Area Served
* A12 – revised pseudo code
  + <<(reference data on MCH-01: MCH-01a section J field 12; or MCH-01b section G field ~~09~~**13**; or MCH-01c section I field 11, or MCH-01d section L field ~~11~~**13**)
* Section D – replaced table with new table

CF3R-MCH-25d

* A01 – revised static text and schema
  + **Space Conditioning** System Identification or Name
  + *HvacSystemName* to *ResidentialSpaceConditioningSystemName*
* A02 – revised static text
  + **Space Conditioning** System Location or Area Served
* Section D – replaced table with new table

CF2R -MCH-25 f

* A01 – revised static text and schema
  + **Space Conditioning** System Identification or Name
  + *HvacSystemName* to *ResidentialSpaceConditioningSystemName*
* A02 – revised static text
  + **Space Conditioning** System Location or Area Served
* A12 – revised pseudo code
  + <<(reference data on MCH-01: MCH-01a section J field 12; or MCH-01b section G field ~~09~~**13**; or MCH-01c section I field 11, or MCH-01d section L field ~~11~~**13**)
* Section D – replaced table with new table

CF2R/3R-MCH-26

* A03 – remove row
  + Remove Indoor Unit Name field
* A04 (was A05) – fully revised pseudo code
* A06 – new row
  + Status: HSPF Performance Compliance Credit Check
  + <<calculated field: if the CF1R flags the requirement for HERS verification of HSPF Performance, then result = Yes; else result = No>>
* Section B – completely revised table
* B04 – new column
* B09 and B10 (was B08 and B09) – revised column header
  + **Installed** ~~Air Handler,~~ Furnace ~~or Fan Coil - Installed~~ Manufacturer (Model) Name
* Section C – completely revised table
* C04 – new column
* C07 and C08 (was 06 and 07)
  + ~~Inside~~ **Indoor** Unit -Installed Manufacturer (Model) Name
* C09 and C10 (was C08 and C09) – revised column header
  + **Installed** ~~Air Handler,~~ Furnace ~~or Fan Coil – Installed~~ Manufacturer (Model) Number
* Section D header – revised pseudo code
  + <if ~~A04~~ **A03** equal to "No " then display the "section does not apply" message; else display Table D>>
* Section D end note – revised static text
  + Signature by responsible ~~party~~ **person** ~~below~~ **on this compliance document** certifies that the installed cooling equipment meets or exceeds the required value listed on the CF1R.
* Section E header – revised pseudo code
  + <<if ~~A05~~ **A04** equal to "No" then display the "section does not apply" message; else display Table E>>
* Section E end note – revised static text
  + Signature by responsible ~~party~~ **person** ~~below~~ **on this compliance document** certifies that the installed cooling equipment meets or exceeds the required value listed on the CF1R.
* Section F header – revised pseudo code
  + <<if ~~A06~~ **A05** equal to "No " then display the "section does not apply" message; else display Table F>>
* F03 – revised pseudo code
  + <<auto filled from CF2R-MCH-01 **if value is available, else value=n/a**>>
* Section F end note – revised static text
  + Signature by responsible ~~party~~ **person** ~~below~~ **on this compliance document** certifies that the installed cooling equipment meets or exceeds the required value listed on the CF1R.
* Section G – new table
* Section H header (was G)– revised pseudo code
  + <<if A09 equal to "No" then display the "section does not apply" message; else display Table ~~G~~**H**>>
* H01 (was G01) – revised static text
  + If a specific air handler, furnace or fan coil is required by the directory used to certify product performance, the responsible ~~party~~ **person** certifies by signing ~~below~~ **this compliance document** that the installed air handler/furnace matches the equipment ~~on the AHRI Certificate~~ **specified by the Directory of Certified Product Performance.**
* Section I header (was H) – revised pseudo code
  + <<if A10 equal to "No" then display the "section does not apply" message; else display Table **I**~~H~~>>
* I01 (was H01) – revised static text
  + If a Time Delay Relay is **specified by the Directory of Certified Product Performance** ~~required by the directory used to certify product performance~~, the responsible ~~party~~ **person** certifies by signing ~~below~~ **this compliance document** that the Time Delay Relay is installed and has been tested to operate correctly according to the protocols of RA3.4.3.
* Section J header (was I)– revised pseudo code
  + <<if A11 equal to "No" then display the "section does not apply" message; else display Table **J**~~I~~>>
* J01 (was I01) – revised static text
  + If a TXV is **specified by the Directory of Certified Product Performance** ~~required by the directory used to certify product performance~~, the responsible ~~party~~ **person** certifies by signing ~~below~~ **this compliance document** that the TXV is properly installed and has been visually verified, including proper placement of **the** sensing bulb.
* K01 (was J01) – revised pseudo code
  + <<…Or If section F is displayed and F05 Compliance Statement = “System Fails” do not proceed,

