

**SITE PLANNING  
AND  
INSTALLATION  
FOR  
GENERAL ELECTRIC  
42' MOBILE CT**

**E&W MODEL VB600 / VC400 / VE6XX**

**REV. J USED ON VB619 & UP**

**REV. J USED ON VC406 & UP**

**REV. J USED ON VE613 & UP**

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## **SECTION 1 INTRODUCTION**

- 1.1 The following is set up to assist in the preparation of a site for the Ellis & Watts Models VB6XX / VC4XX / VE6XX. For additional instructions on set-up, transport, operation and maintenance, please refer to the applicable Ellis & Watts Service Manual and to the applicable Ellis & Watts Operator's Manual.

Site Planning includes that portion of the CT project in which the location and orientation of the Mobile CT System is selected. Also referenced are the concrete pad, power, telephone, water, and clearance requirements necessary prior to installation.

Installation looks at all activities which take place once the Mobile CT System has been prepared for shipment, through power hook up at the site.

### **1.2 Division of Responsibilities**

The following shows the division of responsibilities between Ellis & Watts and the customer. Any exceptions should be communicated to Ellis & Watts in writing as early in the planning stages as possible to avoid delays in the schedule.

Ellis & Watts will provide:

- Service Technician to familiarize owner/operator with features and operation of unit.
- Standard price does not include transportation from Ellis & Watts to site, but Ellis & Watts can provide this service for additional cost.

Customer to provide:

- Transportation of unit to site including required permits.
- Foundation constructed in compliance with this document and attached drawings including plumbing and electrical. Depth of foundation below grade shall meet applicable local and national codes.
- A reasonable means of entry and exit for the unit. Approximate total length of Mobile CT System trailer and its tractor is sixty feet (60').
- Labor to connect plumbing, telephone and electrical power.

- Any local or state building permits. (For both the Pad & the Mobile Unit)
- Any connecting corridor or walkway.

Permits to comply with local and/or national codes with regard to the radiation field and its surrounding environment. The mobile CT unit is constructed with lead shielding in the scan room.

**Note:**

**To power up and operate your Mobile CT System, consult the applicable Ellis & Watts Operator's Manual.**

Please contact our Mobile CT System Site Planner at (513) 752-9000 for any questions that you may have.

## **SECTION 2 SITE PLANNING**

### **2.1 Location**

Locating your Mobile CT System is a function of the criteria you have developed for your operation. A list of criteria might include:

- A) Proximity of personnel who might be continuously exposed to low level radiation which is not contained by the lead shielding in the van. It is the customers responsibility to ensure that appropriate radiation protection exist for persons in proximity to the CT operation.
- B) Length of walkway to hospital or other facility.
- C) Side of building for best patient access.
- D) Adaptability to landscaping.
- E) Compatibility between air conditioners and surrounding facility.
- F) Acceptable clearances and ventilation for generator airflow. (See Illustration 3.1.)
- G) Flat level areas for patient lift operation, and for personnel platform set-up. (See Illustration 3.1)
- H) CT trailer must be sited outside of the 1 gauss line exclusion zone of any adjacent MRI installation.

For the new mobile GE Shielded Systems (CXK4 magnet), the 1 gauss line is located approximately 8' from the MR van walls.

The Mobile CT System houses a CT Gantry at one end (above the wheels) with a patient door toward the front.

The air suspension on the trailer is designed for normal highway service. Do not operate the trailer off-road, over the breaks at the beginning and end of steep inclines or on otherwise irregular surfaces. The pneumatic leveling and load compensation system is limited and excessive displacements can cause severe axle/suspension overloading.

It is wise to consider the approach of a 60'-70' tractor and trailer combination will have to make in order to reach the designated parking site (See illustration 3.3).

## 2.2 Support Pad

It is necessary to consult with the architect designing the job with regard to soil conditions and local building codes prior to designing the support pad for the Mobile CT System.

The recommended concrete pad is 28ft wide X 75ft long. The minimum pad size is 10ft wide X 50ft. long, this configuration does not allow for stair set-up, lift operation or service access (see illustration 3.1).

The top of the patient access doorsill is located 49-1/4' (the finished floor is 48-1/2") from the ground when the trailer is in the sited position. Walkways, if any, should be structured accordingly. A patient lift is available as well as a platform and stairs for patient/operator access. (See Illustration 3.1.)

The patient lift, platform, stairs and expanding sides must have adequate space on the pad for both service and operations.

Pad to be level within 1/8" over 10 ft.

## 2.3 Power

The Mobile CT System utilizes 125 amp, 480 volt, 3 phase, 3 wire power (A,B,C configuration) with ground for the CT system and HVAC system.

