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TECHNICAL REPORT
NATICK/TR-96/005

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LATRINE EVALUATION FOR MILITARY USE

by

Brian Bagdonovich

December 1995

Final Report

August 1995 - September 1995

Approved for public release, distribution unlimited

U.S. ARMY SOLDIER SYSTEMS COMMAND
NATICK RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
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SUSTAINABILITY DIRECTORATE

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An evaluation was conducted to assess soldier acceptability of latrines and toilets with potential for military applications. Soldiers used the toilets during field exercises and were surveyed to determine their preferences. The results of the surveys indicate user preferences and will be used to focus more accurately the candidates to be tested for improving soldier hygiene and health in the FY98 latrine program.

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PREFACE

This evaluation was conducted August - September, 1995 to provide information regarding soldier acceptability of commercial latrines with potential Army applications. Information obtained will be utilized to accelerate and to focus more accurately FY 98 latrine program.

The author gratefully acknowledges the following agencies and personnel for contributing to this successful effort: John Hall, Doug Triblic, and Vaughn Goodall, Directorate of Logistics, Ft. A.P. Hill, for their support and cooperation; Marine Corp 22nd MEU, for providing troops for the evaluation; members of Operational Forces Interface Group, Soldier Systems Command, (SSCOM) Natick Research Development and Engineering Center, (NRDEC) for identifying an evaluation site; Major Brent Smith, Marine Corps Liaison Officer, SSCOM, for his coordination efforts with the Marine Corp; Mr. Donald Breene, Force Modernization Office, Ft. Drum, for his support and cooperation; 1018th Quartermaster Company and HHC 10th Mountain Division, for providing soldiers for the evaluation; the Force Provider RDT&E Team for coordination efforts and evaluation support; Debra Meyers for MANPRINT support; and Mr. Michael Belmonte, SSCOM, NRDEC for his tireless effort to ensure all equipment was available and ready for the evaluations.

Questions regarding the content of this report should be directed to Mr. Brian Bagdonovich of Combat Service Support Equipment Branch, Equipment & Systems Division, Sustainability Directorate at (508) 233-5423 or DSN 256-5423.

LATRINE EVALUATION FOR MILITARY USE

A. INTRODUCTION

Field-expedient latrines used in previous deployments are no longer suitable or acceptable for all situations in which U.S. forces may operate. Therefore, the Army has defined a series of new operational requirements, included in Appendix A, for latrine support across the entire spectrum of military operations. The Modular Initial Deployment Latrine (MIDL) is to be a readily available, portable, highly mobile system that can accompany deploying personnel into the theater of operations. The Maturing Theater Latrine (MTL) is a more stable, durable system that will be made available in the theater following initial deployment (D+30) for use as the theater matures. The final latrine to reach the mature theater will be the Follow On Latrine (FOL), a containerized system with sinks, mirrors and flushing toilets. A range of Commercial Off-The-Self (COTS) products and Non-Developmental Items (NDI) have been identified as possible options for each of these latrine systems.

This evaluation was performed to demonstrate and evaluate the various latrine alternatives; to acquire relevant data and information relating to their feasibility, operability, performance, and acceptability by the soldier; and, to justify an accelerated acquisition strategy.

The MIDL module consists of a folding or collapsible base with a toilet seat, into which a disposable bag is placed to contain human waste, and a privacy screen. Each bag is manually sealed and disposed of, after a single use, in a collection receptacle provided for that purpose. A module supports up to 25 troops and may be set up and operated on the ground or in a shelter, e.g., tent, building, or ISO container. Four different toilets for the MIDL were selected for the evaluation---a collapsible steel tube toilet, a white bucket toilet, and two different styles of folding fiberboard toilets. Brief Reliefs, bags solely for urinating into, were also provided for use and evaluation, in lieu of urinals. The toilets were housed in a screen latrine, an individual tent latrine, and a Tent Extendable Modular Personnel (TEMPER) for the evaluation. These items are depicted and described in Appendix B.

Commercially available individual portable toilets commonly used at outdoor events, the candidates considered for the MTL, were not evaluated since their capabilities and inadequacies are known from previous troop deployments.

The FOL, consisting of a container with low water flush toilets, urinals and sinks, with both a potable water supply and black water storage capability, is depicted and described in Appendix C.

B. FIELD EXERCISE SCENARIO AND EVALUATION METHODS

The latrine evaluation was conducted at Ft. A.P. Hill, VA 13-27 September, 1995. Included were four baggie toilets, the Brief Relief, and two privacy tents/screens, which are considered potential candidates for the Modular Initial Deployment Latrine. The latrines, located at four different sites, were available to approximately 1200 Marines in training at Ft. A.P. Hill.

The four types of toilets, Figures B-1, B-2, B-3 and B-4, were rotated among latrine sites during the evaluation. Brief Reliefs, shown in Figure B-5, were available at each latrine site. Each latrine site had various levels of usage by the soldiers. Bags of waste generated at each site were collected in receptacles, hauled away by a contractor, then incinerated. At each latrine site five gallon water containers, soap and paper towels were provided for soldiers to wash their hands.

At the first latrine site, a 16' TEMPER with six stalls was set up at Camp Rodes. Upon entering the latrine the user saw a display indicating each type of toilet available, and pictorial instructions for its use. The user would pick a toilet bag or Brief Relief to use and would go to the appropriate stall. The instructions, the bags, and toilet stalls were clearly marked and identified to ensure the proper bags were used with the corresponding toilets (see Figures B-8 and B-9). The Brief Reliefs could be used in any toilet stall. After using the toilet, the soldier sealed the bag and deposited it in a collection receptacle outside the tent. The fixed latrine facilities at Camp Rodes were periodically closed for short periods, requiring approximately 200 Marines in the area to use this latrine.

A second latrine site, at Camp Archer, was identical to the one at Camp Rodes. However, since the fixed facilities were well maintained and always available, the more than 800 Marines at Camp Archer rarely used this latrine.

A Screen Latrine, Figure B-6, was set up at the third site, an Ammunition Supply Point (ASP). It was used extensively by the five to seven Marines assigned to duty at the ASP and by soldiers picking up supplies since no fixed facilities were available. Pictorial instructions illustrating the use of the Brief Relief and toilets were located inside each stall. Bag supplies were kept in waterproof containers outside the stalls and the containers were labeled to indicate the type of bag to be used. The curtains to the stalls were labeled, indicating the type of toilet inside, ensuring the appropriate bag be used with each toilet. Toilet paper was hung inside by a string from the framework. After using the toilet or Brief Relief, the personnel sealed the bag and deposited it in a collection receptacle behind the latrine.

The Individual Tent Latrine, Figure B-7, was set up at a fourth site near Camp Rodes for use by personnel on watch duty at a remote communication site. This facility was used 24-hours/ day, by the 1-2 soldiers on duty. Verbal instructions were given on the operation of the toilet and Brief Relief. The instructions were passed on from shift to shift. The soldiers on duty at this site were from Camp Rodes; therefore, they were also familiar with the operation of the toilets from

the first latrine site. Supplies were kept in a pocket on the tent wall, and additional supplies were kept in the communication trailer. After using the toilet or Brief Relief, the soldier sealed the bag and deposited it in a collection receptacle behind the tent.

The evaluation of the FOL at Ft. Drum, NY 21-29 August, 1995 included the prototype containerized latrine designed for the Force Provider program. The latrine was initially set up adjacent to a shower point and was supplied with water from a Reverse Osmosis Water Purification Unit (ROWPU). The latrine was used constantly by the 10-15 soldiers who operated the shower point. New Environmental Protection Agency (EPA) regulations restricted water production by the ROWPU, thus limiting the number of soldiers taking showers at this location, causing a reduction in latrine users. The latrine was still used by approximately 100 soldiers. Although usage was limited, its preference over nearby portable toilets by the soldiers was immediately observed, and a request by the HHC 10th Mountain Division was made to relocate the latrine for an additional field exercise. The latrine was set up at an airfield and operated 5-20 September, 1995 for approximately 200 soldiers. The latrine was used continuously since the soldiers stayed at this location for the duration of the exercise and the only alternative toilet facilities were portable toilets. There were no water problems at the new location since potable water was trucked in, gray water was pumped down a sewer drain, and black water was hauled away by a contractor.

Surveys were distributed to soldiers at both the Ft. A.P. Hill and Ft. Drum exercises to determine user satisfaction and where improvements are required (see Appendix D). Interviews were also conducted to obtain a more in-depth information on the latrines. The soldiers were generally interviewed in groups, to discuss the pros and cons of each item, and how their unit could benefit.

C. RESULTS AND DISCUSSIONS

The most clear-cut observation from the MIDL evaluation at Ft. A.P. Hill is the soldier's preference for the fixed facilities over the toilets being evaluated. However, among the toilets evaluated, the white bucket toilet was generally most preferred and considered the most comfortable. The favorable response may have been bolstered by the more conventional appearance of the toilet seat. The fiberboard toilets may have received poorer reviews due to the soldiers' preconceptions the boxes would not support their weight. The collapsible steel tube toilet could undergo some design modifications to improve its comfort rating, but the tradeoff could increase its shipping cube or cost.

The Brief Relief was well received by the soldiers. Numerous soldiers at the evaluation had previously used the Brief Relief, during deployment to Haiti, and liked it. The item is being purchased by their units for future deployments. The most significant aspect of the Brief Relief is its cost at $2.26 apiece.

The Screen Latrine, and the Individual Tent Latrine were well received by the users, which may be attributable to the lack of nearby alternate latrine facilities. Both systems could use minor design modifications, but will work in the field as they are now. The Screen Latrine will serve the soldier better for longer deployments, while the Individual Tent Latrine will serve the soldier better for more frequent short term deployments. The fabric for both latrines requires further evaluation for durability and water resistance.

In Appendix E, Table E-1 compares quantity, cube, weight, and cost of each item required for one MIDL module when used by a unit of 25 personnel for a 30-day deployment.

The following is a consolidation of soldier feedback pertaining to each latrine option evaluated at Ft. A.P. Hill:

Collapsible Steel Tube Toilet (Figure B-1)

The toilet seat is too small and a bit uncomfortable.
The toilet is unstable, the base should be enlarged.
The toilet seat should be higher.
The bags should be a little larger.
The vertical tubes attaching the base to the seat occasionally fall out during assembly while other tubes are difficult to attach.

VA Finest Toilet (Figure B-2)

The toilet seat is too small.
The toilet is too tall and narrow, therefore very unstable.
The toilet is simple to assemble.
The toilet will not be good in wet weather or if someone urinates on it.
The weight capacity is suspect.

Drop Box Toilet (Figure B-3)

The toilet is a good height.
The toilet seat opening is too large for some users.
The toilet seat came unassembled on damp days.
The toilet does not feel sturdy.
The toilet will collapse when wet.
The clear bags are not liked.

White Bucket Toilet (Figure B-4)

The toilet is a good height and stable.
The toilet seat is very comfortable.
The deodorizer is effective.
There was enough toilet paper included in the package.

Brief Relief (Figure B-5)

The brief relief will be good on convoys or other situations where regular facilities are not accessible.
The brief relief could be larger.
No problems opening and closing the brief relief.
No reports of leakage were made.
Some reports of splash back while urinating were made.

Screen Latrine (Figure B-6)

The stalls are very private and provide plenty of space for the soldiers' combat gear.
The screen latrine appears durable, but manufacturing workmanship can be improved.
A place for toilet paper is required, possibly a fabric pocket on the internal wall.
Hooks for hanging jacket would be desirable.
Roof and frame should be higher to avoid hitting head.
Rain water would build up on the roof and leak whenever it was touched.
The frame should snap into proper length without adjustments.
The trash barrel requires a cover to prevent filling with water when it rains.
The lid on the storage box is too heavy and awkward to attach.
The toilets could be more stable.
More ventilation is required on hot days.
The storage box may be too large to add to current packing plan of vehicles.

Individual Tent Latrine (Figure B-7)

Suitable privacy is provided.
Additional space is required for the soldiers' combat gear.
The Individual Tent Latrine leans when a soldier hangs up a heavy jacket or during strong wind gusts.
Pocket for the toilet paper was good.
Insignificant weight and cube of individual tent latrine will not alter current packing plans.

This feedback indicates each of the options evaluated would be capable of completing the mission, but with varying degrees of success, costs, and soldier satisfaction. Further, the evaluation successfully indicates the soldiers' dislike for baggie-type toilets, in comparison to modern facilities, which suggests that the sooner the MTL and the FOL arrive the more satisfied the soldiers will be.

