U.S. Department of Housing and Urban Development Office of Program Planning and Evaluation-Region 9

Evaluation of the High Cost of Indian Housing

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Program Planning and Evaluation Region IX

December, 1979

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HIGH COST OF INDIAN HOUSING

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EXECUTIVE SUMMARY

EVALUATION OF THE HIGH COST OF INDIAN HOUSING

EXECUTIVE SUMMARY

Over the last 15 years, the cost of housing in the United States has increased dramatically. The recent HUD Task Force on Housing Costs identified a number of factors which have accounted for this dramatic increase, including increasing cost of labor and materials, rising interests rates and growing regulations at all levels of government. Increased costs have affected both public and private housing development, and the cost to the taxpayer of public housing has come under increasing scrutiny.

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Among public housing projects developed by HUD in partnership with local housing authorities, the most expensive are projects built for American Indians and Alaskan Natives. This was not always the case. As short as ten years ago, Indian Housing development costs were significantly less than development costs for public housing in urban areas. However, the rate of increase in the cost of these projects has been so dramatic that today the per unit cost of Indian and Alaskan Native public housing is significantly greater than for urban public housing. There is reason to expect that this trend will continue.

Region IX contains the largest population of American Indians in the United States. In 1975, Region IX's "Office of Indian Programs" was created in order to better serve the special housing and community development needs of Native Americans. For purposes of Indian programs alone, Region IX's boundaries include the State of New Mexico (normally part of Region VI), as well as Arizona, Nevada, California, and Hawaii. As a result, Region IX has the largest volume of Indian Housing production of any HUD Region.

As costs of Indian Housing continued to rise, Region IX's Regional Administrator, Emma D. McFarlin, requested her Office of Program Planning and Evaluation to undertake a comprehensive and thorough evaluation of the reasons behind the extraordinarily high cost of Indian Housing development. Her concern was further increased by the frequency that the Office of Indian Programs (OIP) asked her to waive normal prototype cost limitations in order to proceed with projects. The study began in February of 1978 with the purpose of identifying Regional or Central Office HUD actions which might be taken to reduce the costs of Indian Housing and to bring them more in line with the costs of other public housing projects.

Study Methodology

Following a review of a number of earlier studies, reports and internal memoranda concerning development, management, and cost problems in the Indian Housing program, PP&E concluded that there were many theories concerning a number of factors which were believed to contribute to the high costs of Indian Housing, but that data were lacking on the relative importance of these factors. Without this information, Regional managers had not been able to formulate strategies which could eventually lead to cost reduction or containment.

The study began with refinement of a series of hypotheses concerning those factors which were thought to add significantly to the costs of Indian Housing. These hypotheses were developed from previous studies and reports, from discussions with HUD Central Office personnel, and from detailed discussions with Housing Development staff in Region IX's Office of Indian Programs. In order to test these hypotheses, PP&E selected a representative sample of 1,460 Indian housing units recently built or under construction in 35 separate projects in Region IX. This was a 100 percent sample of all new construction projects begun during FY 1977 and the first quarter of FY 1978 (i.e., between October 1, 1976, and December 31, 1977). All of the projects were developed under the Conventional production method (none were Turnkey projects). The Total Development Costs (TDC) of the 35 projects were \$79,320,733, equaling a per unit average of \$54,329, which was comparable to the FY 1977 national average for Indian Housing projects of \$54,000 per unit.* Extensive data analysis was then performed on this sample in order to determine which of the aforementioned factors were contributing significantly to increased costs. A further refinement was added to the analysis to determine which of these factors were indeed "controllable," or subject to modification, and which were essentially uncontrollable and necessarily a part of Indian Housing production.

As findings were developed through this analysis, they were discussed with Region IX, OIP staff, and other technical specialists in the Regional and San Francisco Area Office to ensure that PP&E's interpretation of the data was technically and logically accurate. As a result, OIP staff have already taken action to implement several of the recommendations of this evaluation.

*Total Development Costs, excluding long-term subsidies.

Findings and Conclusions

The major findings and conclusions of this study are presented below with summary explanations. Specific findings and conclusions are presented in detail in Sections V and VI of the full report.

As expected, the study revealed that, for the study period of FY 1977 and the first quarter of FY 1978, <u>the costs of Indian Housing units</u> <u>exceeded the costs of the comparison sample of Section 8 projects by</u> over \$26,000 per unit (\$54,329 compared with \$27,745).

However, over \$14,000 of the excess \$26,000 (54%) were costs that were determined to be either essential or uncontrollable, and there is little that HUD, OIP, or Indian Housing Authorities can do to significantly reduce these extra costs. The two most significant of these factors are the need to provide housing for large families (which adds \$8000 in extra cost per unit) and high site improvement costs on Indian reservations (which adds \$4000 per unit to development costs). The two other significant essential, uncontrollable costs are the existence of poor bidding climates and necessary quality design standards which could be rescinded only at the unacceptable risk of increasing already high future maintenance expenses. Each of these factors adds approximately \$1500 to the excess cost of Indian housing. The one offsetting factor is the savings on the average land cost per unit due to less expensive land in these remote areas, which results in a savings (offset) of \$1300 per unit of Indian housing compared with land cost for Section 8 units.

The majority of the remaining costs were judged to be controllable and could be reduced by appropriate administrative action. The three most significant factors in this category were the single-family detached design, controllable site improvements and large floor areas. Each of these factors adds approximately \$3000 in excess costs. Whereas it is not possible to eliminate all single-family detached design (which is frequently a strong cultural preference on Indian reservations) some future designs in row configurations could be considered in appropriate circumstances, particularly on higher-cost reservations. Site improvement costs could also be reduced by additional scattered site development, increased Planned Unit Developments, and building on smaller lot sizes in situations where standard subdivisions are permitted. Further savings could be achieved through insisting that the architectural design of homes does not exceed the size of the dwelling that HUD uses to establish prototype limitations. Elimination of other amenities such as alternative heating systems (fireplaces), adobe and masonry veneer, landscaping, outdoor barbeques and other such non-essentials could further reduce costs.

Additional cost savings of approximately \$5500 per unit could be realized in areas which are not unique to the Indian housing program. Two examples are in reducing project delays and eliminating carports. Project delays previously averaged as high as 16 months; OIP has been able to reduce this figure to seven months. However, these delays still add approximately \$2800 additional cost per unit. Secondly, whereas carports are currently permitted in both Section 8 and Indian housing projects, the elimination of carports (except in areas with extreme climatic conditions) would save an average of \$2600 per unit.

Finally, it was surprising to learn that many factors which were originally thought would add significantly to the costs of Indian housing projects did not do so. Factors in this category were wage rate variations* diseconomies of scale, severe climatic conditions and Indian preference requirements. A relatively low correlation was found between wage rates and dwelling construction costs. Wage rates are clearly a major determinant of total project cost, but did not appear to be a major differentiating factor contributing to the costs of the most expensive Indian housing projects. Secondly, expected diseconomies of scale resulting from the small size of most Indian housing projects also were not discovered; rather, large projects were found to cost more than small projects on a per unit basis. Third, there was little evidence to suggest that significant extra expense was caused by severe weather conditions in areas where Indian Housing is located. Finally, Indian preference bidding requirements in general construction contracts did not add significantly to project costs; rather than exploiting their 10 percent price advantage, most Indian contractors appeared to have bid guite conservatively.

An additional finding emerging from this study is that there are no procedures for ensuring that all Indian Housing Authorities are treated equally. Prototype cost limits were originally intended to provide standards of equity, but have proved ineffective in doing so, resulting in large variations among projects. For example, the per unit variance between Total Development Costs of the least expensive family project, \$37,704, and the most expensive, \$65,212, was \$25,508, or 64 percent. The variance in prototype costs of a three-bedroom detached unit between the two areas was only \$800, or 3 percent.

This leads to the final conclusion of the study, which is that the prototype system, as presently constituted, is both efficient and ineffective. It is inefficient since the costs of building various prototypes must be researched and established for each prototype area. There were 94 prototype areas within Region IX's jurisdiction in 1977. Each area has four construction types, and each construction type has seven bedroom sizes and hundreds of cost components.

^{*}No comparison was possible between the Indian Housing program and others where Davis-Bacon wage rates are not required. See page 23 for a full discussion of this issue.

With all these different categories, current data cannot be maintained accurately, shortcuts in updating data are employed, and errors result which must be corrected, causing delays which cost money due to inflation. The prototype system is also <u>ineffective</u> since it controls only dwelling construction and equipment (DC&E) costs and provides no guidance concerning other costs. In 1978, the Department attempted to correct this problem by establishing maximum allowable project costs calculated as a proportion of prototype costs. If implemented in 1977 and applied to these sample projects, costs of eight projects would have been reduced, but costs in the others would have <u>increased</u>, potentially increasing overall sample costs by \$2500 per unit.

A further effort to reduce costs has been initiated this year with the establishment of "benchmark" costs for each type of development and by HUD office jurisdictions. Unlike prototype costs, benchmark costs cover total project development costs and provide each office with flexibility in considering each project, while still limiting total average costs. In our opinion, benchmark costs could provide a workable alternative to the prototype cost system.

Recommendations

Based on the findings and conclusions discussed, PP&E offers the following recommendations for actions which will have the effect of reducing the average cost of Indian Housing development.

The Director of the Office of Indian Programs should take steps to speed up initial project planning and reduce delays during project development. A general policy should be instituted of proceeding immediately to Annual Contributions Contracts (ACC) following approval of Program Reservations, thereby making funds available to Indian Housing Authorities to proceed directly with project planning. ACC's would provide for funding at 175 percent of project prototype costs; at contract award the ACC should be amended to recapture any funds not actually needed for the project. Alternately, larger preliminary loans would have the same effect of enabling more complete project planning to proceed early. Secondly, delays during project development could be reduced by including an expiration date in each ACC commensurate with the scale of difficulty of the project. Projects not achieving construction start by the expiration date would then automatically terminate, except in exceptional circumstances.

To ensure greater equity among Indian Housing projects, the Director of OIP should establish architectural and site design standards based on the prototype house concept. Architectural guidelines would limit total floor area in each bedroom size category; limit three-bedroom units to one bathroom; prohibit unnecessarily expensive siding and roofing materials, prohibit the addition of expensive amenities such as alternative heating systems and carports (except in special circumstances) and set such other architectural limitations as deemed appropriate. OIP should also establish similar site design standards to limit site improvement costs.

In order to encourage less expensive types of development, the Director, OIP, should incoorporate appropriate incentives in the architectural and design standards to encourage future development of duplexes, row houses, walk-up apartments and PUDs. Incentives should be incorporated into the design standards such as allowing more extra amenities in row house and apartment projects and more site improvements (paved driveways, playgrounds and parks) in Planned Unit Developments than in conventional subdivisions. Also, in appropriate circumstances, the Director, OIP, should discourage projects larger than 100 units due to their diseconomies of scale in rural areas. Finally, the Director, OIP, should encourage development of more units for the elderly and for small families on reservations where these needs exist.

In order to take advantage of their potential cost savings identified in this study, the Regional Administrator and the Director, OIP, together should take a number of policy initiatives to reduce the cost of Indian housing units. First of all, it should be Regional policy that total permissible development costs be limited to 175 percent of project prototype costs rather than 180 percent. In addition, the Director, OIP, and the Regional Administrator should recommend to Central Office that Mutual-Help contributions be treated as donations to projects and therefore deducted from rather than added to Development Cost Budgets as is presently the case. The Regional Administrator and the Director, OIP, should recommend to the Secretary that the prototype cost system be replaced by the "benchmark system" at the earliest feasible opportunity. In the meantime, the Regional Administrator should require the Director of OIP to develop a 105 percent to 110 percent prototype checklist to review all projects proposed to the Regional Administrator for waiver of prototype cost limitations. The Director of OIP should subsequently review the checklist information for each project submitted for waiver and certify to the Regional Administrator that the project is not over designed, that cost reductions are not feasible, and that project costs appear accurately allocated among prototype and non-prototype costs. Finally, the Regional Administrator should recommend to the Secretary that other Regions with significant Indian Housing production be encouraged to review the recommendations of this report to determine whether the implementation of these recommendations would be appropriate to their situation. Several of the proposed recommendations of this study are in conflict with a number of cultural preferences of our Indian clients, such as the preference for single-family detached design. Decisions concerning trade-offs between cost reduction and containment and cultural preferences will be difficult, as will be distinguishing between cultural preferences and necessities. Such issues are not addressed in this evaluation, which focused solely on the cost issue. However, as housing costs continue to rise even higher, it is likely that cost containment will become increasingly important. Deliberations on how best to contain costs will be a primary issue for HUD if the Department is to retain the continued capacity to assist in providing shelter to all those in need -- Indian and non-Indian alike.

I. INTRODUCTION

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I. INTRODUCTION

This report presents findings, conclusions, and recommendations resulting from an extensive analysis of the costs of Indian Housing projects in Region IX. The evaluation was initiated by the Regional Administrator, Region IX, and was conducted by the Office of Program Planning and Evaluation (PP&E). The Office of Indian Programs (OIP), which administers Indian housing programs in the states of California, Nevada, Arizona, and New Mexico, provided PP&E with extensive technical assistance throughout the study. Additional data collection and analysis support was provided by the Survey Research Center, University of California, Berkeley, under contract to PP&E.

The report is organized in six sections. Following this introduction, Section II describes the background of the study and the Regional Administrator's purpose in requesting it. Section III presents the study methodology. Section IV describes the 35 sample projects which were examined during the study. Section V presents the hypotheses which were tested by the analysis and the detailed findings of the study. Section VI contains PP&E's overall conclusions and its recommendations to the Regional Administrator and the Director, Office of Indian Programs.

II. BACKGROUND AND PURPOSE

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In February 1978 the Regional Administrator, Region IX, requested the Office of Program Planning and Evaluation (PP&E) to evaluate the reasons for the high costs of the Indian Housing Programs in Region IX. Her concern was prompted by the frequency that the Office of Indian Programs (OIP) asked her to waive normal prototype cost limitations in order to proceed with projects.

PP&E's first action was to obtain copies of previous studies of the Indian Housing Program and to examine them for their relevance to the question of cost. The following six reports contained some discussion of the factors contributing to the high cost of Indian Housing projects:

- "Evaluation Report: Indian Housing Study," by PP&E, August 1972;
- "Report on Indian Housing Development Costs," by Fred Badenoch, undated;
- "Region IX Indian Housing Cost Study," by OIP's Housing Production Division, September 3, 1976;

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- Memorandum to Robert H. Baida, former Regional Administrator, from Robert J. Vasquez, former Director, OIP, regarding Indian Housing Costs, February 22, 1977;
- Memorandum to all Regional Administrators from Reaves F. Nahwoosky, regarding Indian Housing Costs, February 22, 1977; and
- "Issues in Indian Housing, a Background Paper," by David Kaminsky, Office of Policy Development and Program Evaluation, June 1977.

A review of these reports revealed a number of ideas as to why the costs of Indian Housing projects were higher than those of other HUD housing programs. Extensive explanations were provided in the six reports of special regulations, requirements, and problems which affected the costs of housing projects developed on Indian Reservations.

However, the explanations available in these reports could not be synthesized into an answer to the Regional Administrator's question because they were lacking quantification. Only Badenoch's report discussed general cost categories in recent Region IX Indian Housing projects. The other five reports provided some illustrative statistics, but none of them provided much data on the cost implications of each problem identified. Nor did the reports quantify how frequently each cost factor occurred. Thus, PP&E could not determine whether each cost factor discussed in the reports occurred rarely, occasionally, or frequently.

PP&E then discussed the situation with the senior staff of OIP's Housing Production Division. Different options for addressing the Regional Administrator's concern were explored and agreement was reached on a focus for the study. That agreement was that the PP&E study would quantify as many of the pre-identified cost factors as possible using program data available in OIP's files. PP&E would analyze the file data, develop findings and conclusions, and make recommendations for Regional actions which would minimize extra costs in the Indian Housing Program. If additional specifics were required, the option remained open to further refine possible strategies for cost reduction in a second phase of the evaluation. This approach to the evaluation was endorsed by the Regional Administrator.

The purpose of this report is to present PP&E's analysis of the significant cost factors in the Indian Housing Program as determined from existing data in OIP's files. PP&E believes that the findings of this report address the major portion of the extra costs incurred

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in the Indian Housing Program. They do not address <u>all</u> identified cost factors* because the approximate impact of certain other factors on program costs could only have been determined through extensive interviews with architects, builders, and Indian Housing Authority staff involved in the Indian Housing Program. However, it appeared that many of these other cost factors were relatively insignificant.

This report also presents a series of recommendations for reducing some types of extra costs which have been incurred in the past. However, a number of cost factors discussed in this report are essentially mandated or uncontrollable, so no corrective actions are possible. Such costs are still presented in the findings so that distinctions can be made between extra costs which necessarily must be incurred if decent housing is to be provided on Indian Reservations and extra costs which are avoidable through careful planning and administration.

PP&E would like to emphasize here that this report focuses solely on cost related aspects of the Indian Housing Program. While some of the findings of this study imply criticism of the way the Office of

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^{*}A complete listing of all factors which were hypothesized to create extra costs in the Indian Housing Program is included as Appendix A.

Indian Programs has administered the Indian Housing Program, they must be read in context. OIP was created in 1974 to correct many serious problems in HUD's services to reservation Indians. It has been very successful in its mission of improving HUD services to reservation Indians. OIP has increased the number of Indian housing units being built. It has decreased processing time very significantly. It has improved both design and construction quality. It has improved the administrative capacity of local Indian Housing Authorities, both in production and in management, and it has had many other successes. In addition, it must be clarified that the planning of the projects in this study was accomplished mainly during the initial two years of OIP's existence. During that time, OIP was organizing itself, hiring and training new staff, developing new policies, and coping with many inherited problem projects and commitments. Since the start of this study, OIP's operations have become well established, and OIP has been able to turn increased attention to solving the types of problems discussed in this report.

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III. METHODOLOGY

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The initial task in the evaluation of Indian housing costs was to review a number of earlier reports and memoranda concerning development, management and cost problems in the Indian Housing Program.* Following this review, PP&E distributed a memorandum to the senior staff of the Office of Indian Programs (OIP) which summarized PP&E's assessment of existing information on the costs of Indian housing. PP&E's assessment was that the causes of higher costs in the Indian Housing Program were well known to HUD staff working with it. Nine major categories of cost factors, four related to design considerations and five related to construction, had been identified and discussed in the previous reports. The same cost factors were sometimes mentioned in as many as three of the reports. Thus, it did not appear necessary to study further the general issue of <u>why</u> Indian housing projects were costing more. The major reasons were already well documented.

What none of the earlier studies did do, however, was to quantify how frequently each of the known cost factors occurred and how much extra costs each factor created. Lacking any data on the relative magnitude of the many cost factors, no Regional managers had been able to establish priorities and systematically attack those extra costs which could be reduced or eliminated.

*The specific reports are listed in Section II.

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PP&E and OIP staff then discussed a number of options for structuring the study given what was already known. The primary concern was that the study provide new information which could potentially be valuable to the Regional Administrator and the Office of Indian Programs in determining where cost savings might be achieved. The result of those discussions was agreement that PP&E would select and study in detail a representative sample of recent OIP projects. PP&E would look for data indicative of how frequently certain pre-identified cost factors occurred in the sample projects and indicative of the extra cost caused by each factor over and above typical costs incurred in other HUD housing programs. If this file research succeeded in identifying areas of potentially significant cost savings, then the evaluation could be expanded to include field interviews of appropriate builders, architects, and staff of other agencies on how to best minimize extra costs in the Indian Housing Program.

Proceeding from this agreement, PP&E prepared a preliminary list of special factors in the Indian Housing Program which were thought to create extra costs. The list included items identified in the six previous reports and items discussed at a training conference conducted by OIP for architects and consultants active in the Indian Housing Program.

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PP&E next met with OIP Housing Production supervisory staff, architects, and cost analysts to discuss the preliminary list of high cost factors. The purposes of the discussion were to review the accuracy and completeness of the list and to ensure that PP&E understood the nature of each factor. Review of the list with OIP staff led to some revisions and the addition of other cost factors that had not been previously identified.

PP&E then distributed to OIP a final list of factors thought to create extra costs in Region IX Indian housing projects. This list is included as Appendix A. The final list was again reviewed with OIP staff, this time with the primary intent of determining possible data sources for each factor in OIP files. Subsequently, PP&E developed a "Data Base Description," listing potential data sources for each cost factor and indicating which factors could not be assessed from data available in OIP files. That description is included as Appendix B.

Following identification of data sources, PP&E drafted a file review form for recording specific information about each sample project. During the course of drafting and testing the file review form, PP&E had to abandon some of its plans. The primary loss occurred in the area of determining responsibility for a variety of possible processing delays. PP&E and OIP knew that many delays in project

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planning and processing had occurred due to actions, or lack of action, by HUD, Tribal governments, Indian Housing Authorities, architects, the Bureau of Indian Affairs, the Indian Health Service, and others. However, the development process in the Indian Housing Program was too complicated and OIP's file documentation was not suitable to assess accurately the responsibility for all project delays. Some examples could be documented, but PP&E did not feel it was appropriate to include isolated occurrences when the frequency of such occurrences could not be determined.

A final version of the file review form, prepared after three earlier versions were modified through pre-tests, is included in Appendix C.