A standard 35' shore power cable is located in the rear belly compartment (see Illustration 2.1). This cable can be accessed from either the roadside or curbside. One end is already hardwired into the trailer's electrical system. The free end of this cable has a 200 Amp Russellstoll connector attached for compatibility with the site's 480 volt, 3-phase receptacle. (See paragraph 2.3.1) **Connection of shore power is to be performed by local, qualified electricians only.**

### 2.3.1 Power Distribution Requirements

In Ellis & Watts continuing efforts to establish compatibility at all hospitals and to have instant interchangeability with the many systems we now offer in the mobile medical fields, it is our recommendation that all sites supply 480 volt, 3 phase, WYE, 5 wire with ground and neutral, 150 amp dedicated power. However, the

following are the actual power requirements for General Electric CT Mobile Systems:

Receptacle Voltage (Nominal)	480 VAC, 3-phase, 4-wire with ground
Maximum Allowable Daily Line Voltage Variations	414 to 517 VAC
kVA Dedicated Power (Note: nothing else is to be connected to this circuit)	112.5 kVA
Supply Circuit Breaker/Fuses	150 AMPS
Line Voltage Balance	All lines within 2% of lowest line voltage.
Frequency	60 Hertz $\pm$ .5 Hz
Regulation	4% Max at 112.5 kVA max power demand
Feeder Size	Less than 2% voltage drop at max power demand of 112.5 kVA.
Transients	Transients, other than those created by the CT System, shall not be more than 800 volts peak (on a 480V line) with a duration of less than 75 micro seconds.
Ground Conductor	An insulated copper ground conductor, sized in accordance with national and local codes, but not less than AWG #1/0, shall be installed between the facility vault and the Russellstoll receptacle. This ground shall not have a resistance to earth of more than 2 ohms.

2.3.2 Installation of Mobile CT System To Existing Hospital Power Distribution System

For installation of a Mobile General Electric CT Unit at a hospital where the mobile unit will be furnished electrical power from an existing hospital power distribution system through a power distribution panel. The Mobile CT unit must be provided

power through a dedicated branch circuit having no less than 112.5 kVA available power (refer to Illustrations 2.2 and 2.3 for electrical hook-up and phase rotation).

2.3.3 Installation of Mobile CT System To Dedicated Hospital Power Distribution Transformer

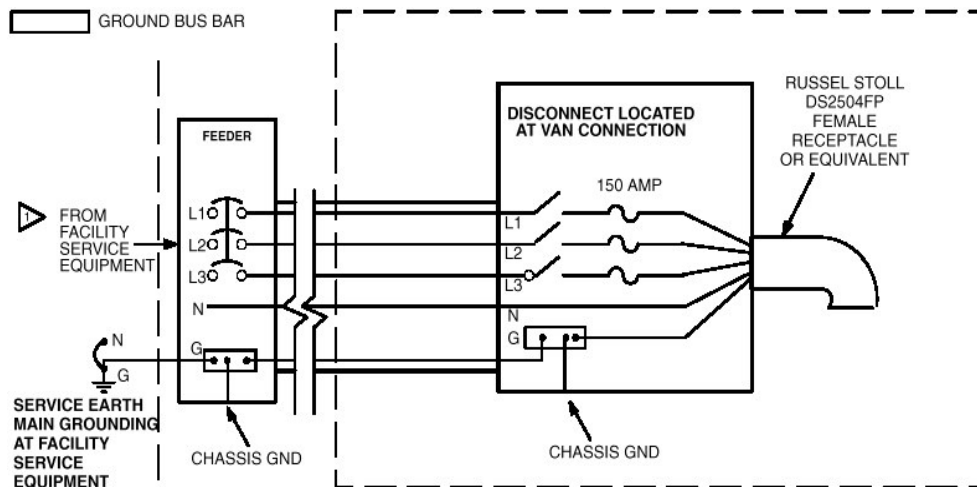
For installation of a Mobile General Electric CT Unit, where the hospital power distribution transformer will feed only the Mobile Unit System, the minimum recommended size power distribution transformer is 112.5 kVA. Refer to Illustrations 2.2 and 2.3 for electrical hook-up and phase rotation.

2.3.4 Mobile Grounding Requirements

Note:

- All work to be done in accordance with national and local electric codes. Information shown here is only a recommendation and must be verified for site national and local codes.
- Ground wires inside enclosures to be taped green for entire visual length for identification.

▷ Main bonding jumper between grounded (neutral) conductor and equipment grounding conductor to be provided in facility service equipment and downstream at separately derived system transformer secondary as shown.



**Illustration 2.1**  
**Shore Power Cable**

## GROUNDING

The ground for our system shall originate at the system power source, i.e., transformer or first access point of power into a facility, and be continuous to our system power disconnect in the trailer. This ground can be spliced with “High Compression Fittings” and should be terminated at each distribution panel it passes through. When it is broken for a connection to a panel, it shall be connected into an approved grounding block with the incoming and outgoing ground in this same grounding block, which is then connected to the steel panel. Never use the steel panel or other material of the panel as the block.

The connection at the power source shall be at the grounding point of the “Neutral-Ground” if a “Wye” transformer is used, or typical grounding points of a separately derived system. In the case of an external facility, it shall be bonded to the facility ground point at the service entrance.

