

Document: ACI CODE-122.Y Thermal Bridge Mitigation for Buildings having Concrete and Masonry Walls and Masonry Veneer—Code Requirements and Commentary

No.	Public Commenter Name	Pg #	Line #	Public Comment	Committee Response
1.	Kevin Cavanaugh			General Comment – Please double check that the Public Discussion Draft released to the Public contained all balloted and approved committee revisions per TAC’s commentary and cmt. ballots.	Confirmed. The working draft was reviewed and verified to contain all committee-approved revisions.
2.	Jason Thompson			General Comment – Please review and coordinate as necessary with the draft versions of the Residential and Commercial standards under development.	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-011.
3.	David P. Gustafson	2	2, 6	Replace “ <i>This code</i> ” with “ <i>This Code</i> ”.	Thank you for the thorough review and feedback. The Committee will coordinate with ACI staff to verify that the document’s content follows proper form and style prior to publication.
4.	Gary Ehrlich	3	20-22	<p>Revise as follows:</p> <p>1.2.2 The provisions of this code do not apply to:</p> <p>a) Single family houses and residential structures with three stories or fewer above grade</p> <p>b) Buildings that do not contain conditioned space use either electricity or fossil fuel</p> <p>c) <u>Buildings in Climate Zones 1 through 4</u></p> <p>Reason for changes:</p> <p>a) While I appreciate the thought in exempting low-rise residential construction completely, the UA alternative for low-rise residential in the IECC does include consideration of thermal bridging (see 2021 IECC Section R402.1.5). So, it seems like low-rise residential (particularly multifamily or hotels/motels) should be permitted to use the standard.</p> <p>b) As far as I know, all buildings are required to have a minimum number of electrical outlets, and lighting for the means of egress. So, all buildings potentially "use electricity". I think what you're after is excepting a building that does not contain conditioned space, as such buildings are exempt from the IECC (see 2021 IECC Section C402.1.1, Item #2).</p>	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-002 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
5.	Gary Ehrlich	3	2	Suggested editorial revision: “This code provides requirements for mitigation of thermal bridges for <u>use with</u> energy efficiency codes...”	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-001.

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6.	David P. Gustafson	3	2	Replace “This code” with “This Code”.	See response to Public Comment No. 3.
7.	David P. Gustafson	3	4	Replace “The code” with “The Code”.	See response to Public Comment No. 3.
8.	David P. Gustafson	3	5	Note the style of “trade-off”.	See response to Public Comment No. 3.
9.	David P. Gustafson	3	9	Replace “This code” with “This Code”.	See response to Public Comment No. 3.
10.	David P. Gustafson	3	11	Replace “This code standard” with “This Code”.	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-001.
11.	David P. Gustafson	3	14	Replace “the code” with “the Code”.	See response to Public Comment No. 3.
12.	Ivan Lee	3	18	Window to wall details should be included since they are significant thermal bridges for most buildings, particularly mass masonry/concrete buildings where the window is installed directly on to the masonry/concrete. Thermal bridging at these details are all around the building at every window perimeter which can quickly add up.	The Committee agrees that there are potentially many more sources of thermal bridging than currently addressed by 122.Y. The Committee’s objective was to focus on those sources that are typically the largest contributors to thermal bridging in a simple and straightforward manner, but will continue to explore expanding on the scope of 122.Y in future editions. No change made in response to this public comment.
13.	David P. Gustafson	3	26	Replace “the code” with “the Code”.	See response to Public Comment No. 3.
14.	David P. Gustafson	3	20, 24	Replace “this code” with “this Code”.	See response to Public Comment No. 3.
15.	Gary Ehrlich	4	28-30	The standard should reference the 2021 editions of the IBC and IECC as those are the most current.	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-003.
16.	Gary Ehrlich	4	8-9	The IECC uses the term “Building Thermal Envelope” with a similar definition., recognizing that a building could have a “building envelope” that protects the interior against wind, rain, etc. but does not necessarily provide thermal protection. For easy coordination with the I-Codes, perhaps this new ACI standard should also use Building Thermal Envelope,	The Committee considered both terms in drafting 122.Y, however, chose to use ‘building envelope’ for consistency with ASHRAE 90.1. The Committee will continue to monitor the usage of ‘building thermal envelope’ and ‘building envelope’ and make revisions accordingly if the use of this term continues to evolve. No change made in response to this public comment.
17.	David P. Gustafson	4	1, 3	Replace “This code” with “This Code”.	See response to Public Comment No. 3.
18.	David P. Gustafson	4	5	Replace “this code” with “this Code”.	See response to Public Comment No. 3.

