

GENERATORS

Portable

Electric permit for transfer switch and plug in outlet

Permanent

Zoning Application is required – showing location on copy of survey - \$30.00 residential

Need brochure on model to be installed with clearances to combustibles

Building Subcode - application for concrete pad

Electric Subcode - application with the following:

For a whole house generator with a transfer switch – provide a complete load calculation as well as spec sheet on service rated ATS and equipment

Wire Size

Number and type of wire

Wiring method

Plumbing Subcode - application for gas piping (show diagram with distance & pipe size) propane tank and natural gas

Fire Subcode – application for appliance propane or natural gas fired

HOME GENERATOR INSTALLATIONS; YES THERE ARE CODE RULES

Home Generator installations are not "Emergency Systems" or "Legally Required Standby Systems". They are "Optional Standby Systems" and are covered by Article 702 of the Code.

If the transfer switch is manual, The USER not the AHJ decides what loads will be supplied. The source must then have the capacity to supply *that* load.

If the transfer switch is automatic, the Code has two choices: First, the source shall be capable of supplying the full load that is transferred. Second, where a load management system is used, the source shall have a capacity to supply the maximum load that that will be connected by the load management system.

Transfer equipment is required. There is an exception to this but it won't apply to home generator installation. It's not permitted to simply back-feed a receptacle in the dwelling.

A sign is required at the service equipment that indicates the type and location of an on-site power source.

A sign is also required where the optional system is installed as a NON-SEPARATELY derived system warning of a shock hazard if the grounding or bonding connection is removed. This sign would be placed at the normal source service equipment.

Optional system wiring does not have to be separated from the normal power wiring. It is permitted in the same boxes, raceways, cables, cabinets as general wiring.

If the system is installed as a separately derived system, refer back to 250.30 for grounding requirements. This is not usually the case for home systems as the neutral isn't typically switched. Pay attention to the installation instructions provided for the generator AND the transfer switch.

If the system is installed as a nonseparately derived system, 702.11(B) requires the equipment grounding conductor be bonded to the system grounding electrode. You will have to check that the path is provided and complete.

REMEMBER, THESE ARE NOT EMERGENCY SYSTEMS, DON'T EVEN OPEN YOUR BOOK TO ARTICLE 700 !

Show A PLAN. (Line Diagram) See Example.
Submit Load Calculation
Provide Spec's + Installation on Equipment
(Generator + Transfer Switch Typically)

Optional Load Calculations for Dwelling Units NEC 220.82

Work Site:

Block:

Lot:

Date:

Owner in Fee:

GENERAL LOADS	QTY	RATING (watts)	FACTOR	TOTAL LOAD (watts)
Lighting and General Use Receptacles		3va*ft ²	100%	0
Small Appliance Branch Circuits	2	1500	100%	3000
Laundry	1	1500	100%	1500
Well Pump			100%	0
Sump Pump			100%	0
Refrigerator			100%	0
Freezer			100%	0
Microwave			100%	0
Dishwasher			100%	0
Disposal			100%	0
Range			100%	0
Oven			100%	0
Water Heater			100%	0
Dryer			100%	0
Garage Door Opener			100%	0
Whirlpool Tub			100%	0
Pool Equipment			100%	0
Air Conditioner #1 (largest A/C)	1		100%	0
Air Conditioner #2 (smaller A/C)			100%	0
				0
				0
				0
Total General and Appliance Loads				4500

Demand Factor (NEC 220.82)

First 10,000 at 100%

4500

Remainder at 40%

0

Air Conditioner #1 (From above)

