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***Olsen is a licensed architect with an extensive background in accessible and inclusive design. As Senior Project Architect, Mr. Olsen facilitates a client-focused approach, tailoring architectural solutions to each client's unique needs. His residential portfolio includes design for new construction homes and multi-family projects, as well as historic restoration, single-family renovation, and custom interiors. He has completed numerous projects for owners, developers, municipalities, and government agencies related to improving the built environment and removing barriers to access. FHA, ADA, and ABA consulting and design services include survey work, transition planning, architectural design, construction administration, and remediation assessment.***

# LESSONS IN UNIVERSAL DESIGN AND THE AI-IC

*Clarence D. Olsen, AA, NCARB*

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## Objectives

***What is the AHC? Importance of Universal Design in housing.***

***Context - Siting, Architectural Features,***

***Concepts-Working with UD Consultant: Schematic Design***

***Construction Phase: Issues in the Field***

***Completed Projects***

***Conclusions***

## Why Universal Design



**At its very core, universal design in a residential setting is about multigenerational design. We are designing homes for a range of family stages. Universal design considers then needs of current and future inhabitants including; safety, durrability, movement capabilities, age, strength, and cognitive ability.**

## Goals of Affordable Housing Commission

**Providing better housing that meets the minimum Universal**



**Design Guidelines Remove barriers to home ownership. Provide quality building construction with less waste, more efficiency. Revitalize decaying urban communities. Maintain historic fabric.**

## Universal Design Guidelines

### Overview

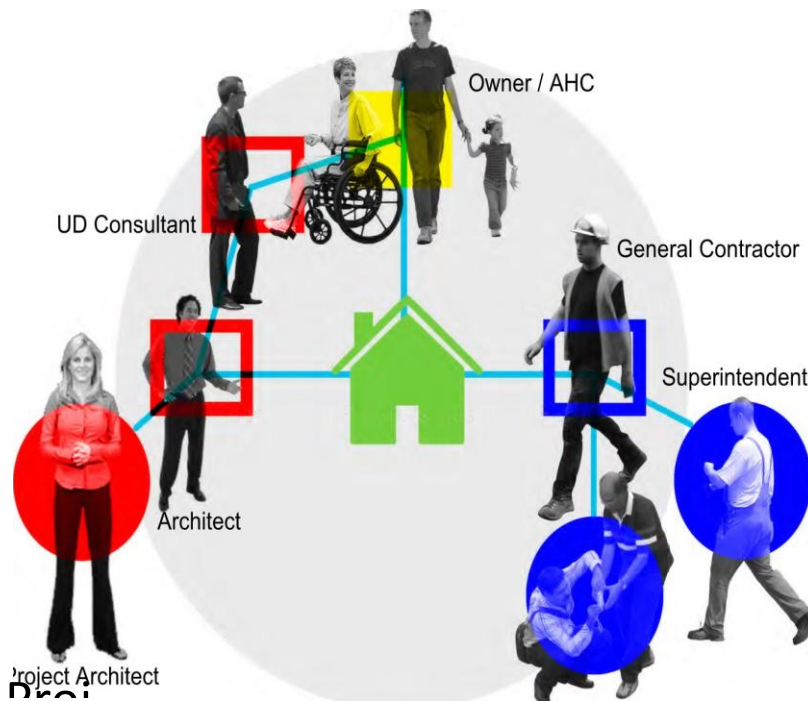
**Ch1 : Application and Administration**

**Ch2: Scoping & Technical Requirements Site and Building**

**Ch3: Scoping & Technical Requirements**

### Specific Elements and Spaces

**"A universal house begins with three essential components: a step-less entry, wider doors and halls, and a usable bathroom. Without them, no dwelling can be considered universal. Conversely, a home with only those three features isn't universal either. In addition to the Basic 3, a universal home includes a variety of other features that provide convenience, safety, and ease of use. The combination produces a universal home." (Center for Universal Design, 2000). Sphere of Influence**



