Fort Ord Reuse Authority Pilot Deconstruction Project

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PILOT DECONSTRUCTION PROJECT COORDINATOR

Final Report
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Acknowledgments

Sincere acknowledgments and thanks are expressed for the invaluable financial contribution by the Lucile and David Packard Foundation in support of this Project. The Packard Foundation funds provided critical core funding that enabled FORA to advance this important community program.

This Project would also like to acknowledge and voice appreciation to many other contributors of time, interest and commitment by individuals, organizations and businesses such as: the Technical Support Group, for their guidance and support; A & S Metals, Fresno House Movers, TA Le Desma Builders, and the University of California, Santa Cruz Extension who have provided deconstruction crew members.

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Support and interest from Fort McCoy, Fort Knox, Indian Head, Fort Chaffee Redevelopment Authority, Aberdeen Proving Ground and Bay Area Defense Conversion Action Team has created the beginning of a network between institutions actively trying to find the best ways to remove former W.W.II buildings.

Special appreciation is acknowledged to Mr. Les White, former FORA Executive Officer for his faith in the deconstruction project. Equal appreciation extends to Mr. Michael Houlemard, the current FORA Executive Officer, for his sustaining commitment to this project. Without the support of both Executive Officers, this prototype project could not have succeeded.

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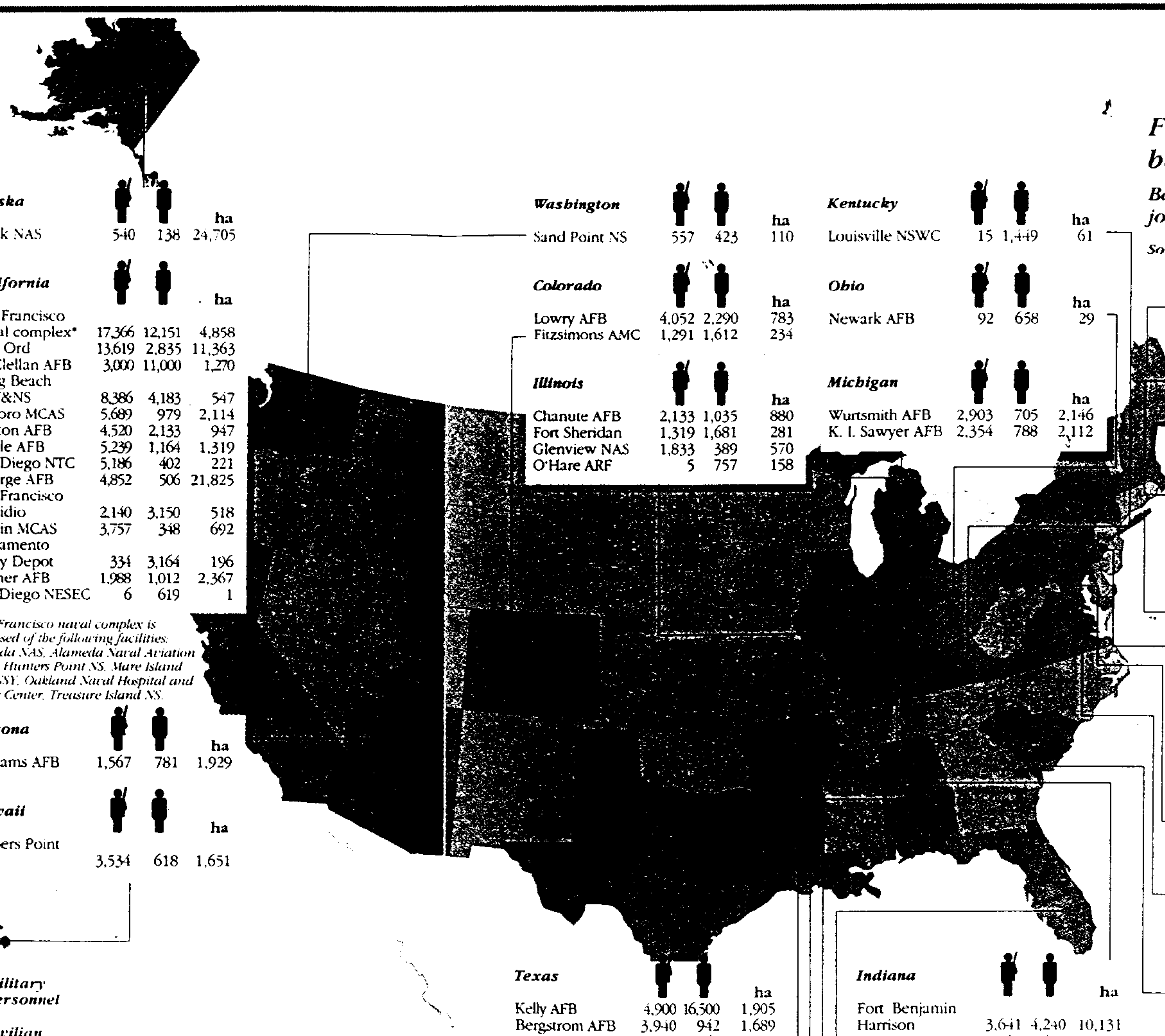
United States Base Closures

Figure 5.1: United States base closures, 1988–2000

Bases with more than 500 total direct jobs, actual and planned closures

Sources: *DoD, 1988, 1991, 1993, 1995*



Alaska

	Military	Civilian	ha
Adak NAS	540	138	24,705

California

	Military	Civilian	ha
San Francisco naval complex*	17,366	12,151	4,858
Fort Ord	13,619	2,835	11,363
McClellan AFB	3,000	11,000	1,270
Long Beach NSY&NS	8,386	4,183	547
El Toro MCAS	5,689	979	2,114
Norton AFB	4,520	2,133	947
Castle AFB	5,239	1,164	1,319
San Diego NTC	5,186	402	221
George AFB	4,852	506	21,825
San Francisco Presidio	2,140	3,150	518
Tustin MCAS	3,757	348	692
Sacramento Army Depot	334	3,164	196
Mather AFB	1,988	1,012	2,367
San Diego NESEC	6	619	1

** San Francisco naval complex is composed of the following facilities: Alameda NAS, Alameda Naval Aviation Depot, Hunters Point NS, Mare Island NS & NSY, Oakland Naval Hospital and Supply Center, Treasure Island NS.*

Arizona

	Military	Civilian	ha
Williams AFB	1,567	781	1,929

Hawaii

	Military	Civilian	ha
Barbers Point NAS	3,534	618	1,651

Washington

	Military	Civilian	ha
Sand Point NS	557	423	110

Colorado

	Military	Civilian	ha
Lowry AFB	4,052	2,290	783
Fitzsimons AMC	1,291	1,612	234

Illinois

	Military	Civilian	ha
Chanute AFB	2,133	1,035	880
Fort Sheridan	1,319	1,681	281
Glenview NAS	1,833	389	570
O'Hare ARF	5	757	158

Kentucky

	Military	Civilian	ha
Louisville NSWC	15	1,449	61

Ohio

	Military	Civilian	ha
Newark AFB	92	658	29

Michigan

	Military	Civilian	ha
Wurtsmith AFB	2,903	705	2,146
K. I. Sawyer AFB	2,354	788	2,112

Texas

	Military	Civilian	ha
Kelly AFB	4,900	16,500	1,905
Bergstrom AFB	3,940	942	1,689
Dallas NAS	1,374	268	324
Reese AFB	900	1,183	1,334
Chase Field NAS	855	956	3,901

Arkansas

	Military	Civilian	ha
Eaker AFB	2,712	792	1,594
Fort Chaffee	2,617	710	29,068

Louisiana

	Military	Civilian	ha
England AFB	3,042	697	1,070

Alabama

	Military	Civilian	ha
Fort McClellan	6,095	2,441	18,500
Mobile NS	524	126	41

Indiana

	Military	Civilian	ha
Fort Benjamin Harrison	3,641	4,240	10,131
Grissom AFB	2,497	807	1,288
Indianapolis NAWC	36	2,805	75
Jefferson Proving Ground	89	411	22,386

Florida

	Military	Civilian	ha
Orlando NTC and Hospital	8,727	753	833
Cecil Field NAS	6,833	995	8,179

Maine

	Military	Civilian	ha
Loring AFB	2,875	1,326	3,965

New Hampshire

	Military	Civilian	ha
Pease AFB	2,250	400	1,724

Massachusetts

	Military	Civilian	ha
Fort Devens	1,662	2,178	4,688
South Weymouth NAS	653	365	911

New York

	Military	Civilian	ha
Staten Island/ Brooklyn NS	2,017	1,545	57
Plattsburgh AFB	2,116	346	1,951

Pennsylvania

	Military	Civilian	ha
Philadelphia NSY, NS & Hospital	2,714	8,219	3,756

Maryland

	Military	Civilian	ha
St. Inigoes NESEC	33	2,786	392
Fort Ritchie	1,011	1,333	260
Annapolis NSWC	2	520	0

Virginia

	Military	Civilian	ha
Cameron Station	337	4,355	68
Vint Hill Farms	407	1,472	284

South Carolina

	Military	Civilian	ha
Charleston NSY &NS	8,708	6,031	779
Myrtle Beach AFB	3,193	799	1,610

Military personnel

Civilian personnel

Acronyms

AFB	Air Force Base
AMC	Army Medical Center
ARF	Air Reserve Facility
MCAS	Marine Corps Air Station
NAS	Naval Air Station
NAWC	Naval Air Warfare Center
NESEC	Naval Electronic System Engineering Center
NS	Naval Station
NSWC	Naval Surface Warfare Center
NSY	Naval Shipyard
NTC	Naval Training Center

Courtesy of Bonn International Center for Conversion

1.0 Executive Summary

Project Purpose/History

The closure of the Fort Ord US Army Military Reservation (Fort Ord) in 1994 left more than 28,000 acres and over 7,000 buildings to be programmed for civilian reuse. A significant number (1200 +/-) of the remaining structures do not meet civilian building code requirements and contain remnant hazardous materials that require abatement. In order to make way for the economic reuse program of the former Fort Ord property, these substandard facilities must be removed. The Fort Ord Reuse Authority (FORA), using baseline data from the US Army, has estimated the cost of demolition and removal to far exceed $100 million.

Working collaboratively with the University of California Santa Cruz (UCSC) Extension and the Presidio of Monterey Base Realignment and Closure (BRAC) Office, FORA sought funding to establish a specialized program that would test the feasibility of a more environmentally effective approach to remove these substandard facilities and abate the remnant hazards. The project began through the UCSC Extension "Extra-Ord-inary" Program and transformed into the "Pilot Deconstruction Project" (Pilot Deconstruction Project) as FORA received a generous grant from the David and Lucile Packard Foundation to "deconstruct" distinct building types and monitor the cost, timing, and job creation results of such an effort. This purpose was central to testing the potential to reuse materials within the structures and to examine options to filling the precious limited landfill space with asbestos and lead contaminated building materials. The results of this work are documented within this report.

Major Activities

- Pilot Deconstruction Project staff identified at least one building in each former Fort Ord land use jurisdiction and various building types to offer comparative data as deconstruction was undertaken.

- Field Surveys augmented the existing US Army environmental information for each selected building, and local regulatory agencies contributed guidance in mitigating hazardous materials. Crew members were trained as Lead Workers, however, asbestos work was restricted to a certified abatement contractor.

- Pilot Deconstruction Project staff formed the Technical Support Group, composed of representatives from Construction, Regulatory Agencies, and the Salvage Industry to advise and guide the project. The project focused on local involvement, deconstruction with simple hand tools and the practical implication of new and existing hazardous material regulations.

- Implementation began on April, 1998 with four buildings selected for deconstruction; three more to be relocated; and one concrete building to be disassembled. Non-contaminated materials were offered at a public sale; and contaminated materials

were stockpiled for future research. Over one thousand pieces of the deconstructed structural members have been re-graded and have been shipped by the USDA to their Forest Products Lab.

- The Pilot Deconstruction Project developed an internet web-site in the summer of 1997 and maintains it as a means of outreach to other bases and the public. Access figures show that use is regular and repetitive.

- The sale of salvaged wood exteriors and structural members provided information on market value, and material inventory was produced for staff. The documentation and interpretation of this information will continue into the Pilot Deconstruction Project's second year.

Challenges/Recommendations

Pilot Deconstruction Project has determined the following regulatory issues need to be clarified and incorporated into the building removal process to be undertaken at the former Fort Ord. Recommendations are noted:

1. The Building removal process needs to be guided by the parameters that the buildings are made from quality materials, materials should not leave the base without hazard remedation, buildings can be screened to predetermine the best end-use and remediation techniques.
2. Deconstruction crews will need Lead Awareness training and blood lead level monitoring.
3. The Pilot Deconstruction Project research demonstrates that for most deconstruction tasks special protective equipment will not be required by CAL/OSHA. Liability Insurance, Workmen's Compensation Insurance, completion bonds, payment bonds, liens and lien releases will be required. Appropriate notices must be provided to jurisdictions, contractors, and or developers for consistency.

Community Challenges

Direction and guidance begins with the land use jurisdictions and regulatory agencies taking a proactive role in creating a strategy that meets their needs and prevents regulatory gaps. The Monterey Bay communities will benefit if they are proactive in incorporating the following concepts into the building removal at the former Fort Ord.

1. Jurisdictions will save direct and indirect costs by implementing a one-stop permit process for deconstruction/demolition that distributes information and fees to all of the applicable regulatory agencies.
2. A local market for salvaged materials can be created by stipulating that they should/must be used in the new construction at Fort Ord, thereby, keeping salvage values and deconstruction wages high.
3. The wage rates for deconstruction workers will have to be determined at a level that will allow training and elevate to a level that will retain trained, qualified workers.

4. "In place reuse" of existing buildings may be desirable in some areas of Fort Ord, but is generally not expected to be the rule.
5. Demolition (Deconstruction) permits should include a notice and brief waiting period before new construction can begin, this will allow time for salvage.
6. Demolition should remain an option for structure removal if it is not economic to reuse, relocate or deconstruct. The most economical form of building removal will probably be a hybrid of deconstruction and demolition techniques.

Entrepreneurial Challenges

Entrepreneurial opportunities present themselves by developing cost reducing processes with the following recommendations:

1. The relocation of buildings creates many economically sound reuse possibilities, but the end-uses and abatement methods must prevent contact between children and Lead Base Paint covered surfaces.
2. "Panelized Deconstruction" can offer solutions to transportation and labor cost in the reuse of all buildings; whether wood or concrete.
3. Deconstruction is more effective when the site is laid out so that materials are segregated early for processing and directed to meet market needs.

Next Steps

The next steps of the Pilot Deconstruction Project are:

1. Seeking economic methods to remove Lead Based Paint from salvaged siding and update hazard assessments on a parcel prioritized for early reuse.
2. Complete a base wide inventory of salvageable materials that will accompany this report in an outreach to deconstruction/ demolition contractors for a potential Request for Qualifications.
3. The Pilot Deconstruction Project research will be structured into a curriculum to be offered to other Base Reuse communities and education institutions.
4. The Pilot Deconstruction Project has created an inventory that represents the salvageable materials from 75% of the base, the remaining 25% needs to be surveyed.
5. Development of a standard decision tree, based on reuse concepts to screen each building for the most economical reuse or demolition, thereby assisting jurisdictions to efficiently use building removal funds.

Acknowledgment

Many Individuals, groups, businesses and organizations have donated generously to the Pilot Deconstruction Project from their resources. The Pilot Deconstruction Project attempted to extend FORA's appreciation to all involved in the acknowledgment section of this report. However FORA especially thanks the David and Lucile Packard Foundation for their outstanding financial support and continuing interest in the project. The Packard foundation funds provided critical core funding that enabled Fort Ord Reuse community to advance this important program.

FORT ORD REUSE AUTHORITY
PILOT DECONSTRUCTION PROJECT
FINAL REPORT

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SECTION 3.0 - PREPARATION

3.1 Background/Purpose

Background

The Closing of Fort Ord
A significant shock wave hit the Monterey Region in January 1991. The Fort Ord Military Reservation (Fort Ord) was on the first list of proposed military base closure and realignments.

Monterey Region residents were greatly concerned. Fort Ord was a piece of their existence and history, the home of tens of thousands of soldiers since it had opened in 1917. Moreover it had become a key to the economic health of the region, taking a position alongside the agricultural and tourist industries and the educational institutions.

Not surprisingly, the public and private sectors launched a fight to keep Fort Ord open. Simultaneously, many were starting to consider what would be the best uses for the 45 square mile base if the military departed for good.

Fort Ord's closure, one of the largest base closures in the United States, could have created an economic disaster. Clearly, action had to begin quickly. It was. Only five days after the proposal to close Fort Ord was announced, then-Congressman Leon Panetta appointed a task force of community leaders to assist in evaluating what the impact would be on the region if the end of Fort Ord as the area knew it occurred.

Cornerstones quickly became economic development, education and the environment. Economic advances at the expense of the environment would not be tolerated. The area's beauty is a central reason why the quality of life is a standard that attracts visitors from all over the world.

The task force that Congressman Panetta convened appointed covered these issues-, land use, economic development, education, housing; utilities, infrastructure, pollution cleanup, and health, community and public services. Intensive work occurred. In June 1992, the task force's efforts resulted in the publication of a Fort Ord Community Task Force Strategy Report. Shortly thereafter the local communities formed the Ford Ord Reuse Group to initiate reuse work.

Reuse
In September 1993, Secretary of Defense William Perry visited the base and determined the reuse efforts to be a national model for base conversion. Local efforts had received special recognition and would be used to help areas impacted by base closings. President Clinton's Five Point Base Closure Program job centered property disposal, easy access to transition and redevelopment help, fast-track cleanup,

transition coordinators at all major base closures, and larger economic development planning grants - were being followed. They still are.

The Fort Ord Reuse Authority

In December 1993, State Senator Henry Mello proposed Senate Bill 899 to create a Fort Ord Reuse Authority (FORA) as the successor to the informal Fort Ord Reuse Group. Its mission is to prepare, adopt financing and implement a plan for the former Fort Ord. Key areas include plans for land use, transportation systems, conservation of land and water, recreation and an operations business plan.

FORA is the governing body that oversees the transition of the former military base at Fort Ord to civilian usage. It has jurisdiction over 45 square miles in one of the most beautiful areas in the world, on California's coastline.

FORA is governed by a 13-member board consisting of three members of the Monterey County Board of Supervisors, two City Council members each from the cities of Marina and Seaside and one City Council member each from the cities of Carmel, Del Rey Oaks, Sand City, Monterey, Pacific Grove and Salinas. There are also several ex-officio non-voting members including the University of California, California State University, Monterey Peninsula College, and state and federal elected officials.

The following development is planned:

- Commercial - Light industrial research and development business parks and retail.
- Hospitality - Resort complexes and conference centers.
- Residential - Wide selection of single and multi-family housing.
- Recreational - Golf courses, tennis, equestrian center, hiking, mountain biking and other eco-tourism activities.

FORA, through the cooperation of public and private sectors, has developed this plan to attract corporations and industries that value both a quality of life with a business atmosphere that produces high-output employees. Approximately 365 people are now employed at the former military base, only a small fraction of the 18,000 expected by the year 2015. The reuse efforts to convert the former base were commended on by President Clinton during his visit over the Labor Day weekend in 1995. "This thing we celebrate today is a decision that you made for yourselves, your children and your grandchildren," President Clinton told a cheering Labor Day crowd of 23,000 people on the new California State University, Monterey Bay campus, which had opened only the preceding week. "It's a decision you made for the 21s' century. It's a decision you made by working together to prepare for tomorrow."

Environmental protection remains a key aspect of development plans. The Bureau of Land Management will manage about 63 percent of the former base under policies that were established in the multi-species Habitat Management Plan. The plan is financed

by the surrounding communities and is in compliance with the Federal Endangered Species Act. California State Fish and Game requirements are being met.

Working in eco-tourism - combining environmental attractions with economic development are the Bureau of Land Management and the California State Parks system. Eco-tourism activities such as cross-country runs, hiking competitions and mountain bike competitions.

In all, seven educational institutions have or will soon have facilities at the former base, providing both clean and beneficial economic reuse. One is the California State University, Monterey Bay campus. Another is the University of California Monterey Bay Education Science, and Technology (MBEST) Center, led by the University of California, Santa Cruz.

Additional educational (among others) institutions will include Monterey Peninsula College, the Monterey College of Law, the Monterey Peninsula Unified School District, the Monterey Institute for Research in Astronomy and Golden Gate University.

Such advances in education come to an area already known as the "The Language Capital of the World." This designation results from the greater Monterey area providing 25 percent of the nation's post-secondary learning in languages other area than English, as these local institutions play a major role in delivering translation and interpretation services around the globe. It is In 'this context" that the Pilot Deconstruction Project exists and is an integral part of the Fort Ord Reuse.

Purpose

The Purpose of the Fort Ord Reuse Authority Pilot Deconstruction Project is to explore and examine deconstruction methods that result in reduced cost to the reuse of the former Fort Ord.

The underlying principle is to identify environmentally appropriate, and economically sound methods to address this major concern. It is also an important element of the effort to develop replicable methodologies and to foster a network of base reuse efforts to share in this purpose/principle.

Approximately 1200 buildings at the former Fort Ord are slated for removal and are currently abandoned. The working estimate for demolition cost of these buildings is approximately $142 million dollars. Most of these structures contain asbestos and lead contamination, with removal cost identified as one of the major expenses associated with the building removal at Fort Ord. Cost associated with remediating these contaminants will remain relatively constant whether the buildings are deconstructed by hand or removed with machinery (demolished).

An important factor to note is that the Monterey Bay contracting community is not currently trained or capable of handling a task of this magnitude. Before there can be

any kind of redevelopment/reuse activities in these areas, buildings must be removed. The Pilot Deconstruction Project believes this can best be accomplished through a combination of deconstruction, structure relocation, and aggressive recycling. However, demolition remains an option if the funding, markets or other feasibility factors direct such a decision.

The Pilot Deconstruction Project has taken a regional approach to dealing with this removal. The development of empirical information and the sharing of this data assists in this growing national and international issue.

3.2 Project Direction and Guidance

The Pilot Deconstruction Project direction and guidance came from the Technical Support Group. This group was comprised of members who represented those organizations that would be regulating the removal of buildings from the former Fort Ord. It also included members of the local contracting community that had expressed an interest in the removal of buildings at Fort Ord. (See Appendix 14.3 Technical Support Group Members)

On January 21, 1997 the following letter was sent out requesting participation in directing the Pilot Deconstruction Project.

> *The Fort Ord Reuse Authority (FORA) has begun a Packard Foundation funded Pilot Deconstruction Project identifying cost saving measures for the building removal at the former Fort Ord. We will be creating a "Technical Support Group" to guide our staff during the deconstruction and salvage of several buildings on base.*
>
> *The Technical Support Group will be asked to review staff concepts and to guide them through the logistics of various tasks. I would like to solicit your organizations support for this project by asking that one of your staff be nominated to serve on this group.*
>
> *The persons selected would be asked to:*
> - *Meet other selected members of the Technical Support Sub-Group during business hours.*
> - *Be available for consultation by phone during business hours.*
> - *Have a full understanding of the rules, regulations, and their implementation as they pertain to their organization or business.*
> - *Review draft documents, and make suggestions as to concept direction.*
> - *Other task as determined by the group.*

The Technical Support Group is envisioned as a network with individuals participating on an as needed basis. Meeting should only need to occur between individuals that requiring interaction for specific project task. Most work should be able to be accomplished by fax or phone. Although, additional participation will be appreciated the idea is to minimize the time needed by each group member. Their participation will ensure that this vital project achieves top quality results.

It is our hope that organizations like yours will utilize the opportunity presented by this Pilot Deconstruction Project to review their internal procedures and ability to work together in preparation for the full scale removal of buildings at Fort Ord."

It was hoped that participation in the Technical Support Group would give the members a "heads-up" on the complexity and cooperation that is needed to coordinate the issues associated with base reuse and specifically deconstruction of former military structures. Duplicated effort and loss of time for those involved in the deconstruction of buildings is costly and is an aspect of the economic viability of deconstruction that can be controlled by the jurisdictions that will benefit if it can become economically viable. To this end it was imperative that these land use jurisdictions and even special districts such as the Monterey Regional Waste Management District be involved from the beginning.

3.3 Project Baseline and Parameters

Baseline State Parks Project-Demolition of 57 Buildings East of Highway One
The small outbuildings associated with the firing ranges located east of Highway One at Fort Ord were demolished in preparation for reuse of this area by the California State Parks Department in late 1996 and early 1997. Because the Pilot Deconstruction Project was not funded before the contract was awarded, it could not assist with the building removal. However, the work by State Parks was used by the Pilot Deconstruction Project as a case study and baseline for the deconstruction work.

The 57 buildings removed under this contract were crushed on site, by a local contractor, utilizing a modified excavator, then loaded on trucks and taken to the contractors yard. At the contractors yard the material was separated for recycling. The wood products were crushed to produce mulch, the concrete was crushed and the metal was recycled. This process was reviewed by the Pilot Deconstruction Project's Technical Support Group and critiqued for the similarities and differences to those anticipated for the Pilot Deconstruction Project.

The points of discussion focused on the following issues:

- The theory of deconstruction stipulated that separation of materials should be done first, before recycling, so the materials could be reused/recycled in their most valuable form.

- That the recycling of waste wood covered with Lead Based Paint for mulch would place it in contact with humans and as the wood decomposed the lead concentrations might increase because of its lower rate of decomposition. Also, the use of this mulch around houses would place the material in the proximity to children. The Pilot Deconstruction Project is waiting for the results of the Health Department's tests of this contractor's mulch.

- The buildings were typically small one story buildings of wood and sheet metal construction. The floor and foundation types varied between raised floor and slab on grade. The buildings were less substantial than the buildings proposed for deconstruction by the Pilot Deconstruction Project.

- The contract was let and primarily completed before the March 7,1997 date when changes to Cal/OSHA Lead in Construction Standards came into effect. The Lead Worker Training and exposure assessment cost and time would not be reflected in the work done by the demolition contractor.

- The Air Pollution Control District representative related his experience during the demolition of these building with the Pilot Deconstruction Project. His observation was that the existing asbestos surveys were done while the buildings were in use and did not use destructive testing, therefore, during demolition a significant amount of Asbestos Containing Materials (ACM) were found that had not been identified in the existing surveys. He also noted that the condition of the a known ACM in some cases was changing from non-friable to friable.

- The question arose among the Technical Support Group members as to the amount of Lead Based Paint that was being released and left in the soil as the buildings were crushed and loaded for trucking.

The issues that were inherent in these points of discussion framed much of the Pilot Deconstruction Projects initial direction. (Many of these issues were similar to those presented in Appendix 14.4 - EPA/NAHB Expanded Discussion of Industry Issues.)

Parameters
The Pilot Deconstruction Project began with some self imposed Parameters. These were imposed with the object of maximizing the three E's of FORA's Reuse Plan; Education, Environment and Economic Development.

These self imposed Parameters are:

- Community involvement.
- Representation for all land use jurisdictions.
- Active involvement of our local enforcement agencies in every step of the Pilot Deconstruction Project.
- Paying the best possible wages to the deconstruction crew.
- "Buy in" is essential to maintaining consistency, and quality in a research project.
- The marketability of building components.

Community involvement took two forms,
(1) An appeal to local contractors for the loan of their employees as deconstruction crew members and,
(2) active participation from local contractors, agencies, and land use jurisdictions on the Pilot Deconstruction Project's Technical Support Group. Those who were casually interested were encouraged to stay involved by reviewing the periodic updates to the web-site and commenting directly with the Pilot Deconstruction Project Coordinator.

Representation of all land use jurisdictions also took two forms:,
(1) like the community involvement above, the land use jurisdictions were asked to provide representatives from their staff to participate on the Technical Support Group and,
(2) The land use jurisdiction was to select at least one building type in their area at Fort Ord for deconstruction. This was not only equitable, but by deconstructing a representative building in each land use jurisdiction, irregularities particular to each jurisdiction could be identified.

Actively involving local enforcement agencies in every step of the Pilot Deconstruction Project was firstly an invaluable resource in providing guidance and, secondly, created an information conduit that could inform them of every aspect in the Pilot Deconstruction Project. This would prepare both the Pilot Deconstruction Project and these agencies for the massive building removal that lies ahead.

Paying the best possible wages to the Pilot Deconstruction crew was important to the spirit of the Fort Ord Reuse Authority's Procurement Code and a top priority to the Pilot Deconstruction Project. Creating quality jobs that are possible with limited financial resources not only effects the Pilot Deconstruction Project but will effect the communities receiving land on the former Fort Ord.

"Buy-in" was asked from all participants in the Pilot Deconstruction Project. Buy-in represented a commitment to see the project through from beginning to the end. The forms of buy-in varied and were judged to be sufficient if they represented their commitment, and would not overtax the resources of the participant in time, money or energy:

- Crew members were asked to bring their own tool belts, and pass classes.
- Employers had to cover insurance cost.

- Technical Support Group Members were asked to attend meetings and offer prudent technical assistance.
- The project budget paid the crews operating and training cost.
- The Army contributed the buildings for deconstruction.
- Casually interested parties were asked to send their critiques and support in writing to the Project Coordinator.

By determining the marketability of a building component after salvage it was hoped to prevent unwittingly destroying items with potential value. This parameter was designed to prevent the deconstruction crew and staff from presuming that it knew the market value of a un-salvaged item. For practical reasons some items had to be sacrificed to salvage others and a field decision was needed to determine which item was of lesser value and should be sacrificed. This intentional forced attention to salvage detail prevented "cherry-picking", but added considerably to the time it took to deconstruct a structure. It also provided a mechanism for retraining experienced construction workers to rethink their own assumptions about the value of salvaged material.

Other parameters that were part of the Pilot Deconstruction Project were outside of its control and influenced considerable impact on the project in the form of constraints.

These constraints were:

- <u>Time</u>. The participant's time was generously loaned, but not unlimited. The time frame allotted for this portion of the project was one year from release of funds until a finished report could be ready. The Pilot Deconstruction Project findings will be more valuable to FORA, Army, land use jurisdictions, enforcement agencies, and private industry the sooner they can be made available.
- <u>Project Funds</u>. The Project began with a fixed amount of money that was budgeted very judiciously to complete the project goals with in a year. Very little money was allotted for unknowns and very little was budgeted to be generated by the sale of salvaged materials.
- <u>Other participant's commitments</u>. All participants made openings in their schedules and obligations to accommodate the contributions they gave to the Pilot Deconstruction Project. Eventually, some of these other commitments required their full attention and pulled the participants away from the Pilot Deconstruction Project.
- <u>Army restrictions</u>. As owners of the buildings and the land , they had the ultimate responsibility to see that all liability issues were addressed. To facilitate this and to help facilitate the Pilot Deconstruction Project the Army structured the Pilot Deconstruction Project as a Contract between the Army and FORA. With FORA being a contractor to the Army and field crew providers being sub-contractors to FORA. The Army's compensation in this contract is to receive a copy of the final report and a copy of the video footage. FORA 's compensation is the building for deconstruction and their subsequent materials.

- Site constraints. The sites did not have access to electricity or phone service. However, the sites did have water to the buildings. The sites were spread across the base with the furthest being approximately four miles from the storage warehouse. Most of the site security work revolved around limiting public exposure to the site hazards and preventing theft.
- Labor constraints: The major constraint when dealing with Lead Based Paint related tasks, was that only those workers with the Department of Health Services (DHS) certified Lead Worker Training should perform these tasks, even though monitoring showed no risk. As some of the original trained workers left the crew there was not time or money to train their replacements, so the tasks were segregated to match the workers training.
- Weather constraints. The weather at Fort Ord can range from over 100 degrees to under 50 degrees within a few hours or a few miles of travel. Worker safety and the considerations for heatstroke and hypothermia were daily constraints to the efficiency of salvage.
- Hazardous Material constraints. Beside the constraints mentioned above under "labor constraints" The collection of Lead Based Paint chips, site cleanliness and personal hygiene were particularly time consuming until the crew became more experienced. The ninety day limit for accumulation of Lead Paint chips could have become a bigger cost factor if the whole of Fort Ord was not considered a single site. Currently, under Army jurisdiction, Fort Ord is considered a single site, allowing the Pilot Deconstruction Project to use one 55 gallon drum for collecting all of the paint chips from the various buildings and shipping them under one manifest for disposal.
- Health Department constraints. From the beginning the Monterey County Health Department was concerned with the resale of Architectural Components covered with Lead Based Paint . Although the EPA is only now reviewing the idea of limiting the resale of Lead Based Architectural Components and adding them to their regulations, the Pilot Deconstruction Project agreed with the Health Department to not sell Architectural Component covered with Lead Based Paint.
- Regional Constraints. The Monterey region poses a challenge to the distribution of salvaged materials. Its limited transportation infrastructure and relative isolation hampered cost effective distribution of this small amount of salvaged materials to mass markets in the San Francisco Bay and Los Angles Areas. Interested parties from these areas were contacted and invited to tour Fort Ord and take samples of the salvaged materials with them for evaluation.

3.4 Building Descriptions

Description of Building 21

Background:
Building 21 was constructed in 1941 as a dental clinic and its construction appears to have remained unchanged.

The building was 24' 8" wide and 90 feet long.

Roof:
The roof was shingled with three layers of composition shingles over roofing felt. The roof sheathing consist of tongue and groove 1"X 10". The rafters are 2"X8" placed 24 inches on center. The eaves and roof ridge are 8 feet and twelve feet, respectively above the finished floor.

Internal Support :
The roof rafters are supported at one end by a ridge truss constructed from 1"X4" and the exterior walls on the opposite end.

The floor diaphragm is constructed from 2"X8" joist placed 18 inches on center. The joist are covered with a sub-floor constructed of 1"X6" laid diagonally. The diaphragm is supported by four girders, each constructed from two mechanically laminated 2"X10" that rest on 8"X8" wood columns.

Walls:
The exterior walls consist of 1"X6" horizontal tongue and groove siding over 2"X4" framing. A layer of drywall and roofing felt are sandwiched between the siding and framing. During the original construction interior drywall were added to the exterior walls.

The interior walls are framed from 2"X 4" material and covered with drywall or 1"X12 tongue and groove. The tongue and groove material was present in the hallway on the lower 5 feet .

Floor:
The floor in all but the mechanical room was originally finished with 1"X4" tongue and groove fir flooring. Recent floor "up-grades" have included laying a layer of 3/8" plywood over the original floor and placing tile on top of this. The mechanical room had a 3 inch slabs poured over the sub-floor.

Foundation:
The 8"X8" columns that support the first floor rest on concrete pad foundations placed in a 6 foot by 12 foot grid. Each pad foundation is approximately one and a half feet

square and one foot thick. An additional girder with columns runs under the middle of the mechanical room.

Description of Buildings 1801, 1807, 2182 and 2184

Background:
Buildings 1801, 1807, 2182 and 2184 were identically constructed in 1940. Buildings 2182 and 2183 had been converted to classrooms. Buildings 1801 and 1807 were converted to office space.

Each building is single story, 24' 8" wide and 45 feet long. Only Building 1807 was deconstructed. Buildings 1801, 2182 and 2184 were relocated.

Roof:
The roof was shingled with three layers of composition shingles over roofing felt. The roof sheathing consist of tongue and groove 1"X 8". The rafters are 2"X8" placed 24 inches on center. The eaves and roof ridge are 8 feet and twelve feet, respectively above the finished floor.

Internal Support :
The roof rafters are supported on one end by a ridge truss constructed from 1"X4" and the exterior walls on the other end.

The floor diaphragm is constructed from 2"X6" joist placed 24 inches on center. The joist are covered with a sub-floor constructed of 1"X6" laid diagonally. The diaphragm is supported by four girders, each constructed from two mechanically laminated 2"X10" that rest on 8"X8" wood columns.

Walls:
The exterior walls consist of 1"X6" horizontal tongue and groove siding over 2"X4" framing. A layer of drywall and roofing felt are sandwiched between the siding and framing. Sometime after the original construction interior drywall were added to the exterior walls.

The interior walls are framed from 2"X 4" material and covered with drywall. Originally the only internal walls were those of the mechanical room. Other non-bearing partitions have been added.

Floor:
The floor in all but the mechanical room was originally finished with 1"X4" tongue and groove fir flooring. Recent floor "up-grades" have included laying a layer of 3/8" plywood over the original floor and placing tile on top of this. The mechanical room has a 3 inch slabs poured over the sub-floor.

Foundation:
The 8"X8" columns that support the first floor rest on concrete pad foundations placed in a 6 foot by 12 foot grid. Each pad foundation is approximately one and a half feet square and one foot thick. An additional girder with columns runs under the middle of the mechanical room.

Description of Building 2143

Background:
Building 2143 was constructed in 1940 as a barracks. In 1994, when Fort Ord was vacated, the upper floor was still used as a barracks while the lower floor was used as a class room.

This two story building is 30 feet wide and 80 feet long.

Roof:
The roof was shingled with three layers of composition shingles over roofing felt. The roof sheathing consist of tongue and groove 1"X 10". The rafters are 2"X6" placed 24 inches on center. The eaves are 19 feet high and the roof ridge is 27 feet high. An awning type roof runs along the gable ends with the eve height matching that of the main roof. A similar awning roof runs around the entire perimeter of the building just above the first floor windows.

Internal Support :
The roof rafters are supported by a beam at their mid-point constructed of 2 mechanically laminated 2"X8" and at the ends by the exterior walls. The beams rest on top of 6"X6" timber columns that run the full length of the second floor.

The second floor diaphragm is constructed from 2"X 10" joist placed 24 inches on center. It is covered with a sub-floor constructed of 1"X6" placed diagonally. The diaphragm is supported by two parallel beams constructed of 3 mechanically laminated 2"X8" that rest on 6"X6" wood columns and the exterior walls.

The first floor diaphragm is constructed from 2"X8" joist placed 24 inches on center. The floor joist are doubled in the bath and mechanical rooms. The joist are covered with a sub-floor constructed of 1"X6" laid diagonally. The diaphragm is supported by 3 mechanically laminated 2"X8" that rest on 8"X8" wood columns and the exterior walls.

Walls:
The exterior walls consist of 1"X6" horizontal tongue and groove siding over 2"X4" framing. A layer of drywall and roofing felt are sandwiched between the siding and framing. Sometime after the original construction insulation and interior drywall were added to the exterior walls.

The interior walls are framed from 2"X 4" material and originally covered on one side with 1"X12" tongue and groove siding. This has been covered in recent years with dry wall. The bath area walls have been covered with a variety of water proof materials.

Floor:
The floor in all but the bath and mechanical rooms was originally finished with 1"X4" tongue and groove fir flooring. Recent floor "up-grades" have included laying a layer of 3/8" plywood over the original floor and placing tile on top of this. Multiple layers of tile were found in Building 2143.

The bath and mechanical areas have 3 inch slabs poured over the sub-floor. The slab in the bath area has been covered with ceramic tile.

Foundation:
The 8"X8" columns that support the first floor rest on concrete pad foundations placed in a 10 foot by 10 foot grid. Each pad foundation is approximately one and a half feet square and one foot thick.

Description of Building 2252

Background:
Building 2252 was constructed in 1941 as a garage or machine shop. In 1994 when Fort Ord was vacated the building served as a craft shop for service personnel and their families.

This single story building is 47' feet wide and 458 feet long. A "lean-to" addition has been added to the building . Only a representative 60' portion of Building 2252 required deconstruction due to repetitive design of the building.

Roof:
The roof is shingled with a single layer of composition shingles over roofing felt. The roof sheathing consist of tongue and groove 1"X 12". The rafters are 2"X6" placed 24 inches on center. The eaves are 15 feet high and the roof ridge is 21 feet high.

Internal Support :
The roof rafters are supported by a ridge beam, mid-point beam and side-wall beam constructed of three mechanically laminated 2"X6". The beams rest on top of 6"X6" timber columns that run the full length to the floor.

Walls:
The exterior walls consist primarily of 1"X12" vertical board and batten siding or large pairs of 4' 6" wide doors. In some areas the doors have been replaced with banks of

salvaged windows. The end walls are framed from 2"X4" material and covered with 1"X12" vertical board and batten siding.

The interior walls consist of two types. The first type divides the building into roughly six sections. These walls are framed and sided like the external end walls described above. The second type of interior walls are typically about 8' high and support mezzanine structures creating small rooms underneath. This is how the bathroom facilities were constructed. This second type of wall appears to have been added after the original construction.

Floor:
The floor consist of a concrete slab on grade. The slab was not removed and its thickness is unknown. Typically this type of structure will have a minimum of a 6" thick slab.

Foundation:
The foundation was not exposed during the deconstruction. Typically this type of structure will have concrete pad footings, one for each column. Many times these pad foundations will be interconnected with concrete grade beams

Description of Building 7954

Background:
Building 7954 was constructed in 1952 as family housing with a garage. Its construction appears to have remained unchanged.

The building is single story, roughly rectangular measuring 1,313 square feet. Building 7954 was stripped down to its concrete shell in preparation for either dismantling for reuse or crushing for recycling.

Roof:
The roof on Building 7954 was flat and of built-up construction. The roofing consisted of roofing felt, hot-mopped tar and gravel. The buildings insulation was just under the roofing and appeared to be a combination of plaster and some expanded mineral like vermiculite. Support for the roof came from pre-cast cement panels.. These panels were 6 inches thick . Typical roof panels measured approximately 9 feet by 16 feet. Variations from this typical panel size are present .

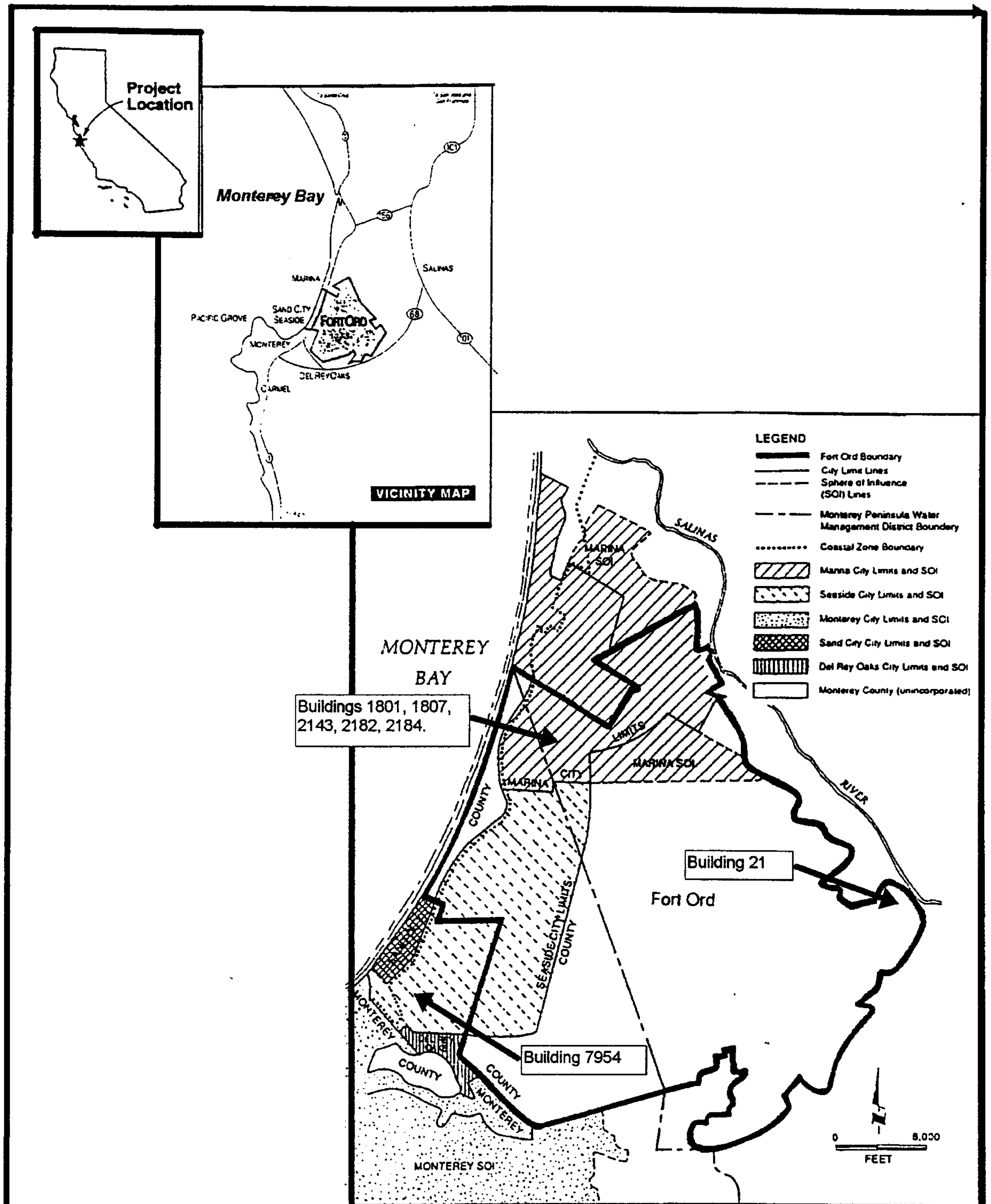
Internal Support :
The roof panels were supported on by the exterior and interior walls.

Walls:
The interior and exterior wall were made as pre-cast panels. The approximately 8 foot by 16 foot by 5 inch panels, which varied with inclusions such as door and window

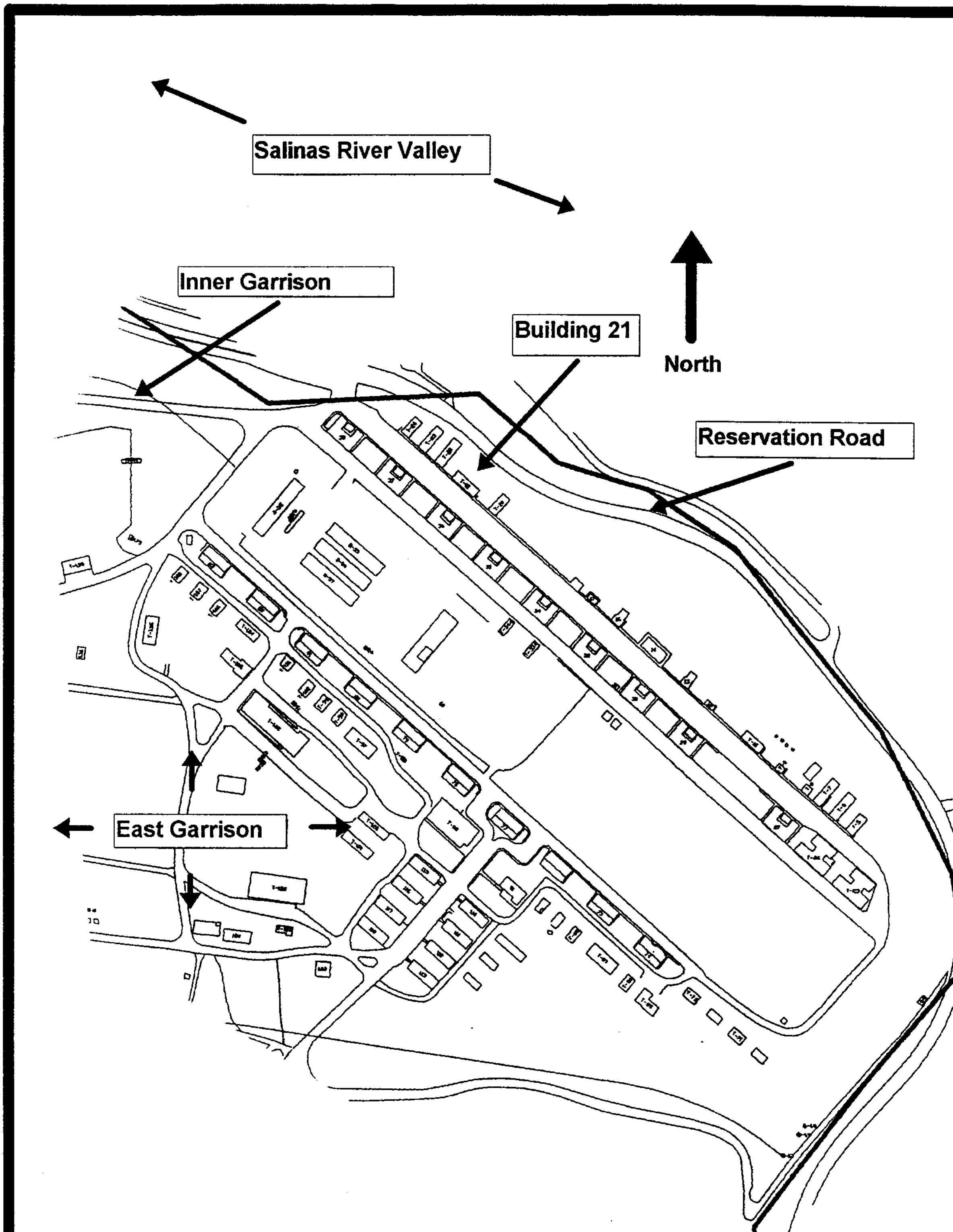
holes. Small portions of the interior walls were framed from 2"X4" material and covered with wood siding. This was done to hide utilities and create closets.

Floor:
The floor is cast concrete. It appears to have been cast after the walls were erected.

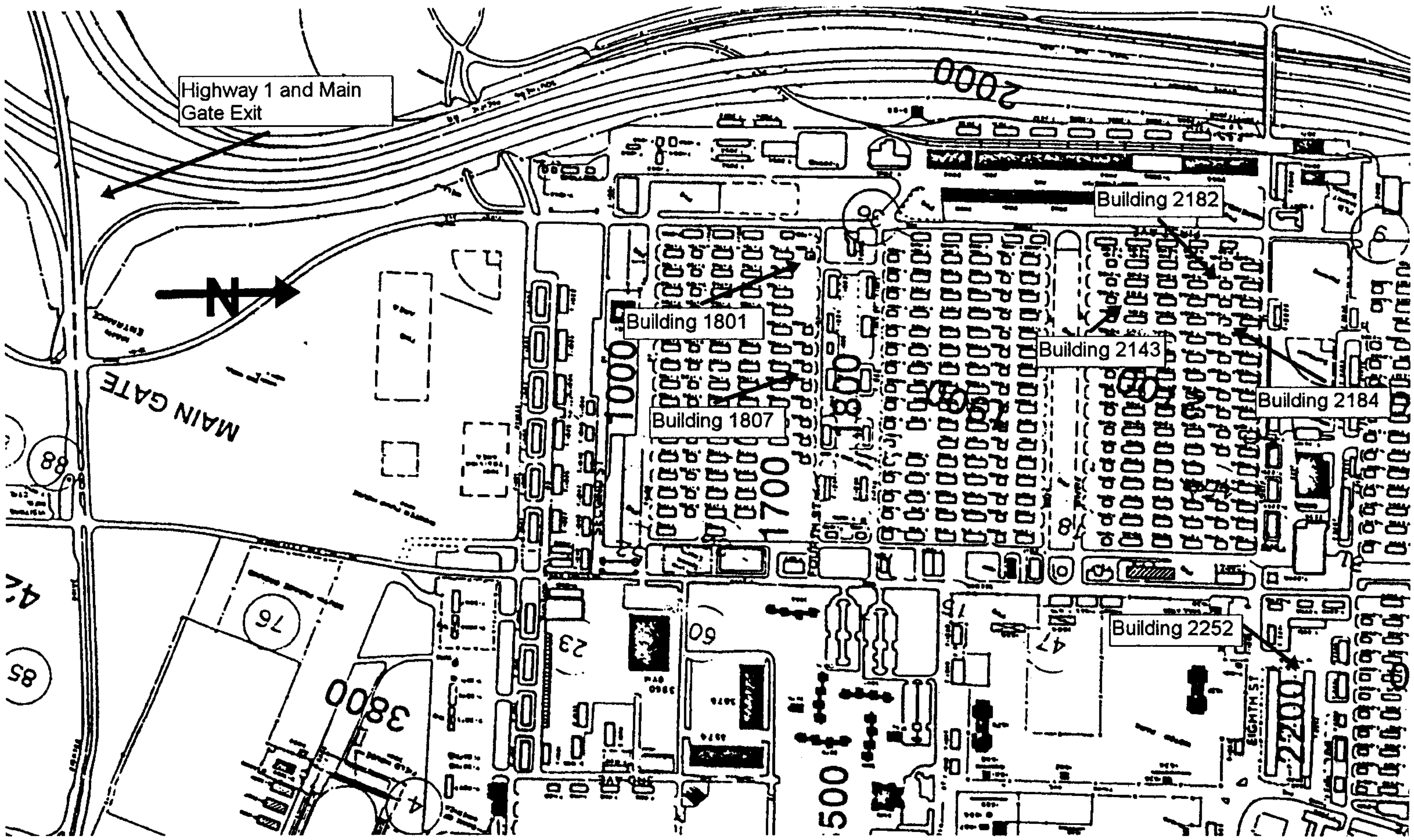
Foundation:
Because the building was only deconstructed down to the concrete shell very little is know about the foundation. The exterior walls appear to have been set on the perimeter foundation after the foundation was poured and cured.



