RCDP Cycle I Builder Exit Survey

Residential Construction Demonstration Project

Bonneville
POWER ADMINISTRATION

May 1990

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RESIDENTIAL CONSTRUCTION DEMONSTRATION PROJECT

Cycle I Builder Exit Survey

May 1990

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I. Executive Summary

The Bonneville Power Administration currently is sponsoring a program that offers reduced heating bills and greater living comfort to buyers of new all-electric homes in the Pacific Northwest.

The Residential Construction Demonstration Project (RCDP) focuses its efforts on saving electricity by making new homes more energy efficient. Resulting benefits are sizeable and long term for the homeowner. But the potential advantages don't end there. Since 46 percent of energy used in homes and by industry in the Pacific Northwest is electricity, saving electricity through more efficient use has sort and long term economic benefits. In the short term, homeowners benefit through lower electric utility bills. The power system benefits, over the long term, through a reduced need for additional generating capacity.

RCDP is a multi-year project that provides the most comprehensive technical arm for Bonneville's Super Good Cents (SGC) and Northwest Energy Code (NWEC) Programs. Specific objectives of the RCDP are:

- Develop and/or refine predetermine conservations techniques and innovations;
- Examine predetermined conservation techniques and innovations by gathering specific data on reliability, cost effectiveness, and marketability;
- Introduce the use of innovations which show potential to be reliable, cost effective, and marketable; and
- Disseminate information gathered from the project which is useful to the shelter industry or to policy makers in the region.

The RCDP began with the solicitation of qualified builders at the start of 1986 – this was called Cycle I. To participate, contractors had to agree to build their new homes to SGC specifications, use the MCS-approved air leakage control Package B, install energy use monitoring equipment, and incorporate at least one of the following RCDP Cycle I energy saving innovations:

- Air-to-Air Heat Exchangers with Supply Air Tempering
- Exhaust Air Heat Pumps
- Energy Efficient, Prepackaged Modular Homes
- Advanced Drywall Approach
- High R-Value Walls

RCDP CYCLE I BUILDER EXIT SURVEY

This report summarizes analysis results of the RCDP Cycle I Builder Exit Survey. The purpose of the survey was to obtain information about builders participating in the program. It was broken into three major categories: Company Profile; Project Evaluation; and, Experience With RCDP Construction Innovations. The Washington State Energy Office (WSEO) mailed surveys to all of the RCDP Cycle I builders.

Of the 112 builders who participated in Cycle I of the RCDP, 64 (56 percent) completed a survey. Half of the builders who responded were from Washington.

Company Profile

Fifty-eight percent of the builders responding to the survey represent firms which employ 1 to 2 full time people (including themselves but excluding subcontractors). Sixty-five percent of these builders presell more than 75 (percent) of the homes they construct. Most of the builders construct almost all of their homes to custom design and no modular homes of any kind.

Project Evaluation

The training offered to builders was found to be at least adequate for building an RCDP home. Builders indicated that the design review process was reasonable, and roughly 75 percent of them experienced no inspection problems Cost reporting instructions were reported to be adequate or better and the review process satisfactory With regard to RCDP Cycle I design specifications, 30 builders recommended improvements to the AAHX specifications. Lastly, meeting the RCDP requirements meant that contractors had to provide more oversight than usual with subcontractors.

Experience with RCDP Construction Innovations

Most of the builders were interested in using the RCDP innovations in the future. Of all the Cycle I innovations, High R-value walls were the most frequently used. Installation of ADA, High R-value walls and the ventilation innovations posed some problems for subcontractors. Locating design information and cost of ventilation systems was listed as a problem by over half of the builders.

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II. Introduction

Bonneville Power Administration's Residential Construction Demonstration Project, initiated in 1986, was designed to implement the energy-efficient Model Conservation Standards developed by the Northwest Power Planning Council and to investigate construction methods and products for meeting those standards.

In Cycle I of RCDP, 165 homes were built using at least one of the following innovations:

- advanced drywall approach (ADA)
- high R-value walls
- air to air heat exchange (AAHX) with duct heaters
- air-to-air heat exchange (AAHX) with forced air furnace
- exhaust air heat pump (EAHP)
- modular housing systems

Areas of investigation for Cycle II were:

- included SGC with energy efficient appliances
- exhaust air heat pumps
- non-heat recovery ventilation systems
- low-cost heat recovery ventilation systems
- manufactured housing
- the Future House
- high-R window as a component of the future house

Cycle III of the RCDP continues to build upon the knowledge and experience gained from the two previous cycles as well as information collected from SGC/NWEC homes. The four areas of investigation for Cycle III are:

- single-family ventilation
- multi-family ventilation
- log homes
- heating systems

BPA continues efforts to evaluate cost, thermal performance, ventilation and infiltration characteristics of the homes, as well as features of individual innovations.

III. Survey Methodology

The RCDP builder survey was conducted by the Washington State Energy Office and was a streamlined version of a similar builder exit survey performed for the Residential Standards Demonstration Program. The Energy Office performed the survey in order to maintain consistency with RSDP and to gather information which would be useful in Cycle II of RCDP.

The Washington State Energy Office mailed surveys to all RCDP Cycle I builders and provided BPA with hard copies of the returned surveys for analysis.

IV. Survey Results

Introduction

Complete survey results, including verbatim responses, are found in Appendix B and Appendix C. The percentages cited in this text are usually based on the number of builders responding to the question, which in most cases is not the entire population of survey respondents. Thus, the same percent may indicate different actual numbers of builders, depending on the survey question under discussion.

Part I - Company Profile

One hundred and twelve builders participated in Cycle I of the Residential Construction Demonstration Project; 64 of these builders (56 percent) completed a survey. The distribution of survey respondents by state is shown in Figure 1. Half those completing a survey were from Washington, just as almost half of the builders in the RCDP were from that state. Figure 2 shows RCDP participants by state compared to survey participants by state.

The RCDP builders surveyed built 260 houses in 1985 and 369 houses in 1986. The same builders predicted they would construct 682 houses in 1987. Figure 3 shows builder size, based on number of houses built annually, in each of three years. The biggest change over the three years is in the relative number of houses constructed by those building more than 10 homes annually. Whereas in 1985, the three builders in this category built a total of 77

homes, in 1987 there were nine builders in this category and they expected to build a total of 512 homes.

The majority of builders (58 percent of those responding to the question) have 1 to 2 full-time employees including themselves (but excluding subcontractors). Only four builders (7 percent of those responding) had more than five full-time employees. Seventy-eight percent of responding builders had 1 to 2 part-time employees.

Pre-selling of homes was typical among these builders, with 65 percent selling more than 75 percent of their homes before they were built. Only 3 builders (5 percent) presold none of their homes.

Custom built homes were also common with 42 builders building all or most of their homes to a custom design and another 13 building some custom homes. Nine builders built mostly to stock plans, 25 built some stock homes and 12 built none. Modular homes, factory built homes and other homes of this type were the least common. Most (92 percent) responding to the question did not build any modular homes.

Part II - Project Evaluation

Training

Builders were asked which Super Good Cents training sessions they attended during 1986: a general two-day workshop, and/or advanced sessions on wiring/plumbing, ventilation, heating, advanced framing techniques, advanced drywall approach or other topics. Three quarters of all survey participants attended some type of Super Good Cents training. Slightly more than half (55 percent) attended the general two-day workshop. Among the advanced workshops, advanced drywall approach attracted the largest number, with 47 percent attending. The ventilation session drew 31 percent, advanced framing techniques 20 percent, and heating 12 percent. Wiring and plumbing ranked last with 8 percent attending.

Most builders (86 percent) felt the training sessions could be improved in specific areas. The areas most often cited for improvement were in mechanical ventilation (22 percent), locating appropriate construction materials, (16 percent) and ADA techniques (13 percent).

All but one builder of those responding considered the training excellent or adequate preparation for building an RCDP home.

Design Review

Builders were asked to rate various aspects of the design review procedure. About half felt the design review packet was very clearly explained and the other half felt it was somewhat clearly explained. Sixty percent found the submittal requirements reasonable; 40 percent found them only somewhat reasonable. Design approval was very timely, according to 60 percent of the builders, somewhat timely for 33 percent and not at all timely for 6 percent (4 builders). Finally, more than three-quarters of the builders found the technical assistance for design very adequate, 21 percent found it only somewhat sufficient, and 2 builders (3 percent) found it insufficient.

Seventeen builders made specific suggestions for streamlining the review process. These included reducing paperwork, having a face-to-face meeting with the reviewer, clarifying ventilation requirements, and assigning design review to one person.

Inspections

Builders were asked about problems they experienced during the inspection process. Almost three-quarters (47 builders) reported no inspection problems. Others reported some uncertainty about how the procedure worked (14 percent), a need for more than three project inspections (9 percent), construction delays before a scheduled inspection (5 percent), inspectors' lack of familiarity with program specifications and requirements (6 percent),inspectors late in visiting the site (3 percent) and other problems

Suggested changes to the inspection process included developing a checklist of common construction problems, having more frequent inspections, and using local inspectors.

Cost Reporting and Review

Builders were asked to comment on the cost reporting form and the performance of the cost reviewer.

The instructions on the reporting form were deemed adequate by 81 percent of builders and excellent by 11 percent. Only 5 builders (8 percent) rated the form excellent in ease of separating component costs. Forty-nine builders (79 percent) found it adequate in this respect. As for total costs, 73 percent thought the form reflected these adequately, 16 percent found it excellent in reflecting total costs and 11 percent (7 builders) found it inaccurate in reflecting costs.

Builders were more enthusiastic about the cost reviewer than the cost reporting form. Almost half felt the cost reviewer did an excellent job of explaining the process, while the other half felt the explanation was adequate. Only one builder thought the cost reviewer explained the process poorly. More than half the builders (58 percent) thought the cost reviewer provided very timely approval of submitted reports, another

33 percent (20 builders) found the timeline adequate and 8 percent (5 builders) thought the approval timeline was poor.

RCDP Design Specifications

Builders were asked to rate Super Good Cents design specifications, air-to air heat exchanger specifications, and RCDP innovation specifications as either adequate, needing improvement or completely inadequate. While almost three-quarters of the builders found the SGC and RCDP specifications adequate, only half found the AAHX specifications adequate. The other half thought the specifications either needed improvement or were inadequate.

Builders suggested the specifications could be improved by clarifying the presentation with simplified language, improving the graphics and increasing their use.

Subcontractor Oversight

In order to meet RCDP requirements most contractors spent more time than usual overseeing subcontractors. Ventilation subcontractors were most in need of oversight; 41 builders (68 percent) had to provide more than usual oversight for these subcontractors. Approximately half the builders found that subcontractors performing electrical, drywall and air-vapor barrier and heating work required more than usual oversight. However, the majority of builders found that oversight for plumbing, framing and insulation subcontractors was as usual.

Part III - Experience With RCDP Construction Innovations

Builders expressed a high degree of interest in using the RCDP innovations in future home building. Figure 4 shows the number of builders who used each innovation during Cycle I of RCDP, the number that have used it elsewhere and the number who are interested in using it in the future.

High R-value walls had the highest amount of use prior to RCDP (70 percent) and the highest use during RCDP (86 percent) as well as eliciting the greatest interest in future use (86 percent). Advanced drywall approach was the next most popular innovation with 84 percent of builders expressing interest in future use. For each ventilation innovation, more than half the builders wanted to use them in the future, though for each innovation less than a third of builders actually used them during RCDP. Modular housing systems were the least used innovation both before RCDP (when none of the builders had used them)

and during RCDP (when only one used the innovation). Only 3 builders were interested in using the innovation in the future.

