Service 2020

Single Family Instructions

User's Manual

SERVICE 2020

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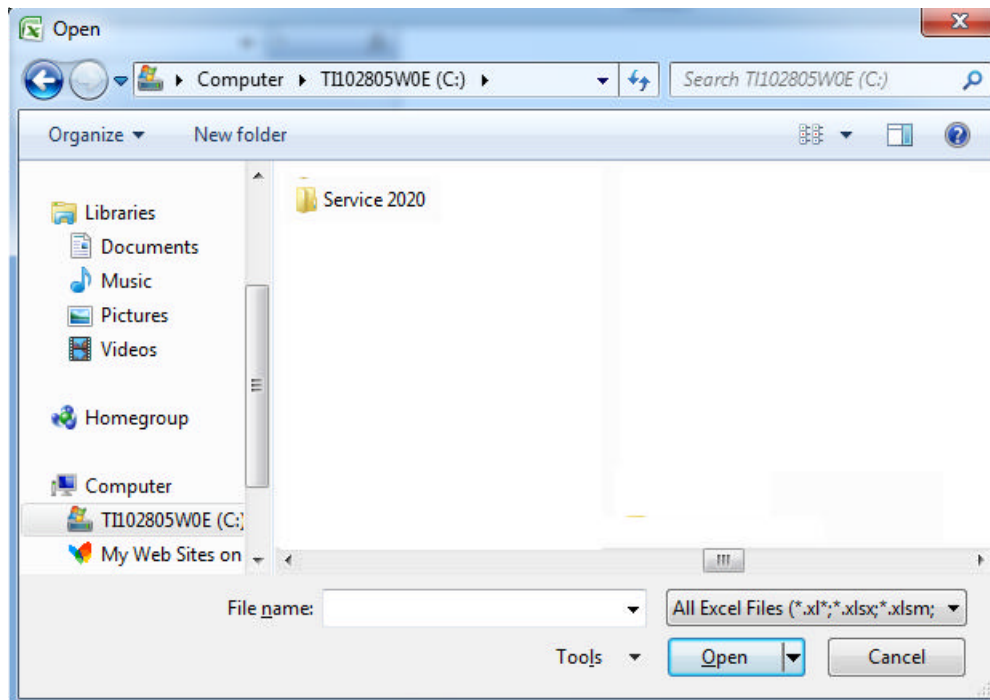
The **Service 2020** software is a spreadsheet template software program for calculating main service panel size, feeder sizes and single family 1-Line drawings. The **Service 2020** software is for reference purposes only, and Durand & Associates cannot assume any responsibility for the accuracy of the program contents. In using this program the user agrees to hold harmless and wave all claims against Durand & Associates.
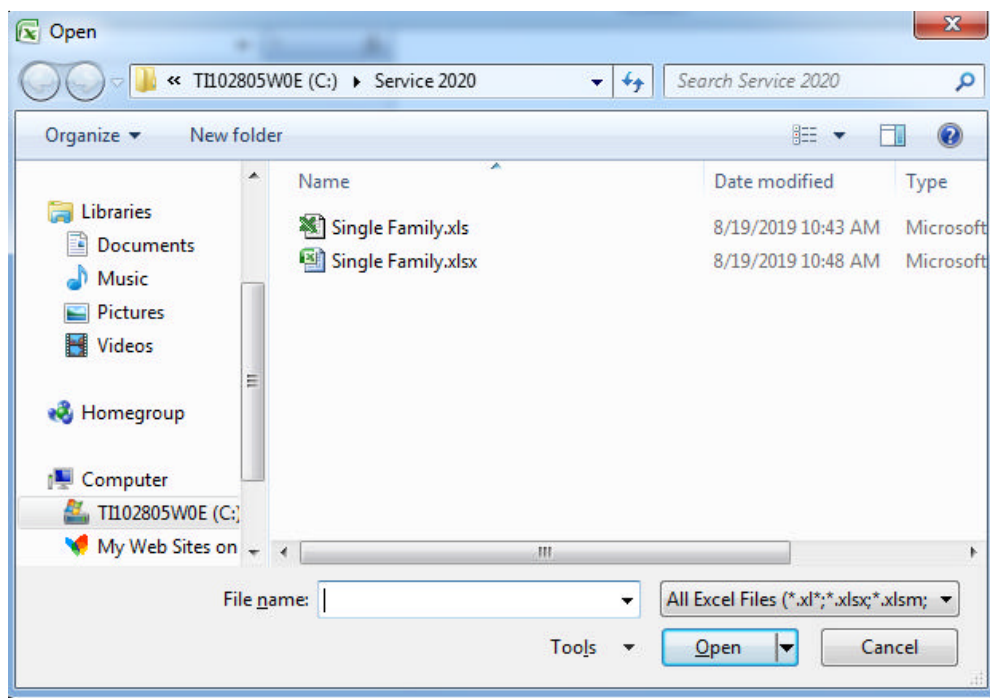
SOFTWARE REQUIREMENTS

