

A HANDBOOK FOR BUILDING AN AFFORDABLE MODULAR ADU OR TANDEM HOUSE



1. UNDERSTANDING THE PROCESS:

Adding a second residential unit to an existing residential property can be a complex and daunting process. This handbook has been created to guide homeowners through the process of accessory dwelling unit (ADU) and Tandem House development. The purpose of this guide is to explain the basics of building a detached ADU or a tandem house.

1.A - What are ADUs and Tandem Houses?

1.B - Why are Second Units Important?

1.C - Understanding the Zoning Requirements.

1.D - Overview Of The ADU & Tandem House Development Process



1.A - WHAT ARE ADUS AND TANDEM HOUSES?

Granny Flat, Carriage House, In-Law Suite, Casita, Backyard Cottage, and many other names are common terms for an accessory dwelling unit (ADU) or Tandem House, which is a second house built on a single family residential lot. ADUs and tandem houses vary in size, shape, and layout and can provide a homeowner spatial flexibility and/or rental income.

Accessory Dwelling Unit (ADU) is the term that planning and design professionals use to describe a second, usually smaller, house on a homeowner's residential lot. Depending upon zoning and the residential lot, this could mean that utility systems are shared. Also, in most cases, a primary house and its ADU must be owned by the same owner and the owner must live in one of the units.

Tandem House is a second house on a property that the Local Zoning Codes consider equal in stature to the other house on the lot. This means a tandem house can be sold separately from the other house. Also, a tandem house has more flexibility in building design and form than an ADU.

1.B - WHY ARE SECOND UNITS IMPORTANT?

Second units offer homeowners many benefits that can maintain and increase quality of life. Homeowners can either use a second unit themselves, rent it, or move into it to free up their primary house for others to use as a rental. General benefits include:

- **Family Support -**

Ability to house multi-generational families and extend family for aging-in-place. This supports familial strength, savings on senior- living and/or childcare costs, and long-term household stability. Additional Addittional independent living space reduces social tension, reduces clutter, and takes away the inconvenience of shared bathrooms, crowded kitchens, and communal sleeping arrangements.

- **Starter Home For New Families:**

Housing prices in Colorado are increasing at an unprecedented rate. Young couples and families looking to purchase a home have few options. Families with ADUs offer thier children and families a way to establish independence and save for a future home purchase.

- **Long Term Investment:**

Homeowners want to maximize the value of thier homes for sale or future generations. Many studies show that ADUs can increase the value of your property by 30% or more. They make use of underutilized property to create not only a secondary dwelling unit , but also potential passive income property.

Although the benefits and use cases for ADUs is and Tandem Houses are extensive, there is one things that links it all together: Housing plans or family integrity planning, this process creates a long term investment for homeowner's looking to create the most value, both financially and in lifestyle enjoyment.



1.C - ATTACHED ADU DEVELOPMENT

Attached ADUs, where zoning allows, may offer an alternative building option for homeowners that choose not to build a detached second unit. An attached ADU may offer an alternative and less intensive building option for homeowners that choose not to build a detached second unit. Some benefits may include:

- Savings on excavation, construction, utility connections, and energy use attached ADUs are integrated into the systems of the existing house
- Opportunities to grow income
- Preserving the existing yard for open space
- Thee ability to connect directly with the primary house by installing a passage way
- Increased housing capacity while avoiding overcrowding and visible density



1.D - OVERVIEW OF THE ADU & TANDEM HOUSE DEVELOPMENT PROCESS

• Understand the Zoning Code & Other Requirements

Homeowners need to verify their property is zoned for an ADU or a Tandem House and meets the minimum site requirements of the local zoning code. Homeowners should take time to understand their zone district and property dimensions before starting the preliminary work of securing financing, and hiring a project team.

- Is the zoning consistent with adopted plans?
- Does the zoning further public health, safety and welfare?
- Study the limitations of your property?
- Locate boundaries and setbacks
- Draw up a site plan.

• Preliminary Work

When a homeowner has confirmed their zoning and site eligibility for a second unit, they are ready to start the preliminary work of the project: meeting with funders to secure financing, identifying goals, concepts and design considerations. This process will likely include meeting and hiring a project management team. A homeowner should allow 4-6 weeks to complete the preliminary work.

