

WARM SPRINGS HEALTH AND WELLNESS CENTER
WARM SPRINGS, OREGON

POST OCCUPANCY EVALUATION

April 1997

Environmental Health and Engineering
Indian Health Service

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TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
INTRODUCTION	1
WARM SPRINGS SERVICE UNIT OVERVIEW AND HISTORY	1
JOINT VENTURE DEMONSTRATION PROGRAM	3
PURPOSE OF THE POST OCCUPANCY EVALUATION	3
SURVEY TEAM	4
PROJECT DEVELOPMENT	5
ARCHITECTURAL	7
CIVIL/STRUCTURAL	38
MECHANICAL	42
ELECTRICAL	46
SUMMARY OF FINDINGS AND RECOMMENDATIONS	49
APPENDIX - PHOTOGRAPHS	52

**WARM SPRINGS HEALTH AND WELLNESS CENTER
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INTRODUCTION

The Indian Health Service (IHS) conducts Post Occupancy Evaluations (POE) of recently completed health care facilities to gain knowledge for planning, designing, constructing, and operating new and replacement facilities. Generally, a POE is conducted during the second year of a facility's operation. This allows the staff an opportunity to become familiar with the facility and to implement procedures for utilizing departmental spaces.

The new health center at Warm Springs was constructed by the Confederated Tribes of the Warm Springs Reservation, and is staffed and operated by the IHS under a joint venture agreement. The POE team greatly appreciates the assistance and cooperation of the Tribes in the study of this facility. The health center was planned, designed, and constructed using English measurements. However, the POE report includes metric measurements in compliance with the Indian Health Service Technical Handbook for Health Facilities, Volume I, Part 16.

The IHS currently provides direct health services to Indians, Alaska Natives, Eskimos, and Aleuts in 43 hospitals and over 400 health centers and health stations. Since 1980, 15 hospitals and 19 health centers, two youth regional treatment centers, and two joint venture projects have been constructed. At the present time, five hospitals, nine health centers, and two youth regional treatment centers and a satellite youth treatment center are in the planning, design, or construction phase.

WARM SPRINGS AREA OVERVIEW AND HISTORY

The Warm Springs Health and Wellness Center is located on the Warm Springs Indian Reservation, located in north central Oregon in Jefferson County. The reservation covers 2 591 square kilometers. Warm Springs is approximately 160 kilometers east-southeast of Portland, Oregon; approximately 144 kilometers east of Salem, Oregon; and approximately 96 kilometers north of Bend, Oregon. The Warm Springs Service Unit covers all of Jefferson and Wasco counties, and portions of Clackamas county. Harney county is within the Service Unit but is considered a separate health location. There are no other service areas within the service unit.

The user population of 4,201 includes the Indian population of Jefferson, Wasco, and Clackamas counties. However, since the Indian population in Clackamas County utilizes the Warm Springs community health and dental services only, it is not included in the 1990 Census population of 3,552 Indians residing in Jefferson and Wasco counties. The Indian population in Clackamas County receive all other ambulatory services from contract health services.

The replaced health center at Warm Springs (Installation No. 11542) was constructed in 1937 as a Bureau of Indian Affairs hospital. In 1957 the building was converted to a Public Health Service Ambulatory Clinic, with services including medical and dental clinics, community health nursing, nutrition, environmental health, and administration. Contract health services, mental health, alcohol treatment, and tribal health programs were located in another building. Following completion of the new health center in 1993, the old building was scheduled to be renovated for use by Tribal human services programs.

Climate: The variation in reservation elevation above sea level extends from 3 199.7 meters at the top of Mount Jefferson to a low of 640.2 meters at the Deschutes River. Annual rainfall ranges from 18 centimeters (cm) in the lower elevations to 38 cm in the higher elevations. Temperatures range from below freezing in the winter to above 32 °C in the summer with an occasional 40 °C. Average humidity in this area is generally low. Frosts can occur during any month of the year at elevations above 762 meters.

Transportation and Communications: A major state highway, Highway 26, which traverses the Warm Springs Reservation, connects central Oregon with the Willamette Valley. A number of secondary roads, paved and unpaved, are maintained by the Bureau of Indian Affairs and serve various areas within the boundaries of the reservation. Greyhound bus service to and from the reservation is available four times a day. Although there is no airport on the reservation, commuter air service is available 64 kilometers south at Redmond, Oregon. Privately owned vehicles are the major form of transportation.

Telephone service is widespread throughout the reservation. Reception of major television networks and radio stations varies from fair to excellent. Two FM radio stations, one commercial and the other education, are located on the reservation. The principal state-wide daily newspaper, The Oregonian, is readily available. A tribal newspaper is published on a bi-weekly basis.

JOINT VENTURE DEMONSTRATION PROGRAM

The replacement health center was constructed by the tribe as part of the Joint Venture Demonstration Program under Public Law 101-512. This program is intended to assist those tribes and tribal organizations that wish to use tribal funds to increase the level of health care services provided to their population. The tribe agrees to finance and construct the facility, and in turn the IHS leases the facility from the Tribe for 20 years without cost. In addition, the IHS equips, supplies, operates, and maintains the facility.

Prior to undertaking the health and wellness center project, the Warm Springs Confederated Tribes had recently completed several construction projects, including an \$8 million museum and an Early Childhood Education Center.

Several factors contributed to a shorter-than-usual time for planning, design, and construction of this project. The A/E firm was hired and concept and schematic design was developed prior to final approval of the PJD/POR. A less formal plan review process involved fewer reviewing parties and fewer review cycles. Concurrent tasking was used to prequalify construction contract bidders, allowing an award to be made within 17 days of bid opening. These actions accelerated the project by approximately 36 months over a typical IHS project of similar scope.

The new health and wellness center houses services such as diagnostic, ambulatory, administration, and facility support. Diagnostic services includes laboratory and radiology; ambulatory services includes medical, dental, optometry, pharmacy, and community health.

PURPOSE OF POST OCCUPANCY EVALUATION

The process of surveying and analyzing recently constructed and occupied facilities is titled, "Post Occupancy Evaluation". The purposes for conducting a POE include:

- o Avoiding design or construction deficiencies in future facilities.
- o Documenting noteworthy construction features or practices for inclusion on future projects.
- o Verifying that functional requirements of the program are met at reasonable costs.

- o Evaluating staffing patterns and determining the adequacy of space provided compared to the approved Program of Requirements.
- o During the POE survey, the team evaluates the planning, design, construction, and operating processes. The subsequent report provides feedback to those offices responsible for each process. The goal is to reduce costs by incorporating efficient features and practices into future facilities.

SURVEY TEAM

The POE of the Warm Springs Health and Wellness Center was conducted on October 18-19, 1995. The following were members of the POE team:

Joseph Corliss	Headquarters/Division of Facilities Planning and Construction (DFPC) Civil Engineer
Kent Morgan	Headquarters/DFPC Architect
Raymond Cooke	Headquarters/DFPC Civil Engineer/Project Officer
Mark Eberling	Engineering Services (ES)-Seattle Mechanical Engineer
John Rogers	ES-Seattle Electrical Engineer
Ramona Ornelas	Headquarters/Office of Health Programs Nurse/Senior Health Analyst
Geoffrey Wachs	Portland Area/Division of Facilities Engineering Civil Engineer
Roselyn Tso	Portland Area/Office of Planning, Evaluation, and Information Systems Planner

This report was prepared by team members. The team greatly appreciates the assistance and cooperation of Russ Alger, Service Unit Director, Michelle Gemelas, Quality Assurance Officer, Chuck Crover, Facility Manager, and many other members of the Warm Springs Health and Wellness Center staff.

Prior to the POE team visit, the health center administration was asked to distribute a survey form to all patients using the facility during a one-week period. The survey requested user opinions on the appearance, convenience, and comfort of the building and its services. Because only six responses were received, no conclusions can be drawn from this survey, and no results are included in this report. However, feedback from "customers" remains an important aspect of IHS facility evaluation, and this information-gathering tool should be employed in future POE surveys.

PROJECT DEVELOPMENT

1. Chronology

Program Justification Document Approved ... February 1992
 Program of Requirements Approved March 1992
 Design Completed June 1992
 Construction Contract Awarded July 1992
 Construction Completed August 1993
 Beneficial Occupancy September 1993

