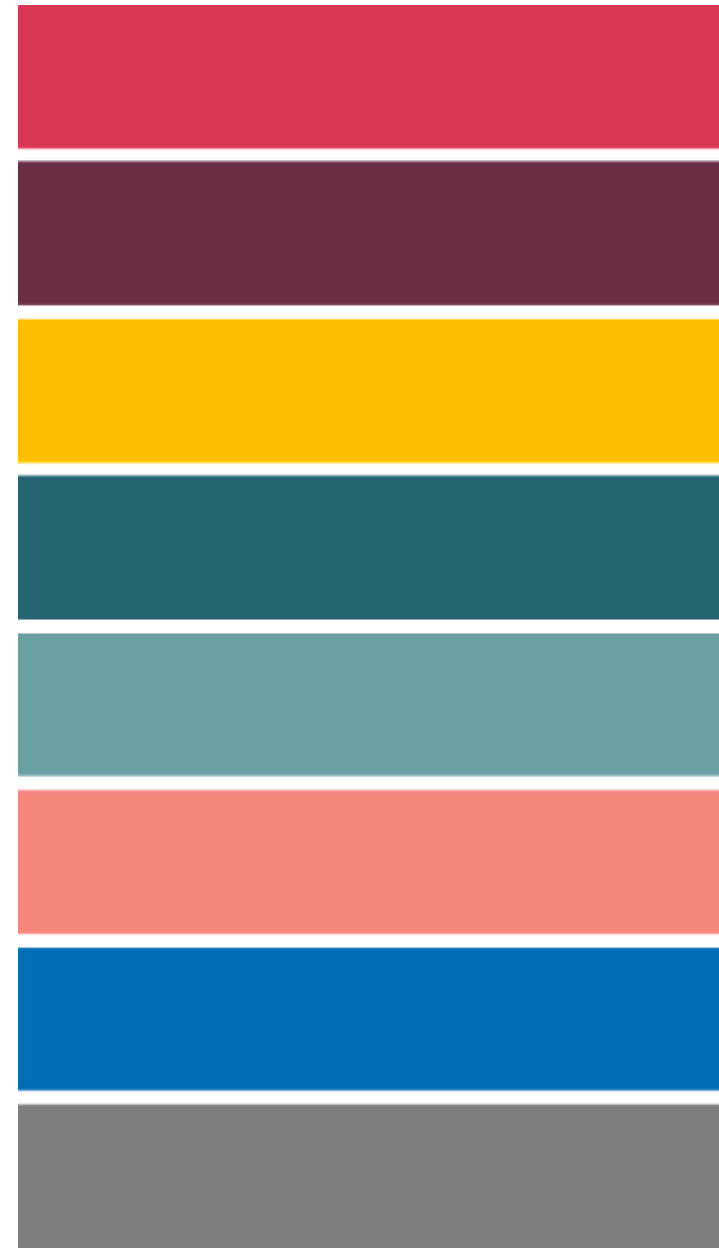


ACCESSIBLE FEATURES *Reference Guide*



Project Intent: This inclusive designed project was developed *by* Disability Network Michigan, Disability Advocates of Kent County, DeJong Design + Consult, LLC, Michigan Association of Planning and funded by Michigan State Housing Development Authority. The intent was to provide accessible designs, specifically for kitchens and bathrooms, to be implemented in any multi-dwelling units that desire and/or require to meet accessibility standards.

Why It Matters: Planning for accessibility upfront costs less and saves time compared to retrofitting later. When accessibility is built in from the blueprint stage, everyone gains the freedom to age in place and adapt their homes as needs change.

Process: This reference guide was developed *through* an inclusive design process where people with disabilities, design professionals and many others working together to solve accessibility challenges. This guide along with the 8 prototypes (4 kitchens and 4 baths) give you an approach and outcomes of the using practical design standards that go beyond minimal code compliance and provide something more inclusive and flexible than the minimal requirements of current building codes.



Acknowledgements:

Participants:

- *Lived Experience
- Temporary *Lived Experience
- No *Lived Experience
- Contractor/Builders
- Engineers
- College and Design Professors
- Design Students
- Developers
- Architects
- Code Officials

**Lived Experience: individuals that have a disability*

Organizations Involved:



Project Team Producers:

- DeJong Design + Consult, LLC
- James Fischer, KCAD student at Ferris State

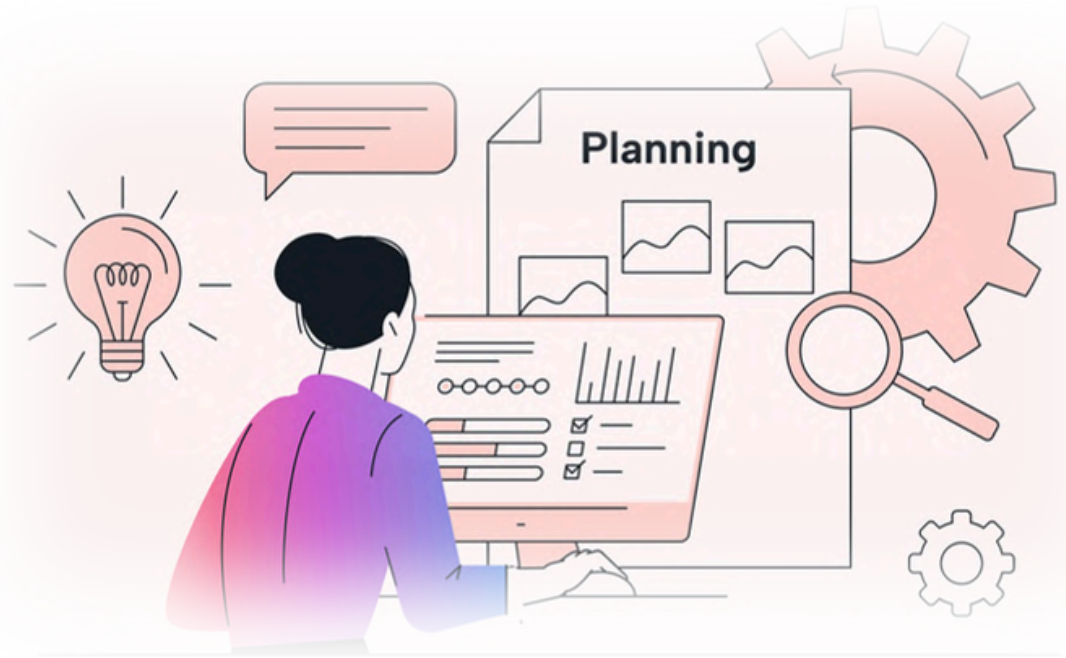
Resources Used:

- ICC/ANSI 117.1-2017; Standards for Accessible and Usable Buildings and Facilities; Printed September 2022 version
- ZERO-STEP GUIDELINES™ Copyright 2009; Update 2021
- THE ACCESSIBLE HOME; Designing for all Ages and Abilities; by Deborah Pierce 2012
- The simplified 2025 MICHIGAN BUILDING CODE BOOK; by James R Callahan; 2025



What is it?

- An easy-to-use guide to use when planning for new housing developments
- 4 Accessible Kitchen Prototypes and 4 Accessible Bathroom Prototypes that aspire to become “permit ready” documents to add to MSHDA’s pre-approved plans for their Statewide Housing plan
- To promote a **proactive model** versus a reactive model in order to achieve the following:
 - Improve the quality of life for **everyone** not just those that are compromised
 - Bake in the details **from the beginning** of the project needed for future adaptations, **saving time and money**
 - **Avoid** clinical aesthetics
 - To maximize **utilization of the space** over time



WHAT IT'S NOT:

It is not a design for a specific set of needs, rather identifies the foundations needed to plan early on in the project in order to guarantee accessibility in a space.

When to use?

Programming and Planning Phases:

- The Reference Guide and Prototypes can be applied for planning for ANY stand alone home OR multi-dwelling unit
- Use the Reference Guide to help navigate best practice or designing around maximums to ensure meeting or exceeding Michigan Building Codes 2025; when ICC/ANSI standards are confusing
- Use the diagrams to help you create your own floorplans in kitchens and bathrooms

Schematic or Design Development Phases:

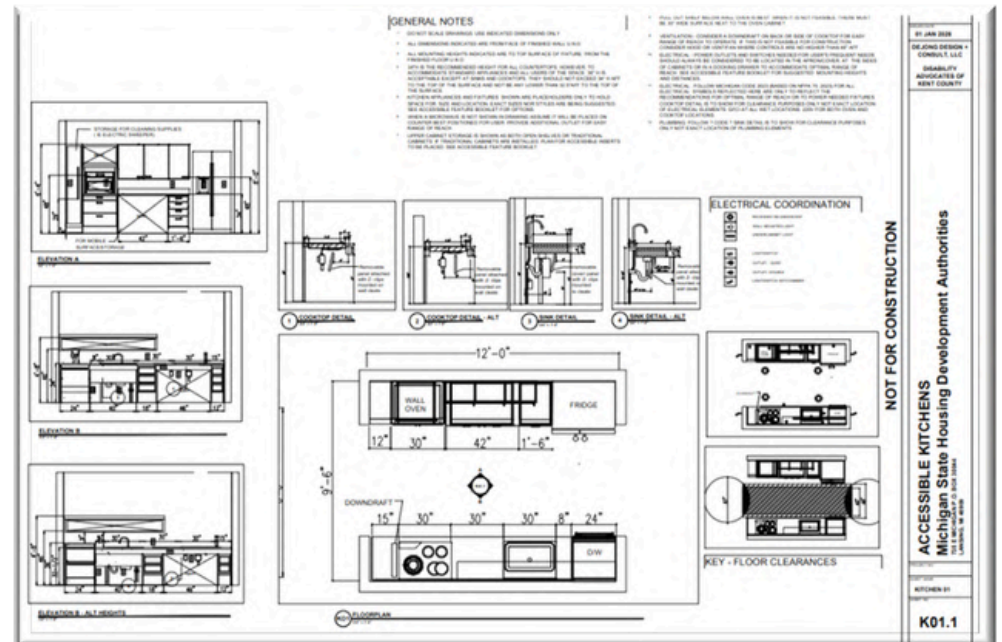
- Use the *Prototypes as templates to implement directly into existing plans
- Use the *Prototypes as starting points and modify per your project

**Architectural drawing sets available in PDF format*

REFERENCE GUIDE



PROTOTYPES



Menu:

LEARNINGS THROUGH SURVEYS AND WORKSHOPS

DESIGNING AROUND MAXIMUMS- FLOOR CLEARANCES

ELECTRICAL AND POWER ACCESS COORDINATION

MOUNTING HEIGHTS AND DISTANCES IN KITCHENS

MOUNTING HEIGHTS AND DISTANCES IN BATHROOMS

WALL REINFORCEMENT/BLOCKING

ZERO-STEP SHOWER CONSIDERATIONS

PRODUCT FEATURES

SURVEYS - TOP PRIORITIES

- *The priorities that surfaced were helpful in informing this Reference Guide and the four kitchen and bathroom Prototypes but were not the only things taken into consideration. There are MANY more factors that are needed to be taken into consideration, through much discussion in the workshops and the feedback throughout the development process other factors were weighed in and applied. Due to the wide range of needs of the human condition there are no perfect solutions, and many times priorities are compromised due to competing needs but all kitchen and bathroom layouts for **this exploration made sure not to compromise on these shared top priorities***
- *Whether you live with a disability, have had experience with having a disability or not, many of the desired features are the same across all groups and designing for the unique need tends to benefit everyone, not just the few, so giving **more weight to the voice of those that live with limitations daily was important in deciding top priorities***
- *Many of the priorities' can be achieved through products, being appliance or fixture types which are not shown in the drawings, but suggested recommendations can be found in this Reference Guide in the **Product Feature Section***

KITCHEN

Fridge with side or bottom freezer

Sink next to dishwasher (drawer dishwasher)

Built-in Wall oven with controls on side or front

Counter space next to or within reach of fridge

Counter space within reach of wall oven or pull-out shelf below

Under cabinet/shelf lighting

All storage below counter should be drawers or pull-out shelves

Automatic or touch faucet

Consider Induction cooktop for safety

Provide counter space at two different heights

Wall-oven to have side hinge door

Ability to have 30" table near kitchen

BATHROOM

Rain shower head and handheld shower desired

Shower controls within reach of shower seat

No shower door
Plan for shower curtain

Under counter storage should be drawers or pull-out shelves

Slider or pocket entry door with pull handle or lever

Wall-hung sink with counter space

Single lever faucet

Clearance on one side of the toilet

Bidet as attachment only

Lights above or integral to mirror

Standard counter depth of 24" or less

Full turning radius

WORKSHOPS-2D & 3D EXERCISE AND COLLABORATION



FLOOR CLEARANCES

These spaces were shaped around most MAXIMUM requirements
NOT minimums

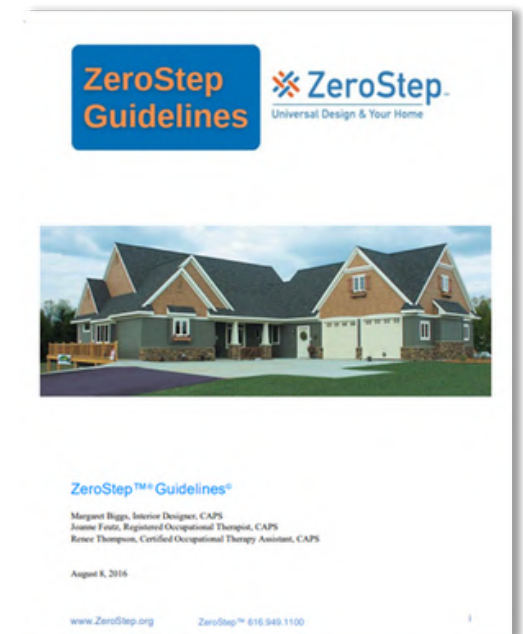
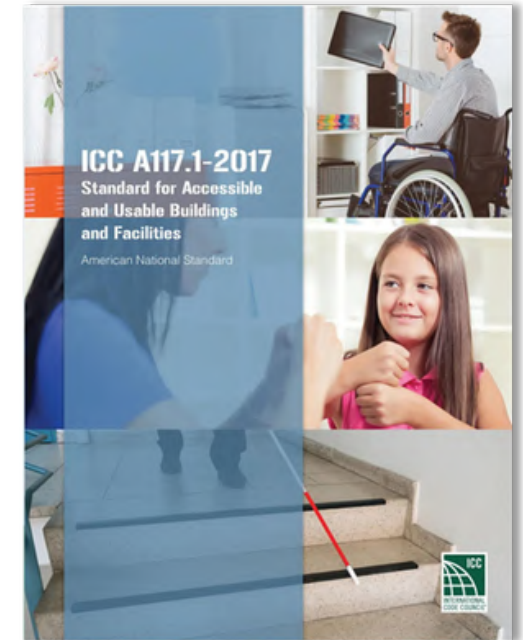
- All layouts meet or exceed both Type A & B units per ICC A117.1-2017 Standards, which means it is meeting the Michigan Building Code 2025 since they adopted the ICC A117.1-2017 statewide
- All layouts meet or exceed Zero Step Guideline (includes ICC/ANSI 117.1- 2009, Fair housing guidelines, Michigan Building Code 2015, Michigan Residential Code 2015.) (Updated in 2021; See Appendix)

NEW standard; turning radius per ICC/ANSI 117.1-2017;

- When turning radius is shown or suggested in this Guide it is meeting the new ICC A117.1-2017 standard requirement of 67" with a 10" overlap allowance.

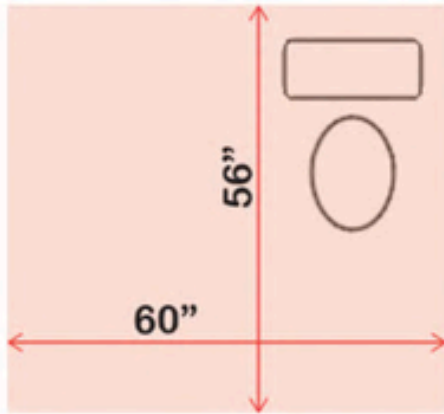
LIVED EXPERIENCE RESPONSE:

Please take into consideration in places where the user needs to reach from one surface to the other, anything larger than 60" compromises their range of reach.