## Sub-Contractors

## City Staging and Urban Infill

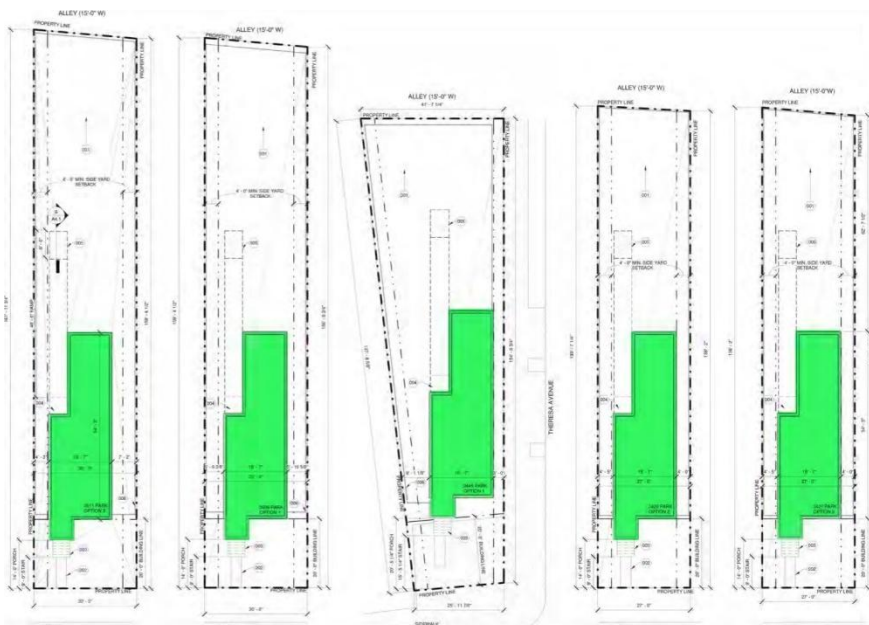
**Important Characteristics Include:** -Numerous open lots within close proximity.

-Access to safe and walkable neighborhood.

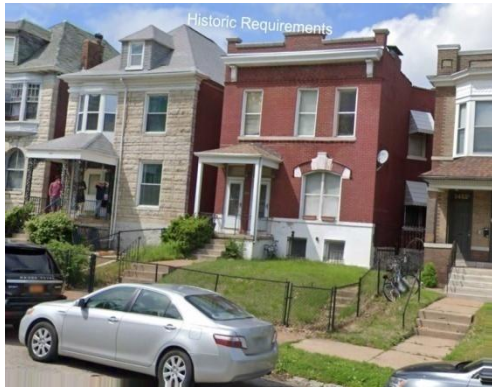
- Public transportation

Nearby. -Cohesive Project Identity.

**Restrictive Property Dimensions**





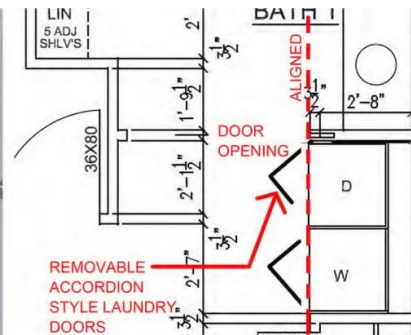
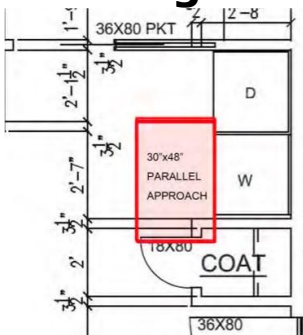


## Historic Character Challenges

- Raised / Covered Porch
- Window Proportions
- Facade Materials
- Roof Shape



## Working With UD Consultant



**Timeliness, coordinated effort, and willing to listen are imperative to a successful outcome.**

- Schematic Design Review
- Construction Documentation Review

**-Project Administration Through Construction****-Final Punch List Approval**

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Universal Design Check List

PROJECT ADDRESS●

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**DESIGN ARCHITECT●-Design Phase Checklist**