The FOL evaluated at Ft. Drum was obviously liked by the soldiers who used it. During interviews, soldiers indicated they would like to see containerized latrine in the field as soon as possible. Table 1. presents user satisfaction with respect to different features of the FOL, as indicated by the surveys.

Table 1. FOL: Mean Ratings of Soldier Satisfaction (n=17)

Extremely Dissatisfied 1	Moderately Dissatisfied 2	Somewhat Dissatisfied 3	Neutral 4	Somewhat Satisfied 5	Moderately Satisfied 6	Extremely Satisfied 7

FOL	Mean	SD
* Amount of space in stalls	6.3	0.7
Ventilation	6.6	0.6
Odor	6.8	0.4
Cleanliness	6.8	0.4
* Privacy	6.2	1.0
Light	6.8	0.4
Toilet	6.8	0.4
Urinal	6.8	1.9
Sinks	6.6	0.6
Latrine facilities overall	6.8	0.4

* Areas for further improvement

The FOL received excellent reviews; however, a few additional minor improvements can be made. Some soldiers indicated they would prefer doors with locking mechanisms. Set up time, weight, cost, space and vulnerability to damage do not make doors a viable option for a field environment. Greater privacy may be obtained more efficiently with a combination of velcro and tie straps that would allow the user to secure the curtain while using the toilet. The amount of space in the stalls can not be increased easily. The elimination of one toilet to increase the width of the toilet stalls will reduce the latrines overall load capacity by 25 soldiers. Hooks will be added in the stalls for the soldier to hang up a jacket, weapon, helmet and web gear. When the containerized latrine was compared with other latrines used on previous

deployments, it was rated much better than cat holes, slit latrines, wooden fabricated latrines and portable toilets.

In addition to this evaluation, containerized latrines from SSCOM have also been used in field exercises at Ft. Bragg, NC, Camp Johnson, VT, and deployed to Haiti. Based on lessons learned at each exercise/deployment, improvements have and will be incorporated in the latrine as time and funds permit. The design of the containerized latrine is near optimum. The only significant question remaining is the reliability of the equipment. Overall, the containerized latrine evaluation was very successful, and, when combined with information gained from the other field exercises, these results will be a significant contribution to the successful implementation of containerized latrines in the Army.

D. CONCLUSIONS

Analysis of the data obtained from the MIDL evaluation at Ft. A.P. Hill indicates each toilet has its advantages in the Army depending on the scenario and the particular unit's capability. However, if the Army only selects one option, it should be the white bucket toilet since it is the most acceptable to the soldiers in terms of comfort. Even though it is the largest of all toilets evaluated and does not collapse for shipment, the combined cube of the toilet and supplies required for a 30 day deployment is the smallest of all options considered. The Brief Relief is a winner for male soldiers in the field, but may not be affordable for general use, since it will cost the Army $2.26 each time a soldier has to urinate. The Brief Relief needs to undergo further evaluation with female soldiers since there were not any at the test. Since neither the Screen Latrine or Individual Tent Latrine supported as many as 25 soldiers on a continuous basis, as required by the ORD, no judgment should be made at this time relative to durability in the field. The MIDL evaluation has provided adequate information to justify an accelerated acquisition strategy; however, due to the limited use, the accessibility to alternate facilities, and the short duration of the evaluation, all MIDL latrine options should be further evaluated.

Analysis of the data obtained from the FOL evaluation at Ft. Drum indicates the containerized latrine exceeds the soldiers expectations and with minor modifications will meet all their needs. The only issue left open is reliability and maintainability of the system in a real life deployment.

The results obtained from the MIDL and FOL evaluation indicate commercial products are available to meet the Army requirements as specified in the ORDs. Since commercial products meet the requirements, an accelerated acquisition strategy should be implemented so the latrines may be fielded in the most timely manner.

E. RECOMMENDATIONS

It is recommended that:

1. The MIDL options be further evaluated by the appropriate number of soldiers in a field environment for a minimum of two weeks, in which there are no alternate facilities available.

2. The Screen Latrine and Individual Tent Latrine should be tested for durability, in particular water resistance in the SSCOM, NRDEC rain room, and ability to sustain high winds in the Doriot Climatic Chambers.

3. Waste disposal be further investigated since it is a critical global environmental issue that needs to be solved. Waste generated by the MIDL was treated as Medical Waste during the evaluation and incinerated at a cost of $35 for a 39 gallon container.

4. The Army monitor the containerized latrine programs of Force Provider for possible adoption.

5. Investigate Air Force and Navy containerized latrine experiences to assess the durability of their equipment.

6. An accelerated acquisition strategy be implemented since there are suitable and satisfactory commercially available items which meet the requirements of the Army.

7. Further evaluation of Brief Relief in the field with female soldiers is needed.

APPENDICES

APPENDIX A

OPERATIONAL REQUIREMENT DOCUMENTS

15 Jun 95

OPERATIONAL REQUIREMENTS DOCUMENT (ORD)

FOR THE

MODULAR INITIAL DEPLOYMENT LATRINE (MIDL)

1. General Description of Operational Capability.

a. Overall Mission Area. The Army has a need to provide timely latrine support across the spectrum of military operations. The Modular Initial Deployment Latrine (MIDL) is a portable human waste disposal system that meets the needs of supporting human waste discharge and containment of human waste generated during various operations. The MIDL can support short, fast paced deployments. It also provides sufficient mobility to support all soldiers in all types of operations, e.g. from low intensity conflicts to operations other than war (OOTW). The MIDL is both environmentally and user friendly. It can be setup and dismantled quickly and has joint applicability. The MIDL will improve field sanitation operations by reducing deficiencies in these operations and enhance the quality of life for soldiers in the field.

b. Operational and Support Concepts.

(1) Operational. The MIDL will provide a latrine that can accompany deploying personnel to provide latrine support. Each MIDL will be able to support 25 personnel. Each module can be interconnected to provide a larger latrine capability. The MIDL is composed of folding stand, with toilet seat and privacy screen that can be placed on the ground, or within a softwall shelter, building, or container. All ancillary equipment, to include disposable bags, disposable bag ties, and hand wipes are stored in the shipping box. Upon arrival at the desired location, the MIDL is unpacked, set up in either on the ground or in a soft wall shelter, building, or container and is ready for operation. Each use will require a new disposable bag. The MIDL will be used and maintained by unit personnel MOS non-specific. MIDL modules can be set up to service any size force. Used bags will be disposed of in accordance with local regulations and military requirements.

(2) Logistical. The MIDL requires disposable bag inserts and disposable bag ties (Each use requires a new disposable bag and tie). It can be supported by items currently in the DoD inventory. It can be transported via all forms of military assets.

(3) Mission Need Statement Summary. Certain deployment scenarios create the need for highly mobile and readily available human waste disposal systems. Field expedient latrines may not satisfy waste disposal requirements during operations in urban locations. The need for an efficient, portable waste disposal system is most apparent to those forces arriving in a theater of

operations during initial deployment. Historically, field sanitation teams and materials required for construction of field sanitation items are not initially deployed. Additionally, contractor support is not usually available at and during initial deployment. Development must be consistent with constraints centered on Manpower and Personnel Integration (MANPRINT) domains, budget, logistics supportability, transportability, standardization, and interoperability. Commercial industry already has the capability to produce the component items required for the MIDL. In some cases, firms are making mobile latrines for use by forest fire fighting camps, isolated communities, and logging operations.

2. Threat. (Non-Applicable).

3. Shortcomings of Existing Systems. The Army currently lacks adequate equipment to provide initially deployed units a latrine that can be transported with the unit, quickly erected and ready for use virtually anywhere within the theater. Present doctrine requires units to construct their own latrine systems, waste tubes for urine, or locally fabricated latrines using whatever building materials are available. Use of the MIDL will provide improved hygienic conditions within the theater. Additionally, current field sanitation doctrine does not address environmental regulations, concerns, or laws, thus making existing field sanitation systems and doctrine in violation of current laws.

4. Capabilities Required.

a. System Performance. The capabilities are required in support of the MIDL. The following system performance requirements are not prioritized:

(1) Must be capable of supporting 25 personnel per 24 hour period.

(2) Must be setup and operational in less than 15 minutes and disassembled/repacked in less than 15 minutes by one soldier, MOS nonspecific.

(3) Must be able to provide a hygienic seat for each soldiers' use.

(4) Latrine stand, toilet seat and privacy screen must be foldable for shipment, able to support up to 300 lbs, and be used on the ground, or in a tent, building, or container.

(5) Must have screens that provide privacy for the soldiers using the latrine. Screen must be capable of being set up on soft and hard stands, in buildings or in containers.

b. Logistics and Readiness. A tailored Army supply and maintenance systems will support the MIDL.

(1) The MIDL will be capable of being carried on or within any transportation assets within the deploying area.

(2) Quantitative Reliability and Maintainability (R&M) requirements are not applicable for the MIDL

c. Critical System Characteristics. There are no critical system characteristics the MIDL will be required to meet.

5. Integrated Logistics Support. A tailored Integrated Logistics Support (ILS) Plan will be developed by the ILS Management Team and updated throughout the acquisition process. The Logistical Support Analysis (LSA)/LSA Record process will determine and define detailed logistics support, personnel tasks, and skills for operations, maintenance, and support. A system support package will be tested and validated during testing. The MIDL will be a common table of allowance (CTA) item, with a small number stored in operational project stocks.

a. Maintenance Planning. Logistics and maintenance support will be in accordance with the Army Supply and Maintenance System.

(1) Unit maintenance will include preventive maintenance checks and services (PMCS), minor adjustments, and inspections of components. Commercial off the shelf (COTS) manuals will be used.

(2) Direct support (DS) maintenance is not envisioned.

b. Support Equipment. There will be no requirement for new system specific test, measurement, and diagnostic equipment. There will be no need for new or special tools to repair or maintain the latrine.

c. Human System Integration.

(1) Training. The MIDL design should minimize unit training, with no institutional training planned. The material developer and combat developer will jointly determine training and new materiel introductory training.

(2) Manpower and Personnel. Fielding the MIDL will have no impact on the manpower or personnel structure. The MIDL operators/users will be military occupational specialty (MOS) non-specific. No additional skills are required for the operation and maintenance of the MIDL.

(3) Human Factors Engineering (HFE). Operators/users must be capable of safely and effectively operating and maintaining the MIDL while wearing the field duty uniform. The MIDL will meet all industry and Government HFE requirements and design practices.

(4) System Safety and Health Hazard Assessment (HHA). The MIDL must comply with industry and government safety and health hazard standards. A system safety program will be established IAW relevant industry standards or be based upon Army guidance. A Safety

Assessment Report will be obtained by the material developer and will:

(a) Present no uncontrolled hazards to operators/users or potential damage to government equipment or supplies.

(b) Comply with appropriate safety and health requirements .

(c) Provide appropriate labels or instructions on or near the latrine to assist soldiers in the safe operation of the latrine.

d. Computer Resources. Not required.

e. Other Logistical Considerations. There will be no requirements for any unique fixed facilities or shelters, any special packaging and handling, or unique data requirements. The MIDL will require suitable COTS manuals.

6. Infrastructure Support and Interoperability.

a. Command. Control. Communications. and Intelligence (C3I) (N/A).

b. Transportation and Basing. The MIDL operates worldwide in hot, cold and basic climatic regions. Transport and storage packaging must meet requirements for international shipment by ground (vehicle and rail), air, and sea.

c. Standardization. Interoperability. and Commonality. At time of fielding, the MIDL will be capable of operating with all U. S. services, NATO forces, and other Allied forces.

d. Mapping. Charting. and Geodesy Support. (N/A).

e. Environmental Support. (N/A).

f. The Joint Potential Designator. Joint Interest.

7. Force Structure.

The MIDL will have no impact on force structure. To support Army requirements, the procurement of the MIDL will be one per twenty-five soldiers.

8. Schedule Considerations.

a. An Initial Operational Capability (IOC) is met when:

(1) All primary and supporting equipment are received.

(2) All manuals, training literature, and related publications are received.

(3) The operators/users have been completely trained and first unit equipped can successfully operate the MIDL in accordance with applicable Mission Training Plan. (MTP).

b. The required IOC is 2QFY99.

ANNEX A

RATIONALE

4. Capabilities Required.

a. System Performance. Each MIDL must have the following capabilities in support of the Operational Mode Summary/Mission Profile (OHMS/MP), Annex B to this ORD:

REQUIREMENT (1). Must be capable of supporting 25 personnel per 24 hour period

RATIONALE: For planning purposes to determine the number of personnel used for each MIDL. The smallest organizational unit supported will be a platoon.

REQUIREMENT (2). Must be setup and operational in less than 15 minutes and disassembled/repacked in less than 15 minutes by one soldier, MOS nonspecific.

