

# Procedures for Shipping to the Soudan Underground Laboratory

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## Abstract

This note describes the procedure for shipping of materials, supplies, and equipment to the Soudan Underground Laboratory. Three types of shipments are addressed: mailed packages (including FedEx, UPS, and US mail), shipped materials, and hand-carried items. Included in this document are the packaging requirements for materials to be shipped underground, contact information for shipping, information to be provided to the MINOS receiving office, and information to be provided to the shipping company. This document also gives information on US mail or express mailing to the Soudan Underground Laboratory. The steps are itemized in the following Soudan-shipping checklist:

1. Package the shipment so it will fit on the cage and stay dry
2. Information given to Soudan (Jack and Eileen):
  - What is being shipped?
  - Package dimensions, quantities, rough weight, and expected delivery date.
  - An entry made in the MINOS shipping database
3. Information given to the shipping company:
  - How to contact Jack.
  - Delivery hours.
  - Surface building driving directions.
4. Follow up:
  - Check the inventory control database to ensure that the shipment was received.
  - If not, contact Jack and/or your shipping company.

## Introduction

Over the next three years, a large number of MINOS shipments will be made to the Soudan Underground Laboratory. A few steps taken by the groups making shipments will make this operation go smoothly for all involved. This note documents the basic procedure for shipping of materials, supplies, and equipment to the laboratory.

All material deliveries, except hand carried items, will flow through the MINOS Surface Building located 1/2 mile from the head frame in the Soudan, Minnesota (which is located in Breitung Township). **Jack Zorman** is the foreman for the surface building and the primary contact for MINOS shipping. Upon shipment, all detector components will be entered into the MINOS shipping database for tracking. Materials received in the surface building will be stored there until arrangements can be made to move them underground and store them awaiting their installation.

## Packaging of materials to be moved underground at Soudan

All materials that cannot be easily carried into the hoist cage must be packaged for easy shipment underground. The basic requirements are that they can either be moved using forklifts or placed on a fork-able pallet. **Since we will not be routinely repackaging materials, all pallets must be a custom size to fit in the cage.** If you have any questions about the size of your shipment please contact Jack Zorman (zman@sudan.umn.edu, 218-753-8990) in advance with a crate design.

We have two cages available for moving materials underground: the new materials handling cage and the two-deck U of M cage. Either cage can be used for moving materials. The back of the materials handling cage is somewhat smaller than the U of M cage. For increased flexibility it's preferred that packaging be designed to fit in either cage.

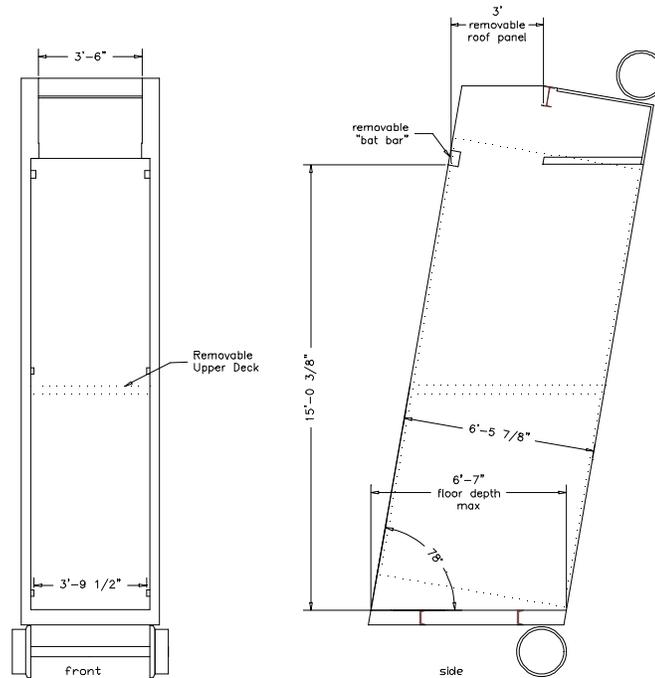
### The Materials Handling Cage

- 1) All loads must have one dimension less than 38"
- 2) Long loads (up to 29 ft) can be accommodated

### The U cage

- 1) All loads must have one dimension less than 45"
- 2) Maximum load length should be 15 feet

For either cage the maximum floor load is five tons. All pallets must have a minimum of 3½" high skids and the skids should be spaced to accommodate a 27" wide pallet cart. A standard "MINOS" pallet measures 38" wide by 44" deep with the skids parallel to the 44" dimension. Maximum loading is 650psf for the lower deck and 160psf for the upper deck. (For a pallet that only fits out the back of the U of M cage pallets can be 40" wide.)



