

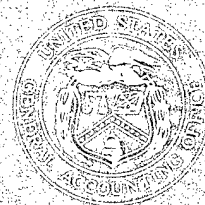
GAO

United States General Accounting Office  
Report to the Honorable  
Pat Roberts, U.S. Senate

March 1999

# MILITARY HOUSING

## Status of the Services' Implementation of the Current Barracks Design Standard



19990326 002



United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-281734

March 24, 1999

The Honorable Pat Roberts  
United States Senate

Dear Senator Roberts:

The Department of Defense (DOD) expects most single junior enlisted servicemembers to live on base in furnished living quarters commonly referred to as barracks. In November 1995, DOD adopted a new barracks construction standard, referred to as the 1+1 design standard, that called for more space and increased privacy in new barracks for servicemembers permanently assigned to an installation. The new standard, which does not apply to barracks for members in basic recruit or initial skill training, provides each junior enlisted member with a private sleeping room and a kitchenette and bath shared by one other member. Under certain circumstances,<sup>1</sup> the service secretaries may approve waivers from the 1+1 standard to allow the use of alternative barracks designs. Appendix I shows typical floor plan diagrams for the 1+1 and two alternative barracks designs. Originally, the services estimated that about \$10 billion would be spent implementing the new standard over a 20-year period.

Because of the importance of the military's barracks program and the significant costs involved in upgrading barracks to meet the new standard, you requested that we review DOD's barracks program in the United States. Specifically, we determined (1) the status of the services' implementation of the 1+1 barracks design standard; (2) DOD's rationale for adopting the standard; (3) the costs of alternatives to the 1+1 standard; and (4) service views of the impact of the standard from a team-building, individual isolation, or similar perspective.

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## Results in Brief

Except for the Marine Corps, the services embraced the 1+1 barracks design standard and in fiscal year 1996 began building new and renovating older barracks to conform to the new standard. In fiscal years 1996-99, about \$1.5 billion in funding was approved for 124 military construction projects designed to provide over 29,000 barracks spaces meeting the 1+1 design standard. Also, to provide increased privacy in existing barracks over a phased time period, the Army, the Navy, and the Air Force plan to

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<sup>1</sup>DOD policy allows the standard to be waived if (1) unique mission requirements or operational commitments are better served by congregate living or (2) the collective quality of life for members would be more enhanced by constructing to a lesser standard but providing new quarters to a larger number of members.

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assign one member to existing rooms designed for two members and two members to existing rooms designed for three members. When required, the barracks capacity lost through this practice will be regained through construction of new 1+1 barracks. In lieu of the 1+1 design, the Marine Corps is building new barracks with two-person sleeping rooms for junior Marines.

DOD justified the adoption of the 1+1 standard primarily as an investment in quality of life aimed at improving military readiness and retention. Although barracks improvements do enhance individuals' quality of life, to what degree is unknown because quality of life is inherently difficult to quantify. DOD has not developed any direct, quantitative evidence showing that barracks improvements, as distinct from other factors, result in improved readiness and retention. Even with existing barracks conditions, the services have achieved their first-term retention goals for the past 3 fiscal years with only one exception. In fiscal year 1998, the Air Force missed its first-term retention goal by 1 percentage point. Information collected from members that do not reenlist has shown that many factors other than housing, such as pay and promotion opportunities, are usually cited as the reasons for leaving the military.

Our comparison of barracks construction costs associated with alternative design standards showed significant differences in the amount of funds that would be required over and above what has already been funded. For example, fully implementing the 1+1 standard (2 bedrooms, 1 bath, kitchenette, 2 persons) in all services, including the Marine Corps, would cost an additional \$13.7 billion. Fully implementing the Marine Corps' 2+0 standard (1 bedroom, 1 bath, 2 persons) in all services would cost an additional \$3.1 billion. Finally, fully implementing the barracks standard used prior to November 1995, the 2+2 standard (2 bedrooms, 1 bath, 4 persons), would cost an additional \$1.7 billion. DOD officials believe that only the 1+1 standard meets their concerns for improving quality of life and that changing standards at this point would result in inequities in the barracks inventory and could be perceived by members as a promise not kept.

Only the Marine Corps voiced concerns over the 1+1 design standard. Because of the isolation provided in private rooms, the Marine Corps believes the 1+1 standard does not allow for the unit cohesion and team building needed to reinforce Marine Corps values and develop a stronger bond among junior Marines. For this reason, the Marine Corps obtained a permanent waiver from the Secretary of the Navy to use a different

barracks design standard—one sleeping room and bath shared by two junior Marines. The other services believe that the 1+1 standard does not include these negative aspects because the standard applies only to permanent party personnel, not to recruits or initial trainees; members of the same unit normally are assigned to the same barracks or area so that unit integrity is maintained; and barracks occupants continue to have adequate interaction with other occupants.

## Background

About 374,000 single, active-duty enlisted servicemembers are housed in the United States. Of this number, about 212,000 are permanently assigned to installations and live in barracks, about 96,000 receive a housing allowance and live off base in civilian communities near military installations, about 36,000 live on Navy ships, and about 30,000 live in barracks while in recruit or other short-term training. Most permanently assigned junior members living in barracks share a sleeping room and bath with one or two others. In many older barracks, everyone living on a hall or floor shares a communal bathroom, or central latrine.

