

**Information Sheet # 69**  
**Construction Applications for Generator Set Systems**

*Your Reliable Guide for  
Generator Maintenance*

**1.0 Introduction:**

Large to small construction projects require on-site electrical power for electrically powered pieces of equipment. In some cases electrical power is already available on-site from the utility, but in many cases utility power is not connected until the later stages of a project and on-site power is delivered by mobile generator systems.

*This Information Sheet discusses the type of generator systems used on construction sites, the various specifications, ratings, and codes applying to generators used in construction.*

**Construction Application Specifications**

Ratings	Prime power ratings to manage continuous loads
Fuel	Primarily diesel above 20kW with some LPG/CNG
Generator End	PMG to manage high motor load starting requirements
Enclosure	Weather and sound attenuated enclosures for outside use
Alternators	In many cases sized to specific high starting kVA requirements
Air Cleaners	Heavy duty for operating in a dust laden environment
Controls	Auto start capability. Sometimes for paralleling 2 or more sets



**Codes & Standards Specific to Healthcare Generator Applications** (see details over)

EPA	Tier 4 for mobile diesel generator sets
NEMA	This standard covers switchgear boxes and electrical connections
Local Codes	Local codes will cover generator use, sound regulations, and construction site requirements
UL Codes Underwriters Laboratories	2200 This covers entire generator set as a manufacturing standard
	142 Applicable to above ground storage tanks to specify leak containment and spillage
	891 Safety criteria applicable to electrical switchgear up to 600 volt systems
	1008 The standard transfer switches are tested and manufactured to (when ATS fitted)
	1558 For low voltage power circuit breakers

To fulfill our commitment to be the leading supplier in the power generation industry, the Loftin Equipment and Bay City Electric Works teams ensures they are always up-to-date with the current power industry standards as well as industry trends. As a service, our **Information Sheets** are circulated on a regular basis to existing and potential power customers to maintain their awareness of changes and developments in standards, codes and technology within the power industry.

The installation information provided in this information sheet is informational in nature only and should not be considered the advice of a properly licensed and qualified electrician or used in place of a detailed review of the applicable National Electric Codes, NFPA 99/110 and local codes. Specific questions about how this information may affect any particular situation should be addressed to a licensed and qualified engineer and/or electrician.

## 2.0 Construction Site Generator Specification Requirements:

If there is no utility power available, any generator used on a construction project will be on a temporary basis until the project is completed and/or utility power is connected.

Temporary generator power used on a construction site will have to take account of the following:

- 2.1 Positioning/location** – Temporary generators are brought to site either mounted on a trailer, or a heavy duty base frame suitable for positioning on any level firm service.
- 2.2 Enclosure** – If the generator cannot be positioned under a weather protective canopy, then it is most likely the generator will be mounted in its own weather protective enclosure. If the project is in a noise sensitive area the enclosure will also be sound attenuated. Local ordinances will normally specify the degree of attenuation.
- 2.3 Fuel** – The size of the generator tends to dictate the type of fuel. Many construction projects utilize small portable 3,600 rpm gasoline powered generators up to 20kW. However, units larger than 20kW are mainly diesel powered running at 1,800 rpm. However, LPG and CNG generators are also being offered on mobile generators up to 500kW, but the majority of construction generators above 20kW are diesel fueled.
- 2.4 Fuel Storage** – Most mobile generators are supplied with fuel tanks, and/or gas cylinders already mounted in the generator assembly. Small gasoline generators will have a built in fuel tank. Fuel storage is regulated, particularly with diesel. Generator systems with mounted tanks will have full spill containment double walled fuel tanks built to the applicable codes. Gas storage will also be applicable to local codes for storing compressed gas.
- Most diesel generators are equipped with tanks having the capacity for at least 8-hours operation on average loads. Refueling of generators on large projects is undertaken by the contractor, or the rental company if a rental generator is being used.
- 2.5 Alternator** – In addition to resistive loads such as lights, many construction sites use pieces of equipment with reactive loads such as electric motors. Motor loads need a lot higher amperage to start than run, therefore the alternator on a generator has to be able to absorb high motor starting loads. The generator specification usually includes:
- PMG (Permanent Magnet Generator) voltage excitation to better voltage regulation with motor loads
  - Brushless 12-wire reconnectable to enable multiple voltage connections for single and three phase
- 2.6 Voltage Selector Switch** – Most rental sets used on a construction site are fitted with a voltage selector switch to provide the user with various the three phase and single phase voltage outputs required by different pieces of electrically power equipment. The lockable switch will be located on the generator complete with outlets for both three and single phase. Voltage selector switches are usually supplied as follows: (see photo-1 below)
- Up to 150kW 3-position selection for 3-phase parallel are series star, and single phase center tapped
  - Above 150kW the 2-position with only the 3-phase voltages to select
- 2.7 Power Distribution** – In many cases the rental company will supply electrical distribution panels with the generator supplying the various site loads through the panel. The distribution panel will have the required single or three phase outlets.
- 2.8 Power Rating** – A prime rating is assigned to an application where the generator set is the primary continuous power source. Generators used on construction sites are usually the only source of power, and as such are rated for prime power. A prime power rating means the generator has been rated to run continuously on full load with 10% overload permitted for 1-hour in any 12-hour period of consecutive hours of operation.
- 2.9 Power Connection** – On a construction site the equipment is connected to the load panel via temporary cables suitable for use in a construction environment. Unlike a fixed installation, the cables have to be easily connected and disconnected. A common method is to use "Cam Lock" connectors. (see photo-2 below).
- 2.10 Engine Emissions** – Generators used on a construction site will be subject to the more stringent EPA exhaust emission standards than a fixed stationary standby generator set application that will only run when the utility is off-line or during a test. The latest mobile generator sets, whether on a skid or a trailer, are rated for continuous operation and will have to meet the latest EPA Tier 4 Final emission levels.

## 3.0 Construction Site Codes/Regulations Covering Generator Systems:

There are several codes and regulations covering the use of generator systems on a construction project. Some of these codes are set by national bodies, and others are regional and local to the area. (See chart page-1 for details)

Photo - 1  
Voltage Selector Switch



Photo - 2  
Distribution Panel and  
Cam Lock Connections



Bay City Main Office - San Diego  
13625 Danielson Street  
Poway, CA 92064  
Toll Free: 866.938.8200  
Fax: 619.938.8202

service@bcew.com

Greater LA Area Sales and Service Center  
860 Lawson Street  
City of Industry, CA 91748  
Toll Free: 866.938.8200  
Fax: 619.938.8216

San Francisco Area Service Center  
322 Lindbergh Avenue  
Livermore, CA 94551  
Toll Free: 866.938.8200  
Fax: 619.938.8216

www.bcew.com



www.loftinequip.com  
service@loftinequip.com

Corporate Headquarters  
2111 E. Highland Ave. Ste. 255  
Phoenix, AZ 85016  
Phone: (602) 272-9466  
Fx: 602.272.7582  
Toll-Free: 800-437-4376

Parts & Service- Phoenix  
12 N. 45th Ave.  
Phoenix, AZ 85043  
Phone: (602) 272-9466  
Toll-Free: 800-437-4376

San Antonio/Austin  
1241 Universal City Blvd.  
Universal City, TX 78148  
Phone: (210) 881-1623 (San Antonio)  
Phone: (512) 464-1890 (Austin)  
Fax: (210) 881-2143  
Toll-free: 866-441-0375

Dallas/Fort Worth  
5204 Bear Creek Court  
Irving, TX 75061  
Phone: (214) 237-4566  
Fax: (469) 359-60188

Houston  
6113 Brittmoore Rd.  
Houston, TX 77041  
Phone: (281) 310-6858  
Toll-Free: 800-822-3078  
Fax: (281) 310-6865

Las Vegas  
701 N. Green Valley Pkwy. STE 200  
Henderson, NV 89074  
Phone: (702) 399-7595  
Fax: (702) 399-7457