While developing a file review form, PP&E concurrently selected the sample projects. Using OIP project control records, PP&E decided to select a 100% sample of new construction projects* which began construction during FY '77 and the first quarter of FY '78 (i.e., between October 1, 1976, and December 31, 1977). This time period provided a large enough number of projects and units to assess how frequently the many cost factors actually occurred. Also, reasonably current and accurate cost data were available for these projects

*Thus excluding two rehabilitation projects.

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since construction contracts had been awarded on all of them prior to the study. The sample* included 35 projects in all four states covered by Region IX's Office of Indian Programs**, with a total of 1,460 dwelling units.

Cost data in this report are generally presented as average costs calculated for each of the 1,460 dwelling units in the study sample. In many cases, where a particular feature was included in only a portion of the 1,460 units, two average cost figures are presented: One calculation shows average costs for only those units containing the feature in question, and a second calculation shows the average cost for all 1,460 units in the sample. For an example, see the discussion of carports and garages on pages 59 and 60.

Following selection of the sample projects and completion of the file review instrument, PP&E began data collection. Assistance with this effort was provided by PP&E's technical consultant, Survey Research Center, University of California, Berkeley, and by an experienced architect temporarily detailed to PP&E from HUD's Area Office in San Francisco. Data were obtained as appropriate from OIP's Project

*The sample is described in detail in Section IV. **California, Arizona, Nevada, and New Mexico

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Docket Files, from architectural plans* and bid specifications, and from the Regional Counsel's files. Documents were obtained from OIP's Docket Files in San Francisco and from OIP's two field offices in Albuquerque, New Mexico, and Phoenix, Arizona. Some information was also obtained from or double-checked with FORMS (one of HUD's major computerized recordkeeping systems), current Processing Control Charts, OIP staff, and OIP's correspondence file.

PP&E's principal analyst and consultants also personally visited a number of sample projects in the vicinity of Albuquerque with OIP staff in order to become more familiar with the details of the projects. This first-hand experience eventually proved very valuable when the raw data were analyzed and interpreted to develop the findings discussed in Section V.

After completing data collection, PP&E tabulated and analyzed the data using a variety of univariate and bivariate statistical techniques. Data were aggregated to determine the frequency of each high cost factor's occurrence in the sample projects and its impact on the costs of those projects where each factor occurs. The total costs of each high cost factor were thus determined and then averaged

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*Architectural plans were reviewed for 22 of the 35 sample projects. The other 13 projects utilized duplicate house plans.

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over the entire sample to establish the extra costs each high cost factor added to an "average" sample unit. From this analysis, PP&E prepared draft findings and recommendations, which were then extensively reviewed with senior staff from the Office of Indian Programs. With the assistance of OIP, several findings, conclusions, and recommendations were improved in terms of accuracy and insight into data interpretation. However, the findings and recommendations presented herein are those of PP&E and are not necessarily agreed to in every instance by the Office of Indian Programs.

IV. SAMPLE DESCRIPTION

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IV. SAMPLE DESCRIPTION

Information for this study was obtained from a sample of 1,460 Indian housing units built or under construction in 35 separate projects. These units constitute a 100% sample of all new Indian housing construction started in Region IX during FY '77, plus the first quarter of FY '78 (i.e., October 1, 1976 to December 31, 1977). The sample excludes only two rehabilitation projects, containing a total of 83 units, on which physical rehabilitation work began during the study period. The sample projects' HUD identification numbers, their respective Indian Housing Authorities, and their dwelling unit counts are shown in Table 1 below.

All the sample projects were developed under the Conventional production method. None of the sample projects utilized the Turnkey production method, although that method is sometimes utilized in Region IX. Twenty-eight projects with 1,123 units were Mutual Help. The other seven projects with 337 units were developed as Low Rent projects. There were no Turnkey III projects.

The Total Developments Costs (TDC) of the 35 projects was \$79,320,733. This amount equaled a per unit average of \$54,329, which is very comparable to the FY '77 national average for Indian housing projects of \$54,000 per unit.*

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^{*}As stated in a recent report from Mr. Joseph Burstein to the Secretary.

Table 1

Sample Projects

Project Number	Housing Authority	No. of Units
AZ-011-009	San Carlos	34
AZ-012-042	Navajo	60
AZ-012-043	Navajo	45
AZ-012-044	Navajo	20
AZ-012-046	Navajo	25
AZ-012-047	Navajo	20
AZ-012-048	Navajo	10
AZ-014-004	Salt River Pima-Maricopa	89
AZ-014-005	Salt River Pima-Maricopa	28
AZ-015-009	Gila River	49
AZ-015-011	Gila River	30
AZ-016-024	White Mountain Apache	45
AZ-019-003	Ft. McDowell Mohave	6
AZ-026-008	Papago	10
AZ-026-00 9	Papago	15
CA-080-006	All Mission	78
CA-097-001	Round Valley	48
CA-097-002	Round Valley	22
CA-100-001	Fort Mohave	50
NV-004-003	Pyramid Lake	75
NV-014-003	Моара	10
NV-015-003	Ely	10
NV-016-002	Te-Moak Western Shoshone	15
NM-012-006	Laguna Pueblo	205
NM-013-004	Mescalero-Apache	63
NM-015-031	Navajo	50
NM-015-032	Navajo	150
NM-019-007	Zuni	100
NM-031-035	All Indian Pueblo	15
NM-031-036	All Indian Pueblo	15
NM-031-037	All Indian Pueblo	5
NM-031-038	All Indian PUeblo	15
NM-031-039	All Indian Pueblo	15
NM-031-040	All Indian Pueblo	15
NM-040~006	Northern Pueblo	18

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The project average* Dwelling Construction and Equipment (DC&E) costs, the only costs which are controlled by prototype cost limitations, were \$32,590 per unit. Almost all of this amount consisted of dwelling construction costs, \$31,027, rather than dwelling equipment costs, which averaged only \$1,563 per unit. The two together represented 62.1% of Total Development Costs (TDC). Project average Site Improvement Costs accounted for another \$9,492 per unit, or 18.1% of TDC. The remaining project costs were distributed among the categories of Non-Dwelling Construction and Equipment, Administration, Interest, Planning, Relocation, Homeownership Counseling, Site Acquisition, and Contingencies.

Thirty-four of the 35 projects consisted of single family houses located either in subdivisions or on scattered sites. One project consisted of 15 duplex structures. One thousand and eighty-four (1.084) units were located in subdivisions and 376 on scattered sites.

The most expensive project was CAL 100-1, a 50-unit Mutual Help project developed by the Fort Mohave Indian Housing Authority. Its TDC was \$65,212 per unit. Its DC&E costs of \$33,171 per unit were

^{*}The project average is the average per unit among the 35 sample projects rather than among the 1,460 sample units. It is calculated by adding the per unit cost of each sample project and dividing by 35 to obtain their average cost. The project average is used rather than the per unit average because the project rather than the individual unit is the basis of comparison.

only slightly above average, however, and accounted for only 50.9% of TDC. The reason it was the most expensive project was its high ranking in other cost categories. It ranked first in the cost of Site Improvements at \$20,742 per unit. It ranked second in the cost of Non-Dwelling Construction and Equipment at \$5,674 per unit. Neither of these costs are controlled by prototype cost limitations.

The least expensive project was AZ 15-11, a 30-unit Low Rent project developed by the Gila River Indian Housing Authority. TDC per unit for this project was only \$32,741 per unit. Its low TDC is attributable to its having the lowest DC&E costs in the sample. Its DC&E costs were only \$19,070 per unit, primarily due to the small size of the units, all one- and two-bedrooms only. The units were also built in a duplex configuration, which may also have resulted in cost savings.

Dwelling Construction and Equipment costs ranged from a high of \$41,199 per unit to a low of \$19,070. The highest DC&E costs occurred in NM 40-6, an 18-unit project developed by the Northern Pueblos Indian Housing Authority at San Ildefonso, New Mexico. The high DC&E costs of this project appear due to the very sophisticated nature of its unit designs, to its adobe construction, and to extra expenses which resulted from the original contractor defaulting on the project. The lowest DC&E costs occurred in the Gila River project discussed above.

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The largest number of units were located in the State of New Mexico, 666 units in 12 projects. Arizona had 486 units in 15 projects. California and Nevada had four projects each with 198 units and 110 units, respectively. California had the highest project average TDC, \$56,756 per unit, but the lowest DC&E costs, only \$28,838 per unit. Arizona had the next highest project average TDC, \$52,885. New Mexico and Nevada were very similar with averages of \$51,367 and \$51,074, respectively. New Mexico had the highest DC&E costs, with a project average of \$33,643 per unit. Arizona was close behind at \$33,383, while Nevada was considerably less expensive with a project average of only \$29,782 per unit.

Dwelling Construction and Equipment costs for the 35 sample projects ranged from a high of 109.9% of prototype costs down to a low of 89.9%. Nineteen of the 35 projects were over 105% of prototype costs, the point at which the Regional Administrator must approve proceeding with the project. However, OIP inadvertently approved 4 of these 19 without requesting the Regional Administrator's concurrence. Nine projects fell between 100% and 105% of prototype, and thus were approvable by the Director of OIP. Seven projects incurred DC&E costs which were less than prototype.

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In order to compare these statistics with the cost of other HUD housing projects in FY '77, PP&E obtained data on 15 Section 8 New Construction projects with mortgages insured under Section 221(d)(4) and which were processed to construction start by the San Francisco Area Office during the same period as the Indian Housing sample. These 15 projects contained a total of 1,436 units with total costs. including the cost of land, which averaged \$27,745 per unit. The 15 Section 8 projects included all those processed to construction start by the SFAO during the study period, excluding those located in the Cities of San Francisco and Oakland. The San Francisco and Oakland projects were excluded from the Section 8 sample because the inner-city location of these projects caused them to be considered non-comparable to the Indian Housing projects. Statistically significant comparisons with non-Indian Conventional Public Housing projects could not be made since only three such projects started construction during the 15-month study period.

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V. HYPOTHESES AND FINDINGS

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The research design for this evaluation involved the establishment of a number of hypotheses concerning the factors behind the high cost of Indian housing projects. The sample of projects was analyzed in detail and compared with the costs of non-Indian housing projects, where possible, in order to determine whether the data either supported or did not support each hypothesis. Specific findings were then developed relative to each hypothesis.

Each hypothesis and its related finding is presented in this section of the report, in the following order. Hypothesis 1 is the overall hypothesis of the study: that the per unit cost of Indian Housing is 'higher than that of other HUD housing programs. Hypotheses 2 through 5 are those which were not supported by the analysis -- in effect dispelling, or at least questioning, a number of commonly-held assumptions about high Indian housing costs. Hypotheses 6 through 8 were supported by the analysis, but were determined to be basically uncontrollable -- i.e., they related to costs which are necessarily a part of Indian housing projects. Hypotheses 9 through 12 were supported by the analysis, and were determined to be controllable -although in varying degrees -- by either policy or programmatic decisions concerning Indian housing projects. Hypotheses 13 through 16, while not directly comparable with the Section 8 New Construction

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sample, were also found to be controllable, and therefore suggest potential cost reducing measures. These latter hypotheses, 9 through 16, provide the basic framework for PP&E's recommendations concerning actions which might be taken to reduce the high cost of development of HUD Indian housing projects.

Each hypothesis and its related finding is presented below.

<u>HYPOTHESIS 1</u>: THAT THE PER UNIT COST OF INDIAN HOUSING IS HIGHER THAN THAT OF OTHER HUD HOUSING PROJECTS.

FINDING 1: THE PER UNIT COST OF INDIAN HOUSING IS HIGHER THAN THAT OF SECTION 8 NEW CONSTRUCTION PROJECTS BY APPROXIMATELY \$27,000 AND \$17,000 HIGHER THAN THE PRICE THE AVERAGE FHA HOMEBUYER PAYS.

All evidence uncovered during this study supported the hypothesis that the cost of Indian Housing is higher on a per unit basis than that of other HUD housing programs. According to a study by HUD's Office of Policy Development and Research, entitled "Issues in Indian Housing," the average costs of Indian Housing units were originally less than the costs of conventional Public Housing units. Then in FY '75 and '76 the average Total Development Costs for Indian Housing grew to \$38,000 per unit, while Conventional Public Housing costs grew to only \$25,000 per unit. In a November 22, 1977, memo to the Secretary concerning his recommendations for the Indian Housing Program, Mr. Joseph Burstein reported that the Indian Housing costs had grown to \$54,000 per unit during FY '77. The average Total Development Costs of Indian Housing units in Region IX approximated the national average.

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The total development costs of the 35 sample projects was \$79,320,773, averaging \$54,329 per unit. In order to compare these statistics with the cost of other HUD housing projects in FY '77, PP&E obtained data on 15 Section 8 New Construction projects with mortgages insured under Section 221(d)(4) and which were processed to construction start by the San Francisco Area Office during the same period as the Indian Housing sample. These 15 projects contained a total of 1,436 units with total costs, including the cost of land, which averaged \$27,745 per unit. Statistically, significant comparisons with non-Indian Conventional Public Housing projects could not be made since only three such projects started construction during the 15-month study period.*

Further evidence of the comparative high cost of Indian Housing was provided in "Area Trends - A Supplement to FHA Trends." This quarterly report on the average characteristics of Section 203 home mortgages includes figures for new construction in the Albuquerque, New Mexico, and Phoenix, Arizona SMSA's, as well as for other areas and the nation as a whole. The report for the fourth quarter of 1977

^{*}However, PP&E did review the fund reservations made for all 26 family Public Housing projects in the San Francisco Area Office during FY '77 and FY '78. The project average Total Development Costs per unit was \$40,520.

found average sales prices for Section 203 homes to have been \$37,533 in the U.S., \$38,443 in Albuquerque, and \$37,014 in Phoenix. These average sales prices were \$16,000 to \$17,000 less than the average Total Development Costs in Region IX's Indian Housing Program.

Of course there are many differences among the predominant types of units produced under each of these programs, which account for much of their cost differentials. Included are differences in average numbers of bedrooms, in types of construction, and in site locations. Specific differences are discussed in detail in many subsequent findings. HYPOTHESIS 2: THAT EXCESSIVELY HIGH DEPARTMENT OF LABOR WAGE RATE DETERMINATIONS ARE A MAJOR FACTOR IN THE HIGH COST OF INDIAN HOUSING.

FINDING 2: A RELATIVELY LOW CORRELATION WAS FOUND BETWEEN WAGE RATES AND DWELLING CONSTRUCTION COSTS. WAGE RATES ARE CLEARLY A MAJOR DETERMINANT OF TOTAL PROJECT COST, BUT DID NOT APPEAR TO BE A MAJOR DIFFERENTIATING FACTOR CONTRIBUTING TO THE COSTS OF THE MOST EXPENSIVE INDIAN HOUSING PROJECTS.

One of the most vexing problems that the Office of Indian Programs has to contend with is rapidly changing, and escalating, Davis-Bacon Prevailing Wage Rate Determinations.* In order to assess how great an effect high wages have on project costs, PP&E examined the Davis-Bacon wage rates applicable to each project and compared wage rates with dwelling construction costs. PP&E was thus able to determine the relative impacts of differential wage rates within the Indian Housing Program, but no comparison was possible between that program and others where Davis-Bacon wage rates are not required.

^{*}Davis-Bacon Wage Rate Determinations establish minimum wages that must be paid workers in various construction trades on Federallyfunded projects. Contractors may actually pay more in some instances, but may not pay less without violating Federal law.

The 35 sample projects were governed by 20 different Davis-Bacon Wage Rate Determinations. Generally, a single Determination applied to all projects in the sample undertaken by each Indian Housing Authority. The one exception was the Navajo Housing Authority, which has a jurisdiction covering both Arizona and New Mexico. Separate Determinations applied to Navajo projects in the two states. On the other hand, separate Determinations applicable to the San Carlos and White Mountain Apache IHA's contained identical wage rates for each of the three Trades examined.

For purposes of analysis, PP&E constructed a single average wage rate from the wage rates for carpenters, plumbers, and electricians as specified in each Determination. Whenever a Trade's wage rate included amounts for various fringe benefits, the cumulative total of hourly wages plus fringe benefits was used. The PP&E constructed average wage rates are shown in the third column of Table 2 below.

Also for purposes of analysis a single indicator of comparative project costs was chosen. That indicator was each project's per unit dwelling construction costs at the time of contract award. Where a Wage Rate Determination applied to more than one project an average figure was calculated for all covered projects. Average dwelling construction costs are shown in the fourth column of Table 2 below.

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Reservation	No. of <u>Proj</u> ects	Average Wage Rates*	Rank <u>Wage Rates</u>	Average Dwelling <u>Construction Cost</u>	Rank A.D.C.C.
Moapa River (NV)	1	\$14.83	1	27,044	15
Fort Mohave (CA)	1	14.75	2	32,139	8
All Mission (CA)	1	14.05	3	23,834	19
Pyramid Lake (NV)	1	13.42	4	27,745	14
Ft. McDowell (AZ)	1	12.98	5	29,043	10
Salt River (AZ)	2	12.94	6	31,233	9
Papago (AZ)	2	12.81	7	34,391	4
Navajo (AZ)	6	12.24	8	37,326	1
Laguna (NM)	1	11.83	9	36,371	3
Northern Pueblos (NM)	1	11.72	10	33,880	5
Navajo (NM)	2	11.26	11	32,807	7
Zuni (NM)	1	10.34	12	37,159	2
All Indian (NM)	6	9.60	13	29,026	11
Mescalero (NM)	1	8.47	14	32,861	6
White Mountain (AZ)	1	7.14	15	26,696	16
San Carlos (AZ)	1	7.14	15	26,519	17
Gila River (AZ)	2	6,94	17	20,589	20
Round Valley (CA)	2	6.58	18	26,475	18
Te-Moak (NV)	1	6.50	19	28,877	12
Goshute (NV)	1	6.08	20	28,264	13

Table 2 - Influence on Costs of Davis-Bacon Wage Rates**

*Average of Three Trades - Carpenters, Plumbers, and Electricians

**Calculations of total labor costs were not included here because of the excessive amount of staff time required to complete such calculations.

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A comparison of average wage rates with average dwelling construction costs shows no correlation between high wages and high construction costs. Of five Indian Housing Authorities with the <u>highest</u> average wage rates, the top quarter of the sample, only one had average dwelling construction costs which exceeded the median. The highest ranking Authority in terms of dwelling construction costs, Navajo, ranked only eight in terms of the wage rates. The highest average wage rate was at Moapa River, which had only the fifteenth highest dwelling construction costs. The All Mission Authority, which had the <u>third highest</u> labor costs, had the <u>second lowest</u> construction costs. Thus, it is almost certain that high wage rates are not a major factor in causing the highest cost projects to be so expensive.

Below the five sample projects with the highest wage rates, however, Table 2 does show a much closer correlation between wage rates and construction costs. Four of the five Housing Authorities in the second highest quarter of the sample in regard to wage rates fell in the highest quarter in regard to construction costs. Four of the five projects in the third quarter of the wage rate rankings fell into the second and third quarters of the construction cost rankings; and three of the five projects with the lowest wage rates also fell into the lowest quarter of the construction cost rankings.

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We must conclude that while there is a general correlation between the level of wage rates and the level of dwelling construction costs in Indian Housing projects, wage rates are not a major factor causing the most expensive projects included in this study to be so expensive.*

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^{*}This surprising conclusion was cross-checked with prototype cost data to ensure its accuracy and the same pattern was evident. The Reservations with the highest prototype costs did not have the highest wage rates. One major caveat should be noted with respect to this finding. Labor cost data used are based on final Total Development Cost estimates prepared when a contract is awarded. The analysis in this report is not based on <u>actual</u> Total Development Costs, since comparably detailed data of this type is not obtained by HUD. See discussion of Finding 13, page 80.

- <u>HYPOTHESIS 3</u>: THAT COSTS TEND TO BE HIGHER IN THE INDIAN HOUSING PROGRAM BECAUSE MANY INDIAN PROJECTS ARE SMALL AND DO NOT BENEFIT FROM ECONOMIES OF SCALE.
- FINDING 3: MANY INDIAN HOUSING PROJECTS ARE TOO SMALL TO BENEFIT MUCH FROM PRESUMED ECONOMIES OF SCALE. HOWEVER, ECONOMIES OF SCALE ARE BARELY APPARENT IN THE INDIAN HOUSING PROGRAM. IN FACT, THE LARGER PROJECTS TEND TO COST MORE PER UNIT THAN THE SMALLER ONES.

The study sample includes 35 projects which range in size from five units to 205 units. They appeared to fall most naturally into the size categories shown on Table 3 below. The median-sized project had only 28 units, hardly large enough to achieve many economies of scale in today's construction industry. The small size of most Indian Housing projects scarcely seemed to matter, however.

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No. of Projects	Total No. of Units	Size Range	Average Square Foot Cost	Average Dwelling Construction Cost
3*	455	10 0-2 05	\$24.46	\$35,668
5	365	60-89	\$21.83	\$30,519
13	466	20-50	\$23.21	\$30,179
14	174	5-18	\$23.36	\$30,757

Influence of Project Size on Costs

*Includes one project constructed on six separate sites.