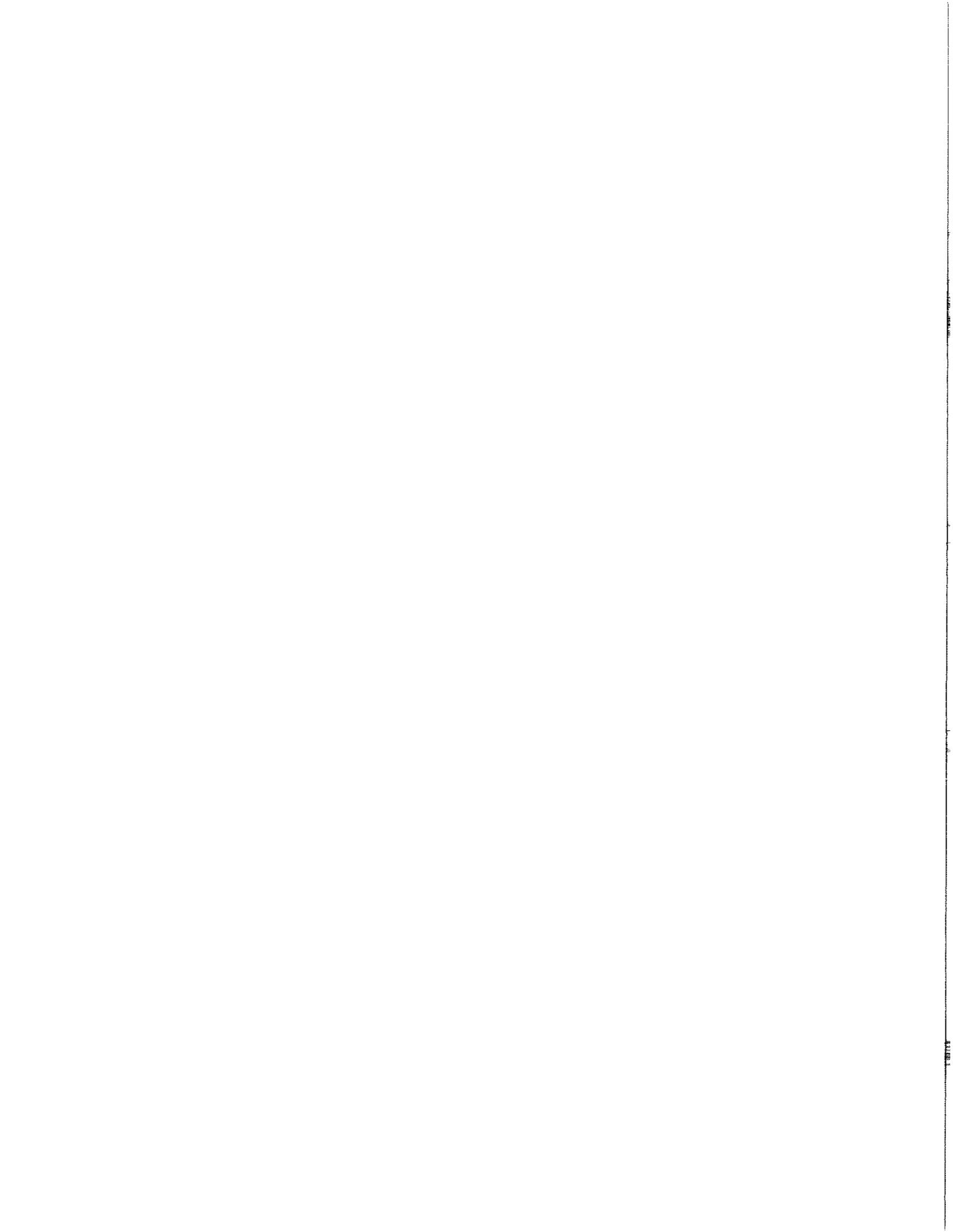
2. Design Contractor KMD Architects & Planners, PC
 421 SW Sixth Ave., Suite 1300
 Portland, Oregon 97204

3. General Construction Contractor ...Donald M. Drake Company
 Portland, Oregon

4. Joint Venture Costs

A. Project Costs by Confederated Tribes of Warm Springs

Planning and Design	\$ 571,871
Engineering and Survey	30,602
Construction	4,357,915
Inspections	95,700
Other	<u>58,989</u>
Subtotal	\$5,115,077
Telephones	<u>\$207,000</u>
Grand Total	\$4,908,077



Building Gross Square Meters:

a) Report to Congress Prepared by Warm Springs, 5/15/94	3 462
b) Approved POR (Facility + Amb. Garage)	3 452

Cost per Square Meter:

(Based on Warm Springs Report to Congress)
(Design and Construction) \$ 1,418/m²

B. Project Costs by Indian Health Service

Equipment	\$1,335,000
Additional Construction Related Items	<u>137,015</u>
Subtotal	\$1,472,015
Total A + B	<u>\$6,380,092</u>
Cost per Square Meter (All Items)	\$1,843

ARCHITECTURAL

1. Building Orientation

- a. The new health and wellness center is located south of the town of Warm Springs, across the road from the tribal Early Childhood Education Center. It is comprised of three roughly hexagonal pods which are joined together in a straight line (see photos A-1 and CS-2). Service functions are located in a wing which is located at the south end of the building.
- b. **Building Entrances:**
 - (1) The main entrance, on the east side of the building between pods "B" and "C", is identified by an entrance structure supported by stone piers (photo A-2).
 - (2) There is an ambulance entrance door at the front of the building south of pod "C" (see photo A-6). The health center does not offer full emergency services, so the door is not identified as an emergency entrance. Except for a small roof overhang (about 1.5 m) over the door, there is no covered area for unloading ambulances. A heated concrete slab at this entrance has been replaced since building occupancy to improve drainage.
 - (3) The service entrance, maintenance garage, and boiler room are located at the south end of the building.
- c. **Parking:** The number of parking spaces is well in excess of POR requirements. The lot provides overflow parking for the Early Childhood Education Center. See CIVIL/STRUCTURAL for additional comments.

2. Exterior Features

- a. General Observations/Design Criteria
 - (1) **General Appearance:** The health center is a single-story, wood-frame building featuring fieldstone veneer exterior walls and a sloped roof (4/12 pitch) with red asphalt shingles. There is extensive, well maintained landscaping around the building (photos A-3 and A-5).
 - (2) **Building Signage/Identification:** A sign at the street entrance to the parking lot reads, "Health and Wellness Center." Flanking the main building entrance are two

bronze dedication plaques mounted on the stone walls. One identifies the building as the Warm Springs Health and Wellness Center, dedicated 1993, and gives credit to various individuals. The second plaque states the goal of the Confederated Tribes of Warm Springs: "Becoming the healthiest Indian community by the Year 2000."

b. Specific Features/Findings

- (1) **Main Entrance:** The entrance is sheltered by a canopy structure which extends from the door to the driveway. This creates an inviting entrance (see photo A-2).
- (2) **Entrance Vestibules:** The main entrance, as well as a similar secondary entrance between pods "A" and "B," is provided with a vestibule to reduce heat loss and wind penetration (see photo A-9).
- (3) **Exterior Walls:** The attractive fieldstone masonry used for the exterior wall features a large round window on the cross axis of each pod. Bleached wood siding is used on some walls above the 1 m or 2 m height (see photos A-4 and A-5).
- (4) **Windows:** Windows are generally fixed sash with metal frames painted dark red to match the roof shingles. The round windows are divided by distinctive sloped muntins (see photo A-4).
- (5) **Roof:** The roof is covered with standard three-tab asphalt shingles laid over a plywood deck. It is drained by perimeter gutters, accented with blue paint, and external leaders. No leaks have been reported. The roof structure encloses a large attic. At the center of each pod, the roof is raised (less than 1 m) to allow clerestory lighting on four sides of the two-story high lobby/waiting area. No access is provided to the roof from inside the building.
- (6) **Handicapped Accessibility:** The site and structure are generally accessible to the physically disabled.
- (7) **Landscaping:** The area adjacent to the building is planted with attractive and well-maintained lawns, shrubs, and trees. There is an in-ground irrigation system. Around the parking lots the planting is more naturalistic, with volcanic rock ground cover and extensive use of native shrubbery (photo A-3).

- (8) **Loading Dock:** A dock with a truck ramp was indicated in the design, but it was not constructed. The loading area is level with the service yard and driveway. This was probably done to avoid digging a ramped pit, which would be difficult to drain properly. However, delivery of materials is much less convenient than it would be with a dock.

c. Comments/Recommendations

- (1) A sloped, shingled roof is a good solution in situations where the building layout permits it, because it is relatively inexpensive to build and maintain, not prone to leaks, and provides a large attic area which is useful for mechanical equipment and systems access. However, the roof configuration makes future additions to the building more difficult to accomplish without building another pod.
- (2) A dock for unloading trucks should be included in designs for health centers.

3. Building Security

a. General Observations/Design Criteria

- (1) No staff is employed to provide off-hours building security. On-duty maintenance staff perform limited surveillance of building and grounds. This is not a very effective means of providing building security.
- (2) The building has been relatively free from break-ins and vandalism, but security during extended (evening) hours and after-hours has been a continuing concern of the administration and the Tribe.

b. Specific Features/Findings

- (1) **Monitoring System:** Security cameras were provided at the ambulance entrance and receiving area. Since building occupancy, a third camera has been added at the control/charting area in Ambulatory Care. Staff noted that additional cameras would be desirable.
- (2) **Vandalism:** There has been some damage to automobiles parked in the health center parking lots.

c. Comments/Recommendations

- (1) In plans for future facilities, provide for installation of adequate number of remotely monitored security cameras.
- (2) Motion-activated lighting should be installed to increase security around the building exterior.

4. Functional Relationships and Traffic Patterns

a. General Observations/Design Criteria

- (1) The health center is organized in three hexagonal pods linked in a straight line by two rectangular connecting links. At the center of each pod is a generously sized waiting area, off of which various departments are located, like shops in a mall. Although the mall and pod concepts result in an attractive design, it is not entirely successful in terms of interdepartmental relationships and patient and staff flow patterns.
- (2) The layout of the building is readily comprehended, and in most cases departments are grouped logically in the appropriate pods.
- (3) The pod arrangement presents some difficulty for future expansion. The building was planned for the future addition of a fourth pod at north end. However, additional space is most needed in Pod C to expand the outpatient functions located there. Adding another pod at the point most remote from Pod C would require major relocations of departments. The configuration of the building (especially the roof design) makes the expansion of an existing pod difficult.

b. Specific Features/Findings

- (1) The geometry of the more-or-less hexagonal pods and their inter-connecting links results in numerous odd-shaped spaces, some with acute-angle corners which cannot be used efficiently.
- (2) The scheme requires some departments to be separated more than they should be, and at the same time it concentrates too many functions into pod C (clinical and diagnostic services, pharmacy). Thus, Pod C is overcrowded and already in need of expansion. The dental clinic, located in Pod B, also is in need of

expansion. Modest expansion of Dental might be achieved by relocating the adjacent optometry clinic.

c. Comments/Recommendations

- (1) Building layout should be driven not by external factors such as predetermined building shapes, but by the needs of the departments being housed.
- (2) A rectangular layout generally would allow more efficient use of space and more flexibility for future alterations and expansion.

