

HAPPY VALLEY CAMP

“HOW TO” MANUAL

Completed by:

**Polar Ice Coring Office
Logistics Department
University of Alaska Fairbanks
205 O'Neill Building
Fairbanks, Alaska 99775-1710
(907) 474-5585**

**PICO
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OVERVIEW

The National Science Foundation (NSF) tasked the Polar Ice Coring Office (PICO) at the University of Alaska Fairbanks (UAF) to design, build, and operate a remote field camp, known as the Happy Valley Camp (HVC), located approximately 82 miles south of Deadhorse, Alaska. It was a portable tent and weatherport camp designed for the summer season. The camp was first set up in April 1994 and was dismantled in September 1994. Stored in two 45-foot trailer vans near the site, it will be reactivated in April 1995.

HVC provides a base for NSF participants in some of the Land-Atmosphere-Ice Interactions (LAI) projects. This portable camp is sized to accommodate up to 20 people. Principle support to field parties consists of berthing, food service, lab/office space and a heliport/refueling site. The camp serves NSF researchers who rotate between sites at Prudhoe Bay, Happy Valley, and the Toolik Field Station.

While currently stored in trailer vans, this camp can also be easily transported by aircraft or ship.

PERMITTING AGENCIES

- 1. Office of the Governor**
State of Alaska
Division of Governmental Coordination
3601 C Street, Suite 370
Anchorage, AK 99503-5930
907-561-6131 (phone)
907-561-6134 (fax)
POC: Janet Meizis
Molly Birnbaum
Juneau Supervisor: Carrie Howard
907-465-8794

This office coordinates all multi-agency permit reviews. If you are obtaining permits from more than one agency, for one project, you are required to file through this office.

- 2. Department of Natural Resources**
State of Alaska
Division of Lands
3700 Airport Way
Fairbanks, AK 99709
907-451-2722 (Bob)
907-451-2729 (Gunter)
907-451-2751 (fax)
POC: Robert (Bob) Craig

You will need a Land Use Permit from this agency if you are performing research on any State of Alaska-owned land.

- 3. Department of Environmental Conservation**
State of Alaska
Permit Information Center
610 University Avenue
Fairbanks, AK 99709
907-451-2360 (phone)
907-451-2187 or -2188 (fax)
907-451-2750 (Bill Smyth)
POC: Brad Fristoe
Leslie Acheson (food)
Bill Smyth (water)

This agency should be contacted regardless of the size of your activities taking place. DEC will let you know if your activities will require any permits. DEC issues several types of permits to include: food service, waste water, potable water, hazardous material guidelines, etc.

4. **North Slope Borough** POC: Vera Williams
Permitting Department
P.O. Box 69
Barrow, AK 99723
907-852-0320 (phone)
907-852-0322 (fax)

A permit will need to be obtained for any project taking place in the North Slope Borough. This is more for information purposes than anything.

5. **Department of Fish and Game** POC: Al Ott
State of Alaska Mac McLain
Division of Habitat
1300 College Road
Fairbanks, AK 99701
907-451-6192 (phone)
907-456-3091 (fax)

You will need a permit from this agency if your project involves crossing, entering, or operating around a stream, river, or lake that has fish.

6. **Bureau of Land Management** POC: Paul Salvatore
Arctic District Office Mike Worley
1150 University Avenue
Fairbanks, AK 99709
907-474-2300 (phone)
907-474-2280 (fax)

You will need a Land Use Permit from this agency if you are performing research on any federal land.

7. **Alyeska Pipeline Service Company** POC: Dennis E. Prendeville
Lands and Permit Supervisor Peter Negal
1835 South Bragaw Street
Anchorage, AK 99512
907-278-1611 (Dennis P.)
907-265-8170 (Peter N.)

You will need to obtain a Letter of Non-Objection from this company if your research activities are taking place on Alyeska land.

8. Department of Transportation
State of Alaska
Dalton Highway Vehicle Permits
2301 Peger Road
Fairbanks, AK 99709
907-451-2249

POC: Kris Marsh

You will need vehicle permits for each vehicle that is traveling on the Dalton Highway.

STAFFING

The camp is designed to be operated by two full-time staff throughout most of the season. The full-time positions are defined as Cook/Camp Coordinator and General Field Assistant (GFA). Depending on experience and skills, either the cook or the GFA may be the camp coordinator. During peak loading periods and busy flight periods, a third staff member is called in to assist with camp coordination. The field operations manager rotates in and out of the field, depending on need.

Depending on conditions, camp setup and camp closing can be accomplished in five to ten days with a crew of six, working ten-hour days. Three additional workers should be hired to assist the staff with opening and closing camp. Hiring a carpenter, an electrician, and a second GFA is recommended.

Job Description: Remote Camp Coordinator/Cook

Full Time, Temporary

Field Season: May-September 1994

Responsibilities:

Responsible for assisting with the construction and maintenance of the temporary remote camp facilities and supervision of Student Assistant; schedule daily camp support activities; maintain daily radio communications and camp log; maintain food, fuel, and supply inventories; compose and submit end-of-season after-operations report which documents camp activities, fuel use, needed repairs and upgrades, and camp inventories; coordinate helicopter flying hours in support of scientific research activities. Cooking duties entail responsibility for complete food service in support of a 6- to 20-person remote camp; overall responsibility for all kitchen activities, food service, and menu planning; oversee complete meal preparation; plan and prepare up to 3 meals per day to include breakfast, sack lunch, and dinner; prepare periodic foodstuff and kitchen supply orders for camp, and maintain current inventories; direct daily duties of the kitchen helper (house mouse); ensure that a clean and healthy food preparation area is maintained; conduct end-of-season food and kitchen inventory and prepare end-of-season report; prepare food order for next season.

Long hours can be expected, especially during camp opening and closing. Average work day is 10-12 hours, seven days per week. However, on an as-needed basis, hours can be higher.

Qualifications:

As camp coordinator the successful candidate must have supervisory skills, the ability to schedule and organize events, the ability to operate an IBM personal computer in a DOS and Windows environment, the ability to complete tasks in an organized manner, familiarity with VHF radios, and excellent communication skills.

As this position is also responsible for the duties of camp cook, the successful candidate must also have the knowledge, skills and training to perform the cook duties as described above. Must be familiar with all phases of sanitary kitchen procedures, menu planning, kitchen administration, food storage and safe operation of the following equipment: 6-burner conventional range and propane refrigerator and freezer.

Although a person is hired to perform a particular task or trade, the operational requirements of a remote research camp dictate the need to cross-utilize personnel. The successful applicant must be willing to learn and adapt to a changing work environment.

Must have valid driver's license.

Job Description: General Field Assistant I

Full Time, Term Funded
Field Season: May-September 1994

Responsibilities:

Responsible for assisting with the construction and maintenance of the temporary remote camp facilities; maintaining 12 kW and 6 kW Lister and ONAN generators; transferring fuel from bulk storage to day tank, monitoring fuel levels in all heated areas, and maintaining weekly fuel consumption records. Responsible for domestic water production to include monitoring gallons transferred, changing filters, and assuring ample water is available for camp use. General construction tasks to include painting, carpentry, electrical, and installations; assist with loading and unloading aircraft; assist with VHF radio communications; assist in dining area, kitchen, and scullery cleanup after meals; and clean portable toilet units and showers.

Long hours can be expected, especially during camp opening and closing. Average work day is 10-12 hours, seven days per week. However, on an as-needed basis, hours can be higher.

Qualifications:

As general field assistant, the successful candidate must have the knowledge, skills, and training to perform the duties as described above. Must be familiar with generators, general construction tools, and VHF radios and have the ability to operate an IBM personal computer in a DOS and Windows environment.

Although a person is hired to perform a particular task or trade, the operational requirements of a remote research camp dictate the need to cross-utilize personnel.

Must have valid driver's license.

GFA Duties:

Main priorities:

1. Generators: daily service check, fueling, and logs.
2. Operate and maintain water system.
3. Fuel stoves, vehicles, aircraft.
4. Kitchen helper.
5. Daily camp chores (listed below).
 - Assist with phaseup and teardown.
 - Check and service generators and log.
 - Check and service water system and log.
 - Monitor all fuel levels and log (gensets, buildings, vehicles).

- Check communication center for message traffic.
- Assist cook with cleanup after meals, as needed.
- Clean bathhouse.
- Clean outhouse; empty when full.
- Securely store nonburnable trash.
- Incinerate burnable trash.
- Load and unload supply trucks.
- Pick up and deliver fuels to remote sites.
- Maintain containment berms.
- Secure buildings nightly.
- Haul trash to dump station.
- Provide airport taxi service.
- Expedite.

Cleaning the bathhouse:

Supplies: rubber gloves, sponge, bucket, disinfectant cleanser, mop, broom.
 Clean sinks, mirror, shelves, counter, and shower.
 Sweep the floor daily.
 Mop the floor as needed (sometimes several times a day).
 Empty trash daily.
 Hang up any towels.
 Restock paper products (cups, paper towel).

Cleaning the outhouse:

Supplies: rubber gloves, sponge, bucket, disinfectant cleanser, mop, broom.
 Spray seat with disinfectant; let spray sit for 60 seconds to kill germs.
 Wipe seat with damp sponge; let air dry.
 Sweep and mop floor twice a week or as needed.
 Empty garbage daily.
 Wipe down the interior walls of the outhouse after initial delivery and/or in
 dusty conditions.
 Restock paper products (tissue, handy wipes).

Trash disposal:

Empty nonburnable and burnable trash cans from kitchen and lab, bathhouse
 and outhouses daily.
 Incinerate burnables, when the wind is blowing away from living areas.
 Double bag and place nonburnables into bear-resistant cans.
 Nonburnable food waste from the kitchen should be taken out at least once
 per day to keep from attracting bears.

Kitchen help:

- Assist cook with kitchen cleanup as needed.
- Wipe down tables.
- Put away condiments.
- Straighten up table and chairs.
- Wash dishes and put them away.
- Sweep and mop kitchen and/or lab as needed or if requested by the Camp Coordinator/Cook.
- Once done assisting the cook, do whatever projects need to be done that day.

Daily communications:

- (These duties are shared with the Cook.)
- Check electronic mail; respond as needed.
- Send telexes.
- Forward e-mail.
- Update logs.
- Make notes for the weekly situation report.
- Place resupply orders.

Refilling the potable water tank:

- Fill the tank when the water level gets down to six inches. This will prevent damage to the pump. (See details under water supply notes.)

Generator maintenance:

- When camp activity is low, turn off or switch the generators to check the oil and perform any other scheduled service. Do not turn the power off without notifying everyone in camp.

Securing buildings:

- At night, check that all doors and/or windows are closed, if the weather demands. In the morning, open doors and windows, if the weather allows. The weatherports get very warm even on a mild day if the sun is shining and all the doors and windows are closed.

Deliveries and retrograde:

- Unload supply trucks as they come in; check and log in supplies; report any damage or discrepancies.
- Prepare retrograde items and paper work.
- Prepare proper hazmat documents as needed.
- Log all incoming and outgoing freight.
- Always notify Fairbanks office of cargo movements.

Miscellaneous:

Be willing to assist scientists with things such as filling gas cans, loading trucks, repairs, fabrication, communications, transportation, or anything within reason that they request. All requests should be cleared with the Camp Coordinator.

Fueling:

Monitor and maintain fuel levels in all equipment as needed for each particular piece of equipment. Most of the equipment and appliances are supplied by bulk-quantity tanks, i.e., 300-gallon or 100-pound tanks.

Equipment needing routine fueling:

Toyo Laser fuel oil stoves	2 ea. w/300-gal tank
Lister 12.5-kW diesel generator	1 ea. w/300-gal tank
Onan 6-kW gasoline generators	2 ea. w/300-gal tank w/auxiliary 6 gal-tanks
Propane room heaters	2 ea. w/2 ea. 100# cylinders
Propane water heaters	2 ea. w/2 ea. 100# cylinders
Propane freezer	1 ea. w/2 ea. 100# cylinders
Propane refrigerator	1 ea. w/2 ea. 100# cylinders
Honda 1-kW generator	1 ea. w/.5-gal tank
Honda 5-kW generator (science)	1 ea. w/1-gal & 5-gal. tanks
Homelite H20 5-hp pump	1 ea. w/.5-gal tank
Pickup truck, gasoline	2 ea. w/15-gal tanks
Helicopters	2 ea. Jet A1 assist pilot
Remote refueling station (Toolik Field Station)*	1 ea. Jet A1 300 gal*
Misc. generators	Assist PIs

*In 1994, 55-gallon drums were stored at this site. The helicopter company Flight Safety Officer and the PICO Field Operations Manager recommend placing a 300-gallon tank at this site instead of 55-gallon drums, to lessen the risk of water contamination of the fuel. PICO would continue to use 55-gallon drums to transfer fuel from the HVC tanker to the Toolik Field Station site, pumping into the 300-gallon tank.

BERTHING

- Permanent employees and long-term occupants are housed in one of the four 10' x 10' arctic ovens. As required by the Department of Environmental Conservation, bedding is provided for personnel staying over 30 consecutive days.
- Transient personnel are housed in 8' x 8' arctic ovens. Each tent is set up with two cots and insulated sleeping pads. When camp loading allows, each person may be housed separately in his/her own tent.
- Be sure that each guest marks which tent he or she is in on the tent occupancy board. In 1995 the tents will have identification numbers stenciled on them to make berthing assignments easier to locate.
- Participants are required to provide their own bedding.

Setting Up Arctic Oven Tents

Step-by-Step Procedure:

One person can set up these tents, though it is easier for two people to set them up, especially on a windy day. The tents come with plastic stakes. In hard ground, use a metal stake to make pilot holes for the plastic stakes. There are four 24-inch metal form stakes provided for staking down the corner guy lines. These can be used to make pilot holes.

1. Select a well-drained site. Smooth out area; rake out big rocks.
2. Spread out the ground cloth, a plastic tarp, over the area. Weight the tarp down to keep it from blowing around.
3. Spread the tent out on the ground cloth.
4. Assemble the external pole frame. There are four two-section poles. The end of the poles nearest the bend slide into the four-way connector permanently attached to the top center of the tent. Connect all four poles into the four-way connector.
5. Raise the tent. Square up the tent.
6. There are four eye bolt connectors permanently attached to the four bottom corners of the tent. Hook these eyebolts into the bottom of the poles.

7. There are four metal rings and shock cord loops at the four top corners of the tent. Hook the shock cord at each corner of the tent into the hooks on the poles.
Caution: *Do not hook the metal rings onto the hooks. This will cause the tent to rip.*
8. There are four webbing straps and fastex buckles permanently attached to the tent between the top and bottom corners. Fasten these around the poles.
9. Arrange the poles so that the tent sits square and doesn't lean to one side. Stake down the four corners.
10. Attach the rain fly.