Homes Built Using the Advanced Drywall Approach Innovation

Forty two builders (68 percent) used the advanced drywall approach during Cycle I and 46 builders were interested in using it in the future. Thirteen builders (29 percent) had used the innovation before RCDP, constructing a total of 36 homes using ADA.

More than 20 percent of builders using the innovation had some problems finding design information for ADA. No builder had major problems acquiring the ADA materials but a third had minor problems doing so. Subcontractor installation was some problem for almost two-thirds of the builders and five builders (12 percent) received callbacks from homeowners regarding the ADA. Seven builders had homebuyers express concern about the ADA but all were reassured by an explanation of ADA's function and process.

Builders were asked what specific advice they would give another builder using ADA for the first time. Thirty-five made suggestions. Several answers focused on the importance of assuring that subcontractors know what is expected; one builder suggested that the subcontractors should also attend the workshops. Other common advice included using good quality caulk and electrical boxes, assuring gaskets are in place before installing drywall, and thinking the procedure through before framing.

Homes Built Using the High R-Value Walls Innovation

High R-value walls was the most widely-used innovation . In RCDP Cycle I 49 builders (86 percent) used this innovation and almost as many were interested in using it in the future. Almost three-quarters had built homes with high R-value walls before RCDP, totaling 258 homes. Most of the builders (86 percent) wanted to use the innovation again.

Problems with High R-value walls were fewer than with advanced drywall approach. Only 16 percent of builders had trouble getting design information on the innovation and all of those problems were minor. Only three builders (5 percent) had callbacks from homeowners about the walls; moisture problems were the most common concern. As with the ADA the most common problem was with the subcontractor ability to install the innovation correctly (23 percent).

Builders had numerous points of advice concerning installation of High R-value walls. These included wrapping doors and windows to keep thickness constant, and planning ahead, particularly for siding, window and door applications, deck attachments and nailing, and firestops.

Homes Built Using Ventilation Innovations

Of the three RCDP ventilation innovations – air-to air heat exchanger with duct heater, air-to-air heat exchanger integrated with forced air furnace, and exhaust air heat pump – builders were most experienced with AAHX with duct heater (48 percent) and least experienced with the EAHP (9 percent). Prior to RCDP, 20 builders had used ventilation innovations in a total of 69 homes.

Builders were questioned about the ventilation innovation with which they were most familiar. The ventilation innovations were more problematic than ADA or High R-value walls. Twenty-eight builders (61 percent) had major or minor problems locating design information and 17 (35 percent) stated that system expense was a major problem. Subcontractor installation of the innovation was a major problem for 10 builders (21 percent) and another 20 builders (42 percent) had minor problems with subcontractors.

According to builders, homeowners had more concerns about the ventilation systems than the other innovations. Twenty builders cited homeowner concerns. Common concerns included noise, cold air and operating costs. These innovations had the highest rate of homeowner callbacks. Callbacks were a major problem for 3 builders (6 percent) and a minor problem for 16 builders (33 percent).

Advice offered to other builders installing the ventilation innovations for the first time included having the unit in hand at the start of construction, sizing and planning ducts before building, using a simple layout for the ducting with short duct lengths, and using an experienced installer.

V. Conclusions

Company Profile

Builders employing more than five full-time employees account for an increasing number of houses built by the surveyed group.

Training

Builders found the training excellent or adequate preparation for building an RCDP home.

Builders felt the training sessions could use improvement in the areas of mechanical ventilation, locating appropriate construction materials and ADA techniques.

Design Review

The majority of builders found the design review packet clearly or somewhat clearly explained, the submittal requirements reasonable or somewhat reasonable, design approval timely and technical assistance adequate.

Inspections

Three quarters of builders had no inspection problems. Among the remaining builders, uncertainty about how the procedure worked was the most common complaint.

Cost Reporting and Review

Ninety-two percent of builders found the cost reporting form instructions adequate or excellent.

The cost reviewer explained the cost review process to the satisfaction of RCDP builders and approval of submitted reports was found timely by all but a few builders (8 percent).

RCDP Design Specifications

Most builders (73 percent) found the specifications for Super Good Cents design and RCDP innovations adequate.

Thirty builders (51 percent) thought the AAHX specifications need improvement or were inadequate.

Subcontractor Oversight

Meeting the RCDP requirements meant contractors had to spend more time than usual in subcontractor oversight.

Ventilation subcontractors required extra oversight from the largest number of builders (68 percent).

RCDP Innovations

Most builders were interested in using the RCDP innovations in the future.

High R-value walls were the most frequently used innovation.

Subcontractor installation was a common problem builders found in using advanced drywall approach, high R-value walls and the ventilation innovations.

Those using ventilation innovations had problems locating design information (51 percent) and found system expense troublesome (77 percent).

