



Retail Food Facility Plan Review Packet

Thank you for notifying Boulder County Public Health (BCPH) about your plans to begin operation of a retail food establishment. The following pages include a list of common items to be addressed before a retail food license can be issued.

The Colorado Revised Statutes (CRS) require that complete plans and specifications be submitted, reviewed and approved by Boulder County Public Health (BCPH) before any construction can begin on a retail food establishment.

A plan review application fee of \$100 is required upon submittal of plans in addition to a \$300 fee for plan review activities. **A total fee of \$400 is due upon submittal of a plan review application and packet.** Plan review activities are charged at an hourly rate, which is subject to change on a yearly basis. Any balance left from the plan review process will be refunded by mail after the opening inspection. (**Note:** unless otherwise noted all refunds will be made to the Principal Contact listed on the application.)

BCPH's plan review team is committed to providing excellence in technical assistance and customer service. Information about the requirements of constructing and operating a Retail Food Establishment can be found in the *Colorado Retail Food Establishment Rules and Regulations*, available on our website at www.BoulderCountyFood.org.

Resources included in this packet:

- Appendix A: Sample Facility Floor Plan
- Appendix B: Ventilation Systems
- Appendix C: Minimum Restroom Plumbing Facilities
- Appendix D: Worksheet for Calculating Minimum Hot Water Requirements

Please provide a copy of your menu and as much detail as possible about your operation. The information you provide will determine if your food handling techniques are consistent with proper food safety. It is important that proper food safety procedures are implemented from the start of operation since the majority of foodborne illness outbreaks are attributed to errors in food handling (e.g., improper cooling, reheating, etc.).

Onsite wastewater treatment systems and non-community and private water supplies are permitted separately. For more information about these requirements contact **Boulder County Public Health at 303.441.1564.**

Plan Review Checklist: These items **must** be submitted in order to begin the application review process. Check off (✓) items as they are completed. If an item is not applicable to construction, write N/A. **An incomplete application will delay the inspection and approval process.**

- _____ Plan review application completed and signed (pgs. 1-2)
- _____ Food handling information completed (pgs. 3-4)
- _____ Copy of menu or list of food prepared on the premises (plans will not be reviewed without menu/list of food)
- _____ Floor plan; drawn to scale on minimum 8.5 x 11" paper and including all equipment and fixtures (pgs. 5-10)
- _____ Site plan, including streets, alleys and entrances (see pg. 8 and Appendix A)
- _____ Equipment list including make, model numbers and installation methods (pgs. 6-8)
- _____ Finish schedule detailing proposed materials for all floors, walls, ceilings, counters, shelves, etc. (pg. 11)
- _____ Plumbing schedule showing location of all fixtures, floor drains, floor sinks, supply lines, drain lines, and backflow prevention devices (pgs. 10-11)
- _____ Water heater location, make and model number, capacity, recovery rate at 100°F rise BTU or KW input, and hot water usage requirements (see Appendix D)
- _____ Waste disposal methods, including garbage disposal locations, grease interceptor location (if applicable), trash storage and container locations
- _____ Ventilation schedule, including exhaust capacity (CFM ratings) of all hoods, location and detailed shop drawings of all hoods (including length and width), and location of all make-up air registers including CFM ratings for outside air (see Appendix B)
- _____ Copy of Colorado sales tax number (if available)

Plan review packets and application fees can be submitted to Boulder County Public Health:

Boulder County Public Health
Environmental Health Division
3450 Broadway
Boulder, CO 80304
Fax: 303.441.1468
Phone: 303.441.1564

You will receive written notification within 14 working days that your plans have been approved or that additional information is required. If additional information is required, the applicant is responsible for submitting the requested plans and specifications. If plans change significantly after they have been approved, new plans and additional fees may be required.

Good luck in your endeavor. We look forward to working with you!

Retail Food Facility Plan Review Application

Please select the option that best applies to you.

