Specifications, Guidelines & Practices

Concrete Shelter Specifications "Bullet Resistant"



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1.0 GENERAL

- 1.1 This statement of work and specifications are for shelter (s) to be supplied to **Ericsson Inc.** Private Radio Systems. The shelter shall be a prefabricated concrete communication type as manufactured by *Andrew, Rohn, VFP* or an **Ericsson Inc.** approved equivalent. **The specifications in this document are intended to set a minimum level which can be modified to meet specific program requirements.**
- 1.2 The specifications contained herein encompass the labor, equipment and materials for a prefabricated concrete communications shelter. The shelter structure shall be bullet resistant withstanding 30/06 rifle fire at a distance of 15 feet per UL 752 standards. The shelter shall be vandal resistant and be constructed of steel reinforced concrete. The shelter structure shall provide a 2-hour fire rating as defined by the Uniform Building Code and meet Zone 4 seismic requirements. The shelter shall be designed for the explicit use of housing electronic equipment within a controlled atmosphere required for the proper conditions for transmitting and receiving equipment.
- 1.3 Shelters shall incorporate non-porous wall and roof sections, to preclude capillary action, and shall be so designed, and constructed to provide a minimum useful life period of 20 years, without need for major maintenance actions. Manufacturer shall provide shelter maintenance and warranty information.
- 1.4 Shelter manufacturer shall supply and install complete AC wiring systems as required by this specification and in compliance to applicable codes. Electrical systems shall be designed based on preliminary floor plan provided by **Ericsson Inc.**
- 1.5 Manufacturer shall supply and install complete air conditioning and heating systems as required to comply with the environmental conditions of these specifications.
- 1.6 Manufacturer shall be responsible for transporting or for supervising the transporting of a shelter or shelters to their respective sites.
- 1.7 Manufacturer shall design an I-beam skid assembly, <u>if</u> <u>required for transportation to site</u>, based on the requirements of this specification and install the shelter on the assembly. Fabricator will submit I-beam assembly drawings within 10 days after receipt of order.

- 1.8 All shelters shall meet the following specifications and standards:
 - (a) Uniform Building Code
 - (b) BOCA National Building Code
 - (c) Standard Building Code
 - (e) Local Basic Building Codes
 - (f) ANSI-A.58.1
 - (g) UL 752 requirements for low, medium and high power rifle
 - (h) National Electric Code latest addition
 - (I) IEC Illuminating Engineering Society

In the event that two specifications conflict, the more stringent shall apply.

 The order of precedence to be used for this request for bid is the Statement of Work provided by Ericsson Inc. Procurement, specific program requirements and this specification.

2.0 SPECIFIC CONDITIONS

- 2.1 The shelter (s) shall be designed to meet the following conditions.
 - (a) Seismic Zone 4
 - ^(b) Ambient temperature of 70° C (158° F) to -55° C (-67° F)
 - (c) Ambient humidity from (0 100) percent
 - (d) Winds 145 mph (235 Km/Hr) while on specified foundation.

3.0 SHELTER SPECIFICATIONS

- 3.1 The manufacturer shall provide a shelter_____feet wide (interior) X ______feet high (interior) X _____long (interior) to be specified when the order is placed. Outside dimensions shall be specified by the maunfacturer. A typical floorplan is shown in Ericsson drawing 193D1333. A program specific drawing will be provided when the order is placed.
- 3.2 Structural Loading The shelter shall meet the following loading requirements.
 - (a) 200 psf floor loading while lifting or on foundation.
 - (b) 3000 pounds concentrated floor load over 4 square feet area
 - (c) 90 pounds per square foot roof live loading 7 day duration
 - (d) 1000 pounds concentrated roof load over 3 feet square area

- 3.3 Thermal Performance Overall u factor \leq .08 Btu/hr/ degrees F
- 3.4 Operating Environment The shelter shall be sealed to resist dust infiltration and be watertight.
- 3.5 Shelter Construction The shelter shall be precast, preassembled steel reinforced solid concrete. Panel to panel connections to be welded. Manufacture of the precast concrete elements shall occur in a <u>suitable environment (enclosed building preferred)</u>. Manufacturer must have a minimum of one ACI Certified Level 1 Concrete Technician supervising the placing of concrete in the forms.

