RESIDENTIAL INFILL PROJECT

INTERNAL CONVERSION REPORT

October 17, 2016

deca ARCHITECTURE INC

PREFACE

This study was commissioned for the Bureau of Planning and Sustainability (BPS) Residential Infill Project, with the goal of studying internal conversions of existing single family dwellings to accommodate two or more dwelling units in a single structure. Many existing homes are currently being demolished to make way for newer and much larger housing stock, and there is little financial incentive to retain existing older homes which are smaller and may have deferred maintenance issues. Internal conversions may offer a viable path to providing financial incentive for preserving existing buildings by converting them to multiple dwelling units.

Current zoning restricts the number of dwelling units in single family zones to one or two dwellings per site. However, the goal of this study was not to evaluate the zoning code issues associated with internal conversions, but rather to focus on the technical, building code, and constructability issues associated with this project type.

INTERNAL CONVERSION SUMMARY

For the purposes of this report, the term "internal conversion" refers to the conversion of an existing single family home into two or more dwelling units. This type of project entails many challenges, but also presents opportunities to save and re-use existing older homes, increase housing availability, and create more diverse housing types without significantly affecting neighborhood character.

Since conversion of a single family home into a duplex (two dwellings) can often be achieved quite readily and without complex or costly upgrades, this report looked primarily at internal conversions resulting in three or more dwelling units. Conversion of a single family house into three or more units often involves navigating complex and/or challenging issues such as:

-Transition from the residential to the commercial building code
-Changes in occupancy from single family to apartments
-Upgrading walls and floors/ceilings to achieve fire ratings
-Upgrading walls and floors/ceilings to achieve sound ratings
-Reducing exterior wall openings to meet commercial code
-Adding fire sprinkler systems
-Addressing ADA and accessibility issues
-Seismic upgrade standards
-Energy efficiency requirements
-Modifications to HVAC systems
-Hazardous materials present in older buildings (asbestos, lead, etc.)
-Upgrading utility infrastructure (water, sewer, electrical)
-Systems Development Charges for new dwelling units

The quantity and complexity of issues with this project type can require more sophisticated architecture and engineering services than typically required for new construction, discouraging many small developers and builders from pursuing internal conversions. Some of these issues involve state or federal level regulations that are beyond the control of the local Authority Having Jurisdiction (AHJ).

Additionally, some of the issues involve degrees of life safety and/or fire protection that should not be reduced. Examples include:

-Wall and floor/ceiling fire ratings (life safety)
-Fire sprinkler systems (life safety)
-Exterior wall openings (life safety, fire spread between buildings)
-ADA and accessibility (federal civil rights legislation)

OPPORTUNITIES

Despite the challenges facing this project type, several of the issues mentioned above are within the powers of the AHJ to affect. Some regulations could be modified, or understanding of them facilitated by a code guide or other document published by the AHJ.

To facilitate more internal conversions, opportunities are discussed in detail below:

Sound Ratings Although required by commercial code, sound ratings between dwelling units are not a life safety concern, but rather a measure of convenience. Expensive third-party testing is typically required to certify the acoustics of particular wall or floor assemblies, as ratings do not exist for many common and historic assembly types. A code guide published by the AHJ describing acceptable methods for achieving required STC (Sound Transmission Class) and IIC (Impact Insulation Class) ratings with existing construction could make this issue much easier to address.

STC is a measure of sound that is transmitted through the air, and is primarily used to quantify the sound resistance of wall construction. This type of rating is more easy to achieve than IIC. IIC measures the transmission of structure-borne sound and vibration, and is typically used to quantify sound resistance of floor/ceiling construction. Appropriate IIC levels can be very difficult to achieve in existing building retrofits, especially those with hard flooring materials. New apartment construction typically utilizes a layer of poured "gyp-crete" topping over the sub-floor to achieve required levels, but this method presents many challenges for existing buildings.

Seismic Upgrades The City of Portland has adopted a local seismic code that, in most situations, is far more stringent than the state's adopted commercial building code. Although older light wood framed structures typically perform well in seismic events, the code requires expensive full building seismic upgrades for internal conversions that trigger commercial code requirements. Since this code is created and administered by the City's Bureau of Development Services, modifications to it are within the City's powers.

Energy Efficient Requirements Although required by the state energy code, insulation and fenestration requirements for efficiency are not a life safety issue. The question of whether the base energy code requirements would apply to an internal conversion appears to be within the powers of the local building code official to interpret. Because internal conversions retain existing materials (embodied energy), there may be opportunities locally to balance environmental objectives.

Systems Development Charges (SDC) For new dwelling units created within the City of Portland, significant SDC fees are charged on a per-dwelling unit basis. Reducing or eliminating these charges for retaining an existing house could provide a significant ($10-50,000+ value) incentive for internal conversions.

Building Code Flexibility A primary obstacle to converting houses into 3+ units is the transition from residential to commercial building code. Although appeals are regularly considered to allow for alternative paths to code compliance, advocating for a statewide change in the building code thresholds for internal conversions could more readily enable conversions and minimize the level of exterior change required for 3+ unit conversions. Additionally, a code guide prepared by the Bureau of Development Services specific to internal conversions could provide applicants with best practice advice for conversions proposed within both sets of codes.

Zoning Code Although this report does not focus on zoning code issues, the Residential Infill Project can encourage internal conversions through changes such as responsive floor area ratio allowances, flexible parking minimums, variances to setback requirements, and definitions that place appropriate parameters around permissible levels of exterior change when new dwelling units are created. It's important to note that some of the examples in this report exceed the parameter of what has been proposed in the Residential Infill Project's recommended concept draft.

It should also be noted that this report looks at dwelling units within the context of a single building and not the entire site. Opportunities for placing three or more dwelling units on the site of an existing house utilizing detached structures could be achieved under the residential code, thus avoiding commercial code upgrades.

CONCLUSIONS

Although internal conversions, especially those creating more than two units, can be challenging to complete, they represent a powerful tool for retaining existing building stock and encouraging diverse and less expensive housing options. Changing a building from the residential to commercial code is a significant barrier, but duplex and townhouse conversions are readily achievable and, if coupled with a detached structure, could provide a way to gently increase density while still preserving existing structures. Through strategic assistance and clarification of the complex issues associated with internal conversions, the City may be able to encourage and incentivize this type of development throughout Portland.

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Photo credits
Cover: Montgomery House, 7-unit apartment converted in 2013
Photo courtesy of Addam Goard

P. 2: House converted to duplex
Photo courtesy of DECA Architecture

P. 3: Moulton House, 6-unit condominium converted in 1999
Photo courtesy of Keller Williams Realty

P. 5: Duplex in SE Portland
Photo courtesy of Michael Molinaro

There are a number of opportunities to increase the viability of internal conversions. Among them are:

1) Zoning code changes as part of the Residential Infill Project.

2) Revisions to local sound, seismic, and energy efficiency requirements and publication of a best practices code guide.

3) Financial incentives, including reduction in systems development charges.

4) Advocating for changes to state building code thresholds.

GOVERNING CODE

Single family homes are typically regulated and constructed under the 2014 Oregon Residential Specialty Code (ORSC) or "residential" code. This code allows for construction and renovation of one and two-family dwelling, as well as townhouse-style layouts where single dwelling units are located side-by-side, separated by fire rated walls, and considered separate yet adjoining buildings.

Structures containing more than two dwelling units and not utilizing ORSC townhouse provisions are regulated under the 2014 Oregon Structural Specialty Code (OSSC) or "commercial" code.

ORSC RELEVANT REQUIREMENTS

R302.2 Townhouses Townhouses shall be considered separate buildings and shall be separated by 2-hour rated wall assemblies. Buildings shall adjoin or have access to a yard, street, alley or public way on at least one side. Townhouses may or may not be separated by real property lines. Restrictions on utility routing may apply.

R302.3 Two-Family Dwellings Dwelling units in two-family dwellings must be separated from each other by 1-hour fire rated walls and floors. Construction supporting these walls and floors must also be fire rated.

The ORSC does not include sound transmission or impact isolation requirements.

OSSC RELEVANT REQUIREMENTS

310 Residential Group R Apartments are typically classified as R-2 whereas single family homes are typically R-3. These designations are critical to understanding the code regulations that apply to a building, but are perhaps most important in that they relate to dramatically different hazard levels addressed by seismic upgrade requirements.

420 Special Requirements for Dwelling Units Walls and floors separating dwelling units from each other and from common spaces must be 1-hour fire rated.

TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA[a]
0 to less than 3[b, c]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S)[j]	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5[d, e]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S)[j]	15%
	Protected (P)	15%
5 to less than 10[e, f, j]	Unprotected, Nonsprinklered (UP, NS)	10%[h]
	Unprotected, Sprinklered (UP, S)[j]	25%
	Protected (P)	25%
10 to less than 15[e, f, g]	Unprotected, Nonsprinklered (UP, NS)	15%[h]
	Unprotected, Sprinklered (UP, S)[j]	45%
	Protected (P)	45%
15 to less than 20[f, g]	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S)[j]	75%
	Protected (P)	75%
20 to less than 25[f, g]	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S)[j]	No Limit
	Protected (P)	No Limit
25 to less than 30[f, g]	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S)[j]	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S)[j]	Not Required
	Protected (P)	Not Required

602 Construction Classification / 705 Exterior Walls Exterior walls within 10 feet of a property line must be 1-hour rated construction. Exterior walls within 30 feet of an adjoining lot line are also subject to maximum opening area requirements as outlined in table 705.8. Walls must meet the opening requirements on a "per-floor" basis. For the purposes of this table, a building equipped with a Type 13R sprinkler system is considered "nonsprinklered".

Exterior walls facing streets, alleys, or other public open spaces have no limitations on openings. Protected openings are windows with fire rated glazing or shutters.

Wall, floor, and roof assembly fire ratings are tested and certified for most modern materials and methods. However, fire ratings may be more difficult to achieve with older materials.

903.2.8 Automatic Sprinkler Systems - Group R Sprinklers must be installed in group R (residential type) occupancies. In most cases a Type 13R sprinkler system will suffice, which is less expensive than a typical commercial Type 13 sprinkler system.

Type 13 sprinkler systems are commonly used for commercial buildings, provide greater coverage for concealed spaces (attics, etc.) and are intended to protect both building occupants and the building structure. Type 13R sprinkler systems offer a lesser degree of protection in that they are intended to protect only the occupants, not the building. They do not provide sprinkler coverage for concealed and unoccupied spaces.

1207 Sound Transmission Walls and floors separating dwelling units from each other and from common areas must have a Sound Transmission Class (STC) of at least 50. Floors must have an Impact Isolation Class (IIC) of at least 45.

Ch. 11 Accessibility & Ch. 34 Existing Building and Structures Typically, new apartment buildings with four or more dwelling units must be provided with ADA accessible units, classified as either Type A or B. Both units types provide adaptability and clearances to enhance access, should a disabled individual move into the unit. Type A units offer a higher level of accessibility than Type B units due to increased clearances and other features.

In new non-elevator buildings, only those units on stories that are required to have a wheelchair accessible route must be Type A or B. Typically, this is only the ground level, and the vast majority of these units are Type B, with only a few Type A's.

Depending on the type of alteration proposed, ADA upgrades may or may not be needed. In an internal conversion of a single family residence to multiple dwelling units with no other uses, no ADA dwelling units are required, per OSSC 3411.1, provided the building was constructed before 1991. If the building was constructed after 1991, the ground floor units may need to be made accessible. If the conversion involves an addition, the addition likely needs to be made accessible. If an internal conversion involves other public uses, such as commercial space or community spaces, those spaces likely need to be made accessible.

ADA requirements for alterations vary based on a number of factors, but in a typical house without an elevator, only the units on the ground level may need to comply with Type A or B unit requirements. State building code officials have provided some guidance in making this interpretation, but have stressed that local building code officials have the final say.

CITY OF PORTLAND REQUIREMENTS

Title 24.85 Seismic Improvement Standards Regulations for existing buildings require seismic upgrades to existing buildings when changes of occupancy or significant renovations occur. OSSC occupancies are assigned relative hazard classifications, and when more than a third of the building area is changed to an occupancy of a higher hazard class, seismic upgrades are required by the City of Portland, as per the following tables:

TABLE 24.85-A		
Relative Hazard Classification	**OSSC Occupancy Classification**	**Seismic Improvement Standard**
5 (Highest)	A, E, I-2, I-3, H-1, H-2, H-3, H-4, H-5	OSSC or ASCE 41-BPON
4	R-1,R-2, SR, I-1, I-4	
3	B, M	41-BPOE
2	F-1, F-2, S-1, S-2	
1 (Lowest)	R-3, U	

TABLE 24.85-B				
Percentage of Building Net Floor Area Changed		**Occupant Load Increase**	**Required Improvement Standard**	**Relative Hazard Classification**
1/3 of area or less	and	Less than 150	None	1 through 5
More than 1/3 of area	or	150 and above	ASCE 41-BPOE	1, 2, and 3
More than 1/3 of area	or	150 and above	OSSC or ASCE 41-BPON	4 and 5

Converting an existing house to apartments under the OSSC would require a change of occupancy from R-3 to R-2, raising the hazard classification from 1 to 4 and triggering a seismic upgrade to current commercial code.

