



**Garden
Spot of
Colorado**

**MEETING OF THE TOWN BOARD
Town Board Room
807 Mountain Avenue
Town of Berthoud, Colorado
Tuesday, February 14, 2023, 6:30 p.m.**

This is an IN-PERSON meeting at the location and time noted above.
You may also join virtually using Zoom: Phone: 1-346-248-7799 or 301-715-8592
Web: www.zoom.us/join Use this Meeting ID: 210 035 9423

The Town Board may take action on any of the following agenda items as presented or modified prior to or during the meeting and items necessary or convenient to effectuate the agenda items.

1. Regular Meeting Called To Order - Mayor William Karspeck
2. Pledge Of Allegiance - Mayor William Karspeck
3. Roll Call - Mayor William Karspeck
4. Citizen Participation
5. Scheduled Items And Estimated Time For Discussion
- 5.I. Consent Agenda

Documents:

[BOARD INFORMATION SHEET CONSENT AGENDA.PDF](#)
[A. 2023.02.14 TOWN BOARD AGENDA.PDF](#)
[B. 2023.01.24 TOWN BOARD MINUTES.PDF](#)
[C. PICKLEBALL COURTS RFP.PDF](#)
[C. PICKLEBALL COURTS RFP.PDF](#)
[D. TOWN PARK RFP.PDF](#)

- 5.II. Website Reveal

Documents:

[2. BOARD INFORMATION WEBSITE REVEAL.PDF](#)

- 5.III. Adoption Of Codes By Reference - Public Hearing

Documents:

1. BOARD INFORMATION SHEET_ADOPTION BY REFERENCE
CORRECTION V2.PDF
2. ORD 1315 IBC IRC IPMC BY REF 010523.PDF
3. APPENDIX A_CODE AMENDMENT CLEAN.PDF
4. FINAL-COLORADO-FRONT-RANGE-GUST-MAP-2013.L.PDF
5. LARIMER COUNTY WIND_SPEED MAP.PDF

6. Elected Official Reports

1. Town Board - Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.
2. Mayor - William Karspeck
3. Staff - Town Administrator, Attorney

7. Executive Session

Pursuant to C.R.S. § 24-6-402(4)(e)(I) to determine positions relative to matters that may be subject to negotiations, developing a strategy for negotiations, and instructing negotiators; and, pursuant to C.R.S. § 24-6-402(4)(b) for a conference with legal counsel for the purpose of receiving legal advice on specific legal questions. And the following details are provided: Water Line Reimbursement

8. Adjourn

The order of agenda items listed above is approximate and intended as a guideline for the

Town Board. Individuals needing special accommodation may request assistance by contacting the Town Clerk 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.

BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Consent Agenda
Type of Item:	Regular Item
Purpose:	The Consent Agenda contains routine items that can be approved with a single action by the Board.
Presented by:	Christian Samora

ATTACHMENTS:

- a) February 14, 2023, Meeting Agenda
- b) January 24, 2023, Meeting Minutes
- c) Pickleball Courts RFP
- d) Town Park RFP

BACKGROUND:

"Consent Agenda" is a group of routine matters to be acted on with a single motion and vote. The Mayor will ask if any Board Member wishes to remove an item for separate discussion. Items removed from the consent agenda should be considered immediately following adoption of the amended Consent Agenda.

UPDATE/NEXT STEPS:

Any updates or next steps for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

FISCAL IMPACT AND FUND SOURCE:

Any fiscal information for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

COMMUNITY TOUCHSTONES:

Any Community Touchstones for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

RECOMMENDED ACTION(S):

"Move to combine and approve the items on the Consent Agenda."

Followed by a second and a vote.



MEETING OF THE TOWN BOARD

Town Board Room
807 Mountain Avenue
Town of Berthoud, Colorado
Tuesday, February 14, 2023, 6:30 p.m.

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Web: www.zoom.us/join

Use this Meeting ID: 210 035 9423

Please note that you will need to call into the meeting if you wish to speak and do not have a microphone on your computer. If you are using a mobile device, it is highly recommended that you download the Zoom app.

The Town Board may take action on any of the following agenda items as presented or modified prior to or during the meeting and items necessary or convenient to effectuate the agenda items.

- I. REGULAR MEETING CALLED TO ORDER** – Mayor William Karspeck
- II. PLEDGE OF ALLEGIANCE** – Mayor William Karspeck
- III. ROLL CALL** – Mayor William Karspeck
- IV. CITIZEN PARTICIPATION**
- V. SCHEDULED ITEMS and ESTIMATED TIMES FOR DISCUSSION**
 1. **Consent Agenda** (Christian Samora) (5 Min)
Consent Agenda items are considered to be routine by the Town Board and will be enacted with a single vote. There will be no separate discussion of these items. If discussion is deemed necessary, that item should be removed from the Consent Agenda and considered separately.
 - a) February 14, 2023, Meeting Agenda
 - b) January 24, 2023, Meeting Minutes
 - c) Pickleball Courts RFP
 - d) Town Park RFP
 2. **New Website Reveal** (Christian Samora) (5 Min)
 3. **Adoption of Codes by Reference – Public Hearing** (Chris Kirk) (15 Min)
Ordinance 1315 – An Ordinance amending Chapter 11, of the Municipal Code of the Town of Berthoud, for the purposes of adopting the 2021 International Building Code by reference with amendments and the 2021 International Residential Code by reference with amendments.
- VI. ELECTED OFFICIAL REPORTS** (10 Min)
 1. Town Board – Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.
 - a) Study Session Scheduling
 2. Mayor – William Karspeck
 3. Staff – Town Administrator, Attorney

February 14, 2023, Meeting Agenda

The order of agenda items listed above is approximate and intended as a guideline for the Town Board. Individuals needing special accommodation may request assistance by contacting the Town Clerk 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.

VII. EXECUTIVE SESSION

Pursuant to C.R.S. § 24-6-402(4)(e)(I) to determine positions relative to matters that may be subject to negotiations, developing a strategy for negotiations, and instructing negotiators; and, pursuant to C.R.S. § 24-6-402(4)(b) for a conference with legal counsel for the purpose of receiving legal advice on specific legal questions. And the following details are provided: Water Line Reimbursement

VIII. ADJOURN

Town Clerk or Deputy Town Clerk

William Karspeck, Mayor

February 14, 2023, Meeting Agenda

The order of agenda items listed above is approximate and intended as a guideline for the Town Board. Individuals needing special accommodation may request assistance by contacting the Town Clerk 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.



MEETING MINUTES OF THE TOWN BOARD

Town Board Room
807 Mountain Avenue
Town of Berthoud, Colorado
Tuesday, January 24, 2023, 6:30 p.m.

I. REGULAR MEETING CALLED TO ORDER – Mayor William Karspeck

Mayor Karspeck called the meeting to order.

II. PLEDGE OF ALLEGIANCE – Mayor William Karspeck

Mayor Karspeck led the Pledge of Allegiance.

III. ROLL CALL – Mayor William Karspeck

The following Board Members were present:

William Karspeck, Mayor
Mike Grace, Mayor Pro-Tem
Karl Ayers, Trustee
Tim Hardy, Trustee
May Soricelli, Trustee
Sean Murphy, Trustee
Jeff Butler, Trustee

The following were also present:

Chris Kirk, Town Administrator
Christian Samora, Town Clerk
Erin Smith, Town Attorney
Michelle Adams, Deputy Town Clerk

IV. CITIZEN PARTICIPATION

Linda Wilson spoke virtually regarding xeriscaping.

V. SCHEDULED ITEMS and ESTIMATED TIMES FOR DISCUSSION

1. **Consent Agenda** (Christian Samora) (5 Min)
Consent Agenda items are considered to be routine by the Town Board and will be enacted with a single vote. There will be no separate discussion of these items. If discussion is deemed necessary, that item should be removed from the Consent Agenda and considered separately.
 - a) January 24, 2023, Meeting Agenda
 - b) January 10, 2023, Meeting Minutes
 - c) December 2022 Board Report
 - d) Resolution Supporting Housing Project ARPA
 - e) Cancellation of Temporary Water Use Permit

Trustee Hardy moved to combine and approve the items on the Consent Agenda. Mayor Pro-Tem Grace seconded the motion. In a 7-0 roll call vote, **THE MOTION CARRIED.**

2. **Veteran Flag Program Proclamation** (Town Board) (5 Min)

Mayor Karspeck introduced the proclamation and read the proclamation aloud to the Board of Trustees and others present at the meeting.

3. **Flock Neighborhood Camera Presentation** (Deputy Anderson) (30 Min)

Zachary Anderson, Community Impact Deputy, provided an introduction and presentation regarding the Flock camera program.

4. **Oil and Gas Regulations** (Mike Foote) (45 Min)

Foote gave an update and received direction from the Town Board. The next session will be a general introduction of Tranche II.

Mayor Pro-Tem Grace moved to extend the meeting past 9:30 PM. Mayor Karspeck seconded the motion. With all in favor, THE MOTION CARRIED.

5. **Transit Study Presentation** (Kelly Leadbetter) (45 Min)

Leadbetter provided a presentation and background information.

Trustee Murphy moved to approve the Town of Berthoud Transit Assessment. Trustee Soricelli seconded the motion. In a 7-0 roll call vote, THE MOTION CARRIED.

6. **2022 In Review** (Chris Kirk) (15 Min)

Kirk indicated that he would send the 2022 In Review to the Trustees by email.

VI. ELECTED OFFICIAL REPORTS (10 Min)

1. Town Board – Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.

Trustee Soricelli requested the meeting agenda items be previewed on the Facebook posts along with the 2022 in review that can be shared.

Trustee Murphy reported he will be absent for the February 28th meeting.

Murphy stated he met with residents who live on 2nd Street, south of Welch Ave regarding the condition of the street.

Murphy referenced net zero building codes. The Board was supportive of having the item on the agenda.

Mayor Pro-Tem Grace reported that Youth Advisory would be meeting.

Grace asked about the timing of the Mountain Avenue/Berthoud Parkway light. Kirk indicated the Town has been speaking with CDOT regarding issues at that intersection and others. Kirk indicated CDOT will also be reviewing the speed limits.

Grace asked if there was a way for the Town to assist with the railroad crossing at Mountain. Kirk will reach out to Keith Knoll to follow up.

Grace reported the deadline to RSVP for the Casino night is the following day, and that the Administrator review is approaching.

2. Mayor – William Karspeck

Mayor Karspeck reported that Yadira Caraveo visited the Town and spoke regarding earmarking. Karspeck indicated they also spoke regarding the Post Office facility.

Karspeck will begin public meetings again.

Karspeck also met with the PrairieStar President.

3. Staff – Town Administrator, Attorney

Kirk stated he will be sending an email regarding study session scheduling.

VII. ADJOURN

The Meeting Adjourned at 10:00 PM.

Town Clerk or Deputy Town Clerk

William Karspeck, Mayor

BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Pickleball Courts
Type of Item:	Consent Agenda
Purpose:	Request to bid for project
Presented by:	Deputy Town Administrator Jeremy Olinger

ATTACHMENTS:

- Pickleball Court Bid Documents
- Pickleball court 100% CD submittal

BACKGROUND:

Pickleball is a sport that combines various elements of tennis, badminton, and ping-pong. In 2022, it was determined that there is a need for additional pickleball courts in Berthoud. Over the last ten years, the popularity of the sport has grown significantly and ultimately warrants the construction of new courts to accommodate the needs of the community.

To address the community need, the Board gave direction for staff to work with design consultants, community members, trustees, and PORT membership to put together the design, location, and work through the construction design process to be able to bid a viable project. Currently, Staff has taken the conceptual design work and input from the team members above to work with the consultant on delivery of completed construction docs.

Staff is ready to put this project out to bid and is requesting the Town Board's approval to proceed in doing so. The project is to build 8 courts (ADA accessible, 1 championship court included), Parks shelter/shed, benches and limited shade as well. These courts are suggested and planned to have the ability to be lit at night for play as well. At previous Board meetings, staff has garnered approval for the previous design steps to this point from Trustee direction and input.

UPDATE/NEXT STEPS:

Pending Board approval, Bids will be received and reviewed to determine the viability of the next step to construction and brought back to select company and award bid for construction.