Rain Fly:

1. Put the rain fly over the tent. Align the fly on the tent, making sure the door of the tent and the fly match up.
2. There is a ring in the middle of each outside wall of the tent. There is a hook in the middle of each inside wall of the fly. Hook the clips on the inside fly to the rings on the outside of the tent.
Note: There is no ring or clip on the door wall of the tent.
3. Make sure the ground cloth is folded under the tent or it will gather rainwater.
4. Stake down the corners of the fly. The fly has split corners and requires two stakes per corner. Begin in any corner and work around in one direction pulling against the previously staked corner to get the base tight and square.
5. There are attachment rings on the top outside corners, sides and back of the fly. Attach parachute cord lines to these rings and run them out either to the plastic stake for the center lines or to the metal form stakes for the corners.
6. On the base of the rain fly, there are tie-down loops of webbing attached to each side. With parachute cord, tie these tightly to the same stake used for the mid-wall guy line.
7. The tent and fly are now secure.
8. Open the door of the fly and the tent and clip the canvas floor liner to the rings in the inside corners of the tent.
9. There are black rubber vent tubes for use with the arctic oven tents. Cover these tubes with mosquito netting, held on with zipties or rubber bands. Then

slip the rubber tubes into the vent sleeves. Tighten down the drawstring of the vent sleeve to hold the tube in place.

10. Put two assembled roll-o-cots and two insulated sleeping pads in each tent.

FOOD SERVICES

An 18' x 25' x 10' weatherport serves as a kitchen and dining area. The kitchen is set up in compliance with the Department of Environmental Conservation to feed 4 to 16 people.

The main kitchen appliances are:

- Six-burner commercial range with oven
- Commercial 3-hole sink
- Hand wash sink
- Electric freezer
- Electric refrigerator
- Propane freezer
- Propane refrigerator
- Microwave oven

A hot breakfast, cold lunch, and hot dinner are prepared daily. Meals for shift workers are prepared and left in the refrigerator for later heating. Fruit, pastries, and beverages are available at all times.

Fresh food is delivered to camp each week.

During the 1994 season, food staples were stored in a 12' x 17' boonie barn. In 1995 the food will be stored in a bear-resistant 45' trailer.

ELECTRICAL SYSTEM

- Lister 12.5 kW diesel, two each
- Onan 6 kW gasoline, two each
- Honda EX1000 1 kW gasoline
- Honda EM1800X 1.8 kW gasoline
- Distribution
- Panels, lights, receptacles
- UPS
- Maintenance schedules
- Drawings

Power Supply

Electrical power for HVC is normally provided by the 12.5-kW Lister diesel generator. One Lister runs the camp, and the other is held in reserve in Fairbanks. A 6-kW Onan is used for put-in , pull-out, or anytime the camp's power needs are especially low. These units also provide emergency power when the Lister needs repairs or extended service. Both Onans are kept in camp. When they are used, each one is run on alternate days. All three of these generators sit inside a 400-gallon (approximate) containment berm inside the 8' x 8' generator shed. An adjacent 400-gallon berm outside the generator shed holds a 300-gallon diesel tank to fuel the Lister and a 55-gallon gasoline tank to fuel the Onans.

Power Distribution

Power is fed to each weatherport using approximately 250 linear feet of #8/3 wire. Each 250-linear foot cord has a special three-prong male plug on each end. One end plugs into a distribution box at the generator shed, and the other end plugs into the main breaker panel at each weatherport. To prevent accidental electrical shock, these power cables are run through three-inch ABS pipe laid on the ground between the weatherports and the generator shed. The generator shed and the distribution panels at each weatherport are wired to a standard ground rod.

The wiring system in the weatherports consists of extension cords made up from 14/3 wire. The electrical distribution panels were built with six four-gang boxes to accept an extension cord for each circuit. Nothing is hardwired; simply plugged in and tie-wrapped to the frame of the weather port. Surge-protected, 6-plug power strips are used throughout the lab and kitchen areas. The communications center and the computer tables in the lab also have Tripp Lite 500-va/350-W Uninterrupted Power Supply (UPS) systems. Outside receptacles are GFI protected.

The stand-alone 8' x 8' bathhouse is GFI protected and is supplied power from the breaker panel in the kitchen weatherport.

Each weatherport had at least one GFI-protected weatherproof box on the outside for exterior power needs; that is, for freezers, plant driers, power tools, etc.

The bath module has two incandescent light fixtures and two duplex receptacles.

The weatherports have a string of fluorescent lights tie-wrapped to the frame at the ridge pole of the weatherport. Table-mounted drafting lamps are also provided for the lab tables. Two duplex receptacles are provided for each of the nine lab tables.

The EX1000 Honda is used to power the fuel pump for fueling the helicopter. It is too small to reliably run this pump. A 1.5-kW generator, or larger, is needed.

The EM1800X Honda is a general-service unit designated for Terry Chapin's group.

GENERATOR MAINTENANCE

The generators must be checked daily. They need to be maintained according to the manufacturers' schedules, summarized below. Each season the generators also need some unscheduled repairs.

12.5 kW Lister-Petter Generator

Specifications:

- Kw #3800541TR3A008
- Diesel powered
- Uses 30-wt oil

Maintenance Part Numbers:

- Air filter: 366-07188 Lister
- Oil filter: 201-55370 Lister
- Fuel filter: 351-29760 Lister
- Fuel injector: 201-90463 Lister

Maintenance Summary:

Daily:

- Check oil; fill as needed.
- Check cycle meter; adjust as needed.
- Check for leaks.

150 Hours:

- Change oil, oil filter, air filter; look for leaks.

300 Hours:

- Change fuel filter.

The following is a summary of the 150-hour maintenance taken from the Lister manual. In addition to checking the oil daily, this generator requires maintenance every 150 hours, or every 6 or 7 days. This maintenance consists of changing the oil, changing the oil filter, and changing the air cleaner.

Daily Check Procedure:

1. Check with the personnel in the lab and kitchen to find out if it is okay to cut the power. You must not cut the power if it will impact someone's work. If all agree, then you can turn off the power and proceed.

2. Turn off the switch to the electricity. This removes the load from the generator. It is on the side of the box that the starting switch is on. Down is off, up is on.
3. Turn off the generator.
4. Change the air filter by releasing the snaps on the lid and replacing the old filter with the new one. Put the old filter into the box that the new one came in.
5. The oil drain has a valve with a clear rubber tube about two feet long. Open the valve and drain the oil into a pan. When the pan needs to be emptied, dump it into the designated used-oil drum. If the generator is set up high enough on blocks, drain the oil straight into the used-oil bucket. Close the valve before removing the pan and before the new oil is added.
6. Remove oil filter by turning counterclockwise. It should be hand-tight and not require a wrench. If necessary, use a filter wrench or the chain wrench to loosen the filter. Have a small tin can under the filter, to catch any oil, before loosening the filter.
7. Drain the filter into the used-oil bucket. Put the old filter into the box that the new one comes in. To help keep the filter from leaking, put the new filter on after putting some new oil on the O-ring of the filter. Tighten the filter, clockwise, hand-tight.
8. Refill the generator with 5.8 quarts of SAE30 oil. Check the level with the dipstick and adjust if necessary. Replace the oil filler cap.
9. Check that all caps are on and that the air cleaner lid is secure.
10. To restart the generator, decompress each cylinder if necessary. While the cylinders are compressed and the engine is cranking but won't start, the engine needs to be primed. About four inches above and an inch to the right of the oil filter, there is a triangular brass piece that moves up and down. By pumping this up and down six or seven times, or until there is resistance, the generator should start when cranked. When the generator reaches the correct RPM, push the electrical switch to the *on* position to put the load back on the generator.
11. Discard the air filter in the garbage. The oil filter goes in the oily waste bag or a separate bag.
12. Clean up and put away tools.

In addition to the above-mentioned maintenance, all accessible bolts should be checked for tightness every 250 to 300 hours. It is convenient to do this every other 150-hour maintenance, while the generator is shut down. Tightening of bolts should be done after all the other maintenance is done and the engine is cool.

Note: Overwintering of fuels, and remote conditions in general, dictate the need for routinely using fuel dryers to remove moisture and ensure trouble-free operation.

Maintenance Log:

- Maintain generator operations log.
- Record the hours that the generator runs.
- Record any maintenance that has been performed: oil changes, new plugs, air filters, etc.
- Keep notes on the behavior of the generator.

6.5 kW Onan Generator

Specifications:

- Model #6.5BFAB-3E/1J, 6.5 kW
- Unleaded gasoline(Mogas)
- Serial #G870913442 (generator #1)
- Serial #G870913450 (generator #2)

Maintenance Part Numbers:

- Air filter (paper): 40-1216 Onan brand
- Fuel filter: In-line type, 1/4" ID outlet and inlet
- Spark plug: 167-0298 Onan brand, gap of .005
- Uses 30-wt oil

Maintenance Summary:

Daily:

Check oil.

50 Hours:

Clean foam air cleaner; change paper element.

100 Hours:

Change the oil; check and possibly change plugs; clean breather; clean and change air filters; clean out spark arrester; check bolts for tightness.

There is a sticker on the lid of the air cleaner on the Onan generator which gives suggestions for a maintenance schedule. This sticker, the Onan service personnel, and the service manual--each offer different information for a maintenance schedule. Under extreme conditions (dust, heat, etc.), the frequency of maintenance should be increased.

The following is the maintenance schedule used in 1994:

Note: For all generator maintenance, the generator is normally turned off. Generally, all work is done inside a containment berm.

Daily:

Check the oil and fill as needed.

Every 50 hours:

Clean the foam element of the air cleaner.

Replace the paper element in the air cleaner.

Every 100 hours:

Change the oil.

Check the spark plugs; regap or change as needed.

Clean the breather tube.

Clean air filter foam element.

Replace air filter paper element.

Clean the spark arrester.

Check all visible bolts for tightness.

Cleaning the Onan Foam Air Filter Elements:

1. Shut off generator.
2. Place absorbent under the generator
3. Remove air cleaner lid.
4. Separate paper and foam element; discard paper element.
5. Clean foam element by immersing in suitable solvent. (The manual says to use warm, soapy water. This does not work at all.) Work solvent through the filter by squeezing the filter; rub highly stained areas to loosen dirt.
6. Squeeze excess solvent from element. (Don't ring the element; it will rip or tear.) Let air dry.
7. Oil the element with clean oil (30 wt); squeeze to evenly distribute the oil. A thin coat is all that is needed.
8. Put new paper element inside the foam element.
9. Reinstall air cleaner elements and replace lid.

10. Dispose of solvent in the designated used-solvent container.

Changing the Oil:

1. Shut off generator.
2. Place a drain pan and absorbent under the drain plug to catch the oil. The generator should be up on 4x4s to make changing the oil easier. Also, the side opposite the drain plug should be put up on additional 2x4s to aid in draining.
3. The drain plug is located at the base of the dipstick tube. The plug usually requires a medium-sized crescent wrench to loosen it.
4. When trying to loosen the plug, be careful. When the plug does break free and start to loosen, the side of the engine is very close and you will probably smash your knuckles into it.
5. Remove drain plug, let oil drain into pan.
6. After the oil is drained, replace the drain plug and refill the generator with new 30-wt oil. Capacity is 1.25 quarts.
7. Put the old oil into the designated used-oil container.
8. Clean up and put tools away.

Checking/Changing the Spark Plugs:

1. There is one plug located on each side of the generator, for a total of two plugs.
2. Locate each plug and remove the spark plug wire.
3. Remove plug(s); check condition of plug(s). If necessary clean, regap, or replace plug(s).
4. To install plug, turn till finger-tight, then a half to three-quarter turn more with a wrench. Once the plug is snug, it will function properly; too tight, and it may break!
5. Reconnect spark plug wire(s).

Cleaning the Spark Arrester:

1. Turn off generator.
2. To clean out, remove the cleanout plug on the exhaust pipe (muffler).

3. Start generator with plug out, let run five minutes.
4. Shut off generator.
5. Replace the cleanout plug.

Cleaning the Breather Tube:

1. Turn off generator.
2. A rubber hose runs from the base of the air cleaner box down to the body of the generator. The hose 90s out of the air cleaner and then 90s down towards the generator body. It is skinny at the air cleaner and widens out to about 1 inch diameter at the generator. The total length of the hose is about 6 inches.
3. Remove the hose. Inside of the hose is a metal mesh. Remove the mesh and then dip in solvent. Allow to air dry.
4. Reinstall mesh and then reattach hose to the generator.

Maintenance Log:

- Maintain generator operations log.
- Record the hours that the generator runs.
- Record any maintenance that has been performed (oil changes, new plugs, air filters, etc.).
- Keep notes on the behavior of the generator.

COMMUNICATIONS

The area around the Happy Valley Camp is, geographically speaking, a “communications hole.” While microwave phone transmitters pass by near the sight, these systems are already filled to capacity. Communications in and out of the camp is typical of many arctic locations; that is, technically difficult, not 100 percent reliable, and relatively expensive. Several different types of systems were employed in an effort to provide an effective communications net.

Cellular Phone

Cellular phones cannot be used in the camp area, but a 15-mile drive to a vantage point allows contact with the cell relay at Prudhoe Bay. In this area, cellular is the most cost-effective medium used for extended voice communications outside the local area. It provides affordable voice contact worldwide. The camp has a 3-watt “lunch box”-size cellular phone that can be operated by battery or off of a vehicle’s electrical system. Two smaller, hand-held phones are provided to scientists for oil field communications at Prudhoe Bay.

Terrastar M (Standard M) - Telephone and Fax

The Terrastar M is a portable satellite earth station that provides voice, fax, and data capability. This is a relatively new unit from Scientific Atlanta that utilizes the INMARSAT satellite network. Operating this system in the high Arctic, on the edge of two ocean regions of the satellite network, has provided new challenges for the existing software. The telephone worked most of the time but would occasionally cut out in mid-conversation. The fax machine software only allows for communication with specific brands of fax machines. The tuned antenna system was recalled in mid-season because of software problems. While calls on this unit cost about \$5 per minute, it offers portability and a range capable of serving most remote research projects. The unit comes with a 12-hour rechargeable battery pack.

The Standard M system uses a coded dialing sequence to protect the unit from unauthorized use. The different dialing sequences allowed for direct dial calls and for credit card calls. The following instructions were posted to assist participants in using this system.

To Make an Outgoing Fax Call on Terrastar M:

All Personnel:

1. Press ***001001** phone number including area code #
2. Example: ***0010019074745582#** (to fax PICO/UAF)
3. Insert document(s) to be faxed face down.
4. Press the start button.

To Receive an Incoming Fax Call on Terrastar M:

All Personnel:

The Terrastar M fax number is 011-872-68-313-0852.
(This is an international call, and the initiator of this call will be charged \$5.50 per minute.)

When a facsimile call is received, it will be processed exactly as at home or in the office

Note: To set up the Terrastar M unit for operation, follow the instructions on pages 11 and 12 in the preliminary Terrastar M User's Guide and Warranty. This unit has already been commissioned.

To Make an Outgoing Voice Call on Terrastar M:

PICO Personnel:

1. Remove phone from base.
2. Press ***001001** phone number including area code #
3. Example: ***0010019074745585#** (to call PICO-UAF)
4. Wait until you are asked for your access code, then enter it (4 digits). If you did this right, the call will go through; if not, a voice message will say "Invalid Access Code."

Non-PICO Personnel (must have a valid credit card):

1. PICO person removes phone from base.
2. PICO person presses **361** phone number including area code #.
Example: **3619074745585#** (to call PICO/UAF).
3. PICO person waits until asked for access code, then enters it (4 digits). If you did this right, the call will go through; if not, a voice message will say "Invalid Access Code."
4. Give phone to the non-PICO person. (The operator will ask person for credit card number.)

