Residential 1-Line 2023

Multifamily & Durplex Instructions for Excel 2016

User's Manual

APPROVED

Copyright 2022
Durand & Associates

Using Residential 1-Line 2023 with Excel

The **Residential 1-Line 2023** software is a spreadsheet template software program for calculating loads of mulifamily buildings. It also calculates the loads for each dwelling unis. The **Residential 1-Line 2023** software is for reference purposes only, and Durand & Associates cannot assume any responsibility for the accuracy of the programs content. In using this program the user agrees to hold harmless and wave all claims against Durand & Associates.

SOFTWARE REQUIREMENTS

Residential 1-Line 2023 was created with Microsoft Excel 2007. To use these templates you must have Microsoft Excel 2007 or later nstalled on your computer.

Residential 1-Line files are located at C:\ Residential 1-Line 2023

INTRODUCTION

The **Residential 1-Line 2023** software is a spreadsheet template program. The program was designed for use in conjunction with Microsoft Excel on the Windows platform. The program should also work on other platforms that can read and write Microsoft Excel file formats.

LOADING THE PROGRAM

Insert the CD in your drive and follow the setup instructions.

The installation of Residential 1-Line will create the following folder on your C drive.

C:\Residential 1-Line 2021

EXPLORING THE PROGRAM

Residential 1-Line software is a complex spreadsheet template program. The program uses 32 files which link to one another. DO NOT CHANGE THE FILE NAMES. If a file name is changed the template can become corrupt.

LOCATING THE PROGRAM FILES

The Residential 1-Line templates are located on your C: drive.
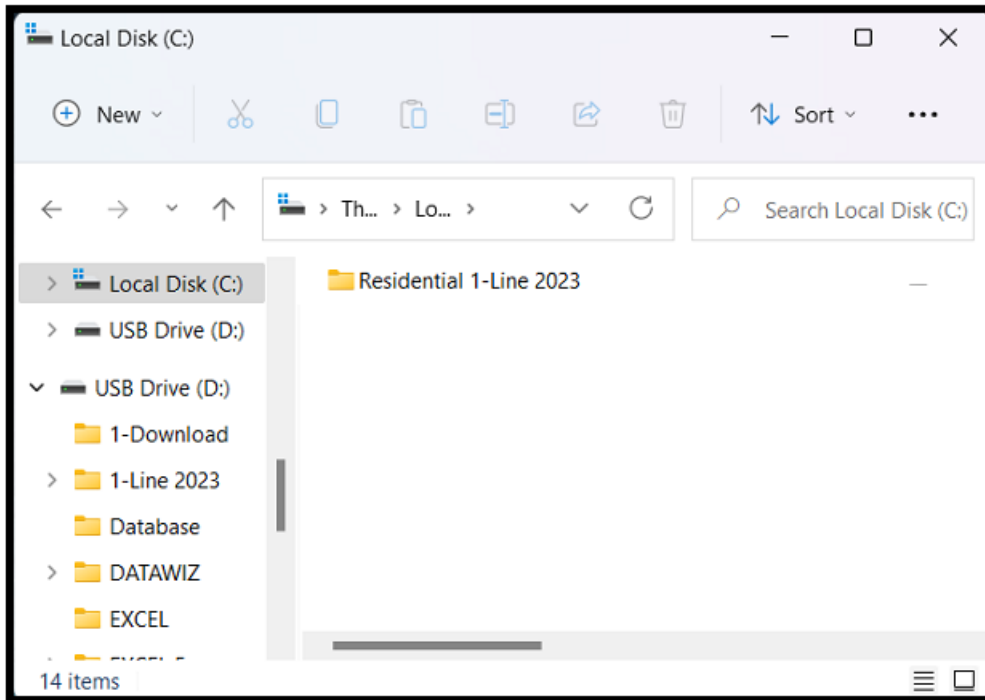
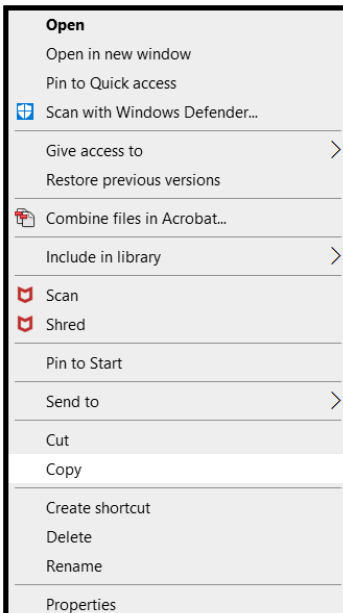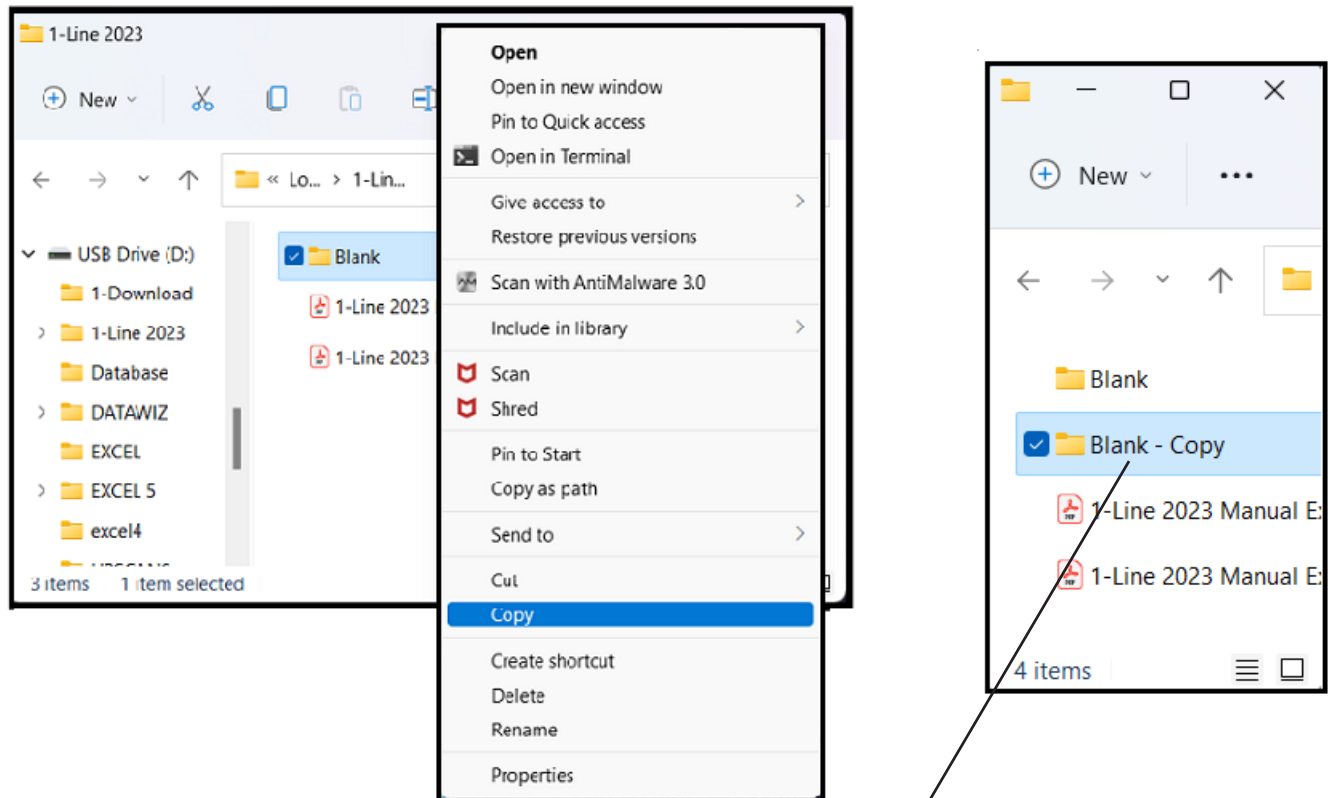If you double click on the Residential 1-Line 2023 folder, you will find 2-files & 1-folder.
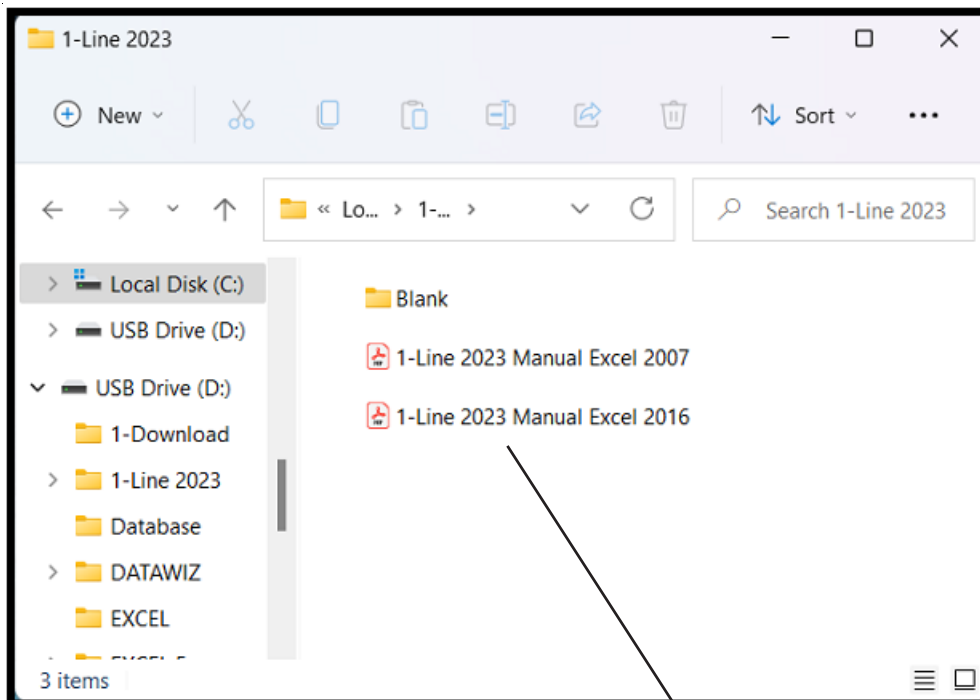
NOTE: Please double click on the Instructions file and print the instructions.