Service 2020 was created with Microsoft Excel 97. To use these templates you must have Microsoft Excel, Version 97 or later, installed on your computer.

SERVICE 2020 TEMPLATE

To use the template start your Excel program and select File Open (Ctrl + O).
Then navigate to the "Service 2020" folder.

Double click on the "Service 2020" folder which will display the folder's contents.

Then double click on the "Single Family" to open the template.

Service 2020 (Version 20.0A) - Single Family Optional Calculation Method (NEC 220.82) or (NEC 220.30) - Copyright 2019 - Durand & Associates

GENERAL INFORMATION

PROJECT NAME	SAMPLE
ADDRESS	123 MAIN
CITY/STATE/ZIP	FOLSOM, CA 95630
CODE YEAR	2020
DISPLAY 1-LINE	YES
OVERHEAD / UNDERGROUND	UNDERGROUND
METER-MAIN.PANEL	METER MAIN
MAIN-PANEL	MAIN
UNDERGROUND CONDUIT SIZE	2 1/2"
CONDUIT TYPE	PVC

FEEDER

FEEDER TYPE	CONDUIT
LENGTH	20'
WIRE CU/AL	CU
WIRE TEMP	60° C
MINIMUM AMPS	0
% FACTOR	0%
GROUND WIRE Y/N	YES
SELECT WIRE TYPE	THHN
CONDUIT TYPE	EMT
VOLTAGE DROP % FACTOR	0

VOLTAGE DROP CALCS	YES
HIGH VOLTAGE	240
LOW VOLTAGE	120
FAULT CURRENT CALCS	YES
AVAILABLE FAULT CURRENT	14,000
PANEL NAME	DP1
PHASE	1
TOTAL SQUARE FOOTAGE	1,500
APPLIANCE CIRCUITS	2
LAUNDRY CIRCUITS	1

SERVICE RISER — **FEEDER**
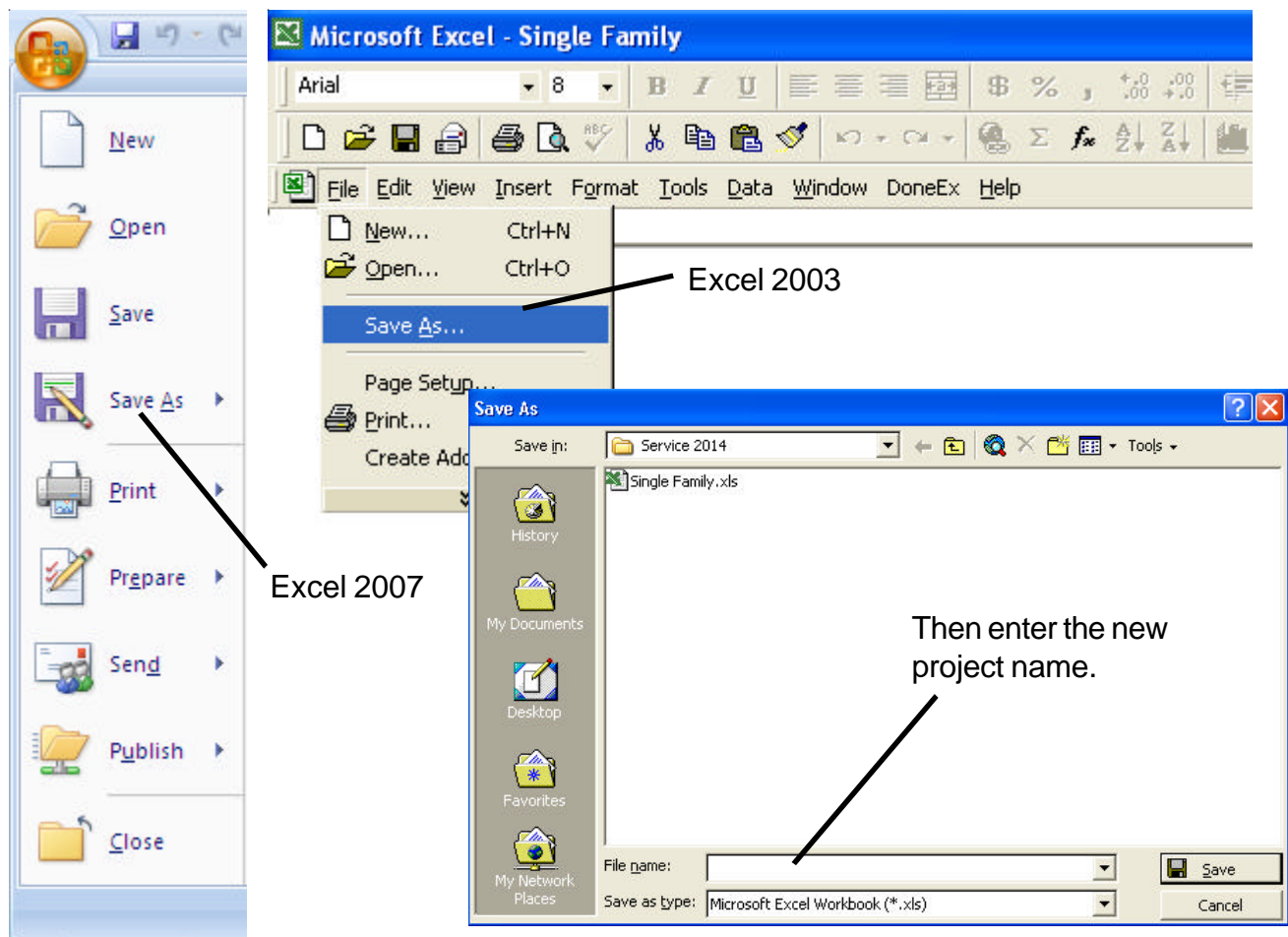
1-1 1/4" EMT
2-#2/0 THHN CU
1-#4 THHN CU (N)
1-#6 CU GND