5. Interior Features (General)

a. General Observations/Design Criteria

- (1) Interior public spaces, with their emphasis on exposed roof structure and natural wood, are attractive and well-maintained (see photos A-7 and A-10). There is clearly a "pride of ownership" among users of the health center.
- (2) In spite of high ceilings and clerestory lighting, the central waiting areas are quite dark, even on a sunny day. This has prompted concern by safety and security personnel. The clerestory windows are not large enough to light the spaces adequately (photos A-10 and CS-6).
- (3) The use of traditional art in the form of murals, weavings, and other wall decorations and displays enhances the appearance of the public spaces (see photos A-8 and A-10). A finely crafted display case in the main entrance lobby contains exhibits loaned by the local tribal museum.

b. Specific Features/Findings

- (1) **Handicapped Accessibility:** Both public and staff-use spaces are generally accessible to the disabled.
- (2) **Floor Structure:** There is a 1 m crawl space under the entire building. The plywood subfloor was glued and nailed to the composite wood joist system. Apparently there has been some delamination of the subfloor due to exposure to moisture during construction. Throughout the building there is an undesirable degree of deflection, springiness, and squeaking in the floor

(even though considerable remedial work has been done to reduce squeaking).

- (3) **Floor Finishes:** The floors in most public areas are carpeted. Carpeting is in good condition. Floors in many clinical and laboratory areas are vinyl composition tile, which is cracking and separating as a result of movement of the floor structure. Uneven and irregular floor surfaces (which are fairly common) present tripping hazards. All vinyl tile floors are scheduled for replacement with sheet vinyl flooring.
- (4) **Wall finishes:** Paint used on most interior walls is generally in good condition and of average durability. Use of semi-gloss paint would provide better washability. Fabric-covered acoustic wall coverings in many public spaces were chosen in consultation with tribal elders (see 45.0 *PUBLIC FACILITIES*).
- (5) **Wall Damage:** Outside corners in a number of high traffic areas have been damaged by equipment impact (see 32.0 *COMMUNITY HEALTH*, for example). These corners should be protected by metal or plastic corner guards.
- (6) **Storage Space:** Staff in many departments commented that storage space is insufficient. The team noted that this complaint arises in virtually all facility reviews. This is a result both of inadequate programming for storage space in the Program of Requirements (POR), as well as inefficient use of the space which was provided.
- (7) **Furniture:** Modular systems furniture is used in many open office areas. Managed Care was provided with custom-made built-in furniture, which is less successful in meeting program needs (see comments under 41.0 *ADMINISTRATION*).
- (8) **Toilet Fixtures:** Many wall-hung water closets are pulling loose from walls, the result of the flexible plywood subfloor and metal stud partitions. They are now systematically being retrofitted with additional support.
- (9) **Pest Control:** Mice and insects (particularly black widow spiders) have created maintenance problems, requiring continuing efforts to control them.

c. Comments/Recommendations

- (1) Provide a stable floor structure and subflooring to minimize deflection and squeaking. An open-web steel joist and composite metal decking system with concrete fill is recommended in lieu of a plywood subfloor. Crawl space is highly desirable for building maintenance and future alterations. Therefore, slab on grade construction is not recommended for most parts of a health center.
- (2) Floors in all areas requiring aseptic conditions (including exam rooms, treatment rooms, laboratory areas, etc.) should be covered with seamless flooring, such as sheet vinyl with integral cove base. These areas should not be carpeted.
- (3) See also comments under Section 7, *45.0 PUBLIC FACILITIES*.

6. Comparison of Building Areas as Programmed and as Designed

NOTE: For the Summary of Building Areas (Table 1) on the following page, the construction document architectural floor plans were scaled to calculate the building gross area as well as the areas of the various departments. This method may result in some deviation from actual conditions.

- a. Overall, the building area as designed is slightly larger than prescribed by the POR. The POR, approved in March 1992, called for a total area of 3 457 gross square meters (gm²), including a 46 gm² ambulance garage. The actual area is about 3 724 gm², or 8% over the POR. Distortions in scaling drawings could account for part of this difference.
- b. The total of all department gross areas is about 1% greater than the POR totals. However, individual departments vary significantly above and below the corresponding POR amounts (see Table 1 for details).
- c. The ratio of building gross to department gross area was set at 1.2 in the POR. The actual ratio of building gross to floor gross is approximately 1.26.
- d. The POR generally follows the planning criteria contained in the 1989 IHS Health Facilities Planning Manual (HFPM). However, the Confederated Tribes received approval for a facility about 10% smaller than

the HFPM would support, based in part on a plan for extended hours of operation. It was proposed to operate the center from 8 a.m. to 8 p.m. Monday-Thursday; 8 a.m. to 5 p.m. Friday; and 8 a.m. to noon Saturday, for a total of 61 hours per week. It was assumed that at least 20% of the workload would occur during the extended hours period, thus taking the load off the clinics, waiting areas, support services, etc. during regular hours. The POE team did not gather data on the extent to which the center was currently being utilized during the extended hours of operation.

Space requirements for facilities maintenance, property and supply, and employee facilities were also reduced because portions of these departments were proposed to be located in nearby tribal buildings.

- e. Space for major mechanical equipment was limited by the POR to 12% of total floor gross area. As built, major mechanical space occupies 13.6% of the total floor gross area. However, this high percentage is misleading because it includes a large area in the attic of each pod, where all air-handling equipment is located. The 378 m² of attic area included in the space calculation is the area which is a minimum of 2 m in height (although occasionally interrupted by structural bracing) and is provided with a plywood floor. The attic space functions somewhat like interstitial space, although its usefulness in servicing the entire building below is limited toward the edges of the pods by the steeply sloping roofs. If attic areas are excluded, major mechanical space comprises only 2% of the total floor gross area.

NOTE: This building was programmed, designed and constructed using English units of measurement. Areas shown in Table 1 have been converted to metric units.

TABLE 1

WARM SPRINGS HEALTH CENTER
SUMMARY OF BUILDING AREAS

Dept. No.	Department/Area	Planned DGM ² per POR	Designed DGM ² per Plans	Area ±	Pct ±	Current HFPM DGM ²
21.0	Laboratory	119	103	- 16	-13%	129
22.0	Radiology	113	112	- 1	-01%	113
32.0	Ambulatory Care	468	449	- 19	-04%	475
33.0	Community Health	380	282	- 98	-26%	380
34.0	Dental Clinic	186	196	+ 10	+05%	196
35.0	Pharmacy	145	127	- 18	-12%	165
41.0	Administration	327	374	+ 47	+14%	333
42.0	Health Records (incl. Business Office)	96	88	- 8	-08%	103
43.0	Employee Facilities	75	66	- 9	-12%	106
44.0	Education and Consult.	80	82	+ 2	+03%	80
45.0	Public Facilities	261	394	+ 133	+51%	311
52.0	Property and Supply	156	145	- 11	-07%	214
54.0	Housekeeping/Linen	67	65	- 2	-03%	83
55.0	Facilities Management	39	50	+ 11	+28%	99
56.0	Building Services	15	27	+ 12	+80%	15
57.0	Clinical Engineering*	11	0	- 11	-100%	19
TOTAL AREA		2 538	2 560	+ 22	+01%	2 821
FLOOR GROSS AREA		3 041	3 239	+ 194	+06%	3 385
Major Mechanical Space**		365	440	+ 75	+21%	405
Ambulance Garage		46	45	- 1	-02%	56
BLDG GROSS AREA		3 452	3 724	+ 268	+08%	3 846

NOTES:

* Programmed in POR, but not included in design

** Includes 378 m² "interstitial" mechanical space in attic

7. Comments by Health Center Department

NOTE: Department numbers and names correspond to the standard system used in the 1989 edition of the IHS Health Facilities Planning Manual.

21.0 LABORATORY

a. General Observations/Design Criteria

POR area: 118 gm²
Area as built: 103 gm²
HFPM allowable area: 129 gm²

- (2) **Location:** Laboratory is located on the east side of Pod C, adjacent to Radiology and across the main outpatient waiting area from Ambulatory Care. It shares a reception window with Radiology, and has no separate subwaiting area of its own.
- (1) **Design vs POR:** The laboratory space is 13% less than the POR allotment. It lacks the supply and records storage areas outlined in the POR. A separate microbiology lab was added to the design.

b. Specific Features/Findings

- (1) **Furniture:** Laboratory casework, which includes a large square center counter fixture in the combined lab module, is generally functional (see photo A-11). Omission of some bench space would be desirable to allow for floor-mounted equipment. Some desk-height (730 mm) counter area is needed in the specimen processing area.
- (2) **Venipuncture:** The single station, located in the short corridor from waiting to the specimen toilet, offers no privacy. The HFPM would provide two stations, but one was dropped on the basis of extended clinic hours. Staff would prefer two stations. The vinyl tile flooring is cracking in this area.
- (3) **Specimen Toilet:** The pass-thru window from the specimen toilet is used as designed. However, it opens to the counter at venipuncture and from there specimens must be carried across the corridor to another pass-thru window, or around the corner to the specimen processing area. The in-swinging door to the specimen toilet makes it inaccessible to wheelchair users.

- (4) **Emergency shower/eyewash station:** A "heavy duty" shower, including a prefabricated curbed receptacle, is located at the entrance to the combined module.
- (5) **Microbiology:** The original vinyl tile flooring has been replaced with sheet vinyl. Ventilation in this room is inadequate.
- (6) **Amenities:** The combined module and microbiology labs are provided with windows, providing abundant natural light.

c. Comments/Recommendations

- (1) Design casework to allow for some units at desk (sitting) height, and to allow for installation of floor-mounted equipment.
- (2) Provide seamless flooring (such as sheet vinyl) with integral base in all lab areas, to eliminate joints and cracks.
- (3) Design small toilet rooms, such as specimen toilets, with out-swinging doors, located so as not to obstruct trafficways.