According to the economy of scale theory, as project size increases there should be a steady lowering of costs until reaching an irreducible minimum, after which diseconomies of scale begin to occur and costs begin to increase again. In the Indian Housing Program no economy of scale effect is apparent. Average dwelling construction costs stay about the same from the smallest size category up to the over 100 unit category. At that point costs escalate rapidly and average dwelling construction costs jump about \$5,000 per unit.

Average Total Development Costs (TDC)* show a similar pattern. In the 100-205 unit category TDC averages \$56,770. In the 60-89 category TDC is less, \$55,043, and it continues to drop with size. In the 20 to 50 unit category the average TDC is \$52,725, and in the smallest project category it is only \$50,717. Thus, as a general rule in the Indian Housing Program, <u>the larger the project the more</u> it costs per unit.

The one minor exception to this rule occurs in the area of square foot costs. There is a slight drop in average square foot costs for projects in the 60 to 89 unit category relative to smaller sized projects. If there is any economy of scale effect here, it does not continue on to projects with 100 or more units since costs jump by over \$2.50 per square foot in that size category.

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^{*}Not shown on the Table.

It appears from the above cost figures that there may be some <u>small</u> economies of scale achieved in projects of about 60 to 90 units. Any such economies of scale abruptly end at about 100 units, however, and even in the 60 to 90 unit category no actual savings are realized. Larger sized dwellings and other higher project costs more than offset any economies of scale. In the over 100 unit category, larger unit sizes, more amenities and other factors cause costs to escalate steeply.

PP&E believes that this phenomenon is probably due to the way the program is designed. Since HUD pays 100% of the development costs of Indian Housing projects, there is no incentive for local Indian Housing Authorities to reduce costs.* Rather, there is every incentive for them to push HUD to approve the largest, highest quality units they possibly can. Most likely, those Authorities that are most sophisticated and politically influential are able to both organize the largest projects (and programs**) and obtain the most

^{*}Mutual Help project contributions are never provided in cash and do not increase if project costs are higher.

^{**}The Navajo program in Arizona included six projects. Although each project was not large, 60 units at the most, their total program was 180 units. The project average dwelling construction costs for these six projects were \$37,330 per unit, almost \$2,000 higher than the average for projects in the 100 to 205 unit size range.

amenities for their projects, thus increasing costs. An example of this process is the Laguna project; the largest in the sample of 205 units. Overdesigned and extremely expensive, this project's costs were approved by OIP only after being directed to do so by Central Office.

- <u>HYPOTHESIS 4</u>: THAT MANY INDIAN HOUSING PROJECTS ARE LOCATED IN AREAS OF SEVERE CLIMATIC CONDITIONS AND THUS EXTRA COSTS ARE INCURRED TO PROTECT DWELLINGS AGAINST THESE CONDITIONS.
- FINDING 4: A LARGE PROPORTION OF REGION IX INDIAN HOUSING PROJECTS ARE LOCATED IN AREAS OF SEVERE CLIMATIC CONDITIONS, BUT THE COST IMPACT OF CLIMATE ON THE SAMPLE PROJECTS WAS NOT VERY GREAT.

PP&E utilized two measures of climatic conditions to assess the severity of the weather that Indian Housing projects face -- Winter Design Temperature and Degree Days. Fourteen of the 35 sample projects were located in areas with severe Winter Design Temperature, i.e., below O Degrees Fahrenheit. These projects were located at the Goshute, Zuni, Laguna, Te-Moak, Mescalero, Pyramid Lake, and Navajo Reservations. Twelve of these 14 projects were provided with ceiling insulation rated R-30 and wall insulation rated R-19. The Goshute and Laguna projects were also insulated, but to lesser standards. All 14 projects had double glazed windows.

Another indicator of climatic conditions is Degree Days, which measures differences in mean outdoor temperatures over a year and is used for estimating fuel requirements. Sixteen of the 35 projects were located on sites rated at more than 4500 Degree Days, the point at which extra insulation is recommended. These projects included all 14 mentioned above plus one at San Ildefonso and one at White Mountain.* Nine of the sixteen projects barely exceeded the cut-off point, however, with Degree Days measured between 4500 and 5000. Only seven projects had Degree Day measurements over 6000.

One other project faced weather conditions that were extremely hot, the Fort Mohave project near Needles, California. This project was insulated to R-30/R-19 standards to protect against the heat, rather than against the cold. It also was the only project provided with a dual air conditioning system, a refrigerated system piggy-backed on an evaporative system to handle extreme cooling requirements on summer afternoons.

It is PP&E's conclusion that 15 of the 35 sample projects, or 43%, were subject to severe climatic conditions (the 14 projects with Winter Design Temperatures of O Degrees Fahrenheit or lower plus the Fort Mohave project). This proportion does not appear greater than the proportion of the nation's non-Indian housing stock that is subject to similar conditions. This is indicated by the 1976 annual

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^{*}Neither San Ildefonso nor White Mountain was insulated to R-30/R-19 ratings.

Housing Survey, which found that 48% of all occupied single family homes have storm doors and 47% have storm windows. Therefore, it is unlikely that climate impacted costs in the Indian Housing Program in Region IX much more than it influenced the national average costs in the Section 203 program.

Some exceptions to this general conclusion should be noted, however. First, OIP design standards during the period of this study required greater insulation than did HUD's Minimum Property Standards. This is discussed in Finding 7 below, which shows the average extra costs to be \$246 per unit.* Climate may also account for some small additional difference in cost between the sample Section 8 and Indian Housing projects, since the Section 8 sample projects are mostly located in Northern California areas with moderate climates. Lastly, since Indian Housing projects are often located in remote areas, construction is more likely to be disrupted due to dirt roads washing out, etc., than in more developed areas. Some such problems were noted in construction reports reviewed for this study and in some instances they may eventually result in change orders that increase project costs.

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^{*}This amount actually overstates the extra costs in the sample projects since many were designed before OIP implemented its new requirements. Currently, there is no difference in costs since MPS insulation requirements have been raised to equal those implemented earlier by OIP.

<u>HYPOTHESIS 5</u>: THAT THE COSTS OF INDIAN HOUSING ARE INCREASED BY INDIAN PREFERENCE BIDDING REQUIREMENTS.

FINDING 5: MEASURABLE EXTRA COSTS ATTRIBUTABLE TO INDIAN PREFERENCE REQUIREMENTS IN GENERAL CONSTRUCTION CONTRACTS ARE NOT SIGNIFICANT.

It was expected that Indian Preference requirements in the Indian Housing Regulations would add extra cost to the program in several ways. First, by providing preference for Indian bidders the regulations were expected to restrict competition from non-Indian bidders and lead to a higher level of bids than might be submitted under a more competitive situation. Second, Indian Preference provisions allow awarding a contract to an Indian bidder even though he might bid as much as 10% more than the low (non-Indian) bidder. Third, Indian contractors as a group were expected to cost more because they were thought to be less experienced, and therefore less efficient, than the average non-Indian contractor. To determine whether these suppositions were accurate, the bidding process in each of the 35 sample projects was examined. The 35 projects in the study sample were or are being built by 23 different contractors. Fifteen of these contractors were building only one project; five were building two projects; two were building three projects; and one had four projects. Seven of the 23 contractors were Indian and six of these were Tribally owned or sponsored. None of the other 16 contracting firms were owned by minorities. Table 4 below shows the distribution of projects among the 23 contractors, and it also shows the average dwelling construction costs per unit for each contractor's projects.

Table 4

Construction Costs by Builders

		Average Dwelling
Builder	Number of Projects	Construction Cost
Evanc	3	\$37 345
Evina	2	407,040 27,200
Ewing	3	37,308
Mannattan	1	37,159
Hunt	1	36,371
Haver	1	34,751
Building Contractors, Inc.	1	33,880
Horak	1	32,861
Quiller	2	32,807
Tibshraeny	1	31,605
Pi-Copa*	1	30,860
Northern Pueblos*	2	30,327
Hinkle	1	29,860**
Harshbarger	1	28,877
Rio Grande	2	28,505
Joseph	2	28,407
Goshute*	1	28,264
Zuni*	2	28,248
Metz	1	27,745
Neumann Caribbean	4	27,244
Moapa Band of Paiutes	1	27,044
White Mountain Anache*	-	26,696
Slavsman	1	26,520
Johns/Farco*	1	17,901
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*Indian firms.

**Median cost.

Table 4 shows that only two of the 11 firms with average dwelling construction costs above the median were Indian firms, while five of the 11 firms below the median were Indian firms. These rankings by themselves do not absolve Indian contractors as a group from contributing extra costs to the Indian Housing program, but they do indicate that any extra cost Indian contractors may contribute is minor compared with other cost factors.

We can also conclude that the cost impact of Indian Preference requirements has been small from the fact that only five of the 35 sample projects utilized Indian Preference bidding procedures. These projects had a total of 132 units or only 9% of the total number of units in the sample. Four other projects were also built by Indian contractors, but these projects were not bid under Indian Preference and the Indian firms were awarded contracts solely on the basis of their being the low bidders.

In the five projects that were bid with Indian Preference there almost certainly were some extra costs, but how much was impossible to determine. For example, in four of the five Indian Preference projects only one bid was received, and it is very likely that lower bids would have been received if the bidding climate had been more competitive.* Yet Table 5 shows the costs of those four projects and suggests that any potential savings would probably have been small.

*See Finding 8.

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<u>Table 5</u>

Project	Percent of Prototype	Average Dwelling Construction Cost
AZ-14-5	109.9	\$30,860
NV-15-3	109.9	28,264
NV-14-3	104.0	27,044
AZ-16-24	94.2	26,696
AZ-15-11	92.8	17,908
Median-All Projects	N/A	\$30,794

Projects Bid Under Indian Preference

The dwelling construction costs on these projects compare favorably with the median cost for all 35 projects of \$30,794, so they do not significantly affect overall costs, if at all. Two of the five did have high prototype percentages, but the dwelling construction cost of AZ-14-5 is slightly less than that of its companion project, AZ-14-4, built by a non-Indian contractor, which cost \$31,605 per unit. No information is available to indicate whether the Goshute (NV-15-3) project was 109.9% of prototype because it was overpriced or because the prototype limit was set unreasonably low.

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Only one project was found to clearly have cost more money due to Indian Preference bidding requirements. That project was one at Gila River, AZ-15-11, and which ironically was the least expensive project in the entire study sample. In that case the project was bid twice. At the first bid opening six bids were received, but the lowest Indian bid was not within 110% of the lowest non-Indian bid, which was \$676,000. Wishing to grant the bid to an Indian contractor, the IHA disqualified the low bidder on a minor technicality. HUD recommended waiving the technicality, but the IHA stalled until all the bids lapsed. They then rebid the project. Naturally, no non-Indian bids were submitted and the low bid received at that time was \$760,000. This was \$84,000 higher than what the project should have cost.

One caveat to this finding should be noted. The data above was accurate at the time construction contracts were awarded on each project. Part of the hypothesis is that extra costs occur due to Indian contractors' lack of experience. Such costs would occur after contract award and might not show up until after data was collected for this report. In fact, there have been some indications that several of the Indian contracting firms have been having serious difficulties completing their work in a timely and satisfactory manner.

- HYPOTHESIS 6: THAT THE COST OF INDIAN HOUSING IS SIGNIFICANTLY INCREASED BY SPECIAL PROVISIONS IN THE INDIAN HOUSING REGULATIONS WHICH ALLOW CERTAIN ITEMS TO BE INCLUDED IN THE DEVELOPMENT COSTS OF INDIAN HOUSING WHICH ARE NOT INCLUDED IN OTHER SUBSIDIZED HOUSING PROGRAMS.
- FINDING 6: SPECIAL PROVISIONS OF THE INDIAN HOUSING REGULATIONS ADD \$1,000 TO THE AVERAGE COST OF EACH INDIAN HOUSING UNIT.

Special provisions of the Indian Housing Regulations authorize inclusion of three items in the Development Cost Budgets of Indian Housing projects that are not included in development costs in other subsidized housing programs. These three items are (1) Homeownership Counseling, (2) a Prepaid Homeowner's Insurance Policy (for three years), and (3) an Alternative Heating System (either a fireplace* or a wood-burning stove).

Homeownership Counseling

Indian Housing Regulations permit a maximum of \$500 per unit to be budgeted for Homeownership Counseling in the Development Cost Budgets of Mutual-Help projects. Twenty-eight of the 35 sample projects were Mutual-Help and each of the twenty-eight had budgeted for Homeownership

^{*}Due to their expense and their inefficiency, OIP is now curtailing installation of fireplaces. See recommendation 3b, page 118 of this report.

Counseling. Twenty-seven projects (918 units) budgeted the \$500 per unit maximum and one project (205 units) budgeted \$200 per unit. In total, \$500,000 was budgeted for Homeownership Counseling or an average of just over \$342 per unit for all of the units in the sample projects (1460 units). Counseling costs will be greater in the future since provision is being made to include counseling programs in rental projects.

No data were available yet on whether the full amount budgeted was actually spent, nor on how effective the Counseling programs have been.

Prepaid Homeowners Insurance

Indian Housing Regulations permit HUD to pay the first three years' premium on a Mutual-Help participant's homeowner's insurance policy. Currently, OIP budgets \$162 per unit as the estimated cost of the homeowner's insurance policy. This amount is included in each Mutual-Help Project's Development Cost Budget. Some of the sample projects had larger amounts included in their Development Cost Budgets because those Budgets were formulated prior to OIP instituting the current formula. However, if we assume the current formula accurately reflects what the policies will actually cost, we can estimate that the total cost for homeowner's policies for the sample projects will be \$181,926 (\$162 times 1,123 Mutual-Help units). This is an average of \$125 per unit for the entire sample (1460 units).

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Alternative Heating Systems

The third unique provision in the Indian Housing Regulations is one which permits installation of alternative heating systems in Indian Housing dwellings. In effect this provision allows Indian Housing units to include either a wood-burning stove or a fireplace if a fuel supply is readily available.

One rationale for this provision is that conventional energy sources (electricity, natural gas, and propane/butane) are frequently interrupted in remote locations and thus a back-up heating system is needed on many reservations. Another rationale is that conventional energy sources are expensive and having a fireplace or wood-burning stove can help a family reduce its reliance on the more expensive conventional heating system. A third rationale is the alleged cultural needs of some tribes.

The average cost of adding either a stove or a fireplace during 1977 was \$600. Thirty-one of the 35 sample projects had one or the other, but by far fireplaces were more popular than stoves. The 31 projects with alternative heating systems contained 1,297 units. The total cost of stoves and fireplaces in these units would approximate \$778,200 (1,297 units times \$600) or \$533 per unit over the entire study sample (1,460 units).

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One measure of the climatic conditions at a site, and thus a measure of the relative heating requirements that a standard house would have in different locations, is "degree days." Degree days are calculated for each project as part of its utility report and are used as one factor in selecting the utility system for a project and in establishing weatherization standards. The highest degree day total was 7,500 for the Goshute project (NV-15-3) and the lowest was 1300 for the Fort Mohave project near Needles (CAL 100-1). The standard cut-off point at which maximum weatherization requirements are invoked is 4500 degree days. Nineteen (19) of the 35 sample projects had degree-day measurements below the cut-off point. Fifteen (15) of these 19 had fireplaces or wood-burning stoves. Ten (10) projects had degree-day measures below 3000. Seven (7) of these 10 included a fireplace.

The price of fireplaces varied widely among projects. The most expensive were masonry fireplaces at the Santa Ana Pueblo, \$1,300 each, and at Isleta, \$1,200 each. The least expensive were very close by in Jemez Pueblo at \$268 each. The most expensive projects generally had moderately priced fireplaces with the exception of San Ildefonso, which had fireplaces that cost \$716 each. The most expensive project, the Fort Mohave project near Needles, California, did not have fireplaces.

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<u>HYPOTHESIS 7</u>: THAT SPECIAL DESIGN STANDARDS OF THE OFFICE OF INDIAN PROGRAMS INCREASE THE COST OF INDIAN HOUSING UNITS OVER THE COST OF BUILDING TO MINIMUM PROPERTY STANDARDS.

FINDING 7: SPECIAL DESIGN STANDARDS OF OIP INCREASE THE COST OF BUILDING EACH INDIAN HOUSING UNIT BY \$1,422.

OIP has issued a five-page list of special design requirements applicable to Indian Housing projects to ensure that homes built for Indians are durable, energy efficient, and adaptable to the long-range housing needs of Indian families. These requirements include 26 items applicable to all dwelling units, one item applicable to non-dwelling structures, four items applicable to elderly units, and five items applicable to site improvements. PP&E reviewed the 26 general dwelling unit provisions* with a OIP Cost Analyst, and it was determined that 15 of these provisions created additional costs over what would otherwise be required by HUD's Minimum Property Standards for Single Family Construction. One of these items, "Stoves/Fireplaces," was discussed under the previous finding concerning Indian Housing Regulations. The costs of the other 14 items were estimated for their cost impact on a three-bedroom standard prototype home. The total cost of the 14 provisions was just over \$1,400. Table 6 lists the 14 provisions and shows their individual costs.

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^{*}The cost of four elderly housing items was not estimated since Region IX has produced few elderly Indian Housing units.

Table 6

OIP Quality Design Standards

	REQUIREMENTS	ADDITIONAL COST OVER MPS*
1.	Sheet Vinyl-Minimum Thickness .070"	\$ 50
2.	Vinly Asbestos Tile - Minimum Thickness	322
3.	3/32" Vanities; Higher Quality Lavatories	120
4.	Higher Quality Kitchen Sinks	33
5.	Higher Quality Bathtubs	33
6.	Wider Closets	63
7.	Higher Insulation Requirements **	246
8.	Fiberglass Sill Sealer	141
9.	Larger Refrigerators	50
10.	Heavy Duty Drapery Hardware	75
11.	Provision for Replacement of Shower/ Bath Valves	50
12.	Water Hammer Arrestors	75
13.	Pre-wiring for Television/Telephone	50
14.	Design for Future Expansion (Extra Heating Capacity)	114
	TOTAL	<u>\$1,422</u>

*For a Three-Bedroom Standard Prototype Dwelling

**Subsequent to OIP special design requirements, HUD has now upgraded the MPS
to equal these standards.

<u>HYPOTHESIS 8</u>: THAT THE COST OF INDIAN HOUSING HAS BEEN INFLATED BY MANY INSTANCES OF POOR BIDDING CLIMATES.

FINDING 8: MOST INDIAN HOUSING PROJECTS HAVE BEEN BID UNDER UNFAVORABLE CIRCUMSTANCES. POOR BIDDING CLIMATES ADD APPROXIMATELY \$1,565 TO THE COST OF EACH INDIAN HOUSING UNIT.

A poor bidding climate can be created through a great variety of factors. The following are alleged reasons why many Indian Housing projects encounter poor bidding climates:

- Potential bidders are frightened away from bidding on projects located on Indian reservations because they are not protected there by state mechanics lien laws. Therefore, if a dispute should arise, they would be dependent on Tribal courts to resolve it. Most contractors are not familiar with Tribal procedures and as "outsiders" fear the possibility of unfair treatment.
- Some Indian Housing Authorities have poor reputations for contract management from previous projects. Many contractors do not want to take a chance on dealing with them.

- 3. Contractors with many regular employees that are paid less than the established Davis-Bacon Wage rates do not want to disrupt employer-employee relations by paying them higher wages only for the duration of the HUD-funded job.*
- Many contractors do not want to be bothered with Indian hiring requirements.
- Many contractors do not want to bid on an Indian Preference project where potential Indian bidders are granted a 10% price advantage.
- 6. Construction in Arizona and New Mexico is booming. Contractors have all the work they can handle in town and don't want to be bothered with small jobs in remote locations.
- 7. EDA has been pouring money into many cities and reservations for large public works contracts. Contractors willing to bid on Federal projects are more attracted to EDA projects than to HUD projects.

^{*}For more discussion on Davis-Bacon Wage rates, see: United States General Accounting Office, <u>Davis-Bacon Act Should Be Repealed</u>, HRD-7918, April 27, 1979, 276 pages.

- 8. OIP requires contractors to guarantee their bids for 60 days, but many subcontractors and suppliers will not hold their prices for more than 30 days, and sometimes no more than 14 days.
- Concrete and insulation shortages have discouraged many contractors from bidding on "marginal" projects.
- 10. Many Indian Housing projects have to delay bids until after new prototype costs are published in June of each year. By then the prime bidding period has passed and many contractors are already too busy to bid on further work.

PP&E did not investigate the bidding circumstances of each project, so no conclusions are presented here as to causes of poor bidding climates in specific instances. However, file reviews did support the contention that Indian Housing projects often face poor bidding climates.

Only 18 of the 35 sample projects were successfully bid on the first attempt. In seven of these 18 projects only one bid was received. In five instances only two bids were received. In two cases three bids were received and in four cases four bids were received. The accepted bids on the seven projects with only one bid each averaged 9.3% higher than the pre-bid estimates; on the five with two bids each, 26.1% higher; on the two with three bids each, 24.8% higher; for all 14 with three or less bids, 17.5% higher. The accepted bids for the four projects which received four bids each exceeded the pre-bid estimates by only 0.5%. These figures indicate that the 14 projects with less than four bidders faced a poor bidding climate.