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**REVIEW**

**DATE●**

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**REVIEWER●**

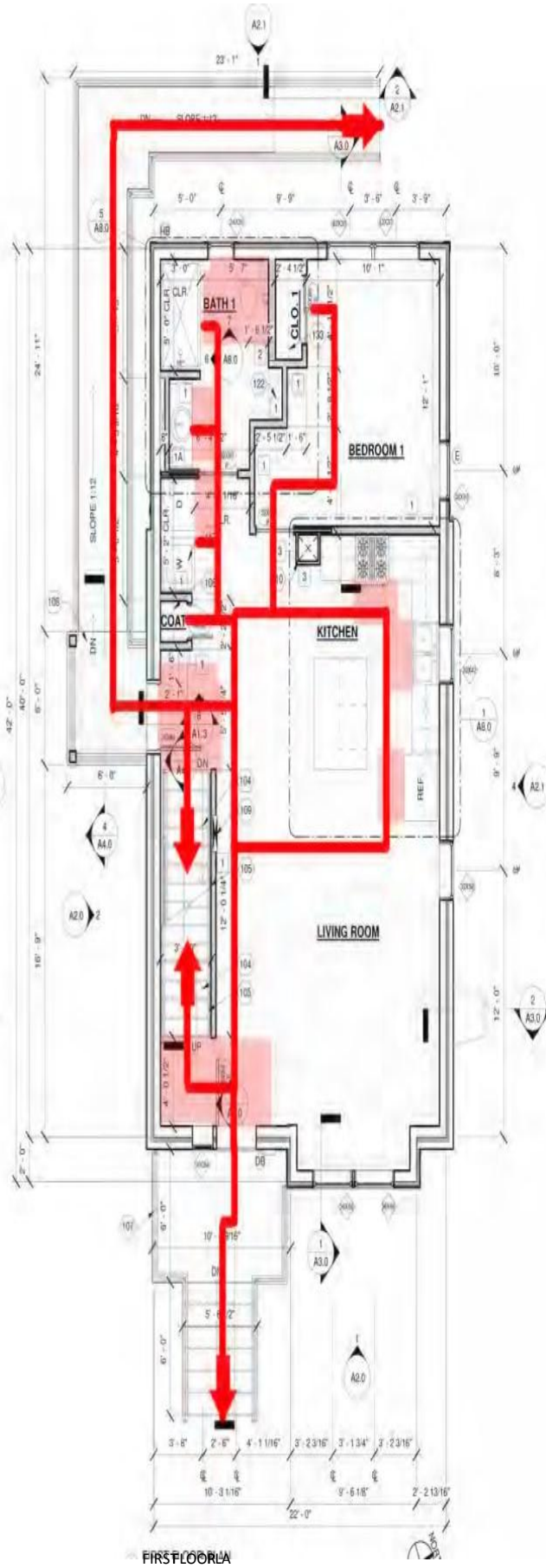
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*The following checklist is designed to verify universal design requirements during the design phase of a project.*

**DESIGN PHASE**

<b>DESCRIPTION</b>	<b>YES</b>	<b>NO</b>
<b>Route:</b>		
<b>Provide at least one accessible route from vehicle drop-off (street) to entry door complying with accessible pathways requirement. The accessible route must extend to the public sidewalk (if any). Sec 202.1</b>		
<b>Provide at least one accessible route from parking area(s) to entry door complying with accessible pathways requirement. Sec 202.1</b>		
<b>Pathway:</b>		
<b>All sidewalks and accessible routes must have maximum 1:20 running slopes and maximum 1:50 cross slopes. Surface to be firm, slip-resistant and smooth.</b>		

<b>Provide minimum pathway width of 42". Sec 202.2</b>		
<b>Parking:</b>		
<b>Provide space for at least one accessible parking space serving this site and connected to the accessible route. The accessible space may be on the street. Signs and striping are not required. The intent of this requirement is to make sure that the space can be provided in the future without requiring additional grading, paving, or curbing. If the project is large enough to trigger accessible parking requirements, provide spaces, signage and striping per City of St. Louis Building Code and ANSI All 7.1 requirements. Sec 202.3</b>		
<b>Parking Location - Parking designated for the dwelling should be as close as possible to the house/unit entry and at the same basic level. The intent is to reduce or eliminate any need for residents to negotiate unassisted vertical transitions (ramps etc.) between parking and entry. Multi-level buildings with elevator service to the parking and entry level(s) are acceptable. Sec 202.3.1</b>		
<b>Parking Space Dimensions (Exterior Covered and Garage) - Provide a 9' x 19' minimum area for the vehicle with a minimum 5' access aisle on one side (14'x19' total). Space and aisle to have a maximum 2% cross slope in all directions. Surface must be paved, firm, slip-resistant and smooth. Striping is not required for aisle at single rking spaces. Sec 2023.2</b>		