To Receive an Incoming Voice Call on Terrastar M:

The Terrastar M voice number is 011-872-68-313-0850.

(This is an international call, and the initiator of this call will be charged \$5.50 per minute.)

011 is for international direct dialing to the Terrastar M terminal. Other prefixes may be needed using credit cards and other telephone companies.

When a call is received, the phone will ring and should be answered exactly as you would answer it at home or at your office.

Note: To set up the Terrastar M unit for operation, follow the instructions on pages 11 and 12 in the Preliminary Terrastar M User's Guide and Warranty. This unit has already been commissioned.

Terrastar C (Standard C) - Telex

The Terrastar C is a portable satellite earth station that provides telex capability. This is a very reliable, proven system, utilizing the INMARSAT satellite network.

This "text only" portable earth station was used for the daily message traffic to and from the field camp. It was hooked up to an IBM compatible computer using CAPSAT communications software. It is limited in that you must send to another telex unit. Messages, including those intended for e-mail, were forwarded to the PICO office in Fairbanks, then by fax or internet to their final destinations. This is a time-tested system and is the most reliable method for communications from arctic field camps.

Sending a Telex:

Hook up the transceiver to the computer by following the instructions manual. Plug in the computer, transceiver, and printer. Follow the instructions in the manual for log-in and self-test.

To begin a new telex (unnumbered):

1. Save previous telex if you want to keep it.
2. After saving, press *escape* to highlight *file* and press *return* to get menu, or just press *alt-f*.
3. Press *T* or *enter*, and your telex is now ready to type.
4. Type message.

To begin a new telex (numbered):

1. Save prior document if necessary.
2. Load latest numbered telex.
3. Update heading stamp (change number, date, etc.)
4. Save document under new, updated number.
5. Erase old text by holding down shift, scrolling down to highlight text, and then pressing *delete*. Erase only what is below the heading stamp.
6. Begin your telex.
7. When finished typing your document, save it. Your number should be in the *Save As* box.
8. If you want, check to see that your number has been saved.

To save a telex:

1. Press *escape* and then *return* or just *alt-f* to show the file menu.
2. Press *S* or scroll down to *save* to save the document.
3. Telex will prompt *Save To*; enter your telex name or number, and press *return*. Your telex is now saved.

To send a telex:

1. Press *escape*, scroll to *transmit*, and then press *return* or just press *alt-T*.
2. Computer will display a transmit box. This is where you tell the computer where to send your telex.
3. At the *To* heading (highlighted), press the space bar to get a list of possible places to send to. Choose your destination by scrolling down to it. Press *enter*. The computer will then put the cursor (highlight) on the *From* box.
4. This is where you indicate where the message is coming from. Press the space bar to show list, highlight your choice, and then press *enter*.
5. The other options in the *Transmit* box are selected to meet your needs. They are selected by scrolling to and then pressing the space bar. Most of these are toggles, only *on* or *off*. If you want a copy of your telex, X the one labeled *print*. Normally all are selected. Select the *routine* instead of the *non-urgent*.
6. Once you have selected the options to suit your needs, you are ready to send. Highlight *send* and then press *return* to send the document.
7. You will get a printout of whether your transmission was successful or failed.

VHF Radio

A base station and six hand-held VHF radios were used for communications with the helicopters and field parties. The hand-held radios were most frequently used for communications between field parties, and between field parties and the helicopter. The frequencies programmed in the Base Station are as follows:

1. 151.625
2. 152.0125
3. 148.0125
4. 162.750
5. 162.600
6. 156.500

The primary channel for use at Happy Valley is 151.625. All hand-held radios are programmed for this frequency.

Recommendations

A CB radio and an aircraft FM radio would be welcome additions to the camp communications center. The more effective communications the camp has, the greater the safety margin of all our operations and the greater the effectiveness of day-to-day operations. The CBs could be used to talk with the 24-hour truck traffic. This would provide a more immediate safety net than any of the other forms of communication we normally use, for it is the most frequently used method of communicating in the area. Being aware of road and weather conditions is of critical importance in this area. A base station and one or two portables would provide communications between camp and our two vehicles. The aircraft FM would put camp and our helicopter pilots in touch with the air traffic which would be particularly useful for tracking local weather conditions

Daily Communications Check

The Standard C telex was checked daily to ensure that the system was operating. Short messages were sent between the Fairbanks office and camp everyday. This informed Fairbanks that all was okay at camp and that the telex system was operational. The telex was connected to the camp computer and operated using CAPSAT software. This is a non-windows DOS-based program. It is menu driven and easily learned using the brief manual that accompanies the software.

Many times it was discovered that the system was not operating correctly. Most often it was a simple problem such as a switch being inadvertently turned off or a power supply problem. Monitoring these minor problems on a daily basis helped ensure that we had an operable system when we needed it. It improved everyone's trouble-shooting

skills and operational awareness. It is very important that all the camp staff be familiar with and know how to operate the communications equipment and learn the proper message format. A rotation was set up so that all staff spent time sending and receiving messages.

All messages were numbered sequentially and stored in computer directories and in a hard-copy log. The directory names are Touaf, Fruaf, Toother, Frother, and Messages.

Communications Schedule

Daily:

At least one telex should be sent everyday to assure that the system is working.

Weekly:

A situation report is due by noon Monday for the previous week.

Phone Numbers - Happy Valley Camp

Happy Valley: 907-322-0790 Cellular Line 1
907-659-0221 Cellular Line 2
011-872-68-313-0850 COMSAT Phone
011-872-68-313-0852 COMSAT Fax

PICO/UAF: 474-5585 Phone
474-5582 Fax

Sam: 474-5547 Phone/Work
488-2345 Phone/Fax/Home

Scott: 474-5584 Phone/Work
457-6511 Phone/Home
451-4327 Fax/Home

Michelle: 474-5544 Phone/Work (from 0630)

John Roberts: 474-6008 Phone/Work

Service Area 10: 659-2635 Phone 659-2454 Fax
Ray or Henya: 659-0102

George Vourlitis: 659-0152 Room
659-0218 C1
659-0219 C2

Toolik Field Station: 659-2417 Fax Fax line open first 15
POC: Mike Abels min. after the hour for
Dave Witt incoming traffic.

CELLULINK: 907-456-9778 Phone POC: Becky Cummins
907-456-9781 Fax
907-488-4135 Home
Dead Horse Cell Rover Access 659-0300

Heli-Lift: 907-452-1197 Phone
907-452-4539 Fax

Dr. Peter Marshall: 488-4433 Phone/Work
322-3090 Phone/Mobile
488-6997 Phone/Home

NANA Services: 907-659-2840 Al Tindle or Dave PO#139891

Arctic Rental:

907-659-3328 Shop

907-659-3555 Pager (Hours: 0600-1800)

POC: Gene or Tommy

Budget Rent-a-Car:

659-3128

SITUATION REPORTS

A summary of the weeks activities was telexed to the Fairbanks office no later than noon on Monday of each week. The format for the situation report (sitrep) was adapted from the Greenland sitrep format.

HVC SitRep Format

1. Telex/sitrep number, date and time
2. Addressee, to
3. Weather
4. Flights
5. Pax movement/transit issues
6. Cargo movements
7. POL status
8. Camp activities
9. Resupply needs
10. Medical status
11. Status of equipment
12. Other projects, activities
13. Summary of accounts/logs:
 - Pax log update
 - Helicopter hours log update
 - Resupply log update

Example:

SPLA CLINK 08/01/94 18:55 070257 582493131818 493131818 PICO X

582493134360+
10:45 1994-08-01

TO:UAF/PICO
FROM:Sarah and Scott
SUBJECT:UAF/HVC/4088 SITREP #11
DATE:7/31/94
RECEIVED:4059, 4061
MISSING:4060

WEATHER: Sunshine with scattered clouds on some days. Fog in some mornings. Temperatures between low 60s and high 70s.

FLIGHTS:

24 July 0.8 hrs Chapin
24 July 0.3 hrs Oechel

25 July 1.7 hrs Chapin

26 July 2.3 hrs Chapin

27 July 1.3 hrs Chapin
27 July 2.7 hrs Oechel
27 July Purchased 82 gallons fuel from NANA

28 July 3.2 hrs Walker

29 July 0.2 hrs PICO-Fuel drums
29 July 0.4 hrs Chapin

30 July 1.1 hrs Chapin

PAX:

Max 12
Min 4

CARGO: Received:

Wed: frontier truck: 4 propane tanks, computer mail, etc.

Fri: Food delivery, 2 300 gallon tanks w/stands.

Sat: Frontier truck: garbage bags, action packer w/Heet, mugs, etc., printer w/cable, flower vase and candy (thanks).

Retro:

1 Action Packer with sleeping bag, Sam's tools and books.

P.O.L.:

Transferred 100 gallons into Lister.

5 Drums Jet A

3 Drums DFA

Jet A tanker, on first tank

HVC activities:

Changed water filters

Toolik fuel runs

Restapled tarp on Gen shed

Thorough cleaning of Lab

Built and installed Kitchen shelves

Installed cup hangers

Built and installed bathhouse shelves

Connect and test new computer

Hook up second printer

Transfer fuel to Lister tank and add oil

Install nozzles on hand pumps

Daily outhouse and bathhouse cleaning

Install eye bolts in outhouses

Unload and store 300 gallon tanks

Generator maintenance

Berm cleanup

Started camp how-to sheets

Installed second tank and new regulator for freezer
in boonie barn

Storing of generator maintenance parts

Update terrastar

Burn garbage

Medical: All in good health.

Critical Parts: None

Equipment:

Oil pressure gauge in truck is nonfunctional. Lister is running fine after it didn't want to start last maintenance. New computer and printer up and running.

Other: I have been told that covering the lug nuts with rubber hose will keep the dirt off of them and make flat changing easier. The lugs look to be about 9/16", so a 9/16" or 1/2" ID rubber hose would work. Each stud would need about 1.5" of hose, so 96" would be enough for all the studs, if this is something that you want to do.

Jennifer:

Here are Scott's hours for the week of 7/24-7/30:

7/24 10.5

7/25 8.75

7/26 10

7/27 11.5

7/28 7.25

7/29 10.

7/30 3.75

total of 61.75 hours

End of message.

POTABLE WATER SYSTEM

Water quality standards are set by the state Department of Environmental Conservation (DEC), based on the size of the camp and the source of the water supply. Coliforms and giardia were our main contaminant concerns, and the system's filtration was set up with this in mind. Potable water system plans were reviewed and accepted by the DEC. Monthly water sampling and testing by a state certified lab is also required. We collected our own samples and sent them to Northern Testing Labs in Fairbanks. The samples need to be tested within 30 hours of being drawn. As an additional precaution, we used a residual chlorine quick-test kit, on site, on a weekly basis.

Happy Creek, the Sagavanirktok River, and the Sag River Department of Transportation (DOT) highway maintenance station are three of our water supply sources. When the water level is appropriate, we can draw directly from Happy Creek. During periods of unsuitable water levels, we use a truck-mounted 300-gallon transfer tank and portable pump to haul water from the river, the DOT station, or any available source.

A 5-hp, 160-gpm Homelite pump with 250 feet of lay-flat fire hose is used to draw water from the creek or river.

Water from the creek is normally pumped directly to the main 250-gallon holding tank in the kitchen weatherport. Water from more distant sources is pumped into the truck-mounted transfer tank. The water is then pumped or gravity fed into the main holding tank.

The main holding tank has a two-inch fill pipe and a 20-micron screen-type sediment filter. The tank top has a 10-inch access port. Chlorine pellets are added to the water through this access. A 3/4-inch pipe with a foot valve runs from the bottom to the top of the tank and connects with a shallow well pump and pressure tank. The water is pumped through a 10-micron sediment filter and a 5-micron charcoal filter. At this point the water enters the potable water supply lines to the kitchen and the bathhouse. The distribution system is a typical household plumbing tree, solvent welded from CPVC pipe. Polybutylene would be preferable for its ability to resist breaking when freezing, its flexibility, and the wide range of compression fittings available. (An adequate supply of fittings were not available locally when the initial system was constructed.)

An in-line ultraviolet filter system is part of the camp's plumbing inventory but was not installed in the system last season.

Water Usage Log

This log is required by DEC to monitor our water usage in relation to our use permit. The data is used for the end-of-season report to DEC.

Record:

- Date.
- Time.
- Amount of water added.
- Amount of chlorine added.
- If the water was tested or not.
- Initials of the person making the log entry.

Fill in the information as the tank is filling or while waiting for the timer to go off.

Holding Tank Filling and Purification

Step-by-Step Procedure:

The camp is limited to 500 gallons of water discharge per day by DEC regulations. Therefore, the 250-gallon storage tank used to supply the camp's needs is never filled more than twice in a 24-hour period. Normally the tank will only need to be filled once a day, depending on camp loading. If the tank is allowed to run dry, the pump will run until it burns out, if unattended. Pay close attention to the water level.

1. Unplug the water pump, located in the utility room of the kitchen weatherport.
2. Open the water tank access port, located on top of tank.
3. Go outside and connect the 2-inch lay-flat supply hose to the tank fill spout.
4. Go to the Homelite pump at the creek and hook up the 2-inch lay-flat hose from the holding tank to the outlet of the Homelite pump.
5. Prime the Homelite pump. To prime, remove the wing nut-type plug on the top of the plastic pump housing. Using creek water and a #10 can, fill the black housing reservoir till water starts running back out of the clear, rigid supply hose. Replace the plug.
6. To start the pump turn the switch to the *on* position and slide the fuel supply lever to the choke setting. Pull the starter cord to start the pump. When the pump starts, let it run on the choke setting for several seconds until it warms up. When the engine starts to cut out, move the fuel supply lever from the choke to the *run* position. The pump will start to draw water up the clear hose within one to two minutes. If it does not draw water, you will need to shut the pump off and reprime it and start it again.

7. Walk/run to the intake filter by the weatherport. The pitch of the engine will change as water hits the reservoir of the pump. Support the large gray hose to keep from stressing the PVC fill pipe coming out of the weatherport. Either support the hose yourself or use the wheelbarrow to support the hose once the water is flowing.
8. Monitor the water level. At about 17 inches, when the tank is about 70 percent full, have somebody else watch the level as you run down to the pump. When the water tank is full, have the other person wave to you to signal to turn the pump off. If you are by yourself, once the water level hits 18 inches, you have 90 seconds to stop the pump and keep from overflowing the tank.
9. Now add chlorine to the water tank: two pellets for every six inches. This information is written on the side of the tank.
10. Set a timer for 20 minutes. This is the time required for the chlorine tablets to dissolve.
11. Fill out the water logbook with date, time, number gallons, and amount of chlorine added. Note if you did a water quality test or took a sample for Northern Testing Labs and write your initials.
12. While waiting for the timer to go off, disconnect the 2-inch lay-flat hose from the fill pipe and drag the hose out of the way to keep it from getting run over. Disconnect the hose at the Homelite pump so that it will drain. It is a self-draining hose.
13. When the timer goes off, the water is safely chlorinated. At this time, you can plug in the shallow-well distribution pump, and the system is ready to use.
14. While the filling of the storage tank is in progress and the pump is turned off, it is okay to use the stored water in the pressure tank if needed, but do not turn the pump on till the 20-minute chlorination period is completed.