APPENDICES

APPENDIX A - RCDP Cycle I Builder Exit Survey

Figures

RCDP – Cycle I Builder Exit Survey
Percentage of Builder Participation

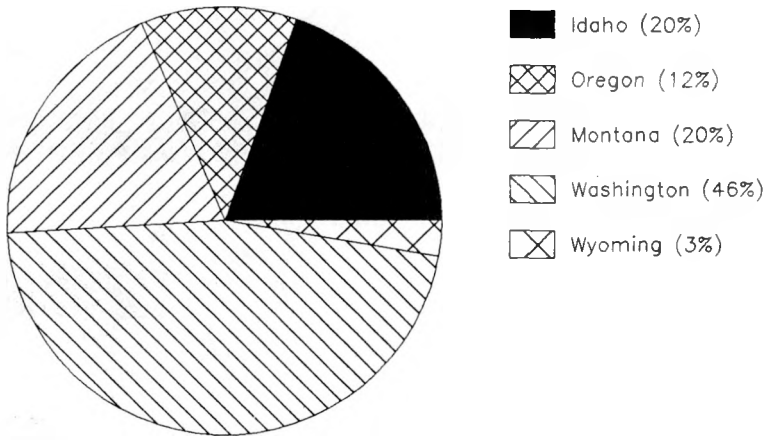


FIGURE 1

Number of Builders Participating in RCDP Cycle I Vs. Survey Response

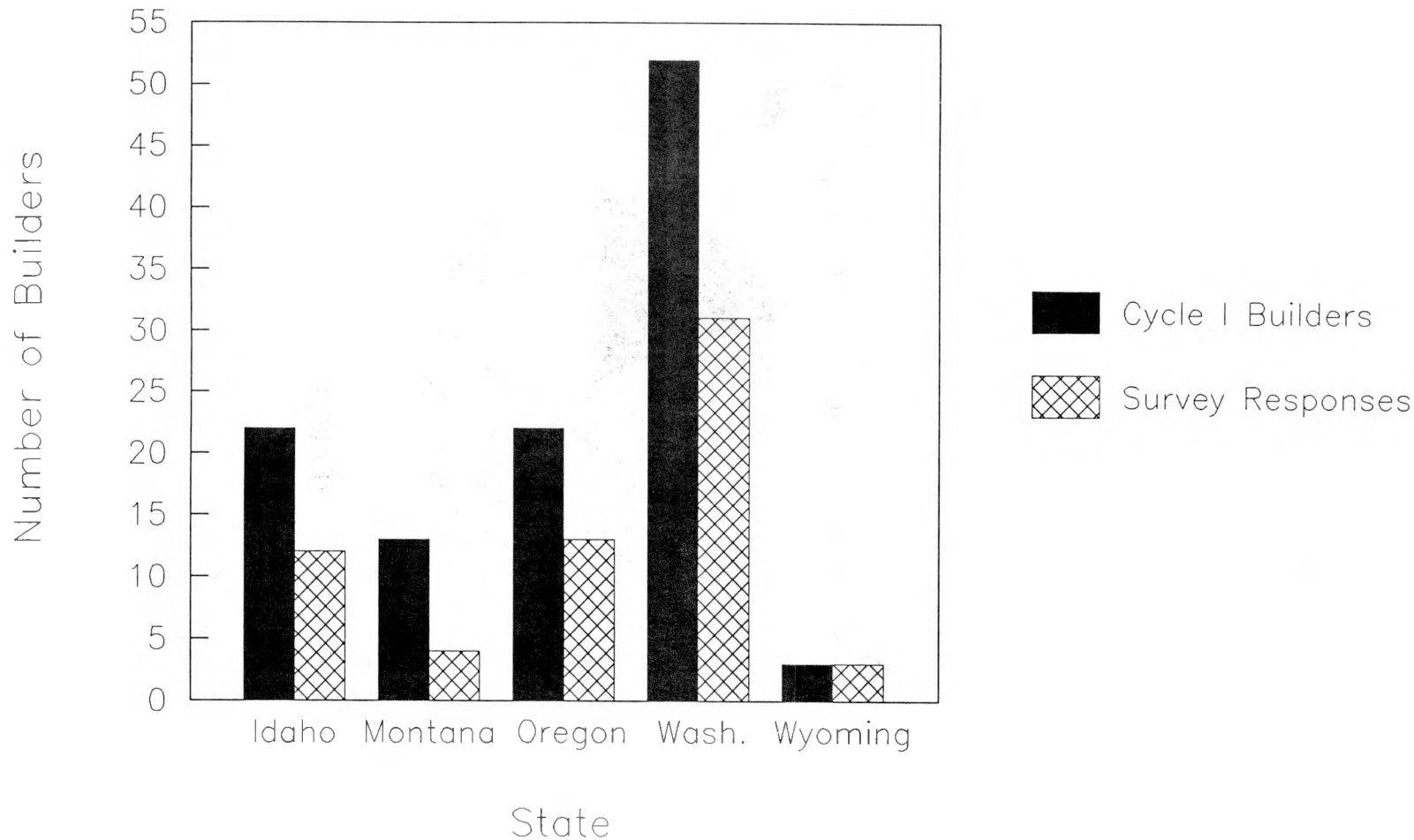


FIGURE 2

RCDP EXIT SURVEY
Builder Size

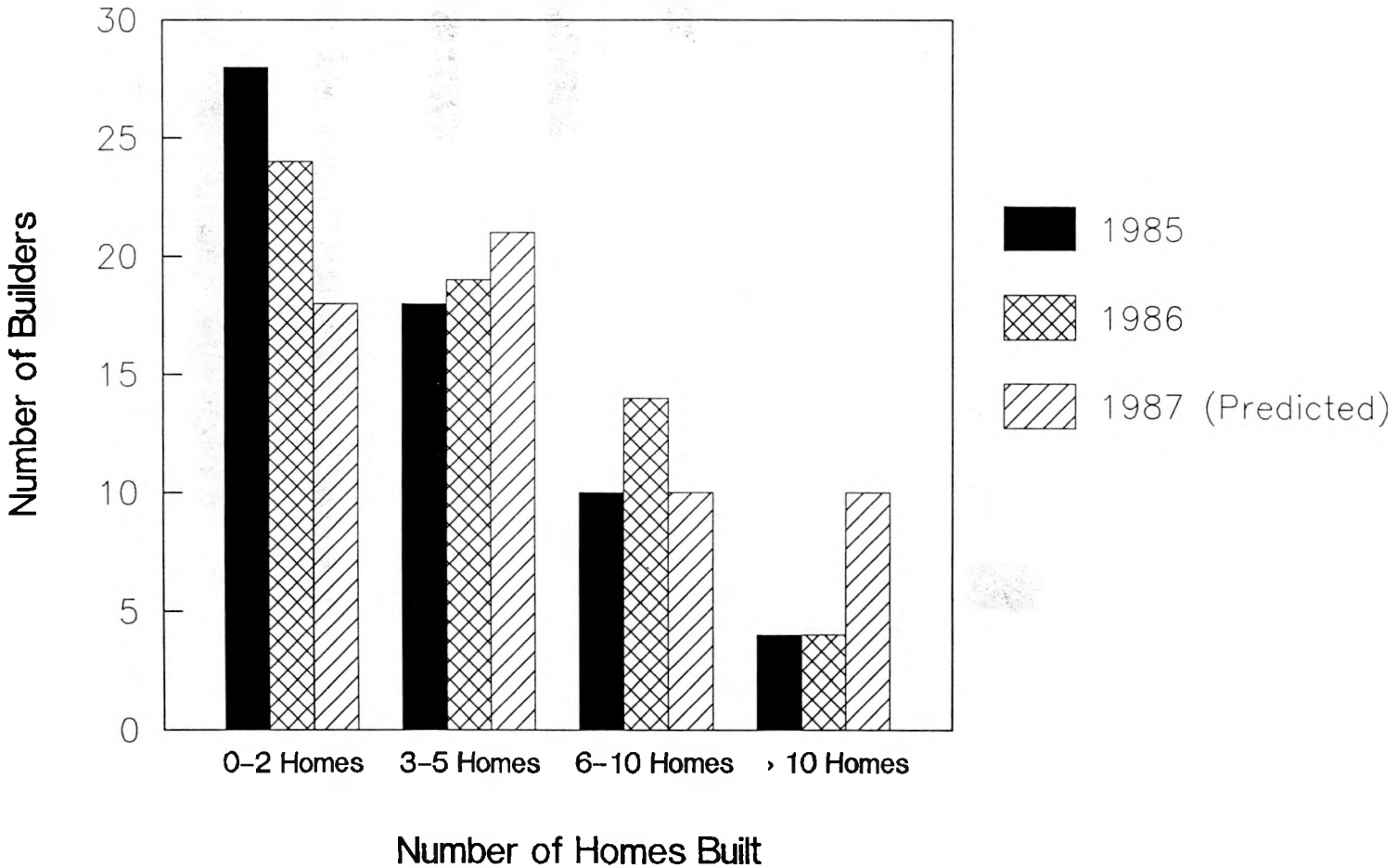
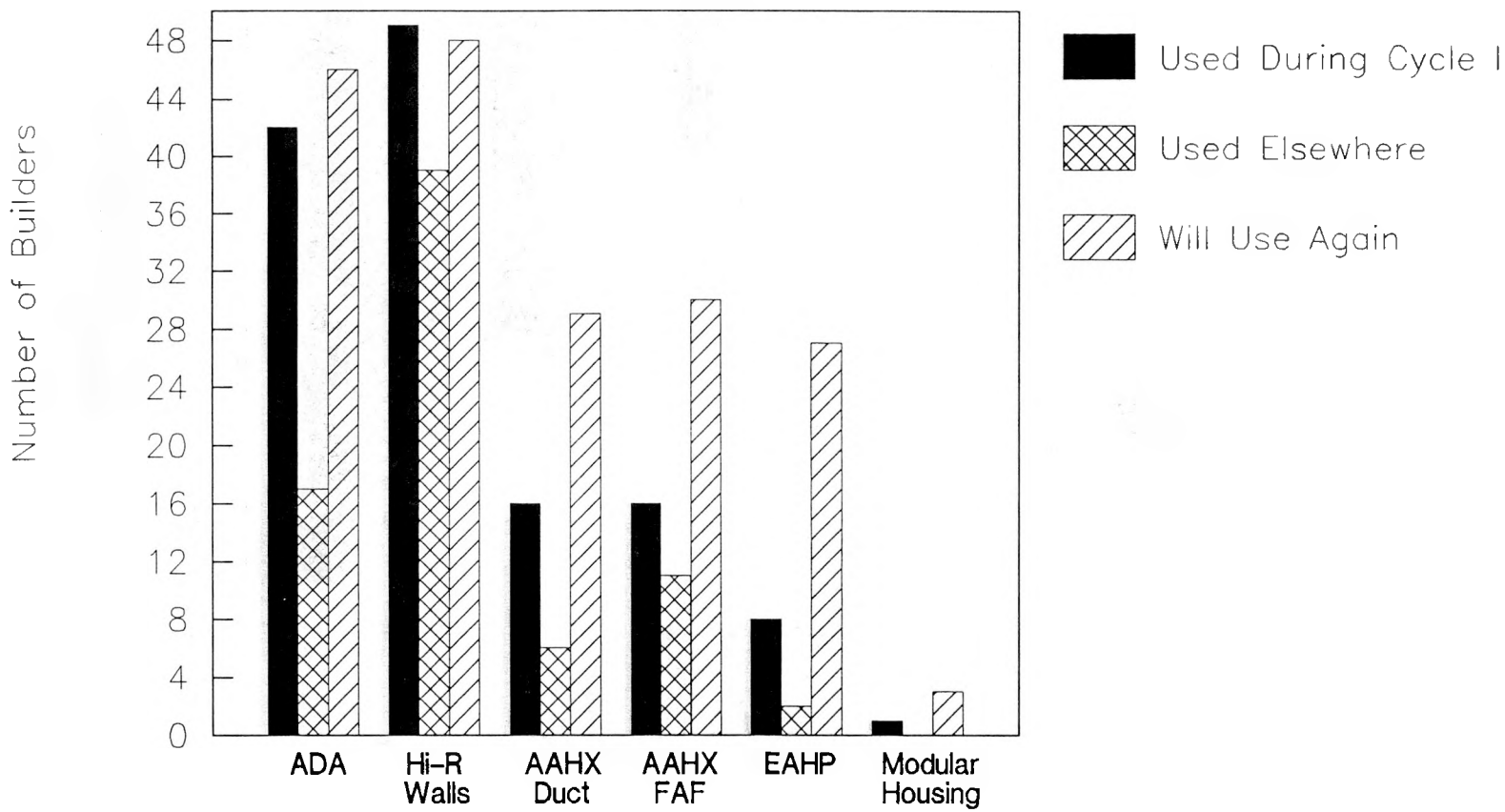


FIGURE 3



RCDP CYCLE I INNOVATIONS

FIGURE 4

APPENDIX B - RCDP Cycle I Builder Exit Survey

Sample Survey

RESIDENTIAL CONSTRUCTION DEMONSTRATION PROJECT
BUILDER SURVEY

Thanks for taking the time to respond to this questionnaire. Please fill out the questions as accurately and completely as possible. If the categories provided for some questions do not describe your experience, please feel free to add explanatory comments. If you have any questions, please contact Hank Date at 1-800-341-4405 in Washington or 1-800-321-RCDP in other states.

PART I: COMPANY PROFILE

The following questions are being asked to help us compare participating Residential Construction Demonstration Project (RCDP) builders to other builders in the region.

1a. Including all homes for which you were prime contractor, how many homes did your firm build in . . .

1985? _____ 1986? _____ (including RCDP homes)

1b. How many homes do you expect to build in 1987? _____

2. Including yourself, how many employees does your firm currently employ? (Exclude subcontractors) (Please circle one answer for each)

Full-Time	1.	One-Two	2.	Three-Five	3.	Six-Ten	4. Over Ten
Part-Time	1.	One-Two	2.	Three-Five	3.	Six-Ten	4. Over Ten

3. What percentage of the homes you typically build are pre-sold? (Please circle one answer for each)

1. None 2. 1-25% 3. 25-75% 4. Over 75%

4. How many of the homes you typically build could be described as . . . (Please circle one answer for each)

Completely custom design	1.	None	2.	Some	3.	All/Most
Based on stock plans with some design alterations possible	1.	None	2.	Some	3.	All/Most
Other (modular, factory-built kits, etc.)	1.	None	2.	Some	3.	All/Most

PART II: PROJECT EVALUATION

In this section we would like your opinions on RCDP operation.

TRAINING

5. Which of the following Super Good Cents training sessions did you or your employees attend in 1986? (Please circle all that apply)

0. None (If None, please proceed to question #8)

GENERAL
1. Two-Day Super Good Cents Workshop

ADVANCED SESSIONS

2. Wiring/Plumbing
3. Ventilation
4. Heating
5. Advanced Framing Techniques
6. Advanced Drywall Approach (ADA)
7. Other_____

6. In what areas could training be improved (Circle all that apply)

0. None
1. General energy-efficient design technique
2. Locating appropriate construction materials
3. Interpreting RCDP/SGC specifications
4. RCDP program requirements
5. Air-vapor barrier installation
6. ADA techniques
7. Mechanical ventilation
8. Building with High R-Value walls
9. Other_____

7. How well did the training prepare you for construction of your RCDP home? (Please circle one answer)

1. Excellently 2. Adequately 3. Poorly

DESIGN REVIEW

8a. During design review, did you feel that . . . (Circle one answer for each question)

The design packet was clearly explained	1. Not at all	2. Somewhat	3. Very
Submittal requirements (plans, checklists) were reasonable?	1. Not at all	2. Somewhat	3. Very
Design approval was timely?	1. Not at all	2. Somewhat	3. Very
Technical design assistance was sufficient?	1. Not at all	2. Somewhat	3. Very

8b. What recommendations would you make to streamline design review procedures?

_____

_____

INSPECTIONS

9a. Did you experience ant of the following problems during the inspection process? (Circle all that apply)

0. No inspection problems experienced
1. Uncertainty about how the inspection procedure worked
2. Inspectors who were unfamiliar with program specs and requirements

3. Construction delays before scheduled inspections

4. Inspectors not visiting site in a timely manner

5. Need for more than three project inspections

6. Other_____

9b. What changes would you like to see made in the inspection process?

_____

_____

COST REPORTING

10a. Did the cost reporting forms . . . (Circle one answer for each question)

Provide clear instructions?	1. Poor	2. Adequate	3. Excellent
Allow for easy separation of component costs?	1. Poor	2. Adequate	3. Excellent
Accurately reflect the total cost of your RCDP innovation?	1. Poor	2. Adequate	3. Excellent

10b. Did the cost reviewer . . .

Provide adequate explanation of the process?	1. Poor	2. Adequate	3. Excellent
Provide timely approval of submitted reports?	1. Poor	2. Adequate	3. Excellent

RCDP DESIGN SPECIFICATIONS

11a. It was necessary to use several sets of design specifications in order to comply with RCDP requirements. Please assess the following specifications in terms of their usefulness during construction. (Circle one answer for each specifications)

	Completely Inadequate	Needs Improvement	Adequate
Super Good Cents Specs	1	2	3
Air-to-Air Heat Exchange Specs	1	2	3
RCDP Innovation Specs	1	2	3

11b. What changes would you make in any of these specifications to make them easier to use?

