# **Appendix B** Code Modeling – Prototypes

# Better Housing by Design

AN UPDATE TO PORTLAND'S MULTI-DWELLING ZONING CODE

The purpose of these prototypes was to model draft multi-dwelling zoning code development standards to illustrate and assess potential built outcomes and to consider how the various regulations work in relationship to each other. Project staff used the prototypes to assess if the draft base and bonus floor area ratios (FAR) for the multi-dwelling zones are achievable, given the other development parameters, such as maximum building height, site coverage, and required setbacks.

Notes on the Code Modeling Prototypes and Parameters

- Zone names: uses current zones. The current R3 and R2 zones are proposed to be combined into the new RM1 zone (the proposed standards for this new zone correspond to those shown for the R2 zone code modeling prototypes).
- **Prototype site locations:** based on common inner neighborhood and eastern neighborhood site configurations.
- Development standards: modeled on basic development standards in the Proposed Draft. See table – shading indicates standards that are the same as current regulations. Not shown on the table are standards for the Deeper Housing Affordability Bonus (modeled for prototypes 2, 4, 8 and 10), which provide 10 feet of additional height and an additional 10% building coverage for qualifying projects.

Development Standards	R3	R2	R1	RH
New Proposed Zone	RM1	RM1	RM2	RM3/RM4
Base FAR	.75 to 1	1 to 1	1.5 to 1	2 to 1 / 4 to 1
Bonus FAR	1.125 to 1	1.5 to 1	2.25 to 1	3 to 1 / 6 to 1
Max. Height	35′	35'	45'	65' / 75'
Max. Building Coverage	45%	50%	60%	85%
Min. Front Setback	10'	10′	10′	10' / 0'
Side/Rear Setback	5′	5′	5′	5'
Outdoor Space / Unit	48 sq. ft.	48 sq. ft.	48 sq. ft.	36/48 sq. ft.
Landscaping	35%	30%	20%	15%

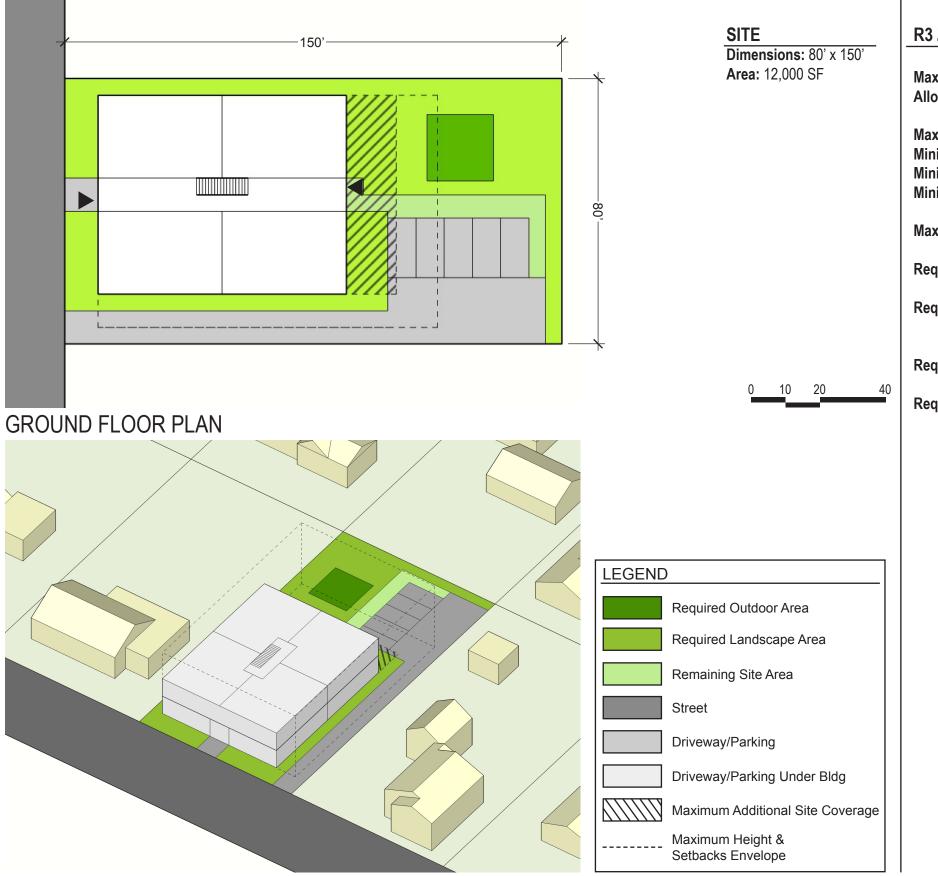
- **Eastern Portland rear setback:** Eastern Portland prototypes used a rear setback equivalent to 25% of site depth.
- Step down height: R1 inner neighborhood prototypes were modeled assuming rear of site abuts single-dwelling zoning, with height limited to 35 feet for a 25-foot distance from rear property line.
- **Outdoor space:** all prototypes show outdoor space as common area (regulations also allow private outdoor spaces such as balconies). Large prototype sites modeled the draft requirement for outdoor common area equal to 10 percent of site area.
- FAR modeling and numbers of units: prototypes illustrate maximum base and bonus FARs, but this is not intended to indicate the likelihood or economic feasibility of this scale. Except for the townhouse variants, modeling assumed approximately 1,000 square feet per unit (gross including shared hallways/stairways).
- Parking: assumes site locations close to frequent transit, where no parking is required for projects with up to 30 units.
- RH (4 to 1 FAR) prototypes: prototypes 10 and 11 did not model the 10-foot side/rear setbacks proposed in the Discussion Draft for buildings taller than 55 feet.

#### **Code Modeling Outcomes**

The code modeling showed that the draft development parameters can accommodate the proposed base and bonus FARs, although the bonus FARs almost entirely fill the potential building envelope defined by the building height, coverage and setback parameters. The modeling also showed that requirements for outdoor common areas and Eastern Portland deep rear setbacks would not prevent the maximum FARs from being achieved.

Additional Information: See Appendix C for a summary of an analysis of the economic feasibility of the proposed base and bonus FARs, based on these prototypes.

# **PROTOTYPE 1** | R3 ZONE - BASE FAR | EASTERN NEIGHBORHOOD



#### **R3 ZONE STANDARDS**

Max FAR: 0.75 : 1 Allowable Building Floor Area: 9,000 SF

Max Height: 35' Minimum Front Setback: 10' Minimum Side Setback: 5' Minimum Rear Setback: 25% of site depth

Max Building Coverage: 45% (5,400 SF)

Required Landscaping: 35% of site area

Required Outdoor Space: 48 SF / unit

**Required Common Area:** 0%

**Required Parking Stalls:** 0

#### **BUILDING PROTOTYPE**

FAR: 0.75 : 1 Building Floor Area: 9,000 SF

Building Coverage: 4,500 SF

Required Outdoor Space: 384 SF

Landscaping: 4,200 SF

Height: 20'

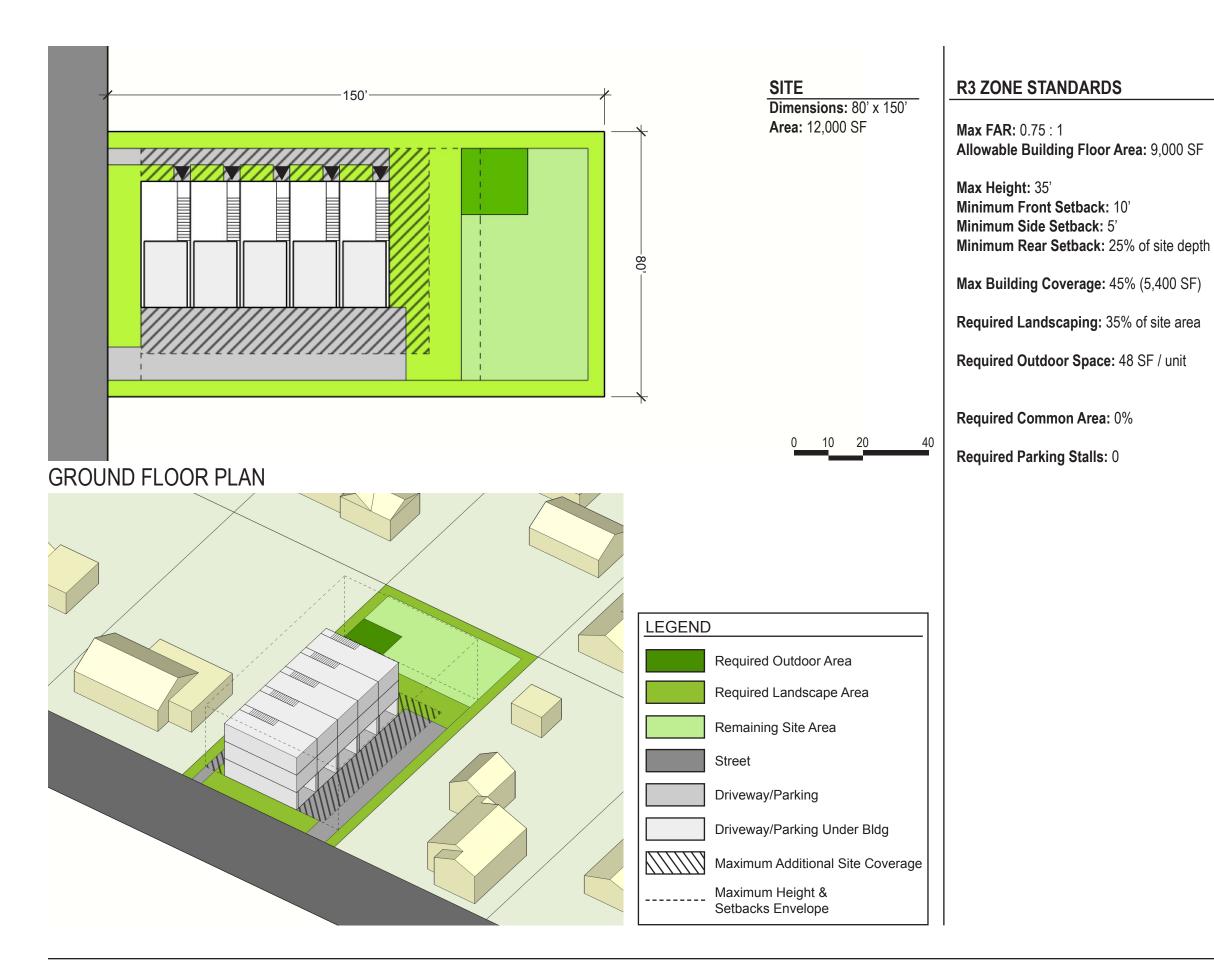
(shown as part of common area) Common Area: 400 SF

**Provided Parking Stalls:** 5

Number of Units: 8 Average Unit Area: 1,000 SF **Building Efficiency:** 88%







#### **BUILDING PROTOTYPE**

FAR: 0.71 : 1 Building Floor Area: 8,500 SF

Building Coverage: 2,850 SF

Height: 30'

Required Outdoor Space: 240 SF (shown as part of common area)

Common Area: 400 SF

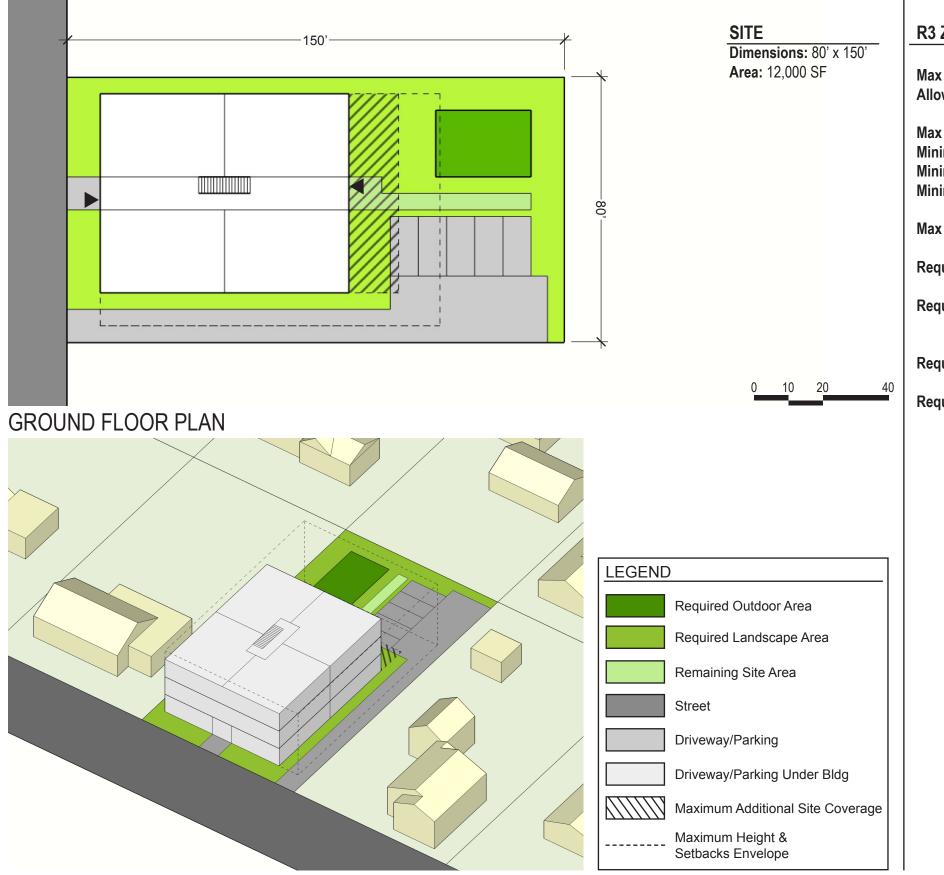
Landscaping: 4,200 SF

**Provided Parking Stalls:** 5

Number of Units: 5 Unit Area: 1,450 SF Garage Area: 260 SF Total Area: 1,710 SF



# **PROTOTYPE 1** | R3 ZONE - BONUS FAR | EASTERN NEIGHBORHOOD



#### **R3 ZONE STANDARDS**

Max FAR: 1.125 : 1 (With Bonus) Allowable Building Floor Area: 13,500 SF Max Height: 35' Minimum Front Setback: 10' Minimum Side Setback: 5' Minimum Rear Setback: 25% of site depth

Max Building Coverage: 45% (5,400 SF)

Required Landscaping: 35% of site area

Required Outdoor Space: 48 SF / unit

**Required Common Area:** 0%

**Required Parking Stalls:** 0

## **BUILDING PROTOTYPE**

FAR: 1.125 : 1 Building Floor Area: 13,500 SF

Height: 30'

