Consulting Practice Case Study

Kafuman and Broad PCMylar/CCS System

In early 1997, Kaufman and Broad's Monterey Bay Division approached itSynergy about the development of a system to help unlock critical data from their legacy AS400 system. In addition to advanced home tracking features, Kaufman and Broad also wanted to consider the possibility of automating and possibly even centralizing construction scheduling activities. The division leadership retained the services of our custom software practice, and specifically our homebuilder specialists. Over the course of the next several months, our specialized consultants studied the current Kaufman and Broad environment and formulated a plan to develop a custom software application that would accomplish all of the stated goals in a single integrated package. The plan also included a method of exchanging information with established legacy systems, in order to prevent double entry. Today, nearly every Kaufman and Broad house in the United States is scheduled and tracked with this application. Kaufman and Broad has realized significant return on investment in many areas. Office personnel are now able to focus solely on those areas that need their attention, and field superintendents now spend more time in the field, and less time in the office on a telephone. Overall this has led to higher volume capabilities without additional staff, and a higher quality of product for the customer.

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Company Background

Kaufman and Broad is one of the largest production homebuilders in the United States. The company is publicly traded under the symbol KBH. The Kaufman and Broad divisions in many markets hold either first or second place in volume for that market. Divisions are spread throughout the southwestern United States in Arizona, California, Utah, Nevada, Texas, New Mexico, and Colorado.

Kaufman and Broad utilizes the JDEdwards system company-wide for the tracking of all of their information related to business activities. The JDEdwards software runs on AS/400 servers in Woodland Hills, California, and users throughout the divisions access the system via a Windows terminal access program.

Although Kaufman and Broad Home Corporation in Los Angeles, California is the parent company of all divisions, each division has its own executive structure and operates on a day-to-day basis in a largely independent fashion. Although some general functions are handled at the national level, the characteristics of each individual homebuilding market are considered, and divisions are allowed to act according to local market conditions.

The Business Challenges

Kaufman and Broad's Monterey Bay division approached itSynergy with several significant issues. The first involved the day to day tracking of activity within the division. Although there was some functionality built into the JDEdwards system for this purpose, the users felt that it was not adequate. In addition, there was a lot of information that was contained in the JDEdwards database, however the users had no way of getting that information out, and creating ad hoc queries and reports.

The Challenges:

Unlock data from legacy AS400 system

Provide more robust home tracking

Provide an infrastructure for centralized scheduling

Roll the final solution out to divisions across U.S.

The Products:

Microsoft® Fax
Microsoft® Access 97
JD Edwards®

The Resources:

itSynergy™ Software Development Practice

itSynergy™ Homebuilder Practice

itSynergy™ Business Analyst

KBHome Internal IS support staff

The Solution:

- A customized software solution facilitating the tracking and management of a division's ongoing homebuilding activity.
- A centralized scheduling system used to track and manage all construction activity, and auto-generate and fax notifications to all involved parties, both internal and external.
- Business process reengineering to change the focus from unit management to exception management. This allowed an increase in production volume, without hiring additional staff.
- Nationwide Implementation

The second issue Kaufman and Broad faced involved construction scheduling. At the beginning of the engagement, Kaufman and Broad, like most homebuilding companies, had field superintendents handle all of the construction scheduling functions. This placed a significant time burden on superintendents because they had to spend hours each day sitting in an office on the telephone. This also affected the quality of the homes, as the superintendents are not able to spend as much time in the homes as they would be able to if relieved of this burden. The second aspect of the scheduling issue is that since scheduling is left to the superintendents, each individual came up with his or her own system for accomplishing the tasks at hand. Some systems were better than others, and none of the systems interfaced in any way with corporate information systems.

The next challenge that Kaufman and Broad faced was one that is shared by virtually every company in the world. Kaufman and Broad wanted a way to increase their production volume, while not having to hire additional staff and in turn create additional overhead in order to support the higher volumes. This challenge was especially difficult, and would have to involve an itSynergy business analyst to reengineer some of the current business processes in use at Kaufman and Broad.