22.0 RADIOLOGY - DIAGNOSTIC IMAGING

a. General Observations/Design Criteria

POR area:	113 gm ²
Area as built:	112 gm ²
HFPM allowable area:	113 gm ²

- (1) **Location:** Radiology is located at the south end of Pod C adjacent to Laboratory. There is a good relationship to the ambulance entrance and treatment room. Radiology shares its reception desk with Laboratory.
- (2) **Program Justification:** Inclusion of Radiology for the projected 1,525 x-ray exams was justified on the basis of distance to the nearest contract radiology services (24 km away in Madras).

b. Specific Features/Findings

- (1) **Patient Dressing/Toilets:** Two dressing booths and one patient toilet were provided and are sufficient.

- (2) **X-ray Control Area:** Although the entrance to the control booth is very narrow, the viewing angle and arrangement of controls is good.
- (3) **Equipment:** A teleradiography hookup has been provided within the x-ray room.
- (4) **Storage Space:** The film file storage room/work area is too small. Additional film storage shelving has been placed between the reception area and the internal department corridor (see photo A-12).
- (5) **Ultrasound:** An office/exam room in Ambulatory Care has been converted to an ultrasound room, which was not included in POR or design. This is not ideal, because it is remote from Radiology, is located across the corridor from a toilet, and is (presently) carpeted.

c. Comments/Recommendations

- (1) Although this department is more cramped than the typical installation, the internal layout functions very well.
- (2) Locate ultrasound within the Radiology department (HFPM provides this space if justified by workload).

32.0 AMBULATORY CARE

a. General Observations/Design Criteria

POR area: 467 gm² (incl. Optometry/ENT)
 Area as built: 449 gm²
 HFPM allowable area: 475 gm²

- (1) **Design vs POR:** The department as built is about 4% smaller than programmed in the POR. The design appears to be short one office/exam room (5 programmed, 4 provided) and the electrocardiography room. In spite of the plan for extended hours of operation, the numbers of exam rooms and offices specified in the POR are not reduced from the HFPM criteria. The only deviations from the HFPM which were requested were the deletion of office space for the optometrist, and the addition of audiology testing space.
- (2) **Location:** Ambulatory Care is located in the west half of Pod C, across the central waiting area from Pharmacy, Laboratory, and Radiology. Health Records is located in

Pod B, through the waiting area and across the main entrance lobby. This problem of distance is handled by having patients carry their own charts.

- (3) **Overcrowding:** Eight standard exam rooms were provided, plus four office/exam rooms. One office/exam has been converted to an ultrasound room, and others at times also function as exam rooms. This has created a shortage of office space for providers.
- (4) **Expandability:** This department already needs additional space, but the hexagonal pod configuration of the building (including the related sloped roof design) makes expansion of a pod difficult. Adding another pod at the north end of the building would not provide space at Ambulatory Care where it is needed.

b. **Specific Features/Findings**

- (1) **Patient Flow:** Patients report to the front window, which functions as a traffic control point. The layout provides a two-sided, mirror-image arrangement which allows simultaneous operation of two clinics (one for appointment and specialty clinics, the other for walk-in patients). There are no internal subwaiting areas.
- (2) **Nurses Control Station:** The large control/charting area includes a reception desk facing the main waiting area, plus two charting desks internal to the clinic, one for each side (see photo A-13). These desks allow good supervision of the clinic.
- (3) **Triage/Vital Signs Space:** Two generously sized rooms are located at the clinic entrance, one on each side in the mirror image layout. No hand washing sinks were provided. Scales have been moved into these rooms. Other vital signs are taken in the exam rooms.
- (4) **Exam Room Layout:** The typical exam room is sized and equipped per the POR, but the exam table has been relocated near the window with the foot of the exam table facing the door (a cubicle curtain was provided). This is not the best arrangement for patient privacy or provider convenience. The work counter and sink are somewhat remote from the exam table (see photo A-14).

Patient consultation is done in the exam rooms. Windows in these rooms provide pleasant natural light and aid in patient orientation.

- (5) **Treatment and Cast Room:** There is a single treatment room at the south end of the clinic with two treatment stations. (A cast room was programmed, but during design this area was incorporated as part of the treatment room.) It is located directly opposite the ambulance entrance, and staff refers to this room as the emergency room. (Note: the HFPM provides no cast room for a department of this size; treatment space is used for casting functions.)
- (6) **Patient Toilets:** Only one patient toilet was provided, at the far north end of the clinic. A second should have been included for the south half of the department.
- (7) **Office Space:** A large, centrally located office has been taken over for physician charting and a nursing office. To relieve a shortage of space, two physician offices have been relocated to Property and Supply space. (The remote location is a problem for the nursing staff, but the physicians are pleased with it.)
- (8) **Floor Finishes:** Most exam rooms have vinyl tile floors. Office/exam rooms have been changed from carpeting to vinyl tile. Corridors, triage, and vital signs rooms are carpeted. All vinyl tile needs to be replaced with sheet vinyl for safety, asepsis, and appearance.
- (9) **Audiology:** Located at south end of Pod C across corridor from emergency treatment room, this separate space is used for ENT patients and is equipped with an audio testing booth.

c. **Comments/Recommendations**

- (1) The provision of office/exam rooms in the design was of questionable usefulness. Generally, these have been taken over as exam rooms, including ultrasound exam. Additional office space for providers is needed within the department.
- (2) Health Records should be closer to Ambulatory Care for more efficient operation, which should have to depend upon patients as chart carriers.
- (3) The design and equipment of the treatment/procedure room raises the question: how much like an emergency room should it be?

32.0 OPTOMETRY

- (1) **Location:** Located in Pod B apart from Ambulatory Care, Optometry occupies a triangular space created by the geometry of the hexagonal pod scheme.
- (2) **Reception:** Optometry was originally designed to share the dental clinic reception window. This arrangement proved impractical, due to the window's remoteness from the optometry suite. Optometry reception now occurs within the suite itself.
- (3) **Eyeglass Fitting:** This space is too small for the display, fitting, office, repair shop, sub-waiting, and corridor functions it performs. It contains an odd triangular corner which wastes some of the available space. Eyeglass repairs are performed in a dark corner of this room. Overhead track lighting has been added to provide better lighting conditions in the display area.
- (4) **Office/Exam/Screening:** The exam room is also an office for the optometrist. The room with outside exposure, labeled "office" on the plans, is used as a screening room; its window (the only one in this department) has been blacked out. The triangular storage room off of the screening room has been converted for use as a visual fields testing room. This is a very awkward space for any use. Access only through the screening room is inconvenient.

33.0 COMMUNITY HEALTH SERVICES

a. General Observations/Design Criteria

POR area:	380 gm ²
Area as built:	282 gm ²
HFPM allowable area:	380 gm ²

- (1) **Location:** Community Health is located in Pod A, along with Administration. It is remote from other patient-oriented departments, especially Ambulatory Care, which is in Pod C.
- (2) **Design vs POR:** The department as built is about 25% smaller than outlined in the POR. Several Community Health programs are housed outside of the building, and apparently fewer programs were included than originally planned.

b. Specific Features/Findings

- (1) **Open-plan Offices:** Most of the department is housed in a large open-plan office area, furnished with modular systems furniture (see photo A-15). Privacy for staff and patients is a serious problem in this open space.
- (2) **Clinical Space:** The department contains a small cluster of rooms around a narrow corridor on the north side of the open-office area. This is a very congested area, which serves multiple uses: Maternal Child Health, PHN, nutrition, WIC well-child clinic, and Diabetes program. The small amount of space makes scheduling a problem.
 - The exam rooms have doors entering off the main waiting area as well as from the internal corridor. This allows flexibility in the use of the rooms, but also makes use of the rooms for exams somewhat awkward. These were originally planned as patient education (consulting) rooms.
 - The present WIC exam room was originally designed to be an office, and does not include a sink. A sink should be provided.
 - The supply/files room is triangular in shape, which is very inefficient for standard filing and storage equipment. This room is also used for administering immunizations to children, but the space is deficient because it lacks a sink.
 - There is no PHN workroom. PHNs use their desks, nearby exam rooms, or exam rooms in the Ambulatory Care clinic at the opposite end of the building. Lack of privacy for patient interviews and counseling is a significant problem.
- (3) **Wall Damage:** Pod geometry results in acute angle corners, at the reception desk for example, which have been damaged by impact from equipment.
- (4) **Environmental Health:** This is a tribally operated program primarily located outside of the building. In the health center a staff sanitarian occupies one crowded private office. This person also serves as safety officer for the health center.
- (5) **Home Health Program:** This tribal program is housed in a triangular space which was originally designated as a storage room (although it has windows). It is adjacent

to the demonstration kitchen, which seems to be vented into it. Cooking odors are strong in this office.

- (6) **Diabetes Program:** Part of Health Education, this program is housed in Community Health. For diagnostic testing, patients must travel to Ambulatory Care in Pod C.
- (7) **Demonstration Kitchen:** see 44.0 EDUCATION AND GROUP CONSULTATION.

c. Comments/Recommendations

- (1) There is a need for more private offices, or private consultation rooms, for patient counseling. Use of open-plan offices for professional staff raises privacy issues.
- (2) The exam room area is too congested to accommodate the multiple programs it serves. The WIC exam room would be better located near the Ambulatory Care module. Rooms which may be used for WIC exams and administering of immunizations should be provided with sinks.
- (3) Provide corner guards to protect outside corners of exposed walls in high-traffic areas.