Additionally, if the building contains unreinforced masonry (URM) components anywhere in the building, and the cost of renovation exceeds $57/sf in a single story building or $43/sf in a two plus story building, a seismic upgrade is required to the level of current commercial code.

There is also an additional requirement for performing an ASCE 41 evaluation report when the construction cost of any project exceeds $252,000. This report can cost $2-5,000 for a structural engineer to produce.

ENERGY EFFICIENCY REQUIREMENTS

Buildings regulated under the ORSC are subject to the energy provisions of that code, whereas buildings regulated under the OSSC must abide by provisions of the 2014 Oregon Energy Efficiency Specialty Code (OEESC). These two codes present different requirements.

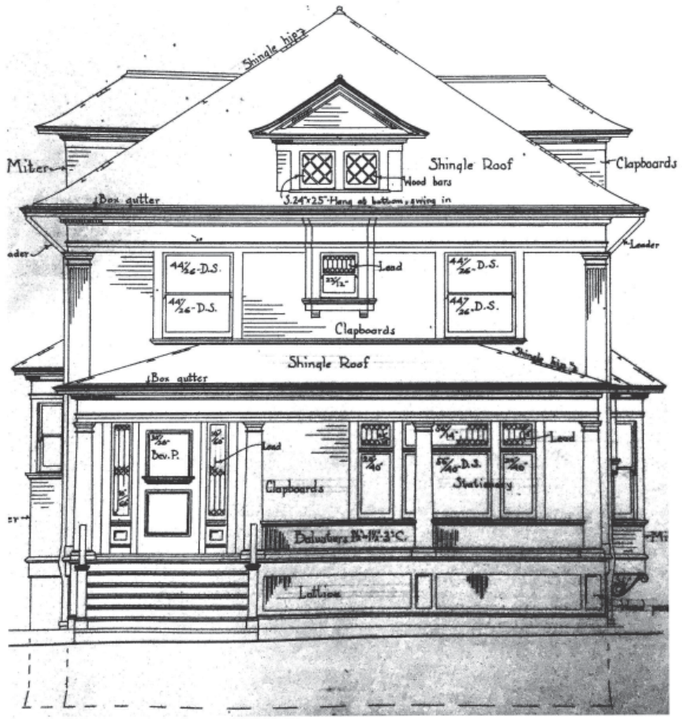
ORSC Ch. 11 considers any unconditioned spaces (such as garages) changed to living area as a "change of use". The converted space must be insulated, but to slightly less stringent standards than for new construction. If the change exceeds 30% of a building's area or more than 400 sf, an additional energy saving measure must be employed from a list of options including increased insulation, blower door testing, duct sealing, efficient water heaters among other measures. Building additions also trigger energy saving measures that may be selected from a list of options.

Projects falling under the 2014 OEESC are only required to make piecemeal energy improvements to the parts being altered, provided the overall energy use is not increased. For example, vacant stud bays that are exposed during construction must be insulated. However, unconditioned spaces that are converted to heated spaces must meet the full envelope requirements of the OEESC.

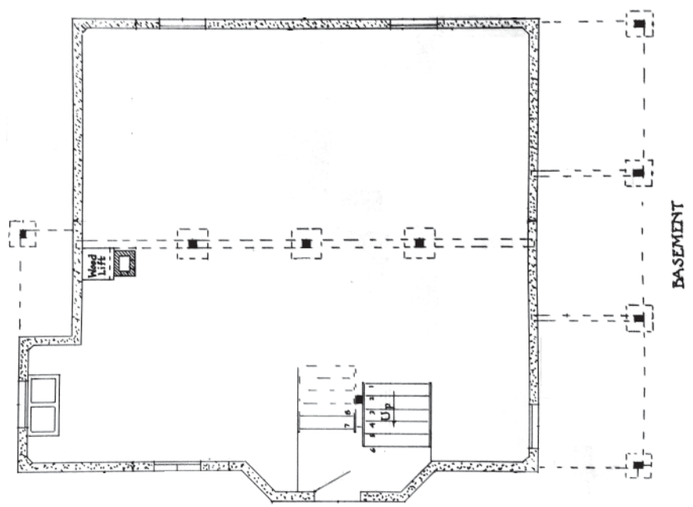
Despite these two different regulation methods, a building moving from the residential code to the commercial code may be required to comply with all aspects of the commercial code, which includes, by reference, the 2014 OEESC. Complying with the base energy code could pose significant challenges for existing older houses with energy inefficient features, such as single-pane glazing.

Case Study Models

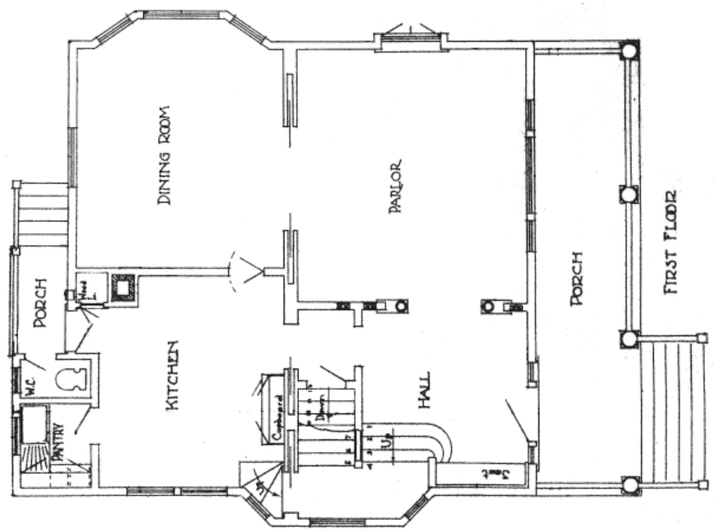
On the pages that follow are conceptual models for internally converting four different house types commonly found in the city of Portland. Each conceptual model identifies a building configuration that would accommodate 3+ units and provides a summary of the challenges and opportunities of the approach. Example buildings were provided by Bureau of Planning and Sustainability staff. Although the models may not be achievable within Portland's current zoning code, they illustrate many of the zoning standards being considered within the Residential Infill Project.



FRONT ELEVATION



PLAN Basement 975 sf



PLAN 1st Level 1,000 sf

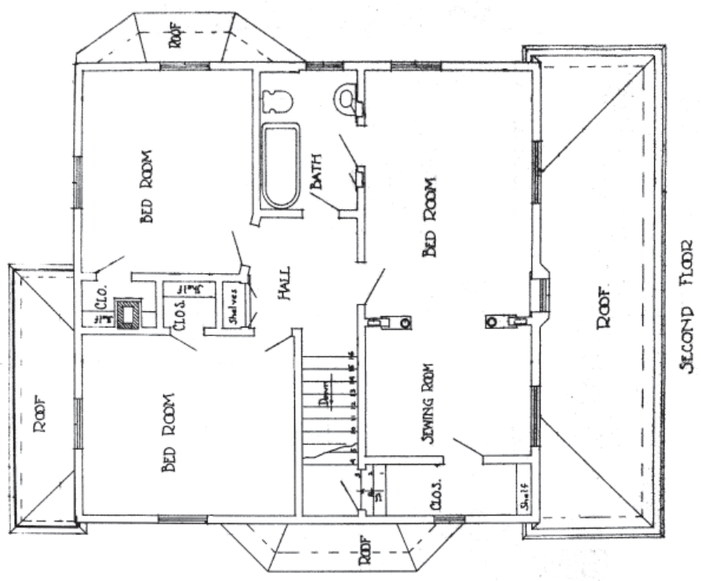
EXISTING BUILDING SUMMARY

The existing building is a two-story 1910s Portland foursquare on a tight site with an attic and basement. For the purposes of this study the attic and basement are assumed to have adequate head height without beams, collar ties or other items that might prevent conversion to living space.

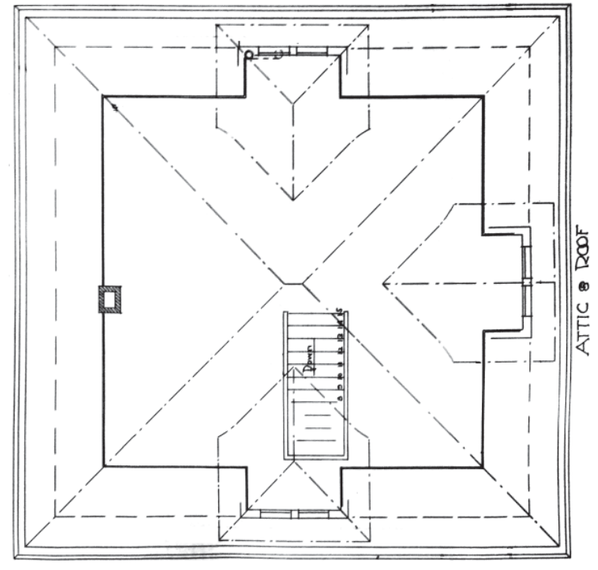
Building Area:	3,550 gsf
Building Height:	32 ft
Site Area:	2,500 sf
FAR:	1.03:1 (without basement)
Construction Type:	V-B (Unprotected Wood Frame)
Sprinklering:	No
Existing Occupancies:	R-3

Scale: 1"=10'

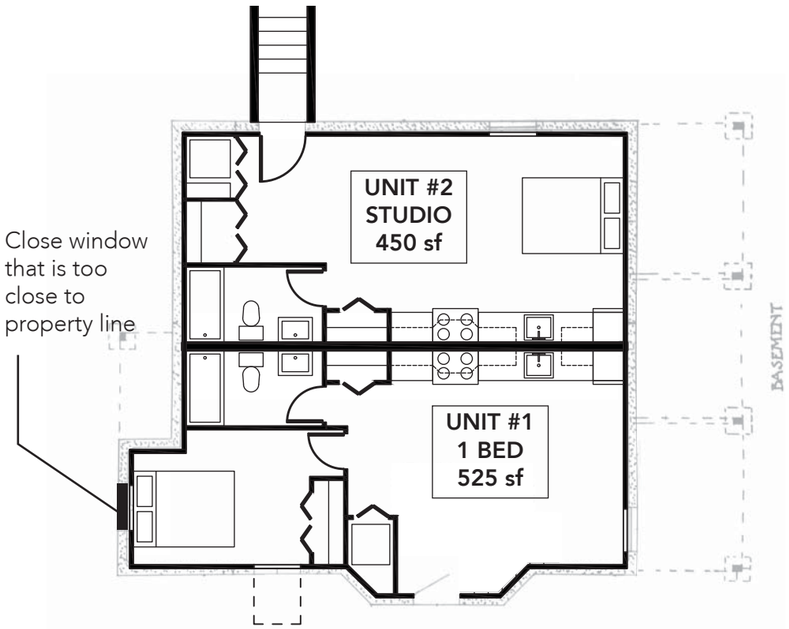
0 2' 5' 10'