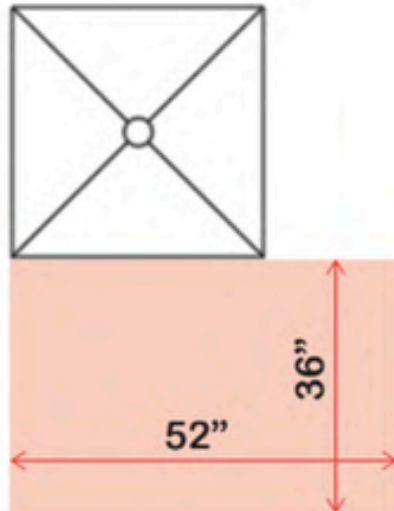


FLOOR CLEARANCES - BATHROOM MAXIMUMS

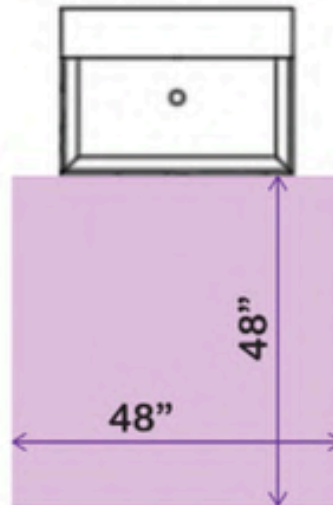
TOILET



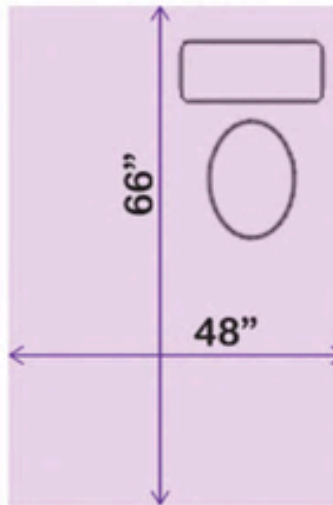
TRANSFER SHOWER



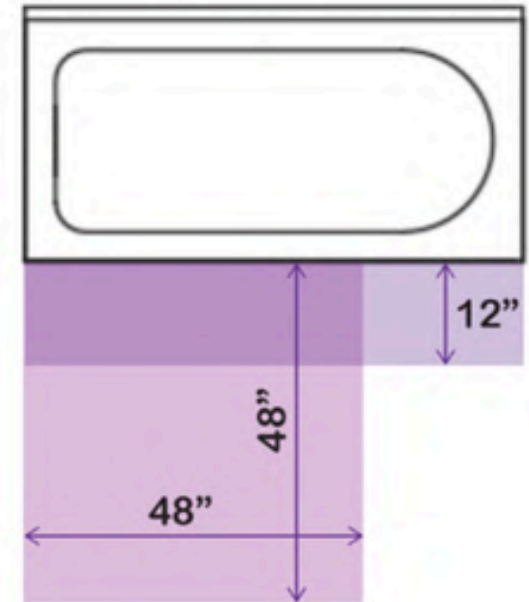
SINK



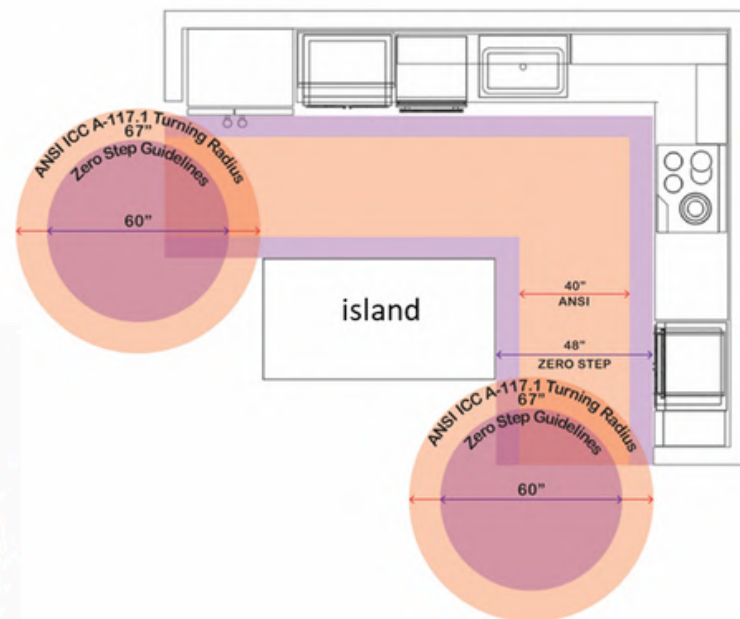
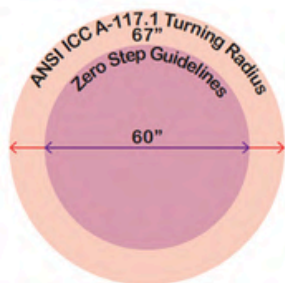
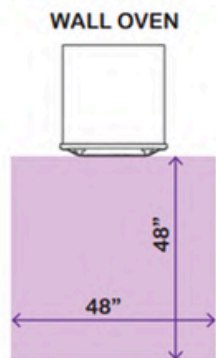
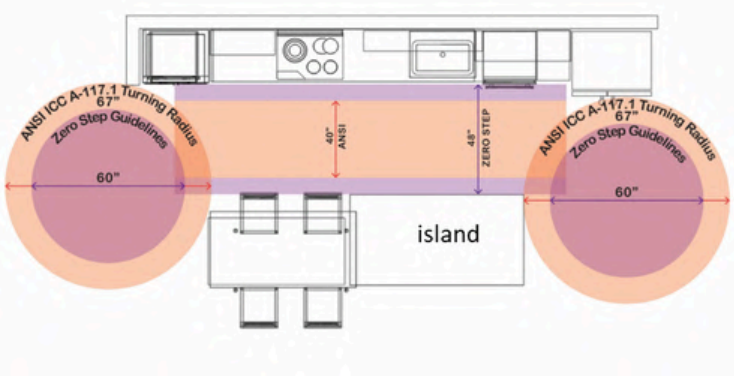
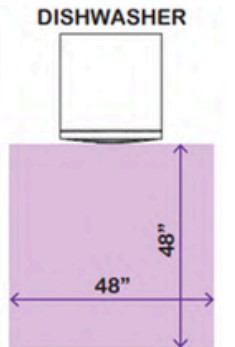
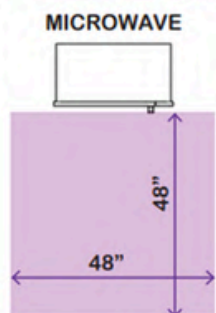
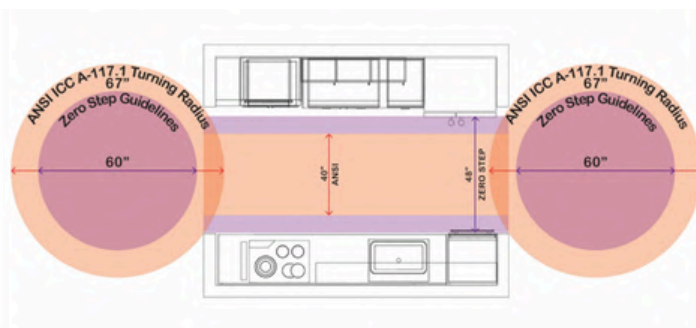
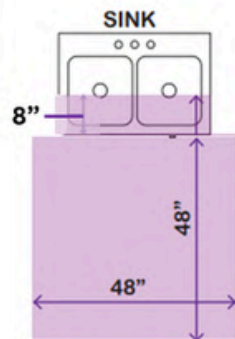
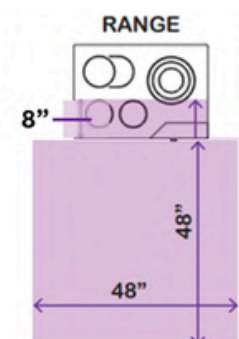
TOILET