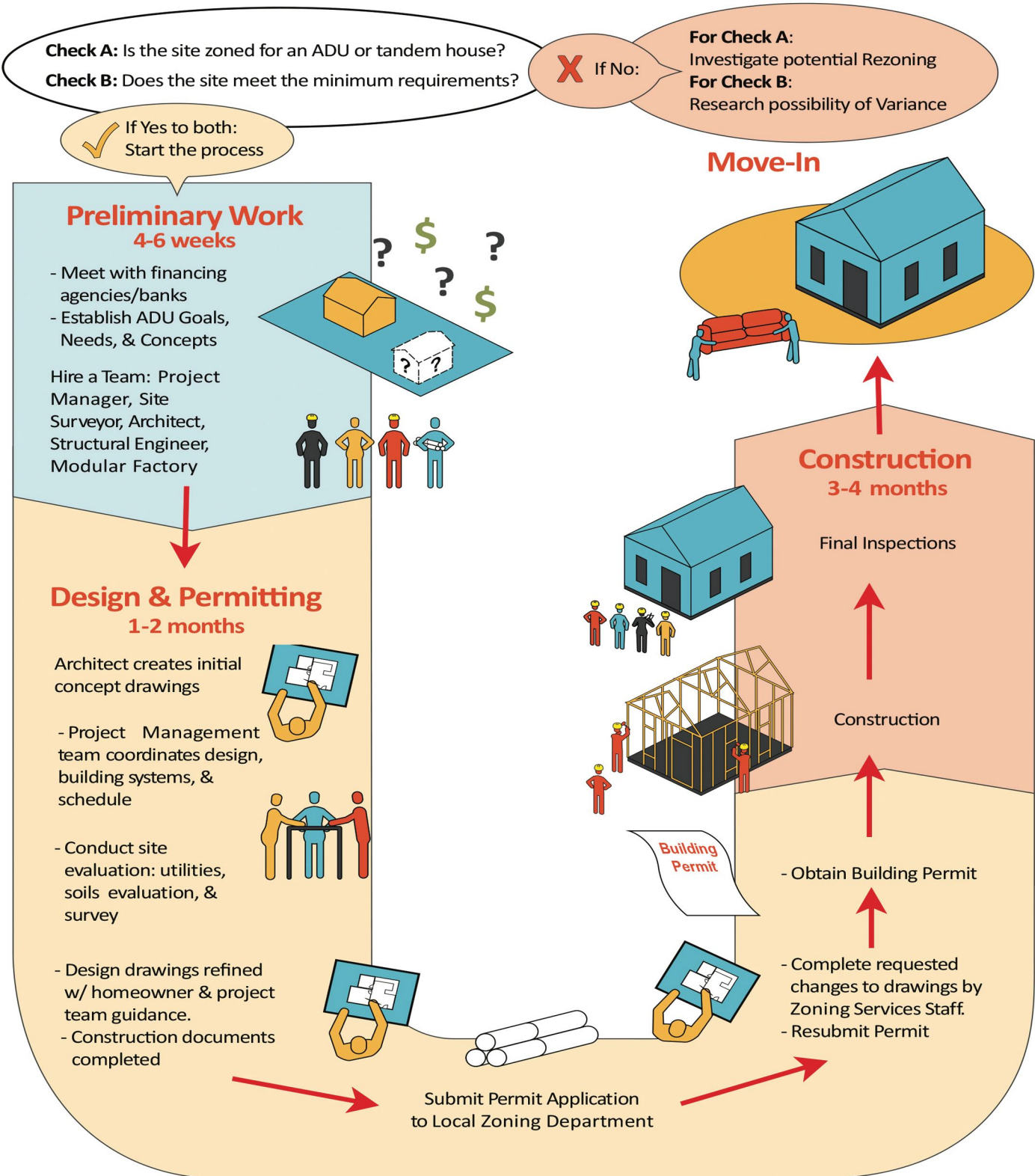
• Design & Permitting

This step will consist of a series of meetings between the homeowner, and the management team resulting in an application to the Local Development Services for zoning and building code review, and concluding with a building permit. It is important for the homeowner to stay engaged to ensure the second unit is designed to meet their needs and will be within the project budget. A homeowner should anticipate 1-2 months for design and permitting.

• Construction

During construction, the site will be prepared, utilities will be identified, and the second unit will be built. This step will consist of a homeowner's property temporarily being disrupted by construction noise, materials and equipment stored on site, and construction crew members working on site. Throughout the construction process, multiple building and zoning inspections will be conducted to confirm all code standards are met. Homeowners should prepare for this phase to last 3-4 months.