RATIONALE: The MIDL is supposed to place a minimal impact on the unit and must be quickly erected/repacked.

REQUIREMENT (3). Must be able to provide a hygienic seat for each soldiers' use

RATIONALE: To keep control of non-hygienic conditions, each soldier should be able to use a clean surface to sit upon.

REQUIREMENT (4). Latrine stand, toilet seat and privacy screens must be foldable for shipment and be able to support up to 300 lbs and be operated on the ground, or in a tent, building, or container.

RATIONALE: Complete MIDL must be able to be packed in a small container that can fit with other supplies of the deploying force by using the least space possible. Once erected, the MIDL must be able to be used by all soldiers.

REQUIREMENT (5). Must have screens that provide privacy for the soldiers using the latrine. Screen must be capable of being set up on soft and hard stand, in buildings or in containers.

RATIONALE: Soldiers require some privacy during operation of the MIDL.

b. Logistics and Readiness. Tailored Army supply and maintenance systems will support the MIDL. It must be repairable at the unit and organizational levels, with no direct maintenance needed.

RATIONALE: This requirement will avoid changes to the logistics system to accommodate the MIDL, and will ensure a supportable field latrine.

REQUIREMENT (1). The MIDL will be capable of being carried on or within any transportation assets within the deploying area.

RATIONALE: To not place a transportation burden on owning unit.

REQUIREMENT (2). Quantitative Reliability and Maintainability (R&M) requirements are not applicable for the MIDL.

RATIONALE: R&M Requirements Rationale (RRR) was prepared and approved by TRADOC Combat Developments Engineering (CDE), 1 Mar 95. Copies are on file at U. S. Army CASCOM, ATTN: ATCL-MES, Fort Lee, VA and TRADOC CDE, Eastern Regional Office, ATTN: ATCD-SRE. Fort Lee. VA.

c. Critical System Characteristics. There are no critical system characteristics that the MIDL will be required to meet.

ANNEX B

OPERATIONAL MODE SUMMARY/MISSION PROFILE (OMS/MP)

1. Wartime/peacetime OMS/MP. The MIDL will provide a latrine that can accompany deploying personnel to provide latrine support. Each MIDL will be able to support 25 personnel. The MIDL is composed of a folding stand, with toilet seat and privacy screens that can be placed within a softwall shelter, building, or a container. Additional MIDLs can be interconnected to provide a greater latrine capability. All ancillary equipment, to include disposable bags, disposable bag ties, and hand wipes stored in the shipping box for each MIDL. Upon arrival at the desired location, the MIDL is unpacked, set up on the ground, or in a soft wall shelter, building, or container and is ready for operation. The MIDL will be used and maintained by unit personnel MOS non-specific. The MIDL will be operated 24 hours a day. Used bags will be disposed of in accordance with local regulations and military requirements. A maximum of 15 minutes is expected for set-up and a maximum of 15 minutes is expected for disassembly and return to storage. The MIDL can be expected to move when the unit moves.

2. Environmental Conditions. The MIDL will primarily be operated in basic climates (60%) but may be operated in hot (25%), and cold (15%) climatic conditions.

ANNEX C

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
1. HEADQUARTERS, DEPARTMENT OF THE ARMY		07	
2. U.S. MARINE CORPS SYSTEMS COMMAND	X		
3. U.S. TRANSPORTATION COMMAND	X		
4. HEADQUARTERS, U. S. AIR FORCE	X		
5. U. S. ARMY EUROPE	X		
6. U. S. CENTRAL COMMAND	X		
7. HQ, EIGHTH U. S. ARMY	X		
8. HQ, FORCES COMMAND	X		
9. U.S. ARMY TMDE ACTIVITY	X		
10. U.S. ARMY TOPOGRAPHIC ENGINEERING CENTER	X		
1 1. U. S. ARMY NUCLEAR AND CHEMICAL ACTIVITY	X		
12. HQ, TRAINING AND DOCTRINE COMMAND		12	
13. U. S. ARMY INFORMATION SYSTEMS COMMAND	X		

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
14. U.S. ARMY SOLDIER SYSTEM COMMAND		05	
15. U. S. ARMY INFANTRY SCHOOL		05	
16. OCAR	X		
17. U.S. ARMY MP SCHOOL	X		
18. U.S. ARMY FAS	X		
19. U. S. ARMY ENGINEER SCHOOL		02	
20. U.S. ARMY CHEMICAL SCHOOL	X		
21. ARMY NATIONAL GUARD BUREAU	X		
22. U.S. PAC	X		
23. U.S. ARMY OEC	X		
24. U.S. SOUTHERN COMMAND	X		
25. U.S. ARMY INTELLIGENCE SCHOOL	X		
26. AMEDDC AND SCHOOL	X		
27. U S. ARMY ARMOR SCHOOL	X		
28. U.S. ARMY AIR DEFENSE SCHOOL	X		
29. U.S. ARMY CHEMICAL SCHOOL	X		

ANNEX D - Funding Implications

MODULAR INITIAL DEPLOYMENT LATRINE (MIDL) COST ESTIMATE SUMMARY (MILLIONS OF DOLLARS) CONSTANT $
BASE YEAR FY94

ANNEX E

TRAINING DEVICES

No training devices are required for the Initial deployment latrine.

October 23, 1995

OPERATIONAL REQUIREMENTS DOCUMENT (ORD)

FOR THE

MATURING THEATER LATRINE (MTL)

1. General Description of Operational Capability.

a. Overall Mission Area. The Army has a need to provide timely latrine support across the battlefield. Latrine support missions on a non-linear battlefield and in Operations Other Than War (OOTW) must be more responsive to shorter, fast-paced deployments. Latrines will provide a capability or may augment the capability of a task force to provide humanitarian aid, noncombatant evacuations, and disaster relief missions. The MTL will reduce deficiencies in the areas of health, welfare, and morale and will enhance the quality of life for soldiers in the field. The MTL is one of three latrine initiatives to address the lack of latrine capability within the theater of operations.

b. Operational and Support Concepts.

(1) Operational. The MTL will provide enclosed stall type latrines that will be shipped into theater following initial deployment (D+30) and used as the theater matures. Each MTL will be able to support 25 personnel per day, and be shipped into theater unassembled on pallets or inside ISO containers. The MTL is composed of four walls containing air vents, a securable door, a recessed/protected toilet paper dispenser, a hook to hold a chemical light, and a tube or receptacle for urine, a roof that has a translucent panel with an opaque cover to allow ambient lighting, and a seat and cover that secure to a base stand which also serves as a waste container. The stand also includes a removable metal container that fits inside of the fiberglass type waste container during shipment and can be used when waste must be burned. The MTL can either stand alone or be used within a softwall shelter, building, or a container. The waste container must be capable of either being serviced by a septic type vehicle or removed from the MTL and the waste be burned within the container. Upon arrival at the desired location, the MTL is unpacked, assembled, and is ready for use. The MTL will be used and maintained by unit personnel MOS non-specific. MTL modules can be set up to service any size force. Upon redeployment, each MTL will be cleaned, disassembled, and shipped to redeployment location. In all cases, waste will be disposed of in accordance with applicable local regulations and military requirements.

(2) Logistical. The MTL can be assembled with tools from the general mechanics tool kit.

Easy to follow directions/instructions for assembly will be attached to the MTL along with all necessary fasteners.

(3) Mission Need Statement Summary. Certain deployment scenarios create the need for highly mobile and readily available human waste disposal systems. Field expedient latrines may not satisfy waste disposal requirements during operations in urbanized locations. The need for an efficient, portable waste disposal system is most apparent to those forces arriving in a theater of operations during initial deployment. Historically, materials required for construction of field sanitation items are not initially deployed. Additionally, contractor support, when it is available, is expensive. Development must be consistent with constraints centered on Manpower and Personnel Integration (MANPRINT) domains, budget, logistics supportability, transportability, standardization, and interoperability. Commercial industry already has the capability to produce the component items required for the MTL. In some cases, firms are making mobile latrines for use by forest fire fighting camps, isolated communities, and logging operations. A mission need statement (MNS) for Field Latrines initiated this program.

2. Threat. (Non-Applicable).

3. Shortcomings of Existing Systems. The Army currently lacks adequate equipment to provide deployed units a reusable latrine that can be transported to the theater following initial deployment, and quickly assembled and ready for use virtually any where within the theater. Present doctrine requires units to construct their own latrine systems, waste tubes for urine, or locally fabricated latrines using whatever building materials are available. Use of locally fabricated systems can become unsanitary quickly and usually can not easily be reused at a different location or removed from the theater. Additionally, the Army has contracted for these type facilities since they did not have an organic capability to meet the need. Use of the MTL will provide improved latrine support within the theater

4. Capabilities Required.

a. System Performance. Each MTL must have the following capabilities in support of the Operational Mode Summary/Mission Profile (OMS/MP), Appendix B to this ORD. The following system performance requirements are not prioritized:

(1) Must be capable of supporting 25 personnel per 24 hour period.

(2) Must be setup and operational in less than 1 hour and disassembled/repacked and cleaned in less than 2 hours by one soldier, MOS nonspecific.

(3) Must have a fiberglass waste container that can be serviced daily by a septic type waste servicing vehicle and a metal container that is shipped inside the fiberglass waste container that can be used in place of the fiberglass container when required to burn waste.

(4) Enclosed stall type latrine must be able to support one soldier's weight of up to 250 pounds, and be either stand alone, or placed within a tent, building, or container.

(5) Must have air ventilation slots to allow air to enter the latrine.

(6) Must have a translucent panel with an opaque cover in the roof and a hook on one of the interior walls for a chemical light or flashlight.

(7) Must have a cover on toilet seat, a recessed /protected area for toilet paper, and a tube or receptacle for urine.

b. Logistics and Readiness. Tailored Army supply and maintenance systems will support the MTL.

(1) The MTL will be capable of being carried on any transportation assets within the area of operations.

(2) Quantitative Reliability and Maintainability (R&M) requirements are not applicable for the MTL.

c. Critical System Characteristics. There are no critical system characteristics the MTL will be required to meet.

5. Integrated Logistics Support. A tailored Integrated Logistics Support (ILS) Plan will be developed by the ILS Management Team and updated throughout the acquisition process. The Logistical Support Analysis (LSA)/LSA Record process will determine and define detailed logistics support, personnel tasks, and skills for operations, maintenance, and support. The MTL will be a common table of allowance (CTA) item, with a small number stored in operational project stock.

a. Maintenance Planning. Logistics and maintenance support will be in accordance with the Army Supply and Maintenance System.

(1) Unit maintenance will include preventive maintenance checks and services (PMCS), replacement of easily accessible unserviceable parts not requiring special tools or test materiel, cleaning, preserving (to include either ensuring latrine is serviced regularly by a septic type waste servicing vehicle or burning the waste in the waste container), tightening, replacement of parts (authorized by the maintenance allocation chart), minor adjustments, and inspections of components. Commercial off the shelf (COTS) manuals will be used. Additionally, cleaning brushes and cleaning solution should accompany each MTL.

(2) Direct support (DS) maintenance is not envisioned.

b. Support Equipment. There will be no requirement for new system specific test, measurement, and diagnostic equipment. There will be no need for new or special tools to repair or maintain the latrine.

c. Human System Integration.

(1) Training. The MTL design should minimize unit training, with no institutional training planned. The material developer and combat developer will jointly determine training requirements.

(2) Manpower and Personnel. Fielding the MTL will have no impact on the manpower or personnel structure. The MTL operators/users will be military occupational specialty (MOS) nonspecific. No additional skills are required for the operation and maintenance of the MTL.

(3) Human Factors Engineering (HFE). Operators/users must be capable of safely and effectively operating and maintaining the MTL while wearing the field duty uniform. The MTL will meet all industry and government HFE requirements and design practices.

(4) System Safety and Health Hazard Assessment (HHA). The MTL must comply with industry and government safety and health hazard standards. A system safety program will be established IAW relevant industry standards or be based upon Army guidance. A Safety Assessment Report will be obtained by the material developer to insure the system:

(a) Presents no uncontrolled hazards to operators/users or potential damage to government equipment or supplies.

(b) Complies with appropriate safety and health requirements.

(c) Provides appropriate labels or instructions on or near the latrine to assist soldiers in the safe operation of the latrine.

d. Computer Resources. Not required.

e. Other Logistical Considerations. There will be no requirements for any unique fixed facilities or shelters, any special packaging and handling, or unique data requirements. The MTL will require suitable COTS manuals.