34.0 DENTAL CLINIC

a. General Observations/Design Criteria

POR area:	186 gm ²
Area as built:	196 gm ²
HFPM allowable area:	196 gm ²

- (1) **Location:** The dental clinic is located in Pod B adjacent to Optometry and across the central waiting area from Health Records and Managed Care.
- (2) **Design vs Criteria:** The clinic as built follows the POR fairly closely. Although the HFPM would allow nine operatories for the Warm Springs workload, the POR deliberately reduced this number to six, assuming that the extended hours of clinic operation would spread the load out. In fact, the addition of specialties such as orthodontics, pedodontics, etc. has increased the demand for operatories.

b. Specific Features/Findings

- (1) **Reception:** The reception desk faces the main waiting area (Pod B) and offers good control of the dual entrances to the department. Note: Optometry originally shared this reception window with the dental clinic. However, this arrangement did not work well, due to the window's remoteness from the optometry suite (see 32.0 Optometry).
- (2) **Operatories:** The five open-plan operatories function well in terms of space and layout, although more chairs could be used to advantage. In addition, there is one enclosed operatory, which is adequately isolated acoustically. Some access passages to open-plan operatories are very narrow.

All operatories have windows overlooking the front entrance to the building. Operatories were not designed with overhead light fixtures for general illumination. Ceiling-mounted fluorescent fixtures have been added since occupancy to address complaints of low light levels.

- (3) **Clean-up Area:** A single, generously sized area is centrally located.
- (4) **Offices:** There are two private offices, plus a shared "open" office for two staff. At the time of the POE visit, space was needed for four full-time providers, four part-time providers (a shared desk), the dental assistant supervisor, and secretarial support staff.
- (5) **Dark Room:** After building occupancy, it was discovered that light was leaking through the lay-in acoustical tile ceiling. The room has been retrofitted with a gypsum board ceiling.
- (6) **Laboratory:** This space is very small (about 6 sm) for the number of providers it serves. It should have a door to provide acoustical isolation from the rest of the clinic.
- (7) **Storage:** All dental supplies are stored within the department, which does not have adequate storage space. The janitor closet within the suite is used for house-keeping supplies and linen storage, as well as clothes changing. The intermixing of soiled and clean spaces causes problems in maintaining aseptic conditions, and

is a violation of JCAHO standards. No employee locker or changing space was provided.

c. Comments/Recommendations

- (1) This is a well-arranged layout, making good use of the pod arrangement, and placing all components in a functional, convenient order. Unfortunately, the number of operatories is inadequate for the expanded level of services being provided.
- (2) Insure that detailing of dark rooms eliminates light leakage from outdoors or adjacent spaces.
- (3) Provide adequate space for storage of supplies, including linens, and space for employee lockers and clothes changing.

35.0 PHARMACY

a. General Observations/Design Criteria

POR area:	145 gm ²
Area as built:	127 gm ²
HFFM allowable area:	165 gm ²

- (1) **Location:** Pharmacy is located in Pod C, adjacent to Laboratory and across the waiting area from Ambulatory Care. The separation of the main outpatient waiting area is viewed as a major barrier by staff. Pharmacy is quite distant from Health Records. However, since patients carry their own charts to Pharmacy, this distance is not seen as a problem by pharmacy staff.
- (2) **Design vs POR and HFFM:** The POR called for a pharmacy about 12% smaller than the HFFM planning criteria would allow, reasoning that the spread out workload over extended hours of operation would reduce space needed for outpatient dispensing, computer work space, bulk compounding, and open office space. As built, the pharmacy is about 12% smaller than the POR amount, with a smaller amount of active and controlled drug storage space.

b. Specific Features/Findings

- (1) **Consulting rooms:** Three patient counseling rooms were provided, but only two are being used for this purpose.

The third is used as an office (its "public" door is outside the pod waiting area).

- (2) **Dispensing/Compounding:** The two-sided layout of the compounding area is a good arrangement (see photo A-16). Intake of charts is through a pass-through slot from the waiting area, offering privacy for staff, but allowing no visual contact with patients.
- (3) **Cabinetwork:** furniture system provided is liked by the staff. Wall-mounted gravity feed shelving is provided (photo A-16). Some of the plastic-laminate cabinets are chipped at the floor level, especially in high-traffic corridor areas. There is a fume hood in the small, but adequate triangular bulk compounding area.
- (4) **Office space:** There are two private offices (including the converted consultation room) and an open office which includes a computer work alcove and drug information center. This open area also serves as an informal conference space for daily "rounds" meetings.
- (5) **Floor covering:** The main pharmacy area is carpeted. Vinyl pads have been placed over the carpeting in work areas. Foot traffic causes the pads to shift on the carpeting, and they must be repositioned daily.
- (6) **Security:** In spite of the large windows in the offices and bulk storage area, no special security problems have been reported. The department has a separate alarm station with a direct connection to the police station.

c. **Comments/Recommendations**

- (1) This department generally works very well. It is efficiently arranged and well equipped.
- (2) Review criteria for the number of consultation rooms that are needed.
- (3) Provide means of communicating prescription status to patients, such as a window for face-to-face contact, or an electronic reader board, posting the patient's name and status.
- (4) If carpeting is used in pharmacy work areas, it should be installed over the vinyl padding to avoid pad shifting.

41.0 ADMINISTRATION

a. General Observations/Design Criteria

POR area: 327 gm²
Area as built: 374 gm²
HFPM allowable area: 333 gm²

- (1) **Location:** Administration shares Pod A with Community Health. Its location, away from the main entrance to the health center, has proved to be a workable arrangement.
- (2) **Design vs POR:** The department as designed is about 14% larger than the POR area. However, this figure includes Managed Care at 149 gm², and excludes the Business Office (37 gm²), which was built as part of the Health Records unit. (Without Managed Care, and with the Business Office, Administration would occupy a total of 262 gm², 20% less than the POR.)
- (3) **Changes to HFPM Criteria:** One clerical position was relocated from the administrative suite to the information desk at the main entrance, which is programmed under 45.0 PUBLIC FACILITIES.

b. Specific Features/Findings

- (1) **Main administrative suite:** There is a large central reception and open office area, furnished with built-in plastic laminate cabinetwork and counters (not systems furniture).
 - The built-in furniture in the open space makes it relatively inflexible. To make reconfiguration easier, it would be better to have this space furnished with typical systems furniture.
 - Acoustical privacy is a concern in the private offices. Sound is readily transmitted above ceilings, and through partitions and doors.
- (2) **Managed Care (formerly Contract Health Services):** This tribally operated program is located in the west side of Pod B, adjacent to Health Records.
 - It is housed primarily in a large open space provided with built-in plastic laminate cabinetwork and counters at both standing and sitting heights. This is not systems furniture.

- The built-in cabinets do not entirely suit the needs of the occupants. The unit at the front entrance gives visitors the impression of a receptionist, but it isn't. Tall built-in units in the center of the space impede workflow rather than facilitate it. Remodeling of the furnishings in this area is planned to correct this and accommodate the automated document management system.
 - The open office area has created problems with patient confidentiality, especially for the patient advocates who area housed in this area.
- (3) **Business Office:** The business office, which was included in the POR, is located in Pod B adjacent to Health Records.
- (4) **ADP:** A computer room/office is located in Pod B, adjacent to telecommunications and electrical rooms. Originally it was vented together with the nearby Dental darkroom. This caused chlorine odors in the computer room, a situation which has since been corrected). A closet in this room contains oxygen tanks for the dental clinic. Additional space could be used for multiple computer terminals for training purposes.

c. Comments/Recommendations

- (1) This unit, which follows the 1989 HFPM and includes functions lacking in other recently constructed facilities, operates reasonably well.
- (2) Due to the addition of numerous functions to Administration over the past several years, it would be advisable to design this space with enough flexibility to accommodate future change. The use of open office areas and a location within the facility which allows for expansion is desirable.
- (3) Consider locating Administration away from the patient-intensive functions near the main entrance of the health center to a more remote portion of the building. This is a good example of such a location.
- (4) Design partitions, ceilings, and doors surrounding private offices to provide adequate acoustical privacy.

42.0 HEALTH RECORDS UNIT

a. General Observations/Design Criteria

POR area: 96 gm²
Area as built: 88 gm²
HFPM allowable area: 103 gm²

- (1) **Location:** Health Records is located in Pod B, remote from Ambulatory Care in Pod C. Delivery of records to other departments requires crossing the main patient waiting areas. The department's placement adjacent to the business office is very good. There is a "back door" from the records storage room into Managed Care.
- (2) **Patient Chart Flow:** The building layout and location of Health Records requires that each patient carry his/her own chart. This is difficult for some patients, and has caused problems.
- (3) **Design vs POR and HFPM:** The open plan work space was reduced from the HFPM allotment because of extended hours of operation. The area as built includes the adjacent Business Office, which was programmed in Administration.

b. Specific Features/Findings

- (1) **Reception:** A reception window and desk was provided off of the reception/waiting area in the link between pods B and C. An interview space offering more patient privacy would be desirable.
- (2) The unit could use additional space for chart review/completion by providers (not included in the HFPM for outpatient facilities).
- (3) **Shelving:** Active records are stored on fixed shelving units, whose location was adjusted after building occupancy to fit the overhead lighting pattern.
- (4) **Security:** Cross traffic through the records storage room has been a problem. This has been alleviated by keeping entry doors locked from both directions.
- (5) **Equipment:** A duplicating machine is located in the center of the records storage room. This encourages traffic into the room by outsiders.

c. Comments/Recommendations

- (1) Health Records should be located to have close physical contact with Ambulatory Care, Pharmacy, Laboratory, so that a chart delivery system can be implemented which does not require hand carrying by patients.
- (2) Coordinate overhead lighting with shelving layout during building design.
- (3) Locate duplicating equipment in a separate space outside of the records storage room, to discourage unnecessary traffic in this space.
- (4) If patients must carry their own records, an after-hours records return slot into a secure area should be provided.