Building Coverage: 4,500 SF

Landscaping: 4,200 SF

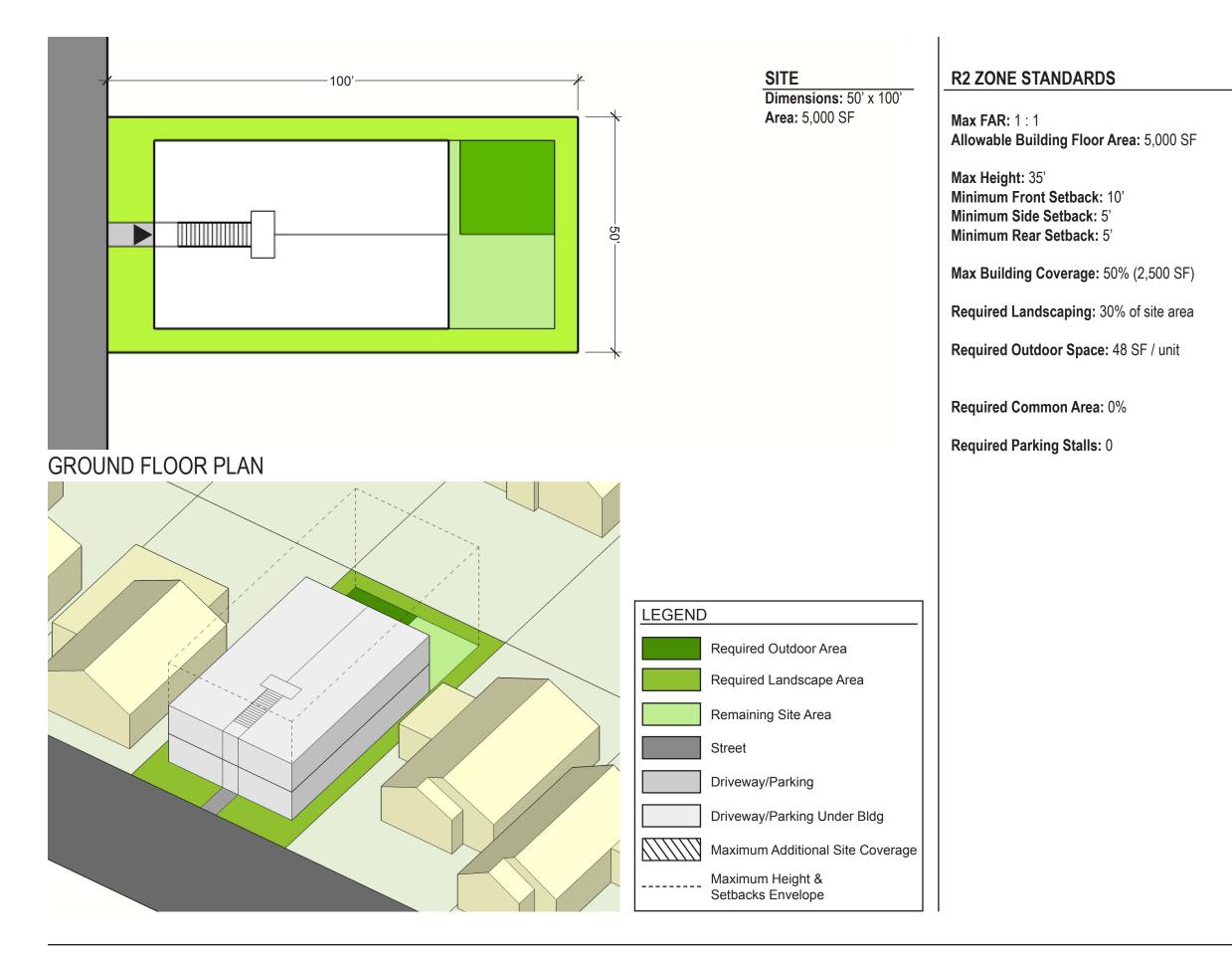
Required Outdoor Space: 576 SF (shown as part of common area)

Common Area: 576 SF

**Provided Parking Stalls:** 5

Number of Units: 12 Average Unit Area: 1,020 SF **Building Efficiency:** 90%





PROTOTYPE 2 | R2 ZONE - BASE FAR | INNER NEIGHBORHOOD

#### **BUILDING PROTOTYPE**

FAR: 1 : 1 Building Floor Area: 5,000 SF

Height: 20'

Building Coverage: 2,500 SF

Landscaping: 1,500 SF

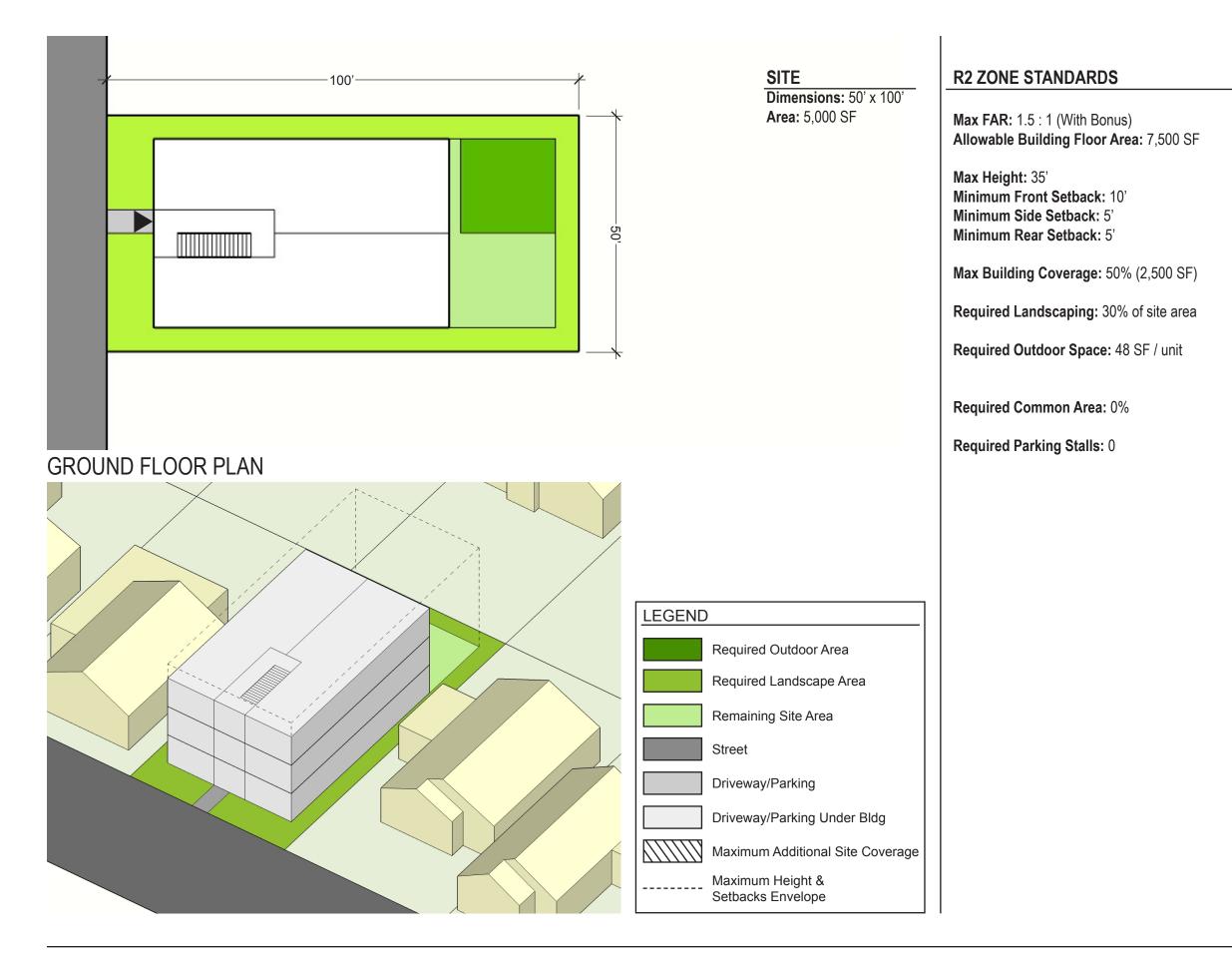
**Required Outdoor Space:** 192 SF (shown as part of common area)

Common Area: 400 SF

**Provided Parking Stalls:** 0

Number of Units: 4 Average Unit Area: 1,173 SF Building Efficiency: 93%





PROTOTYPE 2 | R2 ZONE - BONUS FAR | INNER NEIGHBORHOOD

#### **BUILDING PROTOTYPE**

FAR: 1.5 : 1 Building Floor Area: 7,500 SF

Height: 30'

Building Coverage: 2,500 SF

Landscaping: 1,500 SF

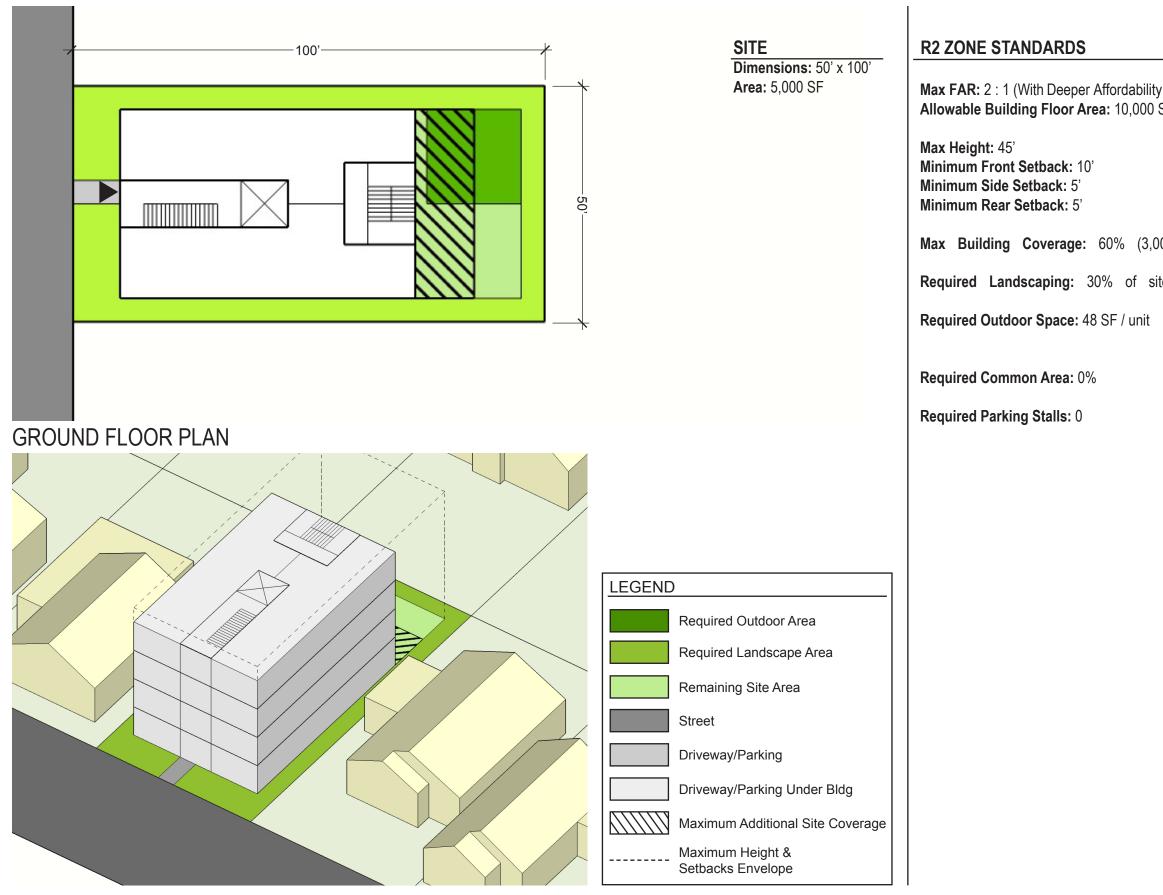
**Required Outdoor Space:** 288 SF (shown as part of common area)

Common Area: 400 SF

**Provided Parking Stalls:** 0

Number of Units: 6 Average Unit Area: 1,122 SF Building Efficiency: 90%

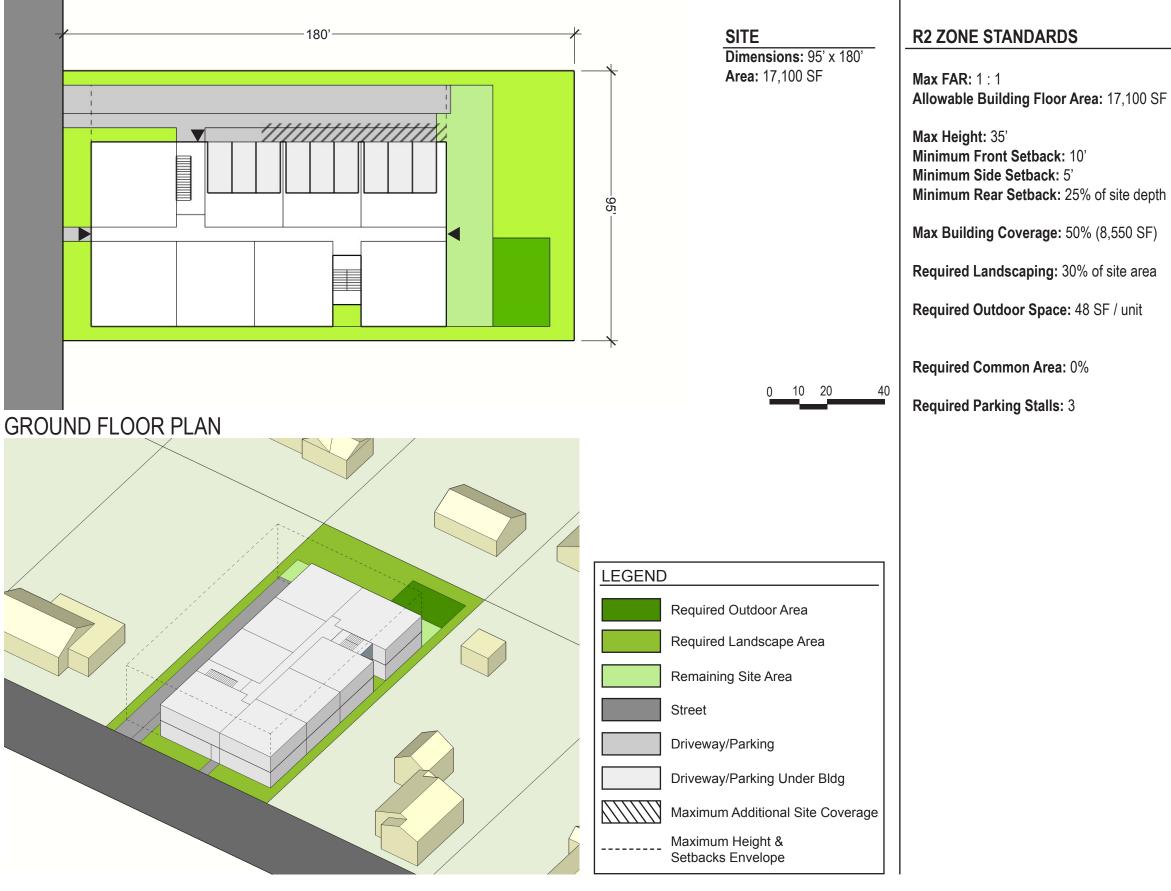




**PROTOTYPE 2** | R2 ZONE - DEEPER AFFORDABILITY BONUS | INNER NEIGHBORHOOD BETTER HOUSING BY DESIGN | BUILDING PROTOTYPES