**Or If section G is displayed and G03 Compliance Statement = “System Fails” do not proceed, … >>**

CF2R/CF3R-MCH-27a

* Revise Appendix ~~X~~**B** listings in instructions (used in B05 and B06)
* B05 – revised pseudo code
  + “…from list of Weather Stations from the Table **B**~~X~~1 US Climates, Normative Appendix **B**~~X~~ shown in the instructions section of this document…”
* B06- revised pseudo code
  + “…Else if parent document is CF1R-NCB-01 or CF1R-ADD-01, lookup wsf based on **“Name of ANSI/ASHRAE Standard 62.2-2016 weather station for climate zone”** ~~Weather Stations~~ (B05 ~~A09~~) **from the** Table **B**~~X~~1 US Climates, Normative Appendix **B**~~X~~ shown in the instructions section of this document…”
* <<calculated field, if “Air Changes Per Hour at 50 Pa” (B04) = default, then value = “Total Conditioned Volume” (B02)\*2/60 (CFM);

Else if “Air Changes Per Hour at 50 Pa” (B04) = measured, **and if ACH50 from MCH-24 D03 > 2.0, then value = B02\*2/60 (CFM)** ~~and if value from the CF2R-MCH-24 ≤ 2.0, then value = “Total Conditioned Volume” (B02)\*(measurement from MCH-24)/60 (CFM)~~;

Else if “Air Changes Per Hour at 50 Pa” (B04) = measured, **and if ACH50 from MCH-24 D03 ≤ 2.0 value = B02\*ACH50 from MCH-24 D03/60** ~~and if value from the CF2R-MCH-24 > 2.0, then value = “Total Conditioned Volume” (B02)\*2/60 (CFM)~~>>

CF2R/CF3R-MCH-27b & d

* A07 – revised pseudo code only (correct in schema)
  + Else if “Ventilation System Type” (~~A11~~**A06**) = Central Fan Integrated & “Ventilation Operation Schedule” (~~A12~~**A07**)= Continuous; then display:

“Central Fan Integrated Ventilation System Not Allowed to Operate Continuously - Do Not Proceed”>>

CF2R/CF3R-MCH-27

* A08 – revised pseudo code
  + ~~Else if “Building Type” (A02) = Multifamily, then display method:~~

~~\*\*27b – Multifamily Ventilation;~~

Else if “Building Type” (A02) = Single Family Detached, Single Family Attached, or Multifamily and “Ventilation System Type” (A06) = Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV and “Ventilation Operation Schedule (A07) = Scheduled or Real-Time Control, then display method:

\*\*27c – Scheduled or Real-Time Control Ventilation System;

**Else if “Building Type” (A02) = Multifamily, then display method:**

**\*\*27b – Multifamily Ventilation;**

if “Building Type” (A02)= “Non-dwelling unit”; then display method:

\*\*27d – Non-dwelling unit>>

CF3R-MCH-27

* A02 – revised pseudo code
  + << calculated field, referenced data from CF1R, allowed values = multifamily, single family detached, single family attached, or allow user to ~~pick :~~