6. Infrastructure Support and Interoperability.

a. Command, Control, Communications, and Intelligence (C3I) (N/A).

b. Transportation and Basing. The MTL operates worldwide in hot, cold and basic climatic regions. Transport and storage packaging must meet requirements for international shipment by ground (vehicle and rail), air, and sea.

c. Standardization. Interoperability. and Commonality. At time of fielding, the MTL will be capable of operating with all US services, NATO forces, and other Allied forces.

d. Mapping. Charting. and Geodesy Support. (N/A).

e. Environmental Support. (N/A).

f. The Joint Potential Designator. Joint Interest.

7. Force Structure.

The MTL will have no impact on force structure. To support Army requirements, the procurement of the MTL will be one per 25 supported personnel.

8. Schedule Considerations.

a. An Initial Operational Capability (IOC) is met when:

(1) All primary and supporting equipment are received.

(2) All manuals, training literature, and related publications are received.

b. The required IOC is 2QFY99.

ANNEX A

RATIONALE

4. Capabilities Required.

a. System Performance. Each MTL must have the following capabilities in support of the Operational Mode Summary/Mission Profile (OMS/MP), Annex B to this ORD:

REQUIREMENT (1). Must be capable of supporting 25 personnel per 24 hour period.

RATIONALE: Army field hygiene and sanitation standards, as well as standards for similar type latrines in civilian markets set a support capability of approximately 25 personnel per seat.

REQUIREMENT (2). Must be setup and operational in less than 1 hour and disassembled/repacked and cleaned in less than 2 hours by one soldier, MOS nonspecific.

RATIONALE: The MTL is designed to be shipped into theater unassembled. This allows more MTL's per pallet as opposed to shipping into theater already assembled. Assembly and disassembly/clean-up should be as easy as possible to allow MTL's to become operational quickly. The additional time for disassembly/repacking is to allow for the cleaning of the MTL for shipment to next location or back to CONUS.

REQUIREMENT (3). Must have a fiberglass type waste container that can be serviced daily by a septic type waste servicing vehicle and metal container that is shipped inside the fiberglass waste container that can be used in place of the fiberglass container when required to burn waste.

RATIONALE: The MTL is primarily intended to be serviced by a septic type waste servicing vehicle. If such a vehicle is not available in theater, either through organic Army assets or through contracting, the waste produced must still be managed. The metal container allows the waste to be removed from the latrine and burned . Military and civilian field hygiene and sanitation standards require latrines to be serviced daily to prevent insect and disease problems.

REQUIREMENT (4). Enclosed stall type latrine must be able to support one soldier's weight of up to 250 pounds, and be either stand alone, or placed within a tent, building, or container.

RATIONALE: Once erected, either as a stand alone item or in a tent, building, or container, the MTL must be able to be used by all soldiers. The weight of 250 lbs is used by civilian industry as a weight standard and allows use of the MTL by all percentile soldiers.

REQUIREMENT (5). Must have air ventilation slots to allow air to enter the latrine.

RATIONALE: To control odors for ease of operation, the MTL needs air ventilation slots to allow fresh air to enter.

REQUIREMENT (6). Must have a translucent panel with an opaque cover in the roof and a hook on one of the interior walls for a chemical light or flashlight.

RATIONALE: Allows the MTL to use ambient lighting during daytime or when placed near a light source at night. When neither is available, the hook allows the user to either provide light by using a chemical light or a flashlight.

REQUIREMENT (7). Must have a cover on toilet seat, a recessed/protected area for toilet paper, and a tube or receptacle for urine.

RATIONALE: Allows for more sanitary operation of the MTL by providing for improved operation of the latrine.

b. Logistics and Readiness. Tailored Army supply and maintenance systems will support the MTL. It must be repairable at the unit and organizational levels, with no direct maintenance needed.

RATIONALE: This requirement will avoid changes to the logistics system to accommodate the MTL, and will ensure a supportable field latrine.

REQUIREMENT (1). The MTL will be capable of being carried on any transportation assets within the area of operations.

RATIONALE: To not place a transportation burden on using unit.

REQUIREMENT (2). Quantitative Reliability and Maintainability (R&M) requirements are not applicable for the MTL.

RATIONALE: R&M Requirements Rationale (RRR) was prepared and approved by TRADOC Combat Developments Engineering (CDE), 23 Mar 95. Copies are on file at U.S. Army CASCOM, ATTN: ATCL-MES, Fort Lee, VA and TRADOC CDE, Eastern Regional Office, ATTN: ATCD-SRE, Fort Lee, VA.

c. Critical System Characteristics. There are no critical system characteristics that the MTL will be required to meet.

ANNEX B

OPERATIONAL MODE SUMMARY/MISSION PROFILE (OMS/MP)

1. Wartime/peacetime OMS/MP. The MTL will provide enclosed stall type latrines that will be shipped into theater following initial deployment (D+30) and used as the theater matures. Each MTL will be able to support 25 personnel, and be shipped into theater unassembled on pallets or inside ISO containers. A MTL is composed of four walls containing air vents, a securable door, a toilet paper dispenser, and a tube or receptacle for urine, a roof, and a covered seat that secures to a base stand that includes a removable waste container and a toilet seat. The MTL can either stand alone or be used within a softwall shelter, building, or a container. The fiberglass type waste container is used when the latrine is being serviced by a septic type vehicle. A removable metal container is shipped within the fiberglass container. It is removed when the MTL is serviced daily by a septic type vehicle. When a servicing vehicle is not available, the metal container is placed in the latrine. The waste is then burned daily. Upon arrival at the desired location, the MTL is unpacked, assembled with the appropriate container, and is ready for use. The MTL will be used and maintained by unit personnel MOS non-specific. Cleaning brushes and solutions will accompany each system. MTL modules can be set up to service any size force. Upon redeployment, each MTL will be cleaned, disassembled, and shipped to redeployment locations. In all cases, waste will be disposed of in accordance with applicable local regulations and military requirements. The MTL will be operated 24 hours a day. A maximum of 1 hour is expected for set-up and a maximum of 2 hours is expected for disassembly and return to storage.

2. Environmental Conditions. The MTL will primarily be operated in basic climates (60%) but may be operated in hot (25%), and cold (15%) climatic conditions.

ANNEX C

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
1. HEADQUARTERS, DEPARTMENT OF THE ARMY		07	
2. U.S. MARINE CORPS SYSTEMS COMMAND	X		
3. U.S. TRANSPORTATION COMMAND	X		
4. HEADQUARTERS, U. S. AIR FORCE	X		
5. U. S. ARMY EUROPE	X		
6. U. S. CENTRAL COMMAND	X		
7. HQ, EIGHTH U. S. ARMY	X		
8. HQ, FORCES COMMAND	X		
9. U.S. ARMY TMDE ACTIVITY	X		
10. U.S. ARMY TOPOGRAPHIC ENGINEERING CENTER	X		
1 1. U. S. ARMY NUCLEAR AND CHEMICAL ACTIVITY	X		
12. HQ, TRAINING AND DOCTRINE COMMAND		12	
13. U. S. ARMY INFORMATION SYSTEMS COMMAND	X		

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
14. U.S. ARMY SOLDIER SYSTEM COMMAND		05	
15. U. S. ARMY INFANTRY SCHOOL		05	
16. OCAR	X		
17. U.S. ARMY MP SCHOOL	X		
18. U.S. ARMY FAS	X		
19. U. S. ARMY ENGINEER SCHOOL		02	
20. U.S. ARMY CHEMICAL SCHOOL	X		
21. ARMY NATIONAL GUARD BUREAU	X		
22. U.S. PAC	X		
23. U.S. ARMY OEC	X		
24. U.S. SOUTHERN COMMAND	X		
25. U.S. ARMY INTELLIGENCE SCHOOL	X		
26. AMEDDC AND SCHOOL	X		
27. U S. ARMY ARMOR SCHOOL	X		
28. U.S. ARMY AIR DEFENSE SCHOOL	X		
29. U.S. ARMY CHEMICAL SCHOOL	X		

ANNEX D - Funding Implications

MATURING THEATER LATRINE (MTL) COST ESTIMATE SUMMARY (MILLIONS OF DOLLARS) CONSTANT $
BASE YEAR FY 94

ANNEX E

TRAINING DEVICES

No training devices are required for the Maturing Theater Latrine.

April 3, 1995

OPERATIONAL REQUIREMENTS DOCUMENT (ORD)

FOR THE

FOLLOW ON LATRINE (FOL)

1. General Description of Operational Capability.

a. Overall Mission Area. The Army has a need to provide timely latrine support across the operational continuum, especially in the battalion areas. Latrine support missions on a non-linear battlefield and in Operations Other Than War (OOTW) must be more responsive to shorter, fast paced deployments. The FOL provides sanitary waste disposal conditions for soldiers to use in a maturing theater. The FOL must setup and tear-down quickly and have a minimal impact on the environment. Additionally, it will provide a capability or may augment the capability of a task force to provide humanitarian aid, noncombatant evacuations, and disaster relief missions. The FOL will reduce deficiencies in the areas of health, welfare, and morale and will enhance the quality of life for soldiers in the field.

b. Operational and Support Concepts.

(1) Operational. The FOL will provide a containerized latrine capability to support 150 personnel. The FOL is composed of six toilets, one two person sink, one two person urinal, one instantaneous water heater, one six gallon water heater, one air compressor, one 35 gpm water pump, one sewage ejection pump, two sump pumps, three florescent light fixtures, a supply cabinet, mounted inside an 8x8x20 ISO container. Additionally, heating and air conditioning knock out panels are included to allow for fans, heaters, or air conditioning to provide environmental control. Upon arrival at the desired location, the container will be dropped off, connected to electric power and a water source (if required) and supported personnel can begin using the latrine. The FOL will be operated and maintained by unit personnel MOS non-specific.

(2) Logistical. The FOL requires two 10 Kw generators. One of which powers the latrine, while the other one is used with the air-conditioning unit. It must also be compatible with commercial power.

(3) Mission Need Statement Summary. The FOL provides a self-service latrine capability to support 150 personnel. It is composed of a commercial water based latrine sinks, and mirrors, mounted in a ISO container. Development must be consistent with constraints centered on Manpower and Personnel Integration (MANPRINT) domains, budget, logistics supportability, transportability, standardization, and interoperability. Commercial industry already has the capability to produce the component items required for the FOL. Additionally, FORCE PROVIDER has incorporated similar type latrine systems. The need for a FOL was demonstrated during Operation Restore Democracy. A mission need statement (MNS) Field Latrines, initiated this program.

2. Threat. (N/A)

3. Shortcomings of Existing Systems. The Army currently lacks adequate equipment to provide latrines for long term operations, operations other than war, or a mature theater. Units are required to construct their own latrines or set up field latrines or porta johns for use by theater personnel. Waste from the latrines are either burned or collected by a septic truck or other conveyance. The FOL can be used to supplement or take the place of contract or Host Nation Support (HNS) provided services. Use of the FOL will provide soldiers a marked improvement in quality of life and will improve hygienic conditions within the theater.

4. Capabilities Required.

a. System Performance. The FOL must have the following capabilities in support of the Operational Mode Summary/Mission Profile (OMS/MP), Appendix B to this ORD. The following system performance requirements are not prioritized:

(1) Have a capability to either use external commercial power (208 volt, 50-60Hz, 3 phase) or be powered off of an Army tactical generator. Total power draw shall not exceed 20Kw.

(2) Must have a capability, if the FOL is water based, to use water either directly from a pressurized water source or from water contained in 3,000 gallon onion tanks or other larger storage bladders.

(3) Must be able to dispose of gray and black waste water either through a holding container with servicing plan, a field waste water disposal solution based on the area of operation, or through a sewage connection point.

(4) Must be capable of supporting handling the waste of approximately 150 personnel per 24 hour period.

(5) Must be setup and operational in less than 2 hours and disassembled/repacked and cleaned in less than 2 hours by two soldiers, MOS nonspecific (does not include filling/emptying water storage tanks).

(6) Must be set up on a tilt of 5 degrees in any direction and be capable of being leveled.

(7) Must fit within a International Standardization Organization (ISO) container (8x8x20 feet) and not weigh over 10,000 pounds shipping weight with all components.

(8) Must contain sinks with water for washing hands.

(9) Must be connected to electrical supply by a 51R, 52C, 52D, or 52G qualified MOS.

(10) Be able to automatically pump gray and black water from the sewage ejection pump container into a holding container when the pump container is 3/4 full.

(11) Have the capability to use air pressure to push waste into the main sewage line.

(12) Be able to use waste water from sinks to be pumped into urinal to wash it down.

b. Logistics and Readiness. The standard Army supply and maintenance systems will support the FOL. It must be repairable at unit and organizational levels, with no direct support maintenance needed.

