



**TO:** Town Board  
**FROM:** Curt Freese, Community Development Director

## **TOWN BOARD INFORMATION SHEET**

**MEETING DATE:** December 10, 2019

**ITEM:** UPDATES TO BUILDING AND RELATED CODES

**Attachment** 1. Proposed Ordinance with specific amendments Appendix A

### **BACKGROUND:**

Staff heard Board Direction to modernize codes related to development, including building codes, etc. Traditionally, Berthoud has been behind in adopting the most up to date code requirements due to lack of qualified staff and resources to make appropriate amendments. In this last year, Staff has worked with Pro-Code (the current Building Inspection Company) to modernize building processes and also update these codes. The majority of these codes have never been adopted by Berthoud but have been utilized in the plan and building review process. Staff believes the adoption of these codes, is a major step in modernizing the building and development process and will ensure higher quality construction for all Town residents. Finally, Staff did hold an open house with Builders to discuss changes in October, and Builders will also be notified of the meeting said ordinances are scheduled for adoption.

### **Changes since Nov. 19 TB Meeting:**

Staff added adopting the 2018 International Energy Code, while retaining the amendments approved in January 2018. Staff did reach out to Pro-Code and Energy Logic, and both recommended keeping the amendments, which are also reflected in the ordinance to be adopted. Staff did send the changes to builders, with an expectation of a January 9<sup>th</sup>, 2020 effective date.

### **Chapter 11 — Building Regulations of the Municipal Code to adopt**

- ✓ The International Building Code, 2018 Edition
- ✓ The International Residential Code, 2018 Edition
- ✓ The International Existing Building Code, 2018 Edition
- ✓ The International Energy Conservation Code, 2018 Edition – retaining amendments approved in 2017.



- ✓ The National Electrical Code, 2017 Edition(or State Adopted Version) – Added Electric Vehicle Requirements
- ✓ The International Fuel Gas Code, 2018 Edition
- ✓ The International Plumbing Code, 2018 Edition
- ✓ Gray Water Systems, Adopting Control Regulation 86
- ✓ The International Mechanical Code, 2018 Edition
- ✓ The International Property Maintenance Code, 2018 Edition
- ✓ The International Swimming Pool and Spa Code, 2018 Edition

**Highlights:**

- ✓ Passive Radon Systems will be required
- ✓ Conduit for Solar will be required
- ✓ Conduit for Electric Charging Vehicles will be Required
- ✓ Multi-family and Commercial Buildings will have required charging station requirements
- ✓ Adding Gray Water Requirements
- ✓ Adoption of Property Maintenance Standards

**RECOMMENDED ACTION:**

**Approve the Code changes, with an effective date of January 9<sup>th</sup>, 2020.**

**Administrator review \_\_\_\_\_**

**Date \_\_\_\_\_**

**TOWN OF BERTHOUD**

**ORDINANCE NO. \_\_\_\_\_**

**AN ORDINANCE AMENDING CHAPTER 11, OF THE MUNICIPAL CODE OF THE TOWN OF BERTHOUD, FOR THE PURPOSES OF ADOPTING THE 2018 INTERNATIONAL BUILDING CODE BY REFERENCE WITH AMENDMENTS, THE 2018 INTERNATIONAL RESIDENTIAL CODE BY REFERENCE WITH AMENDMENTS, THE 2018 EXISTING BUILDING CODE BY REFERENCE, THE 2018 NATIONAL ELECTRICAL CODE BY REFERENCE WITH ELECTRIC VEHICLE AMENDMENTS, THE 2018 INTERNATIONAL PLUMBING CODE BY REFERENCE WITH AMENDMENTS, THE 2018 INTERNATIONAL FUEL GAS CODE, GRAY WATER SYSTEMS ADOPTING CONTROL REGULATION 86 BY REFERENCE, THE 2018 INTERNATIONAL MECHANICAL CODE BY REFERENCE WITH AMENDMENTS, THE 2018 INTERNATIONAL ENERGY CODE BY REFERENCE WITH AMENDMENTS, THE 2018 INTERNATIONAL SWIMMING POOL AND SPA CODE BY REFERENCE.**

