Fiscal Note for
2023 State Electrical Code

Agency: NC Building Code Council

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

Contact: Benjamen Wesley
Assistant Chief Code Consultant, and State Electrical Inspector
NC Department of Insurance, Office of State Fire Marshal
1429 Rock Quarry Road
Raleigh, NC 27610
919-532-4175
ben.wesley@ncdoi.gov

Impact:		
	Federal Government:	No
	State Government:	No
	Local Government:	No (minimal)
	Small Businesses:	No (minimal)
	Substantial Impact:	Yes
	Dwelling $80.00 Increase	Yes

Purpose:
The 2023 edition of National Fire Protection Association (NFPA) 70, *National Electrical Code* (NEC) is a model code that regulates minimum electrical construction requirements for new buildings and installations. The *North Carolina State Electrical Code* is based on the NEC with North Carolina administrative and technical amendments. The State Electrical Code addresses minimum construction requirements for all aspects of electrical installations in both commercial and residential buildings.

The NC Building Code Council (BCC) plans to adopt the 2023 NEC as the new State Electrical Code with some changes in the form of State amendments. The proposed NC amendments to the 2023 NEC that the BCC plans to adopt are listed in Appendix A. The 2023 State Electrical Code major changes are identified in Appendix B. The 2023 NEC changes that may have an economic impact are presented in Appendix C. Appendix D includes a list of the members of the 2023 State Electrical Code Ad Hoc Committee who voted on the amendments to the 2023 NEC.

The purpose of the State Electrical Code is the practical safeguarding of persons and property from hazards arising from the use of electricity. The State Electrical Code is intended for use by code officials, contractors, and designers. The State Electrical Code is not intended as a design specification or an instruction manual for untrained persons. The State Electrical Code is organized by major content into nine chapters: General, Wiring and Protection, Wiring Methods and Materials, Equipment for General Use, Special Occupancies, Special Equipment, Special Conditions, Communications Systems, and Tables.

For example, before one constructs a building, the designer and contractor must determine the minimum electrical requirements for the building. Depending on whether the project includes

AC current or DC current; low-voltage or high-voltage equipment; residential use or commercial use; hazardous locations; the State Electrical Code sets forth minimum requirements for safe electrical power distribution.

Impact:

***Federal Government*:** The US General Services Administration has adopted the technical requirements of the latest edition of the nationally recognized codes, including the current accumulative supplements, in effect at the time of design contract award. The 2023 NEC is the latest edition for electrical installations. Therefore, the 2023 State Electrical Code adoption would have no additional impact on federal buildings.

State Government: The North Carolina Legislature has ruled that all facilities constructed or renovated for the State, 20,000 GSF in area or larger, shall be designed based on life-cycle cost. The goal of this legislation is to ensure that designers maximize the long-term benefits to the State, within the confines of a specific capital appropriation, since it is obvious that the cost imposed on the State over the life of a building far exceeds the initial construction investment. The 2023 State Electrical Code adoption will have negligible impact.

Local Government: The impact to local government is based on the purchase of the 2023 NEC for code enforcement and is considered minimal. The major proposed changes noted below under "Business" are not likely to affect local government.

Business:
The proposed changes would have an impact (some costs and some savings) on developers. Developers may pass the additional cost on to their customers or the end property user. The increased safety and efficiency will be of benefit to the end-user of the building.

Below are descriptions and benefits of the major proposed changes to the code that would result in an impact:

- Revision to expand Ground-Fault Circuit-Interrupter (GFCI) protection to more receptacles and outdoor equipment. Expected to affect an unknown amount of receptacles and outdoor equipment.
- Arc-fault protection requirements have increased throughout a dwelling and other occupancies that have rooms or areas for sleeping. Expected to affect 100% of all dwellings and an unknown amount of other occupancies.
- Revision to require surge protection on service equipment. Surge protection has an upfront cost to protect from expenditures associated with lighting damage in the future. Expected to affect only services where the utility does not provide protection.

There are additional changes noted in Appendix C that indicate minimal change in cost, and whether it is a decrease, increase. The discussion below, by code article, addresses the major proposed changes to the code that would result in an impact.

Impact Analysis:

The Committee initially reviewed and identified the changes in Appendix B that were either an increase to or a relief from the 2020 State Electrical Code requirements. Upon further review, the sections below were determined to have quantifiable costs and savings. The remaining changes identified in Appendix C were deemed minimal without measurable cost or savings.

The Committee members listed in Appendix D were appointed as industry experts and tasked with reviewing for technical and cost changes. Certain changes in the Code will both increase and decrease the cost of installation in various circumstances. There were no individual changes that the Committee believes will have a substantial economic impact. There are changes that as a collective will cause a substantial economic impact in excess of $1M per year. There was one section that the Committee believes may increase the cost of residential construction by more than $80.00 in certain scenarios. The 2020 State Electrical Code is the official current State Electrical Code in effects that references the 2017 State Electrical Code for regulating the electrical systems in one- and two-family dwellings; therefore, the 2017 and the 2020 State Electrical Codes were considered when comparing residential applications.

210.8(A)(8)/ 210.8(D)(8)- 125/250v Ranges (GFCI Protection for Personnel) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that in dwellings where a 125/250v range receptacle is installed within 6 ft of a sink and all electric ranges, the receptacle must be provided with GFCI protection. The current 2020 State Electrical Code does not require a range receptacle installed within 6 ft of a sink, to be provided with GFCI protection. Expected to affect approximately 85% of range receptacles installed in residential kitchens.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.8(A)(8) is applicable to 125/250v range receptacles is for a GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit and receptacle of the range.
- Analysis: Because the typical range breaker is a 50-amp Standard 2-Pole Breaker, the following analysis was performed:
  50-amp Standard 2-Pole Breaker – Average Cost – $16.97
  50-amp GFCI 2-Pole Breaker – Average Cost – $119.32
  Increase of $102.35
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address all receptacles that are in a dwelling's kitchen area that are near a water source and may create a shock hazard to personnel.
- Estimated Impact: This will affect an unknown number of dwelling kitchen installations per year. Only designs that require a 125/250v range receptacle will anticipate an average cost increase of $102.35 per installation.