Finally, Kaufman and Broad's Monterey Bay division would be the first division to implement the system, however Kaufman and Broad wanted to eventually roll the system out to all of their divisions throughout the United States. This brought on unique challenges, as each division had wide latitude in running its own business. This meant that each individual division would have to be sold on the system's value proposition, and agree to commit to implementing and using the system in their daily business.

The Solution

In order to deliver the maximum value to Kaufman and Broad, itSynergy developed a multi-tiered approach to addressing the business challenges. In addition, itSynergy was able to assemble several project teams in order to execute different components of the overall solution in parallel. This helped to reduce overall time to market, in addition to ensuring the highest quality work product possible. Each component of this approach is discussed in detail in the following paragraphs.

Business Process Reengineering

The business challenge in this area involved Kaufman and Broad's current methods of project management. At the beginning of the engagement, the management team of the Monterey Bay division held a daily meeting to assess the current status of every lot in production. This allowed any issues to surface and be handled by the group with all relevant parties present. The problem, however was that this approach did not lend itself well to increased volume.

Since the team was reviewing all activity on a daily basis, as production went up, so did the time required to cover all of the relevant information. The direct result was that key personnel were spending less time in their office with staff, where they really needed to be in order to have the greatest impact on the business.

After an itSynergy business analyst witnessed a few of these sessions, a reengineering plan was formulated. Although all production was reviewed in the daily meeting, there were only issues that arose and needed to be dealt with on a select few. The itSynergy team was able to successfully reengineer this process by creating a system that allowed the management team to focus *only* on those lots that were exceptions, freeing them from reviewing every lot, whether it was necessary or not.

This reengineered model was then documented, and forwarded on to the software project management team. The team was able to integrate key elements of the reengineered process into a system that would support the new business model. The final result of the reengineering engagement was a software system that was specifically targeted at focusing only on those issues that the division management team defined as needing attention.

Since the system was to ultimately roll out to all divisions in the U.S., the software development team had to allow each division to individually define what constituted a condition needing attention. Once these conditions were defined, the system would automatically detect these conditions, and aggregate each lot on a single report by area of responsibility. Ultimately, a report was developed called the exception report for each operational area (sales, décor, mortgage, and construction). The report would show only those areas that needed attention, such as a house that had a final closing date set before projected construction completion. A sample of the exception reports is included in the Appendix.

The itSynergy development team also developed a wealth of reports for each operational area that allowed them to filter and display data in such a way to facilitate maximum efficiency. A set of business rules was developed for each report, and only those lots that did not meet one of the business rules would show, allowing the proper personnel to handle the situation appropriately. A sampling of reports is included in the Appendix.

Finally, the itSynergy development team chose Microsoft® Access 95 (and later converted to Microsoft® Access 97 after implementation) in order to facilitate the easiest possible ad hoc querying and reporting capabilities. This choice allowed the divisions to send one or two key personnel to only a day or two of training, and then have those individuals develop custom reports and perform basic data mining activities using the system's data.

Homebuilder Practice

itSynergy holds a very unique niche in its marketplace in that it is one of the few professional consulting firms that have a practice and team of consultants that are specifically dedicated to the homebuilding industry. These are individuals that have a background in the homebuilding industry. These same individuals also have extremely strong technical backgrounds, and industry certifications in their areas of discipline.

The homebuilder practice had two separate challenges on this particular project. The first involved a report generated out of the current JD Edwards® system, used daily by Kaufman and Broad personnel. The report was a wide grid-style report showing key information and dates for each lot in the production process. Although this report was very useful to division personnel, it was lacking in several key areas. Kaufman and Broad wanted to significantly enhance and expand the functionality of this report, but wanted to avoid any double entry between the JD Edwards® system, and any new system.

The second challenge faced by the homebuilding process was to develop and implement a centralized scheduling system. The system would not only keep track of construction schedules and lot progress, but it would also handle the large number of projections that were made for management and planning purposes, as well as handle the entire notification process to subcontractors. The system would need to handle tremendous volume, as many divisions build in excess of 1,000 homes per year. At the same time, however, they system would have to be highly automated, so the cost of running the system in terms of staff and overhead would be kept to an absolute minimum.