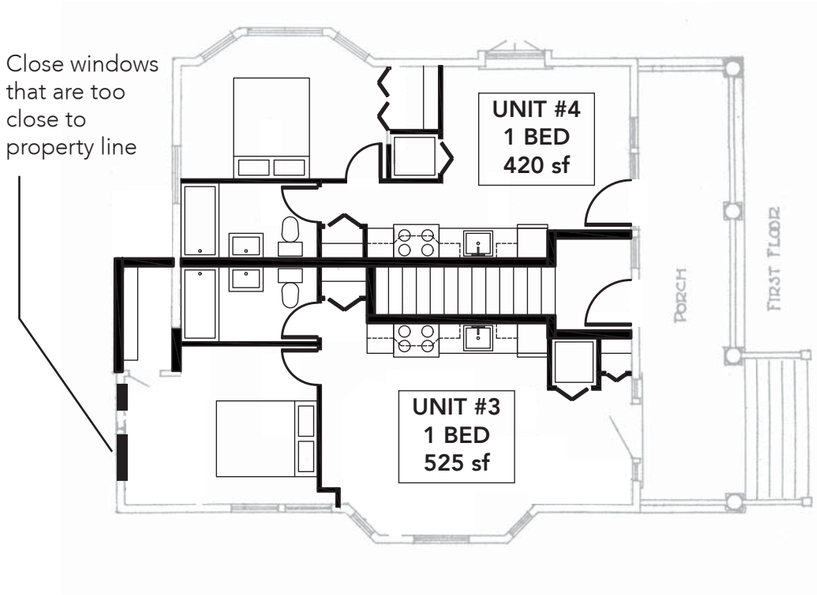
PLAN 2nd Level 925 sf



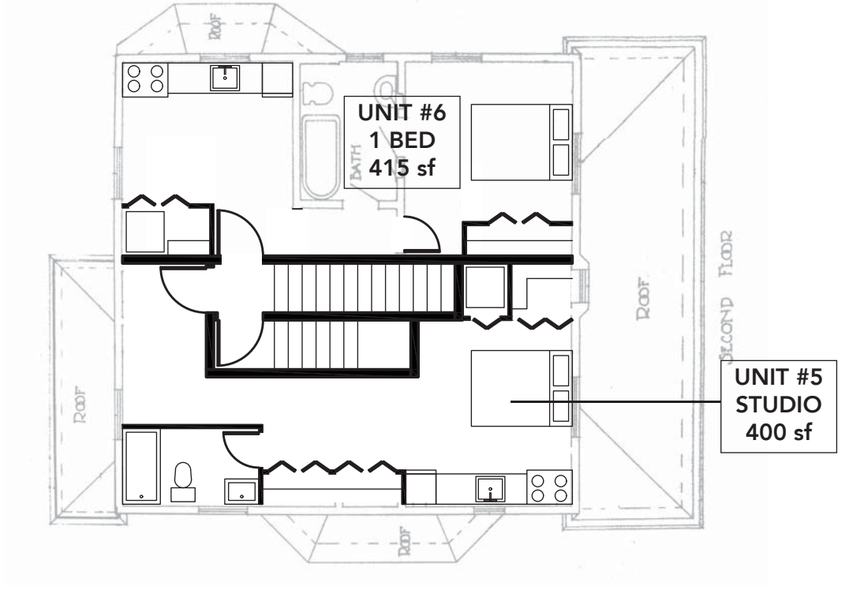
PLAN Attic 650 sf



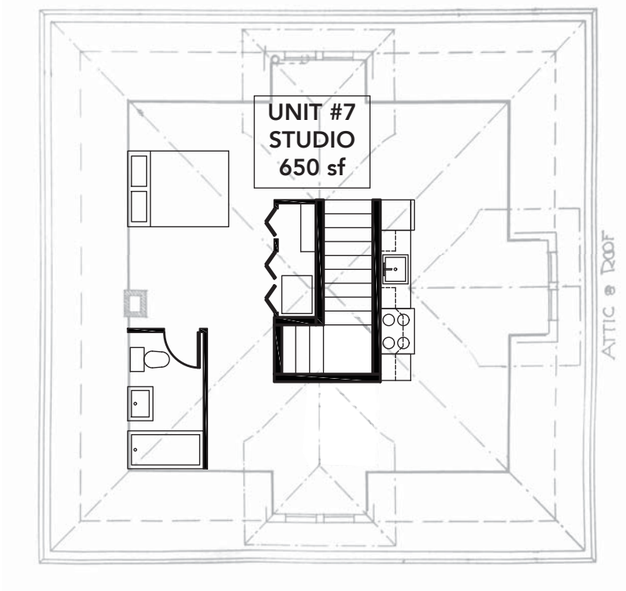
PLAN Basement 975 sf



PLAN 1st Level 1,000 sf



PLAN 2nd Level 925 sf



PLAN Attic 650 sf

Scale: 1″=10′

0 2′ 5′ 10′

LEGEND

Existing construction (grey)

New construction (black)

1900s FOURSQUARE PROPOSED CONVERSION **OPT A - 7 UNITS**

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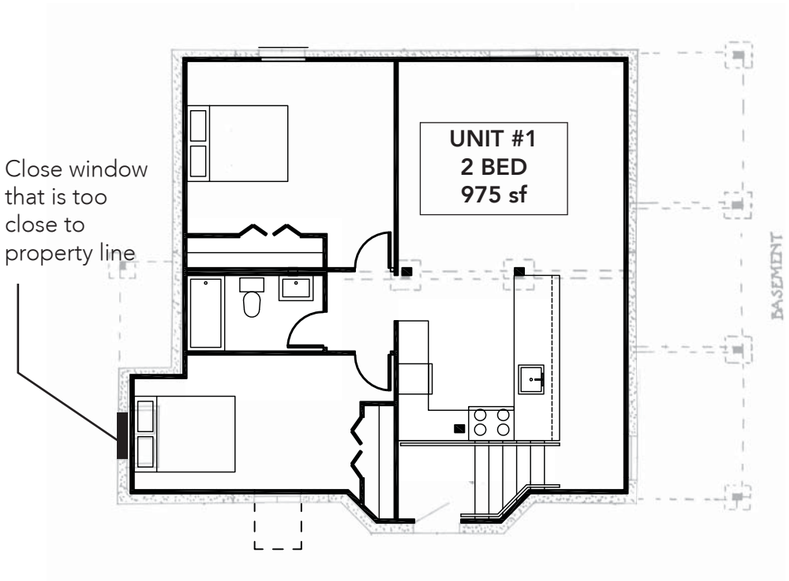
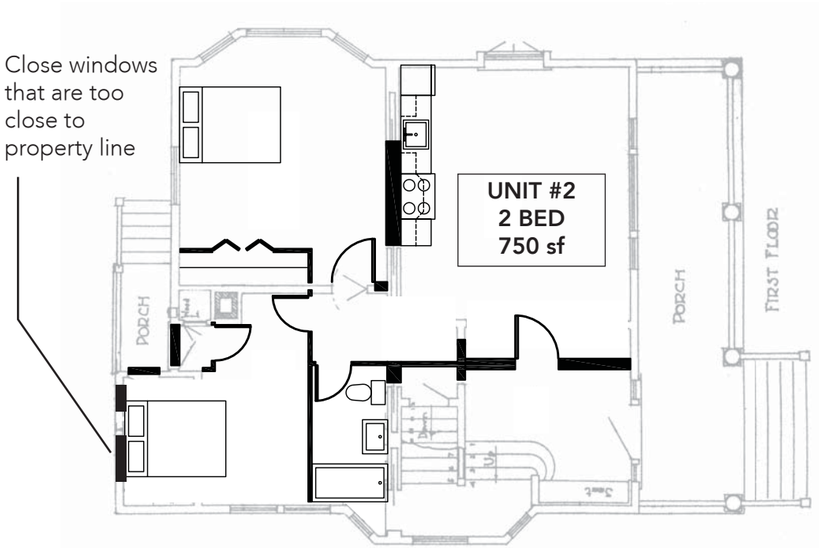
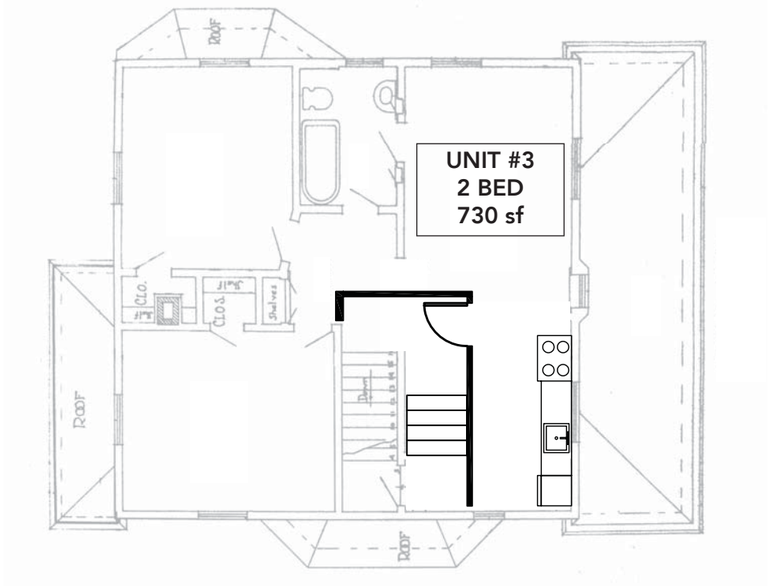


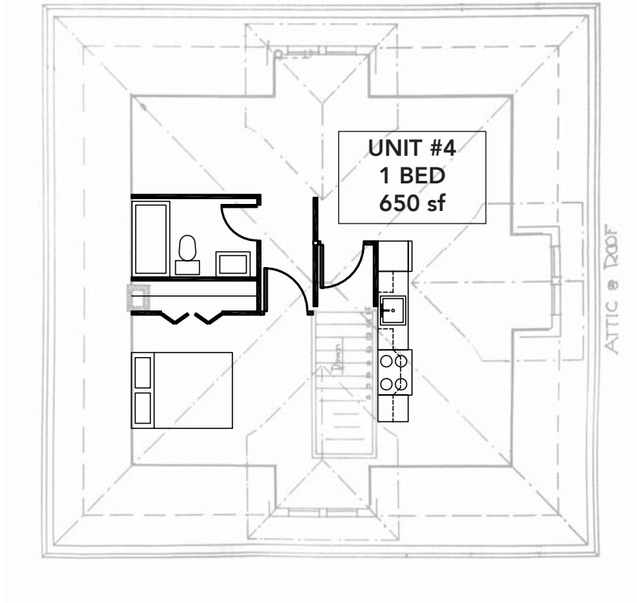
PLAN Basement 975 sf



PLAN 1st Level 1,000 sf



PLAN 2nd Level 925 sf



PLAN Attic 650 sf

Scale: 1″=10′

0 2′ 5′ 10′

LEGEND

Existing construction (grey)

New construction (black)

1900s FOURSQUARE PROPOSED CONVERSION **OPT B - 4 UNITS**

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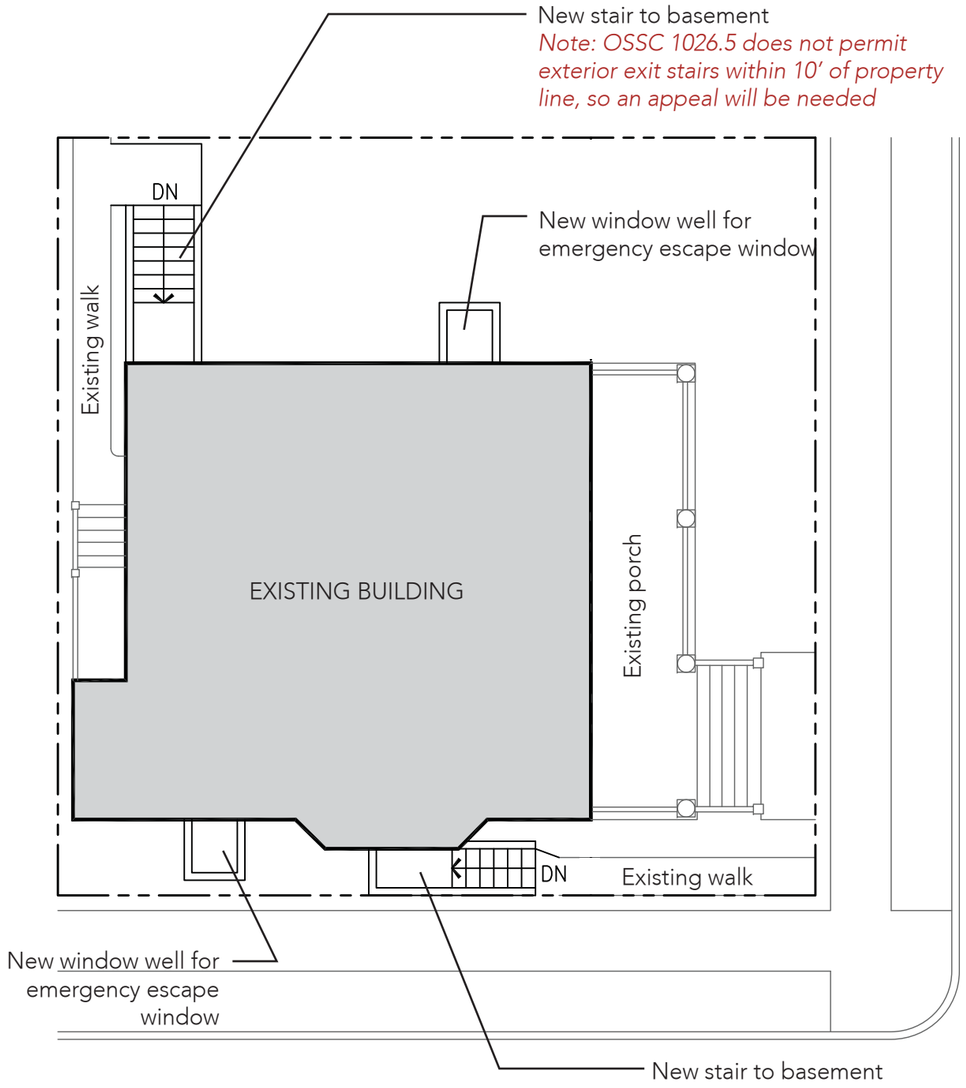


SITE PLAN

Scale: 1"=10'

0 2' 5' 10'

LEGEND

Existing construction (grey)

New construction (black)

PROPOSED SITE IMPROVEMENTS

- Adding dwelling units to the basement requires access stairs to unit entry doors
- Basement bedroom windows must also be provided with window wells to allow for emergency escape
- Due to the tight site, new parking is not proposed

PROPOSED CONVERSION SUMMARY

Option A proposes to subdivide each floor into two smaller apartments, with a single apartment in the attic to maximize the number of dwelling units. A total of (7) apartments are proposed in this layout. Option B, with four units is also shown. The existing interior stair has been reconfigured to provide efficient access to all units. Under either option, the conversion requires compliance with commercial code (2014 OSSC) requirements, due to the number of units and since dwelling units are stacked atop each other.