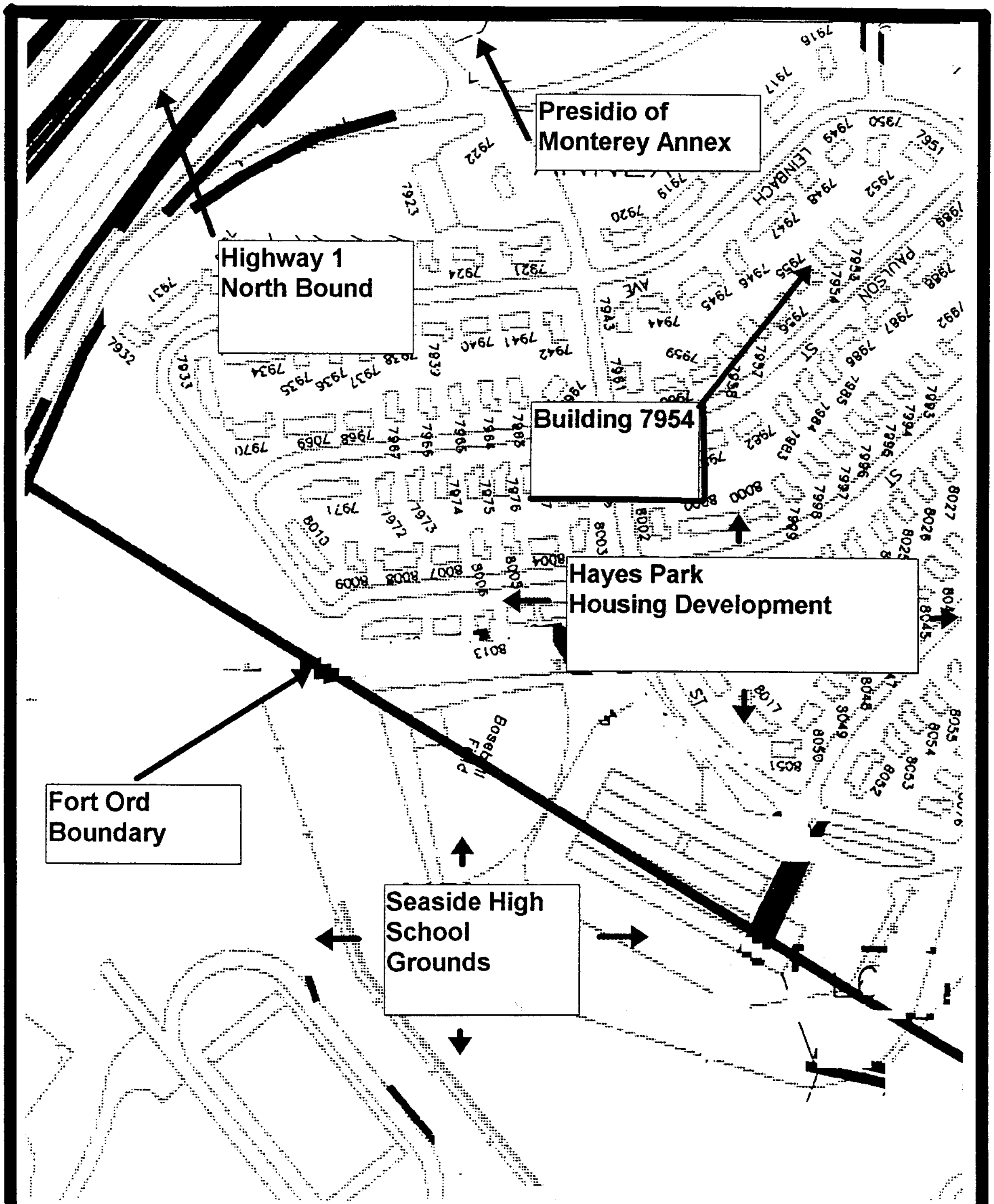
Project Orientation Map



Building 21 Location Map



Buildings 1801, 1807, 2143, 2182, 2184 & 2252 Location Map



Building 7954 Location Map

SECTION 4 - REGULATORY ISSUES

4.1 Insurance

Every deconstruction crew member's sponsor provided "Certificates of Liability Insurance". On these certificates the sponsors listed themselves, the US Army and FORA as additionally insured. The typical insurance policy provided was for at least one million dollars of Commercial General Liability.

The sponsors were all contractors licensed in the State of California. They provided Worker's Compensation Insurance for the Loaned Employees.

4.2 Permitting

Because the Pilot Deconstruction Project was performed as a contract for the US Army on an Army reservation, and utilized only hand tools, there were no permits required. However, as the structures to be deconstructed contained asbestos it was necessary to provide Monterey Bay Unified Air Pollution Control District (MBUAPCD) with a written notification before deconstruction could begin.

Deconstruction is a form of demolition to the MBUAPCD and must follow all of the same notification procedures as demolition. The MBUAPCD is empowered to enforce the Federal Government's National Emission Standards for Hazardous Air Pollutants (NESHAP). A two hundred dollar fee must accompany the notification for each building. An asbestos survey of the building must also accompany the notification. The MBUAPCD then has ten days to visit the site before deconstruction can begin. When the MBUAPCD representative visits the site they are looking for materials that may have been missed by the asbestos survey, in order to prevent an accidental release of asbestos into the atmosphere.

The absence of permits also meant the absence of involvement by local land use jurisdictions. Therefore, the jurisdictions were asked to participate in the Technical Support Group so their concerns would be incorporated in directing the Pilot Deconstruction Project. (See Section 3.2)

4.3 Environmental Assessment

The environmental assessment began with a review of the existing Army surveys on lead and asbestos. Asbestos surveys were available for all of the buildings deconstructed. Lead surveys were only available for Building 7954 and were limited in scope.

MBUAPCD was very helpful in comparing the asbestos surveys to existing field conditions. They shared their experience on Asbestos Containing Materials (ACM) that are found at Fort Ord and knew where to look for hidden asbestos which was missed during the initial survey. With this guidance the Pilot Deconstruction Project was able to prevent at least one unwanted release of asbestos. (see Section 4.4 Asbestos Abatement)

Before deconstruction began all of the buildings were surveyed for Lead Based Paint (LBP) using an X-Ray Florescence (XRF) detection device. Over 200 readings were performed and the readings were written both directly on the components measured and into a test log. This provided not only historical data on the components and buildings that contain LBP, but also served as a graphic display of the lead components to the field crew during deconstruction.

Soil samples were taken directly below the wall line of the structure to determine the amount of lead present in the soil as a baseline before deconstruction, but also to alert the crew to any lead dangers that might exist in the soil. It was felt that sampling directly below the wall line of the structure would capture the highest concentrations of lead from deteriorating LBP and allow easier re-sampling at the end of the project. Re-sampling at the end of the project will show if deconstruction creates additional LBP contamination to the soil.

Before deconstruction began on any components that contained LBP, the crew was trained and certified to work in an unknown lead environment. The crew was suited up and divided into individuals or teams to perform typical task required in deconstruction. Their work practices and engineering controls were monitored by a Certified Industrial Hygienist using air sampling devises located in the workers "breathing zone" and outside the work area. From these results a personal hygiene and site cleanliness program was devised and maintained throughout the Pilot Deconstruction Project. (See Appendix 14.6 Initial Exposure for Air Borne Lead)

Blood lead of the crew were taken before deconstruction began and again after the field work was completed. This allowed monitoring of bio-accumulation of lead in the workers and evaluation of the personal hygiene and site cleanliness program.

4.4 Asbestos Abatement

The DOD Policy on Asbestos Removal at Base Realignment and Closure Properties states:

"Department of Defense (DoD) policy with regard to asbestos-containing material (ACM)is to manage ACM in a manner protective of human health and the environment, and to comply with all applicable Federal, State and local laws and regulations

governing ACM hazards. Therefore, unless it is determined by competent authority that the ACM in the property does pose a threat to human health at the time of transfer, all property containing ACM will be conveyed, leased, or otherwise disposed of as is through the Base Realignment and Closure (BRAC) process."

The DoD Policy goes on to state that it will make available all existing Asbestos Surveys in its Environmental Base Line Survey but: *"however, special studies or test to obtain this material are not required; and results of a site-specific update of the asbestos inventory performed to revalidate the condition of ACM."*

" The remediation discussed above will not be required when the buildings are scheduled for demolition by the transferee; the transfer documents prohibits occupation of the buildings prior to the demolition; and the transferee assumes responsibility for the management of any ACM in accordance with applicable laws."

The field of Asbestos Removal has been refining techniques and regulations through the 1980s and 1990s. Because of this, costs have been dropping for the removal of ACM. The Pilot Deconstruction Project, through pre-screening of buildings before deconstruction, attempted to focus the bulk of its resources away from asbestos removal. Prescreening the existing asbestos surveys developed by the Army for in-place maintenance of ACM were reviewed. Representative structures that had been surveyed as containing minimal asbestos were chosen as candidates for deconstruction. The existing report information was supplemented through destructive testing under the watchful eye of the MBUAPCD.

The supplemental testing, and the deconstruction process show that the existing reports did not reveal substantial amounts of hidden ACM. It further showed that the condition of some formerly non-friable ACM are aging to the point where they are becoming friable. So, although the cost of ACM removal has been dropping since the original surveys were completed there is an offset to these savings in the form of additional cost for removal of hidden ACM and the increase in the amount of friable ACM.

Non-Friable ACM means that it cannot be disintegrated into a powder by hand pressure, where as friable ACM can. This definition changes if typically non-friable ACM can be expected to become friable (a powder form) through the normal forces of demolition (i.e. Non-friable transite pipe, if crushed with a hammer or heavy equipment, creates a powder that contaminates the rest of the surrounding demolition debris. The floor tile in building 2143 emphasized that normally non-friable floor tile could degrade to the point where experienced professionals could not confirm that the tile would not become friable during removal).

Non-friable ACM can be removed with the minimal amount of containment. Special handling, notification and disposal can occur at the Monterey Regional Waste Management District (MRWMD) landfill for approximately twice the dump fees as

normal waste. Friable ACM requires full containment, monitoring, notification and disposal at a special hazardous waste landfill. The above differences between friable and non-friable ACM point out the basic reasons that their removal costs differ greatly.

The Riverdale Deconstruction Case Study, funded by the US Environmental Protection Agency (US EPA), and administered by the National Association Of Home Builders, points to an opportunity to reduce overall ACM removal cost by using deconstruction crews that have had additional 12 hour training to remove non-friable ACM. (See Appendix 14.4 EPA/NAHB Expanded Discussion of Industry Issues) The resources of the Pilot Deconstruction Project and the desire to focus funds on reusable material salvage precluded giving the Pilot Deconstruction Project crew this training.

The Pilot Deconstruction Project hired a Certified Asbestos Abatement Contractor to remove and dispose of friable and borderline friable materials. The exception to this was non-friable roofing mastic and transite that was left intact, double wrapped, and taken to the MRWMD landfill. This latitude is allowed because the federal regulations known as National Emissions Standards for Hazardous Air Pollutants (NESHAP) apply to quantities exceeding those removed by the Pilot Deconstruction Project crew, and since the items were removed intact, there was no worker exposure to asbestos.

Asbestos removal and remediation cost will be a strong factor in the fate of a structure, whether it is economical to reuse, deconstruct, or demolish. The cost of asbestos remediation is affected by each of these end-use scenarios. The cost for asbestos remediation for demolition as compared to deconstruction, from all knowledgeable sources the Pilot Deconstruction Project could find, will probably be very similar.

The following definitions from Federal Register Vol. 55 No. 224 provide the basis for relationship between those in charge of a property, ACM and demolition.

- ***"Regulated Asbestos Containing materials*** (RACM) means (a) Friable asbestos Material (b) Category I non-friable ACM that has become friable (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading or (d) Category II non-friable ACM that has a high probability of becoming or has become crushed, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart."

- ***"Owner or operator of a demolition or renovation activity*** means any person who owns , leases, operates, controls or supervises the facility being demolished or renovated or any person who owns , leases, operates, controls or supervises the demolition or renovation operation or both."

- ***"Renovation*** means altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility components.

Operations in which load-supporting structural members are wrecked or taken out are ***demolitions***. "

4.5 Lead Abatement

The primary source for lead contamination and exposure from deconstruction at Fort Ord is from Lead Based Paint (LBP) used extensively on the buildings both inside at out. Lead Abatement was performed during the Pilot Deconstruction Project for several reasons:

- To protect the deconstruction crew.
- To protect the environment.
- To protect the public.
- To produce safe, salvaged materials ready for reuse.

In one sense, the entire deconstruction process as implemented in the Pilot Deconstruction Project can be thought of as a Lead Abatement Process. The overall project goals to produce safe salvaged materials necessitated that LBP covered items be identified and segregated from the onset. It was necessary to implement this process even before deconstruction could begin so the deconstruction crews would have a safe work environment.

After identification, LBP covered items were assessed for the condition of their LBP coatings. Items that were covered with loose and flaking LBP were assigned a method and time that would provide containment of the LBP chips before the item was deconstructed. Predominantly this abatement was performed before any other work was begun on the building, but some items such as second story exterior walls were easier and safer for the crew to bring down in large panels onto the second story floor. This left the exterior side, with LBP chip problems up and exposed so that a Hepa-vac could be used to vacuum off the loose paint chips.

The selective, yet continuous use of the Hepa-vac through out the Pilot Deconstruction Project kept the structure, work spaces, warehouse and tools clean and played an important role in keeping the crew and environment safe from contamination.

Materials coated with LBP were not offered to the public. They were appropriately disposed of or stockpiled to provide a supply of material for testing LBP removal technologies.

Structures designated to be relocated were abated through the use of encapsulation and encasement systems. Specifically, building 1801 was encapsulate with a engineered coating system designed and manufactured by Global Encasement Inc. This spray on, multi-layer coating was chosen because of the extensive documentation and testing that had been performed by independent laboratories showing that it had an estimated twenty year usable life. Buildings 2182 and 2184 were first manually scraped to remove loose and flaking LBP, than wrapped in roofing felt and sheathed in exterior

grade plywood. The encasement and encapsulation systems were in place before the structures were allowed to leave the base. (See section 8 - Relocation)

The Department of Defense (DoD) Policy on Lead Paint at BRAC Properties provides insight into the level of Lead Paint remediation and documentation applicable to the buildings at Fort Ord when they become available for mass removal. Note the structures use; residential or non-residential will effect how this policy is implemented.

" Department of Defense (DoD) policy with regard to lead-based paint (LBP) is to manage LBP in a manner protective of human health and the environment, and to comply with all applicable federal State, and local laws and regulations governing LBP hazards. The Federal requirements for residential structures/dwellings with LBP on Base Realignment and Closure (BRAC) properties differ, depending on: (1) the date of property transfer, and (2) the date of construction of the residential housing being transferred. "...

..." Target housing constructed before 1960 must be inspected for LBP and LBP hazards, and such hazards must be abated. The results of the LBP inspection will be provided to prospective purchasers or transferees of BRAC property identifying the presence of LBP and LBP hazards on a surface-by-surface basis and a description of the abatement measures taken. In addition, prospective transferees must be provided with a lead hazard information pamphlet and the contract for transfer must include a lead warning statement.

The inspection and abatement discussed above will not be required when the building is scheduled for demolition by the transferee and the transfer document prohibits occupation of the building prior to the demolition; the building is scheduled for non-residential use, or, if the building is scheduled for residential use, the transferee conducts renovation consistent with the regulatory requirements for the abatement of LBP hazards.

Effective January 1, 1995, DoD BRAC properties shall be transferred in accordance with any regulations implementing the Residential Lead-Based Paint Hazard Reduction Act of 1992. The Act also made Federal agencies subject to all Federal, State, interstate, and local substantive and procedural requirements respecting LBP and LBP hazards (see 15 U.S.C. 2688). Therefore, there may be more stringent local requirements applicable to Federal property transfers. "

SECTION 5 - LABOR ISSUES

5.1 Labor Force

There were some basic concepts used when assembling the Deconstruction Crew. These were:

- Training local contractors/labor to prepare for the building removal at Fort Ord .
- Keeping the lessons learned in the community for future use by local contractors.
- Participation by as many local contractors as possible.
- It would be easier and more cost effective to expand and strengthen existing local business into deconstruction than to create new deconstruction businesses from scratch.

Five crew members were loaned by their employers. Their employers were in a business that would benefit directly from training their employees in deconstruction. These businesses were General Contracting, Metal Salvage, Demolition, Construction Clean-up, and House Moving. The Pilot Deconstruction Project required the employers to:

- Provide General Liability Insurance, with all other participants listed as additionally insured.
- Loan one or more employees to FORA for participation on the deconstruction crew.
- Provide Workman's Compensation Insurance for the loaned employee.
- Pay their loaned employees the following wage rates (a) $14.00/hr. for those employees with construction experience. (b) $10.00/hr. for those without any construction experience. (See Section 5.2 - Wage Requirements.)

All training and health monitoring costs were paid for by the Pilot Deconstruction Project. The Pilot Deconstruction Project crew was assembled on April 25th 1997. Sponsoring contractors and participants were solicited through the Monterey, Salinas and Santa Cruz Builders Exchange News Letters. The hybrid deconstruction crew was comprised of 7 members. All of the initial crew members were experienced in the field of construction.

The participants began the first day of their Lead Worker Training with their employers and other community contractors and was offered to the general community as a Department of Health Services Certified Lead Awareness Course. The full Lead Worker Training course took four days to complete.

Immediately after this training they were given two days of Occupational Health and Safety Administration (OSHA) worker training. The second day of their training was hands-on using the tools that would be needed for deconstruction at the first building.

Before deconstruction could begin the crew went to Doctors On Duty for their initial blood lead level readings. The next hurdle for the crew to overcome was personal air

monitoring of the task required for deconstruction to ascertain if air-borne lead levels would exceed those for worker safety as these tasks were performed. One crew member had been previously trained as a Lead Supervisor. The crew suited up for lead work and performed the tasks typical to deconstruction which were drywall removal, sawing, wood component removal, door and window removal.

The Personal Air Monitoring results showed that typical deconstruction tasks did not generate enough air borne particles to require crew members to be fully suited or wear respirators. The three replacement crew members that started on July first did not receive Lead Worker Training. Their work task was narrowly defined to prevent exposure to air borne Lead Based Paint. The replacement crew members had no construction experience and were primarily asked to de-nail and stack lumber. Clean up of Lead Based Paint chips was properly handled by the trained crew members.

Sponsors and Employees:

Chris Dent Trucking
- Christopher Dent (Chris) (April 25th- October 29, 1997)

R.J.L. Inc. - D.B.A. Fresno House Movers
- Matthew Burgess (Matt) (April 25th- October 29, 1997)
- Hector Hernandez (April 25th- June 27, 1997)

S. G. S. Enterprises - D.B.A. A&S Metals
- Samuel Cornejo (Sam) (April 25th- June 27, 1997)
- Miguel Lopez (July 1- October 29, 1997)
- Lombardo Quintero (July 1- October 29, 1997)
- Deonicio Guevara (Demacio) (July 1- October 29, 1997)

T.A. Le Desma Builders
- Tim Le Desma (April 25th- June 27, 1997)

University of California, Santa Cruz Extension
- Ann Schneider (April 25th- June 27, 1997)

5.2 Wage Requirements

The spirit of the Fort Ord reuse Authorities Procurement Code is based upon the concept of attempting to provide local employment opportunities at the best possible rate with the object of creating a strong economic base from the Monterey Bay Area.

The identification of the best possible wages for the Pilot Deconstruction crew with a limited budget and no historical data to start with was solved by first going to the County of Monterey research data on labor rates, California Cooperative Occupational Information System, and Occupational Outlook Monterey County.

A category for Deconstruction Labor was not found, so the rational was used that the skill level required for deconstruction was more than that of a laborer and less than that of a trained carpenter. These two labor rates could be found in the Occupational Outlook Monterey County. The value of deconstruction labor began at the average between the two county labor rates then a dollar an hour was added to this average. This was the compensation offered to the contractors that were loaning their workers to the Pilot Deconstruction Project. Any additional expenses that the worker would cost his employer or any loss of revenue from the worker not being available was to be borne by the participating contractor. The Pilot Deconstruction Project considered this to be equal "buy-in", both by the contractor and the Pilot Deconstruction Project.

5.3 Deconstruction Crew Safety Training

The different experience and background of the deconstruction crew members made it necessary that the whole crew be given common training in work-site safety practices. The training classes were developed through the University of California, Santa Cruz Extension (UCSC, Extension). They were tailored to anticipate the demands of deconstruction.

The two days of instruction utilized both classroom and hands-on training.

The first day of instruction was held at the UCSC, Extension facilities located on the former Fort Ord. The "On site use of Personal Protective Equipment" and the "Injury and Illness Prevention Program" were presented in a classroom setting. The "Back Safety", "Non-Powered Hand Tools" and the "Use of Scaffolding training were presented in both a classroom and hands on format.

The second day of class room instruction focused on "Environmental and Regional Hazards at Fort Ord", "Heat and Cold Stress", and a "First Aid Overview". A combination of class room and hands on instruction were used to present the "Use of Powered Hand Tools, and "Basic Electrical Safety and the Use of Generators".

5.4 Lead Worker Training

The Pilot Deconstruction Project, as originally conceived in 1996, did not anticipate training the deconstruction crew in anything more than an awareness of lead related hazards and how to avoid them. Changes in regulations early in 1997 required that the Pilot Deconstruction Project find the resources to provide Department of Health Services Lead Worker Training for the initial deconstruction crew members.

On March 7,1997 California Occupational Safety and Health Administration's (CAL/OSHA) revisions in Title 8, CCR Section 1532.1 became effective. These required that " All employees and supervisors who are engaged in lead-related construction in

residences or buildings generally accessible to the public, and shown to be exposed to lead at or above the Permissible Exposure Level (PEL), shall be trained by state-accredited training providers and certified by the California Department of Health Services (CDHS)."

Further CAL/OSHA and the Federal OSHA require that, if engaged in certain "Trigger Task", employees must be protected until an exposure assessment can be performed that shows that employees will not be exposed above the PEL. "The 8 hour PEL is 50 micrograms/meter cubed." The protection required before the exposure assessment is complete, consisting, briefly, of respirators, personal protective clothing, change areas, hand washing facilities, blood lead level monitoring, "Hazard Communication", respirator and lead training.

Deconstruction is considered a Trigger Task by both CAL/OSHA and Federal OSHA. The term that they use is "Manual Demolition".

The pre-deconstruction X-ray Fluorescence (XRF) readings on the painted surfaces in the buildings showed a relatively consistent use of lead based paint (LBP). Even if this "Objective data" would have shown that the LBP "contained less than 0.06% (600ppm) of lead" the requirements for an exposure assessment would still apply because, "Objective data is not permitted to be used for exposure assessment in connection with any of the trigger task."

This change in the regulations directed the first steps in the Pilot Deconstruction Project. The crew would have to be given Lead Worker Training by Department of Health Services (DHS) certified trainers, then they would have to be tested and certified to wear respirators, and their blood would have to be tested before they could begin deconstruction. The first task that they would have to perform would be to participate in their own exposure assessment, by suiting up and performing typical deconstruction task while a Certified Industrial Hygienist monitored the air for their exposure levels. The exposure assessment results would determine the level of personal protective equipment required for deconstruction, and the site hygiene requirements.

The DHS Lead Worker Training is a 40 hour classroom training for those who will be working with lead. The crew was presented with the "Background and History of Lead and its Uses", Site Characterization", "Material Identification", "Routes of Entry", "Health Effects of Lead Exposure" as the preliminaries in the lead class. They were acquainted with "OSHA Lead Standards", "Medical Surveillance Programs", "Worker Exposure Control", "Respiratory Protection", "Protective Clothing and Equipment", "Lead Based Paint Abatement Methods", and "Waste Characterization". The final day of class was spent with hands on training in creating plastic barriers and site organization required for lead removal.

After the training and basic medical test were completed, the crew was ready to suit up and perform the exposure assessment. They were divided into individual tasks that

would be needed for deconstruction. One person was assigned the task of removing boards and sawing them into smaller pieces. Another team was assigned the task of removing doors and trim wood. One person was assigned the task of removing drywall from the interior. Finally a person was assigned the task of floating from task to task and assisting the others.

One person assigned to each task was fitted with an air sampling device that measured the amount of lead that was present within twelve inches of their face. An additional air sampling device was placed outside the work area to provide ambient air statistics. The air sampling and testing was administered by a Certified Industrial Hygienist from Forensic Analytical.

Forensic Analytical was asked to produce an "Initial Exposure Assessment for Air Borne Lead" after reviewing the air sample results. The air sample results showed that the exposure level for all of the tasks performed were below the detectable limits of the test. The exposure assessment showed that manual demolition of the buildings at Fort Ord should not present a lead exposure hazard to workers through air borne lead particles. The other avenues of entry into the body were addressed in the exposure assessment through a site hygiene program.

The success of the hygiene program outlined in the Initial Exposure Assessment for Air Borne Lead was proven when the deconstruction crew had their final blood lead level test taken after five months of deconstruction. The lead in their blood had not increased significantly and in one case it had dropped slightly.

SECTION 6 - DECONSTRUCTION

6.1 Regulations Governing Deconstruction

The regulations governing deconstruction are similar to those governing demolition. (See section 6.1 - Regulations) The differences between the regulations governing demolition and deconstruction are outlined in the Environmental Protection Agency (EPA) and National Association of Home Builders' (NAHB) Expanded Discussion of Industry Issues. (Appendix 14.4 - EPA/NAHB)

One of the ways that deconstruction differs from demolition is that deconstruction produces materials that are available for immediate resale and reuse. The regulations are vague that govern the resale of salvaged materials covered with Lead Based Paint (LBP) to private individuals. These regulation are also vague in relation to private individual's reuse of materials containing LBP. Currently, the EPA is drafting regulations that should remove some of the ambiguity in the resale and reuse of LBP covered architectural components.

Until these regulations can be finalized it would seem prudent to require remediation of LBP before reuse of individual architectural components. This would mean tracking the components to insure that they are remediated and reused in ways that would minimize human contact, especially concerning children. This would also mean a method of accountability and control which needs to be implemented between the current owners of the materials and those charged with remediation, LBP disposal and resale of materials. The Pilot Deconstruction Project has proposed to those drafting the EPA regulations that a warning label be attached to these components that would be removed by the end consumer. The label would function to alert the end user to the dangers of LBP.

6.2 Pre-Deconstruction Building Material Assessment

One of the objectives of the Pilot Deconstruction Project was to create a building material inventory during deconstruction. With this in mind, a Pre-Deconstruction Building Material Assessment was performed on only one of the buildings that was deconstructed. The project primarily focused on the building materials that were common to each building type deconstructed.

The building elements that were found to be common were typically the structural components and siding originally used to construct the buildings. The materials and material quantities that were used for remodeling are unique to each individual building and were considered secondary in terms of documentation during the Pilot Deconstruction Project.

Mr. Phil Kreitner of the Wood Resources Efficiency Network spent a day with the project members identifying the species of wood that were used for the structural members of the buildings at Fort Ord. His survey was non-destructive and consisted of spot checking exposed areas of various buildings on base. Destructive methods of surveying were not used because of Mr. Kreitner's time constraints and the potential for unwittingly disturbing Asbestos Containing Materials and Lead Based Paint.

Before deconstruction was performed on Building 21, Ann Schneider of the University of Santa Cruz, Extension took the time to attempt a pre-deconstruction building materials assessment using the "Building (Material) Inventory Form" that was included in the appendices of the US Environmental Protection Agency and National Association of Home Builders' deconstruction report titled "Deconstruction- Building Disassembly and Material Salvage: The Riverdale Case Study. This assessment was performed as a way of understanding the Riverdale study Building (Material) Inventory Form and not as a true material assessment.

6.3 Data Collection

Data collection for the Pilot Deconstruction Project took two forms. The first form was the collection of field notes and the second form was collection of video footage.

Field Notes

The field notes consisted of hand written notes, hazardous material surveys, and receipts. These were collected for each building in the Pilot Deconstruction Project. Specifically these field notes consisted of :

- Time sheets in fifteen minute increments, detailing the crew member's activities during deconstruction.
- Inventory of salvaged materials.
- Receipts from the Land Fill and recycling providers.
- Notes from meetings with the Technical Support Group, Army, and regulatory agencies.
- Hazardous Material Surveys.
- Laboratory test results.
- Medical surveillance records.
- Classroom notes from training classes.
- Material sales results.
- Inquiries by individuals or groups on business opportunities relating to reuse of buildings from Fort Ord.
- Inquiries by other base reuse authorities and active military bases.
- Other deconstruction projects.
- The history and historic uses of buildings at Fort Ord

Video
The video documentation was spearheaded by the University of California, Santa Cruz Extension. They contracted the actual videography to videographer Pablo Gowins, Public Affairs Director for KSJS, San Jose State University. The environmental assessment process was documented. The use of personal protective equipment and the techniques for Lead Based Paint abatement were filmed. The deconstruction crew was also filmed during deconstruction activities to document the techniques of deconstruction and their evolution of these techniques. Key personnel involved with the Pilot Deconstruction Project as well as historic film footage were and added to the video footage. Approximately 13 hours of raw video footage was collected.

The primary objective of collecting this video footage is for future production of a video series correlated with a deconstruction curriculum. This curriculum would be implemented first at Fort Ord as a class for personnel from other Base Reuse communities and could be added to a university curriculum.

The secondary objective of the video collection is to create a video documentation of the Pilot Deconstruction Project, its objectives, processes and accomplishments. A short 30 minute video documentary was compiled and edited from the raw video footage by Pablo Gowins. This video is meant to complement this report on the Pilot Deconstruction Project.

6.4 Deconstruction Versus Demolition

Definitions
For our purposes, Deconstruction means dismantling a building with the goal of maximizing the re-use potential of its components. First, building components that can be salvaged are targeted for reuse, second recycling. This minimizes the amount of materials that are landfilled. Typically, deconstruction involves hand work and careful use of heavy equipment, and takes more time than demolition.

Demolition, by contrast, means the razing of a building with heavy equipment in such a way that the building components are fit for nothing more than mulch, compost or landfill. The use of heavy equipment accelerates the building removal process but turns materials with possible resale value into materials subject to dump fees.

Perspective
The reasons that deconstruction is reemerging in the late twentieth century after approximately fifty years of decline and favoring demolition are many. There is the increasing pressure as world resources are declining and as the world population grows. The interest of many are shifting from labor saving techniques that provide easier jobs for a few to techniques that provide jobs for more, especially those without

access to technical training. There is a growing awareness especially among the educated that the materials in older buildings are many times better that comparable virgin products, due to the current use of second and third growth timber.

Deconstruction has the potential of releasing material resources in older buildings that can augment the supply of new and virgin material resources currently being harvested. The process can be used to employ low skilled workers and work as an avenue for them to acquire skills. The materials salvaged can be used to create structures and finished products that are equal or better than those from virgin products. In a world of dwindling resources, deconstructed materials can provide those less financially endowed with access to serviceable building materials that they could not otherwise afford.

Deconstruction is not a new concept, in fact, in the Monterey area the older portions of the Pebble Beach Lodge were constructed from a hotel that was dismantled in the adjacent City of Pacific Grove. Historically, the pyramids of Gaza were stripped of their surface stones to build other structures. In the USA, the Amish have been the historic deconstruction specialist and around Fort McCoy in Wisconsin the local citizens are the dismantling the buildings. Along the southern border of the United States workers from Mexico regularly deconstruct buildings and ship them to Mexico for reuse.

Economic Benefit

Deconstruction costs approximately the same as demolition when all economic factors are considered. These factors include: Salvaged material value, dump fee savings, and the cost associated with long term landfill life. Deconstruction, naturally costs more in terms of time, however, the impact of time/cost on a project as large as Fort Ord can be mitigated. Substantial cost savings can be achieved when parcels are prioritized for clearing and deconstruction proceeds ahead of development.

Deconstruction creates more job and entrepreneurial opportunities than Demolition. It creates entrance level jobs and training possibilities, that spread the economic opportunities more evenly throughout a community than demolition can.

Predominantly the jobs that demolition would create would be in the areas of transportation and heavy equipment operation. Typically these are high paying jobs requiring skilled labor. Deconstruction would eliminate some of these jobs, but it would also introduce more job opportunities at a level requiring only worker endurance, ability and willingness to learn. These positions begin as low paying and transition upward as employees skills develop. Deconstruction could also add another level of jobs typically paying higher than that of equipment operators and truckers, these would be material handlers and distributors. The cost of the added employment opportunities would be offset by the value of the material salvaged for reuse.

These added levels of job skills produce a more diverse range of ways for local citizens to engage themselves and benefit from the building removal at Fort Ord. Employment at diverse skill levels creates broader financial benefit to the local economy. Demolition would create a narrow range of jobs tending to create a boom-bust economic cycle as the need for positions, jobs, employees/labor emerges and disappears overnight.

Labor costs are not the only element of successfully implemented deconstruction. Other elements are: Market absorption, material quality, time requirements and the cost of regulatory requirements. The land use jurisdictions, acting as developers, can eliminate their indirect cost by streamlining the permit and regulatory process.

The reuse of Fort Ord will create the largest single market for construction/building materials in the Monterey area for the next twenty years. This volume of construction materials can be augmented by materials produced through deconstruction at Fort Ord. Reuse of materials into new construction guarantees a steady market for the deconstructed materials and a steady market for salvaged materials keeps the value of these materials high. High values for salvaged materials mean that deconstruction can be support higher wages. This all adds up to lower total building removal cost if the proper ideological and physical infrastructure is installed.

Education Benefit

The deconstruction industry, as a whole, will benefit from the use of deconstruction at Fort Ord. The buildings at Fort Ord are similar to those at many other closed and active bases, however, it is unique because its size is much bigger than these other bases. A project this large allows perfecting methods of deconstruction that smaller projects could not financially survive. The quality and most importantly the quality of material from the buildings at Fort Ord would allow enough public exposure to a regular supply of salvaged materials that their use would gain public acceptance as an alternative to virgin materials.

The potential to train others at Fort Ord in refined deconstruction skills, techniques, and equipment can be used to set industry standards for safety and skills. Deconstruction as a profession would have a chance to be recognized by labor groups. A method can be developed for determining fair wages for the deconstruction industry substantiated by the value derived from the salvaged materials.

Environmental Benefits

The Marina landfill, local to Fort Ord, has over 100 years of estimated life remaining. The volume from the removal of buildings at Fort Ord would reduce this life by approximately one and a half years. Presently this one and a half years of landfill space may not seem so valuable, but 100 years from now at the end of the landfill's life cycle how much will one and a half years of landfill space cost to replace?

Deconstruction and diversion of materials to other uses will help increase the landfill life that the materials from Fort Ord would otherwise use up.

Summary of Benefits

Deconstruction works when labor is economical, the market is accessible and able to absorb the quantity of materials that are produced and where the regulatory agencies recognize this as an accepted option to demolition. It works if the regulatory agencies work with deconstruction contractors to insure that safe guards are maintained, red tape is minimized and materials can move as quickly and with as little handling as possible from deconstruction to end user.

In many areas, with opportune economic and regulatory conditions, a system has evolved that incorporates the positive aspects of both deconstruction and demolition. Local labor rates determine which items can be salvaged economically. High-value/low-salvage cost items are targeted and salvaged before the heavy equipment is brought in to clean up the items with low-value/ high-salvage cost. These later items are then sorted and assigned to be recycled or landfilled.

Working from the beginning to combine the benefits of deconstruction with the speed and strength of demolition's heavy equipment should produce the lowest cost scenario for building removal at Fort Ord.

6.5 Site Security

Site security consisted of portable chain-link fencing, and a locked tool room. The chain link fence was rented and installed at the first site by the rental company. Subsequent installations were performed by the deconstruction crew. Each panel could be utilized as a gate by simply not bolting it to the adjacent panel. The gates were secured with a length of chain and a padlock. Typically, a site had at least two gates to permit driving through the site and more than one access point.

The fence provided minimum security for the salvage materials left on site, however It also provided a way of limiting access to the site. This was important for liability reasons. Further security was provided for the generator, Hepa-vac and inexpensive hand tools by creating a secure room in an adjacent building. The 55 gallon Lead Based Paint chip drum was secured in this room as the chips were accumulated during deconstruction.

The Pilot Deconstruction Project learned two lessons about site security from the following two incidents.

(1) Preliminary evidence showed that a large portion of the siding from building 2143 was unaccounted for and presumed stolen. The siding was separated by length and bundled into easily handled lots. It was allowed to accumulate on site in preparation for an "on-site sale". The on-site sale canceled and a final sale of all materials was planned at the end of the project. The theft occurred before the siding could be moved to the warehouse for the final sale.

(2) It was interesting to observe the Pilot Deconstruction Project crew's perception of the value of salvaged material change throughout the project. At the beginning of the project their construction and remodeling experience dictated that the salvaged materials were useless. As the salvaged material accumulated and was sold the crew began to see uses for the material in projects at their homes and those of friends. They started to take some materials home under the justification that it was just scrap and would go to waste if they did not use it. This practice was quickly brought to a halt and the crew members bought what items they needed.

These incidents may seem obvious security problems to many, but they occurred even with careful management by the Pilot Deconstruction Project Coordinator. Either separately or in combination, these two types of loss could result in a large scaled loss and jeopardize a larger deconstruction project. It is important in a large deconstruction project, that materials be secured and labeled as soon as possible to prevent loss.

6.6 Deconstruction Tools and Methods

The Pilot Deconstruction Project chose to use simple hand tools for deconstruction. The rational behind this was that it would prevent damage to materials, be reproducible at low cost by others, and the data produced would represent the simplest form of deconstruction. The methods, techniques and data could be relied on and easily improved on to meet the specific needs at hand. These could also be augmented with the use of specialty or heavy equipment.

Tools

The list of basic tools for each crew member follows:

- Tool belt.
- "Bear Claw" style nail puller.
- Hammer.
- Phillips and straight screw driver or combination screw driver.
- Pair small wire-cutting pliers.
- Utility knife.
- Air purifying, half face respirator.
- Boots.

- Long pants.
- Hard hat.
- Shirt.

The crew shared the following tools and equipment:
- Generator.
- Hepa-vac.
- Extension cords.
- "Saws-all" reciprocating saw with various blades.
- Skill-saws.
- Drill motor and drill bits.
- Various length "crowbars".
- "Flat-bars".
- Simple mechanical nail puller.
- Hydraulic pallet jack.
- Hand truck.
- Wheelbarrows.
- Spading forks.
- Grain shovels.
- Standard round point shovels.
- Flat point shovels.
- Very heavy custom wide blade scraper with 4 foot metal handle.
- Heavy duty 6' long wooden handled scraper.
- Ratchet set.
- Wrenches.
- Pipe wrenches.
- Hacksaws.
- Hand saws.
- Sledgehammers.
- Plastic trash cans.
- Rolling scaffolding.
- 12' extension ladder.
- Step ladder.
- Set of rolling steps.
- Saw horses.
- Various types of rope.
- Various sizes of cardboard boxes.
- Reusable cardboard Gaylord boxes.
- Zip-lock baggies.

There were other tools experimented with during the deconstruction, but the above list is what the crew preferred.

An older 4 ton dump truck was rented from a crew member. When the materials that had been salvaged from building 21 were moved to the warehouse a larger stake bed

truck was rented. When lots of materials needed to be moved at one time a 5000 pound forklift was rented.

Method

The basic approach to deconstruction is often referred to as "reverse construction" because the building is disassembled in roughly the opposite order that it was constructed. Deconstruction began after a destructive search for hidden hazardous materials. The Hazardous materials were removed properly before deconstruction began. Then the utilities were disconnected to prevent injury. After this deconstruction could begin.

The Order of Deconstruction

Deconstruction typically occurs in this order:

- Remove the fixture and breakables.
- Remove the roof.
- Remove the walls.
- Remove the floor.

The following description outlines the narrative order in the Pilot Deconstruction Project's techniques.

Fixtures and Breakables

First the fixtures and appliances were removed and bagged, boxed (if applicable) and transported to the warehouse. The doors and windows were also removed and sent to the warehouse for storage. The preferred method of door removal was to pull the perimeter trim. Drive a nail through the door frame into the door and then cut the frame loose from the wall framing with a Saws-all. The result was a door that remained hung in its frame with all of its hardware intact. Windows were removed complete, where practical, by Saws-alling them from the wall framing.

Roof

For terms of clarification this report assumes that the roof and gable ends stop at the top plates of the exterior walls. With this definition the ceiling components and gable ends would be considered part of the roof.

After removing the fixtures and breakables, the roofing materials were removed. The roofing materials were removed directly into the dump truck on smaller buildings and into dumpsters for the larger buildings. Simultaneously, crew members were inside the building pulling the interior drywall down from the walls and onto the floor. After the roofing materials were stripped the exposed sheathing was cleaned of remaining nails and the fastening nails were removed. The sheathing was then handed to the ground for final de-nailing, sorting by size and stacking. After the sheathing was removed the ceiling drywall was knocked to the floor.

The rafters were removed by pulling the nails where they attached to the wall plates and raised to release them form the ridge board. They were handed down to be de-nailed, have the painted ends trimmed, be sorted and stacked. This process of de-nailing (trimming if needed), sorting and stacking was used for all of the lumber to be salvaged. Different building components like rafters and ceiling joist could be removed and processed simultaneously by setting up two de-nailing stations on either side of the building. Each material would be removed then separated for processing by sending one type to one de-nailing station and the other material to the other de-nailing station. This helped the de-nailers and sorters stay organized and more efficient.

The gable ends for one story buildings were removed by cutting the nails between the wall's two top plates with a Saws-all and pulling them outside the building and to the ground with ropes. This left the ends lying on the ground with the siding down and the 2"x4" studs facing upward. The studs were loosened from the siding with a large sledgehammer until they were separated from the exterior drywall that was between them and the siding. (See Typical Girder, Floor, Wall Detail *Drawing 5*) Once the studs were separated enough a Saws-all was used to cut the nails and free the studs and the siding. The exterior dry wall was ten lifted from nails in the siding and put into either bins for recycling or the truck, if painted, for disposal. The siding was then collected and de-nailed, sorted and stacked.

While the gable ends were being deconstructed outside the building the interior and ceiling dry wall was being removed from the floor and put into the truck for disposal.

Walls

The exterior walls needed to be braced when the roof and rafters were removed. They were braced approximately every 15 feet with a 2"x4" running from the top plate to the floor. Large sections of the walls were then dropped to the outside of the building, if possible and then deconstructed like the gable ends described above. Where the walls dropped into the building and onto the floor deconstruction was harder. The crew experimented with various techniques, with the preferred method being to drop the walls in smaller sections onto the floor and then flipping it over to access the studs. The siding was stacked in bundles for easy handling and secured with tie-wire.

The interior walls once stripped of dry wall were cleaned of all other materials until only the studs were left. The walls were then disconnected from the exterior walls and pushed over and onto the floor and the studs were knocked apart from the top and bottom plates. All of the interior wall components were grossly separated as soon as they were disassembled with the cleaner pieces going through one window near the de-nailing station and the more difficult pieces going through another window for de-nailing. After de-nailing the lumber was processed by sorting and stacking.

Floor

Three out of four of the wooden buildings deconstructed had a raised floor. For discussion purposes this report begins the floor below the bottom plate in on the

exterior walls and continues downward to the top of the foundation. This will include the floor girders, pier block column post and cross bracing in this discussion. Typical floor coverings are also included as part of the floor even if remodels have brought finish surface of the floor above the level of the bottom plate.

In Building 21 the floor tile was removed by working pry bars and scrapers under the plywood base that had been placed to bridge irregularities in the original floor surface. The plywood came up in large sheets that had ring nails penetrating every 12 inches by 12 inches. In Building 1807 the original floor surface was covered with a rolled flooring product similar to roofing felt but with a smooth surface and adhered with a tar like substance. This was scraped from the original floor a completely as possible. The tile covering the original floor in Building 2143 was found to be laid directly over asbestos containing tile that was laid over plywood and nailed down to the original floor. This material was removed by a licensed asbestos abatement contractor with a technique that was similar to the one described for Building 21 above.

The original floor in the three building described above was 1"x4" tongue and groove fir flooring. This was removed by working the heavy custom scraper under the groove edge of the flooring exposed on one side of the building. By working along the exposed piece of flooring it could be pried free of the sub floor and the grove of the adjacent piece. After removal the pieces were sent to be de-nailed and processed. The flooring was stacked in bundles easily handled and secured with tie-wire.

The 1"x6" diagonal sub-floor was removed by pulling the nails from the top with "bear claw nail pullers and then lifting it from the joist . The boards were then sent for de-nailing and processing. The perimeter band was knocked from the ends of the floor joist and sent for de-nailing. The nails that held the joist to the girders were pulled then the joist removed for de-nailing. The girders were constructed of multiple members nailed side by side to form the entire girder. These were deconstructed by forcing flat bars between the members and prying them apart with large pry bars.

The column post rested on the Pier footing and lifted off with easily. This completed the deconstruction of a building. Further work was needed to clean the site, like raking and filling in depression found under the buildings. Each of the building with raised floors had utility rooms with concrete floors poured over the sub-floor. T is was removed with sledgehammers and used top fill the voids under found under the building or on site.

Summary

The procedure described above was developed by the crew and refined through out the process. The version described above is somewhat idealized. It does not describe the confusion that overtook the crew when items were not properly separated before sending to the de-nailing stations. This would eventually slow the de-nailing stations down and back up the removal of wood from where it was being placed outside the building creating havoc for the crew inside the building. The description above does not describe how helpful it was for all crew members to be aware of the site lay out and

material flow so that each member would not obstruct his co-workers. (See the Job Site Layout Drawing, *Drawing 6*)

6.7 Segregating and Handling Materials

The handling of materials during salvage creates the cost of salvage. Excessive handling adds salvage cost and increases the chance of damaging the materials, thereby, lowering their value. Streamlining the removal and processing of materials during deconstruction is a cost factor that is controlled by the deconstruction crew. The Pilot Deconstruction Project found that planning how the materials were going to be segregated early in the project and early segregation during removal increased the efficiency of the deconstruction process.

The site was organized so that different types of materials could be segregated simultaneously without conflicting during processing. The large work areas provided at Fort Ord helped with this organization. (See Job Site Layout Drawing *Drawing 6*)

As the crew became more experienced they arranged the work schedule so that only one or two different materials were salvaged at the same time. The other crew members were assigned support tasks so that the processing of removed materials could keep pace with the removal. Processing, like de-nailing, sizing, and stacking were begun as early as possible in the removal process and combined if possible. For example roof sheathing was removed by pulling the nails while in place and handing down relatively de-nailed lumber into designated areas roughly defined by long or short boards. Therefore the de-nailing and the sizing had begun. This separation allowed the de-nailing stations for long boards differed from the one for short boards, increasing their efficiency.

Sorting by size was facilitated by marking the ground in separate lengths. The sorting area was laid out with marks painted on the ground starting at a curb face and extending out to the desired length. The marked lengths usually began at 3' and progressed in one foot increments up to 20'. For example, each siding piece was laid over the mark that was slightly shorter than the wood. The siding was allowed to accumulate until 5 pieces of a single size could be bundled for sale.

When deconstruction produced two distinctly different materials at the same time separation often began by passing one material to one side of the building and the other material to the opposite side. In disassembling the rafters and ceiling joists two different materials were encountered for salvage and short blocking was produced suitable for recycling. The two salvaged materials were handled as described above and the recyclable material was sent out from a designated window into a box.

Wood that is allowed to accumulate into piles right after removal to await de-nailing was found to be very time consuming and dangerous to move because of the nails and the tangled composition of the pile. Removal and de-nailing were arranged to keep pace with each other.

The early segregation of materials and timely processing into a marketable commodity is critical to the economic salvage of materials. The processes described above evolved after only deconstructing a few buildings. It can and will be refined further. As further information is collected on the most marketable forms for salvaged material the process will change to efficiently meet this demand.

For example:

> The preliminary research on lumber grading points to end splits and nail holes as reasons for down grading the grade of the salvaged lumber. The Pilot Deconstruction Project material sale showed that consumer interest was higher in materials that were trimmed to uniform lengths and well stacked.
>
> This information would indicate that a procedure that removed, say rafters, by cutting them loose with a saw behind the nailed and fitted portions would eliminate end splits, and many nail holes. The boards would then proceed to be de-nailed and then a miter saw used to square the ends and trim the lumber to a standard size. The lumber would be ready for sale in the highest grade available and in a form that the customer is known to respond to.

6.8 Material Sale and Market Analysis

Objectives
The Pilot Deconstruction Project sale was conceived of as a method for determining the "Local Market", its extent, the market demand and value the market would place on the materials that were being salvaged. No building materials of any kind were offered to the public that contained Lead Based Paint or Asbestos. All generated funds were considered donations to the Pilot Deconstruction Project and were used to further the deconstruction research.

It was felt that a silent auction with written bids would allow easier tabulation of prices offered for the salvaged materials. The advertising was intentionally limited to the Monterey, Salinas and Santa Cruz Builders Exchange newsletters and a press release. This limited exposure was intended to provide a glimpse at the size and interest of the local Monterey Bay market for salvaged materials. The advertisement was limited to listing the nominal sizes of the material offered and the auction rules.

Successful bidders were queried on the following:

- Intended end-uses.
- Domicile.
- Purpose for buying salvaged material.
- Could follow up occur and see their finished project.
- Occupation/education.

Sale

Predominantly, the materials offered were pre-sorted stacks of structural lumber. Also offered were salvaged fluorescent lights, ceiling tile, wood flooring, forced air gas fired furnaces and salvaged hardware.

The deconstruction crew was used as a sales force during the auction, because they had intimate knowledge of the materials salvaged, and it was felt, they would benefit from first hand knowledge of the value the customers placed on the salvaged materials. The auction was timed to coincide with lunch time, with refreshments offered to the first individuals who came to the auction. This was accomplished to allow local contractors the time to place bids on the materials and not compete with their lunch break.