Floor Section:

Floor section shall be an 8-inch waffled structural precast steel reinforced concrete section. Ribs shall be 2'-0" O.C. transverse and 4'-0" O.C. longitudinal. All surfaces shall be smooth. The interior surface shall be covered with 1/8 inch light colored industrial vinyl floor covering, bonded with a waterproof contact adhesive. The floor shall be supplied with provisions for customer anchoring of equipment.

Roof Section:

The roof section shall be a minimum of steel reinforced 4" solid concrete with 1/8" per foot drainage slope. Ceiling insulation and finish to be foamboard insulation with 3/8" vinyl coated board. Plastic joint or corner trim shall be installed at all panel joints. The roof shall provide at least a 2" overhang on all sides. The roof will be a hip type sloping two (2) directions. It shall be a cap and fit over the walls, leaving no exposed roof to wall joint.

Wall Sections:

Wall section shall be 4" solid steel reinforced concrete with an exterior exposed aggregate finish. Wall insulation and finish shall be foamboard insulation covered with 3/4" thick board, surfaced with fiberglass reinforced plastic. Plastic joint or corner shall be installed at all panel joints. Floor to wall intersection shall be finished with 4" vinyl baseboard. The concrete walls shall overhang the concrete floor a minimum of 7" from the top concrete floor surface. There shall be no exposed wall to floor joint. Inside walls shall be finished with a smooth surface and light in color to permit maximum utilization of available light, and shall be designed to support customer loads as specified.

Steel Reinforcing:

Steel reinforcing to be as per manufacturer's engineered structural analysis.

Insulation:

Standard wall and ceiling insulation shall be foamboard. The insulation R-value shall be consistent with the thermal performance specified in paragraph 3.3.

3.6 Sealing - All joints shall be sealed with a compressible, resilient sealant. There shall be no exposed roof to wall or wall to floor exterior joint sealants. Wall to wall, wall to roof, and wall to floor seals shall be internal.

Exterior Walls:

Surface of walls to be sealed with two coats of Thoroglaze H Sealer and a top coat of Thorosystem's Thorosheen Sealer or equivalent.

3.7 Material Specification - The material specifications shall be as follows.

<u>Concrete</u>

Compressive strength shall be 4000 PSI at 28 days. Mix design of 114-118 lb/cu. ft. structural lightweight concrete expanded shale or expanded clay aggregate is preferred. Mix shall be homogenous. Seeding of aggregate for exposed aggregate finish is not allowed. Cement used in concrete shall be standard Portland cement conforming to the requirement of the "Standard Specifications for Portland Cement", ASTM Designation C150.

Concrete aggregates shall conform to one of the following specifications:

1. "Specifications for Concrete Aggregates", ASTM Designation: C33.

2. "Specifications for Lightweight Aggregates for Structural Concrete", ASTM Designation C30.

Other Materials

Water shall be free from injurious quantities of oil, alkali, vegetable matter and salt. Non-potable water shall not be used in mixing concrete. Reinforcement bars shall be deformed steel bars conforming to the requirements of the "Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement", ASTM Designation: A615.

Welded smooth wire fabric shall be steel wire fabric conforming to the requirements of the "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement", ASTM Designation: A185.

The plywood panels shall be in accordance with stressed-skin panel design of the Timber Design and Construction Handbook.

- 3.8 Door The door frame shall be 16 gauge galvanized steel, primed, painted, and fastened to the wall panel. The door shall be 3'x 7'x 1-3/4" 18 gauge galvanized steel, insulated, primed, painted and installed flush with door check, door stop, weather-stripping, mortise lockset with deadbolt and stainless tamperproof steel ball bearing hinges. The shelter door(s) shall have an internal lock mechanism to allow rapid exit from the building (no key exit). The door shall be equipped with a device to lock the door in the open position in order to prevent the door from being damaged by gusting winds. An illegal entry switch, with form 'C' contacts rated .1 amps at 28 Vdc shall be provided.
- 3.9 Cable Entry Panel Manufacturer shall provide and install a _____ port/waveguide entry panel with _____ inch sleeves and protective blank covers as manufactured by PolyPhaser (PEEP), Microflect or an **Ericsson Inc.** approved equivalent. The size of the cable entry and number of ports will be specified when the order is placed.
- 3.10 Cable Ladder Manufacturer shall provide and install 12 inch wide steel cable ladder/tray for cable distribution and seismic bracing of the communication equipment. The cable ladder shall be *Uni-Strut, Rohn, B-Line, VFP, Inc., Newton* or an **Ericsson Inc.** approved equivalent. The actual quantity required will be determined by size of the building and requirements. Location of the cable tray/ladder will be defined when the order is placed.
- 3.11 Storage Cabinet and Table Manufacturer shall provide a standard 3 drawer file cabinet and folding table. Location will be defined when the order is placed.
- 3.12 Handling Shelter shall have cast-in permanent lifting devices so that additional parts of bolt-on devices are not required for lifting the shelter.
- 3.13 Generator Room An electrical generator room may be required. If required, the generator room shall be part of the concrete shelter with a solid fireproof wall between it and the communication equipment room, and a separate entrance door. The generator room shall be unfinished with the same type door as the communication equipment room. Wall entries shall be provided for generator engine inputs and exhaust, electrical cables and alarms. The electrical generator engine may be diesel, natural gas or LP which will be specified when the order is placed. Generator requirements are provided in a separate document.