Fire and sound separation is required vertically and horizontally between units. Changing the existing R-3 (single dwelling) occupancy to R-2 (apartments) will require a Type 13R sprinkler system be installed throughout the building. The change in occupancy from R-3 to R-2 will also require a seismic upgrade per city code 24.85.040.

Building Area: 3,550 sf

Conversion Requirements

- Construct horizontal and vertical fire/sound separation between units
- Seismic upgrade to current commercial code
- Install automatic fire sprinkler system (Type 13R)
- Install walls and doors as shown on plan to create new units
- New kitchens and bathrooms as shown
- Ensure that units have independent heating control
- Provide access and emergency escape to basement units
- Envelope upgrades at existing unheated spaces

Pros

- (7) units in 3,550 sf maximizes density, although fewer/larger unit options are possible
- No ADA units required for internal conversion only

Cons

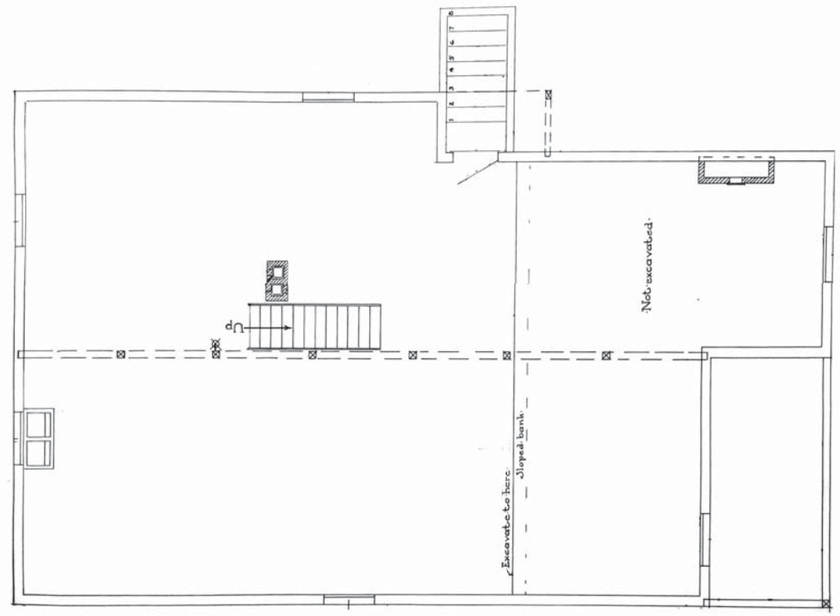
- Units are small and awkward due to size of existing floor plates, especially in Option A
- In Option A, lots of additional kitchens and bathrooms are required
- Small site does not allow for parking

EXISTING BUILDING SUMMARY

The existing building is a typical one-story single family bungalow house with a full height basement and habitable attic space. Existing dormers at the roof allow for light and additional space in the attic. An interior stair connects the basement, 1st level, and attic. An exterior stair also provides direct access to the basement. The construction of the house is wood framing on concrete basement/foundation walls.

Building Area:	3,640 sf
Building Height:	20′
Site Area:	5,000 sf
FAR:	0.51:1 (without basement)
Construction Type:	V-B (Unprotected Wood Frame)
Sprinklering:	No
Existing Occupancies:	R-3