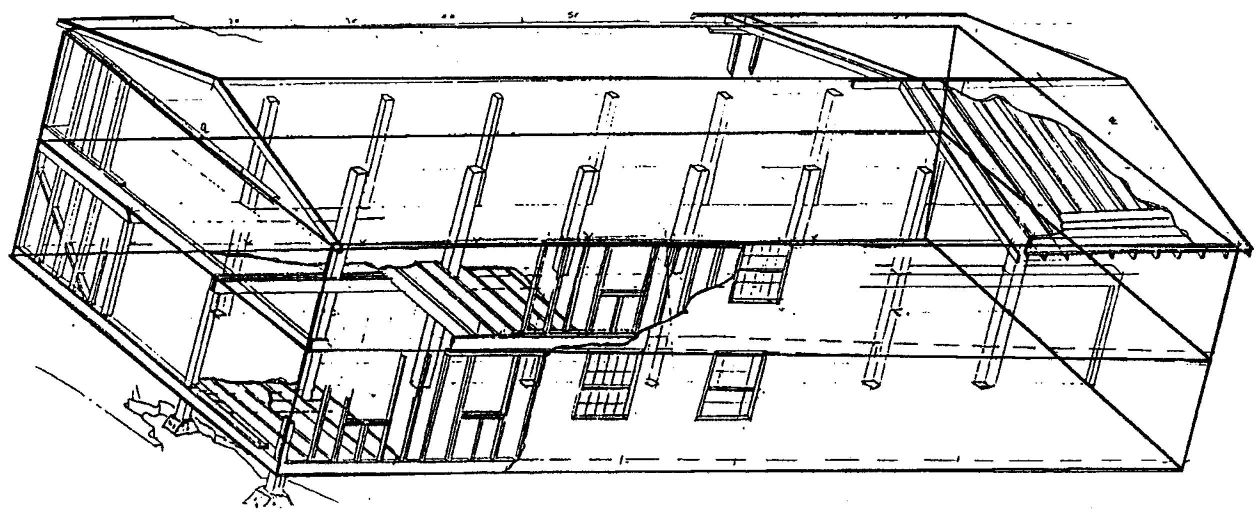
Each bidder was required to fill out a form with their address and phone number. Then they were given a number that identified them on the bid sheets that they filled out with their bids. Successful bidders were to be notified by phone the following day. Material was not allowed to leave the site on the bid date so that material sales could be tracked, consumer information tallied, and a fork-lift could be rented for one day that could be used to load all the materials.

Market Analysis

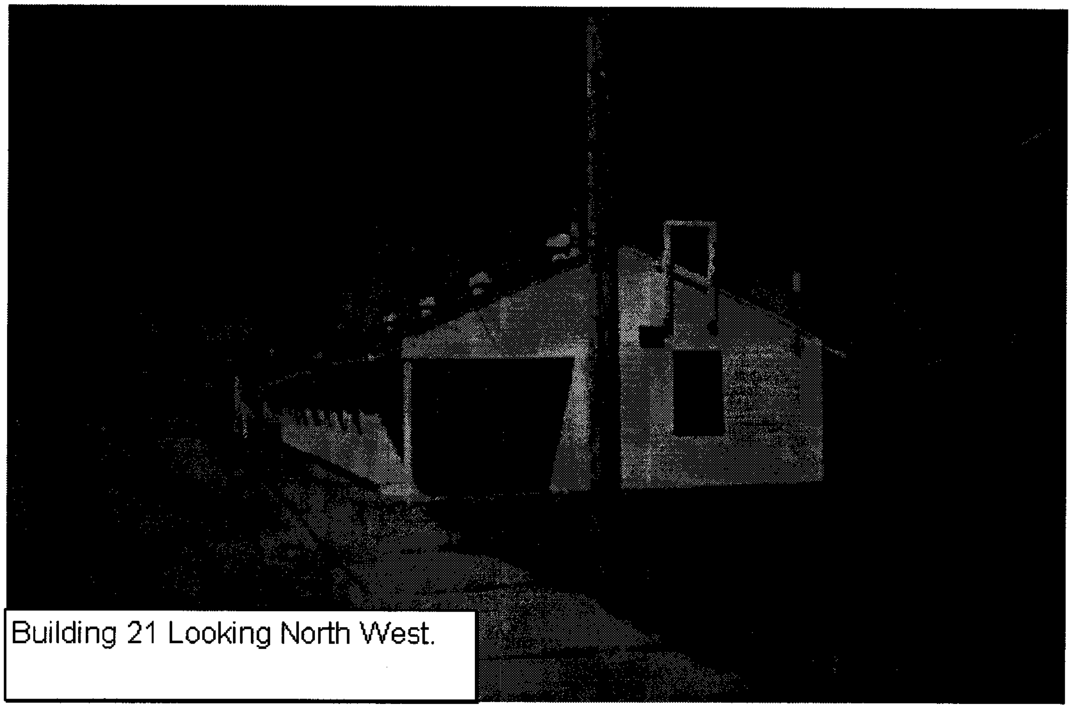
- Total revenue generated- approximately- $3,000 dollars from a portion of the materials salvaged from Building 21.
- 50% of local retail price for similar "virgin" products seemed reasonable to the bulk of the consumers.
- The local market was defined by the location of buyers reaching from Redwood City, encompassing Salinas and south to King City.
- The predominant uses were for agricultural needs and storage.
- The predominant reasons for buying were, superior quality of material, perceived value of material for the cost of material, environmentally sympathetic to reuse concepts, and success they had had with buying other salvaged materials in the past.
- Occupation/ education level of the buyers were predominantly college educated professionals.
- Moving the materials to a central location for storage and sale added handling cost and increased damage to the material.
- There was tremendous interest in purchasing the salvaged windows, however these items were not sold because of the Lead Based Paint.

- The contractor's bids were typically low and they cited the following reasons. Large volume, and more attention to trimming the materials to standard sizes would increase their interested in purchasing the salvaged materials. Without a grade certification for the salvaged materials contractors could not use the materials as structural components.
- Follow-up showed that all of the consumers were very happy with their purchases, the wood was very workable, did not split and performed well in all of their uses. They would purchase more if necessary.
- "Word of mouth" has created additional demand for the salvaged material as the initial consumers recommended the material to others.
- Salvaged plumbing fixtures, furnaces, hardware, and ceiling tiles did not appeal to this group of consumers.

The "higher end" buyer of the salvaged flooring was very happy with the look that he attained when he laid the salvaged flooring upside down in his new Victorian style home. He cited cleaning the tongue and groove as an important labor consideration.



Two Story Barracks Structural Configuration



Building 21 Looking North West.

Building 21 was the first building deconstructed under the Pilot Deconstruction Project

Photo - Building 21

Building 1801 being prepared for relocation

Building 1807 was deconstructed.

Buildings 2182 and 2184 were relocated.

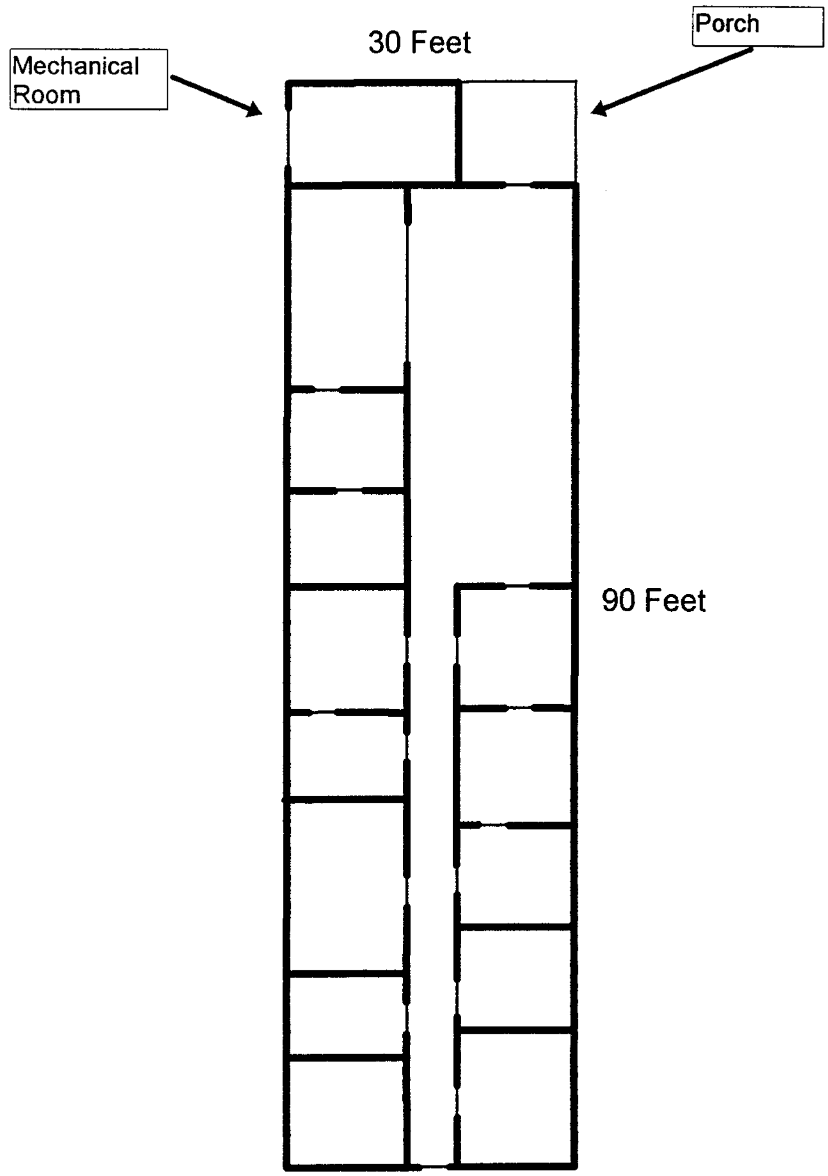
These buildings were all constructed to the same specifications.

Photo - Buildings 1801, 1807, 2182 & 2184.

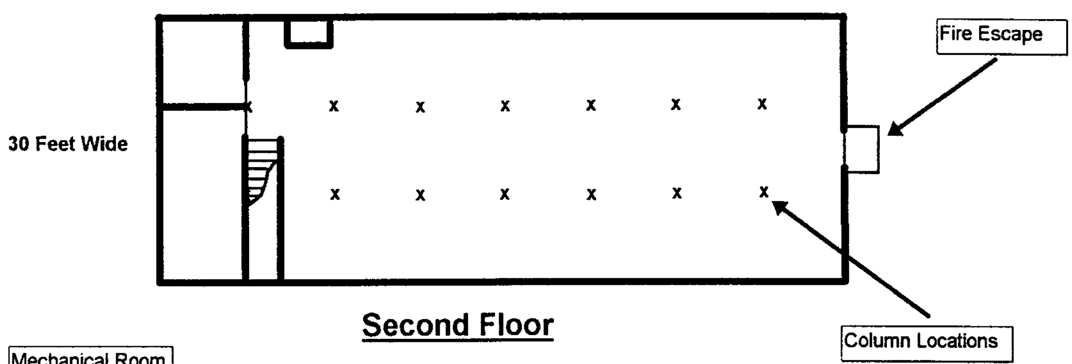
Two Story Barracks like Building 2143

Building 2252 After Deconstruction of the West End

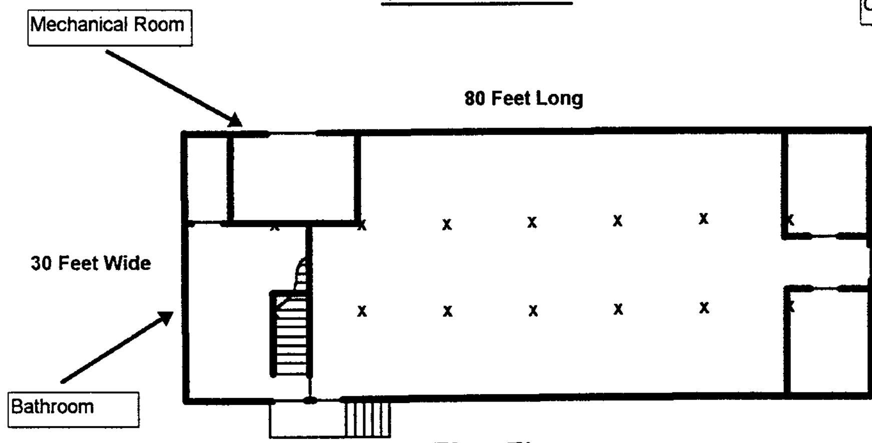
Building 2252



Building 21 Layout

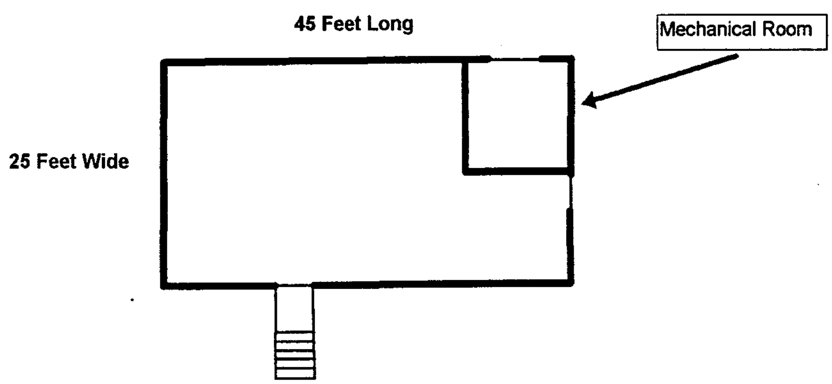


Second Floor



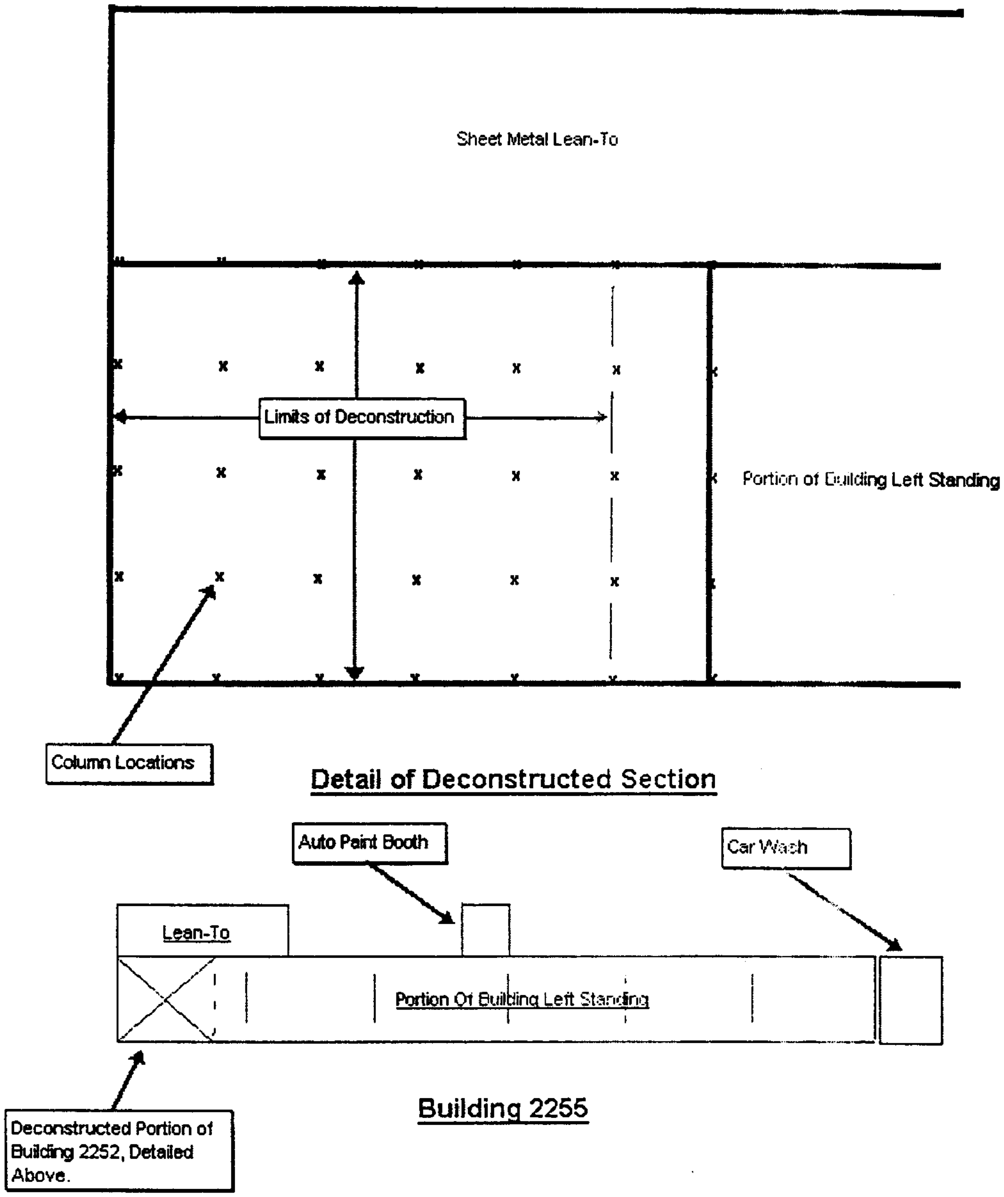
First Floor

Building 2143, Two Story Barracks



Buildings 1801,1807,2182 &2184 One Story Day-Rooms

Sketches of Building Lay-Out Before Remodels



Building 2252 Layout Sketch

SECTION 7 - "PANELIZED" DECONSTRUCTION

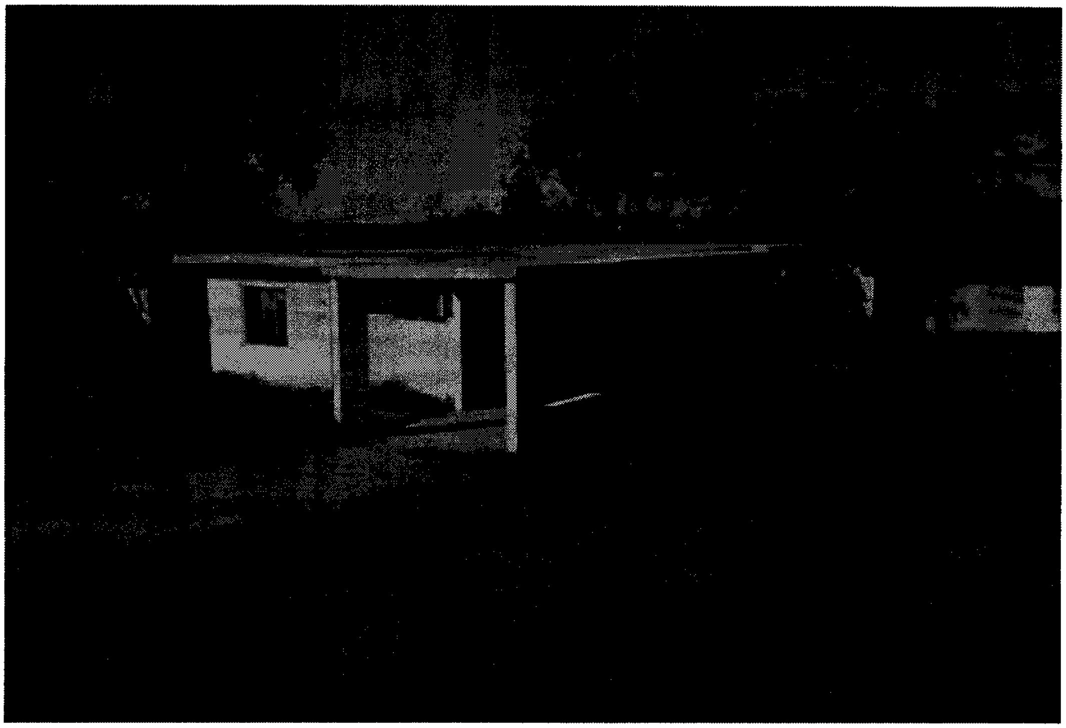
7.1 Panelized Deconstruction

Panelized Deconstruction of Structures was used in the 1950s at former Camp Beale. It is reemerging as a preferred method of deconstruction at Fort McCoy in the late 1990s. Panelized Deconstruction allows saving much of the embodied energy in a building and volume reduction for easy handling and shipping. It allows the remediation of hazards during disassembly and structure upgrading to meet current codes during reassembly. It allows styles and floor plans to be changed by end users, to meet their needs, that differ from that of the original structure.

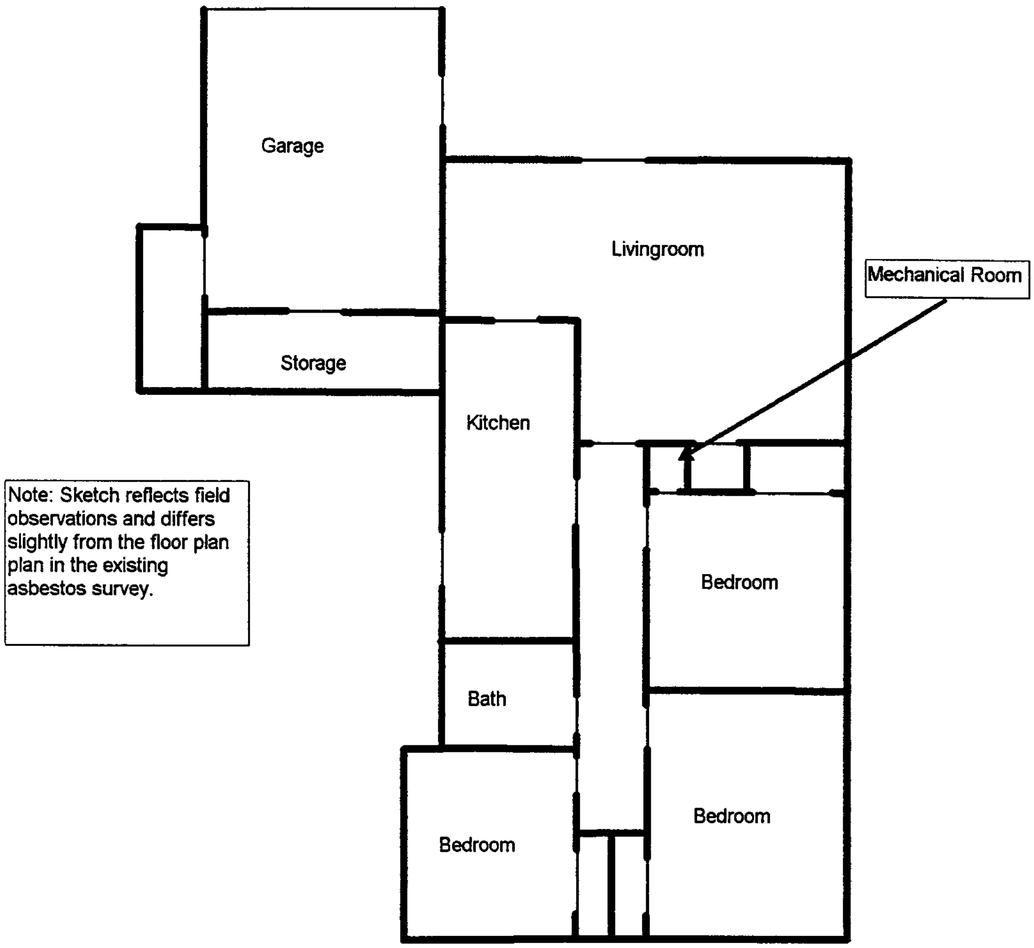
Both the wood raised floor buildings of the former Fort Ord and the concrete building of Hayes Park lend themselves to Panelized Deconstruction. The Pilot Deconstruction Project did not deconstruct any buildings into panels as final products because it would have required the use of a crane and would have best been served by having an agreement with a land owner and architect interested in reassembling the panelized structure. The Pilot Deconstruction Project did experiment with the deconstruction of wooden exterior walls in large sections that approximate the size of panels.

The Project also abated the asbestos, stripped and gutted one of the concrete structures at Hayes Park. The structure is now ready and exposed so that others can view how the pre-cast panels that comprise this building are fastened, and were assembled. Panelized deconstruction of this style of structure would be a reverse of its original assembly. The shear weight of these panels which average 5 inches thick, 8 feet high and 12 feet long will require considerable thought and equipment to disassemble. This disassembly was beyond the scope or resources of the Pilot Deconstruction Project.

During Panelized Deconstruction the interior of the structures can be gutted to reveal any hidden hazards. This gutting will facilitate the cutting required to create the panels and prepare the interior of the panels to be up graded during reconstruction. The remediation of hazards like Lead Based Paint can be facilitated with encapsulants before deconstruction and after reassembly with simple methods like stucco that would also disguise seams and additions. Seaside, CA. has a quaint 1200 SF duplex that was assembled by two men in the late 1950s from barracks at former Camp Beale that had been deconstructed as panels. The building included plans for reassembly when the panels were originally purchased by the owner. (See Interview with Mr. Cederwal in Appendix The structure does not resemble the original barracks and blends in with the surrounding neighborhoods)



Pre-Cast Concrete Building 7954



Building 7954, One Story Residence

Building 7954, Layout Sketch

SECTION 8 - RELOCATION

8.1 Regulations Governing the Relocation of Buildings

The relocation of buildings and their reuse is regulated under a combination of guidelines of demolition and building reuse in place. (see Section 6.1 Demolition Regulations and Section 7.1 Building Reuse (In-Place). A C-21 demolition license is required for any contractor relocating buildings. The relocation of buildings is also regulated by the communities that they will pass through.

Caltrans regulates the transportation of buildings for relocation through a permit process. Utility lines and traffic lights require special consideration and may require fees for relocation. Remediation of hazards should occur so their condition does not create an immediate hazard to life and health during transportation. Hazardous waste regulations are not applicable to the portion of the building being relocated; only to the portion that is removed for disposal.

The hazardous materials in a structure should be properly remediated before the building is moved. It is critical that those who are trying to understand the concept of hazard remediation understand that remediation is - a reduction in the level of hazard, and does not mean complete removal of the hazard. The acceptable level of remediation depends on the ultimate end-user and the ultimate end-use.

Relocation of structures can be safely accomplished. Relocation will be looked at with great interest at Fort Ord because of the quality of the materials, the amount of work that is embodied in the structures, and the apparent large local demand for these structures.

Because of the presence of LBP and asbestos in most of the buildings at Fort Ord, it is important that a detailed understanding of these issues come directly from the agencies that govern the different aspect of building relocation.

The following synopsis is only meant to facilitate discussion of these issues:

The portion of the structure being relocated is not regulated as Hazardous Waste, because it is not a waste. The materials removed from the structure for disposal ,if hazardous, are all that are governed by Hazardous Waste Regulations. The portion of the structure being relocated is not an "Architectural Component" as such and regulations for the reuse of Architectural Components are not applicable.

Housing and Urban Development (HUD) Guidelines are guidelines developed by HUD to determine how they would allocate their internal finances to remediate hazards in the buildings that are under their responsibility. They differ from "Regulations" and "Laws" and do not apply to properties that are privately owned and receive no HUD regulated

public funds. This would not include privately owned single family houses and office space. The end user and use of the relocated structure would determine if HUD guidelines would be applicable to determine remediation standards.

The County of Monterey Department of Health is extremely concerned about public exposure to the hazards of LBP. The Health Department is watching the relocation of buildings from the Fort Ord foot print with disapproval, but it appears that the Health Department has no jurisdiction over the relocation of structures if the following criteria are met:

- Proper remediation of hazards before relocation, i.e. the removal or covering of lead based painted portions of the structure components with acceptable products that prevent exposure
- End-use screening is utilized that limits contact between children and LBP.

Real estate disclosure laws would be applicable in the resale of buildings for relocation. The California Association of Realtors publishes Form FLD-14, titled "Lead-Based Paint and Lead-Based Paint Hazards Disclosure, Acknowledgment and Addendum for Pre-1978 Housing Sales, Leases or Rentals". Inspection firms are available to assist individuals or companies with these considerations.

The public health and safety issues that are associated with the reuse of buildings at Fort Ord are real, yet hardly insurmountable if a serious effort is made to determine the end-use and funding requirements. The end-users needs to understand the precautions associated with LBP. Items that are removed from the structures need to be handled properly and will fall under different guidelines than discussed above.

8.2 Relocation of Buildings

By relocating buildings 2182 and 2184 to their campus, Hartnell College has saved a considerable amount of money and created a new 2,000 square foot building for their Human Resources Department. Hartnell estimates that they saved half of the cost of building as verses new buildings.

The reasons that this form of reuse of buildings has been so effective is the preservation of tangible and intangible resources embodied in the structure and the accessibility afforded to up grade these resources during the relocation. These are summarized below:

- Preservation of "Embodied Energy" (see below).
- Preservation of most materials.
- Preservation of the quality of the materials and Embodied Energy.
- Preservation of the value of the structure.

- Preparation before relocation provide the opportunity to identity and abate any hazards.
- Remodeling after relocation gives the ability to upgrade to current standards.
- Allows matching buildings to land use requirements.

"Embodied Energy" is a term used to describe the human effort that went into the design, testing and manufacture of a building. This is the intangible but costly difference between a pile of sticks and a building. By relocating a structure and remodeling it to current standards we save much of this embodied energy and add to it only the safety requirements and comforts that have evolved since its construction.

Most materials that are part of a relocated buildings will not be altered by the relocation and remodeling, therefore, will not be the loss of materials that occurs during deconstruction, re-sizing and preparation for reuse.

The retention of both the Embodied Energy and most materials creates a retention of the value of a structure as a building. This is a value that consumers can perceive and as such, it is a value that they compare to similar "new " buildings containing embodied energy at today's labor rates. Many people that can not visualize the value inherent in a pile of lumber can easily visualize and place a value on a complete structure.

Preparation to move the structures for Hartnell College began by removing all of the known hazards that were immediately hazardous to life and health. The preparation continued by removing anything like drywall that might conceal hazards. The remaining hazardous materials were remediated by encasement to prevent future exposure except under controlled conditions. Only after these modifications were made did the relocation begin.

After relocation the structure was placed on a foundation which meet current seismic code. The windows that were removed prior to the relocation because of LBP will be replaced with new ones meeting current framing and energy requirements. Some upgrades, i.e. plumbing and electrical can be easier than new construction if completely replaced while the building is in the raised position before lowering to the new foundation.

Building 1801 Ready for Move

SECTION 9 - BUILDING REUSE (IN-PLACE)

9.1 Regulations Governing Building Reuse in Place

Reuse of building in place will typically require extensive remodeling. Reuse will require up-grading structural element, and utilities to current code. It will also require modification to meet the specific needs of the occupant. This discussion of the requirements will be general in nature, actual requirements will be governed by the building structure, local authorities and the wishes of the new occupant.

The existing site should be reviewed to ascertain if there are conflicts between the building and any utilities that cross the site. The utilities to the site must be checked to see if they meet the demands for the intended use.

Seismic requirements will require that the structural elements from the foundation to the roof be reviewed for compliance. Structural elements will also need to be reviewed for changes that have occurred since construction or differences between military requirements and civil building codes. Similarly, the utilities within the building need to be reviewed to see if they are sufficient for the new occupants demand and meet current civilian codes.

It should be kept in mind that the presence of external landscaping, and the internal effects of previous remodels will inhibit the review for structural and utility code irregularities. They also inhibit the discovery of hidden hazardous materials.

9.2 Design Charette on Building Reuse

The Pilot Deconstruction Project under the guidance of University of California, Santa Cruz Extension and in cooperation with the Monterey chapter of the American Institute of Architects (AIA) produced a "Design Charette" to look into the possibilities of adaptive reuse of buildings at Fort Ord.

The word charette in French means cart. Today's concept of a Charette derives from students returning to Paris for class and hurriedly composing assignments in the cart as they traveled. The Design Charette was a quick conceptual look at the reuse of areas and specific buildings of Fort Ord in groups that were headed by the AIA volunteers.

Three groups were formed:

1. The first group was composed of members from the Arts Habitat, a group of artist who want to create a live-work environment for local artist. This group was looking at the adaptive in-place reuse of a group of buildings in the Marina jurisdiction.

2. The second group focused on relocation and adaptive reuse of the buildings both on and off the footprint of the former Fort Ord. Specifically they looked at two projects that are slated to begin next year. The first project was relocation of buildings from Fort Ord to Hartnell College for use as offices where teachers work within a non-traditional class room setting and students tele-commute. The second project was a conference center for the University of California's Monterey Bay Education, Science and Technology Center, located at the former Fritzsche Air Field at Fort Ord.

3. The third group worked with adaptive reuse of building materials salvaged through deconstruction. The idea here was to utilize salvaged materials that would be used during the new construction at Fort Ord during reuse and redevelopment. The group spent a majority of their time on the concerns associated with abatement of material hazards. With that accomplished several creative reuses of the materials were discussed that could produce business opportunities at the base. The group also noted how the salvaged materials would be very valuable as spare parts and materials for remodeling needed by the previous two groups.

The first two groups mentioned above worked on concepts that would mitigate any hazards present, up grade the buildings and create a distinct look and feel to the buildings through maintaining or altering the exterior of the buildings. Surprisingly, many concepts did not involve obliterating the military look of the building, but in preserving this look and using landscape and site alterations that would blend the buildings into the site.

The Design Charette lasted a full day and presentations were made by the different groups. The notes and drawings from the charette are currently being compiled and duplicated by the University of California, Santa Cruz Extension

SECTION 10 - DEMOLITION OF BUILDINGS

10.1 Regulations

Demolition regulations are essentially the same regulations that govern deconstruction. The discussion that follows is general in nature and should only be used as a guideline for those discussing demolition. Local regulations and enforcement will direct the actual requirements for a specific job site. (The Environmental Protection Agency (EPA) and the National Association of Home builders (NAHB) have provided a good discussion of the differences that affect deconstruction which is provided in Appendix 15.4, EPA/NAHB Expanded Discussion of Industry Issues.)

Assessment of the site for asbestos is required for the local Air Pollution Control Board (APCD) and OSHA if the building is over 4 units in size. Assessment for Lead Based paint is required by CAL/OSHA unless an Initial Exposure Assessment shows that employees are not going to be exposed to hazardous levels of lead. (See Section 5.4, Lead Worker Training) If exposure levels are not shown to be in the safe range then workers will need to receive Department of Health Services (DHS) training by DHS certified instructors in Lead Worker training.

The local APCD required notification at least 10 days before demolition can begin. The notification will require that a fee provides for a representative of the APCD to inspect the property prior to demolition. All asbestos containing materials that would become friable through the forces of demolition must be removed prior to demolition.

OSHA permits will be required if the building exceeds safe working height and if "Enclosed Spaces" will be encountered.

Typically permits are required from local land use jurisdiction if any structural members are being removed from a building. The permit process usually requires that a disconnect notice be provided by the local utility service for gas and electric. A disconnect notice from the phone service provided is also typically requested. The permit usually includes a fee that provides for inspection of the site after demolition is complete. Demolition is usually not considered complete until the sewer lateral and water are appropriately capped and an the site is clean and graded smooth.

The disposal of demolition materials is regulated as Hazardous and Non-Hazardous. Typically hazardous materials can not be disposed of at a local land fill and must always be shipped and tracked with a Hazardous Waste Manifest. Non-Hazardous materials may require separation for certain materials that the local land fill must handle specially during placement in the land fill. The land fill may offer special rates for disposal of recyclable materials that make separation of demolition materials cost effective.

10.2 Baseline State Parks Project

The small outbuildings associated with the firing ranges located east of Highway One at Fort Ord were demolished in preparation for reuse of this area by the California State Parks Department in late 1996 and early 1997. Because the Pilot Deconstruction Project was not funded before the contract was awarded, it could not assist with the building removal. However, the work by State Parks was used by the Pilot Deconstruction Project as a case study and baseline for the deconstruction work.

The 57 buildings removed under this contract were crushed on site, by a local contractor, utilizing a modified excavator, then loaded on trucks and taken to the contractors yard. At the contractors yard the material was separated for recycling. The wood products were crushed to produce mulch, the concrete was crushed and the metal was recycled. This process was reviewed by the Pilot Deconstruction Project's Technical Support Group and critiqued for the similarities and differences to those anticipated for the Pilot Deconstruction Project.

SECTION 11 - FINDINGS

11.1 Diversion Rate

The final diversion rate for the project can not be calculated at this time. The Pilot Deconstruction Project attempted to salvage as much material as possible without judging its reuse or resale potential. Many of the items salvaged are currently stockpiled in a warehouse while reuses for the materials are being identified.

Preliminary diversion rates can be calculated based on the items that were sent to the landfill although some of these items could have been recycled but at a substantial cost to the Pilot Deconstruction Project.

The variables preventing compilation of a true diversion rate are noted below:

- A portion of the materials in the warehouse will be reusable and a portion will not. A final material sale will be scheduled and the remaining materials will have to be landfilled when the Army terminates FORA's use of the warehouse.
- The windows, siding and other Lead Based Paint covered items have been stockpiled in the warehouse in preparation for testing removal and remediation techniques. The items that are not properly remediated will have to be land filled.
- Items that could have been recycled were not because of timing and budget constraints. For example, all of the shingles could have been recycled at Raisch Asphalt Products' plant in San Jose, but only one 20 cubic yard dumpster load was recycled there. The small volume of shingles generated did not warrant the two hour drive when the landfill was only fifteen minutes away. A larger volume deconstruction project would allow stockpiling of the shingles until there were enough collected to recycle economically.
- One second story wall on Building 2143 fell and shattered during deconstruction and all of the components were land filled. Otherwise a portion of this wall would have been available for reuse.

*Preliminary Diversion rate for Building 21: **65%**

*Preliminary diversion rate for Building 1801: **88%**
Building 1801 was prepared to relocate without removing the shingles.

*Preliminary diversion rate for Building 1807: **82%**
Example of Preliminary Diversion Rate shown below.

*Preliminary Diversion Rate for Buildings 2182 and 2184: **76%**
Buildings 2182 and 2184 were prepared to relocate by removing the shingles.

*Preliminary Diversion Rate for Building 2143: **66%**

*Preliminary Diversion Rate for Building 2252: **82%**

* This rate was derived by using the following formula: The total building weight **minus** the total building's landfill receipt weights **divided by** the total building weight **times one hundred**. The total building weight was calculated using a proprietary formula used by a practicing demolition contractor. This formula assumes that all of the building components stockpiled in the warehouse could be reused or recycled and that the shingles could not be recycled.

Example of Preliminary Diversion Rate calculation:

41.0 tons	Building 1807 total weight.
-7.2 tons	Material from Building 1807 to landfill.
33.8 tons	Diverted from the landfill.

33.8 tons diverted, divided by 41.0 tons total = .82

.82 x 100 = 82% of material diverted

11.2 Lumber Grading

The following summary is excerpted from the United States Department of Agriculture (USDA), Forest Products Laboratory report on the regrading of lumber salvaged by the Pilot Deconstruction Project. (The full report is attached to this report as Appendix 15.2)

The Fort Ord Reuse Authority has developed a cooperative research agreement with the Forest Products Laboratory (FPL) and the West Coast Lumber Inspection Bureau (WCLIB) to develop information on the grades of lumber reclaimed from deconstructed buildings at Fort Ord. Because the value of lumber is tied directly to its quality, an evaluation of the grades of lumber from these buildings will help in determining market values.

Also, from a broader perspective, there is interest in developing a technical database of the actual engineering properties of recycled lumber. Recycled lumber may have properties quite different than the lumber produced today, since current grading rules and allowable engineering properties have evolved to accommodate currently produced lumber. For this reason, a research program has been developed at the FPL to evaluate the grade characteristics and engineering properties of lumber recycled from

residential and industrial buildings. The objective of this research is to determine if these properties of recycled lumber differ significantly from the properties of currently available lumber. Evaluation of the lumber graded at Fort Ord will help develop the necessary database for these materials.

This report summarizes the results of grading performed on 1009 pieces of lumber collected from four buildings deconstructed at Fort Ord (Buildings 21, 1807, 2143, and 2252). These buildings contained wood structural elements representative of 740 excess buildings at Fort Ord.

Several sizes of lumber were collected for grading. These included 2x4 wall studs, 2x6 roof rafters, 2x8 floor joists, and 2x10 floor joists. These members had been carefully removed by FOR A during the deconstruction process.

Grading Methodology

A lumber grade, and the grading rules that stand behind it, are critical elements in the trade of lumber products. The grade assigned to a piece of lumber verifies its quality and adherence to national grading standards criteria and rules. This quality assurance allows its widespread acceptance by engineers, architects, and building officials at a building site.

The lumber selected at Fort Ord was visually assessed for structural grade by a certified WCLIB grader according to <u>Standard No. 17, Grading Rules for West Coast Lumber</u> (WCLIB, 1996). The WCLIB is one of six rules-writing agencies recognized by the American Lumber Standard Committee (ALSC. As part of its responsibilities, WCLIB publishes and maintains the <u>Standard No. 17, Grading Rules for West Coast Lumber</u> (WCLIB, 1996) as well as several other technical publications. Standard No. 17 is referenced as a recognized standard in the Uniform Building Code.

The deconstruction process performed by FOR A preserved all pieces of lumber from the deconstructed buildings. The <u>full length</u> of each piece of lumber was graded according to the above grading rules, and notes were taken as to what type of defect or lumber characteristic determined grade (e.g., knots, slope-of-grain, wane, warp, damage, etc.). For the purposes of this study, damage is defined as holes due to nails or bolts, splits due to factors other than drying, saw cuts, notches, decay, and mechanical damage (gouges, broken ends, missing sections due to splits, etc.). If a bolt hole and/or nail hole(s) were present in the piece, the grader estimated an equivalent knot size for grade determination. For those pieces with damage present, the grader made an estimate of grade assuming the damage was not present. This provided an estimate of average grade reduction due to damage.

Because pieces shorter than 6 ft. in length were not considered merchantable as structural lumber, they were not graded. Some pieces, though of adequate length, were painted, and could not be graded (paint can obscure critical defects in lumber, such as slope-of-grain and knots).

The 2x4 lumber was graded under WCLIB Standard No. 17 designation "Light Framing". This designation applies to lumber 2-4" thick and 2-4" wide. Four grades exist under this designation (listed from highest to lowest quality): Construction, Standard, Utility, and Economy. The 2x6, 2x8, and 2x10 lumber were graded under designation "Structural Joists & Planks". This designation applies to lumber 2-4" thick, 5" and wider. Four grades exist under this designation (listed from highest to lowest quality): Select Structural, No.1, No. 2, and No. 3. The grade rules and criteria for these designations and grades are listed.

11.3 Market Analysis

- Total revenue generated- approximately- $3,000 dollars from a portion of the materials salvaged from Building 21.
- 50% of local retail price for similar "virgin" products seemed reasonable to the bulk of the consumers.
- The local market was defined by the location of buyers reaching from Redwood City, encompassing Salinas and south to King City.
- The predominant uses were for agricultural needs and storage.
- The predominant reasons for buying were, superior quality of material, perceived value of material for the cost of material, environmentally sympathetic to reuse concepts, and success they had had with buying other salvaged materials in the past.
- Occupation/ education level of the buyers were predominantly college educated professionals.
- Moving the materials to a central location for storage and sale added handling cost and increased damage to the material.
- There was tremendous interest in purchasing the salvaged windows, however these items were not sold because of the Lead Based Paint.
- The contractor's bids were typically low and they cited the following reasons. Large volume, and more attention to trimming the materials to standard sizes would increase their interested in purchasing the salvaged materials. Without a grade certification for the salvaged materials contractors could not use the materials as structural components.
- Follow-up showed that all of the consumers were very happy with their purchases, that the wood was very workable, did not split and performed well in all of their uses. They would purchase more when they needed it.
- "Word of mouth" has created additional demand for the salvaged material as the initial consumers recommended the material to others.
- Salvaged plumbing fixtures, furnaces, hardware, and ceiling tiles did not appeal to this group of consumers.
- The "higher end" buyer of the salvaged flooring was very happy with the look that he attained when he laid the salvaged flooring upside down in his new Victorian style

home. He cited cleaning the tongue and groove as an important labor consideration.

The findings show that the local market around Fort Ord is roughly 75 miles in diameter. The typical small quantity consumer was well educated and environmentally concerned which lead credence to the concept that consumers could be educated in the responsible reuse of materials containing remediated hazards.

Contractors were large volume buyers who would benefit form the US Department of Agriculture, Forest Products Lab work to establish grading criteria for salvaged lumber. Contractors were attracted to uniform length bundled materials that were ready for immediate reuse.

The material was valued by High-end consumers for its look and quality and by Agricultural users by its quality and reasonable price. They were both willing to pay approximately 50% of local retail pricing for materials that still required labor before it could be reused.

11.5 Network/Website

The Pilot Deconstruction Project is successfully networking with various agencies throughout the United States. The Major ones are discussed below:

- The Project continues liaison with the US Environmental Protection Agency (EPA) Department of Economic Development. The US EPA is using the Fort Ord Pilot Deconstruction Project information to help iron out internal regulatory discrepancies and external regulatory discrepancies with the Occupational Health and Safety Administration (OSHA) and the US Department of Housing and Urban Development (HUD). The US EPA has been working jointly with FORA and the County of Monterey Department of Health to define the future of lead contaminated materials at Fort Ord.
- The Project has been working with the Monterey Bay Regional Air Pollution Control District to define the extent of information still needed to adequately assess the asbestos material at Fort Ord.
- The Project continues to outreach to other Base Closure communities in California, the US and in Central America. It has been proactive in reaching out to others to gather and share information to minimize the resources used for building removal.
- The methods of outreach have been press releases, "Request for Participation" in contractors news letters, personal phone calls and letters to other organizations. One of the tools that is becoming increasingly beneficial is the FORA Pilot Deconstruction Project Website (see Appendix 14.14). The bi-monthly updates, list of accomplishments, contacts and references to issues of concern has been very helpful to different groups.

Website
With limited resources available to all base reuse communities and deconstruction research efforts it is critical that information be shared between active and concluded efforts. The widespread membership of the Technical Support Group and the repetition of questions by the public demanded that an information distribution format be established and maintained. To this end the Fort Ord Reuse Authority (FORA) created its website.

The FORA's website<www.fora.org> added a page dedicated exclusively to the Pilot Deconstruction Project. This page has been linked to the University of California, Santa Cruz Extension's Business and Environmental Assistance Center (BEAC) and the US Environmental Protection Agency's Smart Growth Websites.

The Pilot Deconstruction Project web-page opens with a description of the project. All photographs have been pulled from the website because of the time that is required to down load. Hopefully, a change in page format will allow those viewers that want pictures the option of taking that extra time to download specific photos of interest to them.

The second section of the page is a "Milestones" section. This section was designed in a reverse chronological order. This was done so that people could quickly monitor the site for changes and new information. The Milestones were updated every two months.

Following the Milestones is a Section on the Project's Goals, Benefits, Support and Contributors. Following this short section the Pilot Deconstruction Project contacts and participants are listed. Points of contacts, addresses and phone numbers are provided so that anyone can find out more information on their involvement.

SECTION 12 - RECOMMENDATIONS

12.1 Land Use Jurisdictions/Regulatory Agencies - Direction and Guidance

The land use jurisdictions and regulatory agencies need to work together to ensure the efficient building removal process at former Fort Ord. Actively involving local enforcement agencies in the building removal process will provide guidance before the removal begins and as unknowns arise. A "summit" meeting involving legislators and regulatory officials can discuss their respective needs and prevent regulatory gaps. A strategy needs to be created by and agreement reached by the land use jurisdictions and regulatory agencies on critical points before contracts are awarded for building removal. These points include but are not limited to the following:

- Deconstruction can create more jobs and entrepreneurial opportunities than demolition. It creates entrance level jobs and training possibilities that spread economic opportunities more evenly throughout the community than demolition.
- Salvage material markets are volatile, and by producing multiple competing salvage operations on base, this will drive down salvaged material prices.
- Parcels need to be prioritized for building removal and removal needs to proceed ahead of new construction.
- By requiring the use of salvaged materials in the design and construction of new buildings a large local market for salvaged materials can be created, which will help keep salvaged material price up.
- Sharing of permit information and single source collection of fees can save the jurisdictions and agencies staff time and money.

12.2 Setting Parameters

Cost savings can be realized if the following parameters become part of the building removal strategy :

- The network that the Pilot Deconstruction Project has begun with other bases needs to be strengthened so that the communities of Monterey Bay can extend their resources.
- The reuse of buildings and materials from former Fort Ord must be looked at for their quality. The market data and lumber grading data points to the best reuse of the salvaged materials in "higher end" or "mid-range" products. This contradicts the idea that this material would best be used in low income housing.
- Materials should not be allowed to leave the base without remediation.
- Screening buildings for end-use will determine that compatible remediation procedures are used.

- A standard assessment format should be developed and used to determine whether an individual building or its components are most profitable if reused in place, relocated, deconstructed, or demolished.

12.3 Insurance

General Liability Insurance will be required from contractors. Those contractors with employees will need to provide Workers Compensation Insurance. Contractors that have no employees should be required to supply proof of Health Insurance.

There will need to be bonds provided to ensure that building removal is completed. Contractors will need to provide bonds or other forms of surety to ensure that sub-contractors and employees are paid.

Liens and Lien releases will have to be filed by contractors and land owners respectively.

12.4 Permitting

Creating a one-stop permit for Demolition (Deconstruction is considered demolition for permit purposes) can save contractors time and save the land use jurisdictions indirect costs. This is especially true if the land use jurisdictions are acting as developers for any portion of the former Fort Ord.

A one-stop permit should address the following for individual buildings:

- Contractors hold valid demolition licenses in the state for deconstruction or relocation.
- Contractors have Liability and Workers Compensation Insurance.
- Provisions are made for site security and pedestrian protection.
- Electricity, gas and phone have been properly disconnected.
- Water and sewer will be properly disconnected and capped.
- Pre-payment is secured for final inspection services.
- Proper environmental assessments have been performed and properly distributed.
- All inspection and notification fees are collected and distributed.
- Properly trained and certified entities will perform hazard remediations.

A demolition permit can contain a waiting period before new construction can begin that would guarantee there is time for salvage. The waiting period should vary with the size of the building.

12.5 Environmental Assessment

The existing information on the hazards in the buildings at former Fort Ord is inadequate. The existing information needs to be updated and active dialog needs to begin with regulatory agencies. (i.e. Monterey Bay Unified Air Pollution Control District (MBUAPCD).) MBUAPCD is concerned with the lack of information available on the asbestos containing materials incorporated into the buildings at the former Fort Ord. The Army currently plans to transfer the buildings to the local land use jurisdictions with the asbestos containing materials in place. The existing asbestos surveys have been found to be inaccurate concerning location, quantity and condition of the existing asbestos. The close relationship that FORA has developed with MBUAPCD through the Pilot Deconstruction Project has aided both entities. MBUAPCD has proposed that joint FORA/MBUAPCD discussions begin on a program for standard supplemental testing procedures which will result in a reduction of MBUAPCD inspection fees. (See Section 13, Next Steps)

12.6 Asbestos Abatement

Asbestos abatement should occur for every building that is being relocated, deconstructed or demolished.

If applicable and implemented far enough in advance, the following opportunity might save the jurisdictions considerable funds. There is a 12 hour training course that would train and certify deconstruction workers to remove non-friable Asbestos Containing Materials. This option should be investigated and a cost analysis conducted. (See Appendix 14.4 EPA/NAHB Expanded Discussion of Industry Issues)

12.7 Lead Abatement

All buildings should have the Lead Based Paint abated before they leave former Fort Ord. The end-use of each structure should be scrutinized for contact with children. The remediation program chosen for each building should be able to safely mitigate those elements that might reasonably be contacted by children. Architectural Components should also be remediated and scrutinized by end-use for possible contact with children. (See Section 13, Next Steps)

12.8 Labor Force

Lead Awareness Training and blood lead level testing will be required for all building removal workers. The Pilot Deconstruction Project's Initial Exposure Assessment is

considered valid historic data that will cover the California Occupational Heath and Safety Administrations requirements for documentation. This data is only good for the specific task tested. Some task will require that a portion of the work force receive Lead Worker Training.