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt the 2018 International Building Code by reference with amendments, the 2018 International Residential Code by reference with amendments, the 2018 Existing Building Code by reference, the 2018 National Electrical Code by reference with Electric Vehicle amendments, the 2018 International Plumbing Code by reference with Amendments, the 2018 International Fuel Gas Code, the Gray Water Systems adopting control regulation 86 by reference, the 2018 International Mechanical Code by reference with amendments, the 2018 International Energy Code by reference with amendments, the 2018 International Swimming Pool and Spa Code by reference, with certain amendments tailored to accommodate particular circumstances and requirements of the Town; and

WHEREAS, Town staff has conducted an outreach program, working with the regulated construction industry and building professionals in the development of these provisions; and

WHEREAS, the Board of Trustees, after proper notice, has held a public hearing on this ordinance providing for the adoption of said code pursuant to C.R.S. § 31-16-203; and

WHEREAS, the 2018 International Residential Code by reference with amendments, the 2018 Existing Building Code by reference, the 2018 National Electrical Code by reference with Electric Vehicle amendments, the 2018 International Plumbing Code by reference with amendments, the 2018 International Fuel Gas Code, the Gray Water Systems adopting control regulation 86 by reference, the 2018 International Mechanical Code by reference with amendments, the 2018 International Energy Code by reference with amendments, the 2018 International Swimming Pool and Spa Code by reference and amendments thereto have been submitted to the Board of Trustees in writing and the Board of Trustees has determined that such code and amendments thereto should be adopted as herein set forth;

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. That Section 11 the Berthoud Municipal Code is hereby repealed, and the 2018 International Residential Code by reference with amendments, the 2018 Existing Building Code

by reference, the 2018 National Electrical Code by reference with Electric Vehicle amendments, the 2018 International Plumbing Code by reference with amendments, the 2018 International Fuel Gas Code, the Gray Water Systems adopting control regulation 86 by reference, the 2018 International Mechanical Code by reference with amendments, the 2018 International Energy Code by reference with amendments, the 2018 International Swimming Pool and Spa Code as set forth in Appendix A are adopted as follows:

Section 2. If any section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The Board of Trustees hereby declares that it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 3. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

Section 4. The repeal or modification of any provision of the Municipal Code of the Town of Berthoud by this ordinance shall not release, extinguish, alter, modify, or change in whole or in part any penalty, forfeiture, or liability, either civil or criminal, which shall have been incurred under such provision, and each provision shall be treated and held as still remaining in force for the purpose of sustaining any and all proper actions, suits, proceedings, and prosecutions for the enforcement of the penalty, forfeiture, or liability, as well as for the purpose of sustaining any judgment, decree, or order which can or may be rendered, entered, or made in such actions, suits, proceedings, or prosecutions.

Section 5: The Provisions of this Ordinance shall take effect thirty days after publication as required by law, and shall apply to all lighting plans, development, and construction permitted after such date.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED IN  
FULL this \_\_\_\_\_day of \_\_\_\_\_2019.

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William Karspeck, Mayor

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Christian Samora, Town Clerk

## **APPENDIX A: Chapter 11 — Building Regulations of the Municipal Code to adopt**

**The International Building Code, 2018 Edition**

**The International Residential Code, 2018 Edition**

**The International Existing Building Code, 2018 Edition**

**The International Energy Conservation Code, 2015 Edition – No Changes**

**The National Electrical Code, 2017 Edition(or State Adopted Version) – Added Electric Vehicle Requirements**

**The International Fuel Gas Code, 2018 Edition**

**The International Plumbing Code, 2018 Edition**

**Gray Water Systems, Adopting Control Regulation 86**

**The International Mechanical Code, 2018 Edition**

**The International Swimming Pool and Spa Code, 2018 Edition**

**The International Energy Code, 2018 Edition, with Amendments**

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### **Chapter 11.1 International Building Code**

The International Building Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478. Chapters 1 through 33 inclusive and Appendix Chapter I, is hereby adopted by reference as the Town of Berthoud Building Code as if fully set out in this ordinance with the additions deletions insertions and changes as follows:

IBC Section 101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

IBC Section 101.4.3 (Plumbing) is amended by the deletion of the last sentence.

IBC Section 101.4.5 (Fire prevention) is amended by replacing “International Fire Code” with “adopted fire code”.

