

Michigan Office of Administrative Hearings and Rules

Administrative Rules Division (ARD)

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**REGULATORY IMPACT STATEMENT
and COST-BENEFIT ANALYSIS (RIS)**

Agency Information:

Department name:

Licensing and Regulatory Affairs

Bureau name:

Bureau of Construction Codes

Name of person filling out RIS:

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Rule Set Information:

ARD assigned rule set number:

2022-57 LR

Title of proposed rule set:

Construction Code - Part 4. Building Code

Comparison of Rule(s) to Federal/State/Association Standard

1. Compare the proposed rules to parallel federal rules or standards set by a state or national licensing agency or accreditation association, if any exist.

There are no federal rules or standards set by a state or national licensing agency or accreditation association.

A. Are these rules required by state law or federal mandate?

These rules are required by state law in MCL 125.1504(5) and there is no federal mandate.

B. If these rules exceed a federal standard, please identify the federal standard or citation, describe why it is necessary that the proposed rules exceed the federal standard or law, and specify the costs and benefits arising out of the deviation.

There are no federal rules or standards, and these rules are required by state law in MCL 125.1504(5).

2. Compare the proposed rules to standards in similarly situated states, based on geographic location, topography, natural resources, commonalities, or economic similarities.

The proposed rules incorporate by reference the 2021 edition of the International Building Code (IBC) a, published by the International Code Council (ICC), ASHRAE standard 90.1-2019, with Michigan amendments, additions, or deletions. The surrounding Great Lakes states (Ohio, Wisconsin and Minnesota) follow the International Building Code. Michigan's rules look to be more stringent and follow newer codes than similar states. Ohio and Wisconsin follow the 2015 IBC and Minnesota follow the 2018 IBC. In addition, it is anticipated the surrounding states will adopt the latest version of the IBC, protecting the health, safety, and welfare of the public, while ensuring sustainable human welfare.

A. If the rules exceed standards in those states, please explain why and specify the costs and benefits arising out of the deviation.

The International Building Code is a nationally recognized model code used through the United States as a minimum standard. The Michigan rules do exceed the standards of any of the other Great Lake States, (Ohio, Wisconsin, and Minnesota), because the surrounding Great Lakes states Ohio and Wisconsin follow the 2015 IBC and Minnesota the 2018 IBC, but it is anticipated that the surrounding states will adopt the latest version of the IBC. There are costs of deviation from other Great Lakes States because the State of Michigan is using the newest Building Code, which accounts for new technologies in building use and conservation. Once the other Great Lakes States adopt the newest Building Code or newer than what they currently use, those states will fall into line with what Michigan is currently adopting. The State of Michigan will be at the forefront of the most up to date Building Code. Regardless of which Building Code other states use, structure owners within the State of Michigan only use the Building Code when building a new structure or renovating an existing structure. The costs the structure owner will realize is predicated upon the size of the structure. Therefore, the smaller the size of the new build or renovated structure, the less it will cost that owner.

3. Identify any laws, rules, and other legal requirements that may duplicate, overlap, or conflict with the proposed rules.

There are no federal, state, or local laws, rules, or other legal requirements that may duplicate, overlap, or conflict with the proposed rule.

A. Explain how the rules have been coordinated, to the extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter. This section should include a discussion of the efforts undertaken by the agency to avoid or minimize duplication.

There are no federal, state, or local laws, rules, or other legal requirements that may duplicate, overlap, or conflict with the proposed rules.

4. If MCL 24.232(8) applies and the proposed rules are more stringent than the applicable federally mandated standard, provide a statement of specific facts that establish the clear and convincing need to adopt the more stringent rules.

MCL 24.232(8) does not apply to this rule set and the purposed rules are not more stringent because there are no federal standards. The proposed rules update the ASHRAE standard 90.1-2019 and Part 4. Building rules, of the Construction Code as mandated by 1972 PA 230.

5. If MCL 24.232(9) applies and the proposed rules are more stringent than the applicable federal standard, provide either the Michigan statute that specifically authorizes the more stringent rules OR a statement of the specific facts that establish the clear and convincing need to adopt the more stringent rules.

MCL 24.232(9) does not apply to this rule set and the purposed rules are not more stringent because there are no federal standards. The proposed rules update the ASHRAE standard 90.1-2019 and Part 4. Building rules, of the Construction Code as mandated by 1972 PA 230.

Purpose and Objectives of the Rule(s)

6. Identify the behavior and frequency of behavior that the proposed rules are designed to alter.

The proposed rules adopt the 2021 IBC and ASHRAE standard 90.1-2019 with technical provisions designed to alter the outdated building efficiency standards and provide a more energy efficient built environment. The frequency of behavior change due to the proposed rules is only required when altering, renovating, or building a new structure. The requirements outlined in this rule set establish a more economical and environmentally friendly energy used standard.

A. Estimate the change in the frequency of the targeted behavior expected from the proposed rules.

The proposed rules adopting the 2021 edition of the IBC and ASHRAE standard 90.1-2019 will continue to establish a more progressive energy efficient Michigan Building Code, allowing more flexibility while keeping current with technological innovations. However, there are no changes in the frequency from the current ruleset to the proposed rules, as the rules will continue to apply to alterations, renovations, or building of a new structure.