STARTING A NEW PROJECT

If you want to start a new project, RIGHT CLICK on the blank folder and select COPY.

Then RIGHT CLICK on the white area of the window and select PASTE.

This will created a new folder titled "Blank Copy".

RENAME THE FOLDER

You can RIGHT CLICK on the new folder and
 select the RENAME command.

Open
Open in new window
Pin to Quick access
Scan with Windows Defender...
Give access to >
Restore previous versions
Combine files in Acrobat...
Include in library >
Scan
Shred
Pin to Start
Send to >
Cut
Copy
Create shortcut
Delete
Rename
Properties
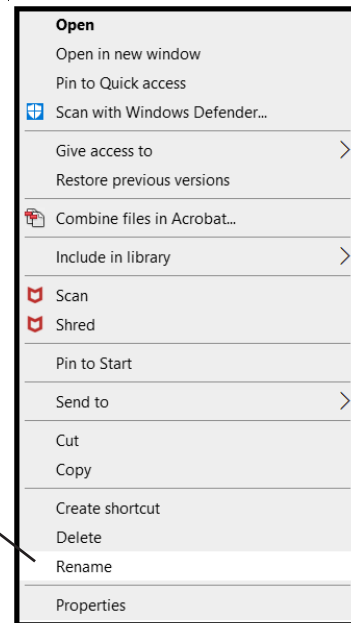
Type in your new project name.
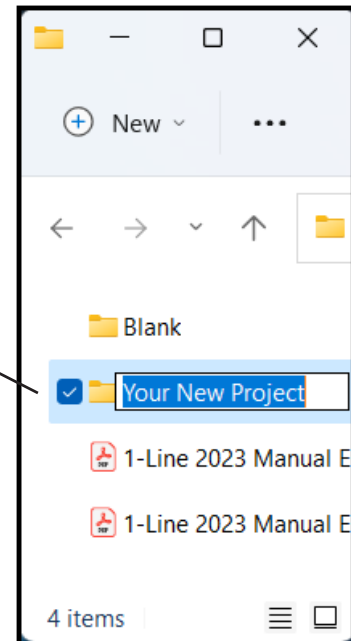
Use this method to create a new project each time you start a new Residential1-Line.

Now that you have created a new folder close all windows.

<u>USING THE PROGRAM</u>

Double click on your Excel icon

This will start your Excel spreadsheet program.