IBC Section 101.4.6 (Energy) is amended by replacing the words “International Energy Conservation Code” with “2012 International Energy Conservation Code”.

IBC Section 105.1 (Required) is amended by replacing the words “building official” with ‘Town”.

IBC Section 105.2 (Work exempt from permit) is amended by:

Building Exception #1 is deleted in its entirety and replaced with “One-Story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet and the roof height does not exceed 10 feet above grade measured from a point directly outside the exterior walls of the structure.”

Building Exception #14 is added to read “Shingle repair or replacement work not exceeding one square (100 square feet in area) of covering per building.

IBC Section 105.5 (Expiration) is amended by the deletion of this section in its entirety and replaced with the following:

“Every permit issued by the building official under the provisions of this code shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within 180 days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of 180 days. Before such work can be recommenced, a new permit shall be first obtained to do so, and the fee therefor shall be one half the amount of the original permit fee, exclusive of any taxes or other fees already assessed, provided no changes have been made or will be made in the original plans and specifications for such work, and provided further that such suspension or abandonment has not exceeded one year. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.”

IBC Section 109.4 (Work commencing before permit issuance) is amended by the deletion of this section in its entirety and replaced with the following:

“Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits may be subject to an investigation fee established by the town. The amount of the investigation fee may be in the amount up to the amount of the permit fee that would normally be assessed for the specific type of construction activity, with any such investigation fee being in addition to all other required permit fees. The investigation fee shall be collected whether or not a permit is then subsequently issued.

Section 109.6 (Refunds) is amended by the deletion of this section in its entirety and replaced with the following:

“The town may authorize refunding of any fee paid hereunder which was erroneously paid or collected. The town may authorize refunding of not more than 80 percent (80%) of the permit fee paid when no work has been done under a permit issued in accordance with this code. The town may authorize refunding of not more than 80 percent (80%) of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or cancelled before any plan reviewing is done. The town shall not authorize refunding of any fee paid except on written application filed by the original permittee not later than 180 days after the date of fee payment.”

IBC Section 111.3 (Temporary occupancy) is amended by deleting the words “building official” in the first and second sentence and replacing it with ‘Town’.

IBC Section 113.1 (General) is amended by the deletion of the last two sentences and replaced with the following:

“The members of the Board of Appeals shall be comprised of the members of the Town Council.”

IBC Section 113.3 (Qualifications) is amended by the deletion of this section in its entirety.

IBC Section 114.2 (Notice of Violation) is amended by the addition of ‘Notice of Violations shall be delivered in accordance with section 107 of the IPMC’ after the last paragraph.

IBC Section 202 (Definitions) is amended by addition of the following:

“Sleeping Room” (Bedroom) is any enclosed habitable space within a dwelling unit, which complies with the minimum room dimension requirements of IBC Section 1208 and contains a closet, an area that is useable as a closet, or an area that is readily convertible for use as a closet. Living rooms, family rooms and other similar habitable areas that are so situated and designed so as to clearly indicate these intended uses, shall not be interpreted as sleeping rooms.

IBC Section 915.2.1 (Dwelling units) is amended by the deletion of the first sentence and replaced with the following:

“Carbon monoxide detection shall be installed in dwelling units within 15 feet of each separate sleeping area and on every level.”

IBC Section 1015.2 (Where required) is amended by the addition of a second paragraph inserted before the exceptions as follows:

“All area wells, stair wells, window wells and light wells attached to any building that are located less than 36 inches (914.4 mm) from the nearest intended walking surface and deeper than 30 inches (762 mm) below the surrounding ground level, creating an opening greater than 24 inches (610 mm) measured perpendicular from the building, shall be protected with guardrails conforming to this section around the entire opening, or be provided with an equivalent barrier.

IBC Section 1020.1 (Table 1020.1 Corridor Fire-Resistance Rating) is amended to replace the corridor rating for R Occupancies with a sprinkler system from 0.5 to 1- Hour fire rating.

IBC Section 1030.2. (Minimum size) is amended by the deletion of the exception.

IBC Section 1301.1.1 (Criteria) is amended by replacing “International Energy Conservation Code” with the “2012 International Energy Conservation Code”.