## GROUND WIRE

The ground wire shall be copper wire with a minimum size of AWG 1/0 or the same size as the power feeders whichever is larger. This means that if there is a primary feeder to a distribution panel of 500 MCM with a secondary feeder to our system of AWG 1/0 wire, the ground to the distribution panel shall be 500 MCM with an AWG 1/0 to our system. The ground wire impedance from our system disconnect, including the ground rod, shall not have an impedance greater than 2 ohms to earth as measured by one of the applicable techniques described in Section 4 of ANSI/IEEE Standard 142 – 1982.

### **Special Notes:**

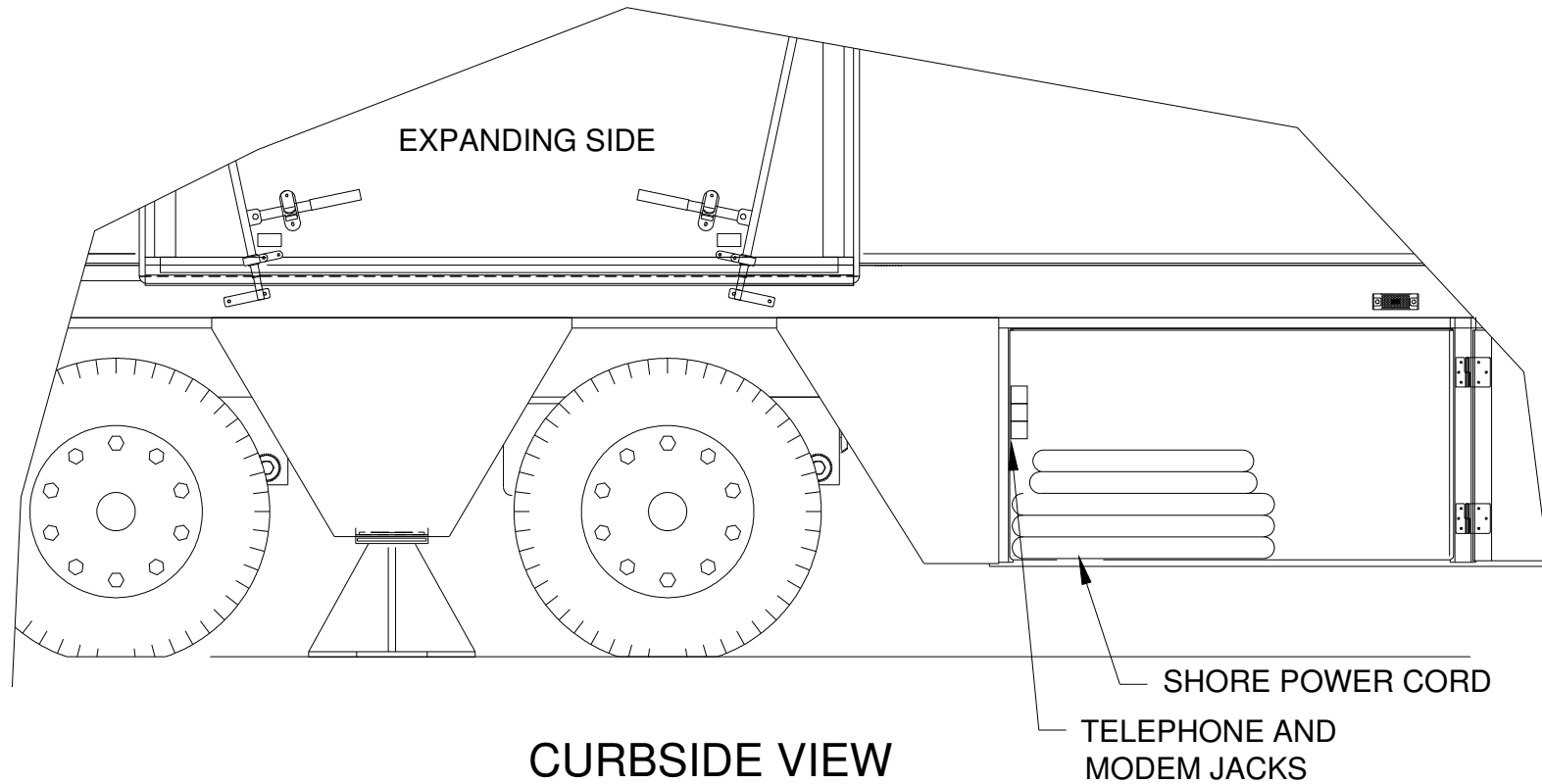
**It is also recommended that a separate (#6 minimum copper) grounding conductor be installed from the main trailer ground lug in the rear curbside belly compartment to a driven ground rod as a supplemental grounding conductor for the trailer. When running (scanning) on generator (NOT RECOMMENDED) the copper wire from the earth ground rod to the trailer ground lug must be installed and used at all times per the NEC.**

**All specifications apply to measurements at the receptacle pins. Line voltage drops from the facility mains to the receptacle must be included in all power calculations.**

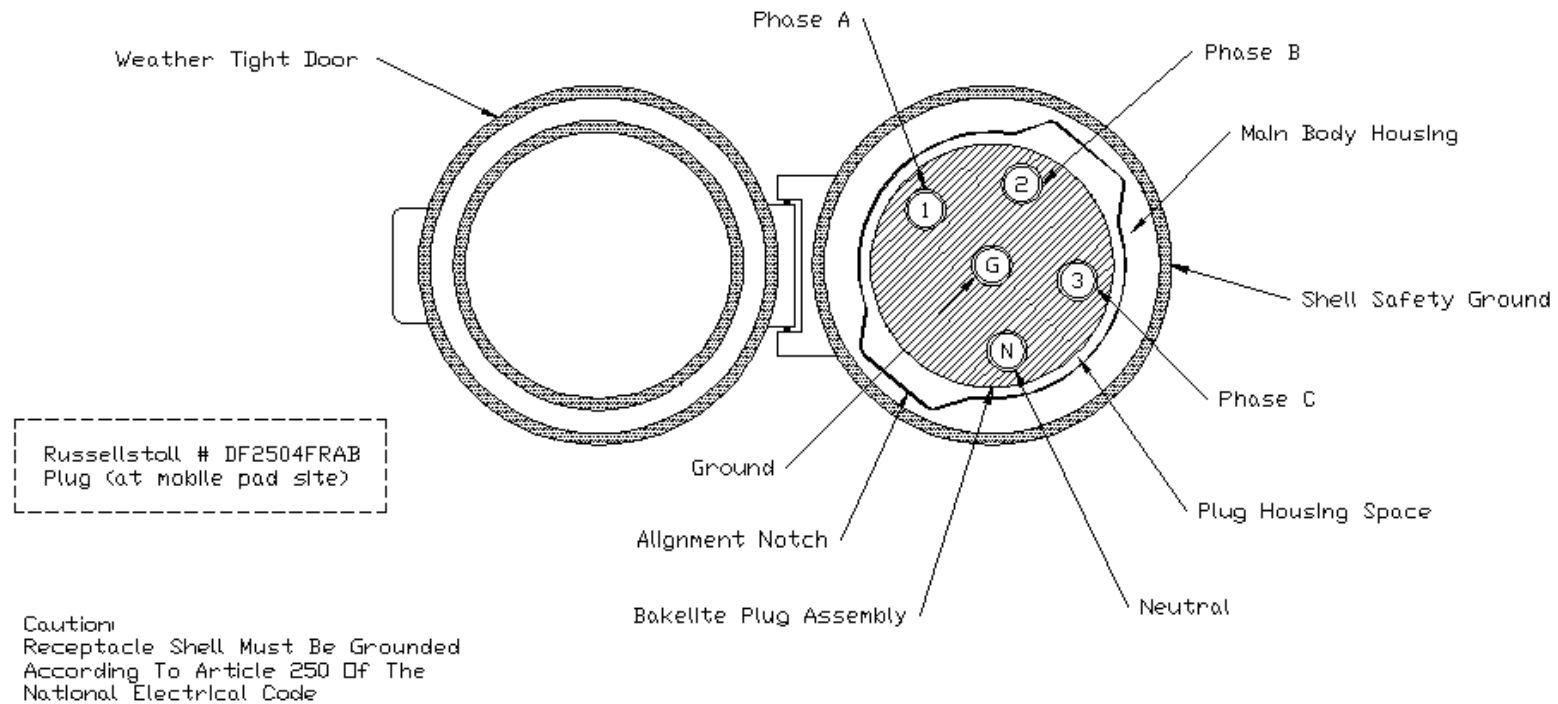
**Instantaneous fluctuations in the line voltage caused by loads other than this Mobile CT Unit must not exceed  $\pm 5\%$ , have a duration in excess of five (5) cycles, and frequency of their occurrence must not be more than ten (10) times per hour.**

**Power lines from the site source to the trailer are not to be run underneath or above the scan room. If it is necessary to run the wires underneath or above the unit, route them so as to avoid the area underneath or above the scan room.**

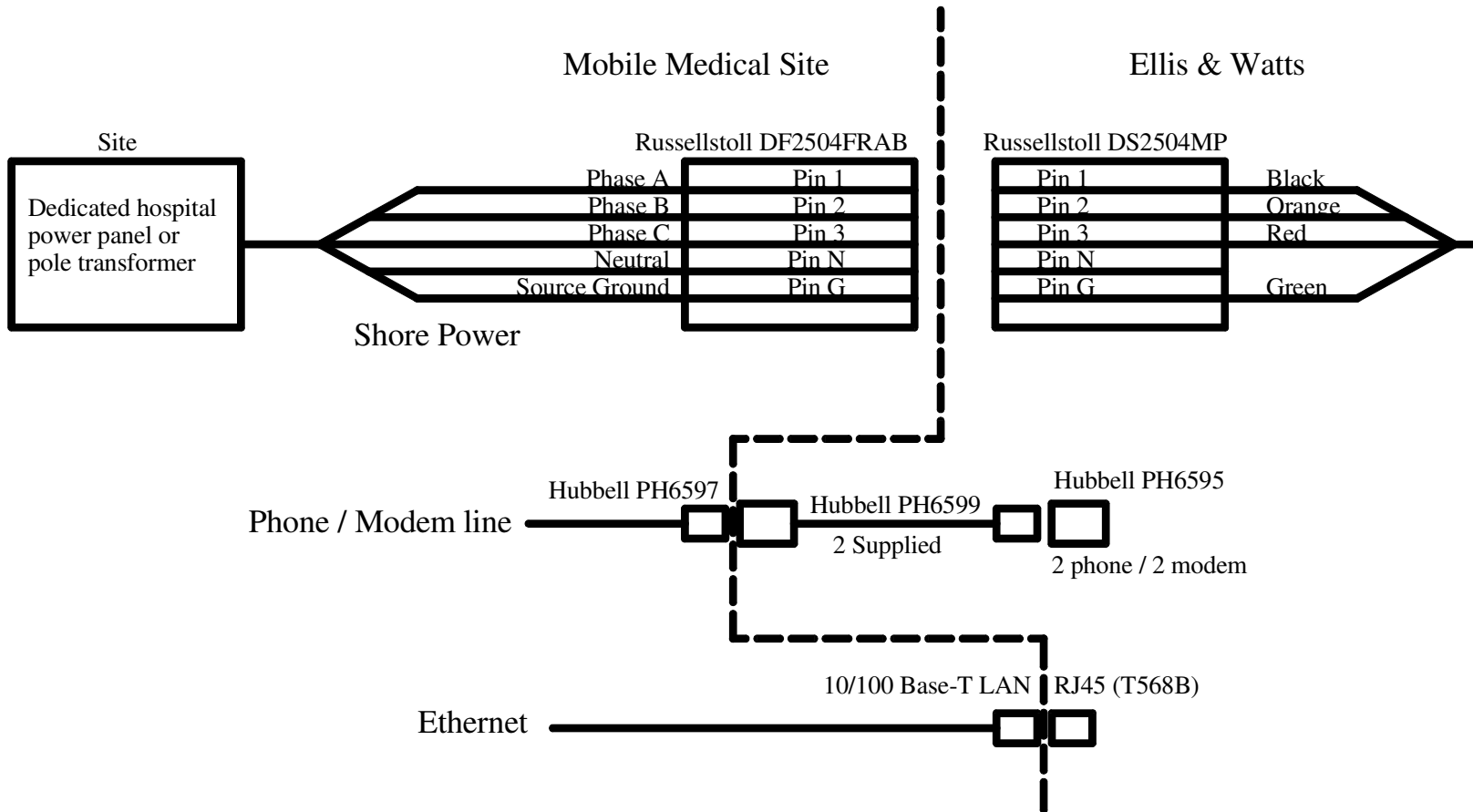
**Customer must install a label stating: "SERVICE DISCONNECT FOR MOBILE MRI/CT UNIT" at hospital power source**



**Illustration 2.1**  
**Shore Power Cable & Telephone Line Receptacles**



**Illustration 2.2**  
**Hospital Receptacle Wiring Configuration**



**Illustration 2.3**  
**Hospital & Van Power Supply Configuration**

## 2.4 Water

In VB6XX and VC4XX trailers, water is necessary to supply the Mobile CT System humidifier and/or optional sink. The water supply tank is located in the third belly compartment on the roadside. The 40-gallon tank has a full load capacity for 24-36 hours. The tank is filled via the standard 3/4" hose connection located on the belly post behind the third belly compartment door. The standard 3/4" hose connection can also be used as a direct supply to humidifier and/or for convenience.

In VE6XX trailers water is necessary only for the optional sink.

**Note:**

**In cold weather conditions, an optional heated water hose is required.**

## 2.5 Telephones

One separate telephone line, one modem line and one CAT-5 data line is terminated in the rear curbside belly compartment (see Illustration 2.1). Telephone and modem receptacles are Hubbell #PH6595. The CAT-5 receptacle is a Leviton #41108-RWS.

The 50ft Hubbell #PH6599 cable is supplied with the trailer. The customer must install Hubbell receptacles #PH6597.

Hospital and local phone lines are to be brought to these lines by the local phone service company.

## 2.6 Air Conditioners

The air conditioning/heating system is comprised of one 4-ton/9kw Bard unit and one 4-ton/18kw unit mounted to the front of the trailer.

The air grills around the air conditioner units must remain clear of obstructions to permit adequate air flow. See Illustration 3.1.