<u>TURNING ON AUTOMATIC UPDATING IN EXCEL</u>

Go to the FILE menu and select OPTIONS

Excel Options

Go to the Tools menu and select Options

Excel Options ? ✕

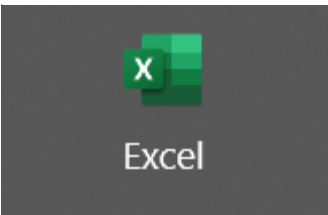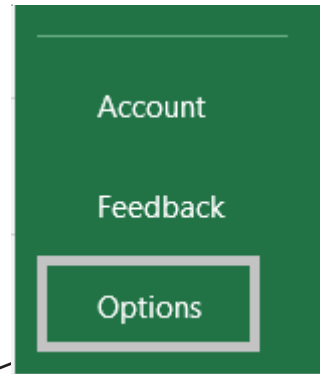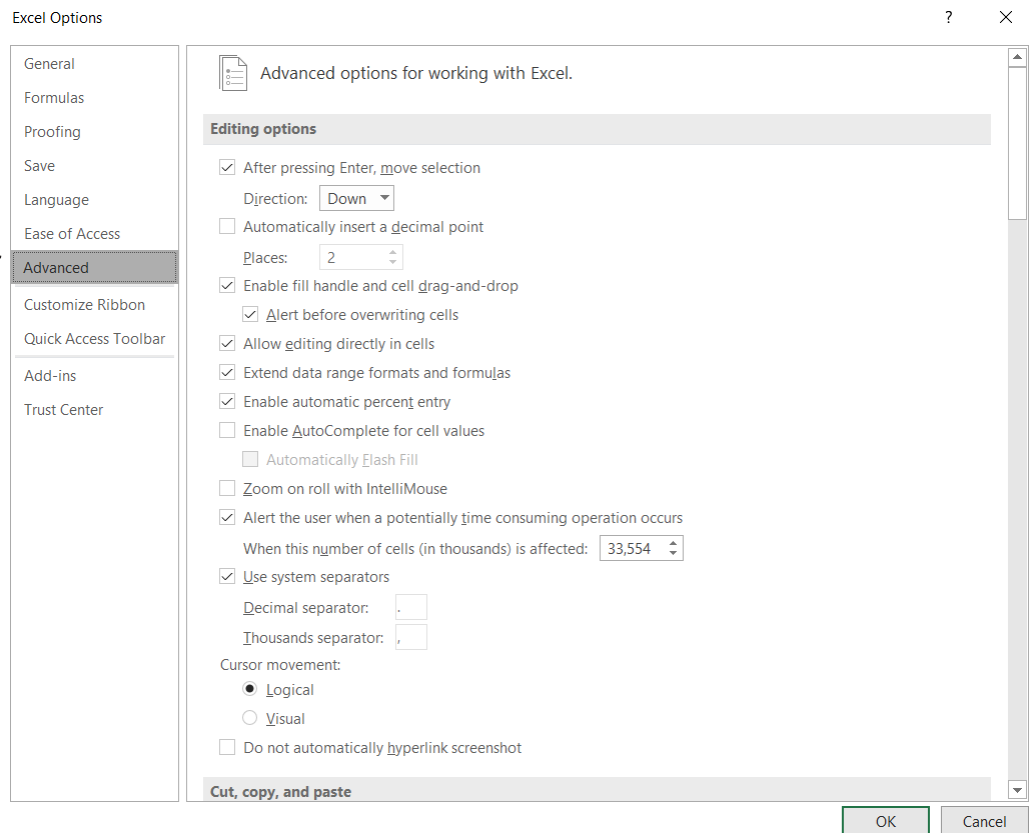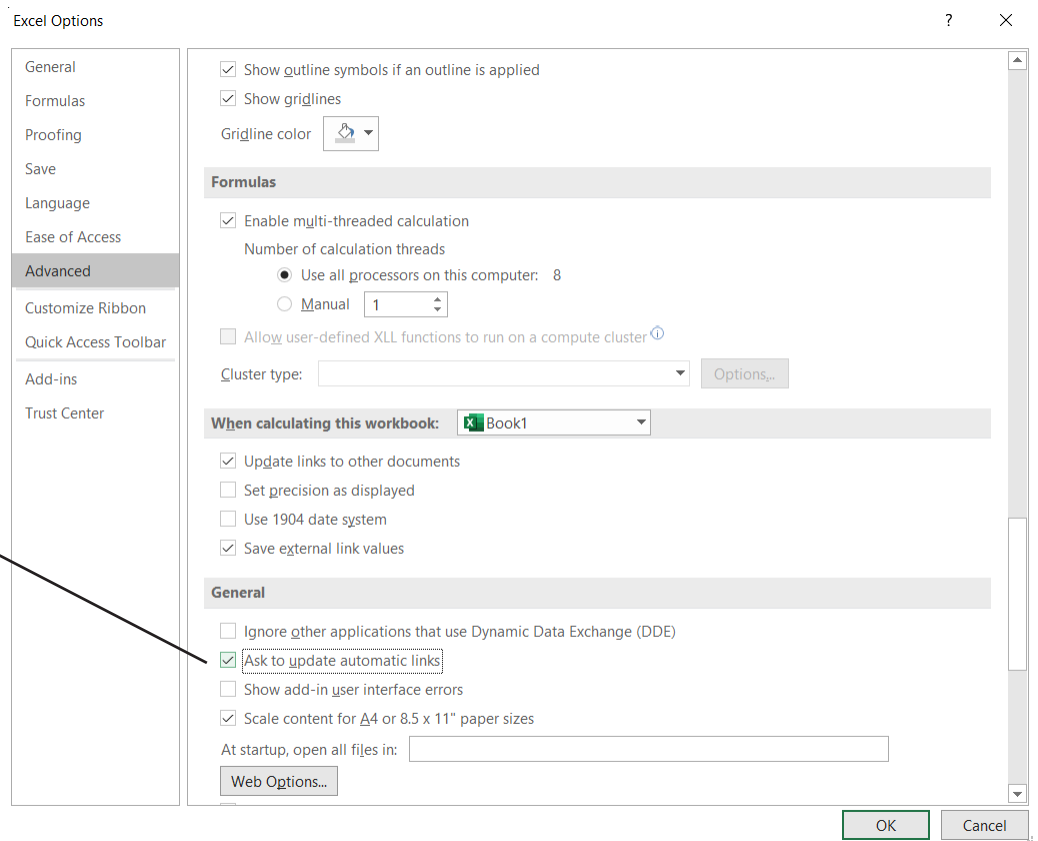| General |
| Formulas |
| Proofing |
| Save |
| Language |
| Ease of Access |
| **Advanced** |
| Customize Ribbon |
| Quick Access Toolbar |
| Add-ins |
| Trust Center |

Advanced options for working with Excel.

Editing options

☑ After pressing Enter, move selection
  Direction: Down ▾
☐ Automatically insert a decimal point
  Places: 2
☑ Enable fill handle and cell drag-and-drop
  ☑ Alert before overwriting cells
☑ Allow editing directly in cells
☑ Extend data range formats and formulas
☑ Enable automatic percent entry
☐ Enable AutoComplete for cell values
  ☐ Automatically Flash Fill
☐ Zoom on roll with IntelliMouse
☑ Alert the user when a potentially time consuming operation occurs
  When this number of cells (in thousands) is affected: 33,554
☑ Use system separators
  Decimal separator: .
  Thousands separator: ,
Cursor movement:
  ● Logical
  ○ Visual
☐ Do not automatically hyperlink screenshot

Cut, copy, and paste

OK   Cancel

Click on the Advanced tab.

Excel Options ? ✕

| General |
| Formulas |
| Proofing |
| Save |
| Language |
| Ease of Access |
| **Advanced** |
| Customize Ribbon |
| Quick Access Toolbar |
| Add-ins |
| Trust Center |

☑ Show outline symbols if an outline is applied
☑ Show gridlines
  Gridline color 🖌 ▾

Formulas

☑ Enable multi-threaded calculation
  Number of calculation threads
  ● Use all processors on this computer: 8
  ○ Manual 1
☐ Allow user-defined XLL functions to run on a compute cluster ⓘ
  Cluster type: ▾ Options...

When calculating this workbook: 🅧 Book1 ▾

☑ Update links to other documents
☐ Set precision as displayed
☐ Use 1904 date system
☑ Save external link values