FISCAL IMPACT AND FUND SOURCE:

The Town Budget in 2023 has a budget line-item for this project at \$850,000 in Larimer County Open Space with \$50,000 of that for CA Management and

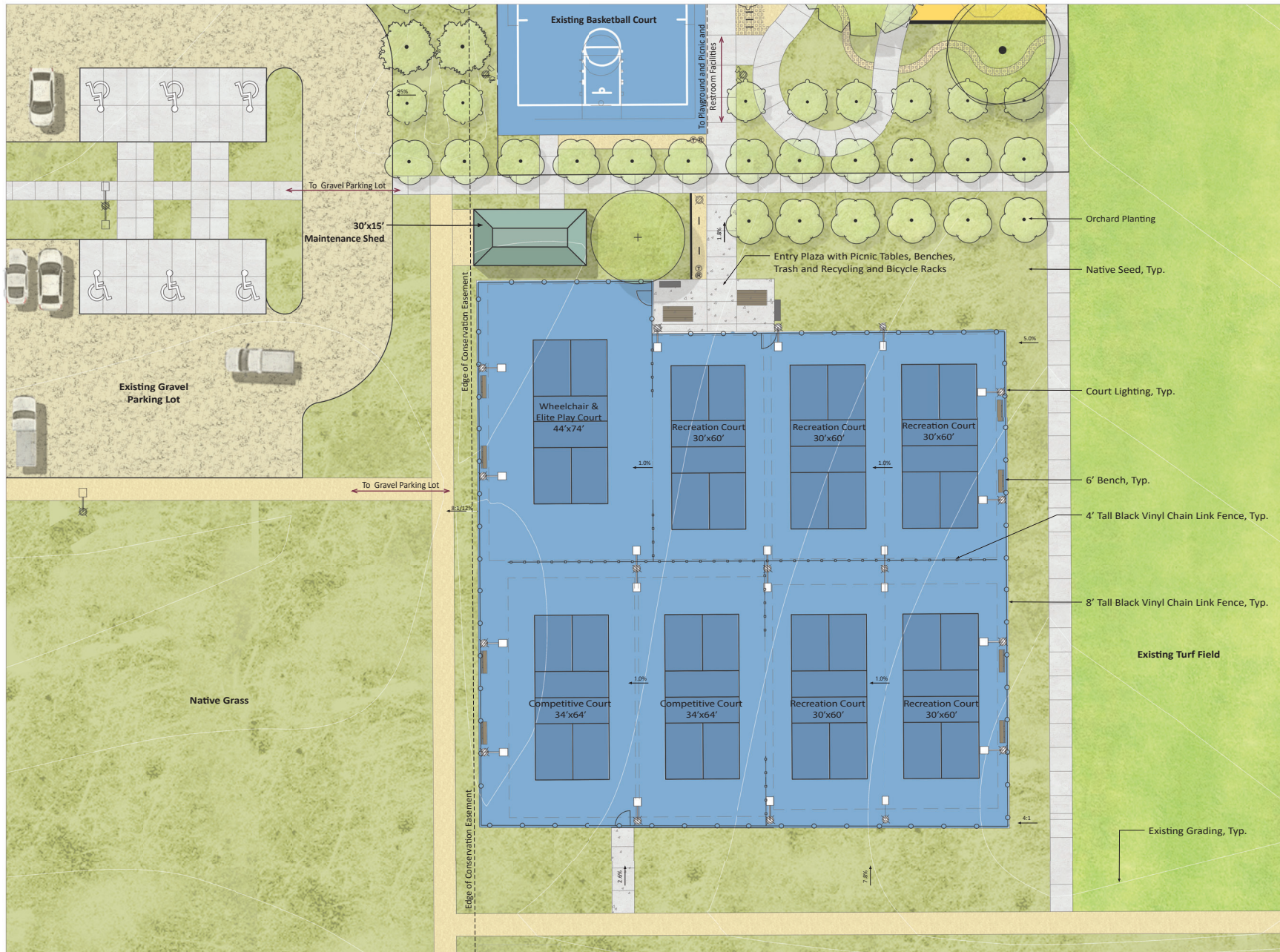
\$800,000 for construction.

COMMUNITY TOUCHSTONES:

The Pickleball courts will be a popular recreation amenity that will continue to enhance Berthoud's **Community Identity** as a great place to visit and recreate. By offering multiple avenues for residents to recreate, Berthoud's newest courts and park amenity will also increase our community's **Sustainability**, as more individuals and families use the courts for play all the while improving overall health.

RECOMMENDED ACTION(S):

Approve as a consent item to allow Staff to proceed with publicly bidding the pickleball courts and various site amenities for the purposes of selecting a construction firm to construct and build.



Berthoud Waggener Farm Park Pickleball Layout

March 2, 2022



BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Pickleball Courts
Type of Item:	Consent Agenda
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Presented by:	Deputy Town Administrator Jeremy Olinger

ATTACHMENTS:

- Pickleball Court Bid Documents
- Pickleball court 100% CD submittal

BACKGROUND:

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FISCAL IMPACT AND FUND SOURCE:

The Town Budget in 2023 has a budget line-item for this project at \$850,000 in Larimer County Open Space with \$50,000 of that for CA Management and

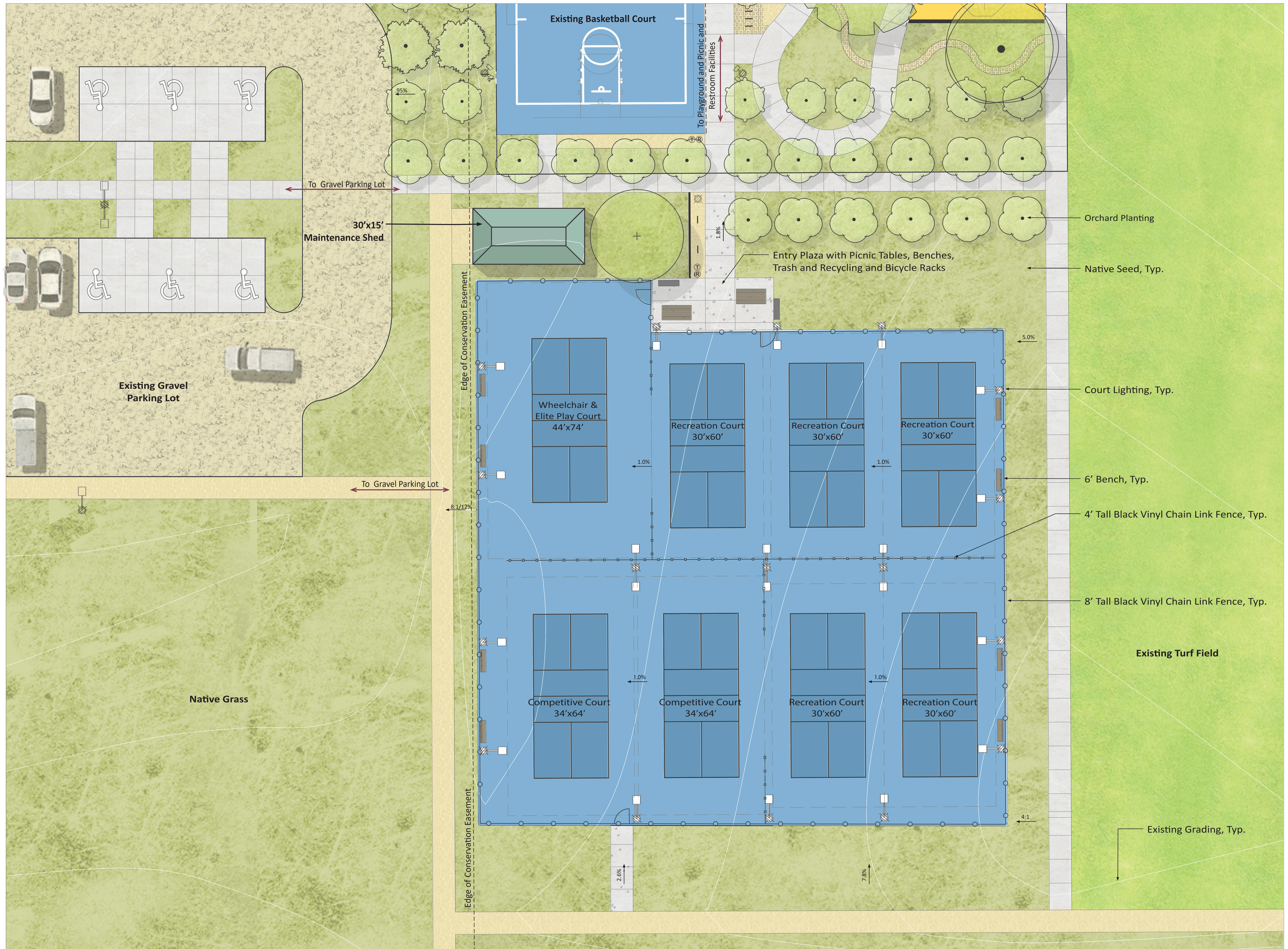
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COMMUNITY TOUCHSTONES:

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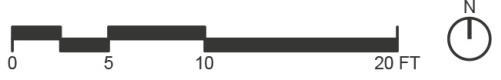
RECOMMENDED ACTION(S):

Approve as a consent item to allow Staff to proceed with publicly bidding the pickleball courts and various site amenities for the purposes of selecting a construction firm to construct and build.



Berthoud Waggener Farm Park Pickleball Layout

March 2, 2022



BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Town Park Phase 1
Type of Item:	Consent Agenda
Purpose:	Request to Bid Phase 1-Town Park
Presented by:	Deputy Town Administrator Jeremy Olinger

ATTACHMENTS:

- Town Park Phase 1 design plan

BACKGROUND:

In the first quarter of 2022, the Town Board gave direction to move forward with the design of Town Park. The design was selected by the Town Board from several options that were presented at a public meeting. The selected park design option included the relocating and placement of Pickleball courts at Waggener Farm Park. Since that time, staff and consultants have recently completed construction design documents and are ready to proceed with publicly bidding phase 1 of the project.

Phase 1 has been determined to be the western portion of Town Park, which encompasses the portion of the park west of the current ballfields. The ballfield chain link fence currently acts as a separator of the two phases. The second phase of the Town Park project will occur at a future date. Phase II of the project will include removing the ballfields and constructing new park amenities.

The proposed park design has been developed with input received from the Town Board, Berthoud residents, and the PORT Committee.

UPDATE/NEXT STEPS:

Pending Board approval, Bids for Phase 1 will be received and reviewed to determine the viability of the next step to construction and brought back to select company and award bid for construction.

FISCAL IMPACT AND FUND SOURCE:

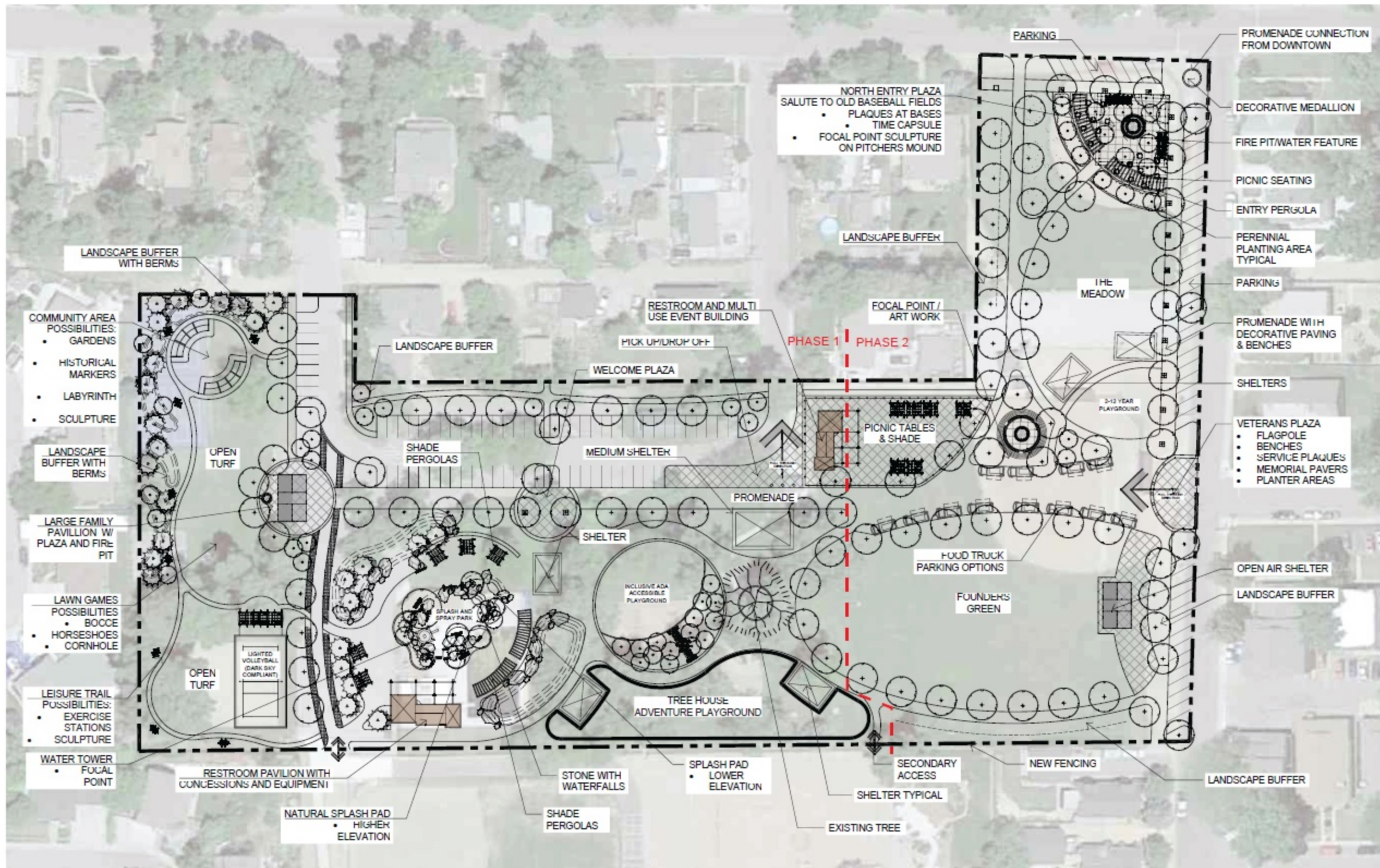
The Budget for 2023 has budget line-items for construction of Phase 1 of the park project in the total amount of \$5.5 million in capital improvements, 1998 and 2019 1% funds. Of the total, \$5.2 million for construction and \$300k for CA management

COMMUNITY TOUCHSTONES:

The Redesign of Town Park will be a chance to update an older recreation amenity into a newer version that will continue to enhance Berthoud's **Community Identity** as a great place to visit and recreate. By offering multiple avenues for residents to recreate, Berthoud's Town Park updates will also increase our community's togetherness and **Sustainability**, as more individuals and families use the park for a multitude of exercise elements all the while improving overall health.