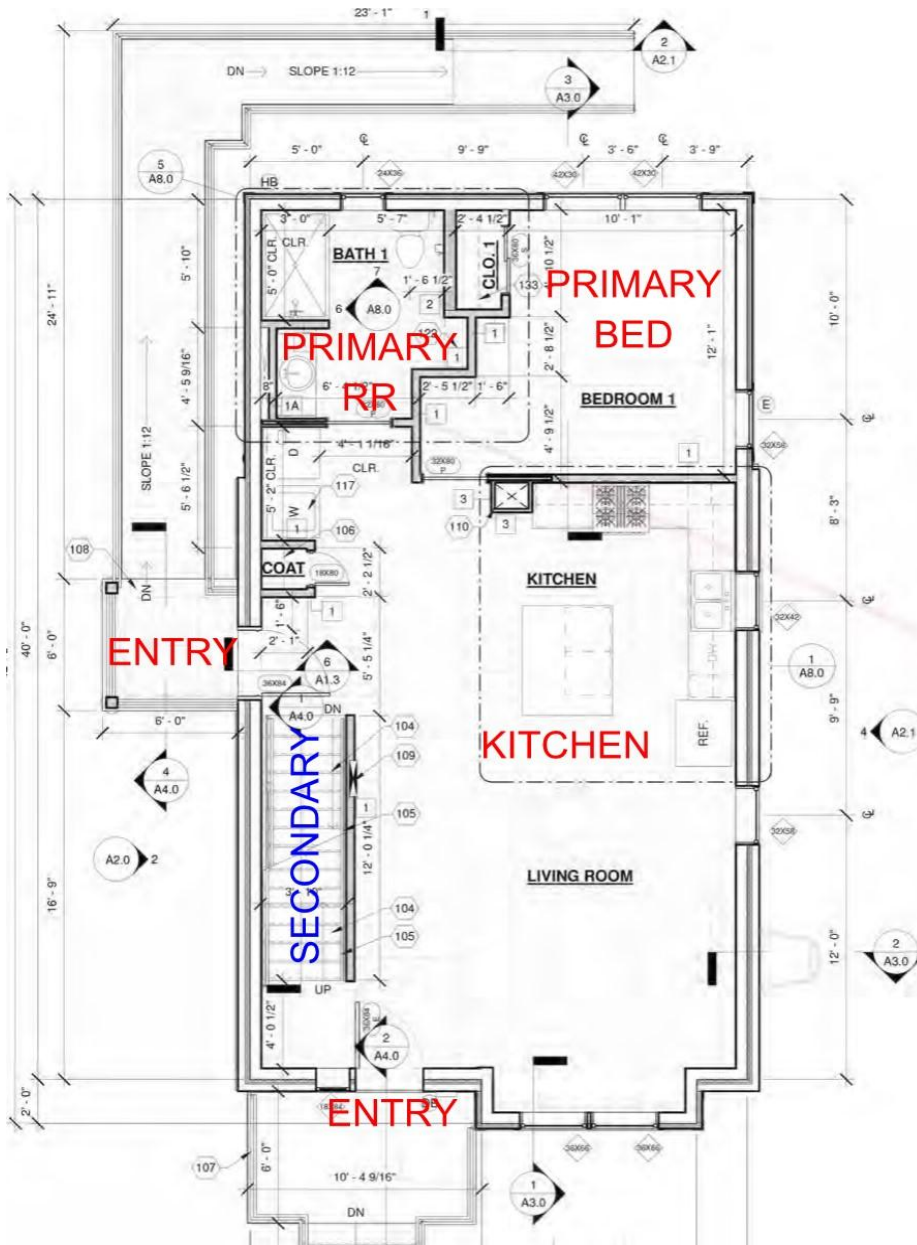
-Egress

-Clear Approach

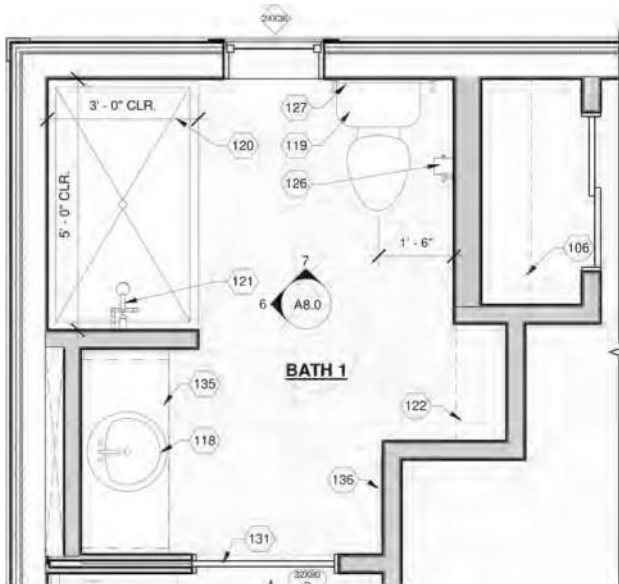


## Unique UD Features

- Additional space requirements.
- Minimum clearances.
- Closet Depths and Door Widths.
- Appliance and Island