~~\*\*Non-dwelling unit~~>>

* A08 – revised pseudo code
  + << … Else if “Building Type” (A02) = Single Family Detached, Single Family Attached, or Multifamily and “Ventilation System Type” (A06) = Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV and “Ventilation Operation Schedule (A07) = Scheduled or Real-Time Control, then display method:

\*\*27c – Scheduled or Real-Time Control Ventilation System;

Else if “Building Type” (A02) = Multifamily, then display method:

\*\*27b – Multifamily Ventilation

~~if “Building Type” (A02)= “Non-dwelling unit”; then display method:~~

~~\*\*27d – Non-dwelling unit~~>>

CF2R/CF3R-MCH-28

* + A03 – new row
    - **Indoor Unit Name or Description of Area Served**
    - **<<auto filled text: referenced from MCH01>>**

CF2R/3R-MCH-29

* + A01 – revised static text
    - **Space Conditioning**~~Duct~~ System Name or Identification/Tag
* A02 – revised static text
  + **Space Conditioning**~~Duct~~ System Location or Area Served
* A03 – new row
  + **Indoor Unit Name or Description of Area Served**
  + **<<calculated field: text referenced from the MCH-01>>**
* **Switch Tables E and F**
* F05 (CF3R only) –revised schema
  + *Change DuctRValue to InsulationRValue* (make consistent with E05 on CF2R)

CF2R-MCH-30

* A03 – new row
  + - **Indoor Unit Name or Description of Area Served**
    - **<<auto filled text: referenced from MCH01>>**
* A06 (was A05) – revised schema
  + Make consistent with MCH-01 B05, which uses *CFVCS\_Type*

CF2R-MCH-32

* Section B, Table 5.1 - revised static text

|  |  |  |
| --- | --- | --- |
| **Application** | **Airflow** | **Notes** |
| Kitchen | 100 cfm | Vented range hood (including appliance-range hood combinations) |
|  | 300 cfm or 5 ACH capacity | Other kitchen exhaust fans, including downdraft |
|  | **300 cfm** | **Other Kitchen exhaust fans, including downdraft in *Nonenclosed* kitchens** |
| Bathroom | 50 cfm |  |

* Section B, Table 5.2 - revised static text

|  |  |  |
| --- | --- | --- |
| **Application** | **Airflow** | **Notes** |
| **Enclosed** Kitchen | 5 ACH | Based on kitchen volume. |
| Bathroom | 20 cfm |  |

* Section C – new table
  + Changes were made to the layout of this table to allow for multiple exhaust system entries. Changes were also made to the logic/pseudo code within this table because continuous exhaust system airflow is now verified in a separate new table.
* Section D – new table

|  |  |  |
| --- | --- | --- |
| **D. Continuous Kitchen Exhaust** | | |
| 01 | Total Continuous Ventilation Airflow | <<Result = Sum(C05 for all C08 = Continuous) {sum ‘listed rated airflow’ for all continuously operated fans};  Else result = “N/A”>> {want this entry to be N/A if there are no continuously operated fans} |
| 02 | Required Minimum Continuous Ventilation Airflow | <<If D01 = N/A, then result = “N/A”,  Else result = 5\*A05**/60**>> |
| 03 | Compliance Statement | <<If D01 = N/A, then result = “N/A”;  Else if D01 ≥ D02 then result = “Complies”, else result = “Does Not Comply” |

* Section E (was D) header
  + The items listed below correspond to the information given in ASHRAE 62.2 **sections 5 and 7**. Refer also to Chapter 4.6…
* E02 – replaced language
  + ~~Permitted automatic control devices include, but are not limited to: humidity sensors, shut-off timers, occupancy sensors, multiple speed fans, combined switching, IAQ sensors, etc.~~
  + **Nonenclosed kitchens shall be provided with a demand-controlled mechanical exhaust system.**