IBC Section 1612.3 (Establishment of flood hazard areas) is amended by the insertion of “Town of Berthoud” where indicated in [Name of Jurisdiction] and the date of the latest flood insurance study for the Town of Berthoud, where indicated in [Date of Issuance].

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

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## **Chapter 11.1 International Residential Code**

The International Residential Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, Chapters 1 through 43 inclusive and Appendix Chapters F, H, and T hereby adopted by reference as the Town of Berthoud Residential Building Code as if fully set out in this ordinance with the additions deletions insertions and changes as follows.

IRC Section R101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

IRC Section R105.1 (Required) is amended by replacing the words “building official” with ‘Town’.

IRC Section R105.2 (Work Exempt from Permit) is amended by:

Building Exception #1 is deleted in its entirety and replaced with “One-Story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet and the roof height does not exceed 10 feet above grade measured from a point directly outside the exterior walls of the structure.”

Building Exception #10 is deleted in its entirety and replaced with: “Shingle repair or replacement work not exceeding one square (100 square feet in area) of covering per building.

IRC Section 105.5 (Expiration) is amended by the deletion of this section in its entirety and replaced with the following:

“Every permit issued by the building official under the provisions of this code shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within 180 days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of 180 days. Before such work can be recommenced, a new permit shall be first obtained to do so, and the fee therefor shall be one half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work, and provided further that such suspension or abandonment has not exceeded one year. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.”

IRC Section R108.5 (Refunds) is amended by the deletion of this section in its entirety and replaced with the following:



“The town may authorize refunding of any fee paid hereunder which was erroneously paid or collected. The town may authorize refunding of not more than 80 percent (80%) of the permit fee paid when no work has been done under a permit issued in accordance with this code. The town may authorize refunding of not more than 80 percent (80%) of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or cancelled before any plan reviewing is done.

The town shall not authorize refunding of any fee paid except on written application filed by the original permittee not later than 180 days after the date of fee payment.”

IRC Section R108.6 Section R108.6 (Work commencing before permit issuance) is amended by the deletion of this section in its entirety and replaced with the following:

“Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits may be subject to an investigation fee established by the town. The amount of the investigation fee may be in the amount up to the amount of the permit fee that would normally be assessed for the specific type of construction activity, with any such investigation fee being in addition to all other required permit fees. The investigation fee shall be collected whether or not a permit is then subsequently issued.

IRC Section R109.1.5 IRC Section R109.1.5 (Other inspections) is amended by the addition of a new subsection as follows:

R109.1.5.2 Insulation Inspection of the structure shall be made following installation of the wall, ceiling and floor insulation and exterior windows and before wall coverings are installed.

IRC Section R110.4 IRC Section R110.4 (Temporary occupancy) is amended by the deletion of the words “building official” in the first and second sentence and replaced with ‘Town’.

IRC Section R112.1 IRC Section R112.1 (General) is amended by the deletion of the last three sentences and replaced with the following:

“The members of the Board of Appeals shall be comprised of the members of the Town Council.”

IRC Section R112.3 IRC Section R112.3 (Qualifications) is amended by the deletion of this section in its entirety.

IRC Section R113.2 IRC Section R113.2 (Notice of Violation) is amended by the addition of “Notice of Violations shall be delivered in accordance with section 107 of the IPMC” after the last paragraph.

IRC Section R202 IRC Section R202 (Definitions) is amended by addition of the following:

“Sleeping Room” (Bedroom) is any enclosed habitable space within a dwelling unit, which complies with the minimum room dimension requirements of IRC Sections R304 and R305 and contains a closet, an area that is useable as a closet, or an area that is readily convertible for use as a closet. Living rooms, family rooms and other similar habitable areas that are so situated and designed so as to clearly indicate these intended uses, shall not be interpreted as sleeping rooms.

IRC Table R301.2 (1) IRC Table R301.2 (1) is filled to provide the following:

Table R301.2 (1)

Climatic and Geographic Design Criteria

Ground Snow Load	Wind Design		Seismic  Design	Subject to Damage From			Winter Design Temp  Deg. F	Ice barrier Underlayment Required	Flood Hazard	Air Freezing Index	Mean Annual Temp
	Speed (V)	Topographic effects	Category	Weathering	Frost Line	Termite					
30psf	115	No	B	Severe	30 in.	Slight to Moderate	1	YES	26713	1000	43F

IRC Section R302.13 IRC Section R302.13 (Fire Protection of Floors) is amended by deleting the section in its entirety.