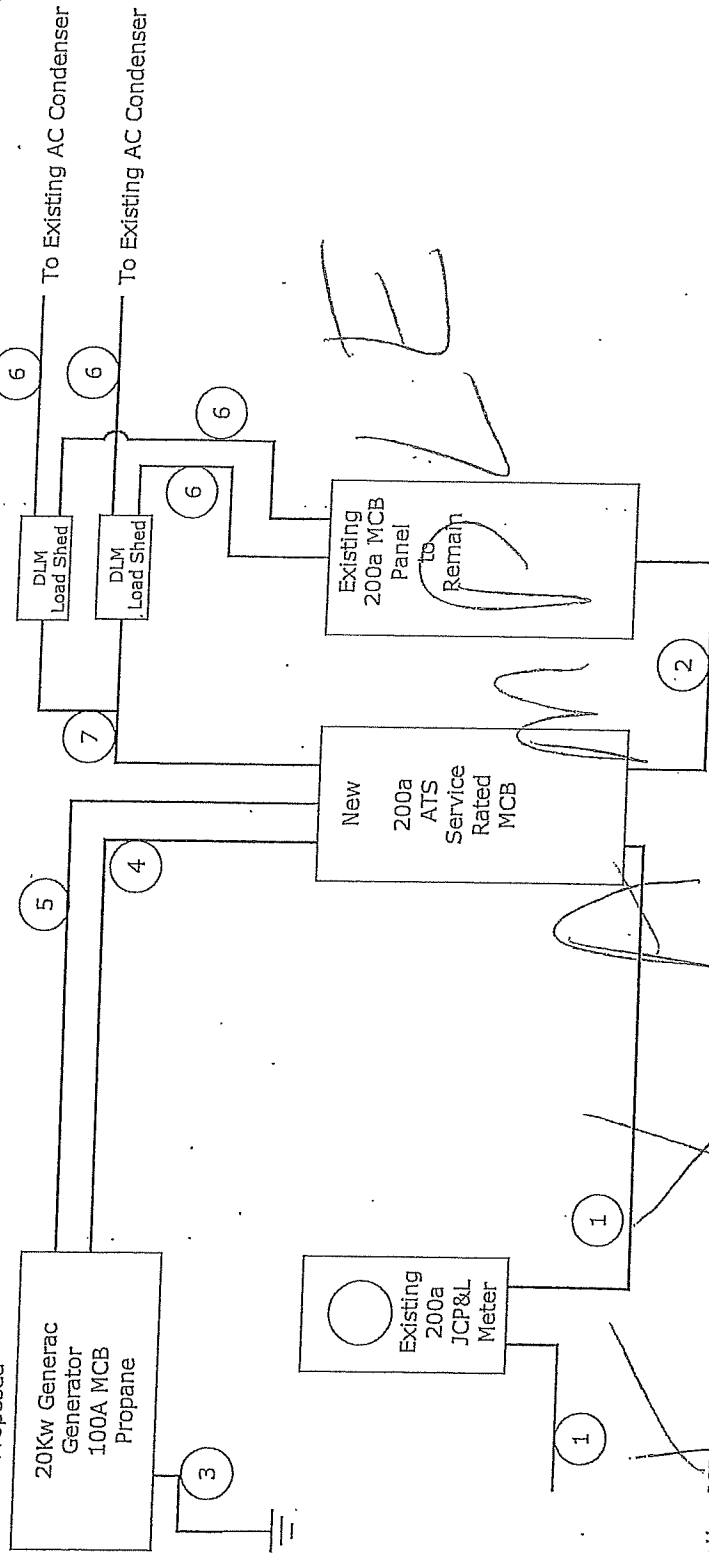
0

Total Watts

Do not include any loads in calculation if utilizing load shedding

But specify which ones are

Proposed



1 Existing JCP&L Service to remain

2 New 200a sub-feeder to remain/re-route via ATS (4/0 SER Service Cable)

3 #6 Bare copper grounding electrode conductor

4 New (3) #2 awg Aui and (1) #6 awg Copper Gmd in 1 1/4" PVC Conduit (Feeder)

5 New (6) #14 awg and (1) #14 Gmd in 3/4 PVC Conduit (Controls)

6 Existing A/C condenser circuits re-routed via load shed module as needed

7 Low-voltage load shed control circuit (Typical of 2 as needed)

Note: Neutral and ground conductors to be separated in existing panel
Note: Load shedding as needed for A/C condenser units

Optional Stand-by Generators

Since Super Storm Sandy, the number of stand-by generators being installed has been rapidly increasing and some common misconceptions need to be addressed. The first is the transfer switch and wiring to the transfer switch. There are manufacturers who install a 100 amp breaker in the generator, but because of the fuel selection, the wire size only needs to be rated at 90 amps. The code states that conductors are to be sized based on the overcurrent device they will be terminated to after all correction factors are applied. Table 310.15(B)(16) is used for final selection. Most believe that Table 310.15(B)(7) can be used which is an allowance for a reduction of wire size for 120/240-volt 3-wire dwelling services. This is not correct because the optional generator feed to the transfer switch does not fall under the parameters for this reduction allowance. This means that, for a generator that contains a 100 amp breaker, the wire size from the generator to the line side of the transfer switch will be #3 AWG Copper or #1 AWG Aluminum. A recent inquiry made to NFPA confirms this.

Next is the transfer switch itself and whether or not it needs to be service rated and if the neutral needs to be bonded. If the transfer switch and generator are sized to pick up the entire load and the transfer is ahead of the main disconnecting means, it now becomes the service disconnect and the panel being fed from the transfer switch is a remote panel board. This now requires an insulated grounded conductor and an equipment grounding conductor; the "SE" is no longer compliant. Also, the grounding electrode system will be moved from the existing service panel to the service-rated transfer switch. The Main Power feeder (from transfer to panel board) can be sized based on table 310.15(B)(7) because it falls under the parameters of the 310.15(B)(7) allowance. In addition, the grounds and neutrals must be separated and isolated from one another.

Finally, the existing branch circuits and feeders which are allowed to be fed by an SE cable come into play. The code allows SE to be used with an uninsulated "grounded" conductor, where it terminates in "service" equipment. By definition, the remote panel is no longer considered "service" equipment, and if the range or dryer requires a neutral, the wiring to these appliances may need to be changed. If the equipment is straight 240 volts requiring only an equipment grounding conductor, the "SE" may remain.

Should you have any questions, you may contact me at (609) 984-7609.

Source: Dave Greenhill
Code Assistance Unit

Contractors Being on Site for Inspections, Not Required

It has come to the Department's attention that a number of inspectors are placing what reasonable people might consider *unreasonable* demands on contractors. Specifically, the Department is receiving complaints of inspectors asking that contractors be on site for inspections without giving specifics as to when or where an inspection might take place. The regulations do not contain a requirement that the contractor be present for the inspection. If assistance is needed to perform the inspection or there is some other basis for asking the contractor to be there, then every effort should be made to set up a time. Both the contractor and the inspector have work to do. Let's be respectful of one another's time. And please, let's be reasonable.

Source: Office of Regulatory Affairs
(609) 984-7672

The Construction Code Communicator is an online publication of the New Jersey Department of Community Affairs' Division of Codes and Standards. It is typically published four times a year.

Copies may be read or downloaded from the division's website at: www.nj.gov/dca/divisions/codes.

Please direct any comments or suggestions to the NJDCA, Division of Codes and Standards, Attention: Code Development Unit, PO Box 802, Trenton, NJ 08625-0802 or codeassist@dca.nj.gov.