210.8(A)(11)/ 210.8(D)(11) - 125/250v Clothes Dryers (GFCI Protection for Personnel) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that in dwellings where a 125/250v clothes dryer receptacle is installed, the receptacle must be provided with GFCI protection. The current 2020 State Electrical Code does not require a clothes dryer receptacle to be provided with GFCI protection. Expected to affect approximately 90% of dwellings when adjusting for 125v and gas-type clothes dryers.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where sections 210.8(A)(11) & 210.8(D)(11) is applicable to 125/250v clothes dryer receptacles is for a GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit and receptacle of the clothes dryer.
- Analysis: Because the typical clothes dryer breaker is a 30-amp Standard 2-Pole Breaker, the following analysis was performed:
  30-amp Standard 2-Pole Breaker – Average Cost – $16.97
  30-amp GFCI 2-Pole Breaker – Average Cost – $112.32
  Increase of $95.35
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: These requirements are to address all receptacles that are in a dwelling's laundry area that are near a water source and all clothes dryers may create a shock hazard to personnel.
- Estimated Impact: This will affect an unknown number of dwelling laundry area installations per year. Only designs that require a 125/250v clothes dryer receptacle will anticipate an average cost increase of $95.35 per installation.

210.8(D)(7)/ 422.5(A)(7) Dishwasher (GFCI Protection for Personnel) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that in dwellings where a dishwasher is installed, the dishwasher must be provided with GFCI protection. The current 2020 State Electrical Code does not require a dishwasher to be provided with GFCI protection. Expected to affect approximately 95% dwellings constructed without dishwashers installed.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where sections 210.8(D)(7) & 422.5(A)(7) are applicable to dishwashers is for a GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit and dishwasher.
- Analysis: Because the typical dishwasher breaker is a 15-amp Standard 1-Pole Breaker, the following analysis was performed:

15-amp Standard 1-Pole Breaker – Average Cost – $7.11
15-amp AFCI/GFCI 1-Pole Breaker – Average Cost – $64.87
Increase of $57.76

- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address dishwashers that are in a dwelling's kitchen area that are near a water source and may create a shock hazard to personnel.
- Estimated Impact: This will affect an unknown number of dishwasher installations per year. Only designs that require a dishwasher installation will anticipate an average cost increase of $57.76 per installation.

210.8(F) Outdoor Outlets (GFCI Protection for Personnel) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings where an outdoor outlet is installed, the outlet must be provided with GFCI protection. The current 2020 State Electrical Code does not require an outdoor outlet, other than a receptacle outlet to be provided with GFCI protection. Expected to affect approximately 75% of dwellings when adjusting for dwellings constructed without outdoor outlets. Listed HVAC equipment are exempt from these requirements until September 1st, 2026.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.8(F) is applicable to outdoor outlets is for a GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit and outdoor outlet.
- Analysis: Because the typical outdoor outlet breaker is a 30-amp Standard 2-Pole Breaker, the following analysis was performed:
  30-amp Standard 2-Pole Breaker – Average Cost – $16.97
  30-amp GFCI 2-Pole Breaker – Average Cost – $112.32
  Increase of $95.35
- Justification of Analysis: Performed using Home Depot , Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address dwelling outdoor outlets subjected to rain and other outdoor elements that may create a shock hazard to personnel.
- Estimated Impact: This will affect an unknown number of outdoor outlet installations per year. Only designs that require an outdoor outlet installation will anticipate an average cost increase of $95.35 per installation.

210.12(B) Laundry Area Outlets (AFCI Protection) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings, the laundry area outlet branch circuits must be provided with AFCI protection. The

current 2020 State Electrical Code does not require laundry area outlet branch circuits to be provided with AFCI protection. Expected to affect approximately 100% of laundry area outlet branch circuits.

- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.12(B) is applicable to laundry area outlet branch circuits is for an AFCI/GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit. Because the AFCI/GFCI breaker also satisfies the GFCI receptacle requirement, the standard receptacle will be installed in lieu of a GFCI-type receptacle.
- Analysis: Because the typical laundry area outlet branch circuit is a GFCI Receptacle on a 20-amp Standard 1-Pole Breaker, the following analysis was performed:
  GFCI Receptacle on a 20-amp Standard 1-Pole Breaker – Average Cost – $30.55
  20-amp AFCI/GFCI 2-Pole Breaker – Average Cost – $64.87
  Increase of $34.32
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address dwelling laundry area outlet branch circuits that may create an arc hazard.
- Estimated Impact: All dwellings are required to have at least one laundry area receptacle outlet. This will affect all dwelling laundry area outlet branch circuits installations per year. All dwelling designs will anticipate an average cost increase of $34.32 per installation of laundry area outlet branch circuits.

210.12(B) Microwave Outlets (AFCI Protection) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings, the microwave outlet branch circuit must be provided with AFCI protection. The current 2020 State Electrical Code does not require the microwave outlet branch circuit to be provided with AFCI protection. Expected to affect approximately 95% of dwellings when adjusting for dwellings without microwaves installed.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.12(B) is applicable to microwave outlet branch circuits is for an AFCI/GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit.
- Analysis: Because the typical microwave outlet branch circuit breaker is a 20-amp Standard 1-Pole Breaker, the following analysis was performed:
  20-amp Standard 1-Pole Breaker – Average Cost – $7.11
  20-amp AFCI/GFCI 2-Pole Breaker – Average Cost – $64.87
  Increase of $57.76
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline

& QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.

- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address dwelling microwave outlet branch circuits that may create an arc hazard.
- Estimated Impact: This will affect all microwave outlet branch circuits installations per year. All dwelling designs with a microwave outlet branch circuit will anticipate an average cost increase of $52.16.