TUB/SHOWER

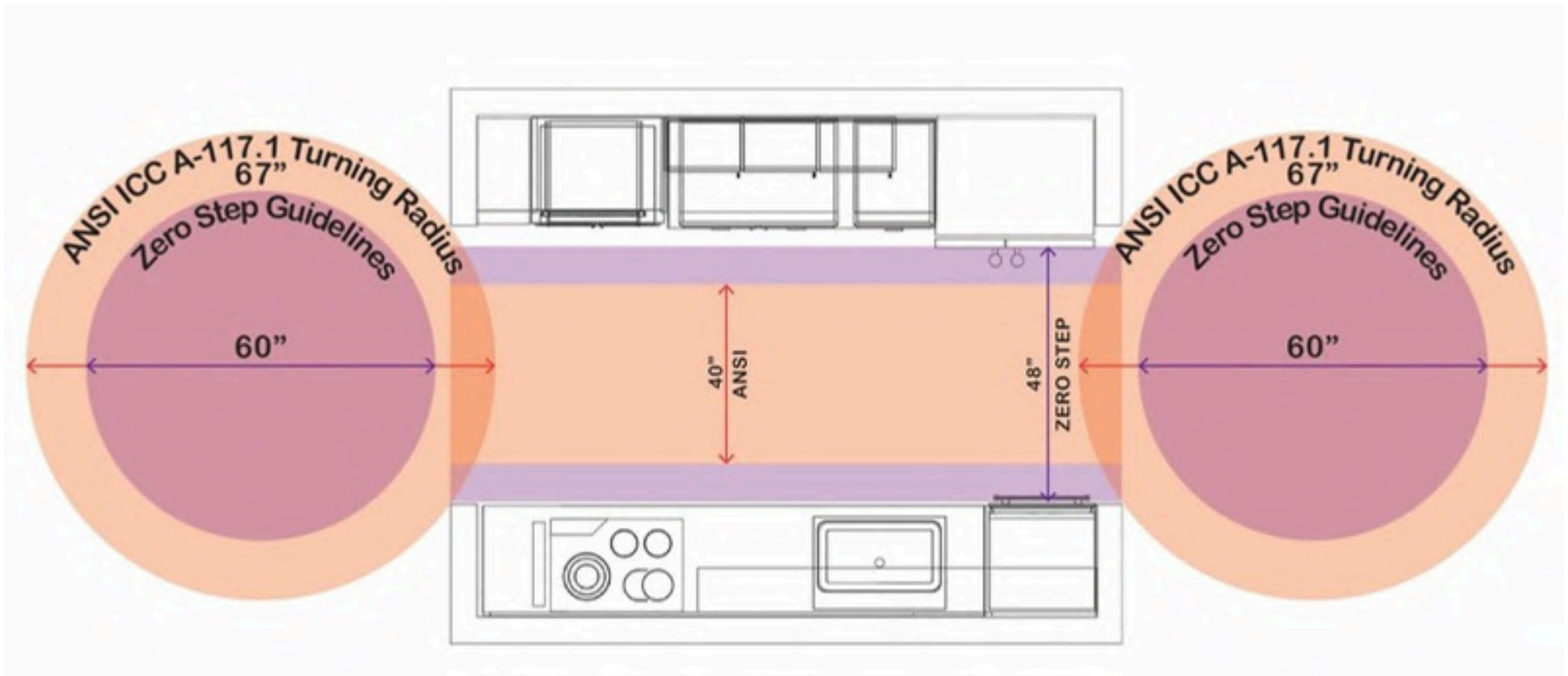


FLOOR CLEARANCES - KITCHEN MAXIMUMS

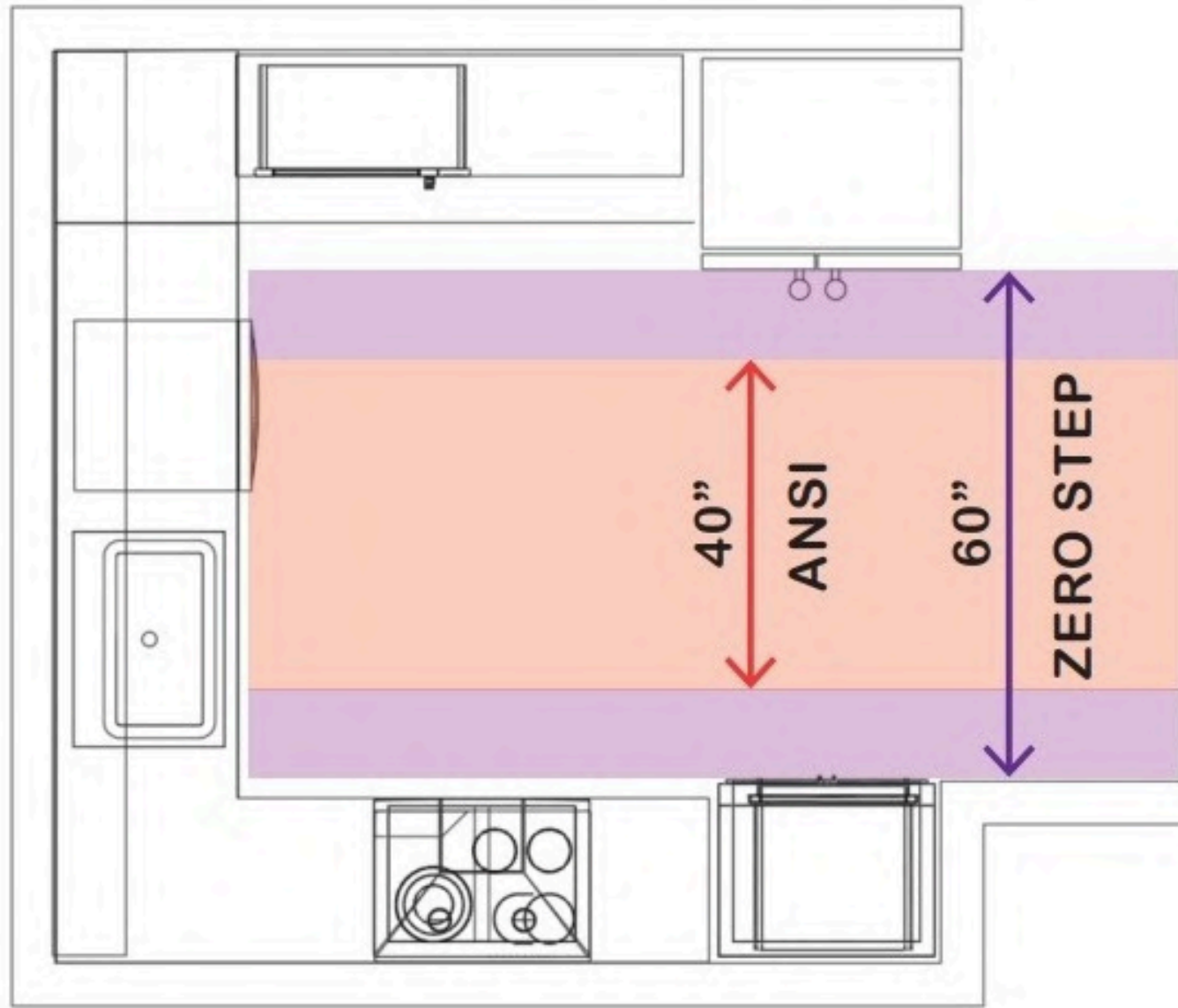


FLOOR CLEARANCES - KITCHEN MAXIMUMS

KITCHEN 01

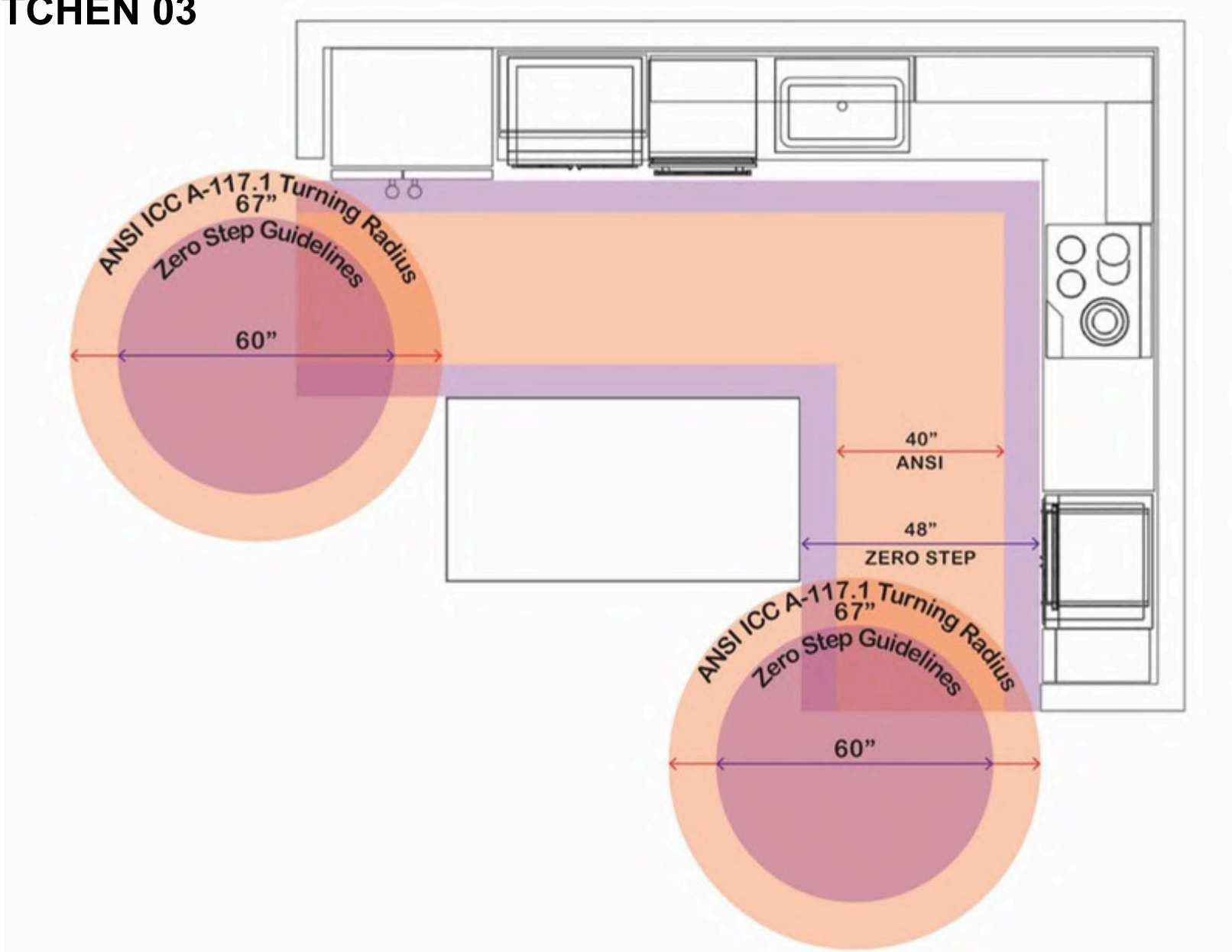


KITCHEN 02



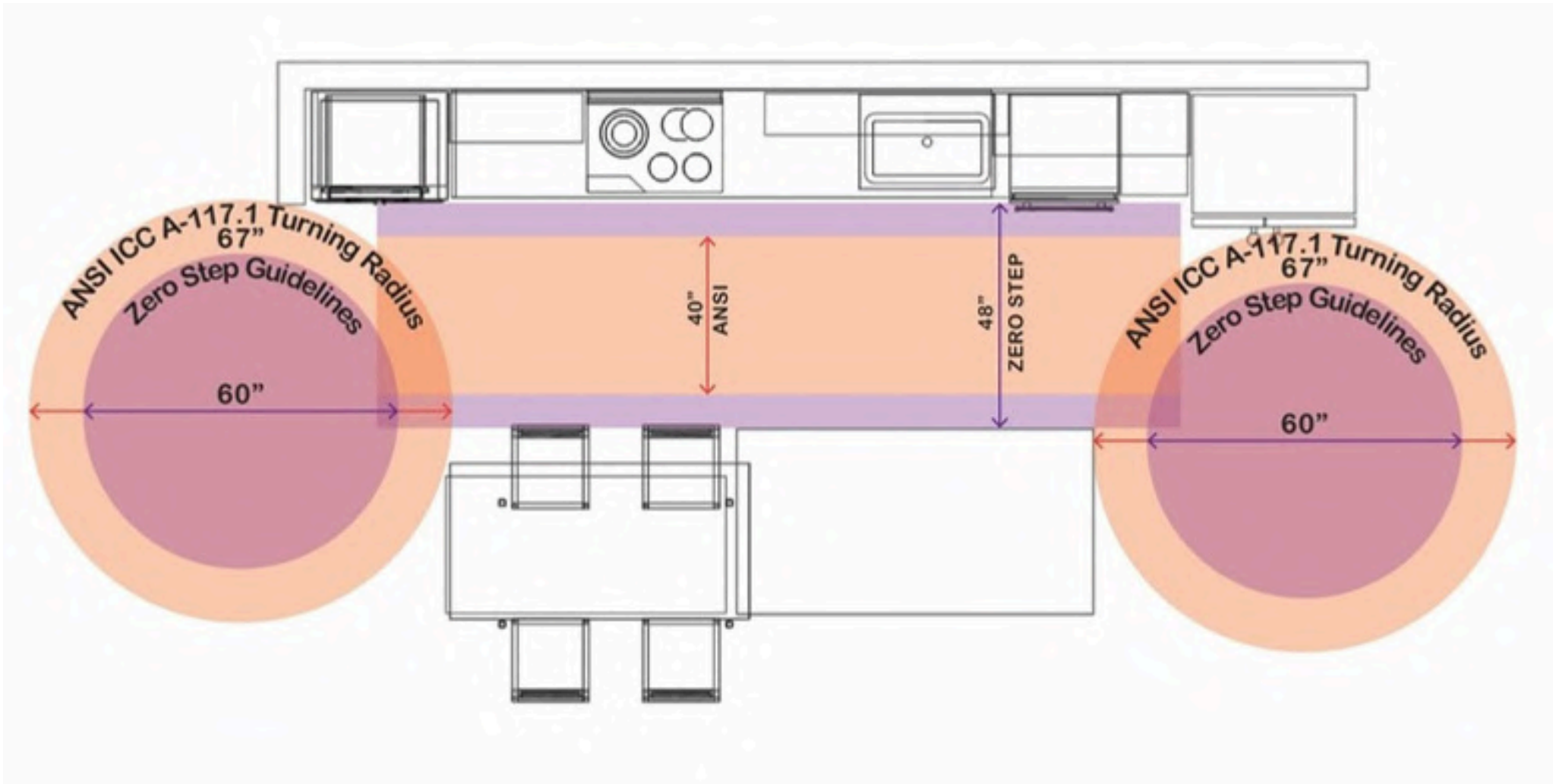
FLOOR CLEARANCES - KITCHEN PROTOTYPE

KITCHEN 03



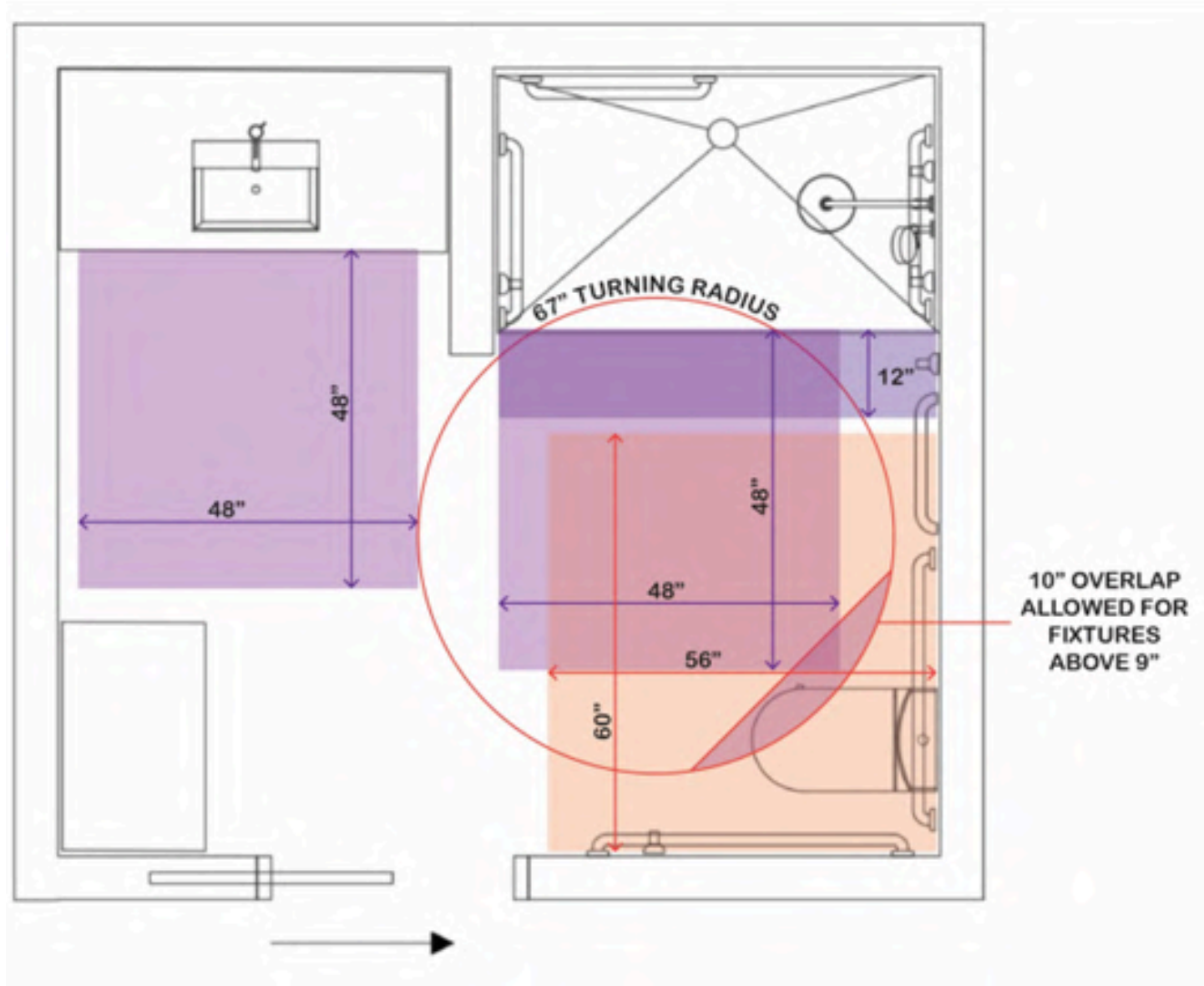
FLOOR CLEARANCES - KITCHEN PROTOTYPE

KITCHEN 04



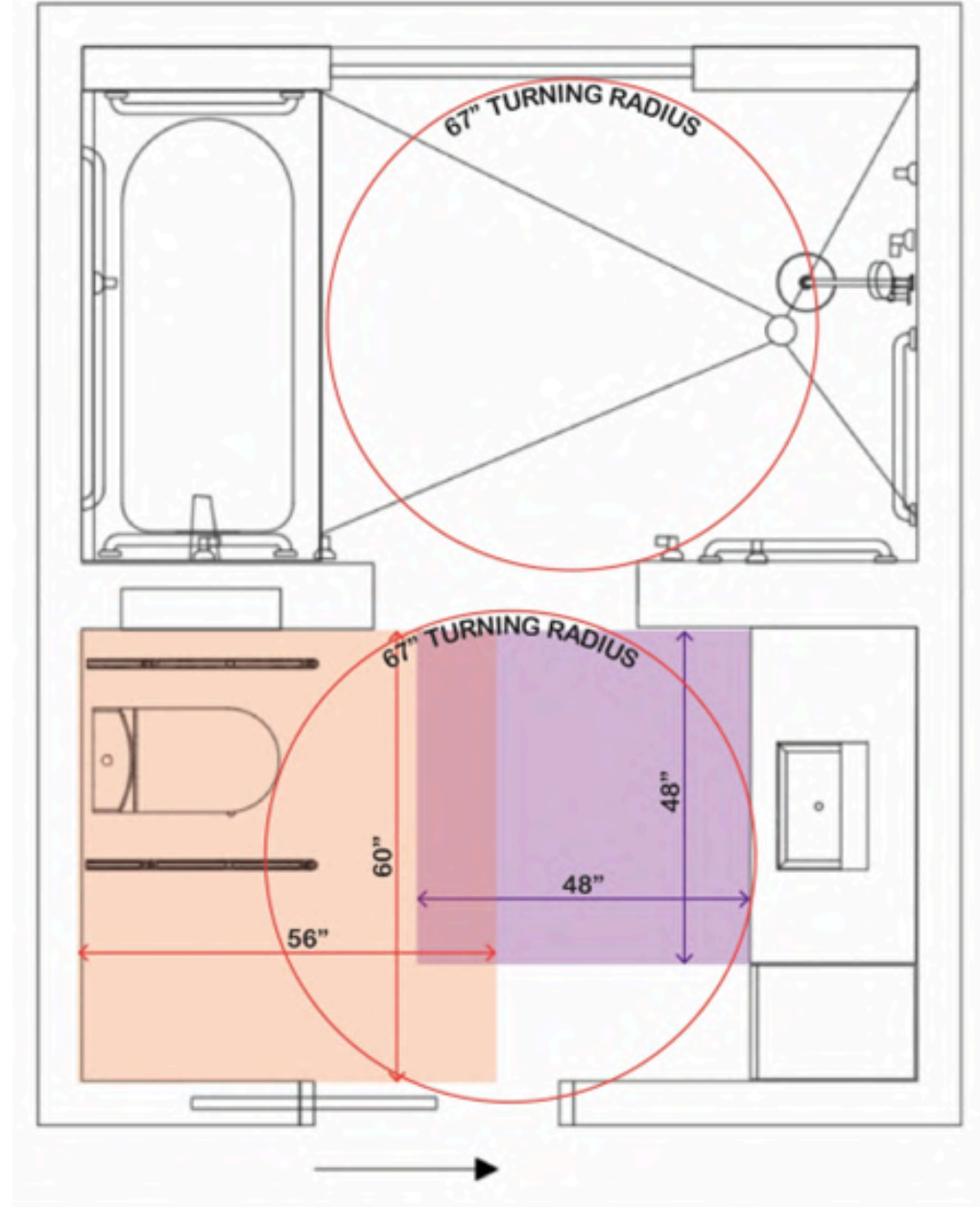
FLOOR CLEARANCES - BATHROOM PROTOTYPE

BATHROOM 01



FLOOR CLEARANCES - BATHROOM PROTOTYPE

BATHROOM 02



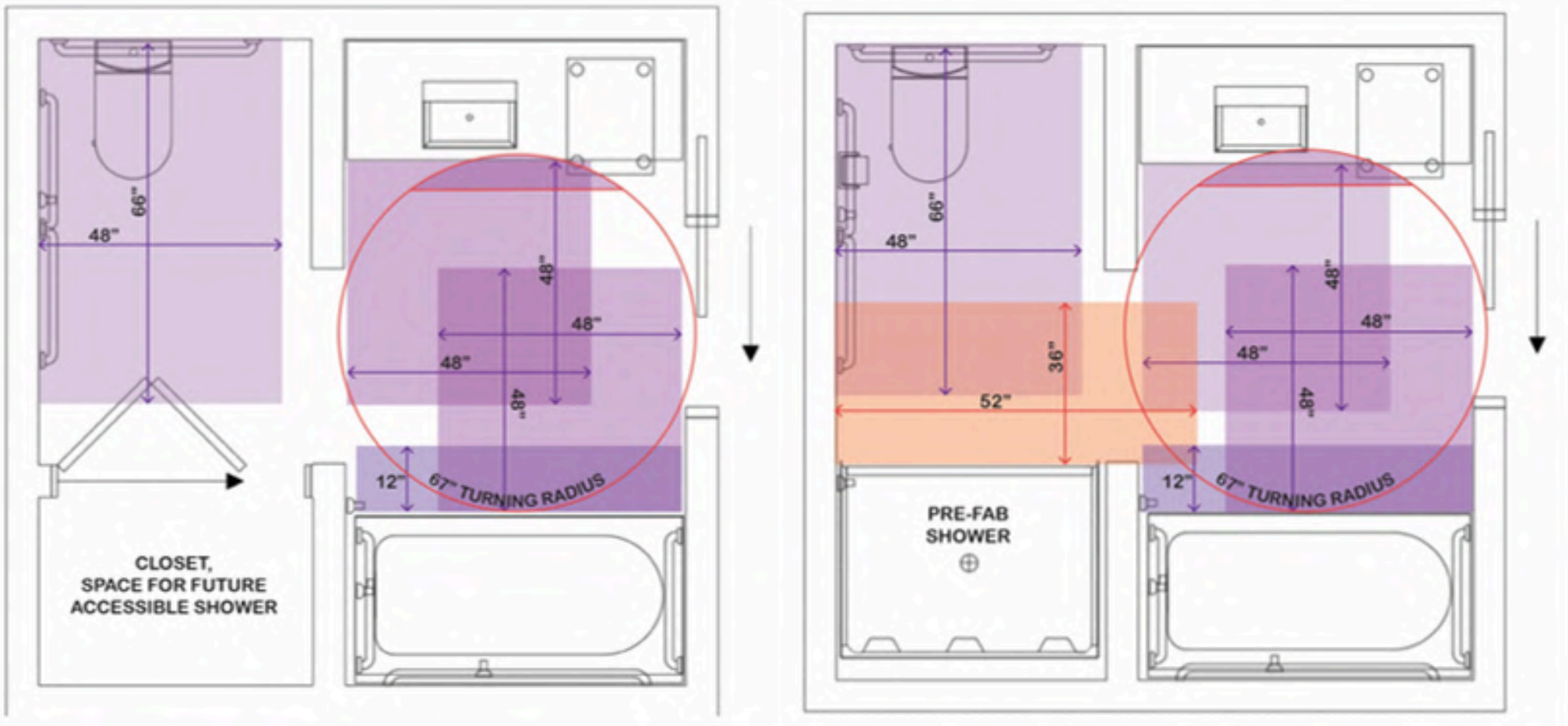
FLOOR CLEARANCES - BATHROOM PROTOTYPE

BATHROOM 03



FLOOR CLEARANCES - BATHROOM PROTOTYPE

BATHROOM 04



ELECTRICAL COORDINATION - MOUNTING HEIGHTS & DISTANCES

NOTE UPON RECOMMENDATIONS

The electrical outlets and switches shown in this project are to reflect the recommendations for LOCATION ONLY. They are not specifying or recommending types of receptacles. Please coordinate with your electrical contractor to provide electrical and lighting plans and details required by Michigan Codes. These drawings reflect our findings of the optimal range of reach of outlets needed for frequent use and/or required for the fixtures for the specific needs. These recommended heights and distances meet or exceed ICC/ANSI 2017.1 – 2017 standards.

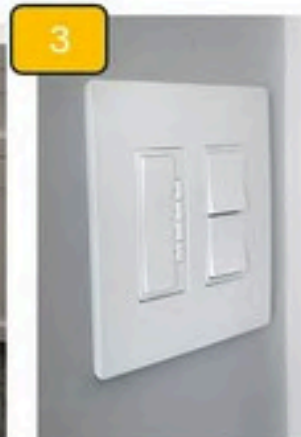
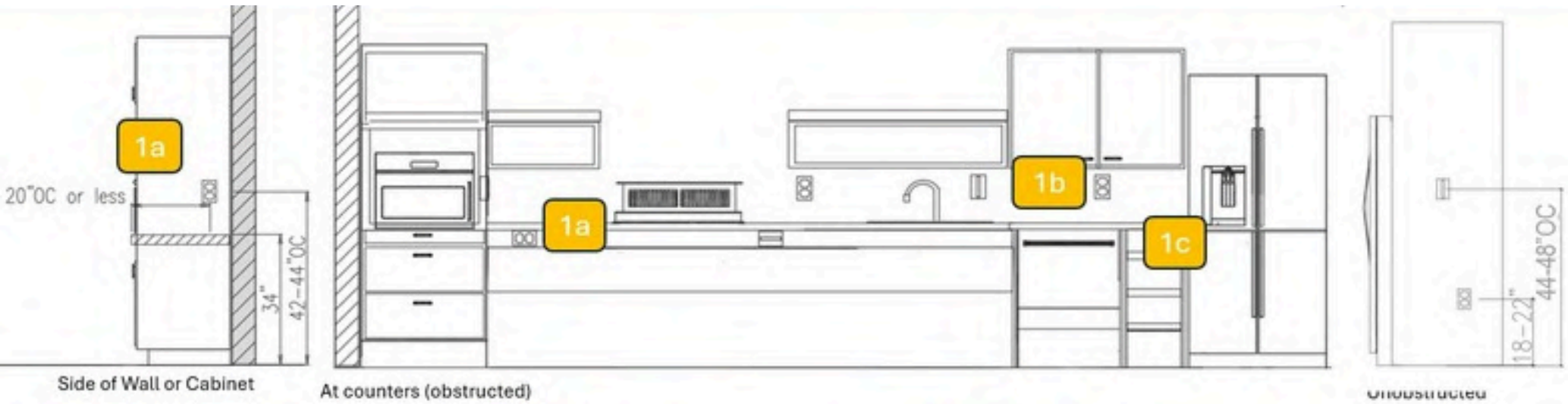
Switches/Controls Recommendations

- Motion sensor lights are desired at closets and bathrooms where locating the recommended switch height or distance indicated below can not be met.