TIMING OF THE DESIGN, PERMITTING & CONSTRUCTION PROCESS

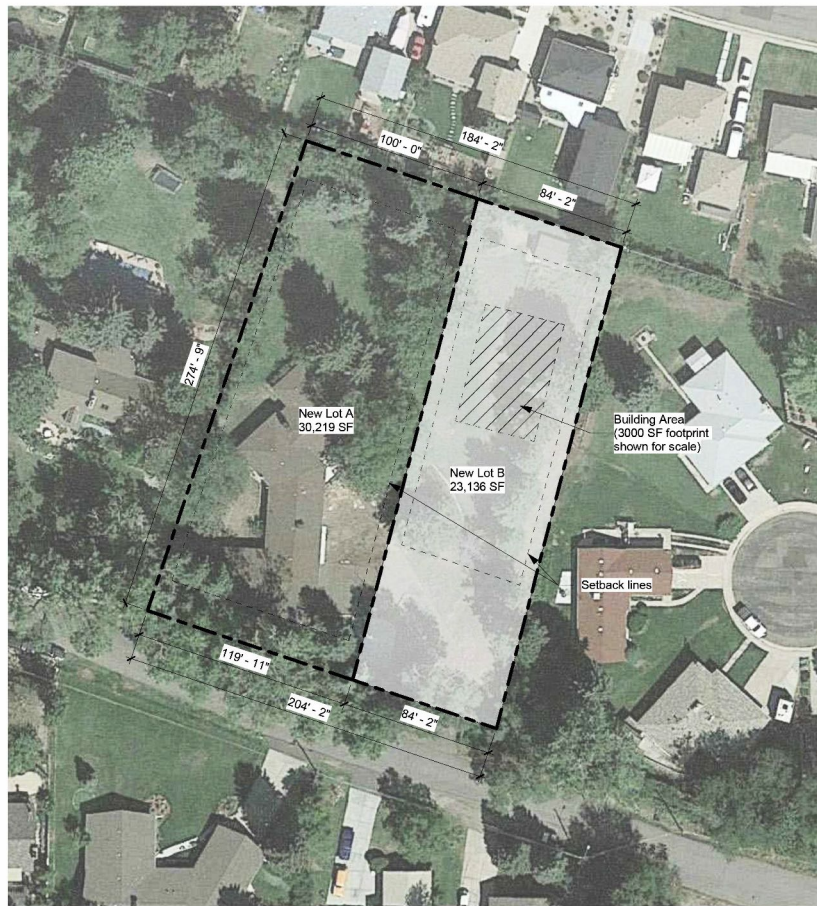


2. DESIGN

Our design philosophy is centered around eliminating risk, reducing costs, and delivering vetted, custom residential construction and interior design solutions that are beautiful, functional, cost effective, and help homeowners move forward with ADU and Tandem House projects confidently.

- 2.A- Design Considerations
- 2.B - Understanding Minimum Sizing Requirements
- 2.C - Understanding Site Plan Requirements

4475 W. Lakeridge Rd. Denver, CO 80219
Denver zoning: S-SU-1 Current Lot Size: 53,355 SF
Lot Minimum Allowable Lot Size: 12,000 SF Minimum Allowable Lot Width: 62.5'
Building Footprint Maximum Allowable Coverage: 50%
Setbacks Front: 20' Sides: 7.5' Rear: 20'



Site Plan Option 1
Conceptual Design
4475 W Lakeridge Rd.
10/27/20
Scale: As indicated

01

Lakeridge Rd. Site Plan
Option 1
Scale: 1" = 50'-0"



2.A. - DESIGN CONSIDERATIONS

Once all the minimum requirements are met, and financing secured the unit can be designed, permitted, and built. There are three components to any house: the land beneath the foundation, the structure that creates the physical space, and the essential water and energy utility systems. Your management team should be experts in these technical areas and should be consulted for assistance. Professionals are central to helping verify zoning eligibility, site impacts on a second unit, and help create a vision and permissible plan for building an ADU or Tandem House. The design of the second unit will include the site plan, the foundation, the structure, and the floor plan and elevations.

- **Engineering The Site**

Understanding the site is an important part of building any structure. Clarification on topography, existing trees, the quality of the soil, and locations of utility lines are important before any new structure is designed or built. The following site documentation is required to be completed before designing and building a second unit .

- **Land Survey**

This report graphically displays information such as legal site dimensions, site elevations, and location of utility lines such as gas, water, electricity, TV / Internet cable, and sanitary & storm sewers.

- **Soils Report**

This report summarizes soil strength, groundwater level, slope angles, floodplain threats, and the effects of grading for a second unit. Understanding the ground which a structure will be built upon is essential for building a stable foundation and long- lasting structure.

With a survey and soil information report your project mangement team will be able to evaluate the site, determine the needs of the foundation, and establish how utilities should to be connected. This process should be closely coordinated with the design of the new unit to ensure the new unit, the foundation, and utility lines fit together seamlessly.

