WORKSHEET FOR CALCULATING MINIMIM HOT WATER REQUIREMENTS
(Tank-type Water Heaters)

1. CALCULATE TOTAL WATER REQUIRED BY ALL FIXTURES:

a. Three compartment sink calculation of water usage:

1. Measure dimensions of each compartment. If compartments are not the dimensions, see note below.
2. Insert measurements into equation

(_____ X _____ X _____ X 3 X .375) ÷ 231 = _____
Length Width Depth Water Usage (gal)

Note: If all the compartment sizes of the sink are not the same, then 3 is taken out of the equations, and the above calculation is done for each compartment. The volumes are added to obtain the total gallons per hour of hot water used in the sink.

b. Utensil soak sink:

1. Measure dimensions of sink
2. Insert measurements into equations

(_____ X _____ X _____ X .375) ÷ 231 = _____
Length Width Depth Water Usage (gal)

c. Dishmachine and conveyor pre-rinse water usage:
Use manufacturer's rating in gallons per hour

d. Clothes washer water usage:
Use manufacturer's rating, or 32 GPH for 9-12 pound washer, or 42 GPH for 16 pound washer

e. **Enter numbers calculated in a, b, c & d above into Table to Calculate Total Water Required by all Fixtures (pg 2).** Use the gallon per hour rating for each type of fixture found in the table and the number of fixtures in the operation to determine maximum hourly usage for each type of fixture in the operation. Add the maximum hourly usage for each type of fixture to calculate total water (gph) required by all fixtures: _____.

2. CALCULATE MAXIMUM HOURLY HOT WATER USAGE:
If gas water heater is used, go to Step a; if electric, Step b.

a. **Gas Water Heater**: If a gas water heater is to be used, calculate the maximum hourly water for the facility by adjusting the total water required by all fixtures by altitude. The altitude adjustment is 4% per 1000 feet of elevation, 20% at 5000 feet.

Use these equations to determine water usage for a gas water heater:
(.04 X _____ ÷ 1000) + 1 = _____
elevation of facility adjustment factor

_____ X _____ = _____
adjustment factor total water required by all fixtures (calculated above) maximum hourly hot water usage

For example, if the total gallons per hour usage for an establishment at an elevation of 5000 feet us 100 GPH, the adjustment factor is 1.2, Therefore, a water heater with 120 GPH recovery rate would be required.

b. **Electric Water Heater**: If an electric water heater is to be used, the maximum hourly usage for the operation is the same as the total water required by all fixtures.
Use this value in the equation to calculate the minimum Kilowatt rating of the water heater.

c. Insert the value determined in step a or b above into Table 9 of the Plan Review form (if applicable). This value is the minimum recovery rate of the water heater which should be provided for the facility.

3. CALCULATE THE MINIMUM BTU OR KILOWATT RATING OF WATER HEATER:

a. For a **gas water heater**, calculate the minimum BTU rating: insert the decimal equivalent of the water heater thermal efficiency rating into the equation below **(if unknown use .75)**

(_____ X 100 X 8.33) ÷ _____ = _____
maximum hourly usage as calculated above | thermal efficiency rating | minimum BTU rating

b. For an **electric water heater**, calculate the minimum Kilowatt rating:

(_____ X 100 X 8.33) ÷ 3412 = _____
maximum hourly usage as calculated above | minimum Kilowatt rating

c. Select water heater based above BTU or Kilowatt rating.

Make: _____ Model : _____

BTU or Kilowatt rating: _____

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

TABLE TO CALCULATE TOTAL WATER REQUIRED BY ALL FIXTURES

Plumbing Fixture	Water Usage	Number of Fixtures	Maximum hourly water usage per type of fixture (gph)
example: dishmachine	50	1	50
example: handsinks	5	4	(5x4) = 20
3-compartment sink			
3-compartment-sink (bar)			
Utensils soak sink			
Dishmachine			
Dishmachine conveyor pre-rinse			
Clothes washer			
Hand operated pre-rinse sprayer	32		
Handsinks (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			