The solution that the itSynergy® homebuilder practice developed ultimately culminated in the software package today known as PCMylar/CCS. This system was designed to meet both challenges stated above, while sharing as much information not only among its various functions and modules, but also with the existing JDEdwards® AS/400 system.

PCMylar

The homebuilder practice began with the existing AS400 report from Kaufman and Broad. Each piece of data on the report was reviewed with the appropriate division personnel to determine relevance and need. In addition, data that needed to be added to the report in order to make it more useful was documented during these interviews. After developing a vision of the new system, and prototyping what the replacement data layout would look like, the homebuilding consulting team began to form a strategy with the itSynergy software development team.

The software team quickly developed a screen to mimic the report on a computer display. Division management could then project the screen on a wall in the conference room during their meeting. This allowed them to update data on the fly, and immediately see the effect of their changes. A corresponding report was also developed so that at any time, anyone could print a hard copy of the report for review or archival.

After the screen and report were developed, the itSynergy team was able to sharply focus on process improvement. The concept of stoplight reporting was developed, where items identified as acceptable were in green, items coming close to needing attention were in yellow, and those items that needed immediate attention were in red (the report showed items in italics and bold italics for the same effect on a laser printer). This allowed key personnel to quickly scan the screen or report for issues that needed attention.

Secondly, a tremendous amount of intelligence was added to the new screen and report. The system made complex projections and calculations based on current status data. If dates were missing, and business rules dictated they should have been there, the system would turn the cell red. Finally, business rules were developed for each field to determine if the JD Edwards® system was the authoritative source, or the PCMylar/CCS system was authoritative. A system was then implemented to exchange data between the two appropriately.

Computerized Centralized Scheduling (CCS)

The next challenge for the homebuilding practice was the development of a centralized, totally automated construction scheduling system. At the time of engagement, the divisions relied on field superintendents to perform all of the construction scheduling functions. Although this system worked, it placed a tremendous burden on the superintendents, and required a significant daily time requirement. The itSynergy team found that the opportunity for a significant return on investment existed if this burden could be removed from the superintendents. The system would be capable of scheduling thousands of houses at any given time with only one or two operators.

The first component of the solution was the construction schedules themselves. The system allowed the operators to build an unlimited number of construction schedules. The schedule was a series of numbered and named sequences (pour slab, begin frame, plumbing top out, etc.), and also included a workday number with each step. This allowed the system to differentiate between the order of construction, name of each step, and the amount of time required to complete each. Each step could also have one or more ‘triggers’ assigned to it. A trigger identified a future step that needed to have notices sent to the subcontractors when the current step was started. This allowed the schedulers to custom build the lead times into the schedule for each individual step of

construction. The final step was to assign one or more subcontractors to each step in the construction process.

Once these schedules were built, the system immediately became very powerful. itSynergy software developers created *extremely* complex calculation routines that allowed the system to project key milestones in the construction process, as well as the ultimate end date. These calculations also took into account weekends, holidays, and rain days. They were even advanced enough to allow features such as designating Saturdays, Sundays or holidays as working days (if contractors were working overtime) or to allow for rain delays on one house (such as a house that had no roof) while not allowing for delays in the house next door (where a contractor might be able to install appliances despite the rain).

The system also allowed tremendous flexibility in controlling the construction process. Schedulers could assign more than one schedule to a lot. Some divisions chose to implement this in a 'front-end back-end' model, where the construction process through framing was on one schedule, and everything after was separate. Other divisions chose to implement two schedules that ran simultaneously, such as an interior and exterior schedule, allowing the inside and outside of the house to progress independently.

Next the scheduling system had to allow for very easy tracking and updating of the construction progress information. The system would automatically generate worksheets for the superintendent to take out to the field and fill out the construction stage of the house. The field superintendents would simply fill out this worksheet and fax it into the centralized scheduling office daily. In the office, a screen was created that appeared in exactly the same order as the worksheet. This allowed the scheduler to simply key punch in the sequence numbers, and the system would automatically update all of its calculations.