	BUILDING PROTOTYPE
r Bonus) SF	FAR: 2 : 1 Building Floor Area: 10,000 SF
	Height: 40'
00 SF)	Building Coverage: 2,500 SF
te area	Landscaping: 1,500 SF
	<b>Required Outdoor Space:</b> 384 SF (shown as part of common area)
	Common Area: 400 SF
	Provided Parking Stalls: 0
	Number of Units: 8 Average Unit Area: 924 SF Building Efficiency: 74%





**PROTOTYPE 3** | R2 ZONE - BASE FAR | EASTERN NEIGHBORHOOD

## **BUILDING PROTOTYPE**

FAR: 0.94 : 1 Building Floor Area: 16,096 SF

Height: 20'

Building Coverage: 8,048 SF

Landscaping: 5,130 SF

Required Outdoor Space: 624 SF (shown as part of common area)

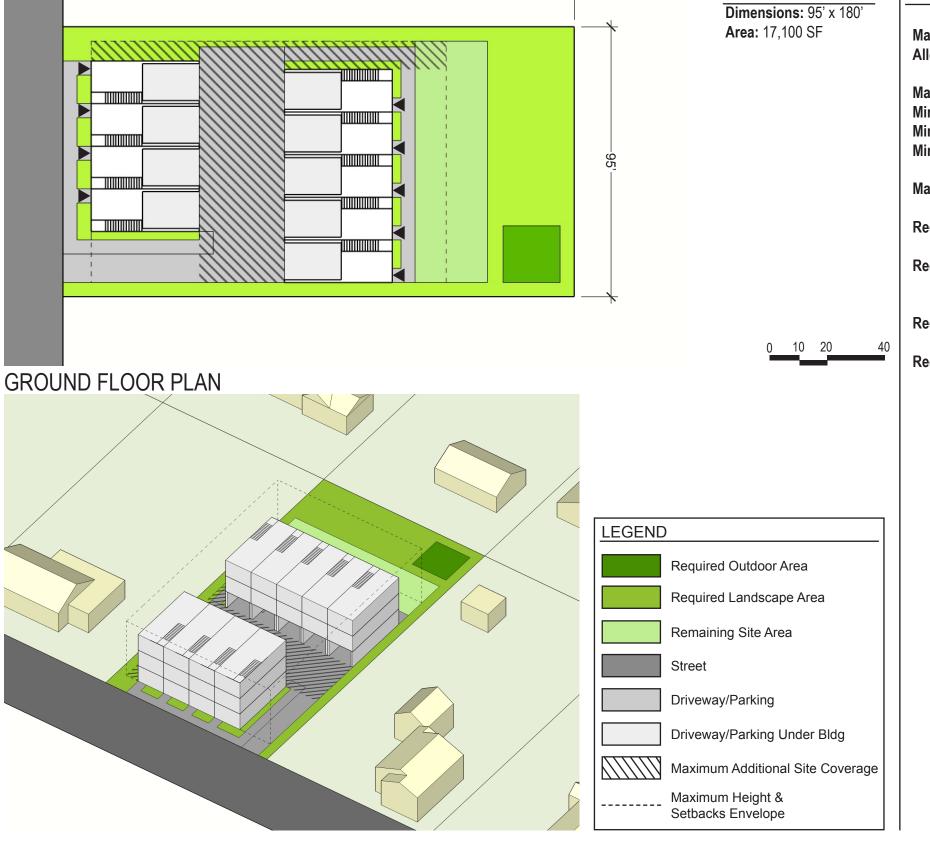
Common Area: 624 SF

**Provided Parking Stalls:** 9

Number of Units: 13 Average Unit Area: 885 SF **Building Efficiency:** 71%







180'

#### **R2 ZONE STANDARDS**

SITE

Max FAR: 1 : 1 Allowable Building Floor Area: 17,100 SF

Max Height: 35' Minimum Front Setback: 10' Minimum Side Setback: 5' Minimum Rear Setback: 25% of site depth

Max Building Coverage: 50% (8,550 SF)

Required Landscaping: 30% of site area

Required Outdoor Space: 48 SF / unit

**Required Common Area:** 0%

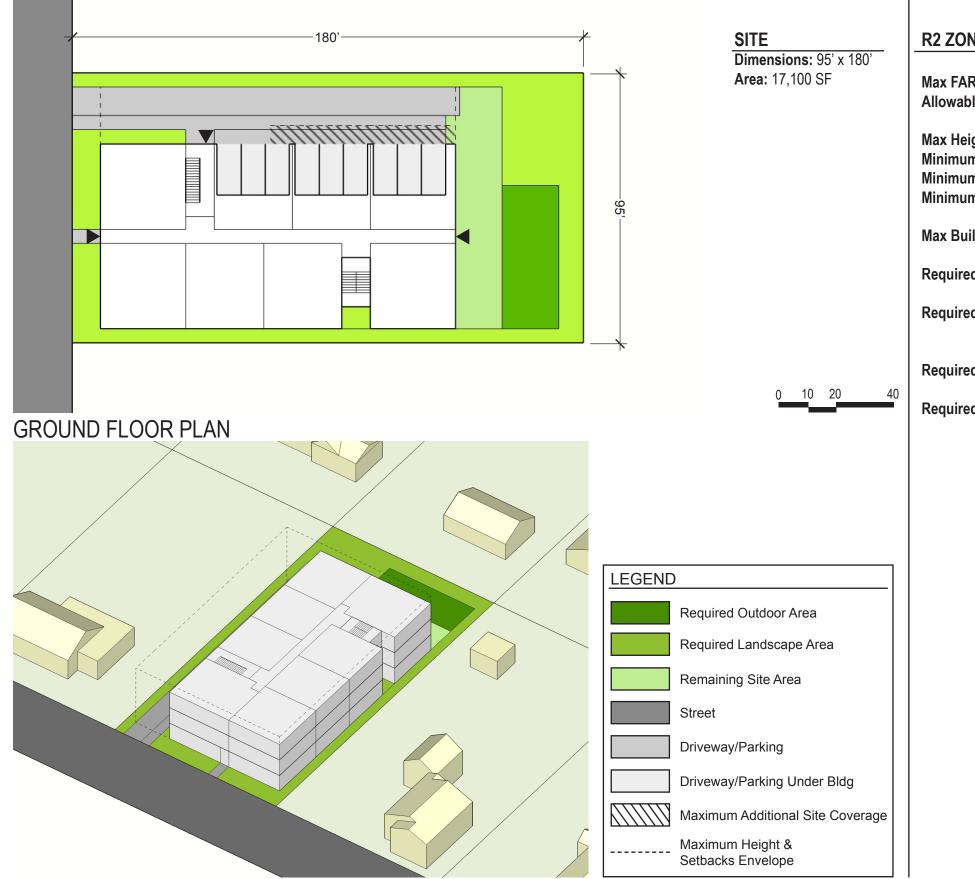
**Required Parking Stalls: 2** 

# FAR: 0.9 : 1 Building Floor Area: 15,390 SF Height: 30' Building Coverage: 5,130 SF Landscaping: 5,130 SF Required Outdoor Space: 432 SF (shown as part of common area) Common Area: 432 SF **Provided Parking Stalls:** 9 Number of Units: 9 Unit Area: 1,450 SF Garage Area: 260 SF Total Area: 1,710 SF

**BUILDING PROTOTYPE** 



# **PROTOTYPE 3** | R2 ZONE - BONUS FAR | EASTERN NEIGHBORHOOD



#### **R2 ZONE STANDARDS**

Max FAR: 1.5 : 1 (With Bonus) Allowable Building Floor Area: 25,650 SF Max Height: 35' Minimum Front Setback: 10'

Minimum Side Setback: 5' Minimum Rear Setback: 25% of site depth

Max Building Coverage: 50% (8,550 SF)

Required Landscaping: 30% of site area

Required Outdoor Space: 48 SF / unit

**Required Common Area:** 0%

**Required Parking Stalls:** 0

**BUILDING PROTOTYPE** 

**FAR:** 1.41 : 1 Building Floor Area: 24,144 SF

Height: 30'

Building Coverage: 8,048 SF

Landscaping: 5,130 SF

Required Outdoor Space: 1,008 SF (shown as part of common area)

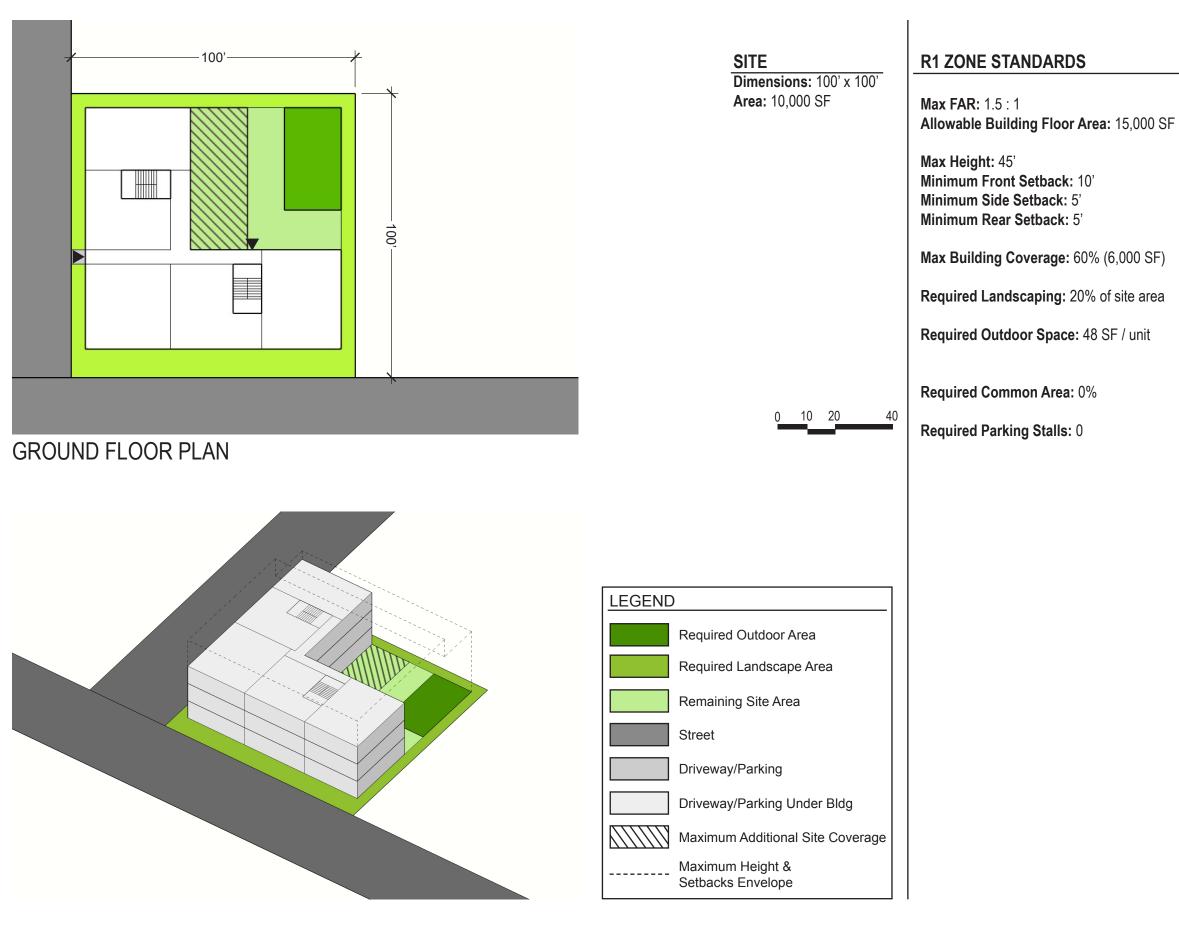
Common Area: 1,008 SF

**Provided Parking Stalls:** 9

Number of Units: 21 Average Unit Area: 888 SF **Building Efficiency:** 77%







# **BUILDING PROTOTYPE** FAR: 1.5 : 1 Building Floor Area: 15,000 SF Height: 30' Building Coverage: 5,000 SF Landscaping: 2,000 SF Required Outdoor Space: 720 SF

(shown as part of common area)

Common Area: 720 SF

Number of Units: 15 Average Unit Area: 863 SF **Building Efficiency:** 86%

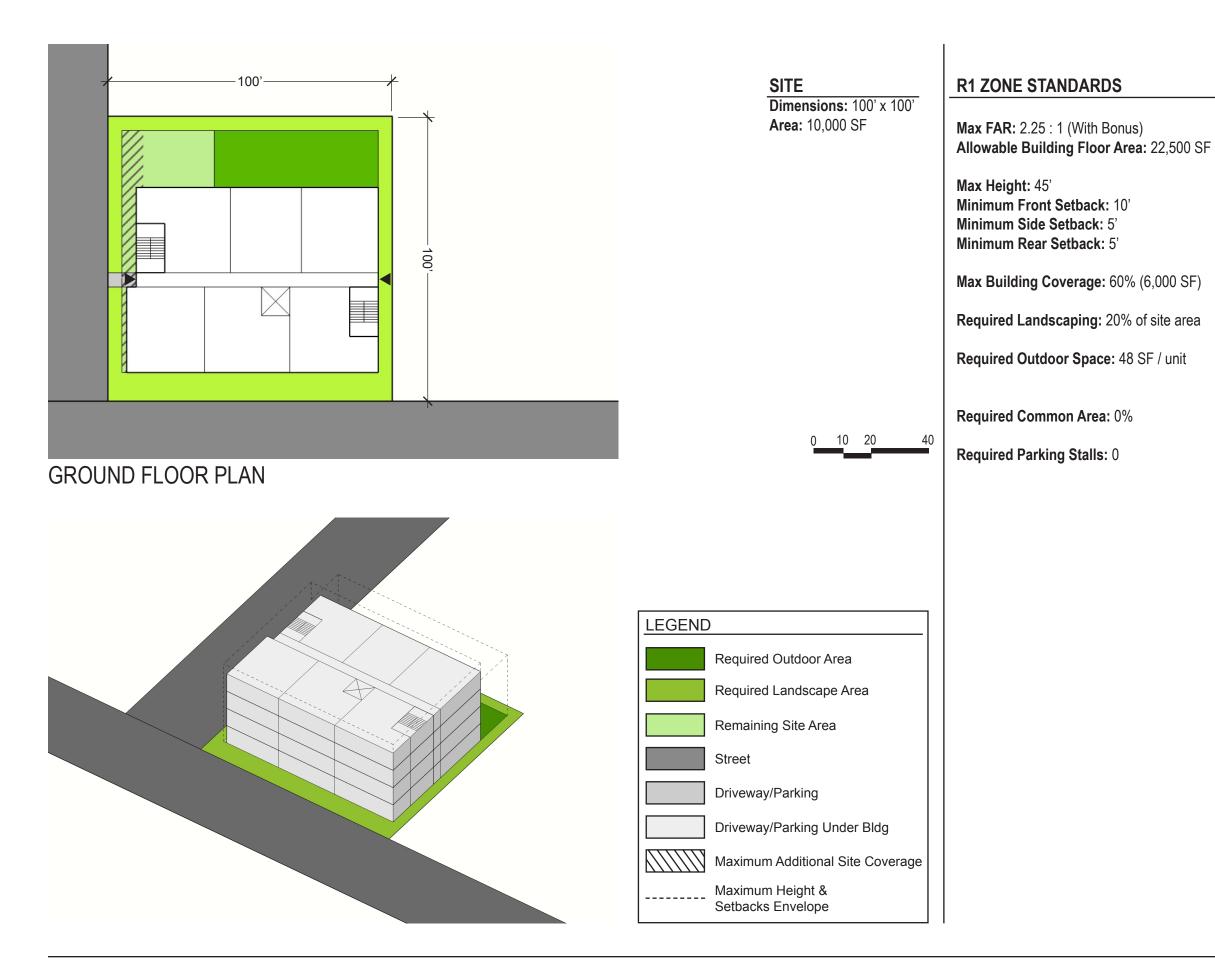
**Provided Parking Stalls:** 0

Note: Prototype shows the building height stepdown required adjacent to single-dwelling zoning, which limits building height to 35 feet within a 25foot distance of abutting lots with single-dwelling zoning.