- Voice activated lights are becoming more common and a desired solution for light operation, however, this assumes the user has the correct technology and software to install and operate. These solutions are highly recommended for custom homes but not multi-dwelling units.

When the ideal solutions above are not feasible for a project type, follow these guidelines:

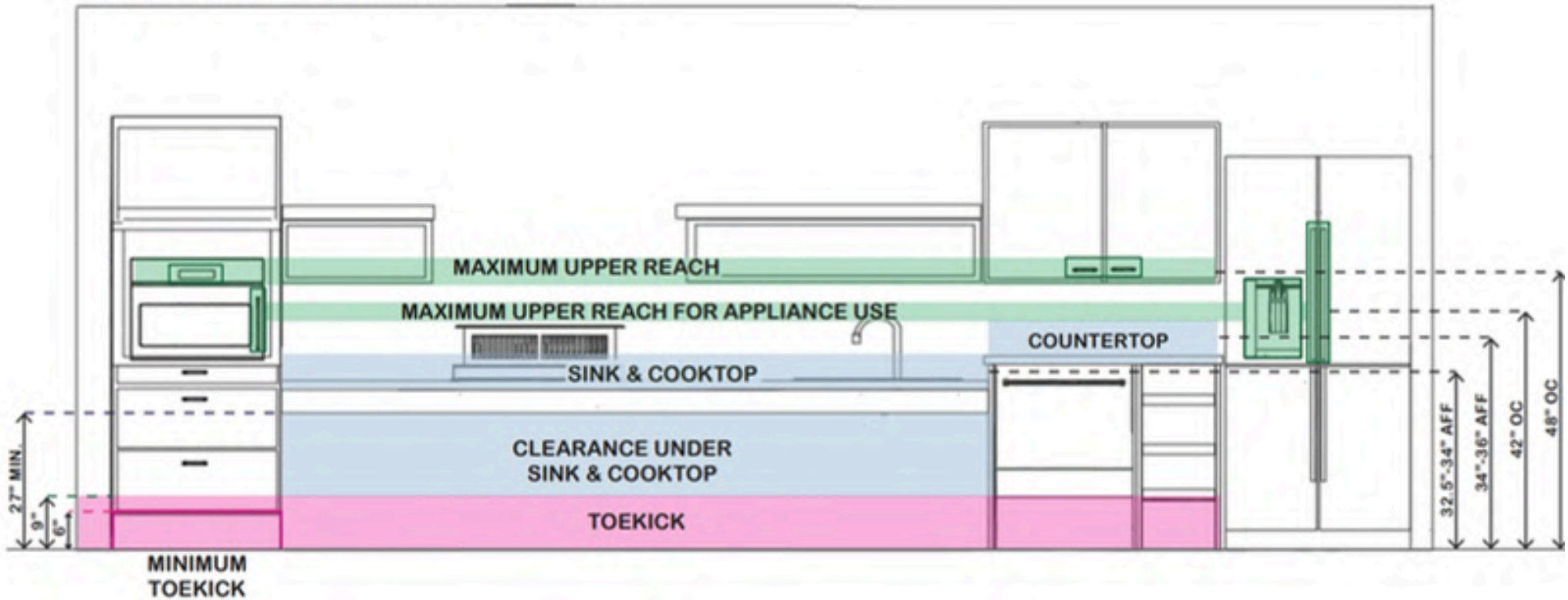
1. **For switches and outlets above counters (“obstructed”)**;
 - a. Plan for outlets and switches that have frequent use (ie charging stations, operation of small appliances) on the side of a wall or cabinet **where it does not exceed 20” from edge** of the surface OR consider locating right under the top of the countertop, horizontally, attached to the front panel or apron of counter and where it will not interfere with knee space.
 - b. When it’s not feasible to locate on fronts or sides of cabinets and needs to be on the wall at the back of the surface and assuming the surface depth is less than 25,” due to the potential various counter heights and backsplash heights **best practice is to plan to locate electrical outlets at 42-44” OC AFF.**
 - c. Consider **docking/charging drawers** for both power outlets and USB ports for kitchen and bathroom spaces but check with your electrical contractor FIRST to understand which ones meet compliance.
2. **For switches and outlets NOT above counters (“unobstructed”)**;
 - a. Switches should be **no higher than 48” OC AFF** and per ICC/ANSI 2017.1 2017 need a clear floor clearance of 30 x 52 parallel or perpendicular to the wall its on.
 - b. Outlets are recommended to be **no lower than 18” OC AFF** to accommodate range of reach and **no higher than 22” OC AFF** to avoid interfering with blocking in the wall that may be as low as 24” AFF.
3. **Switch type**; **Rocker Type** switches are recommended