43.0 EMPLOYEE FACILITIES

a. General Observations/Design Criteria

POR area: 75 gm²
Area as built: 66 gm²
HFPM allowable area: 106 gm²

- (1) **Location:** Employee facilities are provided in Pod A (including lockers, toilets and showers), Pod B (a staff lounge), and at the south end of Pod C (lockers and toilets).
- (2) **Design vs POR and HFPM:** This unit is 9 m² (12%) smaller than the POR allotment. Use of the HFPM criteria would add an employee exercise center.

b. Specific Features/Findings

The staff lounge in Pod B, at 20 m², is too small to accommodate the number of employees on duty. This has caused other areas (library, conference rooms, office space) to be used for employee lounge purposes, with a proliferation of microwave ovens and coffee machines.

c. Comments/Recommendations

The location of employee locker and lounge space within departments such as Dental, Ambulatory Care, and Community Health would promote use by a greater number of staff.

44.0 EDUCATION AND GROUP CONSULTATION

a. General Observations/Design Criteria

POR area: 80 gm²
Area as built: 82 gm²
HFPM allowable area: 80 gm²

- (1) **Location:** Health Education, a tribal program, has been located out of the building at the old health center campus. The diabetes program, which is part of Health Education, is presently housed in Community Health space.
- (2) **Conference Space:** The only designated conference spaces are the small library/conference room in Administration, and the demonstration kitchen/conference room adjacent to Community Health. In addition, there is a large "waiting" space in the link between pods A and B, which has been isolated by movable partitions for use as a conference area. There is no suitable space large enough for a meeting of all staff.

b. Specific Features/Findings

- (1) **Library:** The staff library, which is adjacent the administrative suite and also accessible directly from the Pod A waiting area, doubles as a conference room and copy room.
- (2) **Demonstration Kitchen:** This space, located off a major waiting area and adjacent to Community Health, is difficult to use because it is inadequately illuminated by means of track lights. The space can be separated from the adjacent conference room by a movable partition. Since all the light switches are located in the conference room, even the poor track lighting cannot always be controlled satisfactorily.
- (3) **Storage:** Storage space for educational materials was not provided.

c. Comments/Recommendations

- (1) A relatively large meeting space should be provided to accommodate "all hands" meetings.
- (2) Provide adequate space and lighting for demonstration kitchen areas.

45.0 PUBLIC FACILITIES

a. General Observations/Design Criteria

POR area: 261 gm²
Area as built: 394 gm²
HFPM allowable area: 311 gm²

- (1) **Design vs HFPM:** The size of lobby/waiting and sub-waiting areas programmed in the POR was 16% smaller than the HFPM allowance, with the stated justification that extended hours of operation would reduce peak occupancy, and, therefore, demand for waiting space. However, the area of lobby/waiting spaces as designed and built is about 50% larger than the POR amount. This differential is only approximate, because it is often difficult to distinguish between lobby/waiting space and circulation space (see paragraph 2 below).
- (2) **Net vs Gross Area:** In many instances it is difficult to separate lobby/waiting (net) area from circulation (gross) area, since there are no well-defined boundaries between these areas. However, even if some waiting space is actually circulation space, it appears that Public Facilities is significantly larger than programmed. Note: circulation area (gross space) is also significantly higher than the POR allowance (see *Section 6. Comparison of Building Areas as Programmed and as Designed*).
- (3) **Social Center Function:** This health center, like most in the IHS system, serves as an informal social center as well as a healing center. The well-designed public spaces provide an attractive focus for the community. This magnifies the problem of keeping well people separated from the those with communicable diseases.

b. Specific Features/Findings

- (1) **Circulation and Waiting Areas:** Public lobbies and waiting areas have a comfortable, non-institutional appearance (see photos A-7 and A-10). This "look" was achieved by the designers after conducting a community survey. During the design process a presentation was made to residents at the elder center, and opinions were sought on colors and fabrics for wall coverings, upholstery, etc. Staff said that the final selections turned out to be "a world apart" from what the designers would have chosen.

There are no television sets or video monitors located in the public spaces. A children's play room was provided at the main entrance opposite the reception desk.

- (2) **Reception Windows:** For after-hours security, overhead rolling metal shutters are provided at all departmental reception desks (with the exception of Health Records/Business Office, which uses hinged glass windows). The rolling shutters are tied into the fire alarm system for automatic closure.
- (3) **Lighting:** Illumination levels in public spaces are generally low. This has been identified as a concern by safety and security personnel, as well as by patients.
- (4) **Concession:** This space was not programmed, due to the close proximity of a convenience store. The Tribes also asked that food and drink not be made available in the health center. Vending machines for staff use are located in the staff lounge area.
- (5) **Public Toilets:** Tampering with soap and toilet tissue dispensers is a problem in the public toilet rooms. Vandal-proof (i.e., keyed) dispensers should be used.
- (6) **Drinking Fountains:** Only one public drinking fountain was provided in the entire building. One in each pod would be desirable.
- (7) See also comments under 5. *Interior Features (General)*.

c. **Comments/Recommendations**

- (1) This is a good example of a health center with generously sized and attractive public spaces. Although the IHS does not expect elaborate lobbies and waiting rooms, these spaces should and, at Warm Springs, do present a welcoming, comfortable, and reassuring atmosphere to patients, visitors, and staff.
- (2) Several health center departments which need close contact are separated by public waiting areas. This is a problem inherent in this type of layout.
- (3) Although the clerestory windows in the waiting areas are effective in minimizing solar heat gain in summer, they are not very effective in lighting these large spaces. Somewhat larger clerestories, plus additional or

modified electric lighting would alleviate the darkness of the spaces.

52.0 PROPERTY AND SUPPLY UNIT

a. General Observations/Design Criteria

POR area: 156 gm²
Area as built: 145 gm²
HFPM allowable area: 214 gm²

- (1) **Design vs POR:** Storage space is generally quite limited. A reduced departmental area, deviating from the HFPM allowance, was approved, on the premise that additional storage space would be provided by the Tribe at a nearby facility. Even so, the department area is 7% less than the POR allotment.
- (2) **Location:** At the south end of the building, with direct access from the loading entrance.

b. Specific Features/Findings

- (1) **Changed Functions:** The space directly off the receiving area, designated as linen storage in the original design, was changed to a nurses lounge, then to a physicians office for Ambulatory Care. The Property and Supply procurement office has been converted to an office for the clinical director. The procurement office has been relocated to the adjacent equipment and property storage area.
- (2) **Ceiling Height:** In the central stores area the bottom of the exposed wood framing members are approximately 3 m above the floor. This clear height allows adequate volume for efficient storage.
- (3) **Security measures:** A lockable chain-link gate (single point of access) limits access to the bulk stores area.
- (4) **Loading Area:** The lack of a loading dock has required additional manpower and related scheduling for unloading of vehicles.

c. Comments/Recommendations

- (1) For more efficient use of space, a relatively high ceiling height is recommended for the bulk stores area.

This design resolves this requirement better than some other similar installations.

- (2) Adequate on-site bulk storage space, as prescribed in the HFPM, should be provided.

54.0 HOUSEKEEPING AND LINEN

a. General Observations/Design Criteria

POR area:	67 gm ²
Area as built:	65 gm ²
HFPM allowable area:	83 gm ²

- (1) **Design vs POR:** This department was built close to the size prescribed in the POR. It is well arranged along the service corridor near the loading area. [??This facility utilizes contract housekeeping services, and many supplies are stored outside the building.]
- (2) **HFPM vs Design:** HFPM allows 18 m² (28%) more space--clean linen processing and storage space was reduced in POR, which cited use of disposables and contract linen service.

b. Specific Features/Findings

- (1) **Linen Handling:** The clean linen storage room, located directly off the receiving area, has been taken over by Ambulatory Care for provider office space. This reduces housekeeping space by about 9 m² (14%).
- (2) **Janitor closets:** There is no closet in Pod A. The closet in Dental has been taken over for linen storage and gowning room. This leaves only two general purpose janitor closets for the entire health center: one in the housekeeping area (near Facilities Management) and the other in Pod B near the staff lounge. However, these two closets are generously sized for carts and other equipment being used. Closets are finished with vinyl tile floors, painted gypsum board walls and floor-mounted sinks. Additional shelving could be used for supplies and small equipment.

c. Comments/Recommendations

- (1) The health center is being well maintained. Wall and floor surfaces generally look excellent, and are well cared for.

- (2) The generously sized janitor closets are a good example for other facilities. However, the janitor closet in Dental (as well as the clean linen storage room) were such attractive spaces that they have been given up to satisfy acute space needs of nearby departments.

55.0 FACILITIES MANAGEMENT

a. General Observations/Design Criteria

POR area:	39 gm ²
Area as built:	50 gm ²
HFFM allowable area:	99 gm ²

- (1) **Location:** The maintenance department is located at the south end of the building on the east side of the loading dock.
- (2) **Design vs HFFM:** Originally the PJD proposed not to include a maintenance shop and related storage space, noting that the tribal maintenance department located nearby would provide this function. However, the POR and the design included a small maintenance shop and storage area. The resulting facilities management department is still considerably smaller (49%) than the HFFM would allow, and the use of the spaces has changed since building occupancy.
- (3) **Clinical Engineering:** Although the POR included 11 m² for Clinical Engineering, it was not included in the design. For a health center the HFFM allots 19 m² for a combined shop/storage/administrative space.
- (4) **Mechanical Space:** The building area devoted to major mechanical equipment is about 440 gm², or 13.6% of the total floor gross area of the building. This includes boiler room, electrical switchgear, air handlers, etc. This is higher than the POR allotment of 12% of the gross building area, but the bulk of this area is located in attic space within each pod.

b. Specific Features/Findings

- (1) **Maintenance Shop:** Shop functions are now housed in the ambulance garage space (as well as in tribal facilities elsewhere). This works quite well: the fire separation required for the garage has insured that fume and dust infiltration are not a problem. The small maintenance

shop originally provided (21 m²) has been converted to office space.