RECOMMENDED ACTION(S):

Approve as a consent item to allow Staff to proceed with publicly bidding the Town Park Redesign Project phase 1 for the purposes of receiving quality and completed bids towards selecting a construction firm in a future board meeting to complete the work.



BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Website Reveal
Type of Item:	Presentation
Purpose:	Informational Presentation
Presented by:	Christian Samora

BACKGROUND:

This item will be an informational presentation. There may be additional information distributed during the presentation.

BOARD OF TRUSTEES INFORMATION



COMMUNITY DEVELOPMENT DEPARTMENT

Meeting Date:	February 14, 2023
Agenda Title/Subject:	Adoption of Codes by Reference
Type of Item:	Public Hearing
Purpose:	Adoption of Updated Codes with Amendments
Presented by:	Chris Kirk, Town Administrator

ATTACHMENTS:

- Ordinance #1315 Adopting by reference the 2021 International Building Code, and the 2021 International Residential Code
- Appendix A, Proposed Amendments
- Colorado Front Range Gust map
- Larimer County Wind Speed Map

BACKGROUND:

In December 2022, The Town Board adopted various building codes by reference with amendments. The amendments to the adopted codes were attached as an appendix to the adopting ordinance.

The attached ordinance repeals and readopts the 2021 International Building Code and the 2021 International Residential Code by reference with amendments. The purpose of readoption is to correct the amendments regarding the Basic Design Wind Speed.

The attached Appendix A, Correction Markup, highlights the corrected amendment language in the appendix. These are changes to the amendments that were adopted by the Town Board on December 13, 2022. The revised amendments regarding wind speed will be consistent with the Colorado Front Range Gust and Larimer County Wind Speed Maps, if the attached ordinance is adopted by the Board of Trustees.

Additionally, the attached ordinance adopts by reference the International Property Maintenance Code. The ordinance adopted in December 2022 repealed Chapter 11 of the Berthoud Municipal Code, which inadvertently also repealed 11.20 regarding the Property Maintenance Code. The Property Maintenance Code was adopted in October 2021.

UPDATE/NEXT STEPS:

No additional next steps are needed if the ordinances are adopted. The appendix has been updated to reflect a ground snow load of 35 psf. The appendix presented at the January 10, 2023 meeting indicated a snow load of 30 psf. This change helps the code requirements to be consistent with surrounding jurisdictions.

FISCAL IMPACT AND FUND SOURCE: N/A

COMMUNITY TOUCHSTONES: Sustainability, Resiliency

RECOMMENDED ACTION(S):

Hold the public hearing and hear testimony from the public.

A Board Member may move to approve Ordinance 1315 – An Ordinance amending Chapter 11, of the Municipal Code of the Town of Berthoud, for the purposes of adopting the 2021 International Building Code by reference with amendments and the 2021 International Residential Code by reference with amendments. Followed by a second and a roll call vote.

TOWN OF BERTHOUD

ORDINANCE NO. 1315

AN ORDINANCE AMENDING CHAPTER 11, OF THE MUNICIPAL CODE OF THE TOWN OF BERTHOUD FOR THE PURPOSES OF ADOPTING THE 2021 INTERNATIONAL BUILDING CODE BY REFERENCE WITH AMENDMENTS, THE 2021 INTERNATIONAL RESIDENTIAL CODE BY REFERENCE WITH AMENDMENTS, AND THE 2021 INTERNATIONAL PROPERTY MAINTENANCE CODE BY REFERENCE WITH AMENDMENTS.

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt the 2021 International Building Code by reference with amendments, the 2021 International Residential Code by reference with amendments, and the 2021 International Property Maintenance Code by reference with amendments; said 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 codes pursuant to C.R.S. § 31-16-203; and

WHEREAS, the 2021 International Building Code by reference with amendments, the 2021 International Residential Code by reference with amendments, and the 2021 International Property Maintenance Code by reference with amendments have been submitted to the Board of Trustees in writing and the Board of Trustees has determined that such codes 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. Codes Adopted by Reference.

Pursuant to parts 1 and 2 of article 16 of title 31, C.R.S., there are hereby adopted by reference: The International Building Code, 2021 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478 as amended hereby (“IBC”); The International Residential Code, 2021 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478 as amended hereby (“IRC”); and The International Property Maintenance Code, 2021 Edition as published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, IL 60478 as amended hereby; provided that any penalty provisions are expressly set out in Appendix A. The subject matter of the codes adopted herein relate primarily to the conditions and maintenance of all property, buildings, and structures within the Town. The purpose of this Ordinance and the codes adopted herein is to provide consistent regulations for all property, buildings, and structures within the Town. Three (3) copies of the codes adopted herein are now filed in the office of the Clerk of the Town of Berthoud, Colorado, and may be inspected during regular business hours.

Section 2. Section 11.1 of the Berthoud Municipal Code is hereby repealed, and the 2021 International Building Code is adopted by reference with amendments as set forth in Appendix A as the new Section 11.1.

Section 3. Section 11.2 of the Berthoud Municipal Code is hereby repealed, and the 2021 International Residential Code is adopted by reference with amendments as set forth in Appendix A as the new Section 11.2.

Section 4. The 2021 International Property Maintenance Code is hereby adopted by reference with amendments as set forth in Appendix A as the new Section 11.20.

Section 5. 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 6. 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 7. 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 8. This Ordinance is necessary for health, safety and welfare of the residents of the Town of Berthoud.

Section 9. 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 14th day of February 2023.

William Karspeck, Mayor

Christian Samora, Town Clerk

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

The International Building Code, 2021 Edition

The International Residential Code, 2021 Edition

The International Property Maintenance Code, 2021 Edition

Chapter 11.1 International Building Code

The International Building Code. 2021 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 “ 2021 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 accessed, 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."

IBM 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 1031.3.1 (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 “ 2021 International Energy Conservation Code”.

IBC Section 1608 to read as follows:

The design ground snow load PG shall be 35 pfs for the Town of Berthoud per the Colorado Design Snow Loads, published by the Structural Engineers Association of Colorado (dated April 2016, <https://www.seacolorado.org/publications.php>). The design roof snow load values shall be determined from Chapter 7, ASCE 7-16, including all applicable factors, and loading and drifting considerations. In no case shall the final design roof snow load be less than a uniformly distributed load of 30 psf.

IBC Section 1609.3 (Basic Design Wind Speed) is amended to read as follows The basic design wind speed, V, in mph, for the determination of site wind loads shall comply with the Colorado Front Range Gust Map – ASCE 7-10 Compatible, published by the Structural Engineers Association of Colorado (dated November 18, 2013) or the Larimer County Basic Design Wind Speed Map

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”

Chapter 11.2 International Residential Code

The International Residential Code. 2021 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 AF, AH, and AT 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 (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 (Other inspections) is amended by the addition of a new subsection as follows:

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

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 (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	Subject to Damage From			Winter Design Temp Deg. F	Ice barrier Underlayment Required	Flood Hazard	Air Freezing Index	Mean Annual Temp
	Speed (V)ult	Topographi c effects	Design Category	Weathering	Frost Line	Termite					

35psf	115-140	Yes	B	Severe	30 in.	Slight to Moderate	1	YES	26713	1000	43F
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*Special Wind Region

Footnotes to Table 301.2 are hereby amended to read as follows:

d. The Ultimate Design Wind Speed (Vult) for the determination of site wind loads shall comply with the Colorado Front Range Gust Map – ASCE 7-10 Compatible, published by the Structural Engineers Association of Colorado (dated November 8, 2013, <https://seacolorado.org/publications.php>). Wind Load design values shall be determined from Section 1609 of the IBC. Wind exposure category shall be Exposure C unless designated otherwise by the design professional based on site-specific conditions and approved by the building official.

o. The design ground snow load pg shall be 35 pfs for the Town of Berthoud per the Colorado Design Snow Loads, published by the Structural Engineers Association of Colorado (dated April 2016, <https://www.seacolorado.org/publications.php>). The design roof snow load values shall be determined from Chapter 7, ASCE 7-16, including all applicable factors, and loading and drifting considerations. In no case shall the final design roof snow load be less than a uniformly distributed load of 30 psf, except greenhouses may take full load reductions allowed per ASCE 7.

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

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 2021 Edition.

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

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 R310.2.4.”

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

IRC Section R310.4 (Area wells) is amended by the addition of the following:

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

IRC Section R310.4.2 (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 (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 R310.4.4 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 (Automatic Fire Sprinkler Systems) is amended by the deletion of this section in its entirety.

IRC Section 315.3.3 (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 (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 (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 (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 (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 (Individual outdoor appliances) is amended by the deletion of this section in its

entirety.

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

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 (Sewer depth) is amended by filling in both areas where indicated to read "12 inches (305 mm)".

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 11.1 International Property Maintenance Code

Section 11-16.1 – Amendments

IPMC Section 101.1 IPMC Section 101.1 (Title) is amended by the addition of the term "Town of Berthoud" where indicated.

IPMC Section 103 IPMC Section 103 (Code Compliance Agency) is amended by deleting the section in its entirety.

IPMC Section 104 IPMC Section 104 (Fees) is amended by deleting the section in its entirety.

IPMC Section 107.1 IPMC Subsection 107.1 (Means of Appeal) is amended by deleting the subsection in its entirety and inserting the following:

"107.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be comprised of one hearing officer appointed by the Berthoud Board of Trustees who shall hold office at the board's pleasure."

IPMC Section 107.5 IPMC Subsection 107.5 is added to include the following:

"107.5 Board of Appeals Decision Review. Appeal from a board of appeals decision shall be pursuant to Rule 106(a)(4) of the Colorado Rules of Civil Procedure.

IPMC Section 108 IPMC Section 108 (Board of Appeals) is amended by deleting the section in its entirety.

IPMC Section 109 IPMC Section 109 (Violations) is amended by deleting the section in its entirety.

IPMC Subsection 111.4 IPMC Subsection 111.4 (Notice) is amended by deleting the subsection in its entirety.

IPMC Subsection 302.4 IPMC Subsection 302.4 (Weeds) is amended by deleting this section in its entirety.

IPMC Subsection 302.8 IPMC Subsection 302.8 (Motor Vehicles) is amended by deleting this section in its

entirety.

IPMC Subsection 304.14 IPMC Section 304.14 (Insect screens) is amended by the deleting this section in its entirety.

IPMC Section 308 IPMC Section 308 (Rubbish and Garbage) is amended by the deleting this section in its entirety.

IPMC Section 309 IPMC Section 309 (Pest Elimination) is amended by the deleting this section in its entirety.

IPMC Subsection 604.2 IPMC Subsection 604.2 (Service) is amended by replacing "NFPA 70" with "Electrical Code adopted by the Town of Berthoud."

Section 11-16.2 – Penalties for Violation of International Property Maintenance Code

- (a) Any person who violates a provision of this code or fails to comply with any of the requirements thereof shall be subject to penalties as set forth in Section 20.2 of the Municipal Code of the Town of Berthoud. Each day that a violation continues after due notice has been served shall be deemed a separate offense. Such violation is also deemed a nuisance and may be abated as such.
- (b) The imposition of additional penalties shall not preclude the Town from instituting an appropriate action for injunction, mandamus or abatement to prevent, enjoin, abate or remove any unlawful act, erection, construction, reconstruction, alteration, remodeling or use, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

Section 11-16.3 – Notice of Violation of International Property Maintenance Code

When the code official determines that there has been a violation of this code or has grounds to believe that a violation has occurred, notice shall be given in the manner prescribed below. Failure to provide notice shall not constitute waiver of the violation by the Town.

- (a) **Form.** Notice shall be in accordance with the following:
 - 1. Be in writing.
 - 2. Include a description of the real estate sufficient for identification.
 - 3. Include a statement of the violation or violations and why the notice is being issued.
 - 4. Include a correction order allowing a period of 10 days from the date of the receipt of the notice in which to correct or appeal the alleged violations before further enforcement action shall be taken.
 - 5. Inform the property owner or owner's authorized agent of the right to appeal.
- (b) **Method of Service.** Such notice shall be deemed to be properly served where a copy thereof is served in accordance with one of the following methods:
 - 1. A copy is delivered personally.
 - 2. A copy is sent by certified or registered mail addressed to the owner at the last known address, as determined by the address on file in the records of the applicable County Assessor's office, with the return receipt requested.
 - 3. A copy is posted in a conspicuous place in or about the structure affected by such notice.
 - 4. A copy is delivered in any other manner prescribed by local law.



November 18, 2013

Colorado Front Range Gust Map – ASCE 7-10 Compatible

Prepared by
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Cermak Peterka Petersen, Inc.
Fort Collins, CO

INTRODUCTION AND METHODOLOGY

A Colorado Front Range Gust Map was prepared in 2006 by Peterka (2006) for use with ASCE 7-02 and ASCE 7-05. That map contained 50-year recurrence contours and was endorsed by the Structural Engineers Association of Colorado (SEAC). Many Front Range communities have used that map to guide code wind speed definition.