IRC Section R303.4 IRC Section R303.4 (Mechanical Ventilation) is amended by replacing “5 air changes per hour” with “7 air changes per hour” and replacing the words “in accordance with section N1102.4.1.2” with “in accordance with section 402.4.1.2 of the International Energy Conservation Code 2012 Edition.

IRC Section R309.5 IRC Section R309.5 (Fire sprinklers) is amended by the deletion of this section in its entirety.

IRC Section R310.1 IRC Section R310.1 (Emergency escape and rescue opening required) is amended by adding the following after the first paragraph:

“All windows located in basements, habitable attics and sleeping rooms shall meet all the requirements of section R310.1 through R310.2.5.”

Exception #2 is amended by the deletion of the exception and its conditions.

IRC Section R310.2.3 IRC Section R310.2.3 (Window wells) is amended by the addition of the following;

“All windows in basements shall be an escape and rescue window, if requiring a window well pursuant to the International Residential Code shall comply with the dimension requirements set forth in this section.”

IRC Section R310.2.3.1 IRC Section R310.2.3.1 (Ladder and steps) is amended by the addition of the following exception to read as follows:

“Exception: Only one window well ladder shall be required in an unfinished basement.”

IRC Section R312.1 IRC Section R312.1 (Guards required) is amended by the addition of a third paragraph as follows:

“All area wells, stair wells, window wells and light wells attached to any building that are located less than 36 inches (914 mm) from the nearest intended walking surface and deeper than 30 inches (762 mm) below the surrounding ground level, creating an opening greater than 24 inches (610 mm) measured perpendicular from the building, shall be protected with guardrails conforming to this section around the entire opening, or be provided with an equivalent barrier.

Exceptions:

The access side of stairways need not be protected.

Area and window wells provided for emergency escape and rescue windows may be protected with approved grates or covers that comply with Section R310.4 of this code.

Covers and grates may be used over stairways and other openings used exclusively for service access or for admitting light or ventilation.”

IRC Section R313 IRC Section R313.1 (Automatic Fire Sprinkler Systems) is amended by the deletion of this section in its entirety.

IRC Section 315.3 IRC Section 315.3 (Location) is amended by deleting the first sentence and replacing it with the following:

“Carbon monoxide detection shall be installed in dwelling units within 15 feet of each separate sleeping area and on each level.”

IRC Section R401.2 IRC Section R401.2 (Requirements) is amended by the addition of the following after the first paragraph:

“Foundations shall be designed, and the construction drawings stamped by a Colorado registered design professional. The foundation design must be based on an engineer’s soils report. The drawings must be noted with the engineering firm name, specific location for design and soils report number. A site certification prepared by State of Colorado registered design professional is required for setback verification on all new Group R Division 3 occupancies.”

IRC Section R405.1 IRC Section R405.1 (Concrete or masonry foundations) is amended with the addition of the following after the first sentence: All foundation drains shall be designed and inspected by a State of Colorado registered design professional.

IRC Chapter 11 IRC Chapter 11 (Energy Efficiency) is amended by the deletion of this chapter in its entirety and replaced with the 2012 International Energy Conservation Code.

IRC Section G2415.12 IRC Section G2415.12 (Minimum burial depth) is amended by the addition of the following: All plastic fuel gas piping shall be installed a minimum of 18 inches (457 mm) below grade.

IRC Section G2415.12.1 IRC Section G2415.12.1 (Individual outdoor appliances) is amended by the deletion of this section in its entirety.

IRC Section G2417.4.1 IRC Section G2417.4.1 (Test pressure) is amended by replacing 3 psig with 10 psig.

IRC Section P2503.5.1 IRC Section P2503.5.1 (Rough plumbing) is amended by the deletion of the first sentence and replaced with “DWV systems shall be tested on completion of the rough piping installation by water or air without evidence of leakage.”

IRC Section P2603.5.1 IRC Section P2603.5.1 (Sewer depth) is amended by filling in both areas where indicated to read “12 inches (305 mm)”.

IRC Section P3103.1.1 IRC Section P3103.1.1 (Roof extension) is amended by replacing “6 inches” with “12 inches”.