- (3) **Storage:** The small room (11 m²) provided for outdoor equipment storage has been supplemented by a metal building on the health center site. Additional storage space for maintenance materials is located off-site in tribal facilities.
- (4) **Mechanical Space:** Major mechanical space at the main floor level occupies only 2% of the building gross area. This space is fully utilized. The floored portion of the attic space which is over 2 m in height totals 11.6% of the building gross area. This space is also well utilized (see photo M-1). There have been problems with transmission of noise and vibration from mechanical equipment, such as reciprocating pumps, to the clinical areas.

c. Comments/Recommendations

- (1) On-site placement of the maintenance shop and related functions as outlined in the HFPM is desirable, even though other tribal facilities may be located nearby.
- (2) The attic space in each pod serves as a kind of interstitial mechanical space. This is useful for all-weather access to mechanical equipment located there, but also restricted in its usefulness by the limited area of the catwalks, the slope of the roof, and constricted access by means of ladders.

56.0 BUILDING SERVICES

Loading Dock - see 52.0 PROPERTY AND SUPPLY UNIT.

CIVIL/STRUCTURAL

General: The Warm Springs Health and Wellness Center contains approximately 3 460 square meters gross area and occupies a 2.02 ha site in Warm Springs. The site is gently sloping to the northwest with the facility set on a north south axis and all entrances serving the main floor (photo A-1).

The structure has concrete footings and foundation walls with a predominately wood structure for the first floor and roof. Composite wood joists, wood trusses, and laminated and solid wood beams, girders, and columns are used as required. The first floor is 5/4 plywood with the roof and service spaces sheathed with plywood. A crawl space is provided under the first floor that averages less than a meter in clearance with the crawl space containing drain lines and some water piping and electrical conduit (photo CS-1).

The structure was designed in accordance with the 1988 Uniform Building Code, Seismic Zone 2B with a design wind load of 70 km/h, exposure C.

1. Utilities

- a. **Electric Power:** Electricity is provided by the Pacific Power Utility Grid and has had a good history of reliability at Warm Springs. A small emergency generator was required because of the remoteness of the facility and probability of an outage related to a natural disaster.
- b. **Water Supply:** The potable water is provided by the Warm Springs Utility Authority. Quality of the water is good, with no complaints arising from use of the water in the various fixtures and water systems at the facility.
- c. **Sewerage Treatment:** The Warm Springs Utility Authority provides collection and treatment of the sanitary wastes generated at the facility. All sewer lines are gravity fed from the Health and Wellness Center and the wastes are treated at an EPA approved lagoon installation on the reservation.
- d. **Solid Wastes:** The general trash is centrally collected at the facility and held for pickup by contractor and subsequently hauled to an EPA approved landfill in Madras, OR.

- e. **Medical Wastes:** The medical wastes generated at the center are collected, temporarily stored and collected in accordance with EPA Standards. A contractor, licensed by the State, transports medical wastes and oversees the disposal, also meeting the EPA Standards.

2. Parking

a. Criteria/General Observations

The POR called for 187 spaces to be provided at the center.

b. Specific Features/Findings

In an effort to meet parking demands of the Health and Wellness Center and the adjacent Early Childhood Education Facilities, extra spaces (238 total) were provided.

c. Comments/Recommendations

The parking capacity for the center is in excess of the projected needs. There has been no complaint that overflow parking from adjacent facilities has hampered operations at the center. The concept that facilities with non overlapping parking demands share overflow lots is a sound one and should be used wherever practicable.

3. Roof

a. Criteria/General Observations

The roof consists of standard three-tab asphalt shingles placed on plywood roof sheathing, resulting in a multi-plane form dominated by pods with clerestory areas at the apex (photo CS-2). One area of clerestory windows produced a leak and the facilities engineer stated that it was satisfactorily repaired. He believed the leak activated by wind-driven rain getting behind some cap flashing.

b. Specific Features/Findings

Some valley flashing has multiple fastener penetrations and presents a potential for leaks especially after the flashing goes through several seasons with thermal expansion/contraction (photo CS-3). Also, there are flashing areas where false parapets/buttresses are installed with a scupper. It is believed that these areas

will require extensive periodic maintenance and may have the potential for glaciation problems during the winter (photo CS-4).

c. **Comments/Recommendations**

The roof on a single story Health Center is a major portion of the exterior envelope exposed to the elements, and unnecessary complexities should be avoided. The parapets with the scuppers could be eliminated and the valley drainage could be directed off the roof with a simpler method.

There is no access provided to the roof area. It is recommended that stair access be provided to the roof under the control of the facilities engineering office.

4. **Structural System**

a. **Criteria/General Observations**

As stated in the introduction, the facility is totally wood framed above the concrete foundation. Due to the geometric shapes of the pods, there are many irregular angles in the support structure of the roof and catwalks especially above the spans of lobby areas (photos CS-5 & CS-6).

The sub-flooring in the occupied areas is 5/4 plywood placed over manufactured joists.

b. **Specific Features/Findings**

All trusses and connections that are bolted appear to be loose because of shrinkage of the wood as it ages and dries out. This is a common occurrence for a heavy wood structure.

Cracks in the drywall over the corridor doors are probably due to the shrinkage factor (CS-7). The bolts holding the trusses must be tightened to stop the movement and to improve overall shear strength where the truss anchors on the beam. These connector bolts are difficult to reach on both sides to insure that they properly tightened.

There is considerable movement in the storefront glassed meeting areas on the west side, especially in the higher storefront between the medical pods. A review of the large trusses indicates that the bearing ends may utilize

a different support detail. There appears to be more linear restraint in the low storefront than in the high storefront. If the ends of the trusses spread, it follows that this type of truss will correspondingly drop in the middle. This appears to be the case in the high storefront area, and the trusses have dropped in the center enough to press down on the storefront window system, with the deflection pushing them out of vertical alignment in the frame (photo CS-8). This is further supported by the fact that the top of the door frame presses on the door in that storefront window wall and the slab under the wall shows no cracks or other settlement indices.

The subflooring system is flexible and produces a noticeable squeaking noise when it is walked on. When floor covering is replaced additional screw fasteners are installed, which improves the squeaking situation.

c. Comments/Recommendations

Tighten all structural connector bolts. Return trusses in the high storefront area to their original position. This may be difficult, and may require jacking to original elevation or somewhat above and anchoring with tension members, rods with turnbuckles between metal plates or other method to ensure that trusses near the wall will not move.

MECHANICAL

1. HVAC

a. General Observation/Design Criteria

The Health Center's HVAC system consists of 49 water source heat pumps whose fluid loop is supplemented by a 193 KW propane fired hot water boiler and a cooling tower. The individual heat pumps are located in the attic area of each building pod and accessible by a walkway (photo M-1). Each heat pump is supplied with outside air from one of three propane fired air handlers. Each pod consists of approximately 15 heat pumps, each serving an individual zone for improved temperature control and user flexibility. Control of the HVAC system is accomplished through a Direct Digital Control (DDC) system.

b. Specific Features/Findings

- (1) The single 193 KW boiler has been unable to supplement the heat pumps to the degree necessary to maintain the fluid loop temperatures during the heating mode of operation. An equivalent sized hot water boiler has been installed to supplement the existing boiler capacity. It has also been necessary to provide additional on-site propane storage capacity for the facilities use due to the facilities increased energy use (photo M-2). As a result of having an undersized supplemental heat source; night setback of the HVAC system has not been utilized due to difficulty maintaining design space set points.
- (2) Ventilation rates appear to be inadequate in a number of areas in the Health Center including microbiology. It appears that the diffuser selection and positioning appears to short circuit air flow (directly from diffuser to return air grille) resulting in inadequate air distribution throughout the space. In the staff lounge; which is also utilized as a lunch/break room, air is recirculated back through the heat pump rather than being exhausted to the outdoors. This recirculation of contaminated air results in these odors being transported to other areas throughout the facility. Outside air and return air throughout the facility is filtered by means of 30% efficient filters.

- (3) The nitrous oxide evacuation system in the private dental operatory was expressed as a concern by the Dental Officer. It appears that the evacuation system is adequately sized, but the system's capture zone for the nitrous oxide is through the Dentist rather than away from them.

c. Comments/Recommendations

- (1) It is important that designers be experienced with the performance characteristics of the particular HVAC system to be considered for design. It is equally important that the designer receive and coordinate with building envelope and equipment load and positioning information prior to the design being completed. A system design can only be as accurate as the data received and utilized.
- (2) Ventilation levels can be improved in those areas where short circuiting of air flow exists by repositioning and better selection of supply diffusers in relationship to the space served and the location of the return air grille(s). It is recommended that air from areas with contamination and/or odor problems such as the staff lounge be exhausted to the outside and not recirculated to other areas rather than contribute to indoor air problems. Consideration should also be given in future designs to improve overall filter efficiencies for central ventilation and air conditioning systems in outpatient facilities to the levels as recommended in the Guidelines for Construction and Equipment of Hospitals and Medical Facilities to improve and maintain the overall indoor air quality of the facility.
- (3) The nitrous oxide evacuation system should be positioned low on the wall opposite the work area to minimize worker exposure while maintaining an adequate capture velocity to exhaust gas.

2. Plumbing

a. General Observation/Design Criteria

- (1) MAIN SERVICE - The main water service into the facility is a 150 mm water line.