B. Describe the difference between current behavior/practice and desired behavior/practice.

To comply with the requirements of the Stille-DeRossett-Hale Single State Construction Code Act the proposed rules adopt the updated IBC and ASHRAE standard. These adjustments will improve energy efficiency in building construction when required to be applied to the alteration, renovation, or building of a new structure.

C. What is the desired outcome?

The desired outcome is to bring the Michigan Building Code rules in line with the 2021 IBC and ASHRAE standards to eliminate unnecessary requirements in the code, improve clarity, and align codes with the Michigan rules. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient building designs while ensuring sustainable human welfare.

7. Identify the harm resulting from the behavior that the proposed rules are designed to alter and the likelihood that the harm will occur in the absence of the rule.

Without implementation of the proposed rules, the businesses would not be able to take advantage of new methods, materials, or technologies leading to improved building efficiency. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient building designs while ensuring sustainable human welfare.

A. What is the rationale for changing the rules instead of leaving them as currently written?

MCL 125.1504(5): The Stille-DeRossett-Hale Single State Construction Code Act requires the agency to update the codes not less than once every 3 years to coincide with the national code change cycle.

8. Describe how the proposed rules protect the health, safety, and welfare of Michigan citizens while promoting a regulatory environment in Michigan that is the least burdensome alternative for those required to comply.

Aligning the Michigan Building Code with the 2021 IBC and ASHRAE standard 90.1-2019 will protect the health, safety, and welfare of Michigan citizens while promoting a regulatory environment that is the least burdensome alternative for those required to comply. These rules ensure the ongoing assessment of safety in various energy efficient measures and training of staff to keep current with the most updated information. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient building designs while ensuring sustainable human welfare.

9. Describe any rules in the affected rule set that are obsolete or unnecessary and can be rescinded.

The following rules are unnecessary because they are outdated and will be rescinded: R 408.30401a, R 408.30403, R 408.30404, R 408.30408, R 408.30410, R 408.30411, R 408.30428, R 408.30430, R 408.30441, R 408.30442, and R 408.30443.

Fiscal Impact on the Agency

Fiscal impact is an increase or decrease in expenditures from the current level of expenditures, i.e. hiring additional staff, higher contract costs, programming costs, changes in reimbursements rates, etc. over and above what is currently expended for that function. It does not include more intangible costs for benefits, such as opportunity costs, the value of time saved or lost, etc., unless those issues result in a measurable impact on expenditures.

10. Please provide the fiscal impact on the agency (an estimate of the cost of rule imposition or potential savings for the agency promulgating the rule).

The proposed rules have no fiscal impact on the agency beyond the current operational costs.

11. Describe whether or not an agency appropriation has been made or a funding source provided for any expenditures associated with the proposed rules.

The proposed rules will not result in additional fiscal impact on the agency. Thus, there is no need for an additional appropriation or funding source as a result of the changes in the rules.

12. Describe how the proposed rules are necessary and suitable to accomplish their purpose, in relationship to the burden(s) the rules place on individuals. Burdens may include fiscal or administrative burdens, or duplicative acts.

The application of the rules and adopted IBC and ASHRAE standard is required to set the minimum standards for building code compliance, fostering better solutions for the safety and care placed upon individuals and communities in compliance with the Stille-DeRossett-Hale Single State Construction Code Act. Although there is no administrative burden on the individual, each person must review expenses for the project and decide if costs match budget. There will be an increase in upfront costs for materials for alterations, renovations, or building of a new structure.

A. Despite the identified burden(s), identify how the requirements in the rules are still needed and reasonable compared to the burdens.

The amendments will clarify code requirements which will make compliance less burdensome. The individual may realize a net savings in building costs pursuant to these requirements.

Impact on Other State or Local Governmental Units

13. Estimate any increase or decrease in revenues to other state or local governmental units (i.e. cities, counties, school districts) as a result of the rule. Estimate the cost increases or reductions for other state or local governmental units (i.e. cities, counties, school districts) as a result of the rule. Include the cost of equipment, supplies, labor, and increased administrative costs in both the initial imposition of the rule and any ongoing monitoring.

Local jurisdictions with administrative enforcement of the code may incur some cost in training of inspection staff and would not realize any cost reduction. However, when construction is up in general, there will be increased revenue from permits, (re)inspections, and plan reviews. The construction market is subject to numerous outside influences such as: material costs, labor costs, and interest rates.

Local jurisdictions will be required to comply with the rules when engaging in construction projects on structures owned by the jurisdiction. The agency has no way of knowing what the additional specific expenses will be, as each individual structure will be unique to the needs of the governmental unit. Overall, a person must review expenses for the project and decide if costs match budget. There will be an increase in upfront costs for materials for alterations, renovations, or building of a new structure.

14. Discuss any program, service, duty, or responsibility imposed upon any city, county, town, village, or school district by the rules.