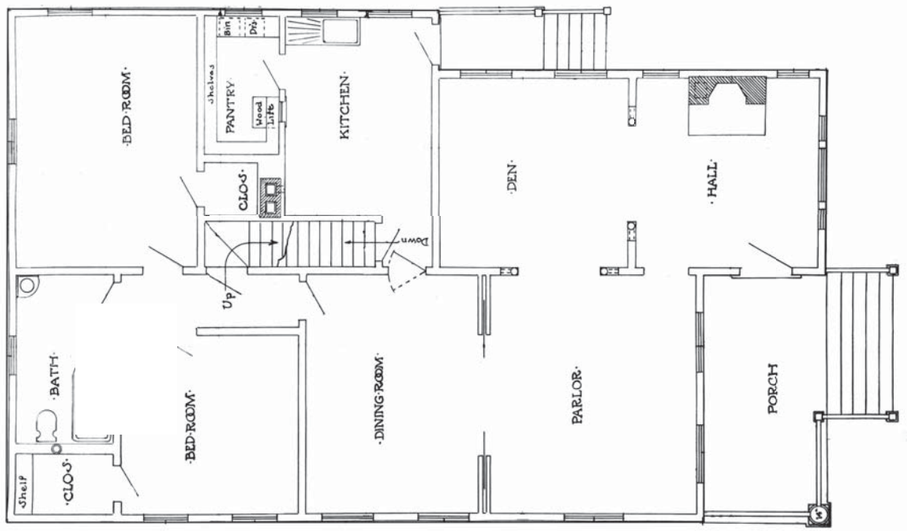
FRONT ELEVATION



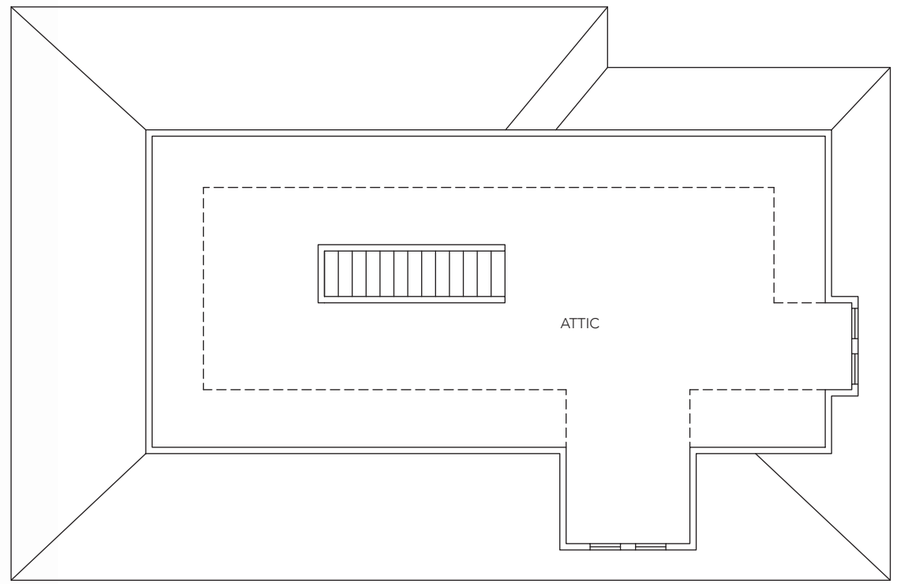
PLAN Basement 1,095 sf

Scale: 1″=10′

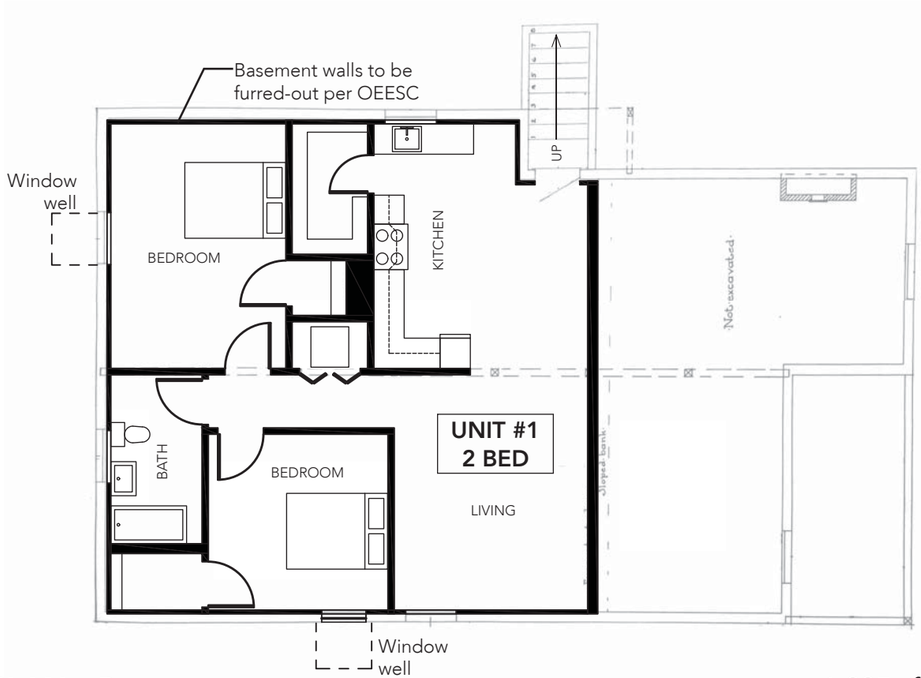
0 2′ 5′ 10′



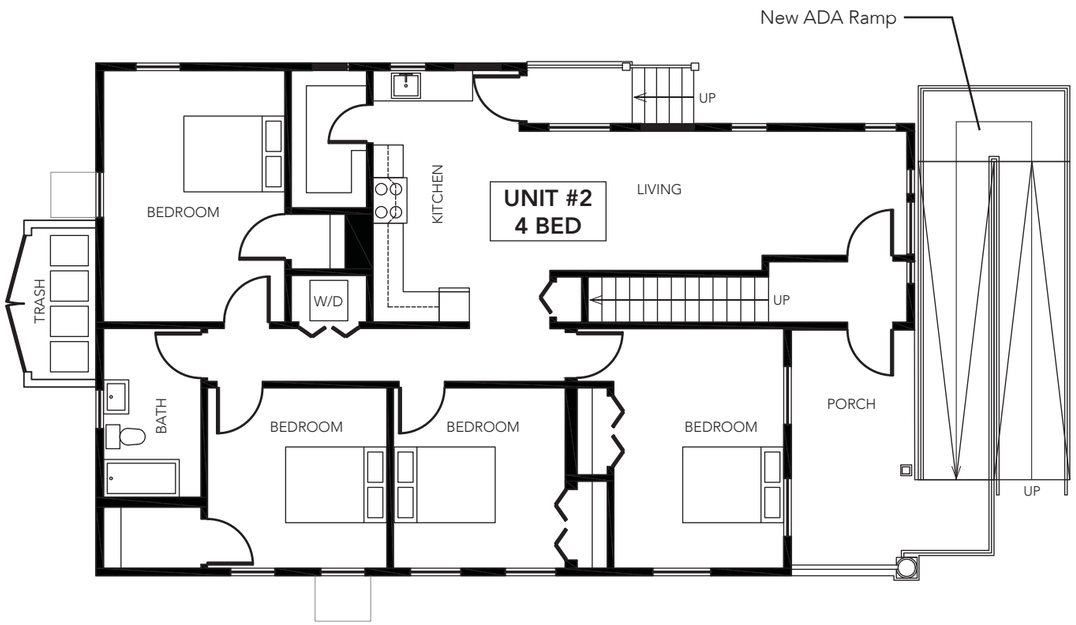
PLAN 1st Level 1,595 sf



PLAN Attic 950 sf



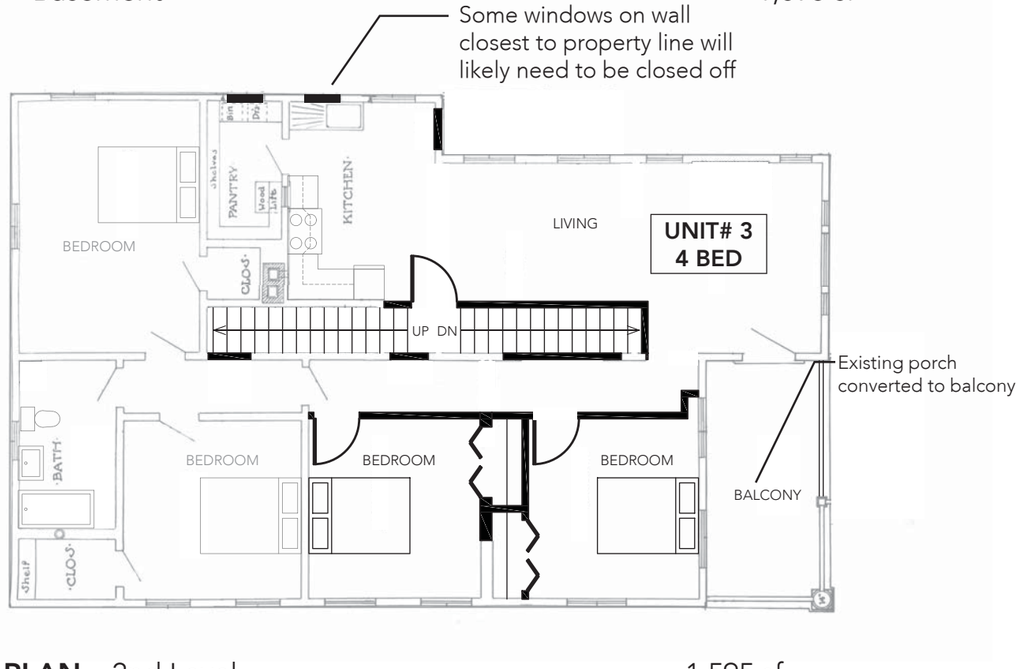
PLAN Basement 1,095 sf



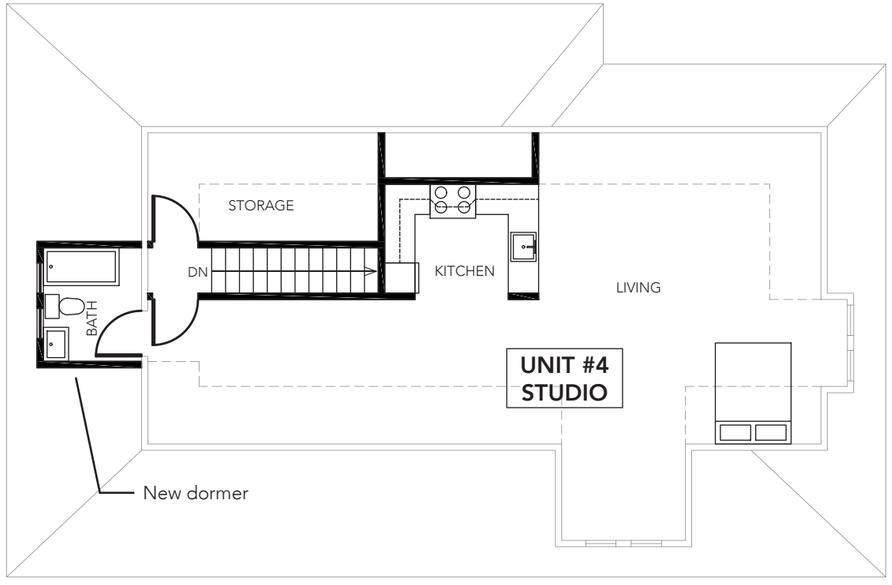
PLAN 1st Level

Note: Existing first level to be elevated, with a new addition story placed below it. New first level is an addition and must meet ADA

1,595 sf



PLAN 2nd Level 1,595 sf



PLAN 3rd Level 1,095 sf

Scale: 1″=10′

0 2′ 5′ 10′

LEGEND

Existing construction (grey)

New construction (black)

1910s BUNGALOW PROPOSED CONVERSION **OPT A - ADDITION**

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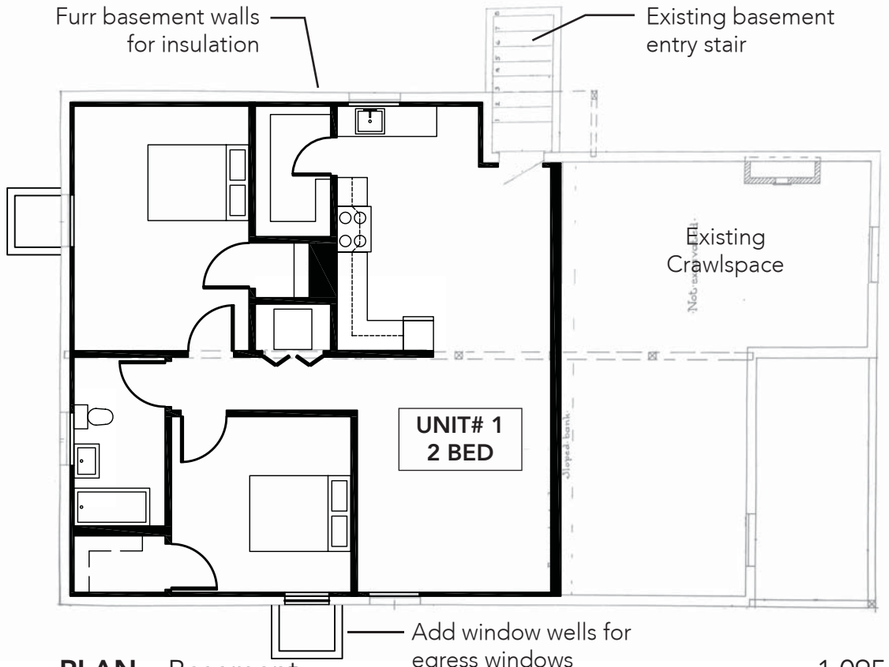
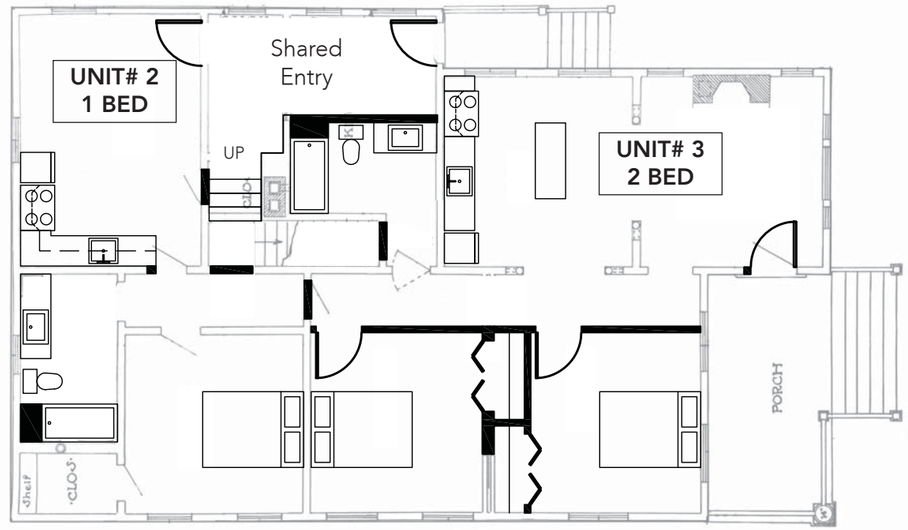
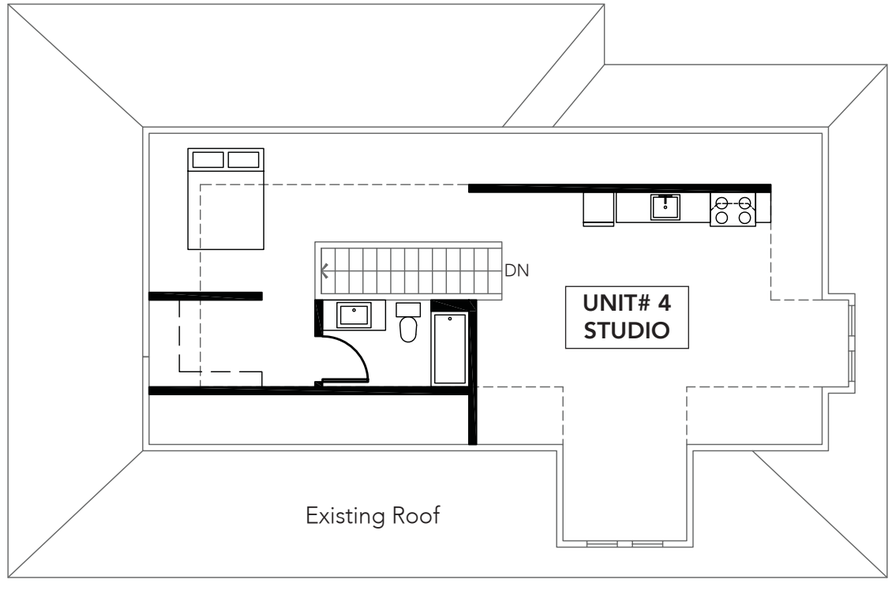


PLAN Basement 1,095 sf



PLAN 1st Level 1,595 sf



PLAN Attic / 2nd Level 970 sf

Scale: 1″=10′

0 2′ 5′ 10′

LEGEND

Existing construction (grey)

New construction (black)

1910s BUNGALOW PROPOSED CONVERSION **OPT B - 4 SMALLER UNITS**

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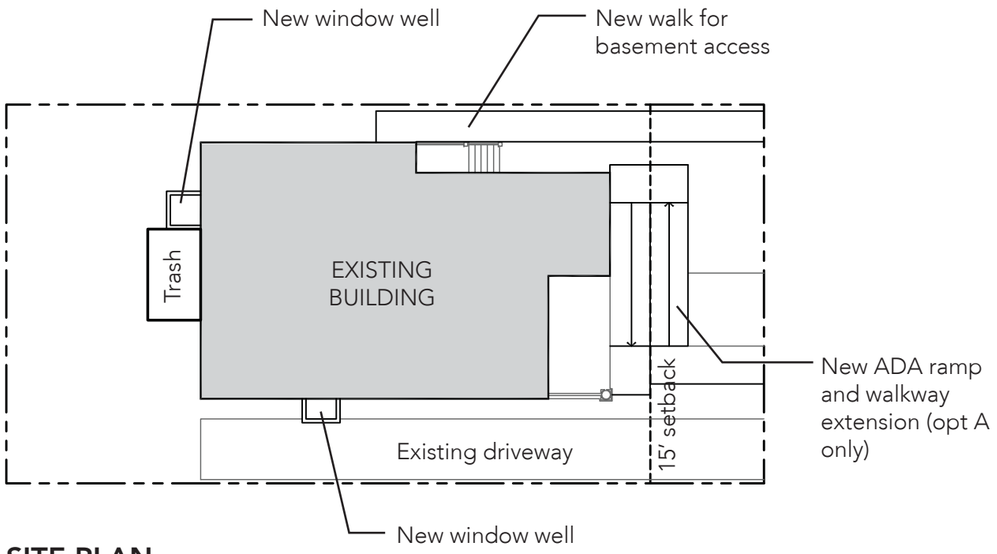


SITE PLAN

PROPOSED SITE IMPROVEMENTS

- Add walkways for unit access
- Add ramp for first floor ADA access (Opt A only)
- Add window wells for emergency escape at basement bedrooms

PROPOSED CONVERSION SUMMARY

Option A is an experimental case study to keep the existing structure while adding floor area by elevating the existing house and placing a new 1st level addition below it. Option B retains the envelope of the existing house and is a true internal conversion.

Both options result in four dwelling units, although the units in Option A are significantly larger and would result in increased rents. Both schemes stack dwelling units on top of each other, so the commercial code must be used.

Fire and sound separation is required vertically and horizontally between units. Changing the existing R-3 (single dwelling) occupancy to R-2 (apartments) will require a Type 13R sprinkler system throughout. The change in occupancy from R-3 to R-2 will also require a seismic upgrade per city code 24.85.040.