12.9 Wages

The Pilot Deconstruction Project has not found a standard wage determination for deconstruction workers, therefore, this allows the possibility of determining a wage rate based upon what the value derived from the salvaged materials. If the resources available through deconstruction are managed well then the wage paid for this can and should be adjusted upward. Deconstruction is labor intensive, the quality of material salvaged is dependent on skill, patience and hard work. These are values that deserve to be rewarded as highly as possible. The money paid into these positions will be distributed back into the community if local labor is employed.

12.10 Training

The information that the Pilot Deconstruction Project has obtained is a valuable commodity to other bases. These bases can save considerably by utilizing the knowledge FORA has acquired. Training packages can be offered by the Pilot Deconstruction Project that pass this information on to other bases.

The primary objective of collecting the video footage of deconstruction techniques is to create a series of videos correlated with a deconstruction curriculum. This curriculum could be implemented at former Fort Ord as a class for personnel, other Base Reuse Communities and could be added to a university curriculum. (See Section 13, Next Steps)

12.11 Choosing to Deconstruct, Relocate, Reuse or Demolish

A standard decision tree can be constructed that would assess the buildings best potential end-use. The decision tree would be based on solid building reuse concepts. The hierarchy of these concepts is: (1) a building retains most of its value from "in place reuse", (2) a building retains a large portion of its value if it is reused whole and relocated, (3) a building's materials retain their maximum value if they are carefully salvaged for reuse, (4) a building's materials retain minimum value if recycled, and (5) that a building's materials are a liability if they are landfilled.

This evaluation would begin by collecting information about the building to determine if it is suitable for in place reuse which is the best use according to the hierarchy listed above. The evaluation would ask questions similar to those listed below:

- Is the building compatible with the surrounding uses and intended reuses?
- What rework would be required to make it fit its intended reuse?
- Is it conflicting with the existing or proposed utilities on site?
- Is the building structurally sound?
- Would long term temporary in place reuse be acceptable?

If the answers to these questions were acceptable then it would be a candidate for "in place reuse". If there was an unacceptable answer to one or more of the questions above the evaluation should continue in respect to relocating the building. The questions would proceed to determine if the building was suitable for relocation, if not, then the evaluation criteria would be put forth to determine if the building had salvage potential. The process would continue until it was determined that the building would be the least liability if demolished and land filled.

12.12 Building Surveys

A survey can be conducted of all the redundant buildings and their best end-use determined so that property marketing can benefit from this information. This will allow prioritizing of buildings for removal on parcels that had previously been prioritized for clearing, thus focusing the limited resources that jurisdictions have where they are needed most. This will also assist in mitigating the time difference between that of deconstruction and demolition or allow a hybrid to emerge that utilizes both deconstruction and demolition techniques.

12.13 Pre-Deconstruction Building Material Assessment

Pre-Deconstruction Building Assessments should be done on the building types that were not investigated under the Pilot Deconstruction Project. Determining the value of materials that can be expected to be salvaged from a building is conducted with a Pre-Deconstruction Building Assessment. This assessment finds, quantifies and qualifies the materials in a structure before deconstruction begins. This allows pre-marketing of valuable and specialty items. The Pilot Deconstruction Project had assessed the materials in four buildings that represent approximately 75% of the buildings on base. The remaining 25% will also need to be assessed.

12.14 Site Issues

Systems will have to implemented that track materials on the site and when they are removed from the site. As large scale deconstruction progresses, materials can be bundled large enough to prevent casual removal. With sufficient supply a material distributor can implement "milk runs" for materials so that the do not accumulate on site. Limiting access to the site will help to curb both theft problems and liability.

Segregating Materials and Site Layout
Immediate and continued segregation of materials speeds up the deconstruction process. Deconstruction crews can benefit from knowing the most marketable form for salvaged materials. The deconstruction processing and material flow through the site should minimize handling materials and be under constant refinement to produce what the market wants.

12.15 Materials Sales and Market

The buildings at Fort Ord are predominantly of good quality Douglas Fir and marketing should reflect this. The lumber components are being tested by the US Department of Agriculture for strength characteristics, which when complete, will open new marketing opportunities for this material.

The largest future market for building materials in the Monterey Bay will be new construction at former Fort Ord. The reuse of salvaged materials into its new construction will minimize the cost associated with transportation and market development. Some of the existing warehouse type buildings and paved yard space can be used as storage facilities until the materials are needed.

The land use jurisdictions can create a market for salvaged materials when they specify a percentage of these materials be reused in new construction. It would be ideal if the jurisdictions produce an environment that uses local labor, eliminates excessive competition, and minimizes transportation and storage cost from salvage to new construction. More materials could be salvaged at lower cost. To do this would require a commitment to reuse salvaged materials at a level that would incorporate all of the economically salvageable materials into the new construction. The emphasis here is on economically salvageable with the hope that if salvaged material cost are equal to new material cost then a commitment can be made to choose a salvaged material of equal quality.

Recommending or requiring that percentages of salvaged materials are reused in new construction needs to be clearly defined. If dismantling results in wood, structural steel, and concrete being recovered then reuse percentages must be set for each of these materials. Reuse percentages must not create a demand that out paces the rate of building removal. There must be a way to regulate both the rate of removal and the percentage of material

required so that as economic factors change the supply and the market will not diverge. Utilizing storage facilities and prioritizing development parcels can act as a buffer in this process.

Material sales and marketing efforts can continue throughout the building removal process. Efforts to find a safe economical way to free the siding from its Lead Based Paint will increase the market opportunities and value of the buildings. (See Section 13, Next Steps)

The local market appears uninterested in the plumbing fixtures, furnaces and hardware. Other markets will have to be found for these materials.

Large volume building removal will provide sufficient quantities for local recycling efforts to include recyclables like shingles into their current recycling processes. Currently there is not enough demand for this type of recycling service in the Monterey Bay area.

12.16 Panelized Deconstruction

Panelized deconstruction offers some interesting benefits. These benefits are listed below:

- Rapid Deconstruction
- Ease of transportation with standard trucking equipment.
- Rapid reconstruction structures.
- Ability to arrange standard panels in multiple configurations.
- Ability to remediate hazards during deconstruction.
- Ability to up-grade structures during the reconstruction process.

This option should be given further investigation. (See Appendix 14.13 - Interview with Mr. Cederwal)

12.17 Relocation

During the redevelopment of Fort Ord, road corridors for moving buildings can be identified and prepared for moving buildings by eliminating conflicts with overhead wires and other obstacles. These corridors will facilitate rapid relocation of structures within the former Fort Ord boundaries. Areas on the former Fort Ord, with existing infrastructure and extremely inferior buildings could be upgraded with remodeled buildings relocated from other parts of the base.

The existing facilities on the former Fort Ord are appropriate for use as staging areas where buildings can be temporarily relocated and remodeled while waiting for their new

location. The buildings suitable for relocation are constructed of high quality materials and should be thought of as marketable for high-end uses.

12.18 Building Reuse

The Pilot Deconstruction Project Design Charette reveled that, surprising, that many do not want to remove the regimented military look and placement of some of the buildings at Fort Ord. Instead they opted for re-grading the sites and landscaping to make the sites and buildings work together. In some areas, even if temporary, this would create a marketable or rentable property with minimal work.

The remodel of the former Red Cross building complex was complicated when a sewer main was found running under one of the buildings. This example points toward the possibility of more buildings conflicting with utilities on site which can prevent reuse in place.

12.19 Demolition

Deconstruction has many advantages for the community as a whole, but some structures will be to run down and of such low quality that demolition will be the best solution to building removal. The heavy equipment used in demolition can be a real cost saver if used to clean up after selective deconstruction is performed. Demolition and its techniques should be worked into a deconstruction program at Fort Ord. Remediation cost and procedures for lead and asbestos will be similar for demolition and deconstruction.

SECTION 13 - NEXT STEPS

13.1 Producing a Detailed Base Wide Inventory

A Fort Ord base wide inventory of salvageable materials needs to be produced in the near future. This will enable contractors, and material brokers to realistically see the total salvage potential. It will present to the communities around Fort Ord a resource and an economic tool in the reuse efforts so that they can see the benefits in preparing for salvage.

Seventy five percent of the buildings are represented by the buildings deconstructed in the Pilot Deconstruction Project. The remaining 25% will need to be surveyed by compiling a Pre-Deconstruction Building Assessment on representative buildings.

13.2 Developing an RFQ/RFP for Deconstruction

A basewide inventory combined with this report will be used as the background material in a Request For Qualifications (RFQ) for contractors in the deconstruction and demolition fields. A panel is proposed to review the RFQ that would include Fort Ord Reuse Authority ,regulatory and land use jurisdictions.

A Request for Proposal will follow the RFQ incorporating the lessons of the Pilot Deconstruction Project with the practical suggestions offered by the responding contractors, regulatory agencies and jurisdictions.

13.3 Strengthening the Network

As the information developed by the Pilot Deconstruction Project will continue to be of use to other closed and active bases as they redevelop or maintain their facilities. FORA has learned a great deal from other bases that have building removal programs. These contacts have created a fragile network that needs to be strengthened so that the Monterey Bay communities can continue to be included in the discovery of solutions and cost saving measures by others.

13.4 Test Site for Lead Based Paint Removal

The Pilot Deconstruction Project has identified the remediation of the lead based paint (LBP) on building siding as an important consideration in building reuse, in addition it has identified LBP removal as critical to the reuse of siding salvaged during deconstruction. To address this the following program is proposed.

Purpose:
To identify, field test and evaluate the efficacy, safety and economics of competing technologies for the removal of Lead Based Paint (LBP) from the wood building siding at former Fort Ord.

What's Driving the Demand for a LBP Remediation Test Site:
1. LBP Removal is a national problem for the Deconstruction and Waste Disposal Industries.
2. The Pilot Deconstruction Project research has found that if the LBP can be removed the resulting siding would have an approximate wholesale market value of $4,000 per 1000 Board Feet.
3. The current siding found has been Clear, Douglas Fir of a grade that that is practically non-existent in today's lumber market.
4. There appears to be a good market for the siding as siding or re-manufactured into high value items such as decorative trim. Another high value market needing this type of materiel is the "Engineered Wood" market that needs well aged dimensionally stable, high quality wood.
5. New techniques for recycling the removed LBP for reuse as lead exist. Recycling of LBP materials eliminates the long term liability that currently exists with disposal.

Current FORA Resources:
1. The Pilot Deconstruction Project has data on cost and methods to remove, sort and prepare siding for remediation.
2. A significant stock pile of siding is available from the deconstruction of five buildings.
3. The Pilot Deconstruction Project has developed contacts in the Wood Industry, Salvaged Material Industry, and Lead Recycling Industry.
4. Pilot Deconstruction Project personnel are trained and certified to work with the LBP covered siding and residual LBP materials.
5. An enclosed facility compatible with most of the needs of the Remediation Test Site is available at Fort Ord.

Additional Pieces Needed to Develop a LBP Remediation Test Site:
1. Upgrades to the existing enclosed facility to function as a remediation test site.
2. Preliminary testing of techniques by technology/ product suppliers.
3. Agreement for prototype testing on one to three of the methods that look most encouraging.
4. Develop standard protocol to insure that the resulting process will not be a hazard to the public or the environment.

13.5 Updating Hazards Survey

The following Fort Ord Reuse Authority inter-office memo describes the what is know to be missing from the Army's existing hazardous materials surveys for the buildings at Fort Ord. The proposed program addressing these discrepancies follows the memo.

MEMO: *July 31, 1997*

Subject: ***Discrepancies in the existing Fort Ord asbestos surveys.***
To: Michael Houlemard, Executive Officer.
From: Stan Cook, Pilot Deconstruction Project Coordinator.

Michael, a recent occurrence in the Pilot Deconstruction Project has highlighted discrepancies in the existing asbestos reports. These discrepancies are important to the future owners of the buildings at Fort Ord. My discussions with Mr. Mike Sheehan of the Monterey Bay Unified Air Pollution Control District and our correspondence will illustrate this concern. This is summarized below and the letters are attached.

The existing asbestos reports appear to have been created for "in place" management of asbestos materials. Typically only materials of immediate danger to life and health or costly to maintain are of concern for in place management. Although these reports are very good, they fail to adequately identify the amount and type of asbestos in the buildings.

Omission of Asbestos Containing Materials has occurred because of:

- *Restricted entry to survey. This could have been for security reasons or simply because objects were in the way.*
- *Sampling appears to have been "non-destructive" in nature. Destructive testing that would reveal hidden older materials was not performed. This is fine for in place management . Conversely, massive renovation or demolition will expose older materials previously "sandwiched" safely away from the public.*
- *Remodeling. One out of four of the Pilot Deconstruction Project buildings has had the interior floor plan altered after the survey. The ban on producing Asbestos Containing materials occurred in 1978, but stockpiled materials may take years before they are used.*

The surveys inadvertently miss identifying many Asbestos Containing Materials because of:

- *Aging of Asbestos Containing Materials. Materials that were surveyed as "non-friable" in the early 90's are becoming "friable" as they age. Non-friable asbestos materials can typically be disposed of at the Marina landfill as a non-hazardous waste. These materials are only minimally regulated during removal and transport. On the other hand friable materials are carefully regulated and must*

be disposed of at a special hazardous waste landfill. Aging of these materials is an almost imperceptible but important factor which is geometric in its progression.

The MBUAPCD is interested in continuing discussions with FORA and ways to minimize the cost to determine the exact nature of all asbestos at Fort Ord. I am available if you have further questions.

Purpose:
Obtain the minimal required Hazardous Material information needed before the buildings at Fort Ord can be Remodeled, Relocated, Deconstructed or Demolished.

What's Driving the Demand for a Fort Ord Building Hazards Update:

1. Conveyance of former Fort Ord land is imminent and many of the buildings will need to be removed for redevelopment to begin .
2. Pilot Deconstruction Project and MBUAPCD have found that the existing Asbestos Surveys are inadequate for any upcoming uses for the buildings at Fort Ord.
3. Accurate surveys will be required for private industry to bid on needed remediation both accurately and for cost control.
4. Pilot Deconstruction Project and MBUAPCD findings that the existing Asbestos Surveys can be easily updated with systematic review, supplemental destructive testing, and review for changes in conditions.
5. MBUAPCD is concerned about this issue and is working with FORA to develop standardized update procedures that can be performed by FORA or third parties.
6. The anticipation that this will save FORA and the communities that receive the land inspection fees and MBUAPCD inspection staff time while insuring that proper documentation and procedures are adhered to.

Resources FORA has at hand:

1. FORA, through the Pilot Deconstruction Project, has a technical advisory committee, an excellent working relationship with MBUAPCD, remediation contractors (asbestos, lead and hazardous materials) and the support of a certified Industrial Hygienist.
2. Pilot Deconstruction Project Data documenting differences existing between field conditions found during deconstruction and conditions described in the existing Asbestos Reports.
3. Existing Army Asbestos and Lead Surveys containing vital background and test data that can be used as baselines for updating information.
4. MBUAPCD experience with the building conditions and hazards at Fort Ord.
5. Trained Pilot Deconstruction Project personnel.
6. Documentation of asbestos and lead hazards in the (raw) Pilot Deconstruction Project video footage.
7. A working relationship with and access to UCSC Extension Hazardous Materials and Hazardous Waste training.

The Missing Pieces Required to Update Building Hazards at Fort Ord:
1. Invasive/ destructive testing of all buildings to be removed from Fort Ord.
2. Standardized methodology for performing testing and documentation necessary.
3. Phased plan that assures timely testing and removal of building hazards to support new development associated with the reuse of Fort Ord.

13.6 Training for Deconstruction Jobs

The lessons of the Pilot Deconstruction Project will be of value to other base reuse communities and should be presented in an organized fashion. To this end FORA and the University of California, Santa Cruz Extension is proposing that a class curriculum be designed here at Fort Ord and offered to interested parties.

Purpose: Apply Fort Ord Pilot Deconstruction Project information and experiences with Fort Ord buildings for training others on methodology. Using the Fort Ord Class Materials and "Hands-on" Learning to train local personnel from other military installations or non-military decommissioned or surplused properties on:
1. Cost analysis/ market development
2. Deconstruction Techniques/ Safety
3. Salvaged material handling
4. Ability to train their own local deconstruction crews.

What's Driving the Demand for a Training Manual:
1. Currently many decommissioned bases and surplused facilities exist across the USA and around the world.
2. US service branches are under a Facilities Reduction Directive.
3. US bases are being directed to significantly reduce their waste stream.
4. HUD has many buildings across the USA needing removal.
5. The Fort Ord buildings typify a large segment of the buildings needing removal.

Resources FORA has at Hand:
1. Approximately 10 hours of raw video footage of actual deconstruction of Fort Ord buildings.
2. Health and Hazardous material data for deconstruction techniques of buildings at Fort Ord.
3. Core group of trained local contractors with local personnel.
4. Building stock to deconstruct.
5. Documented deconstruction experience.
6. Time motion study of deconstruction techniques.
7. A partnership relationship with UCSC Extension providing access to infrastructure and personnel to support instruction in necessary hazmat and safety instruction.

The Missing Pieces Required to Produce a Training Package:

1. Creation of a Manual compiled from existing and developing data, common practices, known technology.
2. Creation of a series of coordinated class length videos compiled from existing footage.
3. A curriculum or curriculums connecting the manual, videos, field experience, and course work together to produce a short comprehensive training program.
4. Out reach to potential participants
5. Cooperative participation from other bases to provide enough personnel for an initial class.
6. Distribution of Manuals and Videos.

13.7 Expanding Relocation Options

Structure relocation to Hartnell College has proven to be cost effective. The relocation process has been filled with delays and restrictions that are surmountable but still need to be reduced. The Fort Ord Reuse Authority will continue to work with the US Army, regulatory agencies and jurisdictions to expand and streamline the possibilities of structure relocation both on and off of the former Fort Ord.

Fort Ord Reuse Authority
Pilot Deconstruction Project

Final Report
December 1997

Appendices

Item	Percent
Oversight	
Project Coordinator	28%
Office Support	4%
Technical Support Group	0%
Sub-Total	32%
Preparation	
Training	
Lead training	2%
Participants pay in lead class	1%
Safety Training	1%
Participants pay in safety class	1%
Equipment/Supplies	
Lead Supplies	1.5%
Generator	0.9%
misc. Supplies	2.7%
Health monitoring	
Blood Lead levels	0.5%
Personnel air monitoring	0.6%
Environmental testing	
soil sampling	0.1%
asbestos sampling	0.1%
Asbestos Abatement	
asbestos abatement	5.3%
Sub-Total	16.4%
Field Work	
Deconstruction 21, 1807, 2143, 2252 & 7954	
Labor	28.4%
dump fees and trucking	3.6%
Structure Relocation 1801, 2182 & 2184	
Labor in preparation for move	4.3%
Moving cost	3.8%
encapsulation	2.3%
dump fees and trucking	0.9%
Material Sale	
Labor	0.3%
supplies	0.2%
Sub-Total	43.6%
Documentation	
Video/ Photo	7.1%
CRRA Tour and round table	0.7%
Design Charette	0.0%
Sub-Total	7.8%
Total $200,000	**100.0%**

Participants in the Pilot Deconstruction Project

A & S Metals*
Fresno House Movers*
T.A. Ledesma Builders*
UCSC Extension, Business Environmental Assistance Center (BEAC)*
Forensic Analytical
ATC Environmental
Central Coast Recycling
Market Development Zone
Global Encasement
Congleton Architect, AIA
Hayward Lumber
Builders Exchange of Monterey
Peninsula Incorporated
Monterey Regional Waste management District
Tri County Minority Business Association
City of Marina
City of Seaside
Economic Development Corporation of Monterey County, Inc.
US EPA
Jobs Through Recycling/Solid Waste
Monterey Bay Unified Air Pollution Control District
County of Monterey Dept. of Health
Tri County Construction Industry Group
Wood Resource Efficiency Network
Granite Construction Company

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APPENDIX A: Expanded Discussion of Industry Issues

Environmental Site Assessment

ASTM Standards E 1527--Phase I Environmental Site Assessment Process--and E 1528--Practice for Transaction Screen Process--were developed to satisfy a requirement for innocent landowner defense for commercial real estate under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the federal legislation for "Superfund" sites. The two practices have become industry standards to evaluate environmental hazards on commercial property and to help protect property owners from liability under the Superfund legislation. Although both lead-based paint and asbestos are listed by the standard as "non-scope considerations", these materials are, in practice, an important part of environmental assessments for properties slated for site clearance. ASTM offers the publications for sale as well as training seminars on a regular basis across the country. Contact ASTM publications at (610) 832-9585.

Asbestos

Identification

There is no definitive way to determine the presence or absence of asbestos in the field. While experienced abatement contractors often have a good sense of which building components are suspect, identification and asbestos content can only be accomplished using polarized light microscopy and quantification of asbestos content must be done by certified laboratories following exacting standard procedures.

EPA

According to EPA rules [40 CFR §61.140 through §61.157, entitled subpart M: National Emission Standard for Asbestos], the removal and disposal of all *friable*[7] ACM must be accomplished prior to any building removal work. The techniques and equipment required for abating friable asbestos (full-mask respirators, negative air pressure systems) mean that only licensed, professional abatement firms handle these materials. EPA rules identify two other types of ACM: category I non-friable (materials like asphalt roofing shingles and floor tiles) and category II non-friable (materials such as asbestos siding shingles and transite board). Category I ACM need only be removed prior to building removal if the material's condition is such that the material has *become* friable. Category II ACM need only be removed if the material is *likely to become* friable during the building removal process.

For more information on handling and disposing of ACM, you can order your own free copy of *Guidance for Controlling Asbestos-Containing Materials in Buildings* (Publication No. EPA 560/5-85-024) by calling (800) 424-9065, or (202) 554-1404 in the greater Washington, DC area.

[7] Friable is defined in the regulations as the capability, when dry, to be crumbled, pulverized, or reduced to a

OSHA

According to OSHA rules [29 CFR §1926.1101, "Occupational Exposure to Asbestos; Final Rule"], handling *any* ACM without asbestos abatement techniques and equipment is based on a permissible exposure limit (PEL) of no more than a 8-hour, time-weighted average (TWA) of 0.1 fiber per cubic centimeter or an excursion limit of 1.0 fiber per cubic centimeter in a sampling period of thirty minutes. Exposure to workers above this limit requires asbestos abatement measures (including full respirators, negative pressure systems, etc.). Typically the measurement of these exposures is handled by an industrial hygienist obtaining filter samples from workers wearing powered air supplies and respirators. Call OSHA's publication office at (202) 219-4667 for their free publication entitled, *Asbestos in Construction* (OSHA 3096).

Other Information

In response to the OSHA ruling on handling asbestos, two industry groups--the Resilient Floor Covering Institute (RFCI) and the National Roofing Contractors Association (NRCA)--worked with OSHA to develop acceptable work practices for handling non-friable ACM flooring and roofing shingles without asbestos abatement measures.

The RFCI work practices involve 12 hours of training for a supervisor, 8 hours of training for workers, record-keeping, wetting techniques, etc. (The rationale for the work practices is substantial independent testing of floor tile removal that demonstrated worker exposures always below the PEL). Any "intact" (flooring with any potential asbestos fibers still bound to the flooring matrix) floor tiles or sheet flooring can be removed by the trained workers without asbestos abatement procedures (respirators, negative pressure enclosures, etc.).

The NRCA recommendations involve removal of shingles with hand tools, lowering of roofing materials off the roof, consideration of wetting, etc. For more information or to obtain copies of industry recommendations for handling these category I ACM, contact the following:

Resilient Floor Covering Institute
966 Hungerford Dr., Suite 12B
Rockville, MD 20850
Ph: 301 340 7283
Fx: 301 340 7283

National Roofing Contractors Association
O'Hare Int. Ctr, 10255 Higgins Rd., Suite 600
Rosemont, IL 60018-5607
Ph: 800 323 9545
Fx: 847 299 1183

Disposal of friable asbestos is the responsibility of the licensed abatement contractor. The disposal of non-friable ACMs such as roofing shingles and resilient floor coverings is not regulated at the federal level. In most cases, these materials can be disposed of in a construction and demolition (C&D) or municipal solid waste (MSW) landfill, but check local landfill policies beforehand.

Lead

Identification

There are several different tests for lead-based paint--understanding the nature and reason for each test is important in understanding how to handle LBP.

1. LBP Test Sticks - The general *presence or absence* of lead can easily be determined in the field using paint sticks (the stick or "crayon" or swab is part of a rhodizonate spot test kit). The stick must come in direct contact with each layer of paint being tested. These test kits are

relatively inexpensive (less than $20), are readily available, and can be used by anyone. This test should only be used as an initial determination of the magnitude of the LBP problem on a project--positive results suggest more detailed analysis and negative results from test sticks are not accepted by regulatory agencies as conclusive evidence of the absence of lead.

2. X-ray Fluorescence (XRF) and Atomic Absorption Spectroscopy (AAS) - Determination of the *concentration of lead in paint or coatings* can be accomplished in the field by XRF equipment--milligrams per square centimeter--or in a laboratory by AAS--% by weight. These tests must be performed with highly trained technicians with equipment ranging in cost from $4,000 to $40,000. These tests have limited utility for the building removal industry (see discussion following number 4) and are most useful for large HUD or other rehabilitation projects.

3. Toxicity Characteristic Leaching Procedure (TCLP) - Determination of the *lead leaching potential in mixed debris* is accomplished by a TCLP. A TCLP must be conducted according to standard procedures with the sample sent to a certified laboratory for analysis. TCLP tests cost approximately $50 or less. A TCLP test determines whether or not a load of demolition debris must be handled as hazardous waste (5 parts per million or greater).

4. Air Monitoring of Workers - The determination of *lead concentration in the air* is done by collecting respiratory filter samples over a specific time period that are subsequently analyzed by a lab--micrograms per cubic meter. Usually, an industrial hygienist collects the samples and sends the samples out for laboratory analysis. Air sampling and testing can cost several hundred dollars. This test is required by OSHA to forego extensive worker protection practices for specific demolition activities such as plaster removal.

There is considerable discussion regarding the relationships between XRF (field test) and AAS (lab test) determinations of lead concentration, between XRF/AAS (concentrations of lead on surfaces) and TCLP determinations (concentrations of lead in mixed debris), and between XRF/AAS (surface concentration tests) and air sampling determinations (concentration of lead in air in work settings).

1. Uncertainties in XRF field determinations can require verification by AAS analysis.
2. No study has ever established a statistically satisfactory relationship between XRF/AAS and TCLP results.
3. The number of variables affecting the relationship between XRF/AAS and air sampling results lead to little if any relationship between concentrations of lead in materials and lead in the air during demolition or deconstruction activities.

The final result of all these uncertainties is that the best information most likely to be available on lead-based paint in a building--XRF or AAS test results--will provide little help and certainly no conclusive evidence that can be used in complying with EPA disposal regulations and OSHA worker protection requirements.

EPA

EPA rules on the disposal of LBP building materials [40 CFR §2612.24] require that the material be handled as hazardous if a Toxicity Characteristic Leaching Procedure (TCLP) reads more than 5 parts per million in lead. The TCLP is a test performed by certified laboratories. Building demolition debris--mixed plaster, masonry, roofing shingles, and LBP wood--generally passes the TCLP and so little demolition debris is, from a disposal perspective, handled as hazardous. Any time building components with significant lead levels (1.0 mg/cm^2 or greater) are segregated for disposal, a TCLP test should be considered.

Although unlikely to result in a failed TCLP, it is possible that salvage of building materials could change the overall concentration of lead in the fraction of the building destined for the landfill. The important points here are that you may not intentionally dilute your disposal mix to pass a TCLP but you are also not required to intentionally segregate LBP building materials. Recent research suggests that the long term leaching characteristics of LBP materials are such that disposal of these materials in either a C&D or a MSW landfill is appropriate. EPA is developing a proposal for disposal and management of LBP debris--it is expected to be published by late 1997.

OSHA

All of OSHA rules pertaining to LBP materials are based on exposure levels--the concentration of lead in the air. There is an action level (AL)--30$\mu g/m^3$ for an 8-hour time-weighted average--and a permissible exposure limit (PEL)--50 $\mu g/m^3$. The action level triggers compliance measures--respirators, protective work clothing, change areas, hand washing facilities, biological monitoring (blood level checks), and training. The PEL sets an absolute level of exposure for an 8-hour work day. It is the responsibility of the employer to observe the compliance measures if workers are conducting activities at or beyond the AL. Research data or data from other work projects can be used to demonstrate that specific activities and or materials do not lead to conditions at or beyond the action level--EXCEPT for specific activities identified by OSHA as an activity that is assumed to involve exposure levels at or above the AL. One of the activities so cited is manual demolition.

For more information on the OSHA lead rules, contact the OSHA Publications Office at (202) 219-4667 for a free copy of *Lead in Construction* (OSHA 3142). Another good reference is *What Remodelers Need to Know and Do About Lead: A Guide for Residential and Commercial Remodelers and Painters*, NAHB, 1993--call (202) 822-0299 to purchase a copy.

Other Information

XRF and AAS test results will be of little help in determining how you should handle LBP materials to meet EPA disposal requirements or OSHA worker protection requirements. Work with your local inspectors ahead of time so that you know before you start a project what they will and will not permit on the job site.

If LBP building materials are to be reused, steps must be taken to minimize lead hazards. The painted surface may be stripped using stripping solutions, recoated with non-LBP, or coated with some other protective coating. It the LBP building material is to be used for energy recovery, it may only be burned in combustors operated in compliance with Clean Air Act requirements. The use of LBP building material as mulch or ground cover is not appropriate since it may result in exposure to lead through inhalation or ingestion.

Workers Compensation Insurance

Workers compensation insurance is legislated at the state level. Thirty-two states subscribe to the National Council on Compensation Insurance (NCCI) which can be designated by the state to administer the insurance program. There is ample evidence in the construction and demolition industries of how widely workers compensation premiums can range based on the experience and diligence of the agent and insurance company you choose. It pays to understand how the worker compensation program works in your state and shop around for coverage.

For more information on how worker compensation premiums, actuarial rates, and classification codes work to determine your worker insurance costs, contact NCCI at 1 (800) 622-4123.

Appendix 14.5

X-Ray Fluorescence Test Results

Lead Based Paint Work Environment
Field Test Results

LEAD PAINT SURVEY DATA 4-9-97

XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE: FORT ORD - BLDG [illegible]					
DATE:	CALIB.:	CALIB. CHECK(NIST III. 1.02. 15 SEC.) A3:			TIME:

Room Equivalent	Component	Substrate	Color	XRF Result (mg/cm2)	Condition
EXTERIOR	WALL BY DOOR		YELLOW	12.22	
	DOOR CASING		WHITE	-.06	
	EAST WALL		Y	1.53	
	NORTH WALL / PORCH		Y	12.39	
	NORTH WALL		Y	12.32	
	WEST WALL		Y	(see below, 12.30)	
	PORCH FRAME / CORNER		W	12.14 / 16.93	
	EAST WINDOW FRAME		W	0.03 / 9.77 / -.11	
	" " LOWER [illegible]		Y	13.28	
	EAST WALL SKIRT		BROWN	4.25	
	EAST / NW CORNER		Y	13.32 / 14.06	
	NORTH WALL SKIRT		B	27.73	
	NORTH DECK		B	2.45	
	NORTH DOOR FRAME		W	13.17 14.87	
	NORTH DOOR		B	13.34	
	N. WINDOW FRAME [illegible]		W	13.34	
	" " LOWER		Y	13.43	
	N. WALL SKIRT		B	26.37	
	N. WALL [illegible]		Y	15.43	
	N. WALL WINDOW FRAME		W	5.45	
	" " LOWER		Y	9.95	
	NW CORNER		Y	16.02	
	W. WINDOW FRAME		W	0.02	
	" SILL		W	3.79	
	" LOWER		Y	12.70	
	W. WALL		Y	12.30	
	SW CORNER		Y	3.56	
	S WINDOW FRAME		W	0.02	
	" " SILL		W	13.30	
	" " LOWER		[illegible]	16.27	
	S WALL		[illegible]	14.31	
	S SKIRT		B	2.65	
	SE CORNER		W	6.10	
	PORCH POST		W	0.57 / 0.63	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				

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FRONT DOOR	B	-0.12
" " FRAME	B	-0.02

XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE:	FORT DEL. BLDG 21				
DATE:	CALL. :	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:

Room Equivalent	Component	Substrate	Color	XRF Result (mg/cm2)	Condition
INTERIOR	DOOR CASING FRONT		B	0.21	
FRONT ROOM	LOWER WALL E	WOOD	W	5.44	
	UPPER WALL E	ACOUSTIC	W	0.31	
	COAT RACK	WOOD	B	0.38	
	LOWER WALL S	WD	W	4.62	
	UPPER WALL	AT	W	0.25	
	WINDOW FRAME	WD	BLUE	0.35	
	" SILL		BLUE	2.20	
	W. WALL LOWER W	W	W	5.04	
	W. " UPPER	AT	W	0.20	
	N. WALL LOWER N	WD	W	3.79	
	" UPPER	AT	W	0.17	
	N. LO. ALCOVE FRAME	WD	B.	0.67 / 0.32	
ALCOVE	ALCOVE	DRY WALL	W	0.22	
	" LOWER WALL	WOOD	W	1.18 / 1.54	
	" BULLETIN BRD	AT	W	0.12	
	" WINDOW FRAME	WD	B	0.31	
	" " SASH	WD	"	0.50	
	" BASEBOARD	WD	"	0.35	
	" DOOR FRAME	"	"	0.08 / 0.11	
KIT. NOOK	KIT. NOOK WALL	DW	W	0.18 / 0.09	
	"	WD	W	1.20	
	" WINDOW CASE		B	0.21	
	" SASH		B	0.62	
	" MOLDING		B	0.15	
	" CEILING	DW	W	0.17	
[illegible]	[illegible]	DW	W	0.15	
KITCHEN	COUNTER	W	B	0.22	
	SHUTTERS		B	0.40	
	WALLS	WD	W	2.25	
	[illegible] CABINET	"	B	1.60	
	BC COUNTER	"	B	0.30	
	BC SHELF		TAN	0.01	
	BC INTER.		"	0.17	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			—	
	WINDOW FRAME		W	0.35	
	WINDOW SASH		B	0.41	
	" CASING		B	0.32	

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XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE: FO-1	BLDG 21				
DATE:	CALIB.:	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:

Room Equivalent	Component	Substrate	Color	XRF Result (mg/cm2)	Condition
FRONT ROOM	CEILING DUCT	METAL	W	0.52	
PINK ROOM	LOWER WALL	DW	PINK	0.01	
	"	DW	W	0.02	
	WINDOW CASING	WD	B	1.70	
	DOOR	"	B	1.61	
STAINED ROOM	DOOR	"	B	0.06	
	PANEL	"	RED STAINED	-0.03	
	DOOR W/ PANEL MISSING	"	B	0.19	
SINK ROOM	DOOR	"	B	-0.04	
GRAY ROOM	DOOR CASING	"	DUSTY ROSE	0.15	
	DOOR	"	"	-0.03	
	LOWER WALL	WD	GRAY	11.07	
	UPPER WALL	DW	LT. GRAY	2.89	
	CEILING	"	BLACK	0.22	
BATHROOM ?	DOOR	WD	MEDIUM STAIN	-0.02	
(NO FIXTURES)	WINDOW CASING	"	B	0.02	
	WALL	DW	W	0.02	
BATHROOM	DOOR	WD	B (LT.	0.22	
	SHOWER STALL EXT.	DW	W	-0.01	
ROOM X 5	DOOR FRAME		B	0.23	
	DOOR		B	0.22	
	WINDOW SASH		B	0.38	
BACK DOOR	DOOR	W	B	3.26	
ROOM 5	WALL PANEL	W	MEDIUM STAIN	0.60	
	DOOR	W	DUSTY ROSE	-0.01	
	DOOR FRAME	W	UNPAINTED	-0.03	
	ABOVE PANEL	DW	"	0.01	
[illegible]	[illegible] UNDER	W	GRAY	0.21	
	DOOR [illegible] (EXT.)	W		3.93	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				

Mmxmbl

XRF SURVEY FOR LEAD BASED PAINT					PAGE OF	
CLIENT:	C/JOB# /		ON SITE:			
SITE: =O -	BLDG 1801					
DATE:	CALL. :	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				TIME:
Room Equivalent	**Component**		**Substrate**	**Color**	**XRF Result (mg/cm2)**	**Condition**
EXTERIOR	FRONT WALL (WEST)		WD	Y	15.85	
	DOOR CASING			W	0.01	
	PORCH DECK			TAN	0.02	
	" RAIL			T	0.03	
	SKIRT			T	21.37 / 24.86	
	NW CORNER			Y	20.90	
	W. WIND. SASH			B	15.97	
	" CASING			W	16.42	
	" SILL			W	11.00	
	W. WALL			Y	20.51	
	FRONT DOOR CASING			W	-0.03	
INT.	" " INT.			GRAY	-0.04	
(FRONT RM)	INT. WIND. SASH			W	6.84	
	WALL (FRONT RM)		PANEL	STAINED	-0.05	
	"		DW	B	0.15	
	WALL PANEL		WD	RED	0.06	
EAST ROOM	WALL		BARE DW	UN	-0.04	
(LEFT) NORTH	WINDOW CASING		WD	W	0.03	
	" SASH		"	W	0.35	
	" SILL		"	W	0.05	
	5-PANEL DOOR		"	W	0.93	
EAST ROOM	WINDOW SASH		"	W	0.19	
(RIGHT) SOUTH	" CASING		"	W	0.02	
	" SILL		"	W	-0.09	
	PANELING			(STAINED)	-0.03	
W MIDDLE RM	DOOR CASING			W	0.01	
	PANELING			B[illegible]	0.02	
	DOOR CASING → SO.			W	1.69	
	PASS THRU FRAME		WD	W	2.14	
	WIND. SASH			W	0.31 0.34	
SW ROOM	DOOR CASING INT			W	1.37	
	DOOR (detached)			B	0.	
	WIND. SASH			W	2.04	
	EXT. DOOR Inside			GRAY	-0.02	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				—	
	" Jam			W	.06	

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XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /		ON SITE:		
SITE: FO —	BLDG 1801				
DATE: 4/8/97	CALL.:	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:

Room Equivalent	Component	Substrate	Color	XRF Result (mg/cm2)	Condition
EXT.	N. WALL		Y	16.35	
	N. SKIRT		T	29.47	
	E. WALL		Y	22.36	
	E. SKIRT		T	21.11	
	E. WINDOW SASH		B	14.95	
	" SILL		B	13.20	
	" CASING		W	17.10	
	S. WALL		Y	19.24	
	S. SKIRT		T	21.18	
	S. WINDOW SASH		B	15.11	
	" SILL		B	28.18	
	" CASING		W	25.55	

CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:

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XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE: FO	BLDG 1807				
DATE: 4-8-	CALI... :	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:

Room Equivalent	Component	Substrate	Color	XRF Result (mg/cm2)	Condition
EXT.	W. WALL		Y	16.36	
	W. SKIRT		T	17.48	
	W. WINDOW) PROTECTED		W	0.03	
	S. WALL		Y	17.94	
	E. WALL		Y	16.31	
	N. WALL		Y	17.33	
	N. SKIRT		T	21.48	
	W. DOOR (FRONT)		T	0.08	
INT.	WALL (LOWER)	WD	Beige	3.88	
	" UPPER	DW	W	0.16	
	WINDOW SASH		BLK	1.07	
	WALL (LOWER)		RED	6.14	
	DOOR		RED	5.93	

CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:

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XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE: FO	BLDG. 2252				
DATE:	CALL. :	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:
Room Equivalent	**Component**	**Substrate**	**Color**	**XRF Result (mg/cm2)**	**Condition**
EXTERIOR	S. WALL		Y	0.69/0.19/0.05/0.00	
	S. WINDOW SASH		B	0.26	
	" CASING		W	0.30	
	S. DOOR 1		B	-0.05	
	S. AWNING FRAME		Y	0.02	
	S. DOOR 2		B	0.01	
	" 3		B	-0.08	
	" 4		B	0.17	
	S. WALL (HORIZONTAL BOARDS)		Y	6.85	
	S. DOOR 5		Y	0.10	
SOUTH	S. WINDOW SASH		Y	2.37	
	" CASING		W	7.14	
	S. WALL (WEST OF HORIZ.)		Y	0.12	
	S. WINDOW CASING		W	-0.12	
	S. DOOR CASING (#6)		W	0.14	
	S. DOOR 6		B	-0.01	
	S. DOOR 7	METAL	B	0.18	
	S. WALL (NARROW VERTICAL BRDS)		Y	0.10	
	"		BEIGE	0.12	
	WINDOW FENCE FRAME		T	0.10	
WEST	WALL		Y	9.74	
NORTH	DOOR (NW CORNER)		Y	8.74	
	SIDING	METAL	Y	0.21	
	HORIZ. BOARD WALL		Y	2.98/5.26	
	DOOR CASING		W	4.96	
	DOOR (DBL.)		B	3.45	
	VERT. BRD. WALL		Y	9.36	
	ROUGH SAWN PLY. SIDING		Y	-0.05	
	NE VERT. BRD. WALL		Y	0.63/0.37/0.12	
	DBL. DOORS		B	0.11	
	DOOR CASING		W	0.01	
EAST	WALL		Y	-0.16/0.05	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				

XRF SURVEY FOR LEAD BASED PAINT				PAGE OF	
CLIENT:	C/JOB# /	ON SITE:			
SITE: FO	BLDG. 2252				
DATE: 4-8-97	CALL.:	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:			TIME:
Room Equivalent	**Component**	**Substrate**	**Color**	**XRF Result (mg/cm2)**	**Condition**
INTERIOR	WALL (BEHIND DOORS)	DW	W	0.06	
	UPRIGHT POST		W	3.17	
	POST CONCRETE		RED	6.5	
	PONY WALL UNDER COUNTER	PRESSBOARD	W	0.19	
	WALL	PLYWOOD	Y	0.07	
	DOOR CASING		GRAY	-0.02	
	DIVIDER WALL	VERT. BRDS	W	15.19	
	EXT. WALL (INSIDE)		GREEN	0.75	
	DOOR (EXIT)		W	0.01	
	TEXTURED WALL	SHEETROCK	W	-0.03	
	POST		GREEN	0.64	
	WALL X SANDING ROOM		BEIGE	14.95	
	POST		GOLD	8.21	
	POST		GREEN	5.89	
	WALL SANDING ROOM	METAL	BEIGE	7.11	
	" "	WD	GREEN	0.62	
	" "	WD	BEIGE	15.57	
	BARN DOORS		B	0.10	
	POST		B/RED	0.46	
	PONY WALL	DW	W	0.02	
	WINDOW SASH		W	9.93	
	BURLAP WALL		W	-0.01	
	VERT. BRD. WALL		W	0.50	
	TEXTURED PONY WALL	DW	W	0.03	
	INTERIOR WINDOWS		R	10.20	
	POST		W	0.25	
	CALIB. CHECK(NIST III, 1.02, 15 SEC.) A3:				

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Appendix 14.6

Initial Exposure Assessment for Airborne Lead

Personal Air Monitoring Results for Typical Task

for

Working With Lead Based Paint Covered Building Materials

Initial Exposure Assessment for Airborne Lead

Project Location

Ford Ord Reuse Authority
Fort Ord, Building 21
Marina, California

Prepared For:

Mr. Stan Cook
Fort Ord Reuse Authority
100 12th Street
Building 2880
Marina, CA 93933

Prepared By:

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Hayward, California 94545

Date

May 19, 1997

Project Number

3427/3774

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Forensic Analytical was retained by the Fort Ord Reuse Authority (FORA) to conduct an initial exposure assessment at their "deconstruction" project located at Building 21, Fort Ord, Marina, California. The initial exposure assessment was conducted to determine the personal exposure levels to airborne lead for construction workers while performing "deconstruction" activities. The initial exposure assessment was conducted on May 8, 1997.

The initial exposure assessment was conducted by collecting personal air samples on four of the seven workers. These employees were monitored while performing all the tasks that will normally be encountered during this "deconstruction" project. These tasks included cabinet, door and trim removal, drywall removal, skirtboard removal, and a combination of all tasks. These tasks were performed as part of a "deconstruction" project where the intent is to carefully dismantle abandoned buildings. The building materials were removed intact so that they could be reused. The workers used power saws without attached HEPA vacuums and hand tools. A HEPA vacuum was on-site and used for cleaning up the small debris. Sample collection and analysis was performed in accordance with the National Institute for Occupational Safety and Health's (NIOSH) Method 7082. The time weighted average (TWA) for the sample results was calculated using the following formula:

$$\text{8 Hour TWA} = \frac{(C_1 * T_1) + (C_2 * T_2) + (C_n * T_n)}{480 \text{ minutes}}$$

All workers wore half face respirators equipped with HEPA filters and disposable tyvek suits during the initial exposure assessment. An equipment/changing area was established outside the building adjacent to the regulated work area. All workers exited the work area through this equipment/changing area. Workers HEPA vacuumed their suits and tools before exiting. Immediately after leaving the work area, the workers proceeded to the handwashing facility located adjacent to the equipment/changing area.

The results for the initial exposure assessment are listed below. The results are expressed as an eight hour time weighted average.

Name	Job Description	Result
Ann Schneider	All Tasks	< 4.935 $\mu g/m^3$
Hector Hernandez	Cabinet, Door and Trim Removal	< 4.686 $\mu g/m^3$
Matt Burgess	Drywall Removal	< 4.935 $\mu g/m^3$
Tim LeDesma	Skirtboard Removal	< 4.932 $\mu g/m^3$

The results of the initial exposure assessment show that the airborne lead dust concentrations were within Cal OSHA's permissible exposure limit of 50 $\mu g/m^3$. Based on these results, these workers are no longer required to wear personal protective equipment, should they choose.

Please note, that as stated in 8 CCR 1532.1 (d)(7), "whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being to lead at or above the action level...the employer shall conduct additional monitoring in accordance with this paragraph."

However, due to the presence of lead, Cal OSHA, 8 CCR 1532.1, does require all employees to be trained in the hazards associated with lead and exposure monitoring every twelve months. In addition, the standard also require the use of housekeeping practices and hygiene facilities. Finally, all workers issued a respirator must be included in a respiratory protection program. This includes a physical examination by a physician stating that the worker is physically fit to wear a respirator.

INTRODUCTION

Forensic Analytical was retained by FORA to conduct an initial exposure assessment at their "deconstruction" project located at Building 21, Fort Ord, Marina, California. The initial exposure assessment was conducted to determine the personal exposure levels to airborne lead for construction workers while performing "deconstruction" activities. The initial exposure assessment was conducted on May 8, 1997.

Forensic Analytical provided the following services for the initial exposure assessment:

- Collection of personal air samples;
- Analysis of personal air samples for lead concentration; and
- Development of a final report detailing IEA results.

The initial exposure assessment work was performed on May 8, 1997. The samples were analyzed on May 11, 1997 and the final report was completed on May 19, 1997.

BACKGROUND

On May 4, 1993 the Occupational Safety and Health Administration (OSHA) published an Interim Final Rule for Lead in Construction (29 CFR 1926.62) which revised its existing lead rule applicable to the construction industry (29 CFR 1926.55). OSHA was required to take this action under the Housing and Community Development Act of 1992 (42 U.S.C. 4853). The agency was required to adopt an interim final standard in a six month period and, therefore, was not constrained to follow the Section 6(b) rulemaking procedures (i.e., proposal, comment period, hearings) of the Occupational Safety and Health Act of 1970.

On September 28, 1993 California OSHA (Cal/OSHA) filed CCR Section 1532.1 of Title 8 pursuant to the Labor Code section 142.3 (a)(4) (Register 93, No. 40). This section is identical to the interim final rule adopted by federal OSHA on May 4, 1993. Pursuant to Labor Code section 142.3(a)(4)(c), this section was to remain in effect until May 4, 1994 unless readopted for an additional six months or superseded by permanent regulations. As a result, Cal/OSHA's Lead in Construction Standard remained identical to the federal version until March 7, 1997 when Cal/OSHA's revised standard became effective.

The purpose of the interim final rule is to provide a level of protection to workers exposed to lead in construction equivalent to that afforded other lead workers under OSHA's general industry standard 29 CFR 1910.1025. The interim final lead standard for the construction industry applies to all occupational exposures to lead in all construction work in which lead, in any amount, is present in an occupationally related context. For the purpose of this standard, construction work is defined as work involving construction, alteration and/or repair, including painting and decorating.

The standard applies to all occupational exposures to lead during the course of construction work. It does not specify a minimum amount or concentration of lead which must be present before any risk of exposure is determined. Therefore, unless the employer has appropriately tested all potential sources of lead exposure, utilizing a valid method of detection for the presence of lead, and found no detectable levels of lead, the standard applies.

METHOD

The initial exposure assessment was conducted by collecting personal air samples on four of the seven workers. These employees were monitored while performing all the tasks that will normally be encountered during this "deconstruction" project. These tasks included cabinet, door and trim removal, drywall removal, skirtboard removal, and a combination of all tasks. All of these tasks were performed inside the building, except the skirtboard removal which was conducted outside the building.

These tasks were performed as part of a "deconstruction" project where the intent is to carefully dismantle abandoned buildings. The building materials are removed intact so that they can be reused. The workers used a variety of power and hand tools. The following is a breakdown of each task and the equipment used.

Construction Activity	*Tools and Equipment Used*
All Tasks	All of the tools and equipment noted below
Removal of Cabinets, Doors, and Trim	Flat bar, hammer, wrenches, pliers, nail puller, flat screw driver, phillips screw driver, plastic bags, nail punch, small wedge of wood, and box for hinges
Removal of Drywall	Jig saw, gaylord boxes, claw hammer, and flat bar
Skirt board Removal	Polysheeting, pieces of pipe, HEPA vac, boxes, scraper, skill saw, claw hammer. Note: A cardboard box was used as a cutting surface. This box had a HEPA vac inserted as a local exhaust. See Appendix A for detailed drawing.

A HEPA vacuum was on-site and used for cleaning up the small debris. Sample collection and analysis was performed in accordance with the National Institute for Occupational Safety and Health's (NIOSH) Method 7082.

All workers wore half face respirators equipped with HEPA filters and disposable tyvek suits during the initial exposure assessment. An equipment/changing area was established outside the building adjacent to the regulated work area. All workers exited the work area through this equipment/changing area. Workers HEPA vacuumed their suits and tools before exiting. Immediately after leaving the work area, the workers proceeded to the handwashing facility located adjacent to the equipment/changing area. Exposures assessment field data sheets are in Appendix A.

Prior to sampling, each employee was informed of the purpose of the sampling, when and where the equipment would be removed, and the importance of not removing or tampering with the sampling equipment. The employee was also instructed to notify Forensic Analytical's field representative if sampling equipment required temporary removal.

The sampling equipment was placed on the employee so that it would not interfere with work performance. The sample cassette was taped in place on the shirt collar near the workers nose and mouth in a hemisphere forward of the shoulders within a radius of six to nine inches. The inlet of the cassette was pointed downward to avoid gross contamination.

Sampling was conducted by drawing air through thirty-seven millimeter diameter cellulose ester membrane (0.8 micrometer pore size) filters, which were housed in three-piece cassettes. The cassettes were connected to variable flow pumps by .25 inch tygon tubing. Sample collection was done closed face with a flow rate of 1.9 to 2.0 liters per minute. Flow rates were established using a rotameter (previously calibrated by a primary standard) before and after each sampling period.