After the daily information update cycle, the scheduler would simply choose a menu item to send faxes, and the system would be set into action. First, based on the just-updated numbers from the field, the system would look up required lead times and 'triggers' that had been reached as a result of the day's progress. The system would then group all of these triggers by subcontractor, and compose a fax with a listing of the trigger, and its due date. A sample fax is included in the appendix. Once the fax was composed, a notice was automatically added to each fax prompting the vendor to call the scheduler the next morning to confirm receipt, and the faxes were sent out during the evening.

When the scheduler arrived the next morning, the system had automatically generated and printed a summary sheet of each vendor that had received a fax the previous night. The sheet showed the vendors name, phone, and what they had been notified of. If the scheduler didn't hear from the vendor by the designated time, they would simply call the vendor to confirm receipt. As each fax receipt was confirmed, the date and time of confirmation was recorded, along

with the name of the confirming individual. This eliminated the 'I never got the fax' story from the subcontractors.

In addition to the daily faxing routine, the system also had tremendous intelligence built into it from the construction standpoint. The system was able to do complex projections of key dates and completion, as well as real-time ahead and behind schedule monitoring and reporting. In addition, the system had advanced data mining capabilities built in that allowed management to view trends and problem areas in many different ways. For example, a manager could pull a report showing the average number of days a particular vendor was ahead or behind schedule across multiple subdivisions.

Custom Software Development and Project Management

The itSynergy custom software development and project management practices were extremely vital in the successful execution of the ultimate solution. The software development project team, process reengineering team, and homebuilding team were able to work closely together in order to design a solution that fit the business challenges like a glove. In addition, the software team specifically chose development tools that would allow an extremely rapid time-to-market with both the application and each of its revisions and improvements. This lead to reduced project costs, while allowing Kaufman and Broad to accelerate their return on investment through rapid implementation.

Finally, the project management team was able to design, plan, manage, and execute the entire lifecycle of the project. The project management teams were involved from the first step with the management of concurrent parallel processes, all the way through to final implementation in each division. Project managers were also used to travel individually to various divisions in order to explain and demonstrate the business value of the solution to division management. This removed a tremendous burden from Kaufman and Broad information systems staff, as itSynergy was able to provide total lifecycle management, in effect delivering a turnkey solution with minimal resource usage by Kaufman and Broad.

Conclusion

Although many disciplines were required from the itSynergy professional consulting practice, the key to this project was being able to deliver on every front with a single integrated solution resulting from the collaboration of several itSynergy teams. There were many varied disciplines required, but each was able to make a significant contribution to the overall success of the project. As a direct result of this project, Kaufman and Broad realized several significant benefits.

1. Divisions could now handle increased volume without increased personnel or overhead expense.

2. Scheduling was now centralized and automated, freeing field superintendents to manage their projects, relieved of office and administrative duties.

3. Advanced data mining capabilities were introduced, allowing Kaufman and Broad to view and extract data in new ways not previously possible with the AS/400 system. This allowed management to more effectively manage the business and make better business decisions armed with superior information.

4. Ad hoc querying and reporting capabilities were introduced, allowing the accommodation of future unanticipated needs, thereby increasing the usable life of the project.

5. Tremendous intelligence was built into the system, allowing managers to focus only on those items that required their attention, rather than getting information overload.

6. itSynergy delivered a fully functional, implemented, turnkey solution, relieving Kaufman and Broad the expense of implementation after completion.

7. Customized reports were developed to address specific needs, allowing Kaufman and Broad to immediately have the information they needed, rather than taking the time to compile it manually.

8. A system was devised to exchange data with the existing JD Edwards® system, allowing the new solution to leverage the power of the existing ERP infrastructure, without impacting the users in any way.

9. The system was developed using rapid development tools, reducing the overall project cost, as well as accelerating return on investment by achieving incredibly fast time to market.