Opt A Building Area:	5,380 sf
Opt A Building Height:	30 ft
Opt B Building Area:	3,660 sf
Opt B Building Height:	20 ft

Conversion Requirements

- Construct horizontal fire/sound separation between units
- Seismic upgrade
- Install automatic fire sprinkler system (Type 13R)
- Install walls and doors as shown on plan to create new units
- Install additional kitchens and bathrooms
- Ensure that units have independent heating control

Pros

- Option A maximizes building area
- Maximizes number of separate dwelling units
- Re-use existing walls, doors and other construction to the extent possible
- Matching materials and fenestration patterns can minimize visual impact of vertical addition (Opt A)

Cons

- ADA access is difficult to elevated first level and basement
- Costly commercial code upgrade including seismic & sprinklers
- Opt A may be beyond scope of internal conversion

BUILDING ELEVATIONS OPT A

Scale: 1"=10'

0 2' 5' 10'

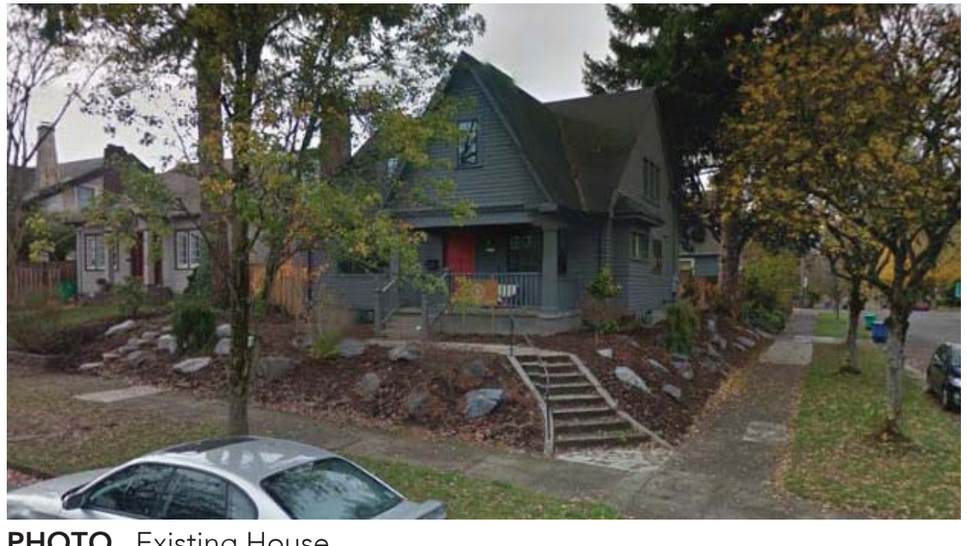


PHOTO Existing House

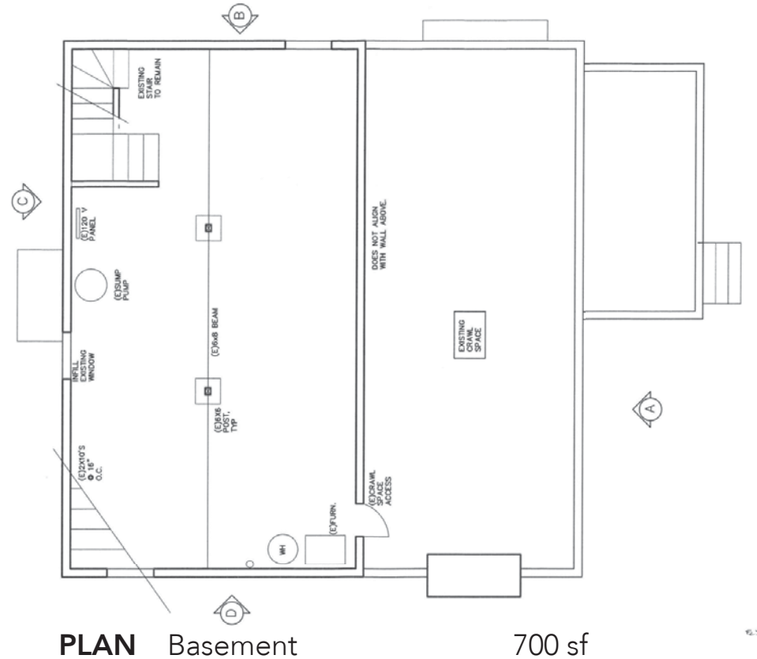
EXISTING BUILDING SUMMARY

The existing building is a two-story Tudor-style home with a partial basement. For the purposes of this study, it is assumed the basement has adequate head height. The site also includes a 1-story detached garage.

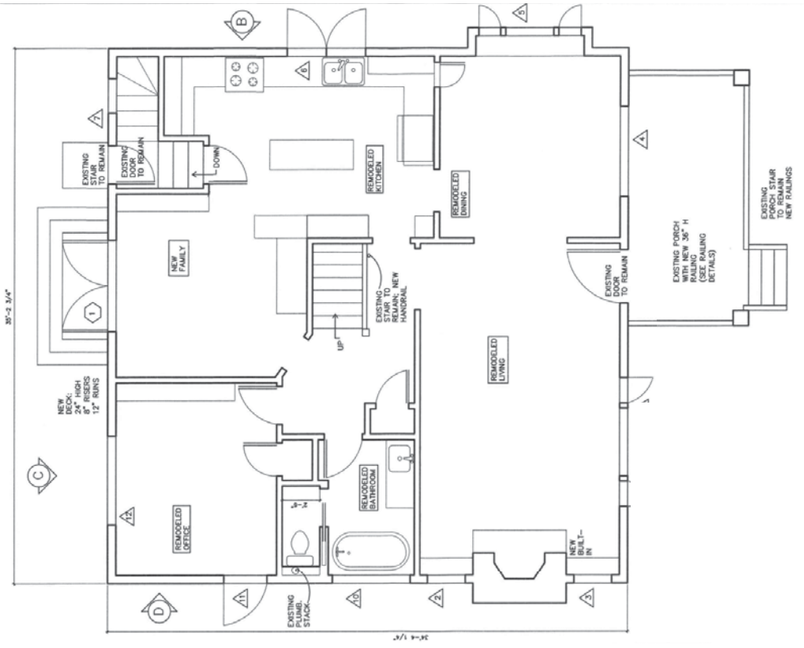
Building Area:	2,875 sf
Building Height:	28 ft
Site Area:	5,000 sf
FAR:	0.44:1 (basement excluded)
Construction Type:	V-B (Unprotected Wood Frame)
Sprinklering:	No
Existing Occupancies:	R-3

Scale: 1″=10′

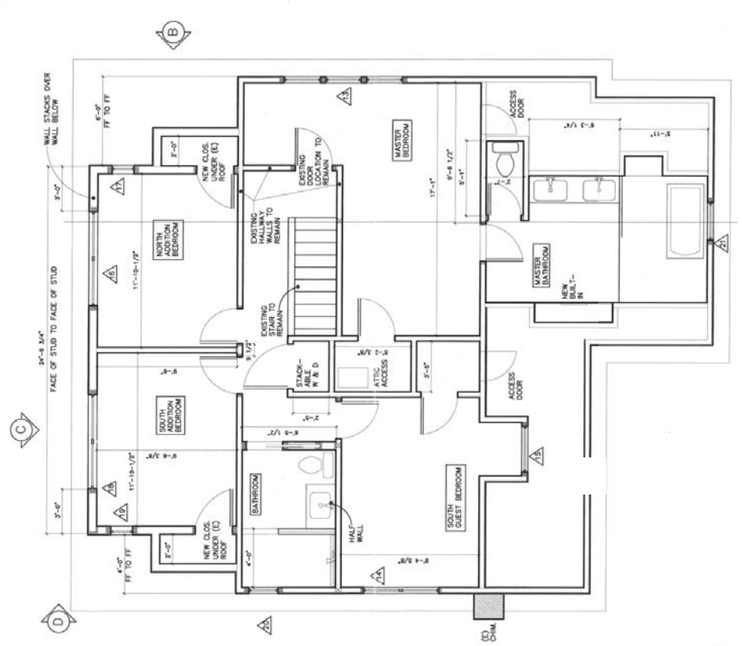
0 2′ 5′ 10′



PLAN Basement 700 sf



PLAN 1st Level 1,225 sf



PLAN 2nd Level 950 sf

PROPOSED CONVERSION SUMMARY

This scheme proposes dividing the house into five units. A sixth dwelling unit could be added on site by converting the existing detached garage structure into a dwelling unit without having to meet OSSC. The proposed internal conversion will require compliance with commercial code (2014 OSSC) requirements.

Fire and sound separation is required vertically and horizontally between units. Changing the existing R-3 (single dwelling) occupancy to R-2 (apartments) will require a Type 13R sprinkler system be installed throughout the building. The change in occupancy from R-3 to R-2 will also require a seismic upgrade per city code 24.85.040.

Building Area:	2,875 sf
Building Height:	28′

Conversion Requirements

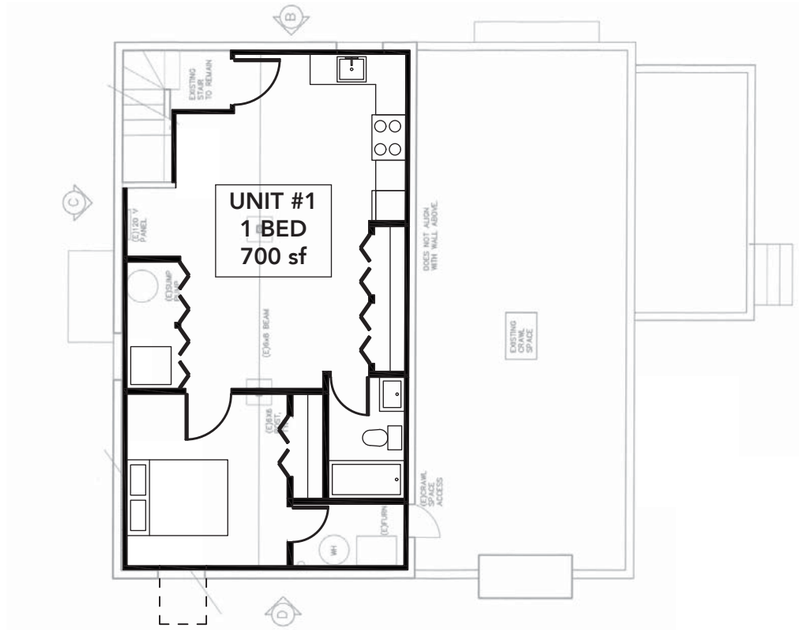
- Construct horizontal and vertical fire/sound separation between units
- Seismic upgrade
- Install automatic fire sprinkler system (Type 13R)
- Install walls and doors as shown on plan to create new units
- Install kitchens and bathrooms as shown
- Provide access and emergency escape to basement units
- Envelope upgrades at existing unheated spaces

Pros

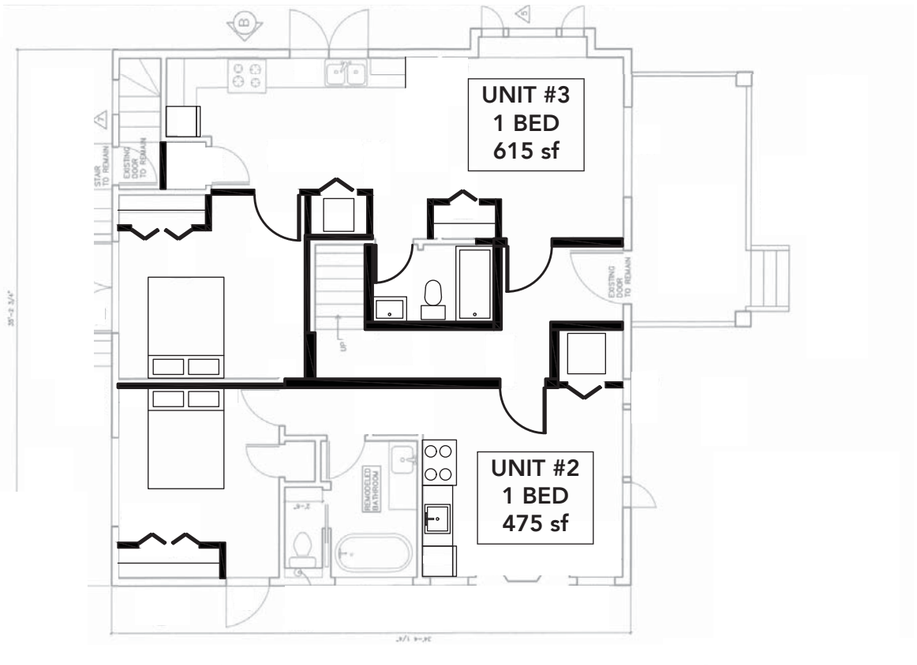
- 5 units in 2,875 sf maximizes density
- No ADA units required for internal conversion
- Existing interior stair can be re-used