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

## **Chapter 11.2 International Existing Building Code**

The International Existing Building Code, 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, Chapters 1 through 16 inclusive, is hereby adopted by reference as the Town of Berthoud Existing Building Code as if fully set out in this ordinance with the additions, deletions, insertions and changes as follows.

International Existing Building Code is amended by replacing all references to “International Fire Code” with “Adopted Fire Code”.

IEBC Section 101.1 IEBC Section 101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

IEBC Section 1401.2 IEBC Section 1401.2 (Conformance) is amended by the deletion of this section in its entirety and replaced with the following: “Structures moved into or within the jurisdiction shall comply with the provision of this code for new structures.”

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

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**Chapter 11.04 International Energy Code.** 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, is hereby adopted by reference as the Town of Berthoud with the additions, deletions, insertions and changes as follows:

1. SECTION R202 GENERAL DEFINITIONS is hereby retained except the following addition:

Dwelling Unit Enclosure Area: The sum of all the boundary surfaces that define the dwelling unit, including top/ceiling, bottom/floor, and the sides of all walls. This does not include interior partition walls within the dwelling unit. Wall height should be measured from the finished floor of the dwelling unit to the underside of the floor above (rather than stopping at the finished ceiling).

2. Section R303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the International Building Code or the 2012 or 2015 International Residential Code, as applicable.
3. Section R402.1.1 Vapor retarder. Wall assemblies in the building thermal envelope shall comply with the vapor retarder requirements of Section R702.7 of the 2012 or 2015 International Residential Code or Section 1405.3 of the International Building Code, as applicable.
4. Section R402.4.1.2 Testing: Single family detached buildings or dwelling units shall be tested and verified as having an air leakage rate of not exceeding three air changes per hour in Climate Zones 1 through 8, or 0.24 cubic feet per minute at 50 Pascals/square feet of dwelling unit enclosure area. Attached single family or multifamily buildings or dwelling units shall be tested and verified as having an air leakage rate of five or less air changes per hour in Climate Zones 1 through 8 or 0.30 cubic feet per minute at 50 Pascals/square feet of dwelling unit enclosure area.
5. R403.3.3 Duct testing (Mandatory). Ducts shall be pressure tested to determine air leakage by one of the following methods: and shall not leak more than 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area served, (4cfm/100sqft), when the air handler is installed at the time of the test. When the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area; (3cfm/100sqft). Registers shall be taped or otherwise sealed during the test.

Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All registers shall be taped or otherwise sealed during the test.

2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

**Exception:**

- a. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.

- b. If the HVAC duct system is serving less than or equal to 1,200 square feet of conditioned floor area, the allowable duct leakage shall be 60 cubic feet per minute or less.

A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

**R403.3.4 Duct leakage (Prescriptive).** The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

1. ~~Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.~~

2. ~~Postconstruction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.~~

6. SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE has been repealed in its entirety, and replaced with the 2018 version below:

#### **SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE**

**R406.1 Scope.** This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

**R406.2 Mandatory requirements.** Compliance with this section requires that the provisions identified in Sections R401 through R404 indicated as “Mandatory” and Section R403.5.3 be met. The *building thermal envelope* shall be greater than or equal to levels of efficiency and *Solar Heat Gain Coefficients* in Table 402.1.1 or 402.1.3 of the 2009 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the *building thermal envelope* shall be insulated to an *R-value* of not less than R-6.

**R406.3 Energy Rating Index.** The Energy Rating Index

(ERI) shall be determined in accordance with RESNET/ICC 301 except for buildings covered by the *International Residential Code*, the ERI Reference Design Ventilation rate shall be in accordance with Equation 4-1.

Ventilation rate, CFM =  $(0.01 \times \text{total square foot area of house}) + [7.5 \times (\text{number of bedrooms} + 1)]$

**(Equation 4-1)**

Energy used to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the *ERI reference design* or the *rated design*.

**R406.4 ERI-based compliance.** Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value indicated in Table R406.4 when compared to the *ERI reference design*.

