

NAHB Four-Year Residential Construction Management Competition Guidebook



NAHB Student
Chapters

Residential Construction
Management Competition

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Opening Letter

Congratulations on becoming a part of the NAHB Residential Construction Management Competition experience. You were selected because your team's advisor or captain felt as if you had a passion for residential development and are determined to work hard in this rigorous competition. The journey ahead will be tough with countless meetings, hours of research, and hard work that will ultimately culminate in the submission of a real-life investment committee proposal and presentation in front of leading professionals within the industry. Although tough, this experience may be one of the most rewarding and beneficial parts of your education.

Before getting into the details of the competition, let me introduce myself. My name is Eric Bet and I am a Senior at Cal Poly San Luis Obispo majoring in Construction Management and Business Finance. I began my NAHB career when I helped co-captain the 2015-2016 RCMC team. As a member of a team who placed in two consecutive years, it was my mission to lead our team to another successful year.

The following year, I became President of the NAHB Club. In the summer between my two competing years, I attended the NAHB sponsored Student Symposium at their headquarters in Washington D.C. This experience opened my eyes to the vast opportunities available through the NAHB and inspired me to pursue a career in residential development.

The purpose of this packet is to help future students. As I was involved in this competition for multiple years with returning students, I was fortunate to have a strong support group when working on the RCMC. As people graduate and traditions not always passed down with case competitions, teams are sometimes left with minimal support before embarking on the next year's problem. By collaborating with other universities who have historically been strong in the competition, this guidebook is meant to give future competing schools a better understanding of the problem and roadmap on how to navigate it. While its main intention is for the Residential Construction Management Competition, the problem is so real world that students who are interested in real estate development can also use this guidebook. It will help those get a better understanding of the industry before choosing their eventual career path.

This guidebook will lay everything out from the team selection process to the eventual presentation in front of industry judges at the NAHB International Builders' Show. Feel free to reach out and best of luck with the competition.

Regards,

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About NAHB

The National Association of Home Builders (NAHB) is one of the largest trade associations in the United States whose mission is “to enhance the climate for housing and the building industry.” Founded in 1942, NAHB is a federation of more than 700 state and local associations. With about one third of its 140,000 members working as homebuilders or remodelers, the NAHB members’ construction accounts for about 80% of the new homes, both single-family and multifamily, built in the United States annually.

The NAHB is the main contact for the residential construction world. It has all resources that deal with the housing market from legal matters to economic forecasts. It provides members with vital information about upcoming events, trade shows, workshops, and is the lead advocate for homebuilders nationwide. Each year, the NAHB organizes the International Builders’ Show (known as IBS), the largest convention of its kind for the residential and light commercial construction industry. This conference hosts thousands of residential-related companies from around the world.

Each year at the IBS, the NAHB hosts a Residential Construction Management Competition (RCMC) for Secondary, Associate, and Four-Year Programs. This guidebook is intended for teams competing in the Four-Year Program. The mission statement for the competition, provided by the NAHB, is:

“The mission of the NAHB four-year student competition is to expose students to an in-depth residential construction project from concept to closing. Using real projects, students compete with other schools as they display their problem solving abilities and learn more about homebuilding.”

Competing in this problem does exactly that. It is meant to give students interested in residential construction the ability to demonstrate and present what they have learned in school in a real-world application. From my experience as well as talking with others who have competed, this experience is second-to-none in terms of educational opportunities available to those interested in development.

Problem Overview

The NAHB Four-Year RCMC is composed of two main parts: an investment committee proposal and a presentation. The material given to the teams tends to vary year-to-year. Typically, the teams will be given soils and geotechnical reports while distribution of project plans varies based on the project sponsor's discretion. The site will be either single-family homes, multifamily homes, a mix of both, or possible mixed-use buildings. The teams will be acting as a division of a large homebuilder in the region of the project site. The objective is to convince your company's investment committee, the judges, that your division should be authorized funding for the development. All rationale and reasoning will be presented in the proposal and presentation.

Judges

There will be a total of four to six judges, based on NAHB discretion, who will review your team's proposal and presentation. The judges are typically made up of executives in leading homebuilders across the nation. One of the project judges will be the development director on the residential site the project is based on. This individual tends to know all the details associated with the project. This presents a great opportunity for the students as they can receive feedback and critiques from a very hands-on figure.

Proposal

The proposal encompasses anything and everything dealing with the development of the residential site. It will contain all information from buying the land to selling the last home. The sections of the sample NAHB Grading Summary Report are:

- Market Analysis
- Product Design and Selection
- Construction Management
- Project Management
- Financial and Risk Analysis
- Sustainability
- Quality of Written Proposal

The proposal is 80% of your team's final grade. This guidebook is a detailed explanation of how to construct the proposal with emphasis on the 7-main sections listed above. These sections are broken out into further detail later in the guidebook.

Over the past couple years, the NAHB has put a limit of 100 pages on the length of the proposal with an emphasis that "less is more." This requires teams to be concise, yet thorough in their proposals.

Presentation

The six presenting members will give a 15-minute presentation followed by a 10-minute question and answer period from the judges. The presentation typically presents a struggle for

most teams as you are required to condense your 100-page packet into a 15-minute presentation where the main objective is to convince the judges you are the best-qualified builder for the job. In the presentation, the teams must explain to the judges their overall strategy, give reason to the various strategies practiced, as well as provide concrete numbers from their financial statements. The presentation will be covered in more detail later in the guidebook.

Pre-Problem Arrival Tasks

This section is dedicated to helping teams prepare as much as possible before the NAHB releases the problem. With such a detailed deliverable, it is important for students to have a plan of attack as soon as possible. Many tasks can be completed or put into process without access to the problem. As a note, the following are only suggestions that have worked well for previous teams. Feel free to adjust the styles outlined in this guidebook accordingly if you and your team sees fit.

Team Selection

To begin the proposal, the school first needs to select its team. The team consists of six presenting members and as many non-presenting members as deemed appropriate. The team selection process begins when the previous year's captain selects the captain and team advisor shortly after the competition concludes. The captain should begin having serious meetings with his/her advisor in March to understand the responsibilities associated with captaining a RCMC team. The captain and advisor should begin reaching out to students in early April and hold interviews later that month for those interested in participating on the team. When interviewing students, it is important to find a passion and sense of pride in real estate development, **not necessarily an expertise**. As real estate development is an art that takes great experience to master, it is sometimes difficult to find students with extensive experience. **However, that is OK!** Students dedicated to development and willing to learn will make much better team members than those with experience who lack the passion.

When interviewing, it is important to explain the problem and all of its sections to gauge the areas of interest of the future team members. Try to have the final team selected as well as preliminary areas of interest determined before summer break to allow team members to focus on certain areas and seek a mentor in their internships.

Sub-Teams

When working on the proposal, it is important to "divide and conquer." While division of tasks is very important, overall team input is crucial to success. **So how is this done?**

Four sub-teams are formed:

1. Business – Marketing
2. Architectural Design
3. Construction Operations
4. Business – Finance

Once the sub-teams are formed, a calendar of deliverables (to be discussed later in the guidebook) is agreed upon by all team members. Once a sub-team completes a deliverable, it is presented upon at a weekly meeting to the rest of the team. **This is where the collaboration comes together.** If the team is convinced of the sub-team's findings, the next sub-team on the deliverable calendar will be released to do their tasks. If not, then the sub-team needs to gather findings that are more concrete by the next team meeting. This is especially true for the design aspect of the problem as it has implications on the entire problem.

For example, once the Business – Marketing sub-team completes their market analysis and presents their findings to the team, the Architectural Design team is released to begin the site plan and product plans as they now have an understanding of what to design for the market. Design ends up being a very iterative process where the Architectural Design sub-team is mainly responsible for its completion but the whole team is involved in the process.

Meetings

Three major types of meetings take place:

1. Update Meetings – Weekly
2. Workdays – As deemed necessary by sub-teams
3. Industry Sponsor Meetings – After major deliverables have been completed

Update Meetings

These are the foundation of the deliverable process. Sub-teams present to the entire team on their findings. This causes increased collaboration and allows other sub-teams to be released on their respective tasks.

Workdays

It is imperative that work is done on time so the overall schedule does not get pushed back, ensuring the team has adequate time to complete the problem. Sub-teams conduct research, meet with the team advisor, or reach-out to industry sponsors to gather information to complete their assigned deliverable.

Industry Sponsor Meetings

Reaching out to industry when working on the proposal is crucial as they are experts in the field but also because it proves to be invaluable to the learning experience associated with the problem. Most competing schools have differing techniques for when it comes to industry sponsors.

- One school tends to reach out to previous team members and people with a minimum of 5 years' experience in real estate or development. The industry sponsors for the given year are picked out early in the deliverable process and are invited to the team's welcome dinner in the fall. At this dinner, the team is advised to create a critical path method schedule of deadlines to complete the project in the most efficient way possible.
- Another school invites industry speakers to every team meeting. The faculty advisor reaches out to local professionals including land developers, civil engineers, and residential market analyst specialists to attend these meetings and advise the team. At the end of October, the team presents their findings to the local HBA on all project information to date and field questions from the audience. This proves to be very beneficial for the team in terms of project understanding as well as ability to receive scholarship funding.

These methods are very like the process at Cal Poly SLO. One important step we take is that we review all major deliverables with industry sponsors after they are completed. This is similar

to the development review process in the industry as the deliverables always build on one another. Similar to building a house, if the foundation is weak (comparable to market analysis and site design for the RCMC), then the end product will be weak. We plan meetings with industry sponsors to review work after the following milestones:

1. Market Analysis
2. Site and Product Design
3. Land Development and Phasing
4. Project Estimate

This process ensures a logical progression and that the team stays the course throughout the proposal.

Deliverable Calendar

Establishing a deliverable calendar is a good way to keep the team on track and is essential to success. With just over 3 months to complete the proposal, time goes by much more quickly than you would think. The main advantage of this calendar is to show the deadlines that the team needs to meet in order to complete the packet on time.

At Cal Poly, we create a calendar in Google Sheets. This allows everyone to make changes to the calendar and for progress to be tracked throughout the proposal “season”. This schedule is agreed upon and receives buy-in from the entire team within the first two team Update Meetings. It is important that the first schedule remains flexible and somewhat open as it allows for flexibility on the back-end of the project

NAHB RCMC Four-Year Scoring Rubric

The Scoring Rubric, new for the 2016-2017 competition, is divided into seven-main categories. These include:

1. Market Analysis
2. Product Design and Selection
3. Construction Management
4. Project Management
5. Financial and Risk Analysis
6. Sustainability
7. Quality of Written Report

Based on these seven-main categories, most schools divide their proposal into ten sections that eventually become their Table of Contents. This helps add more detail in sections that require it and less confusion for the judges. The 10 sections in the Table of Contents include:

1. Project Overview
2. Market Analysis
3. Land Development
4. Product Description
5. Green Building Strategy
6. Sales and Marketing Strategies
7. Project Management
8. Project Estimate
9. Financial Analysis
10. Risk Assessment

The names and number of sections are up to the team's discretion and may be altered if deemed necessary. Unique, yet thought out techniques to portray an understanding of the problem to the judges will greatly help the teams' Final Score. The establishment of a Table of Contents is a major milestone that teams should try to meet as soon as possible. This helps organize all ideas and ensure the team stays focused on the end goal.

With that said, the guidebook will be divided into these 10 sections in order to provide some consistency.

Project Overview

This section typically includes the proposal's Table of Contents, team pictures and an Executive Summary. The Executive Summary is the “nuts and bolts” of not only the Project Overview Section, but the entire proposal. Let's start with a background on the Executive Summary.

The Executive Summary is the overview of the main points in each section of the proposal. The Executive Summary should be written in a way that if the judges only read this section of the proposal, they would have a good understanding of your team's development strategies and be confident in your strategy for success. As this section is typically quite brief, it is important to include only the most significant and unique information about each sub-section in a brief paragraph. Important topics to cover in the Executive Summary are:

Market Analysis

- Description of project's location
- Insight into economic state of region and how this impacts sales strategy

Land Development

- Determination of project's entitlement state and whether or not rezoning needs to occur
- Start date and total duration associated with preparing the site for home construction

Product Description

- Description of product(s) being sold (i.e. 25 – 2000 SF Front Loaded Townhomes, 35 – 3200 SF Rear Loaded Single-Family, and 300 Multifamily Units with mix of 1 and 2 Bedrooms)
- Unique aspects of site and product design that your team believes will positively impact sales strategy

Green Building

- Explanation and justification for spending additional construction dollars on green practices

Sales and Marketing

- Overview of pricing strategy (i.e. Townhomes starting at \$200,000, Single-Family Units at \$300,000, and Multifamily Units ranging from \$120,000 - \$200,000)
- Key strategies to attract future homebuyers
- Description and rationale for product pricing

Project Management

- Construction operations plan to mitigate project risks and limit disturbances on community

Project Estimate

- Total costs of project, including land development, as well as total contingency allotted
- Strategies to mitigate against cost associated risks

Financial Analysis

- Ability to meet company's financial objectives (if specific in Problem Description)
- Important financial metrics such as initial equity amount seeking approval, Peak Equity, Total Profit, Net Profit, and Levered IRR (Internal Rate of Return)

Use concrete numbers in the Executive Summary whenever necessary to show detail. Emphasis on numbers to the thousand-dollar accuracy will prove to the judges that your team has a great understanding of the problem.

Market Analysis

Everything the designated town or city offers should be included in the market analysis. The main purpose of the market analysis is to get an understanding of the region surrounding your site and pinpoint a set of buyers your team believes is the “target market” for your development. Research will be conducted to find out those characteristics about the region your site is located in. The main topics used to describe a region and determine a target buyer are employment and income, demographics, education, accessibility and transportation, and climate. In addition, it is important to determine the affordability range of the target market as well as absorption per price point and competing development to have a sense of what type of products to design and what specific competitive advantages to seek throughout your proposal. The judges need to understand that your team has analyzed every aspect of the project; a complete Market Analysis does just that.

Employment and Income

- Where is the money coming from and how stable is it?

This tends to be the most important factor when analyzing a specific market for potential development opportunities. Ability to analyze trends, such as median household income’s change over time and how this compares to national/state figures will prove a great understanding of the market.

Demographics

- Who are the buyers?

This is based on education levels as well as presence of children and families. Conducting demographic analysis is important because it helps determine the type of amenities that will help increase demand for a development. As discussed above, analysis of trends will help your team make a very strong argument.

Education

- How do the nearby schools compare to regional and national standards?

Every family homeowner wants to know about the schools in the area. Research all elementary, middle, and high schools along with secondary education options. Describe the educational institute and their associated rating along with any unique or interesting facts.

Accessibility and Transportation

- How close is the site to major transportation avenues and is access to major employment hubs convenient?

Include information about the main types of transportation and details of each. Useful information to include would be main highways, closest airport, public transportation, and any other statistics about transportation.

Amenities

- What amenities are in the surrounding region and how does this influence the amenities our development should offer?

The amenities are all additional marketing features the location has to offer to its residents. Amenities may include but are not limited to:

- Attractions
- Sports Teams
- Parks
- Shopping and restaurants

Include a detailed description of each amenity and how it adds value for future homebuyers. Keep a positive model of the location. The purpose is to show why the location of the development is desirable.

Climate

- Does this region's weather naturally draw homebuyers to the area?

Emphasize the characteristics that make the location a wonderful place to live (i.e. percentage days with sunshine, low wind speeds, etc.). Describe any features that stand out and make the location more attractive. Include statistics to back up reasoning.

Affordability

- Based on our target market, what can we price homes at and what type of homes should we plan to design/build to optimize our company's sales?

Absorption Rate per Price Point

- Based on the market, what price of homes are most popular among buyers?

Confidence in your pricing strategies is a major determinant of a community's success. This chart will gauge the price range where most homes in the market are being sold, a very valuable statistic.

Competition

As a large national homebuilder, it is important to keep an eye on all types of competition. This includes breaking down new home competition by builder, subdivision, and product. In addition, it is important to understand the resale home market as this is your target buyer's substitute product. This data is important for showing ability to sell resale product as well as at what price point. There needs to be a plan for every possible situation and judges expect teams to know how to survive in difficult markets.

Sources for Market Data

As accurate market data is crucial to your team's success, it is important to use reliable sources. These sources include:

- MetroStudy

- ESRI
- U.S. Census Data
- Zonda (provided by NAHB)
- Xceligent
- STDB

This is very common in the industry as well. Many developers pay for a market-related service, similar to what is listed previously, to have greater confidence in their projects. As this is a student competition, many data sources are open to offering free student trials.

Land Development

The Land Development section serves a “hybrid” role in the proposal. As land development is not one of the seven-main categories on the NAHB provided scoring rubric, many schools use this section to introduce the site design, break out the unit mix, establish a phasing plan, and provide detailed land development estimates. By fitting all these categories in one section, you can establish a logical progression through the packet.

Site Design

It is important to present the site map in a visually appealing fashion. If site design is a major part of the problem, discuss the various zoning requirements including density, lot sizes, open space requirements, etc. This section explains the details associated with the site’s purchase and discusses the beginning of the project’s timeline.

Unit Mix

With unique sites, the developments assigned in the RCMC will nearly always consist of various product types. Sometimes, it is up to the team’s discretion to determine their location while sometimes the product sponsors predetermine it. Either way, it needs to be clear how the various products will fit within the overall site, but also which product fits on which lots. For example, higher end products should be in the more expensive parts of the site or on the outside of a set of townhomes because these products will target wealthier buyers. This strategy becomes important when calculating cash flows in the Financial Analysis section of the proposal.

Phasing Plan

A phasing plan is important because it helps limit a development’s risk. When establishing a phasing plan, it is crucial to think through a logical progression for the site. The main areas of focus in your phasing plan are: creation of a sense of community before the entire community is built-out, limit impacts on future residents and an allowance for your company a natural exit strategy.

To attract the initial homebuyers, it is important that they feel as if they will be buying a home within a community, not just within a construction site. Amenities, site landscaping, and neighboring homes completed within a specific phase create this sense of community. For example, amenities in Phase I should be completed before 50% of the homes in Phase I have been occupied. With this said, the ability to supply amenities may result in conflicts between the land development and marketing objectives as its land development’s incentive for these costs to be incurred as late as possible while its marketing’s incentive for all amenities to be complete day one.

When phasing a development, homebuilders want to limit their impact on future residents by having residents drive through construction as opposed to having construction drive through residents. What is meant by this is that whenever possible, you want to have work progress from the end of the site back towards the entrance. This strategy creates happy residents and limits the builder’s liability for property damage claims.

By ensuring that a phasing plan allows for an exit strategy, a company can limit its peak capital spent. Were the development to go south for any number of reasons, a builder would much rather have limited their costs instead of spending all development costs at once. Although these costs will eventually need to be spent, the builder can limit their risk if phased properly.

Land Development Estimates

These estimates include demolition (if required), earthwork, stormwater, water, sanitary sewer, dry utilities, roads, and landscaping. It is important to break down these categories into detail to prove your team did the necessary due diligence in their cost estimates. As land development is a quite risky part of any development due to the uncertainty associated with excavation, it is important to include a contingency allowance. The percent contingency is up to your team to determine based on the risk they see present but a general rule of thumb for land development contingency is 10% of hard costs.

Product Description

This section is dedicated to explaining the site design and various products in detail. For site design, present the vision and inspiration behind the community and focus on what makes it unique. For product design, promote the features that will attract future homebuyers.

Site Design

This requires great creativity and is the foundation of your proposal. A development is only as strong as its site plan allows. No two communities have the same vision or features so it is important to highlight their unique features in the site map. Whether it be mixed-use, transit-oriented, or a development that prides itself on multiple amenities, it is crucial to have a unique site map that is aligned with your team's overall vision for the development.

Product Design

If the homes have multiple elevations, show each of them. Give a brief description of the home: square footage, number of beds, baths, stories, garages, etc. Based on team discretion, you may or may not wish to include pricing figures in this section as it may detract from the design emphasis. Using pictures and floor plans is a great way to visually display this information to the judges.

Green Building Strategy

The Green Building Strategy is designed to identify if a market for green building exists and, if so, what measures will be taken to increase your company's overall bottom line. One of the ways to verify if your green building practices are in-line with those in the industry is to choose a rating standard and see what certification level is achieved. As this is a NAHB Competition, it is typical to choose the International Code Council (ICC) 700 National Green Building Standard (NGBS) to score your team's green building practices.

Market for Green Building

Before spending the effort to incorporate green building practices into your proposal, you first need to research whether a market for green building exists. If your team analyzes the local building codes for the project, there is a potential that your project will meet Energy Star or NGBS with little or no changes to the base requirements. Contacting a local builder could be critical for understanding the implications of green building on your development.

Ability to Increase Bottom Line

After determining if a market exists, builders then ask themselves if they will be able to make money from their green building efforts. In order to determine this, try to determine a realistic estimate for the additional costs associated with green building efforts in your development. This breakdown proves your team understands the implications of green building practices and is willing to make the additional investment of increased construction costs.

ICC 700 National Green Building Standard

The ICC 700 NGBS consists of two main scorecards: one for Land Development and another for New Construction. Land Development is governed by Chapter 4 of the ICC 700 NGBS Manual and is given a performance level ranging from One Star to Four Stars. The New Construction Scorecard is governed by Chapters 5 to 10 of the ICC 700 NGBS Manual and is given a performance level ranging from Bronze to Emerald.

By researching these scorecards, your team should determine what ratings to receive. It is important to be quite careful with details as the judges will ask questions about your scorecard methodology and try to determine if it is overly optimistic. This is a great opportunity to understand the scorecard and ask questions about it to your advisor and industry sponsors.

Sales and Marketing Strategies

The Sales and Marketing Strategies are designed to optimize sales to the identified target buyer groups. After identifying a target market, you implement in-house sales strategies as well as innovative product marketing solution to win over homebuyers. Presale, premium, and model home strategies are also utilized to increase bottom line and product absorption.

In-House Sales Strategy

The staffing and personnel costs associated with Sales and Marketing are very important. These should be documented in a clear budget that is then translated into the financial model. One aspect of an in-house sales strategy that will resonate greatly with the judges is the interconnectedness between this team and the construction operations team. Implementing effective strategies that allow these groups to work together will prove very valuable.

Product Marketing

To stand out, it is important to implement state-of-the-art marketing strategies in the proposal. Research strategies and even get in contact with national homebuilders in your local area or network to understand their strategies. This is one area where the sky is the limit and teams can really impress the judges.

Presale Structure

Research the housing market in the region surrounding your site and try to get an understanding of what presale strategies are being used. These can prove very valuable in terms of risk mitigation and health of cash flows as it allows revenue to be recognized earlier in the process.

Premiums

Depending on the site layout, it may be acceptable to increase the cost of a home. The following are possible reasons to apply a lot premium:

- Corner lot
- Waterfront location
- Lot size
- Proximity to community amenities
- Cul-de-sac
- Increased natural privacy

If you have proper justification for implementing a lot premium, make sure to do so as it helps increase project return metrics tremendously.

Model Homes

Select model homes and floor plans strategically as customers tend to buy the homes that are modeled. With that said, modeling your most profitable homes will be the best investment for your company.

Determine where these homes will be located. These homes are typically located near the entrance of the site to create easy access for potential homebuyers. Remember to designate parking locations for visitors.

Project Management

Project Management contains a bulk of the points associated with the NAHB RCMC Scoring Rubric. As construction management is the basis for the competition, it is crucial that all Project Management strategies are fully vetted. The two-main subsections of Project Management are associated with site management/logistics and scheduling.

Site Management and Logistics

Staffing is one of the largest components associated with site management. It is important to list and describe the role of each employee on your team. A few examples include project managers, superintendents, and laborers. When staffing a project, be aware that it is not required to have all employees on-site. Be strategic with your staffing to reduce unwarranted costs.

A site logistics plan is another crucial aspect to Project Management. This map needs to clearly specify the location of temporary facilities, construction/resident access, material storage, Stormwater Pollution Prevention Plan (SWPPP) measures, site security, and a plan to mitigate site disturbances. When planning temporary facilities, be strategic in those you choose as construction teams can typically set up temporary offices in the garages of model homes. Use of maps as well as narrative descriptions will be important for identifying these methods.

Scheduling

Scheduling, the second main area of Project Management, covers the time frame in which a development is built and includes all phases of the project: pre-development, site construction, and home construction.

Anything that can affect the project's schedule will be addressed here. Key scheduling factors are:

- Rezoning – If additional planning is required for your development, make sure to allow time for predevelopment tasks. If you assume all planning work is completed, make that clear to the judges.
- Climate – If the weather is extreme (i.e. too hot, cold, windy, or rainy), the schedule will be delayed. Be proactive in your understanding of the climate and how your team plans to mitigate its potential risks in the project schedule.
- Repetition – Building similar homes continuously allows trades to become familiar with problem areas and address them within the first set of homes completed. This will result in a faster production of homes.
- Workforce – Availability of a committed workforce as well as maintaining a professional relationship with trade partners can have serious implications on a project's schedule. If there is a labor shortage, make sure to have a strategy to ensure your products will still be built.

The development schedule should cover all construction aspects. Create a highly detailed schedule that incorporates both predevelopment and vertical home construction. Be specific and use as much detail as possible when establishing a work-order sequence for the schedule.

Making a schedule for every home is unnecessary. Create a schedule based on the most abundant products to display to the judges your understanding of home construction. These durations in the individual homes will be translated into your team's master schedule.

Project Estimate

The Project Estimate is a detailed review on how the site and home costs were calculated. Show as much detail as possible. The Project Estimate will include a summary of all project costs, a detailed estimate that includes development fees for each product type, and option packages.

Total Project Estimate

This breakdown is meant to show all development associated costs and serve as a basis for the eventual figures to be incorporated into the financial model. Note that the values in this chart will be slightly off from what is used in the financial model because those figures consider inflation over time while this chart does not.

Detailed Estimate

The detailed estimate strictly defines the total direct construction cost of the home. This price does not include indirect costs such as land acquisition, land improvement, or project and developer fees. Every component of a home is carefully estimated. Show a summary of every home categorized by each major trade. A good rule of thumb is to double check your detailed estimate with the NAHB's Cost of Constructing a Home Breakdown that is released annually. A copy of this report is shown on the following page.

Project Fees

It costs every city a significant amount of money to support the increase in population caused by a new development. With that said, the city requires developers to pay various permit and impact fees such as building, plumbing, HVAC, electrical, land development, fire marshal, and water and sewer fees. Check the city or county website to learn of the fee and permit schedules. Show a detailed breakdown of the fee impact on each home.

Options Packages

Options are upgrades to a home that the homeowner can purchase. Builders typically have steep markups on options to dramatically increase their profit. All options need to be estimated to find their additional costs and associated profit.

A variety of option strategies may be established. The following are two possible strategies:

- Multitude of options – This groups options by trade and allows the homeowner to choose what they like.
- Limited options – This gives homeowners three to four option packages to choose from creating an easier selection process.

After determining an option strategy, the team needs to determine the following values:

- Cost – The price of the option/package
- Occurrence – How often a homeowner will select the option/package
- Net Margin – The additional sales earned that is translated into profit.

Provide an overview that highlights the option strategy you choose as well as its associated costs. Judges want to see how the team utilizes options to increase the bottom line of the project.

NAHB Cost of Constructing a Home Example:

Table 1. Single Family Price and Cost Breakdowns 2015 National Results		
	Average Lot Size:	20,129
	Average Finished Area:	2,802
I. Sale Price Breakdown	Average	Share of Price
A. Finished Lot Cost (including financing cost)	\$85,139	18.2%
B. Total Construction Cost	\$289,415	61.8%
C. Financing Cost	\$6,285	1.3%
D. Overhead and General Expenses	\$26,345	5.6%
E. Marketing Cost	\$3,739	0.8%
F. Sales Commission	\$15,104	3.2%
G. Profit	\$42,292	9.0%
Total Sales Price	\$468,318	100%
II. Construction Cost Breakdown	Average	Share of Construction Cost
I. Site Work (sum of A to E)	\$16,092	5.6%
A. Building Permit Fees	\$3,601	1.2%
B. Impact Fee	\$1,742	0.6%
C. Water & Sewer Fees Inspections	\$4,191	1.4%
D. Architecture, Engineering	\$4,583	1.6%
E. Other	\$1,975	0.7%
II. Foundations (sum of F to G)	\$33,447	11.6%
F. Excavation, Foundation, Concrete, Retaining walls, and Backfill	\$32,576	11.3%
G. Other	\$871	0.3%
III. Framing (sum of H to L)	\$52,027	18.0%
H. Framing (including roof)	\$44,640	15.4%
I. Trusses (if not included above)	\$3,884	1.3%
J. Sheathing (if not included above)	\$1,238	0.4%
K. General Metal, Steel	\$1,272	0.4%
L. Other	\$993	0.3%
IV. Exterior Finishes (sum of M to P)	\$43,447	15.0%
M. Exterior Wall Finish	\$20,717	7.2%
N. Roofing	\$10,069	3.5%
O. Windows and Doors (including garage door)	\$12,127	4.2%
P. Other	\$534	0.2%
V. Major Systems Rough-ins (sum of O to T)	\$37,843	13.1%
O. Plumbing (except fixtures)	\$12,302	4.3%
R. Electrical (except fixtures)	\$12,181	4.2%
S. HVAC	\$12,623	4.4%
T. Other	\$738	0.3%
VI. Interior Finishes (sum of U to AE)	\$85,642	29.6%
U. Insulation	\$6,467	2.2%
V. Drywall	\$11,744	4.1%
W. Interior Trims, Doors, and Mirrors	\$12,409	4.3%
X. Painting	\$9,002	3.1%
Y. Lighting	\$3,517	1.2%
Z. Cabinets, Countertops	\$16,056	5.5%
AA. Appliances	\$4,463	1.5%
AB. Flooring	\$13,367	4.6%
AC. Plumbing Fixtures	\$4,465	1.5%
AD. Fireplace	\$2,760	1.0%
AE. Other	\$1,393	0.5%
VII. Final Steps (sum of AF to AJ)	\$19,567	6.8%
AF. Landscaping	\$6,156	2.1%
AG. Outdoor Structures (deck, patio, porches)	\$4,349	1.5%
AH. Driveway	\$6,240	2.2%
AI. Clean Up	\$2,054	0.7%
AJ. Other	\$768	0.3%
VIII. Other	\$1,349	0.5%
Total	\$289,415	100%

Financial Analysis

The financials are one of the most important sections of the proposal. The judges rely on this information to rate the team's overall success. All financial calculations determine the strength of your team's findings; therefore, accuracy is essential.

Provide a brief overview of main financial metrics, assumptions made, schedule of projected cash flows (otherwise known as 'proforma'), unlevered v. levered return scenarios, and sensitivity/scenario analysis to examine the impact of assumptions made.

Financial Metrics Overview

As the judges look mainly at the financial metrics to determine a team's success, be very transparent with these numbers. The main financials they are looking for are total initial equity needed, peak equity, equity multiple, net profit, annual IRR and break-even date. All of this information should be contained in the executive summary as well as readily accessible in the Financial Analysis section.

Assumptions Overview

Because financials involve forecasting cash flows that will occur in the uncertain future, many assumptions need to be made by your team. The accuracy of your proforma depends heavily on the accuracy of your underlying assumptions. These include the development timeline, inflation values, sales growth rates, presale benchmarks, commission values, etc. Good sources for finding data for your assumptions include Real Estate Agents in the area, Zonda, Zillow, etc. As the financial analysis section takes into consideration all previously determined estimates and values, transparency with assumptions will give judges increased confidence in your team.

Proforma

The proforma lists all cash flows, both positive and negative that occur over the course of the development. The proforma can be developed in programs such as Tract-Pie, a service many schools use, or Microsoft Excel. Either way, the proforma is where the judges tend to scrutinize heavily so make sure you understand the numbers thoroughly and have a rationale for any unique scenarios. When developing a proforma, it is important to track cash flows with as much detail as possible, such as monthly intervals. When translating into a format that can be read in a proposal, quarterly intervals of the proforma are best presented on 11x17 paper as permitted in the NAHB RCMC Rules and Guidelines. It is generally easier to read this way.

Unlevered v. Levered Return Scenarios

When calculating returns, there are two main strategies. The first is the unlevered scenario. The unlevered IRR is the annual return of the project if it were to be financed with 100% equity (i.e. no loan is taken out). Unlevered returns involve less risk but have much lower overall return metrics due to the very large peak capital investment required.

The second, and more popular, scenario is the levered scenario. Whenever a business venture takes on leverage, it means that they are taking on debt to help finance their endeavor. Taking on debt can increase the risk of a project because if the venture is unable to meet their debt payments, then the bank can assume ownership of the project. Most projects do take on debt

because it decreases the initial equity investment but allows for increased returns on equity. For example, if a project requires \$50 Million in capital and yields a net profit of \$30 Million in 5 years, the internal rate of return is 9.86%. If the same project secures a \$30 Million loan that reducing the initial capital required to \$20 Million but requires \$2 Million in loan payments that will be subtracted from the net profit, the internal rate of return is 19.14% or nearly double. An illustration of these IRR calculations is shown below.

Unlevered						
Period:	0	1	2	3	4	5
Cash Flows from Operations	(50,000,000)	-	-	-	-	80,000,000
Net Cash Flows	(50,000,000)	-	-	-	-	80,000,000
Capital Required	50,000,000					
Total Revenues	80,000,000					
Total Project Debt	-					
Interest Expense	-					
IRR	9.86%					

Levered						
Period:	0	1	2	3	4	5
Cash Flows from Operations	(20,000,000)	-	-	-	-	50,000,000
Interest Payments		(400,000)	(400,000)	(400,000)	(400,000)	(400,000)
Net Cash Flows	(20,000,000)	(400,000)	(400,000)	(400,000)	(400,000)	49,600,000
Capital Required	50,000,000					
Total Revenues	80,000,000					
Total Project Debt	30,000,000					
Interest Expense	2,000,000					
IRR	18.69%					

When conducting your analysis, be aware of both unlevered and levered scenarios. This will prove to the judges your team’s understanding of development financing as well as your awareness to increasing returns.

Sensitivity and Scenario Analyses

Because many of the assumptions made will vary as they play out in real time, performing sensitivity and scenario analyses will give the judges increased confidence in your proposal. For example, sensitivity analysis involves examining the impact of small changes on your assumptions for your base case. On the other hand, scenario analysis involves changes to your construction schedule and overall timeline of your development. Some of the most common assumptions tested are inflation, growth rate of sales prices, growth rate of hard construction costs, various characteristics of the loan received (for the levered returns), and whether or not construction delays will occur. By using data tables in Microsoft Excel to test the sensitivity of these key variables on the project’s IRR, the judges will understand where the main project risks exist.

Risk Assessment

The risk assessment section proves to the judges that your team is aware of development-associated risk, but more importantly that there is a plan in place to mitigate the risks before they become a major issue. The Risk Assessment section is generally divided into three major categories: business risks, construction risks, and exit strategies.

Business Risks

These risks include mostly issues with your development strategy, including potential rezoning requirements, and macroeconomic factors. As the outcome of business risks are generally out of your control, mitigation plans for when they do occur are very important. For example, a common business risk for homebuilders nationwide is rising material and labor costs. To prevent this risk from wiping out the development's bottom line, certain measures, such as contingencies, can be put in place.

Construction Risks

Construction associated risks are site-specific and are mitigated by active management strategies. By noting and providing mitigation strategies for these sorts of risks such as weather or labor shortages, the judges gain confidence in your proposal.

Exit Strategies

If economic conditions restrict the positive cash flow to the development, an exit strategy must be executed. Describe when, why, and how you will use your exit strategies. Some possible strategies are as follows:

- Offer homebuyers incentives (options upgrade and reduced home sales price)
- Sell to investors as opposed to solely homebuyers
- Sell land to private owners

Plans to exit the development should be addressed throughout the proposal and summarized in the Risk Assessment Section.

Packet Layout and Design

When determining how to layout your packet, look at previous winning packets. This will give you a general sense on how they should be laid out while also sparking new ideas on how you can make your packet better than those prior. Decide as a team what you want the overall look to be.

Page Layout

It is recommended that all main proposal pages be portrait-oriented except for those allowed to be 11x17, as determined by the NAHB. This helps keep uniformity within the packet while giving the judges larger sheets of paper for the more detailed sections.

Page Design

Each page should have an identical look. This is easily done in many formatting programs such as Adobe In-Design or Microsoft Publisher where you can create master pages that are copied throughout the packet. Adding an artistic header and footer as well as unique margins gives the appeal of a professional packet to the judges. Make sure to follow the NAHB Rules and Guidelines for the given year's problem, as the NAHB typically requires your university's name as well as "RCMC Four Year Program" on every page. Pay close attention to this requirement as failure to meet this could have negative consequences on your team's scoring.

Packet Design

Keeping the packet user friendly is extremely important. Remember that the judges will be reviewing over 30 team packets and may only look at key features. Implement the following tips into the packet:

- Do not put text too close to the edge. It may be cut off when the judges bind the packets.
- Avoid long paragraphs as they may be skipped; breakup this information into bullet points.
- Only add high quality pictures and do not use pictures to fill space.

Proofreading and Proposal Review

This is critical. Errors influence the judges' perception of the proposal as much as anything. For example, fonts need to be uniform, layouts need to be consistent, grammar needs to be correct, etc. This is an issue the judges always stress during the debrief and can always be improved upon.

Final Tips

- Use Adobe In-Design or Microsoft Publisher to create the packet.
- Save often and keep back-up files.
- Create a PDF on file just in case there is an error in submitting your proposal to the judges.
- Make sure to add page numbers. This is very helpful for the judges when taking notes and determining questions to ask in presentation.

Oral Presentation

The presentation portion of the problem consists of a 15-minute talk by the six competing members to the NAHB Industry Judges followed by a 10-minute question and answer session. This section is designed to help you prepare for the presentation as well as provide some useful information.

General Guidelines

With six team members only given 15-minutes to present, your team needs to be very concise with what they include in their presentation. Each member will have about two-three minutes to speak on his or her topic. With that said, it is important to choose information that is critical to the judges' understanding. Ask yourself the following questions when preparing for the presentation.

- What will the judges be most interested in?
- Why is this information important to the judges?
- Why should the judges know this information?
- What will set us apart from other teams?

Constantly ask yourself these questions as your objective is to prove to the judges that you are the best team for the job.

Practice

Be sure to prepare your presentation and be comfortable before flying out to the competition. Memorization is not necessarily required. When giving professional presentations such as this, it is better to only memorize the main points and transitions of your talk because it allows you to speak more smoothly and freely during the presentation. With that said, this is sometimes more efficient than memorization, because you need to know the information inside-and-out as opposed to just memorizing a certain script.

Practice your speech with your team to make sure everyone is on the same page. Also, try to present in front of your advisor, other faculty, as well as industry sponsors. Presenting in front of an audience makes the experiences seem more like real life and is the best simulation for the presentation in front of the NAHB judges

Question and Answer Overview

The question and answer section by the judges really allows your team to highlight their knowledge of the problem. When doing so, it is important that the team keep a few guidelines in mind. First, assign a team captain to take the lead on questions asked. This helps ensure your team is organized in their response and allows the right expert to be delegated to respond if need be. Second, explain your team's thought process and rationale thoroughly for any assumptions made. This helps the judges understand your logic and feel more confident in your strategy. Lastly, if you do not know an answer say, "we'll need to get back to you on that". It is much better to be open about your misunderstanding than to guess and provide the judges with an ill-advised response, as they can sense when you do not know an answer.

Tips

Make sure your team's presentation is straight to the point and is in a language that everyone can understand. By working on the proposal for over three months and then spending additional time on the presentation, it is important to take a step back. Speak in a sense that people not as familiar with the presentation can understand while also paying attention to details. This will prove to the judges that your team understands the material but is also very confident. Some additional tips include:

- During the presentation, look interested in what your team members are saying and do not stare into space.
- Practice passing the clicker for your PowerPoint. Know who and when each team member should be handed the clicker. It is embarrassing if small mishaps like this occur in the presentation.
- Do not read the PowerPoint slides. The judges can do that for themselves.

A special thanks to everyone who helps put this great event together.

Although challenging, you will remember your NAHB RCMC Experience for the rest of your life and it may be something that helps kick-start your career. Best of luck to all future competing teams and make sure to enjoy yourself at the Annual IBS!



Student
Chapters