Cons

- Units are small and awkward
- Costly commercial code upgrade including seismic & sprinklers



PLAN Basement 700 sf



PLAN 1st Level 1,225 sf

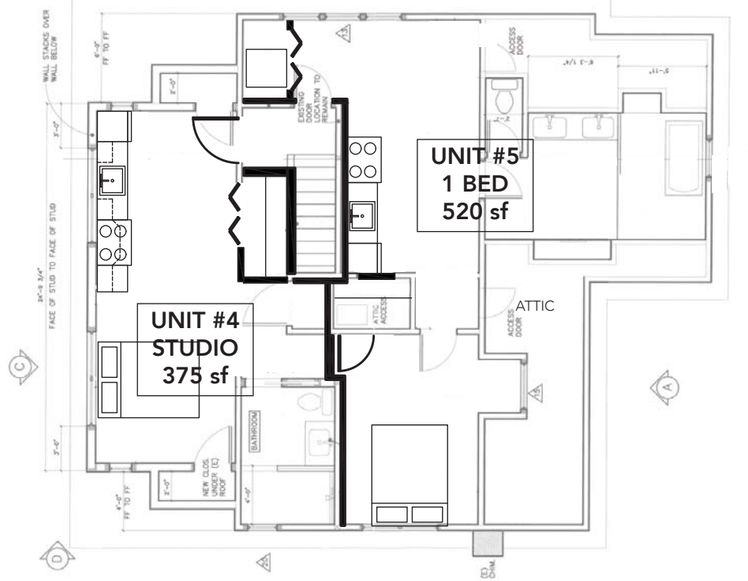
Scale: 1″=10′

0 2′ 5′ 10′

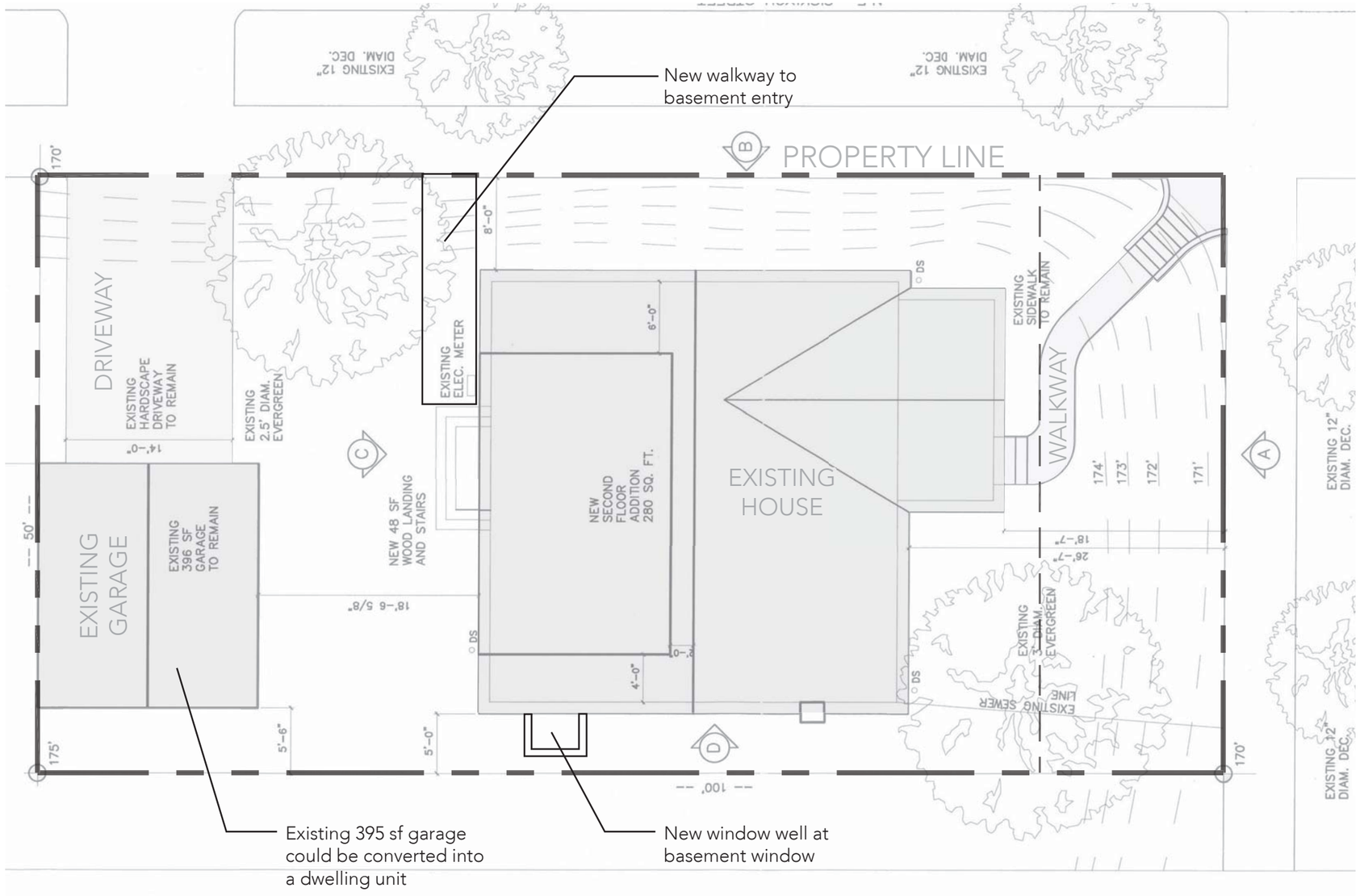
LEGEND

Existing construction (grey)

New construction (black)



PLAN 2nd Level 950 sf



SITE PLAN

Scale: 1"=10'

0 2' 5' 10'

PROPOSED SITE IMPROVEMENTS

- Add walkway for basement unit access
- Add window well for emergency escape at basement bedrooms
- Option to convert existing garage into dwelling unit

PHOTO Existing House

EXISTING BUILDING SUMMARY

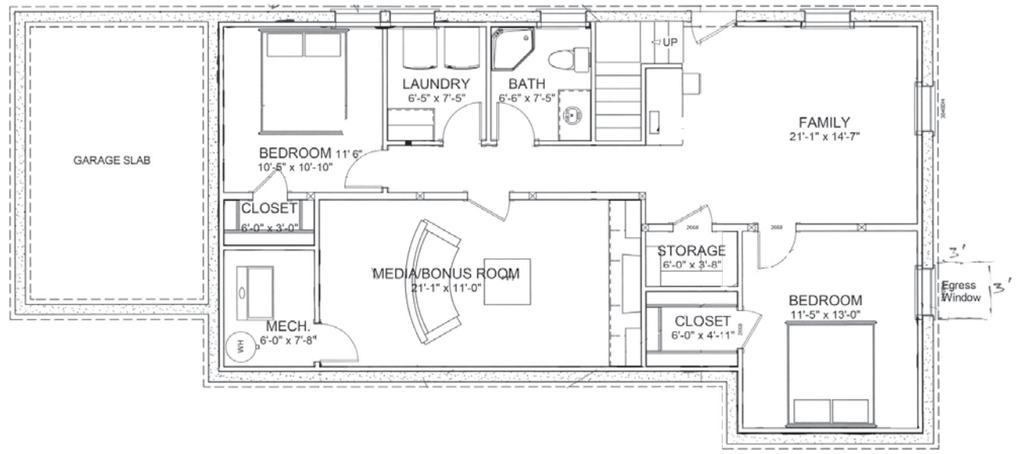
This existing building is a typical one-story single family ranch house with a one car garage and a full height basement. An interior stair connects the 1st level and the basement. The construction of the house is wood framing on concrete basement/ foundation walls. The existing site slopes to the south and allows for a walk-out basement at the rear of the house.

The house was originally built in 1952, but has since been renovated to accommodate 4 bedrooms and 3 baths. During renovations, the basement walls were furred-out and insulated to meet energy code and a window well was added to provide code required egress for a basement bedroom.

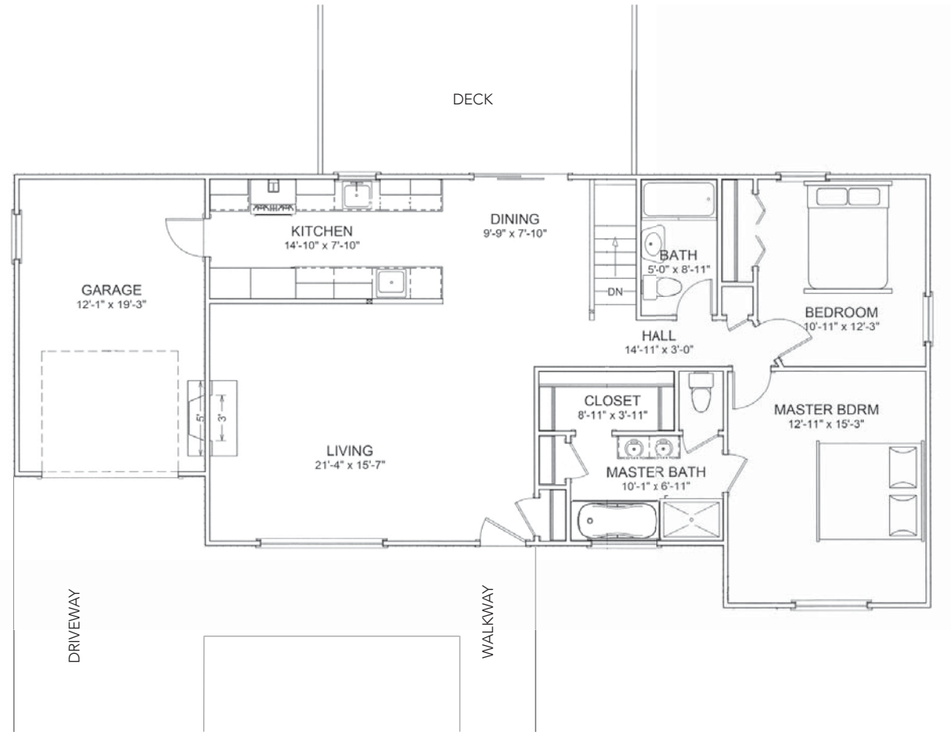
Building Area:	2,700 sf
Building Height:	15 ft +/-
Site Area:	8,300 sf
FAR:	0.18:1 (excluding basement)
Construction Type:	V-B (Unprotected Wood Frame)
Sprinklering:	No
Existing Occupancies:	R-3

Scale: 1"=10'

0 2' 5' 10'

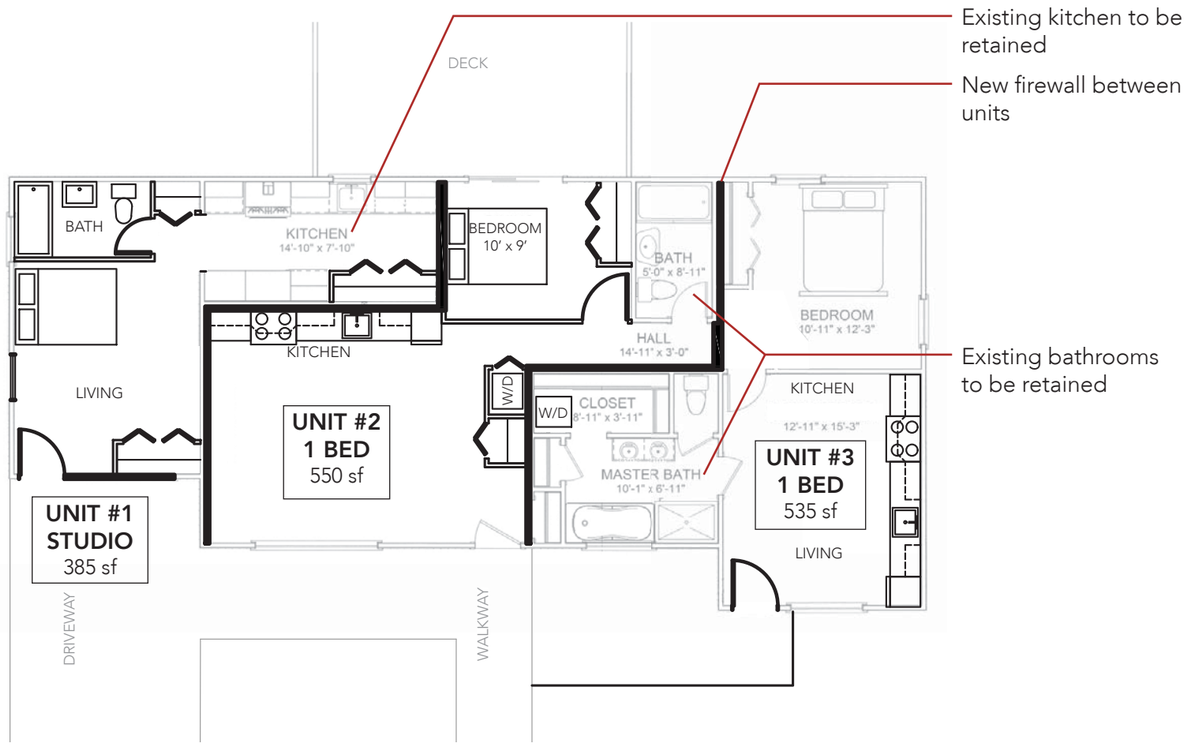


PLAN Basement 1,225 sf



PLAN 1st Level 1,475 sf

1950s RANCH EXISTING BUILDING



PLAN 1st Level 1,475 sf

PROPOSED CONVERSION SUMMARY

This scheme aims to maximize the number of dwelling units achievable in a typical post-war ranch house, in this case assuming there is no existing basement.