- (2) HOT WATER SYSTEM - Domestic hot water for the facility is provided by a single 66 KW propane fired water heater delivering water to a 303 liter storage tank.
- (3) DENTAL EQUIPMENT - Dental air and a duplexed vacuum system are located in the North mechanical room.

b. **Specific Features/Findings**

- (1) MAIN SERVICE - The main service includes a backflow preventer, which is required to prevent cross contamination of the local water supply.
- (2) HOT WATER SYSTEM - Domestic hot water circulating pumps operate on a storage tank aquastat to circulate water through the hot water heater. Circulating pumps provide hot water supply to individual pods.
- (3) DENTAL EQUIPMENT - The Dental air compressor and vacuum pumps create excessive vibration and noise which are transmitted into surrounding areas outside of the mechanical room.

c. **Comments/Recommendations**

- (1) MAIN SERVICE - The quality of the water supply should be evaluated during design and appropriate actions taken to ensure water quality does not adversely affect the long term operation of the facilities plumbing systems.
- (2) HOT WATER SYSTEM - Calculations and estimates should be performed during design to determine the usefulness of hot water heat exchangers in lieu of individual hot water tanks.
- (3) DENTAL EQUIPMENT - Dental Equipment design and selection should include vibration and noise reduction considerations so as not to adversely affect clinic operations. Equipment should be acoustically isolated from other clinic functions.

3. **Fire Protection**

a. **General Observation/Design Criteria**

FIRE PROTECTION - A complete fire sprinkler system was installed in this facility in accordance with NFPA.

b. **Specific Features/Findings**

No special features or findings were noted on the fire protection system.

c. **Comments/Recommendations**

Inspections and testing should be performed regularly as required by the local Fire Marshall and NFPA.

ELECTRICAL

1. Main Electrical Service

a. General Observations/Design Criteria

- (1) The main electrical service provided by Pacific Power and Light is 12,470 volt primary and 480/277 volt secondary, three phase, 60 hertz system. Facility electrical metering and the main service disconnect (600 Amp circuit breaker) are located in the main switchboard.
- (2) The service is grounded per the requirements of the National Electrical Code (NEC). The electrical service ground was not measured as part of the project requirements, but site conditions indicate that the service ground is at least 25 ohms.
- (3) The secondary voltage is reduced by dry type transformers (8) to 208/120 volts for branch circuit applications in the clinical and administrative areas.
- (4) One diesel generator rated 15 Kw, 480v, 3 phase, 4 wire is the source of alternate power when the normal utility power is not available. One automatic transfer switch connects the alternate power supply to the building emergency loads.

b. Specific Features/ Findings

- (1) The main electrical service power quality is good. System reliability is average. The clinic experiences 5-8 power outages per year. These outages generally are of short duration (4-5 minutes).
- (2) Power conditioners have been added to the laboratory equipment and surge protection has been provided to the office computers.

c. Comments/Recommendations

The rural nature of this site and the severe seasonal weather supports the finding that electrical utility reliability is average to good. The large electrical capacity of the utility distribution line makes the power quality good most of the time. The installation of a

diesel generator in the original construction project is fully justified.

2. Lighting

a. General Observation/Design Criteria

- (1) Site lighting is generally very effective. Exterior lighting provided by high pressure sodium (HPS) is efficient and adds to the architectural presentation of the health center (photo E-1).
- (2) Interior fluorescent light fixtures (40 watt, T-12 type lamp) are low maintenance and cost effective. Task lighting is provided in dental, surgery, and outpatient exam rooms.
- (3) Interior hallway lighting in the "open" areas lacks adequate lighting levels. Temporary lighting fixtures have been added to this space to provide additional lighting. Existing incandescent light fixtures in these spaces are expensive to operate and provide low levels of lighting to these areas, which are used for classroom/meeting sites.

b. Specific Features/Findings

- (1) The lighting system was installed as designed and is performing well in the office and clinic areas.
- (2) The major hallways and side spaces lack adequate lighting for their present use and lack the cost effectiveness of other areas of the building.

c. Comments/Recommendations

- (1) Recent government manufacturing requirements for fluorescent lamps delete the vast majority of the T-12 type lamps. The new replacement lamp (T-8) which will fit in the existing fixtures requires a different ballast as part of retrofitting existing fixtures. Upgrade existing fluorescent light fixtures to provide a maintainable lighting system. Current lamps will no longer be manufactured after 1995.
- (2) Add energy efficient discharge lighting (metal halide) to the major hallway spaces.

3. Power Quality

a. General Observation/Design Criteria

The clinic design incorporated power quality devices and loading criteria to minimize the effects of harmonics on systems with multiple electronic loads.

b. Specific Features/Findings

Field testing indicates that the areas where post clinic completion installation of equipment and systems furniture are areas with excessive current on the branch circuit neutral conductors. The areas of concern are the administrative and outpatient areas of the health center.

c. Comments/Recommendations

Specification/installation of specialty equipment and systems furniture shall be part of the main project design/construction. Proper design consideration for power quality issues can only be done when the responsibility is centralized with the principal project designer.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

General

This section lists major desirable and undesirable design features, as well as major recommendations for consideration by the Design Criteria Committee for revisions to the Health Facilities Planning Manual (HFPM). This may provide revised criteria for inclusion in future PORs. For additional recommendations see Comments/Recommendations sections in individual chapters of this report.

Although the floor gross area of the building as designed exceeds the amount specified in the POR by about 6%, some departments are significantly smaller than their POR allotments. This situation is due to the unusually large amount of lobby and waiting space, as well as the large amount of circulation (gross) area (see Table 1).

The concept of expanded hours on which the facility design was based has worked, but it has not reduced space needs as much as envisioned in the PJD (see observations/comments under 45.0 PUBLIC FACILITIES, 32.0 AMBULATORY CARE, and 34.0 DENTAL CLINIC). According to staff, workload has increased since the new facility opened, and, to some extent, the Warm Springs Health and Wellness Center is the victim of its success.

Some of the problems experienced by the staff and observed by the POE team are the result of placing additional programs and staff into spaces which were not designed to accommodate them. Considering changes in staff and programs, this facility functions remarkably well.

1. Desirable Design Features

- a. In spite of several negative findings discovered during the POE survey, as documented in this report, this overall is a very successful facility, well worth the investment by the Tribes in meeting the health care needs of their population. It also shows the success of the Joint Venture Demonstration Project in improving access to health care in a timely and cost-effective manner.
- b. Public spaces are generously sized and attractive, providing a welcoming, comfortable, and reassuring atmosphere to patients, visitors, and staff. Part of the success of the public spaces is that the selection of finishes and furnishings included input from the user population.

- c. The entrance canopy from the front door to the curb is a very useful feature.
- d. The separate building entrances to the clinical area and Administration/Community Health work well.
- e. There is ample parking, and attractive, well-maintained landscaping.
- f. The dental clinic is very well arranged, making good use of the pod arrangement. However, the dental services being provided have exceeded the capacity of the space provided.

2. Undesirable Design Features

- a. Although the pod concept provides an organizing focus and visual harmony, it sometimes interferes with optimal departmental relationships, and limits flexibility. The pod layout raises some basic issues: (1) staffing of multiple reception areas in times of staffing shortages, (2) movement of patient charts and patient access to health records, and (3) how to expand in the future, i.e., by adding another pod, or by the enlargement of an existing pod (which is made difficult by the pod geometry and the pitched roof design).
- b. Several departments which need to be in close contact are separated by public waiting areas. This is an inherent problem in this type of layout.
- c. The geometry of the linked hexagons creates internal difficulties in room layouts. Although it provides an excellent degree of exterior wall exposure, this geometry also creates many odd, triangular spaces which cannot be utilized efficiently.
- d. The wood joist floor system and plywood subflooring produce an undesirable degree of deflection, springiness, and squeaking. Deflection has caused cracking and separation of floor tile in some areas.
- e. Interior public areas are quite dark, even on sunny days. The clerestory windows in the central waiting areas are not large enough to light those spaces adequately. Inadequate artificial lighting during evening hours raises issues of safety and security.
- f. The attic mechanical spaces are limited in their usefulness by the slope of the roof, which restricts the

reach of the catwalks, and also by constricted access only by means of interior ladders and narrow hatches.

3. Recommendations

- a. Building layout should be determined by the needs of the departments and functions being housed, rather than by such external factors as a predetermined building or structural configuration. A rectangular layout would allow more efficient use of space and greater flexibility for future alteration and expansion.
- b. Provide a stable floor structure and subflooring, such as an open-web steel joist and composite metal decking system with concrete fill. This is recommended in lieu of a plywood subfloor to minimize deflection and squeaking.
- c. Floors in all areas requiring aseptic conditions (exam rooms, treatment rooms, laboratory, etc.) should be covered with seamless flooring with an integral cove base. These areas should not be carpeted.
- d. Provide for installation of an adequate number of security cameras with remote monitoring capability.
- e. Install corner guards to protect outside corners of walls in high traffic areas from damage by carts and equipment.
- f. Locate duplicating machines intended for general use outside of restricted areas such as the Health Records work space, to discourage unnecessary traffic.
- g. Provide a covered loading dock for facilities over 3 000 gross square meters in building area.
- h. To improve and maintain the overall indoor air quality, increase overall filter efficiencies for central ventilation and air conditioning systems to the levels as recommended in the Guidelines for Construction and Equipment of Hospitals and Medical Facilities.
- i. All projects with wood trusses and structural members which utilize bolted connectors should have a specification requirement for inspection and adjustment of connectors (tightening of bolts to compensate for shrinkage of the large wood structural members) one year after the building is completed and occupied.

WARM SPRINGS HEALTH AND WELLNESS CENTER
WARM SPRINGS, OREGON
POST OCCUPANCY EVALUATION

APPENDIX - PHOTOGRAPHS

(Pages 1-16)