_____

_____

SUBCONTRACTOR OVERSIGHT

12. Compared to most homes that you build, what degree of oversight was necessary to meet RCDP requirements with each of the following subcontractors?
(Circle one answer for each subcontractor type)

Subcontractor Type	Subcontractor Not Used in RCDP Home	Less Than Usual Oversight	Usual Oversight	More Than Usual Oversight
Framing	0	1	2	3
Electric/Wiring	0	1	2	3
Plumbing	0	1	2	3
Insulation	0	1	2	3
Air-Vapor Barrier	0	1	2	3
Drywall	0	1	2	3
Heating	0	1	2	3
Ventilation	0	1	2	3

PART III: EXPERIENCE WITH RCDP CONSTRUCTION INNOVATIONS

This section contains questions relating to your field experience with the RCDP innovations.

13. For each of the six RCDP innovations, please indicate whether you used that innovation during RCDP, whether you have used it elsewhere, and whether you would be interested in using it in the future.
(Circle one answer in each column for each innovation)

	Used Innovation In RCDP		Used Elsewhere		Would Like To Use It In The Future	
Advanced Drywall Approach	Yes	No	Yes	No	Yes	No
High R-Value Walls	Yes	No	Yes	No	Yes	No
AAHX/Duct Heaters	Yes	No	Yes	No	Yes	No
AAHX/Forced Air Furnace	Yes	No	Yes	No	Yes	No
Exhaust Air Heat Pump	Yes	No	Yes	No	Yes	No
Modular Housing Systems	Yes	No	Yes	No	Yes	No

Please fill out a section for each of the construction practices you have experience with, whether or not that experience was with the RCDP.

IF YOU HAVE USED THE ADVANCED DRYWALL APPROACH PLEASE ANSWER 14 a-d

14a. Prior to participation in RCDP, how many single-family homes had you built using the Advanced Drywall Approach (ADA)? #_____homes

14b. Did any of the following areas cause difficulties when using the Advanced Drywall Approach? (Circle one answer for each question)

	No Problem	Minor Problem	Major Problem
Availability of design information	1	2	3
Availability of ADA materials	1	2	3
Subcontractor's ability to install innovation correctly	1	2	3
Callbacks from homeowners	1	2	3

Other_____

14c. What specific advice would you give to another builder using ADA for the first time?

_____

_____

14d. Did your homebuyer express any concerns about the use of ADA in the home you built? If yes, what were they? _____

_____

IF YOU HAVE USED HIGHER-VALUE WALLS, PLEASE ANSWER QUESTIONS 15 a-d

15a. Prior to participation in RCDP, how many single-family homes had you built using High R-Value Walls (Hi-R)? #_____homes

15b. Did you experience any of the following difficulties when using High R-Value Walls? (Circle one answer for each question)

	No Problem	Minor Problem	Major Problem
Availability of design information	1	2	3
Subcontractor's ability to install correctly	1	2	3
Callbacks from homeowners	1	2	3

Other_____

15c. What specific advice would you give to another builder using Hi-R Walls for the first time? _____

_____

Did the homebuyer express any concerns about the installation of Hi-R Walls in the home you built? If yes, what were they? _____

_____

IF YOU HAVE EXPERIENCE WITH ANY OF THE RCDP VENTILATION INNOVATIONS, PLEASE ANSWER 16 a-e

16a. Which of the following ventilation innovations have you had the most experience with? (Circle on answer)

1. Air-to-Air Heat Exchanger with duct heater

2. Air-to-Air Heat Exchanger integrated with Forced Air Electric Furnace

3. Exhaust Air Heat Pump

16b. Prior to participation in RCDP, how many single-family homes had you built using this type of ventilation system? #_____homes

16c. Did you experience any of the following difficulties when installing this kind of ventilation system? (Circle one answer for each question)

	No Problem	Minor Problem	Major Problem
Availability of design information	1	2	3
System expense	1	2	3
Subcontractor's ability to install correctly	1	2	3
Callbacks from homeowners	1	2	3

Other_____

16d. What specific advice would you give to another builder installing a similar ventilation system for the first time? _____

_____

16e. Did your homebuyer express any concerns about the installation of this ventilation system? If yes, what were they? _____

_____

Thanks for your help. Please use this space for any further comments about the project.

_____

_____

_____

_____

_____

_____

(VS5-RMRD-6376r)

APPENDIX C - RCDP Cycle I Builder Exit Survey

Raw Data/Frequency Distributions

RESIDENTIAL CONSTRUCTION DEMONSTRATION PROJECT
BUILDER SURVEY

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PART 1: COMPANY PROFILE

The following questions are being asked to help us compare participating Residential Construction Demonstration Project (RCDP) builders to other builders in the region.

1a. Including all homes for which you were prime contractor, how many homes did your firm build in... 1985? _____ 1986? _____ (including RCDP Homes)

HOME85	Frequency	Percent
0	4	6.6
1	11	18.0
2	14	23.0
3	7	11.5
4	6	9.8
5	5	8.2
6	4	6.6
7	1	1.6
8	3	4.9
9	1	1.6
10	1	1.6
12	2	3.3
18	1	1.6
35	1	1.6

Frequency Missing = 3

HOME86	Frequency	Percent
0	1	1.6
1	9	14.5
2	15	24.2
3	12	19.4
4	5	8.1
5	2	3.2
6	1	1.6
7	4	6.5
8	2	3.2
9	3	4.8
10	4	6.5
12	1	1.6
19	1	1.6
41	1	1.6
75	1	1.6

Frequency Missing = 2

1b. How many homes do you expect to build in 1987? _____

HOME87	Frequency	Percent
0	6	10.0
1	6	10.0
2	7	11.7
3	15	25.0
4	4	6.7
5	2	3.3
6	3	5.0
7	1	1.7
8	3	5.0
10	3	5.0
12	1	1.7
14	1	1.7
16	1	1.7
20	1	1.7
24	2	3.3
36	1	1.7
90	1	1.7
125	1	1.7
151	1	1.7

Frequency Missing = 4

2. Including yourself, how many employees does your firm currently employ? (Exclude subcontractors)

Full-Time: (One-Two) (Three-Five) (Six-Ten) (Over Ten)

EMPLOYFT	Frequency	Percent
One-Two	31	58.5
Three-Five	18	34.0
Six-Ten	4	7.5

Frequency Missing = 11

Part-Time: (One-Two) (Three-Five) (Six-Ten) (Over Ten)

EMPLOYPT	Frequency	Percent
One-Two	25	78.1
Three-Five	5	15.6
Six-Ten	2	6.2

Frequency Missing = 32

3. What percentage of the homes you typically build are pre-sold?

PRESOLD	Frequency	Percent
None	3	4.9
1 - 25%	5	8.2
25 - 75%	13	21.3
Over 75%	40	65.6

Frequency Missing = 3

4. How many of the homes you typically build could be described as...

Completely custom design:

CUSTOM	Frequency	Percent
Some	13	23.6
All/Most	42	76.4

Frequency Missing = 9

Based on stock plans with some design alterations possible:

STOCK	Frequency	Percent
None	12	26.1
Some	25	54.3
All/Most	9	19.6

Frequency Missing = 18

Other (modular, factory-built kits, etc.):

OTHER	Frequency	Percent
None	33	91.7
Some	2	5.6
All/Most	1	2.8

Frequency Missing = 28

PART 11: PROJECT EVALUATION

In this section we would like your opinions on RCDP operation. (T=True, F=False)

TRAINING

5. Which of the following Super Good Cents training sessions did you or your employees attend in 1986?

None: (If None, please proceed to question #8)

TRAINO	Frequency	Percent
F	49	76.6
T	15	23.4

GENERAL

Two-Day Super Good Cents Workshop:

TRAIN1	Frequency	Percent
F	29	45.3
T	35	54.7

ADVANCED SESSIONS

Wiring/Plumbing:

TRAIN2	Frequency	Percent
F	59	92.2
T	5	7.8

Ventilation:

TRAIN3	Frequency	Percent
F	44	68.7
T	20	31.3

Heating:

TRAIN4	Frequency	Percent
F	56	87.5
T	8	12.5

Advanced Framing Techniques:

TRAIN5	Frequency	Percent
F	51	79.7
T	13	20.3

Advanced Drywall Approach (ADA):

TRAIN6	Frequency	Percent
F	34	53.1
T	30	46.9

Other:

TRAIN7	Frequency	Percent
F	63	98.4
T	1	1.6

6. In what areas could training be improved?

None:

IMPROVE0	Frequency	Percent
F	54	85.7
T	9	14.3

Frequency Missing = 1

General energy-efficient design technique:

IMPROVE1	Frequency	Percent
F	60	95.2
T	3	4.8

Frequency Missing = 1

Locating appropriate construction materials:

IMPROVE2	Frequency	Percent
F	53	84.1
T	10	15.9

Frequency Missing = 1

Interpreting RCDP/SGC specifications:

IMPROVE3	Frequency	Percent
F	58	92.1
T	5	7.9

Frequency Missing = 1

RCDP program requirements:

IMPROVE4	Frequency	Percent
F	58	92.1
T	5	7.9

Frequency Missing = 1

Air-vapor barrier installation:

IMPROVE5	Frequency	Percent
F	59	93.7
T	4	6.3

Frequency Missing = 1

ADA techniques:

IMPROVE6	Frequency	Percent
F	55	87.3
T	8	12.7

Frequency Missing = 1

Mechanical ventilation:

IMPROVE7	Frequency	Percent
F	49	77.8
T	14	22.2

Frequency Missing = 1

Building with High R-Value walls:

IMPROVE8	Frequency	Percent
F	63	100.0

Frequency Missing = 1

Other:

COMPUTING INFORMATION FOR MECHANICS L VENT.

ENOUGH PRESENTATION TIMES.

FOCUS ON THE ONE TECHNIQUE, TAKE HOUSE FROM START TO FINISH.

MORE SESSIONS IN J.H. AREA.

7. How well did the training prepare you for construction of your RCDP home?

TRAINPAR	Frequency	Percent
Excellently	14	29.2
Adequately	33	68.7
Poorly	1	2.1

Frequency Missing = 16

DESIGN REVIEW

8a. During design review, did you feel that...

The design packet was clearly explained:

DRPACK	Frequency	Percent
Not at all	1	1.6
Somewhat	31	50.0
Very	30	48.4

Frequency Missing = 2

Submittal requirements (plans, checklist) were reasonable?:

DRSUBMIT	Frequency	Percent
Somewhat	25	39.7
Very	38	60.3

Frequency Missing = 1

Design approval was timely?:

DRAPP	Frequency	Percent
Not at all	4	6.3
Somewhat	21	33.3
Very	38	60.3

Frequency Missing = 1

Technical design assistance was sufficient?:

DRASSIST	Frequency	Percent
Not at all	2	3.2
Somewhat	13	20.6
Very	48	76.2

Frequency Missing = 1

8b. What recommendations would you make to streamline design review procedures?

1986 FORMS MUCH BETTER THAN ODOE FORM FOR 1985 BUT STILL DIFFICULT TO USE FOR DAY-LIGHT BASEMENT HOUSES TRIM JOIST PROBLEM.

ALLOW SOME CONSTRUCTION TO BEGIN, MAYBE UP THROUGH FOUNDATION.

ASSIGN DESIGN REVIEW TO ONE PERSON TO SPEED UP FINAL APPROVAL SO PAYMENTS CAN BE MADE QUICKER.

BUILDER HAVE OPTION OF ONE FACE-TO-FACE WITH REVIEWER TO CLEAR UP RESULTS OF REVIEW.