The Secretary of Defense is required to establish uniform barracks construction standards that define size limitations for newly constructed permanent barracks.<sup>2</sup> Over the years, barracks construction standards have changed to provide for increased space and privacy. Prior to the 1970s, most permanent party barracks consisted of large, open-bay rooms with central latrines shared by many members. To meet the needs of the all-volunteer force, DOD adopted a new barracks standard in 1972. This standard provided a 270-square-foot room for three junior members that also shared a bath. Citing the need to provide more space for all pay grades, DOD adopted a new construction standard in 1983. This standard, known as the 2+2 design, consisted of a module with two, 180-net-square-foot sleeping rooms and a shared bath. With this design, two junior enlisted members normally would occupy each sleeping room, and four members would share a bath.

The current 1+1 design standard provides a barracks module consisting of two private sleeping rooms, each with 118 net square feet, a bath, and a kitchenette. Two junior enlisted members in pay grades E-1 through E-4 are assigned to each module with each member having a private sleeping room. Normally, enlisted members in pay grades E-5 and above are

<sup>2</sup>This requirement is contained in 10 U.S.C. 2856.

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assigned the entire module, using one sleeping room as a living room.<sup>3</sup> Citing concerns over unit cohesion and team building, the Marine Corps obtained a permanent waiver from the Secretary of the Navy from using the 1+1 design standard in its new barracks construction. The Marine Corps prefers to use a barracks standard known as the 2+0 design, which provides a 180-net-square-foot room with a bath. Normally, either two junior Marines in pay grades E-1 through E-3 or one Marine in pay grade E-4 or E-5 are assigned to each room.

Because the design standards apply to the construction of new barracks, adequacy of the existing barracks for housing members may not necessarily change. DOD separately establishes minimum standards of acceptable space and privacy for members assigned to existing barracks. For example, the current minimum assignment standard for permanent party personnel in pay grades E-1 through E-4 is 90 square feet of net living area per person, not more than four persons to a room, and a central latrine. When this assignment standard cannot be met or when space is not available, installation commanders can authorize single members to live off base and receive a housing allowance. Regardless of the availability of adequate barracks space, senior personnel in pay grades E-7 through E-9 may elect to live off base and receive a housing allowance.

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## Status of the 1+1 Barracks Program

With the exception of the Marine Corps, the services have embraced the 1+1 design standard and began building new and renovating older barracks in accordance with the standard in fiscal year 1996. As shown in table 1, through fiscal year 1999, about \$1.5 billion in funding was approved for 124 barracks projects designed to provide over 29,000 barracks spaces meeting the 1+1 design standard.

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<sup>3</sup>The Air Force does not program barracks space for members in pay grades E-5 and above. If space is available, these members may be assigned to the barracks under the assignment standards applicable to members in pay grades E-1 through E-4.

**Table 1: 1+1 Barracks Projects  
Approved Through Fiscal Year 1999**

Dollars in millions

Service	Number of projects	Number of spaces <sup>a</sup>	Cost <sup>a</sup>
Army	44	12,500	\$680
Navy	25	7,100	336
Air Force	51	6,900	425
Marine Corps	4 <sup>b</sup>	2,700	106
<b>Total</b>	<b>124</b>	<b>29,200</b>	<b>\$1,547</b>

<sup>a</sup>For projects not yet under construction, the data reflects the spaces and costs in the project justifications. For projects under construction or completed, the data reflects the services' estimates of actual spaces and costs at the time of our review.

<sup>b</sup>Although the Marine Corps prefers the 2+0 design, base realignment and closure decisions resulted in approval and direct funding of four barracks projects for the Marines that used the DOD 1+1 design standard.

Except for the Marine Corps, each service has adopted a plan for improving its barracks and implementing the 1+1 standard. According to service officials, the plans generally call for (1) eliminating barracks with central latrines primarily through construction of new 1+1 barracks, (2) providing members with increased privacy and approximating the 1+1 standard in existing barracks by assigning one member to rooms originally designed for two members or two persons to rooms originally designed for three persons,<sup>4</sup> (3) constructing new 1+1 barracks to meet existing barracks shortages and to regain capacity lost when fewer members are assigned to existing rooms, and (4) replacing existing barracks at the end of their economic life with new 1+1 barracks. The services, as discussed below, estimated that an additional \$7.4 billion would be required to implement their plans and approximate the 1+1 standard. The Marine Corps' plan is similar to the other services' plans except that it calls for implementation of the 2+0 barracks design standard in lieu of the 1+1 design.

