

Sea Ice Science Support: Fish and Dive Huts, McMurdo Station

OP-M-454

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Approved by [REDACTED]

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Active Divisions/Departments:
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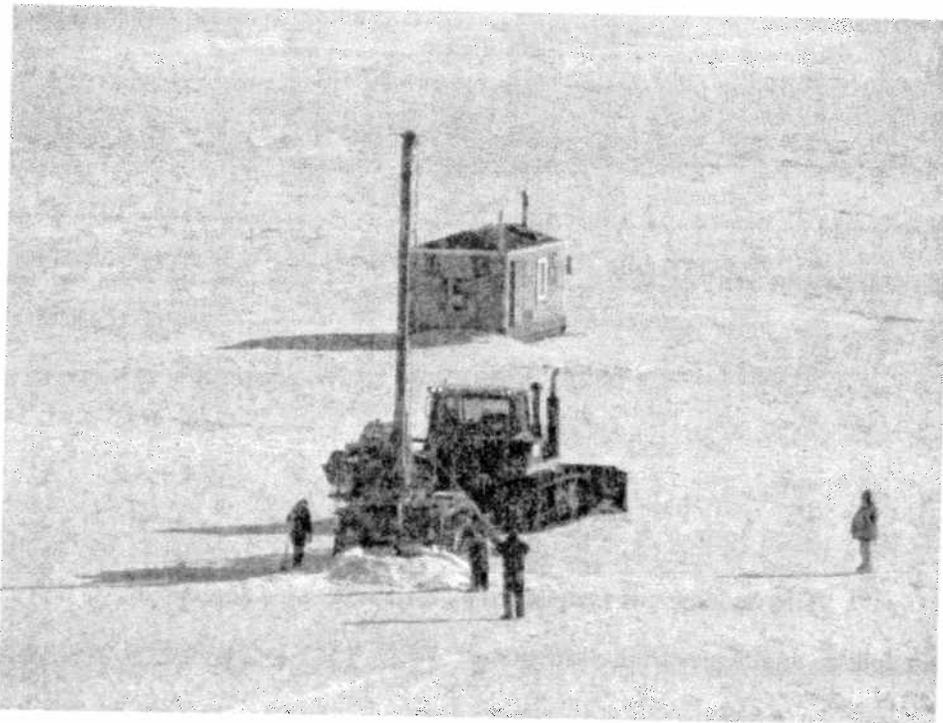


photo 1: K. Harvey

Table of Contents

PURPOSE	1
SCOPE/APPLICABILITY	1
TERMS AND DEFINITIONS	1
RESPONSIBILITIES.....	2
<i>Equipment Operator.....</i>	<i>2</i>
<i>Supervisor, Dive Services</i>	<i>2</i>
<i>Science Construction Supervisor.....</i>	<i>2</i>
<i>Field Safety Training Program (FSTP) Personnel.....</i>	<i>2</i>
DISCUSSION.....	2
PREPARATION.....	2
TRAVEL.....	3
AT SITE	4
HUT SITE MAINTENANCE	5
HUT RELOCATION/REMOVAL.....	6
REEDRILL NOTES.....	6
<i>Augers.....</i>	<i>7</i>
HEAVY EQUIPMENT NOTES	8
HUT NOTES	8
REFERENCES	9
RECORDS.....	9
APPENDICES AND ATTACHMENTS.....	9
APPENDIX A: HUT CHECKLIST	10

This document is maintained by the RPSC Area Directorate.

Send updates and requests for correction to: DEN-AAODocumentPOC@usap.gov.

Purpose

This document describes the responsibilities and activities associated with setting up fish and dive huts on the sea ice near McMurdo Station.

Scope/Applicability

This procedure applies to the Equipment Operator; the Supervisor, Dive Services; the Science Construction Supervisor, and other support personnel associated with fish and dive huts on the sea ice near McMurdo Station.

Terms and Definitions

ECW

Extreme Cold Weather gear

FSTP

Field Safety Training Program

GA

General Assistant

GIS

Geographic Information Systems

GPS

Global Positioning System (navigational tool)

MacOps

McMurdo Communications Operations Center

Reedrill

Manufacturer of Texoma® brand auger drills used for sea ice drilling

VMF

Vehicle Maintenance Facility

VXE-6 Transition

Area where the sea ice meets the shore, esp. on the road to the McMurdo Ice Runway airfield

Responsibilities

Equipment Operator

Set up, maintain sites, and remove huts in accordance with this procedure.

Supervisor, Dive Services

Coordinate drill schedule and hut locations with grantees, Equipment Operator, and Science Construction Supervisor.

Science Construction Supervisor

Prepare huts for use; coordinate camp setup with grantees, Equipment Operator, and Dive Services Supervisor.

Field Safety Training Program (FSTP) Personnel

Assist with planning site location(s) and routes across the sea ice.