4.0 ENVIRONMENTAL CONDITIONS

- 4.1 The shelter shall be designed and equipped with an environmental control system consisting of air conditioning and heating capable of maintaining the inside temperature under operating conditions, plus sensible and latent heat gains from personnel, at 24° C (75° F) (\pm) 3° C (5° F). The internal temperature shall not rise above 30° C (84° F) with an outside ambient temperature of 45° C (110° F) (temperatures are to be maintained while the equipment is operating at 75% duty cycle) and shall not fall below 18° C (-30° F) with an outside ambient temperature of -35° C (-30° F) while equipment is OFF.
- 4.2 Air conditioning units shall be wall-mounted type as manufactured by *Bard, Marvair, Carrier* or an **Ericsson Inc.** approved equivalent. The units shall be equipped with as a minimum low ambient and compressor anti cycle controls, and integral resistance heat strip (s) and permanent expanded metal dust filter (s).
- 4.3 The air conditioning unit (s) shall be controlled via a separate remote mounted thermostat. If more than one unit is specified a redundant lead lag controller which allows for approximate equal operating time on each air conditioner unit is to be provided. The system shall provide switching to prevent both units from activating at the same time so as to prevent power surge.
- 4.4 The air conditioned air shall be directed toward the center aisle as shown in Ericsson drawing 193D1333 to support the Ericsson station equipment.
- 4.5 All temperature control equipment shall be installed in strict compliance with manufactures instructions and guidelines.
- 4.6 Heating and cooling calculations based on manufacturer installed equipment and customer installed heat loads shall also be required. Ericsson will provide the manufacturer with heat dissipation information.

5.0 ELECTRICAL AND LIGHTING

- 5.1 The shelter manufacturer shall supply and install a complete working electrical system including the following:
 - a) Main power distribution and provision for service entrance
 - b) Lights, interior and exterior
 - c) Receptacles and circuit breaker for communications equipment as specified when the order is placed.

- d) Receptacles for customer and user test-equipment shall be on separate circuits.
- e) Heating and cooling
- f) Conduit, fittings and wiring
- g) Lightning and surge protection Generator transfer switch, if required
- 5.2 All equipment and materials furnished and installed shall be new and of the highest quality, and shall be standard products of manufacturers regularly engaged in the production of such equipment and materials. Materials shall also be of the latest standard design, and shall be *Underwriters Labrotories* (UL) listed where applicable.
- 5.3 Installation shall comply with the latest edition of the USA National Electric Code, NFPA 70.
- 5.4 Electrical System (Minimum Requirement) -
 - The manufacturer shall supply a minimum of 200 ampere, 120/240 VAC, single phase, 60 Hz, or equivalent power with main breaker, snap-in utility power distribution panel as manufactured by General Electric, or an Ericsson Inc. approved equivalent. The enclosures shall be NEMA 1 surface mounted. Electrical installation and wiring shall conform to the latest edition of the National Electrical Code and shall consist of the following as a minimum: surface mounted EMT conduit: grounded duplex outlets, one every 4 feet on 3 walls; fluorescent lights (two lamp type fixtures) as required with inside switch; 200 AMP 120/240 VAC main; 20, 30, or 40 position breaker box with a minimum of 16 single pole 20 AMP breakers (as required).
- 5.5 Circuit breakers for all manufacturer installed equipment and customer loads shall also be provided.
- 5.6 Manufacturer shall provide and install a Joslyn Model 1265-85, PolyPhaser IS-PM240-BP or Ericsson Inc. approved equivalent, AC surge arrester for connection to the incoming power lines.
- 5.7 A rigid metal conduit, shall be provided and sized accordingly for the service entrance conductors.
- 5.8 All interior shelter wiring shall be installed in surface mounted electrical metallic tubing (E.M.T.), Article 348 of the USA National Electric Code shall apply. Other application notes are illustrated in Figure 5.
- 5.9 All conductors shall be properly sized and rated for the load and application, and, shall be no smaller than # 12 AWG. Conductors shall be copper, type THHN.
- 5.10 The splicing of conductor wires should be kept to a minimum. Where splices are required, wire nuts shall

be used and shall be properly sized, insulated type connectors.