- **Building and Fire Codes**

A second unit must follow the regulations of local building and fire codes to ensure the structure is safe and habitable. Visit your local jurisdictions web page for information on the required building and fire codes that will regulate the construction of a second unit and other related material.



- **Floor Plans**

Layouts can vary greatly so a few factors can help guide how they are created: the site, safety, noise, sunlight, the age and number of the users, adjacent properties, homeowner preferences, and the project management team's advice.

Home utility systems and energy efficiency are a significant component of creating a comfortable and habitable living space. During the design phase, utility systems should be discussed, planned, and agreed upon by the management team, builder, and homeowner to achieve the homeowner's goals and to meet local building code requirements. A few topics should be addressed in utility system discussions:

- **Energy Efficiency**

Designing for energy efficiency can save resources and help to minimize monthly utility costs. Common ways to achieve energy efficiency involve building small units, using a property's existing infrastructure, using green building materials, and constructing energy efficient systems:

- **Shared Utility Use for ADUs and Primary Houses**

Most Zoning Codes require a primary house to share utilities with the ADU. Meaning that there is a single tap for sewer and water pipes and a single meter for electricity and gas utilities. If utilities are shared between the primary house and ADU, a homeowner will need to establish how to handle utility billing between the two units. If sharing is not feasible, due to a number of existing utility factors, a homeowner should be prepared to handle additional costs related to constructing separate utility lines.

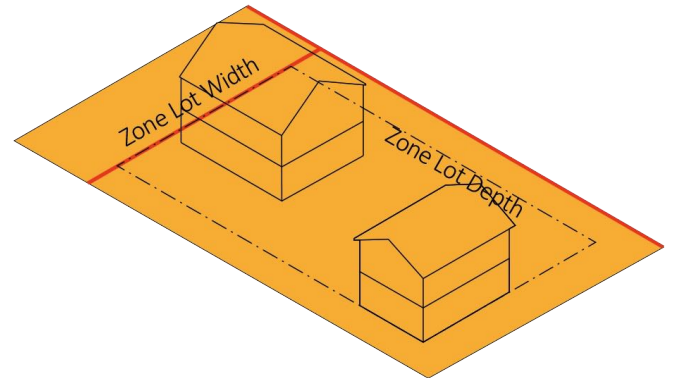
- **Using & Maintaining Systems**

It will be important that new tenants are educated on the unit's energy systems and the resulting annual costs. Correct use of heating and cooling systems, kitchen and bathroom fixtures, household appliances should be understood and if applicable, communicated to tenants to maintain efficiency.

2.B - MINIMUM SIZING REQUIREMENTS

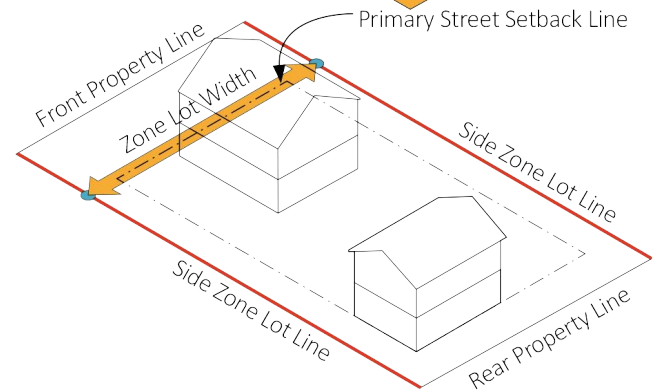
2. Minimum Lot Size

Reference the minimum lot size in your local zoning district to determine if a lot meets or exceeds the minimum lot size.



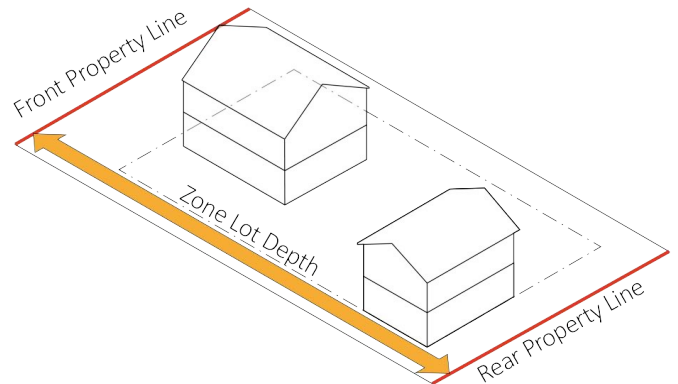
1. Minimum Lot Width

The lot width is the distance between side zone lot lines at the primary street setback line. Check your local zone districts' minimum lot width requirement for determining ADU and Tandem House eligibility.