# PROTOTYPE 4 | R1 ZONE - BONUS FAR | INNER NEIGHBORHOOD



# BUILDING PROTOTYPE FAR: 2.25 : 1 Building Floor Area: 22,500 SF

Height: 40'

Building Coverage: 5,625 SF

Landscaping: 2,000 SF

**Required Outdoor Space:** 1,152 SF (shown as part of common area)

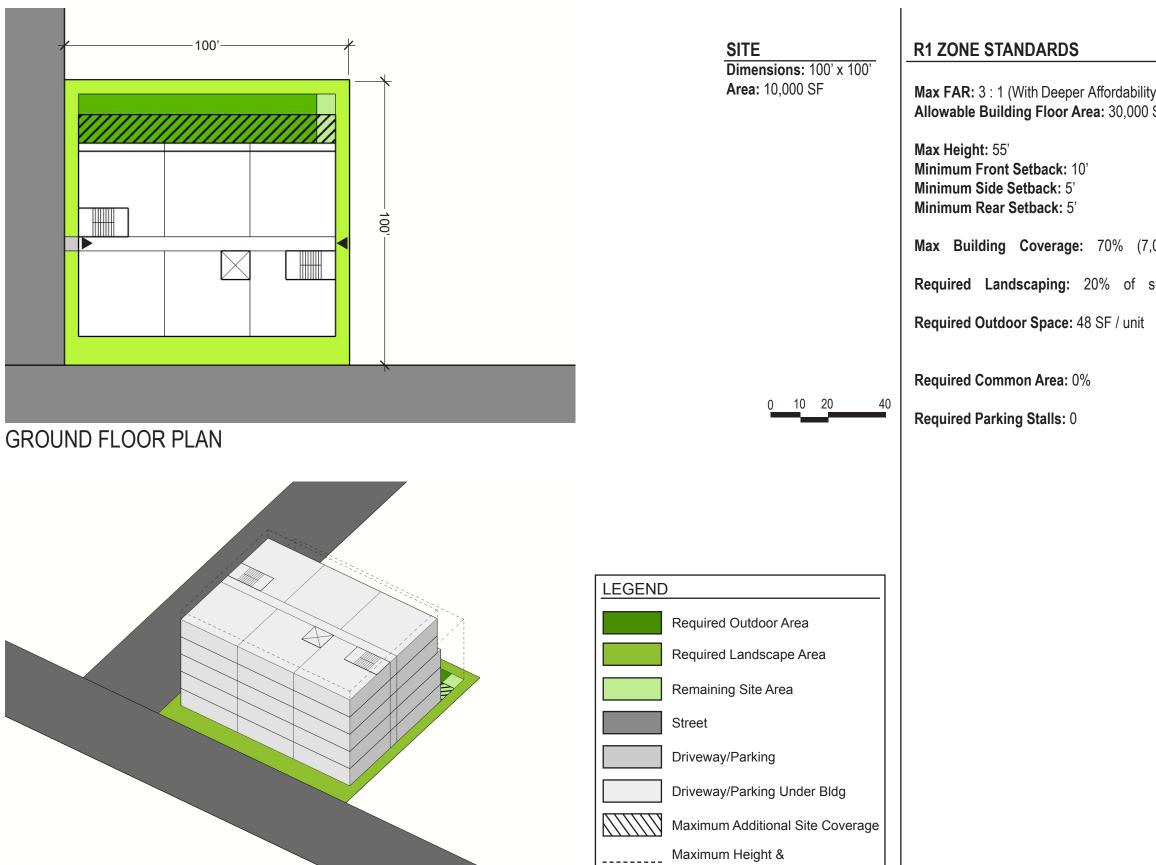
Common Area: 1,152 SF

**Provided Parking Stalls:** 0

Number of Units: 24 Average Unit Area: 793 SF Building Efficiency: 85%

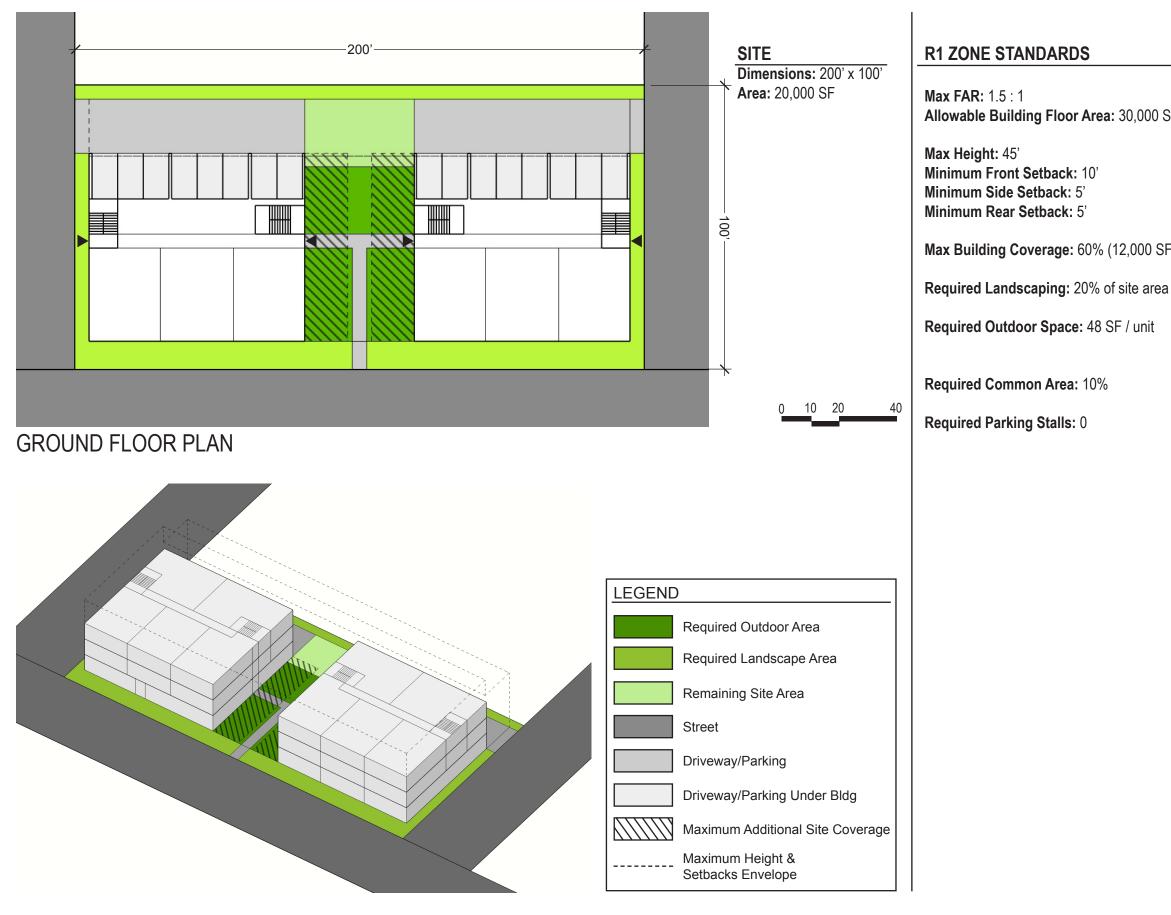
Note: Prototype shows the building height stepdown required adjacent to single-dwelling zoning, which limits building height to 35 feet within a 25foot distance of abutting lots with single-dwelling zoning.





	BUILDING PROTOTYPE
r Bonus) SF	FAR: 3 : 1 Building Floor Area: 30,000 SF
	Height: 50'
000 SF)	Building Coverage: 6,100 SF
ite area	Landscaping: 2,000 SF
	<b>Required Outdoor Space:</b> 1,440 SF (shown as part of common area)
	Common Area: 1,440 SF
	Provided Parking Stalls: 0
	Number of Units: 30 Average Unit Area: 826 SF Building Efficiency: 85%
	Note: Prototype shows the building height step- down required adjacent to single-dwelling zoning, which limits building height to 35 feet within a 25- foot distance of abutting lots with single-dwelling zoning.
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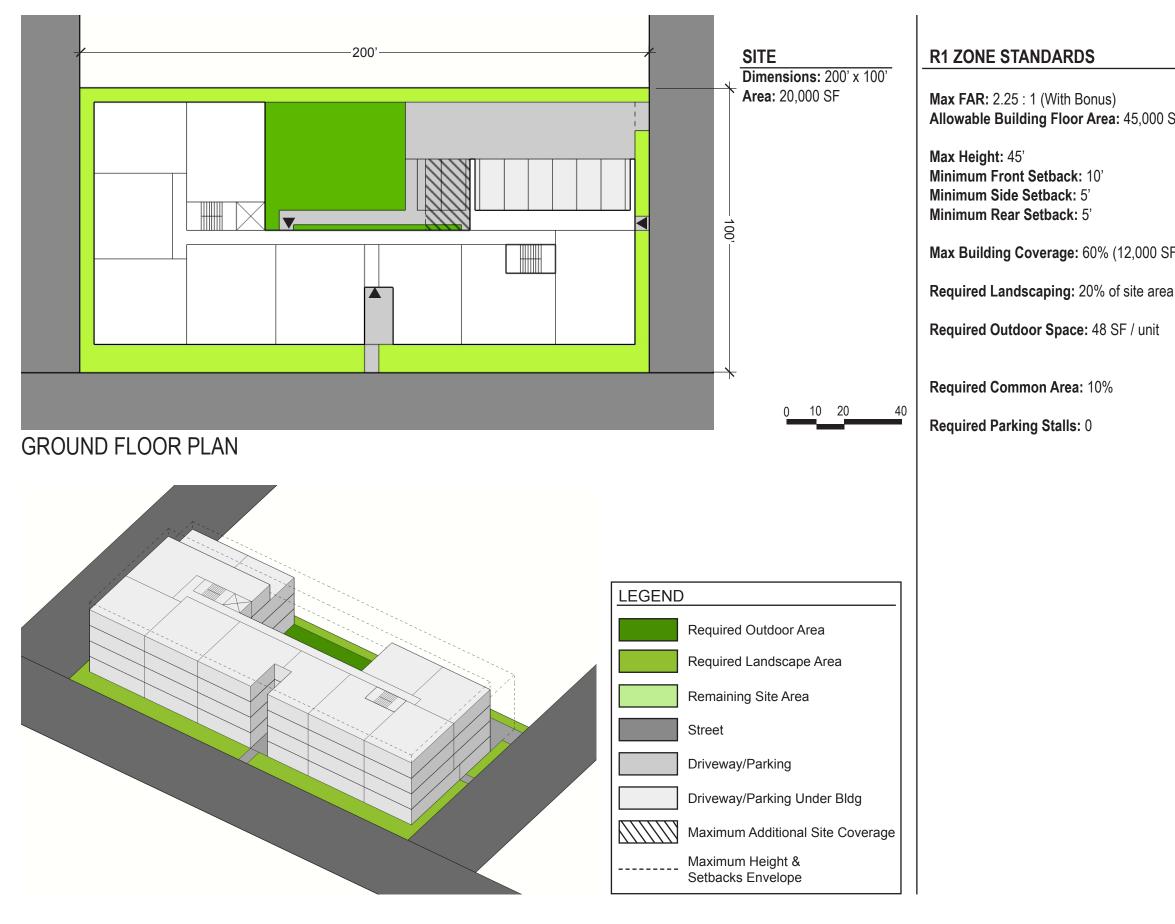




PROTOTYPE 5 | R1 ZONE - BASE FAR | INNER NEIGHBORHOOD

	BUILDING PROTOTYPE
SF	FAR: 1.5 : 1 Building Floor Area: 30,000 SF
	Height: 30'
F)	Building Coverage: 10,000 SF
l	Landscaping: 4,000 SF
	<b>Required Outdoor Space:</b> 1,248 SF (shown as part of common area)
	Common Area: 2,000 SF
	Provided Parking Stalls: 16
	Number of Units: 26 (13 / Building) Average Unit Area: 865 SF Building Efficiency: 75%
	Note: Prototype shows the building height step- down required adjacent to single-dwelling zoning, which limits building height to 35 feet within a 25- foot distance of abutting lots with single-dwelling zoning.
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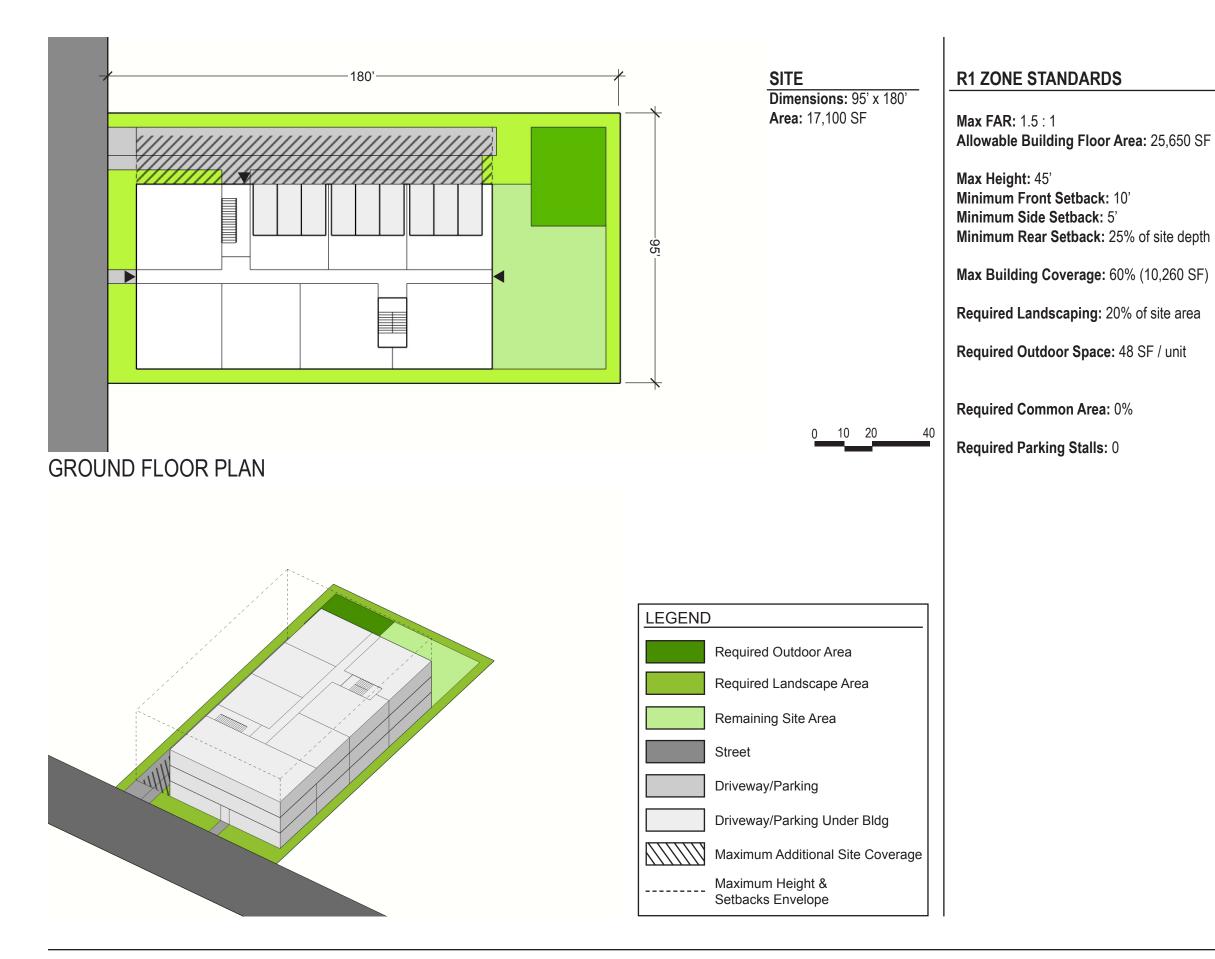
PROTOTYPE 5 | R1 ZONE - BONUS FAR | INNER NEIGHBORHOOD