Hot-Water Heater

The Aqua Stars are propane-fired demand hot-water heaters. There is one for the kitchen and one for the bathhouse. They have standard compression fittings and are plumbed into the water system. They are vented to the outside of the building with 6-inch class-B double-wall gas vent piping. Wall thimbles or safeties are used to pass through solid or fabric walls. The heaters must be protected from drafts but should not be installed in an unventilated closet. The heaters operated trouble-free all season.

1. Lighting instructions are printed on the front of the heater. After initial lighting, a pilot light ignites the burners on demand. Relighting the pilot is required whenever the propane tanks are changed.
2. To adjust the temperature of the water, turn the numbered knob from 1 to 8 to reach the desired temperature. For washing hands and showering, somewhere between 3

and 4 is the normal comfort range. When filling a bucket for cleaning, turn the dial up to 8 to get very hot water.

3. The heaters will not run if the water pressure is too low. Check that the pump is working. Check the water filters; they may be plugged. A visual check is often not valid. A quick check involves removing the filter elements, reconnecting the empty filter base, and then checking the change in water pressure at the tap. If it is noticeably better, the heater will turn on. Install new filter elements. Check the propane tanks; the heater may be out of fuel.

Note: An empty tank may be adequate to keep the pilot light lit but not adequate to fire the burner.

Water Filter Changing

Step-by-Step Procedure:

It is time to change the water filters when the pressure in the water system drops. If left too long, you may be unable to get hot water from any of the taps. The line pressure may be too low to toggle the pressure switch on the demand hot-water heater. This may be caused by plugged filter elements. Replace both the sediment and the charcoal filter elements. (See the enclosed drawing of the tank-pump-filter-heater setup.)

1. Turn the valves off on both sides of the filters. For *off*, turn the valve handle perpendicular to the pipe. For *on*, turn the valve handle parallel to the pipe.
2. Put a dishpan under the filters to catch the water. Press the red button on the filter body to release the pressure. Do this to each filter until no more water sprays out.
3. Once the pressure has been fully released, unscrew the blue or clear filter housing. Remove the filter elements. The filters may stick to the black top. If this happens, pull and twist off the filters.
4. Replace old filters with new ones. Some filters have one closed end; this end goes toward the bottom of the filter. If the filter is put in backwards, the water will not flow through.
5. Screw housing(s) back on. Make certain that the small O-ring gasket is properly seated between the base and the cap.
6. Turn the valves to the *on* position.
7. Press the red button on top of the filter to bleed air out of the system. Hold the button down until a steady stream of air-free water squirts out.

8. The system is now operational. Throw away the old filter(s), put away dishpan, and mop up any water that missed the dishpan.
9. There may still be some air in the system, but it will be let out through the faucet when the faucet is turned on.

GRAY-WATER SYSTEM

The gray water, or waste water, from sinks is required by the Department of Environmental Conservation to be filtered. The waste water from the sink gravity feeds through a grease trap. The water then continues to a sump tank (plastic garbage can). There it is pumped through a 20-micron filter to the drain field. The drain field is 50 feet away from the 20-micron filter; the water runs through 2-inch PVC piping. The last 10 feet of the pipe is perforated and buried 18 inches down. (DEC only requires 6-inch burial.) **Note:** A 200-micron filter is the DEC requirement, but the 20-micron was the only unit we could source.

Grease Trap

The grease trap needs to be cleaned when the draining of the sink slows, usually daily. Dump the slime from the trap into a plastic bag. It is necessary to scrape or shake the slime out. Throw the bag into the bear-resistant container with the rest of the food waste.

Outhouses

Four outhouses were rented. Two outhouses should be on-line with the other two in reserve. When two are full, bring the other two on-line and notify the home office that the extra outhouses have been brought on-line. The home office will call the vendor and schedule a service call to have the units pumped. The pumper truck may come from Fairbanks or Deadhorse, depending on the vendor.

There are locks on the outhouses. These locks are to keep tourists, hunters, and unauthorized personnel from using them. Set the locks to a combination that is easy to remember and give the combination to all LAII participants. Keep the other two units locked with a different combination, known only to camp staff. These are the reserve outhouses for when the other two are full.

TRASH DISPOSAL

Nonburnables

Trips to Service Area Ten for trash disposal were made on an as-needed basis. This was usually every 2 weeks. The nonburnable trash, along with the used oil, can be taken to the Prudhoe Bay waste treatment center. It is located behind Service Area Ten. Drive around back with the load of garbage. If no one is there, go around the front and up the stairs to the office and tell them that you want to empty your garbage. Tell them where you are from, and they will record your fee for the dump. The minimum fee for a pickup truck is the same, no matter how much you bring, so make it worthwhile and bring a full load. Do not use the word *waste* when referring to anything you want to dispose of, such as normal trash or used motor oil. *Waste* implies a classified and regulated substance.

Burnables

Paper and wood products were the only products burned. Two upright 55-gallon barrel stoves were used to burn this trash.

BERM SYSTEM

- The Department of Environmental Conservation requires that all fuel and other hazardous materials be stored in appropriate containment berms.
- Berms must be sized to hold 110 percent of the storage container capacity.
- Approved spill cleanup kits must also be kept on site.
- A spill notification protocol must be established and kept on site.
- A 24-hour emergency response phone number must be posted.

Several types of containment berms were employed throughout the season. Twenty-mil impermeable fabric was used to construct berms on site as needed. Hypalon-neoprene fabric berms from PIGG Co., ATL Co., and Alaska Tent and Tarp were also used.

Generator shed berm: 7' x 7' x 1'. A bathtub floor was made by laying 20-mil fabric on the floor, folding it up onto the interior walls, and attaching it with wooden battens.

The berms that were used in 1994 are as follows:

7600-Gallon Berm:

ATL Co.: tanker berm, 7600 gallons, 45' x 16' x 17', inflatable pontoon sides. This berm has three components: a 20-mil ground cloth, a berm liner, and 4 pontoons. Setup time is 60 minutes, using a 12-v high-volume pump and double-action high-volume manual raft pump. Once the berm is up, tie a sandbag to each strap to keep it from blowing back when the helicopter lands.

900-Gallon Berm:

Alaska Tent and Tarp: 900 gallon, 9' x 9' x 2.5'. BLM helicopter berm designed to resist prop wash. Used for Toolik Field Station refueling site. Four long metal stakes and four corner posts hold this berm up. Use with a 20-mil ground cloth and line the floor inside with plywood. Setup time is 30 minutes.

748-Gallon Berm:

PIGG Co.: new, 748 gallon, 10' x 10' x 1', two each, self-supporting. Use 20-mil ground cloth and line the floor inside with plywood. Setup time is 30 minutes.

350- to 600-Gallon Berm:

Twenty-mil fabric is kept on site for building additional berms as needed. At one time, five fabric berms with earth and/or timber sides were set up for the generator

shed, 500-gallon diesel storage, and 55-gallon drum storage. Note that for the 1995 season, the camp should only need three of these berms: one for the generator shed, one for the 300-gallon diesel tank adjacent to the shed, and one for the heli pad. If these berms are used for drum storage, it is best to lay plywood inside on the floor to avoid punctures when moving the drums. The two new PIGG berms listed above replaced the other earth/timber berms.

All berms should be cleaned and pumped on a regular basis or after a heavy rain. Use either the hand bilge pump or the 12-volt electric sump pump to empty the berms. Be sure to skim the surface of the berm with absorbent before pumping to remove any spilled fuel from the water.

Note: Two new berms will be needed for the 300-gallon diesel fuel tanks for the new Toyo Laser 73 stoves.

FUELS

The fuels used at HVC consisted of:

- Jet A1 for the helicopters.
- Diesel for the Lister generator and some vehicles.
- Unleaded gasoline for vehicles and small generators.
- Coleman fuel for camp stoves.

The Jet A1 was provided by PICO/UAF from an on-site 6000-gallon tanker and from 55-gallon drums. The unleaded gasoline and diesel supplies were maintained from bulk tanks at the Arctic Wilderness Lodge, located across the Dalton Highway from HVC. Vehicles were also refilled from any DOT station as needed.

When diesel is needed, inform the Arctic Wilderness Lodge and they will bring some across in a transfer tank. It is good to give them one or two days' notice, as they are busy once the hunting season starts. The unleaded gasoline is in a 500- or 1000-gallon tank and is locked up. The personnel at HVC and the Arctic Wilderness Lodge should be the only ones with the combination to this fuel tank. A 12-volt pump for unleaded gasoline is mounted on the fuel tank. This belongs to the Arctic Wilderness Lodge. It is run by the battery in the vehicle that is being fueled. Plug the cord into the pump before hooking it to the battery. Then hook up the battery. Now unlock the hose, open the valve on the tank, turn on the pump, and dispense the fuel into the truck.

Fuel Logs

Track the amount of fuel delivered to camp for the bulk tanks and 55-gallon drums. The logs simply show delivery date and quantity delivered. The amount of any fuel on hand is measured or estimated and reported in the weekly situation report.

- A diesel (DFA) log is kept.
- A gasoline (Mogas) log is kept.
- A Jet A1 log is part of the daily flight summary.
The pilot keeps it and we sign off on it.
- Propane usage should be logged in 1995. (1994 can be calculated from old invoices or transportation receipts.)

55-Gallon Drums: Techniques for Loading, Moving, and Storing

Fifty-five-gallon drums are an inevitable element of remote camps. They will need to be loaded, unloaded, transported, and stored. When they are full, they weigh approximately 450 pounds. The camp GFA must be able to handle full drums by himself.

The following information tells how one person can successfully move full drums without getting injured.

Fifty-five-gallon drums are **HEAVY**. They will injure you if you are not careful when working around them!

- Always stay out of the direction of travel of the barrel.
- Always wear gloves and appropriate shoes (preferably steel toed).
- Whenever there is a doubt that you can do a job safely, have someone help you.
- Two people can move a drum much easier than one!!

Basic Drum Movements:

Standing up a drum:

1. Ideally begin with an empty drum for practice, then a partially full one, etc.
2. Lay the empty drum on its side.
3. Position yourself at the end of the drum that you want up.
4. Squat down with your back straight and knees bent.
5. Grasp the barrel around the rim, about three inches up from the ground on each side.
6. Using your legs for power and your arms for control, you can raise the barrel.
7. Slowly stand up.
8. As you stand, let your arms straighten out.
9. Continue to stand, using your legs to power the lift.
10. When your legs are fully extended, the barrel should be at or near its balance point.
11. Complete tipping the barrel upright, using your arms.
12. Don't try to yank it up; it won't work.

Laying down a drum:

Method 1 - Towards you. Use only in situations with limited area.

1. Reach across the drum with one hand. Grasp the edge of the drum.
2. Put one foot at the base of the drum--the side closest to you.
3. Bend the leg that is at the base of the drum. Lean toward the drum and then in a quick motion lean away from the drum pulling with your arm, your leg, and also hanging your other leg out away from the drum for leverage. Looks funny but it works.

4. Once the drum reaches its fulcrum point, it will be easier to move. Slowly lower the drum by pushing against the weight of the direction it wants to fall. This is basically a controlled fall.

The drums are tough and should survive being knocked over and let fall, but doing this repeatedly will damage or even crack the drum.

Method 2 - Push away. The recommended method-- rough on the drums but easy on you.

1. Stand on one side of the drum.
2. Put both hands on the side of the drum at the top.
3. Bend knees and push.
4. Once the drum reaches the balance point, a little more effort will put it on the ground.

Option:

Once the drum reaches the balance point, move around to the opposite side and follow step 4 of Method 1. This saves wear and tear on you and the drum

Advanced Drum Movements:

Loading drums into a truck:

Empty drums can simply be loaded into the truck. Even though the drum is empty, you should still bend your knees and use your legs and momentum as much as possible to minimize risk.

Full drums are much trickier and should be loaded with two people.

Note: If possible roll the barrels up a low-angle rise in the ground. Then set up the 4x4s. The lower the angle of the 4x4s into the truck, the easier it will be to roll the drums into the truck.

1. Make a ramp out of 4x4s. Remove tailgate (if possible); set 4x4s on bumper. Make sure the 4x4s will not slide or roll around. If you must, dig the 4x4s partly into the ground. This will make starting the roll up them easier and will also help to stabilize the ramp.

2. With two people, roll the drum up the ramp and into the truck bed. Now, centering the drum between the two of you and bending your knees, stand the drum up.

Unloading drums from a truck:

1. Stack four tires, without rims, on the ground next to where the barrel is to be stored.
2. Back up the truck, with tailgate down, till the edge of the tailgate is over the edge of the tires.
3. Lay down the drum and roll it to the edge. You or the second person should now get on the ground. Slowly roll the barrel, centered on the tires, onto the stack of tires. The tires will give, and the barrel should come to a rest on the tires.
4. The barrel can now be rotated to whatever direction you want it.
5. Lift up on the top of the barrel, and it will slide off the tires ever so gently.
6. Repeat steps 3-5 for each barrel.

What to do if you have no tires: It is highly recommended that two people work together for this method of unloading barrels.

1. Lower the tailgate.
2. Set a piece of scrap wood about 2 feet behind the truck. This is for the barrel to land on. It protects the spill berm from puncture and/or the barrel from damage.
3. Roll the barrel to the edge of the bed. The barrel should run lengthwise with the bed. Be sure the barrel is lined up to hit the wood.
4. Slowly move the barrel closer to its balance point. You will feel the barrel want to slide out of the bed. Make sure that you and nothing else is between the barrel and wood.
5. Move the barrel out a little bit more and it will slide/fall to the ground, landing on the wood and hopefully staying upright. Hold on to the bottom rim as it falls out. As the barrel nears the ground, move your hands quickly out of the way! This is nerve-wracking but does work, even by yourself.

You can also roll the barrels down the 4x4s if you have no tires.

Storing the Drums:

Drums should be stored in a spill berm that has 110 percent capacity. (For example, a 55-gallon drum requires a berm with a capacity of 60.5 gallons.)

To compute the amount that a berm will hold, use the following information:

- 1 gallon = 7.7 cubic feet
- Divide the amount of fuel (110 percent) in gallons you want to hold in the berm by 7.7. This will give the cubic feet that your berm needs to be.
- To figure cubic feet, multiply length x width x height. Example: a 1' x 10' x 1' berm would have a 10-cubic-foot capacity, or will hold 770 gallons, if perfectly level.

PROPANE

Propane powers the oven, heaters, a refrigerator, a freezer, the hot-water heaters, and the barbecue grill. One-hundred-pound tanks are used for all appliances. At each appliance, there are two tanks of propane. The logic behind this is when one runs out, you can just switch to the next one, then change out the empty one, not causing a delay in the use of the appliance.

The propane tanks must be mounted so that they cannot fall or be knocked over. The best method for securing the tanks is to fasten them to the building. The fire marshal cautioned against digging a hole to stand the tanks, as this is potentially hazardous. We had to dig a hole for the tanks approximately 10 to 12 inches deep, then tie a rope around them and fasten them to the building to provide extra stability. The tanks that are being stored should be secured also. This is easily done by putting them next to the bathhouse and then securing a rope around them to the building.