I am applying for a plan review application for:

- Construction of New Facility
- Remodel of Existing Facility
- School (Kitchen only)
- Retail Food Processor working out of new commercial kitchen
- Childcare Facility

Name of Facility: _____

Address: _____ Suite / Unit #: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax _____

Email: _____

Name of Owner: _____

Name under which the license is to be issued:

Individual(s) or Corporation Name: _____

Address: _____ Suite / Unit #: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax _____

Email: _____

Name of Principle Contact Person: _____

Name of Principle Contact Company (If applicable): _____

Address: _____ Suite / Unit #: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax _____ Email: _____

Facility status: Is this a remodel of an existing food facility? Yes ____ No ____

If yes, name of previous establishment: _____

If no, previous type of business: _____

If this is a facility change of ownership, when did the change of ownership occur? _____

Seating capacity: Indoor: _____ Outdoor: _____ Total: _____

Total square footage of facility: _____ Sq. Ft.

Total square footage of food preparation and storage areas: _____ Sq. Ft.

Type of Ownership: (as indicated on your Colorado Business/Sales Tax Registration)

- Individual (if sole proprietor, you must complete a Public Benefit Affidavit and provide an approved form of identification)
- General Partnership
- Limited Partnership
- Limited Liability Company
- Limited Liability Partnership
- Limited Liability Limited Partnership
- Corporation
- "S" Corporation
- Association
- Estate
- Government
- Joint Venture
- Trust
- Non-profit 501(c)(3) (please enclose copy of IRS letter of exemption)
- Other: Non-profit

Maximum number of meals served: Breakfast _____ Lunch _____ Dinner _____

Employees: Maximum number per shift: _____

Seasonal operation: Yes ____ No ____ If yes, dates of operation: _____

Days of operation: _____

Hours of operation: _____

Have plans been submitted to, or do you intend to submit plans to other counties in the state of Colorado?

Yes ____ No ____ If yes, where? _____

By signing, I understand that:

- The plan review expires one year from date of approval.
- If construction or remodeling is not started within that time period, it may be necessary for you to resubmit for a new review of plans.
- Any changes or alterations to plans **must** have prior approval by Boulder County Public Health. Significant changes or alterations to plans will require a new plan review and plan review fee.

Owner signature

Date

Public Health Use Only

SR # _____ AR # _____ OW# _____

Date plans submitted: _____ Due Date: _____ Fee Paid: \$ _____

Restaurant: _____ fee(0131) _____ no fee(0132)

Application fee: INV# _____ Rcpt # _____

Plan review fee: INV# _____ Rcpt # _____

I. Food Handling Information

Attach additional paper as needed when listing foods and describing procedures.

A. Menu and Facility Management

1. Submit a menu or list of foods to be served. **Plans will not be approved without a menu.**
2. Do you have a food handling procedures manual or Hazard Analysis Critical Control Point (HACCP) plan that describes preparation, cooling, reheating, cooking of foods, and the handling of leftovers? Yes ____ No ____
3. Will vacuum packaging be conducted in the establishment? Yes ____ No ____
If yes, please provide the required HACCP Plan for each category of food to be vacuum packaged.
4. Describe the food safety training the person in charge has received. Describe the food safety training plan for employees.

B. Personnel Hygiene

5. Describe how employees will prevent direct bare hand contact with food.
Bare-hand contact of ready-to-eat foods (i.e. no further cook step will be done) is prohibited. Physical barriers (e.g. tongs, spatulas, bakery papers, and gloves) are required when handling ready-to-eat food.
6. Describe the handwashing policy (e.g. where and when handwashing will occur).
7. Describe the ill employee policy (including policy for cuts and burns).

C. Food Safety Procedures

8. List the foods that will be cooled and describe your methods for cooling foods to 41°F (5°C) or below (note: hot foods must be cooled from 135°F to 70°F in 2 hours and then from 70°F to 41°F in 4 hours and room temperature foods must be cooled from 70°F to 41°F within 4 hours).
9. List the foods that will be reheated and describe your method for rapidly reheating to 165°F (74°C) or above (note: food must reach 165°F within 2 hours).

10. List the foods that will be held hot and indicate how these foods will maintain a temperature of 135°F (60°C) or above.

11. List the foods that will be held cold and indicate how these foods will maintain a temperature of 41°F (5°C) or below.

12. How will food temperatures be monitored?

13. How will frozen foods be thawed?

14. Will raw meats, poultry, and seafood be stored/displayed in the same refrigerator(s) and freezer(s) with cooked, ready-to-eat foods? Yes ____ No ____
If yes, how will they be stored to prevent cross-contamination?

15. How will raw meats, poultry, and seafood be prepared to prevent cross-contamination with other foods?

16. Where will produce be washed?

17. Will catering be conducted? Yes ____ No ____
18. Will food be transported or delivered to another location? Yes ____ No ____
If yes, what equipment will be provided to maintain food at proper temperatures during transport?

19. Describe cleaning and sanitizing procedures for utensils and food preparation equipment (including slicers, prep tables, cutting boards, sinks, etc.).

II. Facility Floor Plan

Submit the floor plan drawn to scale. See Appendix A for a sample floor plan. The floor plan must include location and identification of **all equipment and areas** including:

1. Sinks:
 - a. Handsink(s): Number provided, including in restrooms: _____
 - b. Food preparation sink(s): Number provided: _____ Not applicable: _____
 - c. Mop sink(s): Number provided: _____
 - d. Dump sink(s): Number provided: _____ Not applicable: _____
 - e. Warewashing (three-compartment) sink(s): Number provided: _____
2. Wait station(s): Number provided: _____ Not applicable: _____
3. Toilet facilities: Required
4. Dry food storage area(s): Required
5. Employee locker/storage area(s): Required
6. Chemical storage area(s): Required
7. Water heater: Required
8. Bar service area(s): Number provided: _____ Not applicable: _____
9. Indoor and outdoor seating: Number provided: _____ Not applicable: _____
10. Outdoor cooking or bar area(s): Number provided: _____ Not applicable: _____
11. Laundry facilities - Number provided: _____ Not applicable: _____
12. Recycle/damaged/returned goods location: Number provided: _____ Not applicable: _____
14. Grease interceptor or grease trap? Yes _____ No _____
If yes, indicate the location and contact the local wastewater authority for sizing information and any required permits.
15. Ice bins / ice machines: Number provided: _____ Not applicable: _____
16. Dipper wells: Number provided: _____ Not applicable: _____
17. Chemical dispensing units: Number provided: _____ Not applicable: _____

- B. If available, it is helpful to submit equipment specification sheets, including make and model numbers of the equipment. If the specification sheet lists more than one piece of equipment, identify the specific equipment to be used. If there is no specification sheet available, the equipment will only be accepted upon a field inspection to determine if it meets commercial design criteria.
- C. Submit shop drawings of all ventilation hoods, drawn to scale.
- D. Submit shop drawings of all custom fabricated equipment and cabinetry, drawn to scale.

E. Submit the following warewashing information:

Manual Warewashing

Include the following for all warewashing sinks (kitchen, dish room, bar, etc.)

a. Size of each sink compartment in inches:

Length: _____ Width: _____ Depth: _____

Length: _____ Width: _____ Depth: _____

Length: _____ Width: _____ Depth: _____

b. Size of all soiled and clean drain board(s)/drying racks in inches:

Length: _____ Width: _____

Length: _____ Width: _____

Length: _____ Width: _____

Note: All drain boards must be self-draining. Drain boards must be at least 18 inches (length) for bars, 24 inches (length) in establishments using single service utensils, and 36 inches (length) in establishments using multi-use dishes and multi-use utensils.

c. Pre-rinse / spray hose provided: Yes _____ No _____

Mechanical Warewashing

a. Make and model numbers of warewashing machine(s): _____

b. Heat or chemical sanitization: _____

c. Booster heater (if applicable):

Make and model number: _____

Recovery rate, 40°F rise, at sea level: _____

Distance from the warewashing machine: _____

d. Manufacturer's hot water requirement (gallons per hour): _____

e. Size of all drain boards / drying racks (length and width): _____

f. Pre-rinse / spray hose provided: Yes _____ No _____

g. Soak sink provided: Yes _____ No _____

F. Garbage disposal(s): Yes _____ No _____ If yes, indicate location(s)

G. Submit the following water heater information:

Make _____ Model number: _____

Energy input rating: _____ BTU, or _____ Kilowatts

Recovery Rate in gallons per hour, 100°F rise, at sea level: _____

Note: See Appendix D for worksheet on calculating minimum hot water requirements.

H. Refrigeration/freezer capacity. Complete the following table:

Type of unit	Number of units provided	Total cubic feet
Walk-in Refrigeration		
Reach-in Refrigeration		
Walk-in Freezer		
Reach-in Freezer		
Blast Chiller		
Retail Display		

I. Displayed food items: See Retail Food Sanitation Act, 24-4-1301 CRS

1. Bulk food items: Yes _____ No _____

If yes, submit equipment specifications for food bins, including vendor supplied equipment.

2. Food shields - Submit the type and location (If custom design, please submit shop drawings).

IV. Premises

A. Submit a site plan which includes the following: refuse enclosures, compactors, outside walk-in cooler(s)/freezer(s), location of water supply, sewage disposal system, grease interceptor, alleys, streets, parking, and outside storage areas.

B. Water supply and waste water systems:

1. Water supply:

a. Community/Public (name of district): _____

b. Non-Community/Private: _____ PWSID #: _____

Well: _____ Spring: _____ Other (specify): _____

Method of Disinfection: _____

2. Sewage disposal:

a. Municipal/public: _____

b. Onsite wastewater system (OWS) permit number _____

C. Exterior doors and windows:

1. Windows: closed, tight-fitting _____ screened _____ air curtain(s) _____

2. Doors: closed, tight-fitting _____ screened _____ air curtain(s) _____

V. Mechanical, Plumbing, and Electrical Schedules

A. Mechanical:

1. Submit a complete ventilation schedule, including exhaust capacities (cubic feet per minute [CFM] ratings) for all hoods and the location and capacity of all make-up air diffusers. See Appendix B for example ventilation schedule.
2. If the ventilation hoods are UL listed for lower air flows, submit the information located on the manufacturer's UL listing card.
3. Include ventilation systems in restrooms.

B. Electrical:

1. Submit the location and type of light fixtures throughout the facility, including the fixtures in walk-in refrigeration/freezer units.
2. Submit the type of bulbs and/or shielding for each type of light fixture, where required.
3. Indicate the location of transformers and electrical panels if located in the food preparation/ food storage areas.

C. Plumbing:

1. Indicate that the following equipment is provided with **indirect drain** connections:

Dishmachine - floor sink	provided _____ not applicable _____
Food preparation sink - floor sink	provided _____ not applicable _____
Three-compartment utensil washing sink - floor sink	provided _____ not applicable _____
Ice machine - floor sink or floor drain	provided _____ not applicable _____
Ice bin(s) - floor sink or floor drain	provided _____ not applicable _____
Water heater - floor sink or floor drain	provided _____ not applicable _____
Refrigeration condensate lines - floor sink or floor drain	provided _____ not applicable _____
Dipper well(s) - floor sink or floor drain	provided _____ not applicable _____
Salad bar(s) - floor sink or floor drain	provided _____ not applicable _____
Steam table(s) - floor sink or floor drain	provided _____ not applicable _____

2. Submit the location of all hose bibs.
3. Submit the number and location of all toilet fixtures (including lavatories, urinals, and water closets). See Appendix C for the minimum toilet facilities required.
4. Submit the location of the grease trap or interceptor.
5. Submit the make, model, and location of all chemical dispensing unit(s).

6. Use the following chart to list the location of all backflow prevention devices on potable water connections, including all vendor-supplied items. Any discharge from a backflow prevention device must be indirectly discharged to the sanitary sewer.

Equipment	Internal protection	External protection
Warewashing machine		
Water wash hoods		
Chemical injection towers		
Soda stations		
Coffee urns		
Ice makers		
Dipper wells		
Commercial disposal with pre-rinse		
Tea dispenser		
Mop sink		
Hose bib(s)		
Reel lines		
Steam kettle faucets		

VI. Interior Finishes

Submit room finish specifications. Indicate the page in the plans with the finish schedule or use the following chart. Include additional pages if necessary.

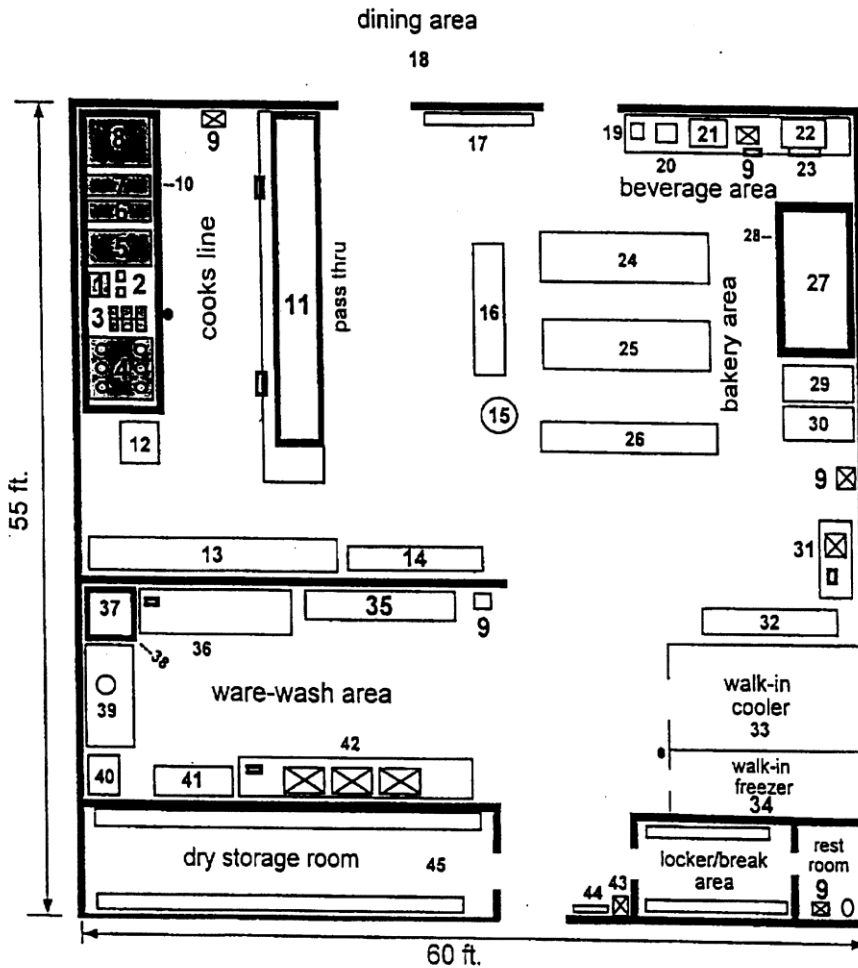
Please see room finish schedule located on page ____ of plans.

Room finish schedule:

Room name and mark	Floors			Walls (material and finish)				Ceilings	
	Material	Finish	Base	North	South	East	West	Material	Finish
example: Kitchen 101	quarry tile	smooth, sealed	6" quarry tile	FRP smooth	FRP smooth	painting smooth	painting smooth	vinyl acoustical tile	smooth

Appendix A

Sample Facility Floor Plan



Equipment (make and model #)

- | | | |
|---|---|--|
| 1. Cheese melter (ABC #123) | 16. Shelving unit | 32. Stainless prep table |
| 2. Microwave (XYZ #34) | 17. Bread shelving racks | 33. Walk-in cooler (COLD #AZ1) |
| 3. Steamtable (HOT #A1) | 18. Dining area | 34. Walk-in freezer (COLD #AZ3) |
| 4. Stove (AOK #22) | 19. Coffee maker (ABC #16) | 35. Drying shelf |
| 5. Griddle (AOK #Q17) | 20. Tea maker (ABC #87) | 36. Clean drainboard |
| 6. Fryer (ABC #55) | 21. Soda machine (PDQ #2A) | 37. Dishmachine (Magic #15) |
| 7. Fryer (ABC #55) | 22. Espresso machine (ABC #5) | 38. Hood, type II (Ezair #17) |
| 8. Charbroiler (HOT #A7) | 23. Under counter refrigeration unit (COLD #A3) | 39. Dirty drainboard w/ spray hose, & garbage disposal |
| 9. Hand sink | 24. Bakers table | 40. Dirty dish rack |
| 10. Hood, type I (Ezair #99) | 25. Bakers table | 41. Drying shelf |
| 11. Refrigerator/freezer make-table unit with pass-thru and shelf. (Cold #10) | 26. Shelving unit | 42. 3-comp. sink w/ 36" drainboards |
| 12. Stainless steel table | 27. Bake oven (JAM #33) | 43. Mop sink |
| 13. Sliding 3 door refrigeration unit (Cold #12) | 28. Hood, type II (Ezair #35) | 44. Chemical storage shelf |
| 14. Shelving unit | 29. Proof cabinet (ABC #T2) | 45. Shelving |
| 15. Mixer (XYZ #q23) | 30. Proof cabinet (ABC #T2) | Floor sink |
| | 31. Vegetable prep sink & 18" drainboard | Floor drain |