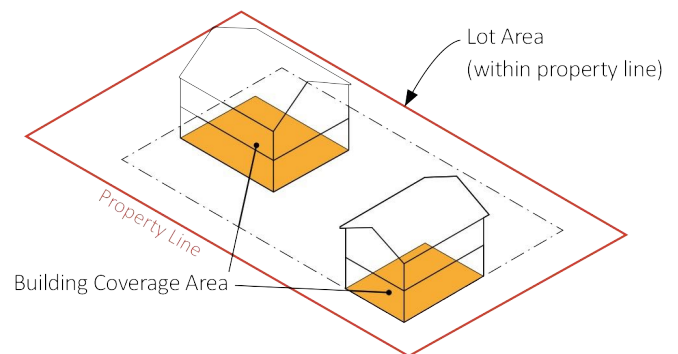
3. Minimum Lot Depth

Lot depth is the distance from the front property line to the rear property line. Each zone district will require a minimum lot depth.



4. Building Coverage

Building coverage is the ratio of a structure's footprint to total lot area. All structures include a primary house, garage, or an ADU. The % of building coverage is limited and varies by lot size and zone district. Refer to your local zone district for specific building coverage maximums.



2.C - UNDERSTANDING SITE PLAN REQUIREMENTS

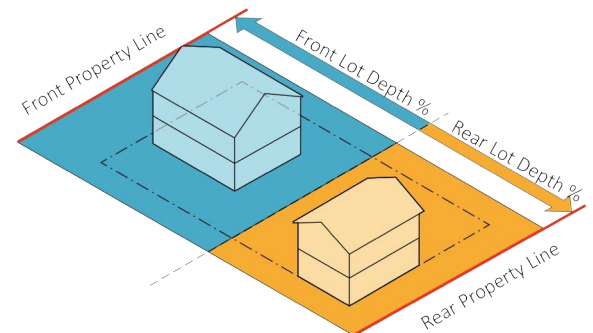
With zoning and minimum site requirements confirmed, the next step is to determine how an ADU or Tandem House can fit on a property. Zoning codes have rules governing building form and placement of second units. These rules determine how big, how tall and where on a property an ADU or tandem house can be located. The following design standards are addressed:

- Zone Lot Depth Percentages
- Second Unit Location
- Building coverage
- Setbacks
- Height
- Stories
- Bulk Plane Height and Calculating Bulk Plane
- Minimum Spacing between Primary House & Second Unit

For each of the following design requirements, reference the local zoning codes for specific requirements. The following images and definitions explain the general zoning code design requirements for an ADU or Tandem Houses:

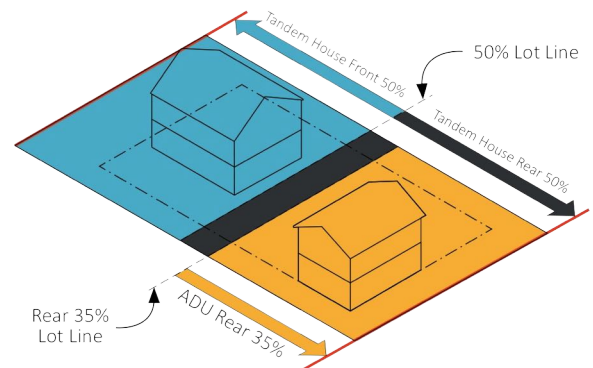
1. Zone Lot Depth Percentages

The Zoning Code uses percentages of lot depth to define the front and rear areas of residential lots. These area definitions regulate height, setbacks, unit location, and bulk plane (explained on the following pages). The regulations for the rear Lot typically are more limiting regarding height and bulk plane and usually have requirements regarding the use of alleys.



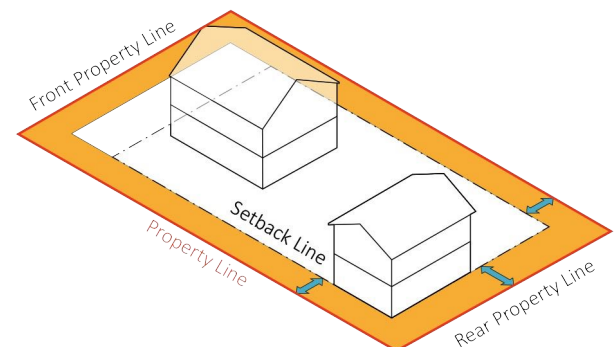
2. Second Unit Location

There are requirements specific to ADU and Tandem House building forms that determine where to locate a second unit. ADUs typically are located in the rear 35% of a lot and Tandem Houses usually are sited in the front 50% and rear 50% respectively. Also, lot orientation, ADU height, and amount of stories can affect where an ADU can be constructed.



