Fiscal Note for
Amendment to 2024 NC Administrative Code Section 107 to add Sheathing Inspections

Agency: NC Building Code Council

Statute: G.S. 143-136; 143-138

Contact: Carl Martin
Deputy Commissioner Engineering Division
NC Department of Insurance, Office of State Fire Marshal
1202 Mail Service Center
Raleigh, NC 27699-1202
919-888-00284
carl.martin@ncdoi.gov

Impact:		
	Federal Government	No
	State Government	No
	Local Government	No
	Small Businesses:	No (minimal)
	Substantial Impact:	Yes [§ 150B-21.4(b1)]
	Dwelling $80.00 Increase	Yes [§ 143-138(a1)(1)]

Purpose:
The 2024 edition of NC Administrative Code and Policies is to direct building inspection departments, builders, and the general public regarding standard procedures and NC statutory requirements for safe construction in the state. "Sheathing inspections" is then included as a requirement to safely construct structures where the sheathing is an integral part of the lateral live load resistance system. Lateral resistance refers to a building's ability to withstand wind and seismic forces without collapsing.

Impact:

Federal Government: Federal buildings are not regulated by the state; so, there is no impact to such buildings.

State Government: State buildings are inspected by the designer in principal charge of the construction and are not subject to the list of inspections listed in NC Administrative Code and Policies Section 107.

Local Government: Cost to local government associated with this amendment are recovered through permit fees.

Small Businesses: The impact to small businesses is tied to permit cost increases imposed by local code enforcement agencies.

Dwellings: The impact to dwelling is tied to permit cost increases imposed by local code enforcement agencies.

Impact Analysis:

The amendment only applies to structural sheathing resisting lateral live loads such as wind and seismic events in new construction. The amendment is limited to commercial buildings that use sheathing for lateral load resistance and for detached one- and two-family dwellings and townhouses constructed in

130mph wind zones or higher. The inspection is verifying that the sheathing is installed as required either by the codes or to the engineered design drawings to resist the applicable lateral live loads. Typically sheathing is only used as a lateral load resistance system for wood structures. When sheathing is part of the lateral live load resistance system for commercial construction the sheathing inspection is typically performed in conjunction with the framing inspection; so, this amendment adds minimal cost to commercial construction. Currently sheathing inspections are not part of the inspections for detached one- and two-family dwellings and townhouses even though sheathing is an integral part of the lateral live load resistance system in those structures. This analysis, therefore, only addresses the impact to the construction of detached one- and two-family dwellings and townhouses.

According to the U.S. Census Bureau, the average size of a single-family unit built in the southern U.S. in 2021 was 2,491sf.[1] Information from local NC code enforcement agencies indicates that a sheathing inspection for a dwelling of this size takes an average of 2 hours.

Based on $75.00 per hour labor and two hours to provide a sheathing inspection, the cost of the inspection is $150.00 per dwelling. The building inspector compensation information of $75.00 per hour includes salary plus benefits and was derived from Mecklenburg County Code Enforcement Agency information. Actual compensation will vary by local jurisdiction, so this cost should be considered an approximation.

This cost only applies in counties that have a wind speed of 130mph or greater. 42 of the 100 North Carolina counties have winds speeds of 130mph or greater per 2024 NC Residential Code, Table R301.2(4). The majority of these counties are east of I-95. Some are in western NC but the amendment only applies where the mountain elevations are 3,000 feet above sea level or higher. It is expected that this added cost will be forwarded on to the building permit applicant and then on to the homebuyer.

Table 1. Projected Single-Family Housing Starts for North Carolina and Estimated Added Cost

Year	2023	2024	2025	2026	2027	5-year NPV
SF Housing Starts, Total (Thousands)[2]	49.6	53.2	55.3	54.1	53.3	
42% of Total, Affected (Thousands)	20.8	22.3	23.2	22.7	22.4	
Sheathing Inspection Cost per SF Dwelling[3]	$150	$150	$150	$150	$150	
Total Estimated Cost ($M)	$3.1	$3.4	$3.5	$3.4	$3.4	**$13.69[4]**

Table 1 shows the total estimated cost of the proposed amendment for years 2023-2027. This estimate was based on the projected number of single-family housing starts for North Carolina for those years. It was assumed that housing starts will be evenly distributed across the 42 affected counties.

Risk and Uncertainties:

There are several uncertainties related to this analysis due to assumptions made or lack of available data. First, the estimated labor costs use average house size data for the southern states in aggregate as a proxy for average housing size in North Carolina. It is possible that the average house size in the affected NC

[1] quarterly_starts_completions_cust.xls (census.gov)
[2] Housing start forecast data is from the IHS Connect Regional Database.
[3] Costs have not been adjusted for future changes in labor costs.
[4] Calculated in 2022 dollars using a 7% discount rate.

counties is either larger or smaller. This could increase or decrease the time required to perform the sheathing inspection, thereby increasing or decreasing the total labor cost.

Second, the compensation rate for inspectors who will perform the work will vary by local jurisdiction. We used the rate for Mecklenburg County as a reasonable approximation for all NC jurisdictions; however, the actual costs could be higher or lower.

Third, the estimates in Table 1 use forecasted housing starts. Forecasts are inherently uncertain, so the actual number of housing starts could be higher or lower. In addition, the forecast data was for the whole of North Carolina and was not broken down by county. For purposes of this analysis, we assumed the number of housing starts was distributed evenly across all 100 counties. This is likely an overestimate because some of the most populous counties in the state with a large portion of the building activity (e.g., Wake, Mecklenburg, Guilford, Forsyth) are not included in the 42 subject counties and will not be impacted by the proposed amendment.