It is anticipated that a local government unit would incur added responsibility due to the proposed rules if a local unit of government has decided to administer and enforce the code under the Stille-DeRossett-Hale Single State Construction Code Act. They would be responsible for learning, understanding, and applying the new code accurately. However, no additional program, service, duty, or responsibility will be imposed on any city, county, town, village, or school district by the rule changes.

A. Describe any actions that governmental units must take to be in compliance with the rules. This section should include items such as record keeping and reporting requirements or changing operational practices.

The proposed rules would require additional or new responsibilities on behalf of governmental units to be in continued compliance with the rules. They would be responsible for learning, understanding, and applying the new code accurately, which would require training of all applicable staff.

15. Describe whether or not an appropriation to state or local governmental units has been made or a funding source provided for any additional expenditures associated with the proposed rules.

No additional appropriations for additional expenditures associated with the proposed rules have been made to state or local governmental units. However, \$1.2T in federal grant programs through the Bipartisan Infrastructure Law and/or the Inflation Reduction Act are available to states, local governments, and other organizations contingent upon the adoption of the 2021 IBC and ASHRAE standard 90.1-2019.

Rural Impact

16. In general, what impact will the rules have on rural areas?

The proposed rules affect the state of Michigan as a whole. There is no specific rural impact, rules are applicable to both urban and rural new build structures alike. Where allowed under the Stille- DeRossett-Hale Single State Construction Code Act, there continue to be limited agricultural exemptions under the applicable construction codes. Therefore, there is no specific rule impact as these rules are applicable to urban and rural new building structures alike.

A. Describe the types of public or private interests in rural areas that will be affected by the rules.

Pursuant to the Stille- DeRossett-Hale Single State Construction Code Act, there is an agricultural exemption to the applicability of the construction codes from permits and inspections for those reasons; however, any structures not falling under the agricultural exemption would still need to follow the code. It is unlikely that the proposed rules will have any impact on public or private interests in rural areas.

Environmental Impact

17. Do the proposed rules have any impact on the environment? If yes, please explain.

As cited in Pacific Northwest National Laboratory (PNNL) Cost-Effectiveness Analysis of the ASHRAE standard 90.1-2019 for the State of Michigan, it is expected with the adoption of the standard annual energy cost savings of \$0.063 per square foot on average across the state and reduce statewide CO2 emissions by 10.0 MMT (30 years cumulative).

The adoption of the 2021 IBC includes expanded allowances for the use of mass timber construction. Wood is a natural, renewable, and sustainable material for building. According to the Wood Products Council and American Wood Council, maximizing wood use in both residential and commercial construction across the United States could remove an estimated 21 million tons of CO2 from the atmosphere annually-equal to taking 4.4 million cars off the road. Additionally, the use of wood products helps ensure healthy, resilient forests. According to an analysis by Dovetail Partners mass timber and other building innovations can reduce emissions by 68% based on a whole life analysis of a mass timber building over a 60-year life span.

Small Business Impact Statement

18. Describe whether and how the agency considered exempting small businesses from the proposed rules.

Because the Stille-DeRossett-Hale Single State Construction Code Act does not allow for exemption of small businesses from the Michigan Building Code, the agency has no authority to exempt small businesses from the proposed rules.

19. If small businesses are not exempt, describe (a) the manner in which the agency reduced the economic impact of the proposed rules on small businesses, including a detailed recitation of the efforts of the agency to comply with the mandate to reduce the disproportionate impact of the rules upon small businesses as described below (in accordance with MCL 24.240(1)(a-d)), or (b) the reasons such a reduction was not lawful or feasible.

The agency is required to follow the Stille-DeRossett-Hale Single State Construction Code Act, which is applicable to scenario “(b) the reason such a reduction was not lawful or feasible” as the act did not provide for such an exemption within the act.

A. Identify and estimate the number of small businesses affected by the proposed rules and the probable effect on small businesses.

According to the most current federal data available, Michigan has 765,487 small businesses. These businesses will be affected by this rule set only if new structure construction or renovations occur needing permits and inspection approvals regarding the proposed rules. Small businesses may incur higher upfront costs, but these expenses will be offset by the long-term financial savings because of this rule set.

B. Describe how the agency established differing compliance or reporting requirements or timetables for small businesses under the rules after projecting the required reporting, record-keeping, and other administrative costs.

The agency did not establish differing compliance or reporting requirements or timetables for small businesses as the agency was obligated to follow the Stille-DeRossett-Hale Single State Construction Code Act which applies to all structures, regardless of the size of the business owning the structure or contracting for improvements of the structure.

C. Describe how the agency consolidated or simplified the compliance and reporting requirements for small businesses and identify the skills necessary to comply with the reporting requirements.

The agency did not establish consolidated or simplified the compliance and reporting requirements for small businesses as the agency was obligated to follow the Stille-DeRossett-Hale Single State Construction Code Act which applies to all structures, regardless of the size of the business owning the structure or contracting for improvements of the structure.

D. Describe how the agency established performance standards to replace design or operation standards required by the proposed rules.