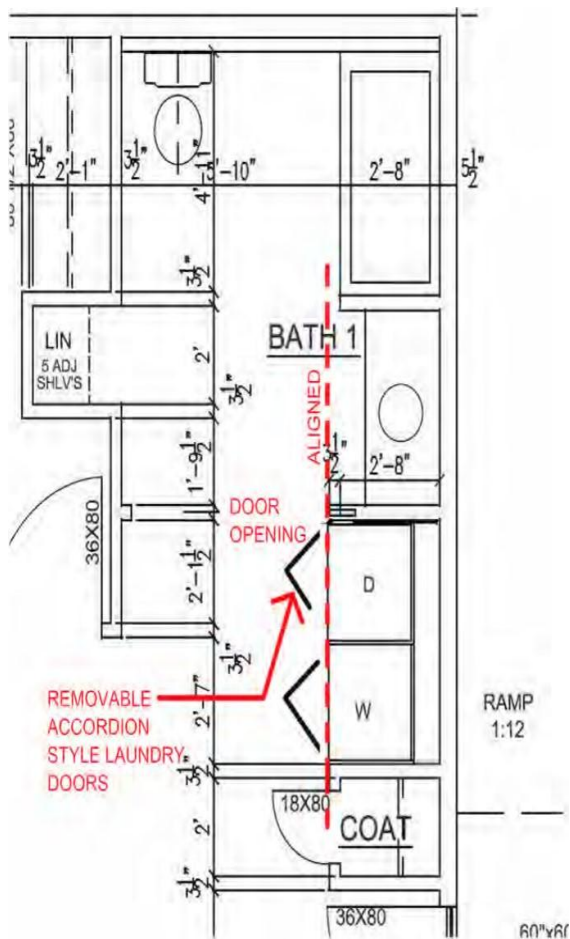


**Spacing. -Sinks with approach.**

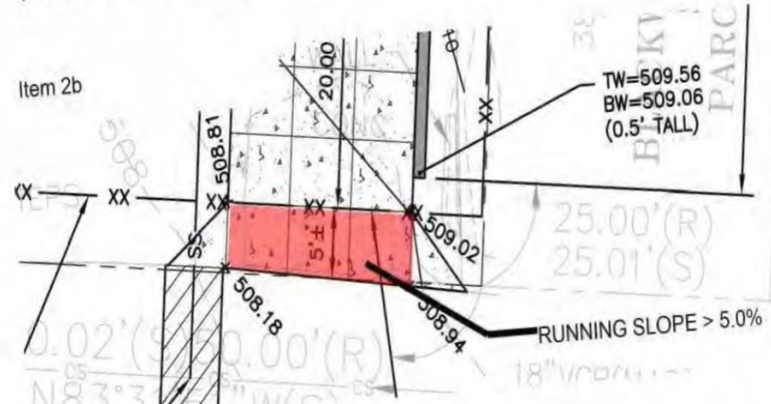
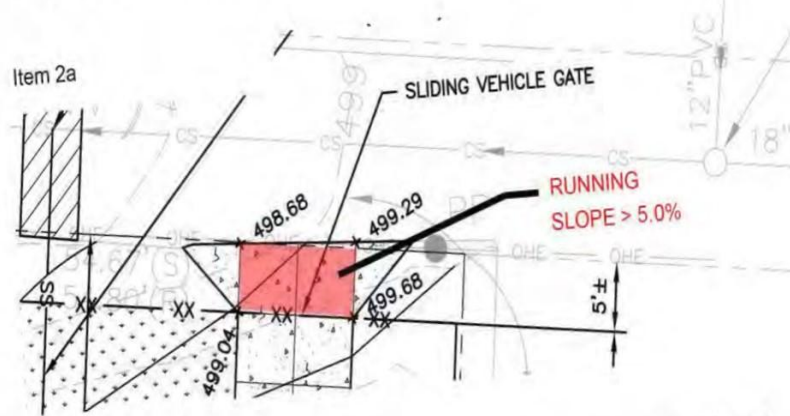


## PRIMARY RR Feedback Commentary

- Highlight Design issue
- Provide Solution**
- Graphic and Written Response







**-Slopes  
Continous Routes**

**Comments:**

- I. The concrete pathways leading to the parking and the parking pad are all compliant, but there are a few missing grade points at the maneuvering landings. You may want to consider adding points at each corner of the concrete slabs to ensure you meet the 2.0% cross slope in both directions when it is poured. See attached.**