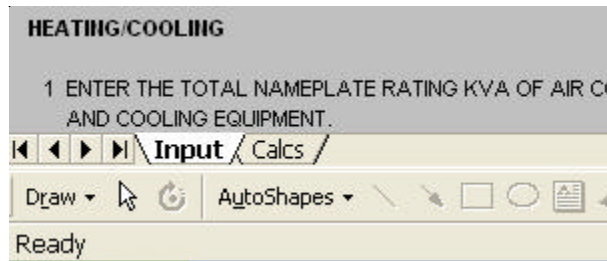**AFC AT THIS PANEL**

11,508 CLC

Once the template is open, use the "File Save As" command to save the file as a new project.

Excel 2003

Excel 2007

Then enter the new project name.

<u>TABS</u>

HEATING/COOLING

1 ENTER THE TOTAL NAMEPLATE RATING KVA OF AIR CO
  AND COOLING EQUIPMENT.

|◄ ◄ ► ►| \ **Input** / Calcs /

Draw ▾   �   AutoShapes ▾   ＼ ＼ □ ○ ▨

Ready

Located at the bottom of the screen are 2 tabs. One marked Input and the other marked Calcs.

The Input tab is used to enter your project's information.

The Calcs tab is used to view and print your load calculations.

<u>GENERAL ENTRIES</u>

GENERAL INFORMATION

PROJECT NAME	SAMPLE
ADDRESS	123 MAIN
CITY/STATE/ZIP	FOLSOM, CA 95630
CODE YEAR	2008
DISPLAY 1-LINE	YES
OVERHEAD / UNDERGROUND	UNDERGROUND
METER-MAIN.PANEL	METER
MAIN-PANEL	MAIN
UNDERGROUND CONDUIT SIZE	2 1/2"
CONDUIT TYPE	PVC

CODE YEAR	Select 2002, 2005, 2008, 2011, 2014 2017, or 2020
DISPLAY 1-LINE	This will turn on or off the 1-Line drawing on the load calcs.
OVERHEAD / UNDERGROUND	Selecting overhead will display an overhead service on the 1-Line, and selecting underground will display an under ground conduit on the 1-Line.
METER MAIN PANEL	METER - Will display a single meter.
	METER MAIN - Will display a meter main combination.
	METER MAIN PANEL - Will display a meter main & panel combination.
MAIN PANEL	MAIN - Will display a separate main breaker.
	MAIN PANEL - Will display a panel with a main breaker.
CONDUIT SIZE	Select none or the desired conduit size for your riser or underground conduit.
CONDUIT TYPE	Select the type of conduit.