CF3R-MCH-32

* Section B – deleted table
* Section B (was C) – new table
  + Changes were made to the layout of this table to allow for multiple exhaust system entries. Changes were also made to the logic/pseudo code within this table because continuous exhaust system airflow is now verified in a separate new table.
* Section C – new table

|  |  |  |
| --- | --- | --- |
| **D. Continuous Kitchen Exhaust** | | |
| 01 | Total Continuous Ventilation Airflow | <<Result = Sum(C05 for all C08 = Continuous) {sum ‘listed rated airflow’ for all continuously operated fans};  Else result = “N/A”>> {want this entry to be N/A if there are no continuously operated fans} |
| 02 | Required Minimum Continuous Ventilation Airflow | <<If D01 = N/A, then result = “N/A”,  Else result = 5\*A05**/60**>> |
| 03 | Compliance Statement | <<If D01 = N/A, then result = “N/A”;  Else if D01 ≥ D02 then result = “Complies”, else result = “Does Not Comply” |

* Section D (old E) – new table

|  |  |
| --- | --- |
| **D. Determination of HERS Verification Compliance**  All applicable sections of this document shall indicate compliance with the specified verification protocol requirements in order for this Certificate of Verification as a whole to be determined to be in compliance. | |
| 01 | <<if B11 = complies for all rows (exhaust systems), and C03 = complies or N/A, then Result = “Complies: All specified verification protocol requirements on this document are met”; else Result = “Does not comply: One or more specified verification protocol requirements on this document are not met”>> |

NRCV-MCH-32

* C08 – revised pseudo code
* <<If C07 = Demand Control and C02 = Vented Range Hood, then Result = “100 cfm”;

Else If C07 = Demand Control, A06 = Enclosed, and C02 = Other or Downdraft, then Result = lesser of 300 cfm and 5\*A05**/60**;

Else If C07 = Demand Control and C02 = Other or Downdraft, then Result = 300;

Else If C07 = Continuous, then Result = 5\*A05**/60**(Kitchen Total Cond Vol)>>

CF2R-PLB-01a

* C08 – revised pseudo code
  + **Elseif C03 = Boiler or Indirect, no limit on input value**
  + Section G06 – static text
    - Piping installed in interior or exterior walls that is surrounded on all sides by at least 1 inch (**2.**5 cm) of insulation
    - Piping installed in crawlspace with a minimum of 1 inches (**2.**5 cm) of crawlspace insulation above and below.

CF2R-PLB-01b

* B02 – revised pseudo code
  + <<Reference values from CF1R-PRF-01; **else user input**>>
* B04 – revised pseudo code
  + <<**Reference value from CF1R**>>
* C04 – revised pseudo code
  + <<**Reference value from B04 (allow NA if B04 = NA**)>>
* F06 – static text
  + - Piping installed in interior or exterior walls that is surrounded on all sides by at least 1 inch (**2.**5 cm) of insulation
    - Piping installed in crawlspace with a minimum of 1 inches (**2.**5 cm) of crawlspace insulation above and below.

CF2R-PLB-02a

* Section A and B
  + Delete Column 08 – Central DHW System Distribution
* A01 – new column
  + Dwelling Unit Name
  + <<reference value from CF1R; if Single Family, then value = Single Family>>
* A09 – revised pseudo code
  + <<reference values from CF1R

If performance and ~~A08 = NA~~ then allowed values are

\*Standard Distribution System

\* Point of Use

\* Parallel Piping \*Recirculation System Non-Demand Control

\* Demand Recirculation Manual Control

\* Demand Recirculation Sensor Control ~~Else if A08 ≠ NA then allowed values are~~