In its plan, the Army estimated that about \$3 billion would be required through fiscal year 2008 to approximate the 1+1 standard for about 84,000 servicemembers in the United States in pay grades E-1 through E-6. When the Army meets this goal, about 38 percent of the Army's barracks spaces will meet all requirements of the 1+1 standard. The balance of the spaces will consist of existing (1) private sleeping rooms that do not meet all requirements of the 1+1 standard and (2) multiperson rooms that have been downloaded. The Army's barracks strategy also provides for

<sup>4</sup>This practice is referred to as downloading.

improving the entire barracks community. As such, many Army barracks construction projects include construction of new company operations buildings, battalion and brigade headquarters buildings, soldier community buildings, and dining facilities. The Army is also developing a barracks master plan that will include an installation-by-installation assessment of barracks conditions and detailed plans for replacement or renovation to meet requirements of the 1+1 design standard. The master plan is to be completed by September 1999. The Army has approved no waivers to the 1+1 standard for barracks projects in the United States.

In 1997, the Air Force completed a comprehensive barracks master plan that defines the Air Force's long-range barracks investment strategy and lays out a road map for implementing the 1+1 standard. The Air Force's strategy calls for providing private sleeping rooms for permanent party servicemembers in pay grades E-1 through E-4 by downloading existing 2+2 rooms and constructing new 1+1 rooms to regain the lost capacity. The strategy also calls for paying housing allowances for single members in pay grades E-5 and above to live off base. The Air Force estimated that about \$750 million would be required through fiscal year 2009 to approximate the 1+1 standard for about 48,000 members in the United States in pay grades E-1 through E-4. The Air Force has approved no waivers to the 1+1 standard for barracks projects in the United States.

The Navy estimated that about \$2.9 billion would be required through fiscal year 2013 to approximate the 1+1 design standard worldwide. The Navy's strategy calls for (1) providing barracks space for about 36,000 permanent party, shore-based single servicemembers in pay grades E-1 through E-4 in the United States; (2) paying housing allowances to most members in pay grades E-5 and above to live off base; and (3) continuing to house about 36,000 single members in pay grades E-1 through E-4 assigned to large ships, on the ships, rather than in barracks, even when the ships are in their homeports. The Navy is developing a barracks master plan that will include an installation-by-installation assessment of barracks conditions and detailed plans for barracks replacement or renovation to meet requirements of the 1+1 design standard. The master plan is scheduled to be completed by April 1999.

The Navy has approved waivers from using the 1+1 design standard for four projects in the United States, and one additional waiver request was pending.<sup>5</sup> The waivers were granted because these installations could

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<sup>5</sup>The majority of the waivers included the expectation that the 1+1 standard would still be achieved by fiscal year 2013.

improve barracks conditions more quickly and for more members by building the projects using a lower and less costly standard. In addition, two of the projects were for barracks designed for Navy personnel assigned to Marine Corps installations. In these cases, the waiver justifications also stated that the barracks should use the Marine Corps 2+0 design standard to be compatible with other barracks at the installations.

In July 1998, the Secretary of the Navy approved the Marine Corps' request for a permanent waiver to allow the use of the 2+0 barracks design standard in lieu of the 1+1 design standard. The waiver request stated that Marine Corps junior members in pay grades E-1 through E-3 would live in two-person rooms and that private rooms would be provided for members in pay grades E-4 and above. Through fiscal year 1999, about \$205 million was approved for 16 Marine Corps 2+0 barracks projects that will provide about 5,900 barracks spaces. The Marine Corps' strategy calls for providing barracks space for permanent party single servicemembers in pay grades E-1 through E-5 and paying housing allowances for most members in pay grades E-6 and above to live off base. The Marine Corps estimated that about \$725 million would be required through fiscal year 2022 to approximate the 2+0 standard worldwide. A Marine Corps official stated that a barracks master plan similar to the other services plans is under development.

## DOD's Justification for Adopting the 1+1 Standard

DOD primarily justified the adoption of the 1+1 barracks design standard in 1995 as an investment in quality of life aimed at improving readiness, retention, and motivation of a professional, all-volunteer armed force. In a December 1995 report to the House and Senate Committees on Appropriations,<sup>6</sup> DOD stated that "savings in recruiting, training, and productivity will offset the quality-of-life investment. To what degree is impossible to say, but focusing only on the barracks cost would risk missing those savings." DOD further stated that the new standard addressed the results of a 1992 triservice survey of barracks occupants at 12 installations. The survey showed that servicemembers were dissatisfied with the privacy and living space offered with the previous design standard and wanted larger rooms, private rooms, private baths, and more

<sup>6</sup>Troop Housing: Establishment of Standard for Construction of New, Permanent Party Barracks, Office of the Secretary of Defense, December 1995.



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storage space.<sup>7</sup> Hence, DOD concluded that continuing to build more of the same type of barracks would have been unwise.

According to DOD officials, adoption of the 1+1 standard also reflected an attempt to treat single servicemembers in a more equitable manner compared to married servicemembers who normally live in multiroom houses. More equitable treatment of single members in housing was a matter of concern expressed by the House Armed Services Committee in 1993.<sup>8</sup> To illustrate, married members in pay grades E-1 through E-4 living on base normally are assigned to a house with at least 950 square feet, two bedrooms, a full kitchen, a family room, and one or one and a half baths. If available, housing with a separate bedroom for each dependent child is provided. In comparison, single members in pay grades E-1 through E-4 living on base in barracks designed under the standard in place prior to 1995 would live in a 180-square-foot room shared with another member and would share a bath with three other members.