	BUILDING PROTOTYPE
SF	FAR: 2.25 : 1 Building Floor Area: 45,000 SF
	Height: 40'
F)	Building Coverage: 11,550 SF
à	Landscaping: 4,000 SF
	<b>Required Outdoor Space:</b> 1,920 SF (shown as part of common area)
	Common Area: 2,000 SF
	Provided Parking Stalls: 8
	Number of Units: 40 Average Unit Area: 961 SF Building Efficiency: 86%

Note: Prototype shows the building height stepdown required adjacent to single-dwelling zoning, which limits building height to 35 feet within a 25foot distance of abutting lots with single-dwelling zoning.



# **PROTOTYPE 6** | R1 ZONE - BASE FAR | EASTERN NEIGHBORHOOD



# **BUILDING PROTOTYPE**

**FAR:** 1.43 : 1 Building Floor Area: 24,375 SF

Height: 30'

Building Coverage: 8,125 SF

Landscaping: 3,420 SF

Required Outdoor Space: 912 SF (shown as part of common area)

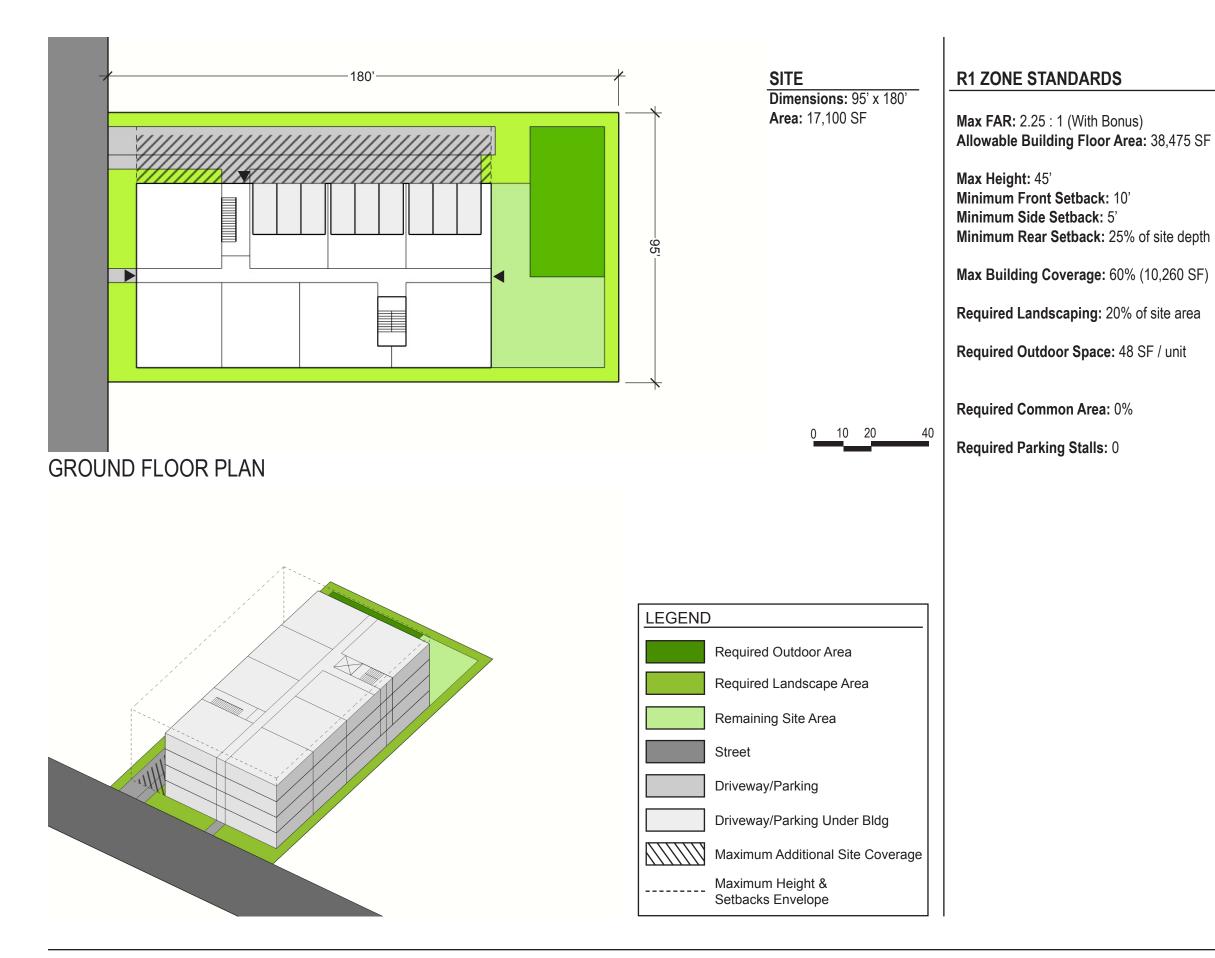
Common Area: 912 SF

**Provided Parking Stalls:** 9

Number of Units: 19 Average Unit Area: 983 SF **Building Efficiency:** 76%



# **PROTOTYPE 6** | R1 ZONE - BONUS FAR | EASTERN NEIGHBORHOOD



# **BUILDING PROTOTYPE** FAR: 1.90 : 1 Building Floor Area: 32,500 SF

Height: 40'

Building Coverage: 8,125 SF

Landscaping: 3,420 SF

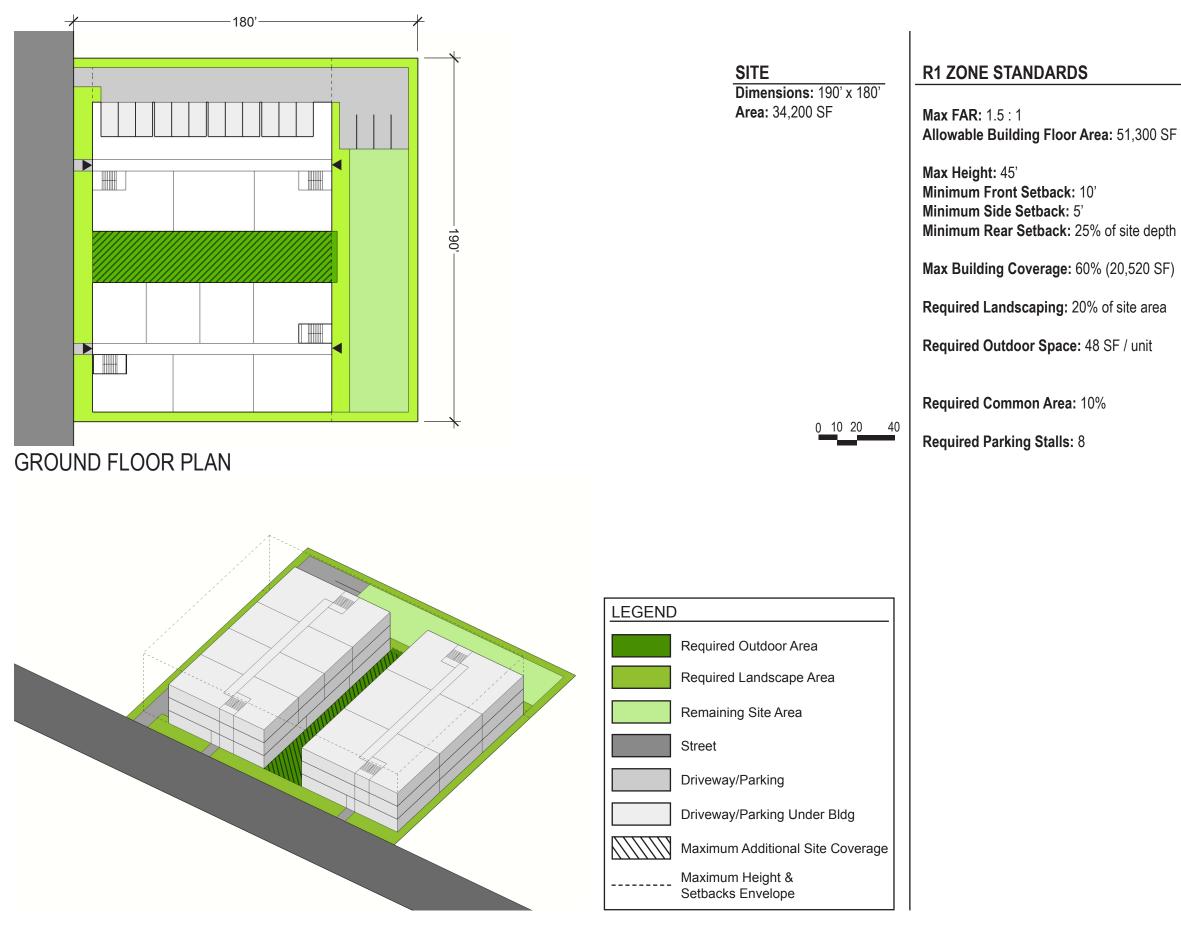
Required Outdoor Space: 1,392 SF (shown as part of common area)

Common Area: 1,392 SF

**Provided Parking Stalls:** 9

Number of Units: 29 Average Unit Area: 851 SF **Building Efficiency:** 76%





**PROTOTYPE 7** | R1 ZONE - BASE FAR | EASTERN NEIGHBORHOOD

# **BUILDING PROTOTYPE** FAR: 1.48 : 1 Building Floor Area: 50,707 SF

Height: 30'

Building Coverage: 16,902 SF

Landscaping: 6,840 SF

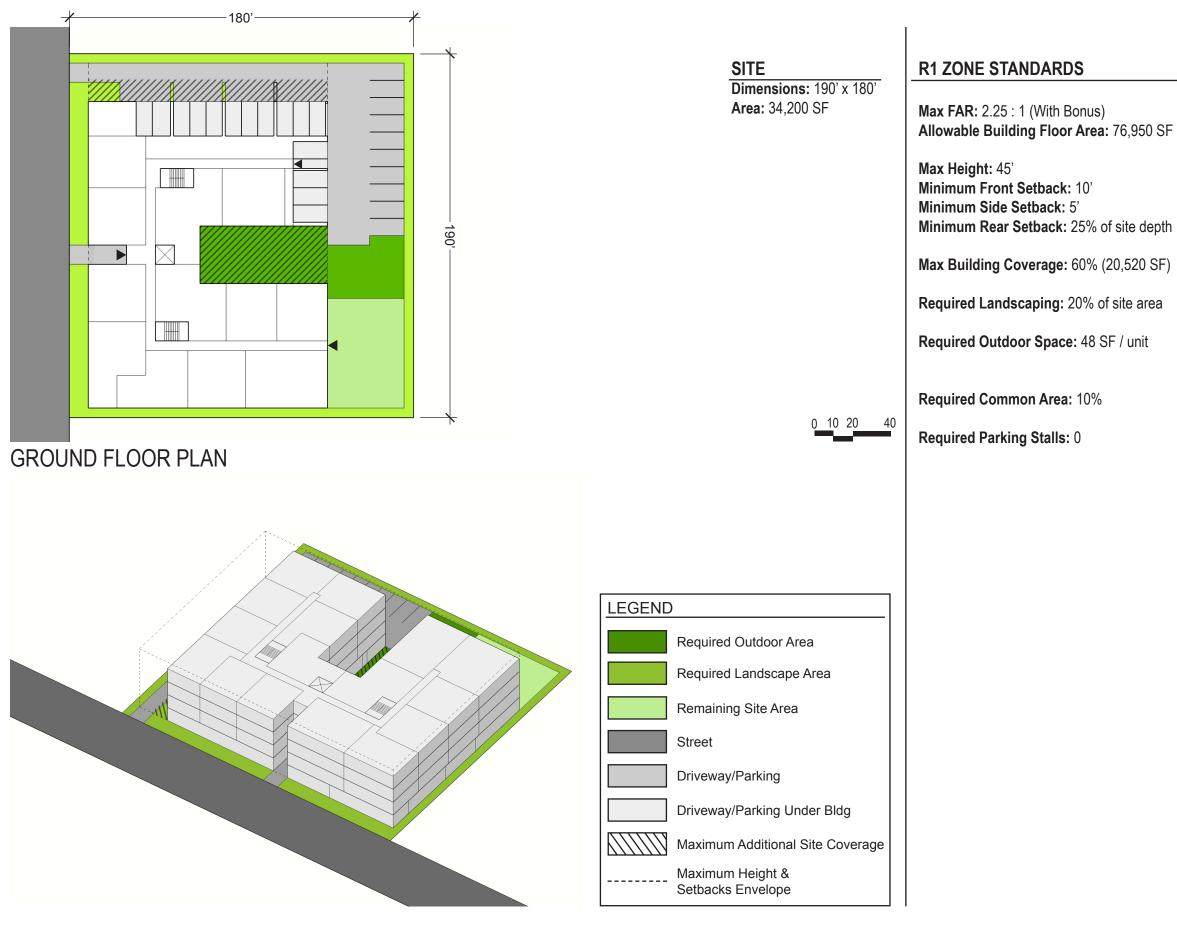
Required Outdoor Space: 1,824 SF (shown as part of common area)