R. 408.30401 adopts by reference the 2021 IBC and ASHRAE standard 90.1-2019 which is a nationally recognized model code. For that reason, the agency need not establish performance standards, as the design and operation standards are established through the 2021 IBC and ASHRAE standard 90.1-2019.

20. Identify any disproportionate impact the proposed rules may have on small businesses because of their size or geographic location.

The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a small business chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. The proposed changes to the rules have a disproportionate impact on small businesses engaged in residential construction in the three different climate zones defined in the IBC, with each climate zone having its own unique building requirements (installation) effect cost because of their size or geographical location. Small businesses located in climate zone 5 (southern lower peninsula) will have lower compliance costs than small businesses located in climate zone 7 (upper peninsula) due to the environmental differences in the climate zones.

21. Identify the nature of any report and the estimated cost of its preparation by small businesses required to comply with the proposed rules.

There are no increased costs of preparing reports to small businesses, or requirements mandating completion of reports with the proposed rules.

22. Analyze the costs of compliance for all small businesses affected by the proposed rules, including costs of equipment, supplies, labor, and increased administrative costs.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the small business. Additionally, inflationary costs and specific material selections will factor into the expenses for the small business. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a small business chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. It is likely that any increase in cost will be passed along from the small business engaged in the building construction project to the owner contracting for the project. Owners will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. The following are impacts due to the proposed rules, but are not limited to the list below:

Standard 90.1-2019 will provide an annual energy cost savings of \$0.063 per square foot on average across the state. In 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. The estimated annual energy cost savings for these projects under the proposed rules equates to \$6,887,034.

It will reduce statewide CO2 emissions by 10.0 MMT (30 years cumulative), equivalent to the CO2 emissions of 2,182,000 cars driven for one year.

Updating the state building code and energy code based on Standard 90.1-2019 will also stimulate the creation of high-quality jobs across the state.

Standard 90.1-2019 is expected to result in buildings that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort, and resilience.

Early investment in energy efficiency will pay dividends to residents of Michigan for years into the future.

When a building is built to a more stringent energy code, there is the long-term benefit of the ratepayer paying lower utility bills.

Regulated small businesses may incur training costs for building code continuing education courses with fees ranging from free to \$400.00 from ASHRAE. If the regulated small businesses desire use of the code book, a fee of \$144.00 will be required for the building code. The agency leaves it to the discretion of the regulated small businesses to choose how they obtain their training.

23. Identify the nature and estimated cost of any legal, consulting, or accounting services that small businesses would incur in complying with the proposed rules.

There is no anticipated change to the nature and estimated cost of any legal, consulting, or accounting services that small businesses would incur in complying with the proposed changes to the rules.

24. Estimate the ability of small businesses to absorb the costs without suffering economic harm and without adversely affecting competition in the marketplace.

It is likely that any increase in cost will be passed along from the small business engaged in the building construction project to the owner contracting for the project. Owners will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. It is assumed all builders who are small businesses pass the costs along to the building owner; therefore, competition would not be impacted.

25. Estimate the cost, if any, to the agency of administering or enforcing a rule that exempts or sets lesser standards for compliance by small businesses.

There are no rules that exempt or set lesser standards for compliance by small businesses. If the agency were to administer or enforce a rule that exempted or set lesser standards for compliance by small businesses the agency would incur some cost in training of inspection staff. Based on the current number of staff who would need to be trained, the estimated cost would be approximately \$2,195.00 (average of \$43.90 per hour times for 50 people).

26. Identify the impact on the public interest of exempting or setting lesser standards of compliance for small businesses.

There is no public interest at play as it relates to exempting standards of compliance for small businesses. To maintain the integrity, security, and fairness of businesses conducted in Michigan, all businesses must be held to the same compliance and exempting small businesses or setting lesser standards of compliance is not an option for fair and equal businesses practices. The code is applied uniformly across the state to ensure all jurisdictions are providing for the health, safety, and welfare of the public. Setting lesser standards of compliance for small businesses would negatively impact the safety of structures built by the small businesses and therefore the occupants of those structures.

27. Describe whether and how the agency has involved small businesses in the development of the proposed rules.

The agency involved small businesses through the Code/Rule Change Proposal Form, and rules review committee process.

A. If small businesses were involved in the development of the rules, please identify the business(es).

Small business participation on the committee included plumbing, electrical and mechanical contractors, building inspectors, residential builders, energy rating companies, professional engineers, small home and residential builders. In addition to the following listed small business involved within the development rules:

New Building Institute

Michigan Energy Innovation Business Council (MIEIBC)

Burglar and Fire Alarm Association of MI

American Concrete Institute

Code Savvy Consultants

Laddertech LLC DBA Ladderport

Cost-Benefit Analysis of Rules (independent of statutory impact)

28. Estimate the actual statewide compliance costs of the rule amendments on businesses or groups.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business or groups. Additionally, inflationary costs and specific material selections, will factor into the expenses for the businesses or groups. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a business or group chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. Any business or group already established in a preexisting structure or moves into a preexisting structure will derive no impact by these proposed rules. Probable causes effecting businesses or groups will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. Overall, the agency has no way of knowing what the additional specific expenses will be, as each individual structure will be unique to the needs. The following are impacts due to the proposed rules, but are not limited to the list below:

Standard 90.1-2019 will provide an annual energy cost savings of \$0.063 per square foot on average across the state. In 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. The estimated annual energy cost savings

for these projects under the proposed rules equates to \$6,887,034.