GENERAL ENTRIES (continued)

VOLTAGE DROP CALCS	YES
HIGH VOLTAGE	208
LOW VOLTAGE	120
FAULT CURRENT CALCS	YES
AVAILABLE FAULT CURRENT	25,000
PANEL NAME	DP1
PHASE	1
TOTAL SQUARE FOOTAGE	1,800
APPLIANCE CIRCUITS	2
LAUNDRY CIRCUITS	1

VOLTAGE DROP CALCS   Select Yes or No. This will turn on or off the display of voltage drop calculations.

HIGH VOLTAGE   Enter the highest voltage.

LOW VOLTAGE   Enter the lowest voltage.

FAULT CURRENT CALCS   Select Yes or No. This will turn on or off the display of fault current calculations.

AVAILABLE FAULT CURRENT   If you are using an overhead service, enter the available fault current at the point of connection (service cap) to the incoming power.

     If you are using an underground service, enter the available fault current at the meter.

PANEL NAME   Enter panel name.

PHASE   Select 1 or 3Y.

TOTAL SQUARE FOOTAGE   Enter the total square footage of the dwelling.

APPLIANCE CIRCUIT   Enter the number of appliance circuits. (Minimum 2)

LAUNDRY CIRCUITS   Enter the number of laundry circuits.

GENERAL ENTRIES (continued)

```
FEEDER
   FEEDER TYPE              CONDUIT
   LENGTH                   10'
   WIRE CU/AL               AL
   WIRE TEMP                75° C
   MINIMUM AMPS             100
   % FACTOR                 0%
   GROUND WIRE Y/N          NO
   SELECT WIRE TYPE         THHN
   CONDUIT TYPE             EMT
   VOLTAGE DROP % FACTOR    0
```

FEEDER TYPE   Select CONDUIT, SER, or MC

LENGTH   Enter total length of wire from service cap to panel.

WIRE CU/AL   Select CU or AL.

WIRE TEMP   Enter wire temperature 60, 75, or 90.

MINIMUM AMPS   Enter the minimum amps.

% FACTOR   Enter the % factor. This will increase the design load by the percentage. Example: If the calculated load is 90 amps and you enter 20%, the program will add 18 amps to the calculated load giving you a design load of 108 amps.

GROUND WIRE Y/N   Enter YES or NO. This option only appears when you are using a conduit feeder.

SELECT WIRE TYPE   Select wire type. This option only appears when you are using a conduit feeder.

CONDUIT TYPE   Select conduit type. This option only appears when you are using a conduit feeder.

VOLTAGE DROP %   Enter the % factor for voltage drop correction. This will increase the wire size thus reducing voltage drop.

NOTE: Increasing the % factor forces the program to increase the wire size thus reducing the voltage drop.

GENERAL ENTRIES (continued)

MAJOR APPLIANCES

DESCRIPTION	QTY	KVA (EA)
RANGE(S) & OVEN(S)	1	8
CLOTHES DRYER(S)	1	5
WATER HEATER(S)		

RANGE(S) & OVEN(S)   Enter number of ranges, ovens, and KVA rating.

CLOTHES DRYER(S)   Enter number of dryers and KVA rating.

WATER HEATER(S)   Enter number of water heaters and KVA rating.

HEATING/COOLING 220.82(C)

1. ENTER 100% OF THE NAMEPLATE RATING(S) OF THE AIR CONDITIONING AND COOLING EQUIPMENT.   ENTER KVA: **5**

2. ENTER 100% OF THE NAMEPLATE RATING(S) OF THE HEAT PUMP WHEN THE HEAT PUMP IS USED WITHOUT ANY SUPPLEMENTAL ELECTRIC HEATING.   ENTER KVA: **0**

3. ENTER 100% OF THE NAMEPLATE RATING(S) IN KVA OF THE HEAT PUMP COMPRESSOR.   ENTER KVA: **0**

   ENTER 100% OF THE SUPPLEMENTARY ELECTRIC HEAT USED WITH THE HEAT PUMP.
   NOTE: PROGRAM WILL AUTOMATICALLY ADJUST THIS AMOUNT TO 65%.   ENTER KVA: **0**