An International Building Code version which refers to ASCE 7-10 is now being adopted in Colorado. ASCE 7-10 uses wind maps with recurrence intervals of 700, 1700, and 300 years (for Risk Categories II, III-IV, and I respectively) within the standard, and maps of 10, 25, 50, and 100 years recurrence in Commentary Appendix C (Serviceability Considerations). To assist the process, this report has produced appropriate maps. It is intended that SEAC review and endorse this set of maps as a recommendation to local communities for structural design in the Front Range area. Maps are prepared in three formats: 1) printed maps in this report, 2) shape files usable in a geo-referenced application, and 3) a kmz file usable with Google Earth.

For this report, no new measured wind speed data was acquired or analyzed. The speed contours of the new maps were derived from the 2006 50-year map contours using the rate of change of speed with recurrence interval as determined by Peterka and Shahid (1998). Peterka (2006) showed the rate of change of wind speed with return period in the Front Range area was consistent with the 1998 paper. The rate of change of wind speed with return period is given by Equation 3 of Peterka and Shahid:

$$Frc = 0.36 + 0.10 \ln(12 T)$$

where T is the return period in years and Frc is the ratio of the return period speed at T years to the return period at 50 years (note that Frc = 1.00 at T=50) in the continental US. Table 1 represents the updated contour values rounded to the nearest 5 mph consistent with ASCE 7-10.

Table 1. 3-Second Wind Speeds in ASCE 7-10 Format

2006 Map Gust Spd mph	ASCE 7-10 Format 3-Second Gust Speed in mph for T, yrs						
	700	1700	300	10	25	50	100
90	115	120	105	75	85	90	95
100	125	135	120	85	95	100	105
110	140	150	130	90	100	110	120
120	150	160	140	100	110	120	130
130	165	175	155	110	120	130	140
140	175	190	165	115	130	140	150
180	225	245	210	150	165	180	190



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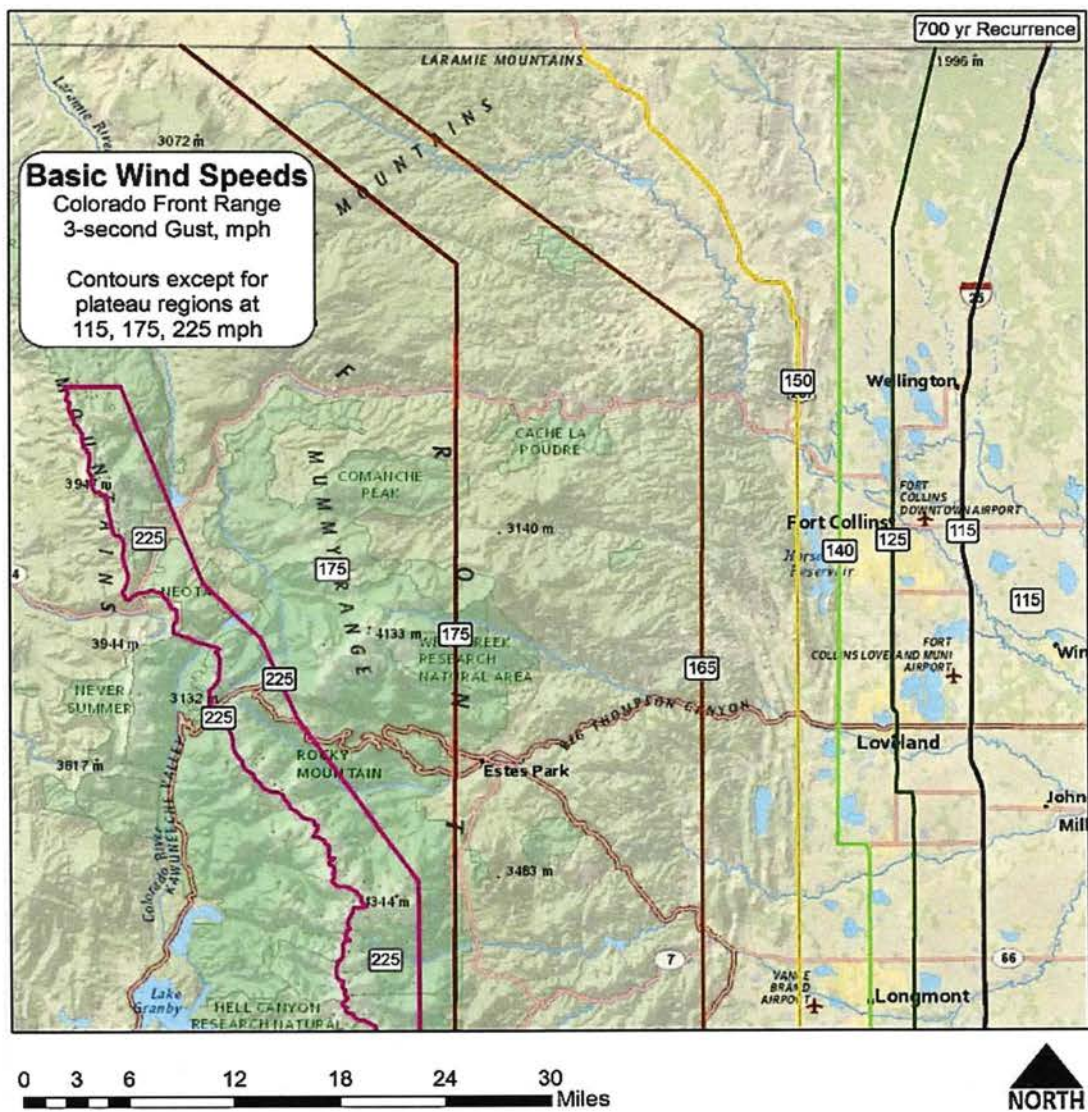
Figure 1 contains the 700-year, 1700-year, and 300-year recurrence maps suitable for use with Risk Category II, III-IV, and I structures respectively in ASCE 7-10. Speeds are at 10m height in effective open terrain. The map covers the area from the Wyoming border to south of Denver and from about I-25 west to the Continental Divide or Larimer County line. Maps needed for serviceability considerations in Commentary Appendix C of ASCE 7-10 are in Appendix 1.

The reason these maps were originally developed was a lack of knowledge of design level wind speeds for the Front Range area and significantly different speeds adopted by various communities prior to 2006. The logic used to develop the 2006 50-year map is not repeated here (see Peterka, 2006, available on the SEAC web site). Only the information required to use the maps has been repeated. In preparing the current maps, a few minor inconsistencies between the old map and word description of the contours were discovered. In making the new maps, the word description was used to guide the contour locations. All adjustments in contour locations were much smaller than our ability to know where the contours should be placed. The original 2006 map was based on 3-second gust wind data identified and organized into a suitable database by the Colorado State Climatologist's office under the direction of Nolan Doesken. Funding for the database was organized by the Colorado Chapter of the International Code Council, who assisted by contacting and involving 35 Front Range jurisdictions situated in the special wind region as defined by ASCE 7. Jon Peterka of Cermak Peterka Petersen, Inc. (CPP, Inc.) analyzed the data using a Type I Extreme Value Distribution along with spot reports from storm data publications to develop the map. A technical review by Bill Esterday of CPP assisted in finalizing the map. The current maps were produced by Jon Peterka with assistance from the CPP drafting department with a technical review by Bill Esterday.

High wind speeds in the Front Range area on the plains adjacent to the Rocky Mountains and in the mountains east of the Continental Divide are well known to residents as winter and spring events that are sometimes damaging. The winds are known to occur from roughly the Continental Divide/Larimer County Line (the line of highest terrain running approximately north to south that marks the high terrain western edge of the Front Range area) to approximately I-25 (that runs north-south about 8-15 miles east of the intersection of the mountains with the plains). The Continental Divide is very close to the plains in the Front Range area, resulting in high downslope wind speeds where the mountains and plains intersect.

High winds in the Front Range region are apparently due to two meteorological conditions:

- (1) Downslope (known locally as "Chinook") winds are driven by a pressure gradient and act much like a hydraulic jump causing highest winds near the intersection of mountains and plains and in the mountains just west of the plains. Boulder, Colorado, is well known as being highly susceptible to downslope winds. A peak gust wind speed of 147 mph has been measured at the National Center for Atmospheric Research (NCAR) on Table Mesa at the southwest edge of the city of Boulder.
- (2) Jet stream winds dip close to mountain-top level causing high wind speeds at higher terrain elevations, peaking near the Continental Divide. A peak gust of 168 mph was measured on Niwot Ridge just east of the Continental Divide west of Boulder.



North Portion

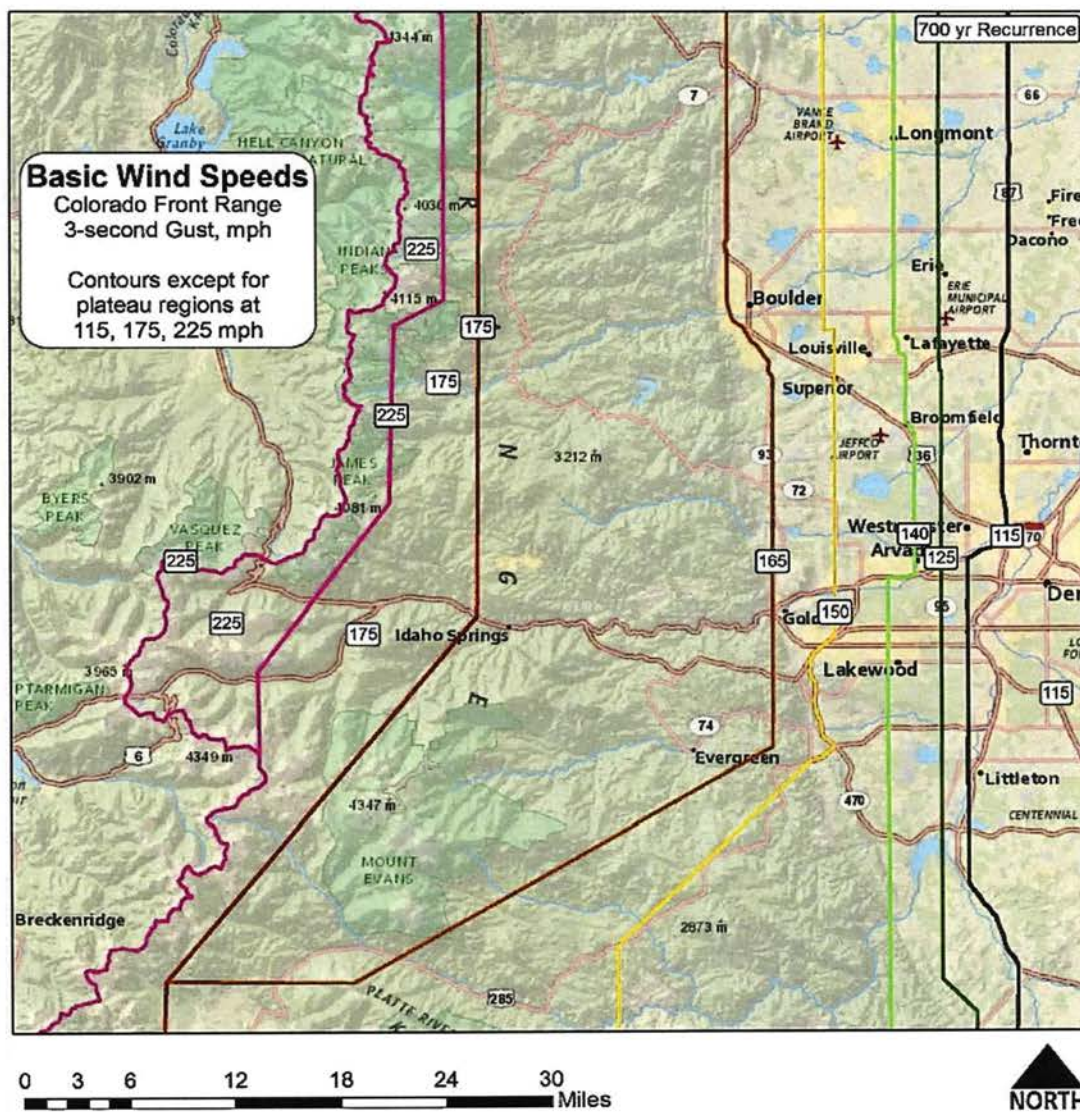
Risk Category II, 700 year recurrence, 0.00143 probability per year

Figure 1a Colorado Front Range Gust Map.