Appendix

CONSTRUCTION EXCEPTION AREAS BY OCCURRENCE

Description	Occur.	Div	Proj	Proj Name	Tr-Bl	Lot	Buyer	Sale Date	Grade	Sched COE	Proj COE
House is days behind schedule	7	00999	581	HEIGHTS	HEIGHTS	51	Smith	11/2/98	2	4/10/99	
House is 131 days behind schedule	6	00999	581	HEIGHTS	HEIGHTS	72	Smith	3/11/99		4/14/99	4/13/99
Loan Lock Precedes Est Final	2	00999	591	GREENS	GREENS	72	Smith	11/20/98	2	5/20/99	
House is 101 days behind schedule	2	00999	581	HEIGHTS	HEIGHTS	32	Smith	2/5/99	3		
House is 133 days behind schedule	2	00999	581	HEIGHTS	HEIGHTS	42	Smith	3/18/99			5/24/99
Cust Orient Precedes Est. Final	2	00999	581	HEIGHTS	HEIGHTS	51	Smith	11/2/98	2	4/10/99	
Cust Orient Precedes Est. Final	2	00999	581	HEIGHTS	HEIGHTS	72	Smith	3/11/99		4/14/99	4/13/99
Cust Orient Precedes Est. Final	2	00999	581	HEIGHTS	HEIGHTS	86	Smith	1/10/99	3	5/18/99	
House is 85 days behind schedule	2	00999	581	HEIGHTS	HEIGHTS	92	Smith				
Loan Lock Precedes Est Final	1	00999	191	CHAPARRAL	TATUM	231	Smith	11/15/98	3	4/20/99	
Loan Lock Precedes Est Final	1	00999	191	CHAPARRAL	TATUM	531	Smith	12/1/98	3	4/20/99	
Loan Lock Precedes Est Final	1	00999	581	HEIGHTS	HEIGHTS	51	Smith	11/2/98	2	4/10/99	
Loan Lock Precedes Est Final	1	00999	042	MANOR I	NEELY	01	Smith	11/15/98	3	4/17/99	

Figure 1a - Exception Areas Report

DÉCOR EXCEPTION AREAS BY OCCURRENCE

Description	Occur.	Div	Proj	Proj Name	Tr-Bl	Lot	Buyer	Sale Date	Grade Sched COE	Proj COE
House sold > 10 days ago with no appt.	2	00999	060	GRANDE	GRANDE	88	Smith	3/18/99		
House sold > 10 days ago with no appt.	1	00999	191	CHAPARRAL	TATUM	071	Smith	4/1/99		
House sold > 10 days ago with no appt.	1	00999	191	CHAPARRAL	TATUM	241	Smith	3/29/99		
House sold > 10 days ago with no appt.	1	00999	060	GRANDE	GRANDE	42	Smith	4/4/99		
House sold > 10 days ago with no appt.	1	00999	060	GRANDE	GRANDE	62	Smith	4/2/99		
House sold > 10 days ago with no appt.	1	00999	060	GRANDE	GRANDE	94	Smith	4/1/99		
House sold > 10 days ago with no appt.	1	00999	581	HEIGHTS	HEIGHTS	26	Smith	4/2/99		