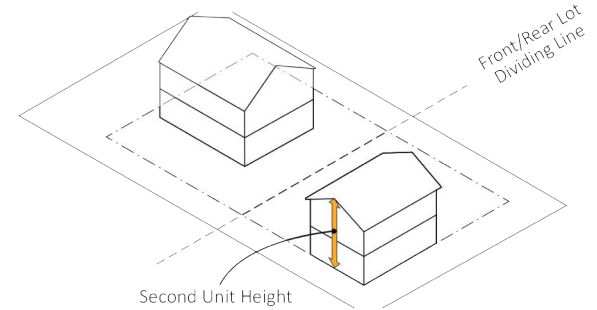
3. Side & Rear Setback

Side and rear setbacks determine the required distance between the side and rear property lines and an allowed building. Generally, no part of a structure can be placed between the setback and property lines, however there may be exceptions to setback requirements in the each Zoning Code. (example: chimneys, overhangs, HVAC equipment, etc.)



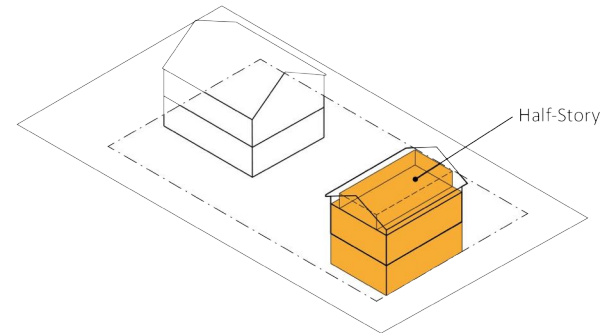
4. Height

Height is how tall a second unit can be built. For ADUs and tandem houses, height can vary by zone district and location on a lot. For ADUs in many zone districts, height can affect where the structure is constructed for the purpose of maximizing sunlight for surrounding property owners.



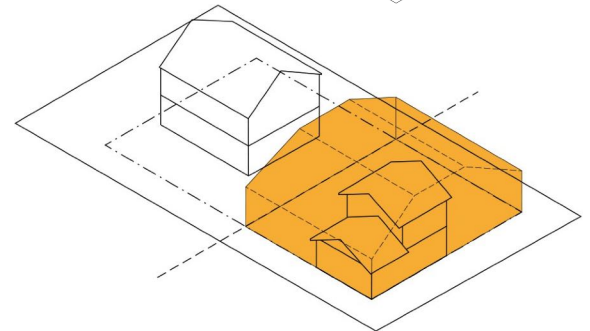
5. Stories

Generally, ADUs are limited to 1.5 stories and Tandem Houses are limited to 2.5 stories, but story requirements vary by zone district. ADUs can be a 1.5 story unit or be built over a garage as a half or full story depending on its zone district.



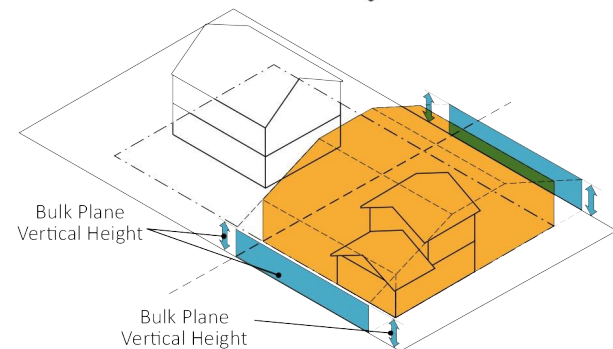
6. Bulk Plane

A Bulk Plane is the series of planes that form an invisible three-dimensional building envelope/volume on the property. Any new unit must be built within the bulk plane and may limit a second unit's height near the side setbacks. Bulk plane requirements will likely limit a building size more than height requirements.