Samples were analyzed by Forensic Analytical Specialties, Inc. (FASI) in Hayward, California. FASI is accredited by the Department of Health Service's (DHS) Environmental Laboratory Accreditation Program (ELAP) and the American Industrial Hygiene Association (AIHA). FASI also has extensive experience in the analysis of lead. Analysis was performed by flame-atomic absorption spectrography using NIOSH Method 7082.

Following sample results, the eight hour time weighted average (TWA) was calculated using the formula below.

$$\text{8 Hour TWA} = \frac{(C_1 * T_1) + (C_2 * T_2) + (C_n * T_n)}{\text{480 minutes}}$$

Where:

X = Total hours in the shift
C_1 = Concentration for the first sampling period
T_1 = Duration for the first sampling period
C_n = Concentration for each additional sampling period
T_n = Duration for each additional sampling period

RESULTS

The results of the initial exposure assessment are listed below. The results are expressed as an eight hour time weighted average. The result units are expressed in micrograms per cubic meter of air ($\mu g/m^3$).

Employee Name Social Security #	Work Activities	Exposure 8HR-TWA
Ann Schneider (557-27-2742)	All Tasks	< 4.935 $\mu g/m^3$
Hector Hernandez (557-39-6857)	Cabinet, Door and Trim Removal	< 4.686 $\mu g/m^3$
Matt Burgess (295-72-0741)	Drywall Removal	< 4.935 $\mu g/m^3$
Tim LeDesma (572-08-2167)	Skirtboard Removal	< 4.932 $\mu g/m^3$

DISCUSSION

To interpret the air monitoring results, the levels of airborne lead each employee is exposed to is compared to the following two health action levels established by Cal and Fed OSHA.

The Lead Action Level: 30 micrograms/ cubic meter
This is the airborne level specified by the Occupational Safety and Health Administration (OSHA) for workers who are exposed to lead occupationally. If the airborne lead concentration exceeds this level, employers are required to take certain actions, e.g., provide employees with medical surveillance and lead hazard training.

The Permissible Exposure Limit: 50 micrograms/cubic meter
This is the maximum airborne lead level specified by OSHA that employees may be exposed to during a normal work day. If the airborne lead concentration exceeds this level, employers are required to take more stringent actions, e.g., institute administrative and engineering controls, and provide personal protective equipment in addition to the actions above.

Based on the results of the initial exposure assessment, 29 CFR 1926.62 and Title 8 CCR 1532.1 requires the following:

1. Conduct employee exposure monitoring every twelve months, or whenever there is a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being to lead at or above the action level.

2. The use of respiratory equipment in accordance with 29 CFR 1926.62 and Title 8 1532.1, if an employee requests one.

3. The use of protective work clothing and equipment in accordance with 29 CFR 1926.62 and Title 8 1532.1.

4. The implementation of housekeeping practices in accordance with 29 CFR 1926.62 and Title 8 1532.1.

5. The use of hygiene facilities including change areas and eating areas in accordance with 29 CFR 1926.62 and Title 8 1532.1.

6. The institution of biological monitoring in the form of blood testing in accordance with 29 CFR 1926.62 and Title 8 1532.1.

7. The implementation of medical removal protection in accordance with 29 CFR 1926.62 and Title 8 1532.1.

8. A training program in accordance with 29 CFR 1926.62 and Title 8 1532.1.

9. The use of warning signs in accordance with 29 CFR 1926.62 and Title 8 1532.1.

10. The creation and upkeep of recordkeeping system in accordance with 29 CFR 1926.62 and Title 8 1532.1.

The initial exposure assessment covers only the tasks indicated in this section. Should additional activities be added to the scope of work, or if there are any changes in work conditions, additional initial exposure assessments must be performed. Interim control measures must be followed in accordance with section (d)(2)(I) of the federal standard.

LIMITATIONS

Conclusions stated here refer only to the specific site investigation at the time of the survey. Enclosed materials are not intended to guarantee that a site is or is not free from conditions which could pose a threat to human health or safety. Should further research on the site be conducted the additional data should be reviewed by Forensic Analytical and the conclusions presented herein may be modified. This report is for the sole use of our client.

If you have any questions regarding this report or if you require additional information please do not hesitate to contact this office.

Respectfully,
FORENSIC ANALYTICAL

Fred J. Vinciguerra
Environmental Services Division
DHS Interim Certified Lead Project Designer/Inspector/Supervisor

ESD\WPDOCS\LEAD\3427\3774\IEAFNL

APPENDIX A

Exposure Assessment Field Data

Forensic Analytical AIR Request Form

☐ Mail Directly to Client

Client Name & Address: FORA		Phone:	Date: 5/8/97
Contact: STAN COOK		Collected By: FJV Analyzed By:	☐ Code F
Client # 3427	ESD Job #: 3774	Special Instructions: Pb / 24 HR	BY MON 7^am
P.O. #	Client Job #:	☒ PCM ☐ 2hr ☐ 24hr ☐ Ext	
Site: FORT ORD, BLD. 21		☐ TEM Yamate I ☐ 12hr	
Rotometer #: ____ Hi Flow: 10560 Lo Flow: 10552		☐ TEM Yamate II ☐ 24hr	
Calibration Date: 1/7/97 & 5/1/97		☐ TEM AHERA ☐ 48hr	
Cassette Lot #: 9607583		☐ 5 day	

Sample Number	Date Collected	Sample Location/Activity	Type	Pump ID	LPM Avg.	T. On / T. Off	T. Tot. / V. Tot.	F/cc / F/fld
319617	5/8/97	FIELD BLANK	A P C	—	—	— / —	— / 0	
319616	↓	PERS: ANN SCHNEIDER (557-27-2742) - DOOR RM TRIM REMOVAL, DRYWALL, DENAILING WOOD, SKIRT BOARD REMOVAL A OF REMOVAL	A (P) C		2.0/1.8 1.9	910 / 1210 / 1545	365 / 694	
319608		PERS: HECTOR HERNANDEZ (557-29-6857) DOOR, TRIM & CABINET REMOVAL & SCRAPING	A (P) C		2.0/2.0 2.0	912 / 1214 / 1355	255 / 510	
319605		PERS: MATT BURGESS (295-72-0741) DRYWALL REMOVAL	A (P) C		2.0/1.8 1.9	914 / 1211 / 1540	353 / 671	
319613		PERS: TIM LEDESMA (572-08-2167) REMOVING SKIRT BOARDS, SAWWING, HEPA VAC'ING	A (P) C		2.0/1.8 1.9	916 / 1213 / 1542	356 / 676	
319596		AREA - N.E. CORNER, ADJ. TO WORK AREA / DURING DECONSTRUCTION	(A) P C		8/8 8.2	931 / 1158 / 1538	320 / 2624	
319610	↓	AREA - S.E AREA, NEAR HANDWASHING FACILITY / DURING DECONSTRUCTION	(A) P C		8/8 8.2	932 / 1159 / 1539	320 / 2624	
			A P C					

Relinquished By: [signature] Date/Time: 5/9/97	Received By: Date/Time
Relinquished By: Date/Time:	Received By: Date/Time

(A)

INITIAL PREP TALK

EVERYONE IS DOING A VERY GOOD JOB

WHO HAS WORKED IN HAZ OR SUITED ENVIR-[illegible]
WHAT WE ARE DOING SIMULATES TASK - WE WILL MAKE MISTAKES
NEED TO MAKE THIS A LITTLE STRUCTURE TODAY
THIS WILL: 1) AVOID CONFUSION
2) SPEED THINGS UP.

STRUCTURE:
1) DON'T INTERRUPT / JOKE
2. SAVE QUESTIONS UNTIL ASKED
3) ANN TO TAKE NOTES & FLOAT
ANN ASK "HOW CAN I HELP" NOTE ON PAPER
OTHER QUESTIONS UNTIL BREAKTIMES
4) HELP EACH OTHER SUIT UP. (NUMBER SUITS BY ENTRY)
SUIT UP PERSON PREFORMING LEAST COMPLICATED TASK 1ST. PROGRESS TO MOST COMPLICATED TASK.
COME OUT IN REVERSE ORDER.

ENTRY ORDER — AIR MONITOR

1) M - ANN - NOTES, FLOATER, TIME KEEPER. 1ST IN-2ND OUT
6) CHRIS - PREP. EQUIPMENT TO GO INTO HOT AREA, LAST IN-1ST OU
7) STAN - PREP. EQUIPMENT TO GO INTO HOT AREA.
5) M - TIM - PULL SKIRT BOARDS & SAW, HEPA VAC
2) M - HECTOR - DOORS & TRIM REMOVAL
3) M - SAM - REMOVE CABINETS, SHOWER
4) M - MATT - REMOVE DRYWALL.
FRED - MONITOR

FRUSTRATION WILL BE EASY. STOP IF YOU ARE GETTING FRUSTRATED. COME OUT IF YOU HAVE TO.

ANN

(1)

NOTES / FLOATER / TIME KEEPER

NOTE PAD
WRITING IMPLEMENT - 2
CAMERA

1) RECORD INFO AS OTHERS SUIT UP - HELP OTHERS SUIT UP

2) PLAN ON SPENDING ONE 1½ HOURS WITH EACH OTHER PERSON PREFORMING A TASK (APPROXIMATLY FROM BREAK TO BREAK

3) WATCH - KEEP QUESTIONS FOCUSED AS TO HOW YOU CAN HELP.
4 RECORD YOUR OTHER QUESTION FOR ANSWERS @ BREAK TIME.
5) HELP W/ TASK
6) KEEP AN EYE ON TIME
7) CALL BREAKS @ 10:00, 12:00, 2:00
8) HAVE EVERYONE START CLEAN-UP @ 3:30
9) HAVE EVERYONE ASSEMBLED @ 4:00 FOR DE-BRIEFING

HECTOR

②

REMOVE DOORS & TRIM

FLAT BAR
HAMMER
NAIL PULLER
FLAT SCREW DRIVER
PHILLIPS SCREW DRIVER.
PLASTIC BAGS

NAIL PUNCH
SMALL WEDGE OF WOOD
BOX/BAG FOR HINGES

REMOVE DOOR
REMOVE KNOB - TAPE KEYS TO KNOB - PUT IN PLASTIC BAG
REMOVE HINGES - TAPE SCREWS TO HINGE
REMOVE TRIM
REMOVE DOOR FRAME
PULL ALL NAILS
CARRY DOORS OUT SIDE & STACK ON PALLET
PUT HINGES IN BOX/BAG.

SAM

(3)

REMOVE CABINETS / SHOWER

FLAT BAR
PIPE WRENCH
FAUCET WRENCH
PLYERS
HAMMER
FLAT SCREWDRIVER
PHILLIPS SCREW DRIVER.

MATT

4

DRY WALL REMOVAL

JIG SAW
GAYLORD BOX - 2
CLAW HAMMER
FLAT BAR.

1) PLACE GAYLORD BOX 3' FROM WALL.
2) MARK WALL 4' ABOVE FLOOR (HORIZONTAL)
3) CUT DRYWALL AT 4' ABOVE FLOOR MARKING STUDS AS FOUND
4) CUT DRYWALL VERTICALLY ON ONE SIDE OF STUD.
5) PRY DRYWALL OFF STUD
6) STACK DRYWALL IN GAYLORD BOX
7) PULL NAILS FROM STUDS
8) PUT NAILS IN CONTAINER.

TIM

SKIRT BOARD REMOVAL

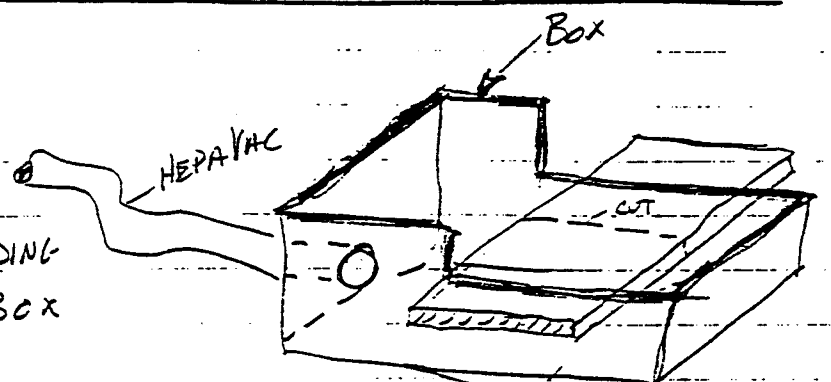
10' X 20' PIECE POLY.
2-10' PIECES PIPE
HEPA VAC
BOX FOR SCRAPING & CUTTING
SCRAPER
SKILL SAW (TAPE EXHAUST PORT)
EXTENTION CORD.
CLAW HAMMER

GAYLORD BOX.

STEPS.

1) LAY OUT POLY
2) WEIGHT POLY w/ PIPE

3) PRY PIECE FROM BUILDING
4) CARRY TO VACUUM BOX



5) SCRAPE PIECE IN BOX
6) PULL NAILS FROM PIECE
7) MARK PIECE AT MIDPOINT FOR CUT
8) CUT PIECE OVER BOX.
9) VACUUM UP LOOSE SAW DUST.
10) CAREFULLY STACK IN GAYLORD BOX.
11) KEEP MOVING POLY WITH WORK.

CHRIS

EQUIPMENT PREP

1) HELP EACH PERSON ASSEMBLE TOOLS / SUPPLIES
2) HELP THEM IN ORDER OF ENTRY.
3) CHECK GAS IN GENERATOR.
4) STAY IN CLEAN AREA AND BRING OTHERS TOOLS THEY NEED (UNTIL 10:00 BREAK)

4) AT 10:15 GO WITH STAN TO PICK-UP STUFF AT WAREHOUSE

5) AFTER LUNCH SUIT-UP AND HELP WHO EVER NEEDS IT

6) AT 3:30 BE THE 1ST ONE OUT AND DOUCE DECONTAMINATION PROCEEDURES. OF TOOLS.

7) STACK CLEAN TOOLS SO THAT EVERYONE CAN HELP PUT THEM IN TOOL ROOM AFTER EVERYONE IS CLEANED UP.

APPENDIX B

Laboratory Reports - AA Spectrometry Analysis

Metals Analysis

Flame AA

Fort Ord Reuse Authority

100 12th Street, Building 2880
Marina, CA 93933

Client Number : 3427
Report Number: M011906
Date Received : 05/09/97
Date Analyzed : 05/11/97
Date Reported : 5/16/97

Purchase Order# :
Job ID # : ESD Num : 3774
Site : Fort Ord - Building 21

Air-Metals

Final Report

Sample Number	Lab Num	Volume	Elem	Loading	Result	Units	*MRL	Reference
319617	39718482	N/A	Pb	<4.50	<4.50	ug	4.50	NIOSH 7082
319616	39718483	693.5	Pb	<4.50	<6.49	ug/m3	6.49	NIOSH 7082
319608	39718484	510.0	Pb	<4.50	<8.82	ug/m3	8.82	NIOSH 7082
319605	39718485	670.7	Pb	<4.50	<6.71	ug/m3	6.71	NIOSH 7082
319613	39718486	676.4	Pb	<4.50	<6.65	ug/m3	6.65	NIOSH 7082
319696	39718487	2624.0	Pb	<4.50	<1.71	ug/m3	1.71	NIOSH 7082
319610	39718488	2624.0	Pb	<4.50	<1.71	ug/m3	1.71	NIOSH 7082

Comment: No discernible blank was submitted with this set.

Karen L de Sterke

Karen de Sterke, Laboratory Supervisor

'MRL':Method Reporting Limit gives the lower limit of numerical reliability for this analytical method.

APPENDIX C

8 Hour Time Weighted Average Reports

CALCULATING TWA'S				
	EMPLOYEE NAME			
NAME	A. Schneider	H. Hernandez	M. Burgess	T. LeDesma
Conc. 1	6.49	8.82	6.71	6.65
Time 1	365	255	353	356
Conc. 2				
Time 2				
Conc. 3				
Time 3				
Conc. 4				
Time 4				
Conc. 5				
Time 5				
Conc. 6				
Time 6				
Conc. 7				
Time 7				
Conc. 8				
Time 8				
TWA (8HR	4.935	4.686	4.935	4.932

Appendix 14.7

Blood Lead Level Test Results

Blood Lead Level Test Before Deconstruction

and

After Five Months of Deconstruction

LabOne
8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REQ NUMBER: 61262714-16
PATIENT: LEDESMA, TIM
DATE OF BIRTH/AGE: Feb 11 1963/34 YEARS
SEX: M
ID OR ROOM NO: 572062167
REPORT STATUS: FINAL REPORT
DATE REPORTED: May 06 1997
DATE/TIME COLL: May 05 1997 11:15 AM
DATE RECEIVED: May 06 1997 09:30 AM
ACCOUNT: A400
REFERRING DR: DAMBROSIO
FASTING: NO

DOCTORS ON DUTY
PAGE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
YVETTE BANKS

000-000-0000

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
LEAD, BLOOD		41	< 40	MCG/DL
ZINC PROTOPORPHYRIN	34	34	0 - 70	MCM/M HEME

- END OF REPORT -

Lab Work Results
Reviewed by Physician [signature] Signature

Results Given & Explained:
Positive or Negative
May 6, 97 By [signature]

5-7-97 Faxed to [illegible] 883-3675F [illegible]

LabOne

8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REQ NUMB--: .583895-16
PATIE. .: LEDESMA, TIM
DATE OF BIRTH/AGE: Feb 11 1963/34 YEARS
SEX: M
ID OR ROOM NO: UNKNOWN
REPORT STATUS: FINAL REPORT
DATE REPORTED: Sep 11 1997
DATE/TIME COLL: Sep 10 1997 04:40 PM
DATE RECEIVED: Sep 11 1997 09:50 AM
ACCOUNT: AB9L
REFERRING DR: WEBB ERIC
FASTING: UNKNOWN

DOCTORS ON DUTY-MARINA
PAGE 1
3130 DEL MONTE BLVD
MARINA, CA 93933
* *. LAB RESULTS COORDINATOR

408-883-3330

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
EAD, BLOOD	1		< 40	MCG/DL
ZINC PROTOPORPHYRIN	35		0 - 70	MCM/M HEME

- END OF REPORT -

LabOne

8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REQ NUMBER: 61262710-16
PATIENT: COOK, STANDER
DATE OF BIRTH/AGE: Dec 02 1971/25 YEARS
SEX: M
ID OR ROOM NO: 212882579
REPORT STATUS: FINAL REPORT
DATE REPORTED: May 06 1997
DATE/TIME COLL: May 05 1997 12:00 PM
DATE RECEIVED: May 06 1997 09:30 AM
ACCOUNT: A400
REFERRING DR: DAMBROSIO
FASTING: NO

DOCTORS ON DUTY
PAGE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
YVETTE BANKS

000-000-0000

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
LEAD, BLOOD	1		< 40	MCG/DL
ZINC PROTOPORPHYRIN	41		0 - 70	MCM/M HEME

- END OF REPORT -

Work Results Reviewed by Physician
Signature
Results Given & Explained
Positive or Negative
By
May 6, 97

5-6-97 [illegible] Cord 813-3675 F
5-13-97
[illegible]

LabOne Inc.
8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REQ NUMBER: 61434415-16
PATIENT: COOK, STAUDEN
DATE OF BIRTH/AGE: Dec 27 1955/41 YEARS
SEX: M
ID OR ROOM NO: 212662579
REPORT STATUS: FINAL REPORT
DATE REPORTED: Sep 10 1997
DATE/TIME COLL: Sep 09 1997 02:00 PM
DATE RECEIVED: Sep 10 1997 09:26 AM
ACCOUNT: 4409
REFERRING DR: ANLPOSIC
FASTING: NO

DOCTORS ON DUTY
[illegible]OE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
[illegible]ETTE SAN[illegible]S

[illegible]-[illegible]-[illegible]

TEST NAME	IN RANGE	OUT OF RANGE	REFERENCE UNITS
LEAD, BLOOD	2		< 40 MCG/DL
ZINC PROTOPORPHYRIN	41		0 - 70 MCM/M HEME

- END OF REPORT -

LabOne Inc.

8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

DOCTORS ON DUTY
PAGE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
YVETTE BANKS

000-000-0000

REQ NUMBER: 61262713-16
PATIENT: DENT, CHRISTOPHER
DATE OF BIRTH/AGE: Apr 26 1948/49 YEARS
SEX: M
ID OR ROOM NO: 569803308
REPORT STATUS: FINAL REPORT
DATE REPORTED: May 06 1997
DATE/TIME COLL: May 05 1997 11:00 AM
DATE RECEIVED: May 06 1997 09:30 AM
ACCOUNT: A400
REFERRING DR: DAMBROSIO
FASTING: NO

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
LEAD, BLOOD	4		< 40	MCG/DL
ZINC PROTOPORPHYRIN	31		0 - 70	MCM/M HEME

- END OF REPORT -

Lab Work Results
Reviewed by Physician ______ Signature

Results Given & Explained
Positive / Negative
May 6.97

5-7-97 [illegible] Cook 883-3675 AH 5-15-97 Sent original to their office AK

LabOne

8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REG NUMBER: 61434424-16
PATIENT: DENT, CHRISTOPHER
DATE OF BIRTH/AGE: Apr 26 1948/49 YEARS
SEX: M
ID OR ROOM NO: UNKNOWN
REPORT STATUS: FINAL REPORT
DATE REPORTED: Sep 16 1997
DATE/TIME COLL: Sep 09 1997 12:00 AM
DATE RECEIVED: Sep 10 1997 09:26 AM
ACCOUNT: A480
REFERRING DR: ANDR0819
FASTING: NO

DOCTORS ON DUTY
PAGE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
EVETTE BANKE

000-000-0000

ESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE UNITS
AD, BLOOD	6		< 40 MCG/DL
INC PROTOPORPHYRIN	28		0 - 79 MCM/M HEME

- END OF REPORT -

LabOne

8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REQ NUMBER: 61262711-16
PATIENT: BURGESS, MATTHEW
DATE OF BIRTH/AGE: Apr 24 1971/26 YEARS
SEX: M
ID OR ROOM NO: 295720741
REPORT STATUS: FINAL REPORT
DATE REPORTED: May 06 1997
DATE/TIME COLL: May 05 1997 11:10 AM
DATE RECEIVED: May 06 1997 09:30 AM
ACCOUNT: A400
REFERRING DR: DAMBROSIO
FASTING: NO

DOCTORS ON DUTY
PAGE 2260 N. FREMONT BLVD.
1 MONTEREY, CA 93940
YVETTE BANKS

000-000-0000

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
LEAD. BLOOD	8		< 40	MCG/DL
ZINC PROTOPORPHYRIN	32		0 - 70	MCM/M HEME

- END OF REPORT -

Reviewed by Physician
Signature

Results given to patient

May 6 97

5-6-97 Expects Steve Cook 883-3675 F AH 5-15-97 Sent report to their office AI

LabOne
8915 Lenexa Drive
Overland Park, KS 66214
(800) 646-7788

REG NUMBER: 61434422-16
PATIENT: BURGESS, MATHEW
DATE OF BIRTH/AGE: Apr 24 1971/26 YEARS
SEX: M
ID OR ROOM NO: 295728741
REPORT STATUS: FINAL REPORT
DATE REPORTED: Sep 10 1997
DATE/TIME COLL: Sep 09 1997 03:00 PM
DATE RECEIVED: Sep 10 1997 09:56 AM
ACCOUNT: A400
REFERRING DR: AMBRO610
FASTING: UNKNOWN

DOCTORS ON DUTY
PAGE 1
2260 N. FREMONT BLVD.
MONTEREY, CA 93940
YVETTE BANKS

000-000-0000

RESULT NAME	IN RANGE	OUT OF RANGE	REFERENCE	UNITS
LEAD, BLOOD	6		< 40	MCG/DL
ZINC PROTOPORPHYRIN	33		0 - 72	MCM/M HEME

- END OF REPORT -

Appendix 14.8

Task Performed for Each Building

A list of the Task Performed by the Deconstruction Crew

During Deconstruction

Task Summary for Building 21

5/6/97	5/12/97	5/15/97
asb-roof vents remove	signage	clean up
bag lawn waste	remove window protection	stack lumber
clean street gutter	stacked roof sheathing	build Gaylord boxes
clean-up	light fixtures remove	electrical removal
elec. outlets remove	roof sheathing removal	rafter removal
elec. remove	dump run	2x4 removal
Gas and oil mowers	clean up	de-nail ext. t&g
hot water unit remove	get out tools	inter dry wall remove
light fix. remove	shingle removal	de-nail 2x4
mowing	supply run	de-nail rafters
photo	5/13/97	de-nail int. walls
plumbing removal	stacked lumber	5/16/97
site security	stacked windows	clean up
storage security	de-nailed vent screens	make Gaylord boxes
Supply run	de-nail	de-nail rafters
Weed whack	cleanup	stack rafters
window boards de-nail	de-nail trim	set out tools
window boards remove	heat duct remove	clean up dry wall
5/7/97	truck repair	remove insulation
asb-roof vent removal	supply run	de-nail int. walls
clean-up	build Gaylord boxes	de-nail rafters
hepa-vac interior	ceiling dry wall removal	plan assignments
haul shingles to dump	assigned task	5/19/97
remove shingles	set up tools	clean up
5/8/97	windows remove	setup
Fit test respirator	furnace remove	work discussion
help others suit-up	trim remove	stacked lumber
supply run	5/14/97	inter t&g remove
make Gaylord boxes	stack wood	stack doors
debrief	de-nail	doors remove
doors and trim removal	compile data	sink and cabinet remove
dry-wall removal	stack acoustic tile	de-nail frame
scrape-and cut boards	stack rafters	de-nail int. t&g
acoustic tile removal	move scaffold	plan int. t&g remove
decontaminate tools	de-nail ext. t&g ceiling	interior frame remove
prep. work area	build Gaylord boxes	5/20/97
decontaminate selves	organize site	clean up
de-nail	clean up	stack lumber
5/9/97	get out tools	de-nailing
get out tools	eve blocking removal	move dry wall boxes
remove window protection	rafter removal	inter t&g remove
strip shingles	supply run	inter framing remove
dump run	t&g ceiling removal	de-nail int. t&g
heat stroke	de-nail rafters	de-nail 2x4
clean up	trim rafters to size	shower remove
	interior dry wall removal	
	interior plywood removal	
	acoustic tile removal	
	interior t&g removal	
	removal electrical	

Task Summary for Building 21

5/21/97	5/27/97	6/5/97
crew meeting-ext. wall	meet fork-lift truck	clean up
clean up	de-nail siding	sub-floor remove
interior walls	stack lumber	t&g floor remove
de-nail exterior frame	load lights to warehouse	de-nail
stack lumber	box paper from ext. wall	de-nail t&g
brace exterior walls	clean up	size and stack wood
ext. wall blocks remove	dump run	6/6/97
supply run	t&g floor removal	t&g removal
ext. wall 2x4 remove	size lumber	t&g de-nail
gable 2x4 removal	plywood/tile remove	demo dry-rot in floor
inter 1x12 remove	load waste drywall	sub-floor de-nail
inter 1x12 sizing	good mat'l to warehouse	6/9/97
de-nail ext. 2x4	pick-up flat-bed	stack t&g floor
plumbing remove	5/28/97	sub-floor remove
5/22/97	clean up	6/11/97
inter 1x12 stacked	stack 1x12 skirting	clean up
2x4 stacked	warehouse, boxes	set up
stack lumber	dump run	mat'l to warehouse
set out tools	mat'l to warehouse	sub-floor remove
ext. wall blocks remove	strip skirting	ext. wall remove
ext. wall 2x4 remove	de-nail	stack lumber
make boxes	organize site	floor joist remove
tile & plywood remove	load fence	6/12/97
2x4 sizing	plywood/tile remove	clean up
de-nail 2x4	t&g floor remove	2x8 to warehouse
5/23/97	plywood/tile load	stack lumber
supply run	stack wood	de-nail
stack ext. drywall	fork-lift load truck	plumb/elec. under floor
stack siding	paint signs	2x8 joist remove
de-nail siding	return flat bed	remove piers
site layout	5/29/97	ext. wall t&g sheetrock
break	t&g remove	ext. wall studs remove
plastic for rain	t&g de-nail	6/13/97
clean up	stack wood	clean up
	1x6 sub-floor remove	dump run
	5/30/97	de-nail 1x6
	1x6 sub-floor remove	denial & stack siding
	6/3/97	mat'l to warehouse
	tools to warehouse	de-nail
	clean up	concrete slab remove
		size 2x4
		size siding
		de-nail 2x4
		7/28/97
		dump run
		load scrap wood
		load broken drywall
		deconstruct sub floor
		concrete slab remove

Summary of Task Building 1801

6/23/97	7/29/97
window plywood remove	set-up
skirt removal	clean up
clean-up	encapsulate windows
6/24/97	7/30/97
Trim tree and clean site	clean up
load truck	set-up
dump run	encapsulate windows
remove trim	8/4/97
striping interior walls	clean up
7/21/97	setup
site prep, denailing sta.	encapsulate windows
clean-up	remove elec wires
de-nailing	sweep roof
load dump truck	replace door
Remove elec. fixtures	encapsulate door
remove interior walls	5/20/97
remove ceiling tiles	clean up
remove ceiling frame	set-up
move Lead encapsulant	scrape windows
7/22/97	touch-up
remove interior wall	remove elec panel
remove ceiling drywall	stack at warehouse
move dump truck	replace door
stage plywood	encapsulate windows
de-nailing	8/6/97
load truck	clean up
dump run	set-up
hang door	scrape windows
clean-up	touch up
de-nail int. wall/ceiling	8/7/97
7/23/97	clean up
de-nailing	scrape windows
hep-a-vac	pick up supplies
mask windows	site clean up
encapsulation	touch up
7/24/97	8/8/97
Chalk Exterior Walls	set up
Encapsulate top coat	site clean up
to landfill	reassemble windows
encapsulate windows	
clean up	
get out tools	
7/25/97	
materials to warehouse	
encapsulate windows	
cleanup	
7/28/97	
encapsulate exterior	
encapsulate door trim	
encapsulate windows	
set-up	
clean-up	

Summary of Task Building 1807

5/29/97	6/9/97	6/18/97
fencing	set up	clean up
remove roof shingles	clean up	linoleum remove
dump run	elec. wire remove	de-nailing
5/30/97	drywall remove	instruction
remove shingles	denail studding	supply run
dump run	stack joist lumber	ext. matl. size
supply run	windows remove	ext. wall matl. stack
stack skirt boards	rafter blocking remove	T&G mat'l remove
window plywood remove	ceiling joist remove	6/19/97
get toilet	rafters remove	clean up
pick up nails	wainscotting remove	load dump truck
roof sheathing remove	denail skirt	dump run
stack roof sheathing	6/10/97	matl to warehouse
clean up	instruction	T&G flooring removal
remove skirt boards	set up	skirt wood removal
6/2/97	drywall remove	sub-floor removal
stack roof sheathing	dump run	de-nailing
roof sheathing remove	elec remove	T&G flooring stacking
ceiling drywall remove	denail	6/20/97
Load drywall in truck	stack doors	sub-floor matl stack
dump run	load truck	sub-floor de-nail
construct gaylord boxes	size lumber	floor joist remove
clean up	plywood remove	rim joist/stringer remove
trim wood remove	stack wood	set up
supply run	joist remove	stacking wood
remove windows	denail studding	sub-floor matl. banding
trim rafters	rafters remove	clean up
instruction	6/11/97	6/23/97
rafter deconstruction	material to warehouse	matl to warehouse
decontaminate selves	6/16/97	dump run
denailing	clean up	supply run
6/3/97	instruction	sub-floor matl banding
mat'l to warehouse	stack wood	T&G floor banding
load drywall	linoleum remove	break
clean up	exterior walls remove	load truck
denail	skirt wood remove	clean up
stack wood	set up	7/29/97
drywall remove, walls	went to get truck	clean up
trim wood to size	remove drywall	concrete slab remove
6/5/97	elec service cut wires	floor joist/stringer remove
removed drywall	supply run	8/11/97
load drywall in truck	denail exterior walls	concrete slab remove
removed wainscott	6/17/97	
denail	clean up	
remove elec wiring	denail ext. wall matl.	
	dump run	
	linoleum remove	
	ext wall remove	
	stack lumber	

Summary of Task Building 2143

6/24/97	9/9/97	7/17/97	8/7/97
site prep	drywall remove	de-nailing	drywall remove
roof guardrail construct	de-nailing	dump run	elec. wiring remove
6/25/97	drywall load in roll-off	supply run	insulation remove
site prep	site prep	ext wall remove	clean up
clean up	elec fixtures remove	load truck	8/8/97
elec fixtures remove	plumbing fixtures remove	clean up	de-nailing
roof guardrail construct	heat ducts remove	7/18/97	clean up
supply run	elec wiring remove	de-nailing	insulation to storage
plywood from windows	heater remove	ext wall remove	8/14/97
created tool room	blocking remove	load truck	hot water heater remove
stack plywood	insulation remove	dump run	de-nailing
furniture removed	clean up	eave remove	T&G flooring remove
6/26/97	7/10/97	clean up	heat ducts remove
instruction	de-nailing	7/21/97	clean up
clean up	roof sheathing stack	de-nail	8/15/97
site prep	roof sheathing remove	7/24/97	wood stacking
asphalt shingles remove	drywall load in roll-off	clean up	de-nailing
supply run	clean up	de-nailing	set up
plumbing fixture remove	7/11/97	wood stacking	T&G flooring remove
elec fixtures remove	roof sheathing remove	7/28/97	sub-floor remove
Gaylord boxes make	roof sheathing stack	de-nailing	clean up
6/27/97	rafters remove	7/30/97	8/18/97
instruction	ceiling joist remove	bathroom deconstruct	de-nailing
windows stack	drywall into roll-off	set up	wood stacking
elec fixtures remove	de-nailing	door remove	heat ducts stacking
clean up	roof shingles pick up	exp. w/ asb. tile removal	sub-floor remove
supply run	clean up	clean up	elec wiring remove
site prep	7/14/97	8/4/97	set up
plumbing fixture remove	de-nailing	insulation remove	flooring stacking
matl to warehouse	drywall load in roll-off	bathroom deconstruct	sub-floor stack
drywall remove	rafters remove	set up	T&G flooring remove
windows remove	ceiling joist remove	clean up	painted scrap in box
trim removal	blocking remove	8/5/97	clean up
shingle removal	elec wire remove	set up	8/19/97
LBP work	windows remove	de-nailing	de-nail
7/7/97	clean up	8/6/97	wood stack
de-nail	7/15/97	matls inside warehouse	floor joist remove
pick up shingles	de-nailing	wood stack	elec wiring remove
roof shingles remove	drywall remove	drywall remove	T&G flooring remove
clean up	1X10 T&G remove	clean up	sub floor remove
7/8/97	roof supports remove		1X10 T&G remove
pick up shingles	ext. wall remove		intr framing remove
ceiling drywall remove	paint chips hepa/vac		clean up
ceiling insulation remove	clean up		
drywall remove	7/16/97		
shingles remove	de-nailing		
sheathing remove	eave material into truck		
elec fixtures remove	dump run		
elec wiring remove	mat'l to warehouse		
clean up	windows remove		
	eaves remove		
	wood stack		
	clean up		

Summary of Task Building 2143

8/20/97	8/28/97	9/5/97
de-nail	T&G flooring de-nail	floor joist de-nail
wood stack	T&G flooring stack	wood sort/band
floor joist remove	sub-floor remove	pier blocks remove
elec remove	clean up	clean up
drywall remove	8/29/97	9/8/97
1X10 T&G remove	T&G flooring de-nail	De-nail Boards
intr framing remove	T&G flooring stack	Sort and Band Boards
intr stairs remove	Floor joist de-nail	Floor joist de-nail
beams remove	Floor joist stack	supply run
rim-joist remove	sub-floor de-nail	de-nail rim joist
clean up	sub-floor stack	de-nail foundation blocks
8/21/97	ext studs de-nail	clean up
de-nail	ext studs stack	9/9/97
wood stack	floor joist remove	sheathing stack/band
intr framing remove	rim joist remove	T&G flooring stack/band
floor joist remove	clean up	clean up
drywall in roll-off	9/1/97	9/10/97
skirt boards remove	rim joist de-nail	load dump truck
plumbing leak	rim joist stack	T&G flooring stack/band
beams remove	floor joist de-nail	load drywall in truck
brace walls	floor joist de-nail	siding stack/band
rim-joist remove	sub-floor de-nail	dump run
ext stairs remove	sub-floor stack	clean up
clean up	Concrete slab break	9/25/97
8/22/97	stringers de-nail	tools to warehouse
de-nailing	stringers stack	clean up
stack wood	clean up	9/30/97
remove skirt boards	9/2/97	siding to warehouse
drywall into roll-off	sub floor de-nail	siding stack/band
ext walls remove	sub-floor stack	clean up
clean up	concrete slab break	10/10/97
8/25/97	supply run	Material to warehouse
siding de-nail	clean up	clean up
wood stack	9/3/97	10/21/97
ext walls remove	concrete slab remove	Material to warehouse
plumbing leak fix	supply run	clean up
clean up	sub-floor sort/band	10/22/97
8/26/97	sub floor remove	Material to warehouse
siding de-nail	floor joist remove	clean up
wood stack	clean up	10/23/97
dump run	9/4/97	Material to warehouse
LBP chips HEPA/vac	concrete slab remove	clean up
load truck	floor joist de-nail	10/27/97
T&G flooring remove	sub-floor remove	Material to warehouse
ext wall remove	floor joist remove	clean up
clean up	wood sort/band	10/28/97
8/27/97	foundation piers remove	load truck
ext studs de-nail	clean up	dump run
T&G flooring de-nail		clean up
stack wood		10/29/97
T&G flooring remove		clean up
sub-floor remove		
clean up		

Task Summary Buildings 2182 & 4

10/1/97
site prep
shingles remove
un-stick truck
window plywood remove
skirt boards remove
dump run
remove windows
clean up
10/2/97
load dump truck
shingles remove
windows to warehouse
window plywood remove
dump run
remove windows
clean up
10/3/97
load dump truck
shingles remove
plastic over roof
skirt boards remove
dump run
clean up
10/6/97
roof vents remove
clean up
10/7/97
drywall remove
drywall nails pull
lead paint scrape
dump run
clean up
10/8/97
drywall remove
drywall nails remove
lead paint scrape
dump run
roof vents remove
clean up
10/9/97
plastic on roof
electrical mast remove
dump run
clean up
10/13/97
hepa vac
clean up
10/14/97
hepa vac
clean up

Summary of Task Building 2252

8/13/97	9/19/97
light fixtures remove	de-nail
int. walls remove	ext. wall remove
bath fixtures remove	columns remove
site set-up	clean up
heating remove	9/22/97
matl to warehouse	ext. wall remove
supply run	stack wood
electric remove	de-nail
clean up	ridge beam dismantle
9/11/97	clean up
load dump truck	9/23/97
site set-up	load dump truck
shingles remove	stack wood
dump run	de-nail
clean up	dump run
9/12/97	clean up
roof sheathing remove	9/24/97
rafters remove	load dump truck
stack wood	stack wood
elec. boxes remove	interior walls remove
clean up	de-nailing
9/15/97	dump run
roof sheathing remove	clean up
rafters remove	9/25/97
clean up	stack wood
9/16/97	de-nail
rafters remove	clean up
stack wood	10/25/97
windows remove	matl to warehouse
de-nail	clean up
clean up	
9/17/97	
load dump truck	
int.. drywall remove	
ext. wall remove	
beams remove	
dump run	
clean up	
9/18/97	
load dump truck	
garage doors remove	
plumbing remove	
ext. wall remove	
de-nail	
dump run	
clean up	

10/10/97
cabinets remove
appliances to warehouse
trim/baseboard remove
clean up
10/16/97
site set-up
tar/gravel roofing remove
roof insulation remove
intr. walls remove
inter. trim/doors remove
dump run
supply run
clean up
10/17/97
roof insulation remove
interior remove
dump run
instruction
kitchen cabinets remove
clean up
10/20/97
roof insulation remove
paper work
intr fixtures remove
dump run
tool shed remove
clean up
10/21/97
roof trim remove
garage storage remove
clean up

Appendix 14.9

Time for Each Task Performed for Each Building

Time Required for Each Task Performed

by the Deconstruction Crew

During Deconstruction

5/6/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
asb-roof vents remove				3.75	6.5		1.25	11.5			
bag lawn waste				1.25				1.25			
break	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
clean street gutter			1.5					1.5			
clean-up		0.5	0.25			0.5	0.5	1.25			
elec. outlets remove						1.5		1.5			
elec. remove								0			
Gas and oil mowers			0.5	0.5			0.75	1.75			
hot water unit remove		0.5						0			
light fix. remove	1	2.75				1.25		1.25			
lunch	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
mowing			0.5					0.5			
photo	2							0			
plumbing removal		3.25				1.75		1.75			
site security			0.5					0.5			
storage security			1.5					1.5			
Supply run			0.75		0.5			1.25			
Weed whack			1.5	1.5				3			
window boards de-nail						1.25		1.25			
window boards remove						0.75		0.75			
	4	8	8	8	8	8	3.5				
	35.5										
5/7/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
break	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
lunch	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
asb-roof vent removal					0.75			0.75			
clean-up	0.5		0.5	0.5	0.5	0.5		2			
hepa-vac interior				1		1		2			
haul shingles to dump		1.75						0			
remove shingles	7	1.75	7	6	6.25	6		25.25			
	8.5	4.5	8.5	8.5	8.5	8.5	1				
	35										
5/8/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
Fit test respirator	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
help others suit-up	0.5	2.5	0.5	0.25	0.25	0.25	1.5	2.75			
supply run		2.75						0			
make Gaylord boxes		0.25						0			
debrief	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.25			
lunch	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
break	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5			
doors and trim removal	1.25				5.25	2.75		8			
dry-wall removal	1.5			5.25				5.25			
scrape-and cut boards	0.75		4.75					4.75			
acoustic tile removal	0.5							0			
decontaminate tools		1						0			
prep. work area	0.25	0.25	0.5	0.5	0.5	0.5		2			
decontaminate selves	0.75		0.75	0.75	0.75	0.75		3			
de-nail	1.25		0.25			2.5		2.75			
	8.5	8.5	8.5	8.5	8.5	8.5	3.25				
	37.25										
5/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
get out tools	0.25	0.5	0.5	0.5	0.25	0.5		1.75			
remove window protection	1.5				1.5			1.5			
strip shingles	5.25	6.25	6.25	2	5.25	6.5		20			
dump run		0.75						0			
heat stroke				1.5				1.5			
clean up				1.75				1.75			
lunch	0.5		0.5	0.5	0.5	0.5		2			
break	0.5	0.5	0.5	0.5	0.5	0.5		2			
	8	8	7.75	6.75	8	8	0				
	30.5										
5/12/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
signage	0.5				3.75			3.75			

remove window protection	0.5							0
stacked roof sheathing	5.5			1	2	3.75		6.75
light fixtures remove	0.5							0
roof sheathing removal	1	6	4	5.75		1.25		11
dump run		1.25						0
clean up		0.25	0.5	0.75	0.75	0.5	2.25	4.75
get out tools			0.5			0.5		1
shingle removal			1.5			1.5		3
supply run			0.5					0.5
lunch	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.5
break	0.5	0.5	0.5	0.5	0.25	0.5	0.5	2.25
	9	8.5	8	8.5	7.25	8.5	3.25	
	35.5							
5/13/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	
lunch	0.75	0.75	0.75	0.75	0.75	0.75		3
break	0.5	0.5	0.5	0.5	0.5	0.5		2
stacked lumber	2					1		1
stacked windows	1.25					0.75		0.75
de-nailed vent screens	1							0
de-nail	2.25	0.5		0.5				0.5
cleanup	0.25	0.5	0.5	0.5	0.5	0.5		2
de-nail trim		2				2.75		2.75
heat duct remove		0.5			0.5			0.5
truck repair		1.25						0
supply run		1						0
build Gaylord boxes		1	0.5	0.5	0.5	1	0.75	3.25
ceiling dry wall removal		0.5	0.5		0.5	0.5	0.5	2
assigned task			0.5					0.5
set up tools			2					2
windows remove			2.25	0.75	0.75	0.75		4.5
furnace remove			1	1	1			3
trim remove				4	3.5			7.5
	8	8.5	8.5	8.5	8.5	8.5	1.25	
	35.25							
5/14/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	
lunch	0.75	0.75	0.75	0.75	0.75	0.75		4.5
break	0.5	0.5	0.75	0.5	0.5	0.5		3.25
stack wood	0.75							0.75
de-nail	0.75						1	1.75
compile data	0.75							0.75
stack acoustic tile	0.75							0.75
stack rafters	0.75							0.75
move scaffold	0.75							0.75
de-nail ext. t&g ceiling	1.25							1.25
build Gaylord boxes	0.25							0.25
organize site	0.75							0.75
clean up	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.75
get out tools		0.25	0.25	0.25	0.25	0.25	0.25	1.5
eve blocking removal		0.75	0.25					1
rafter removal		3.5		2.25	3.25			9
supply run		1.75	0.25					2
t&g ceiling removal		0.75						0.75
de-nail rafters			1					1
trim rafters to size			5					5
interior dry wall removal				2	0.5	4.75		7.25
interior plywood removal				1	1	0.25		2.25
acoustic tile removal				0.5	2			2.5
interior t&g removal				1				1
removal electrical						1.75		1.75
	8.25	8.5	8.5	8.5	8.5	8.5	1.5	
	52.25							
5/15/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	
break	0.5	0.5	0.5	0.5	0.5	0.5		3
lunch	0.5	0.5	0.5	0.5	0.5	0.5		3

clean up	0.25	0.25	0.25	0.25	0.25	0.25		1.5			
stack lumber	1.25							1.25			
build Gaylord boxes	2							2			
electrical removal	1							1			
rafter removal		1.5	3	1.5	1.5	1.5		9			
2x4 removal		0.5	0.75			1.75		3			
de-nail ext. t&g		1.25						1.25			
inter dry wall remove		3	3			3		9			
de-nail 2x4				1.75	1.75			3.5			
de-nail rafters				4	4			8			
de-nail intr walls						1		1			
	5.5	7.5	8	8.5	8.5	8.5					
	46.5										
5/16/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch	0.75	0.75	0.75	0.75	0.75	0.75		4.5			
break	0.25	0.25	0.25	0.25	0.25	0.25		1.5			
clean up		1	0.5	1.5	1	1		5			
make Gaylord boxes	1.5							1.5			
de-nail rafters	0.75							0.75			
stack rafters	3.5				0.5			4			
set out tools	0.25	0.25	0.25	0.25	0.25	0.25		1.5			
clean up dry wall		0.75	2.25	2.25	2.25			7.5			
remove insulation		0.5						0.5			
de-nail intr walls		3.5	2.25			4.75		10.5			
de-nail rafters		0.25		2.25	2.25	0.25		5			
plan assignments			1					1			
	7	7.25	7.25	7.25	7.25	7.25					
	43.25										
5/19/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch	0.5	0.5	0.5	0.5	0.5	0.5		3			
break		0.5	0.75	0.5	0.5	0.5		2.75			
clean up			0.25			0.75		1			
setup		0.25	0.25	0.25	0.25	0.25		1.25			
work discussion	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.75			
stacked lumber	1.75						3.25	5			
inter t&g remove		1.75	3.75	4.75	4.75			15			
stack doors		0.25						0.25			
doors remove		0.5						0.5			
sink and cabinet remove		1						1			
de-nail frame		2.25		1		5.25		8.5			
de-nail intr t&g		1.25		1.25		1		3.5			
plan intr t&g remove			0.5					0.5			
interior frame remove			1.75		2.25			4			
	2.5	8.5	8	8.5	8.5	8.5	3.5				
	48										
5/20/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch	0.5	0.5	0.5	0.5	0.5	0.5		3			
break	0.75	0.5	1	0.5	0.5	0.5		3.75			
clean up	1.75	0.5			0.25	0.25		2.75			
stack lumber	4.25							4.25			
de-nailing		3.75		3.75		3.75		11.25			
move dry wall boxes		0.5			0.5			1			
inter t&g remove			3	1	1.75	0.75		6.5			
inter framing remove			2.75		1.75			4.5			
de-nail intr t&g				2.5				2.5			
de-nail 2x4		2.5				2		4.5			
shower remove					2			2			
	7.25	8.25	7.25	8.25	7.25	7.75	0				
	46										
5/21/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
crew meeting-ext. wall	0.75	0.75		0.75	0.75	0.75	0.75	4.5			
lunch	0.75	0.75		0.75	0.75	0.75	0.75	4.5			
break	0.5	0.5		0.5	0.5	0.5	0.5	3			
clean up	0.25	0.25		0.25	1	0.25	0.5	2.5			

interior walls	1.5							1.5			
de-nail exterior frame	0.75							0.75			
stack lumber	1.75						0.75	2.5			
brace exterior walls		0.75			0.75		0.75	2.25			
ext wall blocks remove		1			1		3.75	5.75			
supply run		0.5						0.5			
ext wall 2x4 remove		3.25			2.75			6			
gable 2x4 removal		0.75			0.75			1.5			
inter 1x12 remove				1.75		1.75		3.5			
inter 1x12 sizing				4.5				4.5			
de-nail ext 2x4						4.5		4.5			
plumbing remove					0.25			0.25			
	6.25	8.5	0	8.5	8.5	8.5	7.75				
	48										
5/22/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch	0.5	0.5		0.5	0.5	0.5	0.5	3			
break	0.5	0.5		0.5	0.5	0.5	0.5	3			
inter 1x12 stacked	2.5						2.5	5			
2x4 stacked	1.5							1.5			
stack lumber	0.75							0.75			
set out tools		1		1	1	1		4			
ext wall blocks remove		0.5			0.5			1			
ext wall 2x4 remove		3.25			3.75			7			
make boxes		0.5						0.5			
tile & plywood remove		2.25		1.25	2.25	2.75		8.5			
2x4 sizing				4				4			
de-nail 2x4	0.75			1.25		3.75		5.75			
	6.5	8.5	0	8.5	8.5	8.5	3.5				
	44										
5/23/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
supply run	1	1						2			
stack ext. drywall	0.75	0.75		0.25	1	0.5		3.25			
stack siding	0.75	0.75		1	1	0.75		4.25			
de-nail siding	0.5	0.5		1	0.75	1	1	4.75			
site layout							0.5	0.5			
break				0.25	0.25	0.25		0.75			
plastic for rain	0.5	0.5		0.5	0.5	0.5	0.5	3			
clean up				0.5		0.5		1			
	3.5	3.5	0	3.5	3.5	3.5	2				
	19.5										
5/27/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
meet fork-lift truck	0.75							0.75			
de-nail siding	2.25	2.75		2.25		1.5		8.75			
stack lumber	1.25	0.5			2.5			4.25			
load lights to warehouse	1							1			
box paper from ext wall	1							1			
lunch	0.5							0.5			
break	0.5							0.5			
clean up	1	1		4	0.5			6.5			
dump run		4.25						4.25			
t&g floor removal		0.5			1.25			1.75			
size lumber				1				1			
plywood/tile remove				1.75	1.25			3			
load waste drywall					1			1			
good mat'l to warehouse						8	8	16			
pick-up flat-bed							1.5	1.5			
	8.25	9	0	9	6.5	9.5	9.5				
	51.75										
5/28/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch	0.5	0.5	0.5	0.5	0.5	0.5		3			
break	0.5	0.5	0.5	0.5	0.5	0.5		3			
clean up		0	0.5	1.5	0.5	0.25		2.75			
stack 1x12 skirting	1.75							1.75			

warehouse, boxes	1.5							1.5			
dump run		3.75						3.75			
mat'l to warehouse		4.5			2.25	1		7.75			
strip skirting			3.25					3.25			
de-nail		0.75	2.5	1.25		1.5		6			
organize site			1.25		0.5	1.5		3.25			
load fence		0.5			1	0.5		2			
plywood/tile remove				1.5	1.5			3			
t&g floor remove				2.25	2.25			4.5			
plywood/tile load				0.5	0.5			1			
stack wood				1.5	1			2.5			
fork-lift load truck						4		4			
paint signs				1				1			
return flat bed						1		1			
	4.25	10.5	8.5	10.5	10.5	10.75					
	55										
5/29/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch			0.5	0.5	0.5	0.5		2			
break			0.5	0.5	0.5	0.5		2			
t&g remove			1.5	2.25	4.25			8			
t&g de-nail					1.75	3.75		5.5			
stack wood					1.5	3.75		5.25			
1x6 sub-floor remove			1.25					1.25			
			3.75	3.25	8.5	8.5					
	24										
5/30/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
break			0.25		0.25			0.5			
1x6 sub-floor remove			2.75		2.75			5.5			
			3		3						
	6										
6/3/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
tools to warehouse		1.5		1.5							
lunch								0			
break								0			
clean up			1.75					1.75			
			1.75								
	1.75										
6/5/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch		0.5	0.5	0.5	0.5	0.5		2.5			
break		0.5	0.5	0.5	0.5	0.5		2.5			
clean up			0.5	0.5	0.75			1.75			
sub-floor remove		2	2	2	0.25	2		8.25			
t&g floor remove		1.5	1.5	3	2.25	2.25		10.5			
de-nail		0.75			2.25	1.25		4.25			
de-nail t&g		1.25	0.75					2			
size and stack wood			0.75					0.75			
	0	6.5	6.5	6.5	6.5	6.5					
	32.5										
6/6/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
break		0.25	0.25	0.25	0.25	0.25		1.25			
t&g removal				1.25	2			3.25			
t&g de-nail		3.75				2		5.75			
demo dry-rot in floor			3.25	1				4.25			
sub-floor de-nail		0.75	1.25	1.5	1.75	2.5		7.75			
		4.75	4.75	4	4	4.75					
	22.25										
6/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
break		0.25	0.25	0.25		0.25		1			
stack t&g floor		1.75	1.75	1.75		1.75		7			
sub-floor remove		2	2	2		2		8			
	0	4	4	4		4					
	16										
6/11/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch		0.5	0.5	0.5	0.5	0.5		2.5			

break		0.5	0.5	0.5	0.5	0.5		2.5			
clean up				1	1			2			
set up		0.25	0.25	0.25	0.25	0.25		1.25			
mat'l to warehouse		3.5				3.5		7			
sub-floor remove			1	1	1			3			
ext. wall remove			1.25	1.25	1.25			3.75			
stack lumber				2.25				2.25			
floor joist remove			5.25	2	4.25			11.5			
	0	4.75	8.75	8.75	8.75	4.75					
	35.75										
6/12/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch		0.5	0.5	0.5	0.5	0.5		2.5			
break		0.5	0.5	0.5	0.5	0.5		2.5			
clean up			0.75		2.75			3.5			
2x8 to warehouse		3.25			1	3.25		7.5			
stack lumber		0.5	0.75	1.25		0.5		3			
de-nail		0.75	2.5	2.75	2	0.75		8.75			
plumb/elec under floor			2					2			
2x8 joist remove			1.5	2.25	1.75			5.5			
remove piers				1.25				1.25			
ext. wall t&g sheetrock		1.5				1.5		3			
ext. wall studs remove		1.5				1.5		3			
		8.5	8.5	8.5	8.5	8.5					
	42.5										
6/13/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan				
lunch		0.5	0.5	0.5	0.5			2			
break		0.5	0.5	0.5	0.5			2			
clean up		0.75	0.75	0.75	0.75			3			
dump run		1						1			
de-nail 1x6		1.5		1.5	1.5			4.5			
denial & stack siding		1.25	1.25	1.25	1.25			5			
mat'l to warehouse		1.5	1.5	1.5	1.5			6			
de-nail		1.75	1.75	0.75	0.75			5			
concrete slab remove			0.5					0.5			
size 2x4			0.5					0.5			
size siding			1.5					1.5			
de-nail 2x4				2	2			4			
	0	8.75	8.75	8.75	8.75						
	35										
7/28/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Lombardo	Denisio	Miguel	
lunch		0.5						0.5	0.5	0.5	2
break		0.5						0.5	0.5	0.5	2
dump run		1.75									1.75
load scrap wood		2.5									2.5
load broken drywall		1.75									1.75
deconstruct sub floor								1.75	1.75	1.75	5.25
concrete slab remove								4.25	4.25	4.25	12.75
	0	7	0	0	0	0	0	7	7	7	
	28										