Figure 1b - Exception Areas Report

MORTGAGE EXCEPTION AREAS BY OCCURRENCE

Description	Occur.	Div	Proj	Proj Name	Tr-Bl	Lot	Buyer	Sale Date	Grade	Sched COE	Proj COE
Grade >3	50	00999	191	CHAPARRAL	TATUM	911	Smith	7/28/98	4	4/20/99	
Grade >3	34	00999	591	GREENS	GREENS	03	Smith	10/29/98	4	2/27/99	
Grade >3	6	00999	142	Neely Ranch-Unit II, III	NEELY2	521	Smith	1/12/99	9		
Grade >3	4	00999	042	MANOR I	NEELY	36	Smith				
Grade >3	3	00999	060	GRANDE	GRANDE	31	Smith	2/3/99	4		7/19/99
Shipped >5 days ago with no approval	1	00999	050	Carefree Highlands	CAREFRE	33	Smith	3/16/99	3		5/19/99
>5 days bet. receipt and interview	1	00999	191	CHAPARRAL	TATUM	371	Smith	2/11/99	9		
>5 days bet. receipt and interview	1	00999	191	CHAPARRAL	TATUM	401	Smith	11/29/98	9	4/30/99	
>5 days bet. receipt and interview	1	00999	191	CHAPARRAL	TATUM	651	Smith	3/22/99	9		
>5 days bet. receipt and interview	1	00999	191	CHAPARRAL	TATUM	771	Smith	3/24/99	2		
>99 days between interview and ship	1	00999	191	CHAPARRAL	TATUM	911	Smith	7/28/98	4	4/20/99	
Shipped >5 days ago with no approval	1	00999	060	GRANDE	GRANDE	11	Smith	3/16/99	4		
>5 days bet. receipt and interview	1	00999	060	GRANDE	GRANDE	25	Smith	3/27/99	9		
Shipped >5 days ago with no approval	1	00999	060	GRANDE	GRANDE	31	Smith	2/3/99	4		7/19/99
Shipped >5 days ago with no approval	1	00999	060	GRANDE	GRANDE	41	Smith	3/14/99	3		
Shipped >5 days ago with no approval	1	00999	060	GRANDE	GRANDE	45	Smith	2/27/99	4		
Shipped >5 days ago with no approval	1	00999	060	GRANDE	GRANDE	74	Smith	3/20/99	3		
>5 days bet. receipt and interview	1	00999	581	HEIGHTS	HEIGHTS	04	Smith	1/24/99	3		
>5 days bet. receipt and interview	1	00999	581	HEIGHTS	HEIGHTS	16	Smith	3/21/99	9		
>99 days between interview and ship	1	00999	581	HEIGHTS	HEIGHTS	51	Smith	11/2/98	2	4/10/99	
>5 days bet. receipt and interview	1	00999	581	HEIGHTS	HEIGHTS	65	Smith	3/28/99	3		
>5 days bet. receipt and interview	1	00999	042	MANOR I	NEELY	08	Smith	4/1/99			

Figure 1c - Exception Areas Report

SALES EXCEPTION AREAS BY OCCURRENCE

Description	Occur.	Div	Proj	Proj Name	Tr-Bl	Lot	Buyer	Sale Date	Grade	Sched COE	Proj COE
Contingency Buyer (HTS)	3	00999	191	CHAPARRAL	TATUM	011	Smith		3		
Sold >5 days ago & no mortgage packet	2	00999	050	Carefree Highlands	CAREFRE	11	Smith	7/26/98		4/1/99	
Sold >5 days ago & no mortgage packet	2	00999	050	Carefree Highlands	CAREFRE	22	Smith	7/13/98		5/15/99	
Sold >5 days ago & no mortgage packet	2	00999	050	Carefree Highlands	CAREFRE	33	Smith	11/1/98		5/1/99	
Sold >5 days ago & no mortgage packet	2	00999	050	Carefree Highlands	CAREFRE	66	Smith	5/10/98		4/9/99	4/8/99
Sold >5 days ago & no mortgage packet	2	00999	050	Carefree Highlands	CAREFRE	88	Smith	5/28/98		4/30/99	
Sold >5 days ago & no mortgage packet	2	00999	650	Estates North II	ESTN2	52	Smith	9/7/98		5/7/99	
Sold >5 days ago & no mortgage packet	2	00999	650	Estates North II	ESTN2	62	Smith	9/12/98		3/12/99	
Contingency Buyer (HTS)	1	00999	191	CHAPARRAL	TATUM	041	Smith				
Contingency Buyer (HTS)	1	00999	650	Estates North II	ESTN2	74	Smith		4		

Figure 1d - Exception Areas Report

KAUFMAN BROAD

First Scheduling Notice

You must call the Kaufman and Broad scheduling department at (602) 555-5555 x123 by 10:00 AM on Monday, April 12, 1999 to confirm receipt and acceptance of this notice.