**2.7 Local Codes**

Although the Mobile CT System is manufactured according to stringent quality engineering standards, it is wise to consult local and/or state building code authorities well in advance of installation to avoid any unnecessary delays in the event that special permits are required. Ellis & Watts can produce structural and schematic drawings when necessary, for these cases. In many states and localities, approval has already been granted.

**2.8 Ancillary Space Modules**

When connected to the CT Mobile System, the use of ancillary space modules or weather seals require special consideration.

To prevent vibration of any sort being transmitted to the trailer from the ancillary space module, no hard connection should be made between the two "Soft" connections. "Soft" connections must ensure safe passage from one space to the other, and allow movement of support materials. Weather protection around the doors must be taken into consideration as well. Consult with your architect and/or Ellis & Watts before proceeding with such a design.

### **SECTION 3 INSTALLATION**

#### **3.1 General**

The Mobile CT System represents a substantial investment and should be handled with a representative amount of care and expertise. Therefore, Ellis & Watts offers a service option which accounts for all aspects of installation from obtaining permits to leveling the unit on its final resting pad. For those who prefer to manage these details, the following subsections are indicative of the steps to be taken for a successful installation.

#### **3.2 Packaging**

The Mobile CT System is released from the factory only after it has met the CT system manufacturers and Ellis & Watts' specifications. All portions of the CT system are in place. No articles are loose in the unit. Therefore, once installation of the Mobile CT System is complete, only activities typically associated with final calibrations, customer customization and options will remain.

#### **3.3 Tractor**

An air ride tractor must be used with the trailer. Tractor weights range from 12,000 - 20,000 pounds depending on capacity and are usually provided by the shipper.

#### **3.4 Permits**

As with other forms of ground transportation, certain local, state and federal permits may be required to move the Mobile CT System.

It is the responsibility of the trucking firm involved to obtain such permits, and a confirmation prior to the move is recommended to avoid unnecessary delays.

Maximum weight of system (without tractor) is 40,000 pounds. (Approximately 22,000 pounds on rear stanchions and 18,000 pounds on front jack support legs).

### **3.5 Locating the Mobile CT System**

When the trailer arrives on site, the driver will view the particular access situation. He will then be able to determine the best possible approach strategy to the designated parking site for the Mobile CT System.

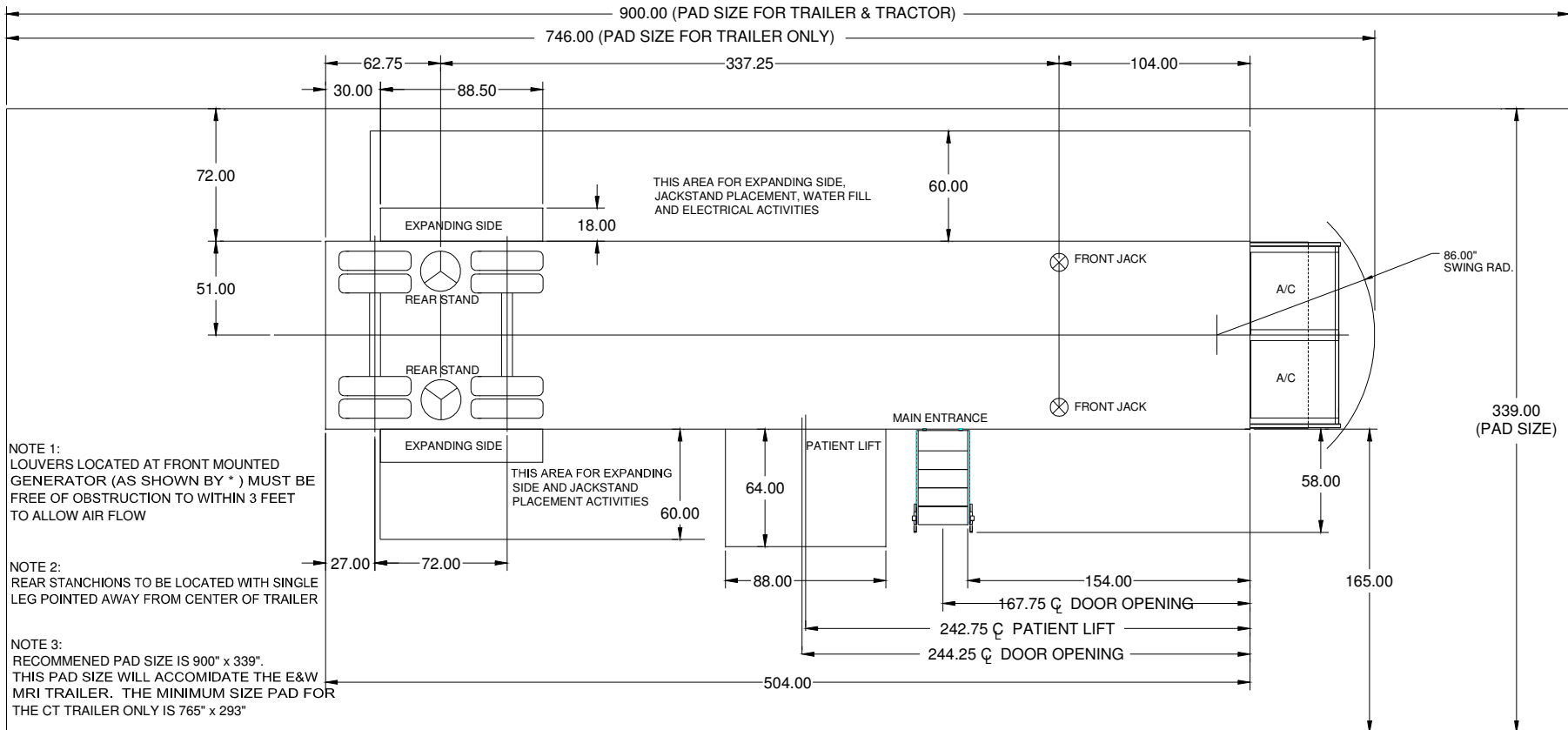
The trailer will usually be backed into place. Depending on the length of the approach and number of turns, this can be done in an hour; or require several hours. Painted or taped markings on the pavement help to guide the driver. Refer to Illustration 3.1 for clearances required.