Basic "U of M" Cage Clearances

## Package requirements and comments on the underground environment

During most months of the year, it's cold in Soudan. While the surface building is climate controlled, loads will reach equilibrium with the outdoor temperature before arriving at the underground laboratory unless special precautions are taken. This is true even in the summer months since most of our materials moving will be during the evening shift. **You cannot count on warm temperatures.** Also, the environment in the shaft is cold, humid, and wet. The air in the shaft is 55 degrees with a 55-degree dew point. The air in the hall is roughly 72 degrees with a 55-degree dew point. Packages will be wet either from moisture in the shaft or from condensation after they reach the underground laboratory. **Objects must be wrapped if they are to stay dry!**

Another aspect of the mine that can occasionally be an issue is the 8% increase in atmospheric pressure (~16psia) from the surface to the 27<sup>th</sup> level. This is not usually an issue but there are rare cases where it has been a problem. Two types of problems have occurred. Fragile objects with large surface area have been damaged (e.g. a vintage barometer). In addition, objects can possibly be damaged from internal condensation when they suck in wet air during their ride down the shaft. Anything that can survive airfreight should be fine with these issues.

## Preparing to ship

**The group sending the shipment is responsible for the tracking and timely delivery of the materials to the Soudan Underground Laboratory.** It is our objective to help make this a smooth process for you, the Mine Crew, and your shipping company.

Ensuring prompt delivery, movement underground, and notification of receipt requires good communications with both you and your shipper. This information can be communicated by email or fax but a short phone call is also very useful to start this communication. Information to be delivered to the MINOS Surface Building prior shipment includes:

1. Contact information for this shipment including:
  - Your name, email address, telephone number, and fax number.
2. Shipper information:
  - The shipping company and contact information (including a phone number).
  - The PRO# or the shipping invoice # (or both) for freight tracking.
3. Shipment information:
  - The item label in the MINOS Materials Tracking Database (if a repeat shipment) or the information needed to enter a new item.
  - Quantities of items shipped.
  - Expected arrival date.
  - Is this an emergency shipment? Is it urgently needed underground?
  - Create a new data base entry for this shipment. (See below.)
4. Receiving Requirements
  - How it is packaged and quantity of packages.
  - Approximate weight and foot print of items.
  - Any handling and stacking restrictions. Special handling requirements?
  - Are the items perishable or are there any temperature specifications for the items?
5. Does the packaging need to be returned to the sender? How will you pay for the return shipment?

You need to have an appropriate shipping data base entry make for this shipment. Either you can do it or you can ask Jack to make the entry. In either case it is your responsibility to ensure that a valid description of the shipment in the database. Instructions are included in the last section of this document.

### **Using US mail or an express mail**

For FedEx or UPS shipments use the following shipping information:

Jack Zorman  
MINOS Surface Building  
41 First Ave  
Soudan, MN 55782

Phone: (218)-753-8990  
Fax: (218)-753-8920

For US Postal service use the following address:

Soudan Underground Laboratory  
P.O. Box 175  
Soudan, MN 55782

Make sure that you have sent email to Jack detailing what will be delivered and how to handle it after it is received. These shipments are all tracking in the Inventory Control Database. You must either make an entry for this shipment or ask Jack to make the entry for you. (See the last section of this document for more details.)

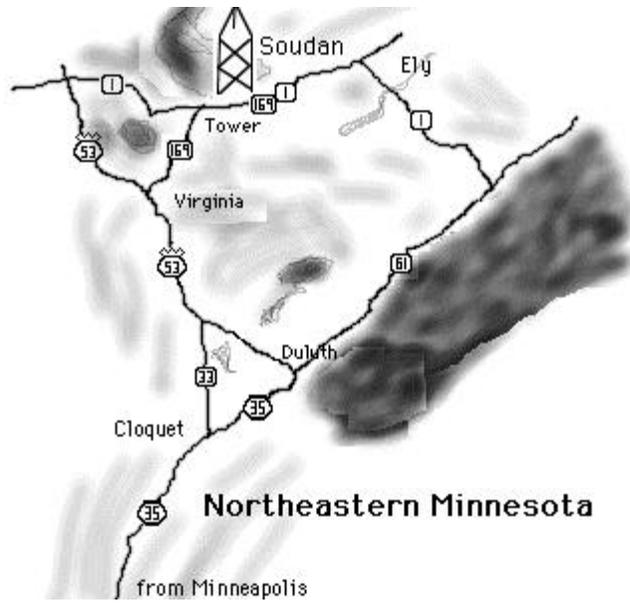
### **Things to tell drivers**

1. Contact information:

Jack Zorman  
MINOS Surface Building  
Phone: (218)-753-8990  
Fax: (218)-753-8920  
Email: zman@sudan.umn.edu

