

United States
Department of
Agriculture

Forest Service

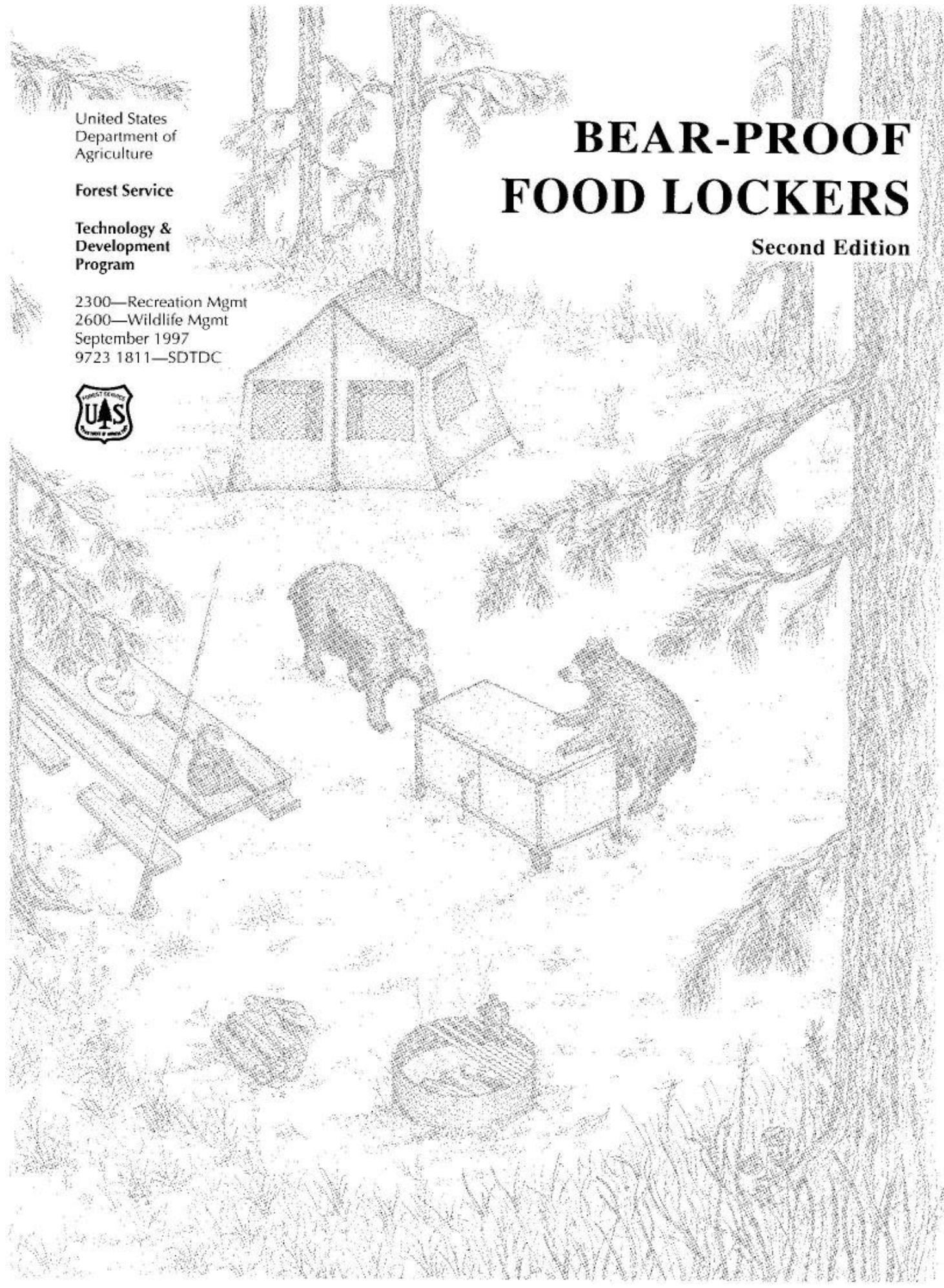
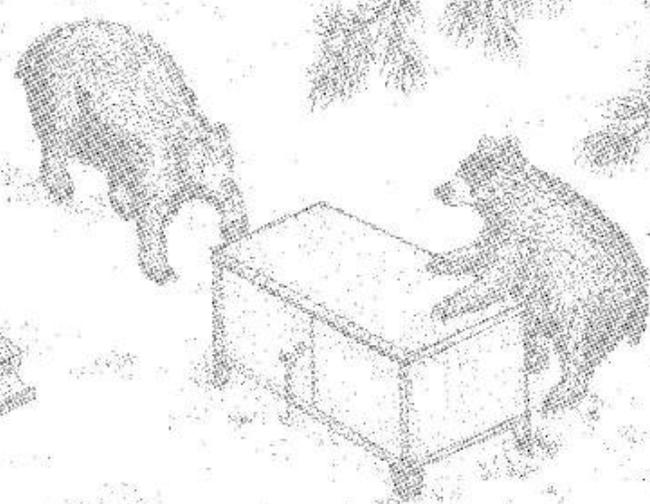
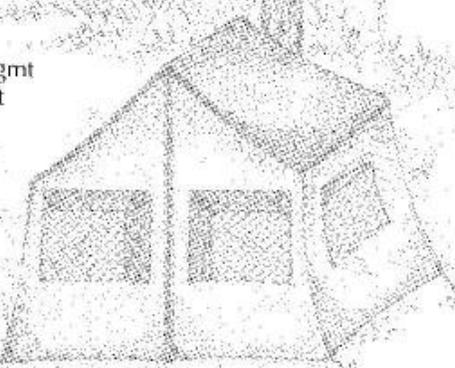
Technology &
Development
Program

2300—Recreation Mgmt
2600—Wildlife Mgmt
September 1997
9723 1811—SDTDC



BEAR-PROOF FOOD LOCKERS

Second Edition



BEAR-PROOF FOOD LOCKERS



September 1997

Lester A. Sinclair
Landscape Architect

San Dimas Technology & Development Center
444 E. Bonita Avenue
San Dimas, California 91773-3198
(909)-599-1667
FAX: (909)-592-2309

Information contained in this document has been developed for the guidance of employees of the Forest Service, USDA, its contractors, and its cooperating Federal and State agencies. The Department of Agriculture assumes no responsibility for the interpretation or use of this information by other than its own employees. The use of trade, firm, or corporation names does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval of any product or service to the exclusion of others that may be suitable.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, natural origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means of communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-1127 (TDD).

To file a complaint, write to the Secretary of Agriculture, U.S. Department of Agriculture, Washington, DC 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

Acknowledgments

Special thanks to:

Harold H. Werner-Fish and Wildlife Biologist, Jill Oertley-Wildlife Biologist, and Brian McKeon-Wildlife Biologist at the Sequoia and Kings Canyon National Parks for their cooperation and professional expertise with bears during the product development and testing phases of this project.

TABLE OF CONTENTS

Background.....	1
Bear-Proof Food Locker Improvements	1
The “SecureStore Locker”	2
“San Dimas Bear-Proof Food Locker”	4
Metal Fabricators	12
Appendix	IBC

Figures

Figure 1.— <i>Bear-proof food locker at a Sequoia National Park campground</i>	1
Figure 2.— <i>Bear-proof food locker at Kings Canyon National Park</i>	1
Figure 3.— <i>SecureStore locker at Sequoia National Park campground</i>	2
Figure 4.— <i>Modified SecureStore locker at SDTDC</i>	2
Figure 5.— <i>Modified 23-cubic foot SecureStore food locker, open position</i>	2
Figure 6.— <i>Modified 23-cubic foot SecureStore locker doors, with retrofit latch kit</i>	2
Figure 7.— <i>Interior view, retrofit latch</i>	3
Figure 8.— <i>Stainless steel spring shank cover with a set screw by SDTDC</i>	3
Figure 9.— <i>Everhard two-point dead bolt latch with SDTDC spring-loaded shank cover</i>	3
Figure 10.— <i>Drill only, bear-proof latch kit by Boxmaster for adaptation on 23-cubic foot SecureStore food locker</i>	3
Figure 11.— <i>Left, 30-cubic foot San Dimas bear-proof food locker and right, 23-cubic foot modified SecureStore food locker with new Boxmaster latch retrofit kit</i>	4
Figure 12.— <i>The 30-cubic foot San Dimas bear-proof food locker in the closed position</i>	4
Figure 13.— <i>The 30-cubic foot San Dimas bear-proof food locker in the open position</i>	5
Figure 14.— <i>The 30-cubic foot San Dimas bear-proof food locker with inside escape/ safety handle</i>	5

Figure 15.—*Bear-proof latch with inserted handle held in closed position* 6

Figure 16.—*Bear-proof latch with inserted handle in open position (SDTDC test model)*... 6

Figure 17.—*Food locker installed on a full concrete slab* 7

Figure 18.—*Food locker mounted on two concrete ribbons* 8

Figure 19.—*Food locker mounted on steel skid plates and connected
to a stainless steel cable and earth anchor* 9

Figure 20.—*San Dimas bear-proof food locker fabrication shop plans and specifications* 10

Figure 21.—*San Dimas bear-proof food locker fabrication shop plans and specifications* 11

BACKGROUND

Bears have always been synonymous with food in picnic areas and campgrounds in forest recreation areas. Efforts to keep bears away from campground sites where food is present has always been difficult; the conflict between people and bears will continue unless there is some way to keep food away from bears. The ideal solution is to keep all bears away from food, thus eliminating the possibility of bears developing a habit of seeking out food brought in by the public.

A food locker, originally developed by the National Park Service (NPS), has been used in the past on several forests and is still currently being used in many campgrounds in the West (figures 1 and 2). This food locker is approximately 20 inches by 20 inches by 48 inches (0.5m by 0.5m by 1.2m) and stores approximately 10 cubic feet (0.3m³) of food and supplies.

This food locker has been traditionally set on the ground and bolted to a concrete base. Two chained swivel eye bolt snaps are used to lock the door. This method has met with some success, but there have been inherent problems with the food locker design. A food locker attached to a concrete pad directly on the ground requires the user to bend down to open the door. The door opens toward the user's feet; this has caused injuries in the past. These food lockers are also difficult to use by people with disabilities; especially when these persons are wheelchair bound or have hand or back impairments. Today's population requires a less restrictive type of bear-proof food locker for outdoor recreation facilities.

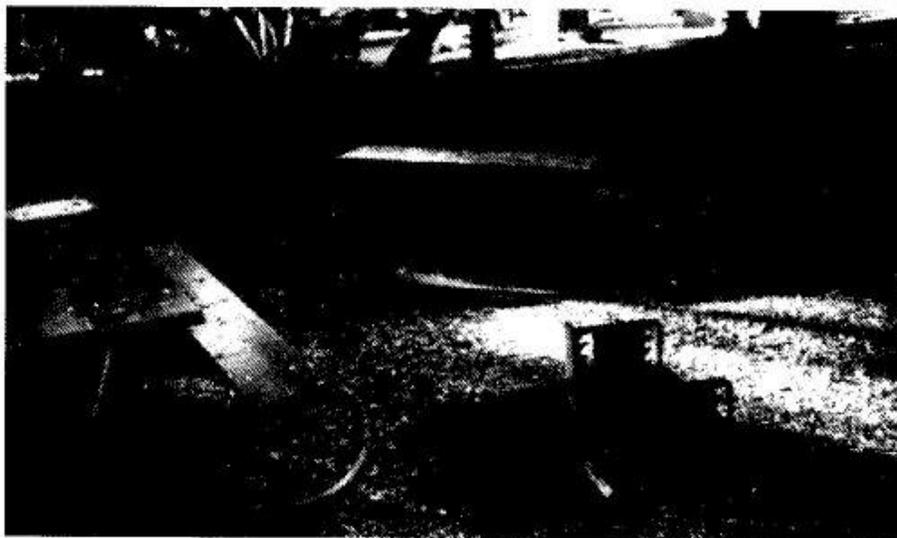


Figure 1—Bear-proof food locker at a Sequoia National Park campground.

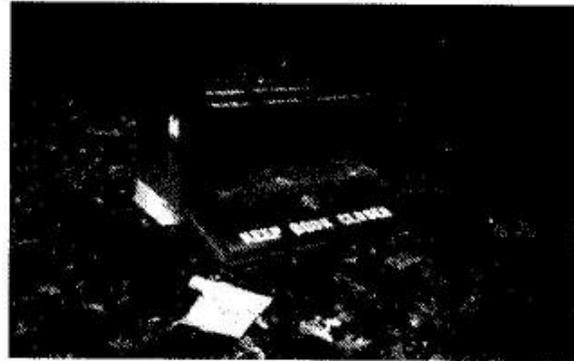


Figure 2—Bear-proof food locker at Kings Canyon National Park.

BEAR-PROOF FOOD LOCKER IMPROVEMENTS

Data collected by the NPS at Sequoia's Cedar Grove campgrounds suggests that the food storage capacity required by a family unit of 2-5 is approximately 27 cubic feet (0.8m³) of space, or approximately *three times* the size of the original NPS food locker. The larger space requirement, 48 inches by 42 inches by 24 inches (1.2m by 1.1m by 0.6m), satisfies 95 percent of the camping public's requirement for stowage of a large ice chest, food, and cooking supplies at developed campsites.

The ice chest of today has become an indispensable means for storing foods that must be kept cold to prevent spoilage. Bear-proof storage lockers must accommodate the largest of ice chests and allow room for additional food, cooking supplies, and health care products (e.g.,

toothpaste and other scented toiletries). Consequently, today's ice chests are almost as large as the old NPS food lockers. The necessity to stow an ice chest requires that the food locker must be redesigned.

Unprotected ice chests can become a target of bears if they are not stowed in bear-proof lockers. Food kept in the seating areas of cars can become a statistic since many bears have figured out how to bend down the top of doors on cars.

THE "SECURESTORE LOCKER"

The Sequoia and Kings Canyon National Parks are currently using a locker fabricated by the California Prison Industry Authority (CPIA) in Folsom, CA that has a 23-cubic foot (0.64m³) capacity (see figure 3). However, the double spring-loaded latch mechanism, currently used on this locker, has not been effective against bears. The first trial lockers were broken into by bears with the use of their prehensile lips and with their claws.



Figure 3—SecureStore locker at Sequoia National Park campground.

SDTDC has worked in cooperation with the NPS to develop a bear-proof latch mechanism that can be retrofitted on this locker (figure 4).

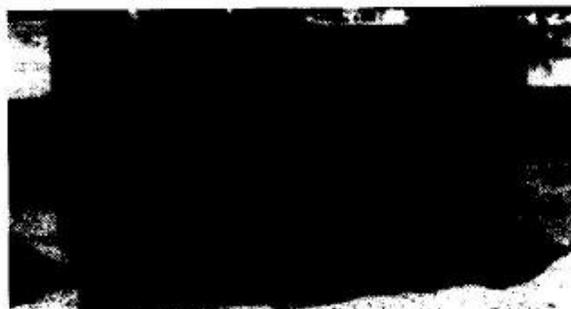


Figure 4— Modified SecureStore locker at SDTDC.



Figure 5—Modified 23-cubic foot SecureStore food locker, open position.

The locker, manufactured with 10-gauge steel, has two doors, stainless steel hinges, and is finished in a dark NPS brown color and painted with a polyurethane coating over gray primer. The exterior size dimensions are 52 inches by 36 inches by 24 inches (1.3m by 0.9m by 0.6m). The locker stands on two 6-inch (152 mm) legs and can be bolted to a concrete foundation or other hard surface materials. The current double-spring unmodified CPIA 23-cubic foot locker costs \$425., plus shipping. The CPIA has a \$10,000. maximum per order sale restriction, which must be taken into consideration prior to purchase. For questions on the "SecureStore Locker," the stock number is 7125-000-7500-9. NOTE: This locker must be modified with the San Dimas Design Specifications in order for it to be "bear-proof."

A retrofit kit is available, through Boxmaster, for older CPIA boxes at a cost of approximately \$125. for each kit.

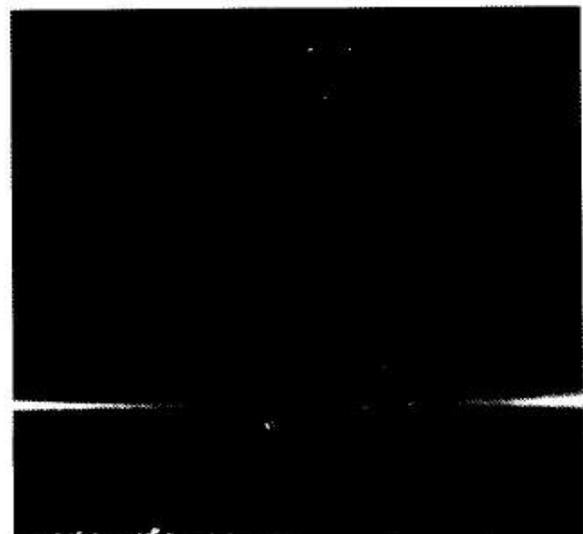


Figure 6—Modified 23-cubic foot SecureStore locker doors, with retrofit latch kit.



Figure 7— Interior view, retrofit latch.

The kit includes the two-point Eberhard dead bolt latch model # 5646-2XX, plus rods and rod guides and attachments (see figures 8, 9, and 10). Also included are the outside and inside handles and all other tamper-proof nuts and bolts and the custom made spring-loaded shank cover for a simplified drill only operation.

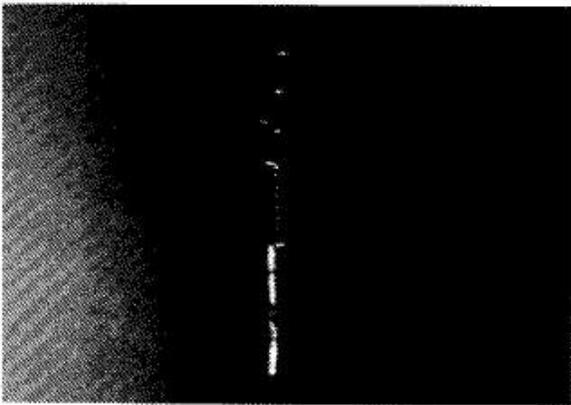


Figure 8—Stainless steel spring shank cover with a set screw by SDTDC.

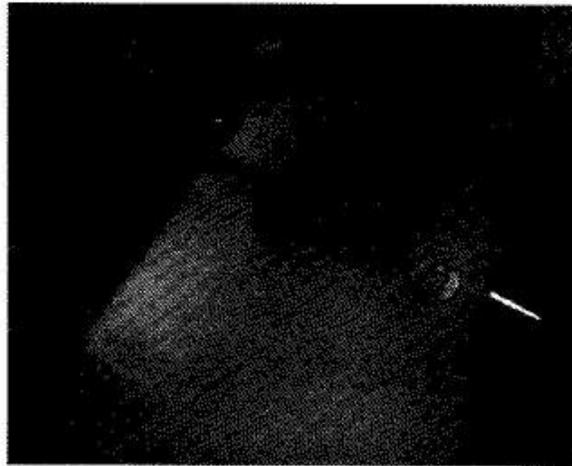


Figure 9—Eberhard two-point dead bolt latch with SDTDC spring-loaded shank cover assembly.

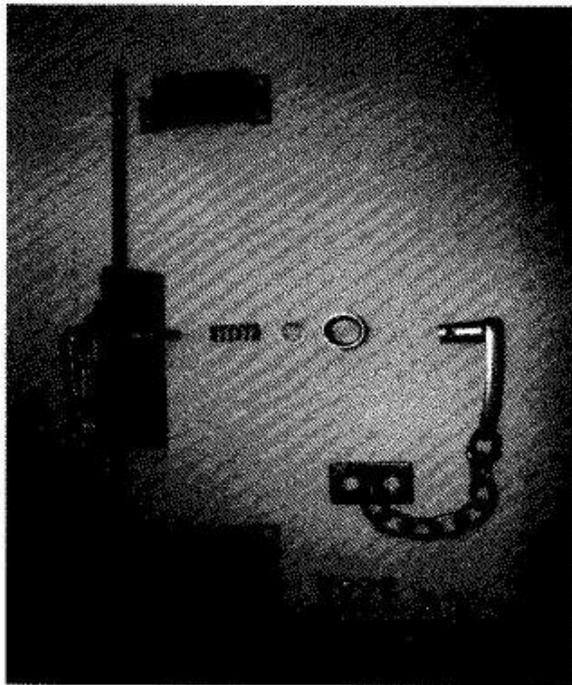


Figure 10—Drill only, bear-proof latch kit by Boxmaster for adaptation on 23-cubic foot SecureStore food locker.



Figure 11—Left, 30-cubic foot San Dimas bear-proof food locker and right, 23-cubic foot modified SecureStore food locker with new Boxmaster latch retrofit kit.

“SAN DIMAS BEAR-PROOF FOOD LOCKER”

The San Dimas Technology and Development Center (SDTDC) has been working with the National Park Service (NPS) and industry to develop and improve bear-proof food lockers.

The newly fabricated bear-proof food locker is a modified version of the NPS/CPIA collaborative effort, enlarged to a 30-cubic foot (.84m³) capacity. Fabricated with all the best features of the NPS design, it has been retrofitted with a proven bear-proof latch and tested by Wildlife Biologists at Sequoia and Kings Canyon National Parks. See Figure 11.



Figure 12—The 30-cubic foot San Dimas bear-proof food locker in the closed position.

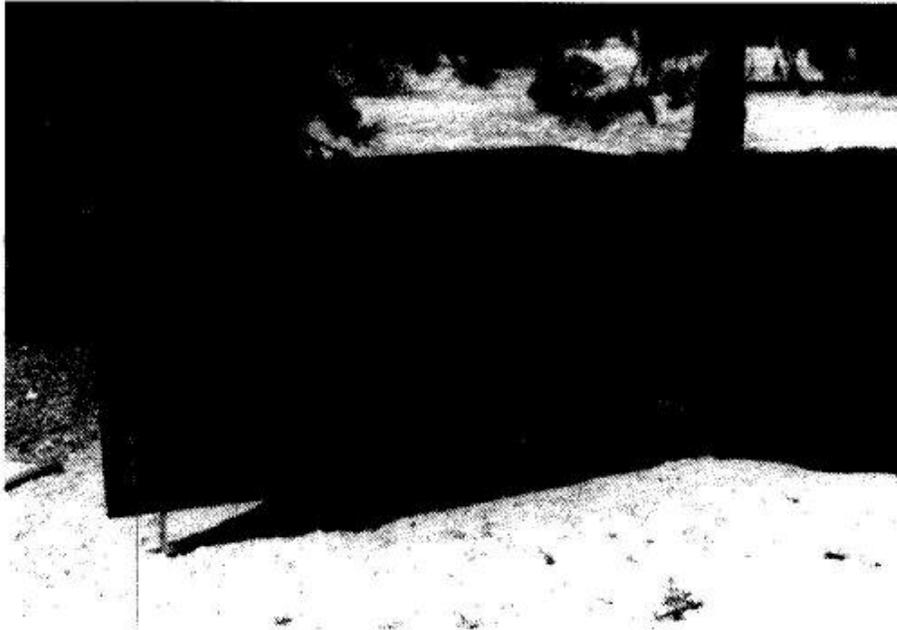


Figure 13—
The 30-cubic foot San Dimas bear-proof food locker in the open position.

The testing phase has revealed that we finally have a tested and proven bear-proof food locker that will, in the words of NPS Wildlife Biologists, “save bear lives.” Keeping the bears away from developed recreation areas to prevent the bears from accessing human food has been a primary concern of wildlife biologists in the past. See Figure 12.

Bears that have been able to access human food have developed a pattern of seeking out food brought in by forest visitors. This habituation can increase bear and visitor conflicts. In the worst case scenario, “**problem bears**” have to be killed.

The San Dimas food lockers do not allow bears access to human food, therefore, fewer bears will ever become “**problem bears**” in the future. Encouraging bears to eat natural wild foods will improve bear health and reduce conflicts between bears and forest visitors.

The new locker is fabricated with stainless steel and zinc-plated latch mechanisms, including all moving parts, to eliminate corrosion problems and extend the life of the food locker. This locker has two doors that open from the center out, towards the user, similar to kitchen cabinets. See Figures 13, 15 and 16.

A safety handle is included opposite the outside latch mechanism to prevent children from being locked inside accidentally. See Figure 14.



Figure 14—*The 30-cubic foot San Dimas bear-proof food locker with inside escape/safety handle.*



Figure 15—Bear-proof latch with inserted handle held in closed position.



Figure 16—Bear-proof latch with inserted handle in open position (SDTDC test model).

The locker rests on four 7-inch (178mm) legs that are predrilled to allow bolting the unit to a concrete footing, a concrete slab, or portable skids. See figures 17, 18, and 19.

The locker dimensions are 51 inches by 35 inches by 30 inches (1.3m x .9m x .8m). The locker is fabricated with 10-gauge hot rolled steel and can be primed and painted with a nontoxic (after drying) high quality industrial grade paint.

The paint selected must be of a type used in a high-touch area, similar to paint used on hand-rails, doors, and other high use public amenities. Special custom paint brands and colors can be specified to suit customer needs; call the fabricator for current pricing.

Pitt-Tech One Pack by Pittsburgh Paints is a high-touch interior/exterior high performance water-borne satin industrial enamel. Pitt-Tech is available in hundreds of satin or high gloss colors. This paint type is an acrylic resin paint that can be used for direct metal application and provides corrosion protection, chemical and solvent resistance, and is fast drying for same day re-coating.

Other paint companies have similar paints available that would meet the high-touch, nontoxic high performance industrial grade qualities of Pitt-Tech One Pack.

Current pricing for the 30-cubic foot (.84 m³) bear-proof food locker is approximately \$450—plus shipping. Call Boxmaster for current quantity pricing.

San Dimas bear-proof food locker fabrication shop plans and specifications are shown in figures 20 and 21.

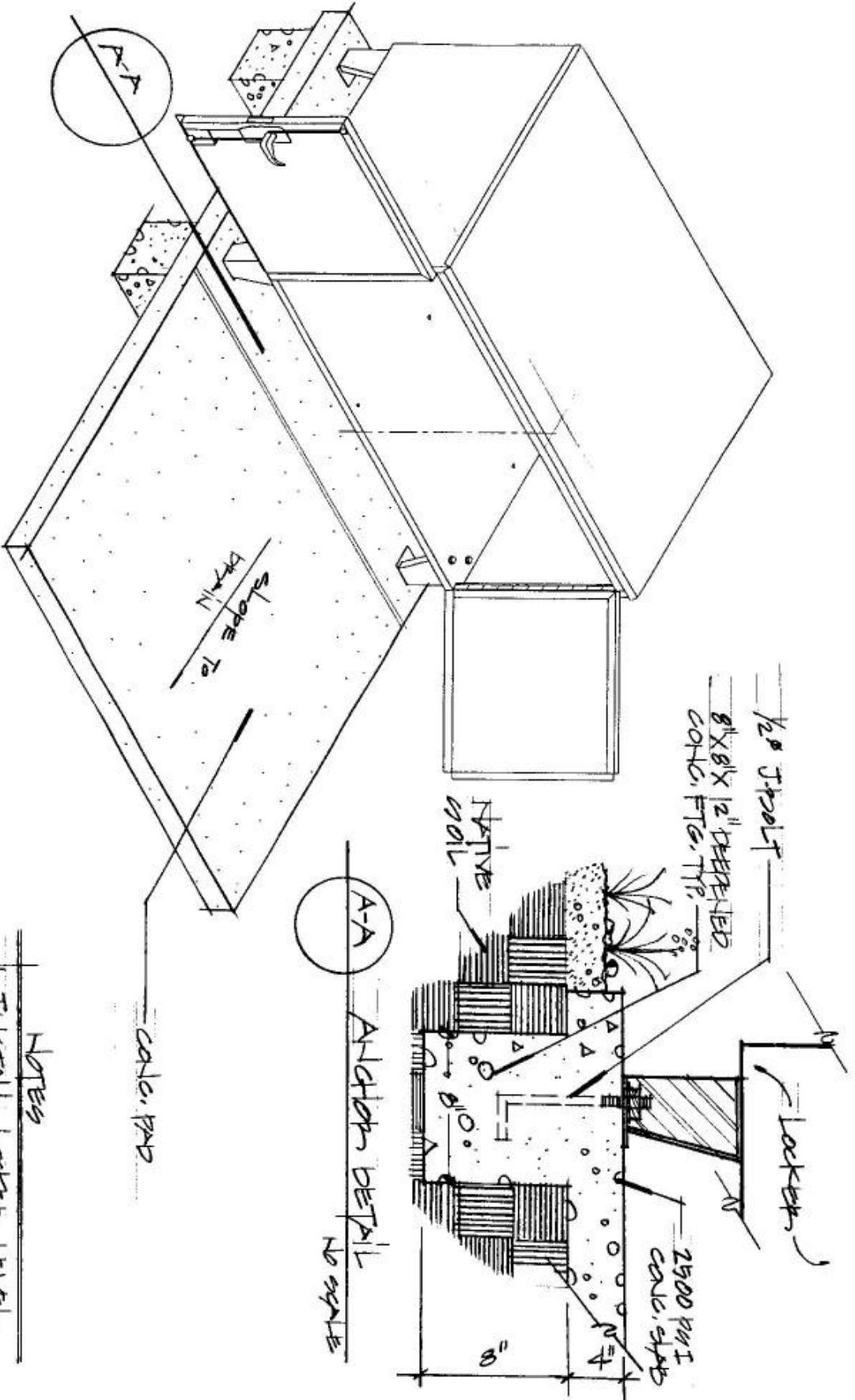


Figure 17 — Food locker installed on a full concrete slab.

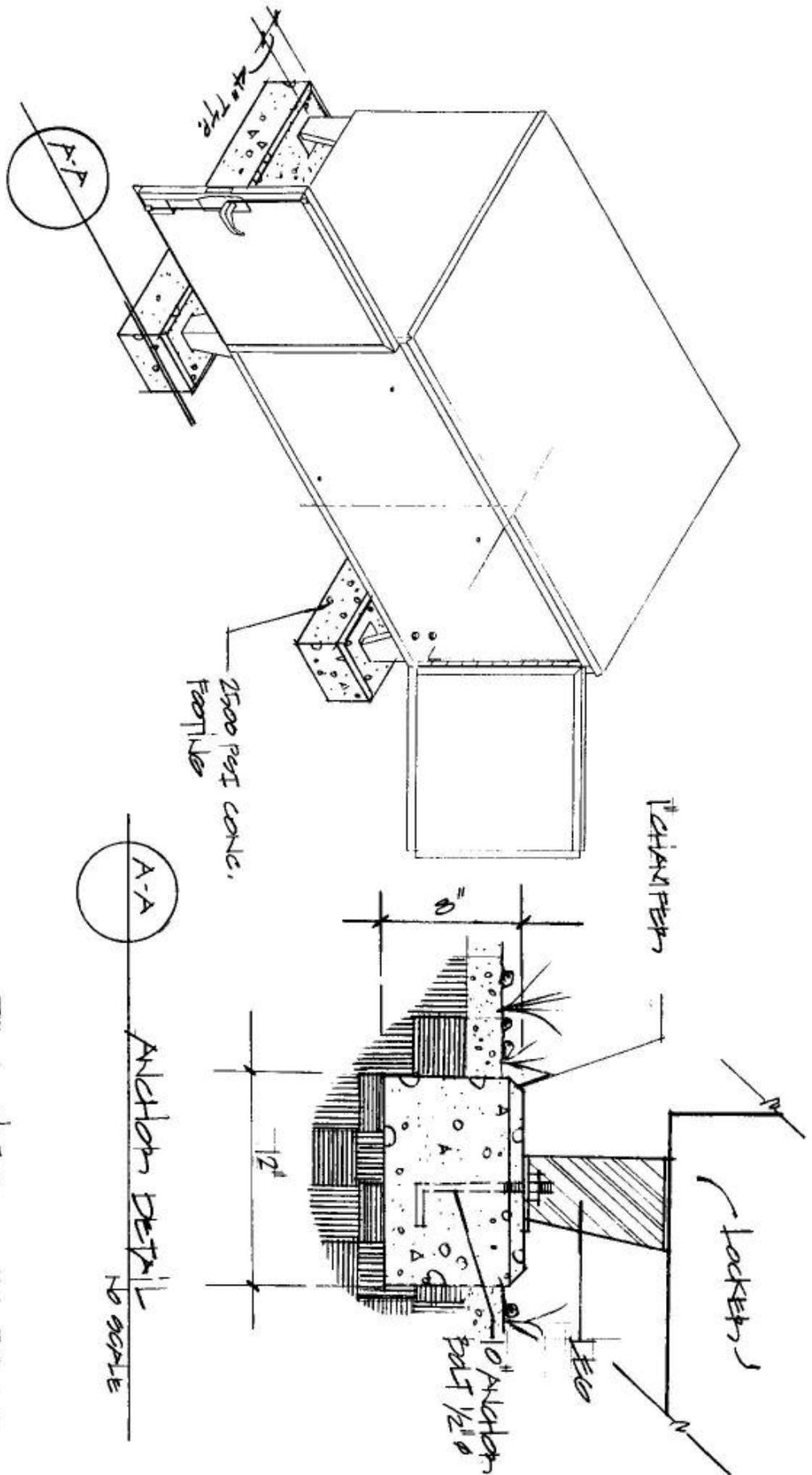


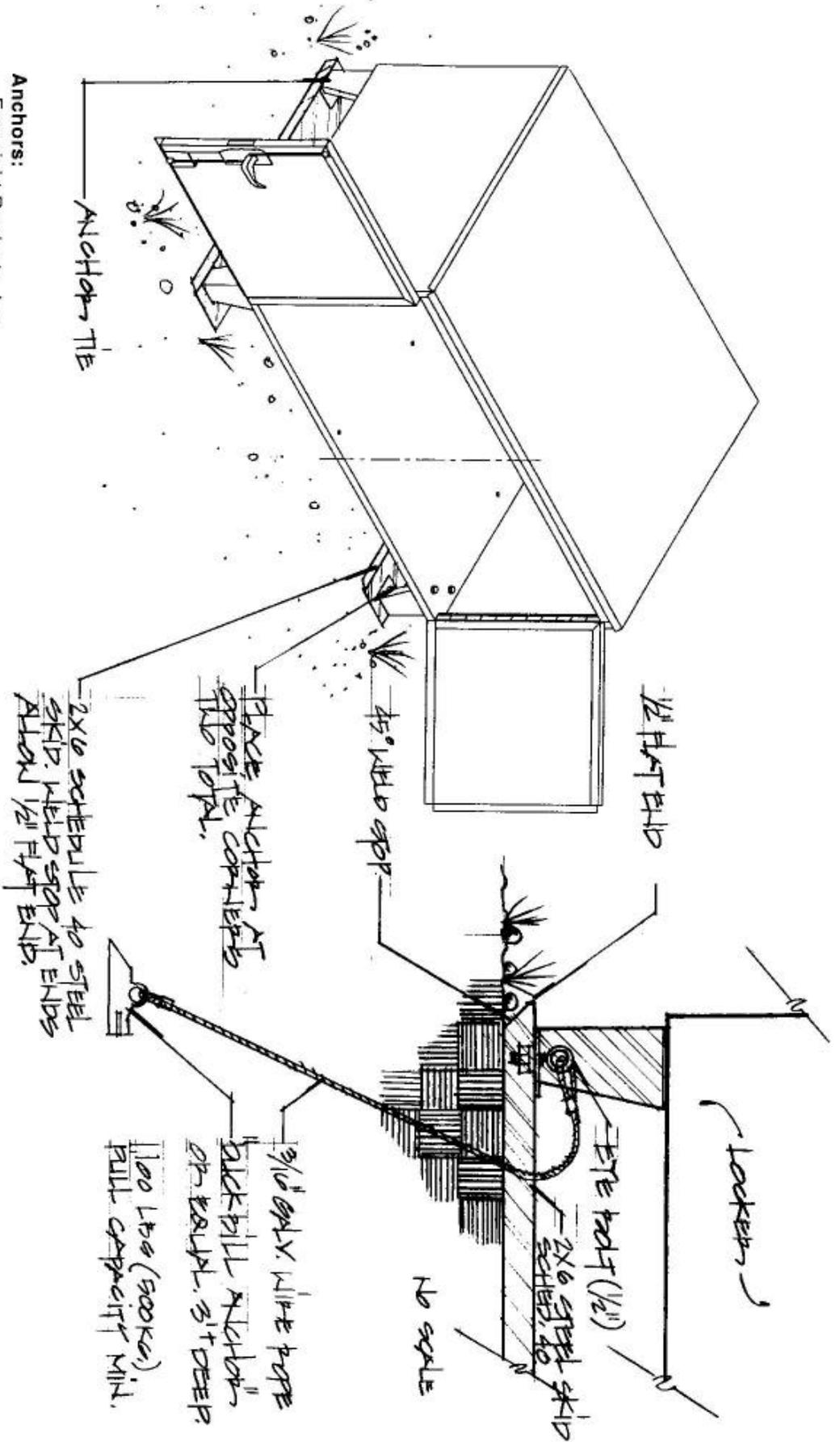
Figure 18 — Food locker mounted on two concrete ribbons.

NOTES

1. MINIMUM LEVEL TO ALLOW DOORS TO WORK PROPERLY
2. 2" SPL. HARDWARE TRIP
3. 2500 PSI CONC.

ANCHOR DETAIL

NO SCALE

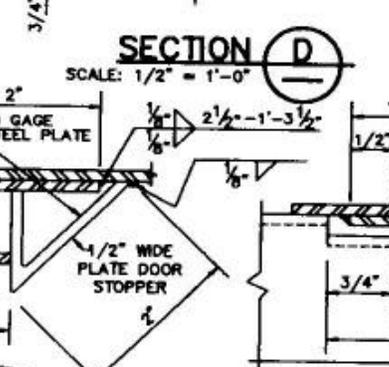
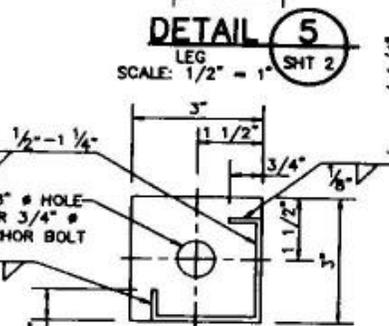
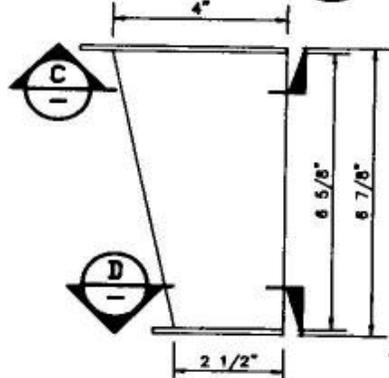
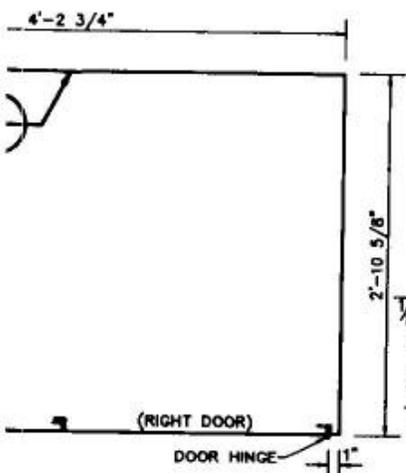
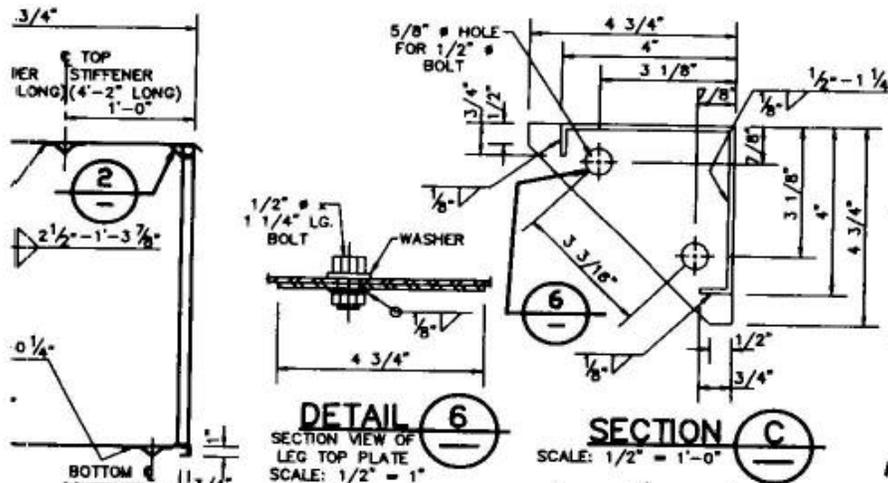


Anchors:

Foresight Products, Inc.
 6430 East 49th Drive
 Commerce City, CO 86022
 Tel. (800) 325-5360
 Tel. (303) 286-8955
 Fax: (303) 287-3866

Notes
 1. Use stainless wire rope on galv. tip.

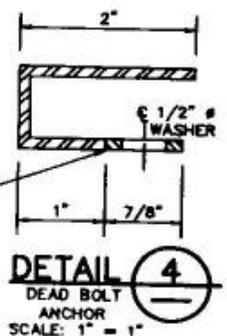
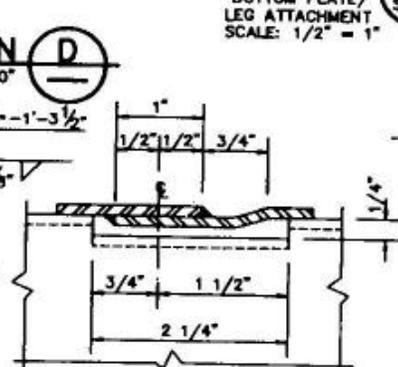
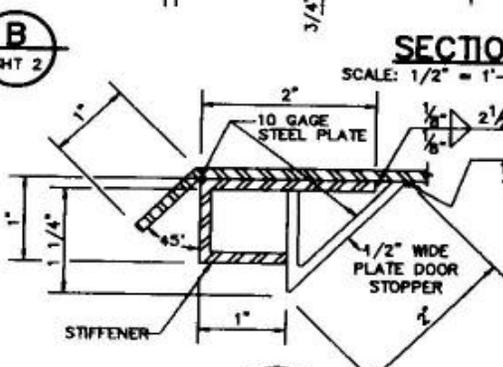
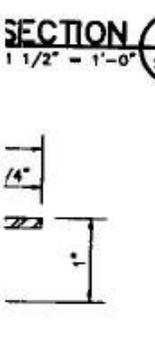
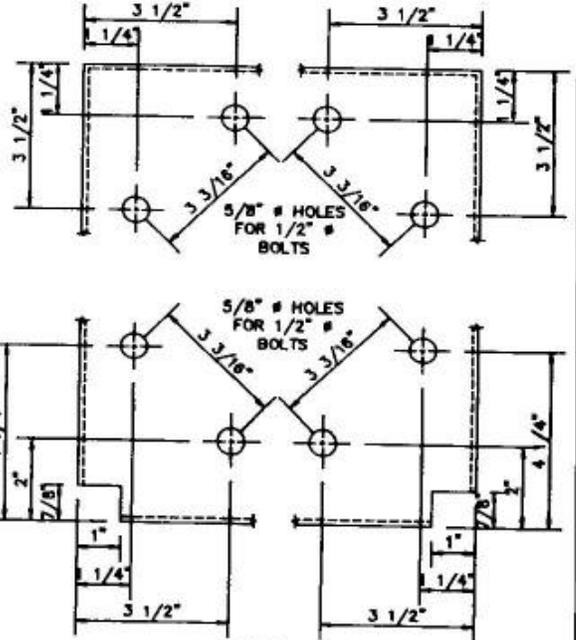
Figure 19 — Food locker mounted on steel skid plates and connected to a stainless steel cable and earth anchor.



NOTES:

1. CARBON STEEL PLATE SHALL BE GAGE 10, ACTUAL THICKNESS IS 0.1379". FOR DIMENSIONAL PURPOSES GAGE 10 WAS SHOWN WITH A THICKNESS OF 1/8" (0.125"). THEREFORE 0.0129" SHALL BE ALLOWED DURING SHOP FABRICATION.
2. ALL SHARP CORNERS SHALL BE GROUND TO A SMOOTH FINISH.
3. DEAD BOLT LATCHES SHALL BE EBERHARD MFG. CO. NO. 5648-2XX WITH MALLEABLE IRON TUMBLER NO. 5647-50. ROD GUIDE SHALL BE 1/2" I.D. x 3/4" LONG GALVANIZED TUBE WELDED ON BOTH SIDES TO THE BACK OF THE LEFT DOOR. THE DEAD BOLT RODS SHALL BE CUT TO SUIT THE HEIGHT OF THE DOOR.
4. THE OUTSIDE AND INSIDE SURFACES SHALL BE PRIME COATED WITH PITT-TECH INDUSTRIAL ENAMEL PRIMER 90-712 AND FINISH PAINTED WITH 2 COATS OF PITT-TECH WATERBORNE SATIN DTM INDUSTRIAL ENAMEL AS MANUFACTURED BY PITTSBURGH PAINTS, OR APPROVED EQUAL COLOR TO BE SELECTED BY THE CONTRACTING OFFICER.

HALF SIZE REPRODUCTION



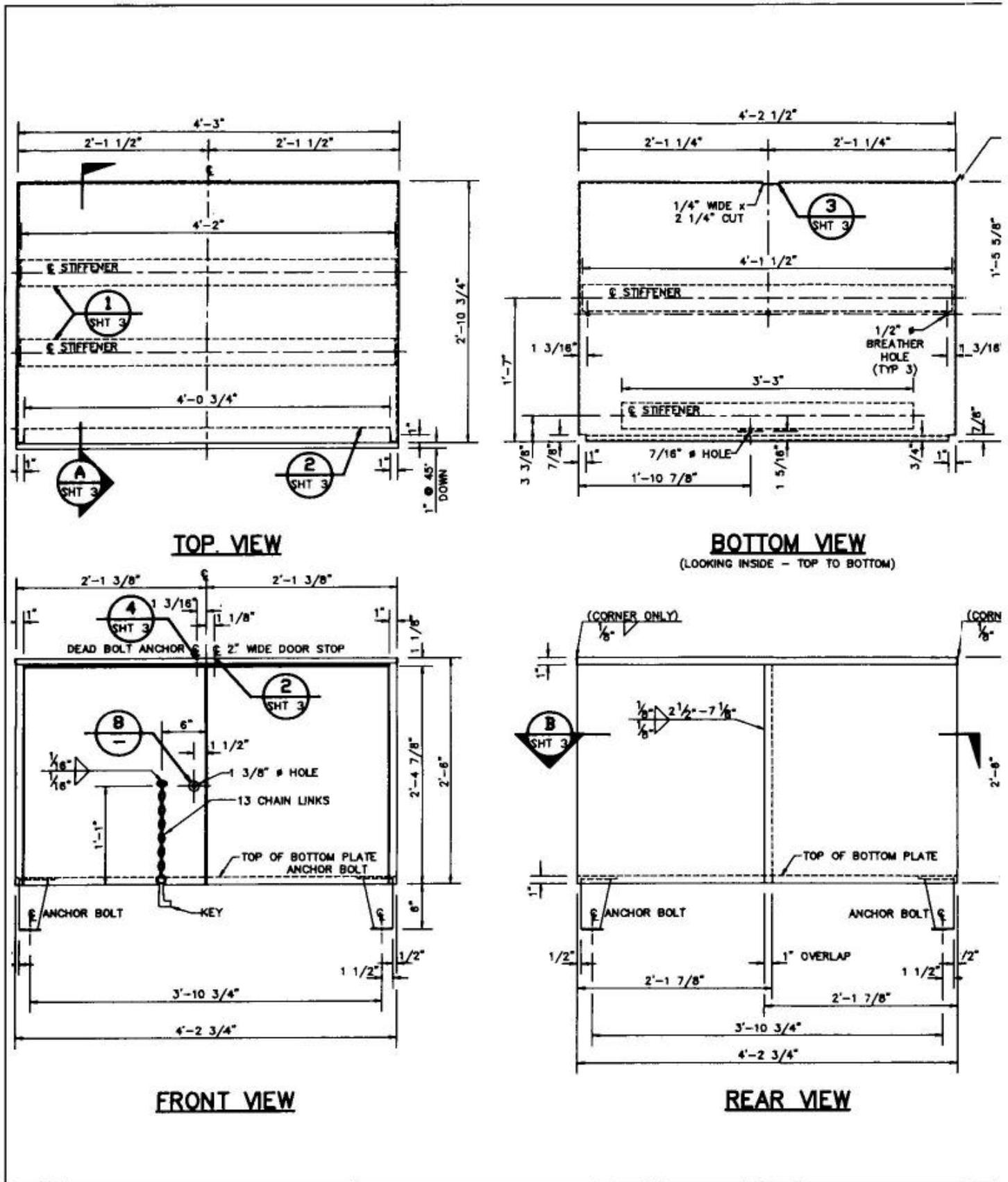
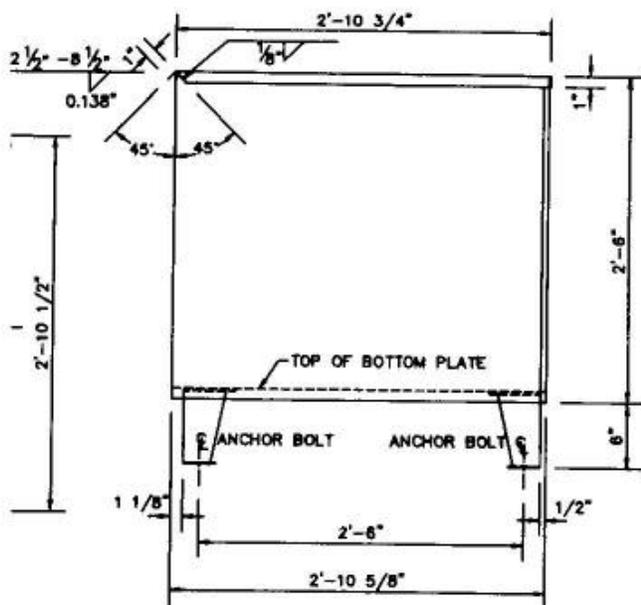
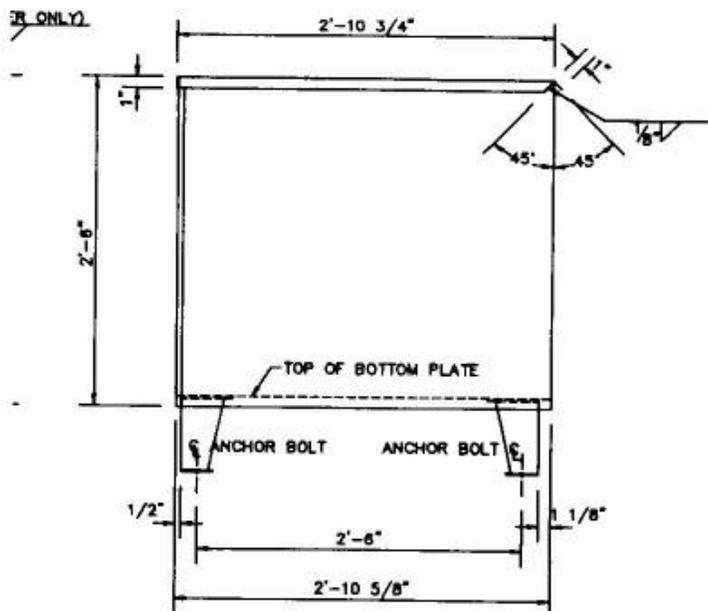