Subcontractor: **ADAMS BROTHERS** Phone: (602) 276-8000 Date: 4/5/01
Attention: [illegible] Fax: (602) 276-1100 Time: 9:30 AM

The following listed lot(s) will be ready on 04/26/1999 for:

INSTALL TRIM / MEASURE COVERINGS

Proj - **CHAPARRAL** Tract - **TATUM** Lot - **133** Plan - **50A L**
5107 E. Roy Rogers Road **335 10**

The following listed lot(s) will be ready on 04/27/1999 for:

INSTALL TRIM / MEASURE COVERINGS

Proj - **MANOR I** Tract - **NEELY** Lot - **78** Plan - **95C L**
715 W. Aviary Way **245 2652**

Proj - **SILVERADO** Tract - **SILVER** Lot - **154** Plan - **43C L**
7550 E. Deer Valley Road **235 2370**

Proj - **LEGENDS** Tract - **LEGENDS** Lot - **260** Plan - **90C R**
10653 E. Arber Avenue **245 3094**

Figure 2 - Auto-Faxed Scheduling Notice

Selects active lots that were originally closing in the current month but which are now estimated to close in the following month. Report is in division, project name, tract, and lot sequence.

Closings Shifting to Next Month

Test (00875)

DAWN (340) / DAWN

Lot	Buyer	Orig Orien	Comp Orien
77	McAleenan	6/2/99	7/29/99

Figure 3 - Sample Report

KAUFMAN and BROAD

Daily PC Mylar Report

412 CASCADES ()

Project Notes :

Dlu / Prd / Tr-Bl	Lot / P/E / Conv Dt	Comp Ap / SAN# / FinPack#	Buyer / Sale Price	Processor / Co-op / Sales Rep	Sale Date / Conting	Recd Date / Initial Date	Shipd Date / Approd Date	LoanID / Mortgage Type	Grade / LTV	Lock Exp / Init Rate / Ratio	Decor App Schd / Decor App Rcd	Partial Release / Full Release	Cutoff1 / Cutoff2 / Cutoff3	Cutoff4 / Cutoff5 / Acl Fm	Docs@ Title / Buyer@ Title	Ini Start / Ini Status / Orig Orien	Ext Start / Ext Status / Rnd/Bnd	Comp Orien / Schd Prel/Ak	SS @ 1 / SS @ 2 / Schd Or	Prel CO E / Sch CO E / Acl CO E	Comments
00875	Z		Rich		11/27/98			OSL			12/26/98	12/28/98				1/28/99	2/12/99	3/30/99	4/26/99		
412	28 L	104753	$109,990	☐												175	-95		4/21/99	4/22/99	
CABCA		104237						CO MV		0	12/26/98	3/18/99			4/28/99	4/30/99	-84				
00875	4		Hoshowski	MEY,ANNA MRE	12/1/98	12/10/98	1/5/99	115002112	3		12/31/98	1/4/99				2/2/99	2/23/99	5/3/99	5/4/99		
412	7A R	104877	$122,990	☑		12/10/98	1/15/99	FHA-FXD-30	97.1	6.875	12/31/98	3/15/99				175	-345		4/30/99	5/1/99	
CABCA		104361								20.35						5/7/99	-83				
00875	8		Wallace	MEY,ANNA MRE	11/17/98	11/17/98	12/1/98	615002016+	4		12/3/98	12/4/98				3/2/99	3/19/99	5/3/99	5/28/99		
412	17A L	104434	$154,490	☑						7.5						175	-240			5/17/99	
CABCA		103918			HTC	11/27/98		C-30YR	75.18	0	12/3/98					6/16/99	-56				
00875	54		Ciuni	MEY,ANNA MRE	12/26/98	12/2/98	12/9/98	115002035	3		12/17/98	1/11/99				2/16/99	3/3/99	5/23/99	5/12/99		
412	17A R	104831	$154,490	☐						6.875						175	-230			3/9/99	
CABCA		104315				12/9/98	12/17/98	C-30YR	84.99	20.36	12/17/98					5/27/99	-85				
00875	55		Myrow	MEY,ANNA MRE	10/11/98	10/22/98	10/28/98	115001816	3	4/9/99	10/26/98	10/26/98			4/6/99	1/5/99	1/22/99		4/5/99		
412	28 R	103043	$109,490	☑						7						175	-400		3/31/99	4/7/99	
CABCA		102528			HTC	10/29/98	10/29/98	VA-30-FXD	3	14.38	10/26/98	12/7/98			4/8/99		-0		4/6/99		
00875	56															3/9/99	3/26/99	5/1/99	6/7/99		
412	7A R			☐												175	-250			5/23/99	
CABCA																6/10/99	-58				
00875	56A		Blunt		11/11/98			OSL			12/8/98	12/9/98				3/9/99	3/29/99	10/14/99	6/3/99		
412	28 L	104196	$109,990	☑												175	-230			5/11/99	
CABCA		103931						FHA		0	12/8/98	12/18/98				6/15/99	-85				
00875	59															3/16/99	4/2/99	10/13/99	6/14/99		
412	2A R			☐												175	-220				
CABCA																6/17/99	-85				
00875	62		Klotz	MEY,ANNA MRE	1/25/99	2/1/99	2/9/99	115002521+	3		1/25/99	2/2/99				2/16/99	3/8/99	5/24/99	5/17/99		
412	88B R	109193	$126,990	☐		2/8/99	2/17/99	FHA-FXD-30	96.09	7						175	-288				
CABCA		103595								25.32						5/25/99	-85				
00875	64															3/16/99	4/5/99	5/13/99	6/15/99		
412	28 L			☐												175	-210				
CABCA																6/18/99	-59				