Ten projects had to be bid twice before contracts could be awarded. In six of these ten rebids, no bids had been received on the first attempt. In three cases, between one and three bids were submitted on the first attempt, but all had been unacceptable. In the tenth instance, six bids were submitted originally, but the IHA let all six lapse because the lowest Indian bidder was at more than 110% of the lowest non-Indian bidder.* On rebidding, eight of the ten projects received between one and three bids, and two received four bids. The accepted bids in the eight projects averaged 11.2% above the pre-bid estimates. The lowest bid on the other two projects with four bids each averaged 1.9% less than the pre-bid estimates.

The other seven projects in the sample had to be put out to bid three times before contracts could be successfully awarded. Six of these seven were a related group of projects being developed by the All Indian Pueblo's Housing Authority that were bid all at once. Five

*This case is discussed in greater detail in Hypothesis 5 above.

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different contractors submitted bids on various combinations of the six projects. The winning bids averaged 2.1% <u>less</u> than the pre-bid estimates. The seventh project also received five bids, the lowest being only 3.1% above the pre-bid estimate.

The above analysis strongly suggests that on one or more occasions 31 of the 35 sample projects were put out to bid under unfavorable circumstances. In at least 22 instances contracts were awarded despite the unfavorable bidding climate. In these 22 instances, the actual contract awards exceeded the pre-bid estimates by \$4,570,652.

It would be impossible to determine precisely how much of this amount is attributable to poor bidding climates causing contractors to "pad" their bids. It may be reasonable to presume that half is due to poor bidding climates and that half is attributable to other factors. Such factors would include poor estimating by some architects, some pre-bid estimates becoming outdated prior to opening of bids, sudden material or labor shortages developing just prior to receipt of bids, or last minute increases in Davis-Bacon Wage Determinations. On that presumption, about \$2,285,000 would be the estimated total extra cost causes by poor bidding climates. There were 922 units in the 22 projects effected by poor bidding climates so the per unit cost would be \$2,478. The extra cost per unit for each of the 1460 units in the entire sample would be \$2,285,000 divided by 1460, or \$1,565.

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- <u>HYPOTHESIS 9</u>: THAT THE COSTS OF INDIAN HOUSING ARE SIGNIFICANTLY INFLATED BY DESIGN FEATURES THAT ARE NOT ESSENTIAL TO THE LIVEABILITY OF THE DWELLINGS.
- FINDING 9: THE COSTS OF THE SAMPLE INDIAN HOUSING PROJECTS WERE INCREASED BY AN AVERAGE OF \$3,916 PER UNIT TO PROVIDE FOR NON-ESSENTIAL AMENITIES.

Preliminary research indicated that many Indian Housing projects included certain design features which were desirable, but not essential to their liveability. Some of the most frequently encountered and/or most expensive items identified were the following:

- 1. Adobe walls
- 2. Solid masonry walls
- 3. Masonry veneer walls
- 4. Cathedral ceilings
- 5. Shake roofs
- 6. Carports and garages
- 7. Outdoor barbecues and cooking pits
- 8. Landscaping
- 9. Clothesline poles and garbage can holders

Adobe Walls

Adobe buildings are highly desired by many Southwest Indians due to cultural and historical factors. However, few adobe structures have been built under HUD's Indian Housing programs recently because HUD's building standards drive the costs of adobe wall construction above permissible prototype cost limits. OIP cost data show that in 1977 adobe wall construction in the Albuquerque area cost \$4.80 per square foot versus \$2.40 per square foot for conventional wood frame construction.

Only one of the 35 sample projects was built with adobe block walls -- the Northern Pueblos project at San Ildefonso. This project originally began construction in 1974, but the contractor defaulted during construction. It was restarted in 1977. By excluding the costs of construction put in place by the defaulted contractor, as directed by Central Office, OIP was able to rebid the remaining work and stay within allowable prototype limits. If the incurred costs had been included in the prototype calculation, the project would have been infeasible to complete since including them would have made total DC&E costs equal 129.5% of its prototype costs. It is unlikely that future projects will be built with adobe by OIP unless there is a major cost modification in the use of this material.*

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^{*}For a further discussion of the issues involving adobe construction, see PP&E's study entitled, "Building with Adobe: An Analysis of Proposed Research and Related Bibliography," August 1978.
Although extremely expensive, the San Ildefonso project had only a minor impact on the average cost of the total sample because it contained only 18 houses. The three-bedroom house had approximately 1500 square feet of exterior wall. Multiplying this by the \$2.40 a square foot cost difference between adobe and wood frame walls results in a minimum extra cost of adobe construction of \$3,600 per unit or \$64,800 for the whole project. This amount added just over \$44 to the average cost of each of the 1460 units in the study sample.

Masonry Walls

A design feature that is strongly desired by Indians in Arizona is masonry walls. Out of 15 sample projects located in Arizona, eight (8) had solid masonry walls and six (6) had masonry veneer walls. One project in Nevada also had solid masonry walls. Perhaps due to their popularity in Arizona the cost difference between solid masonry walls and wood frame with stucco is estimated by the Cost Analyst in the Phoenix Service Office to be only \$200 for a typical three-bedroom house there. No similar estimate is available for Nevada, but a comparison of the costs of the Moapa River project on Table 7 below with the costs of the eight Arizona projects indicates that its masonry walls are the least costly. Therefore, the same cost difference of \$200 can probably be postulated without significantly under-estimating the difference. The total extra costs for solid

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<u>Table 7</u>

Projects With Solid Masonry Walls

Project No.	Location	Units	Dwelling Construction	Masonry Per Unit	Masonry Total
AZ-26-8	Popago - Pisinimo	10	\$34,751	\$5762	\$57,618
AZ-26-9	Popago - Topowa	15	34,032	4933	74,000
AZ-14-4	Salt River - Scottsdale	89	31,605	N/A	N/A
AZ-14-5	Salt River - Scottsdale	28	30,860	3573	100,047
AZ-19-3	Ft. McDowell	6	29,043	5643	33,858
NV-14-3	Moapa River	10	27,044	3299	32,991
AZ-11-9	San Carlos	34	26,520	3435	116,790
AZ-15-9	Gila River	49	23,270	4122	202,000
AZ-15-11	Gila River	30	17,908	3800	114,000
Total		271			
	Sample Average		\$31,027		

masonry walls can thus be estimated at \$200 times the 271 units in all nine (9) projects, or \$54,200. For all 1460 units in the sample projects, this represents an average cost of \$37 per unit.

Masonry Veneer Walls

Another design feature that was included in a large number of units was masonry veneer siding. As shown in Table 8 below, nine projects with 480 units enjoyed masonry veneer siding. Eight of these projects with 380 units were on the Navajo Reservation, and the other 100 units were on the Zuni Reservation. The average cost of the masonry veneer work for all 480 units was \$2,166 per unit.* Partially offsetting the costs of the masonry siding was an estimated savings on stucco of approximately \$460 per unit, resulting in a net extra costs of \$1,706 per unit. This equals a total extra cost of \$818,880, or \$560 per unit for all units in the sample. Neither solid masonry nor masonry veneer walls are being permitted currently by OIP due to their extra costs.

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^{*}This figure does not include a \$37,000 donation of rock provided by the Zuni Tribe to offset some of the extra costs incurred for their project.

Table 8

		No. of	Masonry V	leneer Cost
Project No.	Location	Units	Per Unit	: Total
AZ-12-42	Navajo	60	\$2,740	\$164,400
AZ-12-43	Navajo	45	2,740	123,300
AZ-12-44	Navajo	20	1,935	38,700
AZ-12-46	Navajo	25	1,935	48,375
AZ-12-47	Navajo	20	2,740	54,800
AZ-12-48	Navajo	10	1,935	19,350
NM-15-31	Navajo	50	2,000	100,000
NM-15-32	Navajo	150	2,000	300,000
NM-19-7	Zuni	100	1,909	190,855
Total		480	(Avg.) \$2,166	\$1,039,780

Projects With Masonry Veneer Siding

Cathedral Ceilings

Two projects were designed with cathedral ceilings rather than with standard-pitch roofs and flat ceilings. These projects were NM-12-6 at the Laguna Pueblo, and NV-14-3 at the Moapa River Reservation. The Laguna ceilings were the more elaborate and included clerestory windows. The cost of these ceilings was examined by an OIP Cost Analyst and determined to exceed standard construction by \$700 per unit. The Moapa ceilings covered only the living room area of the

.

houses and were estimated to cost \$325 per unit more than standard ceilings. With 205 units in the Laguna project and 10 units in the Moapa project the total extra costs of cathedral ceilings was \$146,750, or \$101 extra for each sample unit.

OIP no longer permits cathedral ceilings.

Shake Roofs

Wood shake roofs were permitted in three projects rather than standard asphalt composition or tar and gravel roofs. These projects were NV-15-3 at Goshute, Nevada; NV-14-3 at Moapa, Nevada; and NV-16-2 at Te-Moak, Nevada. The average cost of each shake roof was estimated by an OIP Cost Analyst as being \$500 higher than a standard design roof. The total number of units in the three projects was only 35, however, so the total extra cost incurred was insignificant.

OIP is now prohibiting wood shake roofs due to cost constraints.

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Carports/Garages

Another special provision of the Indian Housing Program is that individual carports, and in some instances garages, are now permitted. Before 1974 they were not generally permitted and earlier projects almost always provided only uncovered parking pads. However, 23 of the 35 sample projects had carports and three others had garages.

Cost data were available for 12 of the 26 projects which included one or the other. The per unit cost on these 12 projects ranged from \$1,500 at. White Mountain to \$5,500 at Fort Mohave. The average per unit cost for nine projects having carports (554 units) was \$2,838.* The average per unit cost of garages was \$2,858 (133 units). Average cost for the two together was \$2,842 per unit.

The total costs of carports and garages can be estimated by extrapolating the known costs to the remaining projects without cost data. The total number of units in the 26 projects with garages and carports was 1337. Multiplied by the twelve-project average cost of \$2,842 gives a total cost of \$3,799,754 for carports and garages. This amount equals \$2,603 per unit for each of the 1460 units in the study sample.

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^{*}Includes cost of extra storage space as well where indicated on Table 9.

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<u>Table 9</u>

Cost of Carports and Garages

l		No. of	Carport/Gar	age Costs
Project No.	Location	Units	Per Unit	Total
	r			
AZ-11-9	San Carlos	34	\$2,411	\$ 81,970
AZ-12-42	Navajo	60	N/A	Í N/A
AZ-12-43	Navajo	45	N/A	N/A
AZ-12-44	Navajo	20	N/A	N/A
AZ-12-46	Navajo	25	N/A	N/A
AZ-12-47	Navajo	20	N/A	N/A
AZ-12-48	Navajo	10	N/A	N/A
AZ-14-4	Salt River	89	2,484	221,038
AZ-14-5	Salt River	28	2,665	74,615
AZ-15-9	Gila River	49	N/A	N/A
AZ-15-11	Gila River	30	N/A	N/A
AZ-16-24	White Mountain	45	1,500	67,500
AZ-19-3	Ft. McDowell	6	N/A	N/A
AZ-26-8	Papago	10	1,780	17,800*
AZ-26-9	Papago	15	2,144	32,167*
CA-80-6	All Mission	78	2,939	229,243
CA-97-1	Round Valley	41	2,633	107,941**
CA-97-2	Round Valley	29	2,354	68,266**
CA-100-1	Ft. Mohave	50	5,550	277,531*
NV-4-3	Pyramid Lake	75	N/A	N/A
NV-14-3	Моара	10	N/A i	N/A
NM-12-6	Laguna	205	2,783	570,430*
NM-13-4	Mescalero	63	3,237	203,930**
NM-15-31	Ojo Amarillo	50	N/A	N/A
NM-15-32	Ojo Amarillo	150	N/A	N/A
NM-19-7	Zuni	100	N/A	N/A
Total		1337	N/A	N/A

*Includes cost of extra storage.

**Garages.

Barbecues/Cooking Pits

Outdoor built-in barbecues or cooking pits were proposed for all projects on the Navajo Reservation plus for another four projects elsewhere. They were deleted from three of the eight Navajo projects at the last minute, however, due to cost overruns. Outdoor barbecues, while desirable for social functions and as an alternative means of cooking to save on utility bills, are an amenity provided by only four of the 19 Housing Authorities included in the sample. They are also an item which could be built by the homeowner or long-term tenant.

Cost data were available only for the Navajo projects and the Fort Mohave project.* The average per unit cost of barbecues and cooking pits in these six projects was \$572. Multiplying this average cost by the 467 units in all nine projects provided with these facilities gives a total estimated cost of \$267,124. This amount is equivalent to \$183 extra for every unit in the sample.

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^{*}Communal grills plus benches, tables and trash receptacles were provided to serve all 50 units at Fort Mohave.

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TABLE 10

Cost of Outdoor Barbecues and Cooking Pits

		No. of	Barbecue/Cook	ing_Pits_Costs
Project No.	Location	Units	Per Unit	Total
CA-100-1	Fort Mohave	50	\$918	\$42,000
AZ-12-44	Navajo	20	520	10,400
AZ-12-46	Navajo	25	520	13,000
AZ-12-48	Navajo	10	520	5,200
AZ-14-4	Salt River	89	N/A	N/A
AZ-14-5	Salt River	28	N/A	N/A
AZ-16-24	White Mountain	45	N/A	N/A
NM-15-31	Ojo Amarillo	50	520	26,000
NM-15-32	Ojo Amarillo	150	520	78,000
 Total	· · · · · · · · · · · · · · · · · · ·	467	N/A	N/A

Landscaping

Landscaping (lawns and plantings) is another cost which must be classified as an amenity except under very unique circumstances. While landscaping certainly enhances the attractiveness of a house, it is not normally essential to the liveability of a unit. Further, it is something that a mutual-help participant, or even a tenant, could provide personally and at less expense if he so desired.

Some form of landscaping was provided for 814 units in 17 of the 34 projects for which information was available.* The total costs of landscaping these units was \$453,135** or almost \$557 per unit actually landscaped. This total equals an average cost of landscaping per unit for all 1371 units in the sample for which data is available of \$330.

OIP is allowing landscaping in very few projects.

******This total may include some minor costs for common area landscaping.

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^{*}No contractor's cost breakdown could be found for AZ-14-4 at the Salt River Reservation. This project's 89 units are deducted from some calculations, leaving a net sample of 1371 units in 34 projects, when that breakdown was the only source of information available as to the presence of a particular item.

Clothesline Poles and Garbage Can Holders

Two minor items actually required by Minimum Property Standards are outdoor clothesline poles and garbage can holders. Clothesline poles are of course useful since many low-income persons may not have dryers. Nine projects with 576 units out of 34 sample projects for which information was available had clothesline poles. The average cost of the clothesline poles was just under \$66 per unit.

Garbage can holders were installed in 10 projects with 541 units. The holders are provided in order to help control litter by making it difficult for dogs and children to knock over garbage cans. The average cost of the garbage can holders was just under \$77 per unit.

The two items together added almost \$58 to the cost of each unit in the total sample.*

Six of the 14 most expensive projects in the sample (those with total development costs over \$58,000 per unit) included clothesline poles. Eight of the 14 most expensive projects included garbage can holders. Five included both items.

*Based on 1371 units for which information was available.

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The extra costs of these requirements are relatively small, but PP&E questions whether they are really essential. People who want and need them could provide them for themselves at very little expense.

Summary

Totaling all of the above per unit costs gives the following result:

Design Feature	Average Cost Per Incidence	Average Cost Per Sample Unit
Adoba walls	\$3600	\$ 11 /unit
Solid maconny walls	200	9 44./UIIIL 97
Macanny watts	1706	560
Masonry veneer walls	1708	500.
Catheoral ceilings	683	101.
Shake roof	500	N/A
Carports and garages	2842	2603.
Outdoor barbecues & cooking pits	572	183.
Landscaping	557	330.
Clothesline poles & garbage can holders	143	58.
TOTAL		\$3916.

It must be noted that this list is not exhaustive, and that if time had been taken to estimate the cost of numerous other items for which cost data were less readily available (such as covered patios, basketball courts, roofline variations, extra breaks and insets in exterior walls, exterior trim, site fencing, sprinkler systems, and cattleguards), the average cost per sample unit above would probably be several hundred dollars higher.

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HYPOTHESIS 10: THAT A MAJOR FACTOR IN THE HIGH COST OF INDIAN HOUSING IS OIP'S HEAVY CONCENTRATION ON BUILDING SINGLE FAMILY DETACHED HOUSES.

FINDING 10: DURING THE 15-MONTH STUDY PERIOD, OIP NEW CONSTRUC-TION STARTS TOTALLED 1,460 DWELLING UNITS. ALL BUT 30 OF THESE UNITS WERE SINGLE FAMILY DETACHED HOUSES. OIP COULD PROBABLY HAVE SAVED AT LEAST \$3,300 PER UNIT IF IT HAD BUILT ROW HOUSES INSTEAD OF DETACHED HOUSES - ALTHOUGH SUCH A POLICY WOULD BE IN OPPOSITION TO CULTURAL PREFERENCES.

In keeping with the very strong preferences of Indian participants in OIP's programs, the vast majority of OIP's funds go to build single family detached houses on lots as large as three acres. During the period under study, October 1, 1976 to December 31, 1977, OIP's new construction starts totaled 1,460 dwelling units. Of these, 1,430 were single family detached homes and 30 were semi-detached duplexes. As a general rule detached and semi-detached construction is more expensive than other types of construction potentially suitable for families on Indian Reservations -- row dwellings and walk-up apartments.* This fact is demonstrated on Table 11.

^{*}High-rise elevator structures are the most expensive form of construction. They are not discussed here, however, because they are clearly inappropriate to rural areas, and HUD policy discourages high-rise apartments for families.

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<u>Table 11</u>

TYPE OF STRUCTURE COST COMPARISON

	California		Nevada		Arizona		New Mexico	
Prototype Costs	3 Bedroom	4 Bedroom	3 Bedroom	4 Bedroom	3 Bedroom	4 Bedroom	3 Bedroom	4 Bedroom
<u>State</u>	{						ί.	
Median Price Detached *Units	\$21,200	\$25,450	\$27,350	\$32,750	\$26,525	\$31,950	\$25,000	\$30,300
Same Area Row Unit	26,300	31,750	26,100	31,250	23,175	27,850	20,600	24,700
Same Area Walkup Unit	27,700	31,950	23,550	27,350	22,575	24,975	19,000	22,100
<u>1HA</u>								
Median Priced Detached Unit	34,300	37,950	29,600	35,350	28,375	34,175	29,575	35,550
Same Area Row Unit	25,300	26,550	28,250	33,650	24,150	29,350	27,450	33,150
Same Area Walkup Unit	22,250	24,050	25,650	29,650	22,550	26,325	24,900	29,150

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Table 11 shows the median prototype costs in June 1977 for three- and four-bedroom units of differing design categories in each state.

The upper three rows show the median of all prototype areas in each state. The lower three rows show the medians of just those prototype areas in each state which contain Indian Housing Authorities. For example, the State of New Mexico was divided into 27 prototype areas. The median cost prototype area was Silver City where the prototype cost of a three-bedroom detached or semi-detached house was \$25,000 (and \$30,300 for a four-bedroom). The prototype cost of a threebedroom row dwelling in the Silver City prototype area was \$4,400 less at \$20,600, and a walk-up dwelling was \$6,000 less at \$19,000.

Prototype costs followed similar patterns in almost every other prototype area except for some in California where the prototype cost of row units and walk-up units were set at higher levels than single family detached dwellings. However, PP&E believes that the prototype costs in these instances are somewhat in error. It is inconceivable that an apartment would cost more to build than a house and these same areas in 1976 did have higher costs for single family detached dwellings than for row and walk-up units.

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PP&E used the 1977 prototype figures to <u>estimate</u> the savings that might be realized if OIP funded more row and walk-up units and fewer detached homes. The PP&E estimate is based on a comparison of the prototype costs of building all detached units versus building all row units.*

During the study period new construction starts were distributed as follows:

California	•	•	•	•	•	•	•	•	198
Nevada	•	•	•	•	•	•	•	•	110
Arizona	•	•	•	•	•		•	•	486
New Mexico	•	•	•	•	•	•	•	•	666
			T()T/	۹L				1460

The dwelling construction costs** of these units averaged \$27,243 per unit in California; \$27,982 per unit in Nevada; \$31,876 in Arizona; and \$32,178 in New Mexico. In order to estimate the cost of building

^{*}Row units are a more likely substitute for detached houses than walk-up apartments on Indian reservations.

^{**}Dwelling construction costs include only those construction costs attributable to the house itself. That excludes the costs of site improvements, equipment, administration, interest, community space, land, and contingencies. Costs are those shown on the latest Development Cost Budget for each project.

the same number of row units, PP&E determined the ratio between each state's median prototype costs for detached dwellings and its median for row dwellings. Since most Indian Housing units are three- and four-bedroom units, PP&E calculated the ratio using the average costs of a three-bedroom and a four-bedroom unit in each state and in each dwelling-type category. The results were that California's median cost for a row unit was 124% of that of a detached unit; Nevada's was 95%; Arizona's was 87%; and New Mexico's was 82%. Applying these ratios to the average dwelling construction costs in each state and proportionally weighting each state's figures resulted in an average Region-wide savings of \$3,346 per unit for row units over detached units.

That figure is, of course, only a rough estimate of the extra cost of detached units over row units. However, it is a very conservative estimate. First, it does not include savings in site improvement costs which would undoubtedly occur in a row-house project; and second, it is calculated using California prototype costs which are undoubtedly in error. It surely costs 10 to 20% less to build row houses in California than to build detached units -- not 24% more as indicated in HUD prototype figures.