- 2. There is an issue with the running slope of the concrete pads between the parking area and the alley. The running slope is greater than 5.0% on the 3846 and 3861 Folsom properties. This is an issue for residents to take their trash to the alley dumpster. This may require regrading the site to reduce the running slope to an acceptable tolerance. See attached.**
- 203.4 Trash. Provide an accessible route to trash containers or trash drop-off area.**
- 3. The accessible ramps serving the home should state that the cross slope cannot exceed 2.0%. The ramp top landing should state that cross slope 2.0% both directions. I do not think this is an issue with the design but the information would be helpful to see.**
- 4. House numbers are not indicated on the elevations. Please verify that they will be provided at front and back of home, 4.0" minimum height letters with 70% color contrast to background,**
- 5. I see a keyed note on the elevations #20 for the ramp describing the decking. Please confirm that decking with have gaps no larger than k".**
- 6. Please confirm the location of the mailbox.**
- 7. Primary entry door does not provide a sidelight. I am considering the main door to**
- Project tracking for future reference.**



***the front porch the primary door in this situation.***

- 8. Please confirm that the metal threshold on each exterior door is maximum 1/2" high with bevel or W' high with squared edge.***
- 9. Please confirm internally illuminated doorbell provided that is wired to allow retrofit of visible interior signal. I am considering the main door to the front porch the primary door in this situation.***
- 10. The inside of the side entrance door does not***
- 11. provide 60"x60" clear floor space. See attached.***

***Please confirm that lighting is provided at each exterior entrance door.***

***302.1.9.1 Lighting. Provide outdoor lighting either in porch roof/ceiling or with a sconce mounted on the latch Side of the door.***

***Minimum 100 watt capacity fixture.***

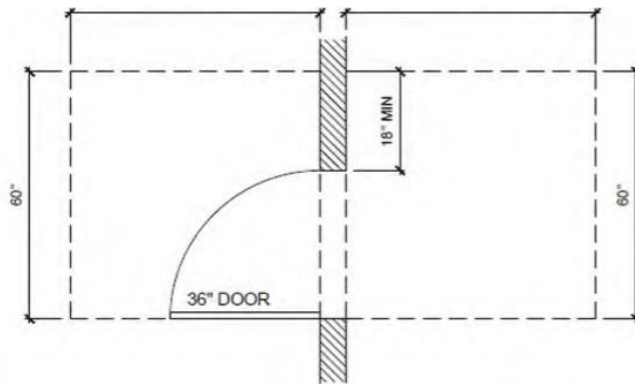
- 12. Verify adjustable shelf supports extending from floor to ceiling provided in accessible bedroom closet ( 1 st floor), Verify blocking provided for shelving and rod supports in other bedroom closets.***

- 13. Please confirm window sill heights.***

- 14. Please confirm cabinetry pull style / door hardware style.***

- 15. Linen closet on second floor is too deep for the size of door. Please reduce this closet to 24.0" interior depth maximum. See attached.***

**302.1.7 Clear floor space. Provide 5' x 5' maneuvering space inside and outside of entry door. At the exterior side of the door, provide a full turning circle (60" radius) of level space clear of the door swing. See illustration 302a.**



302a Approach areas for primary no-step entry



## Entrance door and critical Approach

**303.6 Interior and exterior stairs (if provided). Comply with the following: Staircase**

**303.9.1 Maximum riser height: 7". minimum tread depth 11".**

**303.92 Provide handrails on both sides. Extend rails 12" beyond top and bottom risers and parallel to floor. Return rails to wall or newel.-Riser Heights**

**303.9.3 Minimum width: 42"**

**303.9.4 Minimum landings: 48" deep-Power**

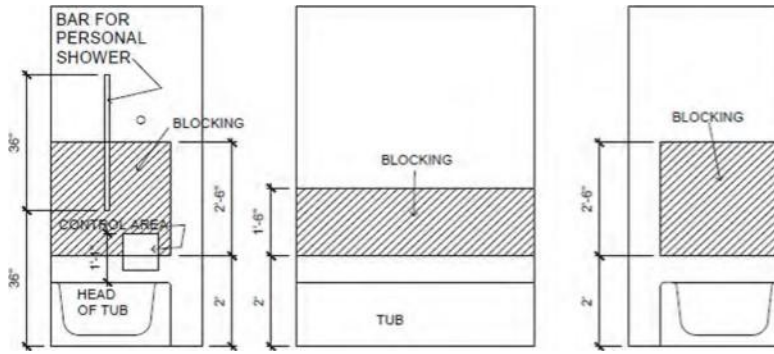
**303.9.5 Rough-in power for future lift.**