Back up contact Eileen Amos (218)-753-6611 or 2905.

2. Receiving hours: 7:30 - 4:00PM M-F (Central) (N.B. with two-weeks advance notice special arrangements can be made for other times or days)
3. Directions to Soudan, Minnesota and the MINOS Surface Building:
- From Minneapolis/St. Paul drive north on Interstate 35.
  - Exit on Minnesota Highway 33 north in Cloquet.
  - Minnesota 33 ends at US 53. Take US 53 north.
  - North of Virginia take Minnesota Highway 169 north.
  - Take 169 north to mile marker 265 (Soudan).
  - At the mile marker, you take a left to the stop sign (about 2 blocks).
  - Take a right and then an immediate left.
  - Go two blocks until you see a building with a green stripe and a painted “MINOS Surface Building” sign.



## Tracking shipments

Want to see if it arrived? Check the inventory database on the web. The URL for the database and basic instructions are included below. Don't see it in the database? Jack Zorman is the primary shipping contact for the Soudan Underground Laboratory. Call 7:30 to 4:00 M-F at

Phone: (218)-753-8990  
Fax: (218)-753-8920  
Email: [zman@sudan5.sudan.umn.edu](mailto:zman@sudan5.sudan.umn.edu)

If there's no answer try Eileen Amos underground at either 218-753-6611 or 2905 7:45-3:45 M-F.

## Examination of Materials at the MINOS Surface Building

When a shipment arrives at the surface building the following steps will be taken when accepting the item

- (1) Verify items shown on packing list with purchase order.
- (2) Verify the number of packages with the provided shipping information
- (3) Identify and document returnable containers.
- (4) Inspection for external damage.

We will contact you with reports of any observed damage or discrepancies.

## Radioactive and Hazardous Materials

Shipment of radioactive materials or hazardous materials needs to be coordinated with Jerry Meier ([meier@sudan.umn.edu](mailto:meier@sudan.umn.edu)) the Laboratory Safety Coordinator.

## **Procedures for Hand-Carried items to the Soudan Underground Laboratory**

Many shipments will be delivered to Soudan directly by hand (or car). It is very important that these deliveries be planned in advance and documented. **It will be the responsibility of the shipping institution to report to the surface building staff the delivery of equipment hand carried to the Soudan Underground Laboratory. It is the shipper's responsibility to ensure that the materials are entered into the Materials Tracking Database.** Either make an entry yourself or ask Jack to make an entry for you. Instructions are included in the final section of this note.

### **Materials tracking database**

All items delivered to the Laboratory in trackable quantities will be entered and tracked in the MINOS Materials Tracking Database.

The inventory control database and a user's manual can be found at the Far-Detector Installation home page: <http://www-numi.fnal.gov:8875/minwork/fardet/farhome.html>. The data entry screen is on the web at <http://www.hep.umn.edu/~factory/cgi-bin/login.pl>

A username and password are required for access to this page. Contact David Demuth ([demuth@umn.edu](mailto:demuth@umn.edu)) or Pete Border ([border@hep.umn.edu](mailto:border@hep.umn.edu)) for a new account. The account is also useful for other web tools such as room reservations in Tower and the current online logbook.

Select "Inventory" from the listed web tools after log in. Under "Part Handling Tasks" select "Parts List". A selection of part categories will appear. Choose the appropriate category (e.g. scintillator). A list of parts in the category will appear showing quantities entered into the database. A list of part locations (recognized by the database) will appear showing the quantities available. Click on the "details" link for more information. Parts in transit to Soudan are listed "en route." When they arrive at Soudan, they are changed to "Soudan Warehouse." New items or categories are easily added.

The user's manual is available online at <http://www-numi.fnal.gov:8875/minwork/fardet/inventory.html>