We agree with DOD that the 1+1 design standard reduces the differences in housing for married and single members. We also agree that improved barracks enhance individual quality of life. However, to what extent is unknown because quality of life is inherently difficult to quantify. Quality of life is a complex issue reflected in a delicate mix of variables such as balancing personal life and the demands of military service, adequate pay and benefits, and many other factors. DOD officials stated that no quantitative measures directly link a single quality-of-life element, such as barracks quality, with readiness or retention. Without such data, there is little evidence to support DOD's assumption that improved barracks will result in improved readiness and higher enlisted retention rates.

Even with existing barracks conditions, the services have met most retention goals over the past 3 fiscal years. In particular, according to service officials, the large majority of barracks occupants are serving in their first term of enlistment, and except in one instance, the services have achieved their first-term retention goals for fiscal years 1996-98. In the one instance, the Air Force missed its first-term retention goal by 1 percentage point in fiscal year 1998. Further, information collected from members that do not reenlist has shown that factors other than housing, such as pay and

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<sup>7</sup>A May 1995 Air Force quality-of-life survey also reported that 88 percent of the single, enlisted respondents stated that the factor that would most improve their quality of life was a private room.

<sup>8</sup>National Defense Authorization Act for Fiscal Year 1993, House Armed Services Committee Report 102-527.

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promotion opportunities, are usually cited as the reasons members leave the military.

We also noted that the 1992 triservice barracks survey, cited as part of the justification for the 1+1 standard, was somewhat limited in scope. The survey began in October 1991 when the Air Force collected information from four installations and was expanded in March and April 1992 to include three Army, three Navy, and two Marine Corps installations. Although the survey showed that about 2,200 Army, Navy, and Marine Corps barracks occupants participated in the voluntary survey, documentation was not clear on how many Air Force members participated or how the survey participants were selected. The survey included 96 questions, and participants were asked to respond to many questions on a scale of "very satisfied" to "very dissatisfied" or "very important" to "not at all important."

The survey also included some interesting results that DOD has not usually cited. For example, 84 percent of the participants reported that they preferred to receive a housing allowance and live off base rather than live in the barracks. The preference to live off base could continue regardless of the type or quality of barracks provided and thereby result in members' continued dissatisfaction with the barracks. Also, when participants were asked, how satisfied or dissatisfied they were with their barracks or dormitory room, 53 percent responded that they were dissatisfied (34 percent) or very dissatisfied (19 percent). At the same time, only 46 percent responded to a similar question that they were dissatisfied or very dissatisfied with living on the installation. Although these numbers show that about half of the respondents were dissatisfied with the barracks, the other half reported that they were not dissatisfied with their housing. Finally, when asked, what one improvement in the barracks or dormitory would most increase retention of enlisted personnel, the most mentioned improvement, cited by 35 percent of the respondents, was fewer rules and restrictions for barracks occupants and freedom from command inspections. A private room was the second most mentioned improvement, cited by 24 percent of the respondents.

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## Costs of Alternative Barracks Designs

We compared the costs of constructing barracks using the 1+1 design standard to the costs of constructing barracks using other design standards, specifically the 2+0 design used by the Marine Corps and the 2+2 design that was the previous barracks design standard. The comparison showed significant cost differences among the designs. For

example, the estimated cost to construct a single barracks space using the 1+1 design standard for a member in pay grades E-1 through E-4 was about \$63,000. The comparable construction costs using the 2+0 design standard was about \$41,000. Using the 2+2 design standard, the comparable cost was about \$38,000 for each barracks space. The designs have different costs primarily because of differences in each design's maximum building area per occupant. For example, the maximum gross building area for each junior member occupant is 355, 229, and 213 square feet for the 1+1, 2+0, and 2+2 designs, respectively.

Table 2 shows the cost per occupant for each of the designs. Costs are higher for members in pay grades E-5 and above because barracks assignment policies normally provide these members with double the space provided to junior members.

**Table 2: Barracks Construction Cost Estimates for Each Occupant**

Pay grades <sup>a</sup>	1+1 design	2+0 design	2+2 design
E-1 - E-4	\$63,000	\$41,000	\$38,000
E-5 and above	\$126,000	\$82,000	\$76,000

Note: The estimates reflect fiscal year 2000 costs for institutional-style construction and include adjustments for geographic area cost differences; support costs; contingencies; and supervision, inspections, and overhead.

<sup>a</sup>For the Marine Corps, the paygrade categories are E-1 through E-3 and E-4 and above.

We also estimated the total additional cost for the services to fully implement each of the three design standards. Specifically, using the cost estimates for each design and the services' estimates of barracks requirements and configuration after the completion of projects funded through fiscal year 1999, we estimated the additional funds required to provide all planned barracks occupants with spaces that comply with each of the standards. Table 3 summarizes our estimates.

**Table 3: Estimated Additional Funds Required to Fully Implement Alternative Barracks Design Standards**

Dollars in millions

Service	1+1 full implementation	2+0 full implementation	2+2 full implementation
Army	\$4,927	\$878	\$490
Air Force	2,626	290	0
Navy	2,130	702	474
Marine Corps	4,024	1,245	710
<b>Total</b>	<b>\$13,707</b>	<b>\$3,115</b>	<b>\$1,674</b>

Note: Our cost estimates to fully implement the 1+1 standard differ from the services' estimates noted earlier because their estimates reflected an approximate 1+1 standard. With an approximate 1+1 standard, many servicemembers occupy downloaded rooms that do not meet all 1+1 requirements.