BUILD LIKE MYSELF--DUCT FRICTION COLVULOTER. OTHER THAN THAT ONLY EXPERIENCE WILL HELP THEM.

CLARIFY VENTILATION REQUIREMENTS.

DESIGN PACKET SHOULD BE RE-DONE FROM THE BUILDER SIDE OF THE TABLE. IT WASN'T ALWAYS CLEAR WHAT WAS BEING REQUESTED.

FURNISH FORM THAT ARE TO BE FILLED OUT BY BUILDER BEFORE MEETING.

I DON'T KNOW HOW MANY HANDS IT PASSED THROUGH, BUT IT SEEMS AS THOUGH NO MORE THAN 2 PEOPLE SHOULD REVIEW IT.

I THINK MOST OF THE PAPERWORK WAS GOOD, HOWEVER IT COULD HAVE BEEN CONDENSED SOMEWHAT.

I THINK THERE MAY HAVE BEEN TOO MANY REQUIREMENTS TO GET GOOD PARTICIPATION FROM BUILDERS.

I WAS ONE OF THE 1ST BUILDERS TO START & THINGS LIKE CONTRACT ETC. WERE SLOW COMING.

LESS PAPER WORK.

MORE TIMELY PLAN APPROVAL.

MY PUD DESIGN INSPECTOR SEEMED TO PUT OFF MY REVIEW TO THE LAST MINUTE. INSPECTION AND ADVISE WAS PROMPT AND EXCELLENT.

NO PROBLEMS.

NONE.

OK.

REDUCE PAPER WORK.

REVIEW NEEDS TO BE MORE SYSTEMATIC WITH ADVANCE NOTIFICATION OF REVIEW PROCEDURES.

TIME LINE WAS TOO SHORT FROM START TO COMPLETION. NEED MORE TECHNICAL ASSISTANCE ESPECIALLY WITH VENTILATION REQUIREMENTS.

INSPECTIONS

9a. Did you experience any of the following problems during the inspection process?

No inspection problems experienced:

INSPECTO	Frequency	Percent
F	17	26.6
T	47	73.4

Uncertainty about how the inspection procedure worked:

INSPECT1	Frequency	Percent
F	55	85.9
T	9	14.1

Inspectors who were unfamiliar with program specs and requirements:

INSPECT2	Frequency	Percent
F	60	93.7
T	4	6.2

Construction delays before scheduled inspections:

INSPECT3	Frequency	Percent
F	61	95.3
T	3	4.7

Inspectors not visiting site in a timely manner:

INSPECT4	Frequency	Percent
F	62	96.9
T	2	3.1

Need for more than three project inspections:

INSPECT5	Frequency	Percent
F	58	90.6
T	6	9.4

Other:

BILL WAS VERY GOOD.

CONFLICT BETWEEN LOCAL UTILITY AND RCDP INSPECTOR.

DEADLINE OF PROGRAM CAUSED EXTRA EXPENSES, AND THEN IT WAS EXTENDED.

INSPECTION PROCESS WAS VERY GOOD BUT NO ONE WAS SURE ABOUT FOLLOWUP.

INSPECTIONS BY DICK RIDDLE WERE IN NO WAY A PROBLEM.

INSPECTOR WAS KNOWLEDGEABLE, HELPFUL, AND MET THE REQUIREMENTS.

9b. What changes would you like to see made in the inspection process?

AAHX CONTROL AND DESIGN REQUIREMENTS.

A QUALIFIED INSPECTOR (IN RCDP) WOULD BE AN EDUCATIONAL PROCESS.

CERTIFY THE BUILDER TO DO OWN OR ANOTHER RCDP BUILDER.

CERTIFICATION OF BOILERS.

EACH HOURS TREATED EQUALLY.

GIVE LOCAL INSPECTORS AUTHORITY TO MAKE JUDGEMENT CALLS.

INSPECTIONS WERE MADE VERY PROMPTLY.

IT WAS OK.

LESS READING OR ITEMIZATION OF REQUIREMENTS.

MORE FREQUENT INSPECTIONS.

MORE INSPECTIONS/WITH POSSIBLE CONSTRUCTIVE CRITICISM.

NONE.

NONE BY DICK, HE COOPERATED IN EVERY WAY HE COULD.

PERHAPS ANY CHECKLISTS THAT COULD BE DEVELOPED FOR BUILDER USE OF COMMON INSPECTION PROBLEMS,SO THEY ARE MORE PREPARED.

USE OF LOCAL INSPECTORS.

USING CITY/COUNTY INSPECTOR RATHER THAN A SPECIAL INSPECTOR, LIKE THE LAST TIME IN SPOKANE.

COST REPORTING

10a. Did the cost reporting forms...

Provide clear instruction:

FORM1	Frequency	Percent
Poor	5	7.9
Adequate	51	81.0
Excellent	7	11.1

Frequency Missing = 1

Allow for easy separation of component costs?:

FORM2	Frequency	Percent
Poor	8	12.9
Adequate	49	79.0
Excellent	5	8.1

Frequency Missing = 2

Accurately reflect the total cost of your RCDP innovation?:

FORM3	Frequency	Percent
Poor	7	11.3
Adequate	45	72.6
Excellent	10	16.1

Frequency Missing = 2

10b. Did the cost reviewer...

Provide adequate explanation of the process?:

REVIEW1	Frequency	Percent
Poor	1	1.6
Adequate	32	51.6
Excellent	29	46.8

Frequency Missing = 2

Provide timely approval of submitted reports?:

REVIEW2	Frequency	Percent
Poor	5	8.3
Adequate	20	33.3
Excellent	35	58.3

Frequency Missing = 4

RCDP DESIGN SPECIFICATIONS

11a. It was necessary to use several sets of design specifications in order to comply with RCDP requirements. Please assess the following specifications in terms of their usefulness during construction.

USEFULNESS OF SGC SPECS:

GCSPEC	Frequency	Percent
Inadequate	5	8.3
Needs Improve	11	18.3
Adequate	44	73.3

Frequency Missing = 4

USEFULNESS OF AAHX SPECS:

AAHXSPEC	Frequency	Percent
Inadequate	6	10.2
Needs Improve	24	40.7
Adequate	29	49.2

Frequency Missing = 5

USEFULNESS OF RCDP SPECS:

INOVSPEC	Frequency	Percent
Inadequate	5	8.5
Needs Improve	11	18.6
Adequate	43	72.9

Frequency Missing = 5

11b. What changes would you make in any of these specifications to make them easier to use?

A SIMPLE LIST OF INNOVATIVE IDEAS WITH DETAILS ELSEWHERE.

BETTER EXPLANATIONS ON HOW TO IMPLEMENT THE SPECS.

CLARIFY REQUIREMENT FOR AAHX AND ALLOW MORE FLEXIBILITY.

DESIGNING THE AIR TO AIR HEAT EXCHANGER FOR CHEAPER INSTALLATION.

DON'T CHANGE SPECS DIVING THE PROGRAM. GET YOUR ACT TOGETHER BEFORE THE PROGRAM STARTS.

EVEN THOUGH I AM AN ENGLISH MAJOR GRAD, THE LANGUAGE COULD BE SIMPLIFIED.

GET THE SPECS OUT TO THE FIELD WITH LESS CHANGES ONCE THEY ARE INITIATED; (I.E., NON-HEAT RECOVERY VENTILATION ETC.).

IT WOULD HAVE BEEN NICE TO DEAL WITH SOMEONE ONE-ON-ONE AND NOT OVER THE PHONE. WYOMING IS A LONG WAY FROM WASHINGTON.

LESS DETAILED.

MAKE THEM MORE UNDERSTANDABLE.

MORE DRAWINGS.

MORE GRAPHIC PRESENTATION.

NONE.

ON HRV'S ALLOW MORE LEEWAY TO ADAPT TO MANUFACTURERS SPECS AND HOME USE.

ONLY ONE SET-DON'T CHANGE IN MID-STREAM.

PROVIDE ARROWS ON AIRFLOW ON DUCTS LINE ON PLANS FOR BASIC UNDERSTANDING. I HAD TO HAVE MY INSTALLER COME BACK & CHALLENGE CORRECTION.

NO. I DIDN'T REALIZE THE CONNECTION WAS NEEDED.

SIMPLEX, AAHX.

SIZING ON AAHX.

TOO MUCH OVERLAP, REDUCE PAPER WORK.

WE TURNED THE AAHX PROCESS OVER TO BOB PORTER.

SUBCONTRACTOR OVERSIGHT

12. Compared to most homes that you build, what degree of oversight was necessary to meet RCDP requirements with each of the following subcontractors?

SUBCONTRACTOR OVERSIGHT: FRAMING

OSFRAME	Frequency	Percent
No Subcontractor	26	42.6
Usual	14	23.0
More Than Usual	21	34.4

Frequency Missing = 3

SUBCONTRACTOR OVERSIGHT: ELECTRIC

OSELEC	Frequency	Percent
No Subcontractor	2	3.3
Usual	24	40.0
More Than Usual	34	56.7

Frequency Missing = 4

SUBCONTRACTOR OVERSIGHT: PLUMBING

OSPLUMB	Frequency	Percent
No Subcontractor	2	3.3
Usual	37	61.7
More Than Usual	21	35.0

Frequency Missing = 4

SUBCONTRACTOR OVERSIGHT: INSULATION

OSINSUL	Frequency	Percent
No Subcontractor	6	9.8
Usual	29	47.5
More Than Usual	26	42.6

Frequency Missing = 3

SUBCONTRACTOR OVERSIGHT: AIR-VAPOR

OSVAPOR	Frequency	Percent
No Subcontractor	19	31.1
Less Than Usual	1	1.6
Usual	11	18.0
More Than Usual	30	49.2

Frequency Missing = 3

SUBCONTRACTOR OVERSIGHT: DRY-WALL

OSDRYWAL	Frequency	Percent
No Subcontractor	5	8.2
Usual	23	37.7
More Than Usual	33	54.1

Frequency Missing = 3

SUBCONTRACTOR OVERSIGHT: HEATING

OSHEAT	Frequency	Percent
No Subcontractor	3	5.0
Less Than Usual	1	1.7
Usual	28	46.7
More Than Usual	28	46.7

Frequency Missing = 4

SUBCONTRACTOR OVERSIGHT: VENTILATION

OSVENT	Frequency	Percent
No Subcontractor	5	8.3
Less Than Usual	1	1.7
Usual	13	21.7
More Than Usual	41	68.3

Frequency Missing = 4

PART III: EXPERIENCE WITH RCDP CONSTRUCTION INNOVATIONS

This section contains questions relating to your field experience with the RCDP innovations.

13. For each of the six RCDP innovations, please indicate whether you used that innovation during RCDP, whether you have used it elsewhere, and whether you would be interested in using it in the future.