**305.1.7 Shower. Provide personal shower unit on 30" minimum slide bar. Include shower head with cut off thumb control at head. Provide minimum 60" long hose.**

**Primary Restroom**

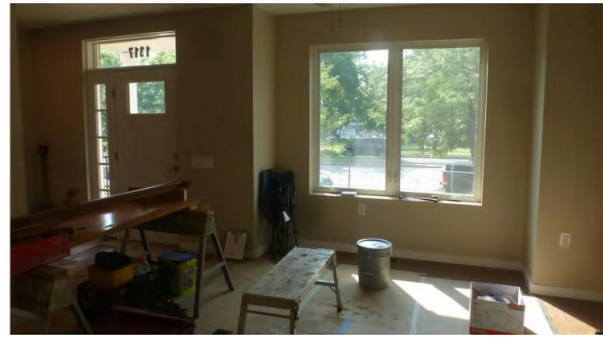
**-Fixtures**

**-Controls**



### 305b Tub blocking and controls

## Construction Observation



## Important milestones for field observations:

- Foundation Pour (15%)
- Rough Framing (45%)
- Drywall (80%)
- Final Walkthrough (95%)

## Observation phase

### 1. Foundation





## 2. Rough Framing



<b>DESCRIPTION</b>	<b>YES:</b>	<b>NO</b>
<b>Primary Entry:</b>		
<b>Door— Minimum 36" wide. (Pivot). Sec 302.11</b>		
<b>Threshold — 1/2" beveled threshold or 1/4" squared edged. Sec 302.1.3</b>		
<b>Doorbell — Internally illuminated doorbell, Wired to allow retro fit of Visible internal Signal. Mount doorbell 36" above level landing outside door. Sec302.1.4</b>		
<b>Clear Floor Space — 5' x 5' maneuverable space inside and outside of entry door. Sec 302.1.7</b>		
<b>Covered Entryway — Shelter entry from weather with an overhang. sec 302.1.10</b>		
<b>Secondary Exterior Doors:</b>		
<b>Door - Minimum 36" wide. Sec 302.2.1</b>		
<b>Clear Floor Space — 5' x 5' maneuvering space on the pull side(s) of the door and a minimum of 36" x 48" approach on the push side. 302.2.2</b>		
<b>Interior Doors:</b>		
<b>Door - Minimum 32" wide clear opening. Sec 303.11</b>		
<b>Threshold — 1/2" maximum threshold. Sec 302.1.3</b>		
<b>Interior and Exterior Stairs (If Provided):</b>		
<b>Max. riser height 7", minimum tread depth 11", minimum width 42". Sec 303.9.1</b>		
<b>Handrails both sides. Extend rails 12" beyond top and bottom risers and parallel to floor. Return rails to wail or newel. Sec 303-9.2</b>		
<b>Minimum landing depth 48". Sec 303.9.4</b>		
<b>Rough-in power for future lift. Sec 303.9.S</b>		
<b>Hallways:</b>		
<b>Minimum 42" wide hallways. (finished). Sec 303.2</b>		
<b>Windows:</b>		
<b>Sill Height 32" max. above finish floor (except over casework). Sec 3036.1</b>		
<b>Window locks within reach range. Sec 303.6.3</b>		
<b>Kitchen:</b>		



<b>Sink:</b>		
<b>Piping — Insulate sink pipes. Sec 304.22</b>		
<b>Counter:</b>		
<b>Workspace — Include a section of adjustable counter surface with knee space below; or space for a free —standing 24" x 36" table while maintaining required clearances. Sec 304.3.2</b>		
<b>Kitchen Storage —50% of the storage space within reach range. Sec 304.5</b>		
<b>Primary Bathroom:</b>		
<b>Clearance— Clear turning circle or T-turn. Sec 305.1</b>		
<b>Phone — Provide phone jack. Sec 305.1.1</b>		
<b>Toilet — Locate 18" to center off a sidewall in a clear space minimum 48" wide, 60" deep. sec 305.1.2</b>		
<b>Tub — (If provided). Provide a clear 30" x 48" approach space aligned with side of tub. sec 305.1.4</b>		

## CONSTRUCTION PHASE (PRE-DRYWALL)

### -Pre-Drywall Checklist

## Observation Phase 3+: Drywall and Final Punch List



The following checklists are designed to aid in verifying universal design construction tolerances and other requirements in Substantial Completion phase of a project.