210.12(B) Refrigerator Outlets (AFCI Protection) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings, the refrigerator outlet branch circuit must be provided with AFCI protection. The current 2020 State Electrical Code does not require the refrigerator outlet branch circuit to be provided with AFCI protection. Expected to affect approximately 100% of dwellings.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.12(B) is applicable to refrigerator outlet branch circuits is for an AFCI/GFCI-type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuit.
- Analysis: Because the typical refrigerator outlet branch circuit is a receptacle on a 20-amp Standard 1-Pole Breaker, the following analysis was performed:
  GFCI Receptacle on a 20-amp Standard 1-Pole Breaker – Average Cost – $30.55
  20-amp AFCI/GFCI 2-Pole Breaker – Average Cost – $64.87
  Increase of $34.32
- Justification of Analysis: Performed using Home Depot , Lowes & Amazon due to supply chain availability with and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address dwelling refrigerator outlet branch circuits that may create an arc hazard.
- Estimated Impact: This will affect all dwelling refrigerator outlet branch circuits installations per year. All dwelling designs with a refrigerator branch circuit will anticipate an average cost increase of $34.32.

210.12(B) Kitchen Small Appliance Circuits (AFCI Protection) (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings, the two required kitchen small appliance branch circuits must be provided with AFCI protection. The current 2020 State Electrical Code does not require the small appliance branch circuits to be provided with AFCI protection. Expected to affect approximately 100% of dwellings.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 210.12(B) is applicable to small appliance branch circuits is for an AFCI/GFCI-

type breaker to be installed in lieu of a standard-type breaker that protects the branch-circuits.

- Analysis: Because the typical small appliance branch circuit is a GFCI Receptacle on a 20-amp Standard 1-Pole Breaker, the following analysis was performed:
  GFCI Receptacle on a 20-amp Standard 1-Pole Breaker – Average Cost – $30.55
  20-amp AFCI/GFCI 2-Pole Breaker – Average Cost – $64.87
  Two Required at and increase of $34.32 per circuit is a Total Increase of $68.64
- Justification of Analysis: Performed using Home Depot Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to address kitchen dwelling small appliance branch circuits that may create an arc hazard.
- Estimated Impact: This will affect all dwelling small appliance branch circuits installations per year. All dwelling designs will anticipate an average cost increase of $68.64.

230.67 Surge Protection to Services (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires that for dwellings, the service must be provided with surge protection. The current 2020 State Electrical Code does not require the surge protection at the service. Expected to affect approximately 100% of dwellings.
- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 230.67 is applicable is for a type one or two surge protection device to be installed at the service.
- Analysis: Because there is no requirement for a surge protective device to be installed under the 2020 State Electrical Code, the following analysis was performed:
  No surge protective device – Average Cost – $0.00
  Whole home surge protector – Average Cost – $79.52
  Increase of $79.52
- Justification of Analysis: Performed using Home Depot - https://www.homedepot.com/ and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: This requirement is to prevent damage to the electrical system during lighting strikes and high voltage surges.
- Estimated Impact: This will affect all dwelling service installations per year. All dwelling designs will anticipate an average cost increase of $79.52.

230.85 Emergency Disconnects (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires an emergency disconnect located on the exterior of a one- or two-family dwelling. The current 2020

State Electrical Code that governs one- and two-family dwellings does not require an emergency disconnect. Expected to affect approximately 50% of dwellings.

- 2020 State Electrical Code Requirement: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 230.85 is applicable is to install either an additional separate emergency disconnect on the exterior of the dwelling or to locate the service equipment on the exterior of the dwelling.
- Analysis: Because there is no requirement for a surge protective device to be installed under the 2020 State Electrical Code, and it will be likely that the contractor will choose to install the service disconnect on the exterior, the following analysis was performed:
  Exterior meter base enclosure only – Average Cost- $74.53
  Exterior meter base service equipment combination enclosure- Average Cost- $148.25
  Increase of $73.72
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Eaton, GE, Siemens, and Square D Homeline & QO manufacturer's online prices and an average cost from Eaton, GE, Siemens, and Square D Homeline manufacturer's online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: By providing first responders a safe method to remove power from a dwelling without being exposed to live parts of a meter base, this change increases safety.

314.27(C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets (One- & Two-Family Dwellings)

- 2023 State Electrical Code Change: The new Code section requires provisions for installing ceiling fans in habitable rooms at either time of construction or at a later date. The 2020 State Electrical only requires provisions for supporting ceiling fans in habitable rooms if more than one switched ungrounded conductor is installed to a ceiling lighting box. Expected to affect approximately 100% of dwellings.
- 2020 State Electrical Code Requirements: Current typical installation practices suggest that to achieve Code compliance under the proposed 2023 State Electrical Code where section 314.27(C) is applicable is to either install a ceiling outlet box rated to support a ceiling fan or install a structural member that is available to attach a fan rated box at a later date.
- Analysis: Because there were limited requirements for ceiling fan support in the 2020 State Electrical Code the following analysis was performed:
  Non-ceiling fan rated ceiling box - $2.84.
  Ceiling fan rated ceiling box - $6.63.
  Increase of $3.79 per box with an estimate of ten boxes in typical homes.
- Justification of Analysis: Performed using Home Depot, Lowes & Amazon due to supply chain availability with an average cost from Carlon, Commercial Electric, & Southwire online prices.
- Proposed State Electrical Code Change: Adopt the 2023 NEC language.
- Necessity: By installing a ceiling fan rated box or structural member for future fan installation it ensures future ceiling fan installations will be secured to a rated enclosure.