We included the Marine Corps in our calculations, even though its current plan is to implement the 2+0 standard in lieu of the 1+1 standard. The total additional cost to fully implement the 1+1 standard in the Army, the Navy, and the Air Force and the 2+0 standard in the Marine Corps, as currently planned, is about \$10.9 billion. In comparison, if all services used the 2+0 design standard, they would need about \$3.1 billion to fully implement the standard—or about \$7.8 billion less than the current plan; and if all services used the 2+2 standard, they would need about \$1.7 billion to fully implement the standard—or about \$9.2 billion less than the current plan.

Although DOD officials agreed that costs associated with the 1+1 design are significantly higher, they stated that the less costly designs do not relieve their concerns for improving quality of life. Army, Navy, and Air Force officials stated that the reasons for initially adopting the 1+1 design—to improve quality of life and provide more equity in housing for single and married members—continue to be valid. In addition, they noted that a considerable investment, about \$1.5 billion, has already been made in implementing the 1+1 standard and that changing the standard would result in inequities in the barracks inventory. Further, the officials expressed concern that abandoning the 1+1 design and its improvements could be perceived by members as a promise not kept and consequently have an adverse impact on morale.

## Service Views of the 1+1 Design

Marine Corps officials stated that the higher cost of the 1+1 design was a concern to them. For 2 years, the Marine Corps obtained a waiver allowing use of the 2+0 design on the basis that they could improve barracks conditions faster by using the less costly design. The Marine Corps also

sees an additional drawback to the 1+1 standard. Specifically, because of the increased isolation provided in private sleeping rooms, the Marine Corps believes that the 1+1 standard does not allow for the unit cohesion and team building needed to reinforce Corps values and develop a stronger bond among junior Marines. It was for this reason that the Marine Corps obtained a permanent waiver from using the 1+1 design for Marines in pay grades E-1 through E-3.

Army, Navy, and Air Force officials stated that they do not see any negative aspects to the 1+1 standard from an individual isolation or team-building perspective. They stated that the standard is used only for permanent party personnel, not for recruits or initial trainees; whenever possible, members of the same unit are assigned to the same barracks or area so that unit integrity is maintained; and barracks occupants continue to have adequate interaction with other occupants. These officials also noted that the Marine Corps' first-term retention goals are significantly lower than the goals of the other services. As a result, they believed that the potential benefits from improved quality of life provided by private sleeping rooms outweighed any potential drawbacks from increased isolation in private rooms.

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## Conclusions

Although the 1+1 barracks standard improves the quality of life for single servicemembers and to some degree addresses housing differences between single and married members, DOD has no quantifiable evidence that barracks improvements result in improved readiness and retention. Implementing the 2+0 or 2+2 design standard in lieu of the 1+1 standard would be significantly less costly to the military; however, the less costly designs do not alleviate DOD's concerns about improving servicemembers' quality of life. Whether the 1+1 standard has drawbacks from an individual isolation or team-building standpoint appears to be a matter of military judgment that varies depending on each service's culture, mission, and goals. Ultimately, the barracks design standard decision is a qualitative policy decision.

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## Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD affirmed its commitment to providing quality housing for single members stating that improved quality of life is a critical component to attracting and retaining high quality personnel. While recognizing our assessment that measuring the impact of improved barracks on individual quality of life, retention, and readiness is inherently difficult, DOD maintained that providing more

privacy and amenities in the barracks is important in order to address concerns raised by single servicemembers. DOD stated it has no precise measures linking barracks improvements to retention and readiness because (1) few 1+1 barracks have been completed, which limits the availability of data for analysis, and (2) the quality of home life is just one of many factors affecting individuals' quality of life, and individuals' quality of life is just one of many factors affecting readiness.

DOD commented that in discussing the reasons that DOD adopted the 1+1 standard, we should have mentioned a May 1995 Air Force quality-of-life survey. This survey reported that barracks occupants cited privacy as their number one concern. We have added to our report a reference to the Air Force survey. We had considered this survey during our review but did not originally mention it because (1) its key barracks-related finding of privacy was the same as the key finding from the 1992 triservice survey, which we do discuss, and (2) DOD officials more frequently cited the 1992 triservice survey results as documentation of servicemembers' dissatisfaction with their barracks.

DOD commented that although the 1992 triservice survey found that the majority of the survey participants preferred to live off base, on base housing is needed to maintain good order and discipline. Our point, as stated in the report, is that the preference to live off base may continue regardless of the type or quality of barracks that are provided. Unfortunately, reliable, quantitative data is not available to show what impact improved barracks will have on members' perceptions of their quality of life and ultimately on members' decisions to stay in the military.