Finally, given the lack of data, benefits are hard to estimate and are not included in this analysis. Ensuring that sheathing is installed in accordance with building code will provide an additional layer of safety just as other inspections provide. As a component of the lateral live load resistance system, sheathing helps to transfer lateral loads to the foundation, thereby preventing damage and building collapse. This is especially critical in high wind conditions. Based on prior phone calls to the DOI Engineering Division the proposed amendment will result in a higher number of homes being constructed in compliance with the building code. As a result, these homes will be less susceptible to damage due to high winds. In turn, this should provide an additional element of protection to the people who reside in those homes. The avoidance of potential damage to property and risk to human life due to the proposed amendment could not be quantified, but these benefits are expected to exceed the sheathing inspection costs.

Alternatives:
The options are to:

(1) remain at the current level of protection provided by 2024 NC Administrative Code Section 107 which does not require a sheathing inspection. Sheathing is an integral part of the lateral live road resistance system, and requiring inspections helps to ensure that structures are safely built. For this reason, the alternative to not adopt the proposed amendment was rejected.

(2) adopt the 2024 NC Administrative Code and Policies Section 107 amendment for all 100 counties of the state. Redundancy in structure helps assist in resisting lateral forces in both low and high wind areas. Sheathing that is not installed in full compliance with the building codes is more likely to be reinforced by the building's framing system and interior finish system, potentially making the building more susceptible to damage. Although the risk of damage in low wind areas is not zero, it is minimal compared to the risk in high wind areas. Using the same forecasted housing start data as in Table 1, the estimated cost of expanding the proposed amendment to all 100 counties is $32.59M (5-yr NPV)[5]. Although the benefits of requiring sheathing inspections could not be quantified, they are more likely to be realized in high wind areas than in low wind areas. Recognizing the need to balance the potential risks with the costs, the NC Building Code Council rejected the alternative to adopt the amendment in all 100 counties.

Appendix A:
2024 NC Administrative Code Section 107 amendment.

Appendix B:
Administrative Code Standing Committee Members

[5] 5-year NPV calculated in $2022 using 7% discount rate.

ATTACHMENT A

CHAPTER 1
ADMINISTRATIVE CODE
SECTION 107
INSPECTIONS

107.1 General. The inspection department shall perform the following inspections:

1. Footing – 107.1.1;
2. Under slab, as appropriate – 107.1.2;
3. Foundation – 107.1.3;
4. Building framing – 107.1.4;
5. Sheathing – 107.1.5;

~~5~~ 6. Rough-in ~~107.1.5~~ 107.1.6;

~~6~~ 7. Insulation ~~107.1.6~~ 107.1.7;

~~7~~ 8. Fire protection ~~107.1.7~~ 107.1.8; and

~~8~~ 9. Final ~~107.1.8~~ 107.1.9.

107.1.5 Sheathing inspection. Required for structures constructed under the NC Building Code where the exterior sheathing is part of the lateral force resistance system. Required for dwellings constructed under the NC Residential Code in 130 mph wind zones or higher where the exterior sheathing is part of the wall bracing system. Sheathing inspection shall be made during or after the framing inspection, but before the water-resistant barrier and exterior finish is installed.

Commentary: This inspection verifies that sheathing and sheathing fasteners are installed as required by the code or the design professional. Sheathing fasteners connect sheathing to the framing to prevent framing from racking during wind or seismic loads. At the discretion of the building inspector, this inspection can be performed concurrently with the framing inspection.

~~107.1.5~~ 107.1.6 Rough-in inspection. Rough-in inspections shall be made when all building framing and parts of the electrical, plumbing, fire protection, or heating-ventilation or cooling system that will be hidden from view in the finished building have been placed, but before any wall, ceiling finish, or building insulation is installed.

~~107.1.6~~ 107.1.7 Insulation inspection. Insulation inspections shall be made after an approved building framing and rough-in inspection and after the permanent roof covering is installed, with all insulation and vapor retarders in place, but before any wall or ceiling covering is applied.

~~107.1.7~~ 107.1.8 Fire protection inspection. Fire protection inspections shall be made in all buildings where any material is used for fire protection purposes. The permit holder or his agent shall notify the inspection department after all fire protection materials are in place. Fire protection materials shall not be concealed until inspected and approved by the code enforcement official.

~~107.1.8~~ 107.1.9 Final inspection. Final inspections shall be made for each trade after completion of the work authorized under the technical codes.

ATTACHMENT B

Building Code Council Administrative Code Standing Committee Members

Bridget Herring	BCC Chair/ Committee Chair	828-259-5558	herring@ncbcc@gmail.com
Mark Matheny	BCC Vice-Chair/ Committee Vive-Chair	828-778-0754	mmatheny@ashevillenc.gov
Kim Wooten	Electrical Engineer	980-312-5301	khumiston@devitainc.com
Jason Shepherd	Fire Code Standing Committee Chair / Fire Service	919-201-6638	jshepherd@dconc.gov
Natalie MacDonald	Mechanical Standing Committee / Mechanical Engineer	984-255-7062	nmacdonald@dewberry.com
Andrew Cole	Architect	919-941-9000	acole@obrienatkins.com
Rob Zapple	County Government Representative	910-798-7145	rzapple@nhcgov.com
Chris Berg	Structural Standing Committee / Structural Engineer	919-322-0115	chris.berg@summitde.com