Table 1. Forecasted Number of Housing Starts and Estimated Added Cost

Year	2023	2024	2025	2026	2027	5-year NPV
Housing Starts, Total (Thousands)[1]	63.59	59.62	62.70	62.39	61.69	
210.8(A)(8)/ 210.8(D)(8) Range Outlets GFCI Protection Cost per House[2]	$102.35	$102.35	$102.35	$102.35	$102.35	
75% of Total, Affected (Thousands)	47.69	44.72	47.03	46.79	46.27	
Total Estimated Cost ($M)	$4.88	$4.58	$4.81	$4.79	$4.74	**$20.88**
210.8(A)(11)/ 210.8(D)(11) Dryer Outlets GFCI Protection Cost per House[2]	$95.35	$95.35	$95.35	$95.35	$95.35	
90% of Total, Affected (Thousands)	57.23	53.66	56.43	56.15	55.52	
Total Estimated Cost ($M)	$5.46	$5.12	$5.38	$5.35	$5.29	**$23.35**
210.8(D)(7)/422.5(A)(7) Dishwasher GFCI Protection Cost per House[2]	$57.76	$57.76	$57.76	$57.76	$57.76	
95% of Total, Affected (Thousands)	60.41	56.64	59.57	59.27	58.61	
Total Estimated Cost ($M)	$3.49	$3.27	$3.44	$3.42	$3.39	**$14.93**
210.8(F) Outdoor Outlet GFCI Protection Cost per House[2]	$95.35	$95.35	$95.35	$95.35	$95.35	
95% of Total, Affected (Thousands)	60.41	56.64	59.57	59.27	58.61	
Total Estimated Cost ($M)	$5.76	$5.40	$5.68	$5.65	$5.59	**$24.64**
210.12(B) Laundry Outlet AFCI Protection Cost per House[2]	$34.32	$34.32	$34.32	$34.32	$34.32	
100% of Total, Affected (Thousands)	63.59	59.62	62.70	62.39	61.69	
Total Estimated Cost ($M)	$2.18	$2.05	$2.15	$2.14	$2.12	**$9.34**
210.12(B) Microwave Outlet AFCI Protection Cost per House[2]	$57.76	$57.76	$57.76	$57.76	$57.76	
95% of Total, Affected (Thousands)	60.41	56.64	59.57	59.27	58.61	
Total Estimated Cost ($M)	$3.49	$3.27	$3.44	$3.42	$3.39	**$14.93**
210.12(B) Refrigerator Outlet AFCI Protection Cost per House[2]	$34.32	$34.32	$34.32	$34.32	$34.32	
100% of Total, Affected (Thousands)	63.59	59.62	62.70	62.39	61.69	
Total Estimated Cost ($M)	$2.18	$2.05	$2.15	$2.14	$2.12	**$9.34**
210.12(B) Two Small Appliance AFCI Protection Cost per House[2]	$68.64	$68.64	$68.64	$68.64	$68.64	
100% of Total, Affected (Thousands)	63.59	59.62	62.70	62.39	61.69	
Total Estimated Cost ($M)	$4.36	$4.09	$4.30	$4.28	$4.23	**$18.67**

230.67 Surge Protection Cost per House[2]	$79.52	$79.52	$79.52	$79.52	$79.52	
100% of Total, Affected (Thousands)	63.59	59.62	62.70	62.39	61.69	
Total Estimated Cost ($M)	$5.06	$4.74	$4.99	$4.96	$4.91	**$21.63**
230.85 Emergency Disconnects Cost per House[2]	$73.72	$73.72	$73.72	$73.72	$73.72	
50% of Total, Affected (Thousands)	31.80	29.81	31.35	31.20	30.85	
Total Estimated Cost ($M)	$2.34	$2.20	$2.31	$2.30	$2.27	**$10.03**
314.27(C) Boxes at Ceiling-Suspended Fan Outlets Cost per House[2]	$37.90	$37.90	$37.90	$37.90	$37.90	
100% of Total, Affected (Thousands)	63.59	59.62	62.70	62.39	61.69	
Total Estimated Cost ($M)	$2.41	$2.26	$2.38	$2.36	$2.34	**$10.31**
Total Estimated Cost for all Increases ($M)	**$41.62**	**$39.02**	**$41.03**	**$40.83**	**$40.37**	**$178.06**[3]

[1] Forecast data is from the IHS Connect Regional Database and includes single-family housing starts.
[2] Costs have not been adjusted for future changes in construction and installation prices.
[3] Calculated in 2023 dollars using a 7% discount rate.

Alternatives:

The options available are to:
(1) remain at the current level of protection provided by the 2020 State Electrical Code,
(2) adopt the 2023 NEC without State amendments, or
(3) adopt the 2023 NEC with State amendments.

The NEC is amended and published every 3 years through a consensus process. The 2020 NEC, with State amendments, is the current State Electrical Code. The risk in retaining the 2020 State Electrical Code is that industry changes will not be recognized. Further life-safety changes, such as GFCI expansions will not be implemented.

The 2023 NEC is the latest edition published by NFPA. The risk of adopting the 2023 NEC as the State Electrical Code is that the 2023 NEC without amendments restricts the State of North Carolina to a national standard without regard to the State's additional codes and laws associated with construction. An example is the state amendment that removes GFCI protection from sewage lift pumps in order to comply with the North Carolina Department of Health's septic regulations. There are also savings, such as an amendment to provide relief to expanding GFCI protection into finished basements as required by the 2023 NEC.

The preferred option is to adopt the 2023 NEC with the Appendix A amendments. This option captures the national industry and life-safety updates, while allowing input from interested groups represented by Ad Hoc Committee members listed in Appendix D.

Risks and Uncertainties:

There are several uncertainties related to this analysis, and most of them deal with assumptions made or lack of available data. First, the estimates of the total costs in the table above use the housing starts forecast. However, the changes to the Code would apply to any new installation, regardless of whether it is in an existing or new building. As a result, these numbers may be underestimating the potential cost.

Second, the BCC expects that several of the proposed changes to the Code would result in negligible costs or savings, and therefore did not quantify them. However, given that those changes could impact on a significant number of installations, in aggregate they may have a significant positive or negative impact.

Third, given the lack of data, benefits are hard to estimate, therefore this analysis does not present the full impact of the changes. While some of the proposed changes would prevent fire and shock hazards, there is no reliable source for recent fires or shocks in North Carolina, or nationally, that could be attributed to an issue that the proposed changes would address. As a result, estimation of avoided fires, damages and shocks are difficult to estimate.