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It would be impossible to build only row-house and apartment projects on Indian reservations due to many obstacles, so the full potential savings will never be realized. Besides cultural preferences the major hindrance is the trust status of land on most reservations. In addition, a great amount of land on most reservations is already allotted or assigned to individual families. This makes land assemblage for a condominium or Planned Unit Development (PUD) style project extremely difficult, if not impossible, on many reservations. However, the possibility of building at greater densities should be explored in every project and some situations may be found where townhouse and PUD projects are feasible.

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HYPOTHESIS 11: THAT PROJECTS WHICH ARE DEVELOPED AS SUBDIVISIONS HAVE HIGHER SITE IMPROVEMENT COSTS BUT LOWER DWELLING CONSTRUCTION COSTS THAN PROJECTS BUILT ON SCATTERED SITES.

FINDING 11: PROJECTS BUILT AS SUBDIVISIONS HAVE HIGHER SITE IMPROVEMENT AND HIGHER DWELLING CONSTRUCTION COSTS THAN SCATTERED SITE PROJECTS, WITH SITE IMPROVEMENTS ALONE AVERAGING \$3,136 HIGHER PER UNIT.

It was presumed that projects planned in a standard subdivision configuration would cost HUD more for site improvements than projects planned for scattered sites. This assumption was partially based on the provisions of a new Inter-Agency Agreement between HUD, BIA, and IHS, which put a greater cost burden on HUD for subdivision projects than was previously the case.* Under the new Agreement, HUD assumed responsibility for all roads and for water and sewer lines within

^{*}In a typical Indian Housing project the Indian Health Service provides potable water and sanitary facilities, and the Bureau of Indian Affairs provides access roads. An Inter-Agency Agreement guides each agency in determining its funding responsibilities under varying circumstances. Numerous misunderstandings among the three agencies led to a recent re-negotiation of the Agreement in March 1976. The new Agreement has resulted in improved planning and budgeting coordination among the agencies, but it has also had the effect of shifting some costs to HUD which had previously been paid by IHS and BIA.

subdivision boundaries. BIA retained responsibility for providing access roads to each subdivision and to scattered site units and IHS retained responsibility for off-site hook-ups to community water and sewer systems.

Upon analysis, the original hypothesis concerning site improvement costs proved to be correct. The 35 sample projects were sorted according to type of development. Twenty of the projects were planned with all units in subdivisions. Another three projects included both subdivision units and scattered site units, but a majority of the houses located in subdivisions. The average project cost of site improvements was \$10,922 per unit in these subdivision projects. The average project cost of site improvements per unit for the other 12 scattered-site projects (eight exclusively scatteredsite and four mixed with a majority of the units being on scattered sites) was only \$6,698. The difference was \$4,224 per unit or a cost savings to HUD of 39% in scattered-site projects.* The total extra cost of site improvements for all 1,084 subdivision units was \$4,578,816, which was equivalent to \$3,136 extra per each of the 1460 units in the total sample.

*The costs to BIA and IHS could not be determined from OIP's files.

Site improvement costs (to HUD) ranged from a high of \$20,742 per unit in the Fort Mohave project (CAL-100-1), a 50-unit subdivision near Needles, to a low of \$2,313 in the All Indian Pueblos project at Santa Ana (NM-31-37), a five-unit project on scattered sites. The median site improvement costs were \$9,655 per unit in the Te Moak Western Shoshone project near Southfork, Nevada (NV-16-2). Only two scattered-site projects had site improvement costs above the median. On the other hand, six of the seven projects in the lowest quintile (20%) of site improvement costs were scattered-site.

While site improvement costs were expected to be highest in subdivision projects, it was also expected that some of those costs would be offset by lower dwelling construction costs. The assumption was that houses would be less expensive to construct in a subdivision where greater efficiency can be achieved compared to scattered-site construction. This expectation was not realized, however. The average project dwelling construction costs per unit were larger in subdivision projects than in scattered-site projects, \$31,890 versus \$29,293, a difference of \$2,597. Either there were no efficiencies actually realized through subdivision construction or any savings through increased efficiency were offset by other cost factors.

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The project average site improvement costs for all types of development was \$9,474 per unit. No comparable data were available for the average FHA sales home, but the project average site improvement costs in the Section 8 sample was only \$2,156 per unit, or \$7,318 less. Three of the Section 8 projects were row-house projects rather than walk-up apartments. The average site improvement cost in these three projects was slightly higher than for all 15 projects, but still only \$3,312 per unit. This is indicative that large savings could potentially be realized if more Indian Housing projects were built as townhouses. <u>HYPOTHESIS 12</u>: THAT THE COSTS OF INDIAN HOUSING ARE SIGNIFICANTLY INCREASED BY LARGE DWELLING SIZES.

FINDING 12: INDIAN HOUSING COSTS ARE INCREASED BY APPROXIMATELY \$8,000 DUE TO LARGER BEDROOM SIZED UNITS, AND AN ADDITIONAL \$2,720 DUE TO EXCESSIVE SQUARE FOOTAGES.

Dwelling unit size affects the costs of the Indian Housing Program in three ways. First, the Indian Housing Program in Region IX mainly provides dwellings for large families. Out of the 1460 sample units, just 10 had only one bedroom, and only 21 had two bedrooms. Fortysix percent of the sample, or 675 houses, had three bedrooms; 35%, or 521 houses, had four bedrooms; and 16%, or 233 houses, had five bedrooms. The average number of bedrooms per unit was 3.65.

These unit sizes contrast sharply with the sample Section 8 new construction family projects utilized for comparison in this study. Out of that sample of 15 projects with 1435 dwelling units, only 25 units had three bedrooms. Twelve units were studios*, 934 had only one bedroom, and the other 456 had only two bedrooms. The average

*One project included both family and elderly units.

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Section 8 unit had only 1.34 bedrooms. This two-bedroom difference in the average bedroom sizes of the Indian Housing and Section 8 programs accounts for about \$8,000 of the difference in their average costs according to 1977 prototype figures.* It should be noted that the larger number of bedrooms per unit found in the Indian sample is related to larger households served.

Second, dwelling unit size has some effect on cost variances within the Indian Housing sample projects. Almost 59% of the houses in the seven** most expensive sample projects (in terms of dwelling construction costs) had four and five bedrooms. Forty-nine percent of the units in the middle seven projects and only 42% of those in the least expensive seven projects had four and five bedrooms.

It was not possible to estimate precisely how much of an effect this proportional variation in bedroom sizes had on costs. It is likely, however, that the high proportion of large bedroom-sized homes accounts for between \$1,000 to \$2,000 of the high average dwelling construction costs of projects on the Navajo***, Zuni, and Laguna Reservations.

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^{*}Based on the average cost difference between two- and four-bedroom houses in the Albuquerque and Phoenix prototype areas. **i.e. in the top 20% of the sample. ***Arizona side only.

A further example of the impact of bedroom size on costs is the two sample projects at Gila River. One project has all three- and fourbedroom units and average dwelling construction costs per unit are \$22,781. The other project has all one- and two-bedroom units, and its average dwelling construction costs are only \$17,901 per unit.

Third, Indian Housing costs are increased by excessive square footages. Prototype costs are based on the costs of constructing a standard, modest, but adequate unit in different locations. The standard prototype model used in Region IX to establish prototype costs has approximately 1180 square feet in its three-bedroom version, 1310 square feet in the four-bedroom version, and 1450 square feet in the five-bedroom version. The three-bedroom units in only eight sample projects had square footages which fell within 105% of the prototype guide. The four-bedroom units in only six projects, and the five-bedroom units in only three projects had square footages which fell within 105% of their respective prototype guides.

The three-bedroom units in the sample ranged in size from 1100 square feet to 1522 square feet. The average was 1261 square feet, or 81 square feet larger than the prototype guide. The four-bedroom units ranged from 1300 to 1708 square feet. The average was 1481 square feet, or 171 square feet more than the prototype guide.

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Such wide variations in unit size are unnecessary and unjustifiable. The variation among five-bedroom units is over 600 square feet even though they are all presumably serving similar sized families.* Out of the five Housing Authorities with the highest construction costs, only Zuni had any unit sizes that did not exceed prototype guides. One tribe, Laguna, enjoyed the largest sized units in each bedroom category with sizes exceeding the next largest by over 100 to 200 square feet.

Some indication of the extra costs incurred by HUD due to excessive square footages can be gained by multiplying the extra space by its cost per square foot. The average extra square footage for all three-, four-, and five-bedroom units was 136**. The average dwelling construction costs per square foot in the sample was \$23.80. Since this figure includes the expensive square foot costs of the bathrooms and kitchens, a more conservative figure of \$20.00 per square foot better approximates just the cost of the extra space. At that price, the extra costs created by the extra space allowed by OIP averaged \$2,720.00 per unit.

^{*}Some tribes try to obtain extra square footage knowing that many of their participants intend to house other relatives in addition to the nuclear families that the units are ostensibly being designed for.

^{**}This figure ignores the 31 one- and two-bedroom units which are too few to be significant in this comparison.

<u>HYPOTHESIS 13</u>: THAT DWELLING CONSTRUCTION AND EQUIPMENT COSTS ARE UNDER-ESTIMATED AND OTHER COSTS ARE OVER-ESTIMATED IN ORDER TO EVADE PROTOTYPE COST LIMITS.

FINDING 13: SOME ARCHITECTS HAVE PROBABLY MANIPULATED THEIR COST ESTIMATES IN ORDER TO MAKE THEIR PROJECTS APPROVABLE.

A previous study of Indian Housing costs in Region IX noted a curious coincidence of site improvement costs tending to be high in the same projects that had high dwelling construction costs. The author suspected that many architects who designed expensive projects were deliberately allocating dwelling construction costs, which are controlled by HUD prototype cost limits, to the site improvements category, which is not so controlled, in order to make their projects financially feasible. PP&E tested this theory and found that it appears accurate.

In order to ensure that projects do not exceed allowable prototype limits, HUD requires that project architects cost out their designs on Form HUD-52396, "Analysis of Proposed Main Construction Contract." This form provides spaces to allocate estimated project costs among five categories: site improvements, dwelling structures, dwelling equipment, non-dwelling structures, and non-dwelling equipment. The dwelling structures and dwelling equipment cost categories are limited to 110% of published prototype costs, while the other three categories are not limited by either statute or regulation. One might easily imagine, under these circumstances, the temptation any architect must feel to propose a well designed house, and if dwelling construction and equipment costs run over allowable prototype costs, to allocate enough costs to the uncontrolled categories to make the design acceptable to HUD. The temptation is especially acute in the many instances when prototype limits are unrealistically low, since the administrative machinery to revise published prototype figures is extremely slow and cumbersome.

In order to prevent errors and manipulation of the prototype system, architects' cost estimates are reviewed by HUD cost analysts for reasonableness, and project designs are reviewed for their cost efficiency. Due to many factors, however, including the extreme difficulty of obtaining current cost data to accurately estimate costs, the practical difficulty of requiring an architect to significantly alter a design once completed, and intense pressure by Central Office to meet production goals, cost review recommendations were not implemented as often as they probably should have been.*

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^{*}OIP has recently reorganized its Housing Production Division and delegated cost review functions to its field offices. OIP executive staff feel that much closer coordination of reviews by cost and architectural staff has resulted.

To test the misallocation theory, PP&E compared architects' estimates of site improvement costs with contractors' cost breakdowns for those sample projects with the greatest probability of manipulation having occurred -- those that exceeded 109.0% of their prototype costs.

Contractors' site improvement charges were available for 10 of 11 such projects. The architects' estimates analyzed were those prepared just prior to going out to bid on each project as adjusted for their contract award budgets.

At contract award the project architect's pre-bid estimate is adjusted to correspond to the lowest acceptable bid by means of a technique called factoring. This technique involves calculating the ratio of the architect's total pre-bid estimate to the lowest acceptable bid and then applying this ratio, or factor, to each of the five cost categories. For example, if the apparent low bid were 10% higher than the pre-bid estimate, the architect's estimates for each of the five cost allocation categories would be adjusted upwards by 10%. The new figures for the dwelling construction and dwelling equipment categories would then be re-compared against prototype limits to see if the bid could be approved. If the "factored" DC&E costs exceed 105% of prototype costs, the Regional Administrator's concurrence

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must be obtained before the bid can be awarded. If DC&E costs are over 110% of prototype costs, then the bid must be negotiated down under 110%* or the project must be rebid.

Table 12 below shows the results of PP&E's comparison.

Table 12 shows that in every instance where DC&E costs exceeded 109% of project prototype costs, the architect's estimates of site improvement cost exceeded the actual bid prices as calculated by the contractors.** The variance per unit ranged from \$1,312 to \$5,641 in monetary terms and from 14.4% to 170% in percentage terms. On the average, architects for these projects over-estimated site improvement costs by \$3,623, or 41.2%. While some of this variance is due to random error, much of this amount should have been attributed to DC&E costs. If it had, however, most of these projects could not have been approved as designed.

^{*}When certain deletions from the low bid are negotiated, then deductions should be made in corresponding cost categories rather than by the factoring method.

^{**}The amounts shown include a prorata share of General Conditions, the contractor's overhead and start-up costs, but do not include a share of performance bond costs. Including some of the bond costs might add another \$100 to \$150 per unit to the contractor's estimates.

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Table 12

Site Improvement Cost Estimates

Project <u>Number</u>	Location	<u>Units</u>	Prototype Percent	Architect's Estimate	Per <u>Unit</u>	Contractor's <u>Estimate</u>	Per <u>Unit</u>	Dollar Variance	Percent <u>Varianc</u> e
NM 40-6	San Ildefonso	18	109.9	\$124,536	\$ 6,919	\$91,437	\$ 5,080	\$1,839	36.2%
AZ 12-43	Navajo-Tuba City	45	109.9	512,326	11,385	384,034	8,534	2,851	33.4%
AZ 12-48	Navajo-Dilcon	10	109.9	119,371	11,937	79,407	7,941	3,996	50.3%
AZ 12-42	Navejo-Tuba City	60	109.9	693,272	11,555	458,566	7,643	3,912	51.2%
AZ 14-4	Salt River	(89)*	109.9	(839,040)*	(9,427)*	N/A	N/A	N/A	N/A
AZ 14-5	Salt River	28	109.9	238,844	8,530	88,529	3,162	5,368	170.0%
NV 15-3	Goshute	10	109.9	104,110	10,411	90,992	9,099	1,312	14.4%
AZ 12-47	Navajo	20	109.8	243,045	12,152	130,215	6,511	5,641	86.6%
CA 80-6	All Mission	78	109.8	1,026,935	13,166	822,435	10,544	2,622	24.9%
NM 13-4	Mescalero	63	109.5	826,415	13,118	575,834	9,140	3,978	43.5%
NM 12-6	Laguna	205	109.1	2,776,034	13,541	1,997,589	9,444	3,797	40.0%
	Total/Average	537		\$6,664,888	\$12,411	\$4,719.038	\$8,788	\$3,623	41.2%

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* Not included in "Total/Average" figures

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Obviously, OIP's cost review procedures have not been adequate to prevent misallocation in architects' cost estimates. PP&E believes, however, that estimating costs in housing projects scattered over four large and varied states is a herculean task that can never be performed accurately enough to prevent abuse. HUD's cost analysts should never have been forced into the "policeman" role that the prototype cost system has required. Rather, HUD's prototype cost system, which is an overly complex, overly rigid, error-ridden bureaucratic nightmare that encourages manipulation of cost estimates, should be replaced by a simpler system in which cost analysts can perform a more positive, constructive role. HYPOTHESIS 14: THAT VARIOUS DELAYS IN THE PLANNING AND PROCESSING OF INDIAN HOUSING PROJECTS ADD SIGNIFICANTLY TO WHAT THOSE PROJECTS WOULD HAVE COST IF DEVELOPED WITHIN STANDARD TIME FRAMES.

FINDING 14: THE AVERAGE COST OF DELAYS IN INDIAN HOUSING PROJECTS HAS BEEN APPROXIMATELY \$6,368 PER UNIT.

Twenty-seven (27) of the 35 projects in the study sample have required increases in their Annual Contributions Contracts (ACC) over the amounts originally established; seven (7) were completed within the originally reserved amounts; and one (1) experienced a decrease. Many factors account for the cost increases, but the primary one is undoubtedly the impact of inflation during the project delays. According to standard processing time frames, the typical Indian Housing project should require about 6.5 months between signing of the Annual Contributions Contract List and starting construction. The 35 projects in the study sample required an average of just over 23 months, or almost two years.*

^{*}Development time should be reduced somewhat in the future as OIP, the local Authorities and Tribes, the BIA, IHS, and other program participants become increasingly experienced with the Indian Housing Program. Six of the 35 sample projects had ACC Lists signed before the establishment of OIP. The average "ACC List to Construction Start" period for these six projects was over 69 months. The same development period for the other 29 projects (where OIP authorized the original ACC List) averaged slightly less than 14 months. The development process is complicated, however, and will always take a long time. Recognizing this fact the Department has recently increased its standard time frames.

To estimate the cost impact of project delays, PP&E compared the original Estimated Total Development Cost (ETDC) per unit on each project's initial ACC List with the ETDC on its most recent ACC List. The per unit increase (or decrease in one instance) was divided by the period of time between the initial and the latest ACC Lists to obtain the monthly rate of increase (or decrease). The monthly rates were then totaled and divided by the number of projects to obtain an average for all projects in the sample. The average rate of increase in total project costs was thus estimated* at over \$398 per unit per month.

The total cost impact of unnecessary project delays can be estimated by applying the per unit rate of increase to the extra time the sample projects spent in development. The standard ACC List to Construction Start period is 6.5 months, or approximately seven (7) months. The actual development period for the sample projects

^{*}The calculated rate of increase cannot be considered an exact figure for several reasons. One is that the costs specified in each ACC List may be projected into the future for differing lengths of time. Another is that later ACC Lists may include more or fewer cost items than earlier lists. We believe that such variations are random and probably cancel each other out, however, and that the \$398 per unit per month is a reasonable estimate of past cost increases attributable to inflation. Future increases will be much larger since the costs base has increased since the time covered by this study, and because the rate of inflation is increasing rapidly. Therefore, future project delays will prove to be even more costly than has been the case in the past.

averaged 23 months, which results in an average delay of 16 months per project. Cost increases attributable to unnecessary delays therefore were <u>approximately</u> \$6,368 per unit (\$398 per unit per month increase times 16 months) or \$9,297,280 for all 1460 units in the study sample.

It was originally PP&E's intent to apportion responsibility for project delays among HUD, the Indian Housing Authorities, Tribal governments, the Bureau of Indian Affairs, and the Indian Health Service, but it was impossible to construct detailed project histories from just the data OIP is required to maintain in its files.

Since the rate of increase in project costs described above is admittedly only an estimate, another method of estimating cost increases was utilized to double-check the reasonableness of the primary approach. In the second method, PP&E arranged the per unit dwelling construction costs for each project in chronological order by date of bid. An average dwelling construction cost was then calculated for each calendar quarter of 1977.* These averages are shown in Table 13 below.

^{*}The last quarter of 1976 was also included in the study, but is excluded here because only one project began construction during that time period.

Calendar Quarter	No. of Projects Successfully Bid	Avg. Dwelling Construction Costs Per Unit
January - March	8	\$28,086
April - June	8	\$29,303
July - September	14	\$31,888
October - December	4	\$35,696

Dwelling Construction Costs by Calendar Quarter

The increase in average dwelling construction costs between the first and the last quarter of 1977 was \$7,610. This figure converts into a monthly rate of increase of \$846 per unit, which is significantly larger than our long-term increase of \$398 per unit per month. The \$846 per unit per month estimate may be too high since the large jump in the last quarter was based on only four projects. However, the increase from the first to the third quarter still was equal to \$634 per unit per month. The implications are, therefore, that the original \$398 per unit per month estimate certainly does not overstate the inflationary cost increases created by project delays and most certainly understates the current rate of increase which may be approaching \$1,000 per month.

TABLE 13
<u>HYPOTHESIS 15</u>: THAT THE GENERALLY HIGHER COSTS OF INDIAN HOUSING WOULD BE PARTIALLY OFFSET BY LARGE SAVINGS RESULTING FROM LOWER LAND COSTS.

FINDING 15: LAND COST SAVINGS IN THE INDIAN HOUSING PROGRAM WERE ONLY \$1,316 PER UNIT COMPARED TO THE SECTION 8 SAMPLE, BUT \$5,874 COMPARED TO THE NATIONAL AVERAGE FOR NEW HUD-INSURED HOMES.

PP&E and OIP anticipated that a significant portion of the higher costs of Indian Housing units would be offset by savings on land costs. Unlike most other aspects of housing development on Indian Reservations the acquisition costs of land were expected to be lower than for other projects due to their remote locations. HUD also requires Indian Housing sites either to be donated by each participating tribe in fee simple or on a long-term lease basis, or to be acquired with strict limitations on the acquisition price. For rental projects the land donation is made at no expense to the project. In Mutual-Help projects (which require a \$1,500 donation of land, labor, or materials), a credit of \$1,500 per unit is universally included in their budgets. The leasehold value of each Mutual-Help lot has to equal \$2,239 (of which two-thirds, or \$1,500, could be credited), but any additional value, if any, is not recognized. Thus, the maximum land cost of an Indian Housing unit is limited to \$1,500, while land acquisition costs in non-Indian programs were expected to be significantly higher.