DOD questioned our analysis of costs that would be incurred if the Marine Corps' 2+0 barracks standard were adopted by all services. DOD stated that we failed to consider the costs of additional baths that would be required if existing 2+2 barracks were converted to 2+0 use. DOD's contentions are not accurate. In our analysis, we assumed that existing 2+2 barracks would be downloaded by assigning only one member to each of the two bedrooms that share a bath. With this configuration, more net square footage would be provided to each member than required under the 2+0 standard and no additional baths would be required.

DOD commented that some of our cost estimates were misleading because we did not consider the cost of modernizing and renovating existing barracks if a barracks standard other than the 1+1 standard were adopted. We disagree. Regardless of which barracks design standard is used,

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barracks wear out and eventually require repair, modernization, and renovation. For this reason, our analysis considered only costs to fully implement the three barracks design standards.

Finally, DOD commented that our analysis of costs for full implementation of the 1+1 barracks design is not based on any DOD or service plan. As such, DOD stated that our analysis failed to consider that the services plan to replace existing barracks only after they reach the end of their useful life. In describing the services' plans, our report notes that new barracks will be constructed, when required, to replace barracks at the end of their economic life. We did not intend to suggest that existing barracks should be abandoned and new 1+1 barracks should be immediately constructed. Rather, our analysis is intended to estimate the costs for the Army, the Air Force, and the Navy to fully implement the 1+1 standard over time, which represents the current plans of these services.

DOD also provided some technical comments, which we have incorporated as appropriate.

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We are sending copies of this report to Senator Robert C. Byrd, Senator Carl Levin, Senator Ted Stevens, Senator John W. Warner, and to Representative David R. Obey, Representative Ike Skelton, Representative Floyd D. Spence, and Representative C.W. Bill Young, in their capacities as Chair or Ranking Minority Member of Senate and House Committees. We are also sending copies of this report to the Honorable William Cohen, Secretary of Defense; the Honorable Louis Caldera, Secretary of the Army; the Honorable Richard Danzig, Secretary of the Navy; the Commandant of the Marine Corps, General Charles C. Krulak; and the Honorable F.W. Peters, Acting Secretary of the Air Force. Copies will also be made available to others upon request.

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Please contact me at (202) 512-5140 if you or your staff have any questions on this report. Major contributors to this report are listed in appendix IV.

Sincerely yours,

A handwritten signature in black ink that reads "Mark E. Gebicke". The signature is written in a cursive style with a large, stylized initial "M".

Mark E. Gebicke  
Director, Military Operations  
and Capabilities Issues



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## Abbreviations

DOD      Department of Defense



# Typical Room Floor Plans for Barracks Designs

**1 + 1 Module Interior Access**

**Module with 2 Private Sleeping Rooms, 2 Closets, 1 Bath, 1 Kitchenette**

Total building area maximum per module (sq ft):	710
Total building area maximum per room (sq ft):	355
Total net living area in sleeping room (sq ft):	118
Net living area in sleeping room per member (sq ft):	118
E1-E4 (E1-E3 Marines): 1 member per sleeping room, 2 members share bath.	
E5-E6 (E4-E5 Marines): 1 member per module (2 sleeping rooms).	

**2 + 0 Module Exterior Access**

**Module with 2 Sleeping Rooms, 2 Baths, Normally No Kitchenette**

Each room has 2 closets and 1 bath.

Total building area maximum per module (sq ft):	915
Total building area maximum per room (sq ft):	458
Total net living area in sleeping room (sq ft):	180
Net living area in sleeping room per member (sq ft):	90
E1-E4 (E1-E3 Marines): 2 members per sleeping room, 2 members share bath.	
E5-E6 (E4-E5 Marines): 1 member per sleeping room.	

**2 + 2 Module Exterior Access**

**Module with 2 Sleeping Rooms, 1 Bath, No Kitchenette**

Each room has 2 closets, 2 rooms share 1 bath.

Total building area maximum per module (sq ft):	850
Total building area maximum per room (sq ft):	425
Total net living area in sleeping room (sq ft):	180
Net living area in sleeping room per member (sq ft):	90
E1-E4 (E1-E3 Marines): 2 members per sleeping room, 4 members share bath	
E5-E6 (E4-E5 Marines): 1 member per sleeping room, 2 members share bath	

# Objectives, Scope, and Methodology

As requested, we reviewed the Department of Defense's (DOD) barracks program in the United States to (1) determine the status of the services' implementation of the 1+1 barracks design standard; (2) document DOD's rationale for adopting the standard; (3) determine the costs of alternatives to the 1+1 standard; and (4) obtain service views of the impact of the standard from a team-building, individual isolation, or similar perspective. Our review focused on military barracks used to house permanent party enlisted personnel in the United States.

We performed our work at the Office of the Secretary of Defense and the headquarters of each military service. We interviewed responsible agency personnel and reviewed applicable policies, procedures, and documents. We also visited one installation of each service to observe barracks designs and conditions and to talk with barracks managers and occupants. We visited the following installations, as recommended by the respective service headquarters: Fort Lewis, Washington; Cheatham Annex Fleet Industrial Supply Center, Virginia; Edwards Air Force Base, California; and Marine Corps Air Station, Beaufort, South Carolina.

