



# Emergency Services Communications Center

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Brad Solon, Plans Inspector  
Building Inspection Division  
City of Rapid City  
300 6<sup>th</sup> St.  
Rapid City, SD 57701

August 18, 2004

**Subject:** Site plan for a new electronics equipment shelter for the  
Rapid City-Pennington County 9-1-1 Backup Dispatch Project

Brad,

The Rapid City-Pennington County 9-1-1 Backup Dispatch Project (Backup Dispatch Project) is a Homeland Security Grant Program funded project that will establish a backup 9-1-1-dispatch facility in the basement of the Rapid City Fire Department Station 6 at 1920 Promise Rd. The overall project is scheduled for completion in early 2005.

An integral part of this project is the installation of required radio equipment that will allow 9-1-1 Dispatchers to communicate via VHF, UHF and VHF Trunked radio frequencies, with emergency responders throughout Pennington County. An agreement with Western Wireless has been made to locate 20 directional antenna's on their existing cellular tower next to Station 6. The agreement does require us to install our own equipment shelter and electric meter. This site plan will detail our intended plans to locate and install the new equipment shelter and provide electric power to it.

## Location of the new equipment shelter

Please refer to attachment 1 for a site sketch showing the proposed location of the 6x8x8 Thermo Bond equipment shelter.

The proposed location of the new shelter on the west side of the existing Western Wireless shelter is intended to take advantage of an existing 4" conduit located near the south-west corner of the existing Western Wireless shelter. This conduit was installed with this project in mind. This conduit will be used to run three (3) 25-pair wires from inside the phone room on the main floor of Station 6 to the new equipment shelter. The three wires will come out of the conduit and be routed into the new shelter where they will be connected to radio control stations. Antenna lead wires will then exit the new shelter and proceed under the existing ice cap, to the inside of the north-west leg of the tower where a new cable ladder will be installed to facilitate running the antenna lead cables from to their individual antennas.



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It is crucial that the new shelter be located as close as possible to the 4" conduit. We are proposing to leave 8' of space between the existing security fence around the tower and the south edge of the new shelter. This will allow access to the electric service for the Western Wireless shelter. We are also proposing to leave 18" of space between the Western Wireless shelter and the new shelter to allow for building maintenance and weed control between the shelters. The door on the new shelter would face north.

## Concrete pad for the new equipment shelter

See attachment 2 for a drawing of the proposed concrete pad.

The Thermo Bond shelter requires installation of a 6'x 8' concrete pad that has 1' wide, 18" thick edges and is 6" thick in the middle. The new equipment shelter weighs 5,000 lbs. The concrete pad will sit on a 6" gravel fill base and will have #4 rebar 24" on center. There will be four (4) ¾" x 6" anchor bolts installed in the four corners of the pad to secure the shelter to pad. The concrete used for the pad shall attain a minimum ultimate compression strength of 4,000 PSI within 28 days. All wire mesh will have a minimum of 2" concrete cover.

## Electric Plan

We will be hiring an electrical contractor to bring electric power to the equipment shelter, in accordance with all City electrical and building codes.

## The new Thermo Bond equipment shelter

### ENGINEERING DETAILS

#### 1. SIZE

The shelter shall be 6' wide O.D. x 8' long O.D. x 8' high I.D.

#### 2. DESIGN

The minimum **R-Values** in the floor and walls will be 11, R-19 in the roof.

#### 3. FLOOR LOADING

The minimum floor loading shall be **200 pounds** per square.

#### 4. ROOF LOADING

The minimum roof loading shall be **150 pounds** per square foot.

#### 5. ROOF IMPACT RESISTANCE

The minimum roof impact resistance shall be **220 pounds** with no visible damage to either the exterior or interior of the roof or shelter.



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## 6. WALL WIND LOAD

The minimum wall wind load shall be 150 MPH.

## 7. AIR INFILTRATION

There shall be **no air infiltration** of the shelter when measured before installation of any through the wall, floor, or roof items when exposed to winds of 50 mph.

## CONSTRUCTION DETAILS

### 1. SKID ASSEMBLY

The skid assembly for the shelter shall have a minimum of two 6" x 9 lb. beams with 3½" O.D. pipes running through the beams and welded into place. 2" x 2" x ¼" angles shall be placed between the beams every 4' O.C. The complete skid assembly shall be painted with a rust preventative paint after fabrication and secured to the finished sub-floor with high strength 3" lag bolts.

### 2. FLOOR ASSEMBLY

The floor system shall be comprised of 1 layer of ¾" CDX plywood (exterior side) and 1 layer of ¾" tongue and groove plywood (interior side) with 3½" of R-11 fiberglass batt insulation. The floor is constructed of 2"x 4" 16"oc. Before the floor assembly is attached to the skid assembly and the installation of the rodent shield mesh, the underside of the floor assembly shall be treated with an application of a coat of penetrating liquid bituminous sealer.

### 3. RODENT SHIELD

The complete underside of the floor assembly shall be covered with a 16-mesh .011 wire mesh rodent shield before the floor assembly is attached to the skid assembly.