PP&E analyzed land acquisition costs in the Section 8 comparison sample and found that they ranged from \$893 to \$3,500 and averaged \$2,532 per unit. The Indian Housing sample's land costs were \$1,500 per unit for the 1,184 Mutual-Help units, and nothing (other than minor fees) for the remaining 276 rental units, so the average cost for each of the 1460 sample units was \$1,216. The difference in average land acquisition costs between the two programs was thus only \$1,316 per unit.

Land acquisition costs savings were more significant when compared to proposed new homes insured by HUD under Section 203. HUD's "Area Trends" report for the fourth quarter of 1977 indicated that the market value of sites for such homes averaged \$7,090 during that period. This amount exceeded the average site costs in the Indian Housing Program by \$5,874. Site costs in the areas where most of Region IX's Indian Housing units are built are generally less than the national average, however, so actual savings may be a bit less than this. The average market value of sites in Albuquerque was \$6,073 and in Phoenix \$6,269.

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One comment should be made regarding the way land donations are treated in the Mutual-Help program. As explained above, the Indian Housing Regulations require that each Mutual-Help participant make a \$1,500 contribution in the form of land, labor, or materials towards the cost of their house. In every one of the 28 sample projects which were Mutual-Help, the contribution was provided in the form of the leasehold value of the site on which each unit was built. The total amount allowed was \$1,776,000. All other donations to sample projects were entered on the Development Cost Budgets as charges to various Account Classifications, and then these same amounts were deducted at the bottom of the Budgets on a line specifically provided for deducting the value of donations. The Mutual-Help Annual Contributions Contract provides, however, that the Mutual-Help "contribution" is not a "donation" and is to be included in the Budget; thus, OIP did not deduct the value of land donations and the \$1,500 value allowed for each Mutual-Help participant's contribution was entered in each Budget as a cash expense to the project. The \$1,500 so budgeted is not actually spent on project development, but rather is put into a reserve fund which can be drawn against for specified purposes during the term of the ACC.

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Although explicitly required by the Indian Housing Regulations, PP&E believes that it is a poor practice to fund operating expenses from appropriations intended for project development. It would be a better practice to treat Mutual-Help contributions as donations, not include them in development costs, and request appropriations annually for operating subsidies as they are needed. One argument for doing so is that the total budgeted for the 1,184 Mutual-Help units in the study sample, \$1,776,000, would have provided funding for an additional 33 houses at the average Total Development Costs of \$54,329 per unit. These additional homes will never be built, whereas the Mutual-Help contributions held in reserve may or may not ever be required.

HYPOTHESIS 16: THAT TOTAL PROJECT COSTS OF INDIAN HOUSING PROJECTS MUST BE ESTABLISHED AT NOFA* AT 180% OF THEIR PROJECT PROTOTYPE COSTS RATHER THAN AT THE USUAL 175%.

FINDING 16: TOTAL PROJECT COSTS OF INDIAN HOUSING UNITS CAN AND SHOULD BE LIMITED TO 175% OF THEIR PROJECT PROTOTYPE COSTS.

Under new funding procedures adopted last year, limits on overall project costs have finally been established. Now at the earliest stage of project approval, NOFA, a maximum funding limit is established for each new project. That limit is calculated by multiplying the project's prototype costs by 175%, except that in the Indian Housing Program in Region IX the limit is established at 180% of prototype costs. The primary rationale for the extra percentage permitted in Indian Housing projects is that these projects need more extensive and more costly site improvement work than non-Indian Public Housing projects. The "five percent" figure was based on actual development costs during the previous year.

To test whether Indian Housing projects still needed the extra 5% of prototype costs, PP&E compared the actual project costs of the 35 sample projects with 180% of their respective prototype limits.

*Notice of Fund Availability

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Seven of the 35 projects had Total Project Costs which exceeded 180% of their respective prototype costs and would not be approvable under current funding limits. These projects were at Fort Mohave (CA-100-1), Papago (AZ-26-8), Round Valley (CA-97-1&2), All Mission (CA-80-6), Mescalero (NM-13-4), and Goshute (NV-15-3). Five of the six projects with the most expensive site improvement costs fell into this group of projects costing more than 180% of their prototype limits. Their high site improvement costs was the primary factor contributing to their exceeding the new 180% limit. The Goshute project was over 180% of its prototype costs due to a combination of high site improvement costs and high administrative, interest, and planning expenses. One of the Round Valley projects, CA-97-2, was over due to its having the highest non- dwelling construction and equipment costs (\$7,464 per unit) in the sample.*

The other 28 sample projects incurred total project costs which were less than 180% of their respective prototype costs. Their costs ranged from \$603 to \$14,768 per unit less than would have been allowable under the new 180% of prototype limit.

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^{*}The initial project(s) of any new Housing Authority, as in this case, usually has to bear the costs of building management, maintenance, and administrative space for the Authority. These costs are charged to non-dwelling construction and equipment.

All 35 sample projects averaged \$2,500 per unit less than would have been permitted under the new rule. A total of \$3,650,068 more would have been budgeted if all 35 projects had been funded at 180% of their project prototype costs.

It is obvious from the above cited figures that most Indian Housing projects can be developed for substantially less than 180% of their prototype costs. The 180% ratio, therefore, is much too high to effectively control costs of the Program in general and of exceptional, over-designed projects in particular. It appears that the normal ratio of 175% of prototype cost is adequate to cover the costs of Indian Housing projects.

In addition, an extra 5% is not necessary since prototype costs on Indian Housing projects are already much higher than normal. First, adjustments are made in prototype costs to compensate for typically higher construction costs on reservations. Second, the large number of four- and five-bedroom units in Indian Housing projects raise their prototype costs without proportionally increasing non-dwelling costs for site improvements, project design, administration, homeownership counseling, etc. As a result, the 175% of prototype costs funding limit is not unduly restrictive.*

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^{*}New cost containment measures have been taken by HUD just prior to completion of this report, which establish "benchmark" figures for each housing program in each HUD Region. All projects governed by a "benchmark" must have average costs which do not exceed the "benchmark" figure. The "benchmark" figure established for the Indian Housing Program in Region IX will force most projects to be funded at less than 175% of their prototype costs.

VI. CONCLUSIONS AND RECOMMENDATIONS

VI. CONCLUSIONS AND RECOMMENDATIONS

This section of the report presents PP&E's seven general conclusions concerning the costs of the Indian Housing Program in Region IX. Five of the seven conclusions are drawn from the 17 specific findings presented in the previous section. The other conclusions are drawn from data included in a number of those findings.

In addition, this section also presents a number of recommendations for actions that could help reduce some of the unessential costs of the Indian Housing Program.

A. CONCLUSIONS

<u>The average costs of Indian Housing units exceed the average</u> costs of housing units produced under other HUD programs.

The initial finding in the previous section demonstrated that average costs in the Indian Housing program were greater than average costs in two other major HUD programs: the Section 203 insured single-family housing program and the Section 8 subsidized housing program. At an average cost of \$54,329 per unit during the period studies, Indian Housing units exceeded the costs of the comparison sample of Section 8 projects* by \$26,584 per unit and of new FHA-insured homes** by \$16,796.

<u>A majority of the higher costs in the Indian Housing Program are</u> either essential or uncontrollable.

PP&E based most of its cost comparisons on the differences in average costs of various components of the Section 8 and Indian Housing sample projects. However, some Indian Housing costs were compared with the costs of meeting only Minimum Property Standards (MPS) for Single Family Construction, and some comparisons were based on internal variances within the Indian Housing Program. The individual cost differences cited in this report, therefore, will not reconcile exactly with the \$26,584 variance in the per unit average costs of the Indian Housing and Section 8 New Construction samples cited above. Nevertheless, the MPS and internal comparisons are few enough and the cost variance totals are close enough to enable drawing a general conclusion: that the majority of the cost differences between the Indian Housing and Section 8 samples were in cost categories that were either essential components of the Indian Housing Program or were not

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^{*}Which had a per unit average of \$27,745.

^{**}National average for the Section 203(b) program in the fourth
quarter of 1977.

directly controllable by the Office of Indian Programs or by the local Indian Housing Authorities. Table 14 below shows the extra costs judged to be essential or uncontrollable.

The extra costs shown on Table 14 total \$14,321 per unit. This amount represents almost 54% of the total cost difference between the Section 8 and Indian Housing samples. In PP&E's judgment there is little that either OIP or the local Indian Housing Authorities can do to significantly reduce these extra costs. Homeownership Counseling and Homeowner's Insurance premiums are permitted under Departmental regulations. Quality design standards have been established as a result of past experience and could be rescinded only at the unacceptable cost of increasing future maintenance expenses even more. Poor building climates are created by economic and legal factors outside the control of the Department. OIP appears to be doing everything possible to mitigate the effects of poor bidding climates and no elimination or further reduction of this extra cost appears feasible under present economic and legal constraints.

The largest single extra cost is due to the need in the Indian Housing Program to serve large families. Since the need for housing for large families and a lack of demand for elderly units is well documented, it does not appear feasible to significantly reduce the average bedroom size of Indian Housing units in the foreseeable future.

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Table 14

Uncontrollable Extra Costs of the Indian Housing Program

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Cost Factor	Additional Cost	
Homeownership Counseling	\$ 342	
Homeowners Insurance	125	
Quality Design Standards	1,422	
Poor Bidding Climate	1,565	
Large Family Size	8,000	
Site Improvements	4,182	
Subtotal:	\$15,636	
Minus Land Savings	<u>(1,315</u>)	
Total:	\$14,321	

The second largest cost variance was in site improvements. The total site improvement cost difference between the Section 8 and Indian Housing samples was \$7,718. PP&E calculated that if all projects were developed on a scattered site basis rather than in subdivisions, this variance could be reduced by \$3,136 per unit, leaving a basic extra cost of \$4,182. There could also be some savings on site improvements if some projects were designed as Planned Unit Developments (PUD's) using clustering concepts rather than traditional large-lot, single-family detached unit designs. Since no PUD's have been proposed in Region IX, no comparative cost data could be developed for this report. However, PP&E believes that potential cost savings to HUD in PUD's would not exceed the \$3,136* per unit average savings in scattered site projects, and that \$4,182 per unit is a reasonable estimate of the minimum average extra cost of providing site improvements for new housing on Indian reservations.

Offsetting the six extra cost categories discussed above are savings on the cost of acquiring housing sites. The average land cost per unit in the Section 8 sample was \$1,315 greater than in the Indian Housing sample. This savings subtracted from the other factors which caused extra costs left the net result of \$14,321 per unit shown on Table 14 above.

^{*}The combined savings to HUD, BIA, and IHS may possibly be greater in PUD's, however.

Although most of the extra costs in the Indian Housing Program are uncontrollable, a large proportion is controllable and offers an opportunity for significant cost savings. PP&E identified cost factors totaling \$11,048, or 42%, of the variance between the Indian Housing and the Section 8 samples, which could be at least partially reduced through effective administrative action by Region IX's Office of Indian Programs. Those partially controllable extra cost factors are shown on Table 15 below.

Table 15

Cost Factor		Additional Cost
Alternative Heating Systems		\$ 533
Adobe and Masonry		641
Barbecues		183
Landscaping		330
Miscellaneous Amenities		159
Single Family Detached Design		3,346
Controllable Site Improvements		3,136
Large Floor Areas	TOTAL	<u> 2,720</u> \$11,048

Controllable Extra Cost of the Indian Housing Program

The most expensive extra cost factor on Table 15 is "Single Family Detached Design." An average of \$3,346 per unit could have been saved if all units in the Indian Housing sample had been designed in a row configuration rather than in a detached, free-standing configuration. It is, of course, not reasonable to eliminate all single-family detached construction in the Indian Housing Program to achieve this full savings. It is also not reasonable, however, for taxpayers to subsidize the costs of single-family detached homes where those costs are unreasonably high. It is therefore recommended that OIP encourage alternative cost-saving designs, especially for projects on higher cost reservations.

The second most expensive controllable cost factor was site improvements. Here again, it is not possible to eliminate all subdivision construction in the Indian Housing Program in order to save the full amount cited. However, substantial savings could be realized by OIP insisting on more scattered-site development, on more Planned Unit Developments, and on smaller lot sizes in those situations where standard subdivisions are permitted. Further savings could be achieved by OIP's insisting that architects design homes that do not exceed prototype size guidelines. In this case the full \$2,720 extra cost of excessive floor areas in the Indian Housing Program could be saved if strict floor area limitations were adopted.

OIP has already achieved additional, albeit lesser cost savings through careful reassessment of other cost factors. The average cost of alternative heating systems, fireplaces, and wood-burning stoves was \$533 per unit. Only 16 of the 35 sample projects were located in areas with climatic conditions which would clearly warrant inclusion of alternative systems. OIP is now eliminating such systems from some of the more expensive projects in areas with mild climates. OIP is also acting to reduce the average cost of these systems. Some fireplaces cost \$1,300 each, while others cost only \$268 each. OIP is now ensuring that only modestly priced units are installed. It is also encouraging installation of wood-burning stoves rather than fireplaces, since such stoves usually are both less expensive and more energy efficient than fireplaces.

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Other amenities are also being re-evaluated. It is highly questionable for OIP to provide single-family detached homes, which are rapidly becoming luxury items that are unaffordable to the average taxpayer, while also permitting many additional amenities. For instance, OIP paid over \$59,000 per unit for six sample projects on the Navajo Reservation. The costs were so high partially because the units were all single-family detached and because site improvement expenses were \$11,000 to \$12,000 per unit. The costs were also so high due to such amenities as masonry veneer walls, outdoor barbecues (\$520 each), covered patios, landscaping, basketball courts, clothesline poles, and garbage can holders. OIP also provided such other benefits, per HUD Regulations, as homeownership counseling (\$500 per unit), three- year prepaid homeowners insurance premiums, fireplaces, and carports. Now OIP is only permitting those benefits required by the Regulations.

4. <u>Additional cost savings of as much as \$5,400 are possible in</u> areas which are not unique to the Indian Housing Program.

The first three conclusions concern cost differences between Region IX's Indian Housing and Section 8 programs. In addition to reducing these cost differences, it appears that other cost savings could be achieved in areas that are not unique to the Indian Housing Program. Two examples are project delays and carports. Finding 14 discussed how projects in the Indian Housing sample were delayed an average of 16 months, allowing inflation to add an average of over \$6,000 onto the cost of each unit in the sample. It also discussed how OIP has been able to reduce the average project delay to 7 months, thereby reducing the inflationary cost to about \$2,800 per unit. This amount, or at least a portion of it, could be saved if project delays were eliminated entirely or further reduced in future projects.

Finding 9 included a discussion of the costs of carports and garages. At one time HUD policy prohibited carports and garages in the Low-Rent Public Housing Program. The costs of these items were not used in the comparative analyses above because they are now generally included in both Section 8 and Indian Housing projects. However, if HUD's earlier policy were reinstituted, with exceptions perhaps for projects in areas with extreme climatic conditions, much of their \$2,600 per unit average cost could be saved.

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5. <u>Many factors which PP&E and OIP thought would add significantly</u> to the costs of Indian Housing projects did not increase project <u>costs as expected</u>.

Prior to collecting data for this study, OIP and PP&E hypothesized a number of cost-creating factors which turned out to add no significant or measurable costs to the basic costs of the Indian Housing Program. These factors were wage rate determinations, diseconomies of scale, severe climatic conditions, and Indian preference requirements.

Theoretically, it was expected that Davis-Bacon wage rate requirements would increase the costs of Indian Housing projects greatly over what private developers pay for similar units in the same area. No direct comparisons were possible within the scope of this study. Analysis of just Indian Housing projects, however, showed a correlation between wage rates and project costs only among the middle and least expensive projects. The most expensive projects did not have the highest wage rates, indicating that wage rates are not as significant an influence on project costs as expected. Expected diseconomies of scale resulting from the small size of most Indian Housing projects also were not demonstrated by the data. Rather, it appeared that large projects cost more than small projects on a per unit basis.

Project analysis did indicate that there were a disproportionate number of Indian Housing projects located in severe weather areas, as initially expected. Yet there was very little documented evidence of extra expense being caused by weather conditions, but possibly only because the winter of 1976-77 was unusually mild.

Finally, Indian preference bidding requirements did not add significantly to project costs despite clear price advantages granted to Indian contractors by HUD regulations. Rather than exploiting their 10% price advantage, most Indian contractors appeared to have bid very conservatively.

OIP has no procedures for ensuring that all Indian Housing Authorities are treated equally.

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One of the most striking revelations of this study was that there are no standards of equity in the Indian Housing Program. Prototype cost limits were intended to provide such standards, but have been ineffective in doing so. As a result, the variations among projects are great. The per unit variance between the Total Development Costs of the least expensive family project*, \$37,704, and the most expensive, \$65,212, is \$25,508, or 64%. The variance in prototype costs of a three-bedroom detached unit between the two areas was only \$800, or 3%.

Much of the cost variance among Indian Housing projects resulted from differences in unit sizes, in site improvements, and in other development costs not controlled by prototype cost limits. Whether such variations in project development costs are justified or not can be argued on a case by case basis. It is not so easy to justify the great variations in the quality of unit designs which are observed by the evaluation team. Prototype cost limitations, if functioning properly, should have constrained all projects to approximately the same level of design quality without restricting designs to a uniform style. PP&E found instead that both style and quality varied greatly. Whereas, some reservations accepted simply designed units that could be built for less than 100% of prototype costs, others insisted on much more elaborate designs which were questionably kept under the 110% prototype cost limit.

^{*}Excluding the elderly duplex units at Gila River which cost only \$32,741 each.

Many quantitative differences were also noted. The Navajo units in Arizona had two baths in their three-bedroom homes and cost about \$37,000 each for dwelling construction alone. The All Indian Pueblo's units in New Mexico had only one bath in their three-bedroom homes and cost about \$28,000 each. The threebedroom homes on the Laguna Reservation had over 1500 square feet of floor space, and the Papago units had 1370 square feet. The three-bedroom units on the Te Moak Western Shoshone Reservation had only 1100 square feet.

Many other variations are discussed in Section V of this report and need not be repeated here. The point is that variations in the costs of construction were found to account for only part of the high cost variances among units in the Indian Housing Program sample. Qualitative and quantitative differences accounted for much of the cost variance. PP&E believes that these differences have been excessive and constitute a potential embarrassment for the Department. OIP has already begun to eliminate many unjustifiable differences among Indian Housing projects and should be fully supported by the Department in this effort.

7. The prototype cost system is ineffectual.

It was not the purpose of this study to evaluate the effectiveness of HUD's prototype system in controlling costs, but the data collected for this report make the conclusion inescapable that the system is inefficient and ineffective.

In the first place the prototype system is inefficient. It is based on the hypothetical costs of building modest prototype units of various construction types, i.e., detached, row, walk-up, and elevator. Once the different unit types are designed, the cost of building the prototype must be researched and established for each prototype area. There were 94 prototype areas in 1977 in the four states served by Region IX's OIP. Each area has four construction types. Each construction type has seven bedroom sizes, except the elevator category which usually has only three, and each construction type may have hundreds of cost components. It would take dozens of HUD staff-years to maintain all this data accurately, which is clearly infeasible. So short-cuts have to be employed. Short-cuts lead to errors, such as the figures for some California prototype areas showing walk-up apartments costing more to build than single-family houses. Errors have to be corrected when they impact on project feasibility. Correcting errors consumes more staff time and creates delays in projects. Delays cost money due to inflation.

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The prototype system is also ineffective. It "controls" only dwelling construction and equipment (DC&E) costs and provides no auidance concerning other costs. In the most expensive sample project. Fort Mohave, DC&E costs were only 51% of total project costs. OIP had no quidelines for evaluating the propriety of the other 49% of that project's costs. In that case, moreover, cost considerations were lessened somewhat by the pressure OIP felt to approve the project in order to try to make its Operating Plan goals for FY '77. In 1978 the Department tried to correct the problem of no limits on costs other than those for dwelling construction and equipment by establishing maximum allowable project costs calculated as a proportion of prototype costs. As explained in Finding 16, however, this new system if implemented in 1977, would have reduced the costs of eight sample projects, but would have potentially increased the costs of the overall sample by \$2,500 per unit.

The prototype costs system clearly does not even successfully control the DC&E portion of total project costs that it is primarily intended to control. Finding 13 contained evidence that the system is so complex that it is subject to error and perhaps even manipulation. This observation is also supported by data indicating wide variations in unit sizes and level of amenities. If prototype costs were in fact being accurately

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calculated for each prototype area, it is highly unlikely that the design of the units at Laguna could have been approved or that the modest design and price of the units at All Mission could have been equivalent to 109.8% of that area's prototype costs.

A further effort to contain costs has been initiated this year with the establishment of "benchmark" costs for each type of development and by HUD field office jurisdictions. "Benchmark" costs cover total project development costs, unlike prototype costs, provide each office with flexibility in considering each project, yet still limit total average costs. The "benchmark" cost_idea should probably be further refined so that the Department can eliminate prototype costs entirely.