6/24/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	
Trim tree and clean site		2				2		2
load truck		1				1		1
break		0.25		0.25	0.25	0.25		0.75
dump run		1						0
remove trim						1		1
striping interior walls				4	4			8
	0	4.25	0	4.25	4.25	4.25	0	
	0	8.5	0	8.5	8.5	8.5	0	
	34							
7/21/97	Denisio	Chris	Lombardo	Matt	Hector	Miguel	Stan	
break	0.25	0.25	0.25		0.25	0.25		0.75
lunch	0.5	0.5	0.5		0.5	0.5		1.5
site prep, de-nailing sta.	0.5	0.5	0.5		0.5	0.5		1.5
clean-up	0.5	0.5	0.5		0.5	0.5		1.5
de-nailing	4.5		4.5			4.5		9
load dump truck		1.25			0.5			0.5
Remove elec. fixtures		0.5						0
remove interior walls		2.5			2.75			2.75
remove ceiling tiles					0.75			0.75
remove ceiling frame					0.5			0.5
move Lead encapsulant		0.25						0
	6.25	6.25	6.25	0	6.25	6.25	0	
	18.75							
7/22/97	Denisio	Chris	Lombardo	Matt	Hector	Miguel	Stan	
remove interior wall	1	1	1		1	1		3
remove ceiling drywall	2.25	1	2.25		3.25	2.25		7.75
move dump truck		1			0.5			0.5
stage plywood		0.5						0
de-nailing	3		3			3		6
lunch	0.5	0.5	0.5		0.5	0.5		1.5
break	0.5	0.5	0.5		0.5	0.5		1.5
load truck	1	1	1		0.5	1		2.5
dump run		2						0
hang door		0.5						0
clean-up	0.25		0.25		0.25	0.25		
de-nail int. wall/ceiling					1.5		2.5	4
	8.5	8	8.5	0	8	8.5	2.5	
	27.5							
7/23/97	Denisio	Chris	Lombardo	Matt	Hector	Miguel	Stan	
de-nailing	7.25		7.25			7.25		14.5
hepa-vac				2	2			4
mask windows		1.25		1.25	1.25			2.5
encapsulation		6.75		6.75	6.75			13.5
								0
clean up	2.75		2.75			2.75		5.5
lunch	0.5	0.5	0.5	0.5	0.5	0.5		2
break	0.5	0.5	0.5	0.5	0.5	0.5		2
	11	9	11	11	11	11	0	
	44							
7/24/97	Denisio	Chris	Lombardo	Matt	Hector	Miguel	Stan	
Chalk Exterior Walls		2		2	2			4
Encapsulate top coat		3.75		3	3			6
to landfill		1						0
encapsulate windows				1.75	1.75			3.5
clean up		0.25		0.25	0.25			0.5
get out tools		0.5		0.5	0.5			1
lunch		0.5		0.5	0.5			1
break		0.5		0.5	0.5			1
	0	8.5	0	8.5	8.5	0	0	

	17							
7/25/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch	0.5	0.5		0.5	0.5	0.5		1.5
break	0.25	0.25		0.25	0.25	0.25		0.75
materials to warehouse	3.75	3.75				3.75		3.75
encapsulate windows				3.75	3.75			7.5
cleanup	0.5	0.5		0.5	0.5	0.5		1.5
	5	5	0	5	5	5	0	
	15							
7/28/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch				0.5	0.5			1
break				0.5	0.25			0.75
encapsulate exterior				4.5	3.75			8.25
encapsulate door trim				2				2
encapsulate windows					2			2
set-up		1						1
clean-up				1	1			2
	0	1	0	8.5	7.5	0	0	
	17							
7/29/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
break				0.5	0.5			1
lunch				0.5	0.5			1
set-up				1.25	1.25			
clean up				0.25	0.25			0.5
encapsulate windows				6	6			12
	0	0	0	8.5	8.5	0		
	17							
7/30/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch				0.5	0.5			1
break				0.5	0.5			1
clean up				0.25	0.25			0.5
set-up				0.5	0.5			1
encapsulate windows				6.75	6.75			13.5
	0	0	0	8.5	8.5	0		
	17							
8/4/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch				0.5				0.5
break				0.25				0.25
clean up				0.5				0.5
setup				0.25				0.25
encapsulate windows				0.5				0.5
remove elec wires				3.75				3.75
sweep roof				0.75				0.75
replace door				0.75				0.75
encapsulate door				1.25				1.25
	0	0	0	8.5	0	0	0	
	8.5							
5/20/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch		0.5	0.5	0.5		0.5		2
break		0.25	0.25	0.5		0.25		1.25
clean up		0.25		0.25				0.5
set-up				0.25				0.25
scrape windows		5.5						5.5
touch-up				4.25				4.25
remove elec panel				0.75				0.75
stack at warehouse			5.25			5.25		
replace door				1				1
encapsulate windows				1.25				1.25
	0	6.5	6	8.75	0	6	0	

	27.25							
8/6/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch		0.5		0.5				1
break		0.5		0.5				1
clean up		0.25		0.25				0.5
set-up		0.25		0.25				0.5
scrape windows		7		0.5				7.5
touch up				6.5				6.5
	0	8.5	0	8.5	0	0	0	
	17							
8/7/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
lunch		0.5		0.5				1
break		0.5		0.5				1
clean up		0.25		0.25				0.5
scrape windows		2.5						2.5
pick up supplies		0.5		0.25				0.75
site clean up		2						
touch up		1.25		6				7.25
	0	7.5	0	7.5	0	0	0	
	15							
8/8/97	**Denisio**	**Chris**	**Lombardo**	**Matt**	**Hector**	**Miguel**	**Stan**	
set up		0.25		0.25				0.5
site clean up		1						1
reassemble windows				5.75				5.75
break				0.5				0.5
lunch				0.5				0.5
	0	1.25	0	7	0	0	0	
	8.25							

5/29/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
break		0.5	0.5	0.5			
lunch		0.5	0.5	0.5			
fencing		2.75	1.25	2.75			
remove roof shingles		5	4	4.5	1.5	1.5	
dump run		1.25					
	10	10	6.25	8.25	1.5	1.5	0
	17.5						
5/30/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
break		0.5	0.5	0.5	0.5	0.5	
lunch		0.5	0.5	0.5	0.5	0.5	
remove shingles		1.5	1.25	2.25	1.25	2.25	
dump run		0.75					
supply run		1.5					
stack skirt boards		0.5					
window plywood remove			1				
get toilet			0.5				
pick up nails			1.75				
roof sheathing remove				4	4.25	2.75	
stack roof sheathing		3.75		1.75			
clean up		0.25	0.25	0.25	0.25	0.25	
remove skirt boards			1			3	
	0	9.25	6.75	9.25	6.75	9.25	0
	32						
6/2/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
stack roof sheathing			0.75				
roof sheathing remove		1.5		1.5		1.5	
ceiling drywall remove		0.75	2.25	1.5	1	0.75	
Load drywall in truck		2.75			0.75	2.25	
dump run		1					
construct Gaylord boxes		0.75				1.75	
clean up		0.25	0.25	0.25	0.25	0.25	
lunch		0.5	0.5	0.5	0.5	0.5	
break		0.5	0.5	0.5	0.5	0.5	
trim wood remove			1				
supply run			0.75				
remove windows			0.75	0.75	0.75	0.75	
trim rafters			1.25				
instruction		0.25	0.5				
rafter deconstruction				1.5	1.5		
decontaminate selves							
de-nailing				1.75	1.75		
	0	8.25	8.5	8.25	7	8.25	0
	32						
6/3/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
mat'l to warehouse		3.25		3.25			
load drywall		0.75		0.75			
clean up		0.25		0.25	2.75	2.75	
break			0.25		0.25	0.25	
lunch		0.5	0.5	0.5	0.5	0.5	
de-nail			1		1	1	
stack wood			1		1	1	
drywall remove, walls			1.25				
trim wood to size			0.75				
	0	4.75	4.75	4.75	5.5	5.5	0
	20.5						
6/5/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
removed drywall		0.75			0.75		
load drywall in truck				0.75		0.75	
removed wainscot		0.75		0.75	0.75	0.75	
de-nail			2				

remove elec wiring		0.5		0.5	0.5	0.5				
	0	2	2	2	2	2	0			
	8									
6/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan			
lunch		0.5	0.5	0.5	0.5	0.5				
break		0.25	0.25	0.25	0.25	0.25				
set up		0.25	0.25	0.25	0.25	0.25				
clean up		0.25		0.25	0.25	1				
elec. wire remove		1.25								
drywall remove		2		1.5	0.25					
de-nail studding			0.5							
stack joist lumber			0.5							
windows remove			0.5	0.5	0.5					
rafter blocking remove			0.75							
ceiling joist remove				1.25	1.25	0.5				
rafters remove					1.25					
wainscoting remove						0.75				
de-nail skirt						0.25				
	0	4.5	3.25	4.5	4.5	3.5	0			
	20.25									
6/10/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan			
break		0.25	0.5	0.5	0.5	0.5				
lunch		0.5	0.5	0.5	0.5	0.5				
instruction		0.25	0.25	0.25	0.25	0.25				
set up		0.25	0.25	0.25	0.25	0.25				
drywall remove		1.5	1	1.5	1.5	1.5				
dump run		1								
elec remove		2								
de-nail		1		0.75	0.75	3				
stack doors		0.75								
load truck		1				0.25				
size lumber			1.5			1.25				
plywood remove			0.5	1.25	1.25					
stack wood			4			1				
joist remove				1.75	1.75					
de-nail studding				0.75	0.75					
rafters remove				1	1					
	0	8.5	8.5	8.5	8.5	8.5				
	42.5									
6/11/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan			
material to warehouse		4.25				4.25				
break		0.25				0.25				
	0	4.5	0	0	0	4.5	0			
	9									
6/16/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan			
lunch	0.5	0.5	0.5	0.5						
break	0.5	0.5	0.25	0.5						
clean up		0.25	0.5	0.25						
instruction	0.5	0.25		0.25						
stack wood	2									
linoleum remove	0.25	0.25		0.5						
exterior walls remove	1.75	4.5	1.75	5						
skirt wood remove	0.25									
set up		0.75	0.75	0.75						
went to get truck		0.25								
remove drywall		0.5								
elec service cut wires			0.25							

supply run			0.25				
de-nail exterior walls		0.75		0.75			
	5.75	8.5	4.25	8.5	0	0	
	27						
6/17/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
lunch		0.5	0.5	0.5			
break		0.5	0.5	0.5		0.25	
clean up		0.25	0.25	0.25		0.25	
de-nail ext. wall matl.		4.75	5.75	2			
dump run		1					
linoleum remove		1.5	1.5	3		1.5	
ext wall remove				2.25			
stack lumber						1	
	0	8.5	8.5	8.5	0	3	0
	28.5						
6/18/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
lunch		0.5	0.5	0.5	0.5	0.5	
break		0.5	0.5	0.5	0.25	0.5	
clean up				0.25	0.25	0.25	
linoleum remove		2		2.5	2.5		
de-nailing		5	5.75	0.5	2.75		
instruction			0.5				
supply run			0.5				
ext. matl. size						3.5	
ext. wall matl. stack				1.5		3.75	
T&G mat'l remove				2.75			
	0	8	7.75	8.5	6.25	8.5	0
	39						
6/19/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
lunch		0.5	0.5	0.5	0.5	0.5	
break			0.5	0.5	0.5	0.5	
clean up			0.25	0.25	0.25	0.25	
load dump truck		1.5				0.75	
dump run		0.75					
matl to warehouse		0.5					
T&G flooring removal		2	1.75	3	1.5	2	
skirt wood removal		0.75	1.75			0.75	
sub-floor removal		0.75	1.75			1.75	
de-nailing			1.75	4.25	5.75		
T&G flooring stacking			0.25			2	
	0	6.75	8.5	8.5	8.5	8.5	0
	40.75						
6/20/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
lunch		0.5		0.5	0.5	0.5	
break		0.5		0.5	0.5	0.5	
sub-floor matl stack	1						
sub-floor de-nail		2.5		2.5	2.5	2.5	
floor joist remove		1.25		1.25	1.25	1.25	
rim joist/stringer remove		1.5		1.5	1.5	1.5	
set up		1		1			
stacking wood		1		1		1	
sub-floor matl. banding	1				1	1	
clean up		0.25		0.25		0.25	
	2	8.5	0	8.5	7.25	8.5	0
	34.75						
6/23/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan
matl to warehouse		5.75				5.75	
dump run		1					
supply run		0.5					

sub-floor matl banding				1.25						
T&G floor banding				2.25	2.25					
break		0.5		0.25	0.25	0.5				
load truck				0.75	0.75	0.75				
Lunch		0.5		0.5	0.5	0.5				
clean up		0.5		0.5	0.5	1.25				
	0	8.75	0	5.5	4.25	8.75	0			
	27.25									
7/29/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
lunch								0.5	0.5	0.5
clean up								0.25	0.25	0.25
concrete slab remove								4.25	4.25	4.25
floor joist/stringer remove								1.25	1.25	1.25
	0	0	0	0	0	0	0	6.25	6.25	6.25
	18.75									
8/11/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
break								0.25	0.25	0.25
concrete slab remove								2	2	2
	0	0	0	0	0	0	0	2.25	2.25	2.25
	6.75									

6/24/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
site prep										
roof guardrail construct		3.75					3.75			
	0	3.75	0	0	0	0	3.75	0	0	0
	7.5									
6/25/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
break	0.5	0.5		0.5	0.5	0.5				
lunch	0.5	0.5		0.5	0.5	0.5				
site prep	5.25				1.75	3				
clean up	0.75					0.75				
elec fixtures remove	0.5			2.25		0.5				
roof guardrail construct		4.75				1.5	2.5			
supply run		2.25			3.5					
plywood from windows				2.5		1				
created tool room				0.75	1.25					
stack plywood				1.5	0.5					
furniture removed						1.25	1.25			
	7.5	8	0	8	8	9	3.75	0	0	0
	44.25									
6/26/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
break	0.5	0.5		0.5	0.5	0.5				
lunch	0.5	0.5		0.5	0.5	0.5				
instruction	0.5	0.5		1	0.5	1				
clean up		0.25		0.25	0.25	0.25				
site prep	1	1.25		1.25	1	0.75				
asphalt shingles remove	0.5	4.25		3.75	1.5	4.75				
supply run										
plumbing fixture remove		0.75		0.75						
elec fixtures remove						0.75				
Gaylord boxes make					0.5					
	3	8	0	8	4.75	8.5	0	0	0	0
	32.25									
6/27/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
break	0.25	0.75		0.75	0.75					
lunch	0.75	0.75		0.75	0.75					
instruction	0.25	0.5		0.5	0.25		0.25			
windows stack	0.5			2.5						
elec fixtures remove	1	1.75			2					
clean up	0.5	0.25			0.25					
supply run		0.75								
site prep		1		0.75	0.5					
plumbing fixture remove		1								
matl to warehouse	0.5	1		0.5	0.75					
drywall remove		0.25			0.25					
windows remove							1.25			
trim removal				2.25	0.75					
shingle removal		0.5		0.5	0.5					
LBP work					1.25					
	3.75	8.5	0	8.5	8	0	1.5	0	0	0
	30.25									
7/7/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
break		0.5		0.5				0.5	0.5	0.5
lunch		0.5		0.5				0.5	0.5	0.5
de-nail								3	3	3
pick up shingles								4.25	4.25	4.25
roof shingles remove		7.25		7.25						
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
7/8/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel

pick up shingles								2	2	2.75
ceiling drywall remove								1.75	1.75	
ceiling insulation remove				1.5				1.5	1.5	1.5
drywall remove		0.5						1.75	1.75	1.75
shingles remove		1		1.5						
sheathing remove		1		1.5						
elec fixtures remove		3.5		0.75						
elec wiring remove		1		1.75						
clean up		0.5		0.5				0.5	0.5	1.5
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
drywall remove								2	2	
de-nailing								5		3
drywall load in roll-off		0.25		0.25				0.25	0.25	0.25
site prep		0.5								
elec fixtures remove		3.25								
plumbing fixtures remove		3.25								
heat ducts remove									5	2
elec wiring remove				4.75						
heater remove				1						
blocking remove				1.25						
insulation remove										2
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
7/10/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								2.25		
roof sheathing stack								2.5		1.75
roof sheathing remove		5.75		5.75				1.75	5.75	4
drywall load in roll-off		1.5		1.5				0.75	1.5	1.5
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
7/11/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof sheathing remove		3		4.25				2		2
roof sheathing stack		1.25		0.75				1.75		1.75
rafters remove		1								
ceiling joist remove		2		2						
drywall into roll-off				0.25				0.75		
de-nailing								2.75		2.75
roof shingles pick up										0.75
lunch		0.5		0.5				0.5		0.5
break		0.5		0.5				0.5		0.5
clean up		0.25		0.25				0.25		0.25
	0	8.5	0	8.5	0	0	0	8.5	0	8.5
	34									
7/14/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								6		6
drywall load in roll-off								1		1
rafters remove		7		4.25	4.25					
ceiling joist remove				2					5.25	
blocking remove									0.75	
elec wire remove									1	

windows remove				0.75						
lunch		0.5		0.5	0.5			0.5	0.5	0.5
break		0.5		0.5	0.25			0.5	0.5	0.5
clean up		0.25		0.25	0.25			0.25	0.25	0.25
	0	8.25	0	8.25	5.25	0	0	8.25	8.25	8.25
	46.5									
7/15/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								7.25	7.25	7.25
drywall remove		1		1	1					
1X10 T&G remove		2.75		1	1					
roof supports remove		1.5		1.75	1.75					
ext. wall remove		2		3.5	2.75					
paint chips hepa/vac					0.75					
lunch		0.5		0.5	0.5			0.5	0.5	0.5
break		0.5		0.5	0.5			0.5	0.5	0.5
clean up		0.25		0.25	0.25			0.25	0.25	0.25
	0	8.5	0	8.5	8.5	0	0	8.5	8.5	8.5
	51									
7/16/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								6.75	6.75	6.75
eave material into truck		1.5		1.5	1.5					
dump run		1								
mat'l to warehouse		4.25		2.25	2.25					
windows remove				1	1					
eaves remove				2	2					
wood stack										
lunch		0.5		0.5	0.5			0.5	0.5	0.5
break		0.5		0.5	0.5			0.5	0.5	0.5
clean up		0.75		0.75	0.75			0.75	0.75	0.75
	0	8.5	0	8.5	8.5	0	0	8.5	8.5	8.5
	51									
7/17/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing										
dump run		2								
supply run		0.75								
ext wall remove		2.5		6.75	6.75			6.5	6.5	6.5
load truck		1.25		0.5	0.5			0.75	0.75	0.75
lunch		0.5		0.5	0.5			0.5	0.5	0.5
break		0.5		0.5	0.5			0.5	0.5	0.5
clean up		0.5		0.25	0.25			0.25	0.25	0.25
	0	8	0	8.5	8.5	0	0	8.5	8.5	8.5
	50.5									
7/18/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								4.5	5.5	4.5
ext wall remove		3.75		4.5	6			0.5	0.5	0.5
load truck		2		1.25	1.25			2.25	1.25	2.25
dump run		2								
eave remove				1.5						
lunch		0.5		0.5	0.5			0.5	0.5	0.5
break		0.25		0.5	0.5			0.5	0.5	0.5
clean up				0.25	0.25			0.25	0.25	0.25
	0	8.5	0	8.5	8.5	0	0	8.5	8.5	8.5
	51									
7/21/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nail								2	2	2
	0	0	0	0	0	0	0	2	2	2
	6									
7/24/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel

lunch								0.5	0.5	0.5
break								0.5	0.5	0.5
clean up								4	0.25	0.25
de-nailing								3.5	3.5	3.5
wood stacking									3.75	3.75
	0	0	0	0	0	0	0	8.5	8.5	8.5
	25.5									
7/28/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								1	1	1
	0	0	0	0	0	0	0	1	1	1
	3									
7/30/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
bathroom deconstruct								7	7	7
set up		0.5								
door remove		0.5								
exp. w/ asb. tile removal		2.75					2			
lunch		0.5						0.5	0.5	0.5
break		0.25						0.5	0.5	0.5
clean up								0.25	0.25	0.25
	0	4.5	0	0	0	0	2	8.25	8.25	8.25
	31.25									
8/4/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
insulation remove		1.5						2	2	2
bathroom deconstruct		4.75						4.75	4.75	4.75
set up		0.5								
lunch		0.5						0.5	0.5	0.5
break		0.5						0.5	0.5	0.5
clean up		0.75						0.25	0.25	0.25
	0	8.5	0	0	0	0	0	8	8	8
	32.5									
8/5/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
set up		1						1	1	
de-nailing		1						1	1	
break		0.25						0.25	0.25	
	0	2.25	0	0	0	0	0	2.25	2.25	0
	6.75									
8/6/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
matl's inside warehouse								1	1	1
wood stack								1	1	1
drywall remove								5.25	5.25	5.25
lunch								0.5	0.5	0.5
break								0.5	0.5	0.5
clean up								0.25	0.25	0.25
	0	0	0	0	0	0	0	8.5	8.5	8.5
	25.5									
8/7/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
drywall remove								2	4	4
elec. wiring remove								2	3	3
insulation remove								3		
lunch								0.5	0.5	0.5
break								0.5	0.5	0.5
clean up								0.25	0.25	0.25
	0	0	0	0	0	0	0	8.25	8.25	8.25
	24.75									
8/8/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing		1.5						2	2	2
clean up		3.75						4	4	4

insulation to storage		1.5						1.5	1.5	1.5
lunch		0.5						0.5	0.5	0.5
break		0.5						0.5	0.5	0.5
	0	7.75	0	0	0	0	0	8.5	8.5	8.5
	33.25									
8/14/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
hot water heater remove								2		
de-nailing								5.25	5.25	
T&G flooring remove		7.25		7.25						
heat ducts remove									2	
Lunch		0.5		0.5				0.5	0.5	
break		0.5		0.5				0.5	0.5	
clean up		0.25		0.25				0.25	0.25	
	0	8.5	0	8.5	0	0	0	8.5	8.5	0
	34									
8/15/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
wood stacking								2	2	2
de-nailing								5.25	5.25	5.25
set up		0.5								
T&G flooring remove		1.5		2						
sub-floor remove		5.25		5.25						
Lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/18/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nailing								2		3.75
wood stacking								3.25		1.5
heat ducts stacking								2		
sub-floor remove		3.75		5.25						
elec wiring remove		2.75								
set up		0.75								
flooring stacking									3.75	
sub-floor stack									3.5	
T&G flooring remove				2						
painted scrap in box										2
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/19/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nail								3.5	3.75	3.5
wood stack								3.75	3.5	3.75
floor joist remove		5		0.25						
elec wiring remove		2.25								
T&G flooring remove				1.5						
sub floor remove				1.5						
1X10 T&G remove				2.5						
intr framing remove				1.5						
Lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/20/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nail								3.5	3.75	3.5
wood stack								3.75	3.5	3.75

floor joist remove		1.25		1						
elec remove		1.25								
drywall remove		0.75								
1X10 T&G remove		2.25								
intr framing remove		1								
intr stairs remove		0.75								
beams remove				2						
rim-joist remove				4						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.5				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/21/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
de-nail								3.75	1.75	2
wood stack		1.75						3.5	2.75	4
intr framing remove		0.75								
floor joist remove		0.75								
drywall in roll-off		1.75							1.5	0.75
skirt boards remove		1.25							1.25	
plumbing leak		1								
beams remove				3.25						
brace walls				1						
rim-joist remove				1.75						
ext stairs remove				1.25						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.75
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/22/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
de-nailing								3.75	3.75	3.75
stack wood		1.5		1.5				3.5	3.5	3.5
remove skirt boards		1								
drywall into roll-off		2.5		1.75						
ext walls remove		2.25		4						
Lunch		0.5		0.5				0.5	0.5	0.5
Break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/25/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
siding de-nail								3.75	3.75	3.75
wood stack								3.5	3.5	3.5
ext walls remove		6.25		7.25						
plumbing leak fix		1								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/26/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
siding de-nail								3.75	3.75	2.75
wood stack								3.5	3.5	3.5
dump run		3.25								
LBP chips HEPA/vac		1.25								
load truck		2.5								
T&G flooring remove				5.75						
ext wall remove				1.5						
lunch		0.5		0.5				0.5	0.5	0.5

break		0.5		0.5				0.5	0.5	0.5
clean up		0.5		0.25				0.25	0.25	1.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/27/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
ext studs de-nail								2	2	2
T&G flooring de-nail								1.75	1.75	1.75
stack wood								3.5	3.5	3.5
T&G flooring remove		5		5						
sub-floor remove		2.25		2.25						
Lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/28/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
T&G flooring de-nail								3.75	3.75	3.75
T&G flooring stack								3.5	3.5	3.5
sub-floor remove		7.25		7.25						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
8/29/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
T&G flooring de-nail								2.25	2.25	1
T&G flooring stack								2	2	1
Floor joist de-nail								1.25		1.25
Floor joist stack								1		1
sub-floor de-nail									1.25	
sub-floor stack									1	
ext studs de-nail										1.25
ext studs stack										1
floor joist remove		2		2						
rim joist remove		4.5		4.5						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
	0	7.5	0	7.5	0	0	0	7.5	7.5	7.5
	37.5									
9/1/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
rim joist de-nail								1	3.75	2
rim joist stack								1	3.5	1.75
floor joist de-nail								2		0.75
floor joist de-nail								1.75		0.75
sub-floor de-nail								0.75		
sub-floor stack								0.75		
Concrete slab break				7.25						
stringers de-nail										1
stringers stack										1
Lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		7.5		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/2/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
sub floor de-nail								2.25	3.75	3
sub-floor stack								2	3.5	3
concrete slab break		6.25		7.25				3		1.25

supply run		1								
Lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/3/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
concrete slab remove		6.5		2				7.5		
supply run		1								
sub-floor sort/band									7.5	7.5
sub floor remove				3.75						
floor joist remove				1.75						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.75	0	8.75	0	0	0	8.75	8.75	8.75
	43.75									
9/4/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
concrete slab remove		3						2		
floor joist de-nail								4.25		
sub-floor remove				2						
floor joist remove		1.25		2.25						
wood sort/band									6.25	6.25
foundation piers remove				1.5						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		2.25		0.75				0.25	0.25	0.25
	0	7.5	0	7.5	0	0	0	7.5	7.5	7.5
	37.5									
9/5/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
floor joist de-nail								4.25	7.5	7.5
wood sort/band										
pier blocks remove				5.75						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		7.75		2				3.5	0.25	0.25
	0	8.75	0	8.75	0	0	0	8.75	8.75	8.75
	43.75									
9/8/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
De-nail Boards		1						1.75		
Sort and Band Boards								1.75	7.25	7.25
Floor joist de-nail				1.75				3.75		
supply run		1								
de-nail rim joist		1.75								
de-nail foundation blocks				2						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	5	0	5	0	0	0	8.5	8.5	8.5
	35.5									
9/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
sheathing stack/band									3.75	3.25
T&G flooring stack/band								7.25	3.5	3.75
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		2		2				0.25	0.25	0.25
	0	3	0	3	0	0	0	8.5	8.5	8.25
	31.25									

9/10/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		1.75		1.75						
T&G flooring stack/band								7.25	3.25	7.25
load drywall in truck		2.25		2.25						
siding stack/band									4	
dump run		1.25								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		1.5				0.25	0.25	0.25
	0	6.5	0	6.5	0	0	0	8.5	8.5	8.5
	38.5									
9/25/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
tools to warehouse		1.25		1.25						
lunch										
break										
clean up										
	0	1.25	0	1.25	0	0	0	0	0	0
	2.5									
9/30/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
siding to warehouse		5.5		5.5						
siding stack/band								6.75	6.75	6.75
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	6.75	0	6.75	0	0	0	8	8	8
	37.5									
10/10/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
Material to warehouse		3.25		3.25				3.25	3.25	3.25
lunch										
break										
clean up										
	0	3.25	0	3.25	0	0	0	3.25	3.25	3.25
	16.25									
10/21/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
Material to warehouse		3.5		3.5				3.5	3.5	3.5
lunch										
break										
clean up										
	0	3.5	0	3.5	0	0	0	3.5	3.5	3.5
	17.5									
10/22/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
Material to warehouse		7.25		7.25				7.25	7.25	7.25
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/23/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
Material to warehouse		6.5		6.5				6.5	6.5	6.5
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		1		1				1	1	1
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/27/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel

Material to warehouse		6.25						6.25	6.25	6.25
lunch		0.5						0.5	0.5	0.5
break		0.5						0.5	0.5	0.5
clean up		0.25						0.25	0.25	0.25
	0	7.5	0	0	0	0	0	7.5	7.5	7.5
	30									
10/28/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load truck		2		2				2	2	2
dump run		2								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	5.25	0	3.25	0	0	0	3.25	3.25	3.25
	18.25									
10/29/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		4		1.25				4	4	4
	0	5	0	2.25	0	0	0	5	5	5
	22.25									

10/1/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
site prep		1		0.5				0.5	0.5	0.5
shingles remove		0.75		0.75				6.5	6.5	6
un-stick truck		1.5		0.25				0.25	0.25	0.25
window plywood remove		2								
skirt boards remove		1		2.5						0.5
dump run		1								
remove windows				3.25						
break		0.5		0.5				0.5	0.5	0.5
lunch		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/2/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		0.75		0.75				0.75	0.75	0.75
shingles remove								6.5	6.5	6.5
windows to warehouse		3		3						
window plywood remove		1.25								
dump run		1								
remove windows		1.25		3.5						
break		0.5		0.5				0.5	0.5	0.5
lunch		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/3/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		2		2						
shingles remove		3.25						5.75	5.75	5.75
plastic over roof				1.5				1.5	1.5	1.5
skirt boards remove				3.75						
dump run		2.25								
break		0.25		0.5				0.5	0.5	0.5
lunch		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/6/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof vents remove				7.25						
break				0.5						
lunch				0.5						
clean up				0.25						
	0	0	0	8.5	0	0	0	0	0	0
	8.5									
10/7/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
drywall remove								3.75	3.75	3.75
drywall nails pull								3.5	3.5	3.5
lead paint scrape		6.25		7.25						
dump run		1								
break		0.5		0.5				0.5	0.5	0.5
lunch		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/8/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
drywall remove								4	4	4
drywall nails remove								2	2	2
lead paint scrape		6.75		6						
dump run		1								

roof vents remove				1.25						
break		0.5		0.5				0.5	0.5	0.5
lunch		0		0.5				0.5	0.5	0.5
clean up		0.25		0.25				1.5	1.5	1.5
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/9/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
plastic on roof		2						2	2	2
dump run		1.5								
break		0.5						0.5	0.5	0.5
lunch		0.5						0.5	0.5	0.5
clean up		4						3.5	3.5	3.5
	0	8.5	0	0	0	0	0	6.5	6.5	6.5
	28									
10/13/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
hepa vac				3.5						
break				0.5						
lunch				0.5						
clean up				0.25						
	0	0	0	4.75	0	0	0	0	0	0
	4.75									
10/14/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
hepa vac				2						
break				0.5						
lunch				0.5						
clean up				0.25						
	0	0	0	3.25	0	0	0	0	0	0
	3.25									

8/13/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
light fixtures remove								4	5	
int walls remove				6.25				1.25		
bath fixtures remove								1.75		
site set-up		0.75		0.75						
heating remove		1.25								
matl to warehouse		2.75								
supply run		1.5								
electric remove									2	
lunch		0.5		0.5				0.5	0.5	
break		0.5		0.5				0.5	0.5	
clean up		1.25		0.5				0.5	0.5	
	0	8.5	0	8.5	0	0	0	8.5	8.5	0
	34									
9/11/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		1.25		0.5				0.5	0.5	0.5
site set-up		0.5		0.5				0.5	0.5	0.5
shingles remove		4.5		6.25				6.25	6.25	6.25
dump run		1								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/12/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof sheathing remove		5.25		5.25				5.25	4.25	2
rafters remove		2		2				0.75		
stack wood								1.25	3	3
elec. boxes remove										2.25
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/15/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof sheathing remove		6.25		6.25				6.25	6.25	6.25
rafters remove		1		1				1	1	1
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/16/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
rafters remove		2		2				2	2	2
stack wood								2.75	2	3.5
windows remove		5.25		5.25						

de-nail									2	
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				2	1.5	2
	0	8.5	0	8.5	0	0	0	7.75	8.5	8.5
	41.75									
9/17/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		2		2				2	2	2
intr. drywall remove		1.25		1				1	1	1
ext wall remove		0.75		3.25				3.25	3.25	3.25
beams remove		1		1				1	1	1
dump run		2.25								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/18/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		1		1				1	1	1
garage doors remove		2.75						4.75	1.75	
plumbing remove									1	
ext. wall remove		2		4.75					2	
de-nail										4.75
dump run		1		1						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.75		0.75				1.75	1.75	1.75
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/19/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
de-nail				2.75				2	2	7.25
ext wall remove				2				2	2	
columns remove				1.75				1.75	1.75	
lunch				0.5				0.5	0.5	0.5
break				0.5				0.5	0.5	0.5
clean up				1.75				1.75	1.75	0.25
	0	0	0	9.25	0	0	0	8.5	8.5	8.5
	34.75									
9/22/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
ext. wall remove				3				2	3	
stack wood				2				3.75	2	
de-nail		5.75								5.75
ridge beam dismantle				0.75					0.75	
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		1.75		1.75				1.75	1.75	1.75
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5

	42.5									
9/23/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		1.5		1.5				1.5	1.5	1.5
stack wood		1.5		4.25				2.5	4.25	4.25
de-nail		1.75						1.75		
dump run		1								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		1.75		1.75				1.75	1.75	1.75
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/24/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
load dump truck		2						2	2	
stack wood		2		1.5				3	1.5	
interior walls remove				3.75						
de-nailing									1.5	5.25
dump run		1								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		2.5		2.25				2.5	2.5	2.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
9/25/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
stack wood		2		4				5.25	3.5	3.75
de-nail		2							1.75	1.5
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		2.25		2.25				2.25	2.25	2.25
	0	7.25	0	7.25	0	0	0	8.5	8.5	8.5
	40									
10/25/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
matl to warehouse		5.5		3.5				5.5	5.5	
lunch		0.5		0.5				0.5	0.5	
break		0.5		0.5				0.5	0.5	
clean up		0.25		0.25				0.25	0.25	
	0	6.75	0	4.75	0	0	0	6.75	6.75	0
	25									

10/10/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
cabinets remove		1						1	1	1
appliances to warehouse		2						2	2	2
trim/baseboard remove		1						1	1	1
lunch		0.5						0.5	0.5	0.5
break		0.5						0.5	0.5	0.5
clean up		0.25						0.25	0.25	0.25
	0	5.25	0	0	0	0	0	5.25	5.25	5.25
	21									
10/16/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
site set-up		0.75		0.75				0.75	0.75	0.75
tar/gravel roofing remove		0.75						3.5	3.5	3.5
roof insulation remove		0.5						3	3	3
intr. walls remove		1.5		4						
inter. trim/doors remove		2.25		2.5						
dump run		1								
supply run		0.5								
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/17/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof insulation remove		2						7.25	7.25	7.25
interior remove		2		4						
dump run		2.25								
instruction		1								
kitchen cabinets remove				3.25						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									
10/20/97	Ann	Chris	Tim	Matt	Hector	Sam	Stan	Denisio	Lombardo	Miguel
roof insulation remove		3.25		1.75				7.25	5.5	7.25
paper work		0.5								
intr fixtures remove		1.5		2						
dump run		2								
tool shed remove				3.5					1.75	
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
	0	8.5	0	8.5	0	0	0	8.5	8.5	8.5
	42.5									

10/21/97	**Ann**	**Chris**	**Tim**	**Matt**	**Hector**	**Sam**	**Stan**	**Denisio**	**Lombardo**	**Miguel**
roof trim remove								2	2	2
garage storage remove				3.75						
lunch		0.5		0.5				0.5	0.5	0.5
break		0.5		0.5				0.5	0.5	0.5
clean up		4		0.25				2	2	2
	0	5	0	5	0	0	0	5	5	5
	25									

Appendix 14.10

Composite Time by Building Component for Each Building

Time* Required for Deconstructing each Building Component**

* D = Time for those crew members given Lead Worker Training and assigned to deconstruct Lead Based Paint covered materials.

L = Time for those crew members without specialized training.

** Element or Component in this data means the following:

- Roof - Means all members the top of the building down to the top plate of the walls.
- Exterior Walls - Means all members of the exterior walls from the top plate to the bottom plate.
- Interior Walls - Means all members of the interior walls from the top plate to the bottom plate.
- Floor - Means all members below the bottom plate of the walls.

Task	D	D	D	D	D	D	D	L	L	L
Windows and Doors										
stacked windows	1.25					0.75				
de-nailed vent screens	1									
de-nail trim		2				2.75				
windows remove			2.25	0.75	0.75	0.75				
trim remove				4	3.5					
stack doors		0.25								
doors remove		0.5								
	2.25	2.75	2.25	4.75	4.25	4.25	0	0	0	0
						Total D	20.5		Total L	0
Electric										
elec. outlets remove						1.5				
elec. remove										
light fix. remove	1	2.75				1.25				
light fixtures remove	0.5									
removal electrical						1.75				
electrical removal	1									
	2.5	2.75	0	0	0	4.5	0	0	0	0
						Total D	9.75		Total L	0
Exterior Walls										
de-nail exterior frame	0.75									
brace exterior walls		0.75			0.75		0.75			
ext wall blocks remove		1			1		3.75			
ext wall 2x4 remove		3.25			2.75					
gable 2x4 removal		0.75			0.75					
de-nail ext 2x4						4.5				
2x4 stacked	1.5									
stack lumber	0.75									
ext wall blocks remove		0.5			0.5					
ext wall 2x4 remove		3.25			3.75					
2x4 sizing				4						
de-nail 2x4	0.75			1.25		3.75				
stack ext. drywall	0.75	0.75		0.25	1	0.5				
stack siding	0.75	0.75		1	1	0.75				
de-nail siding	0.5	0.5		1	0.75	1	1			
de-nail siding	2.25	2.75		2.25		1.5				
stack lumber	1.25	0.5			2.5					
box paper from ext wall	1									
size lumber				1						
stack 1x12 skirting	1.75									
strip skirting			3.25							
de-nail		0.75	2.5	1.25		1.5				
ext. wall remove			1.25	1.25	1.25					
de-nail		0.75	2.5	2.75	2	0.75				
ext. wall t&g sheetrock		1.5				1.5				
ext. wall studs remove		1.5				1.5				
denial & stack siding		1.25	1.25	1.25	1.25					

de-nail		1.75	1.75	0.75	0.75					
size 2x4			0.5							
size siding			1.5							
de-nail 2x4				2	2					
load scrap wood		2.5								
load broken drywall		1.75								
	12	26.5	14.5	20	22	17.25	5.5	0	0	0
						Total D	118		Total L	0
Floor										
tile & plywood remove		2.25		1.25	2.25	2.75				
t&g floor removal		0.5			1.25					
plywood/tile remove				1.75	1.25					
plywood/tile remove				1.5	1.5					
t&g floor remove				2.25	2.25					
plywood/tile load				0.5	0.5					
stack wood				1.5	1					
t&g remove			1.5	2.25	4.25					
t&g de-nail					1.75	3.75				
stack wood					1.5	3.75				
1x6 sub-floor remove			1.25							
1x6 sub-floor remove			2.75		2.75					
sub-floor remove		2	2	2	0.25	2				
t&g floor remove		1.5	1.5	3	2.25	2.25				
de-nail		0.75			2.25	1.25				
de-nail t&g		1.25	0.75							
size and stack wood			0.75							
t&g removal				1.25	2					
t&g de-nail		3.75				2				
demo dry-rot in floor			3.25	1						
sub-floor de-nail		0.75	1.25	1.5	1.75	2.5				
stack t&g floor		1.75	1.75	1.75		1.75				
sub-floor remove		2	2	2		2				
sub-floor remove			1	1	1					
stack lumber				2.25						
floor joist remove			5.25	2	4.25					
stack lumber		0.5	0.75	1.25		0.5				
2x8 joist remove			1.5	2.25	1.75					
remove piers				1.25						
de-nail 1x6		1.5		1.5	1.5					
concrete slab remove			0.5							
deconstruct sub floor								1.75	1.75	1.75
concrete slab remove								4.25	4.25	4.25
	0	18.5	27.75	35	37.25	24.5	0	6	6	6
						Total D	143		Total L	18
Hauling										
haul shingles to dump		1.75								
dump run		0.75								
dump run		1.25								
truck repair		1.25								

dump run		4.25								
pick-up flat-bed							1.5			
dump run		3.75								
fork-lift load truck						4				
return flat bed						1				
dump run		1								
dump run		1.75								
	0	15.75	0	0	0	5	1.5	0	0	0
						Total D	22.3		Total L	0
H-V-AC										
heat duct remove		0.5			0.5					
furnace remove			1	1	1					
	0	0.5	1	1	1.5	0	0	0	0	0
						Total D	4		Total L	0
Instruction										
photo	2									
heat stroke				1.5						
assigned task			0.5							
compile data	0.75									
plan assignments			1							
work discussion	0.25	0.25	0.25	0.25	0.25	0.25	0.25			
plan intr t&g remove			0.5							
crew meeting-ext. wall	0.75	0.75		0.75	0.75	0.75	0.75			
	3.75	1	2.25	2.5	1	1	1	0	0	0
						Total D	12.5		Total L	0
Interior Walls										
interior dry wall removal				2	0.5	4.75				
interior plywood removal				1	1	0.25				
interior t&g removal				1						
inter dry wall remove		3	3			3				
de-nail intr walls						1				
clean up dry wall		0.75	2.25	2.25	2.25					
remove insulation		0.5								
de-nail intr walls		3.5	2.25			4.75				
inter t&g remove		1.75	3.75	4.75	4.75					
de-nail frame		2.25		1		5.25				
de-nail intr t&g		1.25		1.25		1				
interior frame remove			1.75		2.25					
stack lumber	4.25									
de-nailing		3.75		3.75		3.75				
inter t&g remove			3	1	1.75	0.75				
inter framing remove			2.75		1.75					
de-nail intr t&g				2.5						
de-nail 2x4		2.5				2				
interior walls	1.5									
stack lumber	1.75						0.75			
inter 1x12 remove				1.75		1.75				
inter 1x12 sizing				4.5						

inter 1x12 stacked	2.5						2.5			
load waste drywall					1					
	10	19.25	18.75	26.75	15.25	28.25	3.25	0	0	0
						Total D	122		Total L	0
Lead Related Work										
hepa-vac interior				1		1				
Fit test respirator	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
help others suit-up	0.5	2.5	0.5	0.25	0.25	0.25	1.5			
debrief	0.25	0.25	0.25	0.25	0.25	0.25	0.25			
doors and trim removal	1.25				5.25	2.75				
dry-wall removal	1.5			5.25						
scrape-and cut boards	0.75		4.75							
acoustic tile removal	0.5									
decontaminate tools		1								
prep. work area	0.25	0.25	0.5	0.5	0.5	0.5				
decontaminate selves	0.75		0.75	0.75	0.75	0.75				
de-nail	1.25		0.25			2.5				
clean up	0.25	0.25		0.25	1	0.25	0.5			
clean up				0.5		0.5				
clean up	1	1		4	0.5					
clean up		0	0.5	1.5	0.5	0.25				
clean up			0.75		2.75					
	8.75	5.75	8.75	14.75	12.25	9.5	2.75	0	0	0
						Total D	62.5		Total L	0
Plumbing										
hot water unit remove		0.5								
plumbing removal		3.25				1.75				
sink and cabinet remove		1								
shower remove					2					
plumbing remove					0.25					
plumb/elec under floor			2							
	0	4.75	2	0	2.25	1.75	0	0	0	0
						Total D	10.8		Total L	0
Roof										
asb-roof vents remove				3.75	6.5		1.25			
asb-roof vent removal					0.75					
remove shingles	7	1.75	7	6	6.25	6				
strip shingles	5.25	6.25	6.25	2	5.25	6.5				
stacked roof sheathing	5.5			1	2	3.75				
roof sheathing removal	1	6	4	5.75		1.25				
shingle removal			1.5			1.5				
stacked lumber	2					1				
de-nail	2.25	0.5		0.5						
ceiling dry wall removal		0.5	0.5		0.5	0.5	0.5			
stack wood	0.75									
de-nail	0.75						1			
stack acoustic tile	0.75									
stack rafters	0.75									

de-nail ext. t&g ceiling	1.25									
eve blocking removal		0.75	0.25							
rafter removal		3.5		2.25	3.25					
t&g ceiling removal		0.75								
de-nail rafters			1							
trim rafters to size			5							
acoustic tile removal				0.5	2					
stack lumber	1.25									
rafter removal		1.5	3	1.5	1.5	1.5				
2x4 removal		0.5	0.75			1.75				
de-nail ext. t&g		1.25								
de-nail 2x4				1.75	1.75					
de-nail rafters				4	4					
de-nail rafters	0.75									
stack rafters	3.5				0.5					
de-nail rafters		0.25		2.25	2.25	0.25				
stacked lumber	1.75						3.25			
	34.5	23.5	29.25	31.25	36.5	24	6	0	0	0
						Total D	185		Total L	0
Site Work										
bag lawn waste				1.25						
clean street gutter			1.5							
clean-up		0.5	0.25			0.5	0.5			
Gas and oil mowers			0.5	0.5			0.75			
mowing			0.5							
site security			0.5							
storage security			1.5							
Weed whack			1.5	1.5						
window boards de-nail						1.25				
window boards remove						0.75				
clean-up	0.5		0.5	0.5	0.5	0.5				
make Gaylord boxes		0.25								
get out tools	0.25	0.5	0.5	0.5	0.25	0.5				
remove window protection	1.5				1.5					
clean up				1.75						
signage	0.5				3.75					
remove window protection	0.5									
clean up		0.25	0.5	0.75	0.75	0.5	2.25			
get out tools			0.5			0.5				
cleanup	0.25	0.5	0.5	0.5	0.5	0.5				
build Gaylord boxes		1	0.5	0.5	0.5	1	0.75			
set up tools			2							
move scaffold	0.75									
build Gaylord boxes	0.25									
organize site	0.75									
clean up	0.25	0.25	0.25	0.25	0.25	0.25	0.25			
get out tools		0.25	0.25	0.25	0.25	0.25	0.25			
clean up	0.25	0.25	0.25	0.25	0.25	0.25				
build Gaylord boxes	2									
clean up		1	0.5	1.5	1	1				

make Gaylord boxes	1.5									
set out tools	0.25	0.25	0.25	0.25	0.25	0.25				
clean up			0.25			0.75				
setup		0.25	0.25	0.25	0.25	0.25				
clean up	1.75	0.5			0.25	0.25				
move dry wall boxes		0.5			0.5					
set out tools		1		1	1	1				
make boxes		0.5								
site layout							0.5			
plastic for rain	0.5	0.5		0.5	0.5	0.5	0.5			
meet fork-lift truck	0.75									
organize site			1.25		0.5	1.5				
load fence		0.5			1	0.5				
paint signs				1						
clean up			1.75							
clean up			0.5	0.5	0.75					
clean up				1	1					
set up		0.25	0.25	0.25	0.25	0.25				
clean up		0.75	0.75	0.75	0.75					
	12.5	9.75	17.75	15.5	16.5	13	5.75	0	0	0
						Total D	90.8		Total L	0
Supply Run										
supply run		2.75								
supply run			0.5							
supply run		1								
supply run		1.75	0.25							
supply run		0.5								
supply run	1	1								
Supply run			0.75		0.5					
	1	7	1.5	0	0.5	0	0	0	0	0
						Total D	10		Total L	0
Matl to Warehouse										
load lights to warehouse	1									
good mat'l to warehouse						8	8			
warehouse, boxes	1.5									
mat'l to warehouse		4.5			2.25	1				
tools to warehouse		1.5		1.5						
mat'l to warehouse		3.5				3.5				
2x8 to warehouse		3.25			1	3.25				
mat'l to warehouse		1.5	1.5	1.5	1.5					
	2.5	14.25	1.5	3	4.75	15.75	8	0	0	0
						Total D	49.8		Total L	0