The air suspension on the trailer is designed for normal highway service. Do not operate the trailer off-road, over the breaks at the beginning and end of steep inclines or on otherwise irregular surfaces is strongly advised against. The pneumatic leveling and load compensation system is limited and excessive displacements can cause severe axle/suspension overloading.

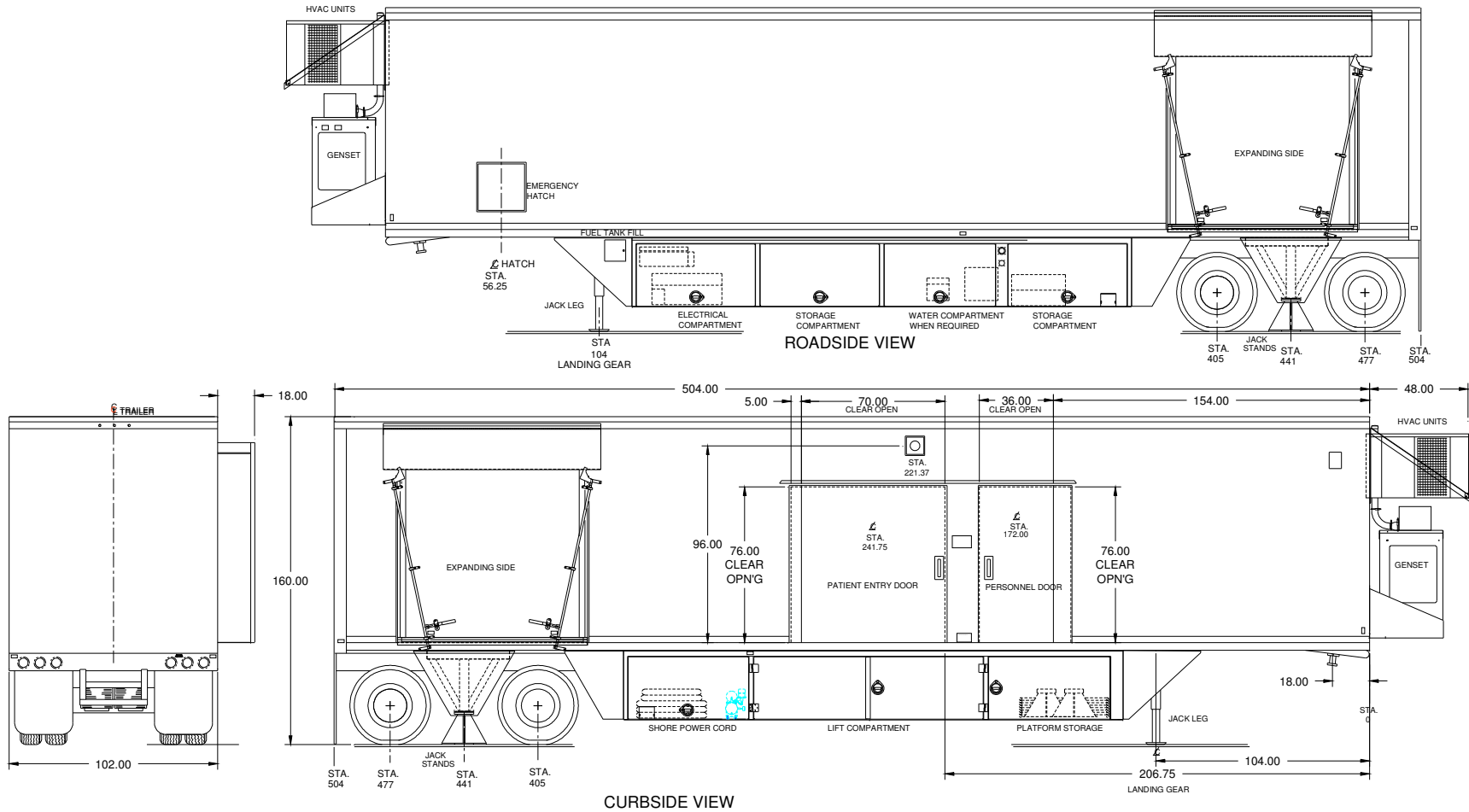
It is wise to consider the approach of a 60'-70' tractor and trailer combination will have to make in order to reach the designated parking site (See illustration 3.3).