~~\* Standard Distribution System~~…>>

* B01 – new column
  + Dwelling Unit Name
  + <<Reference value from A01 >>
* B07 – revised pseudo code
  + **Elseif B03 = Boiler or Indirect, no limit on input value**>>
  + B08 and B09 (was B09 and B10)
    - <<Referenced from ~~A09/A10~~ **A08/A09**>>
  + Section C – revised pseudo code
    - ~~<<If A08 “Central DHW Distribution” ≠“NA”, then display the "section does not apply" message; else display this entire table >>~~
* C07 – revised pseudo code
  + <<**Reference value from CF1R**>>
* Section D – revised pseudo code
  + ~~<<If A08 “Central DHW Distribution” ≠“NA”, then display the "section does not apply" message; else display this entire table >>~~
* D02 – revised pseudo code
  + <<Reference value from C02. **Value may be NA if C02 is NA** >>
* D07 – revised pseudo code
  + <<**Reference value from C07.** Value may be NA is CF1R value is NA>>
* Section E – revised pseudo code
  + ~~<<If A08 “Central DHW Distribution” ≠“NA”, then display the "section does not apply" message; else display this entire table >>~~
* Section G header
  + Revised static text
    - For dwelling units with multiple systems, ~~only allow one value to be~~ enter~~ed for both~~ **the** master bath distance and kitchen distance **to the closest water heater, and enter the average of the furthest fixture to each water heater.**
  + Revised pseudo code
    - << ~~if all systems in Table A have A10 = Basic, then r~~Require one row for each ~~system~~ dwelling identified in Table A **with A10 = Basic. If no dwelling in A10 = Basic**, ~~else~~**then** display section does not apply message>>
* G01 – revised column header
  + **Dwelling** ~~System~~ Name
* G05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* G06 – revised pseudo code
  + (G03\*0.4)+(G04\*0.4)+(~~average of column~~ G05\*0.2)
* Hidden Table 4.4.6-2: Coefficients for the Qualification Distance Calculation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 4.4.6-2: Coefficients for the Qualification Distance Calculation  << do not show table, only use for equation in G07>> | | | | |
|  | Coefficient a | | Coefficient b | |
| Building Type | Non-Recirculating | Recirculating | Non-Recirculating | Recirculating |
| Single Family | **Use when distribution type (A08) is \*Standard Distribution System** | **Use when distribution type (A08) is**  **\* Demand Recirculation Manual Control** |  |  |
| One story | 10 | 22.7 | 0.0095 | 0.0099 |
| Two story | 15 | 11.5 | 0.0045 | 0.0095 |
| Three story | 10 | 0.5 | 0.0030 | 0.014 |
| **Multifamily (Non Central)** |  |  |  |  |
| **One story** | **7.5** | **n/a** | **0.0080** | **n/a** |
| **Two or more story** | **7.5** | **n/a** | **0.0050** | **n/a** |

CF2R-PLB-02b

* A01 – new column
  + Dwelling Unit Name
  + <<reference value from CF1R; if Single Family, then value = Single Family>>
* A04 – revised pseudo code
  + <<**Reference value from CF1R**>>
* B01 – new column
  + Dwelling Unit Name
  + <<Reference value from A01 >>
* B04 – revised pseudo code
  + <<**Reference value from A04**>>
* Section D
  + Revised static text
    - **For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.** ~~For dwelling units with multiple systems, only allow one value to be entered for both master bath distance and kitchen distance.~~
  + Revised pseudo code
    - ~~<<if all systems in Table A have A07 = Basic, then require one row for each system identified in Table A, else display section does not apply message>>~~

**<< Require one row for each dwelling identified in Table A with A10 = Basic. If no dwelling in A10 = Basic, then display section does not apply message>>**

* D01 – revised column header
  + **Dwelling** ~~System~~ Name
* D05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* D06 – revised pseudo code
  + (G03\*0.4)+(G04\*0.4)+(~~average of column~~ G05\*0.2)
* Hidden Table 4.4.6-2: Coefficients for the Qualification Distance Calculation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 4.4.6-2: Coefficients for the Qualification Distance Calculation  << do not show table, only use for equation in G07>> | | | | |
|  | Coefficient a | | Coefficient b | |
| Building Type | Non-Recirculating | Recirculating | Non-Recirculating | Recirculating |
| Single Family | **Use when distribution type (A06) is \*Standard Distribution System** | **Use when distribution type (A06) is**  **\* Demand Recirculation Manual Control** |  |  |
| One story | 10 | 22.7 | 0.0095 | 0.0099 |
| Two story | 15 | 11.5 | 0.0045 | 0.0095 |
| Three story | 10 | 0.5 | 0.0030 | 0.014 |
| **Multifamily (Non Central)** |  |  |  |  |
| **One story** | **7.5** | **n/a** | **0.0080** | **n/a** |
| **Two or more story** | **7.5** | **n/a** | **0.0050** | **n/a** |