4. ENTER 100% OF THE NAMEPLATE RATING(S) OF ELECTRIC SPACE HEATING IF LESS THAN FOUR SEPARATELY CONTROLLED UNITS.
   NOTE: PROGRAM WILL AUTOMATICALLY ADJUST THIS AMOUNT TO 65%.   ENTER KVA: **0**

5. ENTER 100% OF THE NAMEPLATE RATING(S) OF ELECTRIC SPACE HEATING IF FOUR OR MORE SEPARATELY CONTROLLED UNITS.
   NOTE: PROGRAM WILL AUTOMATICALLY ADJUST THIS AMOUNT TO 40%.   ENTER KVA: **0**

6. ENTER 100% OF THE NAMEPLATE RATING(S) OF ELECTRIC THERMAL STORAGE AND OTHER HEATING SYSTEMS WHERE THE USUAL LOAD IS EXPECTED TO BE CONTINUOUS AT THE FULL NAMEPLATE VALUE. SYSTEMS QUALIFYING UNDER THIS SELECTION SHALL NOT BE CALCULATED UNDER ANY OTHER SELECTION IN 220.82(C).   ENTER KVA: **0**

Enter heating & cooling loads listed above.

> **NOTE:**
> **Displayed above is the heating & cooling loads for the 2008, 2011, 2014, 2017, OR 2020 NEC. Other Code years will appear differently.**

GENERAL ENTRIES (continued)

| MISC. 120 VOLT LOADS | | | AMPS |
DESCRIPTION	QTY.		EACH
1 DISHWASHER	1		11.5
2 DISPOSAL	1		6.5
3 MICROWAVE OVEN	1		9.8
4			
5			

Enter the description, number of units, and the amps for each item.

| MISC. 208 OR 240 VOLT LOADS | | AMPS | |
DESCRIPTION	QTY.	EACH	PHASE
1 WELL PUMP	1	18	1
2			
3			
4			
5			
6			
7			
8			
9			
10			

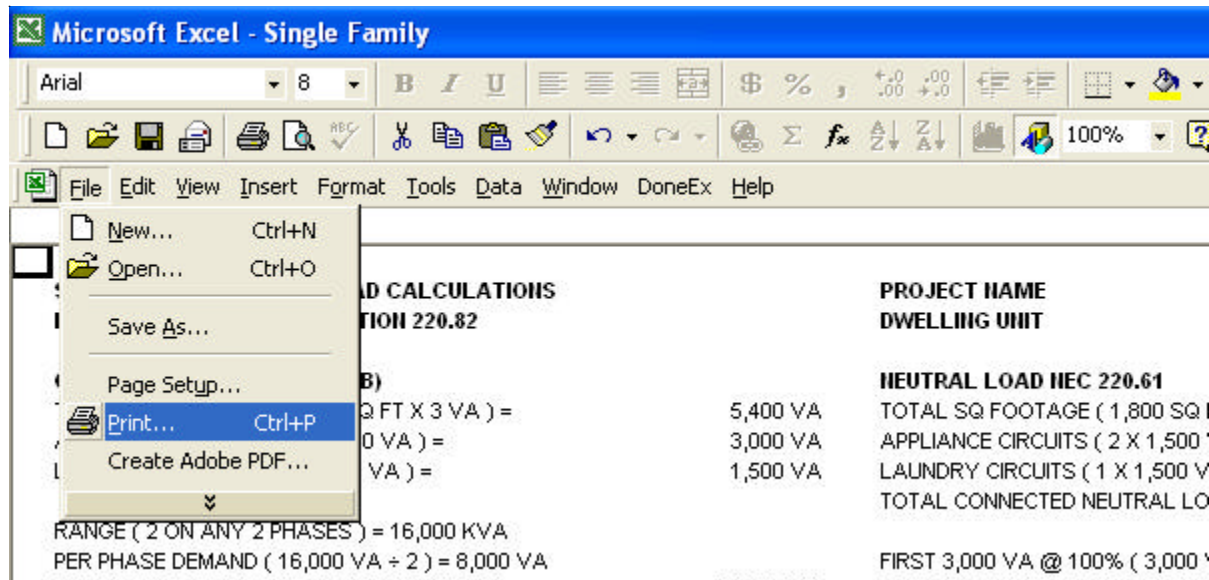Enter the description, number of units, amps, and the phase for each item.

NOTE: Phase column only appears when using a 3-Phase panel.

PRINTING

To print your load calculations click on the Calcs Tab.

Select the File Print Command

If the calculations print on more than one page, go to the "File Page Setup Command" and reduce the percentage.