B. RECOMMENDATIONS

The following recommendations are offered as potential means of minimizing the extra costs of Indian Housing. Since most of the recommendations involve changes in priorities, and in some cases reductions in benefits, PP&E does not expect that every recommendation will be accepted. However, PP&E strongly urges that OIP and the Regional Administrator carefully consider each of the recommendations

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below and implement, seek Central Office approval to implement, or support implementation by others, as appropriate, of as many of these recommendations as possible. In this period of governmental retrenchment we must do everything possible to provide adequate shelter for those in need at the lowest possible expense to the taxpayer.

- To minimize inflationary costs due to project delays it is recommended that:
 - a. <u>The Director, Office of Indian Programs, provide additional</u> funds for initial project planning.

Finding 14 discussed the general problem of project delays and the attendant cost increases of such delays. One area where delays can be reduced is in the initial project planning process. One way to do so would be to establish a general policy of proceeding immediately to executing Annual Contributions Contracts following approval of Program Reservations. This policy would make all funds needed for project planning available to IHA's so they could complete their planning earlier than is now possible. Initial ACC's could provide funding at 175% of project prototype costs. Detailed cost estimates would only be prepared after execution of the ACC and in conjunction with detailed project planning. At contract award ACC's should be amended to recapture any funds not actually needed, if any, but should not be amended to increase project costs except under extreme circumstances.

Alternatively, the Director should request authority to provide IHA's with larger preliminary loans than the \$1,500 per unit maximum now authorized. This would also have the effect of enabling more complete project planning to proceed early in the development process.

b. <u>The Director, OIP, act to reduce delays</u> <u>during project</u> development.

In addition to providing adequate resources for project planning, OIP should ensure that IHA's administer their planning activities in an efficient manner. To do so an expiration date should be included in each ACC appropriate to the scale and difficulty of the project being undertaken. Any project not achieving a construction start by the expiration date would then automatically terminate. If circumstances justify it, however, one short grace period should be allowed during which the IHA might attempt to achieve construction start. A less formalized but still potentially effective approach would be to adopt a much less lenient attitude towards allowing IHA's to change project plans when such changes have the effect of delaying project development and a much tougher attitude towards cancelling old projects which are not progressing.

2. To ensure greater equity among program participants and to eliminate excessive benefits for the few, it is recommended that:

a. <u>The Director, OIP, establish architectural design</u> guidelines based on the prototype house concept.

OIP should establish design guidelines which strictly limit total floor area in each bedroom size category; limit three-bedroom units to a single bathroom; eliminate unnecessary breaks in exterior walls; limit maximum roof pitch; minimize roof line variations; prohibit extraordinarily expensive siding, roofing, and other materials; prohibit extraordinarily expensive equipment, including alternative heating systems; set maximum patio and walkway areas; control carports, garages, and set such other architectural features as the Director determines desirable. To the extent feasible such guidelines should be based on performance standards rather than on detailed specifications in order to allow leeway for design creativity and originality, local self-determination and special unforeseen needs.

 <u>The Director, OIP, establish similar site design</u> guidelines for subdivisions.

OIP should also develop site design guidelines that limit lot sizes and street frontages; road widths; installation of curbs, gutters, and sidewalks; landscaping; storm drains; grading; and other site development features as the Director determines desirable.

- In order to encourage less expensive types of development, it is recommended that:
 - a. <u>The Director, OIP, incorporate incentives in the</u> <u>architectural design guidelines which will discourage</u> <u>development of single-family detached houses and</u> <u>encourage development of duplexes, row houses, and</u> <u>walk-up apartments.</u>

OIP should base its design guidelines on the premise that a single-family detached home is of itself a <u>luxury</u>. Consequently, amenities and even highly desirable features such as fireplaces and carports should not be permitted in detached houses. An exception should be made for wood-burning stoves and carports only in areas of severe weather conditions. Conversely, IHA's willing to accept other less expensive types of construction should benefit from some of the resulting savings through allowance of additional amenities.

b. <u>The Director, OIP, incorporate similar incentives in its</u> site design guidelines.

OIP should also include provisions in the site design guidelines to discourage obsolete conventional subdivision designs by more strictly limiting site improvements in such developments than in planned unit developments. For example, paved driveways, sidewalks, curbs and gutters, underground utilities, playgrounds, neighborhood parks, landscaping, barbecues, clothesline poles, and garbage can holders should all be restricted in conventional subdivisions, but permitted within limits in planned unit developments. c. <u>The Director, OIP, encourage development of more units</u> <u>for the elderly and small families in appropriate</u> circumstances.

Although the greatest housing demand on Indian reservations can be expected to continue from large families, other needs should not be ignored. Thus, whenever possible, OIP should exploit opportunities to build units for the elderly and for small families, and simultaneously reduce average per unit costs.

- d. <u>The Director, OIP, discourage projects larger than 100</u> units due to their diseconomies of scale in rural areas.
- 4. In order to take advantage of other potential cost savings identified in this report, it is recommended that:
 - a. <u>The Director, OIP, limit total permissible development</u> costs to 175% of project prototype costs rather than the present limit of 180%.*

*OIP has already implemented this recommendation.

b. <u>The Director, OIP, and the Regional Administrator recom-</u> <u>mend to the Secretary that Mutual-Help contributions be</u> <u>treated as donations</u>.

Mutual-Help contributions should not be included in Development Cost Budgets. Rather they should be treated as donations to the project and deducted from the Budget like other donations. In replacement, the Department should seek annual appropriations, similar to its requests for operating subsidies, and fund those items now funded from escrowed contributions on an as-needed basis.

- 5. In order to better control <u>all</u> development costs in the Indian Housing program, it is recommended that:
 - a. <u>The Regional Administrator recommend to the Secretary</u> <u>that prototype cost limits be abolished and replaced with</u> <u>a more comprehensive control system.</u>

Since the prototype cost system is so difficult to administer properly and is also ineffective in controlling the cost of Indian Housing projects, it should be abolished. It should be replaced by a simpler,

comprehensive cost control system, perhaps a refinement of the recently introduced benchmark cost system. Whatever system is developed, it must apply to all development costs, not just dwelling construction, if it is to be effective. It must also be realistic. Whatever cost limits are established must be high enough to accommodate reasonably designed, good quality projects, excluding only extravagant or wastefully designed ones and ones with such difficult development problems that their total costs are excessive. Further, those limits must be adjusted frequently to reflect current inflation rates or even modest projects may be delayed, and their cost consequently increased. Thus, any new cost control system should include monthly or, at the least, quarterly adjustment, based on an appropriate index such as the Department of Commerce's Building Cost Index.

b. <u>Pending replacement of the prototype system, the Regional</u> <u>Administrator should continue to review all projects that</u> <u>require a waiver of prototype cost limitations; the</u> <u>Regional Administrator's review should be guided by a</u> checklist provided by the Director of OIP. As long as the Regional Administrator is responsible for granting certain waivers to prototype cost limits, she should continue to review each project requiring a waiver and certify that the project is not overdesigned, that cost reductions are not feasible, and that project cost estimates appear to be accurately allocated between prototype and non-prototype cost categories. The Office of Indian Programs should complete a standard checklist of information for each housing project requiring a waiver. The checklist should include whatever data the Regional Administrator might need to independently and objectively evaluate the necessity of each waiver request.

* * * * *

As a result of these actions the high cost of Indian Housing can be significantly reduced. Of course, many of these proposed actions are in conflict with a number of cultural preferences of Indian clients, many of which have been referred to throughout the report. Decisions concerning the trade-off between reduced costs and cultural preferences, and distinguishing between cultural preferences and necessities, will be difficult and are properly the responsibility of the Regional Administrator and the Director, OIP. Such considerations are therefore not addressed in this evaluation which focused solely on cost reduction and containment. However, as housing costs continue to rise rapidly, it is likely that cost containment will become increasingly important. Deliberations on how best to contain costs will be a primary issue for HUD managers if the Department is to retain the continued capacity to assist in providing shelter to all those in need -- Indian and non-Indian alike.

APPENDICES
Appendix A

HIGH COST FACTORS IN INDIAN HOUSING

			IMP	ACT ON	
		COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	COMMENTS
Α.	Qua	ality Standards in Excess of MPS	Dwelling construction and dwelling equipment	Community, management and maintenance buildings	See attachment
В.	<u>Cu</u>	Itural Preferences			
	۱.	Single family detached units	Dwelling construction		
	2.	Amenities	Fireplaces	Patios Garages Carports Ramadas	
	3.	Privacy a. Scattered site development	Dwelling construction - extra supervision - extra transportation - extra travel - vandalism		
		b. Large lot subdivisions		Site improvements	
	4.	Native materials	Dwelling construction		Primarily adobe
C.	<u>c1</u>	lma te			
•	۱.	Weather proofing against temperature extremes	Extra insulation Storm windows/doors		
	2.	Alternative heating and cooling sy stems	Solar equipment Wood burning stoves		
	3.	Shortened building season	Dwelling construction		Should affect projects bid late in season only.

		1	IPACT ON	
	COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	COMMENTS
D). Labor Standards			
	 Excessively high DOL wage rate determinations 	Dwelling construction	Non-dwelling construction	Davis-Bacon determinations for Indian Housing project may exceed wage rates paid on Insured projects in vicinity.
	 Wage rate increases prior to proto- type revisions 			
	 Importation of labor Per diem allowances Travel expenses 			May result from lack of skills on reservation or from skills not being commensurate with mandated wage rates.
	 Journeymen wages paid unskilled labor 			Due to lack of approved apprenticeship programs.
	 Discouragement of contractors from bidding 			
E	. Indian Preference In Contracting			
	1. 10% price allowance over low bid	Dwelling construction	Non-dwelling construction	
	 Competence Completion time Completion assurance 		Administrative costs Interest	Also affects project quality and future maintenance costs.
	3. Bidding process negotiations	Dwelling construction	Non-dwelling construction Administrative costs Interest	Some units usually split out for Indian preference.

		IMPA	CT ON	
	COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	
F. <u>Ot</u>	ther Bidding Conditions			
1.	. Fear factors	Dwelling construction	Non-dwelling construction	Due to Indian sovereignty.
2.	. Bidding climate			
Э.	. 60-day bid hold requirement			30-days in conventional public housing program.
4.	. Material shortages			Concrete, drywell, and insulation.
6. <u>Pr</u>	roject Location			
1.	Remoteness of reservation	Dwelling construction	Non-dwelling construction	
2.	Site problems a. Difficult Terrain (1) Rugged (2) Steep (3) Flat b. Soils problems C. Flood plain d. Earthquake fault	Dwelling construction - structural reinforcement - special foundations	Site improvements (including utilities) - excavation - site grading - sewer and drainage	May be caused by lack of better sites on a reservation or by previous allocation of better land to other uses.
3.	Lack of existing physical improve- ments		Site improvements - water and sewer lines - access streets (to scattered site lots) - power lines - gas lines	If gas is available.
4.	Lack of water sights		Site improvements	
5.	Special requirements due to location	Dwelling equipment - large refrigerators - fire extinguishers - rough-ins for washer and dryer	Fencing Cattle guards Extra storage Fire stations Fire equipment	Only storage space over minimum requirements charged to Non-dwelling costs.

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		TMI	PACT ON	-	
	COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	СОММЕКТS	
ਮ. <u>Ove</u>	rdesign for Rural Environment		Site improvements - street width - sidewalks - curbs and gutters - driveway materials - street lights	Some items, such as leach fields, are frequently underdesigned creating health hazards and future maintenance.	
I. <u>Admi</u>	inistrațive				
1. 2. 3. 4.	 IHA performance a. Site selection b. Designated site changes c. Land withdrawal delays d. Application submissions e. Bidding process f. Construction management g. Coordination with IHS/BIA HUD performance a. Project funding delays b. Application processing c. Approval of high bids IHS delays a. Project reviews (1) Site selection (2) Working drawings b. Funding delays 	Dwelling construction	Non-dwelling construction Administrative costs Interest	Quality of choices and timeliness. Sometimes delay bids until publication of new prototypes. Incomplete Handbook; little C.O. guidance. HUD processing affected by HUD having to function as local planning and building department. Due to need to meet construction start goals.	

		l	MPACT ON	
	COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	COMMENTS
J.	<u>Planning</u> 1. Special surveys a. Flood plain b. Archeological c. Soils d. Site		Planning costs	More difficult due to lack of markers.
	 e. Engineering 2. Architect performance a. Slowness b. Quality of design; cost estimates c. Coordination with BIA/IHS 	Dwelling construction	Non-dwelling construction Administrative costs	Can lead to project delays for redesign and/or amendments.
К.	<u>Cost Allocations</u> 1. Shift of costs to HUD		Interior subdivision streets Interior subdivision water and sewer systems Off-site hookup to water and sewer systems	As a result of renegotiated Tri-Agency agreement.
	 Facilities serving new and existing projects 		Management space Maintenence space Community space Equipment	
	3. Subdivisions including vacant lots		Site improvements	
	4. Hidden dwelling construction costs		Site improvements	
	5. CCONONTES OT SCALE	Uwelling construction	Administrative costs	

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		 	MPACT ON	
	COST FACTORS	PROTOTYPE COSTS	NON-PROTOTYPE COSTS	
L. <u>Collat</u> <u>Costs</u>	eral Effects of Higher Construction	<u>n</u>	Bonding premiums Interest Architect's fee HUD fees	Higher rates usually charged on reservations.
M. <u>Specia</u>	<u>) Provisions in Indian Housing</u>		Participant training Insurance premiums	Up to \$500 per unit. First three years included in develop- ment costs.
N. <u>Contra</u>	ct Settlement	Dwelling construction	Non-dwelling construction	Some IHA's withhold 2% of bid amount to guarantee correction of constructio defects.
0. <u>Cost S</u>	avings Factors			
l. La	nd donations		Property purchases	<pre>\$1,500 per unit credit allowed for Mutual Help projects.</pre>
2. Re	location		Relocation costs	Infrequently used, but may cost more if necessary.
3. B1/	a services		Appraisals Market surveys Special surveys	
4. Ap	prenticeship programs	Dwelling construction	Non-dwelling construction	
5. La	ck of landscaping		Site improvements	
6. A1	<pre>conditioning</pre>	Dwelling construction		Minimize use of central air condition- ing.
7. No	local government review		Permit fees	
8. Lov	/ Davis-Bacon wages	Dwelling construction	Non-dwelling construction	Some reservations only.
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Appendix B

DATA BASE DESCRIPTION

COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
Constructed Factors	All Projects	N/A		
Daily Administrative Cost	· · · · · · · · · · · · · · · · · · ·		 (1) Date of Preliminary Loan Commitment to - (2) Date of Construction 	Forms Forms
			Completion (or) Date of Construction Start plus Length of Construction	FORMS Notice to Proceed
			Contract divided into - (3) Total Administrative Costs	Development Cost Budget - 1410
Daily Interest Cost			 Date of PLC to Date of Full Availability 	Forms Forms
			divided into (3) Total Interest Costs	Development Cost Budget - 1420
Daily Inflation Rate			Percent increase per day	OIP Cost Analyst
Square Foot Construction Cost	· · · · · · · · · · · · · · · · · · ·		DC&E Costs per Square Foot	Development Program
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DATA BASE DESCRIPTION

COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
A. Quality Standards			Prototype Standard 3 bedroom house	
]. Sheet vinyl	All projects		MPS = ,0204 \$50	Cost Analyst
2. Vinyl asbestos tile	All projects		MPS = 1/6" \$322	
3. Better lavatory and vanity	All projects		MPS = Wall mounted, no vanity, enameled steel \$120	
4. Kitchen sink	All projects		MPS = Enameled steel \$33	
5. Bathtubs	All projects		MPS = Enameled steel \$33	
6. Minimum closet widths	All projects		Plus 2 lineal feet \$63	
7. Additional insulation	All projects		50% over normal \$246	
8. Fiberglass sealer	All projects		\$141	
9. Stoves and fireplaces	All projects All projects		One or the other \$600	
10. Larger refrigerator	All projects		\$50	Architect estimate
11. Heavy duty drapery	All projects		\$75	Cost Analyst
12. Replacement of valves	All projects		\$50	
13. Water hammer arrestors	All projects		13 of them \$75	

COST FACTOR FREQUENCY INDICATOR DATA SOURCE COST HEASURE DATA SOURCE 14. Pre-wiring Most projects \$50 Larger heater 15. Design for expansion All projects \$114 B. Cultural Preferences Total No. of D.U.'s/ Development Program Average cost difference 1. Single family detached Total No. of detached D.U.'s Development Program Federal Register between Prototype costs of appropriate size Single Family Detached D.U.'s and same sized Row D.U.'s. 2. Amenities Total No. of D.U.'s/ FORMS No. of D.U.'s with patios Plans and Specs Price of item OIP Cost Analyst No. of D.U.'s with garages Plans and Specs Price of item **OIP Cost Analyst** No. of D.U.'s with carports Plans and Specs Price of item OIP Cost Analyst No. of D.U.'s with ramadas Plans and Specs Price of item OIP Cost Analyst Total No. of D.U.'s/ FORMS 3. Privacy Average DC&E cost differ-ence between scattered site Pre-bid estimate (adjuste a. Scattered sites No. of scattered site D.U.'s Plans and Specs units and subdivision units per square foot and ad-justed for prototype cost differences. 2) Difference in IHA average Development Cost Budget -

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inspection costs.

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COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
b. Large lot subdivisions	No. of subdivision D.U.'s	Plans and Specs	Difference between length of physical improvements per lot in Indian Housing subdivision.	Plan and Specs
			and length in "Typical" HUD- Insured subdivision times cost per unit of each improvement.	ARA for Housing Pre-bid estimate
4. Native materials	None in sample projects	N/A	N/A	N/A
C. Climate				I
1. Weatherproofing	Total No. of D.U.'s/ No. of D.U.'s with	FORMS Bid Specs	Price of each item	OIP Cost Analyst
	- storm windows - storm doors			
2. Alternative systems	Total No. of D.U.'s/ No. of D.U.'s with	FORMS B1d Specs	Price of each item	
	- solar equipment - wood burning stoves - fireplaces			Pre-bid estimate DIP Cost Analyst DIP Cost Analyst
3. Shortened building season	No. of D.U.'s built on sites	Housing Reps	To be determined on a case by case basis.	
	where snow falls by Nov. T/ No. of D.U.'s in projects in such areas bid after Aug. 1.	FORMS		
D. Labor Standards				
 Excessively high DOL rate determinations 	No. of projects where DQL wage determinations exceed prevailing wages in the area.	Labor Relations Officer	Difference in hourly wages per trade between DOL wage rate determination and prevailing	Labor Relations Offic
			wages in the area.	

COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
2. Wage rate increases prior to prototype revisions	No. of projects where DOL wage rate determinations exceed wage levels anticipated in	OIP Cost Analyst Labor Relations Officer	Difference in hourly wages per trade between DOL determinations and prototype levels.	Project wage rate determination in Specs/OIP Cost Analyst
	most recent prototypes.			
3. Importation of labor	No. of projects on remote sites requiring overnight importation of labor.	Housing Reps	Amount allowed in contractor's bid for travel and sub- sistence.	Interviews
 Journeyman wages paid to unskilled labor 	No. of projects with con- tractors employing unskilled labor at journeyman wage rates.	OIP Construction Inspectors	Amount allowed in contractors bid for lost productivity.	Intervi cu s
E. Indian Preference				
l. Price allowance	Total No. of D.U.'s awarded to Indian contractors/	OIP List		
	 No. of D.U.'s awarded to non-low bidder and 	Bid Tabulations	Difference between low bid and Indian contractors bid.	8id Tabulations
	 No. of D.U.'s reserved for Indian contractors. 	OIP List	Difference between per square foot cost of open-bid and Indian Preference units in a	Project plans and Pre-bid estimates (Salt River 14-4 & 5 only ones)
	_		project.	
2. Competence				
a. Completion time	Total No, of D.U.'s awarded to Indian contractors/	OIP List	No. of days contract extended times Daily Administrative	FORMS/DOFA minus Tentative Completion Date
	No. of D.U.'s not completed within contact time limit.	FORMS	Cost and Daily Interest Cost; plus any contract amendments.	Constructed Variables Architect reviews of change or
b , Completion assurance	Total No. of D.U.'s awarded to Indian contractors/	OIP List	No. of days project completion delayed times DAC and DIC;	
	No. of D.U.'s not completed by original contractor.	NM-40-7 only one. Not in sample.	Plus amount of contract amendment needed to complete.	Special case study on NH 40-7.

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er 14-4 and 14-5 only oject delayed to indian preference, onths.) termined during intervi of projects/ rojects with less than scelved.	Housing Rep Ew phase of the evaluation. FORMS Ew phase of the evaluation.	No. of days project delayed times DAC and DIC.	Constructed Variables.
ermined during intervi of projects/ rojects with less than sceived.	ew phase of the evaluation. FORMS ew phase of the evaluation.	To be determined on a case by case basis,	
termined during intervi of projects/ rojects with less than sceived. termined during intervi	ew phase of the evaluation. FORMS ew phase of the evaluation.	To be determined on a case by case basis.	
termined during intervi of projects/ rojects with less than sceived.	ew phase of the evaluation. FORMS ew phase of the evaluation.	To be determined on a case by case basis.	
of projects/ rojects with less than scelved. termined during intervi	FORMS ew phase of the evaluation.	To be determined on a case by case basis,	
termined during intervi	ew phase of the evaluation.		
termined during intervi	ew phase of the evaluation.		
			····
termined during intervi	ew phase of the evaluation.		
ponstruction bonds r rate than normal.	Construction bonds	Dollar cost per D.U. of incremental rate	FORMS Construction bonds
			· · · · · · · · · · · · · · · · · · ·
termined during intervi	ew phase of the evaluation.		
			ļ
ojects with special	Plans and Specs	Costs of special corrective measures	Architect's review of pre-bid estimate.
	ermined during intervi ojects with special	ermined during interview phase of the evaluation. Djects with special Plans and Specs	ermined during interview phase of the evaluation.