(1) The FOL will be capable of being carried on a stake and platform trailer, dolly mobilizer, self-loading trailer, palletized load system; C-130, C-141, C-17, or C-5a aircraft; or externally from a CH 47 helicopter; rail, sea or the new ATLAS 10k forklift.

(2) The FOL must have 150 hours Mean Time Between Essential Function Failure (MTBEFF) and 230 hours Mean Time Between System Abort (MTBSA). The Mean Time To Repair (MTTR) no greater than 1 hour for all Unscheduled Maintenance Demands (UMD), and a Maximum Time To Repair (MaxTTR) no greater than 2 hours for 90 percent of all Essential Unscheduled Maintenance Demands (EUMD).

c. Critical System Characteristics. There are no critical system characteristics the FOL will be required to meet.

5. Integrated Logistics Support. A tailored Integrated Logistics Support (ILS) Plan will be developed by the ILS Management Team and updated throughout the acquisition process. The Logistical Support Analysis (LSA)/LSA Record process will determine and define detailed logistics support, personnel tasks, and skills for operations, maintenance, and support. A system support package will be tested and validated during testing. The FOL will be a operational project stock item.

a. Maintenance Planning. Logistics and maintenance support will be in accordance with the Army Supply and Maintenance System.

(1) Unit maintenance will include preventive maintenance checks and services (PMCS), replacement of easily accessible unserviceable parts not requiring special tools or test materiel, lubrication, cleaning, preserving, tightening, replacement of parts (authorized by the maintenance allocation chart), minor adjustments, and inspections of components. A Commercial off the shelf (COTS) manual will be used.

(2) Direct support (DS) maintenance is not envisioned.

(3) The desired time for before operation (PMCS) should not exceed a performance goal of thirty minutes. During operations, PMCS will consist of monitoring operations. The desired after operations PMCS should not exceed a performance goal of thirty minutes.

b. Support Equipment. There will be no requirement for new system specific test, measurement, and diagnostic equipment. There will be no need for new or special tools to repair or maintain the latrine.

c. Human System Integration.

(1) Training. The FOL design should minimize unit training, with no institutional training planned. The material developer and combat developer will jointly determine requirements for new equipment training and new materiel introductory training. All training materials will be contractor furnished.

(2) Manpower and Personnel. Fielding the FOL will have no impact on the manpower or personnel structure. The FOL operators will be military occupational specialty (MOS) non-specific. No additional skills are required for the operation and maintenance of the FOL.

(3) Human Factors Engineering (HFE). Operators and maintainers must be capable of safely and effectively operating and maintaining the FOL while wearing the field duty uniform. The FOL will meet all industry and government HFE requirements and design practices.

(4) System Safety and Health Hazard Assessment (HHA). The FOL must comply with industry and government safety and health hazard standards. A system safety program will be established IAW relevant industry standards or be based upon Army guidance. A Safety Assessment Report will be obtained by the material developer.

(a) Present no uncontrolled hazards to operators or potential damage to government equipment or supplies.

(b) Compliance with appropriate safety and health requirements.

(c) Appropriate labels or instructions will be provided on or near operating controls to assist soldiers in the safe operation and emergency procedures of the latrine.

d. Computer Resources. Not required.

e. Other Logistical Considerations. There will be no requirements for any unique fixed facilities or shelters, any special packaging and handling, or unique data requirements. The FOL will require Department of the validated Army Technical Manuals, or suitable COTS manuals.

6. Infrastructure Support and Interoperability.

a. Command, Control, Communications, and Intelligence (C3I) (N/A).

b. Transportation and Basing. The FOL operates worldwide in hot, cold and basic climatic regions. Transport and storage packaging must meet requirements for international shipment by ground (vehicle and rail), air, and sea.

c. Standardization, Interoperability, and Commonality. At time of fielding, the FOL will be capable of operating with all US services, NATO forces, and other Allied forces, including using commercial power in NATO countries (208 volt, 50-60 Hz, 3 phase).

d. Mapping. Charting, and Geodesy Support. (N/A)

e. Environmental Support. (N/A)

f. The Joint Potential Designator. Joint Interest.

7. Force Structure.

The FOL will have no impact on force structure. To support Army requirements, the procurement of the FOL will be one per 150 soldiers.). The FOL will be a operation project stock item to be used when deemed necessary.

8. Schedule Considerations.

a. An Initial Operational Capability (IOC) is met when:

(1) All primary and supporting equipment are received.

(2) All manuals, training literature, and related publications are received.

(3) The operators and maintainers have been completely trained and first unit equipped can successfully operate the FOL in accordance with applicable Mission Training Plan. (MTP).

b. The required IOC is 2QFY99.

ANNEX A

RATIONALE

4. Capabilities Required.

a. System Performance. The FOL must have the following capabilities in support of the Operational Mode Summary/Mission Profile (OMS/MP), Annex B to this ORD:

REQUIREMENT (1). Have a capability to either use external commercial power (208 volt, 50-60Hz, 3 phase) or be powered off of an Army tactical generator. Total power draw shall not exceed 20Kw.

RATIONALE: The FOL may be positioned in a location where it can not use commercial power.

REQUIREMENT (2). Must have a capability, to use water either directly from a pressurized water source or from water contained in 3,000 gallon onion tanks or other larger storage bladders.

RATIONALE: The FOL could be located away from any available water source, or the local water source might not be deemed useable. In either of these cases, it would need the water storage capability.

REQUIREMENT (3). Must be able to dispose of gray and black waste water either through a holding container with servicing plan, a field waste water disposal solution based on the area of operation, or through a sewage connection point.

RATIONALE: Depending on the location in which the FOL is operating, it may be required to meet local/state/national requirements concerning the waste produced.

REQUIREMENT (4). Must be capable of supporting handling the waste of approximately 150 personnel per 24 hour period.

RATIONALE: This requirement is based upon the number of stools available in the FOL.

REQUIREMENT (5). Must be setup and operational in less than 2 hours and disassembled/repacked and cleaned in less than 2 hours by two soldiers, MOS nonspecific (does not include filling/emptying water storage tanks).

RATIONALE: To place minimal impact on the using unit, this system must be easily set up and/or repacked.

REQUIREMENT (6). Must be set up on a tilt of 5 degrees in any direction and capable of being leveled.

RATIONALE: The site the FOL may be placed upon may not be level.

REQUIREMENT (7). Must fit within a International Standardization Organization (ISO) container (8x8x20 feet) and not weigh over 10,000 pounds shipping weight with all components. Must be operable on a tilt of 5 degrees in any direction or be capable of being leveled.

RATIONALE: The Army is currently only buying the 8x8x20 ISO container. The primary forklift is the new ATLAS 10,000 pound rough terrain system which can handle ISO containers.

REQUIREMENT (8). Must contain sinks with water for washing hands.

RATIONALE: Following use of the FOL, the soldier needs some capability to wash their hands. Additionally, the waste water from the sinks is used to wash down the urinals.

REQUIREMENT (9). Must be connected to electrical supply by a 51R, 52C, 52D, or 52G qualified MOS.

RATIONALE: Ensures both safe connection to electrical power and safe operation of the FOL.

REQUIREMENT (10). Be able to automatically pump gray and black water from the sewage ejection pump container into a holding container when the pump container is 3/4 full.

RATIONALE: The pump container is only a temporary holding area for waste water. It is moved from this area to a larger holding container or directly to a sewage connection point.

REQUIREMENT (11). Have the capability to use air pressure to push waste into the main sewage line of the FOL.

RATIONALE: Reduces the need for water by using air pressure to move the waste into the main sewage line of the FOL where it will gravity flow into the sewage ejection pump container.

REQUIREMENT (12). Be able to use waste water from sinks to be pumped into urinal to wash it down.

RATIONALE: Keeps odors down and reduces the need for water within the FOL by reusing the sink waste water in the urinals.

b. Logistics and Readiness. The standard Army supply and maintenance systems will support the FOL. It must be repairable at the unit and organizational levels, with no depot maintenance needed.

RATIONALE: This requirement will avoid changes to the logistics system to accommodate the FOL, and will ensure a supportable field latrine.

REQUIREMENT (1). The FOL will be capable of being carried on a stake and platform trailer, selfloading trailer, PLS; C-130. C-141, C-17, C-5a aircraft, or externally from a CH-47 helicopter; rail, sea or ATLAS 10k forklift.

RATIONALE: To not place a transportation burden on owing unit.

REQUIREMENT (2). The FOL must have 150 hours MTBEFF and 230 hours Mean Time Between System Abort (MTBSA). The Mean Time To Repair (MTTR) no greater than 1 hour for all Unscheduled Maintenance Demands (UMD), and a Maximum Time To Repair (MaxTTR) no greater than 2 hours for 90 percent of all Essential Unscheduled Maintenance Demands (EUMD).

RATIONALE: To ensure that the FOL is reliable, available, and maintainable.

c. Critical System Characteristics. There are no critical system characteristics that the FOL will be required to meet.

ANNEX B

OPERATIONAL MODE SUMMARY/MISSION PROFILE (OMS/MP)

1. Wartime OMS/MP. The FOL will provide a containerized latrine capability to support 150 personnel. The FOL is composed of water based commercial latrine equipment mounted inside an 8x8x20 ISO container. The system includes six toilets, one two person sink, one two person urinal, one instantaneous water heater, one six gallon water heater, one air compressor, one 35 gpm water pump, one sewage ejection pump, two sump pumps, three florescent light fixtures, a supply cabinet, mounted inside an 8x8x20 ISO container. Additionally, heating and air conditioning knock out panels are included to allow for fans, heaters, or air conditioning to provide environmental control. Water pressure for the entire system is provided by a 35 GPM water pump located outside the container. Waste water from the sinks is pumped into the urinal to wash it down. Waste from the urinal flows by gravity into the main sewage line. Waste from the toilets gets pushed out of the toilet with air and into the main sewage line. Waste in the main sewage line flows by gravity into the sewage ejection pump container located outside the container. Once the sewage ejection pump container is 3/4 full, the pump ejects the waste into a holding container. All equipment located external of the container receives power from receptacles on the outside of the container. Upon arrival at the desired location, the container will be dropped off, connected to electric power and a water source (if required) and supported personnel can begin using the latrine. The FOL will be operated and maintained by unit personnel MOS non-specific. It will be operational 24 hours per day as a latrine facility to support the latrine needs of 150 personnel. The popularity of this service with the soldier will mean that the system will normally be operated at its maximum throughput capacity wherever it is deployed. A maximum of 2 hours is expected for set-up and installation and before operation PMCS. A maximum of 2 hours is expected for disassembly and return to storage. Table B-1 below depicts the FOL mission for a 14 day period.

MISSION TASK	AVERAGE THROUGHPUT	OPERATING TIME	14 DAY TOTAL
FLUSH TOILETS	1.5 USES PER TOILET PER HOUR	20 HOURS	280 HOURS
WASH HANDS	10 USES PER SINK PER HOUR	20 HOURS	280 HOURS
ENVIRONMENTAL CONTROL	N/A	AS REQUIRED BASE ON AMBIENT CLIMATIC CONDITIONS UP TO 24 HOURS/DAY	280 HOURS
PMCS, WATER RESUPPLY, AND REFUEL GENERATOR.	15 MINUTES (LATRINE IS STILL OPERATIONAL)	EVERY 10-15 HOURS OF OPERATION	EVERY 10-15 HOURS OF OPERATION

TABLE B-1

2. Peacetime OMS/MP. The peacetime OMS/MP will consist of training exercises lasting from 1 to 30 days. During training exercises, the FOL will operate in the same manner as depicted in table B- 1 above.