General

☐ Ignore other applications that use Dynamic Data Exchange (DDE)
☑ Ask to update automatic links
☐ Show add-in user interface errors
☑ Scale content for A4 or 8.5 x 11" paper sizes
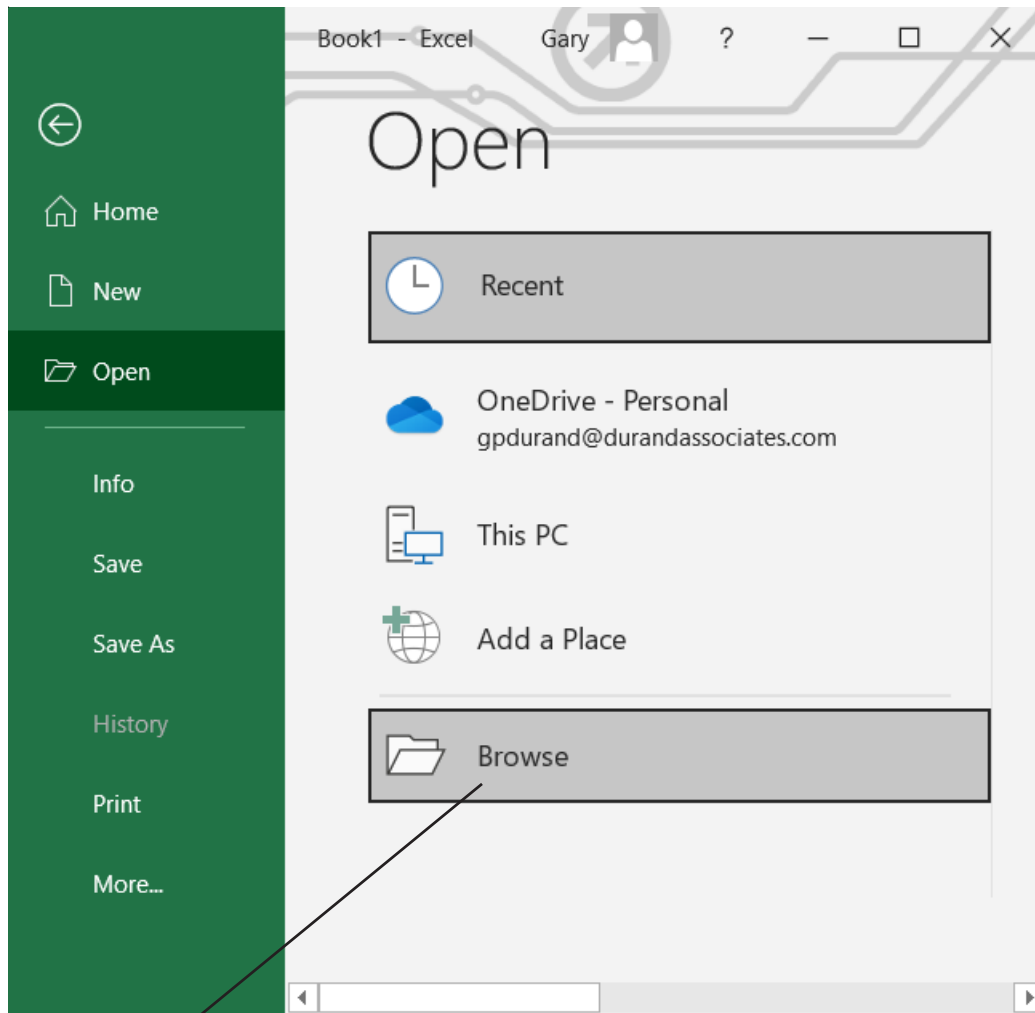 At startup, open all files in:
  Web Options...

OK   Cancel

Scroll down to the General section and uncheck the "Ask to update automatic links"
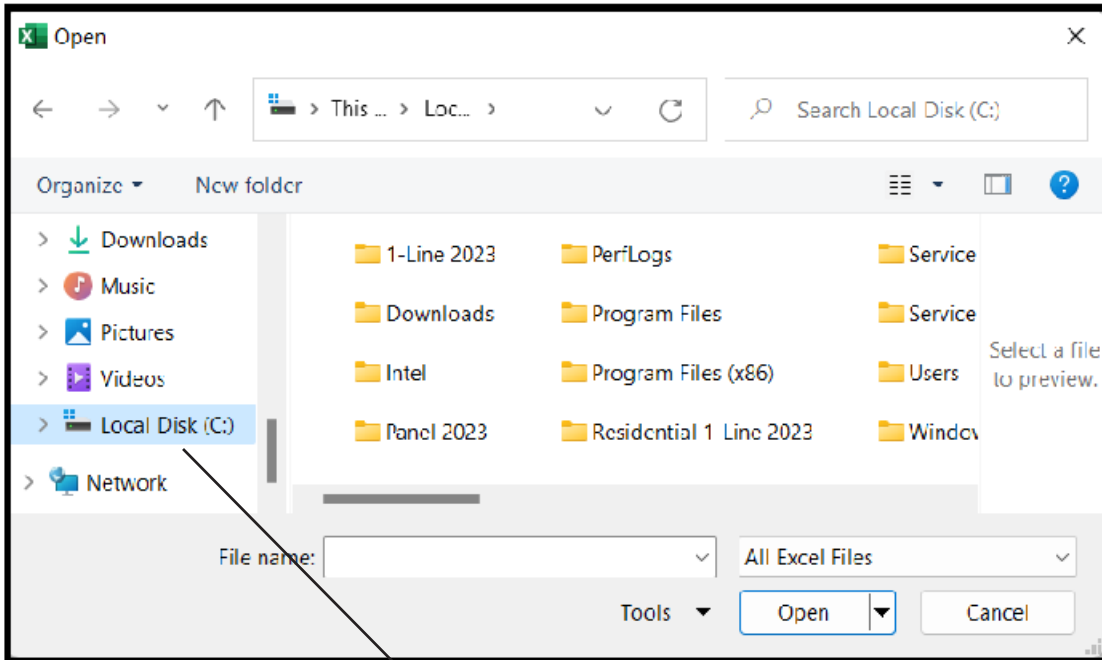
USING THE PROGRAM

Select the FILE OPEN (Ctrl + O) command and then click BROWSE
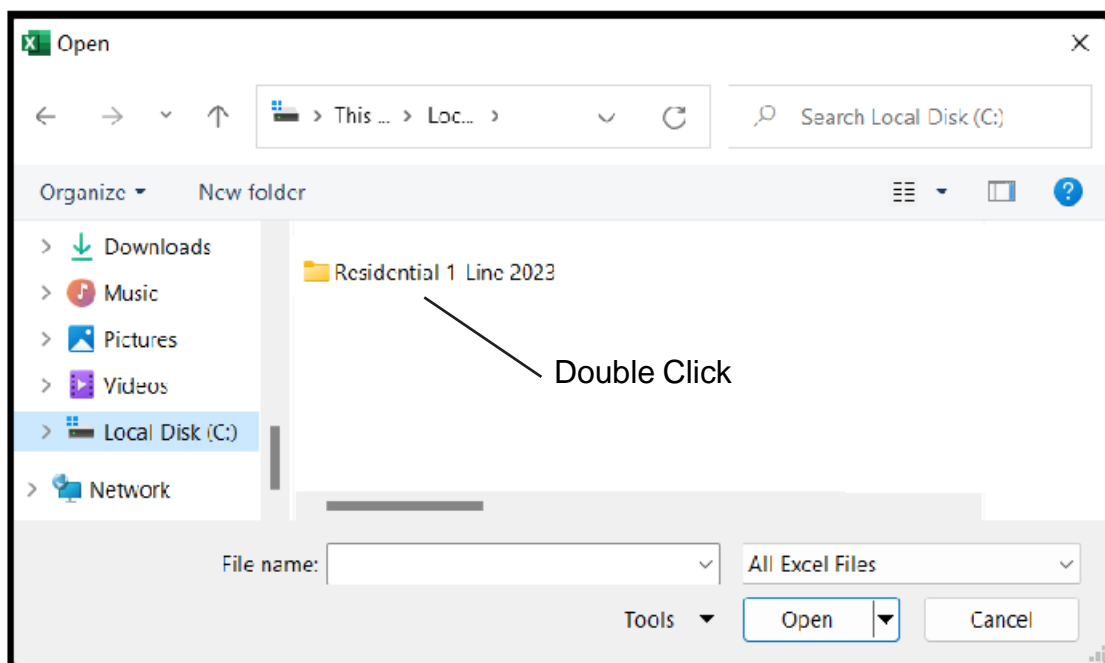
Browse

USING THE PROGRAM

Click on the Windows (C:) which will display the contents od the C drive.