Common Area: 3,420 SF

Provided Parking Stalls: 16

Number of Units: 38 Average Unit Area: 1,078 SF **Building Efficiency:** 81%





PROTOTYPE 7 | R1 ZONE - BONUS FAR | EASTERN NEIGHBORHOOD

# BUILDING PROTOTYPE SF FAR: 2.08 : 1 Building Floor Area: 71,200 SF Height: 40'

Building Coverage: 17,800 SF

Landscaping: 6,840 SF

**Required Outdoor Space:** 2,880 SF (shown as part of common area)

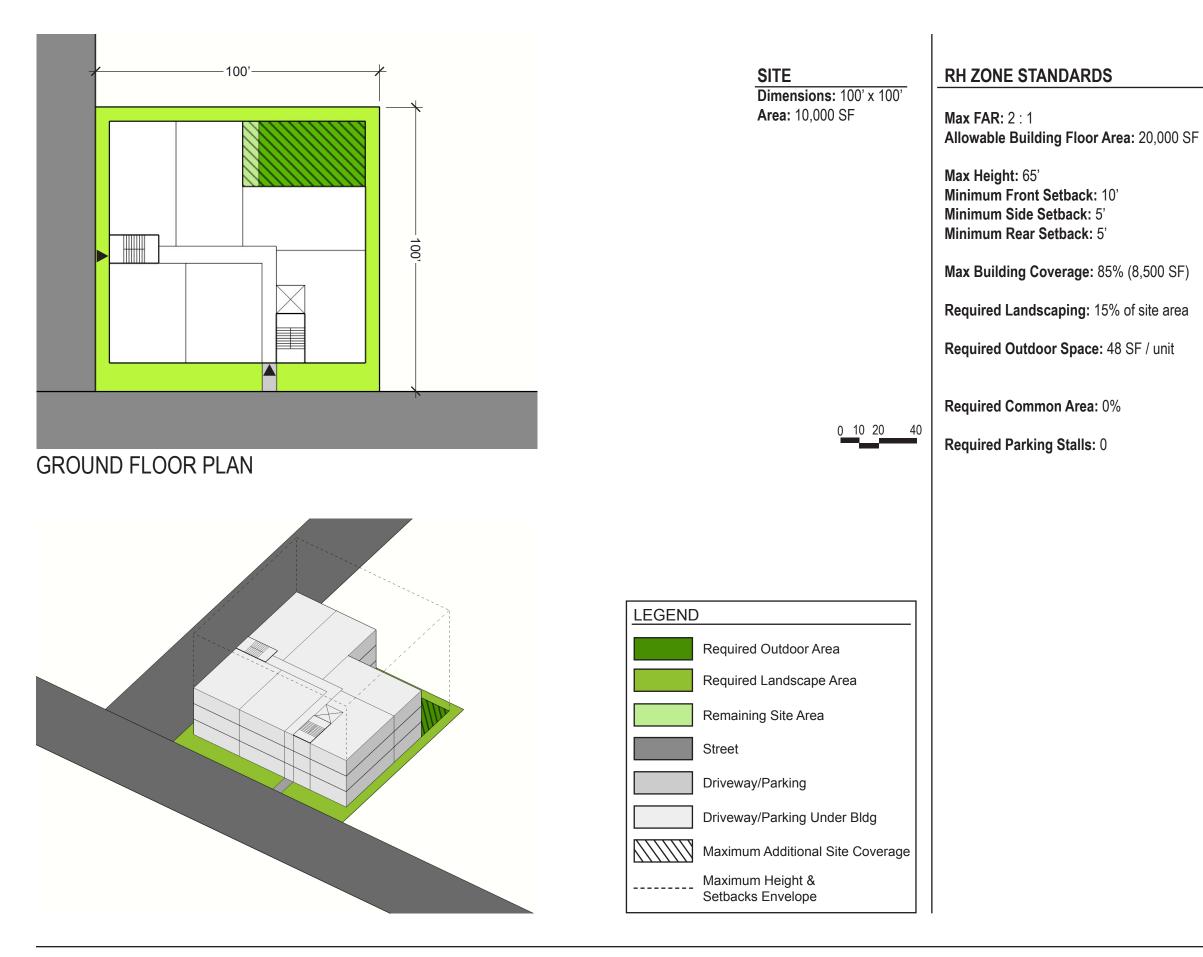
Common Area: 3,420 SF

Provided Parking Stalls: 25

Number of Units: 60 Average Unit Area: 869 SF Building Efficiency: 85%



# PROTOTYPE 8 | RH ZONE - BASE FAR | INNER NEIGHBORHOOD



### **BUILDING PROTOTYPE**

FAR: 2 : 1 Building Floor Area: 20,000 SF

Height: 30'

Building Coverage: 6,666 SF

Landscaping: 1,500 SF

**Required Outdoor Space:** 864 SF (shown as part of common area)

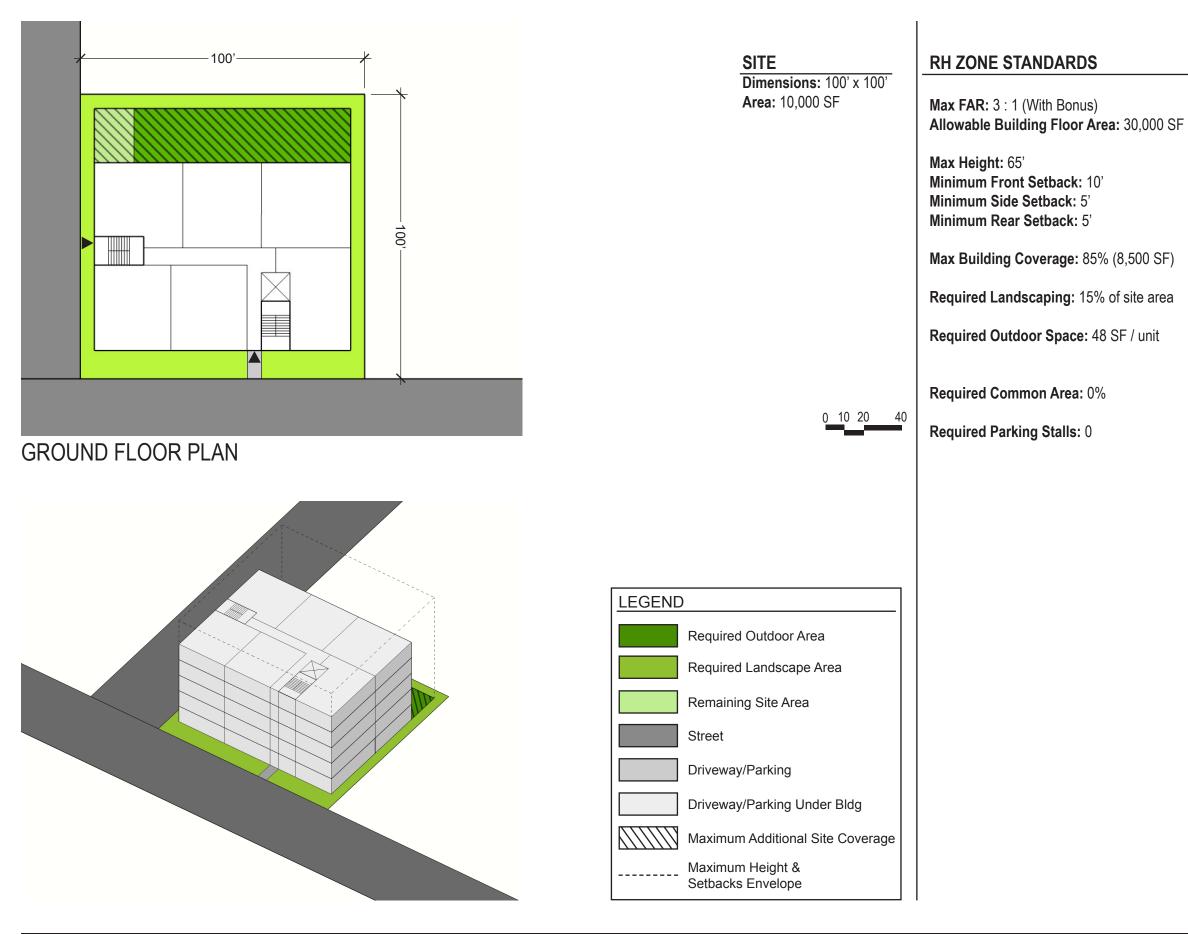
Common Area: 864 SF

**Provided Parking Stalls:** 0

Number of Units: 18 Average Unit Area: 964 SF Building Efficiency: 87%



# **PROTOTYPE 8** | RH ZONE - BONUS FAR | INNER NEIGHBORHOOD



#### **BUILDING PROTOTYPE**

FAR: 2.97 : 1 Building Floor Area: 29,700 SF

Height: 50'

Building Coverage: 5,000 SF

Landscaping: 1,500 SF

Required Outdoor Space: 1,440 SF (shown as part of common area)

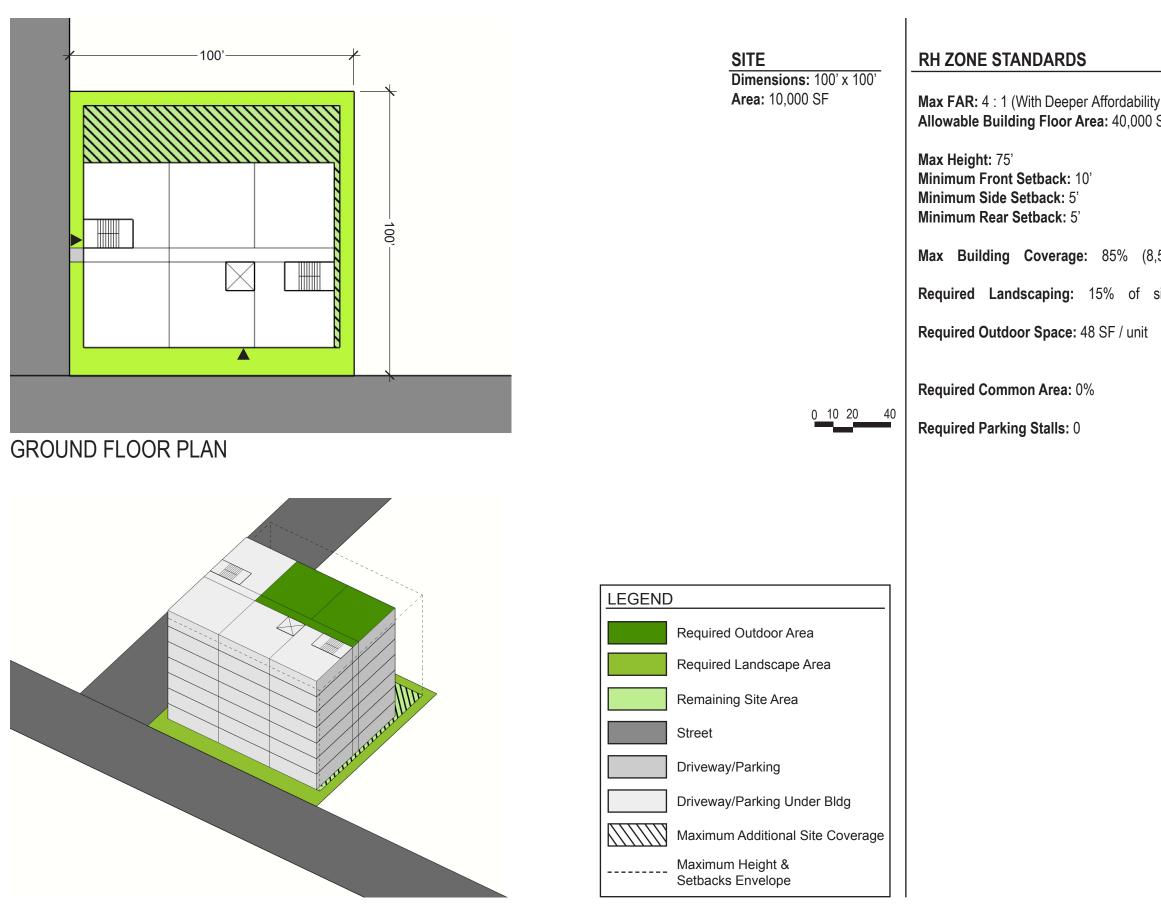
Common Area: 1,440 SF

**Provided Parking Stalls:** 0

Number of Units: 30 Average Unit Area: 842 SF **Building Efficiency:** 85%

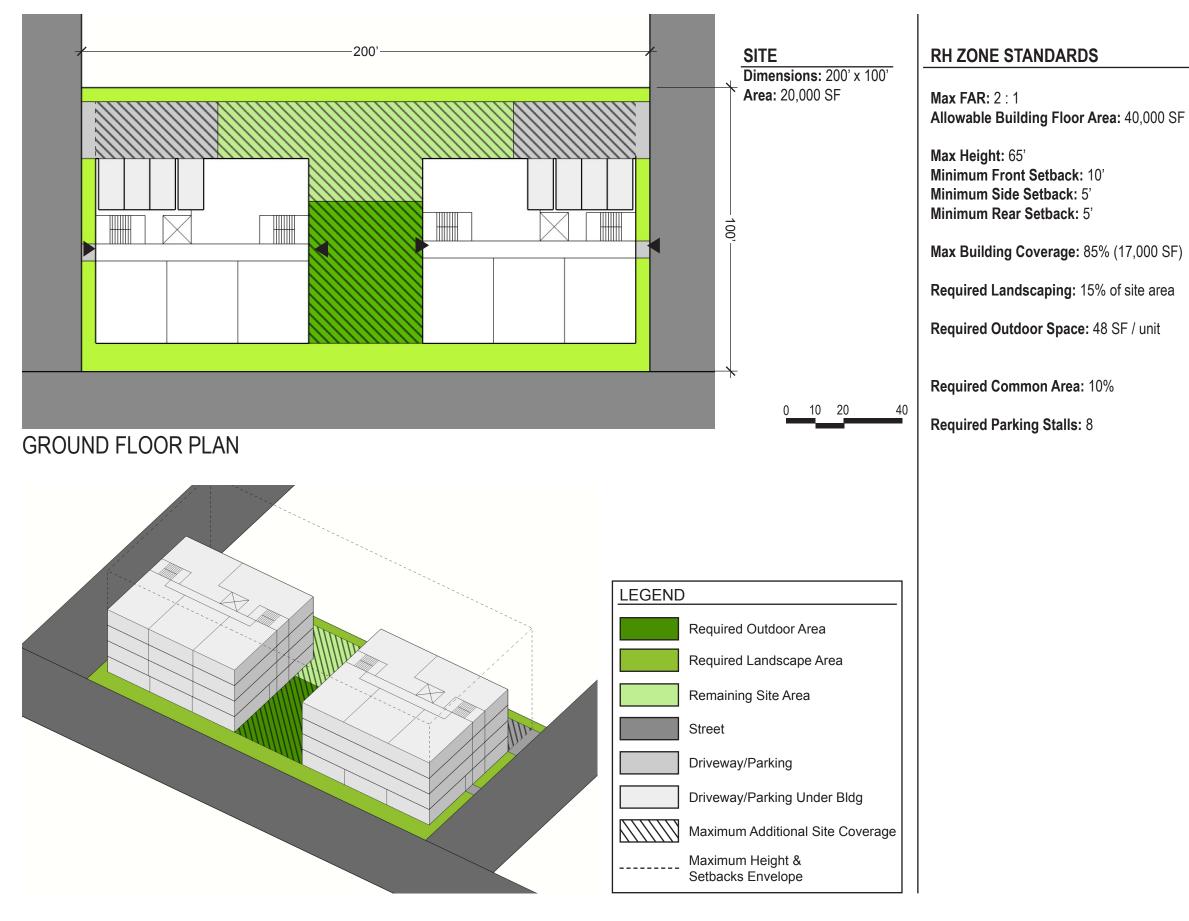


PROTOTYPE 8 | RH ZONE - DEEPER AFFORDABILITY BONUS | INNER NEIGHBORHOOD



	BUILDING PROTOTYPE
' Bonus) SF	FAR: 4 : 1 Building Floor Area: 40,000 SF
	Height: 70'
500 SF)	Building Coverage: 5,715 SF
site area	Landscaping: 1,500 SF
	<b>Required Outdoor Space:</b> 2,016 SF (shown as part of common area)
	Common Area: 2,016 SF
	Provided Parking Stalls: 0
	Number of Units: 42 Average Unit Area: 806 SF Building Efficiency: 85%