RESUPPLY AND ORDERING

Be sure to keep track of the rate at which supplies are used up. Allow for two weeks of leeway when ordering supplies. The road does wash out, truck deliveries can get canceled, or the home office may not have time to expedite your order. Better to have the parts a little too early than to have them too late!

When it is time to reorder, send a message to the home office. The format for purchase orders is as follows: product, quantity, vendor, remarks.

Example:

Item: Soap, Oasis biocompatible, biodegradable, quart size.

Quantity: 1.

Vendor: Whole Earth Grocery.

Remarks: This is the biodegradable soap that has been used all season, as required by DEC.

BUILDINGS

(See attachments for maps of each facility.)

Bathhouse

The bathhouse is a modular 8' x 8' x 8' frame building. The roof has a 2-foot overhang on the rear of the building. Inside, there are two lavatory sinks, one shower stall, a wringer washing machine, and a propane-fired demand hot-water heater. On the rear outside wall, a utility sink is mounted as required by the Department of Environmental Conservation.

This unit is screwed together and breaks down into four wall panels and one floor panel. The roof breaks down completely into its component parts. The roofing material is opaque, plastic, corrugated greenhouse panels.

This unit is set up adjacent to the kitchen weatherport. Electrical power and water are supplied from the kitchen weatherport. The bathhouse is plumbed like a standard residential unit. The exception is that hubless coupling and unions are used at many junctions to allow for seasonal assembly and disassembly. The potable water system is CPVC pipe, and the gray-water system is ABS pipe. The gray-water system should be ready to reassemble with its hubless connectors. The CPVC potable water system was cut in three or four places and will need to be repaired using unions for the 1995 season.

The waste line drains into a gray-water sump and is then pumped through a filter and into a leach field 50 feet behind the kitchen weatherport.

Lab

The lab is a 18' x 25' weatherport. There are eight tables, each with a power strip and a total of four uninterrupted power supply (UPS) units that provide power without spikes and lows. This unit will also provide power when the generator is turned off. This will allow someone on a computer time to save his/her data and not lose it. For specific table setup, see lab diagram.

Kitchen

The kitchen is a 18' x 25' weatherport that is divided evenly between the kitchen and dining area. The kitchen has a six-burner stove with an oven. On one wall, there is a three-compartment sink for dishes. A large L-shaped counter is located across from the sink (see diagram).

Boonie Barn

The boonie barn is used for food storage. Some other items are stored in there as well. The building is a 12' x 17' Quonset hut-style tent. There are six-inch platforms all around to keep the food off the ground. There is a table on one shelf to provide more storage.

Generator Shed

The generator shed is a three-sided 8' x 8' building that houses two Onan 6.5-kW gensets and a Lister 12.5-kW generator. Inside of the shed is a spill berm. Around the interior sides of the shed are shelves on which to put maintenance parts.

THIS MAP SUPERCEDES ALL OTHERS CREATED BY THE POLAR ICE CORING OFFICE FOR THIS LOCATION

EXIT FOR CAMP AT MILE 335 DALTON HIGHWAY

STREAM TO SAGAVINIRTOOK RIVER

MILE 335

TO AIRSTRIP

LLHV0002

WATER PUMP

3' x 30' FOOT BRIDGE

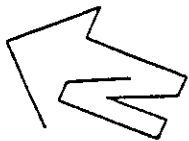
BERM0001



ALYESIA GAS LINE (BURIED)

DALTON HIGHWAY

TAGS LINE



NSB 94-067
 DNR 18937 (Research)
 DNR 18942 (Camp)
 Fish and Game FCG4-NI-0119
 DEC Water Plans PWSID 700000
 DEC Health Permits (Food) 363400034
 State ID# AK 9404-26AA



Polar Ice Coring Office
 1000 North Steese Blvd., Fairbanks, Alaska 99701

HAPPY VALLEY CAMP
 LAYOUT AND LOCATION

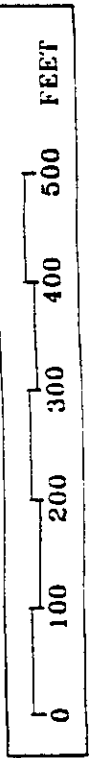
K.G.B.

31 Jan 85

NONE

117470001

DO NOT SCALE THIS MAP



2000477

ROAD AROUND CAMP TO DALTON HIGHWAY

HOSE FROM PUMP AT CREEK

LLHV0007

LLHV0026

12'x17' FOOD STORAGE WEATHERPORT

STORAGE TENT

RENT-A-THRONES

SCREEN TENT

TENTS
SEE LLHV0020 FOR STAKE PATTERN

GREY WATER FILTER

GREY WATER LEACH PIPE

BURN BARRELS

LLHV0005

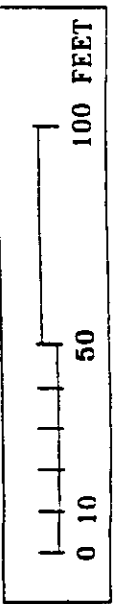
LLHV0006

LLHV0008

FUEL STORAGE



SEE LLHV0021 FOR ELECTRICAL DISTRIBUTION



SEE LLHV0021 FOR ELECTRICAL DISTRIBUTION

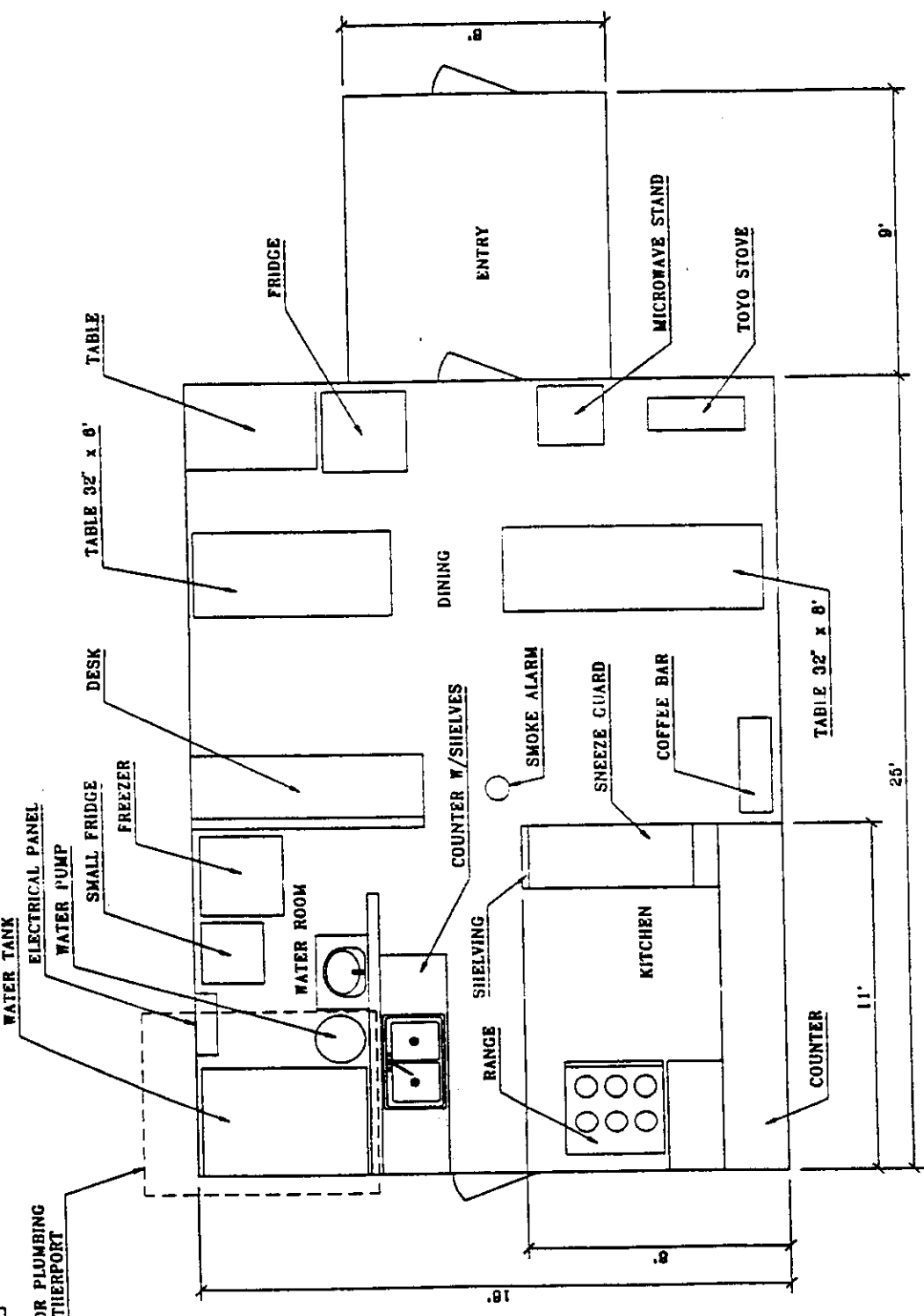


HAPPY VALLEY CAMP
LAYOUT OF MAIN CAMP

K.G.B.
31 JAN. 95
NONE
LLHV0002

50000000

SEE LHV0022 FOR PLUMBING OF KITCHEN WEATHERPORT



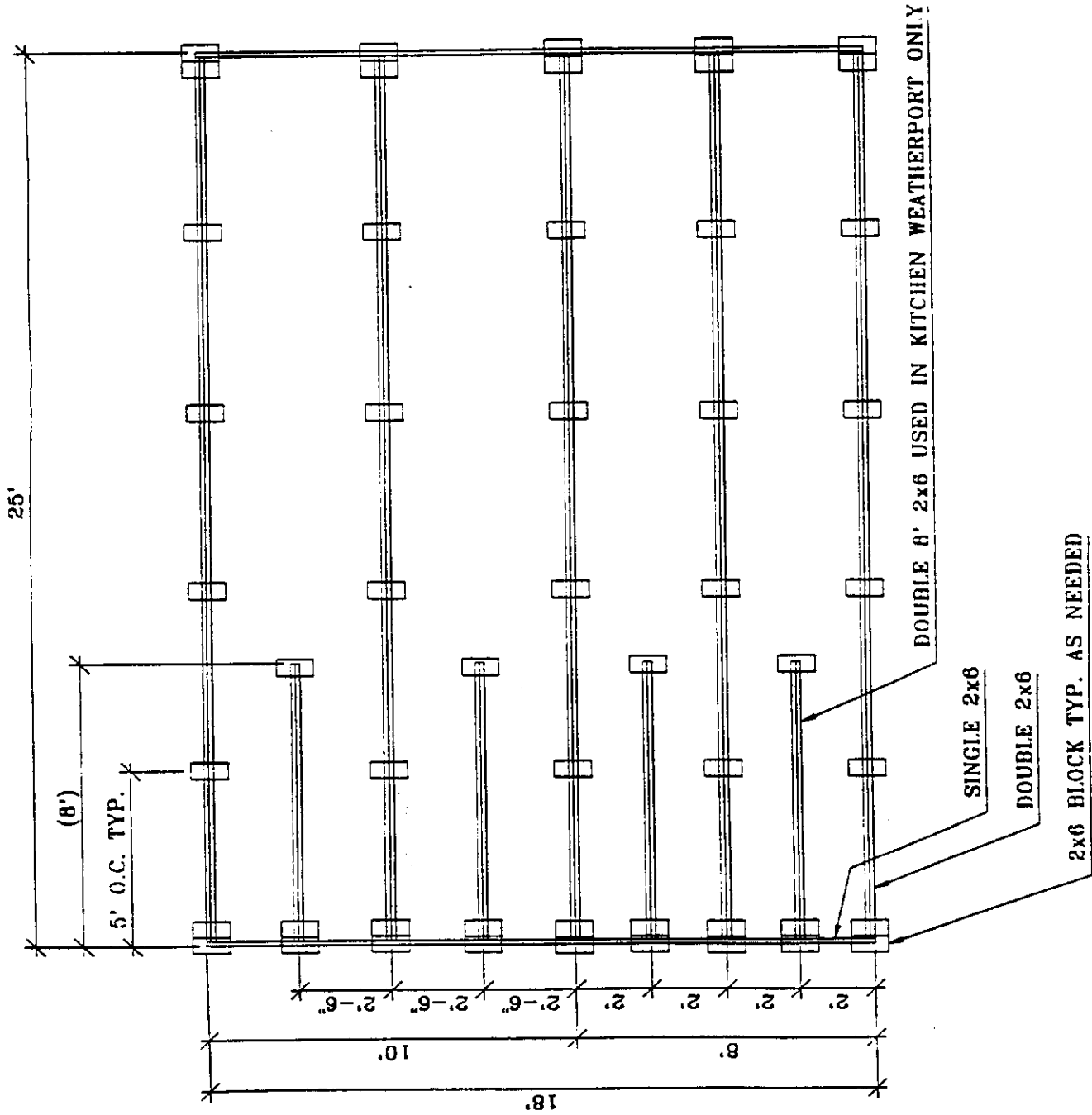
- NOTES:
- 1: FOR FOUNDATION AND FLOOR FRAMING LAYOUT SEE DRAWINGS LHV0003, LHV0004
 - 2: FOR ELECTRICAL LAYOUT SEE LHV0023
 - 3: FOR SHELVING, COUNTER, SINK LAYOUT SEE LHV0025

PICO
 Polar Ice Coring Office
 10700 Highway, University of Alaska, Fairbanks, Alaska 99775