Appendix A:
2023 NEC Proposed NC Amendments

Appendix B:
2023 State Electrical Code Major Changes

Appendix C:
2023 State Electrical Code Summary of Fiscal Impact

Appendix D:
2023 NEC Ad Hoc Committee Members

Appendix A

2023 NEC Proposed State Amendments

Line No.	NEC Section	Synopsis of Amendment
1	Article 10	Administrative Article that regulates enforcement
2	110.26(E)(2)(c)	Relief for dedicated space outdoors above and below electrical equipment
3	210.8	Relief for requiring GFCI where cords pass through a door
4	210.8(A) (Ex. No 5)	Relief for requiring GFCI for receptacle outlets for sewage lift pumps.
5	210.8(A)(5)	Relief for GFCI requirements in finished basements
6	210.8(B)	Relief for requiring GFCI for receptacle outlets for sewage lift pumps.
7	210.8(F)	Relief for GFCI requirements for submersible well pumps only.
8	210.12(E)	Extends circuit modification to 50 feet before AFCI requirement is mandated.
9	210.52(B)	Allows receptacle to be on small-appliance circuit when 6 ft form kitchen sink.
10	230.71(B)	Exempts T-Poles from single throw disconnect
11	230.85	Clarifies commonly used emergency disconnects
12	250.50	Restricts destroying concrete for bonding
13	250.53(A)(2)	Requires only one grounding electrode for T-Poles
14	250.140	Addresses 3-wire ranges and dryers where main is relocated
15	250.142	Address 3-wire feeders where main is relocated
16	300.3(B)	Allows external grounding conductor for 3-wire feeders where main is relocated
17	Table 300.5	Allows lesser coverage where GFCI is provided
18	300.9	Allows 6 ft of length for raceway before deemed a wet location
19	300.26	Adopts the TIA that was written after NEC was first published.
20	314.29	Adopts the TIA that was written after NEC was first published.
21	320.23(A)	Defines locations in attics where wiring is to be protected
22	334.15(C)	Allows strapping of wiring to bottom of floor joist in a crawlspace
23	410.2	Redefines closet storage space
24	410.16(C)	Allows LED and florescent light above closet door
25	517.26	Requires that the critical branch of the essential system meet the requirements of Article 700.
26	551.71(F)(2)	Requires GFCI protection for 30- and 50-amp receptacles for RV sites.
27	555.10	Requires No Swimming be on signage at docks with electrical power
28	680.1	Adds “enterable aquariums” to scope of Article 680.
29	680.4	Removes allowing inspections of existing pools
30	680.21(D)	Requires GFCI protection to pool motor circuits that are modified
31	680.26(B)(2)	Adopts the TIA that was written after NEC was first published, also removes single-wire option.
32	700.4(C)(2)	Adds “listed or approved” to verbiage.
33	700.6	Gives specific location requirements for signal locations.
34	700.12(A)	Adds “listed or approved” to verbiage.

Line No.	NEC Section	Synopsis of Amendment
35	701.6	Gives specific location requirements for signal locations.
36	701.12(A)	Adds “listed or approved” to verbiage.

Electrical Ad hoc Committee's Recommendations For The Adoption of the 2023 North Carolina State Electrical Code.

This Document Was Prepared On April 29, 2023.

Ad hoc Committee Members: Kim Wooten (Chairwoman)

- Rob Axford (IBEW)
- Tony Benton (Union County Inspection Department)
- Terry Cromer (Electrical Contractor/Retired Inspector)
- Gerald Harvell (NC Educator)
- Bryan Holland (NEMA)
- Cliff Isaac (NCHBA)
- Don Iverson (Equipment Manufacturer Representative)
- Misha Meinert (UNC Engineer)
- Gerry O'Connor (Eaton)
- Steven Stack (Union County Inspection Department)
- Benjamen Wesley (OSFM/ State Electrical Division)

The Ad hoc Committee first met on February 17th, 2023, and held the last meeting on April 28th, 2023, with a total of 6 meetings held during this time.

Line No.	NEC Section	Synopsis of Change	Committee Comments
1	110.26(E)(2)(c)	Deletes the requirements for dedicated space beneath and above exterior equipment.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
2	210.8(A)(header)	Include Doors and doorways for excluding the measurement for GFCI protection of receptacles. Also, remove GFCI requirements from 250-volt range, dryer and fixed-in-place cooking equipment receptacle outlets.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
3	210.8(A)(EX)	This section requires exterior receptacle and basement receptacles to be GFCI protected.	Committee recommends that an exception should be made for single, dedicated receptacle outlets installed for the purpose of sewage lift pumps, either indoors or outdoors.
4	210.8(A)(2)	The 2020 State Electrical Code allowed for the exemption of garage door openers for GFCI protection within a garage.	The committee has recommended that this Amendment be repealed.
5	210.8(A)(5)	For the 2020 State Electrical Code, there was an Amendment changing the requirements from “basements” to “unfinished basements”.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
7	210.8(A)(7)	Requires GFCI protection for areas similar to kitchens.	Adopt as written in the 2023 NEC.
8	210.8(B)	The 2020 State Electrical Code provided an exemption for sewage lift pumps from being required to have GFCI protection for receptacle outlets.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
9	210.8(F)	In the 2020 State Electrical Code there was an Amendment that deleted this Section.	The committee recommends the adoption of this section in the 2023 NEC as written, excluding only well pump outlets when installed for a submersible pump only.
10	210.12(E)	For the 2020 State Electrical Code there was an Amendment that increased the length from 6’ to 50’.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
11	210.52(B)(2)	Receptacles installed inside a dwelling and within 1.8 m (6 ft) of any kitchen sink measured by the shortest path the cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
12	210.52(C)(2)	Allows for the receptacle serving an island or peninsular be deleted with provisions.	Adopt as written in the 2023 NEC.