- 5.11 Conductors shall be continuous from outlet to outlet. Splices shall be made within outlet boxes or junction boxes only.
- 5.12 A minimum of 6 inches of extra conductor wire shall be provided at each outlet to make splices or joints, except where it is intended to loop through sockets, receptacles and other fixtures without splices or joints.
- 5.13 Receptacles shall be rated 20 amp, 120V, 3 wire, grounding type, specification grade duplex and shall be on separate circuits. In applications where cabinet power is fed from overhead receptacles, the outlets shall be the twist-loc type. This "twist-loc" (L5-20R or equivalent) receptacle will be defined as part of the original drawings. The number of outlets, locations, and positions will also be defined. Typical spacing for duplex wall outlets is (4) four-foot intervals at 18 inches above finished floor level, except where specified otherwise.
- 5.14 Manufacturer shall provide a lighting system consisting of quality grade 80 watt surface mounted fluorescent light fixtures equipped with lexan type diffusers, RFI noise suppression filters. The system shall be designed to provide as a minimum illumination of 70 foot candles (fc) at 36 inches above the floor. The fixture shall be installed taking into consideration the location of the communications racks and equipment.
- 5.15 Exterior lighting shall consist of a 75 watt incandescent bulb. The fixture(s) shall be supplied with vandal resistant lens and photo cell with a switch override.

6.0 ALARMS AND FIRE PROTECTION

- 6.1 Form "C" type contact alarms shall be provided for the following functions:
 - a) Door entry alarm
 - b) Smoke alarm
 - c) Low temperature alarm
 - d) High temperature alarm
 - e) Air conditioner fail alarm
 - f) Power fail alarm
 - g) Generator alarms, if required

The alarm contacts shall be rated for 0.1 amps at 28 Vdc.

- 6.2 A 4' x 4' wall mounted Telco/alarm board shall be provided for punchblock mounting. The shelter alarms shall be wired to a Type 66 block on the Telco/alarm board.
- 6.3 The minimum fire protection required for the shelter is a smoke alarm and a Class ABC fire extinguisher. An automatic fire suppression may also be required.

7.0 GROUNDING SYSTEM

- 7.1 Grounding of the communications shelter must be consistant with the ERICSSON grounding requirements for communications sites and shelters as defined in LBI-39067.
- 7.2 The manufacturer shall install a "halo" ground system consisting of a #2 AWG stranded green insulated copper halo located approximately 6 inches below the ceiling (see Figure 2 or the Ericsson Grounding Guidelines & Practices, LBI-39067A) with vertical #2 AWG bare/tinned solid copper drops at each corner of the building (see Figure 1 e.g. "PVC" Nipple). At these drop locations a length of bare/tinned solid copper wire capable of extending through and beyond the PVC nipple at least 10 feet shall be coiled and secured to the wall. The customer will use these to connect to the on site grounding system.
- 7.3 The shelter floor will be supplied with penetrations as per Figure 1 to allow the customer to exit at each corner wall location with the #2 AWG halo ground. Silicone sealer or equivalent shall be supplied for customers use to seal these penetrations after grounding connections have been made. An internal shelter "ground-bar" shall be installed as described in Figure 3.
- 7.4 Cable trays, ladders, and metal doors shall be bonded to the internal ground ring as illustrated in Figure 4.
- 7.5 Conduits and conduit couplings shall be bonded to the ground system in a manner consistent with attached Figure 5.
- 7.6 All coax cable and/or waveguide entry grounds will terminate at the "ground window" or a *PolyPhaser Earthed Entry Panel* (PEEP) ground bar installed in an area near to, and/or below the cable multi-port entry panel. A description and example of the ground bar is illustrated in Figure 3.

NOTE

Installation and wire attachment notes are provided on the drawing. Use of the "antioxidant" at all dissimilar metal connections is highly recommended!