Figure 21—San Dimas bear-proof food locker.



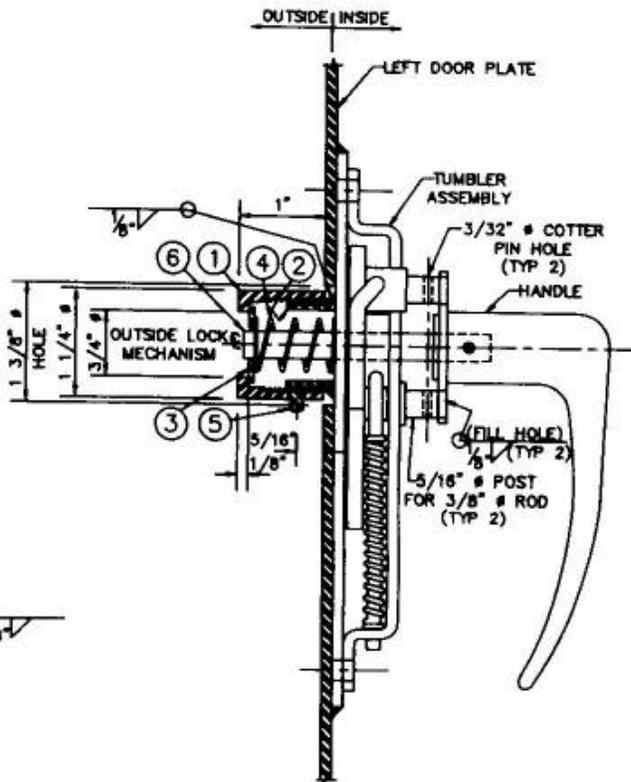
RIGHT SIDE VIEW



LEFT SIDE VIEW

NOTES:

1. CARBON STEEL PLATE SHALL BE GAGE 10, ACTUAL THICKNESS IS 0.1379". FOR DIMENSIONAL PURPOSES GAGE 10 WAS SHOWN WITH A THICKNESS OF 1/8" (0.125"). THEREFORE 0.0129" SHALL BE ALLOWED DURING SHOP FABRICATION.
2. ALL SHARP CORNERS SHALL BE GROUND TO A SMOOTH FINISH.
3. THE OUTSIDE AND INSIDE SURFACES SHALL BE PRIME COATED WITH PITT-TECH INDUSTRIAL ENAMEL PRIMER 90-712 AND FINISH PAINTED WITH 2 COATS OF PITT-TECH WATERBORNE SATIN DTM INDUSTRIAL ENAMEL AS MANUFACTURED BY PITTSBURGH PAINTS, OR APPROVED EQUAL. COLOR TO BE SELECTED BY THE CONTRACTING OFFICER.



DETAIL 8

LATCH MECHANISM
& OUTSIDE LOCK
SCALE: 1" = 1"

LEGEND FOR LATCH MECHANISM:

- ① KEY GUIDE, 1" LONG, FABRICATED STAINLESS STEEL COLLAR WITH 16 PIPE THREAD PER INCH (INSIDE).
- ② 1" # O.D. x 9/16" LONG STAINLESS STEEL PIPE NIPPLE WITH 16 PIPE THREAD PER INCH (OUTSIDE).
- ③ STAINLESS STEEL WASHER, 7/8" # O.D. x 1/16" THICK, CUT INSIDE TO HAVE 3/8" SQUARE HOLE.
- ④ 8 LB. STAINLESS STEEL SPRING, 5/8" # O.D. x 1 1/2" LONG.
- ⑤ ALLEN SET SCREW, 3/16" # x 1/4" LONG.
- ⑥ 5/16" SQUARE KEY ROD CUT TO PROTRUDE 1/16" OUTSIDE THE WASHER ③, APPROXIMATELY 1 1/16" FROM BACK PLATE OF LATCH MECHANISM.

METAL FABRICATORS

Boxmaster

(contact: Art Nevill)
17000 Sierra Highway
Canyon Country, CA 91351
Tel. (805) 298-2666
Fax: (805) 298-3733

Capital Industries, Inc.

5801 3rd Ave. S.
P.O. Box 80983
Seattle, WA 98108
Tel. (206) 762-8585
Fax: (206) 762-5455

McClintock Metal Fabricators Inc.

(Haul-All)
455 Harter Ave.
Woodland, CA 95776-6105
Tel. (800) 350-3588
Fax: (916) 666-7071

Phenix Enterprises, Inc.

14800 Spring Ave.
Santa Fe Springs, CA 90670
Tel. (562) 921-7401
Fax: (562) 921-7502

Cubic Container Manufacturing

11619 Pendleton St.
Sun Valley, CA 91352
Tel. (818) 504-0722
Fax: (818) 504-0460

NOTE: For additional information on local fabricators
see your local telephone yellow pages under "Metal Fabrication"

APPENDIX

Latches and other off the shelf hardware can be found from the following sources:

**HARDWARE MANUFACTURER:
Eberhard Manufacturing Company**

21944 Drake Road
Cleveland, Ohio 44136
Tel. (440) 238-9720
Fax: (440)572-2732
Items: Dead bolt latches

**HARDWARE SUPPLIERS:
Boething-Francis and Co.**

1225 South Hope Street
Los Angeles, CA 90015
Tel. (213) 748-5564
Fax: (213)748-3842

Austin Hardware, Inc.

200 South 18th Street
Sparks (Reno), NV 89432-2206
Tel. (800) 648-1150
Tel. (702) 359-3031
Fax: (702) 359-6954



Printed on recycled paper