Line No.	NEC Section	Synopsis of Change	Committee Comments
13	215.15	Requires barriers for live parts of equipment supplied by feeder taps.	Adopt as written in the 2023 NEC.
14	225.41	Requirement for exterior emergency disconnects for outside branch circuits of feeders.	Adopt as written in the 2023 NEC.
15	230.67(A)(B)(C)(E)	Surge Protection for certain types of services. This section was deleted in the 2020 State Electrical Code.	Adopt as written in the 2023 NEC.
16	230.67(D)	Surge Protection for service changes.	Adopt as written in the 2023 NEC.
17	230.71(B)	Amendment from the 2020 State Electrical Code permitting construction saw poles to have more than (1) disconnect per enclosure	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
18	230.85	Requirement for exterior emergency disconnects for services on one-and two-family dwellings, including service changes.	Adopt as written in the 2023 NEC.
19	230.85	Transfer switches and panelboards, including meter-panel combination enclosures, that include a main breaker or other listed means to disconnect all service conductors shall be considered emergency disconnects and shall comply with subsection (1) of this section when installed as a service disconnect.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
20	230.95	Requirement for GFPE protection for services of 1,000-amps or more and over 150-volts to ground.	Adopt as written in the 2023 NEC.
21	Article 245	Overcurrent protection for Systems Rated Over 1,000-volts ac, 1,500 -volts dc.	Adopt as written in the 2023 NEC.
22	250.50	State Amendment changing word from “present” to “available”.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
23	250.53(A)(2)	Amendment allows for a single ground rod or plate for saw poles meeting certain criteria.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
24	250.140	2020 NC State Electrical Code included exceptions for existing range and dryer circuits.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
25	250.142	2020 NC State Electrical Code included exceptions for dealing with situations where service changes are encountered with 3-wire SE cables.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.

Line No.	NEC Section	Synopsis of Change	Committee Comments
26	300.3	2020 NC State Electrical Code included exceptions for dealing with situations where service changes are encountered with 3-wire SE cables.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
27	Table 300.5	NC State Amendment that permitted reduced depth for residential wiring methods that met certain criteria.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
28	300.9	NC State Amendment that states that the interior of raceways meeting certain criteria may be considered a dry location.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
29	300.26	This section dealt with “Remote-Control & Signaling Circuits Classification”	TIA issued that re-organized this section. Adopt as written in the 2023 NEC TIA.
30	Article 305	General Requirements for Wiring Methods and Materials for Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal.	Adopt as written in the 2023 NEC.
31	Article 310	Minor changes to this Article after the mass changes found in the 2020 NEC.	Adopt as written in the 2023 NEC.
32	312.10	New changes that govern screws for enclosures listed in this article.	Adopt as written in the 2023 NEC.
33	Article 314	This article deals with outlet, device, pull, and junction boxes. Limited changes throughout article.	Adopt as written in the 2023 NEC.
	314.29	TIA issued from the NFPA.	Adopt as written in the 2023 NEC TIA.
34	Article 315	Medium Voltage Conductors, Cable, Cable Joints, and Cable Terminations. It appears this article was Article 311 in the 2020 NEC/ State Electrical Code.	Adopt as written in the 2023 NEC.
35	320.23	2020 State Electrical Code Amendment that permitted cables not located on tops of joists and trusses to be installed without guard strips.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
36	334.15(C)	NC State Electrical Code Amendment that permits cables to be installed on the bottom of floor joists in crawl spaces without running boards.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.
37	Article 352	Article 352 deals with PVC conduit. Minor changes.	Adopt as written in the 2023 NEC.
38	406.4(D)(4)	NC State Electrical Code Amendment that permits receptacles that are replaced are not required to be AFCI protected.	The committee recommends that this amendment not be renewed
39	410.2 & 410.16	NC State Electrical Code Amendment that permits certain types of luminaires to be installed within clothes closets with minimal distance requirements.	This was a 2020 State Electrical Code Amendment to be renewed for the 2023 State Electrical Code.

Line No.	NEC Section	Synopsis of Change	Committee Comments
40	517.26	This section gives the "Application of Other Articles". Life safety branch is to be installed under Article 700 as well.	The committee recommends that the critical branch of the essential system also be added to these requirements.
41	555.10(3)	This section requires signage near a boat dock.	The committee recommends for the wording of the sign to be as follows: **WARNING! NO SWIMMING! POTENTIAL SHOCK HAZARD – ELECTRICAL CURRENTS MAY BE PRESENT IN THE WATER!** Sign shall be reflective, with letters all capitals, reflective, with a minimal dimension of 18" wide by 24" long.
42	555.35	GFPE & GFCI protection for marinas, boatyards, & commercial & noncommercial docking facilities.	Adopt as written in the 2023 NEC.
43	702.4	A representative with the Tesla company proposed an Amendment to add verbiage to this Section.	The committee rejected this amendment.
44	680.1	This section states the scope of this article.	The committee recommends including enterable aquariums to the scope of this article.
45	680.26	A TIA was issued by the NFPA, in relation to the equipotential bonding around special systems listed in this article.	The committee recommends adopting this TIA as an amendment, however, also recommends the removal of single wire #8AWG as an approved method.
46	700.4(C)(2)	Original wording of this section: "***Emergency Sources.*** *Emergency sources shall be permitted to operate in parallel where the necessary equipment to establish and maintain a synchronous condition is provided."*	Committee recommends that the new wording reads as follows: ": "***Emergency Sources.*** *Listed or approved emergency sources shall be permitted to operate in parallel where the necessary equipment to establish and maintain a synchronous condition is provided."*
47	700.6	Original wording of this section: "***Signals****. Audible, visual, and facility or network remote annunciation devices shall be provided, where applicable, for the purpose described in 700.6(A) through (D)".*	Committee recommends to add this sentence to the end of the section: "*These devices shall be located in a 24-hour attended location".*