CF2R-PLB-21a

* G06 – static text
  + Piping installed in interior or exterior walls that is surrounded on all sides by at least 1 inch (**2.**5 cm) of insulation
  + Piping installed in crawlspace with a minimum of 1 inches (**2.**5 cm) of crawlspace insulation above and below.

CF2R/3R-PLB-21a

* C08 – revised pseudo code
  + **Elseif C03 = Boiler or Indirect, no limit on input value >>**

CF2R/3R-PLB-21b

* B04 – revised pseudo code
  + <<**Reference value from CF1R-PRF-01**>>
* C04 – revised pseudo code
  + <<**Reference value from B04**>>
* F06 – static text
  + Piping installed in interior or exterior walls that is surrounded on all sides by at least 1 inch (**2.**5 cm) of insulation
  + Piping installed in crawlspace with a minimum of 1 inches (**2.**5 cm) of crawlspace insulation above and below.

CF2R/3R-PLB-22a

* A01 – new column
  + Dwelling Unit Name
  + <<reference value from CF1R; if Single Family then value = Single Family>>
* B01 – new column
  + Dwelling Unit Name
  + <<Reference value from A01 >>
* C07 – revised pseudo code
  + <<**Reference value from CF1R**>>
* D02 – revised pseudo code
  + <<Reference value from C02. **Value may be NA if C02 is NA** >>
* D07 – revised pseudo code
  + <<**Reference value from C07**>>
* Section G header
  + Revised static text
    - **For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.** ~~For dwelling units with multiple systems, only allow one value to be entered for both master bath distance and kitchen distance.~~
  + Revised pseudo code
    - **<< Require one row for each dwelling identified in Table A with A10 = Expanded. If no dwelling in A10 = Expanded, then display section does not apply message>>**~~<<Require one row where A10 “Compact Distrib.” = “Expanded”; else display the "section does not apply" message>>~~
* G01 – revised column header
  + **Dwelling** ~~System~~ Name
* G05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* G06 – revised pseudo code
  + (G03\*0.4)+(G04\*0.4)+(~~average of column~~ G05\*0.2)
* Section H header
  + Revised static text
    - **For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.** ~~For dwelling units with multiple systems, only allow one value to be entered for both master bath distance and kitchen distance.~~
  + Revised pseudo code
    - **<< Require one row for each dwelling identified in Table A with A10 = Basic. If no dwelling in A10 = Basic, then display section does not apply message>>**~~<< if all systems in Table A have A10 = Basic, then require one row for each system identified in Table A, else display section does not apply message>>~~
* H01 – revised column header
  + **Dwelling** ~~System~~ Name
* H05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* H06 – revised pseudo code
  + (H03\*0.4)+(H04\*0.4)+(~~average of column~~ H05\*0.2)
* Hidden Table 4.4.6-2: Coefficients for the Qualification Distance Calculation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 4.4.6-2: Coefficients for the Qualification Distance Calculation  << do not show table, only use for equation in G07>> | | | | |
|  | Coefficient a | | Coefficient b | |
| Building Type | Non-Recirculating | Recirculating | Non-Recirculating | Recirculating |
| Single Family | **Use when distribution type (A06) is \*Standard Distribution System** | **Use when distribution type (A06) is**  **\* Demand Recirculation Manual Control** |  |  |
| One story | 10 | 22.7 | 0.0095 | 0.0099 |
| Two story | 15 | 11.5 | 0.0045 | 0.0095 |
| Three story | 10 | 0.5 | 0.0030 | 0.014 |
| **Multifamily (Non Central)** |  |  |  |  |
| **One story** | **7.5** | **n/a** | **0.0080** | **n/a** |
| **Two or more story** | **7.5** | **n/a** | **0.0050** | **n/a** |