It will reduce statewide CO2 emissions by 10.0 MMT (30 years cumulative), equivalent to the CO2 emissions of 2,182,000 cars driven for one year.

Updating the state energy code based on Standard 90.1-2019 will also stimulate the creation of high-quality jobs across the state.

Standard 90.1-2019 is expected to result in buildings that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort, and resilience.

Early investment in energy efficiency will pay dividends to residents of Michigan for years into the future.

When a building is built to a more stringent energy code, there is the long-term benefit of the ratepayer paying lower utility bills.

For owners, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. The PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan indicates cost of the material is based on the project size and scope, only if the cause for alterations, renovations or building of a new residence is required. Additionally, inflationary costs and specific material selections, will factor into the expenses for the individual. According to the PNNL analysis, these costs would be offset through life-cycle cost savings as indicated in the chart below.

Cost estimates were developed for the differences between Standard 90.1-2016 and Standard 90.1-2019 as implemented in the six prototype models. Costs for the initial construction include material, labor, commissioning, construction equipment, overhead and profit. Costs were also estimated for replacing equipment or components at the end of the useful life. The costs were developed at the national level for the national cost-effectiveness analysis and then adjusted for local conditions using a state construction cost index (Hart et al. 2019, Means 2020a,b).

Table 5 shows incremental initial cost for individual building types in state-specific climate zones and weighted average costs by climate zone and building type for moving to Standard 90.1- 2019 from Standard 90.1-2016.

The added construction cost can be negative for some building types, which represents a reduction in first costs and a savings that is included in the net LCC savings. This is typically due to the interaction between measures and situations such as the following:

Fewer light fixtures are required when the allowed lighting power is reduced. Also, changes from fluorescent to LED technology result in reduced lighting costs in many cases and longer lamp lives, requiring fewer lamp replacements.

Smaller heating, ventilating, and air-conditioning (HVAC) equipment sizes can result from the lowering of heating and cooling loads due to other efficiency measures, such as better building envelopes. For example, Standard 90.1-2019 has more stringent fenestration U-factors for some climate zones. This results in smaller equipment and distribution systems, resulting in a negative first cost.

Table 5. Incremental Construction Cost for Michigan (\$/ft2)

| Climate Zone | Small Office Apartment | Large Office All Building Types | Stand-Alone Retail | Primary School | Small Hotel | Mid-Rise |
|--------------|------------------------|---------------------------------|--------------------|----------------|-------------|-----------|
| 5A | (\$1.748)(\$2.029) | (\$1.363) | (\$2.042) | \$0.666 | (\$0.381) | (\$1.013) |

| | | | | | |
|---------------|--------------------|-----------|-----------|---------|--------------------|
| 6A | (\$1.728)(\$2.008) | (\$1.305) | (\$2.053) | \$0.675 | (\$0.444)(\$1.196) |
| 7 | (\$1.667)(\$1.992) | (\$1.299) | (\$2.055) | \$0.714 | (\$0.612)(\$1.227) |
| State Average | (\$1.722)(\$2.008) | (\$1.305) | (\$2.053) | \$0.680 | (\$0.452)(\$1.198) |

In 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. Using the above data from PNNL the statewide incremental construction cost equates to a life-cycle net savings of approximately \$130,962,964 across building types and climate zones.

A. Identify the businesses or groups who will be directly affected by, bear the cost of, or directly benefit from the proposed rules.

The businesses and groups who will be directly affected by the proposed rules are those entities who either build a new structure or renovate an existing structure to work in or renovate an existing structure. Also, contractors will be affected by these proposed rules because they will be hired to construct pursuant to the new building requirements. The businesses or groups who will directly benefit from the proposed rules will be the individuals producing the energy products, building contractors, and timber supply and processing businesses because they will be able to profit through the hired work to be performed based upon the new building code requirements. Additionally, structure owners will realize an energy costs savings long-term, as these standards are implemented through new build or renovations. The individuals who will build a new structure or renovate an existing structure will bear the cost of the new standards.

B. What additional costs will be imposed on businesses and other groups as a result of these proposed rules (i.e. new equipment, supplies, labor, accounting, or recordkeeping)? Please identify the types and number of businesses and groups. Be sure to quantify how each entity will be affected.

The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a small business chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. Any small business already established in a preexisting structure or moves into a preexisting structure will derive no impact by these proposed rules. Businesses will incur higher upfront costs, but these expenses will be offset by the long-term financial savings because of this rule set. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business deriving from inflationary costs and specific material selections factoring into the expenses for the business. There are over 61,000 skilled trade licensees who will be impacted. As cited in PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan. The following are impacts due to the proposed rules, but impacts are not limited to the list below:

Standard 90.1-2019 will provide an annual energy cost savings of \$0.063 per square foot on average across the state.