7.7 Grounding of electrical power and surge suppression equipment shall be done in strict compliance to the latest edition of the National Electric Code and manufacturers data.

8.0 QUALITY ASSURANCE

- 8.1 The shelter manufacturer shall have a quality assurance program to ensure that its buildings meet the industry standards. Through this program incoming and in process inspections, components, assemblies, and finished shelters shall be checked for compliance with customer specifications, engineering specifications and drawings. An inspection log shall also be maintained with inspection disposition recorded by the Quality Assurance inspector. These records shall be available for inspection upon request. The major inspection categories are I-beam skid, framing, assembly, concrete, steel assembly, electrical, finish, grounding and preparation for shipping.
- 8.2 All equipment and hardware shall be installed in the shelter using best commercial practices. All wall and floor mounted equipment shall present a neat and symmetrical appearance and shall be installed to withstand shock and vibration due to shipping.
- 8.3 Shelter and accessories, when finished, shall be complete in every respect and ready for use intended.

9.0 DOCUMENTATION

- 9.1 Manufacturer shall submit, after receipt of order, preliminary drawings and documentation consisting as a minimum the following.
 - (a) Shelter layout and structural dimensions. Included shall be drawings and applicable data on equipment included as part of the shelter.
 - (b) A legend which identifies major components and systems.

- 9.2 **Ericsson Inc.** will after receipt of preliminary drawings and design information review and approve and return one signed copy with one of the following:
 - (a) Approved: Prints so marked will authorize the manufacturer to proceed with fabrication of the shelter.
 - (b) Approved as noted: Prints so marked will authorize the manufacturer to proceed with the fabrication of the shelter only after the necessary corrections to drawing have been completed.
 - (c) Not approved: The manufacturer shall make the corrections on the drawings and will be required to resubmit for customer approval. The time required for such resubmitals of drawings does not entitle the manufacturer to any extension of time. However, customer may grant extension upon request if time permits.

– **NOTE** –

Construction of the shelter shall not begin until customer acceptance of the preliminary drawings.

- 9.3 The manufacturer shall also provide upon completion the following:
 - (a) One set of "as-built" drawings and parts list shall be completed and provided with a shelter on shipment. An Operation and Maintenance Manual shall be provided with each shelter system. Included in this manual as a minimum will be manufacturers data and warranty information on all available electrical systems and supplied equipment. Shelter start-up information and maintenance procedures are also to be provided.
 - (b) Manufacturer shall provide quality assurance acceptance documentation on completion of the shelter.

10.0 CERTIFICATION

- 10.1 **Ericsson Inc.** will provide the manufacturer the final site information with purchase order.
- 10.2 It is the manufacturers responsibility to supply **Ericsson Inc.** with any necessary approval or state certification that may be required, PE sealed drawings up to six (6) sets may also be requested.

11.0 INSTRUCTIONS TO BIDDERS

- 11.1 The shelter bidder will submit the following information with his proposal:
 - (a) Price
 - (b) Delivery schedule
 - (c) Shipping cost (separately)
 - (d) Verification that the shelter will be approved in the State where required.
- 11.2 The manufacturer will guarantee that all materials and workmanship shall be free from defect for a period of two (2) year after delivery.
- 11.3 The manufacturer will guarantee the shelter construction for a period of five (5) years after completion.
- 11.4 The manufacturer will address each paragraph of this specification and explain their compliance or exceptions.
- 11.5 Technical questions regarding this specification should be sent to:

Ericsson Inc.

Private Radio Systems CSC Bldg, Mountain View Road Lynchburg, Virginia 24502

Attention:	G. E. "Buck" Rogers SR
Telephone:	(804) 528-7836
Fax:	(804) 528-7129

Grounding and Application notes:

- a. apply "no-ox" grease to all ground bar of halo ground connections; wipe clean all excess.
- b. bond exterior door and frame to halo ring; see detail G10.
- c. make all connections to ground bar with two-hole lugs.
- d. coil 8 feet of #2 green for future connection to exterior ground ring.
- e. use only brass grounding hardware except where noted; see stable below for approved part numbers:
- f. jump all breaks in conduit, junction boxes, connectors, etc., with #6 green.
- g. ground all metal boxes larger than $4{\times}4$ and metal framework to the halo ground with #6 green.
- h. select grounding clamps for conduit in accordance with the following table:

CONDUIT SIZE	WIRE SIZE	GROUND CLAMP #
1/2 - 3/4"	#4 - 6	T & B 3846
1/2 - 1"	#14 - 2	T & B 3849
1/2 - 1"	#2 - 6	Т&В#2
1/2 - 1"	#4 - 4/0	Т&В 3902
1/2 - 2"	#6 - 4/0	Т&В 3970
1 1/4 - 2"	#2 - 6	Т&В#З
1 1/4 - 2"	#4 - 4/0	Т&В 3903
2 1/2 - 3 1/2"	#2 - 6	T & B #4
2 1/2 - 3 1/2"	#4 - 4/0	Т&В 3904
4 - 5"	#2 - 6	Т&В#5

Application notes for use with the illustrations and figures that follow (1 through 5).



Figure 1 - Some Of The Ways The Inside "Halo" Ground Ring Is Connected To The External Ground Ring.

NOTE

The PVC nipple is filled with silicone rubber or a sealant as a moisture barrier and pest deterrent.



Figure 2 - Internal "Halo" Connections

The drawing below illustrates various means of connecting to the internal "Halo" or ground ring. The drop at "A" denotes the manner T&B crimps are used to attach an exit ground drop from the inside "Halo." The drawing at "B" makes use of a better connection using the "Cadweld" or exothermic connecting method.

— **NOTE** –

Only one "Halo" splice may be installed per ground ring. Other attachments are to be made using the drop connections shown in these drawings.

- **NOTE** –

The illustration "HALO GROUND INSTALLATION" represents one method used to attach the "halo" to the inside wall.



Figure 3 - Two Examples For Ground Bar Installation

When using a copper ground bar as a common point for internal shelter grounding, use one of the two methods shown below to attach the ground bar to communications shelter wall.

NOTE –

At "A" insulators are used to support ground bar, while insulated "shoulder washers" are use at "B" to support the ground bar. In either case, the ground bar should be isolated from the shelter walls, support members, and studs.



Figure 4 - Bonding Cable Trays and Metal Doors

This drawing illustrates various techniques used when bonding cable trays and metal doors. The connections illustrated above are necessary to preserve ground integrity to all metal objects within the communications shelter.

– **NOTE** –

If the cable ladder is made of aluminum, use a connection that allows dissimilar metals to become a counterpart. Use of *"No-Oxy"* compound is recommended (available from PolyPhaser Corp).



Figure 5 - Typical Conduit Grounding

This drawing illustrates typical conduit grounding techniques.



SHELTER WORKSHEET

Complete the following information about the site(s) for which you are planning a shelter installation, and the individual who should be contacted if additional technical information is required. *Please print or type*

Customer Name:		
Customer System Name:		
Site Name:		
Site Address:		
City:	State/County:	Zip:
Technical Contact		
Name:		
Company Name:		
Business Telephone:		
Equipment S	election	
Description		<u>Quantity</u>
1. Structural Options		
Shelter Size, W x L	x H(ft or meters)	
(Inside dimensi	ons nominal)	
Structural Openings		
Waveguide Feed-thru Plat	te	
port		
Floor Cable Entry Slot		
PVC Sleeve Opening		
Additional Rectangular O	penings	
2. Architectural Options		
Exterior Finish*		
Steel Door, W x H	(inch or cm)	
Bullet-Resistant Door		
SPSA/44 Mag		
HPR/30.06		
Door Accessories		
Deadbolt Lock		
Lock guard (pick plate)		
Hydraulic Door Closer		
Door Canopy, Wx	H (inch or cm)	
Interior Options		
Insulation, with wood pan	el fiberglass reinforced plastic	
R-12, R-18	_, R-22	
Floor Tile		
Sub-floor		
Partition Walls, Wx	H (ft or meters)	
Partition Wall Doors, W_	x H (ft or meters)	
Folding Wall Desk, 16 ind	ch x 20 inch	
File Cabinet		

* Washed aggregate finish is standard with the basic shelter. Optional exterior finishes are available, and can be quoted upon request.