KITCHEN / GALLEY
 WEATHERPORT

K.G.B. 1
 31 Jan 95 NONE
 LHV0005

FOR LHV0022 FOR PLUMBING OF KITCHEN WEATHERPORT

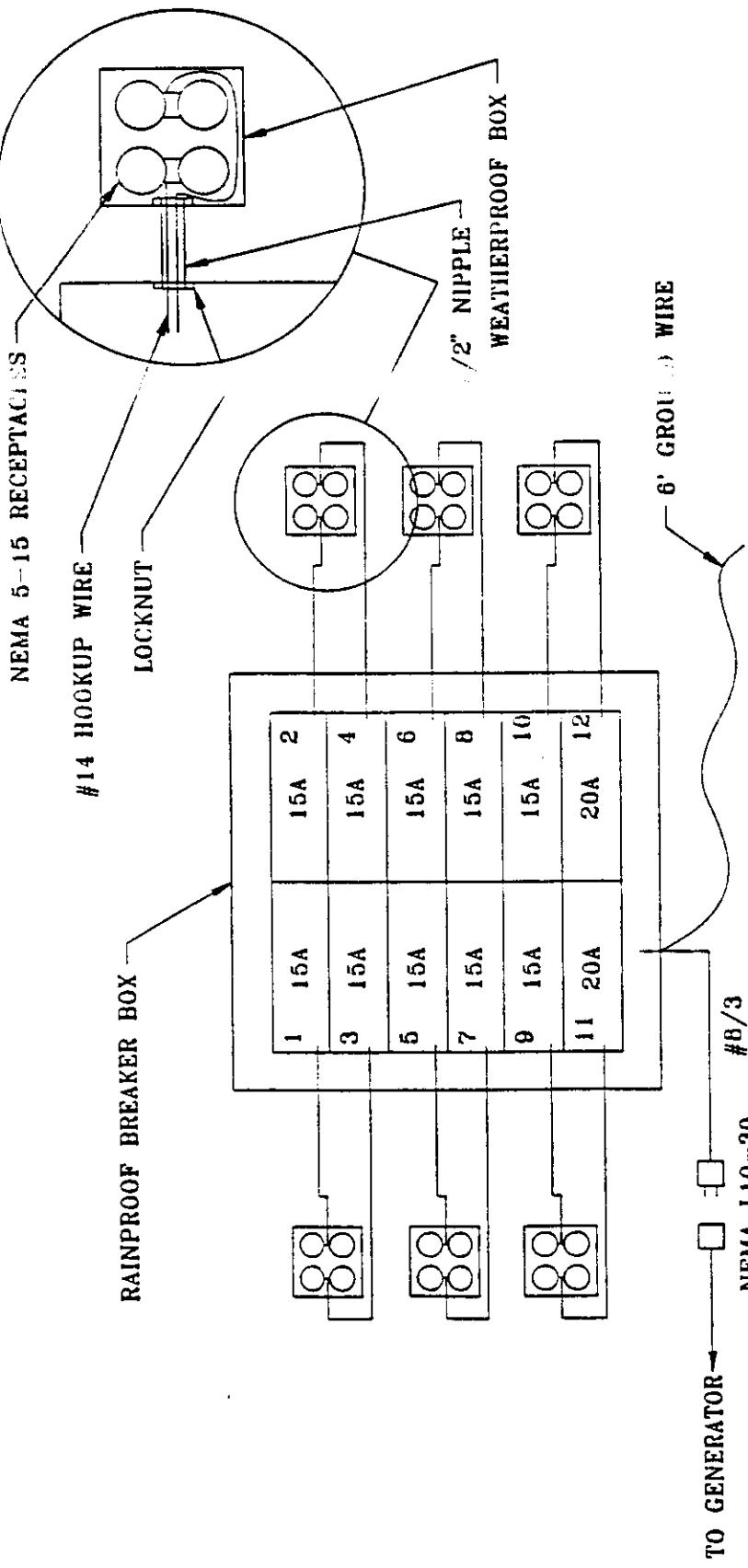


P I O O
 Polar Ice Coring Office
 1700 14th Street, Anchorage, Alaska 99501

LAI - HVC
 WEATHERPORT FLOOR
 FOUNDATION

K.G.H.
 21 Sep. 94
 NONE
 LCHV0003

FOR ALL PROJECTS AND CONSTRUCTION



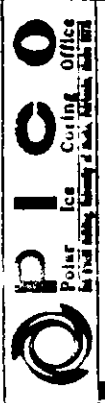
1 LIGHTING	GEN. PURPOSE	2
3 COMPUTER	TELEX	4
5 EL. HEAT	EL. HEAT	6
7 LIGHTING	GEN. PURPOSE	8
9 COFFEE	GEN. PURPOSE	10
11 TOASTER	MICROWAVE	12

DINING SIDE

KITCHEN SIDE

15A BREAKERS

20A BREAKERS

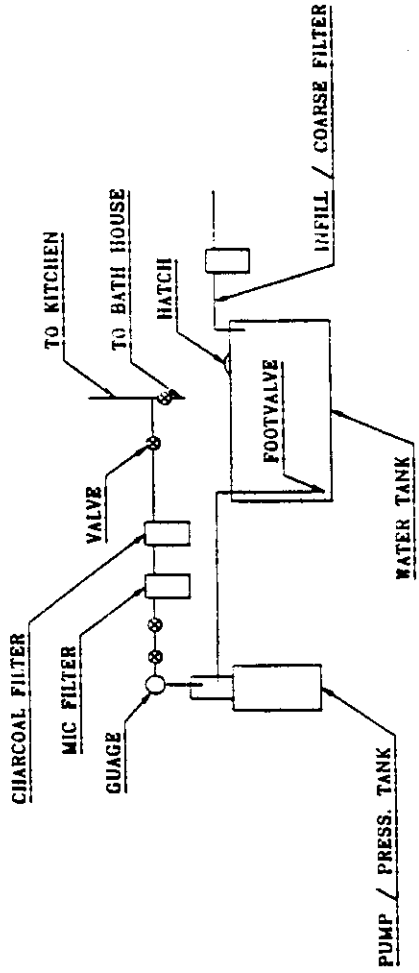
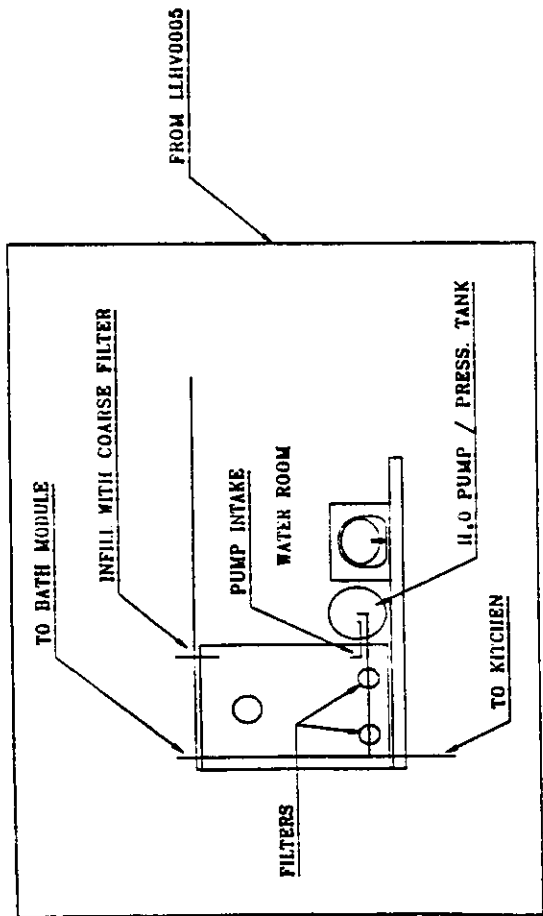


LAIH-HVC
GALLEY ELECTRICAL LAYOUT

K.C.B.I.
1 Feb. 95
NONE



11HV0022

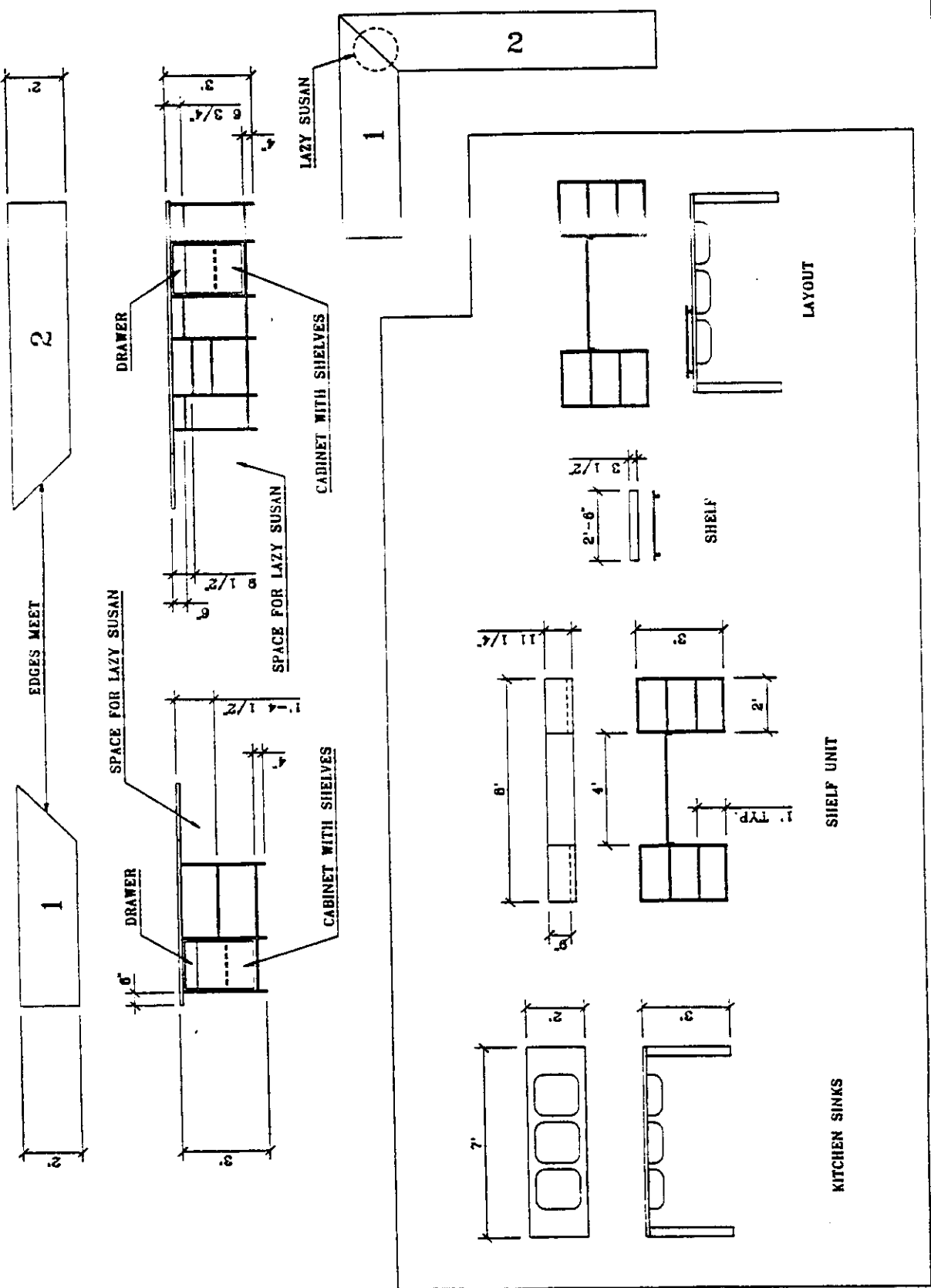


FILTERS, PUMP, TANK
WATER ROOM

K.G.B. / FEB. 85 / NONE

DO NOT WRITE IN THESE SPACES

111V0025



PICO
 Polar Ice Coring Office
 100 West 10th Street, University of Alaska, Fairbanks, Alaska 99775

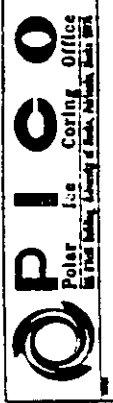
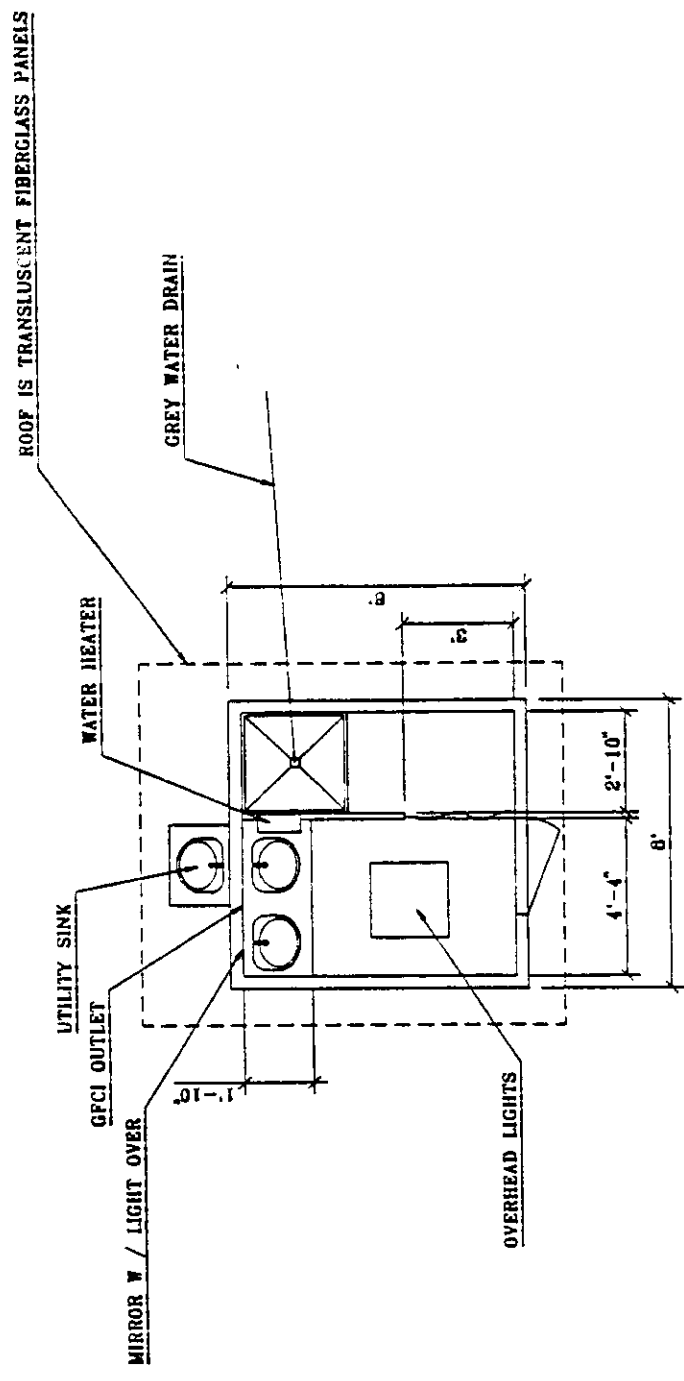
KITCHEN / GALLEY SHELVING