## END OF CONSTRUCTION PHASE (SUBSTANTIAL COMPLETION)

<b>DESCRIPTION</b>	<b>YES</b>	<b>NO</b>
<b>Ramp Inspection. Slopes and Handrails</b>		
<b>Accessible Route Inspection. Slopes</b>		
<b>Parking Inspection, Slopes</b>		
<b>Hand Rail – Interior</b>		
<b>Hand Rail - Exterior</b>		
<b>Doors 32" Clear</b>		
<b>Window Hardware</b>		
<b>Door Hardware</b>		
<b>Mail Box</b>		
<b>Peep Holes / Sidelight</b>		
<b>House Numbers Front and Back</b>		
<b>DESCRIPTION</b>	<b>YES</b>	<b>NO</b>
<b>Ramp Inspection. Slopes and Handrails</b>		
<b>Accessible Route Inspection. Slopes</b>		
<b>Parking Inspection, Slopes</b>		
<b>Hand Rail – Interior</b>		
<b>Hand Rail - Exterior</b>		
<b>Doors 32" Clear</b>		
<b>Window Hardware</b>		
<b>Door Hardware</b>		
<b>Mail Box</b>		
<b>Peep Holes / Sidelight</b>		
<b>House Numbers Front and Back</b>		

DESCRIPTION	YES	NO
<b>Primary Entry:</b>		
<b>Closer— (If provided): Closer must comply with current ANSI standards for closing speed and force (see ANSI A1 17.1 1989, 404.2.8-9). Sec 302.1.5</b>		
<b>Doorbell — Internally illuminated doorbell. Sec 302.1.4</b>		
<b>Front Door— Sidelight or double peepholes. Sec 302.1.2</b>		
<b>Exterior Lighting:</b>		
<b>Entry Door Lighting — Provide a fixture with a minimum of 100 watt capacity. Sec 302.1.9</b>		
<b>Hardware, Fixtures and Fittings:</b>		
<b>Hardware, Fixtures and Fittings — All door hardware, cabinet hardware, faucets, bath and shower valves, diverts and similar items are to be lever and/or Wire handle or D-pull (loop) type. All such items must operate easily using a single closed fist. Exception●. Panel box and HVAC filter access panel, sec 301.9</b>		
<b>Floor Surfaces;</b>		
<b>Use non-slip and dense surface materials. Do not use pads under carpeting. Sec 303.3</b>		
<b>1/2" max. beveled threshold condition between flooring material changes. Sec 303,1.3</b>		
<b>Full Length Mirror:</b>		
<b>ProVide at least one full length mirror in the bedroom and/or bathroom(s) that connect to the accessible route. Sec 303.5</b>		

## **Anatomy of a UD Kitchen**

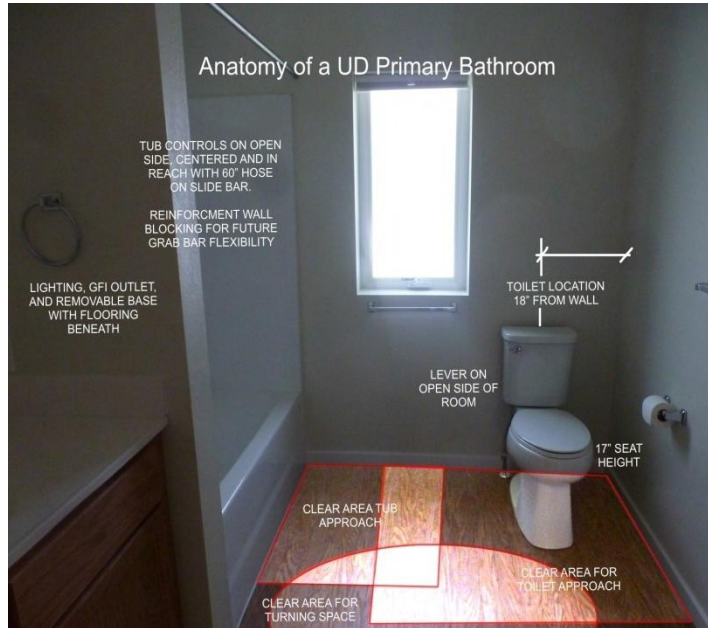
### **PANTRY WITH**

**REACH RANGE -re SWITCH FOB... MOVABLE SHELVING**

**CFI OUTLETS EXHAUST OR MORE**

**STORAGE IN REACH RANGE**

# SHALLOW BOWL AND LEVER FAUCET REMOVABLE SINK BASE WITH FINISHED FLOOR BENEATH SPACE FOR DINING AND MEAL PREP



# REFRIGERATOR WITH WATER LINE DISH WASHER CLEARANCE