To determine the status of each service's barracks program, we obtained and reviewed information on barracks policies, requirements, inventory, and condition of the inventory. We also reviewed each service's plans and cost estimates for improving the barracks, including plans for implementing the 1+1 design standard. We reviewed the status of military construction barracks projects for fiscal years 1996-99, and for all 1+1 projects, we summarized the costs incurred and number of barracks spaces provided.

To document DOD's rationale for adopting the 1+1 barracks design standard, we reviewed (1) changes to barracks design standards since 1970, (2) DOD and service documentation describing the process that resulted in adoption of the 1+1 design standard, (3) previous DOD reports discussing the rationale for the 1+1 design, and (4) the results from the 1992 triservice survey of barracks occupants. We also obtained and reviewed available information on servicemembers' quality of life and reviewed retention statistics since fiscal year 1996.

To determine the costs of alternatives to the 1+1 standard, we analyzed the services' cost information on constructing military barracks using the 1+1, 2+0, and 2+2 design standards. We used this information to develop estimates of the cost to construct a barracks space in accordance with each of these standards. Using these cost estimates, data on the existing

barracks inventory and approved barracks construction projects, and service estimates of barracks requirements, we also estimated and compared the costs for each service to fully implement each of the three design standards. In addition, we obtained the views of service representatives on the use of barracks designs other than the 1+1 design.

To obtain service views of the impact of the standard from an individual isolation, team-building, or similar perspective, we (1) reviewed documentation describing the process resulting in adoption of the 1+1 standard to determine whether any negative aspects of the design had been identified and evaluated, (2) reviewed the justifications supporting all service requests for waivers from using the 1+1 design standard, and (3) obtained opinions on the matter from service representatives.

We conducted our review between July 1998 and January 1999 in accordance with generally accepted government auditing standards.

# Comments From the Department of Defense



ACQUISITION AND  
TECHNOLOGY

## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

March 4, 1999

Mr. Mark E. Gebicke  
Director, Military Operations and Capabilities Issues  
U.S. General Accounting Office  
Washington, DC 20548

Dear Mr. Gebicke,

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "MILITARY HOUSING: Status of the Services' Implementation of the Current Barracks Design Standard," dated January 11, 1999 (GAO Code 703252/OSD Case 1734). Our barracks plays a critical role in the quality of life of our military members and, as such, continues to be a top priority of the Department. We appreciate the opportunity to comment on the draft report and clarify some areas that could lead readers to inappropriate conclusion regarding the Department's "1+1" construction policy.

The DoD remains committed to providing quality housing for our unaccompanied members. We continue to believe that a critical component of attracting and retaining high quality personnel is the ability to provide service members with a quality of life that is competitive with the outside job market. The 1+1 standard provides our soldiers, sailors, marines and airmen a greater measure of privacy and amenity than in the past, while providing Service Secretaries waiver authority to accommodate unique circumstances and raise overall barracks quality in the most effective way. While the report found that measuring the benefit of the 1+1 barracks construction standard to readiness and retention goals is inherently difficult to accomplish, the Department maintains that providing more privacy and amenities is important in addressing concerns raised by our single military members. It is important to note the two reasons that DoD has no precise quantitative analysis linking the 1+1 construction standard and readiness and retention. First, the Services are only now completing construction on their first set of barracks built to the new construction standard. There is not enough data to currently assess a standard that is only now coming on line. Second, readiness and retention encompasses many different components. Quality of living conditions is just one factor of the total quality of life picture, which, in turn, is only one of the many factors that affects DoD's readiness and retention.

Specific comments and technical corrections are enclosed.

Sincerely,

Randall A. Yim  
Acting Deputy Under Secretary  
(Installations)

Enclosure



DoD RESPONSE TO  
GAO DRAFT REPORT - DATED JANUARY 11, 1999  
(GAO CODE # 703252) OSD CASE 1734

**"MILITARY HOUSING: STATUS OF THE SERVICES' IMPLEMENTATION OF THE  
CURRENT BARRACKS DESIGN STANDARD"**

**Page 2, 2<sup>nd</sup> paragraph, 2<sup>nd</sup> sentence:** "Although barracks improvements do enhance individual quality of life, to what degree is unknown because quality of life is inherently difficult to quantify.":

While this statement appears valid, it fails to recognize the inherent value of privacy and improved living conditions for single junior enlisted personnel. This same comment could be made of other key quality of life issues such as pay and compensation and morale and recreation activities. In fact, during readiness testimonies, Congress criticized the Department's funding of quality of life programs and the Department has countered by emphasizing funding in programs such as barracks and housing.

Historically, the Department has recognized the need to correct the deficiencies in military housing:

- In January 1995, Secretary Perry stated, "*There are few human needs in life more basic or important than a decent place to live. Housing is certainly on our people's minds. Every time I visit an installation and sit down with enlisted folks to hear their concerns, they bring up housing. We have a special duty to ensure quality housing.*"
- In October 1995, the Defense Science Board Task Force on Quality of Life conducted an extensive analysis on the condition of bachelor housing in the DoD. They concluded that the great disparity between family and bachelor housing which is a big factor in the dissatisfaction of single junior enlisted personnel and must be resolved.
- In November 1995, when the Department created the new 1+1 barracks construction standard, it was aimed at improving retention and quality of life for single service members. Commanders in every Service embraced the standard.