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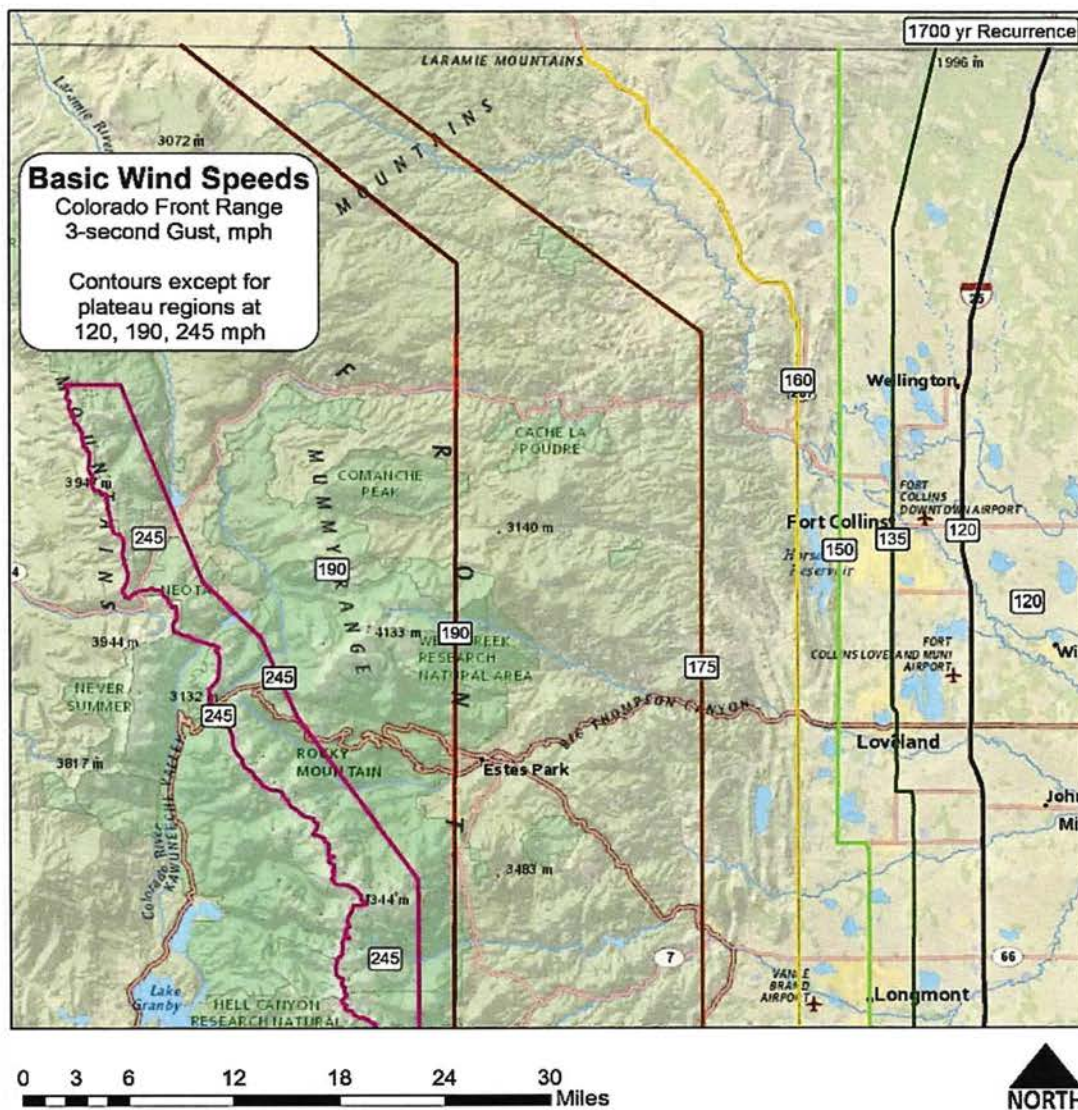
South Portion

Risk Category II, 700 year recurrence, 0.00143 probability per year

Figure 1b Colorado Front Range Gust Map.

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North Portion

Risk Category III-IV, 1700 year recurrence, 0.00059 probability per year

Figure 1c Colorado Front Range Gust Map.

1415 Blue Spruce Drive, Suite 3
Fort Collins, Colorado 80524, USA

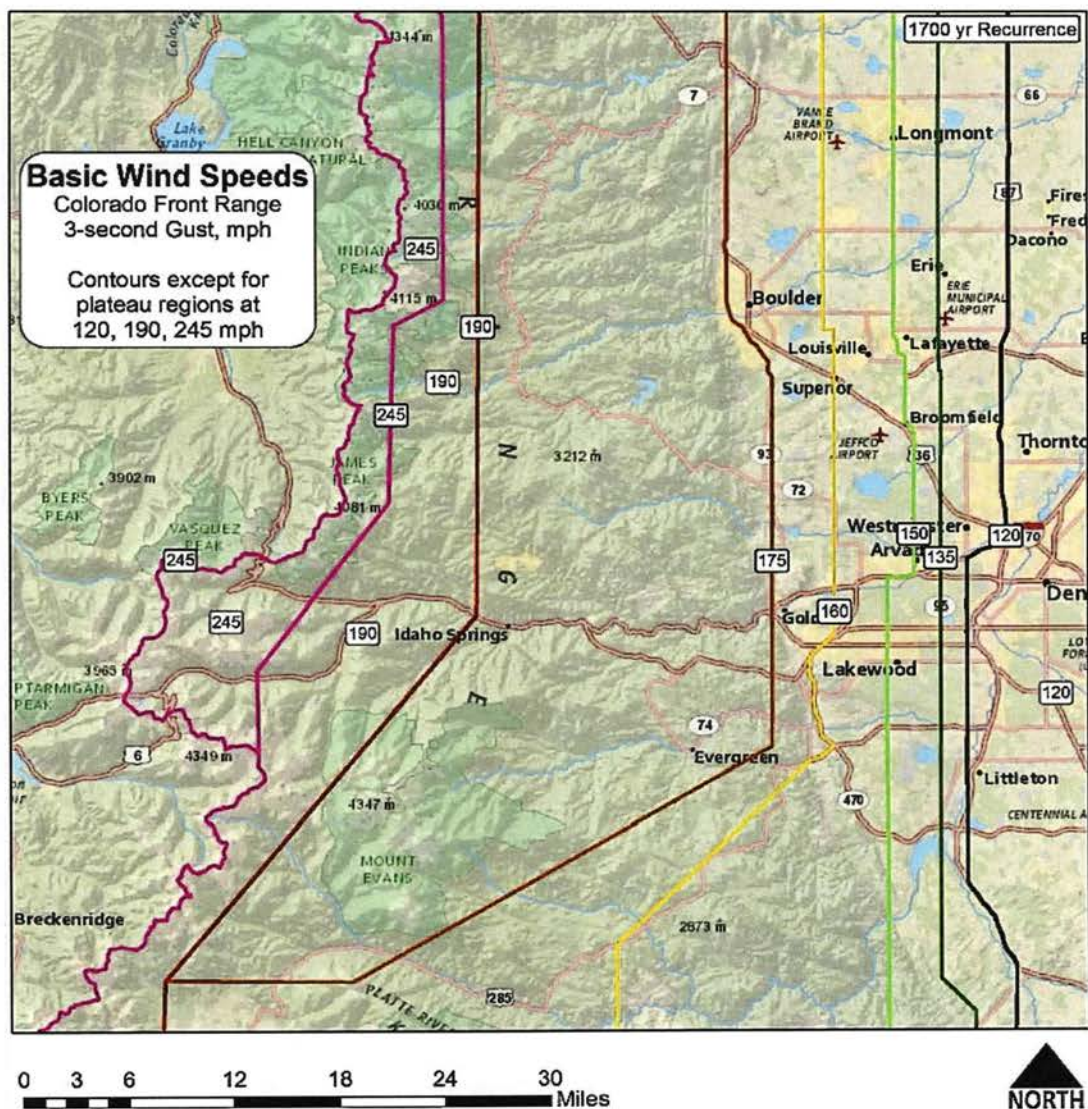
Tel: 1 970 221 3371
Fax: 1 970 221 3124

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www.cppwind.com



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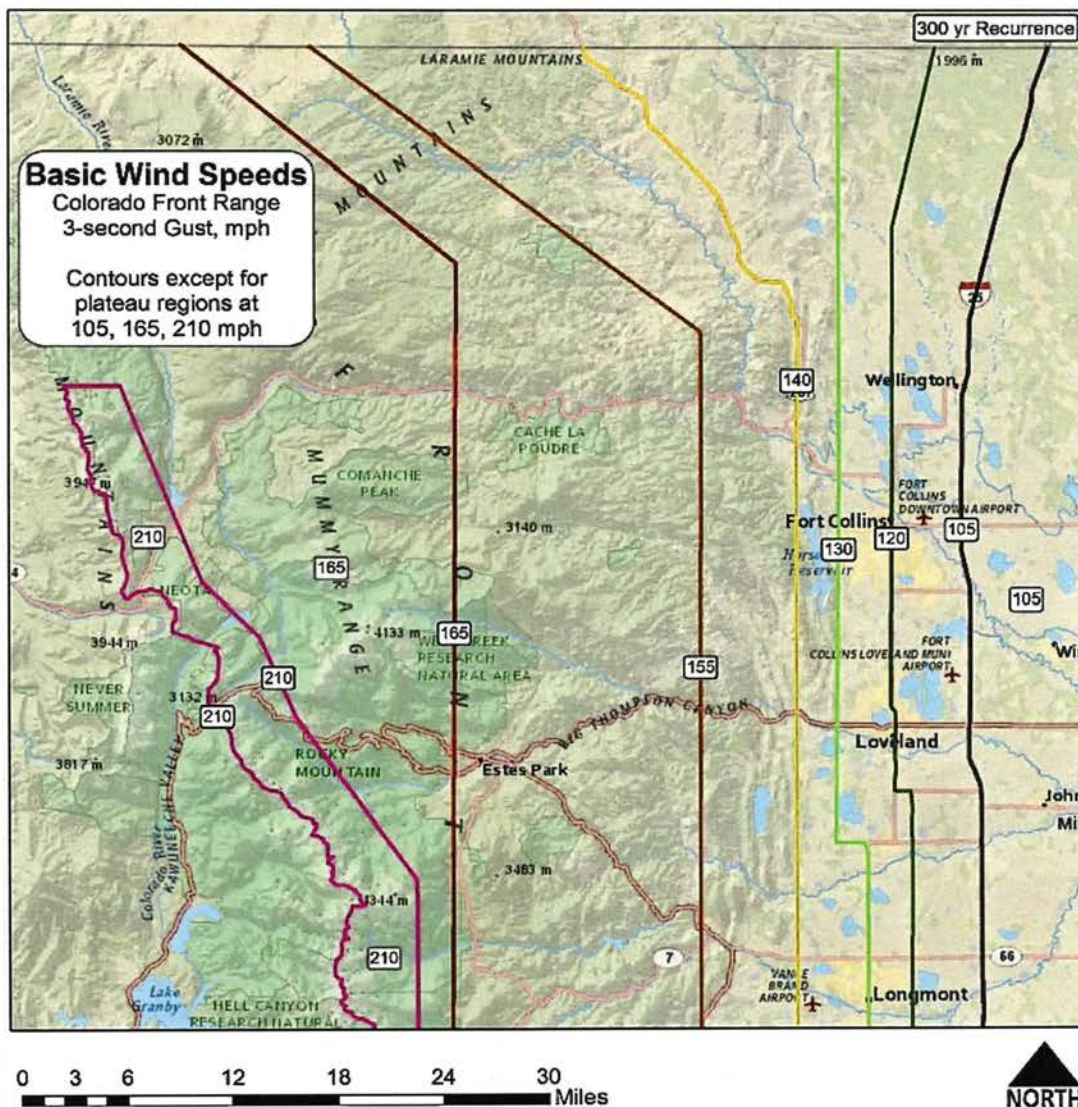
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South Portion

Risk Category III-IV, 1700 year recurrence, 0.00059 probability per year

Figure 1d Colorado Front Range Gust Map.



North Portion

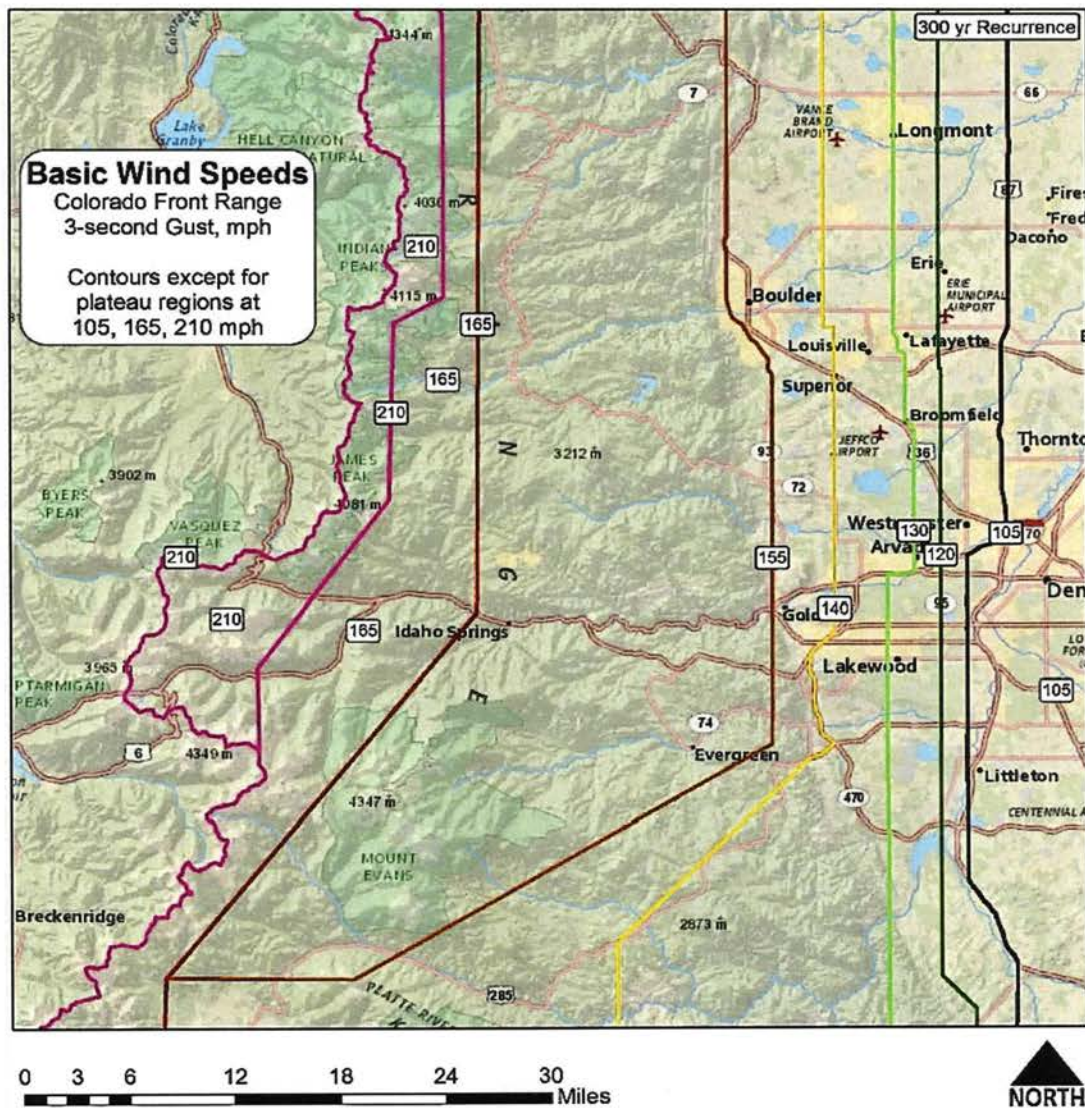
Risk Category I, 300 year recurrence, 0.00333 probability per year

Figure 1e Colorado Front Range Gust Map.