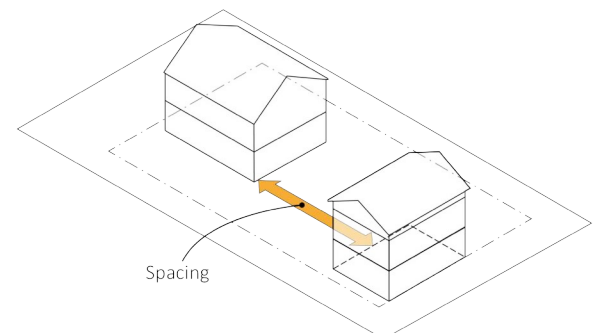
7. Bulk Plane Vertical Height

This dimension defines how tall the side bulk plane can be. Specifically, it is the vertical distance measured from the side lot lines. This dimension influences the height of structures near the side setbacks. Bulk Plane Vertical Height varies based on lot depth percentage. See your local zone district for exact numbers.



8. Minimum Spacing between Units

This is the amount of distance required between a primary house and a second unit. There are spacing requirements for Tandem Houses and building coverage exemptions for ADUs and primary houses. Building codes may also require specific spacing between units. This dimension is taken from the face of the second unit overhang to the face of primary house overhang.



3. CONSTRUCTION REQUIREMENTS

Many people new to building a home don't understand how modular construction can save money and time, while providing a higher quality home. Using a modular building system allows us control our costs by having much of the home built in the factory. Homes built in a factory controlled environment are unaffected by variables that plague site-built homes, such as poor weather, wasted materials, and theft or vandalism.

3.A - Financing Overview

3.B - Permitting a Second Unit

3.C - Building a Second Unit



3.A - Financing A Second Unit

Financing an ADU isn't straightforward. Most banks don't yet have meaningful, competitive opportunities for homeowners looking for the predictability of a 30- year fixed loan for your ADU.

Finding the right financing and getting approvals could require significant time and effort, so it is important to partner early with a bank or mortgage company to navigate financial risks and understand the basic funding requirements. Carriage Home Builders has the contacts and experience that can help you secure financing for your backyard home.

There are not many funding entities that currently offer financing for ADU development. Therefore, homeowners commonly need to assemble funding from many different sources building in flexibility for cost overruns. Sources of funding might be:

- Equity in a primary home that can be converted to a home equity line or credit or loan
- Construction loan- Construction loans are structured differently than mortgages When getting a construction loan, ask for a single close construction to permanent loan. By only closing once instead of twice, you can save thousands in fees and costs.

3.B - Permitting a Second Unit

Once a second unit is designed, the next step is permitting through your local zoning district. The project management team will manage the process which will require maintaining efficient coordination. When the project management team handles permitting, they will coordinate with City staff to complete required reviews, align design with regulations, and handle any technical inquiries about the project. The final approval is called a permit.

To obtain a permit for an ADU or tandem house, guidelines must be followed for the residential permitting process, which, depending on required reviews, could take from 2 to 3 months to complete. The basic process and timeline are listed here and graphically displayed on the following page

ADU & Tandem House Permitting Steps

1. Verify the zone district and historic landmark status
2. Pre-application meeting with the local planning jurisdiction for any regulatory clarifications and to learn if any department reviews are needed
3. Reviews by various departments, (if required).
4. Prepare application package and submission.
5. Staff review and customer re-submittal, as required, city approval, and next steps

3.C - Basic Construction Cost Breakdown

The basic cost of constructing an ADU or tandem house can be broken down into two subcategories:

- Soft Costs - design & engineering services, loan fees, permitting fees, contingency budget and any other non-physical services
- Hard Costs - site clearance, foundation grading, construction, landscaping and any other physical construction services

Cost will vary based on the project location, site, specific design, inclusion of a garage or not, and the current cost of materials. Therefore giving an accurate estimate without knowing more specifics about your project would be difficult. But we can at least give you some insight into the general construction cost of a brand new home or detached ADU.

The following is an estimation of costs broken down by line items to demonstrate the typical components of a 500 square foot ADU or Tandem House Development budget. This estimation will vary based on site, design, location and permitting. Your management team can help to determine actual costs for an ADU or Tandem House.

Sample Budget

Direct Hard Costs	Amount
Site Survey	\$ 1,500
Site Clearance & Grading	\$ 8,000
Utility Connects, Footings, & Foundations	\$ 35,000
Electrical, Plumbing Hookups Construction & Exterior Finishes (500 S.F.)	\$ 15,000
Interior Finishes	\$ 65,000
Hard Cost Contingency	\$ 35,000
	\$ 10,000
Total Hard Costs	\$ 169,500
Direct Soft Costs	
Closing Costs & Loan Origination	\$ 1,800
Fee Plan Review Fee	\$ 1,500
Building Permit	\$ 2,500
Sewer Use & Drainage Permit	\$ 3,000
Water Fee	\$ 5,000
Architecture	\$ 2,000
Engineering	\$ 5,000
Blueprints	\$ 1,000
Appraisal	\$ 3,000
Soft Cost Contingency	\$ 3,500
Total Soft Costs	\$ 28,300
Total Development Costs (does not include potential replacement water or sewer line cost)	\$ 197,800