ELECTRICAL COORDINATION - MOUNTING HEIGHTS & DISTANCES



ELECTRICAL COORDINATION - MOUNTING HEIGHTS & DISTANCES

KITCHEN MOUNTING HEIGHTS



Max Height

Height Range

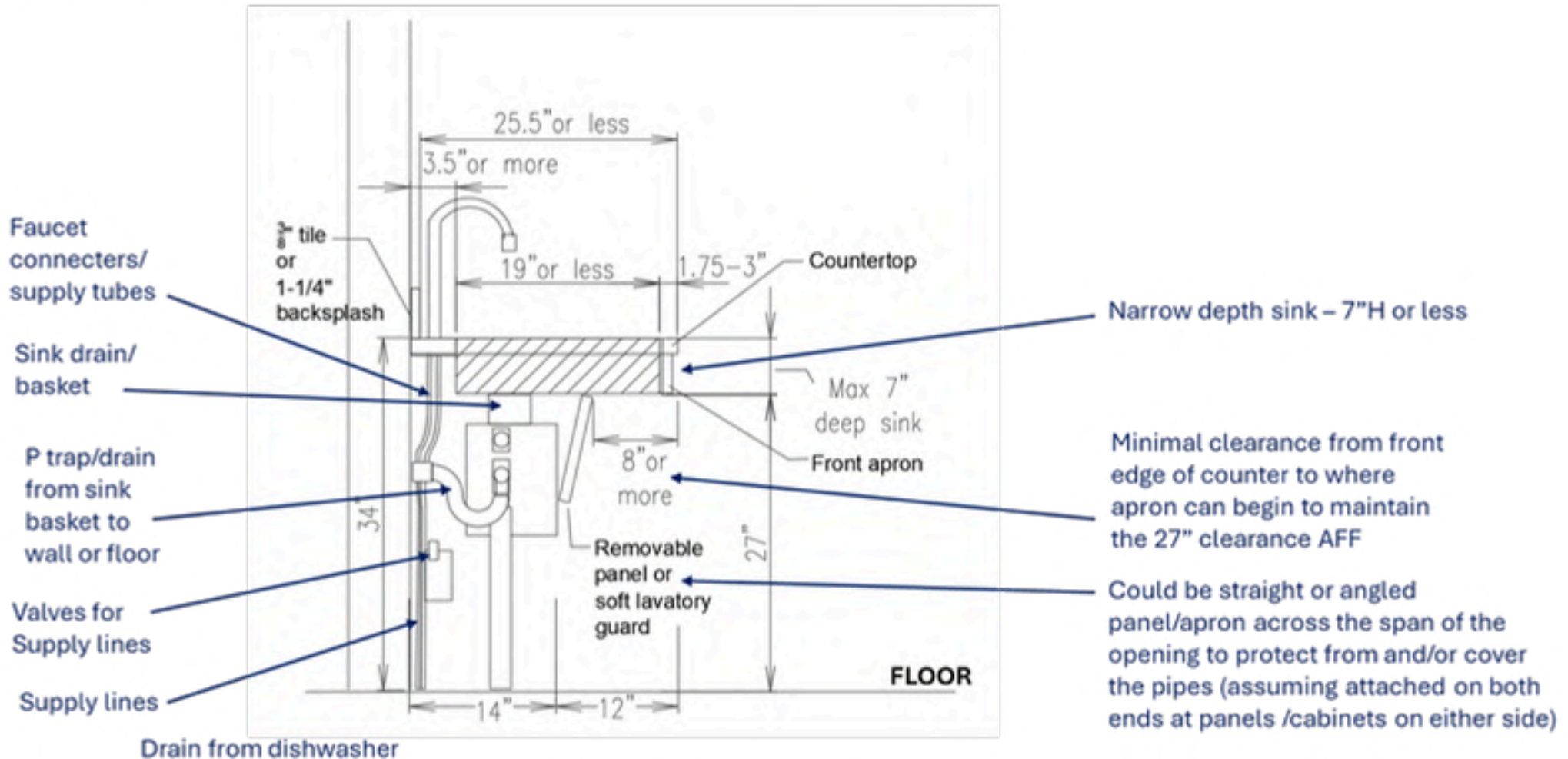
Ideal Height

On Center

Above Finished Floor

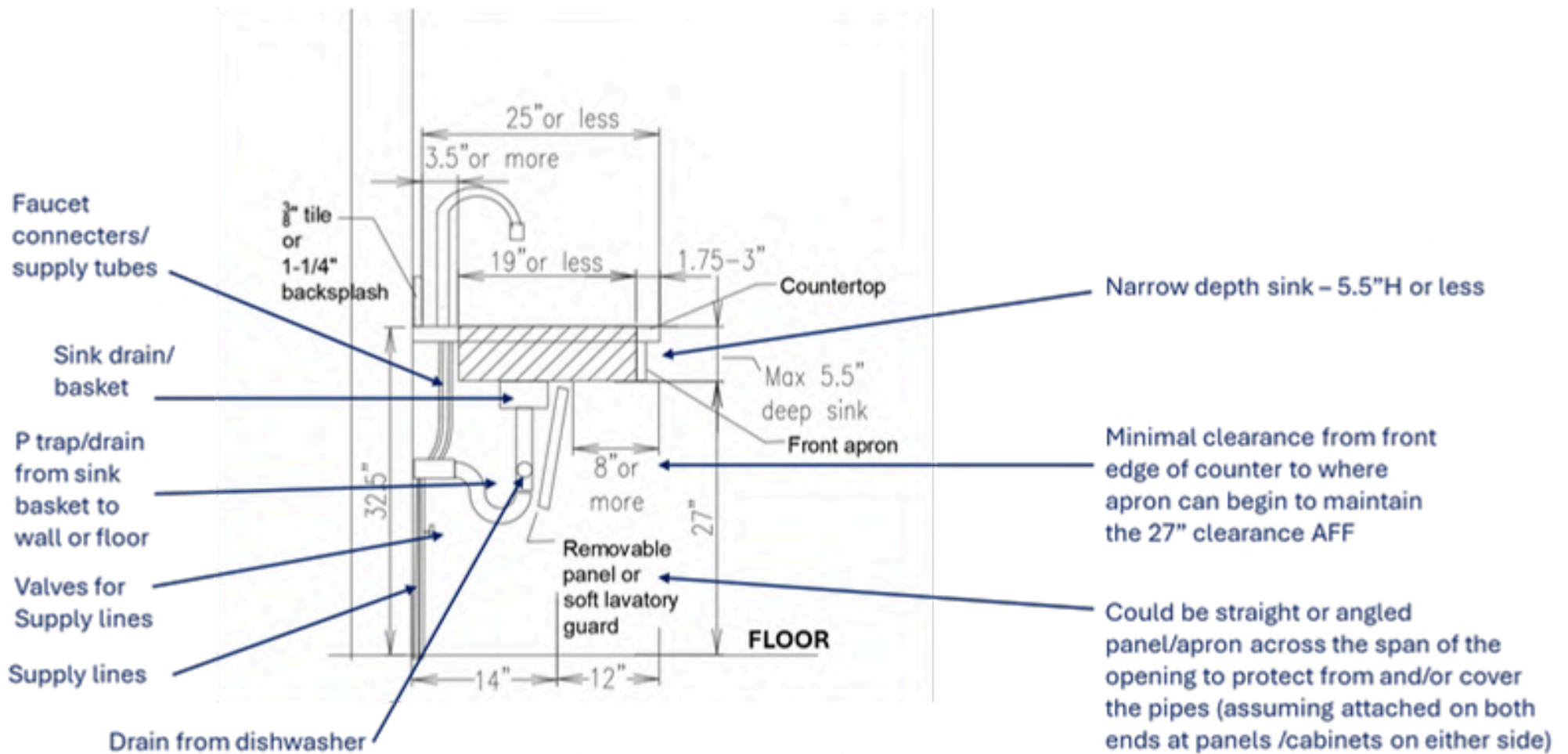
KITCHEN MOUNTING HEIGHTS & KNEE CLEARANCE AT SINK

34H SINK SIDE VIEW – WITH GARBAGE DISPOSAL



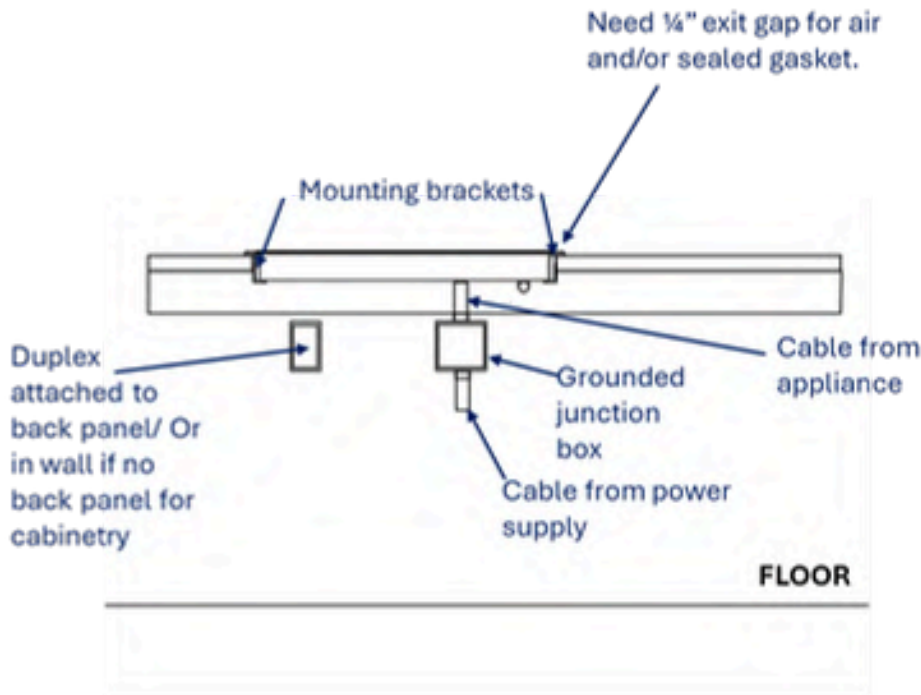
KITCHEN MOUNTING HEIGHTS & KNEE CLEARANCE AT SINK

32.5H SINK SIDE VIEW- WITHOUT GARBAGE DISPOSAL

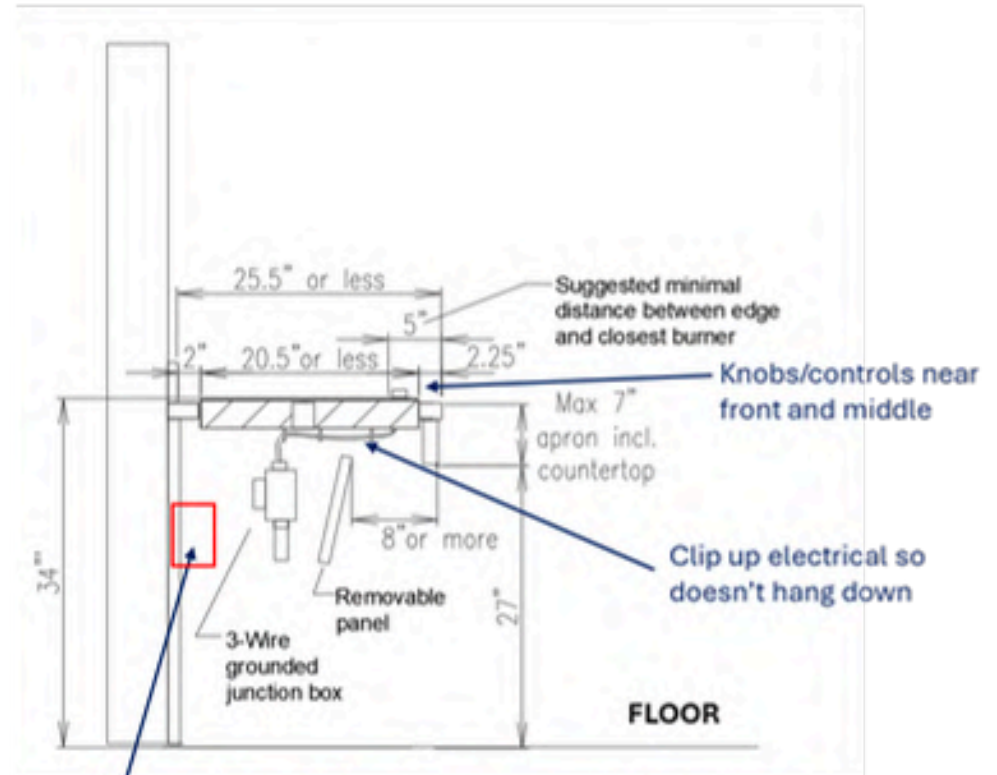


KITCHEN MOUNTING HEIGHTS & KNEE CLEARANCE AT COOKTOP

34H COOKTOP - FRONT VIEW



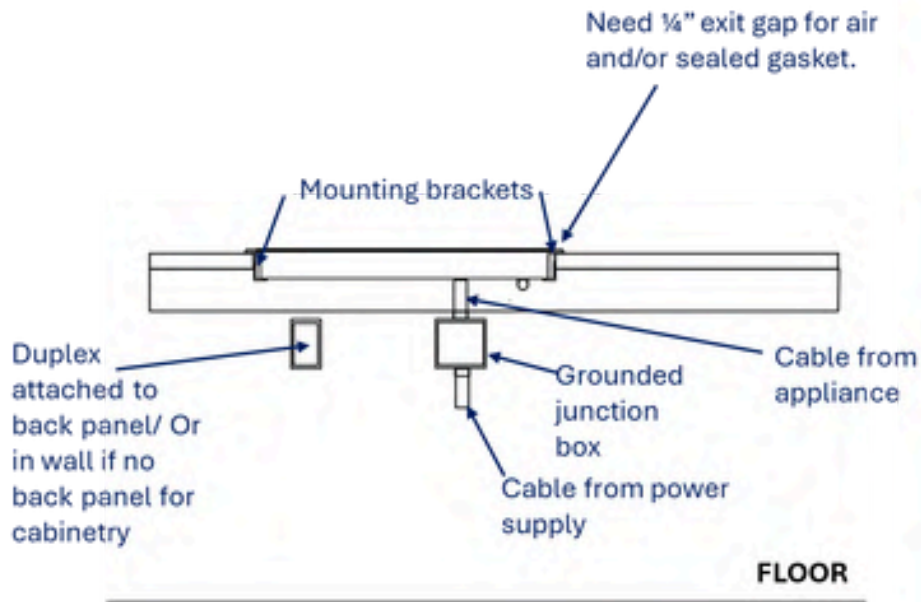
34H COOKTOP SIDE VIEW



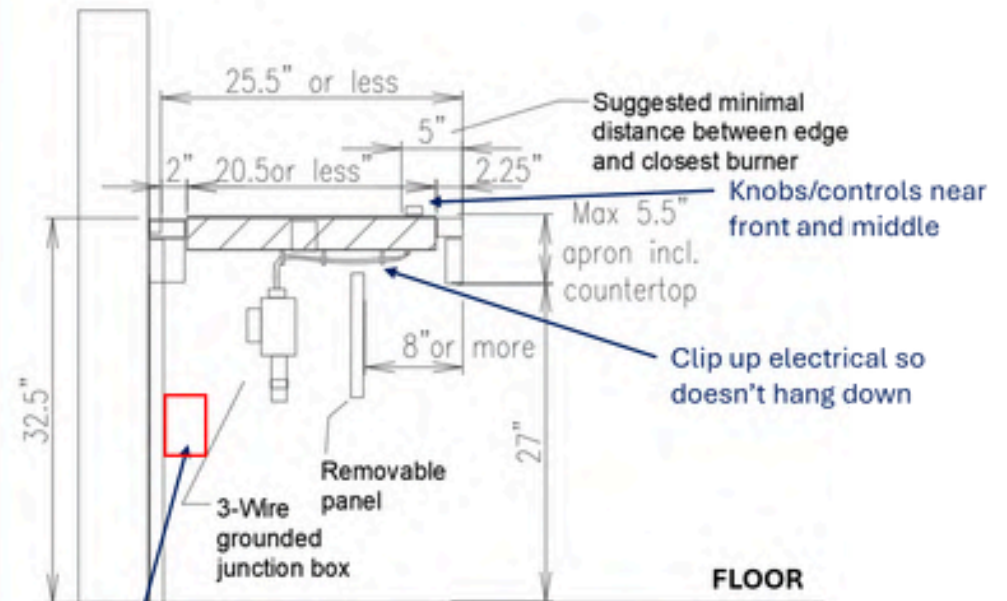
Duplex attached to back panel. may need a hole to run metal tube to attach to hardwire in wall. Need to leave 13/16" air flow space between panel and wall

KITCHEN MOUNTING HEIGHTS & KNEE CLEARANCE AT COOKTOP

32.5H COOKTOP - FRONT VIEW



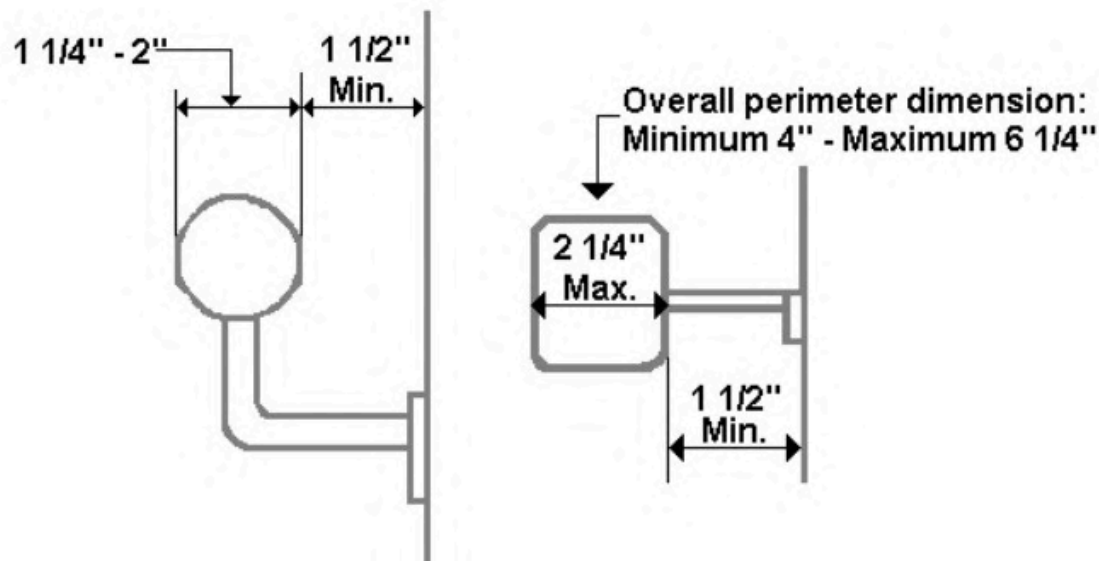
32.5H COOKTOP SIDE VIEW



Duplex attached to back panel. may need a hole to run metal tube to attach to hardwire in wall. Need to leave 13/16" air flow space between panel and wall

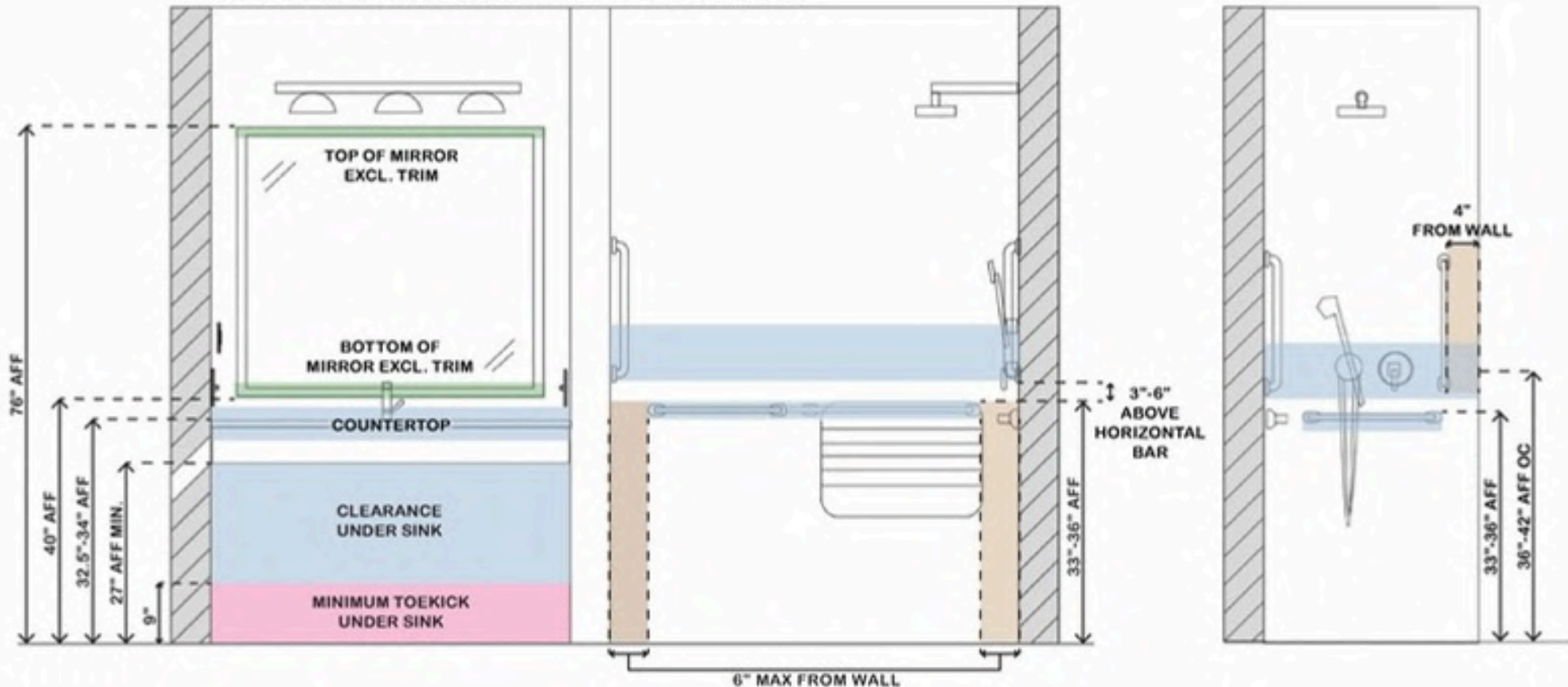
BATHROOM - GRAB BAR AND HAND RAIL MOUNTING DETAILS

- Perimeter of acceptable grab bar is a minimum of 4" to a maximum of 6-1/4"
 - Cross section 2-1/4"
- It must have a 1-1/2" space from surface its mounted on (for space for fingers and to grasp)
 - Circular better than square but not required
- Measurements for horizontal grab bar placement is from the top of the **finished** floor to the **top of the surface** of the bar.
- Measurements for vertical grab bar placement is measuring to the center of the bottom mount point.
- Measurements of the lengths of grab bars are on center of their mounting points.