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South Portion

Risk Category I, 300 year recurrence, 0.00333 probability per year

Figure 1f Colorado Front Range Gust Map.



CONTOUR WORD DESCRIPTION

To assist in defining the locations of contours, a word description of each speed contour is as follows, using the 700-year map of Figure 1:

115 mph Contour

Federal Blvd. in Denver, south to U.S. 85 NW of Sedalia, follows 85 SSE to west of Sedalia, then due south. Federal Blvd. in Denver north to I-76, I-76 ENE to I-25, I-25 north to Wyoming line.

125 mph Contour

Sheridan Blvd. at the west edge of Denver due south to a point west of Sedalia, roughly SE to a point near the plains/mountains interface, then south.

Sheridan Blvd. at the west edge of Denver due north along the Boulder County/Adams County line, continuing along the Boulder County/Weld County line to Colorado 60 south of Loveland, west on 60 to U.S. 287, north on 287, leaving 287 in north Fort Collins when 287 turns west, continuing due north to about Buckeye Road, then roughly NNE to the Wyoming line.

140 mph Contour

Kipling in Lakewood south to map border.

Kipling in Lakewood north to I-70, ENE on I-70 to Wadsworth, Wadsworth north into Broomfield to U.S. 287, NW on 287 following 287 north out of Broomfield, north on 287 through Longmont to CO 56 west of Berthoud, west on CO 56 to 105° 08' (near 21 RD), north on this longitude (approximately 21 RD in Loveland and Overland Trail in Fort Collins) to the Wyoming line.

150 mph Contour

SW on I-70 from the intersection of the longitude line 105° 10' (just east of the I-70 & Colfax interchange) to C-470, south on C470 to U.S. 285, SW approximately along 285 to the Jefferson County Line, south on the Jefferson County line.

North from I-70 on approximately longitude 105° 10' (just east of the I-70 & Colfax interchange) to Baseline Road east of Boulder, west to 75th street, north on this longitude line (approximately longitude 105° 10.8') to a point on US 287 SE of The Forks (NW of Fort Collins) where 287 turns west from this longitude, then approximately NW on 287 to the Wyoming line.

165 mph Contour

South from near the intersection of CO 93 and CO 170 SE of Boulder along a longitude (105° 14') approximating the location of Colorado 93 to a point directly west of the intersection of C-470 and U.S. 285, SW to the summit of Mount Blaine (NE of Jefferson in South Park), west to the west edge of South park, then south. From near the intersection of CO 93 and CO 170 SE of Boulder, follow 93 NW through Boulder to Broadway, north on Broadway (approximately 105° 17') to a point north of the Poudre River at latitude 40° 45', then approximately NW to the Wyoming line.

175 mph Contour

From the intersection of I-70 with longitude 105° 33', southwest to connect to the 165 mph contour, then south on top of the 165 mph contour.

From the intersection of I-70 with longitude 105° 33', north on that longitude to a point approximately 1 km north of Dowdy Lake in Red Feather Lakes, then approximately NW to the Wyoming line.



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225 mph Contour

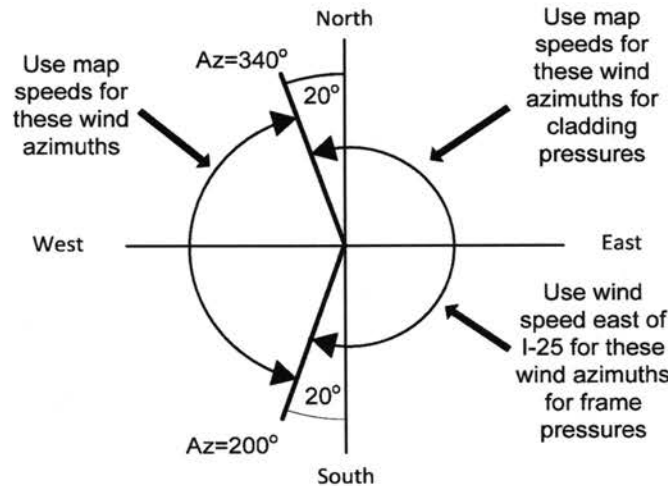
The west contour follows the Continental Divide and Larimer County Line.

The east contour follows roughly parallel but east of the Continental Divide.

APPLICATION

Based on the data presented in the 2006 report, there are several observations that can be made about the data.

While wind direction has not been presented explicitly, both recorded wind directions and knowledge of the meteorological events giving rise to this special wind region shows that the higher winds in this region are due to winds from SSW through NNW, roughly 45 degrees to the N/S orientation of the high ridgeline that induces the high speeds. Thus, winds from roughly wind azimuths of 340 through 0 to 200 degrees may use the wind speed east of I-25 for design of main wind-force resisting systems (MWFRS) under the provisions of IBC or ASCE 7. Cladding pressure design under IBC or ASCE 7 must use the map wind speed since the provisions in ASCE 7 do not specify the wind direction giving the highest cladding pressures. Figure 2 illustrates these concepts.



WIND AZIMUTH means wind approaching FROM that direction

Figure 2. Design speed variation with wind direction

Many of the wind records used in this analysis are short. The Type I Extreme Value Distribution used for this analysis works best for long records of 50-100 or more years of observation (the standard deviation of prediction error decreases as the inverse of the square root of record length). For shorter records, the likelihood of prediction error increases and is statistically biased to higher wind speeds. This means that predictions using short records are somewhat more likely to predict speeds too high than too low. As more data is acquired in the future at the various stations, it is more likely that contour locations will move slightly to the west than it is that the contours will move slightly to the east. This situation is consistent with good engineering practice of designing for slightly higher loads in the presence of uncertainty. In general, wind speeds from the mid 1960's through the mid 1980's were higher than wind speeds in the late 1980's and 1990's in many of the records. This may be due to multi-decadal variability in the atmosphere. Which of these periods better represents the future (if either is the norm) is not known.



RECOMMENDATIONS FOR THE FUTURE

The lack of long records at the various sites used in this study significantly impacted the ability to accurately place contours on the map of Figure 1. The lack of data in many regions was an even larger impediment to placing contours accurately. In particular, the lack of wind speed data in the suburbs west of Denver and in the mountains made the map preparation more difficult.

It is recommended that communities install one or more anemometers to measure wind speeds and directions in their areas. Anemometer placement should be at least 1.5 to 2 times the heights of typical structures or trees in the area. For suburban areas, this means anemometers at 20 meters (60 ft) or higher. In the mountains, the tree height often dictates anemometer heights of nearly 30 m (100 ft). The author has extensive experience in siting of anemometers to measure wind speeds (as a co-author of the anemometer siting provisions of FAA, 1989) without significant interference of nearby shielding elements such as buildings or trees. This information can be used to advise on specific locations.

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APPENDIX 1
RECURRENCE INTERVAL MAPS
TO BE USED
ONLY
FOR
SERVICABILITY CONSIDERATIONS IN
ASCE 7-10 COMMENTARY APPENDIX C