Task	D	D	D	D	D	D	D	L	L	L
Windows and Doors										
hang door		0.5								
replace door				0.75						
replace door				1						
	0	0.5	0	1.75	0	0	0	0	0	0
						Total D	2.25		Total L	0
Electric										
Remove elec. fixtures		0.5								
remove elec wires				3.75						
remove elec panel				0.75						
	0	0.5	0	4.5	0	0	0	0	0	0
						Total D	5		Total L	0
Exterior Walls										
skirt removal				1.5	1.5					
	0	0	0	1.5	1.5	0	0	0	0	0
						Total D	3		Total L	0
Hauling										
dump run		1								
dump run		2								
	0	3	0	0	0	0	0	0	0	0
						Total D	3		Total L	0
Interior Walls										
remove trim						1				
striping interior walls				4	4					
de-nailing								4.5	4.5	4.5
load dump truck		1.25			0.5					
remove interior walls		2.5			2.75					
remove interior wall		1			1			1	1	1
move dump truck		1			0.5					
de-nailing								3	3	3
load truck		1			0.5			1	1	1
de-nail int. wall/ceiling					1.5		2.5			
to landfill		1								
	0	7.75	0	4	10.75	1	2.5	9.5	9.5	9.5
						Total D	26		Total L	28.5
Lead Related Work										
hepavac				2	2					
mask windows		1.25		1.25	1.25					
encapsulation		6.75		6.75	6.75					
Caulk Exterior Walls		2		2	2					
Encapsulate top coat		3.75		3	3					
encapsulate windows				1.75	1.75					
clean up		0.25		0.25	0.25					
get out tools		0.5		0.5	0.5					

encapsulate windows				3.75	3.75					
encapsulate exterior				4.5	3.75					
encapsulate door trim				2						
encapsulate windows					2					
set-up		1								
clean-up				1	1					
set-up				1.25	1.25					
clean up				0.25	0.25					
encapsulate windows				6	6					
clean up				0.25	0.25					
set-up				0.5	0.5					
encapsulate windows				6.75	6.75					
clean up				0.5						
setup				0.25						
encapsulate windows				0.5						
encapsulate door				1.25						
set-up				0.25						
scrape windows		5.5								
touch-up				4.25						
encapsulate windows				1.25						
clean up		0.25		0.25						
set-up		0.25		0.25						
scrape windows		7		0.5						
touch up				6.5						
clean up		0.25		0.25						
scrape windows		2.5								
site clean up		2								
touch up		1.25		6						
set up		0.25		0.25						
reassemble windows				5.75						
	0	34.75	0	71.75	43	0	0	0	0	0
						Total D	149.5		Total L	0
Roof										
remove ceiling tiles					0.75					
remove ceiling frame					0.5					
remove ceiling drywall		1			3.25			2.25	2.25	2.25
de-nailing								7.25	7.25	7.25
sweep roof				0.75						
	0	1	0	0.75	4.5	0	0	9.5	9.5	9.5
						Total D	6.25		Total L	28.5
Site Work										
window plywood remove				1.5	1.5					
clean-up										
Trim tree and clean site		2				2				
load truck		1				1				
site prep, de-nailing sta.		0.5			0.5			0.5	0.5	0.5
clean-up		0.5			0.5			0.5	0.5	0.5
clean-up					0.25			0.25	0.25	0.25
cleanup		0.5		0.5	0.5			0.5		0.5

clean up		0.25		0.25						
clean up								2.75	2.75	2.75
site clean up		1								
	0	5.75	0	2.25	3.25	3	0	4.5	4	4.5
						Total D	14.25		Total L	13
Supply Run										
pick up supplies		0.5		0.25						
	0	0.5	0	0.25	0	0	0	0	0	0
						Total D	0.75		Total L	0
Matl to Warehouse										
move Lead encapsulant		0.25								
stage plywood		0.5								
materials to warehouse		3.75						3.75		3.75
stack at warehouse									5.25	5.25
	0	4.5	0	0	0	0	0	3.75	5.25	9
						Total D	4.5		Total L	18

Task	D	D	D	D	D	D	D	L	L	L
Windows and Doors										
remove windows			0.75	0.75	0.75	0.75				
windows remove			0.5	0.5	0.5					
stack doors		0.75								
	0	0.75	1.25	1.25	1.25	0.75	0	0	0	0
						Total D	5.25		Total L	0
Electric										
remove elec wiring		0.5		0.5	0.5	0.5				
elec. wire remove		1.25								
elec remove		2								
elec service cut wires			0.25							
	0	3.75	0.25	0.5	0.5	0.5	0	0	0	0
						Total D	5.5		Total L	0
Exterior Walls										
stack skirt boards		0.5								
remove skirt boards			1			3				
removed wainscot		0.75		0.75	0.75	0.75				
drywall remove		2		1.5	0.25					
de-nail studding			0.5							
wainscoting remove						0.75				
de-nail skirt						0.25				
exterior walls remove	1.75	4.5	1.75	5						
skirt wood remove	0.25									
de-nail exterior walls		0.75		0.75						
de-nail ext. wall matl.		4.75	5.75	2						
ext wall remove				2.25						
stack lumber						1				
de-nailing		5	5.75	0.5	2.75					
ext. matl. size						3.5				
ext. wall matl. stack				1.5		3.75				
load dump truck		1.5				0.75				
skirt wood removal		0.75	1.75			0.75				
	2	20.5	16.5	14.25	3.75	14.5	0	0	0	0
						Total D	71.5		Total L	0
Floor										
linoleum remove	0.25	0.25		0.5						
linoleum remove		1.5	1.5	3		1.5				
linoleum remove		2		2.5	2.5					
T&G mat'l remove				2.75						
T&G flooring removal		2	1.75	3	1.5	2				
sub-floor removal		0.75	1.75			1.75				
de-nailing			1.75	4.25	5.75					
T&G flooring stacking			0.25			2				
sub-floor matl stack	1									
sub-floor de-nail		2.5		2.5	2.5	2.5				
floor joist remove		1.25		1.25	1.25	1.25				

rim joist/stringer remove		1.5		1.5	1.5	1.5				
stacking wood		1		1		1				
sub-floor matl. banding	1				1	1				
sub-floor matl banding				1.25						
T&G floor banding				2.25	2.25					
concrete slab remove								4.25	4.25	4.25
floor joist/stringer remove								1.25	1.25	1.25
concrete slab remove								2	2	2
	2.25	12.75	7	25.75	18.25	14.5	0	7.5	7.5	7.5
						Total D	80.5		Total L	22.5
Hauling										
dump run		1								
dump run		1								
dump run		1								
dump run		0.75								
dump run		1								
	0	4.75	0	0	0	0	0	0	0	0
						Total D	4.75		Total L	0
Instruction										
instruction		0.25	0.5							
instruction		0.25	0.25	0.25	0.25	0.25				
instruction	0.5	0.25		0.25						
instruction			0.5							
	0.5	0.75	1.25	0.5	0.25	0.25	0	0	0	0
						Total D	3.5		Total L	0
Interior Walls										
trim wood remove			1							
load drywall		0.75		0.75						
drywall remove, walls			1.25							
removed drywall		0.75			0.75					
load drywall in truck				0.75		0.75				
drywall remove		1.5	1	1.5	1.5	1.5				
de-nail		1		0.75	0.75	3				
load truck		1				0.25				
plywood remove			0.5	1.25	1.25					
stack wood			4			1				
de-nail studding				0.75	0.75					
stack wood	2									
remove drywall		0.5								
	2	5.5	7.75	5.75	5	6.5	0	0	0	0
						Total D	32.5		Total L	0
Lead Related Work										
clean up		0.25	0.5	0.25						
clean up		0.25	0.25	0.25		0.25				
clean up				0.25	0.25	0.25				
	0	0.5	0.75	0.75	0.25	0.5	0	0	0	0
						Total D	2.75		Total L	0

Roof										
remove roof shingles		5	4	4.5	1.5	1.5				
dump run		1.25								
remove shingles		1.5	1.25	2.25	1.25	2.25				
dump run		0.75								
roof sheathing remove				4	4.25	2.75				
stack roof sheathing		3.75		1.75						
stack roof sheathing			0.75							
roof sheathing remove		1.5		1.5		1.5				
ceiling drywall remove		0.75	2.25	1.5	1	0.75				
Load drywall in truck		2.75			0.75	2.25				
trim rafters			1.25							
rafter deconstruction				1.5	1.5					
de-nailing				1.75	1.75					
de-nail			1		1	1				
stack wood			1		1	1				
trim wood to size			0.75							
de-nail			2							
stack joist lumber			0.5							
rafter blocking remove			0.75							
ceiling joist remove				1.25	1.25	0.5				
rafters remove					1.25					
size lumber			1.5			1.25				
joist remove				1.75	1.75					
rafters remove				1	1					
	0	17.25	17	22.75	19.25	14.75	0	0	0	0
						Total D	91		Total L	0
Site Work										
fencing		2.75	1.25	2.75						
window plywood remove			1							
get toilet			0.5							
pick up nails			1.75							
clean up		0.25	0.25	0.25	0.25	0.25				
construct Gaylord boxes		0.75				1.75				
clean up		0.25	0.25	0.25	0.25	0.25				
clean up		0.25		0.25	2.75	2.75				
set up		0.25	0.25	0.25	0.25	0.25				
clean up		0.25		0.25	0.25	1				
set up		0.25	0.25	0.25	0.25	0.25				
set up		0.75	0.75	0.75						
went to get truck		0.25								
clean up			0.25	0.25	0.25	0.25				
set up		1		1						
clean up		0.25		0.25		0.25				
clean up		0.5		0.5	0.5	1.25				
clean up								0.25	0.25	0.25
	0	7.75	6.5	7	4.75	8.25	0	0.25	0.25	0.25
						Total D	34.25		Total L	0.75

Supply Run										
supply run		1.5								
supply run			0.75							
supply run			0.25							
supply run			0.5							
supply run		0.5								
	0	2	1.5	0	0	0	0	0	0	0
						Total D	3.5		Total L	0
Matl to Warehouse										
mat'l to warehouse		3.25		3.25						
material to warehouse		4.25				4.25				
matl to warehouse		0.5								
matl to warehouse		5.75				5.75				
load truck				0.75	0.75	0.75				
	0	**13.75**	**0**	**4**	**0.75**	**10.75**	**0**	**0**	**0**	**0**
						Total D	29.25		Total L	0

Task	D	D	D	D	D	D	D	L	L	L
Windows and doors										
windows stack	0.5			2.5						
windows remove							1.25			
trim removal				2.25	0.75					
windows remove				0.75						
windows remove				1	1					
door remove		0.5								
	0.5	0.5	0	6.5	1.75	0	1.25	0	0	0
						Total D	10.5		Total L	0
Electric										
elec fixtures remove						0.75				
elec fixtures remove	1	1.75			2					
elec fixtures remove		3.5		0.75						
elec wiring remove		1		1.75						
elec fixtures remove		3.25								
elec wiring remove				4.75						
elec wire remove									1	
elec. wiring remove								2	3	3
elec wiring remove		2.75								
elec wiring remove		2.25								
elec remove		1.25								
elec fixtures remove	0.5			2.25		0.5				
	1.5	15.75	0	9.5	2	1.25	0	2	4	3
						Total D	30		Total L	9
Exterior Walls										
blocking remove				1.25						
insulation remove										2
blocking remove									0.75	
ext. wall remove		2		3.5	2.75					
de-nailing								6.75	6.75	6.75
de-nailing										
ext wall remove		2.5		6.75	6.75			6.5	6.5	6.5
load truck		1.25		0.5	0.5			0.75	0.75	0.75
de-nailing								4.5	5.5	4.5
ext wall remove		3.75		4.5	6			0.5	0.5	0.5
load truck		2		1.25	1.25			2.25	1.25	2.25
de-nail								2	2	2
de-nailing								3.5	3.5	3.5
wood stacking									3.75	3.75
de-nailing								1	1	1
insulation remove		1.5						2	2	2
insulation remove								3		
painted scrap in box										2
skirt boards remove		1.25							1.25	
brace walls				1						
ext stairs remove				1.25						
remove skirt boards		1								

ext walls remove		2.25		4						
siding de-nail								3.75	3.75	3.75
wood stack								3.5	3.5	3.5
ext walls remove		6.25		7.25						
siding de-nail								3.75	3.75	2.75
wood stack								3.5	3.5	3.5
ext wall remove				1.5						
ext studs de-nail								2	2	2
ext studs de-nail										1.25
ext studs stack										1
load drywall in truck		2.25		2.25						
siding stack/band									4	
siding stack/band								6.75	6.75	6.75
	0	26	0	35	17.25	0	0	56	62.75	62
						Total D	78.3		Total L	180.8
Floor										
T&G flooring remove		7.25		7.25						
wood stacking								2	2	2
de-nailing								5.25	5.25	5.25
T&G flooring remove		1.5		2						
sub-floor remove		5.25		5.25						
de-nailing								2		3.75
wood stacking								3.25		1.5
sub-floor remove		3.75		5.25						
flooring stacking									3.75	
sub-floor stack									3.5	
T&G flooring remove				2						
de-nail								3.5	3.75	3.5
wood stack								3.75	3.5	3.75
floor joist remove		5		0.25						
T&G flooring remove				1.5						
sub floor remove				1.5						
floor joist remove		1.25		1						
rim-joist remove				4						
floor joist remove		0.75								
rim-joist remove				1.75						
de-nailing								3.75	3.75	3.75
stack wood		1.5		1.5				3.5	3.5	3.5
T&G flooring remove				5.75						
T&G flooring de-nail								1.75	1.75	1.75
stack wood								3.5	3.5	3.5
T&G flooring remove		5		5						
sub-floor remove		2.25		2.25						
T&G flooring de-nail								3.75	3.75	3.75
T&G flooring stack								3.5	3.5	3.5
sub-floor remove		7.25		7.25						
T&G flooring de-nail								2.25	2.25	1
T&G flooring stack								2	2	1
Floor joist de-nail								1.25		1.25

Floor joist stack								1		1
sub-floor de-nail									1.25	
sub-floor stack									1	
floor joist remove		2		2						
rim joist remove		4.5		4.5						
rim joist de-nail								1	3.75	2
rim joist stack								1	3.5	1.75
floor joist de-nail								2		0.75
floor joist de-nail								1.75		0.75
sub-floor de-nail								0.75		
sub-floor stack								0.75		
Concrete slab break				7.25						
stringers de-nail										1
stringers stack										1
sub floor de-nail								2.25	3.75	3
sub-floor stack								2	3.5	3
concrete slab break		6.25		7.25				3		1.25
concrete slab remove		6.5		2				7.5		
sub-floor sort/band									7.5	7.5
sub floor remove				3.75						
floor joist remove				1.75						
concrete slab remove		3						2		
floor joist de-nail								4.25		
sub-floor remove				2						
floor joist remove		1.25		2.25						
wood sort/band									6.25	6.25
foundation piers remove				1.5						
floor joist de-nail								4.25	7.5	7.5
wood sort/band										
pier blocks remove				5.75						
De-nail Boards		1						1.75		
Sort and Band Boards								1.75	7.25	7.25
Floor joist de-nail				1.75				3.75		
de-nail rim joist		1.75								
de-nail foundation blocks				2						
T&G flooring stack/band								7.25	3.5	3.75
T&G flooring stack/band								7.25	3.25	7.25
	0	67	0	97.25	0	0	0	100.25	97.75	97.75
						Total D	164		Total L	295.8
Hauling										
dump run		1								
dump run		2								
dump run		2								
dump run		3.25								
dump run		1.25								
dump run		2								
	0	11.5	0	0	0	0	0	0	0	0
						Total D	11.5		Total L	0
H-V-AC										

heat ducts remove									5	2
heater remove				1						
heat ducts remove									2	
heat ducts stacking								2		
	0	0	0	1	0	0	0	2	7	2
						Total D	1		Total L	11
Instruction										
instruction	0.5	0.5		1	0.5	1				
instruction	0.25	0.5		0.5	0.25		0.25			
exp. w/ asb. tile removal		2.75					2			
	0.75	3.75	0	1.5	0.75	1	2.25	0	0	0
						Total D	10		Total L	0
Interior Walls										
drywall remove		0.25			0.25					
de-nail								3	3	3
ceiling insulation remove				1.5				1.5	1.5	1.5
drywall remove		0.5						1.75	1.75	1.75
drywall remove								2	2	
de-nailing								5		3
drywall load in roll-off		0.25		0.25				0.25	0.25	0.25
drywall load in roll-off		1.5		1.5				0.75	1.5	1.5
drywall into roll-off				0.25				0.75		
drywall load in roll-off								1		1
drywall remove		1		1	1					
1X10 T&G remove		2.75		1	1					
bathroom deconstruct								7	7	7
bathroom deconstruct		4.75						4.75	4.75	4.75
de-nailing		1						1	1	
wood stack								1	1	1
drywall remove								5.25	5.25	5.25
drywall remove								2	4	4
de-nailing		1.5						2	2	2
de-nailing								5.25	5.25	
1X10 T&G remove				2.5						
inter framing remove				1.5						
drywall remove		0.75								
1X10 T&G remove		2.25								
inter framing remove		1								
inter stairs remove		0.75								
beams remove				2						
de-nail								3.75	1.75	2
wood stack		1.75						3.5	2.75	4
inter framing remove		0.75								
drywall in roll-off		1.75							1.5	0.75
beams remove				3.25						
drywall into roll-off		2.5		1.75						
load truck		2.5								
load dump truck		1.75		1.75						
de-nail								3.5	3.75	3.5

wood stack								3.75	3.5	3.75
	0	29.25	0	18.25	2.25	0	0	58.75	53.5	50
						Total D	49.8		Total L	162.3
Lead Related Work										
LBP work					1.25					
paint chips hepa/vac					0.75					
hepa vac		0.75		0.75						
LBP chips HEPA/vac		1.25								
hepa vac		0.5		0.25						
hepa vac		2								
Hepa vac		1		1						
hepa vac		2								
	0	7.5	0	2	2	0	0	0	0	0
						Total D	11.5		Total L	0
Plumbing										
plumbing leak		1								
plumbing fixture remove		0.75		0.75						
plumbing fixture remove		1								
plumbing fixtures remove		3.25								
hot water heater remove								2		
plumbing leak fix		1								
	0	7	0	0.75	0	0	0	2	0	0
						Total D	7.75		Total L	2
Roof										
roof guardrail construct		3.75					3.75			
roof guardrail construct		4.75				1.5	2.5			
asphalt shingles remove	0.5	4.25		3.75	1.5	4.75				
shingle removal		0.5		0.5	0.5					
pick up shingles								4.25	4.25	4.25
roof shingles remove		7.25		7.25						
pick up shingles								2	2	2.75
ceiling drywall remove								1.75	1.75	
shingles remove		1		1.5						
sheathing remove		1		1.5						
de-nailing								2.25		
roof sheathing stack								2.5		1.75
roof sheathing remove		5.75		5.75				1.75	5.75	4
roof sheathing remove		3		4.25				2		2
roof sheathing stack		1.25		0.75				1.75		1.75
rafters remove		1								
ceiling joist remove		2		2						
de-nailing								2.75		2.75
roof shingles pick up										0.75
de-nailing								6		6
rafters remove		7		4.25	4.25					
ceiling joist remove				2					5.25	
de-nailing								7.25	7.25	7.25
roof supports remove		1.5		1.75	1.75					

eave material into truck		1.5		1.5	1.5					
eaves remove				2	2					
wood stack										
eave remove				1.5						
sheathing stack/band									3.75	3.25
	0.5	45.5	0	40.25	11.5	6.25	6.25	34.25	30	36.5
						Total D	110		Total L	100.8
Site Work										
site prep										
site prep	5.25				1.75	3				
clean up	0.75					0.75				
plywood from windows				2.5		1				
created tool room				0.75	1.25					
stack plywood				1.5	0.5					
furniture removed						1.25	1.25			
clean up		0.25		0.25	0.25	0.25				
site prep	1	1.25		1.25	1	0.75				
Gaylord boxes make					0.5					
clean up	0.5	0.25			0.25					
site prep		1		0.75	0.5					
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.5		0.5				0.5	0.5	1.5
site prep		0.5								
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25		0.25
clean up		0.25		0.25	0.25			0.25	0.25	0.25
clean up		0.25		0.25	0.25			0.25	0.25	0.25
clean up					0.75			0.75	0.75	0.75
clean up		0.5		0.25	0.25			0.25	0.25	0.25
clean up				0.25	0.25			0.25	0.25	0.25
clean up								4	0.25	0.25
set up		0.5								
clean up								0.25	0.25	0.25
set up		0.5								
clean up		0.75						0.25	0.25	0.25
set up		1						1	1	
clean up								0.25	0.25	0.25
clean up								0.25	0.25	0.25
clean up		3.75						4	4	4
clean up		0.25		0.25				0.25	0.25	
set up		0.5								
clean up		0.25		0.25				0.25	0.25	0.25
set up		0.75								
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.5				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.75
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25

clean up								0.25	0.25	1.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		5.5		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		2.25		0.75				0.25	0.25	0.25
clean up		7.75		2				3.5	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		2		2				0.25	0.25	0.25
clean up		0.25		1.5				0.25	0.25	0.25
clean up										
clean up		0.25		0.25				0.25	0.25	0.25
clean up										
clean up										
clean up		0.25		0.25				0.25	0.25	0.25
clean up								1	1	1
clean up		0.25						0.25	0.25	0.25
load truck		2		2				2	2	2
clean up		0.25		0.25				0.25	0.25	0.25
clean up		2		1.25				4	4	4
	7.5	39.75	0	23.75	7.75	7	1.25	29.5	22.25	23.75
						Total D	87		Total L	75.5
Supply Run										
supply run		2.25			3.5					
supply run										
supply run		0.75								
supply run		0.75								
supply run		1								
supply run		1								
supply run		1								
	0	6.75	0	0	3.5	0	0	0	0	0
						Total D	10.3		Total L	0
mat'l. to Warehouse										
mat'l to warehouse	0.5	1		0.5	0.75					
mat'l to warehouse		4.25		2.25	2.25					
mat'ls inside warehouse								1	1	1
insulation to storage		1.5						1.5	1.5	1.5
tools to warehouse		1.25		1.25						
siding to warehouse		5.5		5.5						
Material to warehouse		3.25		3.25				3.25	3.25	3.25
Material to warehouse		3.5		3.5				3.5	3.5	3.5
Material to warehouse		7.25		7.25				7.25	7.25	7.25
Material to warehouse		6.5		6.5				6.5	6.5	6.5
Material to warehouse		6.25						6.25	6.25	6.25
	0.5	40.25	0	30	3	0	0	29.25	29.25	29.25
						Total D	73.8		Total L	87.75

Task	D	D	D	D	D	D	D	L	L	L
Doors and windows										
remove windows				3.25						
remove windows		1.25		3.5						
load dump truck		2		2						
	0	3.25	0	8.75	0	0	0	0	0	0
						Total D	12		Total L	0
Exterior Walls										
skirt boards remove		1		2.5						0.5
load dump truck		0.75		0.75				0.75	0.75	0.75
skirt boards remove				3.75						
	0	1.75	0	7	0	0	0	0.75	0.75	1.25
						Total D	8.75		Total L	2.75
Hauling										
un-stick truck		1.5		0.25				0.25	0.25	0.25
dump run		1								
dump run		1								
dump run		2.25								
dump run		1								
dump run		1								
dump run		1.5								
	0	9.25	0	0.25	0	0	0	0.25	0.25	0.25
						Total D	9.5		Total L	0.75
Interior Walls										
drywall remove								3.75	3.75	3.75
drywall nails pull								3.5	3.5	3.5
drywall remove								4	4	4
drywall nails remove								2	2	2
	0	0	0	0	0	0	0	13.25	13.25	13.25
						Total D	0		Total L	39.75
Lead related work										
lead paint scrape		6.25		7.25						
lead paint scrape		6.75		6						
hepa vac				3.5						
hepa vac				2						
	0	13	0	18.75	0	0	0	0	0	0
						Total D	31.75		Total L	0
Roof										
shingles remove		0.75		0.75				6.5	6.5	6
shingles remove								6.5	6.5	6.5
shingles remove		3.25						5.75	5.75	5.75
roof vents remove				7.25						
roof vents remove				1.25						
	0	4	0	9.25	0	0	0	18.75	18.75	18.25
						Total D	13.25		Total L	55.75

Site Preparation										
site prep		1		0.5				0.5	0.5	0.5
window plywood remove		2								
clean up		0.25		0.25				0.25	0.25	0.25
window plywood remove		1.25								
clean up		0.25		0.25				0.25	0.25	0.25
plastic over roof				1.5				1.5	1.5	1.5
clean up		0.25		0.25				0.25	0.25	0.25
clean up				0.25						
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				1.5	1.5	1.5
plastic on roof		2						2	2	2
clean up		4						3.5	3.5	3.5
clean up				0.25						
clean up				0.25						
	0	11.5	0	4	0	0	0	10	10	10
						Total D	15.5		Total L	30
mat'l. to warehouse										
windows to warehouse		3		3						
	0	3	0	3	0	0	0	0	0	0
						Total D	6		Total L	0

Windows and Doors										
windows remove		5.25		5.25						
garage doors remove		2.75						4.75	1.75	
	0	8	0	5.25	0	0	0	4.75	1.75	0
						Total D	13.25		Total L	6.5
Hauling										
dump run		1								
dump run		2.25								
dump run		1		1						
dump run		1								
dump run		1								
	0	6.25	0	1	0	0	0	0	0	0
						Total D	7.25		Total L	0
Electric										
light fixtures remove								4	5	
electric remove									2	
elec. boxes remove										2.25
	0	0	0	0	0	0	0	4	7	2.25
						Total D	0		Total L	13.25
Exterior Walls										
ext wall remove		0.75		3.25				3.25	3.25	3.25
load dump truck		1		1				1	1	1
ext. wall remove		2		4.75					2	
de-nail				2.75				2	2	7.25
ext wall remove				2				2	2	
ext. wall remove				3				2	3	
stack wood				2				3.75	2	
load dump truck		1.5		1.5				1.5	1.5	1.5
stack wood		1.5		4.25				2.5	4.25	4.25
de-nail		1.75						1.75		
	0	8.5	0	24.5	0	0	0	19.75	21	17.25
						Total D	33		Total L	58
Interior Walls										
load dump truck		2		2				2	2	2
intr. drywall remove		1.25		1				1	1	1
columns remove				1.75				1.75	1.75	
load dump truck		2						2	2	
stack wood		2		1.5				3	1.5	
interior walls remove				3.75						
de-nailing									1.5	5.25
stack wood		2		4				5.25	3.5	3.75
de-nail		2							1.75	1.5
int walls remove				6.25				1.25		
	0	11.25	0	20.25	0	0	0	16.25	15	13.5
						Total D	31.5		Total L	44.75
Plumbing										

bath fixtures remove								1.75		
heating remove		1.25								
plumbing remove									1	
	0	1.25	0	0	0	0	0	1.75	1	0
						Total D	1.25		Total L	2.75
Roof										
load dump truck		1.25		0.5				0.5	0.5	0.5
shingles remove		4.5		6.25				6.25	6.25	6.25
roof sheathing remove		5.25		5.25				5.25	4.25	2
rafters remove		2		2				0.75		
stack wood								1.25	3	3
roof sheathing remove		6.25		6.25				6.25	6.25	6.25
rafters remove		1		1				1	1	1
rafters remove		2		2				2	2	2
stack wood								2.75	2	3.5
de-nail									2	
beams remove		1		1				1	1	1
de-nail										4.75
de-nail		5.75								5.75
ridge beam dismantle				0.75					0.75	
	0	29	0	25	0	0	0	27	29	36
						Total D	54		Total L	92
Site Work										
site set-up		0.75		0.75						
clean up		1.25		0.5				0.5	0.5	
site set-up		0.5		0.5				0.5	0.5	0.5
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				2	1.5	2
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.75		0.75				1.75	1.75	1.75
clean up				1.75				1.75	1.75	0.25
clean up		1.75		1.75				1.75	1.75	1.75
clean up		1.75		1.75				1.75	1.75	1.75
clean up		2.5		2.25				2.5	2.5	2.25
clean up		2.25		2.25				2.25	2.25	2.25
clean up		0.25		0.25				0.25	0.25	
	0	13	0	13.75	0	0	0	16	15.5	13.5
						Total D	26.75		Total L	45
Supply Run										
supply run		1.5								
	0	1.5	0	0	0	0	0	0	0	0
						Total D	1.5		Total L	0

mat'l to Warehouse										
mat'l to warehouse		2.75								
mat'l to warehouse		5.5		3.5				5.5	5.5	
	0	8.25	0	3.5	0	0	0	5.5	5.5	0
						Total D	11.75		Total L	11

Task	D	D	D	D	D	D	D	L	L	L
Electric										
intr fixtures remove		1.5		2						
	0	1.5	0	2	0	0	0	0	0	0
						Total D	3.5		Total L	0
Exterior										
tool shed remove				3.5					1.75	
garage storage remove				3.75						
	0	0	0	7.25	0	0	0	0	1.75	0
						Total D	7.25		Total L	1.75
Hauling										
dump run		1								
dump run		2.25								
dump run		2								
	0	5.25	0	0	0	0	0	0	0	0
						Total D	5.25		Total L	0
Instruction										
instruction		1								
paper work		0.5								
	0	1.5	0	0	0	0	0	0	0	0
						Total D	1.5		Total L	0
Interior										
trim/baseboard remove		1						1	1	1
intr. walls remove		1.5		4						
inter. trim/doors remove		2.25		2.5						
interior remove		2		4						
	0	6.75	0	10.5	0	0	0	1	1	1
						Total D	17.25		Total L	3
Plumbing										
cabinets remove		1						1	1	1
kitchen cabinets remove				3.25						
	0	1	0	3.25	0	0	0	1	1	1
						Total D	4.25		Total L	3
Roof										
tar/gravel roofing remove		0.75						3.5	3.5	3.5
roof insulation remove		0.5						3	3	3
roof insulation remove		2						7.25	7.25	7.25
roof insulation remove		3.25		1.75				7.25	5.5	7.25
roof trim remove								2	2	2
	0	6.5	0	1.75	0	0	0	23	21.25	23
						Total D	8.25		Total L	67.25
Site Work										
clean up		0.25						0.25	0.25	0.25

site set-up		0.75		0.75				0.75	0.75	0.75
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		0.25		0.25				0.25	0.25	0.25
clean up		4		0.25				2	2	2
	0	5.75	0	1.75	0	0	0	3.75	3.75	3.75
						Total D	7.5		Total L	11.25
Supply Run										
supply run		0.5								
	0	0.5	0	0	0	0	0	0	0	0
						Total D	0.5		Total L	0
Matl to Warehouse										
appliances to warehouse		2						2	2	2
	0	2	0	0	0	0	0	2	2	2
						Total D	2		Total L	6

Appendix 14.11

USDA, Lumber Grading Report

Fort Ord Pilot Deconstruction Project

Lumber Grading Report

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Introduction

The Fort Ord Reuse Authority has developed a cooperative research agreement with the Forest Products Laboratory (FPL) and the West Coast Lumber Inspection Bureau (WCLIB) to develop information on the grades of lumber reclaimed from deconstructed buildings at Fort Ord. Because the value of lumber is tied directly to its quality, an evaluation of the grades of lumber from these buildings will help determine market value.

Also, from a broader perspective, there is interest in developing a technical database of the actual engineering properties of recycled lumber. Recycled lumber may exhibit properties different than the lumber produced today, since current grading rules and allowable engineering properties have evolved to accommodate currently produced lumber. For this reason, a research program has been developed at the FPL to evaluate the grade characteristics and engineering properties of lumber recycled from residential and industrial buildings. The objective of this research is to determine if these properties of recycled lumber differ significantly from the properties of currently available lumber. Evaluation of the lumber graded at Fort Ord will help develop the necessary database for these materials.

This report summarizes the results of grading performed on 1009 pieces of lumber collected from four buildings deconstructed at Fort Ord (Buildings 21, 1807, 2143, and 2252). These buildings contained wood structural elements representative of approximately 740 other buildings on site.

Several sizes of lumber were collected for grading. These included 2x4 wall studs, 2x6 roof rafters, 2x8 floor joists, and 2x10 floor joists. These members had been carefully removed by FOR A during the deconstruction process.

Grading Methodology

A lumber grade, and the grading rules that stand behind it, are critical elements in the trade of lumber products. The grade assigned to a piece of lumber verifies its quality and adherence to national grading standards criteria and rules. This quality assurance allows its widespread acceptance by engineers, architects, and building officials at a building site.

The lumber selected at Fort Ord was visually assessed for structural grade by a certified WCLIB grader according to Standard No. 17, Grading Rules for West Coast Lumber (WCLIB, 1996). The WCLIB is one of six rules-writing agencies recognized by the American Lumber Standard Committee (ALSC. As part of its responsibilities, WCLIB publishes and maintains the Standard No. 17, Grading Rules for West Coast Lumber (WCLIB, 1996) as well as several other technical publications. Standard No. 17 is referenced as a recognized standard in the Uniform Building Code.

The deconstruction process performed by FOR A preserved all pieces of lumber from the deconstructed buildings. The full length of each piece of lumber was graded according to the above grading rules, and notes were taken as to what type of defect or lumber characteristic determined grade (e.g., knots, slope-of-grain, wane, warp, damage, etc). For the purposes of this study, damage is defined as holes due to nails or bolts, splits due to factors other than drying, saw cuts, notches, decay, and mechanical damage (gouges, broken ends, missing sections due to splits, etc.). If a bolt hole and/or nail hole(s) were present in the piece, the grader estimated an equivalent knot size for grade determination. For those pieces with damage present, the grader made an estimate of grade assuming the damage was not present. This provided an estimate of average grade reduction due to damage.

Because pieces shorter than 6 ft. in length were not considered merchantable as structural lumber, they were not graded. Some pieces, though of adequate length, were painted, and could not be graded (paint can obscure critical defects in lumber, such as slope-of-grain and knots).

The 2x4 lumber was graded under WCLIB Standard No. 17 designation "Light Framing". This designation applies to lumber 2-4" thick and 2-4" wide. Four grades exist under this designation (listed from highest to lowest quality): Construction, Standard, Utility, and Economy. The 2x6, 2x8, and 2x10 lumber were graded under designation "Structural Joists & Planks". This designation applies to lumber 2-4" thick, 5" and wider. Four grades exist under this designation (listed from highest to lowest quality): Select Structural, No.1, No. 2, and No. 3. The grade rules and criteria for these designations and grades are listed in Appendix 1 as reproduced from Standard No. 17.

Note that in this report reference is given to a grade "Economy (< No. 3)". This is not an official WCLIB grade, however the designation is used for comparative purposes to indicate those pieces that did not meet the No. 3 grade for Structural Joist & Planks.

Buildings Evaluated

The lumber graded in this study was taken from four buildings. Building 21 was a 2300 sq. ft. single story wood-frame building built in 1941. Approximately 150 buildings of this type exist at Fort Ord. Building 1807 was a 11,500 sq. ft. single story wood-frame building built in 1940. Approximately 180 buildings of this type exist at Fort Ord. Building

2143 was a 4,720sq. ft. two-story wood-frame barracks built in 1940. Approximately 385 buildings of this type exist at Fort Ord. Building 2252 was a 22,000 sq. ft. single story wood-frame shop. Though only partially deconstructed, this building is representative of approximately 25 similarly constructed buildings at Fort Ord.

Results

Lumber Quantity and Specie

As shown in Table 1, a total of 1009 pieces of lumber were graded. About 30% of these pieces came from Buildings 2252, 38% from Building 2143, 21% from Building 21, and 11% from Building 1807. Table 2 indicates the distribution of lumber sizes graded and indicates that the predominate size was the 2x8. As expected, most of the lumber collected was Douglas fir (92%), though some Hem-fir (6%) and Sugar pine (2%) were also present (Table 3).

Table 1
Graded Lumber

Building Number	No. of Pieces	Percent
21	210	20.8
1807	117	11.6
2143	380	37.7
2252	302	29.9
Total	**1009**	**100.0**

Table 2
Lumber Size Distribution
(All Buildings)

Size Lumber	No. of Pieces	Percent
2x4	184	18.2
2x6	275	27.3
2x8	504	50.0
2x10	46	1.3
Total	**1009**	**100.0**

Table 3
Species Distribution
(All Buildings)

Species	No. of Pieces	Percent
Douglas Fir	928	92.0
Hem-Fir	62	6.1
Sugar Pine	19	1.9
Total	**1009**	**100.0**

Lumber Usage

Depending on lumber size and building type, the pieces graded were used for different structural elements. As shown in Table 4, most of the graded pieces had been used as floor joists or rafters.

All of the 2x10's graded had been used as floor joists, while all of the 2x6's had been used as rafters. The 2x8's were used either as floor joists (80.2%), as stringers (17.3%), or as elements in nail laminated beams (2.6%). The 2x4's had had many uses, including studs (63.0%), rafter ties (14.7%), truss braces (15.8%), or wall top plates (6.5%).

Table 4
Distribution of Lumber Usage
(All Buildings)

Usage	No. of Pieces	Percent
Floor Joist	450	44.6
Built-up Beam	13	1.3
Rafter	275	27.3
Rafter Tie	27	2.7
Stringer	87	8.6
Top Plate	12	1.2
Truss Brace	29	2.9
Wall Stud	116	11.5
Total	**1009**	**100.0**

Lumber Grades

As shown in Table 5, 825 pieces of lumber were graded as Structural Joists & Planks. Of these, 6.1% were graded as Select Structural, 19.0% as No. 1, 51.9% as No. 2, 14.3% as No. 3, and 8.7% did not meet the No. 3 grade. Of the 184 2x4's graded as Light Framing, 39.1% were graded as Construction, 53.3% as Standard, 6.5% as Utility, and 1.1% as Economy. Table 6 indicates that the predominant factors for grade determination are knots and damage. Knot size determined grade in 43.2% of the pieces, while damage determined grade in 34.6% of the pieces.

Table 5
Grade Distribution – As Graded
(All Buildings, All Sizes)

Structural Joists and Planks (2x6, 2x8, 2x10)		
Grade	**No. of Pieces**	**Percent**
Select Structural	50	6.1
No. 1	157	19.0
No. 2	428	51.9
No. 3	118	14.3
Economy (<No. 3)	72	8.7
Total	**825**	**100.0**
Light Framing (2x4 only)		
Grade	**No. of Pieces**	**Percent**
Construction	72	39.1
Standard	98	53.3
Utility	12	6.5
Economy	2	1.1
Total	**184**	**100.0**

Table 6
Grade Determining Factors
(All pieces)

Reason	Percent of All Pieces
Knots	43.2
Damage[1]	34.6
Shake	4.9
Splits (due to drying)	2.7
Wane	1.1
Slope-of-Grain	1.9
Warp	0.4
Checks	0.2
Meets Highest Grade[2]	5.7
Other[3]	5.3
Total	**100.0**

[1] Includes holes due to nails or bolts, splits due to factors other than drying, saw cuts, notches, decay and termite damage, and mechanical damage (gouges, broken ends, missing sections due to splits, etc.)
[2] No reason recorded because piece met highest grade requirements
[3] Includes drying defects, skip, grain distortion, dimensional variation, white speck, and twist.

Effects of Damage

From a structural use standpoint, the most distinguishing feature of recycled wood (compared to freshly sawn graded lumber) is the presence of damage. This damage may be a result of: I) the original construction process (nail holes, bolt holes, saw cuts, notches, etc.), II) building use (drying defects, decay and termite damage, etc.), and/or III) the deconstruction process (edge damage, end splitting, gouges, etc.). These three types of damage will be referred to as Type I, II, and III, respectively.

It is desirable to minimize damage so yields of high-grade lumber can be maximized. In an existing building it is not possible to change the amount of Type I or Type II damage, because it is preexisting. It may be possible to minimize Type III damage, however. Note that edge damage, end damage, end splitting, and gouges are all listed as Type III damage. In evaluating the lumber, it could not always be determined if the damage resulted from the deconstruction process or if it was preexisting. For this reason, the data presented will serve as an upper bound estimate of the damage due to deconstruction. In other words, for the deconstruction process used in these buildings, the damage due to deconstruction should not be greater than presented here.

As indicated in Table 6, damage affected the grade of over 1/3 of the lumber evaluated in this study. Table 7 indicates that for the 349 pieces in which damage determined grade, the presence of nail holes was the predominate reason (40.5 %). Edge damage also affected 28.7% of the damaged pieces.

Edge damage was the most common form of deconstruction damage to the lumber. It is likely that this damage resulted while removing floor boards from the joist material and roof sheathing from roof rafters.

Table 7
Damage in Graded Lumber

Damage Type	Reason	Percent of Damaged Pieces (347 total)
Type I	Nail Holes	40.5
	Bolt Holes	5.5
	Notching, Saw Cuts	4.6
Type II	Decay, Termites	6.6
Type III	Splits (due to disassembly)	7.2
	Edge Damage	28.7
	End Damage	6.9
	Total	**100.0**

As shown in Figures 1-4, damage to the lumber has a definite effect in reducing the grade. These graphs indicate the grades of the lumber (as graded, including damage) as well as the grade of the lumber IF no damage existed (undamaged) for all forms of damage (Types I, II, and III). It is apparent that for all sizes of lumber the grade is significantly reduced when damage exists.

Figures 5-8 indicate the effect of Type III damage on the grades of lumber evaluated. Similar to Figures 1-4, Type III damage significantly reduces the grade of the lumber.

Conclusions

The following general conclusions can be drawn from the lumber grading study conducted at Fort Ord:

- Douglas fir is the predominate specie of lumber contained in the buildings evaluated.
- The predominate grade of the 2x6, 2x8, and 2x10 lumber was No.2. Approximately 77% of this lumber is No.2 or better.
- The predominate grade of the 2x4 lumber was Standard. Approximately 92% of this lumber was Standard or better.
- The prevailing grade determining defects were knots and damage. The most frequent forms of damage were nail holes and end damage.
- Lumber degrade as a result of damage in the deconstruction process could be lessened by reducing the edge damage to joists and rafters. More carefully removing the floor underlayment and roof sheathing will help minimize this form of damage.

- Lumber degrade as a result of damage in the deconstruction process could be lessened by reducing the end damage to joists and rafters. More carefully removing the end nails from joists and rafters (and not prying the joists and rafters free, where possible) will help minimize this form of damage.

References

West Coast Lumber Inspection Bureau, Standard No. 17, Grading Rules for West Coast Lumber, Revised January 1, 1996, WCLIB, Portland, Oregon.

Figure 1

Grade Reduction Due to Damage
2x4 Lumber
(All Forms of Damage)

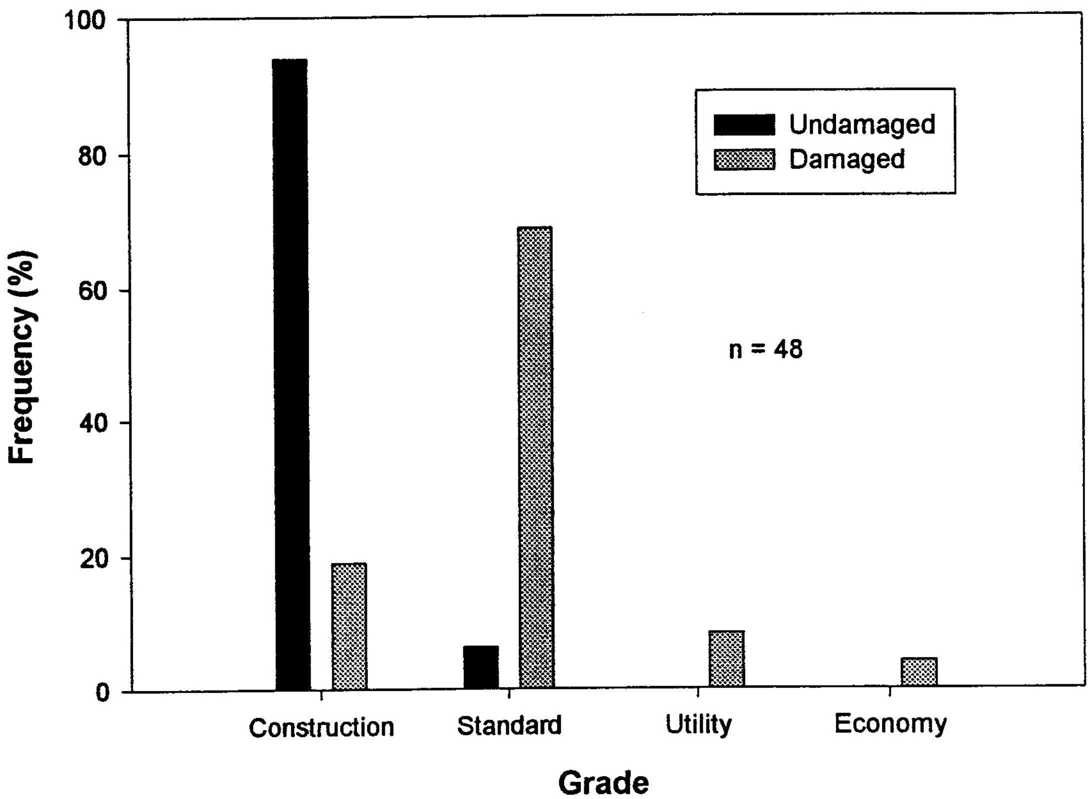


Figure 2

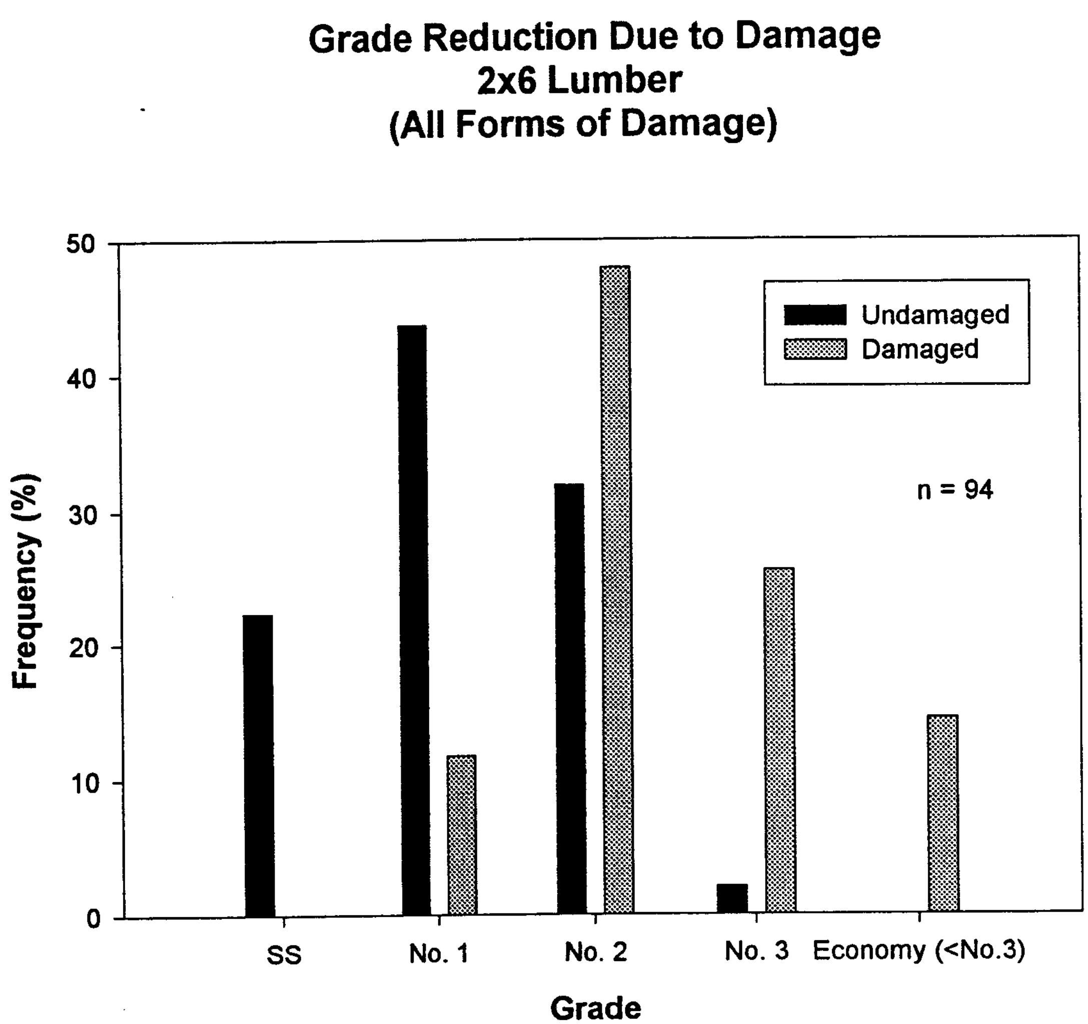
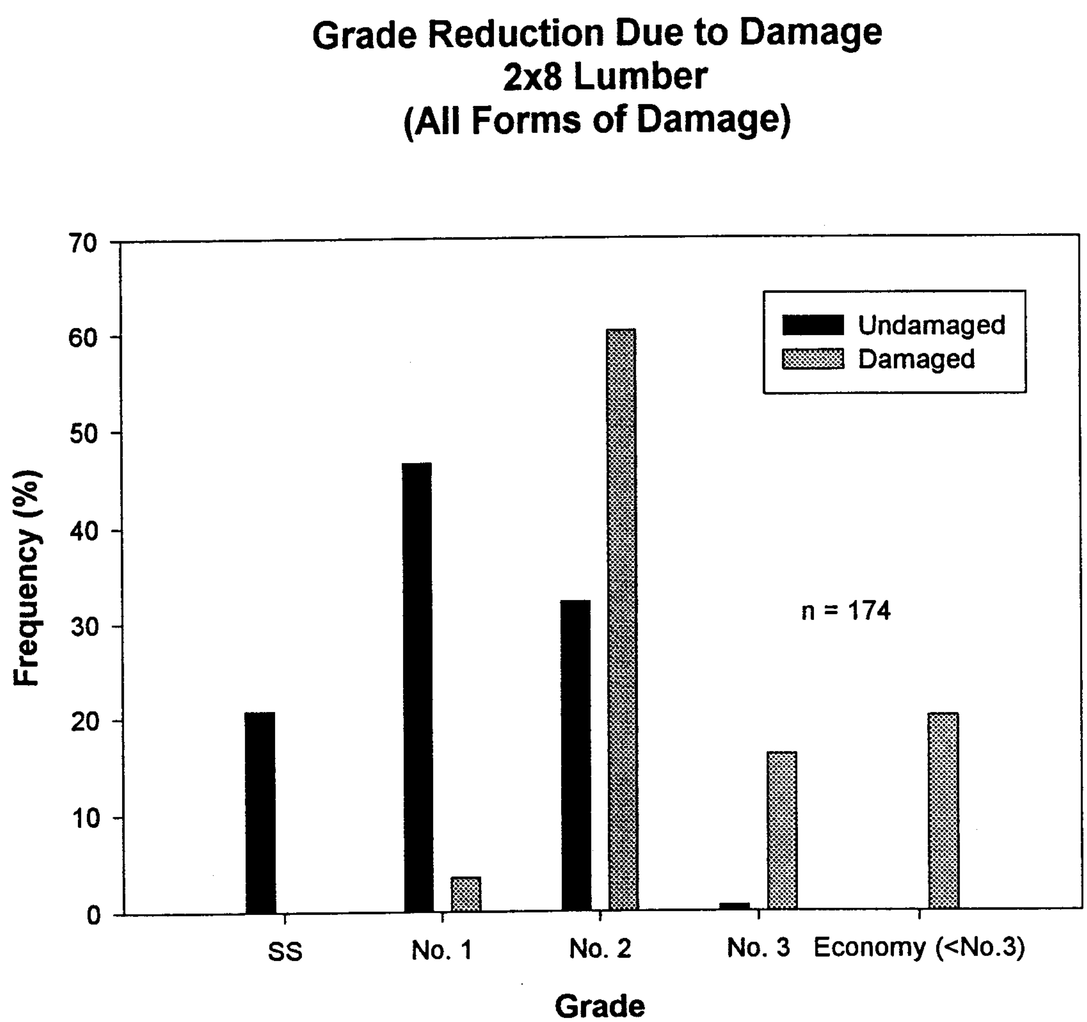