3. Environmental Conditions. The environmental conditions for the FOL are shown below:

CLIMATIC DESIGN TYPE (AR70-38)	% USAGE
BASIC	60
HOT	30
COLD	10

TABLE B-2

ANNEX C

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
1. HEADQUARTERS, DEPARTMENT OF THE ARMY		07	
2. U.S. MARINE CORPS SYSTEMS COMMAND	X		
3. U.S. TRANSPORTATION COMMAND	X		
4. HEADQUARTERS, U. S. AIR FORCE	X		
5. U. S. ARMY EUROPE	X		
6. U. S. CENTRAL COMMAND	X		
7. HQ, EIGHTH U. S. ARMY	X		
8. HQ, FORCES COMMAND	X		
9. U.S. ARMY TMDE ACTIVITY	X		
10. U.S. ARMY TOPOGRAPHIC ENGINEERING CENTER	X		
1 1. U. S. ARMY NUCLEAR AND CHEMICAL ACTIVITY	X		
12. HQ, TRAINING AND DOCTRINE COMMAND		12	
13. U. S. ARMY INFORMATION SYSTEMS COMMAND	X		

ORGANIZATION	CONCUR W/0 COMMENT	COMMENTS SUBMITTED	NOT ACCEPTED
14. U.S. ARMY SOLDIER SYSTEM COMMAND		05	
15. U. S. ARMY INFANTRY SCHOOL		05	
16. OCAR	X		
17. U.S. ARMY MP SCHOOL	X		
18. U.S. ARMY FAS	X		
19. U. S. ARMY ENGINEER SCHOOL		02	
20. U.S. ARMY CHEMICAL SCHOOL	X		
21. ARMY NATIONAL GUARD BUREAU	X		
22. U.S. PAC	X		
23. U.S. ARMY OEC	X		
24. U.S. SOUTHERN COMMAND	X		
25. U.S. ARMY INTELLIGENCE SCHOOL	X		
26. AMEDDC AND SCHOOL	X		
27. U S. ARMY ARMOR SCHOOL	X		
28. U.S. ARMY AIR DEFENSE SCHOOL	X		
29. U.S. ARMY CHEMICAL SCHOOL	X		

ANNEX D - Funding Implications

FOLLOW ON LATRINE (FOL) COST ESTIMATE SUMMARY
(MILLIONS OF DOLLARS) CONSTANT $
BASE YEAR FY 94

ANNEX E

TRAINING DEVICES

No training devices are required for the Follow on Latrine.

APPENDIX B

MODULAR INITIAL DEPLOYMENT LATRINE CANDIDATES

Figure B-1. Collapsible Steel Tube Toilet

The collapsible steel tube toilet offered by J&L Pro Tech Corporation is a NDI, and the company is solely targeting the military for this product. The ability to disassemble the toilet base minimizes the shipping cube. Assembly in the field is very simple, requiring only about a minute. The bags used with the collapsible steel tube toilet are very durable. They are designed to stretch, not rip, when over-extended, which is a quality most desirable when handling human waste. The bags are self-sealing, i.e., a white strip is peeled off at the top of the bag to expose an adhesive surface, that allows the bag to seal to itself. During the evaluation, many of the soldiers did not quite grasp this concept and used the white strip to tie the bag closed, but this method also worked well. The bags, toilet paper, and hand wipes are packaged together with the disassembled toilet in a shipping case for transport. Toilet paper and hand wipes are purchased separately.

COSTS: $60.00 toilet; for an additional $10.00 includes carrying case that can be strapped to a backpack
$20.00 for replacement carrying case
$0.80 each bag

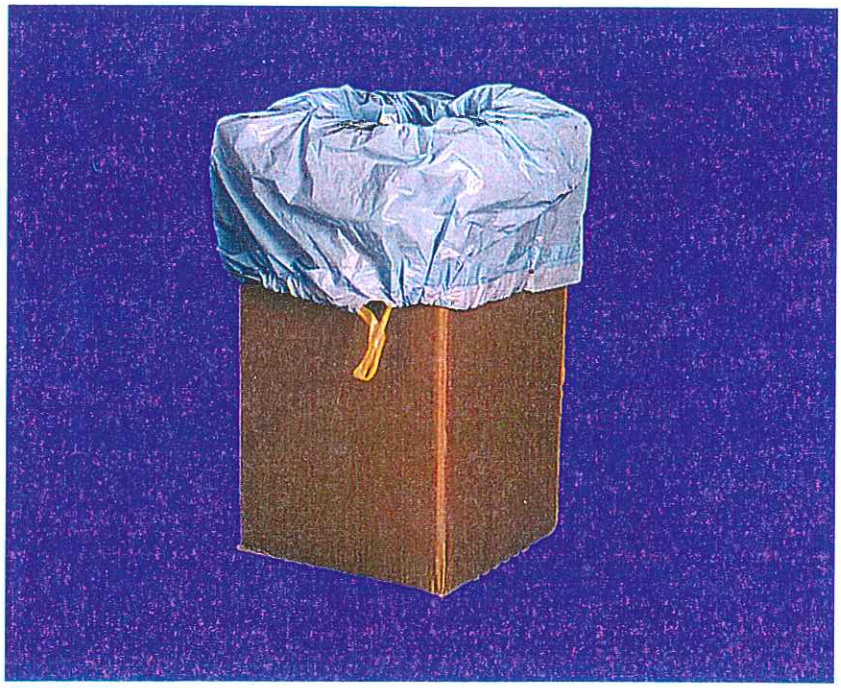


Figure B-2. VA Finest Toilet

The VA Finest toilet offered by Corrugated Containers is manufactured from fiberboard. The bags are very large, fit easily over the toilet seat to provide a clean surface for each user, and have plastic drawstrings for closing. The bags are designed for soiled linen, therefore they need to be tested further before being endorsed as waste collection bags. The toilets provided were manufactured in the company's prototype shop and are not available on the commercial market. The toilets are packed flat for shipping, therefore reducing the shipping cube, and are assembled in the field by the soldier. The bags, toilet paper, and hand wipes are packaged together with the disassembled toilet in a shipping case for transport. Toilet paper and hand wipes are purchased separately.

COSTS: $5.00 toilet, in large quantities
$2.00 each bag

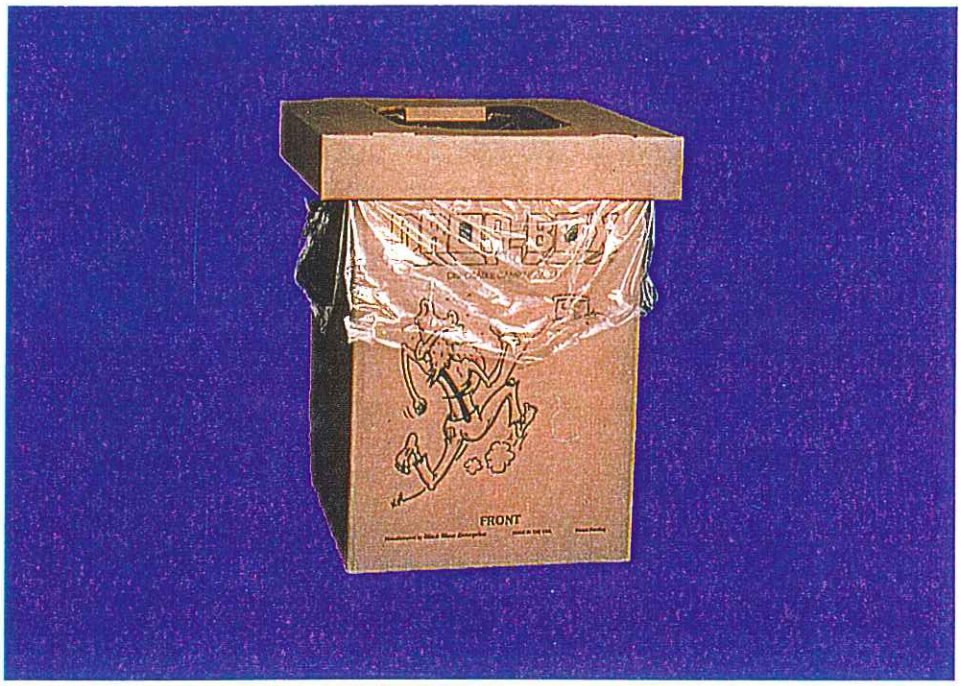


Figure B-3. Drop Box Toilet

The commercially available Drop Box toilet is offered by Black River Enterprises with transparent bags. The toilet does not have a bottom since it was originally designed for campers to place over a hole dug in the ground. Bags were added later. The bag was designed to fit over the fiberboard base, and then the seat is placed over the bag. In theory, several people could use one bag; however, this method would not work well for the Army. The latrine would begin to smell bad; the bags would likely not get emptied; and if the toilet seat is urinated on, nobody else would use the toilet.

During the evaluation, each soldier used a separate bag, and put it over the toilet seat then disposed of it after each use. Since the bag was not designed to go over the seat, it fit tightly and ripped on occasion. The manufacturer said a slightly larger bag could be purchased with no significant change in price. To combat wet weather problems, the manufacturer recommends sliding the entire base of the toilet into one of the bags. The toilets are packed flat for shipping, there by reducing the shipping cube. The toilets are assembled in the field by the soldier. The bags, toilet paper, and hand wipes are packaged together with the disassembled toilet in a shipping case for transport. Toilet paper and hand wipes are purchased separately.

COST: $5.00 toilet
$0.10 each bag

Figure B-4. White Bucket Toilet

The white bucket toilet is offered by American Innotek and is available on the commercial market. The toilet seat fits inside the bucket and a cover screws into the top of the bucket to secure the contents. The toilet seat looks like a conventional toilet seat, and therefore is more likely to be accepted by the user. During the evaluation several soldiers noted the bucket could serve many other useful functions in the field. However, this can be a problem: the toilets are likely to disappear, to be used for purposes other than a toilet. To prevent the bucket being used for carrying water, holes can be drilled in the bottom of the bucket. However, keeping the toilet from being pilfered for other purposes will be difficult. Approximately 30 bags of supplies may be packed inside the bucket to reduce shipping cube. Additional bags are required to be packaged with the toilet in a shipping case for transport.

COST: $30.00 toilet
$2.60 bag unit; each bag unit includes a bag, toilet paper, bag tie, hand wipe and deodorizing powder packaged together in a plastic bag.

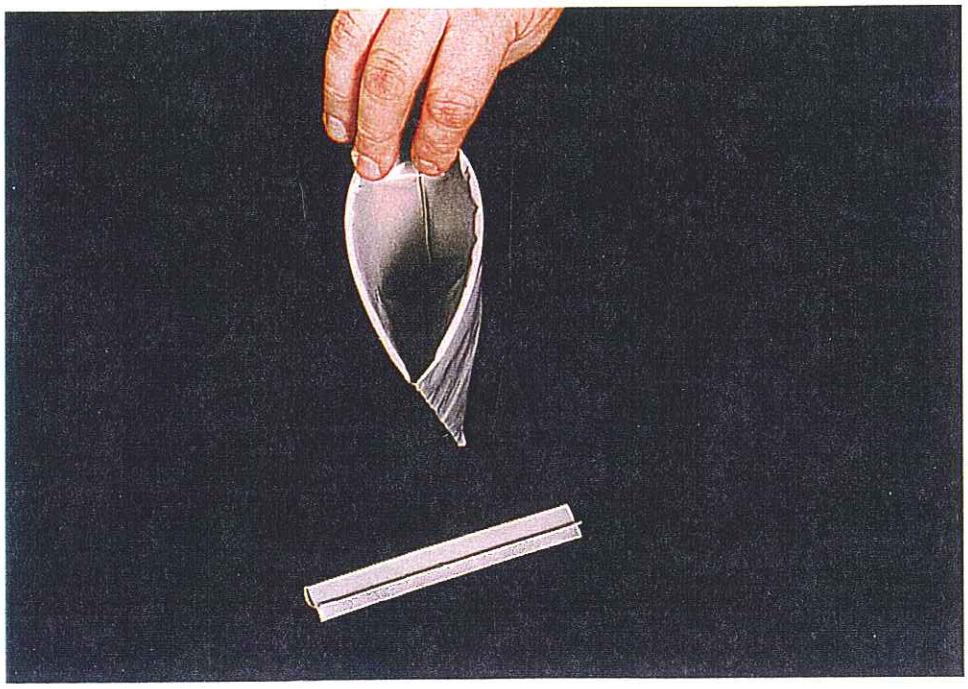


Figure B-5. Brief Relief

The Brief Relief, offered by American Innotek is available on the commercial market. The Brief Relief is used solely for urinating. The soldier removes a clip from the bag and urinates into the bag, which contains a powder. The mixture of the urine and powder creates a gel which will not leak out of the bag. The powder gives off a lemon fresh scent. The clip is then reattached to the bag for disposal. Numerous soldiers took the Brief Reliefs to their tents so they would not have to go out in the cold during the night. Many of the soldiers in the evaluation had used the Brief Relief during their deployment to Haiti, and liked it.

American Innotek also packages an item called the "Daily Restroom Kit" in a plastic bag, which includes two Brief Reliefs and one bag for the white bucket toilet. The intent is to distribute one kit per day per soldier.