If the pad is not within the levelness requirements of 1/8" over 10', aluminum shims may be necessary at the rear stands. Note that wood is not to be used for shims.

Refer to the applicable Ellis & Watts Operator's Manual for details on system set-up.

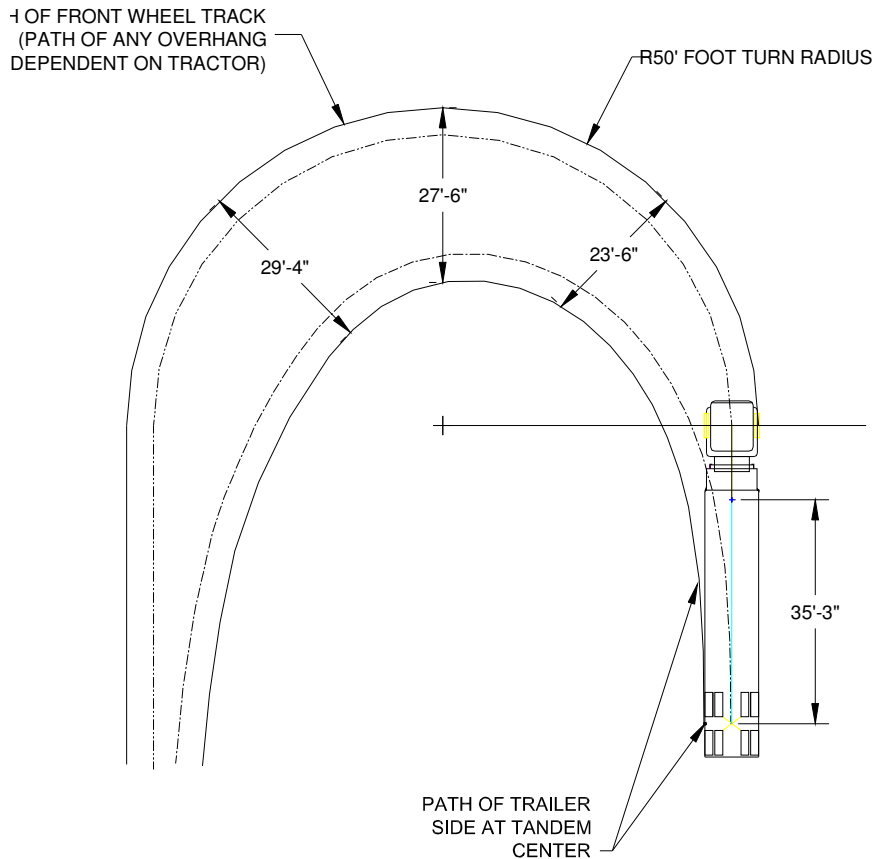


**Illustration 3.1**



**Illustration 3.2**  
**Exterior View**

TYPICAL TRACTOR/TRAILER  
TURN RADIUS  
REQUIREMENTS  
180° TURN  
CT



-17 FOOT TRACTOR  
WHEELBASE EXAMPLE  
-90 INCH STEER  
AXLE TRACK

Illustration 3.3  
Turn Radius

### 3.6 Power Hook-up

The 35' shore power cord is located in the rear belly compartment and can be accessed from either the roadside or curbside. The free end of this cable is to be attached to the site's 480V, 3-phase receptacle. **Connection of shore power is to be done by a qualified electrician.** (See Section 2.3.4)

### 3.7 Telephone Hook-Up

One telephone line, one modem line and one CAT-5 data line for the Mobile CT System is terminated in the rear curbside belly compartment. The hospital and local phone service company should determine the best route and connection location for the incoming service. See section 2.5 for receptacle type.

### 3.8 Water Hook-Up (when applicable)

Sink/Humidifier plumbing: The plumbing contractor will bring the incoming water and drain to the Mobile CT System alongside the water supply tank located at the third roadside belly compartment. The supply water hook up is located in the post behind the third roadside belly compartment.

**Note:**

**In cold weather conditions, an optional heated water hose is required.**

The waste water tank (with sink option) can be drained by connecting a garden hose to the drain tank valve with the other end connected to an approved sewage system.

### 3.9 Radiation Field Warnings

Care should be taken when selecting the site for the CT with relationship to occupied areas. The customer will be responsible for radiation site survey and additional site barriers/warnings.