Discussion

It is assumed that the operators involved with transporting huts and drilling holes in the sea ice are trained and capable of operating the equipment involved:

- Caterpillar® Challenger with blade (or suitably sized dozer)
- Reedrill with 48" auger on auger sled

Preparation

Before the huts can be set up, the following steps must be accomplished:

1. Review related Fleet Operations documents (procedures, job hazard analyses, *Sea Ice Notes*, etc.)
2. Complete safety training, sea ice training, and vehicle licensing; develop competence in GPS use and navigation.
3. Verify heavy equipment availability with the Fleet Ops Supervisor.
4. Check equipment (Challenger dozer, Reedrill, auger[s], rigging) and ensure it is in proper mechanical and operating condition.
5. Ensure additional equipment (shovels, blocks, rigging, survival bag, marker flags) are attached to the Reedrill.

6. Communicate with Field Safety Training Program (FSTP) personnel about sea ice route(s) and site conditions.
7. Coordinate schedules with the Dive Services Supervisor and Science Construction Supervisor, who should coordinate with the science projects first.
8. Stage huts at the VXE-6 Transition after refueling and dewinterization of huts is complete. The Science Construction Supervisor will advise all involved parties when huts are ready to move from the winter storage area to the Transition.
9. Maintain (smooth and goose) the Cape Evans snow route and the sea ice camp routes as needed. (Coordinate use of the Challenger and the Goose groomer with other Fleet Ops department foremen.)

Travel

The following steps should be followed each time you leave McMurdo Station:

1. Check weather conditions and forecasts.
2. Check current sea ice report. Know safety parameters for equipment and sea ice conditions (sea ice tables are available in the Fleet Ops Office).
3. Check to make sure you have enough food, water, supplies (esp. radio and spare battery, GPS unit, emergency supplies), and ECW gear.
4. Check out with MacOps (summer) or Fire House (Winter, Winfly).
5. Travel with assistant and or science party. Travel solo only when certified and approved by Supervisor.
6. Hitch (first to last): Challenger or dozer, Reedrill, hut(s), auger/sled (see photo, next page).
7. Before moving the hut(s), inspect the interior contents to ensure that all material and equipment is properly secured for movement.
8. Measure/check sea ice conditions enroute as necessary.

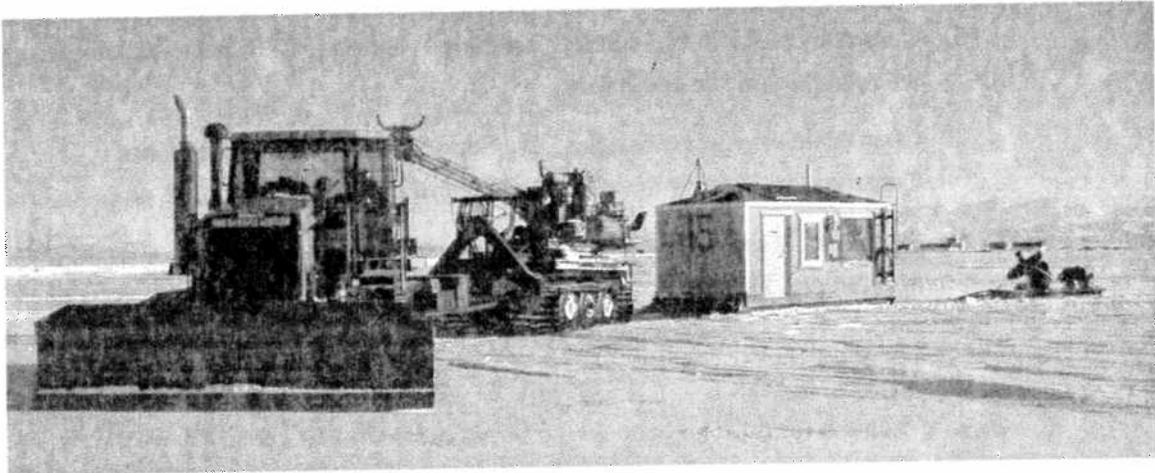


photo 2: T. Holford

At Site

1. Blade (downwind/usually north) off snow if necessary. Organize this with Supervisor, Dive Services. Slope cut banks and berms for walking safety and to prevent drifting.
2. Drill and clean out hole in ice. Use the Reedrill and the 48" auger bit.