Appendix B Ventilation Systems

The kitchen exhaust hood must be approved by the National Sanitation Foundation (NSF) or its equivalent. Airflow must be calculated, and hoods must be designed according to the 1988 Uniform Mechanical Code, Section 508. Hoods must overhang all equipment that produce grease vapors, steam, fumes, smoke, and excessive heat not less than six inches beyond the edge of the cooking surface on all open sides; or be of other approved engineered design. Riveted or painted hoods are not approved. Make-up air should be filtered and tempered during winter months (when exhaust exceeds 2500 cfm). Make-up air must be mechanically introduced into the establishment at a volume equal to or greater than what is being exhausted. The kitchen should be under a slight negative pressure so that make-up air can be exhausted through the kitchen exhaust system after it moves from the dining area into the kitchen. Make-up air must be distributed through several registers to establish necessary air patterns in order not to short-circuit the exhaust system. Windows and doors shall not be used for the purpose of providing make-up air. The exhaust hood switch(s) must be interlocked with the make-up air system(s).

A **Type I Hood** is a kitchen hood designed to collect and remove grease and smoke.

A **Type II Hood** is a kitchen hood for collecting and removing steam, vapor, heat or odors.

Use the following table to list all necessary ventilation equipment. If hoods are UL or NSF listed, submit listing data.

Ventilation Schedule				
Source	Length	Width	CFM Exhaust	CFM Supply
example: RTU - 1				1600
example: hood #1	6'-6"	5'-0"	1500	500

Appendix C

Minimum Restroom Plumbing Facilities

Total seating capacity: _____ Total employees per shift: _____

Establishments with a total seating capacity of **15 or fewer** may have one unisex restroom that has one toilet and one hand sink.

Establishments with seating capacity or employees per shift of **15 or more** are required to have two restrooms, one male and one female. To determine the minimum fixture requirements, calculate the male/female ratio: Total seating capacity / 2 = Ratio of males to females.

Example for total seating capacity of 100

Formula: $100 / 2 = 50$
 Male/female ratio: 50
 Required: Women's restroom: 1 sink and 1 toilet
 Men's restroom: 1 sink, 1 toilet, 1 urinal

Toilet: Men/Women		Urinal	Hand sink: Men/Women	
Capacity	# Required		Capacity	# Required
1 – 50	1	1 per 150 Men	1 – 150	1
51 – 150	2		151 – 200	2
151 – 300	3		201 – 400	3
Over 300	1 additional for every 200 persons		Over 400	1 additional for every 400 persons

Establishments other than restaurants, pubs, and lounges may vary in fixture requirements. Refer to 2000 Uniform Plumbing Code (UPC) or contact BCPH, Environment Health Division for assistance.

Appendix D

Worksheet for Calculating Minimum Hot Water Requirements

Note: If you plan to use an instantaneous hot water heater (i.e. tankless), please contact Boulder County Public Health for information about instantaneous water heater sizing and installation requirements.

Use this worksheet to help calculate the hot water usage and the necessary **tank type** water heater size for your operation.

Step 1: 3-Compartment Sink

1. Measure dimensions of each compartment, if all three compartments are not the same dimensions, see note below.

Length = _____ Width = _____ Depth = _____

2. Insert measurements into this equation:

$$\left(\frac{\text{Length}}{\text{Length}} \times \frac{\text{Width}}{\text{Width}} \times \frac{\text{Depth}}{\text{Depth}} \times 3 \times 0.375 \right) \div 2.31 = \text{water usage (gph)}$$

Note: If all compartment sizes of the sink are not the same, then take (x 3) out of the equation, do the above calculation for each compartment, and then add the volumes to get the total gallons per hour of hot water used in the sink.

Enter total water usage (gph) into attached "Required Water Calculation Table" for "3 compartment sink"

Step 2: Utensil Soak Sink

1. Measure dimensions of sink

Length = _____ Width = _____ Depth = _____

2. Insert measurements into this equation:

$$\left(\frac{\text{Length}}{\text{Length}} \times \frac{\text{Width}}{\text{Width}} \times \frac{\text{Depth}}{\text{Depth}} \times 0.375 \right) \div 2.31 = \text{water usage (gph)}$$

Enter total water usage (gph) into attached "Required Water Calculation Table" for "Utensil soak sink"

Step 3: Dish Machine and Conveyor Pre-Rinse Water Usage

Use manufacturer's rating in gallons per hour

Enter manufacturer's rating (gph) into attached "Required Water Calculation Table" for "Dish machine"

Step 4: Laundry Machine Water Usage

Use manufacturer's rating, or 32 GPH for 9-12 pound washer, or 42 GPH for 16-pound washer.