ADA USED IN RCDP:

USEADA1	Frequency	Percent
N	21	33.3
Y	42	66.7

Frequency Missing = 1

ADA USED ELSEWHERE:

USEADA2	Frequency	Percent
N	38	69.1
Y	17	30.9

Frequency Missing = 9

ADA WOULD LIKE TO USE IN FUTURE:

USEADA3	Frequency	Percent
N	9	16.4
Y	46	83.6

Frequency Missing = 9

H-R WALLS USED IN RCDP:

USEHIR1	Frequency	Percent
N	8	14.0
Y	49	86.0

Frequency Missing = 7

H-R WALLS USED ELSEWHERE:

USEHIR2	Frequency	Percent
N	17	30.4
Y	39	69.6

Frequency Missing = 8

H-R WALLS USE IN FUTURE:

USEHIR3	Frequency	Percent
N	8	14.3
Y	48	85.7

Frequency Missing = 8

AAHX/DUCT USED IN RCDP:

USEAAHX1	Frequency	Percent
N	40	71.4
Y	16	28.6

Frequency Missing = 8

AAHX/DUCT USED ELSEWHERE:

USEAAHX2	Frequency	Percent
N	46	88.5
Y	6	11.5

Frequency Missing = 12

AAHX/DUCT USE IN FUTURE:

USEAAHX3	Frequency	Percent
N	24	45.3
Y	29	54.7

Frequency Missing = 11

AAHX/F. AIR USED IN RCDP:

USEFAF1	Frequency	Percent
N	36	69.2
Y	16	30.8

Frequency Missing = 12

AAHX/F. AIR USED ELSEWHERE:

USEFAF2	Frequency	Percent
N	41	78.8
Y	11	21.2

Frequency Missing = 12

AAHX/F. AIR USE IN FUTURE:

USEFAF3	Frequency	Percent
N	24	44.4
Y	30	55.6

Frequency Missing = 10

EAHP USED IN RCDP:

USEEAHP1	Frequency	Percent
N	46	85.2
Y	8	14.8

Frequency Missing = 10

EAHP USED ELSEWHERE:

USEEAHP2	Frequency	Percent
N	48	96.0
Y	2	4.0

Frequency Missing = 14

EAHP USE IN FUTURE:

USEEAHP3	Frequency	Percent
N	23	46.0
Y	27	54.0

Frequency Missing = 14

MODULAR USED IN RCDP:

USEMOD1	Frequency	Percent
N	51	98.1
Y	1	1.9

Frequency Missing = 12

MODULAR USED ELSEWHERE:

USEMOD2	Frequency	Percent
N	49	100.0

Frequency Missing = 15

MODULAR: USE IN FUTURE:

USEMOD3	Frequency	Percent
N	49	94.2
Y	3	5.8

Frequency Missing = 12

Please fill out a section for each of the construction practices you have experience with, whether or not that experience was with the RCDP.

IF YOU HAVE USED THE ADVANCED DRYWALL APPROACH PLEASE ANSWER 14 a-d

14a. Prior to participation in RCDP, How many single-family homes had you built using the Advanced Drywall Approach (ADA)? #_____homes

ADAHOMES	Frequency	Percent
0	32	71.1
1	5	11.1
2	2	4.4
3	1	2.2
4	3	6.7
6	2	4.4

Frequency Missing = 19

14b. Did any of the following areas cause difficulties when using the Advanced Drywall Approach?

ADA AVAILABILITY OF INFORMATION:

ADAPROB1	Frequency	Percent
No Problem	34	77.3
Minor Problem	7	15.9
Major Problem	3	6.8

Frequency Missing = 20

ADA AVAILABILITY OF MATERIALS:

ADAPROB2	Frequency	Percent
No Problem	29	65.9
Minor Problem	15	34.1

Frequency Missing = 20

ADA SUBCONTRACTOR ABILITY:

ADAPROB3	Frequency	Percent
No Problem	16	39.0
Minor Problem	21	51.2
Major Problem	4	9.8

Frequency Missing = 23

ADA CALLBACKS FROM HOMEOWNER:

ADAPROB4	Frequency	Percent
No Problem	37	88.1
Minor Problem	5	11.9

Frequency Missing = 22

ADA OTHER PROBLEMS:

DRY WALLERS UNFAMILIAR AND USUALLY WANT TO GO TOO FAST.

I WOULD NOT USE SUBCONTRACTOR TO DO SEALING. TOO MUCH OVERSIGHT NEEDED.

NONE.

SOUND SEALANT WAS MESSY AND MY SUBCONTRACTOR GOT A HOLD OF OLD STOCK.

TIME FLOW.

WE HAD NO CALL BACKS WHEN WE SWITCHED FROM FOAM GASKETS TO ACOUSTICAL CAULK.

14c. What specific advice would you give to another builder using ADA for the first time?

% GO TO ADA SEMINAR.

1ST - LOCATE DRYWALL CLIPS & ALLOW FOR LOTS OF ($) MONEY FOR SEALANT.

BE FULLY FAMILIAR WITH PROCEDURE BEFORE FRAMING.

BE PREPARED TO FRAME SO ADA IS RIGHT IN SOME DIFFICULT FRAME CONNECTIONS.

BE THERE/HANDS ON AND PAY ATTENTION TO DETAIL.

BID HIGH AND BE CAREFUL IN CONSTRUCTION. WATCH YOU SUBS YOU NEED TO BE THE EXPERT AGAIN.

DO NOT TRY IT ON MULTI-STORY BUILDINGS.

EXPLORE THE COST.

FOLLOWING UP AN APPLICATOR.

GO FOR IT.

HAVE SUBCONTRACTOR ATTEND THE WORKSHOP WITH YOU.

INSTALL LID BEFORE YOU INSTALL CEILING GASKETS, AND USE POLY FROM FLOOR DOWN OVER BOX SILL.

KEEP GOOD CHECK ON CAULKING.

LET THE SUBS KNOW WHY THEY NEED TO DO A GOOD JOB.

MAKE SURE HE UNDERSTANDS THE SEALING PROCESS.

NONE.

PAY ATTENTION TO DETAIL.

PUT TEXTURE ON WALLS AFTER LOW PERMEANCE PRIMER. WE DID THIS BUT I DON'T RECALL IT BEING ADDRESSED IN CLASSES.

SEEK OUT BUILDER CONSULTANTS WHO WOULD BE CERTIFIED.

STUDY MATERIALS USED FOR GASKETING PRIOR TO ORDERING.

TACK UP FOAM STRIP, BEFORE SHEETROCKERS START SHEETROCKING.

TAKE THE ADA SEMINAR.

TAKE TIME, THINK IT THROUGH.

TELL HIM WHEN SEALING IS NEEDED TO USE 1/8" X 2/8" GASKET TAPE, URETHANE CAULK AND GEOCEL SEALANT IN THE RIGHT PLACES.

THINK IT THROUGH FROM FRAMING ON.

THINK THINGS THROUGH STEP BY STEP.

THINK THROUGH THE PROCESS BEFORE BEGINNING AND BE SYSTEMATIC.

TO BE SURE THAT ALL GASKETS ARE IN PLACE PRIOR TO INSTALLING DRYWALL.

USE A COMPESSABLE GASKET.

USE CAULK ONLY IF YOU DO YOUR OWN DRYWALL USE GASKETS WITH SUBS.

USE CAULKING.

USE GOOD CAULK AND CHECK IT BEFORE THE DRY WALLER BEGINS USING IT. SHOW THE DRYWALLER HOW YOU WANT IT INSTALLED.

USE GOOD QUALITY ELECTRICAL BOXES (NO HOLES).

USE OF CERTAIN MATERIALS IN APPROPRIATE LOCATIONS.

USE RED PAINT TO MARK ALL CAULKING LOCATIONS BEFORE GWB IS INSTALLED.

WRAP ELECTRIC BOXES IN POLY.

14d. Did your homebuyer express any concerns about the use of ADA in the home you built? If yes, what were they?

AIR TIGHTNESS.

"ARE YOU SURE ITS TIGHT?"

MAKING THE HOUSE TOO TIGHT FOR GOOD QUALITY AIR IN HOUSE.

NO.

NONE.

NONE AFTER COMPLETION. BEFORE APPLICATION THE OWNERS WERE CONCERNED ABOUT THE APPEARANCE OF THE PRODUCT.

NONE AFTER EXPLAINING THE PROCEDURES.

NONE. COULD A GLUE SUBSTITUTE FOR BOEHER ROD AND WOULDN'T GASKETING AT BASE OF WALL INSTEAD OF ON TOP PLATE BE JUST AS EFFECTIVE.

THAT IT BE AIRTIGHT.

THE FUNCTION WAS EXPLAINED TO THEM. AFTER THAT THEY HAD NO CONCERNS.

WILL THE PVA AND ENAMEL ACT PROPERLY AS A VAPOR RETARDER.

IF YOU HAVE USED HIGH R-VALUE WALLS, PLEASE ANSWER QUESTIONS 15 a-d

15a. Prior to participation in RCDP, how many single-family homes had you built using High R-Value Wall(Hi-R)? #_____homes

HIRHOMES	Frequency	Percent
0	17	31.5
1	5	9.3
2	8	14.8
3	7	13.0
4	3	5.6
6	4	7.4
7	1	1.9
8	2	3.7
10	2	3.7
12	1	1.9
15	2	3.7
20	1	1.9
75	1	1.9

Frequency Missing = 10

15b. Did you experience any of the following difficulties when using High R-Value Walls?

HI-R AVAILABILITY OF DESIGN INFO.:

HIRPROB1	Frequency	Percent
No Problem	41	83.7
Minor Problem	8	16.3

Frequency Missing = 15

HI-R SUBCONTRACTORS ABILITY:

HIRPROB2	Frequency	Percent
No Problem	37	77.1
Minor Problem	11	22.9

Frequency Missing = 16

HI-R CALLBACKS FROM HOMEOWNERS:

HIRPROB3	Frequency	Percent
No Problem	45	93.7
Minor Problem	2	4.2
Major Problem	1	2.1

Frequency Missing = 16

HIGH R WALLS OTHER PROBLEMS:

HIROTHER	Frequency	Percent
DESIGN WAS FROM	1	14.3
DID NOT USE SUBC	1	14.3
DOES NOT WORK WE	1	14.3
JUST EXTRA WORK	1	14.3
LARGE WOOD SILLS	1	14.3
LOCAL BUILDING C	1	14.3
NO BLOWN BATT SY	1	14.3

Frequency Missing = 57

15c. What specific advice would you give to another builder using Hi-R Walls for the first time?

ALLOW ADEQUATE MONEY TO DO THE JOB CORRECTLY.

ASK FOR INFORMATION.

BE SURE TO ANTICIPATE ANY INTERIOR FINISH PROBLEMS.

DO IT.

DO IT, IT'S WORTH THE COST.

FIND A REAL CONSCIENTIOUS - INSULATOR AND TEACH THEM HOW TO PROPERLY INSULATE, INSTALL AND SEAL THE VAPOR BARRIER.

FOLLOW UP WITH SUBCONTRACTOR.

IT CAN BE A PAIN IN THE NECK, DEPENDING ON DESIGN.

JUST MY PARTICULAR DESIGN WAS EXTREMELY ADEQUATE AND COST EFFECTIVE. WHEN I FINISHED THE WALL I KNOW IT WAS SUPER INSULATED.

JUST THAT THE INTERIOR THERMAX/2X STRIP/FINISH MATERIAL WAS MUCH MORE TIME CONSUMING THAN IT LOOKS.

KEEP DESIGN SIMPLE.

LEAVE PLENTY OF CLEARANCE FOR SHEETROCK AROUND THE DOORS.

LOOK REAL HARD AT SINGLE TOP PLATE.

MAKE YOUR CUSTOMER HAPPY.

NONE.

PAY ATTENTION TO DETAIL.

PAY ATTENTION TO SEQUENCING.

PLAN AHEAD.

PLAN YOUR R.O. (WINDOWS & DOORS).

PUT VAPOR BARRIER ON OUTSIDE OF INSIDE WALL.