COST: $2.26 Brief Relief, each
$5.99 Daily Restroom Kit, each

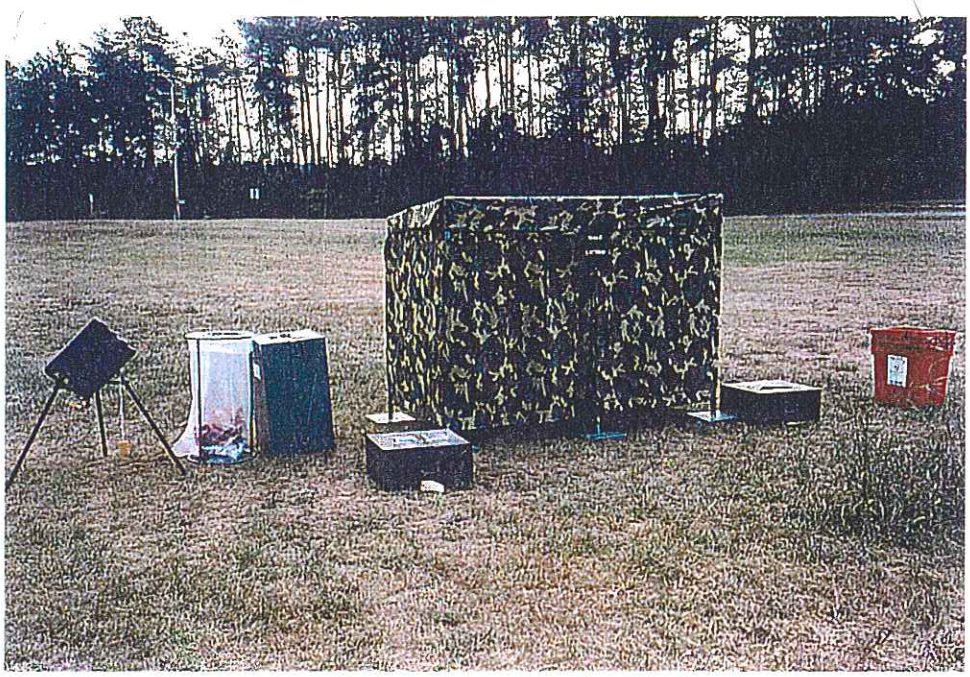


Figure B-6. Screen Latrine

The screen latrine is offered by J&L Pro Tech Corp. The item is NDI and the company is solely targeting the military for this product. The screen latrine is packaged in a steel box (18"x18"x32") with a total weight of 225 lbs. The box contains the frame and fabric for the screen latrine, two collapsible Steel Tube Toilets (see B-1) and one collapsible waste barrel. Supplies of approximately four rolls of toilet paper and 50 waste collection bags when properly packed could be added to the contents of the box. The screen latrine has two private individual stalls, with roofs to provide protection from the rain, may be used by either males or females, and can be set up by two trained soldiers in under one-half hour. The screen latrine can withstand 30 mph winds, or higher if sand bags are placed on the base of the frame.

COST: $1385.00 each latrine, when purchased in limited quantity;
waste bags and toilet paper are not included.

Figure B-7. Individual Tent Latrine

The individual tent latrine is a commercial off-shelf item offered by Black River Enterprises. The item is currently marketed for the hunting and camping industry. The tent is extremely lightweight, 7 lbs, and is packaged in a 32" long, 9" diameter bag, which also has space for four rolls of toilet paper and approximately 20 bags for the toilet. The toilet sold with the individual tent latrine, the "Drop Box", is packaged separately. However, any of the toilets studied in the evaluation could be used in the individual tent latrine. This latrine can be set up in 15 minutes or less by one soldier. The poles that support the tent are fiberglass with an internal bungy cord. One end of each pole is permanently attached to the tent, which reduces set-up time since poles do not get mixed up and prevents poles from getting lost. The individual tent latrine is secured to the ground with four 6" pegs. The individual tent latrine has not undergone any wind-load testing, but there are no reports of collapsing during the two week evaluation. The individual tent latrine provides adequate protection from the rain.

COST: $80.00 each tent latrine
Drop Box: See Figure B-3

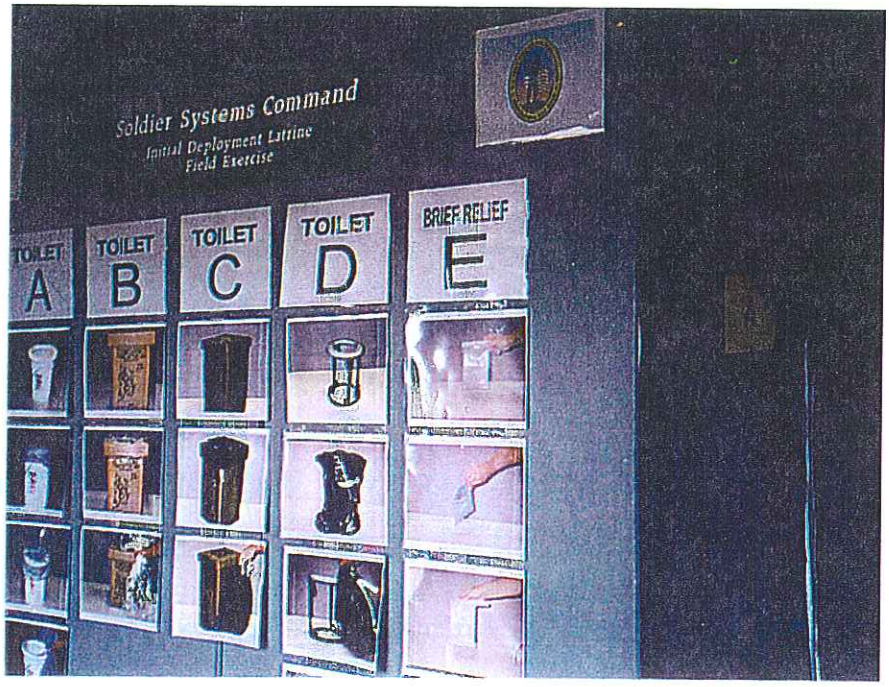


Figure B-8. Display of Latrine Instructions

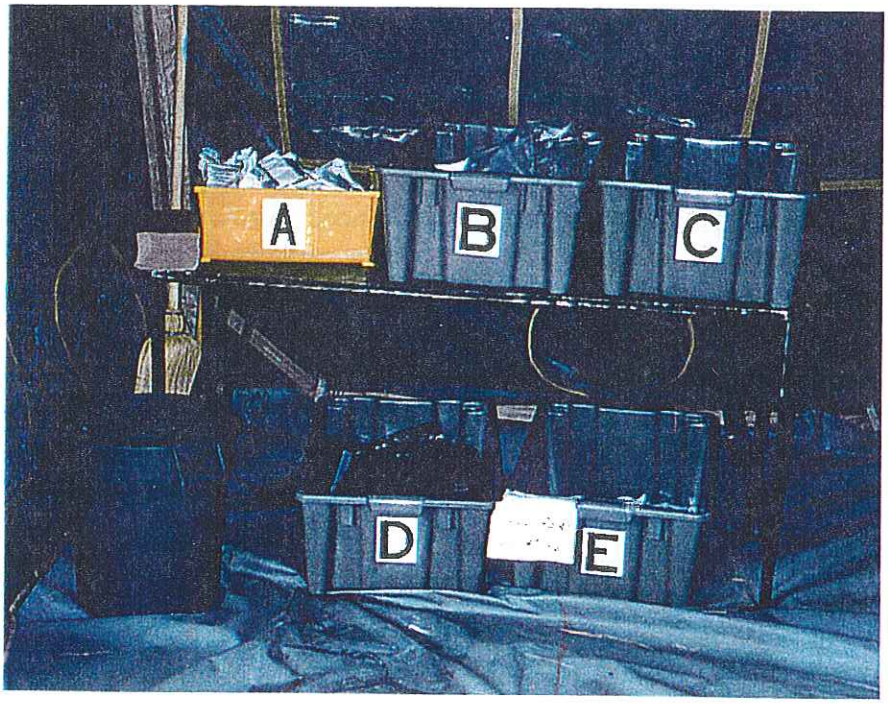


Figure B-9. Containers of Toilet Bags

APPENDIX C

FOLLOW-ON LATRINE

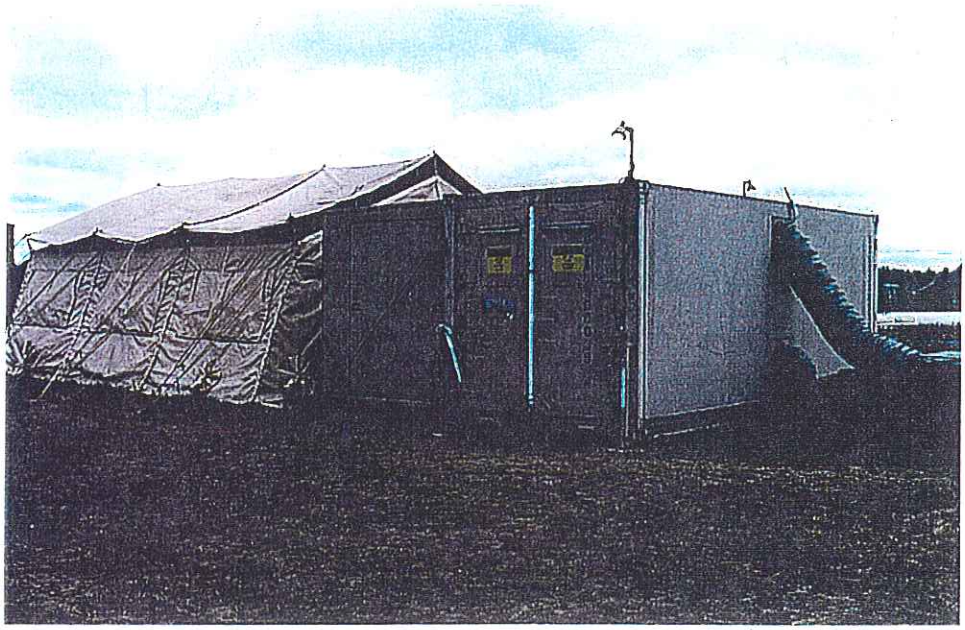


Figure C-1. Containerized Latrine

The containerized latrine is a prototype latrine built at Natick RD&E Center to support the Force Provider program. The latrine is in an Army standard ISO one side expandable shelter heated and cooled by a C-100 Environmental Control Unit. The shelter is divided into separate male and female sides. Each side has six toilets, and sinks with hot/cold water, in addition the male side has a trough urinal. The toilets are air assisted, therefore only require 0.5 gallon of water per flush. The waste exits the shelter through a sewage line by gravity and flows into a sewage ejection pump, where it is then pumped into a 1000-gallon holding tank. The sewage ejection pump, holding tank and 3000-gallon water supply are located in the 24' TEMPER tent attached to the shelter. If the latrine is used in cold weather an H-82 heater is attached to the TEMPER tent to prevent freezing.