Click on Windos (C:)

Locate the Residential 1-Line 2023 folder on the C drive and DOUBLE CLICK on that folder.

Double Click

OPENING YOUR PROJECT

Select the FILE OPEN command and locate the Residential 1-Line 2023 folder on your C: drive. Double click the Residential 1-Line 2023 folder to display the contents.

Double Click

Open the Main Panel file.
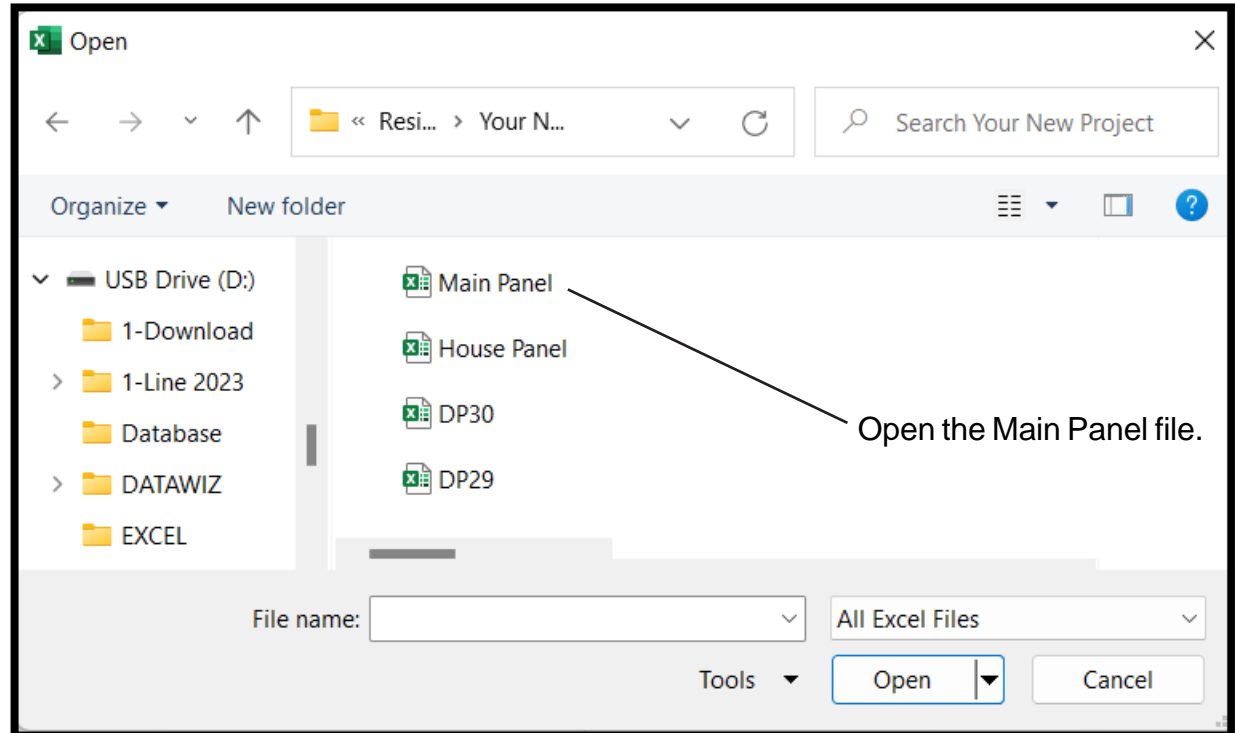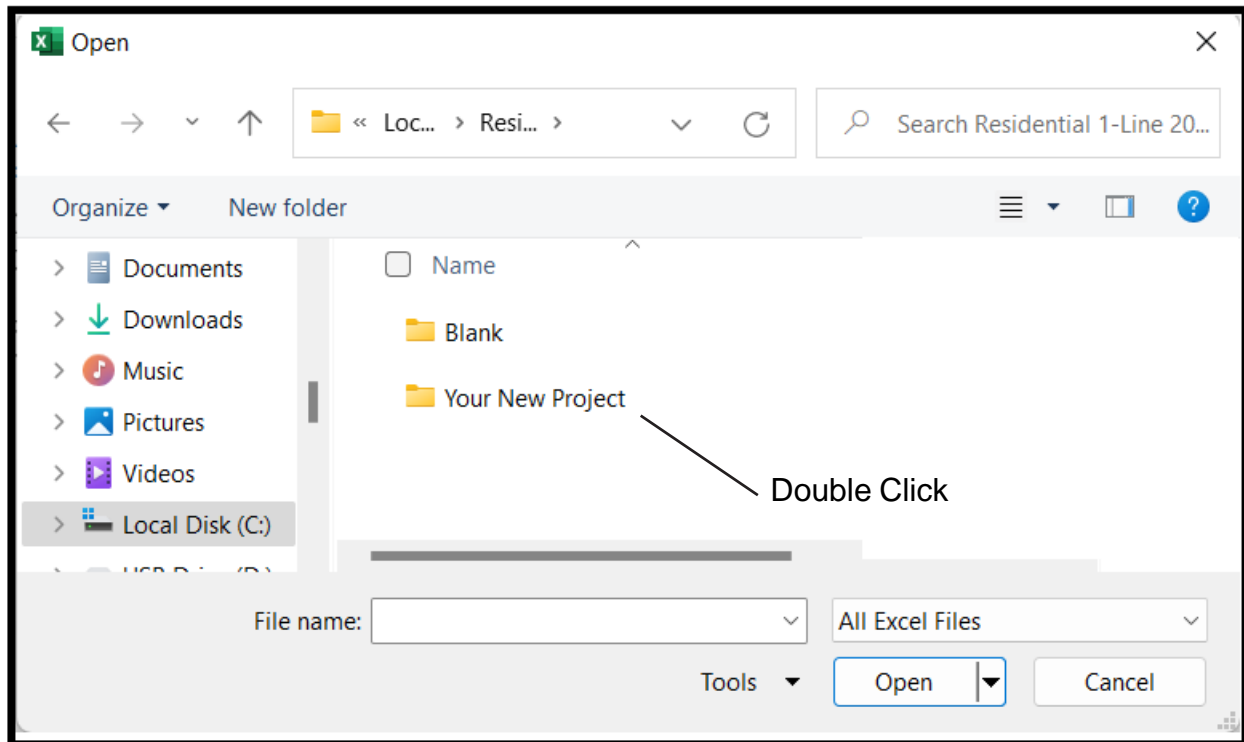
The files in this folder are MAIN PANEL, HOUSE PANEL, and DP1-DP30.

DO NOT RENAME THESE FILES (This will corrupt the files).

WORKING WITH THE MAIN PANEL

Double click on the MAIN PANEL file to display the Main Panel Template

This may take a few seconds to open as Excel updates the links to the other files.