BATHROOM MOUNTING HEIGHTS AND DISTANCES

BATHROOM MOUNTING HEIGHTS



Max Height

Height Range

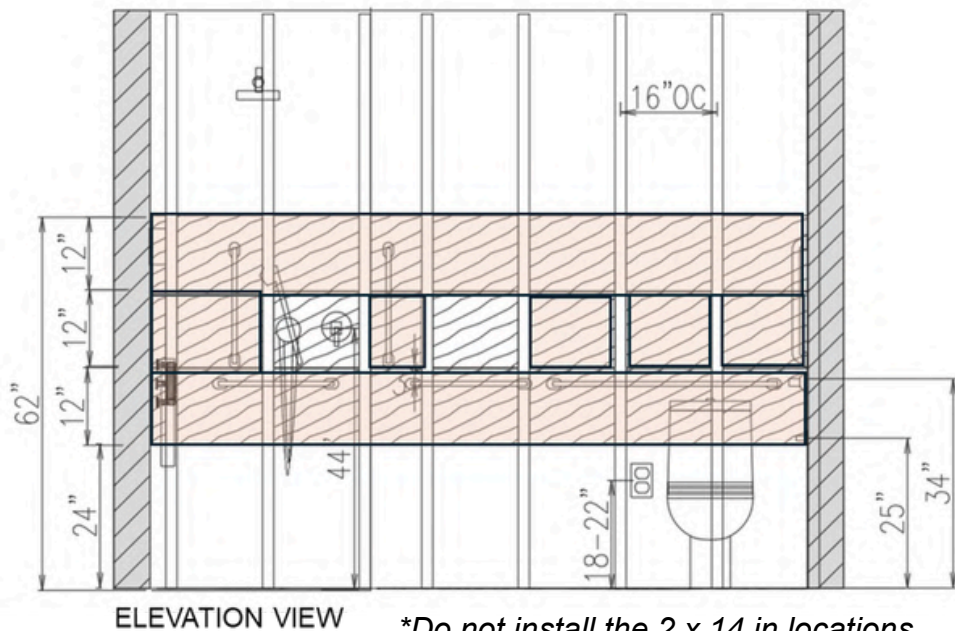
Ideal Height

Distance Range

On Center

Above Finished Floor

WALL REINFORCEMENT/BLOCKING - BEST PRACTICE

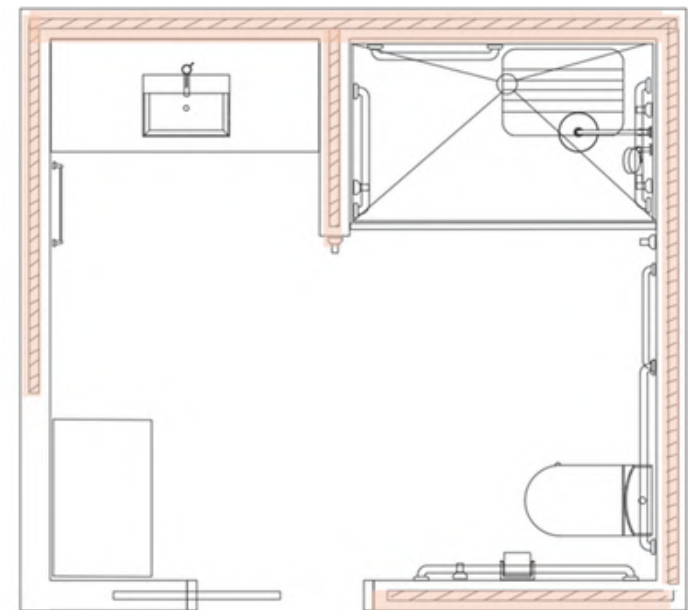


ELEVATION VIEW

**Do not install the 2 x 14 in locations where shower controls/diverters or electrical junction boxes will be.*

A recommendation of the blocking's lowest point of 24" AFF to avoid interfering with electrical junction boxes but present for toilet paper holders when the toilet paper holder's mounting point is mounted at 25" AFF or higher.

For MAXIMUM coverage, walls highlighted in floorplan view should be reinforced with 2x blocking concealed in the wall for all potential grab bar, towel bar and toilet paper holder locations as well as wall-hung shower seats and wall-hung sinks. Best practice is to plan for 2 x 14 blocking stacked *three high in between studs. This can eliminate the extra steps of communication using pictures and dimensions for remembering where the blocking was installed.



FLOORPLAN VIEW

WALL REINFORCEMENT/BLOCKING - ACCEPTABLE PRACTICE

301.6 Wall Reinforcement

We do not recommend using 3/4" plywood for reinforcing entire walls because it isn't as strong as blocking. Also, the bathroom would be 1-1/2" larger if the walls are reinforced. We suggest extending the wood blocking area for greater chance of hitting the reinforced areas when installing grab bars and for greater personalization of grab bar locations.

301.7 Wall Reinforcement Documentation

Without proper documentation accurately depicting or photographs showing the wall reinforcement locations, it is extremely difficult to (1) know if it has been provided and (2) where it has been provided, especially for new residents in the home. Documentation is a vital piece of information that helps avoid unnecessary wall demolition when installing future grab bars.

NOMINAL SIZE	ACTUAL SIZE
1" X 4"	3/4" X 3 1/2"
1" X 6"	3/4" X 5 1/2"
2" X 2"	1 1/2" X 1 1/2"
2" X 4"	1 1/2" X 3 1/2"
2" X 6"	1 1/2" X 5 1/2"
2" X 8"	1 1/2" X 7 1/4"
2" X 10"	1 1/2" X 9 1/4"
4" X 4"	3 1/2" X 3 1/2"

versus the nominal size of 4" X 4"
some popular lumber choices.

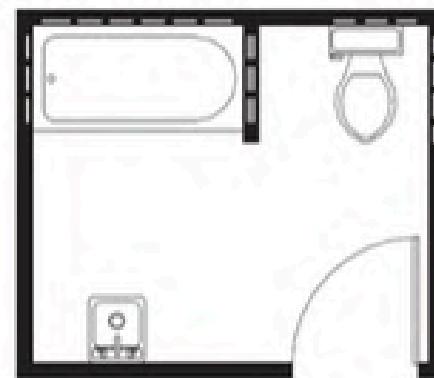
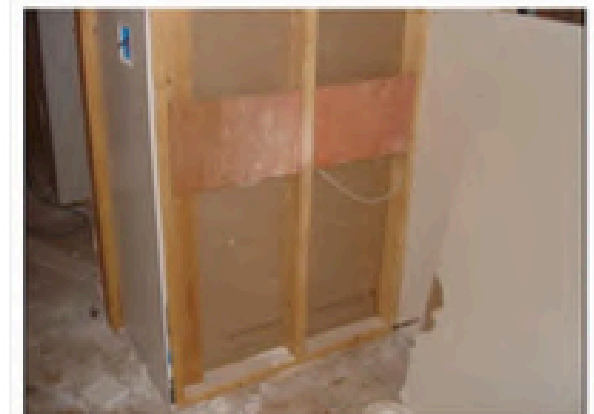
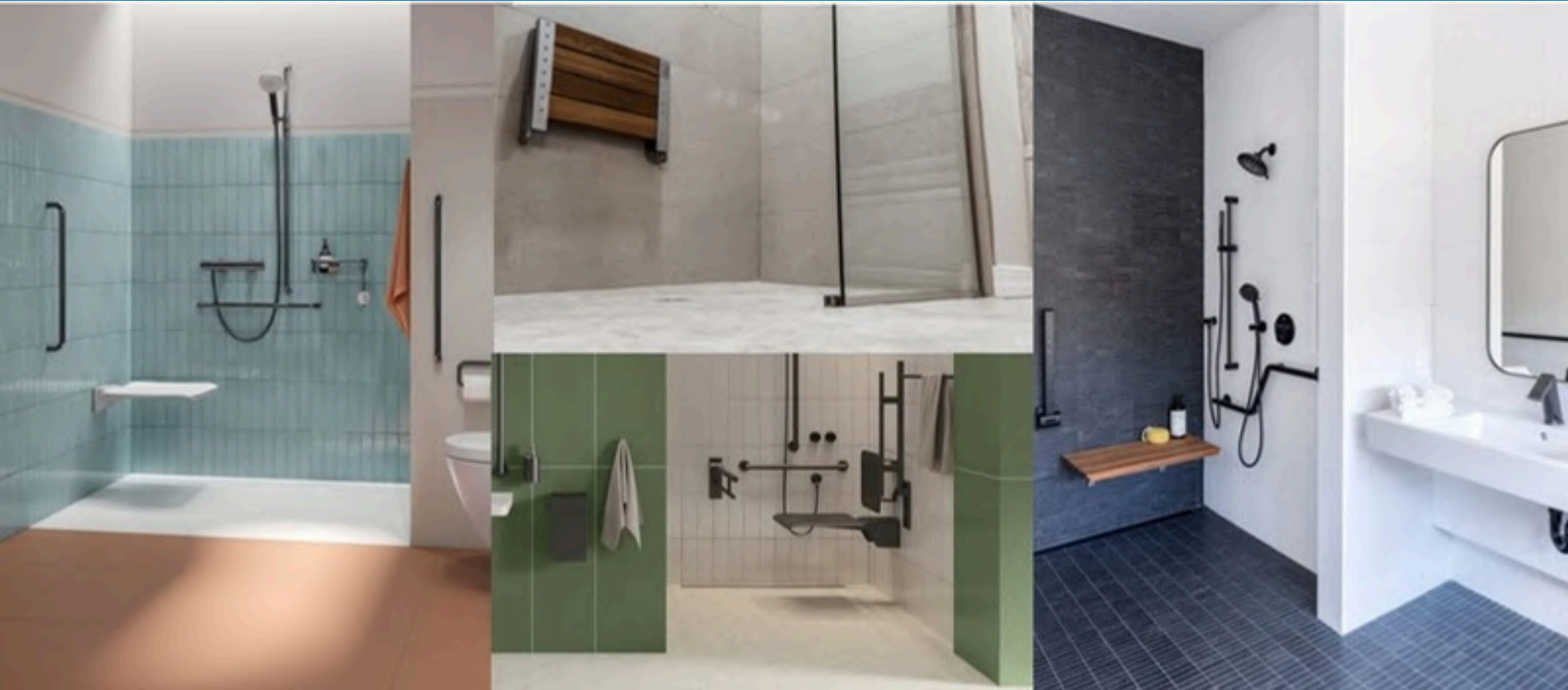


FIG. 301.6 BATHROOM WALL REINFORCEMENT & GRAB BAR LOCATIONS

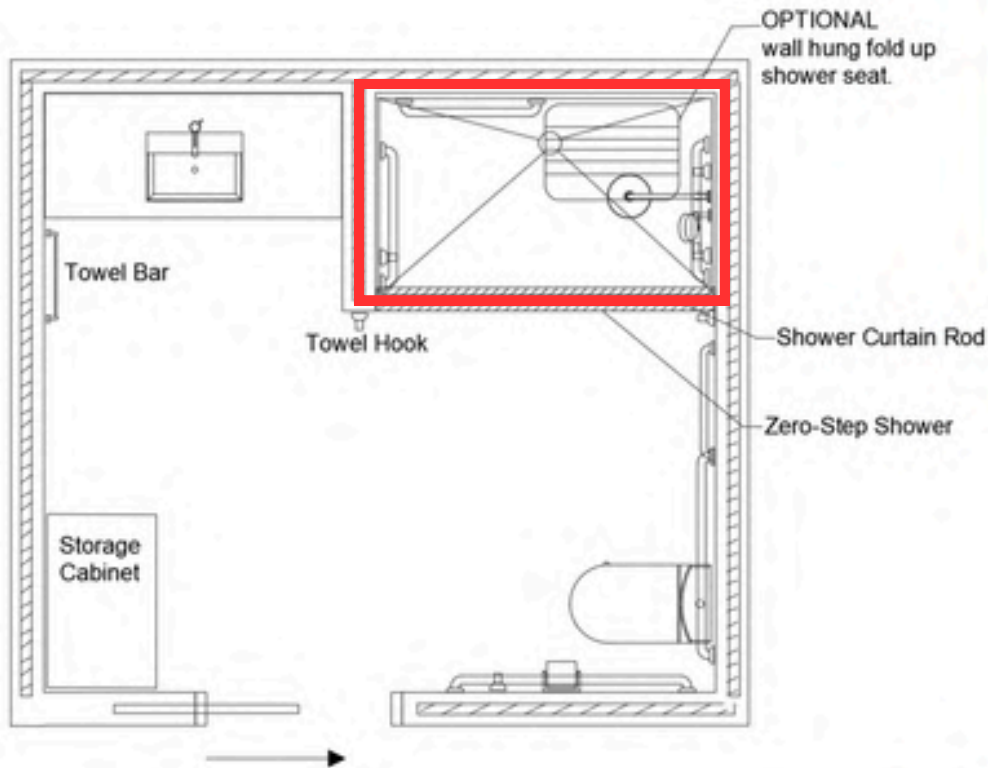


Wall Reinforcement

ZERO-STEP SHOWER CONSIDERATIONS



ZERO-STEP SHOWER CONSIDERATIONS



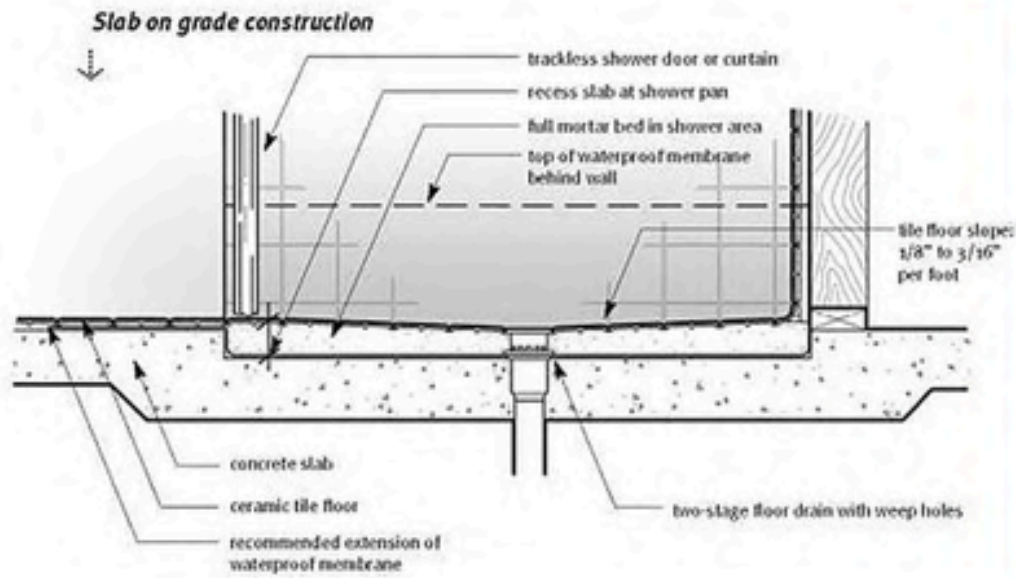
FLOORPLAN VIEW

Box out for concrete; assume 3" depression to accommodate for depth of shower pan. If depth of shower pan is unknown, allowing for an additional 1" depth can be a "safe" plan so that ensures fitting of the pan and any excess space can be built up with thicker membrane or finished tile to meet the height of the main bathroom floor.