It will reduce statewide CO2 emissions by 10.0 MMT (30 years cumulative), equivalent to the CO2 emissions of 2,182,000 cars driven for one year.

Updating the state building code based on Standard 90.1-2019 will also stimulate the creation of high-quality jobs across the state.

Standard 90.1-2019 is expected to result in buildings that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort, and resilience.

Early investment in energy efficiency will pay dividends to residents of Michigan for years into the future.

Table 3. Annual Energy Cost Savings for Michigan (\$/ft2)

| Climate Zone | Small Office | Large Office | Stand-Alone | Retail | Primary School | Small Hotel | Mid-Rise Apartment | All |
|----------------|--------------|--------------|-------------|---------|----------------|-------------|--------------------|-----|
| Building Types | | | | | | | | |
| 5A | \$0.048 | \$0.058 | \$0.096 | \$0.072 | \$0.082 | \$0.019 | | |
| \$0.073 | | | | | | | | |
| 6A | \$0.048 | \$0.057 | \$0.082 | \$0.073 | \$0.079 | \$0.021 | | |
| \$0.062 | | | | | | | | |
| 7 | \$0.052 | \$0.057 | \$0.074 | \$0.072 | \$0.066 | \$0.030 | | |
| \$0.067 | | | | | | | | |
| State Average | \$0.048 | \$0.057 | \$0.081 | \$0.073 | \$0.077 | \$0.021 | | |
| \$0.063 | | | | | | | | |

Jobs Creation through Energy Efficiency

Energy-efficient building codes impact job creation through two primary value streams:

Dollars returned to the economy through reduction in utility bills and resulting increase in disposable income, and;

An increase in construction-related activities associated with the incremental cost of construction that is required to produce a more energy efficient building.

Regulated businesses or groups may incur training costs for building code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. If the regulated businesses or groups desires use of the code book, a fee of \$144.00 will be required for the building code. The agency leaves it to the discretion of the regulated businesses or groups to choose how they obtain their training. There are over 61,000 skilled trades licensees in the state who will be impacted.

29. Estimate the actual statewide compliance costs of the proposed rules on individuals (regulated individuals or the public). Include the costs of education, training, application fees, examination fees, license fees, new equipment, supplies, labor, accounting, or recordkeeping.

Regulated individuals may incur training costs for building code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. The 2021 IBC essentials course offered by ICC online costs \$198.00 for non-members. If the regulated individual desires use of the code book, a fee of \$144.00 will be required for the building code.? The agency leaves it to the discretion of the regulated individual to choose how they obtain their training. Estimated statewide compliance costs, assuming all regulated individuals take a course and purchase a code book is \$28,750,000. The qualitative effect will be to improve licensee knowledge of the code, as well as new technologies and techniques derived when completing training. In addition, in 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. The estimated annual building cost savings for these projects under the proposed rules equates to \$6,887,034.

A. How many and what category of individuals will be affected by the rules?

It is anticipated that approximately 61,000 skilled trades licensees and other regulated individuals (including architects and engineers) will be affected by the proposed rules, but only when new build structures or renovations are contracted for.

B. What qualitative and quantitative impact do the proposed changes in rules have on these individuals?

Regulated individuals may incur training costs for building code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. The 2021 IBC essentials course offered by ICC online costs \$198.00 for non-members. If the regulated individual desires use of the code book, a fee of \$144.00 will be required for the building code. The agency leaves it to the discretion of the regulated individual to choose how they obtain their training. Estimated statewide compliance costs, assuming all regulated individuals take a course and purchase a code book is \$28,750,000. The qualitative effect will be to improve licensee knowledge of the code, as well as new technologies and techniques derived when completing training. In addition, in 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. The estimated annual building cost savings for these projects under the proposed rules equates to \$6,887,034.

According to PNNL, energy-efficient building codes impact job creation through two primary value streams:

1. Dollars returned to the economy through reduction in utility bills and resulting increase in disposable income, and;
2. An increase in construction-related activities associated with the incremental cost of construction that is required to produce a more energy efficient building.

30. Quantify any cost reductions to businesses, individuals, groups of individuals, or governmental units as a result of the proposed rules.

If the aforementioned groups stay within their existing building, and never make changes, they will neither incur costs nor realize savings based on this new set of rules. The cost reductions will depend upon if the individual, business, group of individuals build a new structure or renovate an existing structure where they are located. As cited in PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan. The following are results of cost reductions due the proposed rules, but are not limited to following listed below:

Standard 90.1-2019 will provide an annual energy cost savings of \$0.063 per square foot on average across the state.

It will reduce statewide CO2 emissions by 10.0 MMT (30 years cumulative), equivalent to the CO2 emissions of 2,182,000 cars driven for one year.

Updating the state energy code based on Standard 90.1-2019 will also stimulate the creation of high-quality jobs across the state.

Standard 90.1-2019 is expected to result in buildings that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort, and resilience.

Early investment in energy efficiency will pay dividends to residents of Michigan for years into the future.

When a building is built to a more stringent energy code, there is the long-term benefit of the ratepayer paying lower utility bills.