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19.	David P. Gustafson	5	7	Replace “this code” with “this Code”.	See response to Public Comment No. 3.
20.	Gary Ehrlich	5	9	The standard should allow use of either IECC Figure C301.1 or Table C301.1. I understand the table of climate zones by state and county is more accurate, but in the 2021 IECC the table has become quite unwieldy; someone in their wisdom reformatted it to two columns per page so it takes up 30 pages of the code. Note if you accept my comment on scoping in low-rise residential, this section should also reference IECC Figure R301.1 and Table R301.1.	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-004 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
21.	David P. Gustafson	5	18	Replace “tradeoff” with “trade-off”.	See response to Public Comment No. 3.
22.	Ivan Lee	5	23	Exceptions to thermal bridging should not be based on percentage of vertical fenestration to gross building envelope wall. Thermal bridging occurs for all buildings regardless of the window-to-wall ratio. Linear transmittance of window to wall details should be accounted for in all buildings.	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-005 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
23.	Ivan Lee	5	25	Thermal bridging through masonry ties should not be excluded since ties may impact overall U-value of building assemblies, especially if the ties are directly mounted to the back up wall, such as ties mounted to the steel stud flanges like BC Building Envelope Thermal Bridging Guide (BETB) version 1.5 Detail 5.1.88. Impact of ties should be accounted for unless its point transmittance is below a specified threshold.	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-005 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
24.	Ivan Lee	5	26	Thermal bridging impacts of components with thermal breaks should not be exempted from analysis since thermal bridging may still occur through thermally broken components. Mis-alignment of insulation to the thermal break and differences in thermal conductivities between materials (e.g. mineral wool vs PVC thermal break) will result in thermal bridging. Impact of thermal bridging should not be ignored unless its linear transmittance or point transmittance is below a specified threshold.	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-005 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
25.	Ivan Lee	5	29	Thermal bridging should not be based on area of penetration vs wall area since thermal bridging still occurs through highly	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-005 but

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				<p>conductive materials such as aluminum. Standard should also account for penetrations through insulation and not necessarily through the wall assembly.</p> <p>Impact of thermal bridging should not be ignored unless its linear transmittance or point transmittance is below a specified threshold.</p>	<p>the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.</p>
26.	Ivan Lee	6	3	<p>Thermal bridging should account for penetrations through the insulation and not necessarily through the wall assembly. Details with continuous concrete and no penetrations (e.g. interior insulated concrete walls at intermediate floor detail still has thermal bridging since the insulation is interrupted, see BC BETB version 1.5 Detail 7.2.22)</p>	<p>Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-005 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.</p>
27.	Ivan Lee	6	17	<p>Should be clarified that 2D analysis is recommend for details/assemblies with continuous components and 3D analysis is recommended for details/assemblies with discrete components (e.g. brick ties or intermittently supported shelf angles).</p>	<p>Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-006 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.</p>
28.	Kevin Cavanaugh	6	19	<p>Does section 4.3.1.c allow manufacturer’s literature to qualify as an authoritative source for assembly U-factors? Some insulated CMU and ICF suppliers promote R-30 to R-50 assembly values in their ‘handbooks’, technical and/or marketing literature. What qualifies as a legitimate handbook?</p> <p>For insulated CMU, the next section (4.3.1.d) clearly states the approved calculation method that should be used for any handbook or marketing literature values. However, it does not explicitly state a method for ICFs. I am concerned there may be loopholes here that both insulated CMU or ICF manufacturers may site as a basis for their currently greatly exaggerated R-Value claims.</p> <p>Can the language be tightened up or is the committee satisfied with the current language?</p>	<p>Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-007 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.</p>