K.C.B. 111V0025
 2 Feb. 95
 NONE
 111V0025

NOTES:
 1: SHELVES ARE PAINTED WHITE - CABINETS ARE STAINED

DO NOT SCALE DRAWINGS
 FOR DIMENSIONS USE DIMENSIONS

4000471

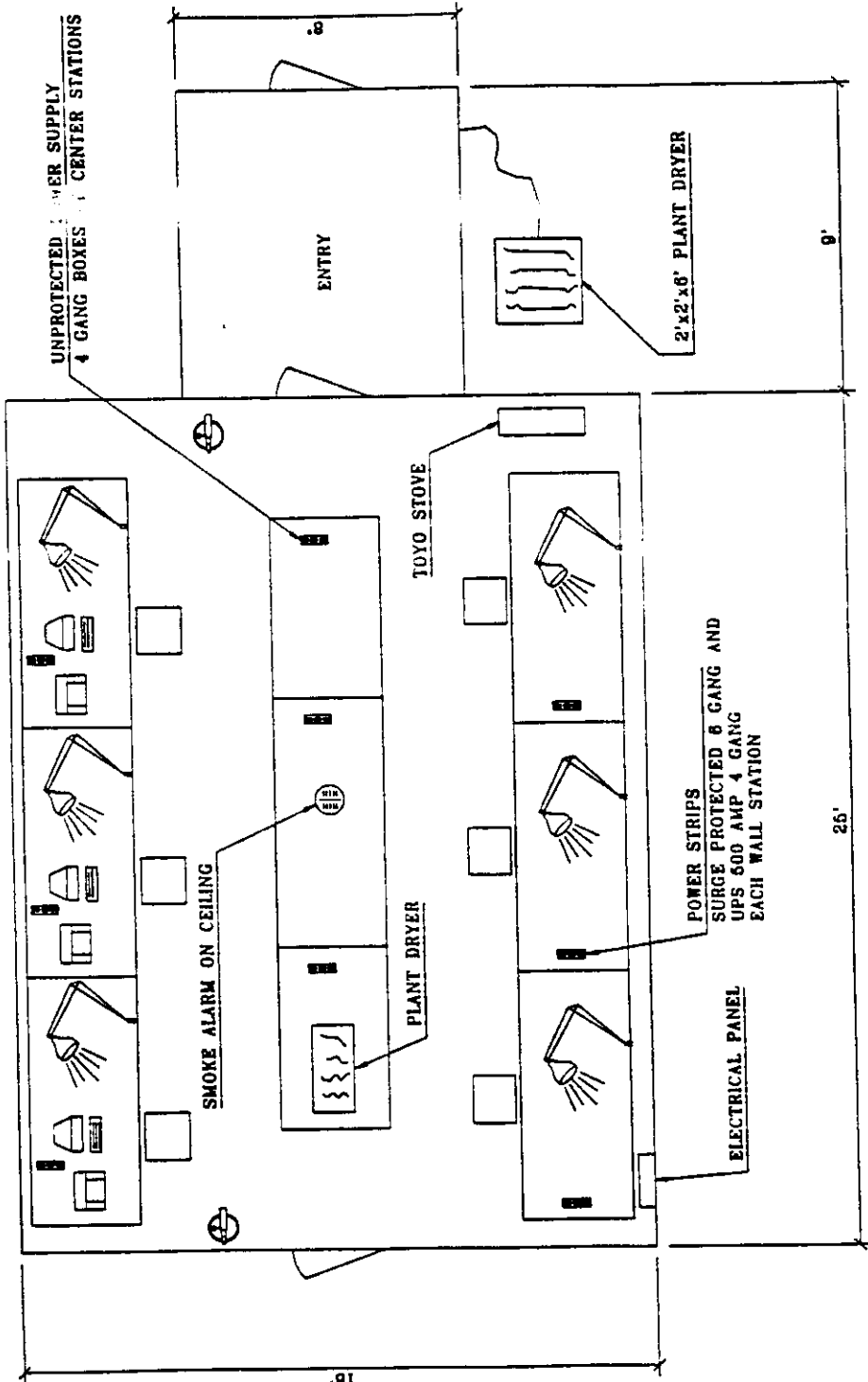


LAI-HVC
BATH MODULE

K.G.B.
31 Jan 95

NONE

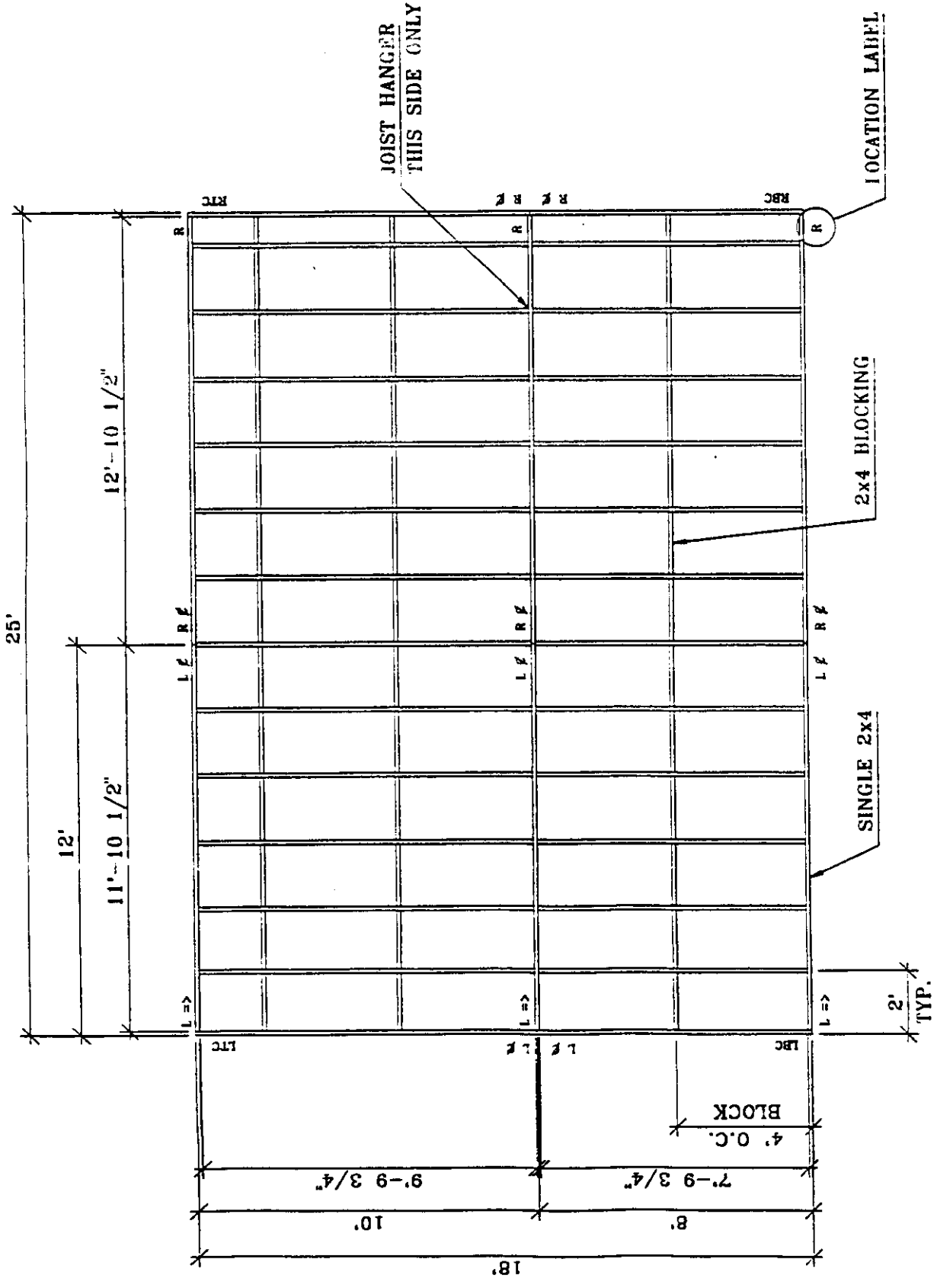
THIS IS A PRELIMINARY DRAWING
DO NOT SCALE FROM THIS DRAWING



NOTES:

- 1: FOR FOUNDATION AND FLOOR FRAMING LAYOUT SEE DRAWINGS LHV0003, LHV0004
- 2: 16 LINEAL FEET FLOURESCENT LAMPS TO BE MOUNTED OVER CENTER WORK SPACES AT CEILING FOR BUILDING LIGHTING
- 3: ELECTRICAL LAYOUT SEE LHV0024

	Pico Polar ice Coring Office 2750 University Ave., Boulder, CO 80502
	LAB SPACES WEATHERPORT
K.G.B.	NONE
31 JAN 95	LHV0006



JOIST HANGER
THIS SIDE ONLY

LOCATION LABEL

2x4 BLOCKING

SINGLE 2x4

LBC = LEFT BOTTOM CORNER
 RBC = RIGHT BOTTOM CORNER
 L=> = LAYOUT
 L<, R< = ENDS TOWARD CENTER

2'
TYP.



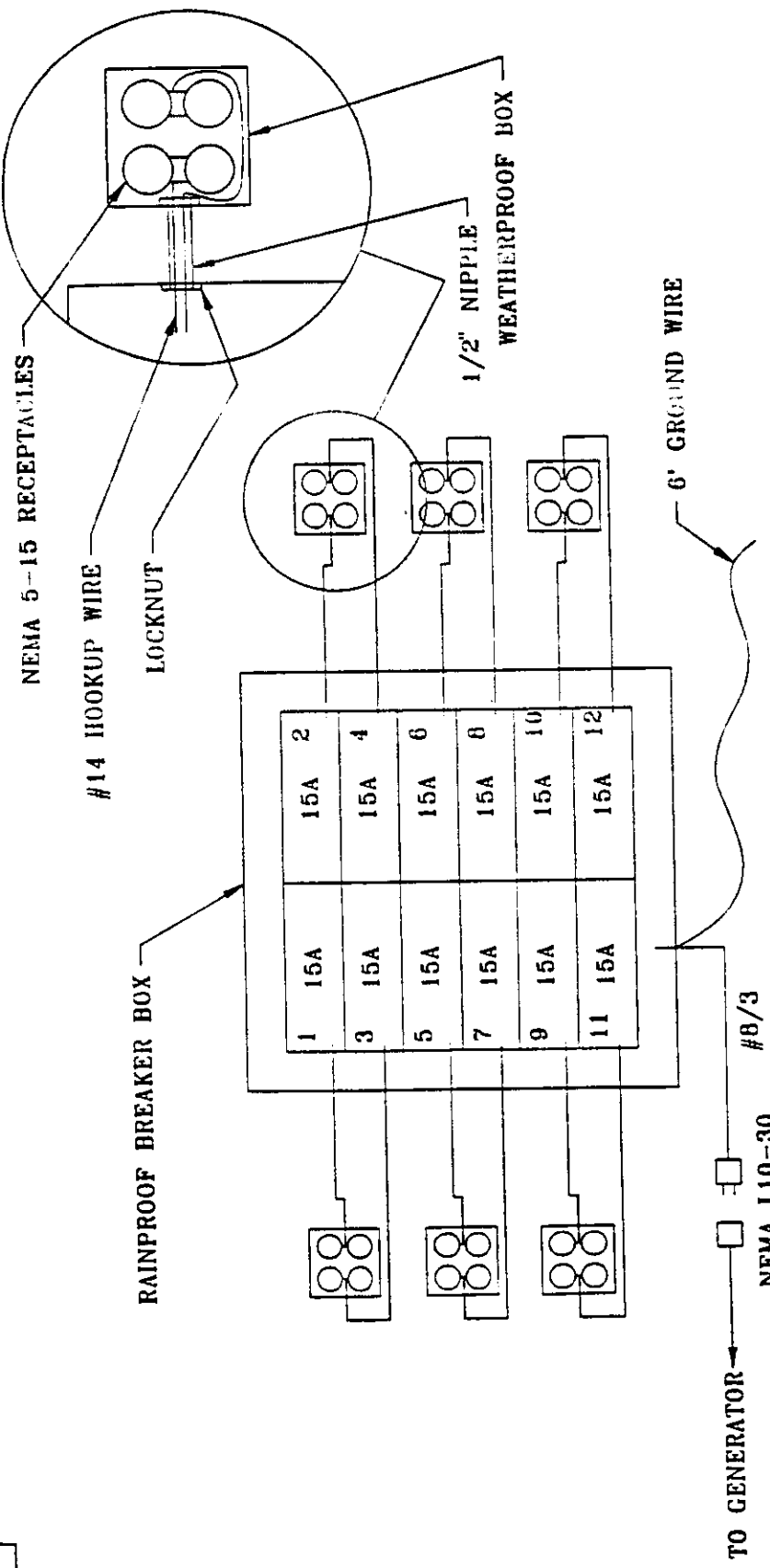
Polar Ice Coring Office
 15000 Highway 2, Inuvik, Northwest Territories, Canada

LAI-HVC

WEATHERPORT FLOOR
 CONSTRUCTION

K.G.B.
 21 Sep 94
 NONE



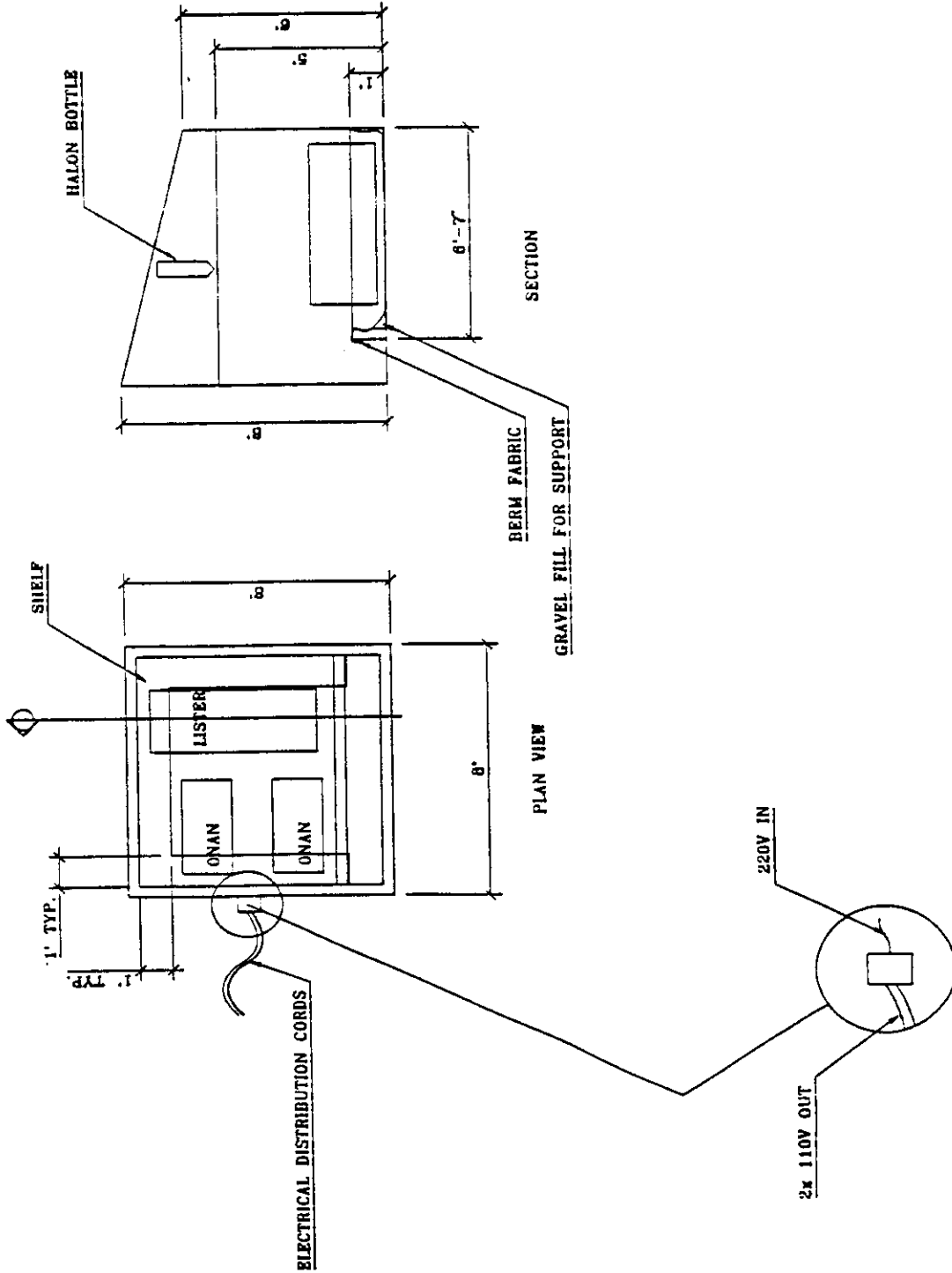


1 LIGHTING	PLANT DESK 1	2
3 COMPUTER 1	PLANT DESK 2	4
5 COMPUTER 2	EL. HEAT	6
7 DESK 1	EL. HEAT	8
9 DESK 2	GEN. PURPOSE	10
11 BATH LIGHT GFCI	BATH POWER GFCI	12