Grade Reduction Due to Damage
2x6 Lumber
(All Forms of Damage)
50
40
30
20
10
0
Frequency (%)
Undamaged
Damaged
n = 94
SS
No. 1
No. 2
No. 3
Economy (<No.3)
Grade

Figure 3



Grade Reduction Due to Damage
2x8 Lumber
(All Forms of Damage)
Frequency (%)
70
60
50
40
30
20
10
0
Undamaged
Damaged
n = 174
SS
No. 1
No. 2
No. 3
Economy (<No.3)
Grade

Figure 4

Grade Reduction Due to Damage
2x10 Lumber
(All Forms of Damage)

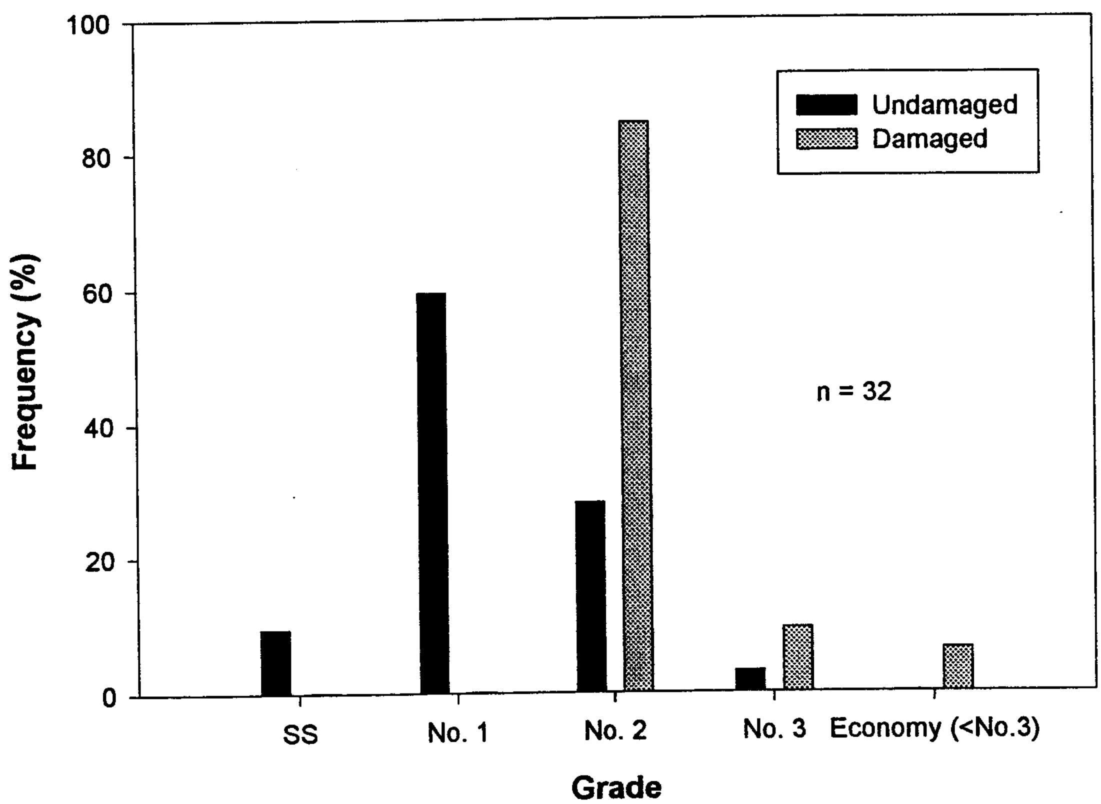


Figure 5

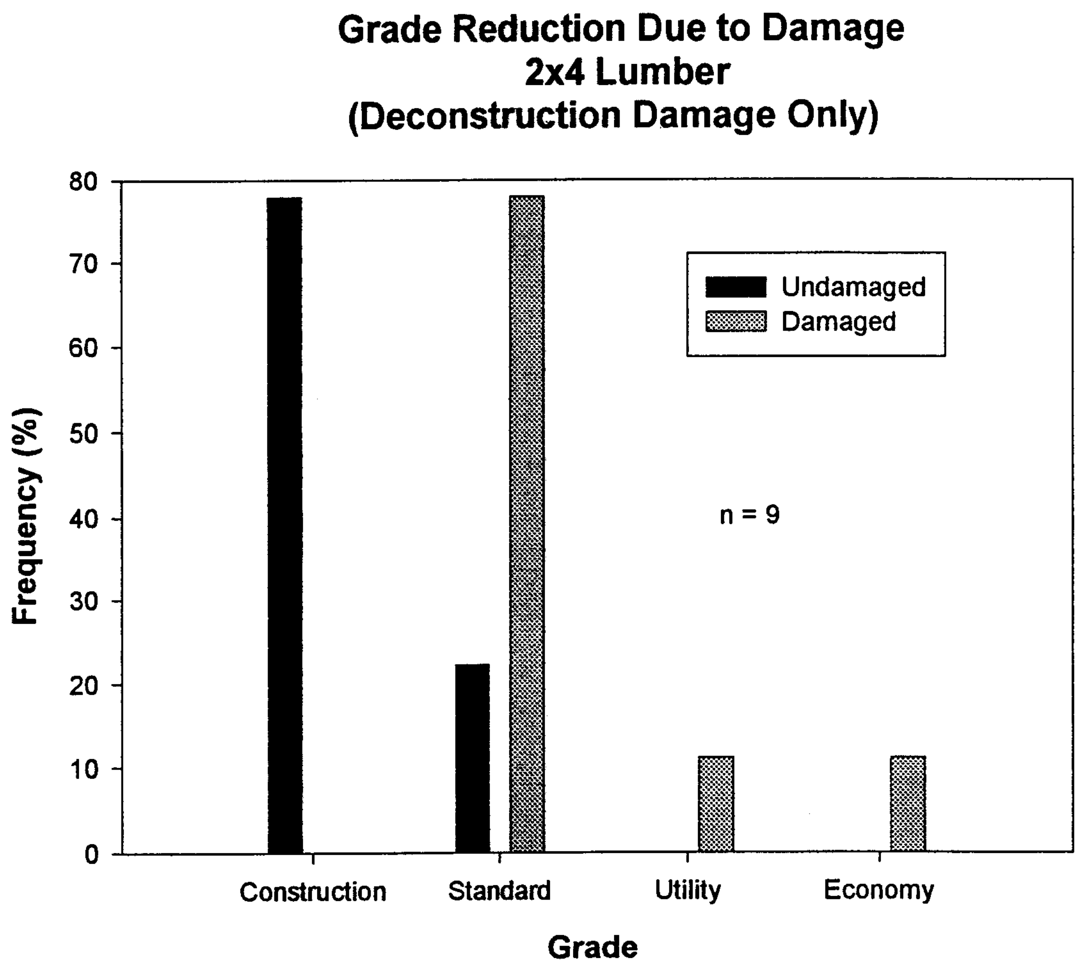

Grade Reduction Due to Damage
2x4 Lumber
(Deconstruction Damage Only)
Frequency (%)
0
10
20
30
40
50
60
70
80
Undamaged
Damaged
n = 9
Construction
Standard
Utility
Economy
Grade

Figure 6

Grade Reduction Due to Damage
2x6 Lumber
(Deconstruction Damage Only)

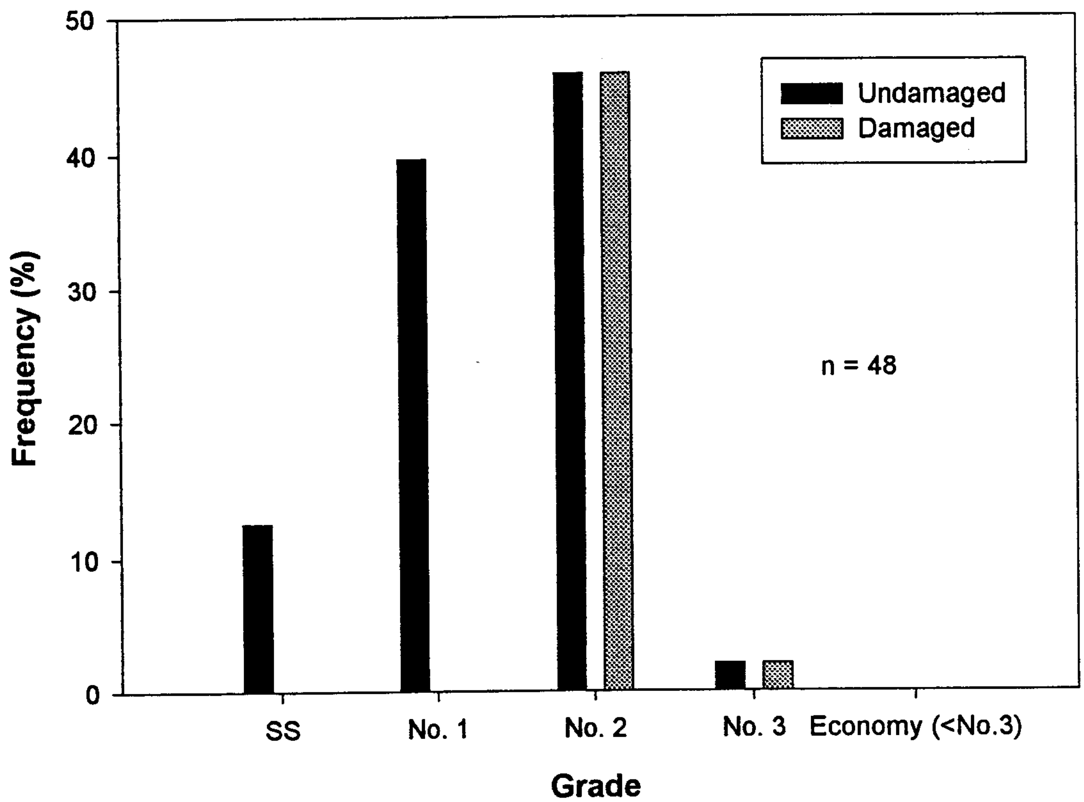


Figure 7

Grade Reduction Due to Damage
2x8 Lumber
(Deconstruction Damage Only)

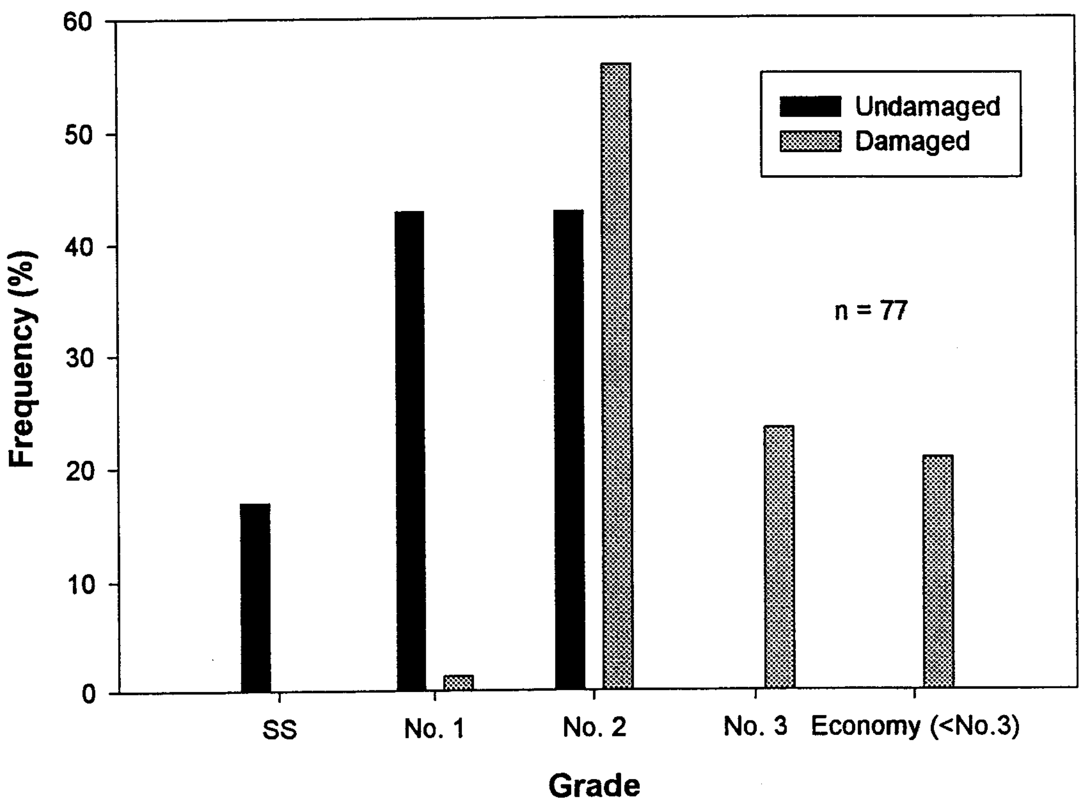
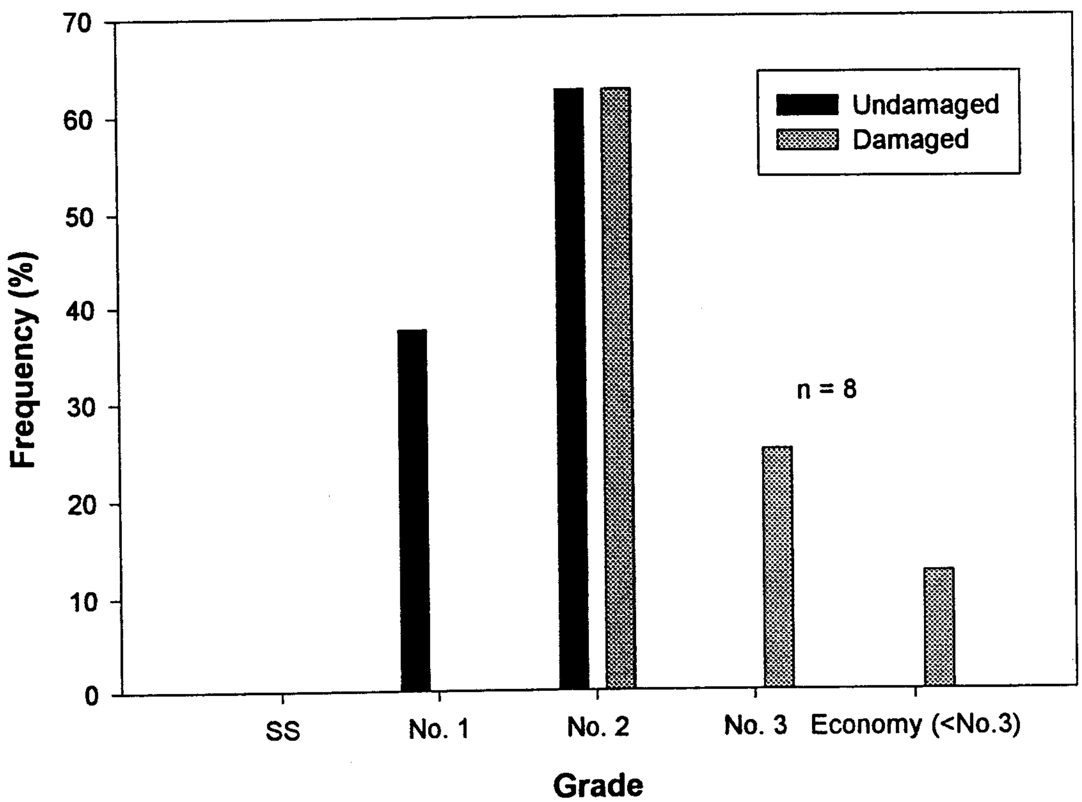


Figure 8

**Grade Reduction Due to Damage
2x10 Lumber
(Deconstruction Damage Only)**



Appendix 14.12

Building Material Inventory* for Each Building

* The Inventory has attempted to include only those materials that were incorporated into the structure as originally constructed and does not the materials from later building remodels.

Building 21 Materials

Quantity	Description
Doors and Windows	
25 ea.	32x54, windows
2 ea.	32x80, single doors, ext
16 ea.	32x80, single doors, int
1 ea.	64x80, double doors, ext.
Exterior Walls	
3165 sf	.5 inch drywall
1019 lf	1x6
3618 lf	1x6 t/g siding
2638 lf	2x4
Floor	
2215 sf	.25 inch plywood
7908 lf	.75 t/g flooring
2215 sf	12x12 tile
4833 lf	1x6
726 lf	2x4
2380 lf	2x8
72 lf	8x8
23 cf	concrete floor
Interior Walls	
1481 sf	.5 inch drywall
2135 lf	1x12 t/g pine
1185 lf	2x4
Roof	
2365 sf	.5 inch drywall
159 lf	1x4
357 lf	1x6 t/g siding
90 lf	2x12
125 lf	2x2
4044 lf	2x4
3982 lf	1x10 t/g sheathing
1472	2x8

Building 1807 Materials

Quantity	Description
Doors/windows	
16 ea.	32x54, windows
2 ea.	32x80, single doors, ext
1 ea.	64x80, double doors, ext
2 ea.	32x80 single doors, intr
Exterior walls	
1085 sf	.5 inch drywall
112 lf	1x10
226 lf	1x6
2260 lf	1x6 t/g siding
84 lf	1x8
1428 lf	2x4
Floor	
1012 sq. feet	.25 inch plywood
3740 lf	.75x4 t/g flooring
1012 sq. feet	12x12 tile
2513 lf	1x6
808 lf	2x6
299 lf	2x8
27 lf	8x8
132 lf	2x4
23 cubic feet	concrete floor
Interior walls	
206 sq. feet	.5 inch drywall
290 lf	2x4
Roof	
1182 sf	.5 inch drywall
80 lf	1x4
357 lf	1x6 t/g siding
2349 lf	1x8 t/g sheathing
45 lf	2x10
63 lf	2x2.
2022 lf	2x4
644 lf	2x8

Quantity	Description
Doors/windows	
1 ea.	23x20 window
4 ea.	32x80 single door, ext
6 ea.	32x80 single door, int
2 ea.	43x52 window
34 ea.	44x53 window
1 ea.	64x80 double door, ext
Electric	
28 ea.	48"-2 bulb, fluorescent
4 ea.	dome ceiling lights
4 ea.	exit light
Exterior walls	
360 lf	.75 qtr rnd
619 lf	.75x4
235 lf	1x10
323 lf	1x2
189 lf	1x4
5083 lf	1x6 siding
469 lf	1x6
176 lf	1x8
1875 lf	2x4
2820 sf	drywall
Floor	
13839 lf	1x4 t/g flooring
8425 lf	1x6
1567 lf	2x10
3766 lf	2x8
228 CF	concrete
4194 sf	12x12 tile
4194 sf	9x9 tile
4194 sf	.25 plywood
625 lf	2x4
54 lf	8x8
2247 sf	drywall (1st floor ceiling)
Interior walls	
240 lf	.75 qtr rnd
315 lf	.75x4
144 lf	1x2
100 lf	1x4
16 lf	1x8 t/g
1299 lf	2x4

Building 2143 Materials

112 lf	6x6
Plumbing	
6 ea.	bath room sinks
4 ea.	toilets
3 ea.	urinals
1 ea.	utility sinks
Roof	
2981 lf	1x10 t/g sheathing
12 lf	1x6 siding
3215 lf	2x6
480 lf	2x8
4240 lf	drywall

Quantity	Description
Doors and Windows	
20 ea.	69"x158" swinging doors, ext.
Exterior Walls	
1040 lf	1x12 vertical siding
317 lf	6x6
Roof	
256 lf	1x12 vertical siding.
1617 lf	2x6
1620 lf	1x12 t/g sheathing
1920 lf	1x10 t/g sheathing
240 lf	2x6
649 lf	2x4
900 lf	2x8

Appendix 14.13

Interview with Mr. Cederwal

Panelized Deconstruction Case Study

10-25-96

Interview with Mr. Cederwal 10-26-96.

About a 1200 SF. duplex re-assembled from parts of former barracks.

Background:

Mr. Cederwal contacted me (Stan Cook) in the summer of 1996 in response to an article that he read in the Herald describing the Pilot Project discussion by the FORA Board. He explained that he had bought barracks from former Fort Beale, in the late 1950's (Check spelling) and had reassembled them in downtown Seaside. These buildings had been disassembled by cutting them into 8' by 12' panels at Fort Beale. He had hired a local trucker and trucked the Panels to Seaside and reassembled them with the help of his brother. He had reassembled the panels into a form that was different then their original configuration with plans that were supplied when he bought the panels. He explained that the buildings were still in use and he would show them to me. Mr. Cederwal (372-5594)

Stan Cook in italics. Conducting interview.

Mr. Cederwal in regular type. Being interviewed.

Additions and explanations in Parentheses.

Interview:

Did you cut up two story buildings like this? (Showing him a sketch of two story barrack on Fort Ord) Yes and some of them were single story buildings. What I got were blueprints to put the pieces together to make a two bedroom house.

And the Army gave you those blue prints? Yes.

And did they have the panels already cut up for you? They cut them up, right and I sent a truck up to Camp Beale to pick them up. Then when I got mine I changed it a little bit. I made a duplex out of it.

Which one is it? (looking around) You want to look it over?

(Walk over to site. The building is the second house to the east of the DMV parking lot. 575 Hilby Avenue. It is a white one story stucco duplex on a raised floor. The units are side by side. It looks very similar to the house next to it on the DMV side. This house next door was moved from across town to its present site.)

How long did it take you to put it together do you remember? It was better then the building next door. It came from close to where the new hotel is.

That wasn't an old barracks though? No, that wasn't an old barracks. This one is the old barracks.

It looks almost the same.? Stucco goes on the outside and put sheet rock on the inside. So in addition to what they sent me I got some more insulation (I think he means from him adding his layer of sheet rock) and its a pretty well built structure.

And how long did it take you to assemble it? Not very long.

A couple of days, a couple of weeks? Oh, no longer than a week.

(At this time the current owner of the building came up and introduced himself. His name is Rick Sagen and his phone number is 393-2837, beeper 373-9995. He said the current tenants are very friendly and probably wouldn't mind us looking at the structure. I have since called him and left a message to arrange a time when it would be of with the tenants to look at the building. Rick had just finished remodeling the building. Incidentally he lives next door on the other side than the house that had been moved. His address is 585 Hilby Avenue He had also live in the house that had been moved.)

How many men did you use? Two men.

Two men one week? Yes.

How many Square feet do you think that this is? Walk it off.

(we proceed to walk off the dimensions and they are roughly 30' x 40', not including the more recent small addition on the rear consisting of two porches and what might be washrooms or bathrooms.)

Was the back part original, did you put this on here? No.

Did you put a basement in it? No.

Just raised it up and put a stem wall around it? Yes.

When you got your panels did they have drywall on the inside or were they just studs? It had drywall. Whether we left that there or not ....I think we left that and put our dry wall on top of that. It was pretty well chopped up then we just covered up what there was.

When you got your wall there had to be a stud right here.... (I draw a sketch of a framed wall panel and point to the far left end and stud, then draw the top plate and bottom plate. Confirming as I go that that was what Mr. Cederwal received as a panel. The I move my pencil to the right end of the panel sketch and ask if there was a stud at the end. He indicates that there was no stud at one end, he had to add the stud here. He says that there was no new lumber put into any of the panels he received.)

When you put the next panel to this one how did you tie it together? (still looking at the sketch, that now has a second panel drawn next to the original one) did you nail the (adjacent) studs together? Yes

Did you put a second plate on top to tie these two (panels) *together?* Yes.

What did you do at the floor? Oh, I don't know it was a long time ago. (here is where I have to apologize for being to excited) Well, like I told you the original drywall was pretty chopped up. I suppose we had to remove some of it and then fasten those two together.

And then you could have put holes in it to tie it to the floor? Yes, that's right. You asked me what we did for the floor. There was floor came with it too.

They were 8' x12' too? (floor panels) Yes.

How about the roof? Was the roof in pieces too? It was in pieces too.

So everything was like a big kit? Yes that's right. It would be nice if you could find out who...I don't suppose the Army would ...I don't remember who I paid. Whether I paid the Army or whether it was some outside civilian organization.

A third party? Yes, I don't remember that.

Do you remember what year it was? Late fifties, but I don't remember exactly.

I could probably find out from the building permit? Yes. It was the County back then.

Where was it from? Camp Beale. (here I have to ask the spelling) Up in Marysville, up in that area. Seems to me that the Air Force took it over afterwards.

What were some of the biggest problems that you ran into? We didn't have any problems with it.

No Problems? No. I don't know if its built to present day codes or not, I don't know.

That's something I can do some investigation on. We all know that things have changes since those times, but I really like the idea and how to make it work. It worked and they did a lot of them that way. My partner in business bought a package like that too. He reconstructed it over on Military Avenue on the other side of Seaside.

Can we still find that building? Its been torn down. Its been redeveloped there.

I just think its an extremely good idea. Well if you can come up with a set of plans and offer that to people or what would you do with the buildings, haul it off or reconstruct it on post, on the base?

Well right now everyone looks at them as an eyesore. I would like to have an architectural contest, rethink everything from scratch. The best ways to cut them. What you can do to bring them up to code right there. Should we strip out the interiors and maybe pre-fab them a little before we ship them to someone so that they have nice drywall in them or leave some of the drywall off because its easier to put it on here. (at the site) *Then what kind of configurations? Can we make nice little houses like this* (one here) *or can maybe an "L" shaped house. Because it looks like you could configure them any way.* Oh, sure. *The best ways we can join them to meet today's seismic? Or can we make them into two story ? Then when people call can they get a kit, just like you did? When we just send people a kit then they get so many "A"-panels, "B"-panels, or "C"-panels.* (Then I go off, on potential markets that might be appropriate for these buildings. Stressing that groups that can take large amounts of buildings would be the best and not sell just one or two buildings at a time. I.E. Replacement farm worker housing, low income housing, Indian tribes) It would save a lot of lumber wouldn't it? Then tear all those buildings down and then to dump it. *Yes, there is between two thousand to five thousand acres of timber that you would have to harvest to get that again.*

So you didn't have any problems with it at all? How many men did it take to move a panel? Two guys. It was all dry lumber.

And they were 8' x 12' panels? As I remember it, Yes. But then they could be anything that you could.... Do you have original plans for those buildings out there at Fort Ord? *There are* *a couple standard drawings, but the drawing I showed you I had to sketch that one myself.*

And the windows and everything were fine in it? Yes.

These (windows) have been replaced? Yes, its been through several hands since I sold it. I got into the Supermarket business and wound up with seven Supermarkets I didn't have time to take care of rentals.

(Here we talk about my house in San Diego and compare it to the house at 575 Hilby) This one (575 Hilby) is well insulated, with stucco on the outside, the (original) walls inside (that), then drywall on that. It has good thick walls.

How did you ...did you do a truss roof in there or did they give you a series of walls to run through the center to act as barring walls? There is no trusses in there. It just supports it from the walls inside. There is if you can get in there, crawl space to get up in the attic from a closet in there. So, one can get into the attic there and look. Just to check again there might be shims and that. (the part about the shims was hard to hear a truck was passing by)

(Looking closely at the driveway side wall stucco we look for cracks that might disclose where the panels were joined. I hoped to get a better fix on the actual panel sizes and if they were all the same size.)

Did you have to do any additional framing, that you remember? No.

It was pretty much a kit when you got it? That's right, yes.

Now when it came to you was it cut like it was cut with a chain-saw or cut with like a skill saw. (Here I make a wavy motion with my hand to indicate a quick crocked cut with a chain-saw.) No a skill-saw, I don't think they had chain-saws in those days.

But they were nice straight cuts? Yes.

That was not the original roof line up there, with the vent in that thing. (pointing at a little dormer vent in the center of the roof) I did it to match that one. (pointing at the house next door)

It worked great it makes it look like a little neighborhood. And then for the electric how did you wire it? No, we hired an electrician to do that, because it was new wiring of course. New plumbing.

I don't know if I should bother these tenants. I think that I will call Rick and make an appointment to come by and crawl underneath the house, because I think that's the polite way to do it. Did you have shingles on the roof panels when they came or were they stripped of shingles? No shingles.

No shingles, just down to bare wood? No shingles.

Yes, I guess that would make them lighter and easier to handle, plus they wouldn't be much use anyway. Did it have tar-paper on it? I think there was tar-paper.

And underneath this, there is the same ship-lap siding? (pointing at the ship-lap siding next door and meaning underneath the stucco) No.... It wasn't ship-lap I know that. It wasn't ship-lap and it wasn't plywood, so what was it?

Could it have been drywall of some kind or sheet-rock, maybe? No it wasn't. No, not on the outside.

How many trucks did it come on? Two as I remember. A fellow up here had a truck for hauling sardines from the canneries, down on Cannery Row, had a little time off, and he was a friend of mine so, he went up there and got it. But it took two trucks.

You built the foundation first from the plans, then he brought it, then you started setting panels, and the floor was in panels too? Yes.

You just picked it up (the floor) and started setting it? Yes.

You put a pier under the corner where each panel the floor intersected? There were a lot of 2" x 6" ... (we look inside a vent)

I'll call Rich and see if I can poke around under here, take some good photos. (Mr. Cederwal points out where the crawl-space opening appears to be)

Do you remember if you plumbed a lot of stuff from underneath here? Maybe electrical also? I think so.

I'll be able to see from underneath here. (We talk about how nice it was for Rick to come over and introduce himself) I was thinking of coming over before we meet and talking to the people, now I'm glad I waited.

Do you have any hints for me on what you would... I mean I think its a great idea and you've done it. It saves a lot of lumber and with the right architect... are you an architect?

(We talk about my background, engineering, construction estimator, demolition estimator. I explain how we would dis-assemble a building salvaging as much wood as possible, but that I was intrigued by how much more wood could be saved where cutting into standard panels was possible.) Then with the proper plans... an architect can figure that out.

Did you have any special tools other than just a skill-saw, hammers, and crow-bars? No.

And it all fit together real good? No tweaked pieces, or things out of square? No.

All dry lumber it wasn't going to move on you? That's right.

And then for heating, you just went with regular standard heating? It was wall heaters.

And you were able to put it up in about a week? Yes.

And then the finish work was extra? Yes the finish work was extra.

(This concludes the interview. I tell him that the idea of cutting buildings into standard panels doesn't look like it would fit all of the buildings at Fort Ord, but probably a majority, and that I was trying to find the appropriate method for each type of building)

Appendix 14.14

Web-Site

(Condensed)

Pilot Deconstruction Project

Made possible from a grant from the David & Lucile Packard Foundation.

Support & Background

Benefits

Contacts

Participants

Contributors

Updates

Hot Links
U.S. EPA
U.C.S.C.
Cedar Page

Purpose

The purpose of the project is designed to link the nation's and California's environmental goals with the economic development and job creation opportunities that reuse of Fort Ord represents. The 1997 Fort Ord Pilot Deconstruction Project is an enterprising opportunity to demonstrate the potential to recover valuable materials, establish new businesses, create jobs, and generate new products from used building materials in an environmentally sensible fashion.

Goals

- To collect critical data about deconstruction of representative buildings including labor needed; quality and quantity of materials; actual resale value of the materials; pre and post-soil, lead and asbestos testing; costs for deconstruction, and impact on regional landfills -- both quantities and savings of diverted materials plus the cost of disposal of residue.
- To collect critical data about deconstruction of representative buildings including labor needed; quality To train local contractors and workers from the demolition and recycling, and construction industries in deconstruction techniques, material preparation, types and quality of woods, and associates job-site health and safety procedures.
- Provide materials for a national materials testing program that will contribute to the development of engineering and use standards for used lumber and associated building materials.
- To create training videos using former Fort Ord as a living laboratory of actual work to use for training locally and across the nation.
- To host a design charrette and design contest in relation to adaptive reuse, remodeling and creation of new architectural projects and products.

If you would like to be notified about upcoming material sales, please E-Mail us with your information.

[HOME] [STAFF] [MEMBERS] [MEETINGS] [FACTS] [EMAIL]

Support

Project grant of $200,000 from the

David and Lucile Packard Foundation

is the primary source of funds for the project.

Background

Fort Ord Reuse Authority (FORA); and University of California, Santa Cruz, Extension Business Environmental Assistance Center (BEAC); have joined forces to create a pilot project to deconstruct 3-8 buildings located on the former Fort Ord Army Base. The types of structures are one, and two story, wood framed barracks and administration buildings, ranging in size from about 950 square feet to over 10,000 square feet. These buildings are representative of the 1200 or so wooden buildings on Fort Ord, most of which must be removed for reuse to occur. Estimates for the removal have been as high as $120 million. This project should demonstrate ways to offset many of these costs and create significant savings. These estimates do not include any cost for remediation of lead based paint. The deconstruction start date: May 1, 1997.

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Benefits

- *Reduced total costs in building and waste removal.*
- *Reduced impact on natural resources and regional landfills.*
- *Knowledge of market value of reused buildings and components.*
- *Create a deconstruction model for economic re-development of closed bases.*

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Pilot Project Updates

October	September	August
July	June	March – May

October 7, 1997 - Pilot Project staff follow up on letter of interest from Round Valley Indian Housing Authority about buildings from Fort Ord. An invitation is extended to have a delegation come to Fort Ord and review the building stock.

October 3, 1997 - The FORA Boardroom is reserved for use by the participants in the November 1st, 1997 Design Charrette. The Design Charrette will bring skilled community members together to brainstorm the architectural needs and possibilities for the W.W.II vintage structures at Fort Ord. The design categories will be remodeling, relocate/ reassemble, designs utilizing salvaged materials.

October 2, 1997 - Pilot Project staff test possible asbestos containing materials in Building 7954 that could not be tested when the building was occupied. Building 7954 is a concrete single family dwelling. It was constructed in panels cast from concrete. These panels were assembled into the walls and roof of the structure.

October 1, 1997 - Pilot Crew begins clean-up and remediation of buildings 2182 and 2184 in preparation for relocation to Hartnell College, Salinas CA. Hartnell will reuse the buildings as adult program classrooms. Hartnell has remodeled two buildings like 2182 and 2184 last year. These two structures had been moved the Hartnell campus property many years ago.

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September 29, 1997 - Representatives of the USDA, Forest Products Lab and the West Coast Lumber Grading Association arrive at Fort Ord to visibly grade (or re-grade) the lumber salvaged by the Pilot Project. Special attention was paid to factors that down graded the lumber due to deconstruction activities. Over 1,000 pieces were graded, these will be shipped back to the Forest Products lab in Wisconsin to compare their structural qualities to those of new lumber.

September 26,1997

Meeting notes:
September 26, 1997 all day meeting:
Location: Aberdeen Proving Grounds, Aberdeen, MD

Agenda:
1) Introductions
2) Round table discussion on the effect the Army's Facility Reduction act is having on the building removal at Aberdeen Proving Ground and their attempt to meet waste reduction requirements by 50%.
3) Tour of representative buildings slated for removal.
4) Quick brainstorming and inventory of materials available in the Aberdeen buildings and relation to lessons learned in the FORA Pilot Project and US EPA Deconstruction Projects.

Discussion items:

- Aberdeen's experimental asbestos remediation process that chemically reduces asbestos fibers to a harmless sand.
- Aberdeen's need to reduce their waste-stream by 50% in the near future.
- How their DRMO currently handles building removal.
- How the Pilot Deconstruction Project was handling almost identical building removal.
- How Aberdeen had a deconstruction and wood reuse policy and distribution system in place ten years ago.
- The barriers to deconstruction that may have developed in the past ten years.
- How a modified form of the former policies might assist Aberdeen in meeting their 50% waste reduction directive.
- Tentative identification of the predominant material in the Aberdeen buildings as an old growth "Yellow Pine". Yellow
- Pine is currently a desirable commodity in the used wood market and as such has a high resale value.)

<u>September 25, 1997</u>
Meeting notes:
10:00 AM
Location: HUD Offices, Washington, DC

<u>Agenda:</u>
1) Introductions
2) Fort Ord Project Overview: Purpose; Accomplishments; Challenges; Next Steps (Speakers: Michael Houlemard, Stan
Cook, FORA)
3) EPA's Deconstruction Strategies: Increase Implementation: Public Housing, Military Bases; Overcome Barriers: Lead-
OSHA, Wood Grading-USDA Lab (Speaker: Robin Snyder, US EPA)

Discussion Items: FORA presented overview of the Pilot Deconstruction Project and 10 minute video on issues pertinent to Fort Ord and Deconstruction.

US EPA, using FORA Pilot Deconstruction Project and EPA/ HUD Deconstruction Project as a case studies, opened discussion on the usefulness of using Deconstruction for Job Creation, Blight removal, Economic Recovery, Environmental Benefits and Cost Savings. Barriers and regulatory inconsistencies that require further investigation were introduced.

1:00 PM
Location: US EPA Offices, Washington, DC

<u>Agenda:</u>
1) Introductions
2) Fort Ord Project Overview: FORA Pilot Project Video on issues pertinent to Fort Ord and Deconstruction; Challenges;
Next Steps (Speaker: Stan Cook, FORA)
3) General Discussion

Discussion Items:
The practicality of deconstruction projects was discussed. Discussions focused on realistic extension of information from existing deconstruction projects into large scale deconstruction projects through supportive programs and policies as a means for creating economic stimulation to blighted disadvantaged areas. Dove-tailing existing resources and programs with the data emerging from the Fort Ord Pilot Deconstruction Project was an additional topic covered.

3:00 PM
Location: OSHA Offices, Washington, DC

Agenda:
1) Introductions
2) Clarification of OSHA Requirements and Applicability of Historic Data Generated from FORA Pilot Deconstruction Project: (Speakers: Robin Snyder, US EPA; Stan Cook, FORA)

Discussion items:
Lead based paint exposure data from the FORA Pilot Project was presented, including blood lead level comparisons before and after 5 Months of deconstruction. Air monitoring results from task performed during deconstruction and work practices and hygiene practices instituted by the Pilot Deconstruction Project were described. Discussion centered on the apparent burden placed on the deconstruction industry by having "Manual Demolition" listed as a "trigger task" requiring that each deconstruction project perform personal air monitoring of each employee, building and task to determine if lead exposure is a problem. (This is in contrast to using "Objective" or "Historic" data to determine if lead exposure will be a problem.) The OSHA representatives were able to provide interpretations of their regulations and how those regulation would apply, based on data generated by the Pilot Deconstruction Project. The US EPA will distribute a synopsis of this through the $MART GROWH NETWORK website as a guideline for other deconstruction efforts.

September 18, 1997 - Pilot Project staff contacts Fort Devens, Massachusetts about information on pesticides that they found under their building slabs.

September 17, 1997 - Vent Hill Economic Development Authority, Virginia contacts Pilot Project to compare notes on building removal.

September 9, 1997 - Western Arizona Council of Governments (WACOG) contacts the Pilot Project as a possible source of structures for their communities. The WACOG jurisdiction is an extremely rural area.

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August 25, 1997 - Deconstruction crew bumps water line and causes leak inside the building, but on the "street" side of the cut-off valve. Water for the entire area must be shut off so that the line can be capped. The Marina Coast Water District was very helpful, locating the proper valves, shutting the water off and turning it back on at their expense.

August 18, 1997 - Fort Chaffee reviews Pilot Deconstruction Project web-page and suggest that the page be altered to eliminate the amount of time it takes to down load. The predominant opinion was that the website was very helpful to their own building removal assessment.

August 8, 1997 - Pilot Project staff contacts Project Walking Shield. Contacts at The Native American United American Indian Project are provided to Project Walking Shield staff.

August 14, 1997 - Hayward Lumber determines that their predecessor "Works Lumber" supplied the siding for the Barracks at Fort Ord. One of Hayward's former employees that worked on this material still lives in the area. The Douglas Fir siding was milled from dimensional stock from Oregon. It was stamped grade "B" or better. The former Hayward employee was contacted for a video interview.

August 12, 1997 - Approximately 4,000 square feet of asbestos containing floor tile is removed from Building 2143.

August 11,1997 - Yurok Tribe representatives contact Pilot Project staff to find out he status of the

Native American United Indian Project seed fund request. Yurok representative provides contact information on Project Walking Shield. Project Walking Shield is an existing program that has relocated structures from military bases to Native American land in the Dakotas.

August 6, 1997 - California State Fish and Game calls Pilot Project staff to see if they could acquire smaller size wood pieces for their "Wood Duck Box" Program. This program uses local organizations, statewide, to assemble Wood Duck Nesting Boxes.

August 6, 1997 - Fort Knox, Kentucky calls Pilot Project staff to compare deconstruction strategies and establish and maintain a networking relationship. Fort Knox is an active base that is removing structures to comply with their Facilities Reduction Directive.

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July 28, 1997 - US EPA requests FORA to link the FORA Pilot Deconstruction Project website with their Smart Growth website <www.smartgrowth.org>.

July 25, 1997 - Test removal techniques for removal of asbestos tiles at Building 2143, to find techniques that maintain its non-friable nature.

July 25, 1997 - Fort Ord Historians are contacted about archived building plans, photographs and film footage Fort Ord. This information will be used to provide the historical background to the buildup of Fort Ord both in the pilot project report and in the video documentation.

July 24, 1997 - Fresno House Movers contacts Central Pier Foundations about modifying their existing portable building foundation system to work for the relocated buildings at Fort Ord.

July 23, 1997 - The Monterey Bay Unified Air Pollution Control district is contacted about previously unidentified floor tile discovered in Buildings 1801 and Building 2143. Samples are taken and sent to lab. Although sandwiched below plywood and non-asbestos tiles, the asbestos floor tiles at building 2143 have deteriorated to the point that they might become friable under some removal techniques.

July 21, 1997 - Encapsulation of Building 1801's Exterior and interior surfaces begins. Global Encasement's representative trains the Pilot Project crew in the use of Global's encasement products. Hartnell College sends representative to be trained with Pilot Project crew.

July 17, 1997 - One load of Shingles from Building 2143 is recycled at Raish Products in San Jose. Raish Products is experimenting with recycling asphalt shingles into their road material products.

July 14, 1997 - Hartnell College, Salinas, CA receives price quote from Fresno House Movers to relocate two buildings from Fort Ord to their campus to be used as adult classrooms.

July 8, 1997 - Pilot Project staff contacted by Tetra Tech, a private contractor is assessing deconstruction as an option in the preparation of an Environmental Assessment at Vandenburg AFB.

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June 26, 1997 - Dale Stansbury and Stan Cook meet with the Monterey County Health Department to discuss the distribution of Lead Base Paint covered Architectural Components. The discussion focused exclusively on the materials that could be salvaged from Fort Ord's buildings.

June 25, 1997 - Time sheet data from Building 21 is organized similar to the format used by the Environmental Protection Agency (EPA) in their Baltimore deconstruction project titled: Deconstruction - Building Disassembly and Material Salvage: The Riverdale Case Study. This is a draft organization of the raw time sheets so that Dale Stansbury, Ann Schneider and Stan Cook begin review of the data to see if it has gaps, errors and if it makes "sense".

June 24, 1997 - Building 21 raw time sheets are completely entered into an "Excel" formatted spread sheet and is circulated for review and comments.

June 23, 1997 - Building 2143 isinspected for asbestos that may have been missed by the existing non-destructive asbestos survey. The only item not previously identified was roof mastic. It was in good condition. It was painted with fluorescent paint to alert the crew members to its presence. The mastic removal and disposal will be performed along with the previously identified transite pipe.

June 19, 1997 - Dale Stansbury, Ann Schneider and Stan Cook meet to discuss the status of the Pilot Project. Items discussed: 1) Remaining finances available, 2) problems at building 2143, 3) deconstruction crew attitude, 4) Upcoming crew vacation, 5) meeting with County Health Department on the sale of salvaged materials covered with Lead Based Paint, 6) Filming schedule, 7) Salvaging materials for USDA, Forest Products Testing Lab, 8) Scheduling visit by West Coast Lumber Association for grading salvaged wood, 9) Setting minimum sales price for salvaged material at one of half retail value, 10) future salvaged material sales, 11) Community educational outreach opportunities needed on the proper handling and disposal of Lead Base Paint covered Architectural Components, 12) Adding crew members specifically for the task of de-nailing and stacking lumber, 13) Encapsulating and preparing Building 1801 to be moved to Carmel Valley Middle School, 15) Using encapsulation of Building 1801 as training for Pilot Project crew and California State Parks employees.

June 11, 1997 - Environmental Protection Agency(EPA) in Washington D.C. asks for contributions and input on deconstruction contract language being collected for discussions with Housing Urban Development(HUD).

June 4, 1997 - Pilot Project holds silent auction of materials salvaged from building 21. Eleven bidders donate $ 3,000 for salvaged materials. All proceeds from the salvaged materials will be routed back into the Pilot Project fund. Some of the end uses for these materials will be: 1) shelving in an airplane hanger, 2) a barn, 3) a large composting bin, 4) custom house flooring.

June 4, 1997 - The California Resource Recovery Association (CRRA) tour of Fort Ord is a success. Approximately 30 people actively involved in the field of Deconstruction in California attend. The tour concluded with a half day workshop on Deconstruction. Presentations are made by FORA and the US EPA, on their respective projects. Criticism and guidance were accepted from all participants.

June 2-3, 1997- Exhibit at Monterey Convention Center of furniture & crafts made from used lumber in conjunction with California Resource Recovery Association (CRRA).

June 2, 1997 - Four day CRRA conference begins in Monterey. The conference is attended by over 750 people actively involved in the reuse, recycling or disposal fields throughout California.

June 2, 1997 - Monterey Bay Unified Air Pollution Control District (MBUAPCD) is contacted with asbestos information on the third building for deconstruction. (Building 2143).

June 1, 1997 - Design charrette - Three project teams will create potential reuses of building on former base. The three teams will consist of representatives in the architectural, planning and reuse and recycling fields. The first team will focus on adaptive reuse in place, the second, adaptive reuse if relocated, and the third, reuse of architectural components. (Cancelled) This will be rescheduled.

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May 30, 1997 - Environmental Protection Agency (EPA) representative arrives from Washington, D.C. to review The Pilot Deconstruction Project on Fort Ord and to share information, gathered to date, from an EPA sponsored deconstruction project in Baltimore, MD.

May 28, 1997 - Inquiries are made to collaborate with a CSUMB student to prepare a CD ROM, as a class project. This would be an inexpensive way to distribute the pilot project information to entrepreneurs, existing outlets, and others working on base reuse.

May 28, 1997 - Crew begins site preparation for deconstruction of building 1807. Building 1807 will provide information for the move of Building 1801. Building 1807, will be used for the filming of deconstruction task and techniques. Buildings 1807 and 21 will be left partially deconstructed until after the California Resource Recovery Association conference and Fort Ord tour. These will be used as a "static display".

May 27, 1997- Cal-trans has approved the route for moving Building 1801 from Fort Ord to the Carmel Valley.

May 27, 1997- Sierra Army Depot's representative calls to ask for suggestions in disposal of buildings at their base.

May 21, 1997- Local High School teacher calls FORA for information to help her student complete a "hands on" report on asbestos. EPA publications are copied and forwarded to her on household items that might contain asbestos. These were to be used by the student for an initial inventory of the students home, and turned in as the final report.

May 20, 1997- MBUAPCD inspects Building 1807. Two additional samples are taken, one from the flooring and one from the drywall joint compound.

May 16, 1997- Carmel Middle school's architect estimates that the cost to bring Building 1801, up to current requirements for children to occupy as classrooms would cost as much as buying new portable classrooms. The decision is made to try and use the building as either; an adult classroom, an adult office, or storage.

May 16, 1997- Army allows Pilot Project to use former vehicle painting facility as a warehouse. The originally chosen warehouses had door openings to small to move salvaged lumber through. This building also has large windows that allow use without electricity. The electricity was disconnected from all but the most essential buildings at Fort Ord in March of 1997.

May 15, 1997- Environmental Protection Agency (EPA) in Washington, D.C. accepts prototype Warning Label as public comment on proposed regulation changes that would effect the reuse of Lead Base Painted architectural components.

May 8, 1997 - Certified Industrial Hygienist does Personal Air Monitoring of typical deconstruction tasks at Building 21.

May 7, 1997 - Crew begins shingle removal at Building 21.

May 5, 1997 - Pilot Deconstruction Crew begins site security and preparation at building 21.

May 1, 1997 - Pilot Deconstruction Crew begins two day OSHA Laborers Safety Training Class.

April 26, 1997 - FORA/UCSC Extension sponsored "Lead Awareness"class is offered to the agencies and contracting firms that have contributed or shown an interest in Pilot Project. Pilot Deconstruction Crew begins four day "Lead Worker" training.

April 24, 1997 - Final selection of Pilot Deconstruction Crew is made using "loaned" supervision and labor from A&S Metals, Fresno House Movers, and T. A. Ledesma Builders, and University of California Santa Cruz.

April 21, 1997 - Army provides FORA with Purchase Order exchanging buildings to be deconstructed for copies of final deconstruction report and video footage.

April 17, 1997 - Carmel Middle School sends Structural Engineer to field verify construction details of Building 1807 for structural analysis so that it or Building 1801 can be relocated to the middle school for their use.

April 10, 1997 - Monterey Bay Unified Air Pollution Control District (MBUAPCD) representative inspects Building 21 for Regulated Asbestos Containing Materials. MBUAPCD representative requests additional testing of shingle materials to supplement the existing Asbestos Report.

April 8, 1997 - UCSC does background filming of buildings chosen for deconstruction. Forensic Analytical does testing of building surfaces for lead content and background soil samples are taken of soil around buildings to be deconstructed.

March 21, 1997 - The Pilot Project Technical Support Group meet. The County Health Department expressed concerns about the reuse and resale of the painted architectural components from the buildings at Fort Ord. The Group agreed to separate the painted materials from the unpainted materials until completing an investigation of the rules and regulations governing the painted materials

March 12, 1997 - "Request for Participation" is published in Monterey, Salinas, and Santa Cruz Builders Exchange asking interested contractors to contact FORA to participate in the Pilot Deconstruction Project.

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