SPECIAL ATTENTION TO GETTING AESTHETICALLY ACCEPTABLE FLAT WALLS.

SPECIFIC INSTRUCTION FOR POSSIBLE ABNORMALITIES.

STAY WITH 2X6 WALL 24" O.C. DON'T GO WITH THICKER WALL--NOT COST EFFECTIVE.

STICK TO ONE TYPE OF MATERIAL.

STUDY DETAILS (FRAMING) CLOSELY SUPERVISOR FRAMING. GET NEWS OF OTHER BUILDERS FROM WSEO WHO USE HI-R AND VISIT THE BUILDING SITE.

THINK SIDING AND WINDOW APPLICATIONS THROUGH AHEAD OF TIME. ADVANCED PLANNING IS NECESSARY WITH DECK.

USE A STRIP OF POLY WRAPPED OVER AND SEALED ACROSS THE TOP BEFORE TRUSSES ARE PUT DOWN, TO CUT OFF AIR MOVEMENT.

USE COMBINATION OF COMPRESSED FIBERGLASS BATTS AND FOIL-FACED POLY ISO-CYANURATE.

USE COMMON SENSE.

USE THE PROPER TAPE.

WATCH FRAMING CREW CAREFULLY.

WATCH WINDOW R.O. WHEN USING DOUBLE WALLS WRAPPING WINDOW R.O. WITH PLYWOOD.

WRAP WINDOW AND DOORS TO KEEP THICKNESS CONSTANT. PLAN FIRE STOP AHEAD

YOU CANNOT BE TO CAREFUL ABOUT YOUR DETAILS FROM START TO FINISH

15d. Did the homebuyer express any concerns about the installation of Hi-R Walls in the home you built? If yes, what were they?

CHEMICAL BLEED-OFF OF FOAM (FORMALDEHYDE).

JUST HOW THE WINDOWS WERE GOING TO LOOK.

MOISTURE BEING TRAPPED IN WALLS.

NO.

NO, IN FACT ON SOME CUSTOM HOMES THEY ASK FOR IT.

NO, OWNER SPECIFIED.

NONE.

NONE.

POSSIBLE MOISTURE PROBLEMS.

VERY HAPPY.

WALL SWEATING - WORRIED ABOUT DRY ROT.

IF YOU HAVE EXPERIENCE WITH ANY OF THE RCDP VENTILATION INNOVATIONS, PLEASE ANSWER 16 a-e

16a. Which of the following ventilation innovations have you had the most experience with?

EXPERIENCE WITH VENT. INNOVATIONS:

VENTINOV	Frequency	Percent
AAHX/Duct	21	47.7
AAHX/FAF	19	43.2
EAHP	4	9.1

Frequency Missing = 20

16b. Prior to participation in RCDP, how many single-family homes had you built using this type of ventilation system? #_____homes

VENTHOME	Frequency	Percent
0	31	60.8
1	4	7.8
2	5	9.8
3	2	3.9
4	3	5.9
5	3	5.9
6	1	2.0
8	2	3.9

Frequency Missing = 13

16c. Did you experience any of the following difficulties when installing this kind of ventilation system?

VENT AVAILABILITY OF DESIGN INFO.:

VNTPROB1	Frequency	Percent
No Problem	18	39.1
Minor Problem	19	41.3
Major Problem	9	19.6

Frequency Missing = 18

VENT SYSTEM EXPENSE:

VNTPROB2	Frequency	Percent
No Problem	11	22.9
Minor Problem	20	41.7
Major Problem	17	35.4

Frequency Missing = 16

VENT SUBCONTRACTORS ABILITY:

VNTPROB3	Frequency	Percent
No Problem	18	37.5
Minor Problem	20	41.7
Major Problem	10	20.8

Frequency Missing = 16

VENT CALLBACKS FROM HOMEOWNERS:

VENPROB4	Frequency	Percent
No Problem	29	60.4
Minor Problem	16	33.3
Major Problem	3	6.2

Frequency Missing = 16

Other:

ITS BEEN IN 8 MONTHS, SO NO CALL BACKS YET.

KNOWLEDGE OF "GOOD, BETTER, BEST" OF THE SYSTEMS.

LACK OF PERFORMANCE ON CORRECT USE BY OWNERS.

LIKE ANYTHING NEW NOW I BELIEVE THAT IT WOULD GO MUCH MORE SMOOTHLY.

NO DUCT HEATER--THUS COLD AIR.

NONE.

SUBCONTRACTOR WAS NOT KNOWLEDGEABLE AND TRIED TO OVERCHARGE US FOR VANNEE.

16d. What specific advice would you give to another builder installing a similar ventilation system for the first time?

ACQUIRE MORE DESIGN INFORMATION.

ATTEND AT LEAST ONE AAHX WORKSHOP.

BE AWARE OF THE HIGH COST.

CHECKOUT THE HEATED CRAWL SPACE SYSTEM.

CHOOSE A GOOD SUB.

DESIGN YOUR HOME TO ACCEPT THE DUCT WORK IN STRAIGHT RUNS WITHIN THE HEATED SPACE.

DON'T.

EVALUATE COST FIRST, IS IT ECONOMICAL? CHECK HOW TO BALANCE SYSTEM.

FIND A SOURCE THAT GIVES EXCELLENT CONSUMER INFORMATION (FIRST FIND THE BEST ONE).

FIND A SUB WHO HAS DONE THIS AND INSIST THAT HE GO TO THE SEMINARS.

FOLLOW UP WITH A SUBCONTRACTOR FOR THE INSTALLATION (ACCORDING TO SGC REQUIREMENTS.)

GET A QUALIFIED PERSON TO INSTALL AND BALANCE AAHX. THE AVERAGE HEATING CONTRACTOR DOESN'T KNOW ABOUT AAHX INSTALLATION.

GET AN INSTALLER THAT KNOWS WHAT HE'S DOING.

GET HELP FROM THE MFG. ON DESIGNING THE SYSTEM.

HAVE ALL DUCTS SIZED AND PLANNED OUT BEFORE BUILDING.

HAVE HEATER IN HAND LONG BEFORE INSTALLATION.

HAVE UNIT ON HAND AT START OF CONSTRUCTION TO HELP INTEGRATE UNIT AND DUCTING WITH BUILDING.

I LIVE IN THE HOME I BUILT FROM THAT EXPERIENCE I WOULD SAY TO PUT AN OVERSIZED AAHX WITH RCDP DUCT DESIGN.

I WOULD ADVICE HIM TO LOOK INTO EXHAUST ONLY SYSTEM (BOISE AREA).

IT IS DIFFICULT TO TELL IF THE HEATER IS WORKING WITHOUT A THERMOMETER TO CHECK HEATER.

KEEP DUCT LENGTHS SHORT WATCH EXTERIOR WALL PENETRATIONS OF DUCTS CLOSELY.

KEEP DUCT SHORT AND SIMPLE. USE GLUING MACHINE. CONSIDER SOUND DAMPENING.

LOOK AT COST PAYBACK.

MAY NOT BE COST EFFECTIVE.

NONE.

NOT TO USE FORCED AIR ELECTRIC FURNACE, USE ZONAL HEAT.

PLAN, PLAN, PLAN AHEAD, USE WELL QUALIFIED SUB OR DO IT YOURSELF!

PUT AAHX AND FURNACE ON A TIMER SO THE HEATING SYSTEM FAN WOULD BE ON IN CONJUNCTION WITH AAHX.

PUT THE UNITS IN AN AREA WHERE YOU COULD RESTRICT THE NOISE FROM THE REST OF THE HOUSE.

READ THE LITERATURE CAREFULLY.

SEE EXPERIENCED CONSULTANT.

SIMPLE LAYOUT, SOUND PROOF AROUND HRV AREA.

TALK TO SOMEONE WHO HAS INSTALLED ONE OR TWO.

TO BUY A WELL KNOWN BRAND NAME AND HAVE AN ACCEPTABLE CONTRACTOR.

USE BATH FANS TIED INTO AAHX SYSTEM.

USE EXHAUST FANS INSTEAD OF AAHX/ BECAUSE OF COST.

16e. Did your homebuyer express any concerns about the installation of this ventilation system? If yes, what were they?

COLD DRAFTS, NOISE AND HIGH HEATING BILLS.

CRITICAL TO GIVE THEM BROCHURES EXPLAINING SYSTEM AND.

HOW DOES IT WORK? IF MY POWER IS OUT WILL IT STOP?...

HOW TO ADJUST TEMPERATURE OF HEATER.

HOW TO CLEAN FILTER. HOW OFTEN TO RUN MACHINE.

HOW TO OPERATE COST.

NEWNESS OF TECHNOLOGY APPLICATION.

NO.

NO, NEED EXPLANATION OF THE SYSTEM.

NOISE.

NOISE AND POSSIBLE CONDENSATION PROBLEMS.

NONE.

NONE, OTHER THAN HOME BUYERS TRUSTING MY JUDGEMENT.

NOT REALLY.

ONLY THE COST OF OPERATION! I COVERED NOISE LEVELS IN MY INTRODUCTION, IT SEEMED TO SATISFY.

THE ACCESS PANEL ON DUCT HEATER IS DIFFICULT TO GET TO BECAUSE THE HEATER COULD NOT BE INSTALLED UPSIDE DOWN.

THE ONLY CONCERN WAS LACK OF INFORMATION ON USE AND OPERATION OF SYSTEM.

THEY WANTED TO KNOW HOW IT WORKS.

WASTE OF MONEY BOTH UP FRONT AND ELECTRICALLY.

YES, "WHY AM I PUMPING COLD AIR INTO MY HOUSE?"

YES, GETTING ACCESS TO IT PLUS NOISE.

YES, INCORRECT ELECTRICAL HOOK UP CAUSED THE HOUSE TO OVERHEAT.

YES, WARRANTY AND BACKING UP THE PRODUCT.

YES. HE WANTED THIS BABY PUT IN RIGHT, AS THIS WAS THE KEY TO THE WHOLE PROGRAM.

YES. SYSTEM DID NOT WORK PROPERLY AS ORIGINALLY INSTALLED. HAD TO BE REWIRED. HOUSE DID NOT HEAT UP. BUT RAN CONSTANTLY.

Thanks for your help. Please use this space for any further comments about the project.

#498 WAS MY FIRST ATTEMPT OF ANY ENERGY EFFICIENT FEATURE. IN THIS HOME I USED AS MANY AS I COULD. IT WAS A LEARNING PROCEDURE. EDUCATION USUALLY COSTS SOMETHING. THIS HOME FINISHED OUT EXCELLENT. NOW I CAN BUILD THIS HOME AND CUT MY COST APPROACH ANALYSIS DOWN TO BY 1/4 - 1/3 (MOSTLY ON LABOR.) I DID CUT MY COSTS ON THE SECOND HOME. I BUILT IN HALF THE COST FROM BOTH OF THOSE EXPERIENCES. I HAVE A SUPER COST EFFECTIVE PLAN AND ABILITY. THIS DIFFERENCE COMES FROM LEARNING WHAT IS EXACTLY NEEDED AND WHAT IS EASY TO INSTALL, THE RIGHT TIME TO INSTALL AND MOSTLY BEING ABLE TO TIME THE WORK EFFECTIVELY.

AAHX SEEMS TOO EXPENSIVE FOR HOMEBUYERS NEED CHEAPER VENTILATION SCHEMES. IS ROOF VENTILATION REALLY NECESSARY WITH HIGH-R ROOFS?