P I C O
 Polar Ice Coring Office
 11 Feb. 95
 LAH-IIVC
 LAB ELECTRICAL LAYOUT
 NONE
 LLAHV0024

See the back for details

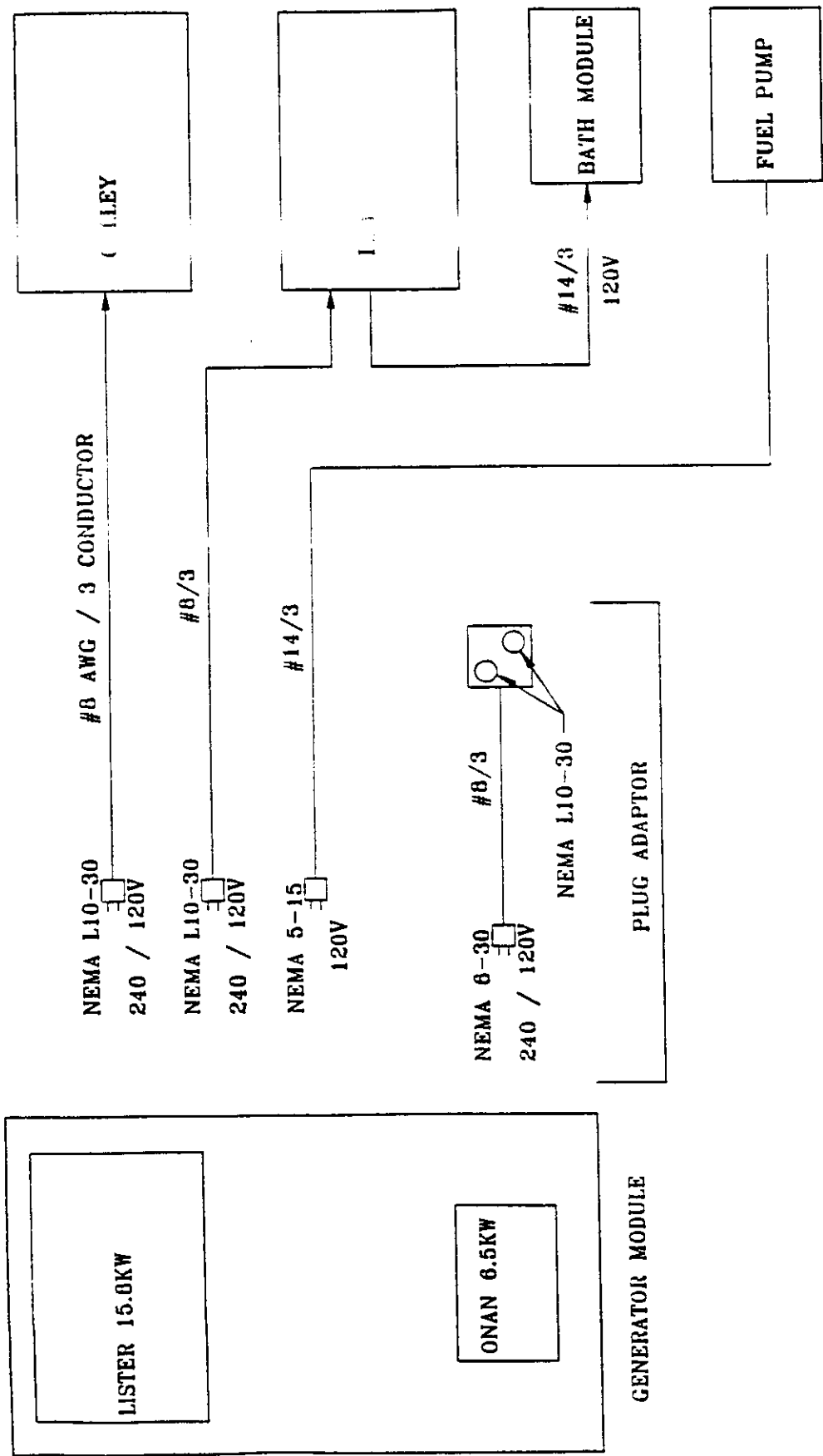
8000011111



LAI-HVC
GENERATOR MODULE

K.G.B.
Feb. 95
NONE

DO NOT SCALE DRAWING



PICO
 Polar Inc. Corning Office
 1000 Main Street, Corning, NY 13612

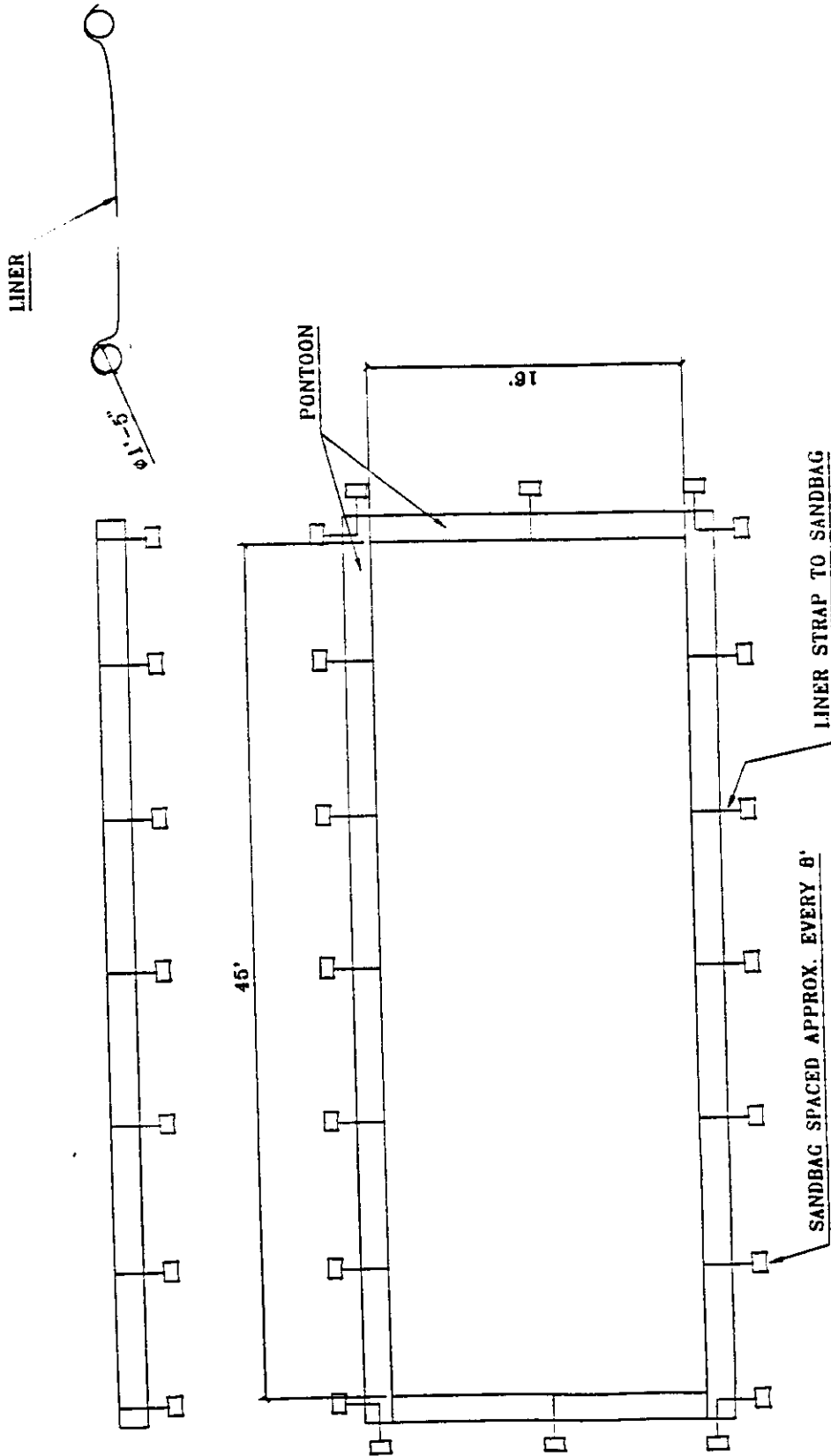
LAI-HVC
 ELECTRICAL DISTRIBUTION

K.G.B.
 Feb. 85

NONE

12000021

FOR THE USE OF THE DISTRIBUTOR



NOTES:

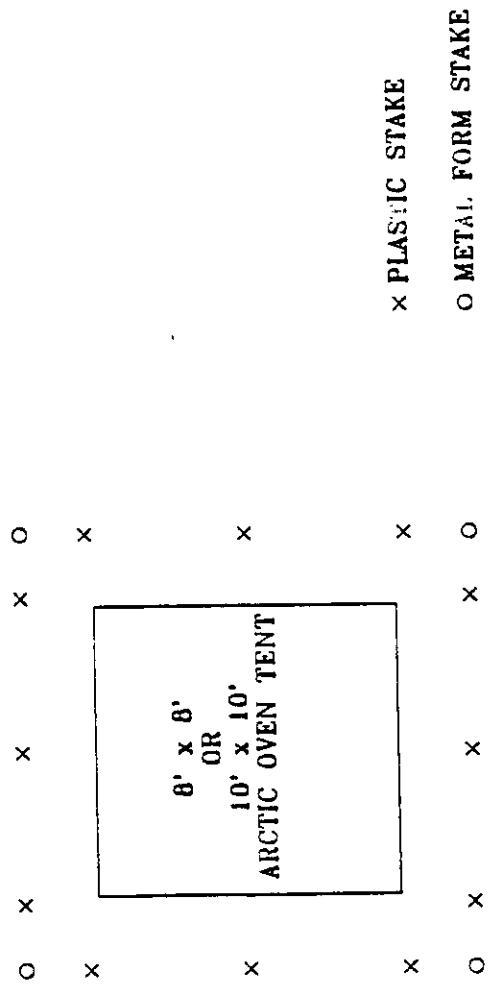
- 1: SAND BAGS OR STAKES TO BE USED ON ALL SIDES TO PREVENT LIFTING BY WINDS
- 2: IF STAKES ARE USED CARE MUST BE TAKEN TO PREVENT PUNCTURES TO PONTOONS

FOR SPECIAL ORDER CONTACT:
 800-343-2334

AERO TEC LABORATORIES, INC.
 PORT-A-BERM
 45' x 16' x 17" 7600 GALLON CAPACITY

P I C O
 Polar Ice Coring Office
 1500 17th St. N.W.
 Seattle, WA 98107-3135
 TEL: 206.462.6262
 FAX: 206.462.6263
 FUEL BERM
 INFLATABLE / PORTABLE
 45' x 16' x 17"
 K.G.D.
 2 Feb. 95
 NONE

141V0020



It is important to use a 24" metal form stake or its equivalent to guy each corner or uneven wind loading may occur and cause pole failure.

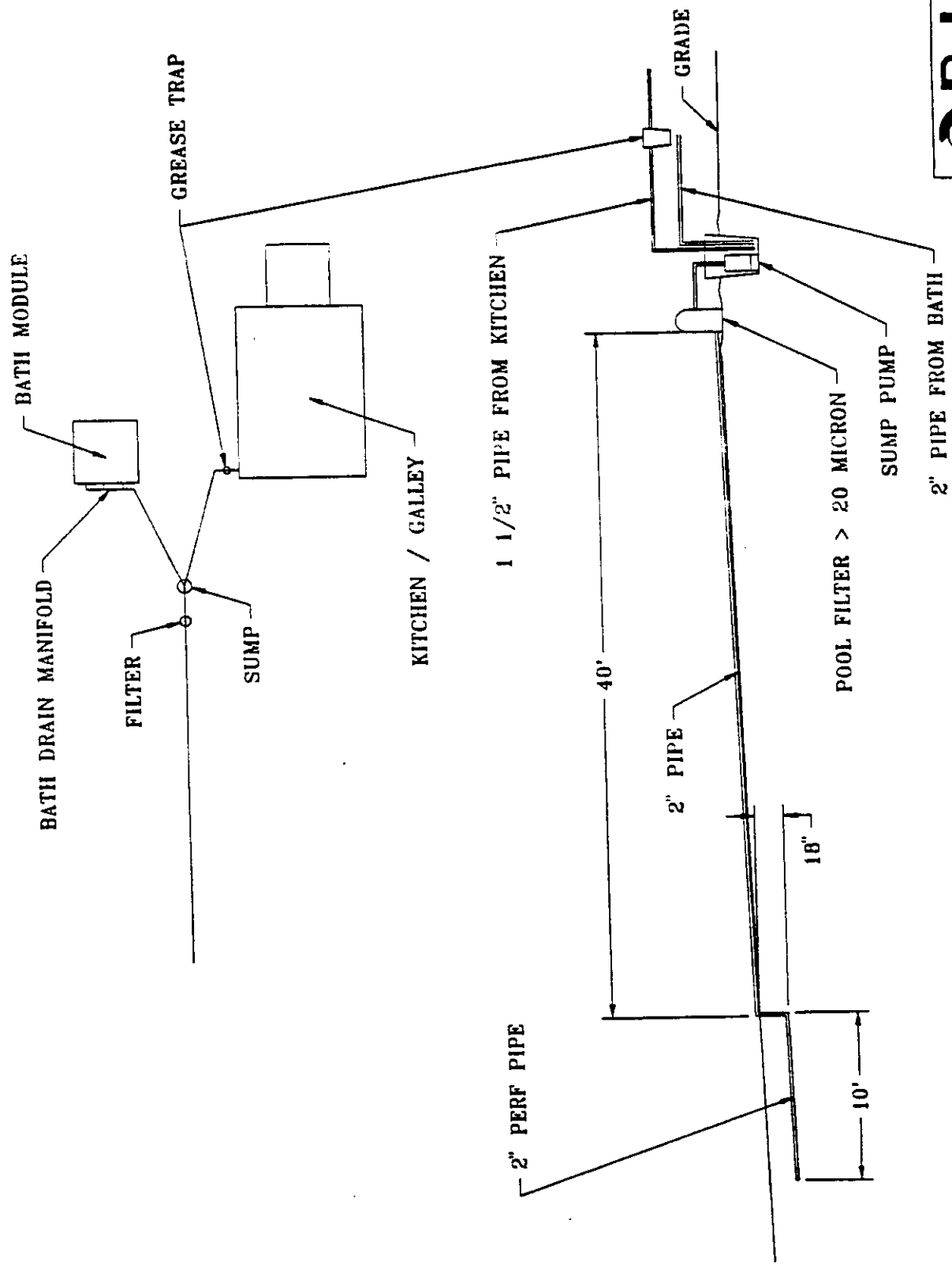


ARCTIC OVEN
STAKE PATTERN

K.G.B.
Feb. 85
NONE

Do not touch or move this stake

2200AVITI



P I C O
 Polar Ice Coring Office
 2200 AVITI
 2 Feb. 95
 NONE
 LLHV0026

LAI / HVC
 GREY-WATER SYSTEM

SEE 2200AVITI FOR COMPLETE PLAN