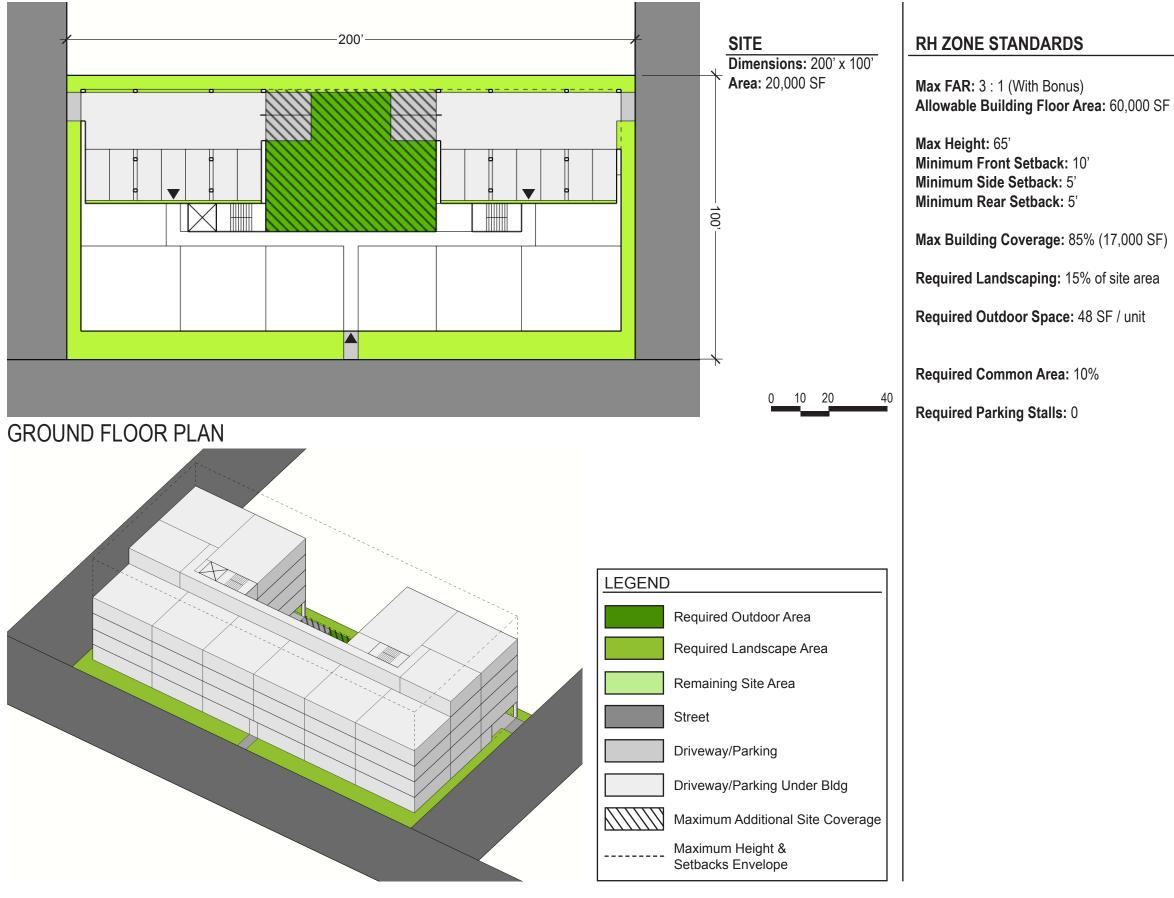




PROTOTYPE 9 | RH ZONE - BASE FAR | INNER NEIGHBORHOOD

# **BUILDING PROTOTYPE** FAR: 1.95 : 1 Building Floor Area: 39,000 SF Height: 40' Building Coverage: 9,750 SF Landscaping: 3,000 SF Required Outdoor Space: 1,824 SF (shown as part of common area) Common Area: 2,000 SF Provided Parking Stalls: 8 Number of Units: 38 (19 / Building) Average Unit Area: 820 SF **Building Efficiency:** 80%

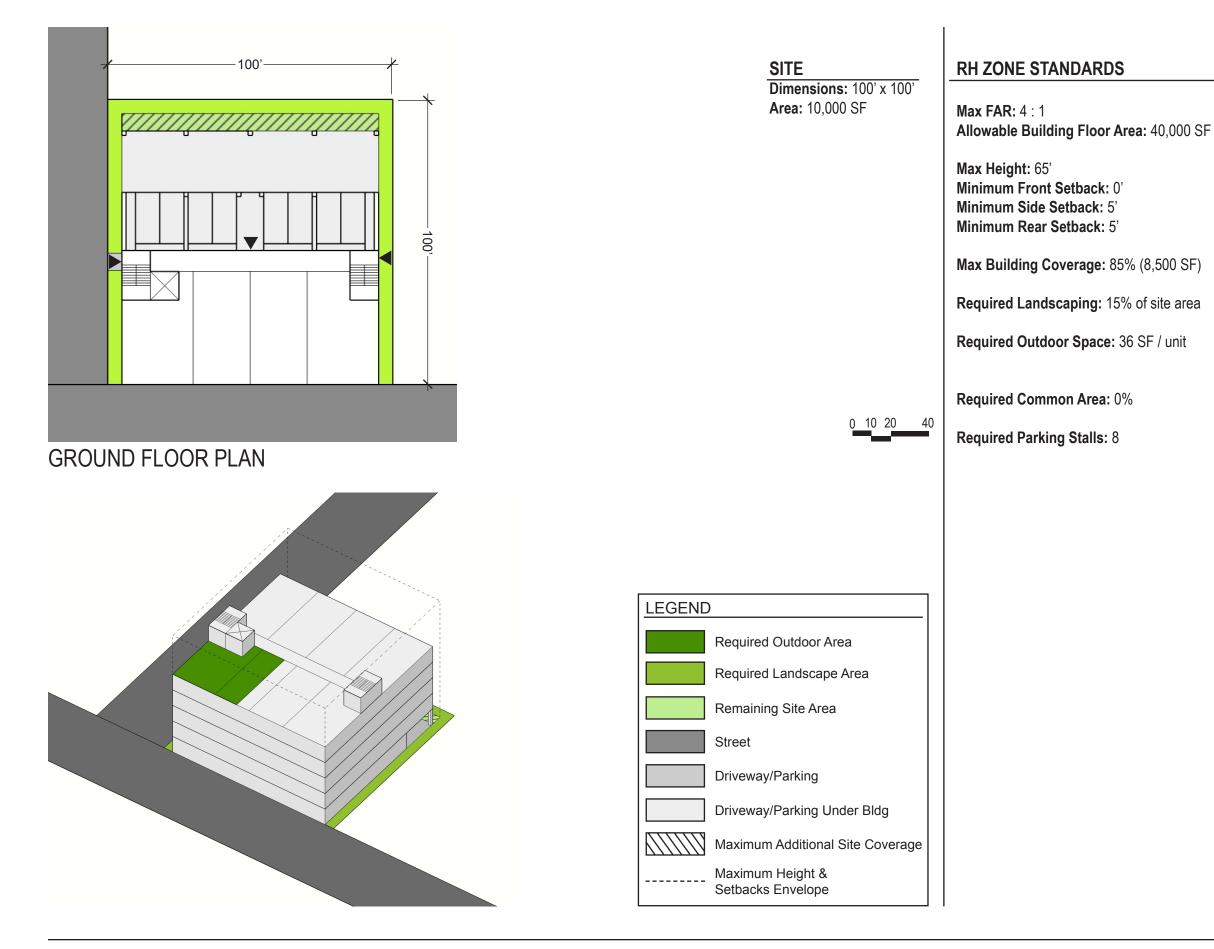




**PROTOTYPE 9** | RH ZONE - BONUS FAR | INNER NEIGHBORHOOD

# **BUILDING PROTOTYPE FAR:** 3 : 1 Building Floor Area: 60,000 SF Height: 50' Building Coverage: 13,150 SF Landscaping: 3,000 SF Required Outdoor Space: 2,304 SF (shown as part of common area) Common Area: 2,304 SF Provided Parking Stalls: 18 Number of Units: 48 Average Unit Area: 975 SF **Building Efficiency:** 78%

# PROTOTYPE 10 | RH ZONE - BASE FAR | INNER NEIGHBORHOOD



#### **BUILDING PROTOTYPE**

FAR: 4 : 1 Building Floor Area: 40,000 SF

Height: 50'

Building Coverage: 8,000 SF

Landscaping: 1,500 SF

**Required Outdoor Space:** 1,296 SF (shown as part of common area)

Common Area: 1,296 SF

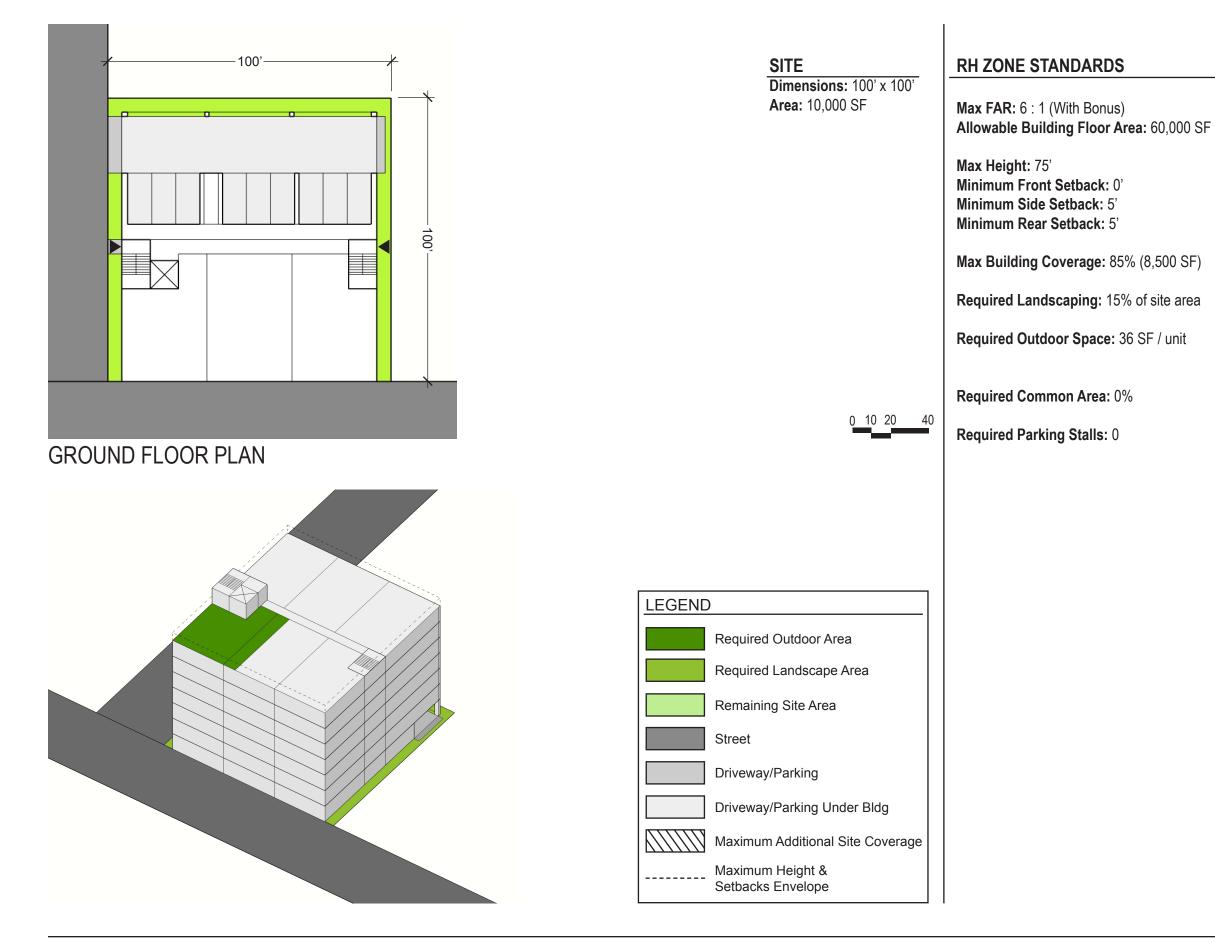
**Provided Parking Stalls:** 8

Number of Units: 36 Average Unit Area: 873 SF Building Efficiency: 79%

Note: The 36 units in this prototype would trigger mandatory inclusionary housing requirements and allowances for additional FAR.