AS OWNER/BUILDER THE MAJORITY OF THESE QUESTIONS DO NOT APPLY TO US.

COMMON SENSE AND GOOD BUILDING PRACTICES COVER MOST OF PROGRAM. VAPOR BARRIERS/AAHX AND SUCH ADD MORE COST THAN CAN POSSIBLY BE COVERED. YOUR HEAT LOSS IS COMPARED TO HOMES BUILT 20-30 YEARS AGO NOT THE WAY A GOOD BUILDER BUILDS TODAY. HOMES I'VE BUILT HAVE 2X4 HALLS (R-11 PLUS 1" THERMAX (R-8) AND WRAPPED (NO VAPER BARRIER ON HALLS), AND R'38 CEILING WITH VAPER BARRIER. ALSO INSULATED CRAWL ON BASEMENT ARE VERY EFFICIENT AND ARE OWNED BY VERY SATISFIED CUSTOMERS. I'VE USED "ENERGY TRUSSES" SINCE BEFORE I'D HEARD OF RCDP.

DETAILS FROM OF A YEAR AGO FAIL ME. THIS FOLLOW-UP SHOULD HAVE COME SOONER.

EVERYTHING WENT WELL.

GOOD PROJECT.

HEATING CONTRACTOR DID NOT TAPE DUCTS AS INSTRUCTED. SUBS DID NOT SEAL OPENING FOR VENTING, WIRING, ETC. ARCHITECT DESIGNED SECOND FLOOR WORK WITH A SLOPED CEILING IN SECOND FLOOR HALLWAY. INSULATOR DID NOT COMPENSATE IN INSULATING ATTIC RESULTING IN COLD AIR INFILTRATING THROUGH THE PIER-RIDGE IT WAS BARELY COVERED--ONLY TO R4. CORRECTIONS WERE MADE ON ALL DEFICIENCIES BY THE GENERAL CONTRACTOR TO THE EXTENT POSSIBLE.

I APPRECIATE THE COOPERATION AND HELP OF ALL THE STAFF AT WSEO.

I APPRECIATE THE HELPFULLNESS AND PATIENCE OF ALL STAFF MEMBERS EXTENDED TO ME DURING MY PARTICIPATION IN THE RCDP PROJECT. PERHAPS A SUGGESTION FOR THE MIRIAD OF PAPERWORK (WHICH I REALIZE WAS BOTH NECESSARY HELPFUL) WOULD BE SOME KIND OF INDEXED NOTEBOOK TO HELP US UNORGANIZED BUILDERS KEEP FORMS AND REPORTS MORE ORDERLY AND RETRIEVABLE. THANKS FOR ALL YOUR HELP AND WOULD LIKE TO PARTICIPATE AGAIN IN THE FUTURE.

I FEEL THAT THE PROJECT IS EXTREMELY BENEFICIAL. PLEASE CONTINUE FUNDING FOR AREAS NOT PARTICIPATING IN SGC.

I FEEL THESE PROGRAMS HAVE DONE A GREAT DEAL IN THE AREA OF CAUSING BUILDERS AND DESIGNERS TO THINK OF INNOVATIVE METHODS THAT WILL CONSERVE ENERGY AND PROVIDE HEALTHIER HOMES.

I UNDERSTAND THE REASON FOR IT BUT I WOULD STILL LIKE TO SEE MORE SUPPORT FOR BUILDERS IN NON SGC AREAS. THE INFORMATION AND FOLLOW UP BY THE FOLKS AT IDWR (SHELLY, MIKE, STEVE AND KEN) WAS, AND IS, EXCELLENT. I HAVE JUST COMPLETED AN ADVANCED TRAINING WORKSHOP IN LEWISTON, ID. AND FOUND BOTH STEVE LAKE AND MICHAEL O'BRIEN VERY GOOD TRAINERS BUT REALIZED THEY DID NOT KNOW ALL THE ANSWERS ON EXHAUST ONLY SYSTEMS. IF YOU WOULD HAVE ANY INFORMATION ON THESE SYSTEMS, I WOULD LIKE TO HAVE IT FROM YOU.

I WAS VERY HAPPY TO HEAR THAT THE AAHX HAS BEEN DROPPED. I HAVE OTHER HIGH R-WALL INNOVATIONS I'D LIKE TO TRY.

IT WAS VERY INTERESTING BUILDING THIS HOUSE. I HAVE LEARNED A LOT ABOUT TIGHT HOUSES FROM THE EXPERIENCE AND I RECOMMEND THEM. WE IN JACKSON NEED MORE SEMINARS. THE ONES IN IDAHO FALLS ARE FILLED WITH IDAHO FOLKS AND THERE IS NO ROOM FOR WYOMING CONTRACTORS. JACKSON HAS A MUCH MORE SEVERE WINTER. IF WE HAD SOME ADVANCED SEMINAR SESSIONS, MANY OF THE QUESTIONS THAT OCCURRED DURING CONSTRUCTION WOULD HAVE BEEN ELIMINATED. THE HOME WE ARE BUILDING NOW WILL BE EASIER BECAUSE THE SUBCONTRACTOR'S I USE BETTER UNDERSTAND WHAT WE ARE TRYING TO ACCOMPLISH AND HOW THEIR JOBS ARE AFFECTED.

I WOULD HAVE APPRECIATED MORE INFORMATION ON THE RESULTS OF THE PROGRAM, ESPECIALLY OUR OWN HOUSES IN COMPARISON TO THE CONTROL HOMES.

I'M LIVING IN THE HOUSE. AFTER LIVING HERE I QUESTION THE COST EFFECTIVENESS OF THE AIR TO AIR HEAT EXCHANGER.

IT WAS A VERY INTERESTING PROGRAM. THE INFORMATION I RECEIVED HAS HELPED ME A LOT IN UNDERSTANDING ENERGY EFFICIENT BUILDING METHODS. I WILL BE USING A LOT OF THE REFINEMENTS I HAVE LEARNED IN THE PROGRAM IN FUTURE PROJECTS.

IN GENERAL I AM VERY PLEASED TO HAVE PARTICIPATED IN THE RCDP CONSTRUCTION AND MONITORING PROGRAMS. I WOULD LIKE TO CONTINUE THE MONITORING PROGRAMS FOR ANOTHER YEAR. IN ADDITION I WOULD LIKE TO THANK STEVE BENNER AND KEN BAKER FOR HAVING FAITH IN MY ABILITIES. THANKS ALSO TO KATHLEEN SKAAR AND WSEO.

ITS BEEN A WHILE SINCE THE RCDP FORMS BUT THEY WERE DEFINITELY BETTER THIS TIME. WSEO WAS VERY HELPFUL AND EASY TO WORK WITH AS USUAL. SO WHAT'S THE BIG DEAL, PIECE OF CAKE, RIGHT?

KEEP THE INCENTIVE MONEY COMING ON OTHER SGC INCENTIVES. WE ARE JUST TURNING THE CORNER ON PUBLIC ACCEPTANCE. THE FRONT END IS SELLING THE CONCEPT AND IS THE HARDEST PART OF THE JOB FOR ME.

MONITORS NOT INSTALLED. THERE WERE LOTS OF PAPERWORK SURPRISES DURING THE PROGRAM.

MORE INFORMATION ABOUT GROUND COUPLING AAHX INTAKE: LENGTH OF RUN IN GROUND; TYPE OF PIPE AND DEPTH; HUMIDITY PROBLEMS WITH WARM AIR (IN SUMMER) THRU COLD PIPE, ETC.

THANKS FOR THE OPPORTUNITY TO PARTICIPATE.

THE MONITORING FOR #447 WAS NOT VERY SUCCESSFUL. YOU HAD PROBLEMS WITH THE MONITORING CONTRACTOR. PASS ALONG THE WORD THAT I MAY BE INTERESTED IN CONTINUING THE MONITORING NEXT SEASON FOR MORE ACCURATE DATA.

THE TRAINING WAS WELL DONE BUT IT DIDNT REALLY TRAIN ME. I'VE BEEN BUILDING SUPER INSULATED HOMES FOR ABOUT 4-5 YEARS AND HAD TO PRETTY MUCH TRAIN MY SELF. I READ ALOT AND & WENT BACK EAST TO SEE HOW ONE BUILDER WAS DOING THEM. THE TRAINING WOULD HAVE BEEN VERY HELPFUL WHEN I WAS STARTING OUT.

THIS FORM SHOULD HAVE BEEN SENT OUT EARLIER.

THIS FORM SHOULD HAVE BEEN SENT OUT RIGHT AFTER THE PROGRAM WAS OVER. I'VE FORGOTTEN HALF OF THE DATA THAT YOU WANT ME TO COMMENT ON.

THIS SHOULD HAVE BEEN SENT OUT A LONG TIME AGO AS IT HAS BEEN AWHILE SINCE I COMPLETED THAT PROJECT. THE ONE MAJOR PROBLEM I CAN REMEMBER WAS AT THE ADA SEMINAR--NOT RECEIVING ANY DETAIL SHEETS FOR INSTALLATION (CROSSSECTION). I DID GET THEM LATER WITH THE RCDP PACKAGE, BUT THEY WOULD HAVE BEEN MUCH MORE HELPFUL AT THE SEMINAR. I GUESS THE ONLY OTHER QUESTION I HAVE IS HOW CAN WE DETERMINE HOW MUCH THIS TYPE OF HOUSE SAVES WITHOUT ANOTHER MODEL BUILT IN THE SAME SETTING TO THE CURRENT CODES TO COMPARE IT TO?

VENTILATION RATE IN HOMES AND WHETHER OR NOT CONSTANT VENTILATION IS NECESSARY IS A VERY IMPORTANT QUESTION BECAUSE I BELIEVE ALL HOMES BUT ONE ARE OVER VENTILATED & SHOULD BE CHANGED.

WE NEED HELP FROM THE BANKS TO ENCOURAGE BUILDING THESE HOMES.

WHEN WE FINALLY FOUND SOMEONE ABLE TO DESIGN A HEATING SYSTEM USING AAHX WITH DUST HEATER, HE SAID IT WOULD HAVE BEEN MUCH EASIER TO DESIGN USING INDUSTRY STANDARD TECHNIQUES RATHER THAN THE RCDP SPECS. FASTER TURNAROUND BY WSEO WITH REGARDS TO PAPERWORK WOULD HAVE BEEN HELPFUL. OF COURSE I CAN'T REALLY POINT FINGERS AS THIS QUESTIONNAIRE IS BEING RETURNED 2 MONTHS LATE!

WHERE CAN I FIND OUT MORE INFORMATION (BY MAIL IF POSSIBLE) ABOUT AAHX WITH FORCED AIR FURNACE (GAS?) ALSO, I WANT SOME HATS OR SIGNS.

WILL PARTICIPATE IN THE FUTURE. THE MORE RESULTS WE GET FROM TESTING, THE STRONGER THE PROGRAM WILL BE.

WITH WHAT EXPERIENCE I HAVE HAD IN BUILDING THE LAST 25 YEARS. I THINK WE ARE FINALLY ON THE RIGHT TRACK YOU GUYS ARE DOING A GOOD JOB EDUCATING THE PUBLIC, BUT THEY ARE STILL A LONG WAY OFF FROM ACCEPTING AIR TIGHT HOUSING.

(VS5-5088r)