Enter manufacturer's rating (gph) into attached "Required Water Calculation Table" for "Laundry machine"

Step 5: Enter water usage totals in the appropriate rows and columns in the table on the following page.

Required Water Calculation Table

1. Enter the gallon per hour (gph) rating for each type of fixture and the number of fixtures in the operation in the table below. Multiply these two numbers to calculate "maximum hourly water usage" for each fixture.
2. Add up the "maximum hourly water usage" amounts in the right column to calculate "total water required by all fixtures" in the operation.
3. Enter the "total water required by all fixtures" into the equations on the next page (for gas water heater or electric water heater) to determine the necessary hot water rating for your operation.

Plumbing Fixture	Water usage (gallons per hour)	Number of fixtures	Maximum hourly water usage per type of fixture (gallons per hour)
<i>Example: dish machine</i>	<i>50</i>	<i>1</i>	<i>50</i>
<i>Example: hand sinks</i>	<i>5</i>	<i>4</i>	<i>(5 × 4) = 20</i>
3-compartment sink			
3-compartment sink (bar)			
Utensils soak sink			
Dish machine			
Dish machine conveyor pre-rinse			
Laundry machine			
Hand operated pre-rinse sprayer	32		
Hand sinks (including restrooms)	5		
Mop sink	7		
Garbage can washer	35		
Employee showers	14		
Hose bib used for cleaning	35		
Total water (gph) required by all fixtures			

Required Tank-Type Water Heater Size

Option A: Gas Water Heater

Step 1: Adjust the total water required by all fixtures (from Required Water Calculation Table) for the altitude of the facility. The altitude adjustment is 4% per 1000 feet of elevation, or 20% for 5000 feet)

Use this formula to calculate elevation adjusted water demand.

$$(0.04 \times \frac{\text{elevation of facility}}{1000}) + 1 = \text{adjustment factor}$$

Step 2: Using the adjustment factor from above, calculate the hourly hot water usage.

$$\frac{\text{adjustment factor}}{\text{adjustment factor}} \times \frac{\text{total water (gph) required}}{\text{total water (gph) required}} = \text{max hourly hot water usage}$$

**For example, if the elevation of a facility is 5000 feet, the adjustment factor would be 1.2. If the total water required by all fixtures (gph from the previous table) is 100 gph, then the maximum hourly hot water usage would be 120. Therefore, a water heater with 120 gph recovery rate would be required for the facility.*

Step 3: Use the "maximum hourly hot water usage" value from the previous equation to calculate the minimum BTU rating of the water heater using the calculation below.

Gas Water Heater Thermal Efficiency Rating (place in box below)

For commercial water heaters, you can find this rating on the spec sheet. If you don't know the rating, use a rating of 0.75. For all domestic water heaters, use a rating of 0.75.

$$\left(\frac{\text{max hourly hot water usage}}{\text{max hourly hot water usage}} \times 100 \times 8.33 \right) \div \boxed{\text{efficiency rating}} = \text{minimum BTU rating}$$

Option B: Electric Water Heater

For electric water heaters, the maximum hourly hot water usage is the same number as the total water required (gph) by all fixtures as calculated in the Required Water Calculation Table. Use this formula to calculate the minimum Kilowatt rating of the electric water heater:

$$\left(\frac{\text{total water (gph)}}{\text{total water (gph)}} \times 100 \times 8.33 \right) \div 3412 = \text{minimum Kilowatt rating}$$

Proposed Gas or Electric Water Heater based on BTU or Kilowatt rating

The BTU or Kilowatt rating for the water heater in the facility must be equal to or greater than the minimum BTU or Kilowatt rating calculated above. Complete the following based on your current or proposed water heater.

Make: _____ Model: _____

BTU Rating: _____ or Kilowatt Rating: _____

Recovery Rate: _____ gallons per hour at 100° rise at sea level

Reminder: If you plan to use an instantaneous hot water heater please contact Boulder County Public Health for information about sizing and installation requirements.