The result is three single-story "townhouse" units separated by code required firewalls. The goal of this scheme is to minimize the amount of demolition of existing materials, especially the kitchen and bathrooms. With the addition of two kitchens, a bathroom, and a few partition walls, the existing house is able to be converted in to two one-bedroom units and one studio unit.

Building Area: 1,475 sf

Conversion Requirements

- Construct fire/sound separation walls between units
- Install (2) additional entry doors
- Install (2) additional kitchens
- Install (1) additional bathroom

Pros

- Commercial building code not required due to townhouse layout
- Seismic upgrade not required
- Sprinklers not required
- Reuse existing kitchen and baths
- Potential for accessible units with minor upgrades

Cons

- Awkward unit layouts
- Removal of garage

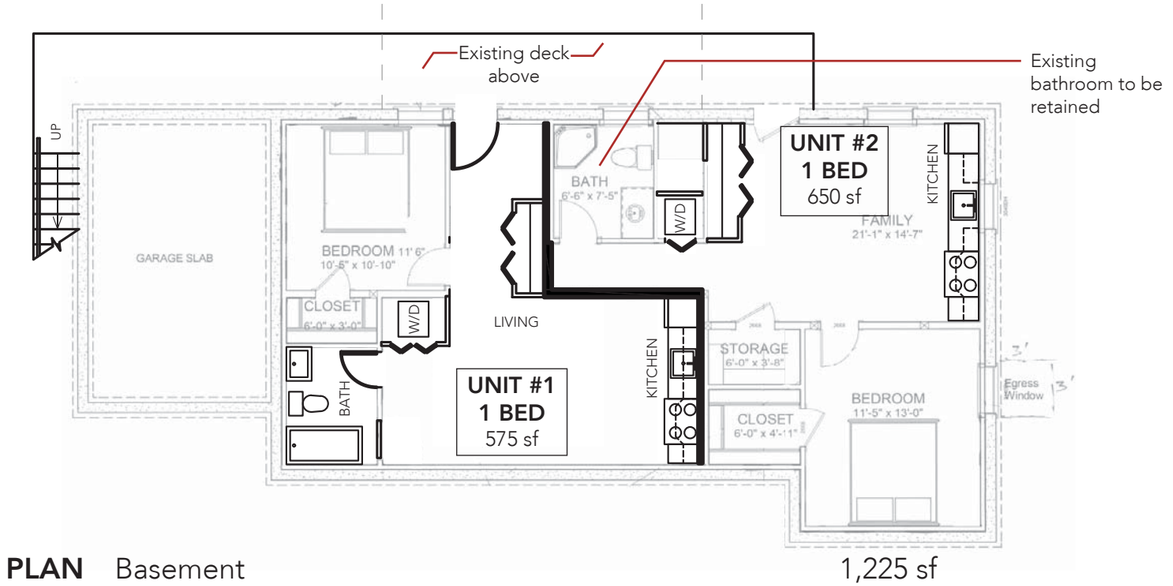
Scale: 1"=10'

0 2' 5' 10'

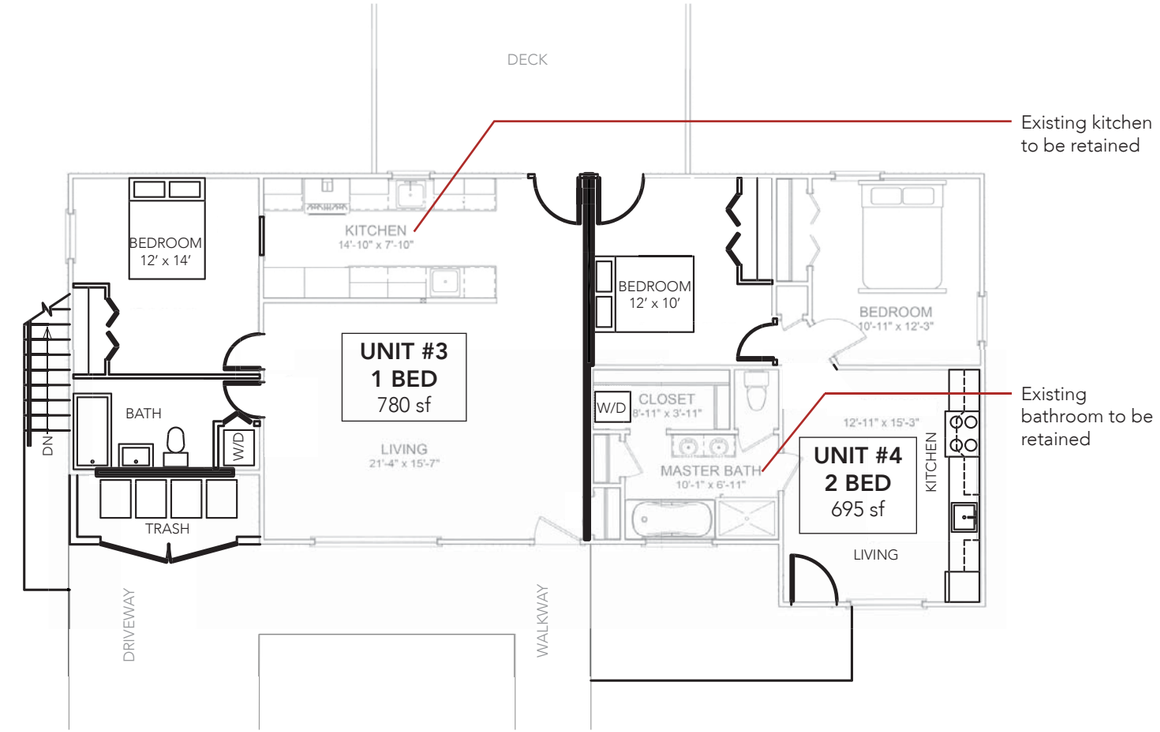
LEGEND

Existing construction (grey)

New construction (black)



PLAN Basement 1,225 sf



PLAN 1st Level 1,475 sf

1950s RANCH PROPOSED CONVERSION **OPT B - APARTMENTS**

PROPOSED CONVERSION SUMMARY

This scheme aims to maximize the number of dwelling units achievable in a post-war ranch house with an existing full height walk-out basement.

The result is a four unit apartment building with a one-bedroom unit and a two bedroom unit on the 1st level and two one-bedroom units on the basement level. Fire and sound separation is required vertically and horizontally between units. This scheme stacks separate units vertically; therefore the occupancy classification is to be converted from an R-3 single family home to an R-2 apartment building. R-2 occupancies require conformance with the commercial building code including providing an automatic fire sprinkler system. This conversion will also require a seismic upgrade per city code 24.85.040.

Conversion Requirements

- Construct fire/sound separation walls between units
- Construct horizontal fire/sound separation between units
- Seismic upgrade
- Install automatic fire sprinkler system
- Install (2) additional unit entry doors
- Install (3) additional kitchens
- Install (2) additional bathrooms

Pros

- Maximizes number of units
- Potential for accessible units on 1st level with minor upgrades

Cons

- Commercial building code required
- Seismic upgrade required
- Sprinklers required
- Removal of garage

Scale: 1″=10′

0 2′ 5′ 10′

LEGEND

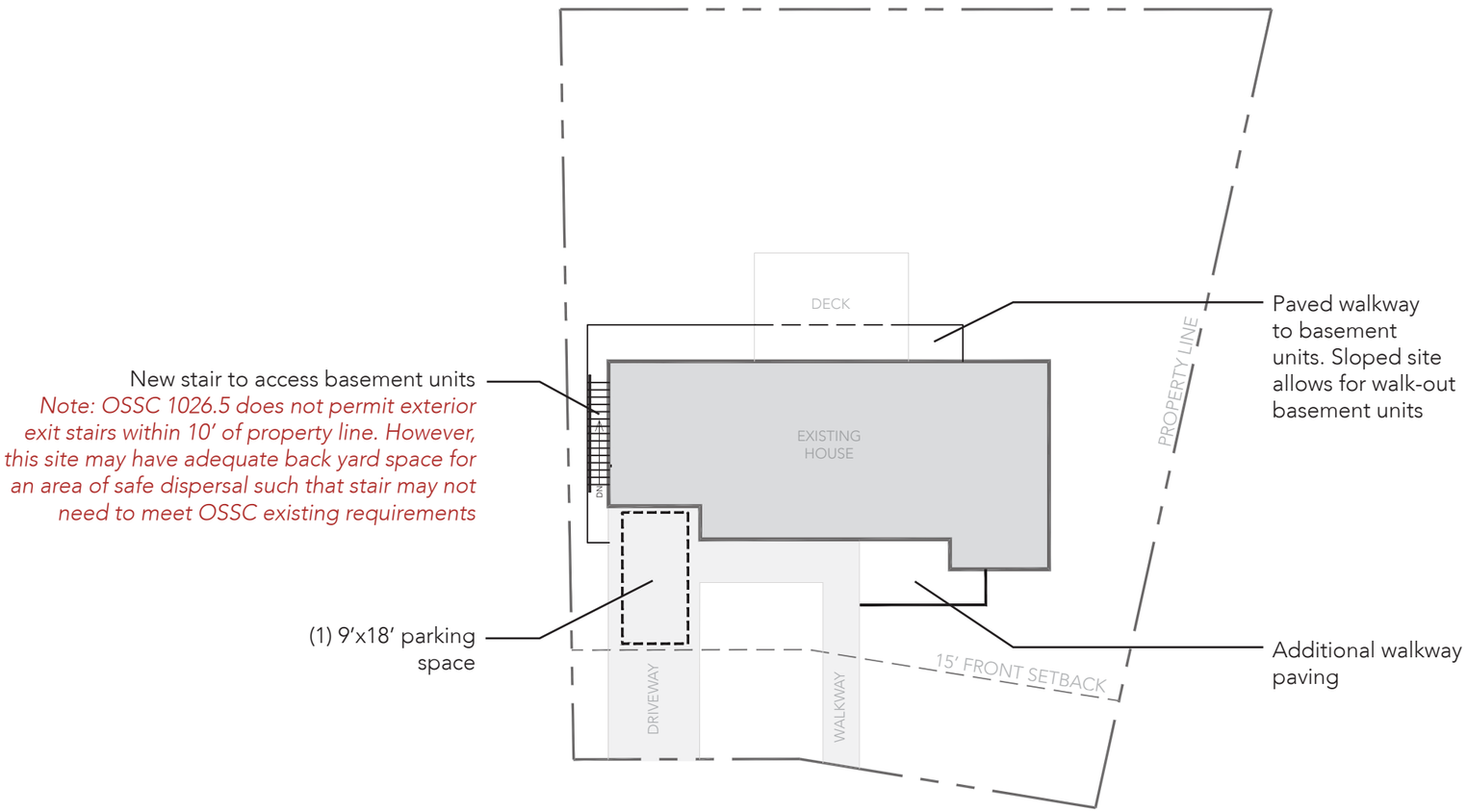
Existing construction (grey)

New construction (black)

deca ARCHITECTURE INC

PROPOSED SITE IMPROVEMENTS

- Additional walkway paving required to provide paved access to all units
- Paved steps required to access basement units



SITE PLAN