# PROTOTYPE 10 | RH ZONE - BONUS FAR | INNER NEIGHBORHOOD



#### **BUILDING PROTOTYPE**

FAR: 5.99 : 1 Building Floor Area: 59,850 SF

Height: 70'

Building Coverage: 8,500 SF

Landscaping: 1,500 SF

**Required Outdoor Space:** 1,404 SF (shown as part of common area)

Common Area: 1,404 SF

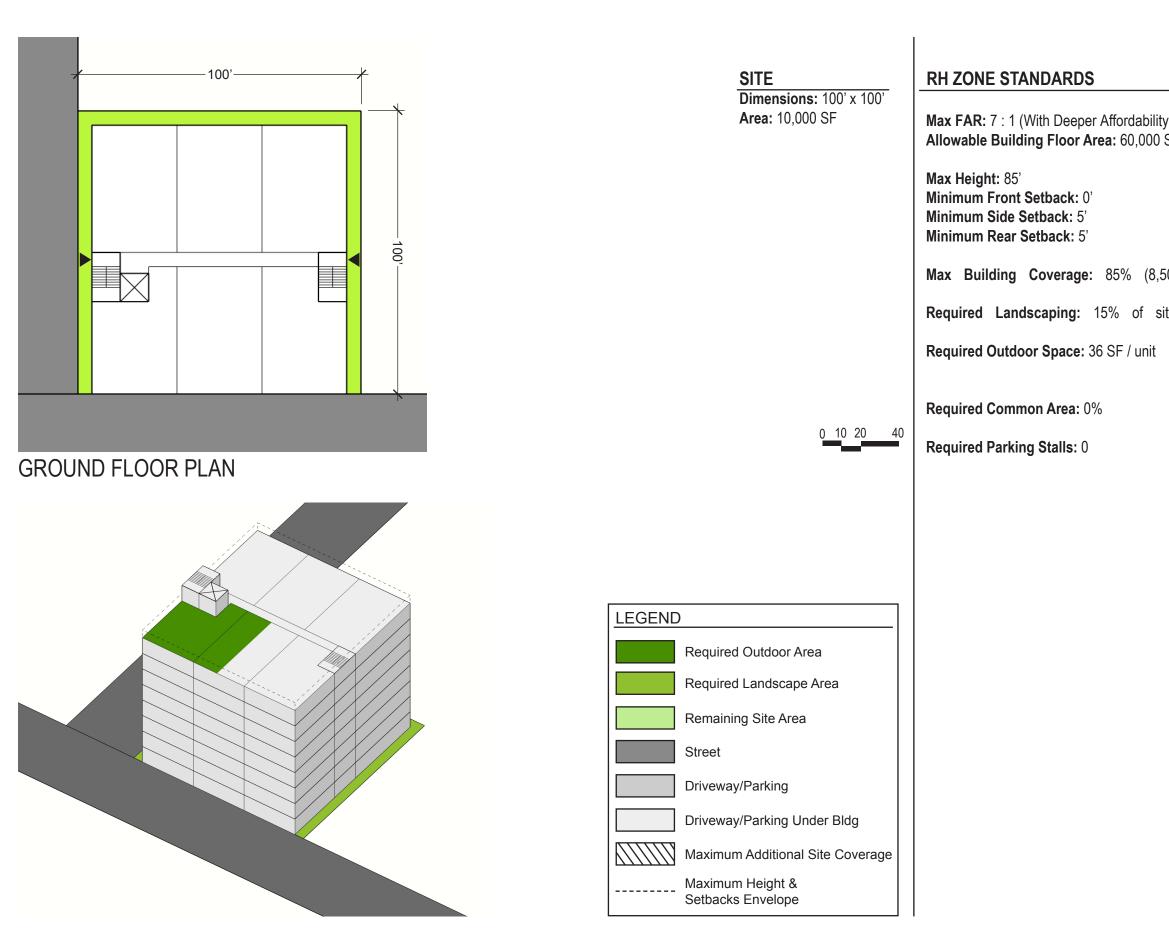
**Provided Parking Stalls:** 9

Number of Units: 39 Average Unit Area: 1,284 SF Building Efficiency: 84%



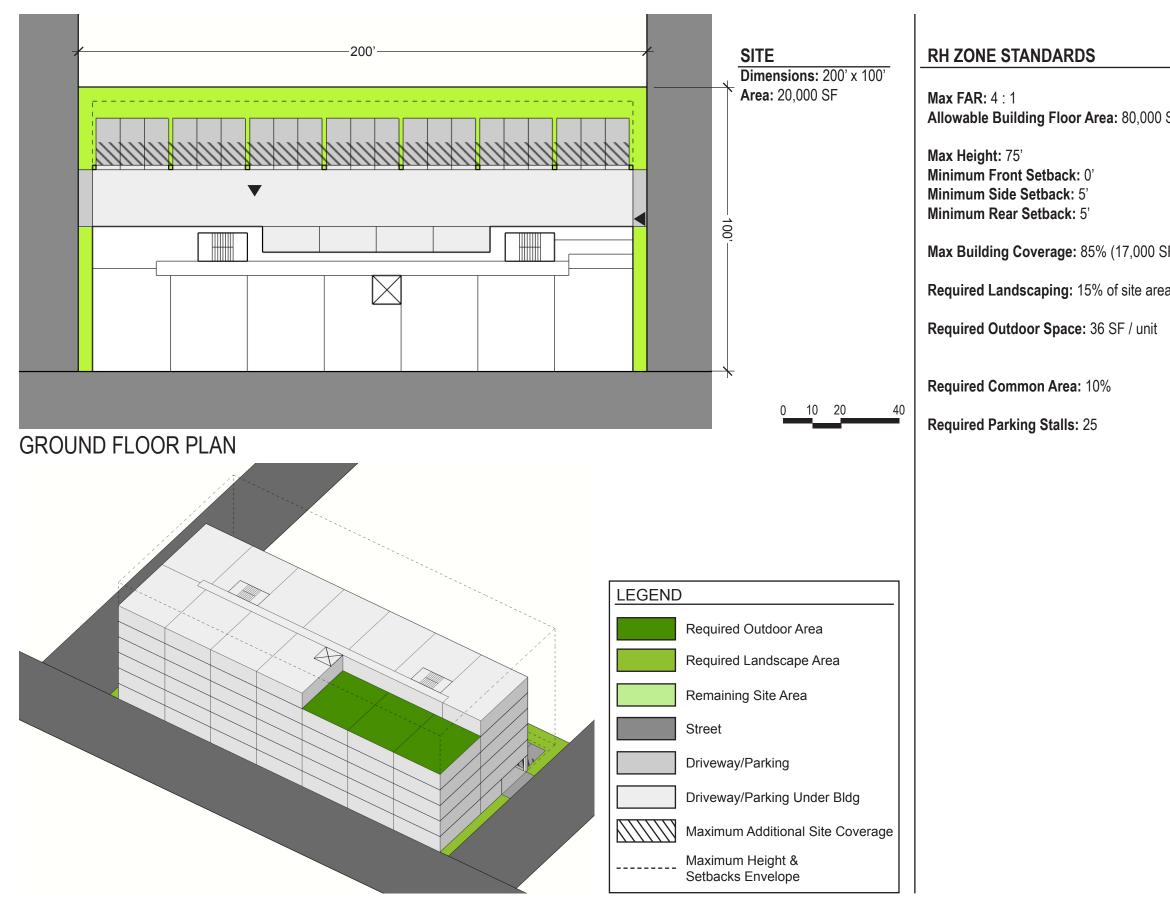
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	BUILDING PROTOTYPE
/ Bonus) SF	FAR: 6.84 : 1 Building Floor Area: 68,400 SF
	Height: 80'
00 SF)	Building Coverage: 8,500 SF
te area	Landscaping: 1,500 SF
	<b>Required Outdoor Space:</b> 1,728 SF (shown as part of common area)
	Common Area: 1,728 SF
	Provided Parking Stalls: 0
	Number of Units: 48 Average Unit Area: 1,288 SF Building Efficiency: 90%

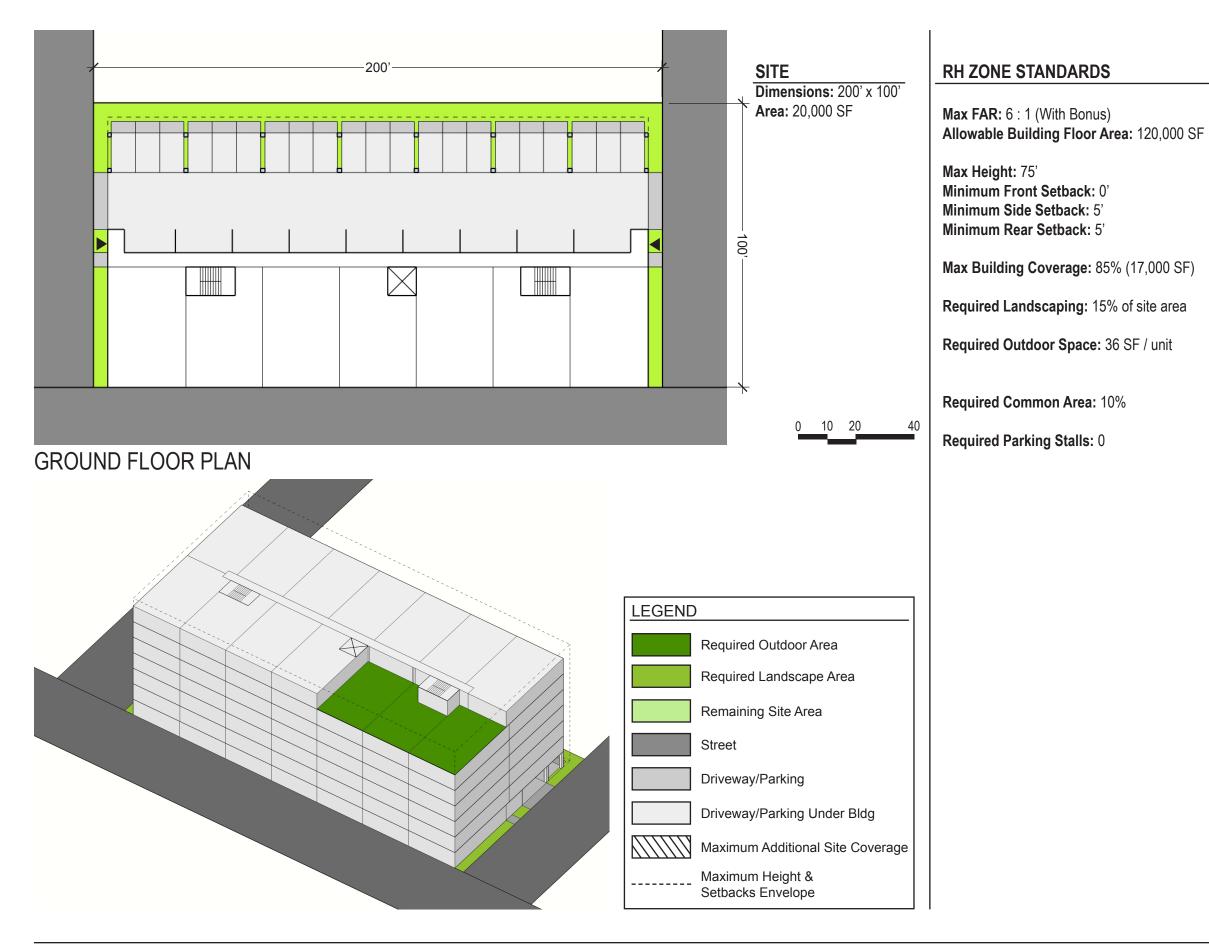




PROTOTYPE 11 | RH ZONE - BASE FAR | INNER NEIGHBORHOOD

	BUILDING PROTOTYPE
SF	FAR: 4 : 1 Building Floor Area: 79,900 SF
	Height: 60'
F)	Building Coverage: 13,775 SF
a	Landscaping: 3,000 SF
	<b>Required Outdoor Space:</b> 2,664 SF (shown as part of common area)
	Common Area: 2,664 SF
	Provided Parking Stalls: 25
	Number of Units: 74 Average Unit Area: 901 SF Building Efficiency: 83%
	Note: The 74 units in this prototype would trigger mandatory inclusionary housing requirements and allowances for additional FAR.





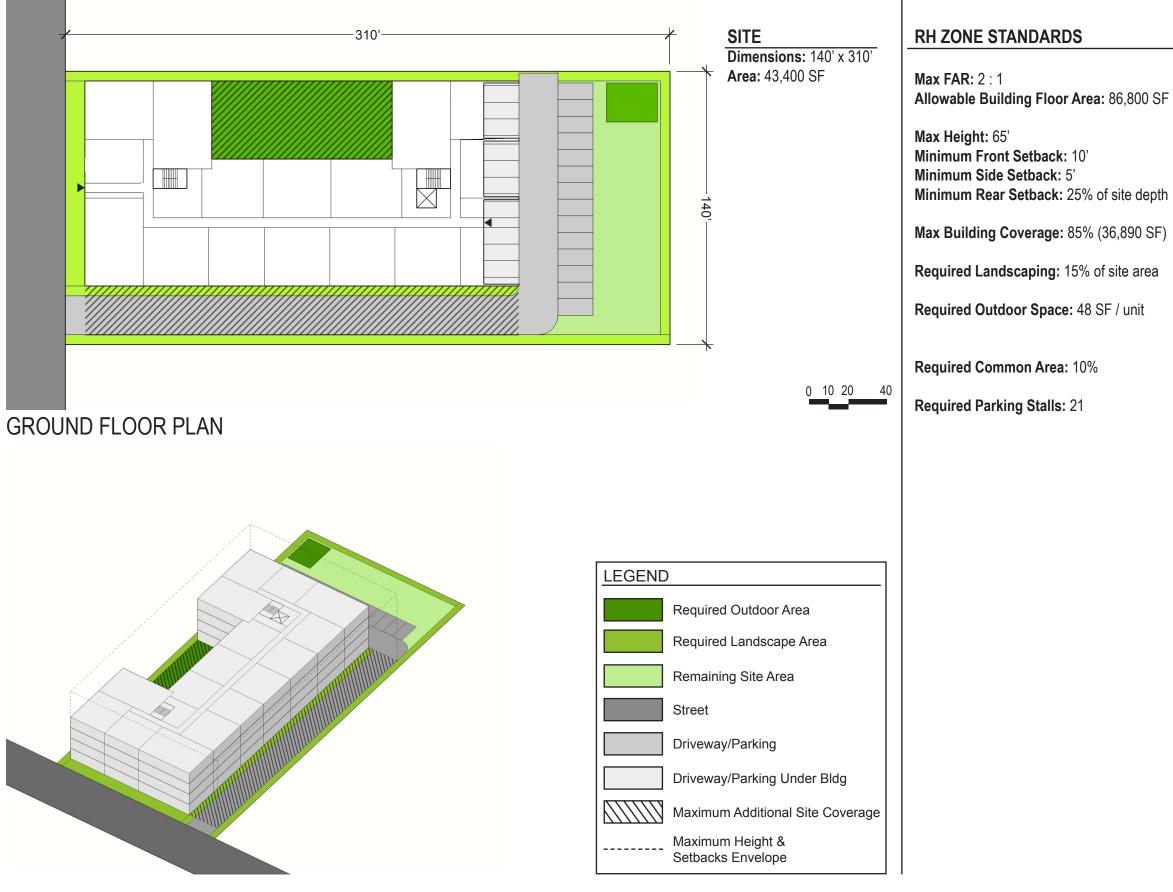
PROTOTYPE 11 | RH ZONE - BONUS FAR | INNER NEIGHBORHOOD

# BUILDING PROTOTYPE FAR: 5.78 : 1 Building Floor Area: 115,675 SF Height: 70' Building Coverage: 17,000 SF Landscaping: 3,000 SF Required Outdoor Space: 3,168 SF (shown as part of common area) Common Area: 3,168 SF

Provided Parking Stalls: 30

Number of Units: 88 Average Unit Area: 1,127 SF Building Efficiency: 86%





**PROTOTYPE 12** | RH ZONE - BASE FAR | EASTERN NEIGHBORHOOD

## **BUILDING PROTOTYPE**

FAR: 1.81 : 1 Building Floor Area: 78,652 SF

Height: 40'

Building Coverage: 19,663 SF

Landscaping: 6,510 SF

Required Outdoor Space: 2,928 SF (shown as part of common area)

Common Area: 4,340 SF

**Provided Parking Stalls: 24** 

Number of Units: 61 Average Unit Area: 1,074 SF **Building Efficiency:** 83%

Note: The 61 units in this prototype would trigger mandatory inclusionary housing requirements and allowances for additional FAR.





**PROTOTYPE 12** | RH ZONE - BONUS FAR | EASTERN NEIGHBORHOOD

### **BUILDING PROTOTYPE**

FAR: 2.72 : 1 Building Floor Area: 117,978 SF

Height: 60'

Building Coverage: 19,663 SF

Landscaping: 6,510 SF

Required Outdoor Space: 4,224 SF (shown as part of common area)

Common Area: 4,340 SF

Provided Parking Stalls: 31

Number of Units: 88 Average Unit Area: 1,080 SF **Building Efficiency:** 81%