31. Estimate the primary and direct benefits and any secondary or indirect benefits of the proposed rules. Please provide both quantitative and qualitative information, as well as your assumptions.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business or groups. Additionally, inflationary costs and specific material selections will factor into the expenses for the businesses or groups. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a business or group chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. Any business or group already established in a preexisting structure or moves into a preexisting structure will derive no impact by these proposed rules. Businesses or groups will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. While each

individual structure will be unique based on the needs of the occupant, the following are impacts due to the proposed rules, but are not limited to the list below:

Standard 90.1-2019 will provide an annual energy cost savings of \$0.063 per square foot on average across the state. In 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. The estimated annual energy cost savings for these projects under the proposed rules equates to \$6,887,034.

It will reduce statewide CO₂ emissions by 10.0 MMT (30 years cumulative), equivalent to the CO₂ emissions of 2,182,000 cars driven for one year.

Updating the state energy code based on Standard 90.1-2019 will also stimulate the creation of high-quality jobs across the state.

Standard 90.1-2019 is expected to result in buildings that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort, and resilience.

Early investment in energy efficiency will pay dividends to residents of Michigan for years into the future.

When a building is built to a more stringent energy code, there is the long-term benefit of the ratepayer paying lower utility bills.

For owners, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. The PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan indicates cost of the material is based on the project size and scope. Additionally, inflationary costs and specific material selections, will factor into the expenses for the project. According to the PNNL analysis, these costs would be offset through life-cycle cost savings as indicated in the chart below.

Cost estimates were developed for the differences between Standard 90.1-2016 and Standard 90.1-2019 as implemented in the six prototype models. Costs for the initial construction include material, labor, commissioning, construction equipment, overhead and profit. Costs were also estimated for replacing equipment or components at the end of the useful life. The costs were developed at the national level for the national cost-effectiveness analysis and then adjusted for local conditions using a state construction cost index (Hart et al. 2019, Means 2020a,b).

Table 5 shows incremental initial cost for individual building types in state-specific climate zones and weighted average costs by climate zone and building type for moving to Standard 90.1- 2019 from Standard 90.1-2016.

The added construction cost can be negative for some building types, which represents a reduction in first costs and a savings that is included in the net LCC savings. This is typically due to the interaction between measures and situations such as the following:

Fewer light fixtures are required when the allowed lighting power is reduced. Also, changes from fluorescent to LED technology result in reduced lighting costs in many cases and longer lamp lives, requiring fewer lamp replacements.

Smaller heating, ventilating, and air-conditioning (HVAC) equipment sizes can result from the lowering of heating and cooling loads due to other efficiency measures, such as better building envelopes. For example, Standard 90.1-2019 has more stringent fenestration U-factors for some climate zones. This results in smaller equipment and distribution systems, resulting in a negative first cost.

Table 5. Incremental Construction Cost for Michigan (\$/ft2)

| Climate Zone | Small Office | Large Office | Stand-Alone Retail | Primary School | Small Hotel | Mid-Rise Apartment |
|---------------|--------------|--------------|--------------------|----------------|-------------|--------------------|
| 5A | (\$1.748) | (\$2.029) | (\$1.363) | (\$2.042) | \$0.666 | (\$0.381) |
| 6A | (\$1.728) | (\$2.008) | (\$1.305) | (\$2.053) | \$0.675 | (\$0.444) |
| 7 | (\$1.667) | (\$1.992) | (\$1.299) | (\$2.055) | \$0.714 | (\$0.612) |
| State Average | (\$1.722) | (\$2.008) | (\$1.305) | (\$2.053) | \$0.680 | (\$0.452) |

In 2023, the state issued 2,021 permits applying to approximately 3,279,540 square feet. As the state is the permitting authority for approximately 3% of the municipalities in the state, it is assumed the statewide number of permits is approximately 67,367 applying to approximately 109,318,000 square feet. Using the above data from PNNL the statewide incremental construction cost equates to a life-cycle net savings of approximately \$130,962,964 across building types and climate zones.

The businesses and groups who will be directly affected by the proposed rules are those entities who either build a new structure or renovate an existing structure. Also, contractors will be affected by these proposed rules because they will be hired to construct pursuant to the new building requirements. The businesses or groups who will directly benefit from the proposed rules will be the individuals producing the energy products, building contractors and timber supply and processing businesses because they will be able to profit through the hired work to be performed based upon the new building code requirements. Additionally, structure owners will realize an energy costs savings long-term, as these standards are implemented through new build or renovations. The individuals who will build a new structure or renovate an existing structure will bear the cost of the new standards.

The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a property owner chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses. Any business already established in a preexisting structure or that moves into a preexisting structure will derive no impact by these proposed rules. Businesses will incur higher upfront costs, but these expenses will be offset by the long-term financial savings because of this rule set. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business deriving from inflationary costs and specific material selections factoring into the expenses for the business.