1415 Blue Spruce Drive, Suite 3
Fort Collins, Colorado 80524, USA

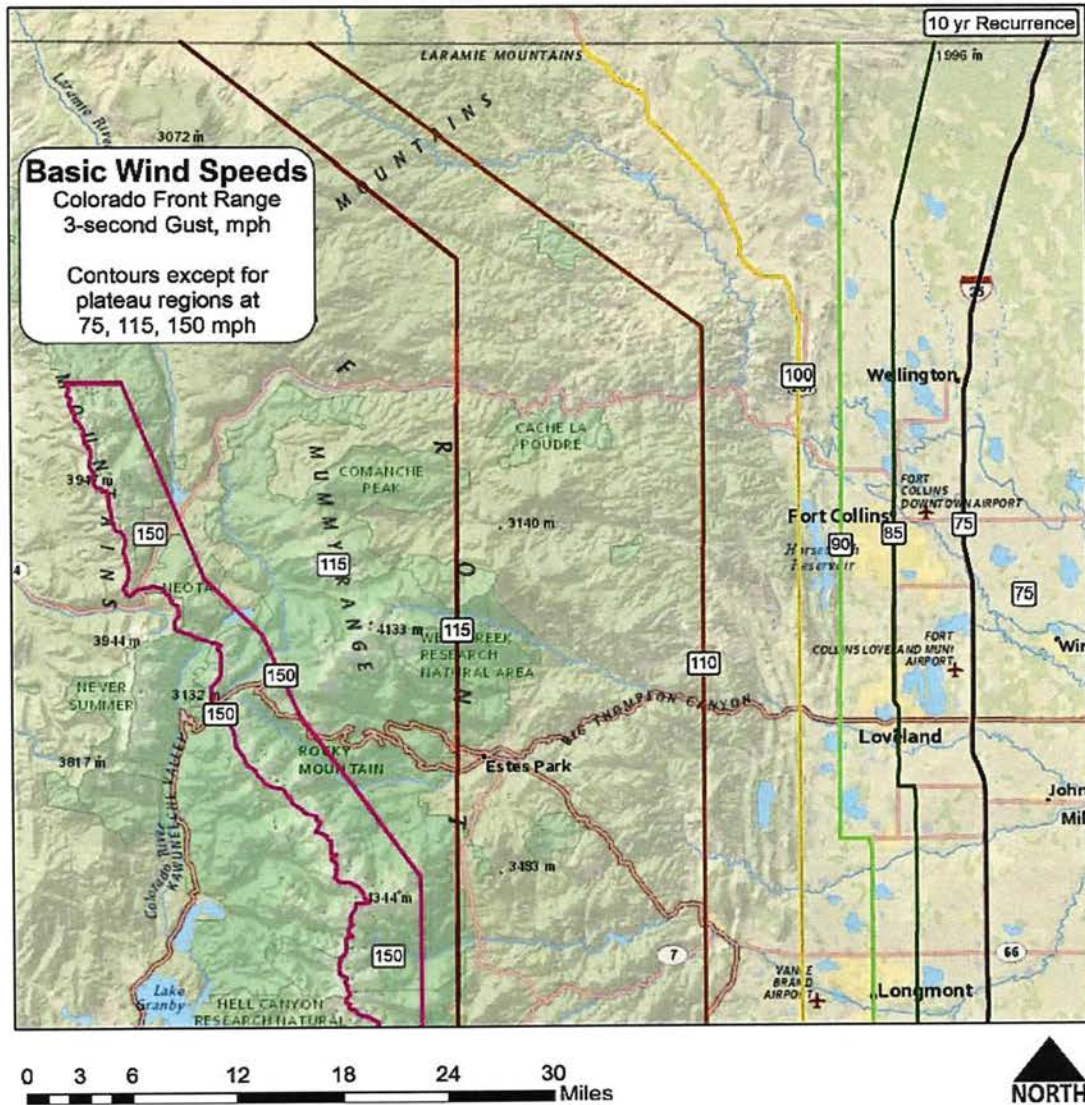
Tel: 1 970 221 3371
Fax: 1 970 221 3124

info@cppwind.com
www.cppwind.com



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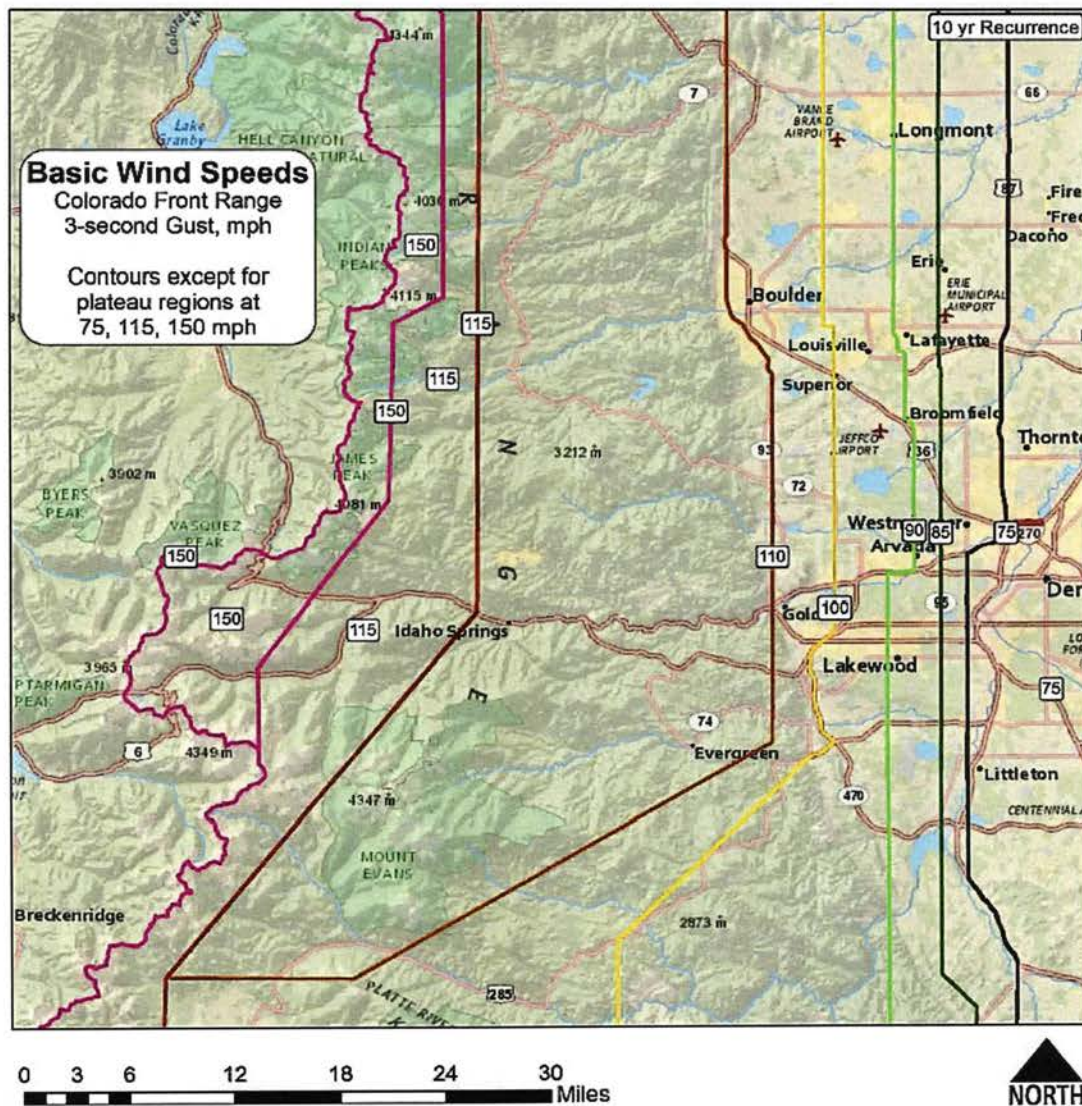


Colorado Front Range 3-Second Gust Map – 10-year recurrence interval north.



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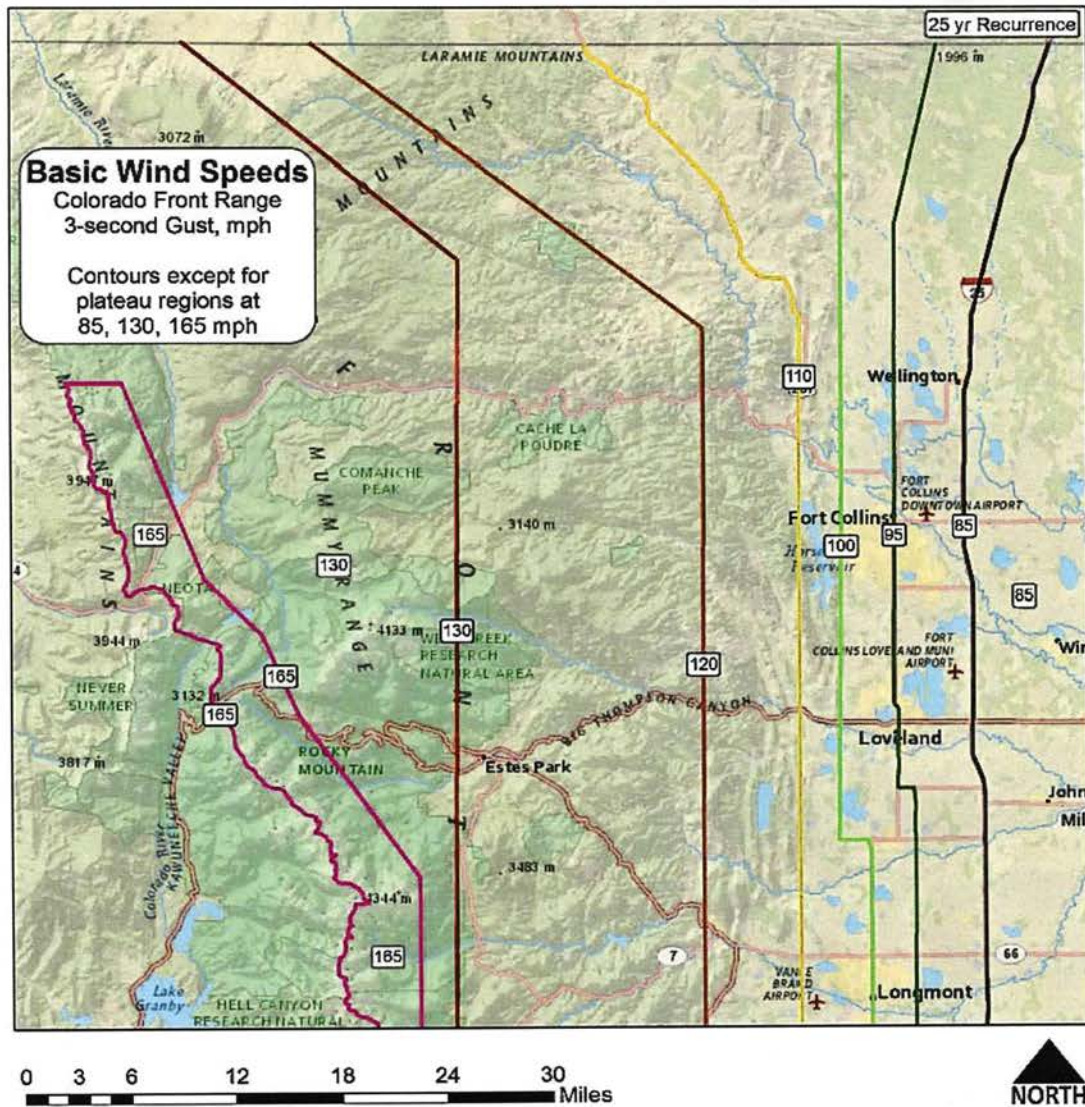


Colorado Front Range 3-Second Gust Map – 10-year recurrence interval south.



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Colorado Front Range 3-Second Gust Map – 25-year recurrence interval north.

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Fort Collins, Colorado 80524, USA

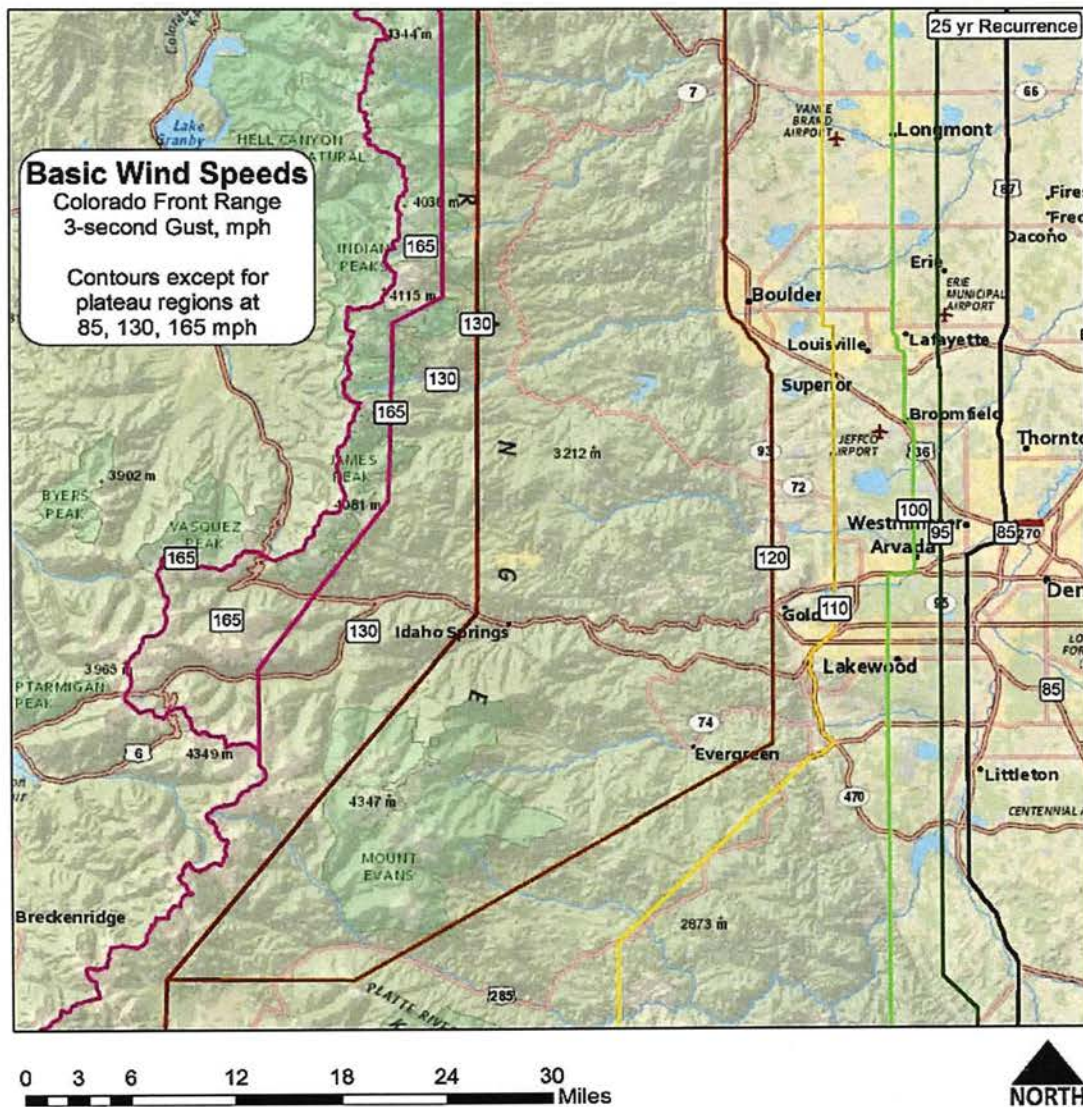
Tel: 1 970 221 3371
Fax: 1 970 221 3124

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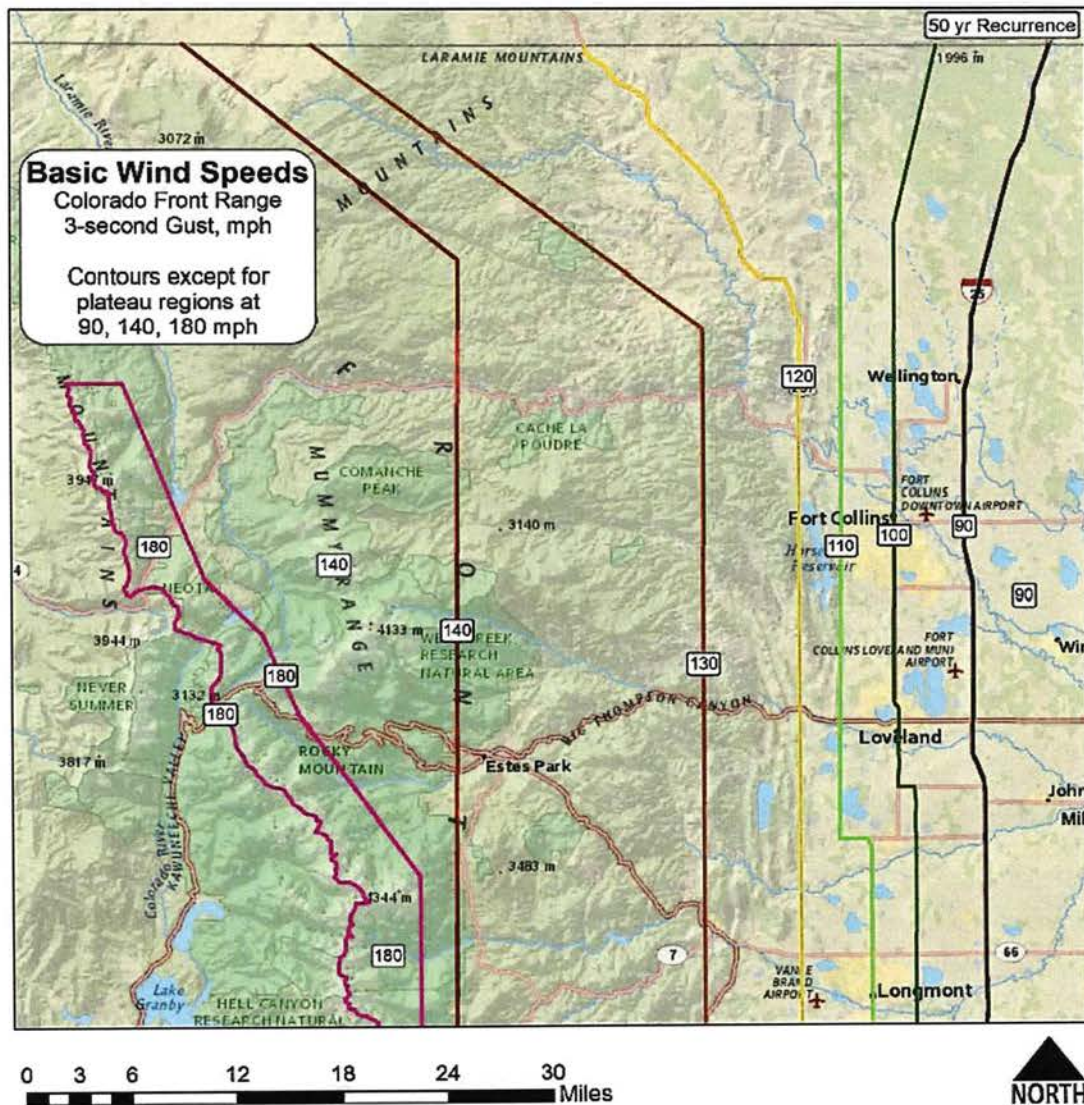