4. MAINTENANCE

There is no sure method of predicting specific maintenance costs since there are many variables that factor into yearly expenses. But there are some general rules that a homeowner considering building an ADU or tandem house can use:





Budgeting ADU Maintenance Costs

- **The 1% rule**

The 1% Rule says that a homeowner's yearly maintenance budget should equal 1% of a unit's market value. For example, if a homeowner's new unit is appraised at \$200,000, then they should budget \$2,000 yearly for maintenance.

- **The Square Foot Rule**

The Square Foot Rule suggests that a homeowner's budget \$1 for every square foot of their unit. So if their unit is 650 SF, then the budget is \$650. This approach results in a smaller budget for smaller units and may be more applicable after the first few years.

- **The Combined Rule**

Since the Square Foot Rule would not account for local market prices for materials and labor, like the 1% Rule does, the Combined Rule takes the average of the results from both rules to determine a budget. Therefore, a homeowner's \$200,000, 650 SF second unit would have a yearly maintenance budget of \$1,325:

$$\$2,000 + \$650 = \$2,650$$

$$\$2,650 / 2 = \$1,325$$

A homeowner should keep in mind that there are more factors such as age, weather and if it is an attached or detached structure that will influence their budget, condition, or location

5. WRAPPING UP

5.A- Lawn and Lanscaping

5.B - Driveways, Walkways, Decks and Patios

5.C - Change Orders, Punch List & Payment

CONSTRUCTION PUNCH LIST CHECK LIST

CATEGORY	ITEM	REPORTED	COMPLETED
CEILINGS			
	Are there any visible drywall tape joints? Check in natural light and with lights on		
	Are the holes for light fixtures and vents overcut so there are gaps at the coverplate		
	Do you notice any cracks in the ceiling		
	Do you notice any cracks at the corners of skylights		
	Do you have adequate access to your attic and is it insulated properly		
	Are skylights sealed		
	Are smoke detectors installed and operational		
WALLS			
	Are there any visible tape joints not properly sanded or missing paint		
	Are there any cracks at the corners of door and windows		
	Do you see any screw heads popped through the drywall		
	Do you see any nail heads popped in wood framing		
	Is there adequate paint coverage or do you see thin spots		
	If your walls are textured, is it uniform		
	Do you notice any gouges, dings or crushed corners		
	Are there any cracked or chipped wall tiles		
	Are there any broken grout pieces on tile walls		
	Is wall covering secure at wall ends and corners		
	Are any trim pieces tight to the wall with no gaps		
DOORS AND WINDOWS			
	Check frames for damage - dents, scratches, buckling		
	Doors should open and close smoothly without catching		
	Self-closing doors should latch on closing		

5.A - Lawn and Landscaping

Many customers decide to do their own landscaping and lawn seeding to save money. Be sure to learn about proper care in your area to start a lawn. Time of year and watering are critical to a good start.

Plants and shrubs add to curb appeal. At least some landscaping should be considered when building a new home. Consider contracting landscaping and lawn installation from a reputable company.

5.B - Driveways, Walkways, Decks and Patios

While a long driveway may be appealing, remember that a long driveway adds to the expense of construction for your new home. Rural homes typically have stone driveways. This is very economical for longer driveways compared to asphalt or concrete. Be sure to plan for a turnaround space parking area or just outside of your garage.

Decks, and Patios will be installed on site. Remember, decks and patios aren't typically required to be in place to get an occupancy permit. They are also easy to add later. Remember to compact loose soil near your foundation and lay a solid base before installing a patio.

5.C -Change Orders, Punch List and Payments:

If you make changes that will affect either time or cost, be sure to put it in writing and have it signed by all parties. During the construction of a home, many things are happening. It is easy to forget what was said or to have misunderstandings. Changes almost always have a cost in time which should be noted in the change order. A change order doesn't have to be complex.

At the final state of the construction project make a punch list, or detailed list of items that need to be completed to comply with the terms of the contract. Note all deficiencies that need to be resolved, stating who needs to do what, and by when. When the contractor has completed that list, final payments should be made.

We hope you've found this handbook to be helpful. Carriage Home Builder's Modular Consultants are always happy to talk with you and answer your questions. You can reach us at:

(303) 618-1790

If you prefer to write to us with your questions you can fill out our contact form here:

<https://carriagehomebuilder.com/contact-us>