**TABLE R406.4**

<b>MAXIMUM ENERGY RATING INDEX</b>	
<b><u>CLIMATE ZONE</u></b>	<b><u>ENERGY RATING INDEX<sub>a</sub></u></b>
<b><u>1</u></b>	<b><u>57</u></b>
<b><u>2</u></b>	<b><u>57</u></b>
<b><u>3</u></b>	<b><u>57</u></b>
<b><u>4</u></b>	<b><u>62</u></b>
<b><u>5</u></b>	<b><u>61</u></b>
<b><u>6</u></b>	<b><u>61</u></b>
<b><u>7</u></b>	<b><u>57</u></b>
<b><u>8</u></b>	<b><u>57</u></b>

a. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 *International Energy Conservation Code*.

**R406.5 Verification by approved agency.** Verification of compliance with Section R406 shall be completed by an *approved* third party.

**R406.6 Documentation.** Documentation of the software used to determine the ERI and the parameters for the *residential building* shall be in accordance with Sections R406.6.1 through R406.6.3.

**R406.6.1 Compliance software tools.** Software tools used for determining ERI shall be *Approved Software Rating Tools* in accordance with RESNET/ICC 301.

**R406.6.2 Compliance report.** Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections R406.3 and R406.4.

The compliance documentation shall include the following information:

1. Address or other identification of the residential building.
2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs entered by the user necessary to reproduce the results.
3. Name of individual completing the compliance report.



4. Name and version of the compliance software tool.

**Exception:** Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.

**R406.6.3 Additional documentation.** The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.
2. A certification signed by the builder providing the building component characteristics of the *rated design*.
3. Documentation of the actual values used in the software calculations for the *rated design*.

**R406.6.4 Specific approval.** Performance analysis tools meeting the applicable sections of Section R406 shall be *approved*. Documentation demonstrating the approval of performance analysis tools in accordance with Section R406.6.1 shall be provided.

**R406.6.5 Input values.** Where calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from RESNET/ICC 301.

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## **Section 11.5 The National Electrical Code, 2017 Edition (or State Adopted Version)**

The installation of the Electrical Vehicle Charging Stations shall meet all requirements of the NEC as well as the following section:

### **Residential EV Charging Language:**

Electric vehicle (EV) charging for new construction.

1. New Construction shall comply with the adopted Electrical Code and this Section. Purpose is to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be as follows:
  - a. New one- and two-family dwellings and townhouses with attached private garages.
    - i. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.
    - ii. Identification. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".
  - b. New multifamily dwellings.
    - i. Where 17 or more multifamily dwelling units are constructed on a building site, 3 percent of the total number of parking spaces provided for all types of parking facilities, but in no case less than one, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number. Note: Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.
  - c. Electric vehicle charging space (EV space) locations.

Construction documents shall indicate the location of proposed EV spaces. At least one EV space shall be located in common use areas and available for use by all residents. When EV chargers are installed, EV spaces, shall comply with at least one of the following options:

- i. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the Building Code, Chapter 11, to allow use of the EV charger from the accessible parking space.
- ii. The EV space shall be located on an accessible route, as defined in the Building Code, Chapter 11, to the building.

d. Electric vehicle charging space (EV space) dimensions.

The EV spaces shall be designed to comply with the following:

- i. The minimum length of each EV space shall be 18 feet (5486 mm).
- ii. The minimum width of each EV space shall be 9 feet (2743 mm).
- iii. One in every 25 EV spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).
- iv. Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

e. Single EV space required.

- i. Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV spaces. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

f. Multiple EV spaces required.

- i. Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. Plan design shall be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.

g. Identification

The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE"

h. Non-Residential EV Stations

Electric vehicle (EV) charging. New Construction shall comply with the adopted Electrical Code and this Section. Purpose is to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be as follows:

1. Single charging space requirements.

- a. When only a single charging space is required per Table 1, a raceway is required to be installed at the time of construction and shall be installed in accordance with the Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:
- b. The type and location of the EVSE.
- c. A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.
- d. The raceway shall not be less than trade size 1.”
- e. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.
- f. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

2. Multiple charging space requirements.

When multiple charging spaces are required per Table 1, raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:

- a. The type and location of the EVSE.
- b. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
- c. Plan design shall be based upon 40-ampere minimum branch circuits.
- d. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
- e. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

2. EV charging space calculation.

Table 1 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

Exceptions: On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

a. Where there is insufficient electrical supply.

b. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of this Section, may adversely impact the construction cost of the project.