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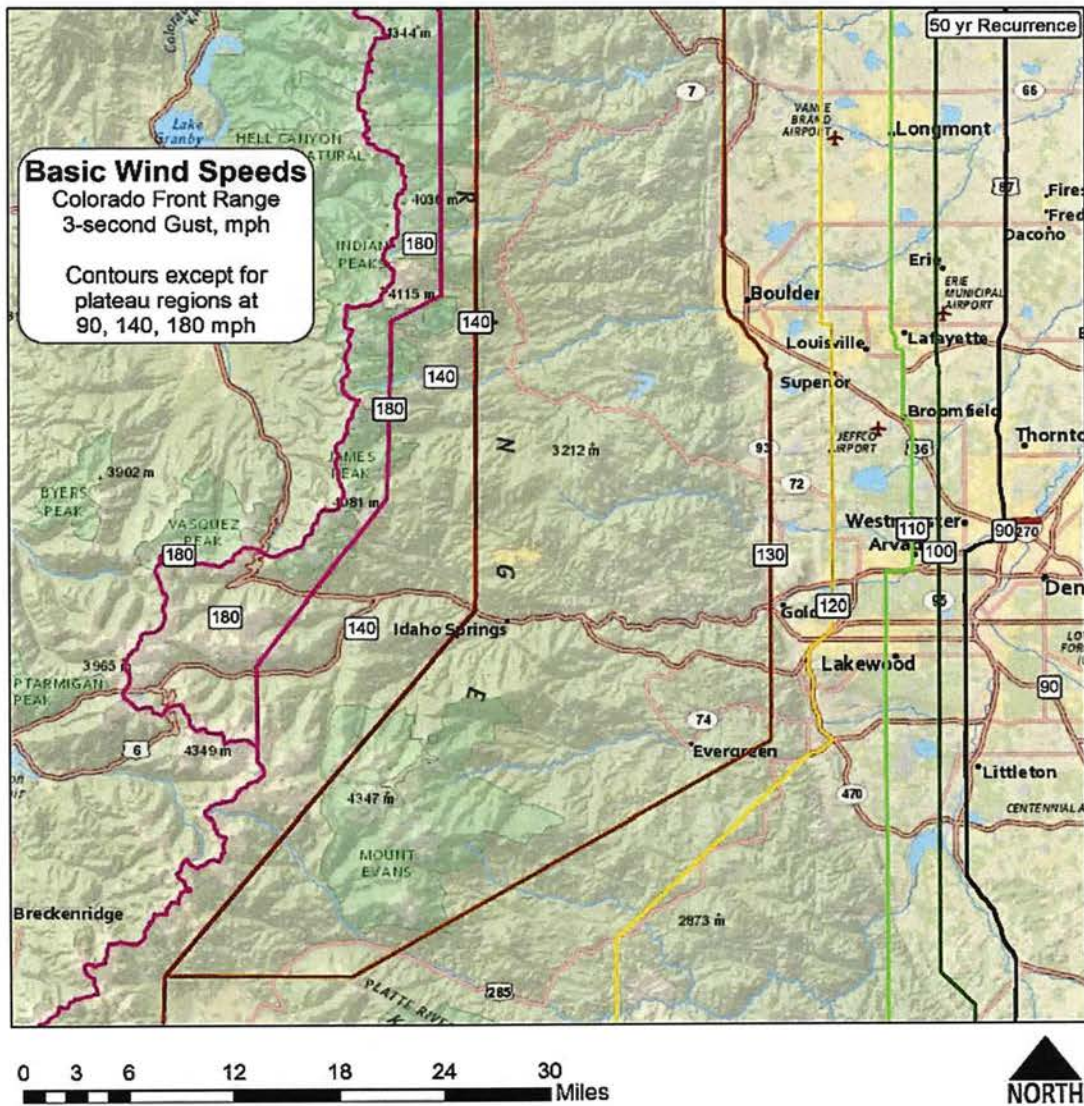
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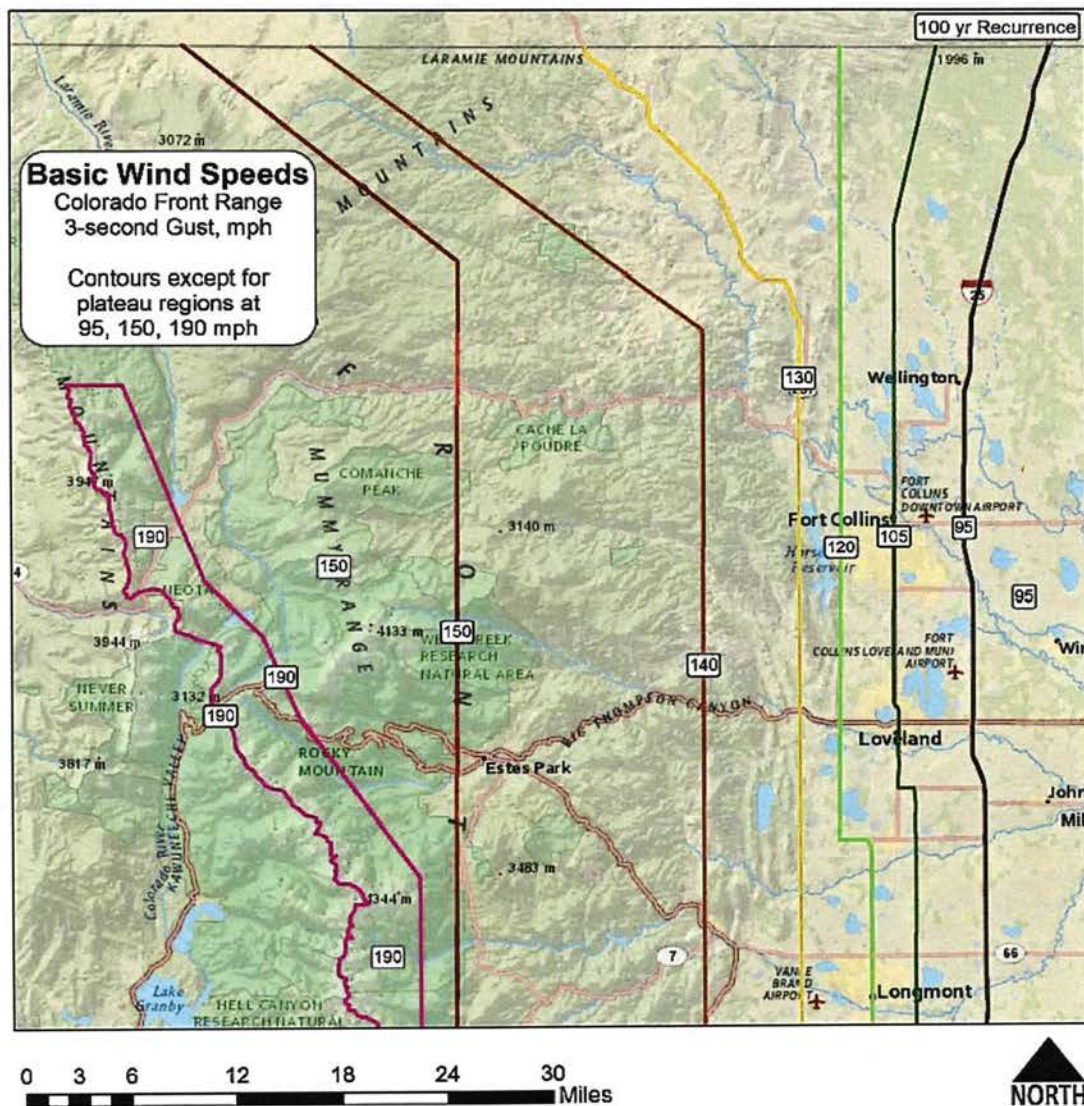
Colorado Front Range 3-Second Gust Map – 25-year recurrence interval south.



Colorado Front Range 3-Second Gust Map – 50-year recurrence interval north.



Colorado Front Range 3-Second Gust Map – 50-year recurrence interval south.

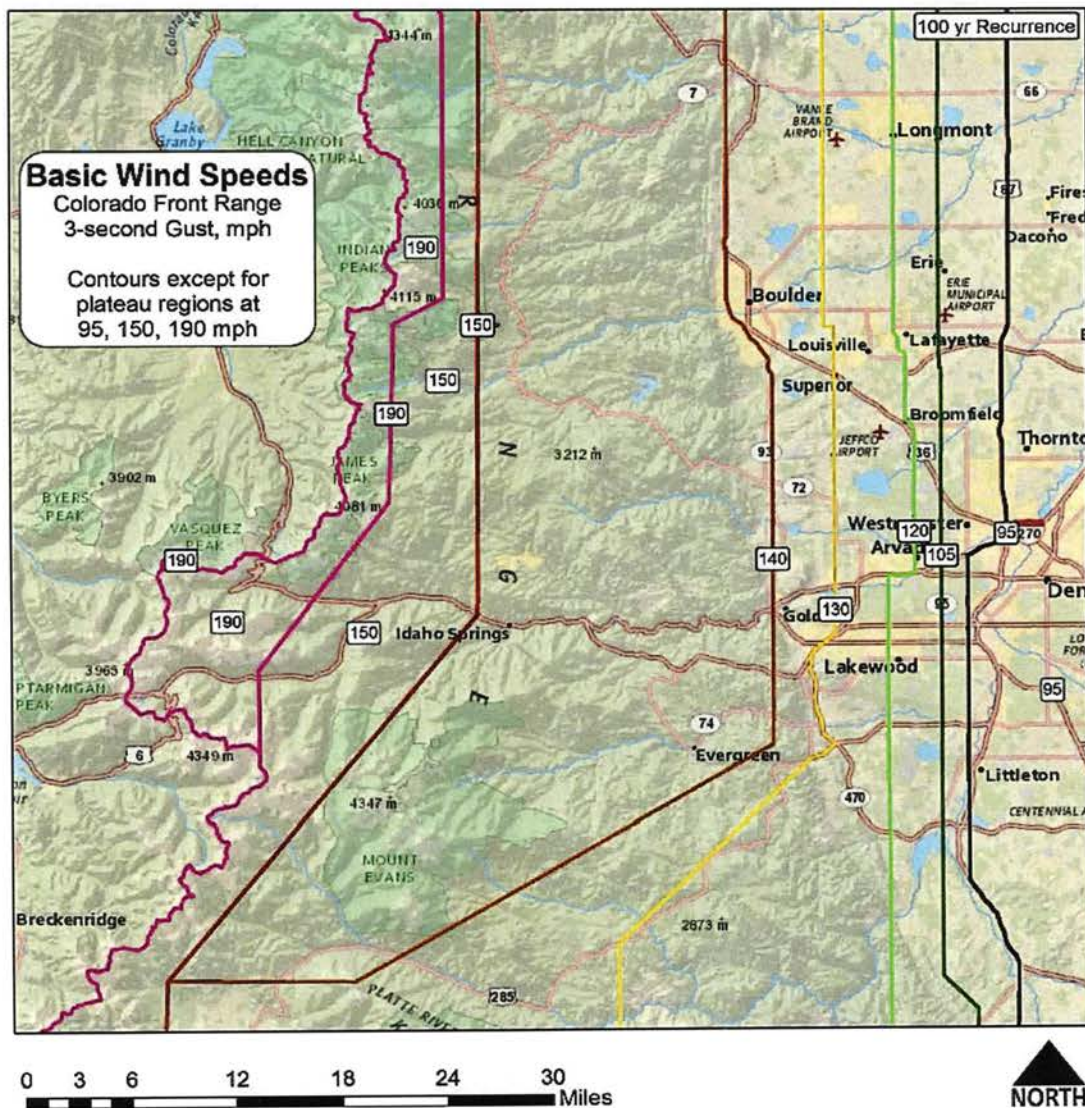


Colorado Front Range 3-Second Gust Map – 100-year recurrence interval north.



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Colorado Front Range 3-Second Gust Map – 100-year recurrence interval south.

Larimer County Ultimate Wind Speed Map