Project Name & Address

PROJECT NAME	SAMPLE PROJECT
ADDRESS	123 MAIN ST
CITY/STATE/ZIP	SOMEWHERE, CA 95620

Phase & Voltage

CODE YEAR	2008
PHASE	3Y
HIGH VOLTAGE	208
LOW VOLTAGE	120

Main Breaker & House Panel

MAIN BREAKER	YES
MINIMUM SERVICE SIZE	100
HOUSE PANEL	YES

GENERAL INFORMATION

- **Project Name** (Enter the project name)
- **Address** (Enter the address)
- **City/State/Zip** (Enter the city, state, and zip code)

- **Code Year** (Select the Code Year from the pulldown menu)
- **Phase** (Select the phase from the pulldown menu)
    1 = 1-Phase
    3Y = 3-Phase Wye)
- **High Voltage** (Enter high voltage)
- **Low Voltage** (Enter low voltage)
- **Main Breaker** (Select YES or NO)
    You must have a main breaker when your have seven (7) or more meters.
- **Minimum Service Size** (Enter the minimum amps)
    The minimum amps is the smallest size allowed for the service. If the load exceeds the minimum amps, the program will automatically size the service to the correct size.
- **House Panel** (Select YES or NO)

Voltage Drop, Fault Current & Ufer Ground

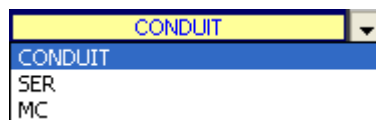|	
VOLTAGE DROP CALCS	YES
FAULT CURRENT CALCS	YES
SHOW UFER GROUND	YES

- **Voltage Drop Calcs** (Select YES or NO)
- **Fault Current Calcs** (Select YES or NO)
- **Show Ufer Ground** (Select YES or NO)

Service Entrance Feeder

SERVICE FEEDER SIZING	AUTO
FEEDER TYPE	CONDUIT
LENGTH	50'
FAULT CURRENT AT SERVICE POINT	65000
WIRE CU/AL	AL
WIRE TEMP	75° C
% FACTOR	0%
GROUND WIRE	NO
WIRE TYPE	THHN
CONDUIT TYPE	PVC-40
OVERHEAD UNDERGROUND	OVERHEAD

SERVICE FEED IN AUTO MODE

When auto mode is selected, the program will automatically calculate the feeder size. If the design load exceeds 1,200 amps, you will have to use the manual mode.

- **Service Feeder Sizing** (Select AUTO or MANUAL)
- **Feeder Type** (Select CONDUIT, SER, or MC)

CONDUIT	▾
CONDUIT	
SER	
MC	

- **Length** (Enter the length of the conduit or cable run)

FAULT CURRENT AT SERVICE POINT	65000
WIRE CU/AL	AL
WIRE TEMP	75° C
% FACTOR	0%
GROUND WIRE	NO
WIRE TYPE	THHN
CONDUIT TYPE	PVC-40
OVERHEAD UNDERGROUND	OVERHEAD

- **Fault Current at Service Point** (Enter fault current)

   If you have an overhead service, enter the fault current at the service point. The service point would be at the top of your service riser at the service cap.

   If you have an underground service where the utility pulls cable to the meter, enter the fault current at the meter.

- **Wire CU/AL** (Select CU or AL)

- **Wire Temp** (Select 60, 75 or 90)

- **% Factor** (Enter % 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** (Select YES or NO)

   This option only appears when you are using a conduit feeder.

- **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.

- **Overhead Underground** (Select OVERHEAD or UNDERGROUND)

Service Entrance Feeder

SERVICE FEEDER SIZING	MANUAL
OVERHEAD UNDERGROUND	OVERHEAD

TYPE THE FEEDER DESCRIPTION

LINE 1	2" EMT
LINE 2	3#2 THHN
LINE 3	1-#6 GND
LINE 4	
LINE 5	
UFER GROUND SIZE	#2 CU
FAULT CURRENT AT SERVICE POINT	28,875

- **Service Feeder Sizing** (Select AUTO or MANUAL)
- **Line 1** (Feeder Description)
- **Line 2** (Feeder Description)
- **Line 3** (Feeder Description)
- **Line 4** (Feeder Description)
- **Line 5** (Feeder Description)
- **Ufer Ground** (Enter Ufer Ground Size)
- **Fault Current at Service Point** (Enter fault current)

> If you have an overhead service, enter the fault current at the service point. The service point would be at the top of your service riser at the service cap.
>
> If you have an underground service where the utility pulls cable to the meter, enter the fault current at the meter.

NUMBER OF DWELLINGS (continued)

Enter the number of dwelling units. If you enter 3 the program will ask if this is a duplex calculation. If you answer yes to program will only display 2 dwelling units on the 1-Line.

UPDATE DWELLING PANELS

If the Main Pane Voltage or Phase change, the Dwelling Panels may need updating. When this condition is present the dwelling panel display turns orange.

NOTE: To update dwelling panels simply open the file.
Example: Open the DP3 file and the file is automatically updated.

File is Updated

DWELLING PANEL ERRORS

If a Dwelling Panel contains an error, the ERROR will be displayed.

```
Dwelling Unit Lables

    DP1         DP
    DP2         DP
    DP3         ERROR IN SUB PANEL
    DP4         DP
    DP5         DP
    DP6         DP
```

To correct this error open the Dwelling Panel File and correct the error.

CODE CHECK RANGES

The program automatically checks the Code requirements for ranges.
If an error is detected, it will display the error and solution.

```
Code Check Ranges

    THIS PROGRAM CALCULATES THE MULTIFAMILY SERVICE SIZE PER NEC 220.84

    NEC SECTION 220.84(A)(2) REQUIRES THAT EACH DWELLING HAVE ELECTRIC COOKING EQUIPMENT.

    YOUR SERVICE CONFIGURATION HAS 30 DWELLING UNITS, HOWEVER, ONLY 1 OF THE DWELLINGS
    HAVE A RANGE. CHECK EACH DWELLING AND MAKE SURE AT LEAST ONE (1) RANGE IS ENTERED

    IF ANY OF THE DWELLINGS DO NOT HAVE A RANGE YOU WILL NEED TO ENTER 1 RANGE AT 8 KW.
    THIS WILL MEET THE REQUIREMENTS OF NEC 220.84(A)(2) EXCEPTION
```


CODE ELECTRIC HEATING OR COOLING

The program automatically checks the Code requirements for heating & cooling.
If an error is detected, it will display the error and solution.

```
Code Check Electric Heating or Air Conditioning

    THIS PROGRAM CALCULATES THE MULTIFAMILY SERVICE SIZE PER NEC 220.84

    NEC SECTION 220.84(A)(3) REQUIRES THAT EACH DWELLING HAVE ELECTRIC HEATING OR AIR CONDITIONING.

    YOUR SERVICE CONFIGURATION HAS 30 DWELLING UNITS, HOWEVER, ONLY 1 OF THE DWELLINGS
    HAVE A HEATING OR AIR CONDITIONING LOADS. CHECK EACH DWELLING AND MAKE SURE EACH
    DWELLING HAS A HEATING OR AIR CONDITIONING LOAD.

    IF ANY OF THE DWELLINGS DO NOT HAVE A HEATING OR AIR CONDITIONING LOAD YOU WILL NEED
    TO ENTER A LOAD. THIS WILL MEET THE REQUIREMENTS OF NEC 220.84(A)(3)
```
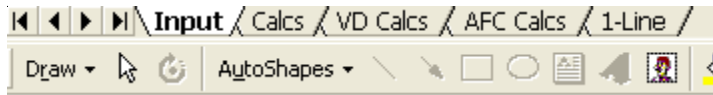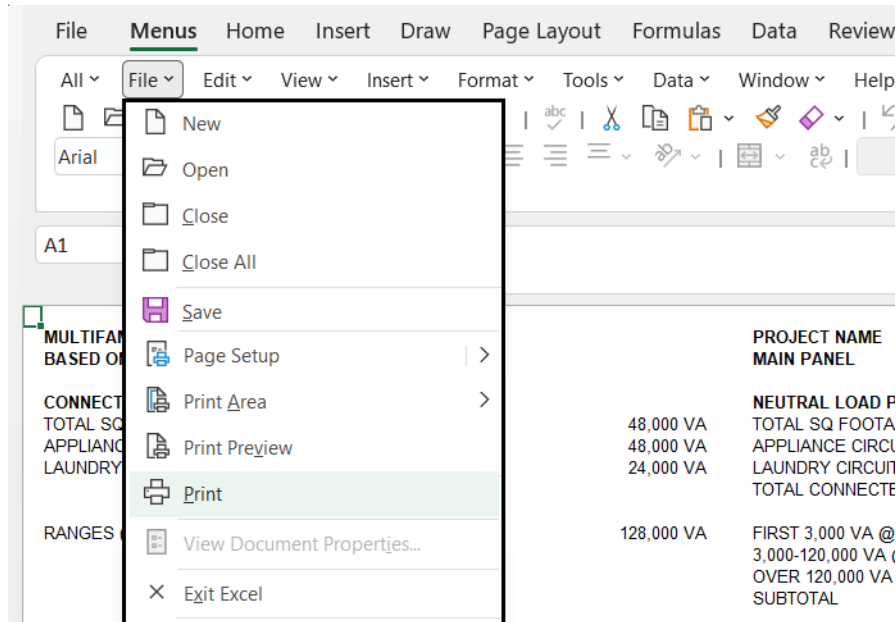
PRINTING