Description	<u>Quantity</u>
3. Electrical Systems	
120/240 VAC, 60 Hz single-phase100A,200A,	Other (Specify)
120 VAC, 60 Hz three-phase100A,200A,	Other (Specify)
220 VAC, 50 Hz single-phase100A,200A,	Other (Specify)
Generator Receptacles	
100A,200A, Other (Specify)	
1 Phase,3 Phase	
Generator Mating Plug	
100A,200A, Other (Specify)	
1Phase,3 Phase	
Ground Fault Interrupt Receptacles	
Additional duplex receptacle, 20A/120V, 60 Hz	
Additional A/C receptacle, 20A/240V, 60 Hz	
Additional A/C receptacle, 20A/220V, 50 Hz	
Additional Circuit Breakers (specify rating/quantity)	•••••
Amp/Qty Amp/Qty	
1 -pole, 240V	
2-pole, $240V$	
3-pole, 240V	
1 -pole, 240V//	
Ligning Systems	
Wire Cuard for fluorescent future	
A surviva mismatia lang for fluorescent	
Additional Incondescent 100 wett	
Additional Incandescent, 100 watt	
Emergency Lighting 7.5 wett	
Destocall	
Filotocen Switches and Controls	
Timor min hr	••••••
1 mer, mm m. Monual Safaty Switch	
$\frac{1000}{2000} = \frac{1000}{2000} = \frac{1000}{2000}$	
100A,200A,11 hase,5 1 hase	
$100 \land 200 \land 1 \text{ Phase} \qquad 3 \text{ Phase}$	
100A,200A,111iase,511iase	
4. Grounding/Lightning Protection	
Ground Bar System	
Halo Ground System	
Perimeter Ground Bus System	
External Ground System	
Ground Drop (equipment)	
External Ground Drop	
Ground Bar, 1/4 inch xx (inch or cm)	
Conduit Grounding	
Faraday Cage	
Surge Arrester	
Primary Arrestor alarms 1 Phase3 Phase	
Secondary Arrestor	

Description

<u>Quantity</u>

5. HVAC Systems	
Air Conditioning	•••••
Wall Unit,BTU/H 1Phase 3 Phase	
Heater	
Heat strip Watts	
Economizer & heat strip Watts	
Lead/Lag Timer	
Window Unit BTU/H	
Heating Systems	
Forced Air Heater Watts	•••••
Flectric Baseboard Watts	
Ventilation Systems	
For Ventilation Systems.	•••••
Fan ventilation System,CTM	
Battam Varte Sustan	
Ballery veni System	
b. Cable Ladders/ wireway	
Cable Ladder, 6 inch W x (ft or m) L,GoldGray	
Cable Ladder, 12 inch W x (ft or m) L, GoldGray	
Cable Ladder, 18 inch W x (ft or m) L, GoldGray	
Cable Ladder, 24 inch W x (ft or m) L, GoldGray	
Junction Tees	
Wireways	•••••
4 inch x 4 inch, 10 ft section	
4 inch x 4 inch, 5 ft section	
4 inch x 4 inch, 1 ft section	
4 inch x 4 inch, 90° elbow	
4 inch x 4 inch, tee section	
4 inch x 4 inch, closing plates	
7. Safety/Security Options	
Alarm Systems	•••••
Mounting Board (telco/alarm)	
Terminal Cabinet	
Open-door Alarm	
Smoke Alarm	
High-temp Alarm	
Low-temp Alarm	
Humidity Alarm, High, Low	
Power-failure Alarm. 1 Phase. 3 Phase	
Air Conditioner Fail Alarm	
Safety/First Aid	
Battery Room Safety Kit	
Emergency Evewash Station	
First Aid Center	
Fire Extinguisher Type lb	
Fire Suppression System	
Control Panel Ungrade	
Double Room Design	
Double Room Design	

Description		<u>Quantity</u>
8. Spare Parts		
<u> </u>		<u> </u>
9. Transportation and Additional Service		
	Ericsson	Vendor
Transportation by:		
Off-loading:		
Site Setup:		
Civil Work & Site Preparation		

NOTICE !

In the next twelve pages that follow are examples of concrete buildings configured in sizes 12 X 14 feet through 12 X 24 feet. The first six (6) drawings are shown *without* generator room attached. The final six drawings are configured *with* the generator room addition.



Basic configuration of 12 X 14 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 16 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 18 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 20 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 22 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 24 concrete communications shelter, see notes and general specifications.



Basic configuration of 12 X 14 concrete communications shelter with generator room attached. See notes and general specifications on each drawing.



Basic configuration of 12 X 16 concrete communications shelter with generator room attached. See notes and general specifications on each drawing.







Basic configuration of 12 X 20 concrete communications shelter with generator room attached. See notes and general specifications on each drawing.



Basic configuration of 12 X 22 concrete communications shelter with generator room attached. See notes and general specifications on each drawing.





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