Line No.	NEC Section	Synopsis of Change	Committee Comments
48	700.12(A)	Original wording of this section read: "*Power Source Consideration. In selecting an emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building*."	The recommends the section should be written as follows: "*Power Source Consideration. In selecting a <u>listed or approved</u> emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building*."
49	701.6	Original wording of this section reads as follows: "*Audible and visual signal devices shall be provided, where practicable, for the purposes described in 706.6(A), (B), (C), and (D).*	The recommends the section should be written as follows: *Audible and visual signal devices shall be provided, where practicable, for the purposes described in 706.6(A), (B), (C), and (D). <u>These devices shall be located in a 24-hour attended location".</u>*
50	701.12(A)	Original wording of this section reads as follows: ***Power Source Considerations**. In selecting a legally required standby source of power, consideration shall be given to the type of service to be rendered, whether of short-time duration or long duration."*	The recommends the section should be written as follows: ***Power Source Considerations**. In selecting a <u>listed or approved legally</u> required standby source of power, consideration shall be given to the type of service to be rendered, whether of short-time duration or long duration."*

Appendix C

2023 NEC Ad Hoc Committee Identification of Fiscal Change Significance from the 2020(2017 for one- & two-family dwellings) State Electrical Code to the Proposed 2023 State Electrical Code

Line No.	NEC Section	Synopsis of Change with Committee Amendments	Fiscal Change	Significance	Evaluation
1	110.17	Servicing and maintaining equipment must be done by qualified persons (2020-2023)	Increase	Minimal	No
2	110.22	The source of supply's location for disconnect must now be posted (2020-2023)	Increase	Minimal	No
3	210.8(A)(Ex)	Excludes dedicated receptacle outlets for sewage pumps from GFCI protection in dwelling units.	Decrease	Minimal	No
4	210.8(A)(2)	Receptacle outlets in garages are all required to have GFCI protection.	Increase	Minimal	No
5	210.8(A)(3)	Exterior receptacle outlets rated 250-volts will require GFCI protection.	Increase	Minimal	No
6	210.8(A)(5)	Add Amendment excluding finished basement from GFCI protection requirements.	Decrease	Minimal	No
7	210.8(A)(6)(7)(8)	Ranges, cooking equipment, and receptacles in these areas will be required to be GFCI protected.	Increase	Minimal	Yes
8	210.8(A)(11)	250-volt, 30-amp receptacles for clothes dryers must be GFCI protected.	Increase	Minimal	Yes
9	210.8(B)(4)	Buffet serving areas must have GFCI protection.	Increase	Minimal	No
10	210.8(B)(13)	Adds aquariums, baitwells & similar open aquatic vessels to GFCI requirements.	Increase	Minimal	No
11	210.8(D)(1)-(12)	Appliances listed, regardless of location and connection type must be GFCI protected.	Increase	Minimal	No
12	210.8(E)	Receptacle outlets required by 210.63 are required to be GFCI protected regardless of location	Increase	Minimal	No
13	210.8(F)	Except for submersible well pumps exterior outlets for dwelling units are required to have GFCI protection, 50-amps and less, single-phase, 150-volts or less to ground. Listed HVAC equipment exempt until 09/1/2026.	Increase	Minimal	Yes
14	210.12(B)(1)	All 125-volt, 15- and 20-amp branch circuits in kitchens of one- and two-family dwellings will require AFCI protection.	Increase	Minimal	Yes

15	210.12(B)(13)	Laundry areas of dwelling units required AFCI protection	Increase	Minimal	Yes
16	210.12(E)	Amendment renewed to increase allowable footage for a branch circuit extension from 6’ to 50’.	Decrease	Minimal	No
17	210.52(C)(2)	Option is given to delete kitchen island receptacle.	Decrease	Minimal	No
18	225.41	One- and two-family dwellings fed by a feeder must now have an emergency disconnect installed on the exterior of the structure	Increase	Minimal	No
19	230.67	Surge protection is required for dwelling units and other areas with sleeping units.	Increase	Minimal	Yes
20	230.71(B)	For one- and two-family dwellings, a single overcurrent will for each enclosure.	Increase	Minimal	No
21	230.71(Ex)	Permits temporary saw pole services that meet certain criteria may have up to six service disconnects per enclosure.	Decrease	Minimal	No
22	230.85	Emergency disconnect going to be required on the exterior of one- or two-family dwellings	Increase	Minimal	Yes
23	240.11	Selective coordination requirements for feeders.	Increase	Minimal	No
24	250.50	Changes wording from present to available for required electrodes.	Decrease	Minimal	No
25	250.53(B)(2)	Permits a single rod or plate electrode for temporary saw poles that meet certain criteria	Decrease	Minimal	No
26	250.64(G)	Grounding electrode conductors not permitted to enter vents.	Increase	Minimal	No
27	250.140	Amendment added to allow for leniency for circuits of existing clothes dryers and ranges.	Decrease	Minimal	No
28	250.142	Amendment added to allow for leniency for existing 3-wire cables feeding panels when new overcurrent device is installed ahead of panel	Decrease	Minimal	No
29	Table 300.5(A)	Table 300.5(A) reduces cover requirements for up to 250-volts, 50-ampere, GFCI circuits.	Decrease	Minimal	No
30	300.9	Allows for the interior of a raceway located above grade to be considered a dry location if it meets certain criteria	Decrease	Minimal	No
31	312.10	New requirements for screws attaching covers.	Increase	Minimal	No
32	314.5	New requirements for screws attaching covers.	Increase	Minimal	No
33	314.27(C)	New requirement for one- and two-family dwellings that require most ceiling outlet boxes in habitable rooms to allow for ceiling fan installations	Increase	Minimal	No
34	320.23(A)	Eliminates the requirements to protect cables mounted above walking areas in attics	Decrease	Minimal	No