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29.	Gary Ehrlich	7	11-33	<p>I am opposed to having an explicit limit on the aesthetic look and configuration of a building or the amenities provided therein buried inside of a standard.</p> <p>This whole thing should be rewritten such that the requirements of 5.2.1 (a)-(e) apply WHERE the total linear length of balconies and projections exceeds either 5.2 (a) or (b).</p>	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-008 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
30.	Ivan Lee	7	2	Ideally insulation should be continuous and wrap around the parapet (see BC BETB version 1.5 Detail 7.5.2). Thermal bridging still occurs when the parapet is not thermally broken and wrapped with insulation (see BC BETB version 1.5 Detail 7.5.1)	Respectfully disagree. The purpose of this code is to address thermal bridging mitigation for concrete and masonry systems that is practical and straightforward for use and enforcement. The objective is to reduce heat transfer due to thermal bridging through practical methods in the context of code provisions, not guides or best practices. Eliminating all forms of thermal bridging in a building's envelope is neither possible nor practical. As the scope and the title of the standard states, the goal is to mitigate thermal bridging with enforceable solutions. No change proposed in response to this public comment.
31.	Ivan Lee	7	3	Extending insulation to underside of roof deck for interior insulated concrete/masonry walls is not enough to mitigate thermal bridging (see BC BETB version 1.5 Detail 7.5.3)	See response to Public Comment No. 30.
32.	Ivan Lee	7	30	Thermal bridging at balconies should not be ignored with a R-3/in thermal break. Thermal bridging still occurs at thermally broken balconies (see BC BETB version 1.5 Detail 5.2.9)	See response to Public Comment No. 30.
33.	Ivan Lee	8	11	25% shelf angle length is still a high number that can impact the overall U-value of the building envelope depending on how well insulated the walls are. Thermal bridging should be considered at shelf angles, and may only be exempt if they are less than a certain percentage of heat loss through the building envelope (e.g. 2%).	See response to Public Comment No. 30.
34.	Ivan Lee	8	14	<p>Thermal bridging still occurs at thermally broke shelf angles. The thermal break thickness should match the exterior insulation thickness in order to mitigate thermal bridging by maintaining thermal control continuity.</p> <p>Are metal flashings considered? Even with thermally broken shelf angles, metal through-wall flashings may undermine the performance gains of the shelf angle. Should be using non-</p>	See response to Public Comment No. 30.

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				conductivity through-wall flashings at shelf angles like membranes.	
35.	David P. Gustafson	8	32	Replace "TRADEOFF" with "TRADE-OFF".	See response to Public Comment No. 3.
36.	David P. Gustafson	9	1	In Line 1, the heading repeats the title of Chapter 6, Line 32 on Page 8.	It was intentional to mirror the language between the section heading and the chapter title...similar to the layout of Chapter 7. No change proposed in response to this public comment.
37.	David P. Gustafson	9	2	Make "methods" singular.	Agreed. Changes consistent with commenter's suggestions were balloted and approved per Ballot Item 122.Y-06-001.
38.	David P. Gustafson	9	5	Replace "This code" with "This Code".	See response to Public Comment No. 3.
39.	David P. Gustafson	9	6, 7	Replace "tradeoff" with "trade-off".	See response to Public Comment No. 3.
40.	David P. Gustafson	9	17	Should Line 17 be revised to: ". . . building envelope in the whole building simulation <u>compliance</u> method?"	Agreed. Changes consistent with commenter's suggestions were balloted and approved per Ballot Item 122.Y-06-001.
41.	David P. Gustafson	9	11, 12	<ul style="list-style-type: none"> In Line 12, the heading repeats the title of Chapter 7, Line 11.. Line 13 speaks of "whole building simulation compliance method". Should Line 11 be revised to: "CHAPTER 7—WHOLE BUILDING SIMULATION COMPLIANCE METHOD"? Should Line 12 be revised to: "7.1—Whole Building simulation <u>compliance</u> method"? 	Agreed. Changes consistent with commenter's suggestions were balloted and approved per Ballot Item 122.Y-06-001.
42.	David P. Gustafson	9	16, 25, 29	Replace "This code" with "This Code".	See response to Public Comment No. 3.
43.	Gary Ehrlich	10	29-30	The 2021 IECC has a similar procedure for determining climate zones as well (see IECC Section C301.3 and R301.3).	Thank you for your comment. The Committee considered your recommendations and letter balloted them per 122.Y-06-010 but the proposed changes did not receive sufficient affirmative votes to pass letter balloting. No change made in response to public comment.
44.	David P. Gustafson	10	1	Replace "This code" with "This Code".	See response to Public Comment No. 3.
45.	David P. Gustafson	10	3	Replace "this code" with "this Code".	See response to Public Comment No. 3.