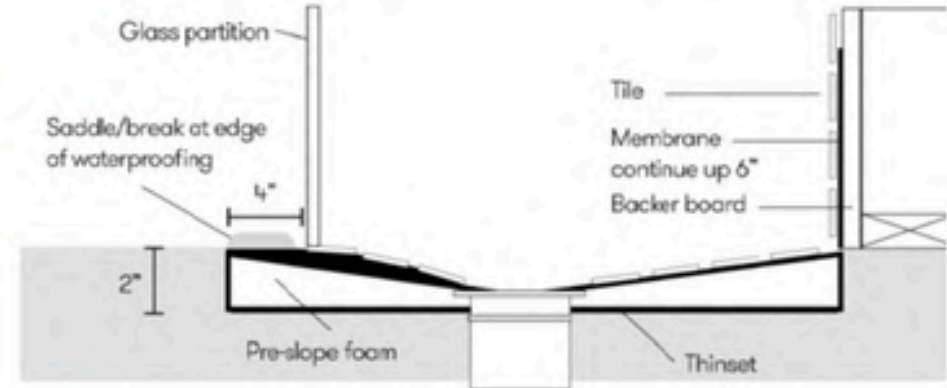


Suggested Membranes and drain trays to be accounted in overall thickness of the floor when creating a zero-step transition from main floor to shower. Ditra or Schluter waterproof membranes and/or sloped shower trays.

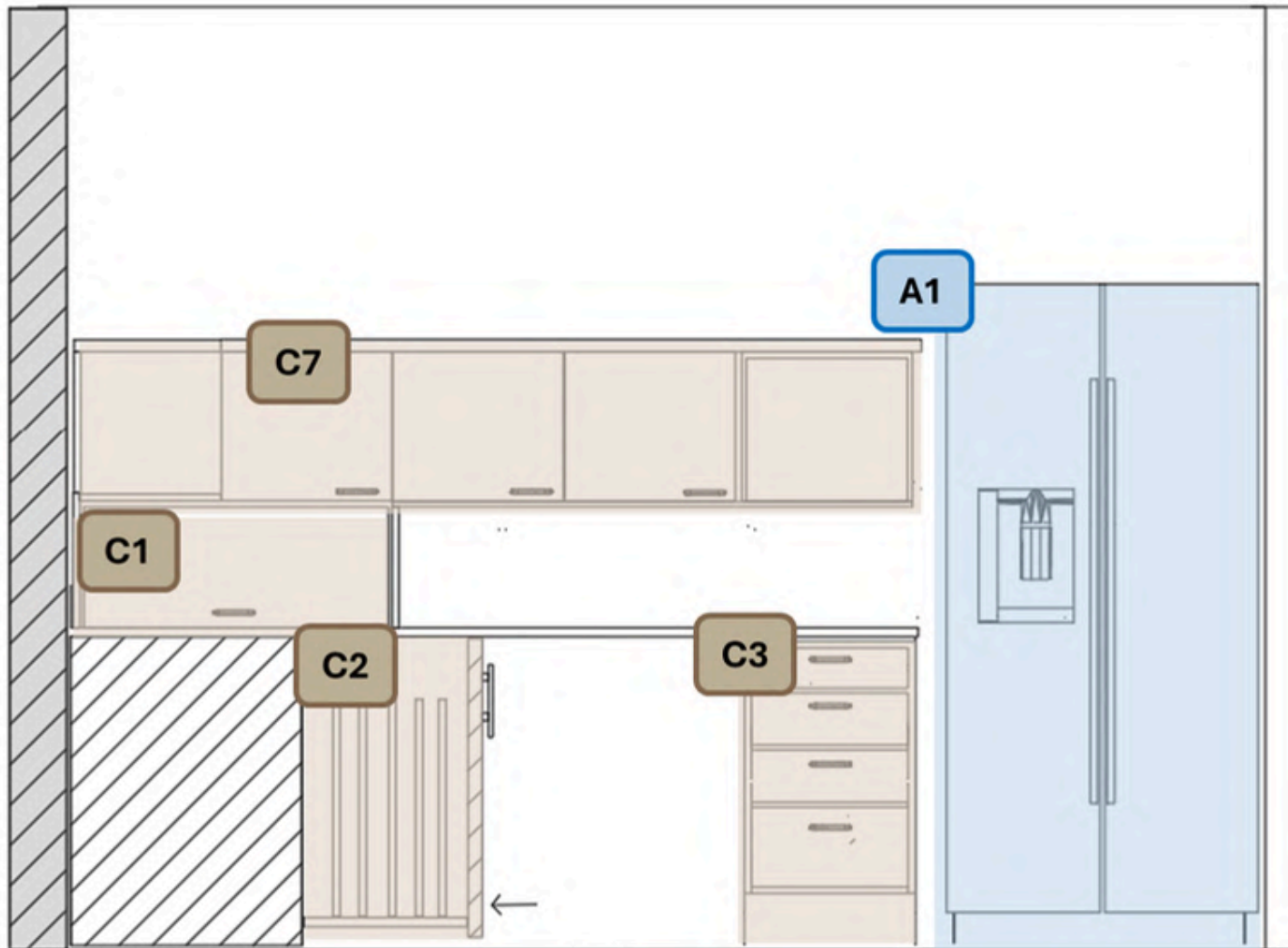
ZERO-STEP SHOWER CONSIDERATIONS



Shower detail



PRODUCT FEATURES - KITCHEN



Appliances

Casework

Fixtures

Mobile

COMING SOON

PRODUCT FEATURES - KITCHEN



C1 Garage Door
 BRAND: BLUM Lift System
 DISTRIBUTOR: Amazon



C2 Base Corner Tray Slide-out
 BRAND: Custom
 DISTRIBUTOR: Custom



C2 Base; Magic Coner II
 BRAND: Hafele
 DISTRIBUTOR: Hafele



C3 Base; Cut-out Cutting board
 BRAND: Rev-a-shelf
 DISTRIBUTOR: Rev-a-shelf



C3 Base; Glideware(TM)
 BRAND: Rev-a-shelf
 DISTRIBUTOR: Rev-a-shelf



C3 Base; Solid Bottom Pullout
 BRAND: Ref-a-shelf
 DISTRIBUTOR: Rev-a-shelf



C3 Base; Wall Cabinet Pullout
 BRAND: Rev-A -Shelf
 DISTRIBUTOR: Rev-A-Shelf



C7 Shelving units
 BRAND: Kungsfors
 DISTRIBUTOR: Ikea



C7 Shelving – add ons
 BRAND: Palycke
 DISTRIBUTOR: Ikea



A1 Fridge
 BRAND: Maytag 36"
 DISTRIBUTOR: Ferguson
 Home

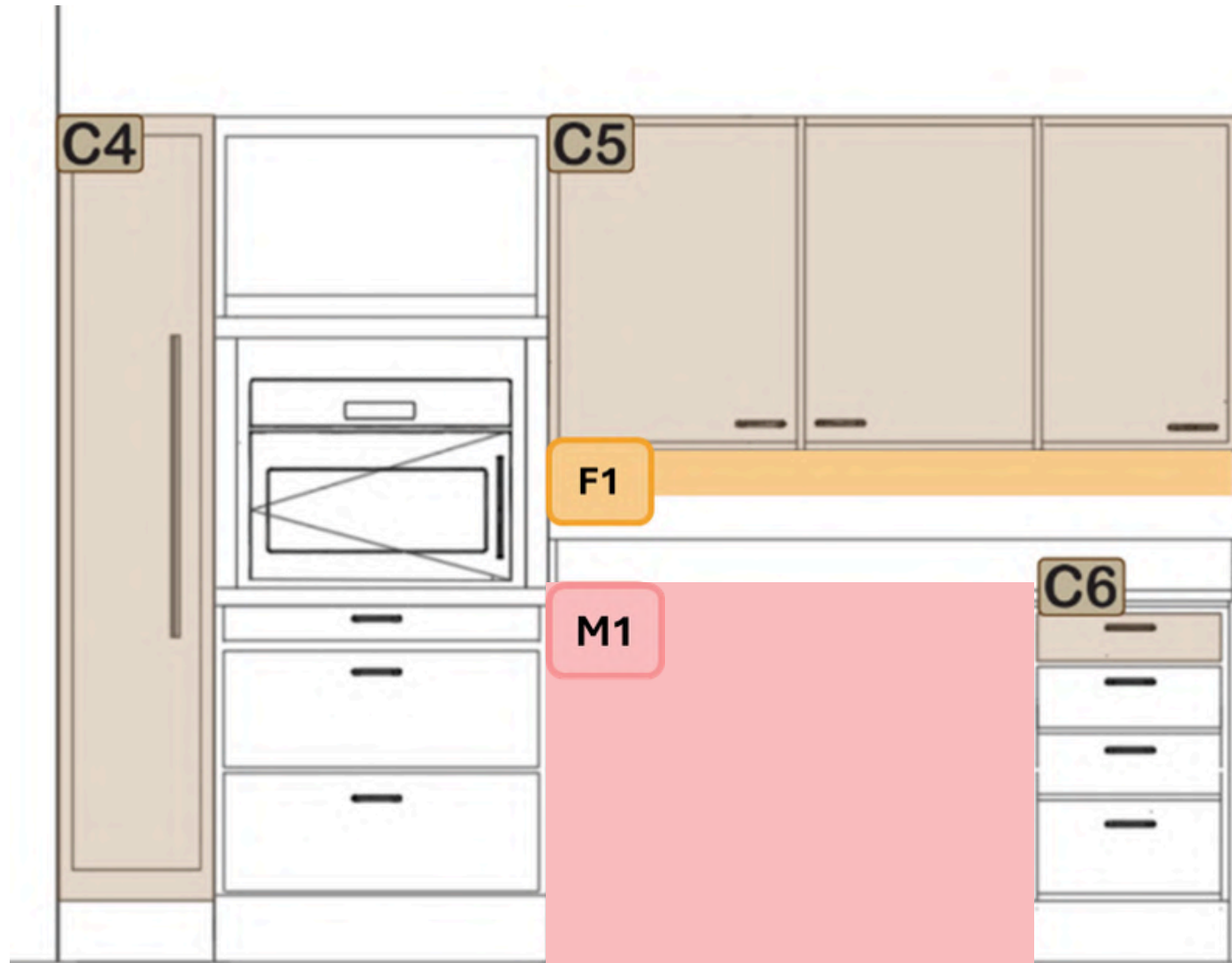


A1 Fridge
 BRAND: GE Profile 36"
 Counter Depth
 DISTRIBUTOR: Ferguson
 Home



A1 Fridge 36" Counter Depth
 BRAND: KitchenAid
 DISTRIBUTOR: KitchenAid

PRODUCT FEATURES - KITCHEN



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C4 Pantry Pull-out
BRAND: Rev-A -Shelf
DISTRIBUTOR:Rev-A-Shelf



C4 Swing-Out Pantry
BRAND: Rev-A -Shelf
DISTRIBUTOR:Rev-A-Shelf



C5 Pull-down Hydrolic
BRAND: Rev-A -Shelf
DISTRIBUTOR:Rev-A-Shelf



C5 Pull-down Spring
BRAND: Rev-A -Shelf
DISTRIBUTOR:Rev-A-Shelf



C5 Automated (drop-down)
BRAND: ROPOX
DISTRIBUTOR:ROPOX



C6 Charging Drawer
BRAND: Rev-A -Shelf
DISTRIBUTOR:Rev-A-Shelf



F1 LED Light Plug In
BRAND: Black & Decker
DISTRIBUTOR:Lowe's



F1 LED Light Voice Activated
BRAND: Philips
DISTRIBUTOR: Home Depot



F1 LED Light remote control
BRAND: ROPOX
DISTRIBUTOR:ROPOX

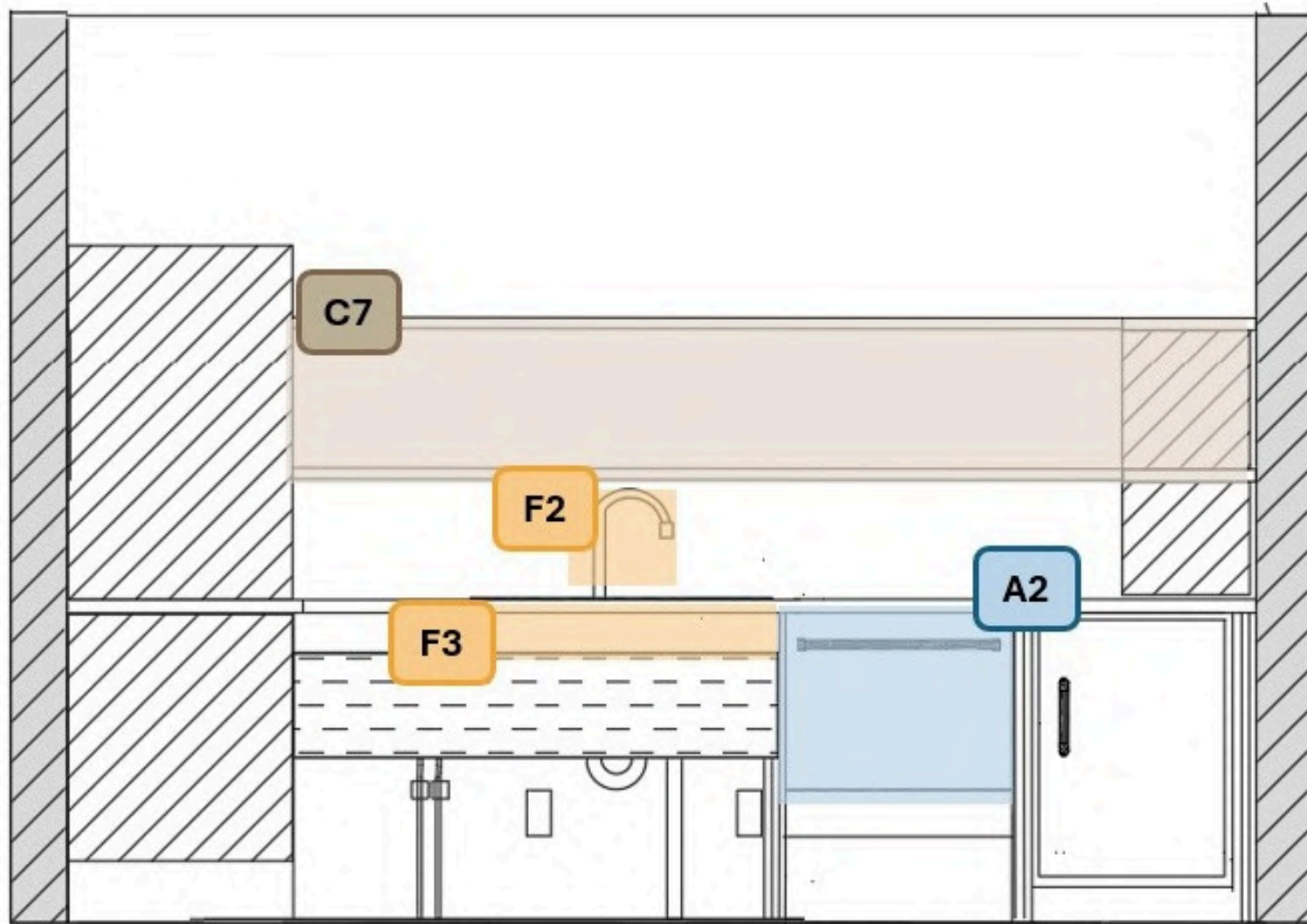


M1 Cart Storage
BRAND: Latitude Run
DISTRIBUTOR:Wayfair



M1 Cart Storage
BRAND: Ronninge
DISTRIBUTOR: Ikea

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C7 Shelving Add-ons
 BRAND: Palycke
 DISTRIBUTOR: Ikea