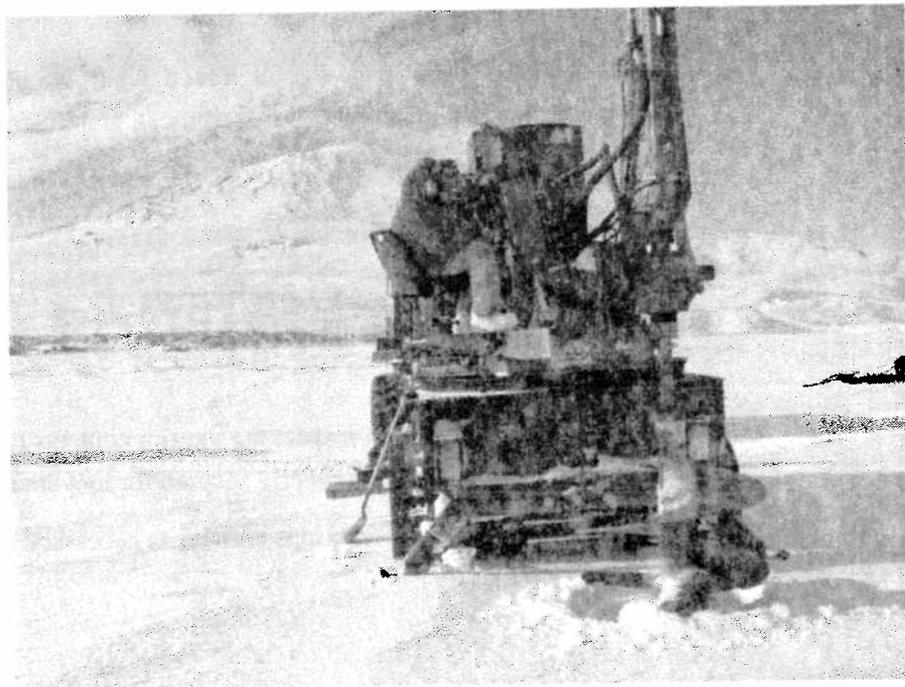


photo 3: T. Falcone

3. Position hut over the hole. Orientate the hut with the door downwind, solar panel in sun, and, if possible, with the window toward the best view.
4. Blade a small (1' or less) snow berm around the hut to keep wind from blowing under the hut, especially on the ends between the skis.
5. Determine GPS coordinates for the site.
6. Check in with MacOps (or Fire House during winter/winfly) upon return to McMurdo Station.
7. E-mail location changes and updated hut location spreadsheet to the "Hut Moves" distribution list: Fleet Ops Supervisor and Office Manager, Dive Services Supervisor, Science Construction Supervisor, FSTP Supervisor, MacOps, GIS Specialist, Survey Supervisor, and Operations GA Foreman.
8. Maintain a current list of hut locations (update spreadsheet).
9. Post current hut locations and sea ice report in the Fleet Ops office.

Hut Site Maintenance

During the course of the season, Fleet Ops is routinely called out to perform snow removal around camps and huts on the sea ice. The benefits are twofold: camps and fish huts are kept from becoming buried by drifting snow, and the weight of the snow removed keeps the ice from being deflected below the water level.

1. Use a Challenger with blade or a dozer for snow removal and maintenance.
2. Blade away excess snow downwind (usually north).
3. Taper/smooth cut banks and berms.
4. Keep an eye on huts for listing (uneven melting), snow buildup, or ice deflection below the sea water level.
5. Coordinate and move hut(s) if conditions warrant.
6. Maintain (smooth and goose) the Cape Evans snow route and the sea ice camp routes as needed. (Coordinate use of the Challenger and the Goose groomer with other Fleet Ops department foremen.)

Hut Relocation/Removal

1. Coordinate schedule with the Dive Services Supervisor and the Science Construction Supervisor, who should coordinate with the science projects first.
2. Before moving the hut(s), inspect the interior contents to ensure that all material and equipment is properly secured for movement.
3. Clear snow from around the hut as well as possible (watch for buried items).
4. Carefully nudge the ski tip of the hut with the blade to loosen the skis.
5. Hitch up and gently pull away.



photo 4: K. Harvey

6. Have grantees flag open holes (if near pedestrian routes).
7. Log and report hut moves.

Note After the close of sea ice field operations, the Science Construction Supervisor will inform all involved parties where huts are to be placed (i.e., 191 yard, storage line, Ballpark, Helo Hangar).

Reedrill Notes

Before heading out for the day, check to make sure all essential items (shovels, blocks, rigging, survival bag) are present.

Always have a second person tending the winch cable when operating the winch. It is hard for the operator to see the winch and it will not wind on or off well without assistance.

When lowering the boom onto the cradle, adjust the leveling cylinder so that the boom does not hit the hydraulic tank. This can be done by aligning the marks on the right angle drive.

When plumbing the boom or aligning the right angle drive, use a light touch on the lever as you could move the boom too far too fast and risk damaging the machine.

Avoid over-extending the outriggers—otherwise they may not be able to retract.

Take care when backing the Reedrill so as to prevent the tongue of the Reedrill trailer from interfering with the tracks of the towing vehicle.

When drilling near overhead power lines, defer to Reedrill safety guidelines, Supervisor, and operator's judgment for safe working distance and possible electrical power shut down. Be aware of upper mast movement during the drilling process.

Augers

Augers are stored on the Fleet Ops "second pad" for the winter. During the austral summer, the 48" Pengo and the auger sled are kept at the VXE6 transition. If necessary (see below), carry both the 48" Pengo and the 30" auger on the sled.



photo 5: K. Harvey

48" auger (Pengo)

- The best deep ice drilling auger we have
- Stored on the auger sled (winter: Fleet Ops "second pad," summer: VXE6 transition.)
- Periodically check the teeth for wear and replace as necessary

30" auger

- Great for most outhouses

24" auger

- Works well for the outfall holes for galley module and restrooms.

18" auger

- This auger is used on the sea ice for drilling utility pole holes.

Back up 48" auger (White)

This auger has button head teeth and it is not ideal for drilling ice as its flights have a steep pitch and TX50 blade style bits seem to work better. We now have blade type teeth to install on it as another option. It can drill up to about 8 ft of ice, but does not clean/carry much more debris than that out of a deeper hole.

Other miscellaneous augers

Rarely used. Check with the Fleet Ops Supervisor for more information.

Heavy Equipment Notes

Select proper equipment for distance and conditions.

Carry a collapsible containment tub and absorbent pads in case of leaks or spills.

Be aware of winch cable on the Challenger for proper stop position when winding in cable. Allow some distance between cable clamps and winch rollers.

Be aware of grousers hitting Reedrill tongue on tight turns.

Hut Notes

Check huts for adequate towing holes, fish hole covers, windows, and general transport integrity inside and out. This could save valuable time when linking up huts for a train to a field camp. (Propane tank levels will be checked and maintained by Science Construction personnel.)

Check fish hut towing cables for wear and matching length. Round up an adequate number of shackles for the season.

When possible, position huts so the door is out of the wind and the solar panel is on the sunny side.

References

Sea Ice Notes (available on Fleet Ops department drive)

Sea Ice Safe Travel Tables (available on Fleet Ops department drive)

Caterpillar Inc. <http://www.cat.com>

TEREX/Reedrill <http://www.reedrill.com>

Records

Record Identification, Format, & Owner	Active Location Storage, Protection, & Retrieval	Facility Storage	Retention Time	Ultimate Disposition
List of hut locations "Fish Hut Moves & Holes Drilled" (hard copy & spreadsheet) Fleet Ops Supervisor	Hard copy maintained in Fleet Ops office; spreadsheet kept on Fleet Ops departmental drive.	N/A	Length of contract	Maintain in Fleet Ops office

Appendices and Attachments

Appendix A: Hut Checklist

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Preparation:

- Review related Fleet Operations documents.
- Complete necessary training; develop competence in GPS use and navigation.
- Verify equipment availability with the Fleet Ops Supervisor.
- Check equipment and ensure it is in proper mechanical and operating condition.
- Ensure shovels, blocks, rigging, and survival bag are attached to the Reedrill.
- Communicate with FSTP personnel about sea ice route(s) and site conditions.
- Coordinate schedules with the Scientists, Dive Services Supervisor, and Science Construction Supervisor.
- Upon notification from the Science Construction Supervisor that the huts are ready to be moved, stage the huts at the VXE-6 Transition.
- Maintain (smooth and goose) the Cape Evans snow route and the sea ice camp routes as needed.

Travel:

- Check weather conditions and forecasts.
- Check current sea ice report. Know safety parameters for equipment and sea ice conditions.
- Check to make sure you have enough food, water, supplies (esp. radio and spare battery, GPS unit, emergency supplies), and ECW gear.
- Check out with MacOps (summer) or Fire House (Winter, Winfly).
- Travel with assistant and/or science party. Travel solo only when certified and approved by Supervisor.
- Before moving the hut(s), inspect the interior contents to ensure that all material and equipment is properly secured for movement.
- Hitch (first to last): challenger, Reedrill, hut(s), auger/sled.
- Measure/check sea ice conditions enroute as necessary.

At Site:

- Blade (downwind/usually north) snow if necessary. (Dive huts: ~4 blade widths. Fish huts: ~3.)
- Taper-cut snow banks and berms.
- Drill and clean out hole in ice. Use the Reedrill and the 48" auger bit.

- Position hut over the hole. Orientate the hut with the door downwind, solar panel in sun, and, if possible, with the window toward the best view.
- Blade a small (1' or less) snow berm around the hut to keep wind from blowing under the hut, especially on the ends between the skis.
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- Clear snow from around the hut as well as possible (watch for buried items).
- Carefully nudge the ski tip with the blade to loosen the skis.
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- Have grantees flag open holes (if near pedestrian routes).
- Log and report hut moves.