There are over 61,000 skilled trade licensees who will be impacted. Regulated individuals may incur training costs for building code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. The 2021 IBC essentials course offered by ICC online costs \$198.00 for non-members. If the regulated individual desires use of the code book, a fee of \$144.00 will be required for the building code. The agency leaves it to the discretion of the regulated individual to choose how they obtain their training. Estimated statewide compliance costs, assuming all regulated individuals take a course and purchase a code book is \$28,750,00. The qualitative effect will be to improve licensee knowledge of the code, as well as new technologies and techniques derived when completing training. This data is based on the assumption that all licensees pursue training on the updated code and purchase a code book.

Table 3. Annual Energy Cost Savings for Michigan (\$/ft2)

| Climate Zone | Small Office | Large Office | Stand-Alone Retail | Primary School | Small Hotel | Mid-Rise Apartment |
|--------------|--------------|--------------|--------------------|----------------|-------------|--------------------|
| 5A | \$0.048 | \$0.058 | \$0.096 | \$0.072 | \$0.082 | \$0.019 |
| 6A | \$0.048 | \$0.057 | \$0.082 | \$0.073 | \$0.079 | \$0.021 |

| | | | | | | |
|---------------|---------|---------|---------|---------|---------|---------|
| \$0.062 | | | | | | |
| 7 | \$0.052 | \$0.057 | \$0.074 | \$0.072 | \$0.066 | \$0.030 |
| \$0.067 | | | | | | |
| State Average | \$0.048 | \$0.057 | \$0.081 | \$0.073 | \$0.077 | \$0.021 |
| \$0.063 | | | | | | |

Jobs Creation through Energy Efficiency

Energy-efficient building codes impact job creation through two primary value streams:

Dollars returned to the economy through reduction in utility bills and resulting increase in disposable income, and;

An increase in construction-related activities associated with the incremental cost of construction that is required to produce a more energy efficient building.

32. Explain how the proposed rules will impact business growth and job creation (or elimination) in Michigan.

The proposed rules will benefit the skilled trades profession as well as the building related industry due to the new requirements which are established in this rule set. Michigan can ensure more resilient businesses by adopting the latest building code, which lower utility bills, improve construction quality, create local jobs and support workforce training for Michiganders.

33. Identify any individuals or businesses who will be disproportionately affected by the rules as a result of their industrial sector, segment of the public, business size, or geographic location.

Overall, the proposed changes to the rules have a disproportionate impact on small businesses in the three different climate zones, with each climate zone having its own unique building requirements effect cost because of their size or geographical location. The code is applied uniformly across the state to ensure all jurisdictions are providing for the health, safety, and welfare of the public.

34. Identify the sources the agency relied upon in compiling the regulatory impact statement, including the methodology utilized in determining the existence and extent of the impact of the proposed rules and a cost-benefit analysis of the proposed rules.

Data for this Regulatory Impact Statement came from the PNNL study on the national cost-effectiveness of the ASHRAE standard 90.1-2019 and information and data provided by stakeholders, the Construction Code Commission, the State Plumbing Board, the Electrical Administrative Board, and the Board of Mechanical Rules. The Residential Builders Maintenance and Alteration Contractors Board was consulted but no substantial changes or suggestions were received. The agency also reviewed comments from the code/rule proposal forms and obtained research on other Great Lake States (Ohio, Wisconsin and Minnesota).

Through the means identified above, the following stakeholders contributed to this regulatory impact statement:

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Pacific Northwest National Laboratory

A. How were estimates made, and what were your assumptions? Include internal and external sources, published reports, information provided by associations or organizations, etc., that demonstrate a need for the proposed rules.

The agency relied on the following when determining the existence and extent of the impact of the proposed rules:

Commission and Stakeholders

The U.S. Department of Energy (DOE) cost-effectiveness methodology

The U.S. Energy Information Administration (EIA)

2018 ENERGY STAR Cost & Savings Estimates

PNNL Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for the State of Michigan

Wood Products Council and American Wood Council at thinkwood.com

Dovetail Partners – Mass Timber Report

Alternative to Regulation

35. Identify any reasonable alternatives to the proposed rules that would achieve the same or similar goals.

No reasonable alternatives would achieve the same goals. The agency is required by statute to adopt the updated IBC and ASHRAE standard.

A. Please include any statutory amendments that may be necessary to achieve such alternatives.

Although the agency does not believe any statutory amendments are necessary to the Stille-DeRossett-Hale Single State Construction Code Act, individuals who believe the building code updates cause additional expenses to be incurred may wish to lobby the legislature to extend the building code adoption to greater than every three years.

36. Discuss the feasibility of establishing a regulatory program similar to that proposed in the rules that would operate through private market-based mechanisms. Please include a discussion of private market-based systems utilized by other states.

The agency is unaware of similar programs or private market-based systems in other states.

37. Discuss all significant alternatives the agency considered during rule development and why they were not incorporated into the rules. This section should include ideas considered both during internal discussions and discussions with stakeholders, affected parties, or advisory groups.

There were no significant alternatives presented for the agency and rules review committee to consider.

Additional Information

38. As required by MCL 24.245b(1)(c), please describe any instructions regarding the method of complying with the rules, if applicable.

Upon promulgation of the Michigan rule's, the agency will publish instructions on obtaining the updated code books.