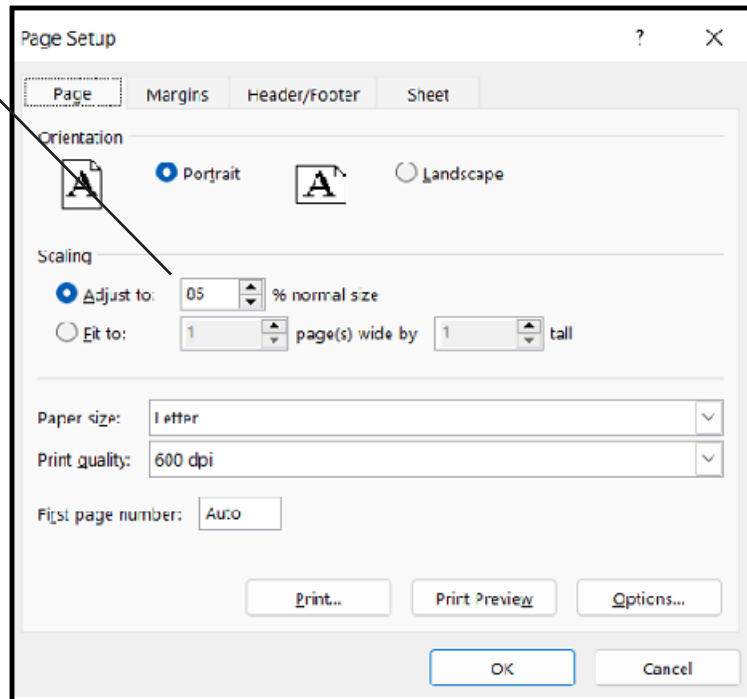To print your load, voltage drop, or fault current calculations click on the Calcs Tabs.

To print your 1-Line Drawing click on the 1-Line Tab.

Then select the File Print Command

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

DWELLING UNIT TEMPLATES

GENERAL ENTRIES

PANEL NAME	DP
SELECT PHASE	1
ENTER TOTAL SQUARE FOOTAGE	700
APPLIANCE CIRCUITS (2 OR GREATER)	2
LAUNDRY CIRCUITS (ZERO OR GREATER)	1

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.

FEEDER

FEEDER TYPE	CONDUIT
LENGTH	50'
WIRE CU/AL	AL
WIRE TEMP	75° C
MINIMUM AMPS	100
% FACTOR	0%
GROUND WIRE Y/N	YES
SELECT WIRE TYPE	THHN
CONDUIT TYPE	EMT

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.

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

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.

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

		ENTER KVA
1.	ENTER THE TOTAL NAMEPLATE RATING KVA OF AIR CONDITIONING AND COOLING EQUIPMENT.	4
2.	ENTER 100% OF THE NAMEPLATE RATING(S) OF THE HEAT PUMP WHEN THE HEAT PUMP IS USED WITHOUT ANY SUPPLEMENTAL ELECTRIC HEATING.	0
3.	ENTER 100% OF THE NAMEPLATE RATING(S) IN KVA OF THE HEAT PUMP COMPRESSOR.	0
	ENTER 100% OF THE SUPPLEMENTARY ELECTRIC HEAT USED WITH THE HEAT PUMP. NOTE: PROGRAM WILL AUTOMATICALLY ADJUST THIS AMOUNT TO 65%.	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%.	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%.	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).	0

Enter heating & cooling loads listed above.

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.

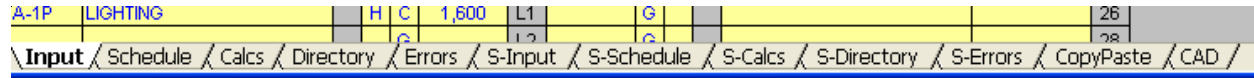| MISC. 208 OR 240 VOLT LOADS		AMPS	
DESCRIPTION	QTY.	EACH	PHASE
1 WELL PUMP	1	18	1
2			
3			
4			
5			
6			
7			
8			
9			
10			

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

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

USING HOUSE PANEL TEMPLATE

USING THE TABS

The template has twelve (12) tabs.

The first five tabs are for the Panel and the second five tabs are for the Sub Panel.

Each tab has a special purpose:

Panel Tabs

      Input - This sheet is used to enter information.

      Schedule - This sheet is used to review and print the panel schedule.

      Calcs - This sheet is used to review and print load calculations.

      Directory - This sheet is used to review and print the circuit directory.

      Errors - This sheet is used to review and print the errors.

Sub Panel Tabs

      S-Input - This sheet is used to enter information.

      S-Schedule - This sheet is used to review and print the panel schedule.

      S-Calcs - This sheet is used to review and print load calculations.

      S-Directory - This sheet is used to review and print the circuit directory.

      S-Errors - This sheet is used to review and print the errors.

Misc. Tabs

      Copy/Paste - This sheet explains the Paste Values command for Excel.

      CAD - This sheet explains how to use the Copy Picture command and
          paste into a CAD program.

GENERAL ENTRIES

Some cells in the template files are protected. You may only enter information into certain cells. If you are using a color monitor, these cells are yellow or lime green.

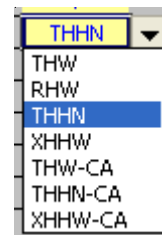| PANEL	HP1			
FED FROM	MAIN PANEL			
# OF CIRCUITS		84		
HI VOLTAGE		240		
LOW VOLTAGE		120	**FEEDER**	
PHASE		1	NUMBER OF CABLES	1
FEEDER TYPE		SER	FEEDER CABLE	SER CABLE
			WIRE SIZE L1	#1
			WIRE SIZE L2	#1
			WIRE SIZE NEUTRAL	#1
WIRE CU/AL?		AL	WIRE SIZE GROUND	#3
WIRE TEMP °C		75	SUB PANEL BKR (CIRCUITS 1 & 2)	1-PHASE
WIRE LENGTH		10'		
MINIMUM AMPS		100		
# KITCHEN LOADS		0		
% FACTOR		0		
MAIN BKR / FUSE		Y		
BREAKER SIZE		100		

Yellow Cells   Lime Green Cells

Each unprotected yellow cell requires a user entry. If an invalid entry is made, a RED error message will appear to the left of the entry or an error message will appear in a pop up box.