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46.	David P. Gustafson	10	5	Replace “the code” with “the Code”.	See response to Public Comment No. 3.
47.	David P. Gustafson	10	7	Replace “this code” with “this Code”.	See response to Public Comment No. 3.
48.	Ivan Lee	11	9	Thermal bridging at walls to window details (e.g. heads, sills, and jambs) are significant and are not necessarily a function of fenestration area rather than the number of windows. This should be accounted for.	See response to Public Comments No. 12 and 30.
49.	Ivan Lee	11	21	Thermal bridging occurs at details with thermal breaks. Insulation alignment is just as important as thermal breaks, so thermal bridging should not be ignored even at details with thermal breaks.	See response to Public Comments No. 12 and 30.
50.	David P. Gustafson	12	3	Replace “tradeoff” with “trade-off”.	See response to Public Comment No. 3.
51.	Ivan Lee	12	8	2D thermal modeling is not adequate for steel frame assemblies where framing goes in multiple directions.	This commentary discussion is simply reviewing current building code requirements for thermal modeling. Revising the approved modeling methods for steel framing is outside of the scope of the Committee. No change in response to this public comment.
52.	David P. Gustafson	13	1, 5	Replace “the code” with “the Code”.	See response to Public Comment No. 3.
53.	Ivan Lee	13	7	Thermal bridging is not mitigated in this case.	Respectfully disagree. The purpose of this code is to address thermal bridging mitigation for concrete and masonry systems that is practical and straightforward for use and enforcement. The objective is to reduce heat transfer due to thermal bridging through practical methods. The heat flow path in these figures is lengthened, which in turn reduces the heat flow. These commentary figures are meant to be helpful in showing the intent of the code language in mitigating thermal bridging as eliminating thermal bridging in a building envelope is neither possible nor practical. No change in response to this public comment.
54.	Ivan Lee	13	9	Thermal bridging is not mitigated in this case.	See response to Public Comment No. 53.
55.	Ivan Lee	13	11	Thermal bridging is not mitigated in this case.	See response to Public Comment No. 53.
56.	Ivan Lee	13	13	Thermal bridging is not mitigated in this case.	See response to Public Comment No. 53.
57.	David P. Gustafson	15	9	Replace “ TRADEOFF ” with “ TRADE-OFF ”.	See response to Public Comment No. 3.

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58.	David P. Gustafson	15	10,	Replace “tradeoff” with “trade-off”.	See response to Public Comment No. 3.
59.	David P. Gustafson	15	20	Replace “This code” with “This Code”.	See response to Public Comment No. 3.
60.	David P. Gustafson	15	21	Replace “tradeoff” with “trade-off”.	See response to Public Comment No. 3.
61.	David P. Gustafson	15	27	Consider deleting the phrase “a great deal of”.	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-001.
62.	David P. Gustafson	15	11, 17	Replace “tradeoff” with “trade-off”.	See response to Public Comment No. 3.
63.	David P. Gustafson	16	5	Replace “This code” with “This Code”.	See response to Public Comment No. 3.
64.	David P. Gustafson	16	7	Three terms are used to identify who I think is the same party. Page 10, Line 7 “designers” Page 12, Line 26 “structural engineer” Page 16, Line 7 “architects and designers” Adopt a single term for the three occurrences of the party. I suggest retaining “designers” on Page 10, use “designer” on Page 12, and use “designers” on Page 16.	Agreed. Changes consistent with commenter’s suggestions were balloted and approved per Ballot Item 122.Y-06-009.