### 4. INTERIOR FLOOR FINISH

The interior surface of the shelter floor shall be covered with a commercial grade vinyl tile. The covering shall be held in place with commercial grade glue.

### 5. ROOF SYSTEM

The roof system shall be comprised of 1 layer of ¾" CDX plywood (exterior side) and 1 layer of 5/8" OSB with laminated glassboard (interior side) with 5½" of R-19 fiberglass batt insulation. The roof construction shall be 2"x 6" 16" oc.

### 6. EXTERIOR ROOF FINISH

The exterior of the roof shall be covered with a commercial grade 45 mil nylon reinforced rubber roofing material secured in place with a commercial grade contact glue. All seams are heat welded. A galvanized metal roof edge shall cover the perimeter of the roof. The roof shall be sloped from the center to the sides to provide proper drainage.



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## **7. INTERIOR WALL AND CEILING CONSTRUCTION**

The interior walls and ceiling shall be a minimum of 5/8" OSB (oriented strand board) with .030 fiberglass reinforced plastic laminated to the interior side.

## **8. EXTERIOR WALL CONSTRUCTION**

The exterior walls of the shelter shall be of natural stone aggregate with a general color of "Buff" (lite brown/tan).

## **9. WALL, ROOF, FLOOR INTERIOR CORES**

The interior core of the walls, roof, and floor shall be filled with R-11 & R-19 fiberglass batt insulation.

## **10. SEAMS**

At all points on the exterior of the shelter where two pieces of material come together, butt against each other, overlap each other, or are fastened one to the other, the seam shall be sealed with an industrial grade polyurethane sealer during and after final assembly to insure water tight joints. A one-piece aggregate angle shall be installed over each corner joint.

## **11. DOOR ASSEMBLY**

The size of the door shall be 3 'x 7 ' minimum clearance. The door shall be a commercial grade insulated steel door manufactured from a minimum of 24-gage steel. The doorframe shall be a commercial grade heavy-duty steel doorframe manufactured from a minimum of 16-gage steel. The door and frame shall be painted with high quality exterior grade paint, suitable for use on metal. The door hinges shall be heavy-duty stainless steel ball bearing hinges with non-removable pins capable of supporting the door over an extended time of frequent use. The door shall be equipped with a heavy-duty commercial grade deadbolt lock. The door and frame assembly shall be equipped with all necessary weather-stripping and seals necessary to make an air-tight assembly. The door shall be equipped with miscellaneous hardware, including a heavy-duty commercial grade open door latch, passage set, chromed interior pull handle and all items necessary to make a complete assembly.

## **12. ELECTRICAL**

All electrical wiring shall be in conduit and raceways. All conduit, raceways, fittings, and hardware shall be galvanized steel or rustproof metal. Conduit shall have reamed ends secured to boxes or raceways with compression type connectors. Bends shall be made so that conduit will not be injured or the internal diameter of the conduit reduced. Conduit kinked, crushed, or damaged will be rejected. All conduit shall be anchored in place at least every four feet. All conduit shall be exposed and attached to the inside surface of the shelter. All wire is copper. All wire runs shall be continuous. The proposed shelter shall be equipped with the following electrical items:

1. 100 amp, 20 position distribution panel with main breaker
2. (2) - 2 tube, 4 foot fluorescent light fixtures with switch
3. (6) - 110v interior duplex receptacles
4. (1) - 12" exhaust fan and motorized intake damper w/thermostat & weather hood
5. (6) - 4" waveguide port (Microflect)



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6. (1) – 4' baseboard heater w/thermostat
7. (1) – Master ground bar
8. Breakers to accommodate the above
9. All wires, boxes, conduit, etc., to make a complete assembly

## MAJOR CONSTRUCTION MATERIALS AND METHODS OF CONSTRUCTION

### 1. THERMO BOND AGGREGATE PANEL

The **standard exterior** of a Thermo Bond shelter is the Thermo Bond Aggregate Panel.

The Thermo Bond Aggregate Panel is impervious to weathering and environmental elements and is virtually **maintenance free**. The panel is widely used in the construction of office buildings and other commercial property.

### 2. THERMO BOND SEALER

At all points in the structure where two pieces of exterior material come together, butt against each other, overlap each other, or are fastened one to the other, the seam is sealed with an industrial grade poly-urethane caulking material to insure water tight joints and connections.

### 3. THERMO BOND PLY-SEAL ROOF

The Thermo Bond Ply-Seal Roof is composed of a 45 mil commercial rubber roofing material bonded to the top layer of ¾" CDX with a commercial bonding glue.

### 4. STAINLESS STEEL SCREWS

The Thermo Bond Stone Aggregate Panel and all other attachments to the exterior of the shelter are made with the use of stainless steel screws.

### 5. METHODS OF CONSTRUCTION

Thermo Bond shelters are constructed with a minimum of 2"x4" on 16" centers. The walls, roof and floor are all fastened together using 6" and 3" lag bolts.

Based on this site plan, please provide me with a list of requirements we must meet to be in full compliance with all City building codes and permit requirements.

The primary contact on this project is: Ted Ruffedt, Jr., 394-6794

Thank you.