C7 Shelving Add-ons
 BRAND: Palycke
 DISTRIBUTOR: Ikea



C7 Pegboard Combination
 BRAND: Skadis
 DISTRIBUTOR: Ikea



C7 Wall grid with storage
 BRAND: Kungsfors
 DISTRIBUTOR: Ikea



F2 Cordova Touchless
 BRAND: Delta
 DISTRIBUTOR: Delta



F2 Lenta Touch On/Off
 BRAND: Delta
 DISTRIBUTOR: Ferguson Home



F3 Cairn undermount sink;
 5" depth
 BRAND: Kohler
 DISTRIBUTOR: Kohler



F3 Top mount sink 5.5" depth
 BRAND: Krauss
 DISTRIBUTOR: Krauss

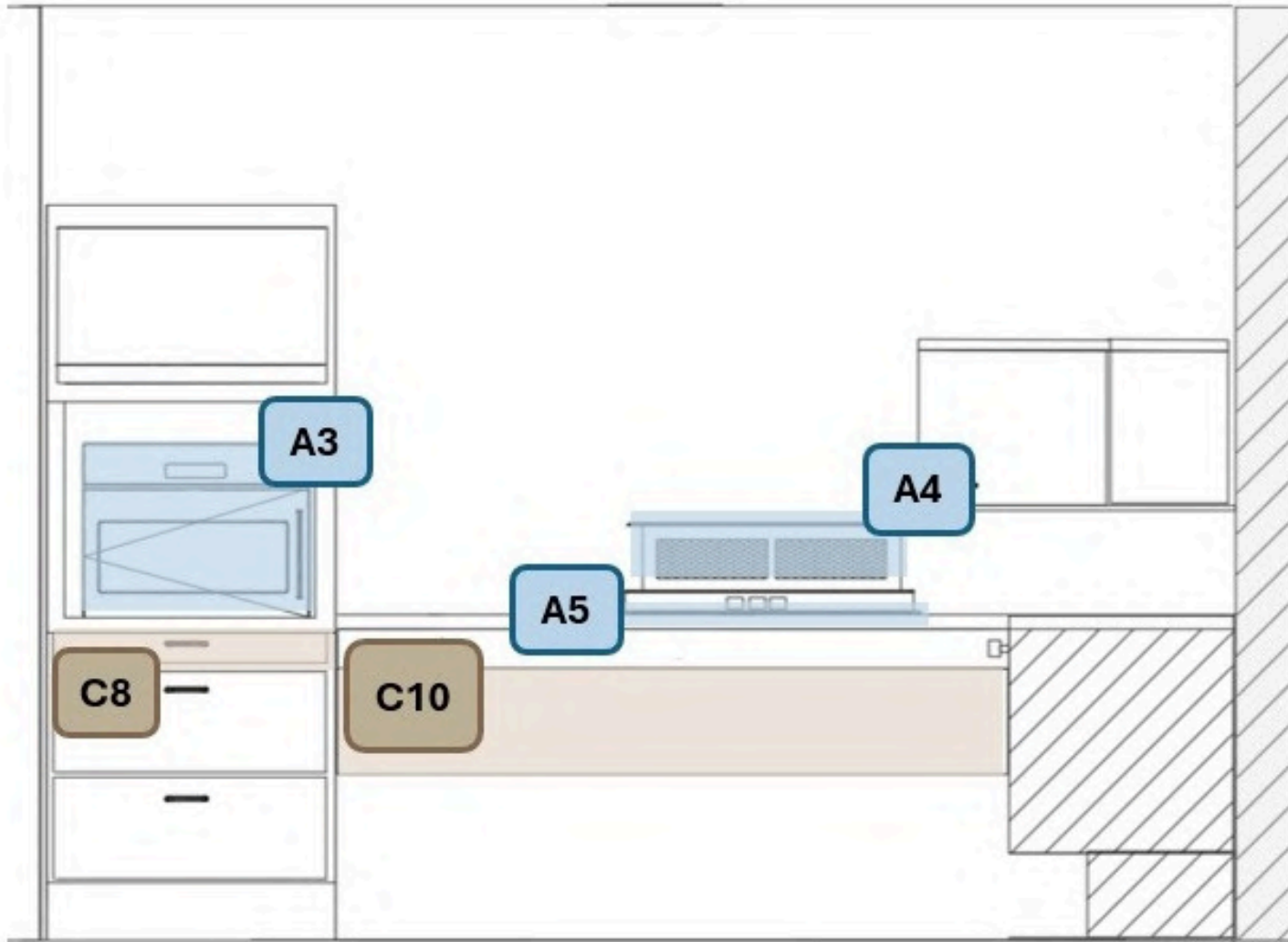


A2 Two Drawer Dishwasher - 34"H DOES NOT FIT UNDER 34"H SURFACE
 BRAND: Cafe
 DISTRIBUTOR: Lowes



A2 Single Drawer Dishwasher 18"H
 BRAND: Fisher and Paykel
 DISTRIBUTOR: Ferguson Home

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A3 Compact Oven
BRAND: Bosch 800 Series
DISTRIBUTOR: Bosch



A3 Single Oven
BRAND: Frigidaire -
Reversible Door Swing
DISTRIBUTOR: Ferg Home



A4 30" Downdraft Vent
BRAND: KitchenAid
DISTRIBUTOR: Ferguson
Home



C8 Downdraft Vent
BRAND: Custom
DISTRIBUTOR: Custom



A5 4 Burner Electric Cooktop
BRAND: GE Profile
DISTRIBUTOR: Ferguson
Home



**A5 4 Burner Electric
Cooktop**
BRAND: Frigidaire Gallery
DISTRIBUTOR: Ferguson
Home

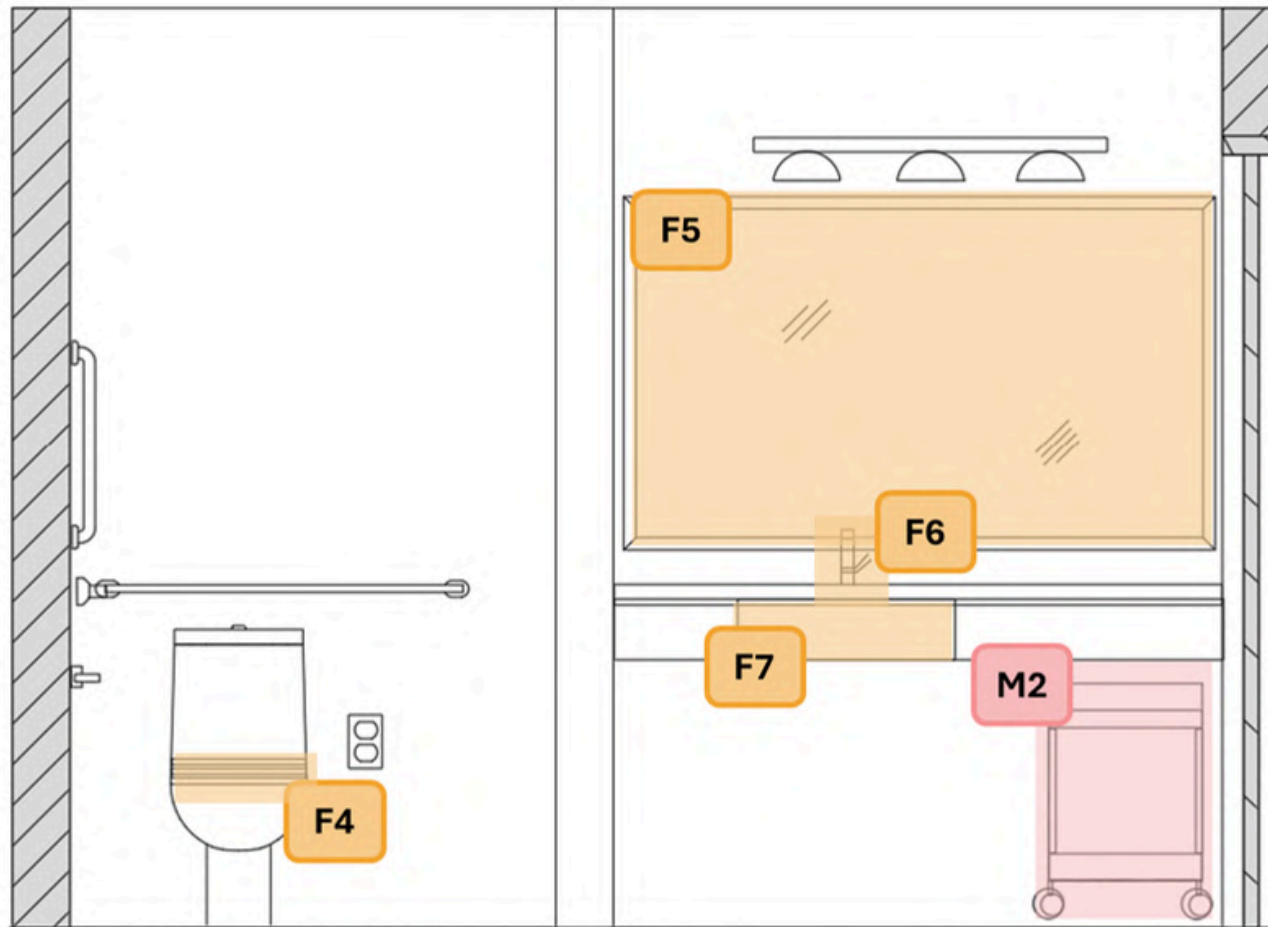


A5 5 Burner Cooktop
BRAND: KitchenAid Sensor
Induction
DISTRIBUTOR: KitchenAid



C10 Modesty Panel support
BRAND: Rakks
DISTRIBUTOR: Rakks

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F5 Framed Wall Mirror
BRAND: Keonjinn
DISTRIBUTOR: Lowes



F5 LED Lighted Smart Mirror
BRAND: Walmart
DISTRIBUTOR: Walmart



F5 Frameless LED Mirror
BRAND: TaiMei
DISTRIBUTOR: Home Depot



F5 Vanity Mirror
BRAND: Ampir
DISTRIBUTOR: Home Depot



F4 Soft Close Bidet Seat
BRAND: Toto Washlet
DISTRIBUTOR: Ferguson Home



F7 Undermount Sink
BRAND: Duravit Vero
DISTRIBUTOR: Ferguson Home



F7 Undermount Sink
BRAND: Kohler Verticyl
DISTRIBUTOR: Ferguson Home



F7 Porcelain Sink
BRAND: American Standard Ovalyn
DISTRIBUTOR: Ferguson Home



M2 Cart, black
BRAND: Ikea Frosjon
DISTRIBUTOR: Ikea



M2 Utility cart
BRAND: Ikea Raskog
DISTRIBUTOR: Ikea

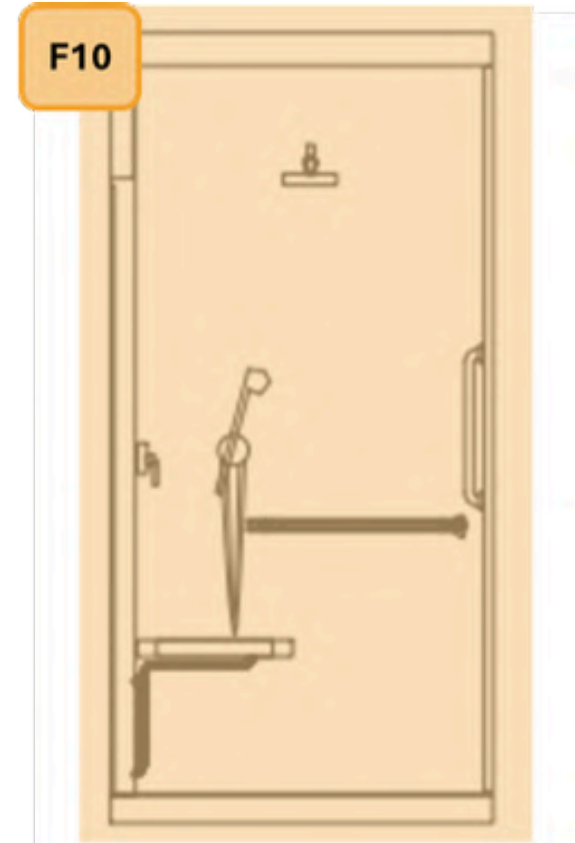
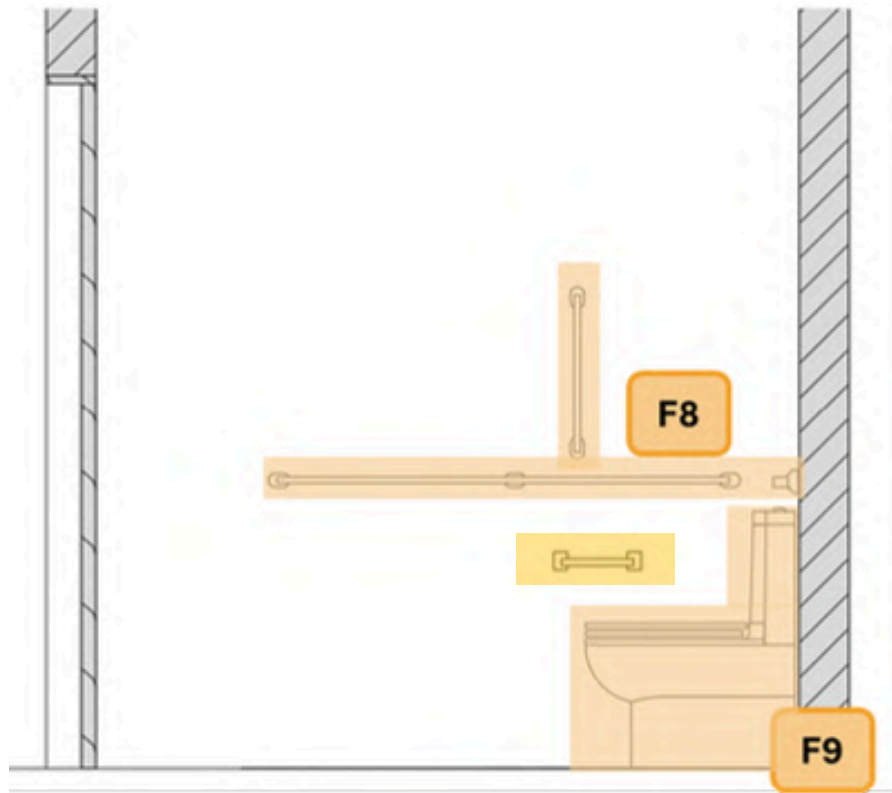


F6 Bathroom Faucet
BRAND: American Standard Clear IR - Touchless
DISTRIBUTOR: Lowes



F6 Bathroom Faucet
BRAND: Delta Lahara Touchless
DISTRIBUTOR: Delta

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F9 Elongated Wall-hung
BRAND: Toto
DISTRIBUTOR: Ferguson
Home



F9 Elongated Toilet
BRAND: American Standard
Cadet
DISTRIBUTOR: A.S.



F10 Shower Kit
BRAND: Clarion
DISTRIBUTOR: Clarion Bath



F8 Grab Bar/Toilet Paper
Holder
BRAND: Kohler-Belay
DISTRIBUTOR: Kohler



F8 Grab Bar Loop
BRAND: Kohler-Belay
DISTRIBUTOR: Kohler



F8 Grab Frame
BRAND: Pottery Barn Linden
DISTRIBUTOR: Pottery Barn



F8 TGrab Bar/Toilet paper
holder
BRAND: Pottery Barn Linden
DISTRIBUTOR: Pottery Barn



F8 Toilet Paper Holder
BRAND: Delta- Angular
Modern
DISTRIBUTOR: Delta

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Reference

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