In May 1997, SecDef stated that the quality of our forces depends on the quality of our military personnel. In the "Report of the Quadrennial Defense Review (QDR)," he stated that throughout the QDR, attention was paid to those issues that affect the quality of life of our military personnel. The report addresses the impact of Quality of Life:

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1. Critical to power projection and to our unique ability to both shape the international security environment and respond to the full spectrum of crises are a host of capabilities and assets. The first critical enabler is in recruiting and retaining the best people the United States has to offer, providing them with challenging careers and a good quality of life.... Our strong commitment to the quality of life of all of our people remains unchanged.
2. An important element of our policy toward our people must be to provide them with a quality of life commensurate with the sacrifices we ask them to make and wit the alternatives available in the private sector. In areas where the issue is the availability of resources, the QDR recommends that adequate resources be provided in key quality of life areas. Every effort will be made to continue the Department's' long-term commitment to provide adequate funding in areas such as housing, community and family support, transition assistance as we make further reductions in force, and education.

Further indicators that the Department's leadership supports the recruitment and retention value of barracks maintenance and construction are expressed annually by the Combatant Command Commander-in-Chiefs' in program discussions and congressional testimony.

**Page 10, last paragaraph:** The draft report mentions the limited scope of the 1992 tri-service barracks survey. However, the results of the 1995 Chief of Staff of the Air Force Quality of Life survey, given to every person in the Air Force to include every dormitory occupant, was not included in the report. The survey stated that 88% of dormitory occupants rated privacy as their number one concern. The report should have included this information within its assessment. As portrayed in the draft report, an assumption could be reached that DoD does not follow up on surveys to determine if they are anomalous, which is clearly not the case.

**Page 11, 2<sup>nd</sup> paragraph, 1<sup>st</sup> sentence:** "The survey also included some interesting results the DOD has not usually cited. For example, 84 percent of the participants reported that they preferred to receive a housing allowance and live off-base rather than live in the barracks."

While this statement may be true, the Services have indicated that on-base quarters are needed to maintain good order and discipline. The 1+1 construction standard is long-term, first step taken by the Department to provide similar levels of quality housing that military families and civilian counterparts receive.

**Page 13, Table 3:** Table 3 note states, "with an approximate 1+1 standard, many service members occupy downsized rooms that do not meet all 1+1 requirements."

This statement is misleading in that most 1+1 barracks spaces are currently upgrades consisting of reconfiguring existing barracks (2+2, 3+, etc.). For instance, the Air Force was able to provide 1+1 barracks by providing each of their airmen with one side of a 2+2 module, which in every instance has more square footage than a 1+1 private bedroom. In some cases, the footprint of existing buildings may require some tradeoffs of amenities and square footage. We believe the Services are being conservative in

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implementing the 1+1 construction standard by renovating where possible before replacing existing barracks. For clarification and consistency, the draft report should have used the term “downloaded” vice “downsized.”

**Page 13, Table 3:** The draft report implies that building to lesser room configurations would be require significantly lower investment. We agree that implementation of lesser construction standards may initially cost less than the 1+1 standard, but lesser living conditions would not promote the living conditions the Department desires its service members to reside in. It is important to note, as the draft report indicates, that the barracks construction standard can be waived if the Service Secretary believes a lesser standard is necessary to meet mission requirements--and this authority has been exercised by some of the Services where needed. We also believe the analysis generating the 2+0 full implementation cost figures may be significantly understated. To achieve the 2+0 standard, the Services would need to convert existing 1+1 and 2+2 spaces to the 2+0 standard. The impact of this conversion requires the Services to double the number of bathrooms in the existing 2+2 buildings and to add approximately 62 square feet to each 1+1 module. The construction of additional square footage and bathrooms of existing barracks would represent a significant cost.

The draft report also indicates that the Air Force would need approximately \$2,626 million to fully implement the 1+1 standard in the CONUS (based on housing all E-1s thru E-4s in 1+1 standard dormitories, not simply providing them with private rooms in adequate 2+2 dorms). The \$2,626 million cost is misleading since it does not consider normal military construction requirements as an offset to the estimate. These dormitories will require significant renovation as they reach the end of their useful life. The Air Force would spend approximately half of the \$2,626 million just to replace and/or renovate existing 2+2 dorms as they reached the end of their economic life. That is, the cost to convert a 2+2 dormitory to the 1+1 standard amounts to the difference in cost to renovate or replace to the 1+1 standard vice the cost to renovate or replace to the 2+2 standard. To accurately reflect this the cost shown in Table 3 to fully implement 1+1 should be greatly reduced or the cost shown to fully implement 2+2 should be greatly increased. Additionally, the GAO's assumption for full 1+1 implementation plan is not based on any DoD or Service plan. The analysis suggest that it based strictly on a numerical representation of today's quantity of 1+1 dormitory spaces less the number of eligible Service members multiplied by an average cost. The Air Force intends to continue using its 2+2 dormitories by assigning one person per room, and renovate or replace 2+2 dormitories to the 1+1 construction standard only after they reach the end of their useful life (~40+ years from now).

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