* Section I – **revised table**

CF2R/3R-PLB-22b

* A01 – new row
  + Dwelling Unit Name
  + <<reference value from CF1R; if Single Family then value = Single Family>>
* A04 – revised pseudo code
  + <<**Reference value from CF1R**>>
* B01 – new column
  + Dwelling Unit Name
  + <<Reference value from A01 >>
* B04 – revised pseudo code
  + <<**Reference value from A04**>>
* B06 – revised schema
  + Remove restriction, should accept all values from A06
* Section D header
  + Revised static text
    - **For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.** ~~For dwelling units with multiple systems, only allow one value to be entered for both master bath distance and kitchen distance.~~
  + Revised pseudo code
    - **<< Require one row for each dwelling identified in Table A with A10 = Expanded. If no dwelling in A10 = Expanded, then display section does not apply message>>**~~<<Require one row where A10 “Compact Distrib.” = “Expanded”; else display the "section does not apply" message>>~~
* D01 – revised column header
  + **Dwelling** ~~System~~ Name
* D05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* D06 – revised pseudo code
  + (D03\*0.4)+(D04\*0.4)+(~~average of column~~ D05\*0.2)
* Section E header
  + Revised static text
    - **For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.** ~~For dwelling units with multiple systems, only allow one value to be entered for both master bath distance and kitchen distance.~~
  + Revised pseudo code
    - **<< Require one row for each dwelling identified in Table A with A10 = Basic. If no dwelling in A10 = Basic, then display section does not apply message>>**~~<< if all systems in Table A have A10 = Basic, then require one row for each system identified in Table A, else display section does not apply message>>~~
* E01 – revised column header
  + **Dwelling** ~~System~~ Name
* E05 – revised column header
  + Furthest Third furthest fixture to Water Heater in feet **(Avg for multiple water heaters)**
* E06 – revised pseudo code
  + (E03\*0.4)+(E04\*0.4)+(~~average of column~~ E05\*0.2)
* Hidden Table 4.4.6-2: Coefficients for the Qualification Distance Calculation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 4.4.6-2: Coefficients for the Qualification Distance Calculation  << do not show table, only use for equation in G07>> | | | | |
|  | Coefficient a | | Coefficient b | |
| Building Type | Non-Recirculating | Recirculating | Non-Recirculating | Recirculating |
| Single Family | **Use when distribution type (A06) is \*Standard Distribution System** | **Use when distribution type (A06) is**  **\* Demand Recirculation Manual Control** |  |  |
| One story | 10 | 22.7 | 0.0095 | 0.0099 |
| Two story | 15 | 11.5 | 0.0045 | 0.0095 |
| Three story | 10 | 0.5 | 0.0030 | 0.014 |
| **Multifamily (Non Central)** |  |  |  |  |
| **One story** | **7.5** | **n/a** | **0.0080** | **n/a** |
| **Two or more story** | **7.5** | **n/a** | **0.0050** | **n/a** |

* F01 – **revised table**

CF3R-PLB-21a

* G06 – static text
  + ~~Piping installed in the attic that are surrounded by at least 1 (10 cm) inch of insulation and covered with 4 inches of insulation need not be insulated~~
* Piping in walls interior or exterior walls that is surrounded on all sides by at least 1 inch **(2.5 cm)** of insulation need not be insulated.