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COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
b. Soil problems	No. of projects with special problems	Soils report	Cost of special corrective measures.	Architect's review of pre-bio estimate.
c. Flood plain	No. of units in 100 year flood plain	Soils report	Same	Same
d, Earthquake fault	No. of units in earthquake zone	Soils report	Same	Same
3. Lack of improvements	No. of projects including the cost of physical improvements	Plans and Specs	Cost per D.U. of: Water lines	Pre-bid estimate
			Sewer lines Septic tanks Access streets	
			Power lines Natural gas lines	
4. Lack of water rights	No. of projects lacking access to water	Housing Reps	Cost per D.U. of individual or community wells	Pre-bid estimate
5. Special locational requirements	No. of projects including one or more special distance items	Plans and Specs	Cost per unit of: Large refrigerators	OIP Cost Analyst
			Fire extinguishers Washer/dryer rough-ins 1 and 2 bedroom units	
			Fencing Cattle guards Extra storage	· · · · · · · · · · · · · · · · · · ·
			Fire stations Fire equipment	· · · · · · · · · · · · · · · · · · ·
H. Overdesign	No. of projects in rural locations including unneces- sary site improvements	Plans and Specs	Cost per D.U. of: Excess street width	Pre-bid estimate
			Unnecessary sidewalks Unnecessary curbs and gutters Unnecessary aspnalt driveways	
			Unnecessary street rights	

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COST MEASURE DATA SOURCE COST FACTOR FREQUENCY INDICATOR DATA SOURCE I. Administrative No. of projects with IHA fail-DAC and DIC times No. of days ing to meet project planning 1. IHA performance FORMS each time frame missed: time frames. PR to Site Submission - 90 Site Approval to DP - 120 ACC execution to Contract F8RMS FORMS Documents - 90 Contract Documents to Submission of Bids - 40 FORMS No. of projects with HUD fail-ing to meet project review DAC and DIC times No. of days FORMS each time frame missed: 2. HUD performance time frames. Site Review and Approval - 60 DP Review to ACC execution - 60 FORMS FORMS Contract Documents Review and Approval - 30 Bid Review and Authorization to FORMS Award - 15 FORMS 3. IHS delays To be determined during interview phase of the evaluation. 4. BIA delays To be determined during interview phase of the evaluation. J. Planning Cost of all flood and arche-No. of projects requiring HUD Development Cost Budget/ ological surveys. Extra cost Development Cost Budget 1. Special surveys payment for special surveys. A&E review/ over norms for soils, site and ARA for Housing engineering studies. 2. Architect performance a. Slowness To be determined during interview phase of the evaluation.

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COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
b. Quality of design	No. of projects which had to be redesigned.	OIP Architects	DAC and DIC times No. of days until redesign completed.	OIP Architects
c. Cost estimates	No. of projects having to be rebid.	OIP Architects/FORMS	DAC and DIC times No. of days until rebid completed.	OIP Architects/FORMS
d. Coordination	To be determined during intervi	w phase of the evaluation.		
K. Cost Allocations				· · · · · · · · · · · · · · · · · · ·
1. Shift of costs to HUD	To be determined during intervi	w phase of the evaluation.		
2. Catch-up facilities	No. of projects including facilities serving previous project(s).	Plans and Specs/ OIP Architect	Proportion of facility serving previous project(s).	Pre-bid estimate apportione by OIP Architect
3. Partially vacant subdivisions	No. of subdivisions with vacant lots.	Plans and Specs	Proportion of physical improvements serving vacant lots	Pre-bid estimate apportioned by OIP Architect,
4. Hidden DC&E costs	To be determined during intervi	w phase of the evaluation.		
5. Economies of scale	No. of projects with less than 20 units.	Forms	Difference in average DCAE costs per square foot between small and large projects.	Development Program or Plans and Specs/Development Cost Budget.
L. Collateral Effects of Higher Construction Costs				
). Bond premium base	No. of projects with DC&E costs above normal.	State median prototype costs/ Federal Register	Bond rate applied to DC&E costs of hypothetical similar project at state median prototypes.	Construction Bond
2, Interest base	No. of projects with Total Development Cost above normal,	State median prototype costs times 1.75/Federal Register	Interest rate applied to TDC of hypothetical similar project at state median prototypes	Development Cost Budget
3. Architect's fee base	No. of projects with DC&E costs above normal.	State median prototype costs/ Federal Register	Fee schedule applied to DC&E costs of hypothetical similar project at state median proto-	Development Cost Budget
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COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
4. HUD fee base	No. of projects with TDC costs above normal.	State median prototype costs times 1.75/Federal Register	HUD fee schedule applied to TDC of hypothetical similar project at state median prototypes.	Fee = .002 of TDC Development Cost Budget
M. Special Provisions				
]. Participant training	No. of projects with funds budgeted for participant training.	Development Program	Amount budgeted per unit	Development Fund Reguisition Development Program
2. Insurance premiums	No. of projects with funds budgeted for 3 year policy	Development Program	Amount budgeted per unit	Development Program
N. Contract Settlement				
1. 2% Repairs Guarantee	No. of projects where IHA with- held 2% of bid.	Interviews	Amount withheld	Interviews
0. Cost Savings				
1. Land donations	No. of projects where land is donated	Development Cost Budget	Amount allowed per lot	Development Cost Budget
2. Relocation	No. of relocation actions proposed,	Development Program	Amount of relocation payments	Development Cost Budget
3. BIA services	No, of projects with BIA providing services	Development Program	Value of appraisals and surveys	ARA for Housing
4. Apprenticeship programs	No. of projects using apprenticeship labor,	OIP Construction Inspectors	Difference in wage rates per apprentice times hours worked.	Interviews
5. Landscaping	No. of projects without landscaping	Development Program	Amount less than "normal" landscaping costs	ARA for Housing/ HUD 2328, Line 39
				HUD 2328 LI, Line 40
6. Air conditioning	No. of projects using swamp coolers.	Plans and Specs	Difference in cost between swamp coolers and refrigerated air conditioning.	OIP Cost Analyst

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COST FACTOR	FREQUENCY INDICATOR	DATA SOURCE	COST MEASURE	DATA SOURCE
7. No. local review	No. of projects not reviewed by local government.	Housing Reps	Savings in "normal" costs of local permit fees.	ARA for Housing
8. Low Davis-Bacon wages	No. of projects where Davis- Bacon wages are below current union wages.	Labor Relations Specialist	Difference in wage rates by trade times No. of hours worked	OIP Cost Analyst
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<u>Appendix C</u>

REGION IX

INDIAN HOUSING COST STUDY

A. PROJECT PROCESSING

1. PROJECT NO	2. IHA
3. PROJECT LOCATIONS:	SCAT. SUBD.
A	NO, OF D.U.'s
^{B.}	NO. OF D.U.'s
C	NO. OF D.U.'s
D	NO. OF D.U.'s
E	NO. OF D.U.'s
4. PROJECT TYPE:	5. PRODUCTION METHOD:
MUTUAL HELP RENTAL	CONVENTIONAL
6. PROGRAM RESERVATION APPROVAL:	
INIT1AL MO DY YR	LATEST MO DY YR
COMMENTS:	
	······································
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7. ANNUAL CONTRIBUTIONS CONTRACT EXECUTION	DNS :
INITIAL MO DY YR	LATEST MO DY YR
COMMENTS:	
8. BID OPENINGS:	
INITIAL MO DY YR	NO. OF BIDS
REBID MO DY YR	NO. OF BIDS
REBID MO DY YR	NO. OF BIDS
COMMENTS:	
	·····
9. CONSTRUCTION STARTS:	
INITIAL MO DY YR	LATEST MO DY YR
COMMENTS:	· · · · · · · · · · · · · · · · · · ·
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10. SCHEDULED COMPLETION DATE:	
INITIAL MO DY YR	LATEST 140 DY YR
DOFA MO DY YR	

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11. UNIT COMPOSITION: NO. OF ELDERLY D.U.'s ____ NO. OF FAMILY D.U.'s ____ NO. OF HANDICAPPED D.U.'s ____ 12. PROTOTYPE COST LIMIT CALCULATION: DC&E COSTS--ACCT. 1460 \$__,___. ACCT. 1465 \$__, PRORATA CONTINGENCY \$ _ , _ _ , _ _ (_ 7) TOTAL \$__,__,__ PROTOTYPE COSTS--SIZE COST LIMIT NO. OF D.U.'S TOTAL 0 BR \$__,__ * ___ * \$__,__, \$__,__ X ___ = \$__,__. 1 BR \$___,___ X ____ * \$__,___ 2 BR 3 BR \$__,___ X ____ * \$__,___, 4 BR \$__,___X ___ = \$__,___, \$__,__ X ____ 5 BR • \$__/___/ TOTAL _ _ _ \$___' DC4E COSTS = _ _ . _ X OF PROJECT PROTOTYPE COST LIMIT 13. REGIONAL ADMINISTRATOR'S APPROVAL OF PROTOTYPE COST LIMIT REQUIRED? YES _ NO _ IF YES, DATE OF APPROVAL: MO __ DY __ YR __ 14. COMMENTS ON ANY UNUSUAL ASPECTS OF THE PROJECT WHICH MAY HAVE DELAYED IT OR CREATED ADDITIONAL EXPENSE: 15. IF PROJECT CONSTRUCTION WAS COMPLETED EITHER EARLIER OR LATER THAN SCHEDULED EXPLAIN WHY: ____

В.	PROJECT	DESIGN

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**	1 800	1001	Dany H	

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FIRM	
ADDRESS	
CONTACT	TELEPHONE

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2. WORKING DRAWINGS COMPLETED: MO __ DY __ TE ___

3. WORKING DRAWINGS APPROVED:

BY IHA--HO _ DY _ YR _ _

BY BIA-MO _ DY _ YR _ _

BY IES--MO _ DY _ YR _ _

4. PROJECT COMPOSITION AT CONTRACT AWARD:

BEDROOM SIZE	NO. OF D.U.'S IN SUBDIVISIONS	NO. OF D.U.'S ON Scattered Sites	SQUARE FOOTAGE	NO. OF BATHS
O BR				_
1 BR				_
2 BR				-
3 BR				_
4 BR				_
5 BR				-
TOTAL				

5. TOTAL NO. OF SUBDIVISIONS:

6. OTHER PROJECTS WITH SAME UNIT DESIGNS:

PROJECT NO. __ - _ - _ NO. OF D.U.'s ____

7. TOTAL NO. OF LOTS IN PROJECT SUBDIVISIONS:

8. NO. OF LOTS PREVIOUSLY DEVELOPED:

9. NO. OF LOTS RESERVED FOR FUTURE DEVELOPMENT:

10. AVERAGE NO. OF D.U.'s PER ACRE:

11. NO. OF D.U.'S WITH LOTS WHICH ARE: & ACRE ____ & ACRE ____ 3/4 ACRE ___ 1 ACRE ____

12. NO. OF D.U.'S WHICH ARE: DETACHED ____ SEMIDETACHED ____ ROW ____

13. WAS THIS PROJECT EVER REDESIGNED AFTER HUD APPROVAL OF SCHEMATICS? TES _ NO _

IF TES, EXPLAIN WHEN AND WHY:

14. SELECTED DESIGN FEATURES:

ITEM	PRESENT	QUANTITY	TOTAL COSTS	COST PER D.L
FIREPLACE/CHIMNEY	YES _ NO _		\$ _ -	\$
WOOD-BURNING STOVE	YES NO		\$	\$
SOLID ADOBE WALLS	YES NO	L. FT./D.U.	\$	\$
SOLID MASONRY WALLS	YES _ NO _	L. FT./D.U.	\$	\$
ADOBE VENEER WALLS	YES NO	L. FT./D.U.	\$	\$
MASONRY VENEER WALLS	YES _ NO _	L. FT./D.U.	\$	\$
BASEMENT	YES NO	\$Q. FT./D.U.	\$	\$
CATHEDRAL CEILING	YES NO		\$	\$
SHARE/SHINGLE ROOF	YES NO		\$	\$
TRIM & DETAILING	MINIMAL _ AV	ERAGE _ EXTENSIVE _	\$	\$
FIRE EXTINGUISHER	YES _ NO _		\$ _	\$
FIRE EX. CABINETS	YES NO		\$ ~	\$
AIR CONDITIONING	YES NO	REFRIGERATED	\$	\$
		EVAPORATIVE _		
SOLAR EQUIPMENT	YES NO		^{\$}	\$
BOOF INSULATION	YES NO	R	^{\$}	\$
WALL INSULATION	YES NO	R	\$	\$
EXTRA EXTERIOR STORAGE	YES _ NO _	SQ. FT./ _ BR	\$	\$
		SQ. FT./ _ BR		
		SQ. FT./ _ BR		
LARPORT	YES NO _	ENCLOSED _ OPEN _	\$	\$
GARAGE	YES _ NO _	SQ. FT./D.U.	\$	\$
COVERED PATIO	YES _ NO _	SQ. FT./D.U.	\$	\$
ARBECUE/COOKING PIT	YES _ NO _		\$	\$ _
LANDSCAPING	YES _ NO _	MINIMAL _ EXTENSIVE _	\$ _ 	\$
SITE FENCING	YES _ NO _	^{L. FT./D.U.}	\$ 	\$
)THER:			\$	\$
			\$ - -	\$
			\$	\$
_			\$	\$ _ _ _
DESCRIBE ANY UNUSUAL, B	EXPENSIVE OR	INEFFICIENT ASPECTS OF U	NIT DESIGNS NOT	ALREADY
COVERED ABOVE:				
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1. NONDWELLING S	PACE:
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FACILITY	SQ. FOOTAGE	TOTAL COSTS	COSTS/SQ. PT.	COSTS/D.U.
ADMINISTRATIVE	- -	\$_ _	\$ _ _	\$
MAINTENANCE		\$	\$	\$ <u>_</u>
COMMUN 1 TY		\$	\$	\$
FIRE STATION		\$ <u></u>	\$ _ <u></u> _	\$
		\$ _ _	\$	\$
TOTAL.		\$ 	\$ -	\$

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2. SITE IMPROVEMENTS:

FACILITY	QUANTITY	TOTAL COSTS*	COSTS/D.U.	CONTRIBUTIONS
PLAYGROUNDS	SQ. FT.	\$	\$	\$
PERIMETER FENCING	GL. PT.	\$	\$	\$
CATTLE GUARDS	EA.	\$	^{\$}	\$
INTERIOR STREETS	L. FT.	\$	\$	\$ _
GRAVEL PAVEL	°_			
ACCESS STREETS	L. FT.	\$	\$ _	\$_ _
GRAVEL PAVE	_ م			
DRIVEWAYS	L. FT.	\$	\$ _	\$_ _
GRAVEL PAVEL	°_			
WALKWAYS	L. FT.	\$	\$ _	\$
CURBS/GUTTERS	L. FT.	\$	\$	\$
WATER LINE	L. FT.	\$	\$	\$ _
SEWER LINE	L. FT.	\$	\$	\$
LIFT STATIONS	EA.	\$	\$	\$
TREATMENT PLANT	_ EA.	\$ _	\$	\$
NEW _ EXPANDE	°_			
EVAPORATION POND	_ EA.	\$	\$	\$
NEW EXPANDED	°_			
SEPTIC TANKS	EA.	\$ 	\$	\$ <u></u>
DRAIN FIELDS _ CT	ESSPOOLS _	\$	\$	\$ _
COMMUNITY WELLS	EA.	\$	\$	\$ _
INDIVIDUAL WELLS	EA.	\$	\$ _	\$
DRAINS/CULVERTS	L. FT.	\$	\$	\$ <u></u>
MANHOLES	EA.	\$	\$	\$
<u> </u>		\$	\$	\$ <u>-</u>
	<u> </u>	\$ _	\$	\$ _
		\$	\$	\$

LIST NATURE AND AMOUNTS OF SITE IMPROVEMENTS SOLELY SERVING LOTS DEVELOPED AS PAR
LIST NATURE AND AMOUNTS OF SITE IMPROVEMENTS SOLELY SERVING LOTS DEVELOPED AS PAU OF EARLIER PROJECTS.
\$\$
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\$\$
IS PROJECT SITED ON DIFFICULT TERRAIN? YES _ NO _ IF YES, DESCRIBE BRIEFLY:
DOES PROJECT HAVE SPECIAL SOILS PROBLEMS? YES NO IF YES, DESCRIBE BRIEFLY
IS PROJECT SITE WITHIN A 100-YEAR FLOOD PLAIN? YES NO _ IF YES, EXPLAIN
MEASURES TAKEN TO PREVENT FLOOD DAMAGE:
IS PROJECT SITED NEAR AN EARTHQUAKE FAULT? YES _ NO _ IF YES, WERE ANY SPECIA
IS PROJECT SITED NEAR AN EARTHQUAKE FAULT? YES _ NO _ IF YES, WERE ANY SPECIA MEASURES TAKEN TO PROTECT AGAINST EARTHQUAKE DAMAGE? YES _ NO _ IF YES, DESCR

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•	WERE THERE ANY OTHER UNUSUAL ENVIRONMENTAL FEATURES OF THIS PROJECT'S LOCATIONS
	WHICH AFFECTED ITS DESIGN OR COSTS? YES _ NO _ IF YES, DESCRIBE BRIEFLY:
	PLAN REFINEMENT AND DETAILING WAS: MAXIMUM _ AVERAGE _ MINIMUM _
	D. PROJECT CONSTRUCTION
	CONTRACTOR :
	FIRM
	ADDRESS
	CONTACT TELEPHONE
	WAS PROJECT BID INDIAN PREFERENCE? YES NO
	WAS CONTRACT AWARDED TO LOW BIDDER? YES NO IF NO. WHAT WAS THE DIFFERENCE
	BETWEEN THE LOW AND ACCEPTED BIDS? \$ WHY WAS THE LOW BID REJECTE
	NC. OF BIDS RECEIVED:
	CONTRACTING FIRM OWNED BY: INDIANS _ NONMINORITY WHITES _ OTHER MINORITIES _
	A JOINT VENTURE INCLUDING INDIAN PARTICIPATION _
	WERE ITEMS DELETED FROM THE WINNING BID? YES _ NO _ IF YES, LIST DELETIONS AN
	AMOUNTS SAVED:
•	CONTRACT WAS GUARANTEED BY: BOND LETTER OF CREDIT OTHER
	IF BY BOND, THE PREMIUM WAS: AMOUNT \$ RATE / PER
•	CONTRACT AMOUNT WAS: \$ ADJUSTED: \$
	TOTAL NO. OF MONETARY CHANGE ORDERS:
	TOTAL AMOUNT OF CHANGES: +\$, OR -\$,
	OPTIMUM BUILDING SEASON(S) AT PROJECT LOCATION(S):
•	
•	LOCATION(S) HO DY TO HO _ DY

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E. LABOR STANDARDS

- 1. WERE DOL WAGE RATE DETERMINATIONS HIGHER THAN EXPECTED? YES _ NO _
- 2. DID THE DOL DETERMINATIONS NECESSITATE A REVISED DEVELOPMENT COST BUDGET? YES __ NO __ AN AMENDED ACC? YES __ NO __ IF EITHER IS YES, AMOUNT OF REBUDGETING OR OF AMENDMENT FUNDS NEEDED TO COVER HIGHER LABOR COSTS: \$ _____.
- 3. WERE DOL WAGE RATES LOWER THAN EXPECTED? YES _ NO _
- 4. DATE(S) DOL DETERMINATIONS RECEIVED: MO __ DY __ YR __, MO __ DY __ YR __,
- 5. WERE APPRENTICES HIRED FOR THIS PROJECT AT APPRENTICE WAGES? YES _ NO _ IF YES, WERE SOME HIRED THROUGH THE RESERVATIONS OWN APPROVED APPRENTICESHIP PROGRAM? YES _ NO _
- 6. WERE WORKERS WITH LESS THAN JOURNEYMAN SKILLS HIRED FOR THIS PROJECT AT JOURNEYMAN WAGES? YES _ NO _ PROBABLY _
- 7. IS PROJECT LOCATION SO REMOTE THAT SOME LABOR HAD TO BE PAID TRAVEL AND SUBSISTANCE COSTS? YES _ NO _ PROBABLY _ COMMENTS: _____
- 8. WERE THAT ANY OTHER LABOR RELATED DELAYS OR EXPENSES EXPERIENCED BY THIS PROJECT? YES NO _ IF YES, EXPLAIN BRIEFLY: ______

F. OTHER COMMENTS

DESCRIBE ANY OTHER UNUSUAL ASPECTS OF THE PROJECT WHICH ARE NOT ALREADY COVERED ABOVE AND WHICH MAY HAVE CAUSED EITHER EXTRA EXPENSE OR A HIGH DC & E COSTS-TO-PROTOTYPE RATIO: