

HOME BUILDING OUTLINE, PLANNER, AND GUIDE

An Owner-Builder Approach to Residential Construction

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Overview

What is involved in the B.Y.O.B. Program?

The ultimate goal of the Build Your Own Barden (B.Y.O.B.) Program is to create **a home to match your family's lifestyle**. Your vision will guide the entire project. For this reason, Barden Building Systems puts you, the Owner, at the center of all decisions.

Roles & Responsibilities

Constructing your new home will require the participation of a variety of professionals including:

- **Real-Estate Agent** – Responsible for assisting the Owner in buying and selling land, and usually coordinates various aspects of the closing when the property deed is transferred.
- **Construction Lenders** – Responsible for lending money to the Owner to purchase land and/or the house. (Most often, the land and house are used as security until the loan is paid in full.)
- **Construction Manager (C.M.) or General Contractor (G.C.) Acting as CM** – Responsible for assisting the Owner in planning, organizing, and controlling the B.Y.O.B. process to ensure the Owner's best interest is maintained from start to finish. *(If you have chosen to act as General Contractor (G.C.) under this B.Y.O.B. program, you may want to consider hiring your Barden Building Systems dealer to act as your Construction Manager under a Personal Service Agreement. In this way, you benefit from his/her connections in and knowledge of the industry but s/he may be involved as little or as much as you deem necessary.)*
- **Architect/Designers** – Responsible for creation of Drawings & Specifications following the requirements provided by the Owner orienting house and the site to family lifestyle prior to and during construction.
- **Civil & Structural Engineers** – Responsible for providing scientific knowledge to solve construction problems related to geological and structural conditions during creation of Drawings and Specifications.

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- **Specialty Trade Contractors** (such as plumbers, electricians, painters, etc.) – Responsible for providing trade labor and bid proposals at each phase of construction adhering to Drawings and Specifications, and are accountable directly to the Owner.
 - **Suppliers & Manufacturers** - Responsible for providing material and products at each phase of construction adhering to Drawings and Specifications, and are accountable directly to the Owner.
 - **Plan Examiner & Field Inspector** – Responsible for reviewing Design/Build criteria both prior to and during the construction process to maintain compliance with applicable codes and ordinances in your area.

Each construction professional should dedicate his/her activities to serving the Owner's best interest. Under the B.Y.O.B. Program, the Owner acts as the General Contractor, leading the entire construction organization. With the possible assistance of a Construction Manager, the Owner contracts all services to save costs, maintain standards for quality, and provide personal attention to all phases of the Design/Build process.

So, Do You Want to B.Y.O.B.?

Do you want to be your own General Contractor under the B.Y.O.B. program? To determine whether or not you “have what it takes,” ask yourself these questions:

1. Do I have the time to dedicate 10-20 hours a week to the G.C. job each week?
2. Am I tenacious enough to communicate effectively with professionals when we disagree?
3. Can I make decisions quickly and confidently?
4. Am I a good planner who remains organized from the beginning to the end of a project?

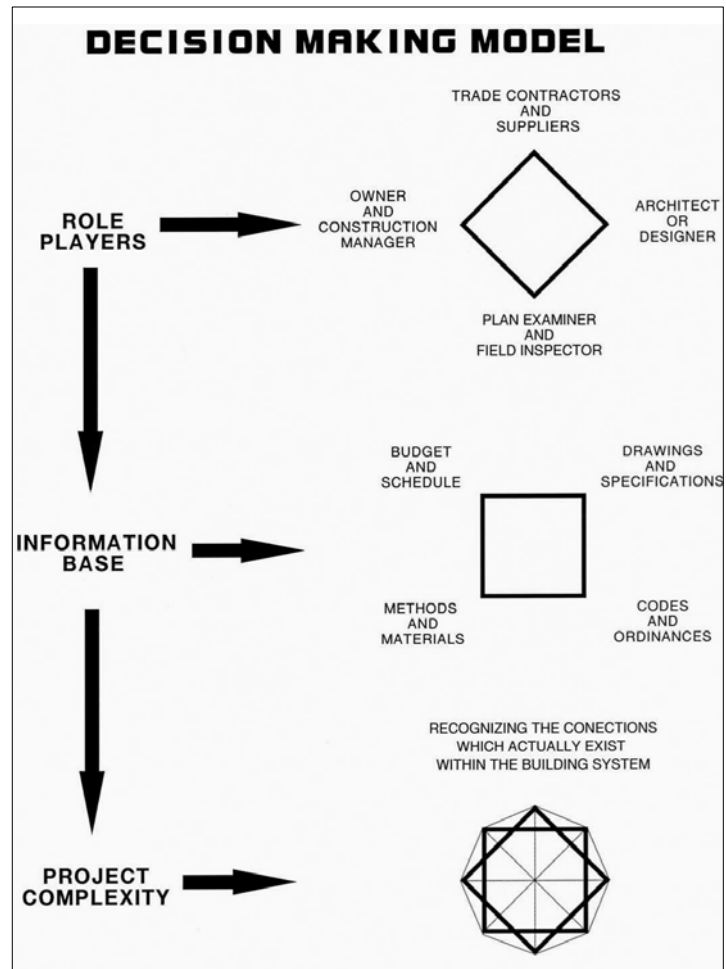
If you've been honest with yourself and answered yes to these questions, then you may have what it takes to undertake the B.Y.O.B. program. ***If not, then you should follow the more traditional route of hiring a General Contractor for your home building project. Or, you could hire your Barden Building Systems dealer to act as your Construction Manager under a Personal Service Agreement.***

Decision-making & Project Management Process

It's important to be a good decision maker to overcome the kinds of problems that customarily arise on any project—budgets, deadlines, conflicting priorities, and the inherent complexities of organizing people with different expertise into an effective team. Follow these simple best practices when making decisions for your project:

1. Pre-qualify with your lender.
2. Know your site before you buy land.
3. Plan with a systems view of the whole process.
4. Build it on paper with a complete set of Drawings & Specifications.

A key to effectively managing your construction project to recognize it is a highly interdependent system. By seeing the connections, you can understand the roles and contributions of the various players, and make effective, informed decisions. *(For instance, where you locate your home on site determines logistics for material delivery and utilities layout. A seemingly terrific location may end up a logistical nightmare – or worse, result in the denial of a building permit.)* The DECISION-MAKING MODEL illustrates the information-sharing and decision-making system of your residential construction project. As you can see, each professional provides specialized information and services, yet each relies on the others for guidance throughout the process.



Although an optimistic "can do" attitude by the Owner is admirable, be mindful that these specialties exist out of necessity. Defining the requirements of your lifestyle, generating Drawings & Specifications, determining a budget and schedule, and locating trade contractors and suppliers are major undertakings. Decision making begins early in the process, so it is important to collaborate with the team (and your attorney/accountant) as soon as possible. This B.Y.O.B. Guide was written to help you anticipate problems! Remember, you, the Owner, should **be at the center of all decisions**.

Staying Organized

Another consideration for the Owner is **how to stay organized throughout the Design/Build process** to manage the project and make decisions efficiently and effectively. You have two choices: a manual or an automated system for information storage and referral. A manual system relies on files, checklists, and the traditional “paper and pencil” techniques. An automated system incorporates computer hardware, construction management software, and an electronic approach to information processing.

Barden Building Systems encourages you to use a manual system. For a one-time use on a construction project, a considerable amount of time will be dedicated to training for and development of a software system geared toward construction management. Rather than expend the time and effort, not to mention costs, to develop a proficiency in the use of a software system, you should concentrate on the primary goal of Project Management: **to create a home which meets the needs of your lifestyle.**

Following a manual approach allows you to begin immediately with the Design/Build process, analyze the circumstances of the project, and concentrate on decisions which directly relate to Project Management. You might consider acquiring a construction calculator (one manufacturer is Calculated Industries) to help you solve building problems in the feet-inch format when figuring material quantities, unit costs, stair and roof layout, square footage, and volume calculations. The instructions are easy to understand, and you can begin using the calculator immediately.

However, if you are proficient in the use of a computer, by all means use the standard desktop word processing, spreadsheet, email and browser capabilities. Microsoft Outlook is a standard feature on all Microsoft Desktops. Its features include a Calendar, Contact Manager, Drafts Folder, Email Inbox/Outbox, Journal, Notes and Tasks. This will be all you need to supplement a manual approach to Project Management. Owners with computer skills can easily begin with what they already know and progress into more efficient desktop applications. The result of supporting a manual system with a construction calculator and Microsoft Outlook creates a hybrid method combining small-scale automated system with traditional paper and pencil techniques. When analyzing and recording information for decision making, the Owner should utilize available technology yet realize the need to get on with the tasks of Project Management.

Project Guide

For the Owner with an optimistic "can do" attitude, the DESIGN/BUILD process may seem manageable – and indeed it can be if you stay organized. The DESIGN/BUILD MATRIX below helps you “compartmentalize” the complex information so that you can make decisions sensibly and sequentially. The matrix allows the Owner to focus on one block of information at a time. First, you will need to translate the requirements of your lifestyle into Contract Documents which will direct all activities for your B.Y.O.B. home building project.

DESIGN / BUILD MATRIX

BUILD	DESIGN				
	SCHEMATIC	DESIGN DEVELOPMENT	CONTRACT DOCUMENTS	BID/ NEGOTIATIONS	CONSTRUCTION OBSERVATION
SITE					
FOUNDATION					
FRAMING					
ROOFING					
EXT FINISH					
PLUMBING					
HVAC					
ELECTRICAL					
INSULATION					
DRYWALL					
INT FINISH					
LANDSCAPING					

Note that the matrix has two dimensions: the DESIGN dimension (which sequences the flow of major events for creation of Drawings and Specifications), and the BUILD dimension (which sequences the flow of major events during construction). To manage your project, you will need to operate in both dimensions.

Both dimensions focus on the Owner's requirements for the house and site. As such, you will need more than a tangle of ideas. Designing your home will be a process of “progressive approximation” where ideas are presented, problems identified, solutions considered, and decisions refined and finally implemented. As you concentrate on each block of information, you will progress toward a final solution which gradually approximates WHAT products and materials will be used for creation of your homestyle. It begins with vague notions and ends with specific choices.

The DESIGN phase AND the BUILD phase ARE INTERDEPENDENT and take into consideration the Owner's needs and desires in both written and graphic form. A reasonable amount of time must be allotted to address all aspects for DESIGN solutions. The purpose of this section is to provide definitions for the terms used on the DESIGN/BUILD MATRIX.

The DESIGN Phase

The DESIGN phase is generally defined as follows:

- | | |
|--|---|
| <ul style="list-style-type: none">• Schematic: Define Owner's lifestyle, site conditions, and relevant code and zoning standards; study alternative ideas and cost ranges for each component of the Building assembly from site to landscape.• DESIGN Development: Consider alternatives and sketches most apropos for Owner's lifestyle and site development; investigate more definitive plans, and up-date Budget Estimate for the entire BUILD sequence.• Contract Documents: Create Drawings and write Specifications through a series of conferences by Owner; prepare documents for code and zoning compliance and building permit application for all components. | <ul style="list-style-type: none">• Bid/Negotiations: Prepare Contract Documents for contractor Agreements and Conditions of construction; establish budget guidelines and secure proposals from Trade Contractors and Suppliers for total scope of work to be performed.• Construction Observation: Check materials and methods at critical points during construction; review Trade Contractor's completion of work and application for payment; up-date design, budget, or products if required by changed conditions. Maintain Quality Control from outset to completion of project. |
|--|---|

The BUILD Phase

The BUILD phase complements the DESIGN phase utilizing materials and products chosen by the Owner and defined by the Drawings and Specifications. Supported by Suppliers, each Trade Contractor completes a major component of the construction project. The BUILD phase is generally defined as follows:

- **Site** – Combines geographical location, topography, climate orientation, water, geology, trees and vegetation, views, and noise considerations.
- **Foundation** – Transfers Building loads directly to soil by use of footings, walls, slabs, piers; anchors Building to site to avoid racking or uplifting.
- **Framing & Roofing** – Provides structural elements of floor, wall and roof systems; acts as a barrier to heat loss, moisture and air infiltration; creates aesthetic form.
- **Exterior Finish** – Includes windows, doors, siding, gutters and downspouts; allows physical, visual, and light penetration; creates stylistic detail.
- **Plumbing** – Supplies potable and utility water, sanitary drainage, and sewer disposal; trim package contributes to interior decor.
- **HVAC** – Generates heating, ventilation, and air conditioning systems; trim package and vent caps lend to decor.
- **Electrical** – Distributes energy for light, heat, and operation of appliances and equipment; trim package adds to interior DESIGN; services installed for television, telephone, security, and office.
- **Insulation** – Controls heat loss or gain in floors, walls, and ceilings; weatherizes doors, windows, and sills; offers sound deadening for interior spaces.
- **Drywall** – Covers interior walls and ceilings for finishes and fireproofing; texture and corner trim contribute to decor package.
- **Interior Finish** – Establishes color, texture, pattern, and scale of interior DESIGN motif; includes paints, doors, hardware, trim, closet kits, cabinets, floor coverings.
- **Landscape** – Arranges vegetation, walks, drives, lighting to marry house architecture to site; allows drainage of storm water; places gazebos, decks, patios, summer kitchens, gardens for climate orientation and lifestyle.

Organization

A good way to begin using the B.Y.O.B. DESIGN/BUILD MATRIX is to label manila files with the eleven categories of the BUILD phase. As you consider different aspects of each of the BUILD events, you should place notes, drawings, and ideas into each respective manila file. It's a process of considering your options, refining your thinking, and making a choice among the range of alternatives open to you. Don't try to finalize decisions. Remember: This is a process of "progressive approximation".

Once you've initially reviewed the major events of the BUILD phase, you'll feel more confident with your original ideas and begin to weigh and consider alternative ideas. Your Schematics are based on considerations such as code and zoning standards, costs, lifestyle requirements, and aesthetic quality. Your manila files will begin to bulge with ideas and the "DESIGN/BUILD Collage" (Read more about the "DESIGN/BUILD Collage" in the PUNCH LIST section) will unfold as an artistic endeavor.

You'll start over again as you refine ideas gathered for each of the BUILD events and progress into DESIGN Development. More than likely, you'll be creating additional manila files to expand your growing information base. For instance, your "Exterior Finish" file may be expanded into separate files for windows, doors, siding, and storm water control (Read more about the "Cardboard Box Files" in the PUNCH LIST section). Your original ideas become more definitive plans and the Budget Estimate becomes more accurate.

At this point, your homestyle should be clearly defined, and you're now ready to create Contract Documents. Depending how adept your drafting and writing abilities, it may become especially important to retain the professional services of a Construction Manager, Architect, or DESIGNer if required by your situation. The creation of Drawings and Specifications are crucial to code compliance and successful Building permit application so be prepared for a collaborative effort.

For Bid/Negotiations to occur, the Owner must have ample copies of Drawings and Specifications in hand to circulate among Trade Contractors and Suppliers in order to solicit their bid proposals. Depending on how skillful your legal and negotiating abilities, the Owner might consider the professional services of a Construction Manager, Lawyer, and Accountant if required by your situation. The preparation of Agreements and Conditions for the work to be performed will refine your Budget Estimate and begin to determine who will provide labor and materials for your project.

Although there is always room for improvement, you should realize that any major changes or deviations may cause financial and logistical problems as you move into

Construction Observation. Quality Control involves checking materials and methods as each phase is completed but changing conditions may cause the Owner to up-date the DESIGN, budget, or products. Your lending institution will require on-site review of construction in order to authorize payment for work completed, and formal inspections by Building officials will also occur at critical points in the schedule.

DESIGN/BUILD Questionnaire

You can use this B.Y.O.B. DESIGN/BUILD questionnaire to begin your action plan:

- | | |
|---|---|
| 1. Is your lot buildable (according to local, city, state, and federal guidelines)? | 13. What are your preferences for door and window styles? |
| 2. What are the dimensions and topography of your site? | 14. Will the garage be detached or attached to your home? |
| 3. Are there special site features to incorporate into the landscape DESIGN? | 15. Where will you locate sidewalks, patios, decks, and porches? |
| 4. Do any distinctive geological, meteorological, or biological conditions exist? | 16. During construction, will site traffic and material pose problems? |
| 5. Are there unique soil or structural conditions which require engineering? | 17. Where are temporary water and power as well as job toilet to be placed? |
| 6. How will utility infrastructure be developed to and on site? | 18. How will you enter/exit the home, and do you require a foyer? |
| 7. Where will driveway access and parking be located? | 19. Will the living room be formal or informal, and how will it be used? |
| 8. Why do you prefer a certain architectural style? | 20. Will the dining room be formal or informal, and how will it be used? |
| 9. Do you anticipate specific square footage and cost range? | 21. Will the kitchen be formal or informal, and how will it be used? |
| 10. Is a one- or two-storey home preferred, and do you require a basement? | 22. Will your family use an outdoor eating area off the kitchen? |
| 11. What roofing material will be used, and what is the color and texture? | 23. Will your family room be open to the kitchen or separate from it? |
| 12. How will the exterior be covered, trimmed, and treated? | 24. Is there a need for a study, home office, hobby room or other special area? |
| | 25. How many bedrooms are required, and where will they be located? |

26. How many bathrooms are required, and where will they be located?	32. What is the total number and types of appliances, and who are the manufacturers?
27. What is the total number of plumbing fixtures, and who are the manufacturers?	33. What is the aesthetic nature of trim package by style, color, and finish?
28. What is the means of heating/cooling your home, and who is the manufacturers?	34. What floor coverings will be used, and how will style/color match decor?
29. Where will you need electrical outlets, switches, lights, fixtures?	35. What style, color, and configuration of cabinets do you want?
30. What are the specific requirements for weatherization and insulation?	36. How will landscape be designed and implemented?
31. Will the drywall be textured, and what will be interior color schema?	37. Who will be responsible for site clean-up and waste recycling?

Keep in mind that corrections or "fine tuning" are always necessary as you progress from schemas, DESIGN development, contract documents, bid/negotiation, and construction observation. It's highly unlikely every detail will be determined at the outset for all the BUILD categories. Good advice is to be a stickler for detail yet allow yourself the freedom to make some decisions later realizing that this "fine tuning" is accepted as part of the DESIGN process.

Let the B.Y.O.B. DESIGN/BUILD Matrix guide you through this process!

Costs

A Cost Analysis is a comprehensive breakdown of all expenditures related to the B.Y.O.B. DESIGN/BUILD process. The following list is a line item representation for a typical residential project combining hard and soft costs. Strive for accuracy as each item is assigned a cost by bidders. Assigning accurate costs will be an extension of estimating activities except these numbers will be based on Trade Contractors' and Suppliers' bid proposals.

WITHOUT any formal contracts or binding agreements, an Owner can solicit proposals from a Trade Contractor or Supplier for each type of work to be performed. You will need copies of Drawings and Specifications to circulate among bidders so be prepared to own a set of six to eight copies. Remember: Two copies will eventually be submitted to the building department for their review so keep these in clean condition.

Whether you purchase stock Drawings from a plan service or hire an Architect to create an original design, either way be sure to attach a copy of your Specifications to each set, then Trade Contractors will make proposals based on same product types, sizes, and quality.

After the first round of proposals, you will be able to embellish your BUDGET ESTIMATE with details provided by the people who will actually do the work and provide the materials. All items of the COST ANALYSIS will be a greater elaboration of your original idea of what your project would likely cost.

A second round of bid proposals from different Trade Contractors and Suppliers will add a competitive edge to this endeavor as each business attempts TO WIN your contract. The following list expands on the basic categories covered in your BUDGET ESTIMATE. What now occurs is a more thorough COST ANALYSIS as you begin to collaborate with the entire building community.

Hard & Soft Cost Worksheet

Item	Estimated Cost
1) Architect/Designer's Fee	
2) Site Survey	
3) Permits	
a) Building	
b) Water	
c) Septic/Sewer -Electric -Plumbing	
d) HVAC	
4) Install Electrical Service	
5) Install Water Service	
6) Excavation	
7) Hauling	
8) Environmental Protection	
9) Framing Labor & Lumber	
10) Framing Hardware	
11) Sealants & Adhesives	
12) Concrete Labor & Materials	
a) Pads	
b) Footings	
c) Walls	
d) Floors	
e) Sidewalks	
f) Steps	
g) Patios	
h) Driveways	
13) Drain tile and/or Dispersal Trench for Stormwater Control	
14) Downspout Drains	
15) Damp and/or Waterproofing	
16) Reinforcing Steel	
17) Anchor Bolts	
18) Sheet Metal Flashing	
19) Backfill	
20) Exterior Doors	
a) Pre-finished	
b) Pre-hung	
c) Handles	
d) Deadbolts	
e) Thresholds	
21) Asphalt Paving	

22) Roofing	
a) Felt Paper	
b) Flashing	
c) Vents	
d) Shingles	
23) Garage Doors	
a) Openers	
24) Windows and Skylights	
25) Doors	
a) Sliding	
b) Specialty	
c) Shower	
d) Include Hardware -Include Finishes	
26) Mirrors	
27) Medicine Cabinets	
28) Glass & Glazing	
29) Brick Veneer or Masonry	
30) Stone Veneer	
31) Fireplace/Wood Stove	
32) Chimney/Vent Stack	
33) Insulation Material & Labor	
a) Foundation	
b) Floor	
c) Walls	
d) Ceiling	
e) Fire Stuffing	
f) Weatherproofing	
g) Soundproofing	
34) Plumbing	
a) Rough-in/Service Connection –Finish	
b) Hot Water Tank	
35) HVAC	
a) Rough-in/service Connection –Finish	
b) Gas or Oil Piping -Oil Tank -Radon Gas	
36) Electric	
a) Rough-in/service Connection –Finish	
37) Fixture Allowance	
a) Hanging Fixtures	
b) Sconces	
c) Hair Dryer	
d) Vent Fans	
e) Heat Lamps	
38) Appliance Allowance	

a) Cook top & Hood	
b) Oven	
c) Microwave	
d) Refrigerator	
e) Dish Washer -Garbage Disposal -Clothes Washer -Clothes Dryer	
39) Finish Labor & Lumber (Millwork Package)	
a) Case & Base	
b) Window Liner -Specialty Trim -Half or Full Jambs -Sauna Kit - Shelf & Ledger	
40) Interior Doors Material & Labor	
a) Pre-finished	
b) Pre-hung	
c) Include hardware	
d) Panel	
e) Flush	
f) Bi-Fold	
g) Bi-Pass	
41) Drywall Material & Labor (Gypsum Wallboard)	
a) Hang	
b) Tape	
c) Finish/Curing	
d) Seal & Texture	
42) Cabinets Material & Labor	
a) Kitchen	
b) Laundry	
c) Bath	
d) Entertainment	
e) Office	
43) Exterior Finish Material & Labor	
a) Siding	
b) Trim –Soffit	
44) Gutters & Downspouts Material & Labor	
45) Paint & Stain Material & Labor:	
a) Interior	
b) Exterior	
c) Trim Pkg	
d) Door Pkg	
e) Window Pkg	
f) Cabinet Pkg	
46) Wall Coverings Material & Labor:	
a) Paper	
b) Fabric	

c) Mirror	
d) Wood Panel	
47) Floor Coverings Material & Labor:	
a) Vinyl	
b) Tile	
c) Stone	
d) Marble	
e) Hardwood	
f) Carpet	
48) Cabinet Countertops:	
a) Laminated Plastic	
b) Solid Surface	
c) Hardwood or Tile	
49) Septic System Material & Labor:	
a) Percolation	
b) Design	
c) Installation	
50) Storm Water Material & Labor:	
a) Leach Field	
b) "French" Drain	
c) Culvert	
d) Perforated Tile	
51) Finish Hardware	
52) Ornamental Iron/Specialty Metals	
53) Deck Material & Labor	
a) Structural	
b) Surface	
c) Guardrail	
d) Stair	
e) Handrail	
54) Landscape Material & Labor	
55) General Labor	
56) Construction Consultant	
57) Clean-up	
a) Recycle/Refuse	
b) Broom & Bags	
58) Builder's Overhead and Profit	
59) Professional Service Fee (Construction Manager/Lawyer/Accountant/Engineer)	

You are NOT expected to figure material and labor costs for each line item of the Cost Analysis BY YOURSELF. The Owner's job is to assemble Drawings and Specifications

then request bids from and negotiate contracts with Trade Contractors and Suppliers for the work to be completed on your project. If this seems overwhelming, another option is to work directly with a General Contractor because his/her reputation is based on an existing organization of Trade Contractors and Suppliers. HOWEVER, as a B.Y.O.B. Owner/Builder, you are expected to be fully responsible for all GC duties!

Pricing

Even though you won't be calculating specific material and labor costs, it may be helpful to understand how bidders arrive at a price for the work to be completed. Generally, most pricing systems fall into one of three categories: Square Foot, Assembly, and Unit Pricing.

- Square Foot pricing is the least accurate, but less time consuming to prepare. This method determines total square footage of an area and assigns an average dollar amount per square foot of that area.
- Assembly pricing is more accurate, and it takes into consideration an entire component of construction, such as a roof truss assembly, and arrives at a more detailed cost of the pieces for that component.
- Unit Pricing is the most accurate, but the most time consuming to prepare. It takes into account every item which needs to be purchased and installed for an entire phase of the work.

R.S. Means Company has developed a construction cost data base covering all phases of residential construction. The database is organized into trade sections covering square foot cost, assemblies cost, and unit price cost. Costs are broken under headings for material, labor, equipment, overhead, and profit. Since these are "average" costs, the Means Residential Cost Data Guide has factored a number of variables affecting costs such as quality, productivity, size of project, and location. There's also a list of other unpredictable factors covered in the book's content which may be useful for identifying less than ideal conditions on your project. Cost data guides from R.S. Means are also available for remodeling and refurbishing homes.

Referring to a residential construction data base is a good way to weigh and consider the bid proposals which are being submitted. Just be sure your cost analysis thoroughly covers all items in the Drawings and Specifications because the bid proposals form the basis of your Contract Documents. You may also want to consult with a Certified Public

Accountant familiar with the construction industry for professional advice regarding Cost Analysis.

You'll be determining what offer to accept based on price, quality, service, and compatibility. Your relationship with Trade Contractors and Suppliers isn't conditional upon lowest bidder. Your relationship is also based on adherence to Specifications and how well the bidder conforms to the conditions under which the work will be performed.

Remember: This process is an opportunity for ANALYSIS and NEGOTIATION!

Budget

A Budget is a financial plan for your entire Design/Build process. It is the dollar equivalent for all the work it takes to design and build your new home. You are NOT expected to create this document accurately at the outset of your experience so it's best to begin with estimates and refine your financial plan as time goes by.

The primary purpose of preparing a Budget is to understand and control costs. Beginning with estimates, one is able to approximate the total dollar amount for the style and size of home on a particular lot. At the very least, an Owner should be able to consider if the project is feasible once estimates are made. The total dollar amount can be broken into two categories: (1) hard costs and (2) soft costs. Hard costs include labor and material to build the house. Soft costs include everything else. The Budget format provided here outlines products and services which one utilizes during the Design/Build process.

The Budget estimate for hard and soft costs is a departure point for considering the scope of Drawings and Specifications. These budgetary considerations BEGIN early in the schematic phase of the Design/Build process. Consider the initial study of costs as an exercise in project feasibility. Based on your projection of costs, the Owner should be able to weigh and consider the Design/Build options.

With estimates prepared, you can now give attention to the Budget review process:

1. Identify priorities;
2. Recognize trade-offs;
3. Complete cost/benefit analysis;
4. Revise cost estimate.

Hard Costs

The following percentage estimate of hard costs is a ballpark guess. It simply is a beginning point for determining if the amount you have to spend is even close to the house you want to build. One should realize that this is a very VOLATILE estimate. For instance, if you choose the "Sub-Zero" brand refrigerator for your appliance package (and if comparable products are used), then you might as well accept that once you

complete your estimate, you will hold the price tag on a very high-end, luxury house. If you purchase the “Sears Best Buy” brand refrigerator for your appliance package (and remain with comparable products), then your estimate will result in a medium-priced, custom house. There is a cost range from economy, to modest, to custom, to luxury which CORRELATES with the products and materials you choose to install in your home. Match material/product choices with the price category in which you can afford to build.

Construction Budget Estimate by % of Hard Costs

(Includes Labor and Material ONLY)

<u>PHASES</u>	<u>%</u>	<u>NOTES</u>
Excavation	3 %	Full Basement
Structural Concrete	7 %	Footer, Walls, Flatwork
Framing	23 %	Floors, Walls, Sheath, Trusses
Roofing	3 %	3-tab asphalt shingles
Windows	4 %	Vinyl to energy code
Plumbing	5 %	Rough and Finish
Electrical	5 %	Rough and Finish
HVAC	5 %	Rough and Finish
Masonry	1 %	Decorative only
Siding	4 %	Walls and Exterior Trim
Insulation	2 %	Floors, Walls, Ceiling
Drywall	5 %	Hang, Tape, Finish, Texture
Sewer Hook-up	1 %	Ditch and Connectors
Water Hook-up	1 %	Ditch and Connectors
Paint/Stain	2 %	Interior and Exterior
Trim Package	12 %	Cabs, Counter, Doors, Millwork
Garage Doors	1 %	2 Doors with Openers
Floor Coverings	7 %	Vinyl and Carpet
Appliances	4 %	Standard Brand in White
Deck	1 %	Structural and Finish
Storm water	1 %	Gutters, Downspouts, Drains
Exterior Concrete	2 %	Garage Apron and Sidewalk
Final Grade	1 %	Machine and Hand Work
	100 %	

Soft Costs

The soft costs are even more difficult to estimate because they are in proportion to the hard costs. In other words, the higher cost of building creates higher costs in order to build. A review of the following items will provide a general guide of what one must take into consideration for soft costs. Assign a cost to these items based on their percentage of total hard cost estimate.

With a projected hard cost estimate of \$150,000.00, your soft costs would increase the project budget by an additional 50% (or \$75,000.00). The total cost of your construction project including hard costs and soft costs would be \$225,000.00.

Construction Budget Estimate by % of Soft Costs

All Permits (may differ)	8 %	(depending on your state)
Builder's Overhead and Profit	10 %	(may vary greatly, see below)
Site Survey	1 %	
Off-site Utilities	10%	
Clean-up and Recycle/Refuse	1 %	
State Sales Tax (will differ)	8 %	(depending on your state)
Landscaping	2 %	
Architect/Designer's Fee	10 %	(may vary greatly)
	50%	

Be aware of the volatility of both soft costs and hard costs. For instance, consider the 10% allotment (or \$15,000.00) for Utility costs, which would go toward Stormwater Management, Septic or Sewer Systems, and Potable Water. A system to handle storm water can be more expensive than a septic system and in some cases may be cost-prohibitive to build for conformance to your local ordinance. Whether you rely on a public sewer or a septic system, you will want to investigate costs and buildable size restrictions on site before you purchase a lot or begin with construction plans.

Issuance of a Building Permit will also require proof of water availability. There may be a municipal water system to your site, but if not you must consider the cost of a well and pump system to service your home. These factors must be taken into consideration to determine if the 10% budget allotment for utilities is sufficient to cover costs.

Builder's Overhead & Profit Breakdown

The following list is a further breakdown of Builder's Overhead and Profit. The breakdown assumes a 10% fee of total hard cost estimate. For example, let's again assume your estimate of total hard costs will be \$150,000.00. With Builder's Overhead and Profit at 10% the amount would be \$15,000.00.

Phone, Fax, Mail	5%
Outdoor Toilet	5%
Office Equipment, Supplies	5%
Rental Equipment, Tools	5%
Automobile Gas, Maintenance	5%
Temporary Heat, Power	5%
Builder's Bond/Liability Insurance	5%
Miscellaneous Hardware	5%
Job Shack	5%
Overhead Labor	10%
Bid/Negotiations	5%
Superintendent	20%
Profit	20%
	100%

Keep in mind that this Budget Estimate is just a beginning point: it's a means for you to better understand how money MAY BE proportioned into various categories. For instance, let's consider Builder's Profit. On a \$150,000.00 project, is it reasonable to expect a Builder to only make \$3,000.00 in Profit? If you take over the duties of the General Contractor as an Ownerbuilder, wouldn't you want to experience more sweat equity? Then, why would you ever begrudge a GC from making more Profit on the management of a project?

Architect/Designer's Fee Breakdown

The following list is a further breakdown of the Designer's Fee. The breakdown assumes a 10% fee of total hard cost estimate. For example, let's again assume your estimate of total hard costs will be \$150,000.00. With Designer's Fee at 10% the total amount would be \$15,000.00.

Schematic Design	15%
Design Development	20%
Contract Documents	40%
Bid/Negotiations	5%
<u>Construction Observation</u>	<u>20%</u>
	100%

Keep in mind that your home design may be acquired from a stock plan service rather than hiring an Architect to provide this service. If you purchase a stock plan for \$1,000.00 rather than spend \$15,000.00 on full architectural services, then you've radically changed how money will be proportioned in your anticipated budget. This type of flexibility is what your Budget Estimate is all about!

Understanding the Process

Budgetary activity can be accomplished at a very rudimentary level literally months before construction begins. Your project may not be feasible now but that doesn't mean one shouldn't prepare for the future. It's never too early to look at three key ideas: objective, strategy, and plan.

An OBJECTIVE is a defined target or position that can be quantified; it is developed from an analysis of the situation at present and projected future development. A STRATEGY is one of the several ways possible to reach an objective. A PLAN is the detailed outline of activities which will be undertaken to satisfy the strategy selected to reach the agreed objective.

An example: You enjoy the home in which you currently live but realize there will come a time when you build a similar residence in a different architectural style. That's the situation: you understand your lifestyle but want to alter your homestyle. More objectives than one are possible, but you decide on one OBJECTIVE: to stick with a similar floor plan but change the motif and decor.

Several strategies come to mind. You can let the situation continue and wait until you find a house for sale which meets your expectations. You can remodel your existing home. You can create a ball park estimate for the new house and complete a feasibility study of Design/Build costs. There are a number of strategies possible but you select one STRATEGY as being most practical for your wants and needs: to do a feasibility study.

Your PLAN is: 1-go to the public library and review plan books or trade magazines for helpful ideas, 2-find a similar house for sale through a local builder and get the "asking" price, 3-use the "Budget Estimate" format for hard and soft costs to breakdown costs into discrete categories, 4-visit local Suppliers and choose products for your new house, 5-compare the quote from your local Suppliers with the percentage estimate, 6-complete the budget review process.

Remember: The primary purpose of preparing a Budget is to understand and control costs. Ideas must take shape and become quantifiable. Project familiarization requires one to move from generalities to specifics. What begins as a vague notion or a few sketches on the back of a napkin, evolves into an itemized list of services, products, and materials chosen specifically for your home design. Or, you may decide to purchase a pre-built home based on your desire just to get into a new home as quickly as possible.

Getting started on a Budget can be very exasperating with no formal training in business. The example described in the previous paragraphs suggests a "seat of your pants" approach but when you get serious, the Owner must take the time to produce a written PLAN OF ACTION.

As the pressures of starting a construction project increase, you'll begin to ask yourself, "Why are we doing this? What do we want from our lifestyle? How should we create our homestyle?"

Begin with a written statement of your OBJECTIVE. This statement will describe the purpose of your endeavor by defining your values and concerns. Try to answer questions like "What do we want this project to achieve?" and "What type of impact will me make on the community in which we live?"

Don't expect to write your objective statement in a few minutes. Take your time. Savor the moment. Go to a favorite cafe or park bench making this a special occasion.

Once your Objective has been defined, you'll begin to ask yourself, "When do we do this? How do we accomplish this? What are our financial goals for the next 24 months?"

Your next step is to prioritize your activities so alternative schemes can be considered and general ideas become more definitive. By developing a STRATEGY, the Owner accepts that there may be multiple ways to reach one's objective, and ample time should be given to considering the options.

As you consider options, be ready to attach costs to the various phases of construction. What you're considering is a list of services, products, and materials for your home. This is a financial projection of what will happen if you go "this way" or "that way." Enjoy the luxury of being able to change your mind.

Now the options have been considered, the Owner is able to direct attention to a specific PLAN. This doesn't have to be fancy. Simply state how you expect to reach what it is you hope to accomplish. Establish hard and soft costs basing estimates on what you can afford and what you want, and compare them with the percentage guidelines. Go to the marketplace to check your estimates with actual costs. If the actual costs go beyond the percentage guidelines, consider a different strategy for reaching your objective or maybe begin to challenge your preconceived notions of what's a reasonable expectation.

Writing a plan of action will only be worthwhile if you review it regularly and revise it when necessary. Don't expect to get it completely right the first time, and allowances should be made for flexibility. Your Budget Estimate is a LIVING DOCUMENT!

Schedule

In home building and remodeling, people rely on one another. Their relationships are interdependent. When you create a Schedule what you're actually doing is arranging events between people. You're making your best effort to organize people and events before the first shovel full of dirt is turned.

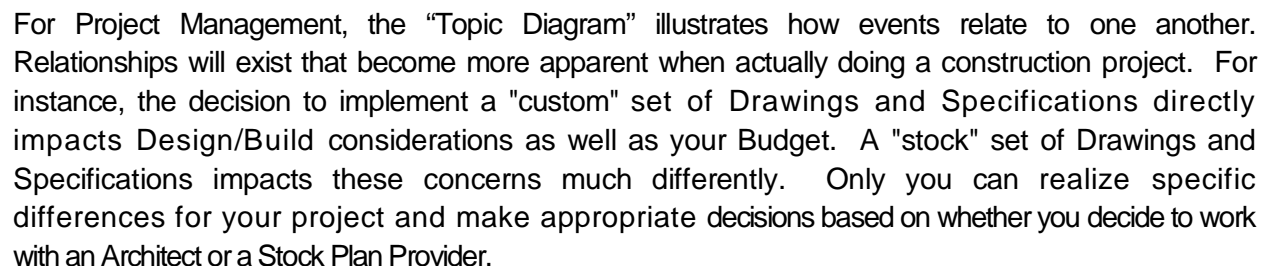
This is not a clean, neat operation: There will be conflicts between Design and Build considerations. Individual differences between participants will create competing values and concerns. Dissimilar sensibilities impose varying standards for Quality Control. And when you're told by a Trade Contractor, "I'll be there on Monday morning," what does this really mean?

For a construction organization to remain effective, the Owner must maintain a dual fit between what goes on in the marketplace and what occurs on the jobsite. The Owner stands in the "middle" looking both directions. On one hand, there's the economic environment comprised of realtors, lenders, realtors, public agencies, manufacturers, suppliers, and trade contractors. On the other hand, there's the site criteria defined by Owner's life/home style, soil conditions, weather patterns, access to public utilities, and flow of work activities.

What this means is the Owner should recognize the natural linkages between off-site and on-site events. The point is to Design/Build with people in mind. The Owner formulates an "agenda" when doing a construction project taking into consideration the key events for management of a residential construction project. By defining what best fits your situation, the Owner is prepared for the uncertainties, and provides leadership to the entire organization of people. Here are the key elements for management of a residential construction project, either new construction or a remodel project:

- | | |
|-----------------------------------|------------------------------|
| 1. Project planning | 10. Cost analysis |
| 2. Decision making process | 11. Purchasing |
| 3. Design-build matrix | 12. Trade contractors |
| 4. Building green | 13. Suppliers |
| 5. Contract documents | 14. Scheduling |
| 6. Drawings | 15. Safety |
| 7. Specifications | 16. Quality control |
| 8. Permits | 17. Punchlist |
| 9. Budget estimate | |

TOPIC DIAGRAM



section five | | page 2

much time you are able to give to the details while still holding everyone accountable for their work. People make the difference!

The best way to describe the interaction of B.Y.O.B. Design/Build events is to understand that both linear and system formats can be useful to you. Approach this endeavor like a painter: you don't start at the corner of the page and work down; you put on one layer and then another layer, step back, and put on another layer. Yes, there is a scientific aspect to residential construction utilizing existing technologies, but the B.Y.O.B. Design/Build process is also an artistic endeavor. The challenge is to draw on your full potential to create a home-style which matches your lifestyle.

The "Topic Diagram" provides the big picture, systems view of your project. But, to insure Quality Control during the course of construction, you'll also want to micro-manage the day-to-day relationships on your project.

Your ability to Schedule during course of construction is based on your competence at assigning priorities to various items of work to accomplish the desired end result in an orderly fashion. The "Generic Schedule" provided here is for a typical residential construction project developed over a six month period of time. It's useful as a general model, but should NOT be misconstrued as being applicable to every situation.

The "Generic Schedule" is presented provided to you as a DIALOG TOOL. You can share it with Trade Contractors and Suppliers during negotiations so every individual can comment on its accuracy. Adapt it to your situation! Most definitely, you'll want to fine-tune it by collaborating with the individuals who'll actually do the work.

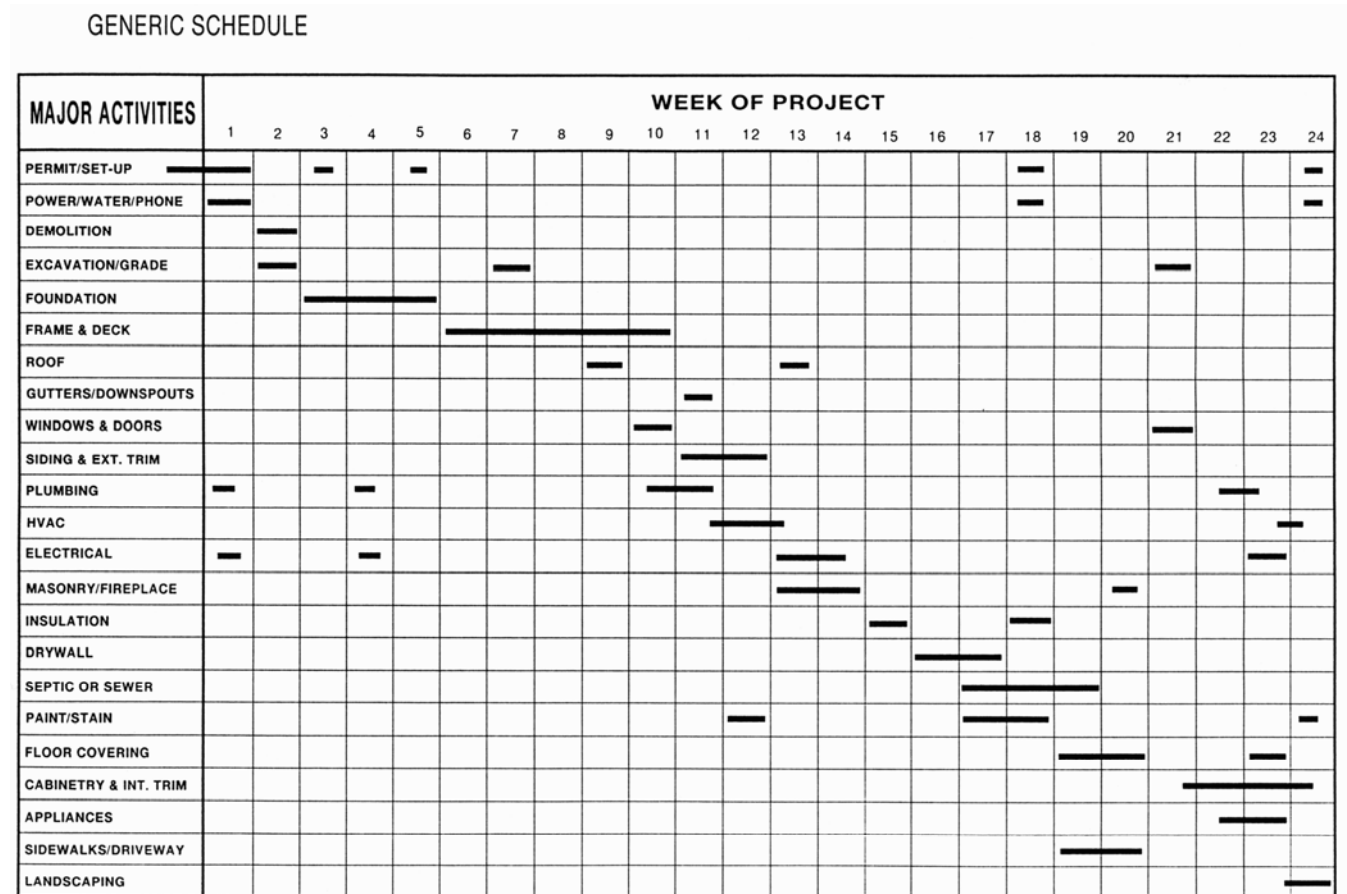
The Bar Chart is probably the best known scheduling technique. For the purposes of scheduling major activities of a construction project, the chart indicates project sequence and scheduling of each major activity plotted on a weekly time scale. The chart has certain shortcomings which limit its usefulness but once aware of these inherent weaknesses, the Owner can rely on it as a beginning point for dialog with the people on your team.

A list of a Bar Chart's shortcomings would include:

- Failure to require a detailed analysis and further breakdown of major activities.
- Omission of indirect, support tasks such as tool maintenance or material purchases.
- Failure to communicate complete details of the project schedule which indicate activity interdependence.
- Failure to indicate adequately the consequences of scheduling changes.
- Failure to provide a suitable means for updating purposes.

From the standpoint of the Owner, the "Generic Schedule" is easy to visualize and understand its meaning. One possible solution to overcome the inadequacies of a Bar Chart is to note, during review of the B.Y.O.B. Design/Build Matrix, pertinent information which would affect activity

duration and changes. This means asking Trade Contractors and Suppliers for assistance in determining length of activity durations and possible obstacles to completion of their work.



Another possible precaution is to understand that the Bar Chart is a "paper model" and, like all scheduling techniques, the results will not always meet one's expectations or the reality of working under field conditions. This approach helps one to realize that all ideal types have limitations and to accept difficulties; however, this does not mean we reject using a model as a reference.

Anticipating construction relationships and key events is central to successful scheduling of your project. For instance, site layout will involve placement of a portable toilet, job shack, and recycle/refuse bins. Simultaneously, you'll want to consider location of temporary electrical power pole, telephone cable, and water supply. Positioning of these items will require the Owner to consider current and future use. Site logistics is vital for an efficient and effective schedule.

Preparing for Trade Contractor's work and Supplier's support will also demand foresight. The idea of good coordination is to plan and organize for labor, material, and products before they are

needed on site. An example would be ordering the exterior door package which includes choosing products and doing field measurements, transporting the package to the finish shop, and scheduling delivery of exterior doors for installation. Part of the framer's contract should include the setting of the exterior door package, and obviously the Owner's responsibility is to make arrangements for the package to be on site during the final week of the framing phase.

Weather conditions also become a concern for control of project schedule. Part of the Owner's evening routine will include watching the five-day weather forecast so one's expectations of the coming week's activities will match what the weather will accommodate. For instance, scheduling a concrete pour for sidewalks and driveway on a "dry" day guarantees a better finish. Why take a chance on inferior finish when there's only one chance to do the job correctly?

Remember: there is no replacement for critical thinking and analysis of your project to determine both standard and unique elements of your project. Planning, organizing, and controlling construction activities are the heart of project scheduling. Keep work activities in natural sequence and don't play hopscotch with your project's Schedule. Here's a list of questions to consider when scheduling:

- | | |
|---|--|
| <ol style="list-style-type: none">1. When will the building permit be issued for construction to begin?2. Do a complete set of specifications exist to accompany the drawings?3. Are house dimensions established on site?4. Do front, side, and rear yard dimensions conform to setback requirements?5. Did you ask utility companies to verify all utility locations?6. Will electrician and plumber coordinate and install temporary services?7. Is demolition or clearing required prior to excavation?8. Does your landscape design include storm water control?9. Is final grade established prior to excavation so elevations can be set?10. Is a soil test required for a foundation design by a structural engineer?11. Did you meet with excavation/foundation contractors to discuss site layout?12. Will framing contractor order lumber package in a "phased" delivery? | <ol style="list-style-type: none">13. Are exterior windows and doors ordered so they can be set during framing?14. Who is responsible for arranging inspections by respective agencies?15. Do mechanical systems require roof penetrations?16. Did you schedule masonry or fireplace installation?17. When will mechanical contractors meet on site with framing contractor?18. How soon can the roof covering be installed?19. When will the exterior decks, siding, and trim be installed?20. Are there conflicts between plumbing/heating layout and structural elements?21. Did you meet with electrician to discuss outlet, switch, and fixture layout?22. Will the cabinet supplier visit the site to confirm all dimensions?23. When will the millwork and interior door supplier visit site to confirm layout? |
|---|--|

-
24. Prior to insulation installation will you do a video recording of rough-in?
 25. When will septic or sewer installation be installed and inspected?
 26. Is the exterior trim and siding ready for paint and/or stain?
 27. Are floor coverings specified and ordered for installation?
 28. When will weatherization package by insulation contractor be installed?
 29. Are wall, ceiling, and floor insulation scheduled?
 30. Is ample time allowed to hang, tape, finish, and seal drywall?
 31. When will the painter complete interior wall coverings?

32. Will appliance supplier warehouse your order until you're ready for delivery?
33. Can the landscape be installed during trim package installation?
34. Are you ready to install sidewalks, patios, and driveway?
35. When will you take delivery of cabinets and interior trim package?
36. Are your punch list items completed?
37. Who will perform final cleaning of house?

Dialog and collaboration are the keys to creating a reliable schedule!

Site Work

Be Forewarned: You may be heading through a vale of tears and sorrows or into one of the most enjoyable experiences of your life. Different land professionals from different regions of the country define what may be called a "buildable site" differently. To some professionals, a "buildable site" means the city, county, state in which the site is located will simply ALLOW you to build on it. Is it economically feasible to do? A lot of times it may be allowable by government agencies but just too expensive to develop!!! Other professionals use the phrase "buildable site" to define a piece of land's characteristics. Language like, "Very buildable, gently sloping, 1.18 acreage." may mean it's pretty to look at, but might be a nightmare when it comes time to install a septic system. To a more experienced professional, a "buildable site" would mean the lot is ready to build -- feasibility studies completed, all utilities available at the site, sometimes even permits for services available.

Bottom line: Research the property.

Does the site meet every requirement at every level of government?

This research can be a trying experience and you may want assistance from someone who's familiar with the process to guide you. Ask all the questions a few times, a different way each time. Government employees are notorious for answering exactly your question and nothing else. If you ask the wrong question you may get the wrong answer.

Remember: It's not a government employee's job to engineer a solution to your problem. Their primary role is to hold you responsible for the design solution you present to them. Don't expect them to do your work!

There is no "guaranteed" way of determining if a site is "buildable" until the governing jurisdiction says it is. The different governing authorities have many and varying sets of criteria ranging from issues like minimum lot size to environmental impact.

First things first: Legal Status

Inquire with the county land assessor regarding legal status. Tell them where the site is located, and they'll provide you with a plat map of the property and legal description. Check if there are any easements of any kind recorded on the site.

If you have a difficult time moving forward on your property search, seek the assistance of a reliable Real Estate professional familiar with residential properties. Be sure to look for a professional with great credentials and a content-rich web presence.

Second concern: Zoning

What is the zoning of the site? If it's not [zoned](#) for what you want to build, what will it take for a variance, or to change the zoning? If it's zoned correctly, find a builder/contractor or survey/land planning company or realtor to get an idea of what may be some of the issues in order to build on the site -- too steep, heavily treed, flood plain, seismic zone. There could be many, many different issues with which to contend, or it could be a very desirable location.

Third concern: Liens

With the address of the property and legal description in hand, contact a title company and find out if there are any liens against the deed or if the site is technically or physically encumbered in any way. If you don't have access both legally and geographically, you can't get building materials to the site!

Fourth concern: Buildability

Go to the county or city planning department and ask them what needs to be done to make the site buildable. "Buildable" may mean whether the soil will perc, will not fall off a cliff, or will not experience flooding. Find out if a septic system is allowed! You may be required to tie into a public sewer system; otherwise, you'll install a septic system. A septic design specialist will determine whether it will perc. (A percolation test is a soil test to see how fast water drains through the soil.) If it percs, application to the county for a septic design approval will determine if the design is appropriate. After that you will incur the cost of installation per design and county regulations.

Where are the other utility services located? Utility services such as electrical power, potable water, fire hydrant, and telephone cable are necessary. How much will it cost to bring them to the site? Do you need alternatives like a water well or tie into a community water system? How much will utility hook-ups cost? Is natural gas or television cable available to the site?

Are any environmental studies required? Are there any wetlands, creeks, lakes on OR NEAR the property? What is your state's legal definition of a wetland? How far is the setback for your house from wetlands or waterways? What possible mitigation might be required? If the site is on or near a hillside, is it in a seismic hazard or landslide area? How much will the geotechnical analysis cost to prove that the site is stable? What precautions are necessary for storm water control?

Fifth concern: Constraints

Is the site located in an area that constrains the design/build process in any way? A city that is concerned about the aesthetic values in a historic neighborhood will usually require an architectural review committee to judge whether or not the design preserves the historical integrity of the locality. If these criteria don't appeal to you, then the site is not buildable.

Similarly, in most developments a set of "covenants, conditions, and restrictions" (CCR) will establish building standards to which you must adhere. Items such as brick veneer, tile roof, or landscape may be mandatory for every home. You may not be allowed to construct additional structures on the property or park recreational vehicles adjacent to your home. If the CCR's don't appeal to you, then the site is not buildable.

Key items to VERIFY:

- legal description and property tax identification
- zoning designation and requirements of lot size/setbacks
- title search for legal or technical encumbrances
- potable water availability and certificate of availability
- sewer availability or approved septic system design
- electrical availability and requirements of public utility
- natural gas availability and requirements of public utility
- fire protection availability and requirements of fire marshal
- driveway accessibility and easement to site if necessary
- storm water drainage and requirements of local authority
- telephone and television cable service requirements
- necessity of a geotechnical analysis
- necessity of a sensitive area review
- covenants, conditions, and restrictions for development
- CALL DIG SAFELY 888-258-0808 TO PREVENT UNDERGROUND DAMAGE

Some high-cost items which may deter site development:

- LENGTHY WATER LINE
- LENGTHY SEWER LINE
- LENGTHY ELECTRICAL LINE
- FIRETRUCK TURNAROUND
- ASPHALT ACCESS ROAD
- FIRE SPRINKLER SYSTEM
- STORMWATER CONTROL

Sixth concern: Building Permits

Ask the building code enforcement department for a copy of their application procedure for a building permit. This document will outline the necessary information required by the agency having jurisdiction over issuance of a building permit. It will not entirely describe the criteria by which this information will be judged, but you'll at least obtain their guideline for application.

Most likely, there'll be a myriad of details to consider when compiling the information required to apply for a permit but that's not the point of obtaining a copy of these procedures. The point is to understand the issues which you'll need to address when building on this particular site. For instance, what if there's a building moratorium due to lack of water availability within the jurisdiction where the site is located?

Finally: Purchase Offer

Make your offer to purchase the property contingent on the site being buildable to your satisfaction. You may be very interested in the site but need some time to do your research. Don't lose your earnest money because you've failed to include this contingency with your offer!!!

Above all else, remember most professionals from whom you'll be seeking information are employed to protect and maintain the public's health, safety and welfare. Nothing is gained by an adversarial relationship. These folks are bound by laws, ordinances, and codes which have been enacted by state, county, and city authorities. Their job is to inform the public and enforce the law. As you work to determine whether your site is buildable, maintain a positive, proactive attitude. It's better to discover the "truth" about a potential site before the land is purchased, but it's no one's fault but your own if you've purchased the site before you did your homework.

Your potential home site may or may not be buildable. Verify that it meets every requirement of the agency having jurisdiction over its location before proceeding with purchase or development of real estate.

DRAWINGS

As you develop Drawings for a new home, be sure that you consider what you want based on the way you live. Before deciding on a design, make a list of those features you find most valuable to your own style of living. (Read the “Home Plan Questionnaire” at the end of this article.) There is no standard procedure for arranging your ideas: your approach will reflect the unique circumstances surrounding your home life and characteristics of your site.

A good starting point might be rough sketches of a Floor Plan, the most fundamental element in a set of Drawings. Many basic decisions are made while considering a Floor Plan such as site orientation, room layout, wall placement, door types and swings, window types and sizes, electrical and plumbing fixtures, cabinets, and trim package. These are not firm decisions, only a way to TEASE ideas onto paper and begin to arrange your thoughts.

A floor plan is a road map of your lifestyle. It's a top view, drawn to scale, showing all the interior features. You'll find that all designers use architectural symbols, which are standard icons, to represent objects that appear in your home. Bath tubs, showers, sinks, and appliances are all represented by symbols. There are standardized acronyms that also appear on the Drawings but these aren't your main concern. Your concern should not be how to create Drawings...your concern should be defining your lifestyle so you get the home style you need.

There are several ways to acquire a home design. One way is to use one of Barden Building System's plans. A second is to purchase a Stock Drawing from a plan book bought through a mail order service. Another way is to retain the services of an Architect or Designer to produce a custom design. A final way would be to note a house in a local neighborhood then contact the General Contractor to replicate a similar house on your lot. A variation on any of these approaches may prove successful; for instance, develop your rough sketches, find a similar stock plan then hire a Residential Designer to assist in changes to fit your requirements.

No matter what method you use to acquire a home design, the main point to remember is that this is a creative process. Most Designers consider themselves to be Artists. Their personal style will dictate how the Drawings are rendered and assembled.

Rather than suggest one method of acquiring a home design over another, it may be best to consider what all Drawings have in common. All Drawings are created through a design process from Schematics, to Design Development, to Contract Documents, to Bid/Negotiations, through Construction Observation. Whether the Drawings are stock or original design, there are universal elements common to all Drawings.

A Complete Set of DRAWINGS will include these Universal Elements:

Site Plan – This bird's eye view of your site shows the lot boundaries, the structures on the lot, any existing features, and the compass direction. It should also indicate any required setbacks and topography contours.

Foundation Plan – This drawing shows layout and dimensions of slab-on-grade, basement or crawlspace walls depending on what best fits your site plan. It indicates how the underpinning structure of your house is supported by the earth below it.

Floor Plan – This drawing shows the room layout of your home. It's the most user-friendly page of the Drawings because it indicates room use, doors, windows, fixtures, cabinets and built-ins. Most of the construction details originate from the room layout of your home.

Framing Plan – This drawing is an oversimplified floor plan showing just the walls. Besides that, the joists, trusses and beams are usually depicted so the structural aspect of the building is revealed.

Roof Plan – This drawing is a top view of the entire roof system, including ridges, hips, valleys, rakes and eaves. It may also indicate where gutters and downspouts are located.

Mechanical Plan – This drawing is an oversimplified floor plan showing the

location of electrical, plumbing and HVAC details. If the house is complicated, a different sheet is dedicated to each trade specialty separately.

Elevations – This drawing shows the front, side and rear exteriors of the house. This drawing of the house provides a flat, straight-on view so you can see the siding, windows, doors, and the entire outside of the building from ground floor to roof ridge.

Cross-sections – This drawing shows all the hidden details of the house by cutting an imaginary line through the middle of the structure so the interior of the walls, floors, ceilings and roof can be examined. This view shows all the major elements of your house's construction.

Details – This drawing highlights specific areas of construction where details need to be shown in order for the building crew to join together the structure. Specific areas, such as foundation connections, door assemblies, and window installations, are presented in greater detail.

Schedule – This chart appears on the drawings, listing doors, windows, fixtures, and hardware. Under each category, there's an indication as to where each item is located within the building, accompanied by the manufacturer's make, model, and size.

Every life and home style is unique. The B.Y.O.B. Design/Build process itself will have its own special conditions. A set of Drawings will assume the unique characteristics of your situation and the Architect/Designer's approach so the document's sequence may not appear exactly as just

described; however, to be complete and correct, all elements should appear.

Of course, the best way to familiarize yourself with the details of your project is to follow the B.Y.O.B. Design/Build Matrix from the very beginning.

However, if you choose a Barden plan or a Stock Drawing from a plan book, you've eliminated Schematic and Design Development activities which are important to familiarizing yourself with the many variables which contribute to how the Drawings are created. If you choose a Stock Drawing, your first contact with your design will occur during preparations to submit for a Building Permit. If this is the case, proceed cautiously while reviewing the Drawings and creating Specifications for the design. Major alterations to your design after Drawings are approved by the Building Department can be costly and difficult.

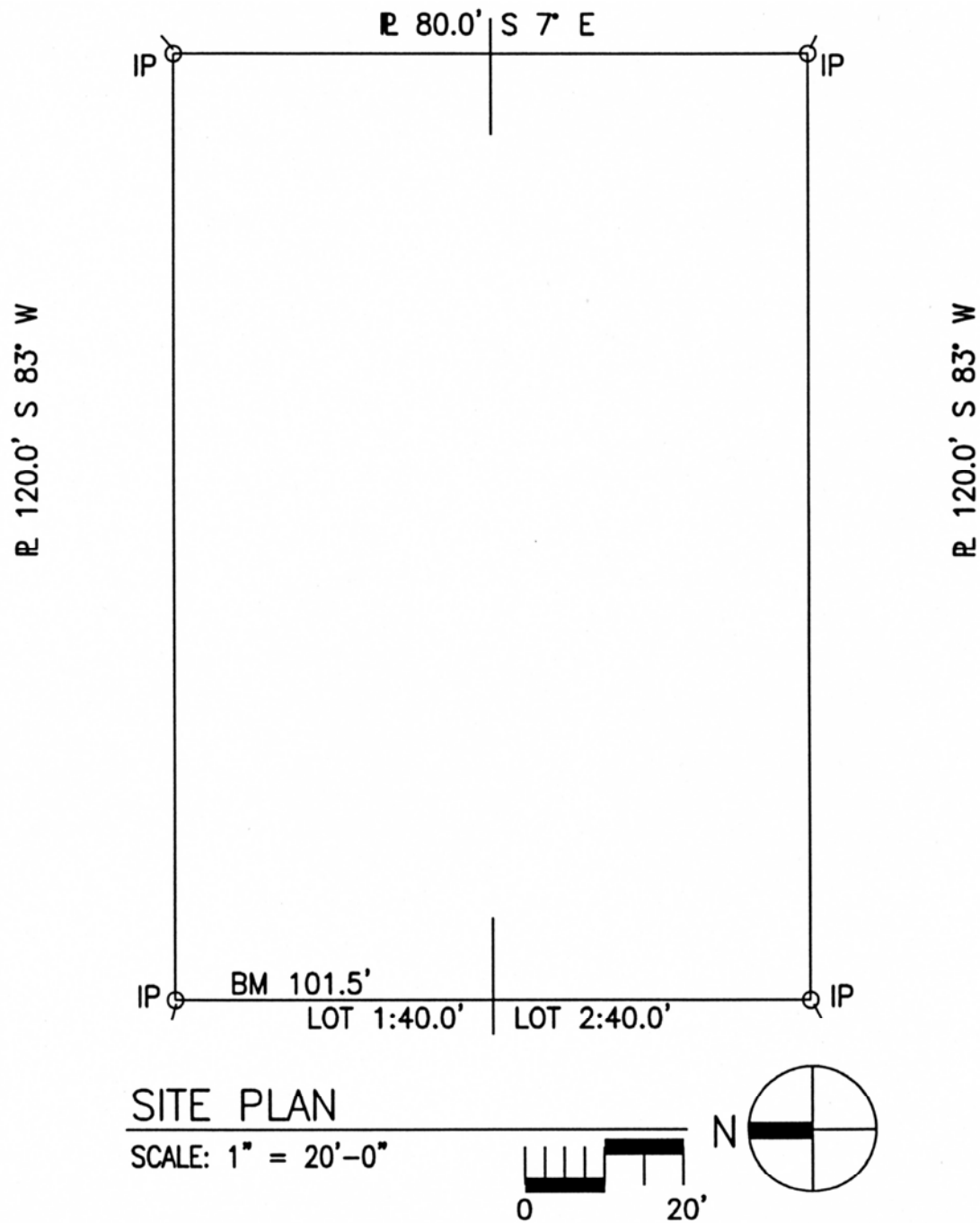
After your Drawings are returned from the Building Department, there will be two official sets: one for the Field Inspector and the other for the Owner. The official set should never leave your files; use extra copies of Drawings to circulate among Trade Contractors and Suppliers for bid proposals; watch for any changes by the Building Department on Drawings.

Remember: Look over the whole set of Drawings as you seek proposals from Trade Contractors before beginning the job. Take notes about points that seem unusual or in need of extra study. Be sure that door, window, electric, plumbing, HVAC (Heating, Venting, and Air Conditioning) and trim package Specifications conform to Drawings. Every piece of material, product, or equipment should appear in respective Trade Contractor's proposal.

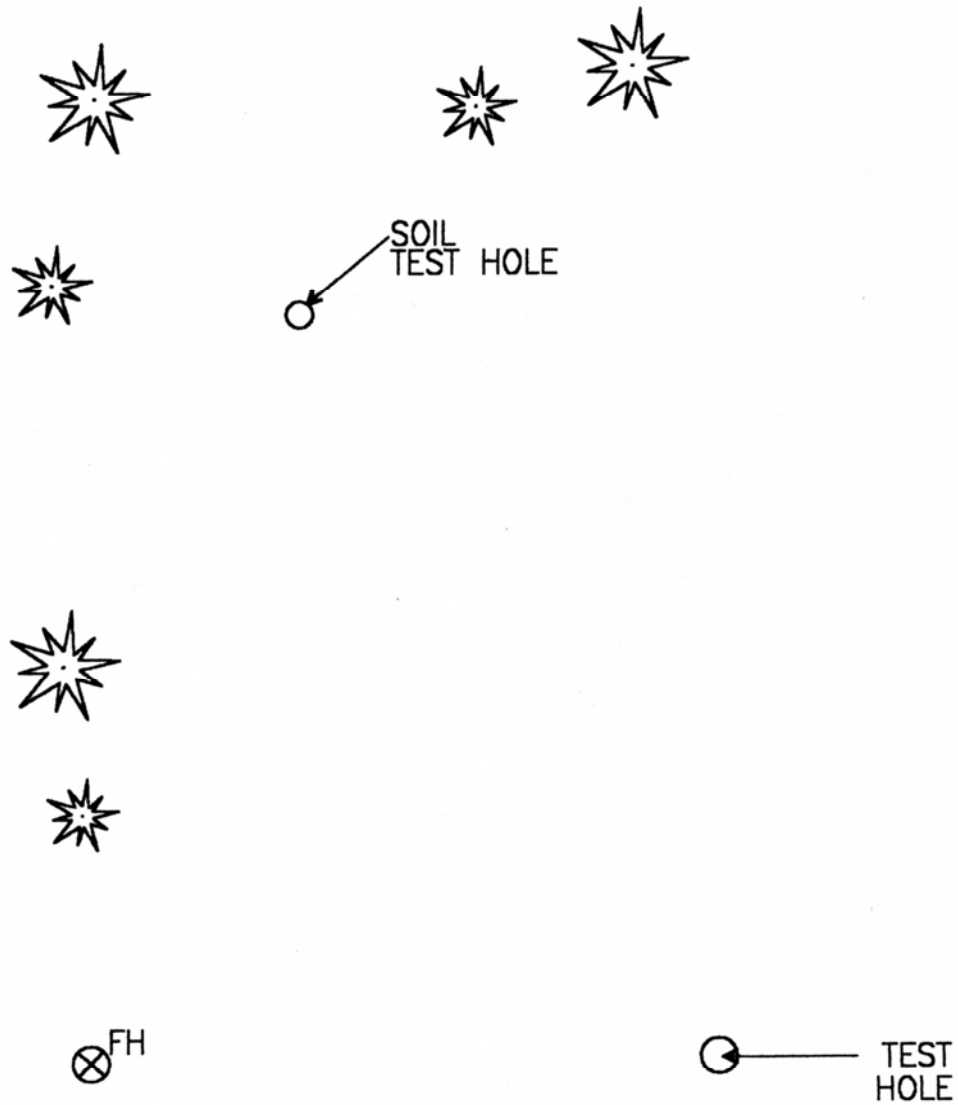
Regardless how complete a set of Drawings should appear, ambiguities will manifest themselves on the job, as the Trade Contractors proceed with their work. Too often, Drawings are so crammed and cluttered that Trade Contractors miss information and misread them when preparing bid proposals. The only way to avoid this type of problem is to become very familiar with all aspects of your design and review layout and details with each Trade Contractor during Bid/Negotiations before work begins. As time consuming as this may seem, every competent General Contractor invests this time and effort in preparing for a construction project in order to avoid material and monetary losses.

The following sequence of pictures is a set of overlays which in combination depict a typical Site Plan. The overlays are provided to illustrate how one might "read" information symbolized on a set of Drawings by separating the layers of information.

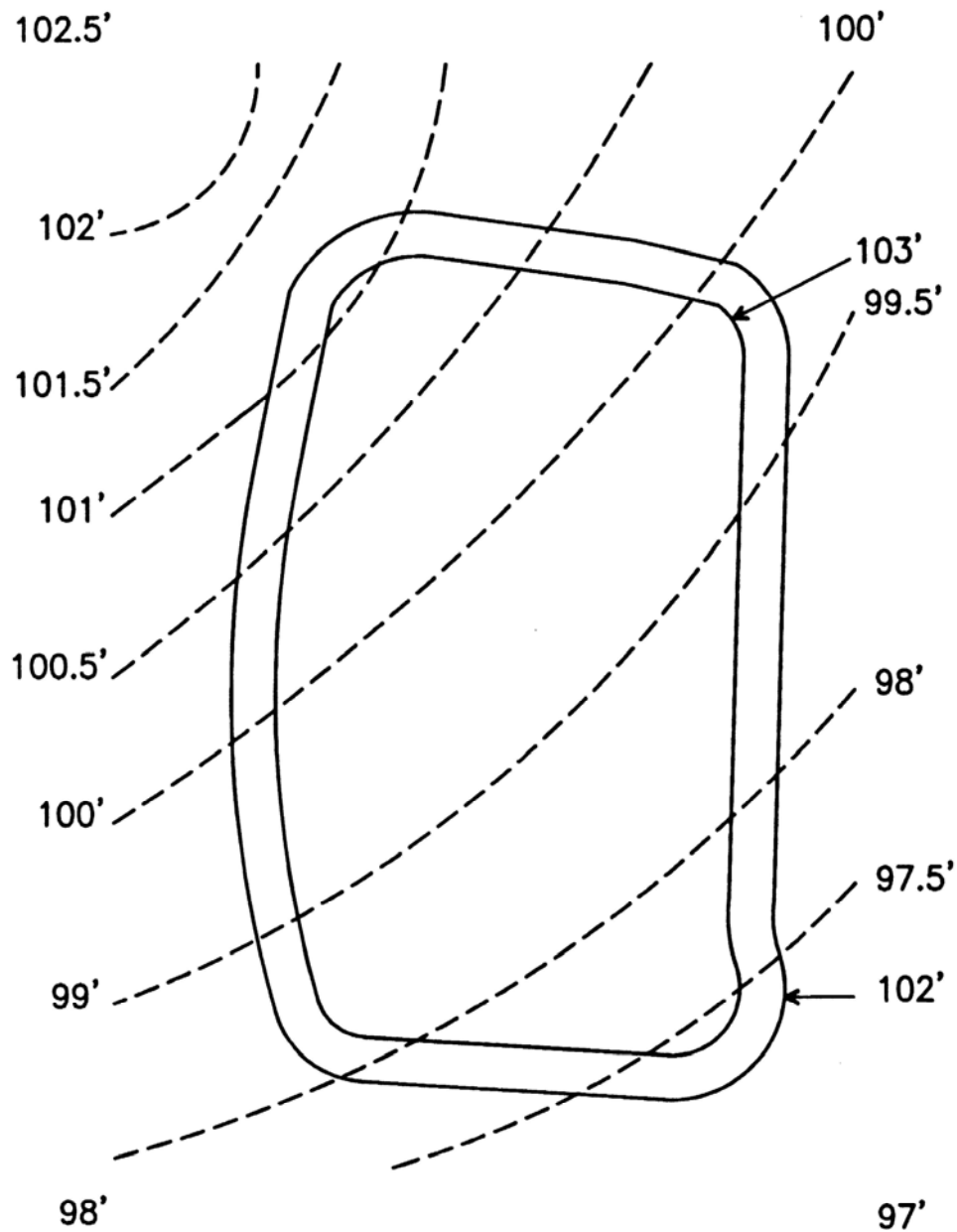
On the first overlay, information pertaining to a legal survey is presented. A "North" Arrow, Dimension Scale, and Property Lines indicate bearing and length of boundaries. The "IP" symbol shows the location of an "Iron Pipe" at each corner of the building lot. The "BM" symbol provides a "Bench Mark" elevation in the lower corner of the building lot.



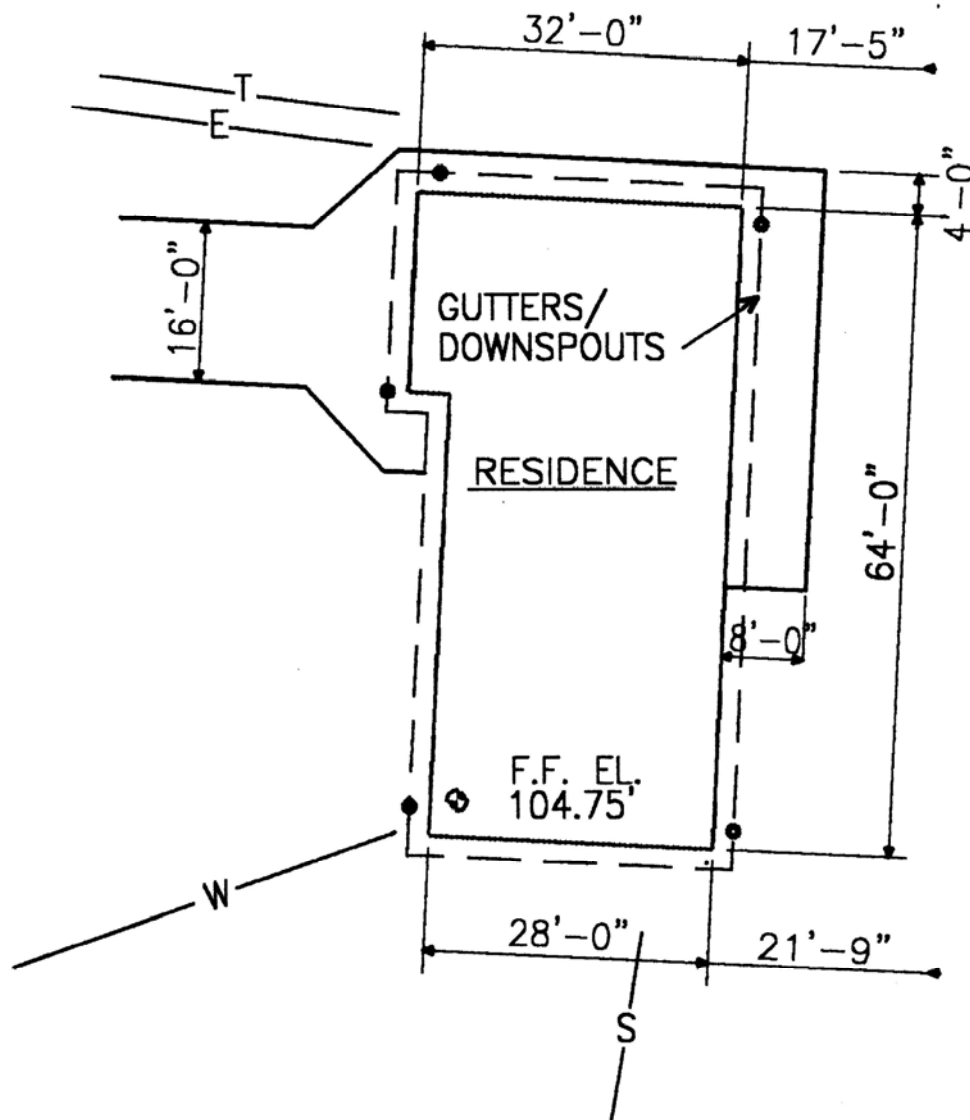
On the second overlay, there's a graphic representation of the raw land with the location of the largest trees, fire hydrant ("FH"), and several test holes which were dug on site in preparation for construction work. In this case, the fire hydrant becomes the fixed point on which the "Bench Mark" elevation has been established for future use.



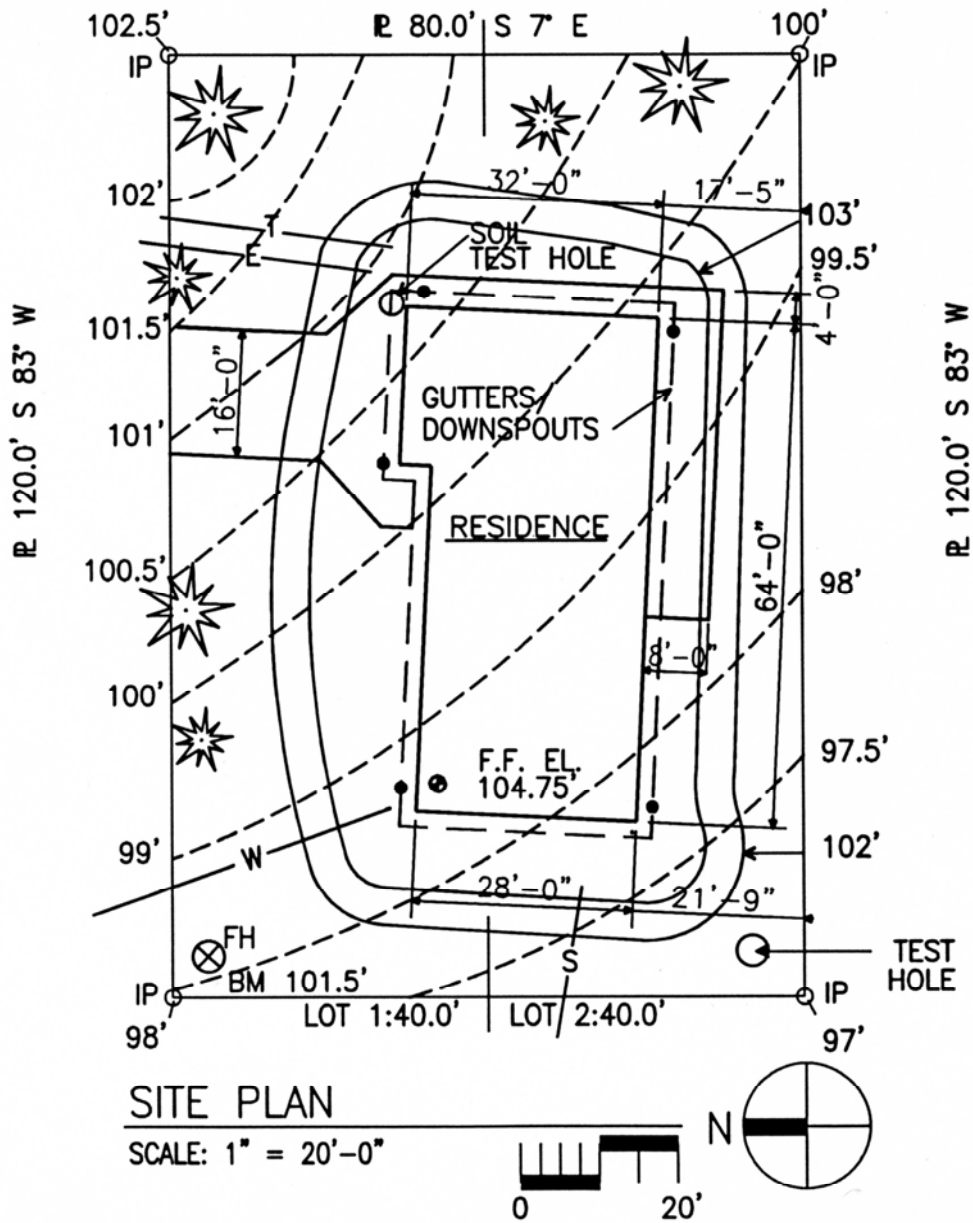
On the third overlay, a topographical profile describes current and future contours of the landscape around the house. The dotted line represents the current contour, and the solid line represents the future contour after the home is completed. The contour elevations are established in relation to the "Bench Mark" elevation taken from the top hub of the fire hydrant.



On the fourth overlay, an outline of the house and driveway indicate their location on site. Overall dimensions are also provided, and the gutter and downspouts are represented by a series of dashes around the house perimeter. The "F.F.El." symbol gives the "Finish Floor Elevation" in relation to the "Bench Mark" established on site. Access for utilities are indicated by "T" for "telephone," "E" for "electrical," "W" for "water," and "S" for "sewer."



The final picture depicts the Site Plan's "layered effect."



There's only one way to learn how to "read" construction Drawings: study, study, study. As you immerse yourself in the details of your project, the lines, dimensions, objects, and symbols will gradually begin to hold meaning. There's no short-cut.

Remember: Your role is to define a homestyle which matches your living pattern and unique site characteristics. Ideally, every design will be created individually, and an appropriate response developed for each situation. Your first impulse may be to memorize the icons and mimic the drawing techniques of the design profession. Resist this impulse. There's no need to purchase design software or drafting equipment for doing just one house. Architects, Designers, and Plan services are ready to offer this technology to you but you can't go to them empty handed. Your job is to DEFINE how you intend to live and CHARACTERIZE the best place in which to do it.

Let's consider the principal element of a design: the floor plan. An enormous amount of thought and coordination must go into the floor plan so rely on your instincts and allow the design to gradually evolve (See "Design/Build Collage" in the PUNCH LIST article.). Take advantage of the "layered effect" by grouping your ideas on separate sheets of paper without worrying about how they might go together. Rest assured: your mind has the capability of self-organizing, a natural means of comprehending the unified whole, which will eventually bring together the disparate pieces.

Ask yourself: "How will I approach the house?" Your response to this question will raise issues relating to car garage, parking, pedestrian pathways, deck, front door, vestibule, and foyer.

Next question: "How will I arrange the living spaces?" Your response to this question will raise issues relating to floor levels, stairways, activity areas, privacy, public centers, and family functions.

Now consider: "How will the interior/exterior relate to one another?" Your response to this question will raise issues relating to windows, doors, views, sounds, roof, climate, geographic factors, topography, and vegetation.

Home PLAN Questionnaire

About the Owner:

1. Who are the family members and their ages?
2. Are there any special needs regarding accessibility?
3. Where does your family spend the most time together?
4. Where does your family eat meals together?
5. Does your family enjoy any hobbies together, or do you engage in family activities in separate areas?
6. How do you entertain?
7. How important are formal living areas to you?
8. How do you plan to use your yard?
9. MOST IMPORTANT: What amount of money did you pre-qualify with your construction lender, and are you using this dollar figure as the basis for proceeding in the Design/Build process?

About the property:

10. What are the dimensions?
11. What is the topography?
12. Are there any special features, such as views, water, trees, adjacent property, steep slope, historic preservation, and home association?
13. Are there any owner requirements, such as driveway access, parking, ramps, rockeries, outdoor living areas, decks and patios?
14. Is the utility infrastructure available to the building site, such as water, power, gas, sewage, cable, and storm water?
15. Does the site buildable according to the standards of the agency having

jurisdiction over the issuance of building permits?

About the house:

16. What is the anticipated square footage of heated/cooled space?
17. What is the preferred architectural style?
18. How many levels in the house?
19. If two-story, where will the staircases be located? How many?
20. Will there be a full or daylight basement?
21. What are the preferred exterior materials and color?
22. What are the preferred window and door styles?
23. How many garages in the house? Attached or detached?
24. Are there any special garage requirements, such as workshop, storage, hobby area, heated or cooled?
25. What are the number and location of bedrooms?
26. What are the number and location of bathrooms?
27. Are there any special room requirements, such as hobby or office?
28. In which rooms to you want fireplaces?
29. Where is the preferred laundry location?
30. MOST IMPORTANT: Are you doing budget-based designing?

About room requirements:

31. Describe the foyer: size; style; ceiling height?
32. Describe the living room: location; formal or informal; use; furniture; special features; ceiling height?
33. Describe the dining room: location; formal or informal; use; furniture; special features; ceiling height?
34. Describe the kitchen:
 - a. Will the kitchen be used for serious meal preparation or for quick, convenient meals?
 - b. Is this where you'll eat most family meals?
 - c. Do you want a breakfast counter with stools?
 - d. Where do you prefer your work area?
 - e. Describe the type of appliances you prefer?
 - f. What are your material

choices for counters?
Floors? Cabinets?

- g. Do you want a desk in or near the kitchen?
 - h. Do you want a walk-in pantry?
 - i. Will there be an outdoor eating area adjacent to the kitchen?
1. Describe the family room: location; entertainment area; fireplace; furniture; wet bar; furniture; special features; ceiling height?
 2. Describe the study or home office: location; formal or informal; use; furniture; special features; ceiling height?
 3. Describe the bedrooms: location; formal or informal; use; furniture; special features; ceiling height?
 4. Describe the bathrooms: location; formal or informal; use; furniture; special features; ceiling height?

The adage "form follows function" will generally hold true. By responding to these questions and preparing rough sketches and a B.Y.O.B. Design/Build collage, the Architect, Designer, or Plan Service has a basis for understanding your needs.

A final word: Collaborate with a professional to better understand your Drawings!

Punch List

A “can do” spirit will help the B.Y.O.B. Owner to persevere and overcome obstacles during the B.Y.O.B. Design/Build experience but there is always room for improvement. A standard of zero defects may seem impossible to attain; however, the ideal presents a measure for Trade Contractor and Supplier performance. A PUNCH LIST organizes and states those details which remain incomplete, broken, lacking parts, or requiring your review. To a great extent, if an installation or product does not maintain a standard of zero defects, it becomes a line item on your PUNCH LIST. A PUNCH LIST is the road to zero defects.

The PUNCH LIST begins as a single note written on a scrap of paper, a simple reminder to call a Supplier requesting two screws to replace the one's missing in the installation package. By the end of a construction project, a scrap of paper may evolve into a two page document with over fifty items in need of final attention. If this happens, you will be required to dedicate several weeks at the end of your project to complete the PUNCH LIST. In other words, the PUNCH LIST becomes a proverbial nuisance: a source of procrastination and aggravation.

To minimize this source of aggravation, B.Y.O.B. Owners are advised to incorporate a few TRICKS OF THE TRADE. By using the techniques suggested here, one's PUNCH LIST can be kept to a short list of items but you don't wait until the end of the job to start your PUNCH LIST. Action is taken on incomplete tasks and activities when they occur by constant vigilance and persistence. What follows are descriptions of five techniques to assist project coordination. Use them to control lengthy and bothersome PUNCH LISTs.

1. STORYBOARD or a DESIGN/BUILD COLLAGE

Find a large wall in a designated area of your current residence to act as a huge bulletin board. Separate the wall area into two sections: one for *interior* Design/Build package, and another for *exterior* Design/Build package. On the first day you begin the decision making process of the Design/Build experience, begin hanging pictures, colors, samples, sketches, newspaper excerpts, magazine pages, or photographs with stick pins to the wall. Add to or subtract from this AESTHETIC COLLAGE on a daily, weekly, monthly basis changing your mind as you improve your preferences for YOUR life and home style. Since these are approximations of your end result, don't get bogged down in details. This is ART WITH A PURPOSE.

2. BANKER BOX HANGING FOLDERS WITH FILES

Purchase a banker's box with dimensions of approximately 12" wide by 15" long. Purchase a box of hanging folders and a box of manila files with third-cut tabs. Place manila files into the hanging folders then place the hanging folders inside the banker's box labeling each file according to the major cost categories of the "Construction Cost Breakdown." Consider this activity a natural extension of the files you previously created for the "Design/Build Matrix." More than pictorial representation, your filing system will be for technical information, product guides, proposals from Trade Contractors and Suppliers, contract documents from principal players, and official building plans and permits. Eventually, this banker's box becomes a place for warranties, installation instructions, and information sheets for future reference or turn-over to the next homeowner.

3. ACTIVITY FLOW CHART

Purchase a Week-At-A-Glance Appointment Book and several felt tip marking pens in different colors. Open the Appointment Book to today's date so both pages represent a full week's worth of work, and write across the top of the pages what your short term goals are for that week. If you're in the Schema Phase of your project, you'll be considering your options. If you're doing Design Development, you'll be refining choices for all your components. Your timeline will vary depending on the size and complexity of your project. Refer to the "Design/Build Matrix" to determine what should be happening during each phase of work. When you talk with Architects, Designers, Trade Contractors, Suppliers, and your Building Department there will be supplemental information to add to your Appointment Book to support each activity. Key ideas and support activities can be written in different colors throughout the sequence of events that reference the B.Y.O.B. Owner to critical points in work flow from week to week. Begin developing your flow chart at the very beginning of your project to better understand how activities relate to one another and keep your appointment schedule up-to-date.

4. JOB DIARY

Purchase an inexpensive Business Card Index, an Incoming/Outgoing Message Register, and a pad of Memo Forms with duplicate sheets attached. Dedicate these items to the Design/Build process noting all contacts, meetings, letters, phone calls, conversations, and changes which occur from beginning to end of your home building project. Business cards will never get lost and always reside in the same place. A thorough phone record will accurately describe all communications and become a source to refresh memories and maintain order. Use the Memo Forms to put into written form all verbal agreements; be factual, honest, and accurate in your written communications; place copies in respective files of each Trade Contractor and Supplier. Remember the old builder's adage: Hard Copy Cures Amnesia.

5. COST LEDGER

In addition to using your Check Register/Job Cost Journal to track expenditures, keep a Cost Ledger to anticipate your Budget Estimate and do a Cost Analysis while you're thinking about your options and refining possible choices. Breakdown your cost ledger into five parallel columns labeled: budget estimate, contingencies, bid proposals, actual payments, and extra costs. At the outset your project, you'll get an overview of how easily your costs can soar and fly away. For each cost item there will be immediate indication for what you estimated the cost would be, any additional contingencies for which you may need to make an allowance, and what the Trade Contractor's proposal indicated the cost to be VERSUS what actually will actually be paid for the product or service and any extra costs which you may incur. Attention should be given to cost items that seem volatile and capable of soaring out of control.

These five techniques will assist in controlling your PUNCH LIST before it becomes a burdensome list of items in need of further attention. The idea is to anticipate your PUNCH LIST.

Best results occur if you're able to note questions or concerns BEFORE the item becomes incomplete or incorrect. The value of your "Storyboard" and "Activity Flow Chart" is to anticipate problems and their solutions. Next to each item of concern write name and phone number of contact person and pertinent identification or model numbers for immediate referral. Your "Banker's Box Hanging Folders/Files," "Job Diary," and "Cost Ledger" will also be useful to anticipate key information. Use the Phone Message Register to record dates, times, and content of all phone communications.

When a General Contractor walks through a house under construction, what s/he is performing is Quality Control per Specifications. The Specifications are rich with details derived from manufacturers' installation instructions, parts' lists, products' warranties, and written guarantees for performance. As an B.Y.O.B. Owner, these are the documents that will enrich the files in your Banker's Box. You are responsible to hold Trade Contractors and Suppliers accountable.

You want to minimize surprises and so do your Trade Contractors and Suppliers. You want to establish acceptable tolerances for materials and workmanship, and know in advance how repairs will be made. *Set deadlines* and place weekly phone calls to eliminate as many incomplete tasks as possible. It's vitally important to set standards and delegate responsibility to the individual or business that provided the product or service.

It's just as important in the Design phase to create a PUNCH LIST as it will be to create a PUNCH LIST in the Build phase. Holding Designers accountable for their scope of work is vital to defining the crucial issues for Trade Contractors and Suppliers' performance.

During the final week of construction activities, you'll call for a final inspection by your local Building Department. This will be their attempt to maintain a standard of zero defects by reviewing your project one last time. Keep in mind that any code requirements which may have been overlooked during the original plan review and did not get noted on the "Approved" Drawings will still apply to your project. For instance, most local jurisdictions require house numbers be placed prominently on a

new home. You probably won't find this requirement written on the "Approved" Drawings but the first comment the field inspector will make as s/he arrives for final inspection is "Where's the house numbers?" Prepare yourself for these types of surprises!

If you thought by hiring an Architect or Designer these types of surprises would be entirely avoided, then think again. Standard language utilized by Architects and Designers is "If there is a conflict between Drawings/Specifications and Code, Code will govern." In other words, as construction professionals they strive to do their best work but sometimes rely on Plan Examiners to discover their design errors. Similarly, Plan Examiners may rely on Field Inspectors to catch any requirements they may have overlooked during their plan review. And, Field Inspectors expect each Trade Contractor and Supplier to be familiar with building requirements and code compliance whether or not noted on "Approved" Drawings. This is why your choice of Trade Contractors and Suppliers is crucial to project success and completion of PUNCH LIST items.

As a result of this final review, you may be required to "call-back" Trade Contractors and Suppliers who need to correct deficiencies in their work. If you were able to anticipate significant difficulties, you may have withheld 10% of the contract price from your payment. This will be a definite incentive to expedite correction of deficient or defective work; otherwise, repeated phone calls may be required to get the "call-back" completed. As a courtesy to Trade Contractors and Suppliers, make a PUNCH LIST identifying what will be required to finalize their work on your project. Don't ask for work to be done piecemeal. Provide each respective business with their PUNCH LIST to correct and complete all remaining work, and then be done with it. Don't become the customer from hell!

Rather than clean windows, floors, and cabinets during this final week of the project, there's a great convenience in engaging the services of a professional cleaning crew to put the polish to your new home. Your time may be better allocated toward the coordination of PUNCH LIST activities. Another factor to consider is the amount of effort dedicated to moving your furnishings from one residence to another. If you're busy cleaning, who's responsible for placing phone calls and making arrangements for logistics?

If your PUNCH LIST has been given its proper attention throughout the project, you'll enter the final week with your mind on what it takes to move-in. With good organization and control, this should be your situation.

It's not enough for Owners to make decisions sensibly and sequentially. It's a good beginning but it's not enough!

To really get a grip on managing a construction project, an individual must contend with the experience of simultaneous interaction of ideas and events. As one proceeds through the Design/Build process, there comes a time when you leave the comfort of the kitchen table and begin to relate ideas to actual events.

If something can go wrong, it will: if it's not inclement weather, it's a flat tire on the wheel barrel; if it's not a late delivery, it's the plumber with a bad knee from a recent ski accident. All the

refined planning and organizing quickly becomes less relevant as you scramble to find another Trade Contractor or reschedule delivery with a new Supplier. What once was someone else's job may unexpectedly become your problem.

A sensible, rational approach to the sequence of events is the start but a more realistic and reliable track allows for the interdependent and unpredictable nature of construction activities.

We discover our endeavor to plan, organize, and control a residential construction project is both an art and a science. Although our preparations are decisive and rational, there's a chaotic side to the construction experience which demands we remain creative problem solvers. Any attempt to give careful consideration to all aspects of building a home will only remove part of the uncertainty. In reality, a modest number of possible Design/Build solutions will be considered, and there's no way of telling whether our solution choices are the best because so many other possibilities go unexamined. The "unexamined possibilities" will become the surprises, the challenges, which test your character and ingenuity.

Providing leadership to your construction organization is an awesome responsibility. The weight of decision making must be fully acknowledged: site analysis, design choices, budget allowances, and work schedules become a significant investment in terms of time, money, and effort. Involving a General Contractor, Construction Manager, Architect, Lawyer, Accountant, Trade Contractors, and Suppliers may alleviate part of the decision making burden but the B.Y.O.B. Owner must accept her/his position at the center of decisions. You can't make the assumption that someone else will identify or solve all Design/Build problems for you. You will rely on construction professionals for their advice and opinion, but ultimately the B.Y.O.B. Owner's position is pivotal to the project team.

Nothing will replace your ability to think critically and analyze the unique circumstances surrounding your project. But more important is your capacity to let artistic and scientific energies combine to become the creative force of your B.Y.O.B. Design/Build experience through collaboration with the entire Building Community.

Specs

Specifications are a written document for organizing the graphic information depicted on the Drawings. All the construction details are shown on Drawings as they relate to one another, with no attempt to separate diverse materials. It is the Specifications that break down the interrelated information shown on Drawings into organized, technical sections so Trade Contractors and Suppliers are more able to identify the work to be performed. Since they are written instructions, Specifications are frequently adjudged by the courts as having greater importance than Drawings when these documents are in conflict, and judgments are frequently resolved on the basis of the Specifications.

Some valuable resources for decision making are the numerous trade, professional, and consumer organizations that establish construction standards and will provide product specifications or installation information to the general public as well as their membership.

Consumer Reports Online is the Web's source of unbiased information about products and services based on testing conducted in their extensive state-of-the-art laboratories. The site offers two levels of access. Visitors can get solid consumer advice for free. Paid site subscribers have access to exclusive product and service Ratings and recommendations. You can subscribe for \$4.95 per month, or \$26.00 for a full year. (Or *Consumer Reports* magazine subscribers can have full access to Consumer Reports Online for just \$19 per year.)

As you develop written specifications for your home design and building project, these product search engines will be very helpful for locating manufacturers and/or determining industry standards:

- [American Society for Testing Materials](http://www.astm.org) – www.astm.org
- [ARCAD Search Engine](http://www.arcad.com) – www.arcad.com
- [Architects First Source](http://www.afsonl.com) – www.afsonl.com
- [Blue Book of Construction](http://www.thebluebook.com) – www.thebluebook.com
- [Building Industry Exchange](http://www.building.org) – www.building.org
- [Construction Specifications Institute](http://www.csinet.org) – www.csinet.org
- [Hanley-Wood's EBuild](http://www.ebuild.com) – www.ebuild.com
- [Sweet's Group](http://www.sweets.com) – www.sweets.com
- [Thomas Register](http://www.thomasregister.com) – www.thomasregister.com

These information resources are helpful to the consumer and professional alike. The resources are organized chronological by phases of work as they may occur during the build sequence.

Site Work and Civil Engineering

- [American Society of Civil Engineers](http://www.asce.org/)-http://www.asce.org/
- [Land Surveyor Reference Page](http://www.lsrp.com/)-http://www.lsrp.com/
- [National Environmental Publications](http://www.epa.gov/epahome/publications.htm)-http://www.epa.gov/epahome/publications.htm
- [US Army Corps of Engineers](http://www.usace.army.mil/)-http://www.usace.army.mil/
- [United States Geological Survey](http://www.usgs.gov/)-http://www.usgs.gov/

Concrete Foundation and Flatwork Installation

- ["Aggregates Manager" Magazine Online](http://www.aggman.com/)-http://www.aggman.com/
- [American Concrete Institute](http://www.cssinfo.com/info/aci.html)-http://www.cssinfo.com/info/aci.html-
- [American Concrete Pumping Association](http://www.concretepumping.com/)-http://www.concretepumping.com/-
- [Concrete Reinforcing Steel Institute](http://www.crsi.org/)- http://www.crsi.org/
- [Portland Cement Association](http://www.portcement.org/)-http://www.portcement.org/
- [The Concrete Society](http://www.concrete.org.uk/)-http://www.concrete.org.uk/

Frame Structures

- [American Institute of Timber Construction](http://www.aitc-glulam.org/)-http://www.aitc-glulam.org/
- [APA - The Engineered Wood Association](http://www.apawood.org/)-http://www.apawood.org/
- [California Redwood Association](http://www.calredwood.org/)-http://www.calredwood.org/
- [Domes Northwest](http://www.domesnorthwest.com/)-http://www.domesnorthwest.com/
- [National Center for Construction and Education Research](http://www.domesnorthwest.com/)-http://www.domesnorthwest.com/
- [National Forest Products Laboratory](http://www.fpl.fs.fed.us/)-http://www.fpl.fs.fed.us/
- [Timber Framers Guild of North America](http://www.tfguild.org/)-http://www.tfguild.org/
- [Western Wood Products Association](http://www.wwpa.org/)-http://www.wwpa.org/

Roofing Materials and Installation

- [Cedar Shake & Shingle Bureau](http://www.cedarbureau.org/)-http://www.cedarbureau.org/
- [National Roofing Contractors Association](http://www.cedarbureau.org/)-http://www.cedarbureau.org/
- [National Tile Roof Manufactures Association](http://www.ntrma.com/)-http://www.ntrma.com/
- [The Roofing Mall](http://www.roofingmall.com/welcome.html)-http://www.roofingmall.com/welcome.html
- [Wood Truss Council of America](http://www.woodtruss.co)-http://www.woodtruss.co

Door and Window Installation and Maintenance

- [Door and Hardware Institute](http://www.dhi.org/)-http://www.dhi.org/

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- [International Garage Door Association](http://www.doors.org/)-http://www.doors.org/
 - [National Glass Association](http://www.glass.org/)- http://www.glass.org/
 - [National Sash & Door Jobbers Association](http://www.nsdja.com/)-http://www.nsdja.com/
 - [National Wood Window and Door Association](http://www.nwwda.org/)-http://www.nwwda.org/

Plumbing Installation and Maintenance

- [Plumbing Forum](http://www.nwwda.org/)-http://www.nwwda.org/
- [PlumbNet](http://www.plumbnet.com) –http://www.plumbnet.com
- [PlumbingNet](http://plumbingnet.com) –http://plumbingnet.com
- [Plumbing Supply](http://plumbingsupply.com/)-http://plumbingsupply.com/
- [Plumbing Web](http://www.plumbingweb.com/)-http://www.plumbingweb.com/
- [. . . and, a classic](http://www.toiletology.com/index.shtml)-http://www.toiletology.com/index.shtml

Heating, Ventilation, Air Conditioning, and Refrigeration

- [Alternative Energy Engineering](http://www.alt-energy.com/)-http://www.alt-energy.com/
- [American Society of Heating, Refrigerating and Air Conditioning Engineers](http://www.ashrae.org/)-http://www.ashrae.org/
- [EPA's Energy Star Program HearthNet](http://www.energystar.gov/) -http://www.energystar.gov/
- [Home Energy Magazine](http://www.homeenergy.org/)-http://www.homeenergy.org/
- [HVAC City](http://www.hvac-city.com/)-http://www.hvac-city.com/
- [HVAC Mall](http://www.hvacmall.com/)-http://www.hvacmall.com/
- [Residential Energy Services Network](http://www.natresnet.org/)-http://www.natresnet.org/

Geothermal (Ground Source) Technology

- [Geothermal Heat Pump Consortium](http://www.geoexchange.org/)-http://www.geoexchange.org/
- [Geothermal Resources Council](http://www.geothermal.org/)-http://www.geothermal.org/

Electrical Installation and Maintenance

- [Appliance Repair FAQ](http://www.repairfaq.org/)-http://www.repairfaq.org/
- [Architectural Lighting](http://www.archlighting.com/)-http://www.archlighting.com/
- [Electrical Contractor Network](http://www.electrical-contractor.net/)- http://www.electrical-contractor.net/
- [Energy Efficiency and Renewable Energy Network](http://www.eren.doe.gov/)-http://www.eren.doe.gov/
- [National Electrical Contractors Association](http://www.necanet.org/)-http://www.necanet.org/
- [National Electrical Resource Center](http://www.electrician.com/)-http://www.electrician.com/

Insulation Installation and Energy Performance

- [Advanced Energy's Applied Building Science Center](http://www.advancedenergy.org/)-http://www.advancedenergy.org/
- [Alliance to Save Energy](http://www.ase.org/)-http://www.ase.org/

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- [Energy Efficient Building Association](http://www.eeba.org/)-http://www.eeba.org/
 - [National Insulation Association](http://www.insulation.org/)-http://www.insulation.org/
 - [North American Insulation Manufacturers Association](http://www.naima.org/)-http://www.naima.org/

Hardwood Floor Installation and Maintenance

- [National Hardwood Lumber Association](http://www.natlhardwood.org/)-http://www.natlhardwood.org/
- [National Oak Flooring Manufacturers Association](http://www.nofma.org/index.htm)-http://www.nofma.org/index.htm
- [National Wood Flooring Association](http://www.woodfloors.org/)-http://www.woodfloors.org/
- [Wood Floors Online](http://www.woodfloorsonline.com/)-http://www.woodfloorsonline.com/

Floor Coverings

- [Floor Installation Association of North America](http://www.fiana.org/html/Home.htm)-http://www.fiana.org/html/Home.htm
- [Tile Council of America](http://www.tileusa.com/)-http://www.tileusa.com/
- [World Floor Covering Association](http://www.wfca.org/)-http://www.wfca.org/

Gypsum Wallboard Installation

- [Association of the Wall and Ceiling Industries](http://www.wfca.org/)-http://www.wfca.org/
- [Ceilings and Interior Systems Construction Association](http://www.cisca.org/)-http://www.cisca.org/
- [The Gypsum Association](http://www.cisca.org/)-http://www.cisca.org/
- [Wall and Ceiling Magazine](http://www.wconline.com/)-http://www.wconline.com/

Paint & Stain Preparation, Installation and Maintenance

- [Color Marketing Group](http://www.colormarketing.org/)-http://www.colormarketing.org/
- [Paint Info](http://www.paintexpo.com/)-http://www.paintexpo.com/
- [Painting and Decorating Contractors of America](http://www.pdca.com/)-http://www.pdca.com/
- [The National Paint & Coatings Association](http://www.paint.org/)-http://www.paint.org/
- [The Virtual Paintstore](http://www.paintstore.com/)-http://www.paintstore.com/

Bath and Kitchen Remodeling

- [Absolute Kitchen and Bath Marketplace](http://www.kitchenplace.com/)-http://www.kitchenplace.com/
- [Integrity Bathtub & Countertop Refinishing Coatings](http://www.integritycoatings.com/)-http://www.integritycoatings.com/
- [Kitchen Remodeling Secrets and Tips](http://www.tapdirect.com/kitchentips.htm)-http://www.tapdirect.com/kitchentips.htm

Cabinet and Millwork Installation and Maintenance

- [Hardwood Information Center](http://www.hardwood.org/)-http://www.hardwood.org/
- [Kitchen Cabinet Manufacturers Association](http://www.kcma.or)-http://www.kcma.or
- [Kitchen to Kitchen Web](http://www.kitchenweb.com/)-http://www.kitchenweb.com/

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- [KitcheNet](http://www.kitchenet.com) <http://www.kitchenet.com>
 - [National Kitchen and Bath Association](http://www.nkba.org/) <http://www.nkba.org/>
 - [Stairway Manufacturers' Association](http://www.stairways.org/) <http://www.stairways.org/>

Landscape Installation and Maintenance

- [American Nursery & Landscape Association](http://www.anla.org/) <http://www.anla.org/>
- [Associated Landscape Contractors of America](http://www.alca.org) <http://www.alca.org>
- [Association of Professional Landscape Designers](http://www.apld.com/) <http://www.apld.com/>
- [Landscape Contractors Association](http://www.lcamddcva.org/) <http://www.lcamddcva.org/>
- [Professional Lawn Care Association of America](http://www.plcaa.org/) <http://www.plcaa.org/>

General and Specialty Contractors

- [Associated Builders & Contractors](http://www.abc.org/) <http://www.abc.org/>
- [Associated General Contractors of America](http://www.agc.org/) <http://www.agc.org/>
- [National Association of Home Builders](http://www.nahb.com/) <http://www.nahb.com/>
- [National Association of the Remodeling Industry](http://www.nari.org/) <http://www.nari.org/>

Tools and Hardware

- [American Hardware Manufacturers Association](http://www.ahma.org/) <http://www.ahma.org/>
- [Builders Hardware Manufacturers Association](http://www.buildershardware.com) <http://www.buildershardware.com>
- [National Retail Hardware Association](http://www.nrha.org/) <http://www.nrha.org/>

Television Shows

- [Home and Garden Television](http://www.nrha.org/) <http://www.nrha.org/>
- [Hometime](http://www.hometime.com) <http://www.hometime.com>
- [This Old House](http://www.thisoldhouse.com/) <http://www.thisoldhouse.com/>
- [Your New House](http://www.yournewhouse.com/) <http://www.yournewhouse.com/>

Working in combination, these informational resources provide consumers with a very integrated approach to remodeling or new home construction project by collaborating with the building community. The homebuilding experience is as much about developing relationships with people you know and trust as it is about creating a home style to match your life style.

REMEMBER: Every region has special geological, biological, and meteorological conditions which must be taken into consideration when writing Specifications. For instance, in some regions radon gas emits naturally from geological formations, and will enter your home through the soil below the foundation. Special ventilation will be required to rid your home of this gas. Another example would be hurricanes or tornadoes which may be part of your region's regular weather

pattern; if so, extreme wind forces will be placed on your home. The foundation and roof assembly will require additional hardware for a positive, uniform connection. Pay attention to natural phenomena affecting B.Y.O.B. Design/Build considerations and consult your local Building Department during Design Development. Specs are the engine that drives the home building vehicle!

Quality Control

Supervision of your project requires a consistent, organized approach to each phase of construction checking the work performed against Drawings, Specifications, and Conditions with Trade Contractors and Suppliers. Your daily and weekly construction "Quality Control" inspections will be much more than examining materials and methods; this will be an opportunity to greet people, establish relationships, as well as look for hazardous conditions or unsafe practices.

Your first concern should be for people. While greeting workers make sure the site is clean and orderly. Using the "Safety Checklist," remain alert for problem areas or behaviors. Your arrival will make workers self-conscious so use this safety tour to put them at ease as well as examine their working conditions. Any problems need to be dealt with directly yet diplomatically. Best procedure is to deal with the lead person of the crew in error rather than breaking the chain of command by going directly to a crew member.

Once the safety and social issues are completed, your attention can focus on construction work. Look over work in progress and check it against Drawings and Specifications. Don't be afraid to carry a clipboard and 35 mm camera or video camera recorder to document your observations. Keep in mind the project's schedule especially in regards to the appropriate sequence of work flow.

Remember: there's no such thing as a dumb question so don't be afraid to ask. You'll need to record key questions and answers in your job diary. Manufacturer's installation instructions and spec sheets are the best way to scrutinize what's being accomplished. Your job is unique so keep in mind that your approach to QC depends on product specific factors like whether you're using stick frame, metal framing, panelization, modular, insulated concrete forms, or log construction.

Many states have passed "notice-and-opportunity-to-repair" (NOR) laws, which let contractors offer to repair a defect before you seek another remedy. You should become familiar with your state's NOR law by checking with your state's Consumer Affairs Division of the Attorney General's Office to determine your rights and responsibilities. Also, some states have enacted a "home warranty policy" or "warranty of habitability" laws to protect consumers from defective work. A "warranty policy" encourages a relationship of trust between a contractor and owner so they can work together to solve a problem. Your state's AG office will provide details on provisions of the warranty law.

Given the variety of circumstances in residential construction, it becomes very difficult to create a master checklist covering all circumstances. Although the following checklist may seem comprehensive, it should merely be regarded as a guide and should NOT be used as a means to troubleshoot your project. The most important aspect of the checklist is to understand the level of detail you'll encounter should you decide to act as an B.Y.O.B. Owner. If you're

uncomfortable with this responsibility, then you'll definitely want to hire the services of a construction manager or general contractor to assist you in project management duties. The following checklist does not become a substitute for good observation and critical thinking about quality control for your project per your product and material specifications.

SAMPLE OF A QUALITY CONTROL CHECKLIST

Preconstruction

Site Access

- Check type, surface, and capacities of roads
- Check traffic flow
- Check number of entrances to site
- Check condition of driveway
- Check overhead electrical utilities
- Check street signs and directions

Temporary Facilities

- Check location for job shack
- Check location for sanitary shack
- Check location for temporary fences if required
- Check adequacy of parking spaces
- Check availability of local storage areas
- Check areas for stockpiling materials

Storage and Protection

- Check relation of storage areas to traffic flow
- Check future activities such as trenches, fills, rockeries
- Check material to be first-in and first-out
- Check security precautions
- Check necessity for tarps or plastic covers
- Check protection for finished surfaces
- Check materials that may require heated space

Cleaning and Debris

- Check debris: reduce, reuse, recycle, and refuse
- Check location of dumpster
- Check scrap for reuse by Trade Contractors
- Check storage areas for aluminum, cardboard, glass
- Check need for bags, brooms, receptacles

Sitework

Demolition

- Check area for demolition with "approved" Drawings
- Check local regulations for debris disposal
- Check location of tie-ins

Layout

- Check location of building corners with site plan
- Check legal setback requirements
- Check location of underground utilities

Site Clearing

- Check location of tree and shrubs to remain
- Check trees for firewood or lumber
- Check local regulations for burn piles
- Check for opportunity to bury trees and brush

Excavation

- Check storage areas for topsoil and sub-soil
- Check foundation location and depth (allow extra 3 feet for work space around perimeter)
- Check fireplace footing location and depth
- Check crawlspace location and depth
- Check garage slab location and depth
- Check areas for downspout leach field
- Check location of trash pit for debris

Backfill

Note: Prior to backfill review foundation checklists

- Check deck installation on foundation for bracing
- Check for necessity of clean fill for drainage
- Check for fill for very large rocks or wood scraps
- Check locations where compaction is needed
- Check locations of water meter and power pole

- Check locations of topsoil for final grade

Grading

- Check deck installation on foundation for bracing
- Check elevations and lines on site plan
- Check allowances for top soil, bedding, plants
- Check for 2-3% slope after final grade
- Check berms for placement, height, form

Retaining Walls

- Check locations with site plan
- Check for "deadman" anchors
- Check placement of rock behind wall for drainage
- Check for drainage holes in lower portion of wall

Asphalt Paving

- Check sub-grade compaction to 95%
- Check mixture is at min. temp, of 280 degree F.
- Check smoothness tolerance of 3/8" in 10 feet.
- Check air temperature is at least 50° F.

Concrete Paving

- Check forms for straightness elevation, slope
- Check sub-grade compaction and gravel fill
- Check necessity for reinforcement: mesh or rebar
- Check location of reinforcement mid-way in pour
- Check concrete mix: slump, mix, additives
- Check finish: broom, smooth, exposed
- Check cure rate: excessive hot or cold temperatures

Brick Paving

- Check compaction of sub-grade
- Check thickness of sand bed

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- Check pattern for brick installation

Public Utilities

- Check location and layout of house footprint
- Check site plan for inclusion of all systems:
 1. Water District or Well
 2. Electrical Distribution
 3. Sewer or Septic
 4. Gas or Oil
 5. Television Cable
 6. Telephone Cable
 7. Storm water
- Check with locating service for existing utilities
- Check with utility companies for installation procedures
- Check with governing agencies for regulations
- Check with Trade Contractors for their requirements
- Check compatibility of installation for layout
- Check proper sequence for scheduling
- Check excavation depth, slope, and elevation
- Check materials consistent with procedures and regulations
- Check inspector's report and retain copy
- Check that proper trench bedding material for utilities is used
- Check site plan to create *"as-built drawings"* when completing actual work

Storm water Control

- Check location, size, and slope of tight lines
- Check required setback from septic system
- Check tie-ins with downspouts
- Check tie-ins with catch basins
- Check tie-ins to leach pit
- Check adequacy of leach pit and rock size

Foundation Drainage

- Check location, size, and slope of lines
- Check for perforated lines separate from tight lines
- Check for tie-in to leach pit
- Check adequacy of leach pit and rock size

Trees, Plants, Groundcover

- Check for site preparation per grading
- Check for location of topsoil, gravel, bark
- Check for plant species, sizes, and quantities
- Check proper application of sod/seed
- Check proper installation of bushes and trees
- Check all plants remain alive and growing; hold Trade Contractor accountable for damage
- Check proper maintenance schedule

Foundation, Slabs, Damp Roofing, Radon Gas

Batter boards

- Check location of property lines
- Check distance of setbacks per "approved" Drawings
- Check for presence of groundwater
- Check for location of major components
 1. Exterior Walls
 2. Piers and Support Columns
 3. Garage or Carport
 4. Fireplace Footing
 5. Porches and Entryway
- Check for level and square
- Check dimensions according to "approved" Drawings

Footings

- Check for location of major components
- Check proper elevation
- Check for level and square
- Check offsets and jogs
- Check width and depth
- Check for cleats to maintain width
- Check location of block-outs
- Check rebar size, spacing, ties: horizontal and vertical
- Check rebar bends at corners
- Check bracing and backfill
- Check inspector's report and signature; retain copy
- Check quantity of concrete ordered, mix, and slump
- Check schedule for delivery
- Check method of pour
 1. Concrete truck chute
 2. Wheel barrel
 3. Pump truck
 4. Vibrator
- Check logistics
 1. Do not allow concrete to drop more

than 5' from chute

2. Do not move concrete more than 20' once in form
3. Do not over-vibrate
4. Prevent radical cure rate: hot/cold temperature

Walls

- Check for plumb, level, straight, square
- Check dimensions: length, width, height (+1/4", -1/4")
- Check elevation with benchmark
- Check location of step-downs
- Check size, location, bracing of major components
 1. Fireplace
 2. Windows
 3. Bulkheads
 4. Beam Pockets
 5. Doors
 6. Offsets and Jogs
- Check for sleeves or block-outs (coordinate with Trade Contractors)
 1. Plumbing
 2. HVAC
 3. Electrical
- Check rebar size, spacing, ties: horizontal and vertical
- Check rebar bends at corners
- Check form ties, shoes, walers, cleats, bracing
- Check anchor bolt size and layout
- Check inspector's report and signature; retain copy
- Check quantity of concrete ordered, mix, and slump
- Check schedule for delivery
- Check method of pour
 1. Concrete truck chute
 2. Wheel barrel
 3. Pump truck
 4. Vibrator

- Check logistics
 1. Do not allow concrete to drop more than 5' from chute
 2. Do not move concrete more than 20' once in form
 3. Do not over-vibrate
 4. Prevent radical cure rate: hot/cold temperatures

Slabs

- Check size, location, bracing of major components
- Check installation of "groundwork" by Trade Contractors
- Check inspector's report of Trade Contractor's work; retain copy
- Check installation of insulation if required by code
- Check gravel fill for drainage
- Check rebar or mesh if required
- Check placement of 6 mil plastic for moisture barrier

Note: Review footing and wall checklists for relevant guides.

Damp Proofing

- Check size, location, bracing of major components
- Check top of wall for smoothness; use "rebar sander" if required day after stripping forms

- Check wall for honeycomb pattern; patch with cement mortar
- Check all ties twisted off and all tie holes filled with asphalt emulsion
- Check wall for any concrete protrusions and remove
- Check seam between wall and footing for cleanliness; fill seam with asphalt emulsion.
- Check asphalt emulsion on all sub-grade walls surrounding habitable areas; not necessary for walls at crawl space
- Check that asphalt emulsion does not go above grade level
- Check all downspout drains securely in place
- Check all footing drains securely in place
- Check all debris removed from trenches

Radon Gas

- Check placement of gravel below slab
- Check placement of 6 mil plastic over gravel
- Check seal at concrete slab joints and all slab penetrations
- Check 4 inch diameter vent stack running from below slab through penetration in roof
- Check installation of electrical supply line and junction box for future fan if required

Note: Contact your local Building Department to confirm its standard construction practice for Radon resistant home construction.

Framing

General Notes

- Check local building code for nailing schedule and sizing structural members
- Check framer's lumber take-off to insure adequate supply of material on site; ask to be notified in advance should additional lumber be required
- Check framing deviations; not to exceed standard 1/4" leeway for error; changes should be recorded on Drawings, dated, and signed

Note: Review all errors objectively to determine difference between those errors which will create major difficulties for quality work and those errors which will have minor impact on quality work. This is a *judgment call*: one must realize that all errors do not create problems which are insurmountable.

Floor Framing

- Check sill plates for exterior grade, pressure treated lumber
- Check sill sealer installed between sill and foundation
- Check anchor bolts installed with nut and washer; min. 2 fasteners per plate, max 16" from each end, max 6' on center
- Check for termite shield if required
- Check grade, species, and span of all floor joists, posts, beams, purlins
- Check location and nailing of all metal connectors shown on official prints for posts and beams
- Check beams for straightness and consistent height
- Check all joists are crowned-up
- Check rim and header joists straight and nailed properly
- Check all joists of uniform width and tight joints with proper nailing pattern

- Check joist doubled at all openings; hangers installed and completely nailed where required
- Check bridging installed and nailed per code; solid blocking installed and nailed per code
- Check plywood (or equivalent) sub-floor installation:
 1. Proper thickness with APA grade stamp correct
 2. Glued and nailed with all-weather adhesive; follow manufacturer's specifications and building code requirements
- Check stairwell installation:
 1. Refer to official prints for locations
 2. Plywood sub-floor should overhang stairwell opening to match treads
 3. Stair risers should be of equal height (max 1/8" variance)
 4. Treads should be level and same width (max 1/8" variance); nailed and glued to stair jacks
 5. Stair jacks should have no cracks
 6. Fire-blocking installed per code
 7. Railings properly fastened and solidly secured
- Check cantilevers per plan: overhang, blocking, joist layout
- Check for proper clearance around masonry or double wall chimney

Wall Framing

- Check walls located per "approved" Drawings
- Check walls for straightness, plumb, and square; correct size lumber for studs and headers
- Check header locations and sizes with proper grade stamp
- Check sheathing size, manufacturer's installation instructions, and nailing schedule per code

- Check critical dimensions; no room studded without installing large fixtures or appliances that will not fit through door openings later
- Check window and door openings; dimensions, plumb, square
Note: Rough framing for window and door openings will require a thorough review with vendors to determine allowances for products chosen for installation. Items such as floor covering, door and window trim will affect the allowances for framing measurements.
- Check all warped studs removed or straightened; pull string along wall lines to determine straightness
- Check plate splices located over studs
- Check trimmer studs and header joints tight
- Check for square corners in critical areas; kitchens, baths, and utility areas where cabinets and countertops designed for 90 degree angles
- Check for backing where required for drywall and fixtures:
 1. Curtain Rods
 2. Towel Rods and Rings
 3. Cabinets
 4. Ledgers and Shelves
 5. Closet Kits
 6. Ironing Boards
 7. Ceiling
- Check garage door jamb and brick mold installed properly
- Check framing and drywall installation per fire code in areas surrounding fireplace masonry; coordinate this activity with framer and masonry contractors prior to enclosure
- Check measurements required for spaces which cannot be altered:
 1. Cabinets and Vanities
 2. Showers and Tubs
 3. Built-in FurnitureNote: Maintain allowances for installation.
- Check that walls have adequate temporary bracing to maintain straightness and plumb prior to setting truss package

Roof Framing

Note: Roof framing may be "*stick frame*" or "*truss package*." The main difference is that "*stick frame*" roofs will be built piece by piece on site; a roof erected with a "*truss package*" will be cut and assembled at the factory and delivered to the site.

- Check trusses erected according to engineered design and installation instructions accompanying package:
 1. Nailing schedule per applicable building code
 2. Framing anchors installed per applicable building code
 3. Catwalk installed at center of attic
 4. Wind brace installed at gable ends
 5. Attic vents installed at gable ends or ridge
 6. All gable and firewall trusses have studs installed per sheathing or drywall layout
 7. Lookouts installed at peak of gable and 4' o.c. for sheathing layout
 8. Fascia and Barge boards installed straight and secure
 9. Vent blocks installed at exterior walls between roof rafters
- Check stick framing installed per "*approved*" Drawings according to applicable building code:
 1. Rafters correct size, straight, crown-up
 2. Ridge board correct size, straight, without sag
 3. Rafters properly connected to wall plates
 4. Collar ties correct size, spacing, height
 5. Vent blocks installed at exterior walls between rafters
 6. Attic vents installed at gable ends or ridge
 7. Fascia and Barge boards installed straight and secure
 8. Lookouts and rake supports installed per layout
- Check for proper clearance around chimney
- Check attic access properly sized and located
- Check ceiling backing in place before sheathing installed Check location and backing for skylights

Roof Sheathing

- Check sheathing grade stamp, size, manufacturer's installation instructions, and nailing schedule per code

Note: Skip sheathing will be required for wood shingles or shakes. Contact roofing contractor to *review requirements* for specialty materials such as tile or metal.

- Check sheathing staggered from row to row
- Check ply clips used at horizontal seams between rafters
- Check vent holes cut at or near ridge if gable vents inadequate or unavailable
- Check skylight framing size and location
- Check storage and protection of excess and scrap sheathing

Note: Many problems occur after construction due to water damage from improper flashing. Metal flashing comes in all shapes and sizes and its applications should be provided in "approved" Drawings; however,

there is no better judgment than common sense and extra protection. During rough framing, flashing for all applications should be available at the site, properly stored to avoid damage, and installed in proper sequence.

Flashing

- Check flashing located/installed per applicable code:
 1. Ground contact
 2. Deck Ledger
 3. "Belly" Board
 4. Window Headers
 5. Door Headers
 6. Skylights
 7. Chimneys
 8. Valleys

Roofing

Roofing Material

- Check "approved" Drawings and Specifications for type, color, size, and manufacturer:
 1. Asphalt Shingle
 2. Wood Shingle or Shake
 3. Fiberglass Shingle
 4. Tile or Slate
 5. Roll Roofing
 6. Metal

Note: Locate all vent stacks that penetrate roof *prior to installation* of roofing. Vents and flashing will be provided by Plumbing and Heating contractors and installed per their layout and NOT be responsibility of Roofing contractor. Vents and flashing are usually required for plumbing, HVAC, wood stove or fireplace, attic ventilation, "moist" room fans.

- Check metal drip edges at rakes or eaves if required
- Check felt paper overlaps: minimum 2" on sides; 4" on ends
- Check manufacturer's warranty for weather exposure and nailing pattern, sealers, membranes, cements, fasteners
- Check roofing material for square, straightness, color uniformity, no buckling or cracks
- Check edges, ridges, hips, valleys for smooth, even trim
- Check roofing material extends over roof edge by 2"
- Check roofing material fit tightly around all stack vents and installed with flashing to shed water.
- Check nails are galvanized and not exposed to weather unless special protection provided by manufacturer or Trade Contractor
- Check all debris removed from roof and site

Gutters & Downspouts

- Check style, color, size as specified by owner

- Check gutters spaced and secured per specifications using aluminum nails and sleeves or "hidden" fasteners
- Check water drainage to downspout using hose; completely in one minute without water collection anywhere
- Check for leaks in corner miters, elbows, downspouts
- Check downspouts secured to walls with straps of same color
- Check downspouts land on splash blocks or connect to drain line leading to leach pit or storm water system per applicable code

Exterior Finish & Siding

Note: Prior to trim and siding installation, siding contractor will provide and install "infiltration barrier" per local building code as air and moisture control. Product will be installed per manufacturer's installation instructions. All wall penetrations will be caulked with suitable latex caulk to eliminate air infiltration.

Exterior Finish

- Check all trim material for all-weather conditions suitable for paint or stain or varnish
- Check soffit installation for tight end and lateral joints, and vents to provide adequate ventilation for attic
- Check corner boards for fit to soffit and tight against building
- Check window trim for joint fit, tight against building and window frame
- Note: If window trim is integral component of frame unit then install window plumb, square, and tight to building
- Check door trim for joint fit, tight against building and door frame
- Note: If door trim is integral component of door unit then install door plumb, square, and tight to building
- Check cornice for tight joints at soffit and fascia with proper flashing to prevent water damage
- Check "belly" board for straightness, tight end joints, secure to building with galvanized casing nails

Siding

- Check Drawings and Specifications for type, style, color, and manufacturer of siding:
 1. Brick
 2. Stucco
 3. Hardboard
 4. Vinyl
 5. Plywood
 6. Lumber
 7. Waferboard/OSB
 8. Aluminum
 9. Shakes or Shingles
 10. Concrete Block
 11. Stone
- Check siding installed per manufacturer's installation instructions
- Check exposure to weather in accordance with Drawings
- Check flashing installed at critical areas
- Check fasteners for flush or countersunk condition and finished per code and manufacturer's instructions
- Check all necessary areas for latex caulk per applicable building code

Masonry, Fireplace, Wood Stove

- Check brick type, size, and color as specified by owner
 - Check reinforcing, anchors, ties if required:
 1. Rebar: Grade 40, No. 3 and larger
 2. Anchors: Galvanized steel per code
 3. Ties: Corrugated and galvanized type
 - Reinforcement: Truss type, drawn steel
 - Check mortar and joints per plans and specs
 1. Mortar Type S (use type I or II cement)
 2. Joints consistent width
 - Check weep holes and vents clear of mortar and debris
 - Check location of bond beams or angle iron
 - Check dimension and location of fireplace/chimney:
- 1. Firebrick inside firebox
 - 2. Refractory mortar
 - 3. Dimensions in accordance with applicable building code
 - 4. Cleanout, ash dump, damper operate properly
 - 5. Vent for outside combustible air
 - 6. Framing proper distance from masonry per code
 - 7. Chimney flashing at roof
 - Check zero-clearance fireplace installed by manufacturer's installation instructions
 - 1. Use stainless steel, double-wall flue
 2. Maintain dimensions and clearances per applicable code
 3. Install proper supports and downdraft cover at chimney

Plumbing

Rough-in

Note: Be sure shower and tub fixtures are ordered and placed in proper location if access will be a problem

- Check location of all utilities to guarantee proper layout and site logistics
- Check access to house supply lines and drains to establish openings in concrete walls and slabs
- Check Drawings and Specifications to verify types and location of plumbing fixtures to guarantee proper layout and Underwriter's Lab approval
 1. Order long lead time items for procurement
 2. Locate and place specialty hardware in walls and floors
- Check framing requirements of plumber to allow for layout of joists and studs to minimize cutting and call-backs
 1. Repair cut-out framing by plumber
- Check roof vents installed with proper flashing
 1. Locate vents on roof for aesthetic appeal
- Check water service active to house so "live" test can be accomplished on water lines and available for "water" test on waste lines
 1. Keep potable water lines under pressure after inspection and continue to observe for evidence of leaks
- Check nail straps at all framing to protect pipes from nails
- Check exterior water spigots and lines insulated and protected from freeze
- Check permit signed by inspector
 1. Note corrections if required
 2. Make copy of permit

Trim

Note: Confirm manufacturer, style, type, color of fixtures at rough-in, prior to ordering trim package, and delivery to site. Inspect fixtures before and after installation for scratches, chips, and dents.

- Check operation of faucets and drains
 1. Hot on left, cold on right
 2. No drips or leaks at traps or joints below fixture
 3. Drain stops operate properly and form seal when closed
- Check operation of toilets
 1. No drips or leaks at shut-off valve or connections
 2. Water fills properly and action stops completely
 3. Flush acts immediately with proper draw
- Check garbage disposal operates properly
- Check operation of dishwasher and clothes washer
 1. Run through entire cycle
 2. No drips or leaks at connections or machine
 3. Hot and cold water present at proper cycle
- Check water heater firmly set, connected to wall, with floor drain pan under appliance
 1. No drips or leaks at connections
 2. Safety relief valve properly installed and connected to drain line leading to building exterior
- Check for evidence of "water hammer" in entire system by turning each faucet on and off very quickly and listen for knocking noise
- Check pipe holes in concrete walls or floors sealed with hydraulic cement
- Check permit signed by inspector
 1. Note corrections if required

-
2. Make copy of permit

Heating/ Ventilation/Air Conditioning (HVAC)

Rough-in

Note: Be sure HVAC fixtures are ordered and placed in proper location if access will be a problem

- Check equipment per specifications for correct manufacturer, model, size, capacity with Underwriter's Lab approval
- Check heating, air units, compressors installed in correct location and anchored properly
- Check zone systems have proper units in correct locations.
- Check ductwork installed according to manufacturer's installation instructions and mechanical code
 1. Proper number of supplies and returns
 2. Joints sealed tightly with duct tape
 3. No return ducts in bath or kitchen
 4. Ducts in floors and walls do not interfere with drywall installation
 5. Duct insulation correct "R" rating and properly secured
 6. Prepare vent for combustible air circulation
- Check adequate vents and ducts for dryer, stove, moist rooms, air circulation. Check heat exhaust vents installed per applicable code
 1. Keep wood framing lumber away from heat vent
 2. Flashing conforms to roof material to resist water
 3. Down draft caps securely in place
 4. Vents placed for aesthetic value
- Check air conditioning condensate drain installed
- Check gas fixture layout and pipe logistics
 1. Locate meter for access and inspection
 2. Place stub-out for future use
- Check placement of floor pan under attic furnace
- Check permit signed by inspector
 1. Note corrections if required
 2. Make copy of permit

Trim

Note: Confirm manufacturer, style, type, color of fixtures at rough-in, prior to ordering trim package, and at delivery to site. Inspect fixtures before and after installation for scratches, chips, dents.

- Check gas line hook-up to gas appliances:
 1. Stove
 2. Dryer
 3. Water Heater
 4. Fireplace
 5. Hot Tub
 6. Furnace
 7. Grill
- Check HVAC electrical hook-up completed per code and manufacturer's installation instructions
- Check thermostat's location and operation
- Check filter installation on furnace and air conditioning
- Check radiators, vents, ducts for cleanliness
- Check air conditioning condensate drain operation
- Check water line to/from humidifier
- Check Noise Rating of Vent fans
- Check exterior openings sealed with caulk to applicable code
- Check furnace operation through 24 hour cycle
- Check supply trim for proper air flow direction
- Check permit signed by inspector
 1. Note corrections if required
 2. Make copy of permit

Electrical

Rough-In

Note: Be sure electrical fixtures are ordered and placed in proper location if access will be a problem

- Check location and size of service panel
 1. Place conduit in wall for underground wiring
 2. Locate for access to public utility and meter installation
 3. Coordinate with public utility
 4. Ground rods placed per electrical code
- Check layout and number of outlets and switches
- Check lighting layout per owner's furniture and expected use or function and Underwriter's Lab approval
- Check wiring provided for appliances and fixtures:
 1. Garbage disposal or Hot Water Dispenser
 2. Dishwasher
 3. Stove and Hood
 4. Refrigerator
 5. Microwave
 6. Entertainment Center
 7. Clothes washer and Dryer
 8. Built-in Ironing Board
 9. Built-in Hair Dryer
 10. Built-in Vacuum Cleaner
 11. Sauna or Hot Tub
 12. Medicine Cabinet Lights
 13. Moist Room Fans
 14. Attic Fans
 15. Landscape Lighting
 16. Outside outlets
 17. Interior hanging lamps
 18. Wall Sconces
 19. Garage door opener

- Check for proper placement and installation of equipment:
 1. Telephone Jacks
 2. Television Jacks and location of cable service or antenna
 3. Smoke Detectors located per fire code
 4. Security installed per manufacturer's installation instructions
- Check for electrical requirements for specialty items
 1. Fire Sprinkler
 2. Landscape fountains
- Check hole penetrations sealed with exterior grade caulk
- Check permit signed by inspector
 1. Note corrections if required
 2. Make copy of permit

Trim

Note: Confirm manufacturer, style, type, color of fixtures at rough-in, prior to ordering trim package, and at delivery to site. Inspect fixture before and after installation for scratches, chips, dents.

- Check covers installed on all switches, outlets, fixtures
- Check operation of all electrical items and equipment following manufacturer's recommendations
- Check panel circuits labeled per house layout
- Check appliances for correct operation
- Check permit signed by inspector
 1. Note corrections if required
 2. Make copy of permit

Insulation, Soundproofing, Weatherization

Note: Insulation and Weatherization *conforms to requirements* of applicable building and energy code

- Check Drawings and Specifications for location and type of insulation, soundproofing, weatherization
- Check insulation installation in areas which would become impossible to insulate at a later date
 1. Shower or tubs on exterior walls
 2. Joist bays and wall corners with tight clearance
 3. Behind furnace and water heater areas
 4. Ceiling corners on hip roofs
 5. Foundation walls and slab perimeters
 6. Sill and wall sealer
- Check exterior wall holes for Trade Contractor work sealed with exterior grade caulk
- Check air/moisture infiltration barrier installed prior to exterior siding
- Check interior wall and floor penetrations stuffed with insulation per applicable building and fire code
- Check wall insulation installed tightly without air gaps or punctures and secured in place behind wiring, plumbing
- Check vapor barrier on warm side of wall conforms to code

- Check insulation placed around perimeter of doors and windows in a manner which conforms to code and correct operation of doors and windows
- Check baffles installed at all vent blocks between rafters
- Check insulation placed at specialty areas such as skylights
- Check areas which will produce unacceptable noise levels and require treatment to reduce problem
 1. Plumbing in walls or ceilings adjacent to living areas
 2. Family or recreation rooms
 3. Stereo or music rooms
- Check floor insulation fits snugly in joist bays and against rim; secure insulation with rods or, if required, twine
- Check ductwork and plumbing properly insulated in areas exposed to cold weather
- Check insulation in attic (either blown or batt) placed uniform depth and cover all areas
- Check vent baffle used between insulation and roof sheathing for vaulted/cathedral ceiling

Note: Prior to insulation of house, use video camera to record all work by contractors inside interior and exterior walls *to verify layout and number of items*; use recording to verify trim package layout.

Drywall

Before Hanging

- Check access and logistics for delivery and storage of drywall, joint compound, tape, nails, corners
- Check framing for moisture content; beware of excessively moist conditions which will contribute to high humidity in house during drying
- Check studs for irregularities in wall line; make partial cuts in studs to straighten wall line
- Check backing in walls and ceilings for nailing
- Check rough openings for square, plumb, level, size

Before Taping

- Check nailing pattern conforms to applicable building code
- Check drywall thickness conforms to fire code at critical walls and ceilings
- Check unnecessary gaps, damage, warpage, or voids which must be replaced prior to finish
- Check rough cuts around all openings for final trim to allow proper fit
- Check nail/screw heads are properly "*dimpled*"
- Check need for waterproof drywall (green board) in moist rooms; tile areas will be provided with cement backer board
- Check metal corners installed on outside corners and nailed flush with finish surface
- Check type of window trim to be installed
- Check type of finish after taping; smooth wall require more labor and higher cost per square foot
- Check floors for cleanliness and cover with building paper prior to finishing and texture
- Check windows, doors, and other finish work covered with plastic to avoid splattering and spillage

- Check video recording to verify location of all items or fixtures which need to penetrate drywall

During Finishing

- Check necessity of heat between coats of drywall compound to assist curing time; who is responsible for heat?
- Check three separate coats of compound are applied to all joints; each successive coat should leave a wider track and smoother finish
- Check windows, doors, and other finish work remain covered with plastic to avoid splattering and spillage
- Check excessive water or compound spillage in house during finish; excess moisture will cause high humidity during curing

After Finishing

- Check all joints feathered smooth and sanded to finish
- Check all openings are exposed and cleaned of compound
- Check cuts are smooth and ready for trim
- Check nap of paper not raised or roughened by excessive sanding
- Check for nail heads exposed
- Check joint compound completely dry before sealing

After Sealing

- Check primer used for sealer is approved by energy code if required
- Check primer applied consistently over all areas
- Check primer allowed to completely dry
- Check walls for imperfections prior to texture; correct imperfections prior to texture application
- Check type of texture to be applied in house

After Texture

- Check consistent pattern throughout entire house
- Check all debris removed from site

- Check plastic remains in place if painting is to be accomplished immediately after texture
- Check texture thoroughly dry before painting

Windows, Millwork, Doors

Windows

- Check rough frame size coincides with window schedule and "approved" Drawings and Specifications
- Check windows conform to applicable building and energy codes
- Check size, type, number, and condition of windows on delivery to site
- Check screens match size and type of window
- Check windows installed per manufacturer's installation instructions
 1. Window frame secure against building
 2. Gap around window frame consistent on all sides
 3. Windows open and close smoothly
 4. Reveal at open window to be consistent
- Check windows installed per manufacturer's installation instructions
- Check window casing nails set below surface and sealed with putty
- Check window size and type consistent with trim application

Millwork

- Check location and type of all wood trim
- Check paint or stain color per owner's requirements
- Check accurate quantity of case trim for windows and doors, and base trim for floor
- Check specialty molding/trim for type and color
 1. Stair kits
 2. Wainscoting
 3. Mantel

4. Window seats
 5. Paneling
 6. Sauna Kits
 7. Closet Rod & Shelf
 8. Pantry Shelves
 9. Handrails
 10. Caps, Aprons, Crowns
- Check trim/molding installed to finish standards
 1. All material is void of major defects
 2. Trim intersects with walls, ceilings, floors evenly with no gaps or irregularities
 3. Trim joints are tight and caulked, sanded and smooth
 4. All finishing nails set below surface and sealed with wood putty
 - Check trim/molding installed per industry standard and functions according to intended use

Doors

- Check door type, quantity, size, swing, finish, hardware per owner's requirements
- Check condition of doors and hardware at delivery
- Check thresholds and weather-stripping accompany exterior doors
- Check automatic closers accompany fire-rated doors
- Check location of all doors per door schedule
 1. Exterior
 2. Interior
 3. Pocket
 4. Bi-Pass
 5. Bi-Fold
 6. Attic
- Check final installation of all doors

-
1. Doors open and close smoothly
 2. Reveal is consistent with proper clearances
 3. Knobs, latches, bolts align with insets
 4. Swing in proper direction with privacy facing correct side
 5. Locks function easily and smoothly
 6. Keys available and keyed the same for ease of use

7. Weather-stripping in place
 8. Thresholds properly adjusted
 9. Door stops in proper locations
 10. Allow for clearance from finish floor surface
- Check finish nails set below surface and sealed with wood putty
 - Check doors free from mars, scratches, dents

Painting, Staining, Wall Covering

Painting & Staining

- Check manufacturer, type, color per owner's selection
- Check proper preparation to surface to be painted or stained
 1. Nail holes filled
 2. All knot holes, pitch pockets sealed appropriately
 3. Cracks and defects filled to finish surface
 4. Drywall imperfections smoothed and textured
 5. Primer/Sealer used where possible
 6. Protected areas to be *"taped and bagged"*
 7. Floors continue to be covered with building paper
 8. Exterior plants and earth protected from overspray
 9. Decks, siding, windows, doors, patios protected
- Check all treated areas appear uniform in color and maintain consistent pattern
- Check trim treated according to owner's requirements
- Check color intersections are distinct and clean creating true and correct lines

- Check no dried paint drips or drops exist
- Check all debris and spillage removed from site
- Check windows, doors, trim free of paint/stain
- Check extra paint/stain remains with owner

Wall Covering

- Check wallpaper located in specified areas
 1. No texture applied to these areas
 2. Seams are consistent without gaps
 3. Pattern matches at seams
 4. End cuts conforms to floor and ceiling
 5. Excess paste removed and paper clean
- Check paneling located in specified areas
 1. Match grain and color of individual pieces
 2. Use color finish nails or color putty to match stain
 3. All cuts match existing area
- Check ceramic wall tile located in specified areas
 1. Owner specifies color, size, pattern
 2. Cement backer board installed as substrate
 3. Use proper setting and grout materials
 4. Use sealant in critical areas

Floor Covering

Note: All floors to be scraped, sanded, cleaned prior to installation of floor covering

- Check plans and specifications for owner's requirements

Carpet

- Check pad/carpet at delivery for color, type, size, condition
- Check manufacturer's installation instructions
- Check carpet stretched tight and secured with nail strips
- Check no damage done to walls or corners
- Check seams tight and trimmed
- Check metal threshold strips for appearance and weather-tightness
- Check carpet stairs tight and secure to treads and risers

Wood Floor

- Check material species, size, grade, and pattern
- Check double layer tar/building paper placed on floor if required
- Check proper fastener:
 1. Strips nailed with ring-shank nails using floor nail gun
 - 2..Parquet adhered with recommended mastic
- Check material layout and joinery
- Check headers at thresholds, fireplaces, registers
- Check sanding completed in three phases to final finish
 1. Specialty sanders equipped with dust bags

2. Smooth, consistent final surface
- Check stain or natural oil applied uniformly
 - Check finish type and glaze per owner's requirements
 - Check formaldehyde off-gassing during curing

Vinyl Floors

- Check material at delivery for make, color, pattern, size
- Check sub-floor installed with ring-shank nails @ 4" o.c.
- Check filler applied to sub-floor to eliminate dips
- Check vinyl installed per manufacturer's directions
- Check seams and edges for smoothness and tight fit
- Check thresholds cover edges at transition area
- Check no scratches or mars after installation
- Check seam sealer applied if recommended by manufacturer

Ceramic Floor Tile

- Check material at delivery for make, style, color, size, and pattern
- Check method for setting tile and preparing substrate
 1. Thin-set adhesive
 2. Mortar bed
- Check for need for vinyl membrane as moisture barrier installed per manufacturer's recommendation
- Check shower pan installed with proper reinforcement and vinyl membrane in place at walls and corners, and secure to floor drain with slope
- Check tile layout for consistent border on all sides

- Check grout spaces are uniform; grout color as specified
- Check tiles are secure and do not move under pressure
- Check grout is sealed as specified

- Check base, cap, corner tiles are factory-produced molded pieces or field-cut with smooth, even edges
- Check no scratches, cracks, chips exist after installation

Cabinets & Countertops

Note: Selection and configuration of cabinets and countertops become a *personal, subjective set of choices* which depend mainly on lifestyle. Whether stock or custom cabinets are incorporated, the combination of drawers, doors, tip-outs, lazy-susans, pull-outs, glass doors, etc. will be the result of how one intends to put the area to use.

Cabinets

- Check dimensions at drywall installation and prior to ordering cabinets to confirm dimensions
- Check wood species, cabinet style, and type of finish
- Check type of hinges and pulls
- Check product at delivery for make, style, finish, quantity, size, condition prior to installation

Note: Cabinet manufacturer/vendor and cabinet installer may be two different Trade Contractors. When possible a single Trade Contractor responsible for both activities will *increase accountability for quality and service*

- Check cabinet installation for level, plumb, and units secured to wall
- Check doors and drawers open and close smoothly

- Check alignment of all units, openings, finished surfaces
- Check all specified components installed

Countertops

Note: Countertops may be made of a plastic laminate such as "*WilsonArt*" or "*Formica*" brands. However, a variety of materials including butcher block, tile, stainless steel, and solid surfaces such as "*Corian*" brand are available based on use and cost considerations.

- Check installation details
 1. Backsplash
 2. Edge
 3. Faucet & Sink Layout
- Check countertop secured to cabinet and level
- Check fit at seams, corners, walls, corners
- Check stability and security of overhangs
- Check backsplash conforms to wall with proper caulk at seam and wall
- Check edge provides solid and sanitary connection with top
- Check cutout "*templates*" for sinks, faucets, cook tops, ranges are available to countertop installer

Trim Package & Hardware

Trim Package

- Check wall covering completed
- Check floor covering completed
- Check woodworking completed
- Check door installation: fit, operation, stops
- Check attic access door insulated
- Check fixtures and appliances for operation
- Check window installation: cleanliness, operation, screens
- Check switch and outlet covers in place and tight to wall
- Check debris removed and all surfaces cleaned

Hardware

- Check bathroom accessories
 1. Towel Bars/Rings
 2. Paper Holder
 3. Mirrors
 4. Shower/Tub Doors
 5. Medicine Cabinet

- Check door hardware
 1. Deadbolts
 2. Handles/Latches
 3. Spring-loaded hinges
 4. Strikes
 5. Thresholds
 6. Weather-stripping
 7. Bi-Fold/Bi-Pass Kits
- Check cabinet hardware
 1. Adjustable hinges
 2. Tip-outs
 3. Sliders
 4. Pulls
 5. Lazy Susan's
- Check electronic hardware
 1. Telephone jacks
 2. Television jacks
 3. Antenna/Cable installation
 4. Security system
 5. Intercom/Radio/Speakers
 6. Home Office/Entertainment Center

Decks & Porches

- Check concrete foundations extend below frost line and engineered to support structure
 - Check galvanized metal connectors installed using "approved" nails
 - Check structural lumber stamped pressure-treated outdoor wood
 - Check all connections to house properly flashed and secured
 - Check decking, rails, pickets, caps are cedar, redwood, or pressure-treated to meet standard of applicable building code
- Check columns, posts, beams certified to carry load and not merely ornamental
 - Check stair dimensions conform to applicable building code
 - Handrails
 - Treads & Risers
 - Pickets & Guardrails
 - Check finish is exterior quality, with unlimited warranty to not peel or flake on deck or rail surfaces

Landscaping

- Check site drains away from house and conforms to requirements of applicable building code
 - Check ground makes no contact with siding and conforms to requirements of applicable building code
 - Check all stoops, walks, aprons are connected to foundation with rebar to limit separation and settling
 - Check all flat surfaces drain away from house and measures are taken for storm water control
- Check areas specified for grass are installed with sod or seed
 - Check plants are placed and protected per landscape plan and specifications
 - Check fences firmly placed in soil to avoid movement or shifting; galvanized metal connectors and nails used where necessary
 - Check Sprinkler System installed per manufacturer's recommendations and Owner's requirements

REMEMBER: Pay attention to natural phenomena affecting Design/Build considerations. Your region will present unique biological, geographical, geological, and meteorological conditions which may require special materials and methods. Contact your local Building Department or a Civil Engineer if more information seems to be required for your project. Your product and material choices are based on personal choices and lifestyle decisions; however, the physical environment of your region and site location will also be a significant determinant of what materials are specified and how they will be installed on your project.

A FINAL NOTE: During construction work, the pace of activities requires the Owner to coordinate and control Trade Contractors and Suppliers on a daily basis. Very quickly there arises a need to record what happens and who is responsible for correct or incorrect work. Don't let the pace of activities interfere with documentation of quality control.

DON'T FORGET: Many states have passed “notice-and-opportunity-to-repair” (NOR) laws, which let contractors offer to repair a defect before the homeowner can sue. Also, some states have enacted a “home warranty policy” or “warranty of habitability” laws to protect consumers from defective work. Check with your state’s Consumer Affairs Division of the Attorney General’s Office to determine your rights and responsibilities.

The B.Y.O.B. Owner will definitely want to record the basics of who, what, when, where, why, how of a problem situation. The use of a Job Diary is a means to document your concerns and communicate them to a Trade Contractor or Supplier. Suggestions for keeping a Job Diary are presented in the PUNCH LIST section.

In addition, a video recording and still photographs are also important methods to authenticate what’s happening. This accomplishes two things: first, it lets people know you’re serious about correcting the situation; second, it allows you to review details in their original condition and share the problem with others. Both points are vital to honest, open communication leading toward project accountability. If the problem isn’t solved, your pictures and diary will become a factual basis for explaining the problem to your attorney.

Here’s what you can do to improve reliable documentation:

Video Recording: Dedicate a video tape for exclusive job site use. Follow normal sequence of events and establish shots which truly represent the work. Record what’s been accomplished during rough-in and finish phases to create a “before and after” effect.

Still Photographs: Purchase a “one use” camera specifically for your project. Close-up shots will amplify details in need of further discussion. Purchase “doubles” so there’s a photograph for your files and another copy to send to a Trade Contractor or Supplier.

Job Diary: Date and label all photographs. In your daily log, keep a record of dates, names and events that occur. As you encounter problems, keep to the facts and plainly describe existing conditions!

Don’t forget the old adage: “One picture is worth a thousand words.”

For Quality Control, no one cares as much about how the work is accomplished than you, the people who’ll live in the home.

Go Green

One of the more onerous problems facing B.Y.O.B. Owners making Design/Build decisions is what to do with construction and demolition (C&D) waste. One has only to drive-by any construction site and see the unattractive pile of debris accumulated to be convinced of this concern. Considering that construction of a single family residence generates about 2.5 tons of C&D waste, this debris quickly becomes an economic problem costing from \$500 to \$1,000 for scrap removal from a job site, not to mention what it takes to clean-up the job on a daily and weekly basis.

The solution is for Owners to apply the **FOUR R's** of the "building green" philosophy to their debris:

- * **REDUCE** the amount of C&D waste you generate.
- * **REUSE** what is reusable (or find someone who will).
- * **RECYCLE** what's left on site.
- * **REFUSE** belongs in a landfill.

Keep in mind...the problem is not just an economic issue but a moral issue, and like most moral decisions the choice to follow the FOUR R's is difficult compared to the ease of renting a mammoth metal container and chucking all debris over the side for the duration of the project. Our concern is for the conservation of natural resources while decreasing material and disposal costs.

What you can do during the B.Y.O.B. Design Phase

- Research publications and sources which will assist in your efforts to conserve. Contact your city or county government for assistance.
 - Specify slab-on-grade foundations, adopt panelized construction, and adjust the floor plans and roof pitches of your home to fit a two foot grid.
 - Incorporate design features which utilize standard sizes of materials such as lumber in 8', 10', 12' lengths; C/D Exterior (CDX) plywood or Oriented Strand Board (OSB) in 4'x 8' modules.
 - Change the way you design a house by following a value-engineered approach that takes advantage of more efficient layout and spacing at corners, joists, headers, top plates, and backing.
- Consider the use of salvaged windows, doors, electrical or plumbing fixtures if they are code compliant. Items such as "flawed" tiles and second-hand wood floor strips may be available. Hardware can often be found at neighborhood garage sales.
 - Make sure job site recycling and clean-up is written in your contract with Trade Contractors. Remember: your program will fail without the support of the people who actually do the work.
 - Dedicate an area on site for recycle-reuse bins. Take into consideration logistics required for excavation, material storage, job shack, utility access, job toilet, and parking area before locating bins.

What you can do during the B.Y.O.B. Building Phase

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|---|--|
| <ul style="list-style-type: none">• Clearly designate bins by attaching large identification signs. Consider using a single bin with dividers.• Provide a trash can for lunch bags, coffee cups, caulking tubes, and other items which will contaminate the load and make it unacceptable for recycling.• Consider locking bins at night and on weekends to prevent people from dumping their trash in your recycling bins.• Centralize wood-cutting operations to make it easier to locate and reuse end cuts and scrap plywood. When cutting is done in other areas, relocate your scrap pile so people won't walk long distances to reuse end cuts. | <ul style="list-style-type: none">• Figure out which categories of waste your project will generate (i.e., dimensional lumber, drywall, cardboard, asphalt, metal, masonry, concrete, plastic). Coordinate regular pick-ups/deliveries to eliminate overflowing bins or huge piles.• Contact Construction Manager (or Superintendent) and Trade Contractors as each phase approaches to review the Conditions of your Agreement. As crews come on the site, talk to the lead person to remind them of your reduce-reuse-recycle-refuse program.• Look for haulers willing to cooperate. If they drag their feet, look for someone else. Make sure haulers who say they recycle aren't actually dumping your waste illegally.• Donate used building materials to non-profit building centers like Habitat for Humanity's Re-Store, which are willing to handle job site leftovers. |
|---|--|

Building your homestyle is just the first step toward creating your lifestyle, and by "building green" you're providing a HABITAT for "living green." Understanding your home as an ecosystem represents a concern for how the basic elements of air, water, energy, and materials interact with nature in a manner consistent with our biological system.

On an economic basis we're interested in efficient operations that save money. But during the construction process, we may be creating hazardous conditions caused by the very technology that was designed to improve our lives. Chemical vapors from materials used during installation and synthetic manufacturing materials used on products may contribute to an unhealthy living

environment. Your responsibility is to determine whether the materials and products for your homestyle will become detrimental to your lifestyle.

The effectiveness of your home design will marry site to lifestyle but a healthy indoor climate creates an additional "hidden" value. Due to energy and building codes, the modern house is sealed tight with concrete floors, vapor barriers, airtight windows and doors, and layers of paints, stains, and floor coverings. More than likely, the materials/products with which you build will contribute to the environment in which you live.

Your challenge will be to choose products/materials for your HABITAT which will complement good health. Remember: Use "green" products and materials that are nontoxic, nonpolluting, low energy, and recyclable.

The Design/Build process allows the B.Y.O.B. Owner to slowly progress towards a final solution so there's every opportunity to consider your community, site, architectural style, materials, products, and decor. Being in harmony with home and life style will bring satisfaction to how you build and live. Here are some building green categories that present an opportunity to introduce healthier products and more efficient practices into your home and life style during the Design/Build process:

<ul style="list-style-type: none">• Energy Star Rating from your local utility provider• Model Energy Code from your local building department• Land Use, such as reusing site topsoil and orienting house properly on lot• Waste Management, such as built-in kitchen recycling center• Building Envelope, such as advanced sealing practices around windows and doors• Mechanical System, such as high efficiency furnace with zone heating/cooling• Indoor Air Quality, such as house meeting American Lung Association's Health House Standards	<p>Water Heating, such as water heater with insulating blanket installed to mfr's specs</p> <ul style="list-style-type: none">• Appliances meeting Energy Star Rating• Lighting, such as efficient, fluorescent light bulbs throughout house• Structural Frame utilizes engineered lumber products rather than dimensional products• Doors, such as insulated garage and exterior doors• Windows, such as double-glazed, Low-E with insulated window coverings• Cabinetry made with formaldehyde-free particleboard and adhesives• Wall Paints and Finishes with minimal VOC content
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To complete your "personal" ecosystem, a B.Y.O.B. Owner will want to develop the building site in a manner which is environment-friendly. How one controls storm water, creates green spaces, allows for driveways and sidewalks, provides spaces for septic and potable water, and orients the residence to the sun will unify the design within and without the home. This environmental effort goes beyond county or municipal ordinances covering setback requirements, green spaces, wetlands, or conditions, covenants, and restrictions established by neighborhood associations. Although these are legitimate issues which will be considered when you apply for a building permit, and certainly need to be addressed even before you purchase a lot, these technical issues are only part of a complete master plan of your site.

Your master plan will be determined by characteristics of the topography, soil, weather, vegetation, size and shape of the site, zoning regulations, utilities, off-site features, and how the Owner intends to use the outdoor space once the home is completed. For proper ecological management, the Owner may want to involve the professional services of a Landscape Architect or Civil Engineer especially if the site presents complex conditions which make a profound impact on issuance of a building permit. However, if site conditions don't pose difficult technical issues, the Owner may proceed using common sense and their own definition for what is suitable to their home and life style. The key to creating an environment-friendly site is working with the processes of both biological and technological systems.

First, the B.Y.O.B. Owner will want to examine existing biological and geological conditions as thoroughly and precisely as possible.

Second, you'll want to become familiar with seasonal weather patterns which affect the geographical area and specifically your site.

Thirdly, account for ALL utility requirements regarding ingress and egress, and any legal requirements which may affect development.

A **fourth** step would be to layout traffic flow to and from the site both during and after construction.

Fifth, place the residence in a location which allows for all the information generated by the previous four steps.

Sixth, co-opt all contractors and suppliers in your initiative to properly handle material and debris disposal.

Finally, utilize the FOUR R'S of the building green philosophy for handling construction and demolition waste.

A natural, technically "correct" site satisfies all requirements by the local building department while producing a healthy, clean, and safe building site. There's no pat formula for making this happen so be prepared to define and analyze the conditions of your site. Remember: it's a process of progressively approximating solutions for your project. All decisions in the B.Y.O.B. Design/Build process make a statement about what you value and its impact on the community.

Permits

In theory, a public agency overseeing building and land development *is* on *your* side! Public agencies exist in order to protect the interests of the citizenry, and there is certainly no reason to encourage an adversarial-type relationship. The purpose of building departments and codes is to provide standards to safeguard the health, safety, and property of the community.

Remember: Cooperation with plan examiners and field inspectors is going to be more effective than confrontation and conflict.

Historically, there have been three "standard" building codes in the United States: building codes have been developed by the International Conference of Building Officials, Building Officials and Code Administrators, and Southern Building Code Congress. ICBO's Uniform Building Code has been the most widely adopted, but recently many states are adopting the International Residential Building Code and the IRC is NOW generally recognized as America's standard code. You should check with your Building Department to identify which code is applied in your area and where you can obtain copies of applicable codes and ordinances.

As you consider where to build your home, you'll want to be sure the site conforms to local codes and ordinances BEFORE you purchase the lot.

When you obtain a residential Building Permit, your project may be checked to meet the requirements of the following codes and ordinances:

1. International Residential Code
2. Uniform Mechanical Code
3. Uniform Plumbing Code
4. National Electric Code
5. Uniform Fire Code
6. Sensitive Areas Provisions and Administrative Rules
7. Storm water / Drainage Ordinance
8. County Zoning Code
9. Energy Code
10. Ordinances and policies adopted by your County or City.

Required Information

Almost any type of construction requires a permit. Permit fees are set by the county or city, and fees are paid when application for permit is made. In order to obtain a permit for New Construction, Additions, and Remodels, you will likely provide the Building Department with the following types of information:

- | | |
|---|---|
| 1. Owner's Name, Phone Number, and Mailing Address | 8. Design |
| 2. Property Tax Account Number | 9. Water Availability Letter/Recorded Well Covenant |
| 3. Legal Description of a Legal Building Site (multiple copies) | 10. Owner Affidavit/Contractor's Registration Number |
| 4. Site Plan (multiple copies) | 11. Valuation for Special Site Items |
| 5. Working Drawings & Specifications (multiple copies) | 12. Fire Marshal Application Receipt |
| 6. Information on Heating Systems, Fireplaces, Stoves | 13. Energy Code Compliance Form |
| 7. Sewer Availability Letter/Septic | Miscellaneous: For instance, Storm water Control or Land Clearing Permits |

Note: Electrical, Plumbing, Septic, Mechanical, and Gas permits may be issued by your Department of Labor and Industries and County Department of Public Health. Contact these agencies in your State for related information. Not all permits will originate from the same public agency!

Inspections

During construction a certain number of inspections are required as a result of the permits issued for your project. Some of the critical inspection points are (this varies from locale to locale):

- before pouring concrete footings
- before pouring concrete walls
- after plumbing rough-in
- after HVAC rough-in
- after electrical rough-in
- after framing rough-in
- after insulation installation
- after drywall installation

-
- after laying sewer or septic lines
 - after final completion

When a building permit is issued to you, there will be a schedule which identifies these critical inspection points. Remember: septic, electrical, plumbing, gas, and HVAC inspections are arranged by the respective Trade Contractors, but it is your responsibility (or the General Contractor) to coordinate on-site activities.

It may not be your responsibility to actually apply for each respective permit. However, it'll be your responsibility to PAY for the permits as well as all work necessary to make your project code compliant. You'll be providing the necessary information for the General or Specialty Contractors to get the permits on your behalf. The Contractors will apply for permits, call for inspections, correct any problems, and receive final approval of their work.

Code Compliance

As work progresses on your project, you assume Drawings and Specifications are in compliance with code requirements because they've been "approved," and Trade Contractors are building according to these standards. Don't make this assumption! Architects, Designers, and Engineers strive to meet the needs of a client, public agencies, and their own design. Often, these construction professionals think that if their work has code violations, the building officials will catch them during plan review. And, the attitude of some professionals is based on the feeling that inspectors will catch any problems during field inspection if they're not discovered during plan review.

REMEMBER: It's much easier to change your home style on paper rather than six months later under field conditions. Hold your B.Y.O.B. Design/Build team responsible for their decisions early in the planning stages!

Regarding Architects and Trade Contractors responsibility, you should make their code compliance a condition of your Agreement with them to perform their work in a professional manner. This may seem obvious but it's rare to find an instance where an Inspector has found no corrections to be made. In other words, don't let the Architect disclaim responsibility for code compliance by pushing it off the Trade Contractors. Similarly, don't let the Trade Contractors push responsibility back onto the Architect for a poor design. Collaborate with your Design/Build team during Design Development to the greatest extent possible.

For instance, a framing inspection is required AFTER plumbing, heating, and electrical rough-in work is complete. Since many Architects and Specialty Trade Contractors may be unfamiliar with where and how often joists can be notched or drilled, the Inspector wants the opportunity

to review how rough-in work has affected structural integrity. Often, poorly cut holes or notches can be repaired, but sometimes a serious mistake may call for a Structural Engineer to create a design solution. Who pays for this extra work by the Structural Engineer?

If this type of issue had been anticipated during Design Development, there wouldn't be a need to make corrections in the field. Proper planning is most important but this won't always happen so field inspectors are given ultimate power to make decisions during the course of construction regardless of what's in the Drawings or has been approved during plan review. So, why not anticipate this dilemma by collaborating with both design and build professionals during Design Development?

Inspections are necessary to enforce provisions of the code and ensure code compliance. If there's a problem with your project, a "Correction Notice" will be issued identifying the problem and the action to be taken to comply with code requirements. The work will be re-inspected! You'll want to discuss the problem with the Field Inspector, and hold the Architect who designed the work as well as the Trade Contractor who completed the work responsible for the correction.

Resolving Conflicts

Whether you're dealing with a Field Inspector, Architect or Trade Contractor, problems encountered during the Design/Build process may place individuals into CONFLICT. Conflict situations usually originate when an individual is frustrated or feels about to be frustrated, in the pursuit of an important goal. The B.Y.O.B. Owner should accept the probability that conflicts will emerge and anticipate ways to resolve problems.

The most straightforward approach to resolving conflict is to attempt to identify the exact nature of the problem, consider possible alternative solutions, and select the solution that is most reasonable when both parties are willing to work together. However, individuals are often placed in situations in which they experience considerable anxiety and often resort to aggressive defense mechanisms in order to get their way. This type of behavior is the least effective when communicating with a Field Inspector, Architect or Trade Contractor.

Compromise defense mechanisms allow individuals to make relatively satisfactory adjustments to less than desirable situations. The process by which change comes about and conflicts are solved rests squarely on communication. The B.Y.O.B. Owner wants the project to remain on schedule and in budget so one must be prepared to contend with difficulties surfacing during inspection of Trade Contractor's work by remaining in a problem solving mode.

After your final inspection, a "Certificate of Occupancy" will be issued. Sometimes this is a formal certificate but often the original permit with all signatures may become this document. Not all signatures appear on the original permit issued by the Building Department. The septic, plumbing, electrical, gas, and HVAC permits may be separate documents, and you'll want to retain these copies as well as the building permit.

As the B.Y.O.B. Owner, keeping signed copies of all original permits for your records is essential as evidence that your project has complied with all codes and ordinances!

Contract Docs

Construction Contracts usually consist of four documents in combination:

1. **DRAWINGS**
2. **SPECIFICATIONS**
3. **AGREEMENT**
4. **CONDITIONS**

DRAWINGS are a graphic representation of the work to be performed consisting of a site, foundation, floor, roof, elevation, and cross section plans. They show the location, character, dimensions, and details of the work.

SPECIFICATIONS are a written description of the work to be performed consisting of product identification, types of finishes, and standards for performance. They explain the work to be performed in terms that are not easily displayed in graphic form.

AGREEMENT identifies the parties to the agreement, the date, payment schedule for the work, the basic commitment of the Trade Contractor to construct the described project in accordance with the Drawings and Specifications, the schedule on which the work is to be performed, and the signatures of the parties. Usually, this form is quite brief, but it incorporates by reference the other parts of the contract.

CONDITIONS clarify in detail the rights and obligations of the Owner, Trade Contractors, and those activities which will be shared by mutual agreement. These clauses deal with various subjects such as Owner, Construction Manager, Architect, disputes, change orders, schedule, liability insurance, safety, inspections, corrections, arbitration, termination, jurisdiction.

All parties will want to be familiar with all the WRITTEN REQUIREMENTS of an enforceable contract. Here's a list of 16 conditions between an B.Y.O.B. Owner and an Architect and/or Contractor that you'll want to put into writing. Consult with an attorney practicing construction contract law to review your contract documents before forming an agreement.

Business Documentation – The legal business name, address and business B.Y.O.B. Owner, or legal representative, should be stated. Indicate license numbers, professional certifications, proof of bond to cover work performed, proof of occupational insurance, personal and property liability insurance (contractor), and errors and omissions insurance (designer). Be sure statutory notice is provided according to your state's law!

Scope of Work – You should identify what will be accomplished. What do you intend to do? What type of work will be performed? The preferred method is to simply refer to Drawings and Specifications, and let those documents do the talking for you, rather than try to re-describe or summarize the scope of work. If drawings and specifications are not yet created, describe how these documents will be created and what fees will be associated with their creation,

Contract Price – How much will be charged? Does the price include sales tax or not? Who is responsible for getting the permits and scheduling inspections? Is the price fixed on drawings and specifications, or cost plus a percentage with an estimate, or based on an hourly fee? Can you break the work into phases of completion?

Schedule of Payments – How are you going to pay? Is there going to be a down payment or retainer fee paid? Are there going to be progress draws? Will you utilize a voucher system? Is the balance due on completion

of work? How long after substantial completion of work is final payment due?

Terms of Payments – How do you determine substantial completion of work: when the permit is issued or signed off or some other more definitive date? Will a notarized waiver of lien be required? Will dual signature checks be utilized? How often will the lender's representative visit the site to verify progress? Never agree to an assignment of funds!

Interest – Will you be charged interest? If so, on what amount are you charged interest? When does interest begin to accrue? If the schedule exceeds the time allotted by lender, who pays any additional interest or penalties?

Site Meetings and Workplace – Where will meetings take place and how frequently? Who will have the authority to call meetings? Who will observe work to be accomplished and become the contact person for all questions and inquiries? Who will maintain workplace clean up and safety? Who will be responsible for maintaining portable toilet, first aid kits, signage, and temporary services on site?

Building Codes – Who is responsible for conformance of drawings and specifications to the building code? What happens during course of construction if building codes change or a field inspector changes the interpretation of a plans examiner?

Lender Requirements – Will both designer and contractor complete a construction cost breakdown form and description of materials using lender's forms? How will you proceed from a very general estimate of costs of work to be accomplished to a specific budget based on a thorough cost analysis? Who are the specialty contractors and suppliers for each phase of the design and build endeavor?

Change Orders – How will changes to scope of work be documented? Are change orders going to be in writing, or can they be authorized orally? How will changes be billed? Will charges or credits be based on time and material at cost or markup price? Will receipts be provided for materials or work outsourced to others? Is payment to be made in advance for changes or at the time of the next progress billing? Are hourly rates established for residential designer, contractor, or staff person?

Disputes and Remedies – If there is a misunderstanding, how will it be resolved? Are you going to spend endless years in mediation or arbitration, or are you going to resolve this through Mandatory Arbitration Rules, which is set up and paid for by the Superior Court system in your state? Will disputes be settled in accordance with the American Arbitration Association and their Construction Industry Arbitration Rules? How will legal fees be paid? Can you terminate the relationship without paying penalties or additional fees to a designer or contractor?

Warranty – What kind of warranty is being offered for products and services? Who is responsible for maintaining warranty? How long does the warranty remain in effect? Will the designer or contractor agree to maintain

warranty of habitability according to provisions of your state's law? What limitations are placed on warranty? Does warranty cover workmanship, products and materials? Who is responsible for collecting and disseminating product specifications, warranties, and installation instructions?

Unforeseen Conditions – Who is responsible for identifying or removing hazardous waste? Who identifies and fixes structural defects, nonconforming plumbing, mechanical or electrical conditions, or concealed problems with the structure? Who takes financial responsibility for theft and vandalism? What special conditions arise during inclement weather that may affect work schedule or performance?

Scheduling – Whose responsibility is it to schedule the work? If the workplace is not ready at each phase of construction, then who takes responsibility? Who pays for unnecessary trips to the workplace? Are provisions given for labor and delay damages? Who determines who will be responsible for causes of delay? If work is interrupted, how will you correct the problem?

Correction or Completion of Work – Who has the right to create the final punch list? Who has the right to complete pickup work? Will any payment be withheld for any reason? Is it necessary to report deficiencies in writing or can these be described orally? How long is a reasonable opportunity to perform corrections? Who will determine substantial completion of a phase of work for designer or contractor's work?

Acceptance of Conditions – Is there a place for signatures by owner and designer and contractor indicating their Agreement? When

is the start date of acceptance? How long
are conditions in effect? Whose forms are to

be utilized for formal agreement?

Becoming familiar with each of these issues begins with an informal meeting of all parties either together or separately to discuss the expectations of each participant. This meeting will open lines of communication on these issues and inform all participants of what is expected of them during the course of construction. No firm agreements should be made during information gathering meetings; this is a time for becoming acquainted with the various issues which contribute to the overall project success. It's always a process of progressive approximation so agree to meet again to discuss the "Conditions" of your "Agreement."

B.Y.O.B. Owner's interest may best be served by meeting separately with the principal players: Construction Manager, Architect, and Trade Contractors and Suppliers. Arranging a meeting with everyone may prove impossible given busy schedules, the difficulty of locating a room which adequately provides for the number of people the B.Y.O.B. Owner may want to attend, and the variety of issues related to each participant.

One scenario which has proven effective is for the B.Y.O.B. Owner and Construction Manager to initially meet and develop an overall strategy geared specifically for the Owner's situation. As the B.Y.O.B. Owner proceeds through the Design/Build process, there is continuity in the contract documents. Drawings and Specifications are developed and end-means relationships are made clear.

At each meeting with Trade Contractors and Suppliers, there should be a prepared agenda so the discussion is organized and comments made at the appropriate time. Begin on time and take notes. Define terms, establish procedures, and stick to the agenda. Solicit opinions from all parties requiring everyone at the meeting to present their opinions and positions at this time. At the meeting's conclusion summarize decisions made and identify concerns that are still open for discussion. As soon as possible, type these conditions on one side of standard 8 1/2" by 11" paper (if possible use a word processor for ease of correction) and use it for later discussions.

Remember: Each profession/business produces standard form contracts which favor their particular interests. For instance, most Trade Contractors have a boilerplate contract to divert Owners from bringing their own, and then customize any special conditions for a particular client. Similarly, Architects usually subscribe to the contracts generated by the American Institute of Architects. There may also be a suggestion to take what's been generated at your meeting and attach it to a standard contract labeled "Addendum," "Rider," "Contingency," "Option." Consider this arrangement carefully.

After the "rough draft" contract documents have been reviewed, there's still plenty of time for changes. Ask for comments, suggestions, deletions, or problems to be identified and meet again to make changes to your Conditions. Keep an open mind to alternatives and solutions. Discussing problems without proposing viable solutions wastes time and may cause dissention needlessly.

If possible, complete the "Conditions" of your "Agreement" in its entirety and create a clean copy to be circulated among all parties for review. At any point in this process, all participants should take the document to a Lawyer familiar with construction contract law for review.

Contract documents will be unique to each Owner's requirements and lifestyle. This is why standardized forms should be avoided but this doesn't mean something cannot be gained from examining documents from the American Institute of Architects and the Associated General Contractors.

A useful approach is to take standard contracts from the AIA or AGC:

- cut them up into the various clauses
- group clauses together so you can compare and contrast similar issues
- adapt standard contracts to your situation by addition or deletion
- arrange the clauses to form "Agreement" and "Conditions" statements which fit your situation.

Be sure this activity is completed PRIOR TO any meetings with Architects, Trade Contractors, or Suppliers in order to become familiar with the many issues which need to be considered and what questions you'd like to ask.

Keep in mind that whoever writes the contract often controls the terms of agreement so the point is for all parties to participate in contract formation so that all parties are fairly represented. A good beginning point is to consider HOW the contract is written. Standard forms are to be avoided. Convince all parties that documents will be written in plain, easily understood English. This means eliminating legally correct but professional language which belongs in the domain of lawyers.

“Legalese”

Here are some examples of common legal phrases and their plain English substitutes:

- *This agreement is made and entered into this _____ day of,
- by and between **"This agreement is made (date) between"**
- Sometime before **"Before"**
- Exhibit A attached hereto **"Exhibit A"**
- On behalf of **"For"**
- Forbearance **"Delay or Refrain"**
- In the event that **"If"**
- Of even date herewith **"Today"**
- The law of the State of _____ **"(Your State) law"**
- Heretofore **"Before now"**
- Hereunder **"Below"**
- Probity **"Relationship"**
- Aforementioned **omit most of the time**
- Herein **omit most of the time**
- Said **"The"**
- Such **"The"**
- Performance **"Fulfill"**
- Cease and desist **"Stop"**
- Clear and unambiguous **"Clear"**
- Covenant and agree **"Agree"**
- Made and entered into **"Made"**
- Full force and effect **"Effect"**
- Above and foregoing **"Above"**
- Consent and approval **"Consent"**

Written Contract Documents should be required for all construction jobs. Of course, the cost and scope of the project will determine the complexity of the contract so be prepared for creating documents which are proportionate to the size of your job.

Remember: Too much detail in a contract may lead to poor feelings between Owner and Trade Contractors but often this can't be avoided. You may be "comfortable" with a person's reputation but a handshake will NOT suffice! A contract whether verbal or written expresses the clarity of communication between the Trade Contractor and Owner; it's an opportunity to describe what is to be accomplished, how long it will take, determine the costs, and state under what conditions the work will occur.

The "Sample Agreement and Conditions Document" which follows is provided as an example of how terms may appear using plain, easily understood English, and how a variety of issues might be systematically organized. This document describes the relationship possible between an Owner and General Contractor.

Owners should carefully review their situation, and tailor Contract Documents to fit their project when working with the General Contractor. You'll definitely want to consult a Lawyer familiar with construction contract law.

DO NOT USE THIS DOCUMENT "AS IS"

Sample Agreement and Conditions Document

The Construction Work of this contract is between _____ Contractor's Name _____,
_____ License Number _____, _____ Contractor's Address _____, AND _____ Owner's
Name _____, _____ Owner's Address _____, for completion of _____ Type of
Work _____.

1. Description of Work and Contract Price

- 1.1 Contractor agrees to furnish all labor, materials, supplies, equipment, services, machinery, tools, and other facilities required for the prompt and efficient completion of work described: to construct, according to the Drawings and Specifications, a house located at _____ Project's Street Address _____.
- 1.2 Drawings and Specifications were prepared by _____ Designer/Architect/Plan Service _____. Contractor will provide additional as-built sketches and depictions that describe work performed.
- 1.3 The Work will be done in strict accordance with applicable codes and ordinances and to the full satisfaction and acceptance of the Owner for the sum of _____ Dollars and Cents _____ to be paid in accordance with the Payment Schedule provisions of the lender's construction loan documents **(or state other terms)**.

2. Owner's Responsibilities

- 2.1 The Owner will fully develop Drawings and Specifications with Construction Manager or Architect prior to issuance of permit in a manner which allows Contractor ninety (90) days to complete bidding process. The Owner will provide full information regarding requirements for Work including all covenants and restrictions which apply to site. Code alterations or changes made by inspecting agency during approval process will be considered Changes according to Paragraph 5.
- 2.2 The Owner will furnish the Contractor with a legal survey and description of the project site, and obtain and pay for the necessary permits, approvals, easements, and variances required for Work.
- 2.3 The Owner will furnish all necessary documents for water service, electrical service, natural gas or propane, sewer or septic, telephone, and television cable, and obtain and pay for installation of utility services to project site when required by Permit Application and Work Schedule.

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- 2.3 The Owner will be fully acquainted with the Work and has budget authority to authorize payment to Contractor in accordance with the Payment Schedule provisions of the lender's construction loan documents, to make Changes in the Work by mutual agreement in writing with the Contractor, to render decisions promptly consistent with Work Schedule and furnish information expeditiously.
- 2.4 The Owner will communicate with Trade Contractors and Suppliers through the Contractor.

3. Contractor's Responsibilities

- 3.1 The Contractor will carefully study all Drawings and Specifications and will at once report to the Owner any error, inconsistency or omission the Contractor may discover. The Contractor will do no Work without Drawings, Specifications, or Change Order with Owner's written approval.
- 3.2 The Contractor will supervise and direct the Work using the most professional skill and attention, and be solely responsible for all construction methods, techniques, sequences, and procedures for completing all Work. The Contractor will coordinate Trade Contractors and Suppliers to be in harmony with one another, and conform to Project Schedule.
- 3.3 The Contractor will provide and pay for all labor, materials, equipment, tools, equipment, machinery, transportation, facilities, and services necessary for the proper execution and completion of the Work, except as provided in Paragraph 9.
- 3.4 All materials and products furnished for the Work will be new and free from faults, defects, and conform to the Drawings and Specifications, unless otherwise specified by Owner. In the event there are any discrepancies from the Drawings and Specifications, the Contractor will arrange for the correction of such discrepancies and will notify the Owner on completion of the work performed to eliminate any such discrepancies. All Work not so conforming to these standards will be considered defective. If required by the Owner, the Contractor will furnish satisfactory evidence to the kind and quality of materials and products. The Contractor will make no deviation from the Drawings and Specifications unless requested by the Owner to do so. The Contractor will cause any Work to conform strictly to the Drawings and Specifications unless the Contractor receives written authorization from the Owner describing in detail what Changes are to be made. Minor deviations may be made by the Contractor from the Drawings and Specifications as are normal in standard practices of the construction industry and the practical application of materials.
- 3.5 The Contractor will pay all sales, business, consumer, use, and other similar taxes required by law.
- 3.6 The Contractor will provide all notices to comply with all laws, ordinances, rules,

regulations, and orders of any public authority bearing on the performance of the Work. The Contractor will also comply with any conditions, covenants, and restrictions which may be applicable to the Project.

- 3.7 The Contractor will employ a competent Superintendent to supply necessary assistance, and be in attendance at the Project site during the progress of the Work to insure correct performance of the Work. The Superintendent will be satisfactory to the Owner and not be changed except with Owner's consent, unless the Superintendent proves to be unsatisfactory to the Contractor and is in his employ. The Owner will at all time deal with the Contractor's employees, Trade Contractors, and Suppliers through the Superintendent. The Superintendent will represent the Contractor and all communication given to the Superintendent will be binding as if given to the Contractor. All significant communications will be confirmed in writing. The Contractor will be responsible to and answer directly to the Owner for the acts or omissions of the Contractor and of all of the Contractor's employees, Trade Contractors, and Suppliers, as well as the wages of all employees and all other persons directly or indirectly employed or retained by the Contractor in connection with the Work.
- 3.8 The Contractor will correct any defects in workmanship and/or materials performed or supplied by the Contractor for the Work or which fails to comply with the Drawings and Specifications, whether observed on or after completion and whether or not fabricated, installed, or completed within the time allotted to the Owner by the lender, i.e., six (6) months (or 8, 10, 12 depending on your situation) from date of start. The Contractor will bear all costs and financial responsibility for the failure to complete and have approved the construction within the six (6) month period (or 8, 10, 12 depending on your situation).
- 3.9 The Contractor agrees to clean Project site and remove debris from the premises after each phase of construction. Each Trade Contractor and Supplier will be responsible for disposal of respective waste material at completion of their portion of the Work, and recycle or reuse material when feasible. The Project site must remain in a clean manner, acceptable to the Owner and consistent with the "Building Green" philosophy.

4. Payment Schedule

- 4.1 The Contract price will be paid to the Contractor in accordance with the required payment schedule and incorporated by this reference are the lender's disbursement requirements to which the Contractor and Owner agree to submit **(or state other terms)**.
- 4.2 With regard to a final inspection and Certificate of Occupancy from the Building Department, the Contractor agrees to indemnify and hold harmless the Owner against any and all mechanics' or material men's liens attaching to the property. If any liens attaching to the property have been recorded, then the Owner may use any or the entire amount of the final payment to remove such liens. Nothing in this subparagraph will limit the Contractor's

liability in Paragraph 13 of this Contract.

- 4.3 The Contractor agrees to complete Work in a lien-free condition for the Owner. Any payment made prior to total completion of the Work will not be construed as evidence of acceptance of any part of the Work nor a waiver of any claim by the Owner arising out of faulty workmanship or materials or for failure of the Contractor to comply strictly with the Drawings and Specifications.
- 4.4 The Owner may withhold 10% of contract price or any payment which may be necessary in the Owner's reasonable discretion to protect the Owner from loss because of:
 - 4.4.1 Defective Work not remedied;
 - 4.4.2 Third-party claims filed, or reasonable evidence indicating a probable filing of such claims;
 - 4.4.3 Failure of the Contractor to make payments promptly to Trade Contractors, Suppliers, or for labor, materials, or equipment;
 - 4.4.4 Reasonable doubt that the Work can be completed for the unpaid balance of the contracted sum;
 - 4.4.5 Reasonable indication that the Work will not be completed within the contracted time;
 - 4.4.6 Unsatisfactory execution of the Work by the Contractor.
- 4.5 Final payment by the Owner will not constitute a waiver or any claims by the Owner including claims for unsettled liens, faulty or defective work, failure of the Work to comply with the requirements of the Drawings and Specifications, any guarantee or warranty required by the Work.

5. Change Orders

- 5.1 The Owner reserves the right to perform portions of the Work on the Project by prior agreement with the Contractor. The Owner will be credited an amount equal to the sum allowed in the payment schedule for the portion of Work performed by the Owner.
- 5.2 The Owner may order changes, modifications, additions, and/or deletions to the Work. Any such changes will not invalidate the Contract. The time for the Project completion and the Project cost will be adjusted by mutual agreement in writing by Contractor and Owner.
- 5.3 Changes to the Work will only be made by written order signed by the Owner and Contractor.

6. Arbitration and Termination

6.1 Arbitration

- 6.1.1 Disputes between Owner and Contractor will be settled by mutual agreement. If a dispute cannot be settled within ten (10) days, the matter will proceed to binding arbitration according to procedures of the American Arbitration Association after notice and demand.
- 6.1.2 If the Owner fails to begin or complete portion of Work on the Project which by prior agreement would be Owner's responsibility, the Contractor may, after five (5) days written notice, begin or complete that portion of the Work. The Contractor will be credited an amount equal to the sum allowed in the payment schedule for the portion of Work to be performed by the Owner.
- 6.1.3 If the Project is stopped for a period of ten (10) days through no act or fault of the Contractor, then the Contractor may, after five (5) days written notice, receive payment from the Owner for all work performed, and proceed to binding arbitration after notice and demand.
- 6.1.4 If the Contractor fails to correct defective work or persistently fails to supply materials or labor or equipment sufficient to perform Work, the Owner may, after five (5) days written notice, order the Contractor to stop Work until the cause for such order has been eliminated.

6.2 Termination

- 6.2.1 If the Owner fails to make payment under the terms of this Contract, through no fault of the Contractor, the Contractor may, after ten (10) days written notice, terminate the Contract. The Owner will pay for work completed and any proven loss with respect to materials, labor, or equipment, and reasonable profit applicable to the Work.
- 6.2.2 If the Contractor fails to carry out the Work in accordance to the Agreement and Conditions Statement, and Drawings and Specifications, the Owner may, after ten (10) days written notice, terminate the Contract, and finish the Work by whatever method the Owner determines. If the cost of completing the Work exceeds the balance due under the terms of the Contract, the difference is to be paid to the Owner by the Contractor.
- 6.2.3 Any Arbitration or Termination matters described in the Contract will be submitted to the American Arbitration Association according to its rules.

7. Project Schedule

- 7.1 Work commences when Building Permit is issued, weather conditions are favorable to excavate, and Contractor's schedule allows.

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- 7.2 The Contractor will continue the Work in a timely fashion, and maintain progress diligently to completion with sufficient labor and material on site at all times.
- 7.3 If at any time the Contractor is delayed in performing the Work by Owner requested changes or additions, the Project Schedule will be extended by the same amount of time as caused by the additional Work.
- 7.4 The Contractor will be excused from performance of Work due to riots, strikes, natural disasters, accidents, and any Act of God. In the event that any such event prevents the Contractor from performing Work, the Owner will not have the right to terminate the Contract.
- 7.5 The Date of Substantial Completion or Designated Portion of Project is the date when construction is sufficiently complete in accordance with the Drawings and Specifications so the Owner can occupy or utilize the Project for the use it is intended.

8. Indemnification

- 8.1 The Contractor will indemnify and hold harmless the Owner and the Owner's agents and employees from all claims, damages, losses and expenses, including lawyer's fees, relating to the performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease, or death or injury of any person or to damage to property, including loss of use, caused by a negligent act of the Contractor, a Trade Contractor or Supplier, or anyone employed by them.
- 8.2 In all claims against the Owner or any of the Owner's agents or employees, any employee of the Contractor, any Trade Contractor or Suppliers, or anyone employed by them, or anyone for whose acts any of them may be liable, the indemnification obligation will not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor, any Trade Contractor or Supplier under Worker's Compensation Act, Disability Benefits Act, or any other employment benefit act.
- 8.3 All damage or loss to any property in whole or in part by the Contractor, any Trade Contractor or Supplier, or anyone employed by any of them, or by anyone, for whose acts any of them may be liable, will be remedied by the Contractor.

9. Insurance

- 9.1 The Contractor will procure and maintain, during the entire term of the Project, the following insurance policies:

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- 9.1.1 Worker's Compensation and Employer's liability insurance;
 - 9.1.2 General Liability, including products and completed operations;
 - 9.1.3 Automobile Liability Insurance.
 - 9.2 Both the General Liability and Automobile Liability coverage will have coverage with limits as required by State law for Bodily Injury and Property Damage, and are to be with an insurance company with a Best Rating of AA or better. The Worker's Compensation and Employer's Liability coverage will have minimum limits as set by law.
 - 9.3 Certificates of insurance acceptable to the Owner pertaining to the insurance required by Paragraph 9.1 will be filed with the Owner prior to commencement of the Work. These Certificates will contain a provision that coverage provided in the policy will not be cancelled until at least ten (10) day prior written notice to the Owner.
 - 9.4 The insured's loss is to be adjusted with the Owner and made payable to the Owner; provided that the Owner will pay to the Contractor that portion of insurance proceeds which is attributable to Work performed by the Contractor for which the Contractor has not received payment. The Contractor waives all rights against the Owner for damages caused by fire or other perils to the extent covered by insurance. The Contractor will require similar waivers by Trade Contractors and Suppliers.
 - 9.5 The Contractor agrees, at all times during the performance of the Work, to provide insurance for the full replacement cost of the house, for the perils of fire and extended coverage (not to include earthquake insurance), naming the Owner as the insured. The Contractor's insurance will only cover Work to be done by the Contractor, and will not cover any additional Work which the Owner may wish to perform on the Project. In the event the Owner will request the Contractor to extend Contractor's insurance to cover additional Work contracted independently by the Owner, the Owner agrees that the Owner will pay all additional premiums required for additional insurance to Contractor on demand.
 - 9.6 The Owner, at the Owner's option, may purchase and maintain other insurance as the Owner may deem appropriate.

10. Prevention of Liens

- 10.1 The Contractor agrees to pay, when due, all claims for labor and/or materials furnished for Work, and to prevent the filing of any liens by mechanics or material men, or attachments, garnishments or suits involving the title of the property on which the Work is performed. The

Contractor agrees, within fifteen (15) days after written demand is mailed to the Contractor, at the address stated in this Contract by United States mail, to cause the effect of any such suit or lien to be removed from the premises. In the event the Contractor has a dispute with a Trade Contractor, Supplier, or person supplying labor or materials to the Project, the Contractor will bond the Owner against any loss from any such claim of liens and then have the right to prosecute the claim of lien to a completion at the Contractor's sole cost and expense. In the event the Contractor can cause lien to be removed from any policy of title insurance which the Owner may obtain covering the real property subject to this Contract, then the Contractor will have no obligation to bond against mechanic's lien and the Owner will accept title insurance policy as sufficient security to the Owner to permit the Contractor to litigate claim of lien, without the necessity of posting a bond.

11. Work Safety

- 11.1 The Contractor will be responsible for establishing, supervising, and maintaining all safety precautions and programs in connection with Work performed on the Project.
- 11.2 The Contractor and Owner will comply with all federal, state, and local laws and regulations applicable to the Project.
- 11.3 The Contractor will take all reasonable steps to prevent damages, injury, or loss to:
 - 11.3.1 All employees performing the Work and all other persons who may be affected;
 - 11.3.2 All of the Work and materials, equipment, or products to be used on the Project, whether in storage or on or off the site, and in the care, custody or control of the Contractor, or any Trade Contractor or Supplier;
 - 11.3.3 All property on the site or adjacent to the site including trees, shrubs, lawns, lots, pavements, roadways, utilities, and structures not designated for removal, relocation, or replacement.

12. Assignment and Subcontracting

- 12.1 The Contractor will not assign any portion of the Work to any person or other Contractor; however, the Contractor will have the right to subcontract portions of the Work to Trade Contractors of the Contractor's choosing without the necessity of obtaining permission, either written or oral, from the Owner.
- 12.2 The Contractor will pay each Trade Contractor, on receipt of payment from the Owner, amounts he may determine appropriate, but consistent with lender's requirements or of this Contract.

13. Guarantees

- 13.1 The Contractor guarantees the Owner, and the Owner's successors in interest, against any loss or damage arising from any defect in materials furnished or workmanship performed under this Contract for a period of one (6) years from the date of Certificate of Occupancy issued by the Building Department
- 13.2 Nothing in this Contract will derogate the Contractor's liability for patent or latent defects under applicable law.

This agreement is made (date).

Signature of Owner _____

Signature of Contractor _____

REMEMBER: DO NOT use this document "as-is." Take the time to adapt similar ideas to your project. If you decide to act as the General Contractor, you'll need to create individual Agreement and Condition documents for each Trade Contractor. Also, a Purchase Order system will be required to coordinate Supplier activities.

By assuming the responsibilities of a General Contractor, the B.Y.O.B. Owner becomes involved with a myriad of contractual details but this is the only way to gain personal control on a daily basis. Otherwise, you must be willing to relinquish control and trust a General Contractor to build your home as if it were his/her own project with a written Agreement to follow your Drawings, Specifications, and Conditions. If this is the case, a set of Contract Documents with your General Contractor will suffice. The General Contractor will then be responsible for creation of individual Agreement and Condition documents for each Trade Contractor and a Purchase Order system to coordinate Suppliers.

Acting as a B.Y.O.B. Owner makes you responsible for managing scope of work. You'll be in charge of all activities necessary to perform Drawings and Specifications and then coordinating the Conditions under which the work will be performed with each individual Trade Contractor and Supplier. You must be assertive, confident, and organized to act as a B.Y.O.B. Owner!

Trades

Traditionally, the practice of General Contracting was to perform the majority of field work with employees under the guidance of a master craftsman. A General Contractor's reputation was often based on the expertise of skilled workers who had been with the company for a number of years combined with the qualifications of a well-rounded journeyman/business owner.

Currently, the trend in building construction places LESS emphasis on General Contracting and more emphasis on Construction Management. The reasons for this shift are primarily economic and technological considerations because a specialist is usually more efficient and knowledgeable so GC's are turning more to managers of a building process rather than craftsmen involved in every phase of work. Many factors enter into the decision to primarily rely on **Trade Contractors (Trades)** for each specific phase of a construction project. The advantages of "managing" a project begin to outweigh the disadvantages of do-it-yourself when deciding how to delegate responsibilities.

Advantages

- Greater flexibility
- Less waste
- Less overhead
- Improved quality
- Improved schedule
- Less detailed supervision
- Less risk
- Less capital investment
- Less bookkeeping

Disadvantages

- More coordination of external resources
- Possibility of unqualified contractors
- Supply and demand makes contractors less available
- Requires more contract negotiation
- Quality Control of other people's work
- Requires accurate Drawings and Specifications

For the purpose of this guide we assume that you are hiring Trade Contractors as a B.Y.O.B. Owner. Locating a qualified contractor can be a hard task but the reward for perseverance is the successful completion of your project with a contractor you know and trust. This list of ways to qualify a contractor is comprehensive and may seem overwhelming but it's your first step toward quality control of your remodel or new home construction project. This list will assist you in your search for a qualified contractor!

1. Ask the contractor for full documentation. This will include:
 - Contractor's License & Registration Number
 - Proof of Liability Insurance covering property damage and personal claims
 - Proof of Bond Coverage for total replacement cost of your project
 - Proof of Worker's Compensation Insurance for employees
2. Call your state's agency having jurisdiction over contractor's license registration to verify the contractor is currently licensed as required by state law.
3. Ask the contractor for a resume. This will include:
 - Legal name, street address, city, zip code, phone number
 - Number of years in contracting business, education, and training
 - Financial stability of business and relationship to your Bank
 - Credit standing with suppliers and terms of payment
 - References of previous customers with jobs similar to yours
4. Call the Better Business Bureau in your region to find out if past customers have complained about the contractor.
5. If you can, visit the contractor's current site to see if the contractor:
 - Maintains a stable and reliable crew
 - Performs their craft in a skillful and professional manner
 - Provides adequate site supervision
 - Cooperates well with other trades
 - Offers fair prices and remains cost conscious
 - Uses material efficiently & effectively
 - Keeps site clean and safe
6. Ask the current client of the contractor these questions:
 - Does the contractor begin/end on schedule?
 - Is the crew adequate for size and scope of work?
 - Does the work successfully pass inspections?
 - How responsive is the contractor to problems?
 - Is the contractor available by voice mail, beeper, or email?

-
7. Be sure to ask the contractor for a copy of the standard contract for your review. Never sign a blank, standard contract. Check the contract for terms on these issues:
- Total Contract Price & Terms of payment
 - Change Order practices
 - Reference to Drawings and Specifications
 - Responsibility for Permit Application & Inspection Schedule
 - Start Date & Completion Date
 - Contractor's Mark-up on Labor & Materials
 - Conflict Resolution & Termination
 - Use of Lien Waiver AT TIME OF EVERY PAYMENT

Locating a qualified Trade Contractor can be an arduous task. You start with the products and materials that you know you'll be using in your home. As the end user, you know what you want better than anyone else! This description of materials specifies what products you'll be incorporating into your home style.

Do you have a set of specifications to complement the drawings?

Specs are a written description of all the products and materials you'll be using in your Drawings. Drawings and Specifications go hand in hand toward successful control of your project.

Once you have your Specs, you can find your local suppliers by networking through the product manufacturers that you've identified in your Specs. Your local suppliers are located as a result of your product choices.

This creates an ACCOUNTABILITY CHANNEL for pricing of products and materials you'll be using in your new home. Work with Trade Contractors who originate from each supplier who distribute the manufacturers' products that you've specified for your new home. To find good Trade Contractors, discover them through your material supplier, asking for their PREFERRED CONTRACTOR LIST.

For every phase of work, each respective supplier knows the contractors who pay their bills on time, create few problems, follow manufacturer's installation instructions, and adhere to a schedule. For instance, the sales manager at your local building supplier or lumber yard will refer you to framing contractors; at your local plumbing supplier, you will be given their preferred contractor list; and, so forth.

AS AN EXAMPLE: You need to decide what type of cabinets appeal to you. Once you've chosen a type of cabinet (you can do this online), you'll contact the manufacturer for a list of the suppliers in your area.

You can visit the suppliers' showrooms (assuming that you'll contact several different businesses) to discuss the product line, the cost of product plus installation AND ask for their preferred contractor list.

If you're trying to find contractors to install your products, then you want to start with drawings and Specs...especially Specifications.

Follow the accountability channel from manufacturer, then to your supplier, and finally to the contractors recommended out of the local store in your area.

If the local supplier isn't helpful, send an email to the customer service representative at the manufacturer's web site explaining that their local supplier is not helpful to you providing product and installer information...and, ask who the local supplier might be who's responsive to your needs and inquiries.

Once a Trade Contractor is chosen, you must have the managerial ability to schedule, coordinate, and control the contractor's work on your job so that work proceeds on time, within the established budget, and according to the quality specified. Always be prepared to pay fair market value for work performed so the contractor will be able to meet payroll and overhead costs, pay their suppliers, and still make a profit. The best Trade Contractors are always busy so there should be no problem visiting their projects to observe the crew and the quality of work.

CHEAP CONTRACTORS ARE NEVER INEXPENSIVE.

Cheap Trade Contractors may get the job for a cheap price, but you can probably count on work that is just as cheap. If you are paying a fair price for the work to be performed you will foster trust and cooperation with your contractor from the beginning of the project. You can make the job run even smoother by being ready when contractors when they arrive on your site. In addition, provide as much lead time as possible to inform the contractor of the status of your job and any unexpected conditions which must be met.

REMEMBER: If you don't have the time or inclination to manage your own project, then a General Contractor or Construction Manager will go this job for you. A GC or CM will go through the same process of finding the right Trade Contractors to perform the work according to Drawings and Specifications under a prescribed set of Conditions. No matter which way you turn, the general trend in the construction industry is to delegate responsibilities through a standard bidding process.

Here is a "Standard Bidding Process" which summarizes how bid proposals are solicited from Trade Contractors and Suppliers. Follow it as a general guide adapting the process to fit your situation.

Follow A Standard Bidding Process:

- | | |
|---|---|
| <ul style="list-style-type: none">• Finalize Drawings and Specifications• Locate potential Suppliers & Trade Contractors• Finalize design and product requirements• Prepare each Supplier and Trade Contractor file<ol style="list-style-type: none">1. Information sheets2. Preliminary Agreement and Conditions documents3. Preliminary Purchase Order form• Contact Supplier and Trade Contractors<ol style="list-style-type: none">1. Mention project requirements2. Discuss Contract terms3. Develop Purchase Order form• Ask Suppliers and Trade Contractors to submit proposal• Receive and evaluate completed proposals<ol style="list-style-type: none">1. Review for completeness: Disclosure and Legal statements2. Require full documentation: warranty & installation instructions• Select the best bids<ol style="list-style-type: none">1. Price, quality, schedule, conditions2. Supplier/Trade Contractor Qualifications3. Compare Bids against Budget | <ul style="list-style-type: none">• Submit counter-offers to Suppliers and Trade Contractors<ol style="list-style-type: none">1. Clarify Drawings and Specifications2. Review Supplier/Trade Contractor Qualifications• Negotiate with prospective Suppliers and Trade Contractors<ol style="list-style-type: none">1. Refine Contract Documents2. Refine Purchase Orders• Select “best” Supplier and Trade Contractor<ol style="list-style-type: none">1. Sign Agreement with Suppliers & Trade Contractors2. Reiterate Conditions based on Drawings/Specifications3. Mail completed Purchase Orders to Suppliers & Trade Contractors• Contact contractors who were not awarded the contract<ol style="list-style-type: none">1. Use standard form letter2. Let them know as soon as possible• Maintain communications with Suppliers and Trade Contractors• Schedule work to be performed• Check work with Drawings and Specifications• Compare Invoice to Conditions and Purchase Order• Obtain notarized “<i>Lien Waiver</i>” from Trade Contractors and Suppliers• Make Payment for work performed |
|---|---|

Don't forget: Follow the Accountability Channel!

Suppliers

Good Suppliers are just as important as good Trade Contractors, and very likely more important. You must have a mutually supportive relationship with your sales representatives: s/he will not only be the person most familiar with installation instructions and warranties but s/he will provide you with a PREFERRED CONTRACTOR LIST for product installation. If you are able to personalize your relationship with your Suppliers, there will be mutual respect and understanding for the products and services required for your project.

When Selecting A Supplier Consider

- Is their location near your site?
- Are you dealing directly with a manufacturer?
- Can you limit the number of suppliers with whom you deal?
- Are you able to open a builder account?
- Size of company
- Condition of the supplier's yard and/or shop
- Rate of turnover of sales staff
- Quality of products/materials
- Type of warranty/guarantee
- Will installation instructions be immediately available?
- Determine if you can return unused material
- Cost of products/materials
- Are discounts offered for early payments?
- Itemized billing and Lien Waiver

When purchasing products and materials for your project, you should be ready to compare your "Purchase Order Terms" with terms which may appear on your Supplier's "Invoice." Remind the sales representative of your terms and notice if there are any discrepancies between your requirements and their policies. For instance, most Suppliers insist there be "No returns on Special Orders." Only standard, current stock items are returnable and the usual practice is to require a 20% to 25% restocking fee for stock items. Another example of differences which may occur is the issue of "acceptability" of purchases. There may be slight variations in shade, color, or patterns of products/materials as they appeared in the showroom versus as they appear at delivery. In this case, any question of acceptability as to shade, color, or pattern must be resolved prior to installation. Inquire what may be considered acceptable "variations."

Remember: Avoid conflict by communicating your terms early in negotiations. If you're not sure what terms fit your situation, then discuss your concerns with both Supplier and Trade Contractor, then take your time to weigh and consider the possibilities. You must state your terms on the "Purchase Order" then assert your position at time of purchase.

When Purchasing Material

- Research product choices to fit your situation
- Use Drawings and Specifications to do a material take-off
- Solicit several bid proposals based on Drawings/Specifications
- Follow standard bidding process
- Control purchases with "*Purchase Order*" forms
- Initiate Orders from your home/office and mail them to Suppliers to authorize Orders
- Coordinate Orders with field to double-check quantities and dimensions
- Place will-call status on Order to allow for changing site conditions

When scheduling delivery of products and materials for your project, be aware that conditions of sale may stipulate the ownership of products/materials, and responsibility for its good keeping, transfer to the customer as soon as it leaves the loading dock of the supplier. This means when this shipment was provided to the Transportation Company, their agent accepted it in good condition. The transportation company agrees to deliver it to you in the same perfect condition. Any claims which you may have must be reported to the Transportation Company immediately to avoid forfeiting claims for damage.

When Scheduling Material Delivery

- Request delivery per field conditions
- Avoid delivery just prior to weekends or holidays
- Provide site address, phone numbers, and directions
- Instructions should stipulate that delivered materials are stacked with the materials to be used first on top

Note: One way to accomplish this is to list those items required on top of the pile at the bottom of the Purchase Order. These items are likely to be loaded on the truck last and therefore end up on top of the load.

- Have materials delivered close to where they will be used

-
- Include site plan for delivery drivers if they must avoid areas such as septic tanks and leach fields
 - Avoid handling materials multiple times
 - Minimize site inventory until time of use

Suppliers do not want damaged goods returned to them unless the Supplier previously assumed responsibility for transportation. Whether or not the Supplier provided transportation, be prepared to inspect and check your shipment for concealed damage, visible damage, or missing cartons. Note any problem on copy of Bill of Lading, keep your copy of the Bill of Lading, and immediately contact the Transportation Company and Supplier in writing.

When Conducting Material Inspections

- Inspect material as it arrives on site for correct sizes, quantities, and free from defects or damages. Contact sales representative immediately to report problems.
- Keep materials protected from weather
- Place materials on dunnage
- What can be done to prevent vandalism or theft?
- Create a plan for contending with waste
 1. Use materials based on modular
 2. Store excess or end cuts
 3. Reduce-Reuse-Recycle-Refuse
 4. Place refuse in dumpster

Note: If this is impractical, sign delivery slip with caveat that final acceptance of material is based on your inspection and ask driver to co-sign that inspection was not made.

When paying for products and materials for your project, you'll want to protect your property from construction liens. Contact a Lawyer in your area to discuss this issue. Two of the more commonly used methods of protection are writing dual checks and obtaining lien waivers. Writing a dual check makes the dollar amount payable jointly to the Trade Contractor providing the labor and the Supplier providing the material. A "Lien Waiver" is a legal document signed and dated by a Trade Contractor or Supplier in the presence of a Notary stating payment has been received for work, services, and material provided for your project. In many states, the lien waiver is the **ONLY** means to protect you from a lien!

When Paying For Material

- Match Purchase Orders with Invoices
- Make allowances for damaged or defective materials
- Take advantage of discounts for early payment
- Use float time for billing cycles
- Obtain Lien Waiver AS PAYMENT IS MADE

Your construction project will require products from all over the United States and possibly from all over the world. Consequently, one should create Specifications for their project early in the design process to understand the products required and arrange for Suppliers. Once you have specified products and located Suppliers, there will be a need to formalize procedures for purchase, delivery, inspection, and payment prior to installation. These procedures may seem unnecessary; however, should you receive unwanted, damaged, or late delivery of materials, your project schedule can be delayed for days and often weeks.

Remember: Your relationship with your product supplier is mutually supportive!

Purchasing

As a B.Y.O.B. Owner solicits and coordinates bid proposals from Trade Contractors and Suppliers, there'll be a need to organize a system for tracking expenditures. A Purchase Order system tracks the costs of your project. The complexity of your Purchase Order system will depend on the complexity of your Drawings and Specifications because a good system requires that ALL materials and labor have a written Purchase Order. So, the more sophisticated your project, there will likely be a more sophisticated means to track costs.

Standard forms are available; however, it may be more appropriate to first understand the meaning and usefulness of a Purchase Order system before buying standard forms which may be ill-suited for your project. You may decide NOT to purchase a pre-made form, and simply create your own format for authorizing a purchase.

In other words, create the Purchase Order system around the specific requirements of your project and what suits your personal style. Just as your Drawings and Specifications reflect the unique circumstances surrounding your home style, your Purchase Order system will match these same unique qualities.

The rudimentary form of a Purchase Order system first takes shape as the B.Y.O.B. Owner follows a process of progressive approximation. The B.Y.O.B. Owner should allow for flexibility in how the tracking system is fully developed. What you're trying to get into writing is the terms of purchase and delivery to your site of all labor and material required to complete the project.

To be competitive, it's important that the B.Y.O.B. Owner obtain bid proposals from as many Trade Contractors and Suppliers as possible. The information in the bid proposals extrapolates from Drawings and Specifications, into Agreements regarding the Conditions under which the work will be performed, and then these terms extend into your Purchase Order system. The Purchase Order system turns bid proposals into terms of purchase and delivery based on the Conditions of Agreement.

AFTER you receive bid proposals from different Trade Contractors and Suppliers, and BEFORE you sign Agreement and Condition statements with each firm, you'll certainly be thinking about ways to track expenditures to guarantee that what you pay is consistent with the price and terms agreed on for the materials and labor to be purchased. This is the purpose of the Purchase Order system.

Awarding the contract will normally be placed with the bidder whose price, quality, service, delivery, product installation cost, and manufacturer warranty, taken as a whole, will offer the B.Y.O.B. Owner the best possible deal for the work to be accomplished. Purchase Orders will be based on

Drawings and Specifications and reiterate terms stated in the Agreement and Conditions documents. Purchase Orders are issued based on the owner's requirements to provide the seller with the required information.

A Purchase Order Should Include

- Your name, address, and phone number
- Site address and phone number
- Supplier/Contractor's name, address, and phone number
- Project name
- Date of issue
- Type of delivery
- Date of delivery or "Will Call" for delivery
- Payment terms and Lien Waiver
- Quantity
- Description of Goods or Services
- Unit Price
- Total Amount
- Space for purchase and receipt authorizations

The simplest type of Purchase Order is a simple statement that reiterates the Conditions of Agreement based on Drawings and Specifications. Duplicate copies are made of the Purchase Order: one for the buyer and another for the seller. The Purchase Order is sent to the seller immediately after Agreement is made. When the materials are delivered or the work is completed, the B.Y.O.B. Owner reviews the Purchase Order to ensure there are no inconsistencies. When the seller presents an Invoice for payment to the Owner, the Owner re-checks the Invoice to ensure that it matches the Purchase Order.

A Purchase Order Terms Should Include

- Warranties and Guarantees of Product Manufacturer
- Product Installation Instructions & Warranties and Guarantees of Workmanship
- Special Order or Delivery instructions if long lead time is required
- The right to cancel the Purchase Order if seller alters the Conditions of Agreement
- Seller will fix damages which occurs during delivery to site

Quite often, you'll place an order for materials or labor over the phone or make a deal over a handshake. This type of informal transaction may get the job done, but what do you do if or when there's a problem?

No doubt, variances may occur. For cost increases, the questions of "how" and "why" must be answered prior to the Owner's payment. Change orders need to be made in writing by mutual agreement! In some instances, the B.Y.O.B. Owner will be responsible for additional costs; but more often, the differences will be generated by the seller and in the seller's favor. The concern should be for accountability: the seller must explain the change AND the buyer must be willing to pay for the change.

Remember: A Purchase Order system is simple to implement but requires discipline. The B.Y.O.B. Owner is required to solicit bid proposals based on Drawings and Specifications, negotiate Conditions under which work will be performed, sign Agreements, and issue Purchase Orders before the work begins. Any new changes must be in writing.

Most Trade Contractors and Suppliers are accustom to providing this level of detail to B.Y.O.B. Owners and getting all information ahead of time for residential construction. The advantage for the B.Y.O.B. Owner is worth the effort because the major benefit is to track costs throughout the building process. Other benefits include catching sellers' billing mistakes, controlling the delivery schedule, and avoiding disputes as a result of poor communication.

To gain further financial accountability of your project, the B.Y.O.B. Owner will want to maintain a Check Register/Job Cost Journal. One way to approach this concern is to utilize a product provided by New England Business Services, a company that sells standard forms to small business owners. "NEBS" incorporates a Personal One-Write Check System into a single payment log. As each check is written an imprint is made directly in the Register, and then the cost can be extended across the page into the log. This eliminates transcription errors, helps classify expenses, and provides an easy audit trail showing at a glance what you've spent on your project.

Assuming a separate checking account is opened for construction purposes, the NEBS system allows the Owner to include a personalized heading, bank name and address, and the bank's magnetic encoding that usually appears on the bottom of a standard, bank-issued check.

Bookkeeping is made easier by maintaining construction-related expenses separate from a personal account. For recordkeeping purposes, there's one source in your files if there's ever a need in the future to refer back to construction expenses.

Standard practice in the construction industry for billing is to submit an Invoice for payment on the 30th of the month in which the work was performed, and payment is expected by the 10th of the following month. Unless other terms are specified, the B.Y.O.B. Owner can expect to follow this billing practice. If early payment is requested, ask for a special discount; it's not unusual to receive a 1% to 10% discount for immediate payment by check. Cash "deals" should be avoided and always insist on getting a lien waiver at each payment with check!

One more time: A Purchase system encourages the B.Y.O.B. Owner to create an Order for all materials and labor included in the Drawings and Specifications. Suppliers and Contractors offer to provide materials and labor under specific Conditions, and a Purchase Order will be issued based on your Agreement with them. After the materials/products are provided to the Owner's satisfaction, payment is made from the Check Register, and the expense entered into a Job Cost Journal.

Don't forget: You need to organize a system for tracking expenditures based on Drawings and Specifications according to the Conditions of Agreement!

Safety

According to the U.S. Department of Labor, worker carelessness and neglect of good safety practices cause 80% of job site injuries. Few problems can affect your project more adversely than the death or injury of one of the crew members or a neighbor's child. Encouraging an interest in safety may be the most important of your Project Management responsibilities.

In 1970, Congress passed the Occupational Safety and Health Act "...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources." The agency with primary responsibility for worker safety was created in the Department of Labor and is called the Occupational Safety and Health Administration. In each State, a similar governmental agency is mandated with responsibility for worker safety. What's important to note is that these Federal and State agencies have developed and published standards for safe and healthy working conditions, and it is your responsibility to be familiar with these standards.

The most common construction fatalities are: falling from a roof or ladder, being struck by an object or equipment, and receiving an electrical shock. These common fatalities can be avoided by proper use of tools, ladders, and personal protection equipment.

The following checklist is a general guideline. A more comprehensive guide is available from your State's Department of Labor and Industries and the Occupational Safety and Health Administration which outlines safety standards for construction work. Write or call for safety standards prior to construction. You should allow ample time to develop a SAFETY PLAN for the unique circumstances surrounding your project.

Safety Checklist

- Arrange for a portable toilet on site.
- Provide adequate drinking water.
- Safety rules communicated to each Trade Contractor.
- Accessible first-aid kit available.
- Certified first-aid personnel available on site.
- Phone numbers for police, ambulance, and fire station.
- Temporary electrical service grounded.
- All electrical tools grounded.
- All electrical cords kept away from water.
- Use listed, labeled, or certified equipment in accordance with manufacturer's instructions.
- Warning and danger signs posted in appropriate areas.
- Hard hats and steel tipped shoes worn where needed.
- Cap protruding steel rebar to eliminate hazard of impalement.
- Careful ladder use.
- Power tools with proper guards in place.
- Protective gear available such as goggles, gloves, and respirators.
- Always use protective goggles when flying fragments are possible.
- Require wearing of personal protective equipment.
- Set a good example as a safety minded individual.
- Adequate slope on edges of all ditches and trenches over four feet deep.
- Place excavated material at least two feet from edge of ditches and trenches.
- Open holes and trenches fenced properly.
- Open holes in sub-floor properly covered or protected.
- Safe access for all types of scaffolds.
- Guardrails provided for open-sided floors or platforms.
- Workers on roof with proper equipment.
- Stair rail system constructed on stair ways of four or more risers.
- Excess and/or flammable scrap not left lying around.
- General housekeeping must be on-going as the job progresses.
- No nails sticking-out of boards or other materials.
- Use approved containers or tanks for storing or handling flammable or combustible liquids.
- Gas cans and other flammable liquids to remain in secure area.
- Welding tanks shut off tightly when not in use.
- Stored secure in upright position.
- Area where soldering work performed checked for smoldering or burning wood.
- Proper clearance from all power lines.
- Spread oily or paint rags outside to dry so they will not ignite.
- Material Safety Data Sheet on site for hazardous chemicals.
- Frequent, daily safety checks are most effective.

Accidents Are Caused!

Accidents don't occur without reason. There are two reasons accidents happen: either workplace conditions are unsafe or workplace actions are unsafe.

Typical unsafe conditions:

- Defective equipment and tools
- Clutter from poor housekeeping
- Exposure to hazardous substances
- Poor layout of work and storage areas
- Lack of proper protective clothing and gear

Typical unsafe actions:

- Using the wrong equipment or tool
- Rushing to complete task
- Failure to observe warning labels
- Following improper work procedures
- Not wearing personal protective equipment

Together, unsafe conditions and unsafe actions create hazards. Job hazards are most likely to cause a problem and the point is to identify each hazard and create actions to correct the problem. The B.Y.O.B. Owner (or General Contractor if you're hiring a GC) is directly liable for safety hazards.

Safety Plan

As a B.Y.O.B. Owner, you should have Course of Construction Insurance covering your building site and accidents which may occur. You'll want insurance coverage against loss due to theft, vandalism, and fire on your residence. Coverage should also be provided for personal injury of yourself and others. However, you are NOT HIRING EMPLOYEES. You are contracting with specialty Trade Contractors to perform each phase of work on your project.

Each Trade Contractor, besides showing evidence of license and bond, will provide proof of Builder's Liability Insurance for the project and Worker's Compensation for their employees to cover their risk while working on your project. If you're not acting as a B.Y.O.B. Owner but hiring a General

Contractor, the GC must also show evidence of license, bond, liability insurance, and workman's compensation coverage.

How can a SAFETY PLAN be implemented? Most important is the leadership you provide to the entire construction organization. This begins at your first meeting with a Trade Contractor to discuss your project and solicit a bid proposal. Mention your commitment to safety rules and procedures emphasizing their incorporation into site operations. As negotiations progress, include language in the "Conditions" portion of Contract Documents which stipulate compliance with federal, state, and local safety regulations. For each Trade Contractor there must be a clear assignment of responsibility to a designated field superintendent.

Next, post signs on your project indicating site hazards. "Danger" and "Caution" signs should only be placed in areas where an immediate or potential hazard exists. It does no good to plaster warnings around the site in a ridiculous manner. Also, post a sign adjacent to the phone on site listing emergency phone numbers such as a local physician, hospital, ambulance, fire department, and police station. Another important precaution is to collect a Material Safety Data Sheet for all hazardous substances being used on your project and start a SAFETY FILE. This is a ready reference when using materials with possible hazardous substance exposures.

Another procedure is to keep on site an approved first-aid kit which is accessible to all Trade Contractors. In addition, each Trade Contractor should provide a first-aid kit. Ask each Contractor if their field superintendent is trained and certified to offer first-aid. If not, suggest ways to make medical services immediately available should an injury occur.

For a SAFETY PLAN to be effective, the B.Y.O.B. Owner and Trade Contractors must be committed to safety. This commitment is primarily attitudinal representing a set of values which recognize the worth of human life and endeavor. Posting slogans and phone numbers or paying lip service to the idea of safety does nothing to directly correct a problem. Look for ways to improve the work place by anticipating hazards on a daily basis.

Safety must be integrated into the production of the house from the standpoint of methods, materials, and machines.