CF2R-PVB-01

* B03 – revised pseudo code
  + <<**if performance, then value = B02; Elseif prescriptive and** A05 = NA, then autofill from B02; elseif A05 = “Battery storage”, then value = ((**P**~~O~~04 from CF1R \*0.75) + **P**~~O~~05 from CF1R); Else user input: decimalnonnegative >>
* Section C – revised schema (pseudo code correct)
  + :<xsd:element name="Section\_C" minOccurs="~~1~~**0**">
    - (This table is not shown if A05 = No PV – limited solar access)
* C02 – revised pseudo code
  + <<If B05=No, then autofill from B03;

~~Else user input~~ but allow user to override only if ≥ B03; Else user input >>

* C04 – revised pseudo code
  + <<If B05=No, then autofill from B06; Else user input **(value must be > 0 and < 359**>>
* C05 – revised pseudo code
  + <<If B05=No, then autofill from B07; Else user ~~input~~ **pick from list:**

**Deg**

**Pitch**>>

* C06 – Revised pseudo code
  + <<If B05=No, then autofill from B08; Else user input **(value must be > 0 and < 10)**>>

CF2R-SRA-01

* C01 – revised static text
  + The single family residence is located in a **newly constructed** subdivision with fewer than ten single family residences.
* E02 – revised schema
  + Add display terms for *home automation system, alternative plumbing, and rainwater catchment system*

CF2R-STH-01

* Section A – revised layout and pseudo code
  + **01 Water Heating System ID or Name**
    - **<<auto filled text: referenced from CF1R>>**
  + A17 - << if A0~~8~~**9** ≥ A~~09~~**10**, show “Solar water heater system complies”, else show “Solar water heater system does not comply”>>

CF3R-EXC-20

* A07 – revised static text
  + ~~Compliance Manager~~ **Software** Version:
* A09 – revised static text
  + ~~Software Version~~ **Front Orientation (deg/cardinal)**:
* A11 – revised static text
  + ~~Building Front Orientation (deg)~~ **Number of Dwelling Units**:
* A13 – revised static text
  + Number of ~~Dwelling Units~~ **Bedrooms**:
* A14 – revised static text
  + ~~Total~~ **New** Conditioned Floor Area(ft2):
* A15 – revised static text
  + Number of ~~Zones~~ **Stories**:
* A16 – revised static text
  + ~~Slab~~ **Existing Conditioned Floor** Area (ft2):
* A17 – revised static text
  + ~~Number of Stories in Building~~ **Fenestration Average U-factor**:
* A18 – revised static text
  + ~~Addition~~ **Total** Conditioned Floor Area (ft2):
* A19 – revised static text
  + ~~Natural Gas Available? (Yes/No)~~ **Glazing Percentage (%)**:
* A20 and A21 – deleted row

CF3R-PLB-22a

* F05 and F06 (revised schema, correct in pseudo code)
  + No Verification Status and Correction Notes fields (nested within the <Section\_E> element)

NRCV-MCH-27b

* A07 – revised pseudo code only (correct in schema)
  + <<…Else if “Ventilation System Type” (~~A11~~**A06**) = Central Fan Integrated & “Ventilation Operation Schedule” (~~A12~~**A07**)= Continuous; then display:

“Central Fan Integrated Ventilation System Not Allowed to Operate Continuously - Do Not Proceed”>>

* E01 – revised pseudo code
  + <<calculated field, “Required Mechanical Ventilation Rate (B0**1**~~6~~) \* 1.20>>
* F01 – revised pseudo code
  + …(taken from **NRCV**~~CF2R~~-MCH-24)… (taken from **NRCV**~~CF2R~~-MCH-24)…

NRCV-PLB-21

* C07
  + << Reference values from B07. **Value may be NA if B07is NA** >>

NRCV-PLB-22

* + Section H – revised layout and pseudo code
    - **07 Verification Status row**
    - **08 Correction Notes row**
    - **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met unless otherwise noted in the Verification Status and the Corrections Notes in this table.**
* Section N – revised pseudo code
  + <<if applicable sections G, **H,** J, K, L, and M do not = fail, then display: “Complies: All specified verification protocol requirements on this document are met”; else display: “Does not comply: One or more specified verification protocol requirements on this document are not met”>>

ResHVAC base schema

* *ResidentialDHWDwellingUNitDistributionType*
  + Add CompactHotWaterDistributionSystemBasic to enumeration values

Res Compliance base schema

* *InducedEnclosurePressureDifference*
  + Allow negative values
* *Title24StandardsVersion*
  + Add Compliance2019