35	334.15(C)	Permits NM cables to be secured to the bottom of floor joists in crawl spaces	Decrease	Minimal	No
36	406.9(C)	Bathtub space was redefined. Some exceptions are permitted.	Decrease	Minimal	No
37	406.12	Tamper resistant increased locations	Increase	Minimal	No
38	408.4(B)	Requires to list location of source of supply.	Increase	Minimal	No
39	410.2	Allowances made in order to install LED or fluorescent luminaires in smaller closets.	Decrease	Minimal	No
40	410.16	Allowances made in order to install LED or fluorescent luminaires in smaller closets.	Decrease	Minimal	No
41	445.19	Readily accessible emergency shutdown of prime movers of generators.	Increase	Minimal	No
42	517.26	Critical branch of the essential system to be covered by Article 700 as well.	Increase	Minimal	No
43	551.71(F)(2)	Amendment requiring GFCI protection for 30- and 50-amp receptacle outlets for RV parks.	Increase	Minimal	Yes
44	555.10	Wording for signs around boat docks amended to make stress no swimming	Increase	Minimal	No
45	680.1	Include “enterable aquariums” to scope of Article 680	Increase	Minimal	No
46	680.4	Delete Inspection of existing swimming pools	Increase	Minimal	No
47	680.5	GFCI or SPGFCI protection to be provide on most all pool pump motors.	Increase	Minimal	No
48	680.21(D)	Requires any modification to pool pump branch circuit to include GFCI or SPGFCI protection	Increase	Minimal	No
49	680.26	Adopt TIA from the NFPA and remove the single wire method from the list of perimeter bonding methods.	Increase	Minimal	No

Evaluation

Home Depot, Lowes, or Amazon												
			Eaton		GE		Siemens		Square D		Average Cost	
20 Amp	Standard	1-Pole Breaker	$	7.58	$	7.18	$	6.98	$	6.68	$	7.11
20 Amp	AFCI/GFCI	1-Pole Breaker	$	62.98	$	73.98	$	62.52	$	59.98	$	64.87
Eaton 20 Amp	GFCI/Tamper	Receptacle	NA		NA		NA		NA		$	23.44
30 Amp	Standard	2-Pole Breaker	$	17.93	$	16.98	$	16.98	$	15.98	$	16.97
30 Amp	GFCI	2-Pole Breaker	$	106.26	$	126.00	$	98.00	$	119.00	$	112.32
50 Amp	Standard	2-Pole Breaker	$	17.93	$	16.98	$	16.98	$	15.98	$	16.97
50 Amp	GFCI	2-Pole Breaker	$	106.26	$	126.00	$	129.00	$	119.00	$	120.07
Surge Protection	Standard	Whole Home	$	66.48	$	46.25	$	99.35	$	106.00	$	77.52

Average Home Appliances & Installation Methods			Average Cost	Cost Increase
Laundry	2017/2020NEC	20 Amp GFCI Receptacle on Standard 20 Amp 1-Pole Breaker	$7.11	$57.76
	2023 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Small Appliance	2017/2020 NEC	20 Amp GFCI Receptacle on Standard 20 Amp 1-Pole Breaker	$7.11	$57.76
	2020 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Small Appliance	2017/2020 NEC	20 Amp GFCI Receptacle on Standard 20 Amp 1-Pole Breaker	$7.11	$57.76
	2023 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Refrigerator	2017/2020 NEC	20 Amp GFCI Receptacle on Standard 20 Amp 1-Pole Breaker	$7.11	$57.76
	2023 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Dishwasher	2017/2020 NEC	Standard 20 Amp 1- Pole Breaker Allowed	$7.11	$57.76
	2023 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Microwave	2017/2020 NEC	Standard 20 Amp 1-Pole Breaker	$7.11	$57.76
	2023 NEC	20 Amp AFCI/GFCI 1-Pole Breaker	$64.87	
Dryer	2017/2020 NEC	Standard 30 Amp 2-Pole Breaker	$16.97	$95.35
	2023 NEC	GFCI 30 Amp 2-Pole Breaker	$112.32	
Range	2017/2020 NEC	Standard 50 Amp 2-Pole Breaker	$16.97	$103.10
	2023 NEC	GFCI 50 Amp 2-Pole Breaker	$120.07	
Outdoor Air Conditioner	2017/2020 NEC	Standard 30 Amp 2-Pole Breaker	$16.97	$95.35
	2023 NEC	GFCI 30 Amp 2-Pole Breaker	$112.32	
Surge Protection	2017/2020 NEC	Not Required	$-	$77.52
	2023 NEC	Required	$77.52	

Emergency Disconnect	2017 NEC	Not Required	$-	$161.00
	2023 NEC	NEMA 3R Service Rated Enclosure	$161.00	
RV Receptacle Outlets, 30/50	2017/2020 NEC	Standard 30- or 50-amp Breaker	$16.97	$95.35
	2023 NEC	GFCI 30- or 50-amp Breaker	$112.32	

Appendix D

2023 NEC Ad Hoc Committee to Adopt the 2023 State Electrical Code (2020 NEC with Amendments)

Kim Wooten	BCC Council/ Electrical Contractor / Ad Hoc Chairman	704-258-4150	Kwooten@fstrategies.com
Rob Axford	IBEW	919-596-8220	raxford@ibew553.org
Tony Benton	Union County Inspection Department	704-634-9196	tony.benton@unioncountync.gov
Terry Cromer	Electrical Contractor/ Retired Inspector	336-382-1928	Terry@ncaec.us
Gerald Harvell	NC Educator	704-301-8656	electricchief@gmail.com
Bryan Holland	NEMA	972-358-0543	Bryan.Holland@nema.org
Cliff Isaac	NCHBA	919-676-9090	Clsaac@nchba.org
Don Iverson	Equipment Manufacturer Representative	517-204-0559	Don.Iverson@se.com
Misha Meinert	UNC Engineer	919-869-4158	Misha.meinert@fac.unc.edu
Gerry O'Connor	Eaton	773-962-7894	GerryJOconnor@eaton.com
Steven Stack	Union County Inspection Department	704-292-2577	steven.stack@unioncountync.gov
Benjamen Wesley	NCDOI/OSFM	919-532-4175	Ben.wesley@ncdoi.gov