Figure 4 - PCMylar Report

Average Days Between Int. Sequences 1/1/99 to: 12/31/99

Phoenix (00875)

CASCADES (412)

Tract-Block	Lot	Avg. Days
CASCADE	10	0
CASCADE	106	0
CASCADE	110	14
CASCADE	113	0
CASCADE	114	0
CASCADE	115	12
CASCADE	116	0
CASCADE	117	15
CASCADE	118	0
CASCADE	119	0
CASCADE	120	20
CASCADE	121	14
CASCADE	122	16
CASCADE	123	20
CASCADE	125	0
CASCADE	126	0
CASCADE	13	0
CASCADE	14	12
CASCADE	2	13
CASCADE	3	0
CASCADE	33	0
CASCADE	4	16
CASCADE	45	0
CASCADE	54	12
CASCADE	55	13
CASCADE	56	12
CASCADE	58	0
CASCADE	59	9

Figure 5 - Average Days Between Construction Sequences

Lot Calendar

Test (00875)

CASCADES (412) / CASCADE / 110 /

Schedule	Seq	Sequence Description	Seq Day	Est Date
CASCADES FOUNDATION	175	STRIP & GRADE	0	4/5/01
CASCADES 2+8	330	INSTALL TOPS	12	4/5/01
CASCADES 2+8	335	DELIVER DISHWASHER / HOOD	12	4/5/01
CASCADES 2+8	340	PLUMB TRIM	11	4/6/01
CASCADES 2+8	355	ROUGH CLEAN / INSTALL BATH PACKS	10	4/9/01
CASCADES 2+8	360	FLOORING ONE	9	4/10/01
CASCADES 2+8	365	FLOORING 2 / CITY FINAL	8	4/11/01
CASCADES 2+8	370	FLOORING THREE / DELIVER RANGE	7	4/12/01
CASCADES 2+8	375	MAKE READY	6	4/13/01
CASCADES 2+8	380	POWER WASH / PAINT T-U / TUB REPAIR	5	4/16/01
CASCADES 2+8	385	MAKE READY / LANDSCAPE	4	4/17/01
CASCADES 2+8	390	VA FINAL / MAKE READY	3	4/18/01
CASCADES 2+8	395	FINAL CLEAN	2	4/19/01
CASCADES 2+8	400	WALK THRU / CLOSE	0	4/23/01
CASCADES 2+8	405	WALK - THRU SIGN - OFF	0	4/23/01

Figure 6 - Lot Calendar Report