THHN   WIRE SIZ
Enter Wire Type

When you select a cell
a hint box will appear.

THHN
THW
RHW
THHN
XHHW
THW-CA
THHN-CA
XHHW-CA

You may also use
the pulldown menu

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Below is a list of valid entries for the general information section of the panel schedule.

Field	Entry	Description
PANEL	P1	Enter the panel name such as LPA. If entry is too long it may be cut off when printed. (As a general rule 22 characters are allowed.)
# OF CIRCUITS	30	Enter number of circuits. (Even number from 6 to 84) or use the pulldown menu.
PHASE	3Y	Enter phase. Note: You may put a 1-Phase panel on a 3-Phase source.
GND WIRE Y/N	Y	Enter Y or N. If you enter Y, an equipment ground conductor will be added to the feeder conduit(s).
WIRE TYPE	THHN	Select the wire type.
WIRE CU/AL?	CU	Enter CU or AL.
WIRE TEMP	75	Enter the wire insulation temperature.
WIRE LENGTH	20	Enter wire length.
CONDUIT TYPE	EMT	Select conduit type.
MINIMUM AMPS	100	Enter minimum amps. If the load exceeds the minimum amps, the program will automatically size the wire for Code requirements.
KITCHEN LOADS	5	Enter the number of kitchen loads.
% FACTOR	20	Enter percentage factor. Example: If you enter 20, the program will provide 20% spare capacity for future loads. You may also use this factor to adjust for voltage drop.
MAIN BKR / FUSE	Y	Enter Y or N. If you enter Y the program will size the main breaker.

SUB PANEL BKR | 3-PHASE |

Select choice from pulldown menu. If you want a sub panel fed from this panel, select 1-Phase or 3-Phase.

NOTE: If you select 1-phase, the program will automatically place a 2-pole circuit breaker in circuit positions 1 & 3.

If this is a 3-phase delta panel feeding 1-phase sub panel, the program will automatically place a 3-pole circuit breaker in circuit positions 1, 3, & 5. In this case the 1-phase sub panel will be connected to L1 and L3.

If you select 3-phase, the program will automatically place a 3-pole circuit breaker in circuit positions 1, 3, & 5.

GENERAL ENTRIES (continued)

You may enter any information in the green cells and it will appear on the panel schedule.

DATED 2-1-06
ABC ELECTRIC COMPANY
FOR SERVICE CALL (555) 626-1800

DISPLAY ONLY

Also, in the general information section there are a group of cells displaying wire and conduit size information, these cells only display information when no errors are present in the template.

FEEDER	
NUMBER OF CABLES	1
FEEDER CABLE	SER CABLE
WIRE SIZE L1	#1
WIRE SIZE L2	#1
WIRE SIZE NEUTRAL	#1
WIRE SIZE GROUND	#3

CIRCUIT ENTRIES

Once you have completed the general entries, you may begin making the circuit entries. Each circuit entry consists of the following:

BREAKER

7	20A-1P	LIGHTING			C	1,600
9	20A-1P	LIGHTING			C	1,600
11	20A-1P	LIGHTING			C	1,600

Enter breaker type.

CIRCUIT DESCRIPTION

7	20A-1P	LIGHTING			C	1,600
9	20A-1P	LIGHTING			C	1,600
11	20A-1P	LIGHTING			C	1,600

Enter circuit description.

CIRCUIT ENTRIES (continued)

LOAD IDENTIFIERS

H (HARMONIC LOAD)

On 3-phase wye panels, loads subject to harmonic currents (such as electronic ballast and computer equipment) must be identified by placing an "H" in the harmonic identifier column.

#	BKR	CIRCUIT DESCRIPTION		H	I	
1	20A-1P	LIGHTING		H	C	1,600
3	20A-1P	LIGHTING		H	C	1,600
5	20A-1P	LIGHTING		H	C	1,600

Enter "H" or a space (Space Bar)

HOW THE PROGRAM CALCULATES HARMONIC LOADS.

When the harmonic load is 50% or more of the load (on 3-phase wye panels) the NEC requires the neutral conductor to be considered a current carrying conductor.

Therefore, the feeder conduit has four (4) current carrying conductors and the conductor ampacity must be derated to 80%. The program does this automatically.

ENTERING CIRCUIT LOADS

LINE TO NEUTRAL LOADS (1-Pole Breaker)

#	BKR	CIRCUIT DESCRIPTION	N	H	I		
1	20A-1P	LIGHTING		H	C	1,600	L1
3				H	C		L2
5				H	C		L3

Enter the VA (Volts X Amps) into the cell.

LINE TO LINE LOADS (2-Pole Breaker)

Enter one half of the VA in each cell.

#	BKR	CIRCUIT DESCRIPTION	N	H	I		
1	60A-2P	AC UNIT			M	6,000	L1
3	X X X	X X X			M	6,000	L2
5				H	C		L3

Example: (50 Amps X 240 Volts) = 12,000 VA
             (12,000 VA ÷ 2) = 6,000 VA in each cell

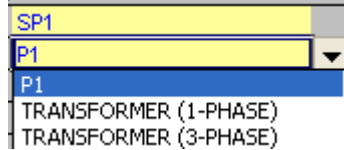### LINE TO LINE LOADS (3-Pole Breaker)

Enter one third of the VA in each cell.

#	BKR	CIRCUIT DESCRIPTION	N	H	I		
1	X X X	X X X			M	4,803	L1
3	50A-3P	AC UNIT			M	4,803	L2
5	X X X	X X X			M	4,803	L3

Example: (40 Amps X 208 Volts X 1.732) = 14,410 VA
             (14,410 VA ÷ 3) = 4,803 VA in each cell
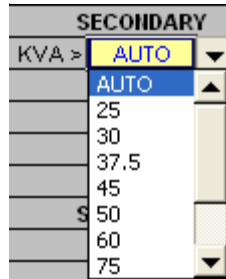
SUB PANEL GENERAL ENTRIES

FED FROM

SP1
P1
P1
TRANSFORMER (1-PHASE)
TRANSFORMER (3-PHASE)

Select Choice

KVA

SECONDARY
KVA > AUTO
AUTO
25
30
37.5
45
$ 50
60
75

If you select a transformer, you can select the KVA rating or select AUTO and the program will size the transformer automatically.

VD ADJUSTMENT   10

If you are using a transformer, a voltage drop adjustment appears. Use this rather than % Factor to adjust for voltage drop.

XMFR % Z RATING   10

If you are using a transformer, a transformer % Z rating appears. Enter the % Z rating of the transformer.

PRINTOUTS

Each panel schedule template is designed to print out four (4) sheets
for the panel and four (4) sheets for the sub panel.

- Panel Schedule
- Load Calculation
- Directory
- Error Checking Report

Using the mouse, click on the tab to display the sheet you wish to
print. When the sheet is displayed, use the FILE/PRINT command.

NO COPY/PASTE

**Do not use the COPY and PASTE commands on this template as
they can corrupt the file.**

Each cell in this template has been formatted with error checking and performance codes.
When you copy a cell and use the paste command, these formats and performance
codes are pasted to the new location.

PASTE SPECIAL (Values Only)

To avoid corrupting the file use the COPY and the EDIT/PASTE SPECIAL command
selecting VALUES from the paste special menu.

Click on "Values"
and click OK