COST: To be determined in future production

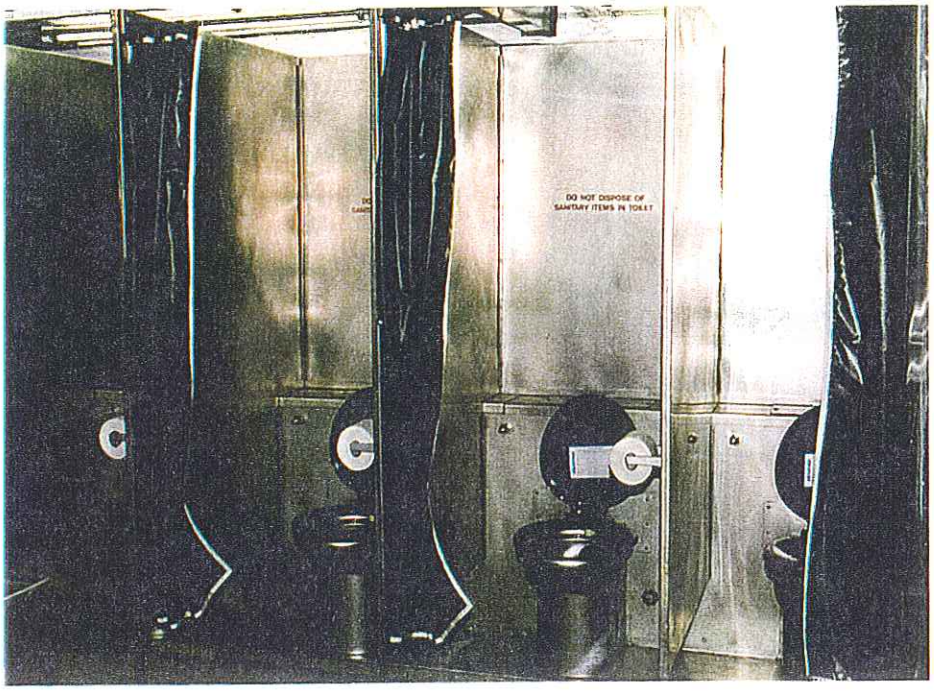


Figure C-2. Low Water Flush Toilets

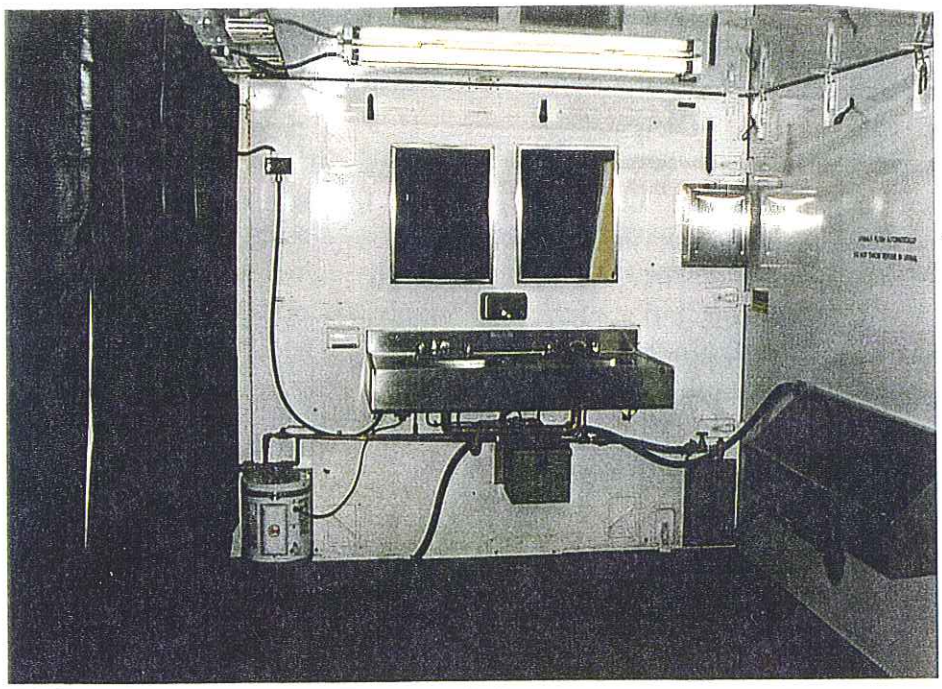


Figure C-3. Urinal and Sinks

APPENDIX D

LATRINE SURVEYS

INITIAL DEPLOYMENT LATRINE SURVEY

What is your:

Unit: _____ Rank: _____
Age: _____ Gender: ( ) Male ( ) Female
Height: ____ft. ____in. Weight: _____lbs.
Length of time in service? _____yrs _____months

1. Which latrine did you use? (Please fill out separate surveys for each latrine)

Toilet stalls in a TEMPER tent ( )
Toilet in screen latrine ( )
Individual tent stall ( )

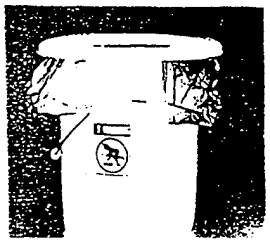
2. Was there adequate space in the stall? ( ) yes ( ) no
3. Was there adequate privacy? ( ) yes ( ) no
4. Was there adequate ventilation? ( ) yes ( ) no
5. Was the latrine sanitary? ( ) yes ( ) no

If you answered no to any of the above questions, indicate how you would correct the problem.

_____

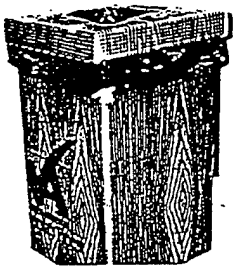
_____

6. Which toilet/brief relief did you use? _____ (Please fill out separate surveys for each toilet)

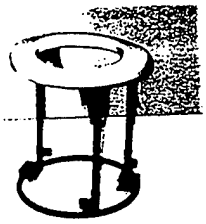


A. White Bucket _____

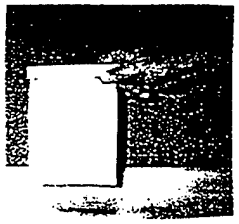
B. Drop Box _____



C. VA Finest _____



D. Steel Tube Toilet _____



E. Brief Relief _____

If you have used several toilets, rank them in order of preference in the space next to their name.

(over)

7. For Brief Relief only:

Did you require more than one Brief Relief bag?	( ) yes ( ) no
Was the Brief Relief difficult to use?	( ) yes ( ) no
Did the urine turn to gel in the bag?	( ) yes ( ) no
Was there any spillage or leakage from the bag?	( ) yes ( ) no
Was it easy to reseal the bag?	( ) yes ( ) no
Were there any unpleasant odors?	( ) yes ( ) no

If you answered unfavorably to any portion of question 7 please describe the problem in detail.

_____

_____

8. For the toilet indicated in question 6 answer the following:

The toilet height was:	( ) too low	( ) just right	( ) too high
The toilet seat was:	( ) too big	( ) just right	( ) too small
The toilet seat was:	( ) comfortable		( ) uncomfortable
Did the toilet feel sturdy?			( ) yes ( ) no
Did you have any problems sealing the bag?			( ) yes ( ) no
Did you mind disposing of your own waste?			( ) yes ( ) no

If you answered unfavorably to any portion of question 8 please describe the problem in detail.

_____

_____

9. Indicate the latrines you have used in previous deployments:
   - ( ) yes ( ) no Portajons/Portalets
   - ( ) yes ( ) no Plywood latrines with 55 gallon drums cut in half
   - ( ) yes ( ) no Other (describe _____)

10. Rank in order of preference the latrine you would like on your next deployment.
   - ( ) Toilet indicated in question 6 of this survey
   - ( ) Portajon/portalet
   - ( ) Plywood latrine with 55 gallon drums cut in half
   - ( ) Other (describe _____)

11. Describe latrine problems you have faced on previous deployments. _____

_____

12. Please list any additional comments or suggestions you have about latrines._____

_____

FORCE PROVIDER LATRINE SURVEY

What is your:
Unit: _____ Rank: _____ MOS/SSI: _____
Age: _____ Gender: ( ) Male ( ) Female
Height: _____ft. _____in. Weight: _____lbs.
Length of time in Army: _____yrs _____mos.

1. How satisfied were you with each of the following aspects of the latrine?
(Using the following scale, please check the number that best describes your opinion of each criterion listed below. If you did not use it, mark N/A.)

Extremely Dissatisfied	Moderately Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Moderately Satisfied	Extremely Satisfied
1	2	3	4	5	6	7

	1	2	3	4	5	6	7	N/A
a. Amount of space in stall	( )	( )	( )	( )	( )	( )	( )	( )
b. Ventilation	( )	( )	( )	( )	( )	( )	( )	( )
c. Odor	( )	( )	( )	( )	( )	( )	( )	( )
d. Cleanliness	( )	( )	( )	( )	( )	( )	( )	( )
e. Amount of privacy	( )	( )	( )	( )	( )	( )	( )	( )
f. Amount of light	( )	( )	( )	( )	( )	( )	( )	( )
g. Toilet	( )	( )	( )	( )	( )	( )	( )	( )
h. Urinal	( )	( )	( )	( )	( )	( )	( )	( )
i. Sinks	( )	( )	( )	( )	( )	( )	( )	( )
j. Latrine facilities overall	( )	( )	( )	( )	( )	( )	( )	( )
k. Other	( )	( )	( )	( )	( )	( )	( )	( )

If you rated any aspect of the latrines listed, below "4" please explain why and give your recommendation for improvement:

_____
_____
_____

2. Was there adequate space in the stall to put your equipment, jacket, etc. in the stall?

( ) Yes ( ) No

If no, explain what you would like to do with your equipment while using the latrine. _____
_____
_____

3. Using the scale below, please check the number that best describes your opinion of the availability or quantity of each of the following aspects of the latrine.

	Never Enough	Occasionally Enough	Always Enough
a. Hot Water	( )	( )	( )
b. Paper Towels	( )	( )	( )
c. Soap	( )	( )	( )

4. Did you have difficulty flushing the toilet? ( ) Yes ( ) No

5. Did the toilet ever backup/ overflow with water? ( ) Yes ( ) No

6. Could anything in the latrine cause personal injury? ( ) Yes ( ) No

If yes please explain.

_____

_____

_____

7. How would you compare the Force Provider (FP) containerized latrine with others you have used in the field?

FP is Much Worse	FP is Moderately Worse	FP is Slightly Worse	FP is Not Better or Worse	FP is Slightly Better	FP is Moderately Better	FP is Much Better
1	2	3	4	5	6	7

	1	2	3	4	5	6	7
a. Cat hole	( )	( )	( )	( )	( )	( )	( )
b. Slit/screen latrine	( )	( )	( )	( )	( )	( )	( )
c. Fabricated (Unit Made)	( )	( )	( )	( )	( )	( )	( )
d. Commercial portajon	( )	( )	( )	( )	( )	( )	( )
e. Air Force Latrine	( )	( )	( )	( )	( )	( )	( )
f. Pacto bag latrine in Haiti	( )	( )	( )	( )	( )	( )	( )
g. Other _____	( )	( )	( )	( )	( )	( )	( )

8. Please list any additional comments or suggestions you have about latrines. _____

_____

_____

_____

_____

_____

APPENDIX E

THIRTY-DAY DEPLOYMENT SUPPLY REQUIREMENTS FOR ONE MIDL

Table E-1. Thirty-Day Deployment Supply Requirement for One MIDL

Item	Quantity	Total Cube	Total Weight	Cost
Brief Relief	1500	8.16 ft^3	180 lbs.	$3390
White Bucket Disposa John Bag	1 1200	1.95 ft^3 10.21ft^3	10 lbs. 180 lbs.	$3150
Steel Tube Toilet Bio Bag	1 1200	0.45 ft^3 14.04 ft^3	6.5 lbs. 480 lbs.	$1020
VA Finest Linen Bag	10 1200	4.59 ft^3 9.79 ft^3	21 lbs. 152 lbs.	$2450
Drop Box Clear Bag	10 1200	2.67 ft^3 11.95 ft^3	30 lbs. 252 lbs.	$170
Screen Latrine	1	6 ft^3	225 lbs.	$1385
Individual Tent	1	1.3 ft^3	7 lbs.	$80
Toilet Paper Rolls	96	4.8 ft^3	51 lbs.	$45
Towelettes	2000	1.54 ft^3	23.3 lbs.	$22

The cube, weight and cost of the items in Table E-1 is for one MIDL unit, to support 25 soldiers for a 30-day deployment, based on the soldier urinating twice a day, and defecating one to two times a day. The Brief Relief was the only item considered solely for urinating during this evaluation, although the toilets could be used and probably would be used by all female soldiers whenever possible. The Brief Reliefs, one of the four toilet systems, toilet paper, towelettes and either the Screen Latrine or Individual Tent Latrine are required for each 25 soldiers. The Screen Latrine is capable of supporting 50 soldiers since it has two stalls; however, the remaining supplies would have to double to support 50 soldiers. The cube, weight and cost of a toilet are discounted for the Screen Latrine since two Steel Tube Toilets are packaged with it. The cube, weight, and cost of toilet paper and towelettes are discounted when the Disposa John Bags are used, since they are supplied with it. The life expectancy of the fiberboard toilets is generously estimated to be three days; therefore, 10 toilets are required for a 30-day deployment.

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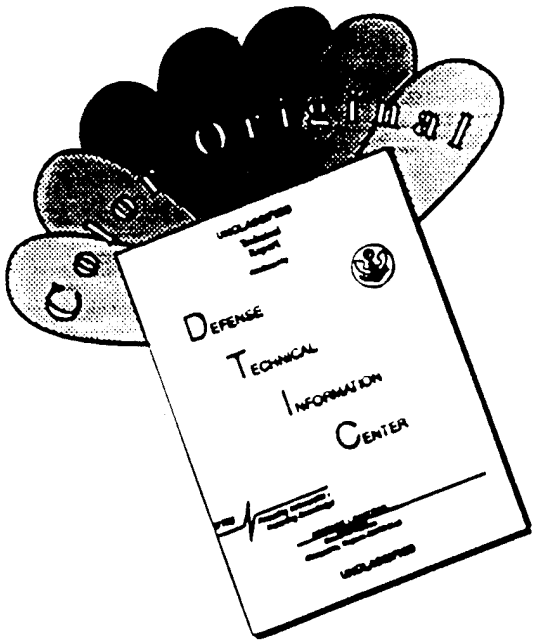

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