TABLE 1

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER REQUIRED FOR EV CHARGING SPACES
0-9	0
10-25	1
26-100	2
101-200	4
201 and over	3 percent of total*

\*Calculation for spaces shall be rounded up to the nearest whole number.

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

## **Chapter 11.10 International Plumbing Code**

The International Plumbing Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, Chapters 1 through 13 inclusive, is hereby adopted by reference as the Town of Berthoud Plumbing Code as if fully set out in this ordinance with the additions, deletions, insertions and changes as follows.

IPC Section 101.1 IPC Section 101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

IPC Section 305.4.1 IPC Section 305.4.1 (Sewer depth) is amended by filling in both areas where indicated to read “12 inches (305 mm)”.

IPC Section 312.3 IPC Section 312.3 (Drainage and vent air test) is amended by the deletion of the first sentence.

IPC Section 903.1 IPC Section 903.1 (Roof extension) is amended by inserting the number “12” (152.4 mm) where indicated in the second sentence.

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

## **Chapter 11.16 International Mechanical Code**

The International Mechanical Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, Chapters 1 through 15 inclusive, is hereby adopted by reference as the Town of Berthoud Mechanical Code as if fully set out in this ordinance with the additions, deletions, insertions and changes as follows.

IMC Section 101.1 IMC Section 101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

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## **Chapter 11.17 International Fuel Gas Code**

The International Fuel Gas Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478 , Chapters 1 through 8 inclusive, is hereby adopted by reference as the Town of Berthoud Fuel Gas Code as if fully set out in this ordinance with the additions, deletions, insertions and changes as follows.

IFGC Section 101.1 IFGC Section 101.1 (Title) is amended by the addition of the term “Town of Berthoud” where indicated.

IFGC Section 404.12 IFGC Section 404.12 (Minimum burial depth) is amended by the addition of the following:  
All plastic fuel gas piping shall be installed a minimum of 18 inches (457 mm) below grade.

IFGC Section 404.12.1 IFGC Section 404.12.1 (Individual outside appliances) is amended by the deletion of this section in its entirety.

IFGC Section 406.4.1 IFGC Section 406.4.1 (Test pressure) is amended by replacing 3 psig with 10 psig.

“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

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## **Chapter 11.18 Graywater Systems – Control Regulation 86**

Requirement. Graywater systems shall comply with the minimum requirements of Colorado State Regulation 86, as well as any and all other applicable state and local requirements.

The Town of Berthoud is the local agency responsible for oversight and implementation of all graywater regulatory activities in the Town limits of Berthoud as required by Colorado State Regulation 86.

The Town of Berthoud's graywater control program meeting the requirements of Colorado State Regulation 86 is as follows:

The Town of Berthoud shall determine any graywater system fee structure, maintain a record of the locations where graywater systems are installed, and review and approve design criteria for any system consistent with Colorado State Regulation 86. Graywater systems are only allowed in new homes where plumbing systems have been designed for the graywater system.

Upon issuance of a certificate of occupancy and the sale of a new home, the legal responsibility including operation and maintenance of approved graywater recycling systems transfers similar to other residential household appliances to the homeowner. The transfer of property ownership must include the transfer of records and operating manuals related to the graywater system and is accomplished by paper or electronic records transferring with a graywater system.

Appropriate graywater space allocation is required for graywater systems and system location must be identified on permit drawings. These drawings should indicate all plumbing connections to ensure compliance with local code requirements. Graywater system specifications are to be included with permit drawings. In the process of inspecting for the certificate of occupancy, if an inspection is adequately conducted and the inspector is knowledgeable of the NSF 350 Standards, Colorado State Regulation 86, and the applicable plumbing code, the final inspection is used to verify that a graywater system meets regulatory requirements.

"Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation"

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**Chapter 11.19 International Swimming Pool and Spa Code**

The International Swimming Pool and Spa Code. 2018 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478, Chapters 1 through 11 inclusive, is hereby adopted by reference as the Town of Berthoud Swimming Pool and Spa Code as if fully set out in this ordinance with the additions, deletions, insertions and changes as follows.

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“Violation of the provisions of this code, as adopted in this ordinance, may be punished in accordance with Section 20.2 of the Berthoud municipal code in addition to any relief at equity to prevent continuing violation”

