



SOMA BUILDING 3
DESIGN REVIEW
PLANNING BOARD SUBMITTAL
JUNE 21, 2017



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1. What We Heard
Planning Board Themes & Response

WHAT WE HEARD



- **BOLD DESIGN**

- Design should be reflective of Kendall Square and MIT

- **FAÇADE DETAILS**

- Differentiate between facades; respond to unique site conditions

- Explore alternative expressions of louvers

- Study fins distribution and depth

- Ensure balance of glass reflectivity

- **CONTEXT**

- Examine relationship of building to clock tower and other buildings

- Strengthen design relationship of building/ cantilever to landscape.

DESIGN EVOLUTION



- **BOLD DESIGN**

Explored mathematical and scientific expressions in building design.

Developed fin pattern in the spirit of the Fibonacci sequence.

- **FAÇADE DETAILS**

Worked on mechanical redesign with engineers to remove louvers completely from north elevation.

Developed strategy of fin density to more gracefully blend louver zone with façade.

Staggered fins to create a more elegant, light, and animated appearance.

Reduced fin density where less sun is received or shading is provided by adjacent building.

Created four distinct façade designs by considering unique conditions of each side.

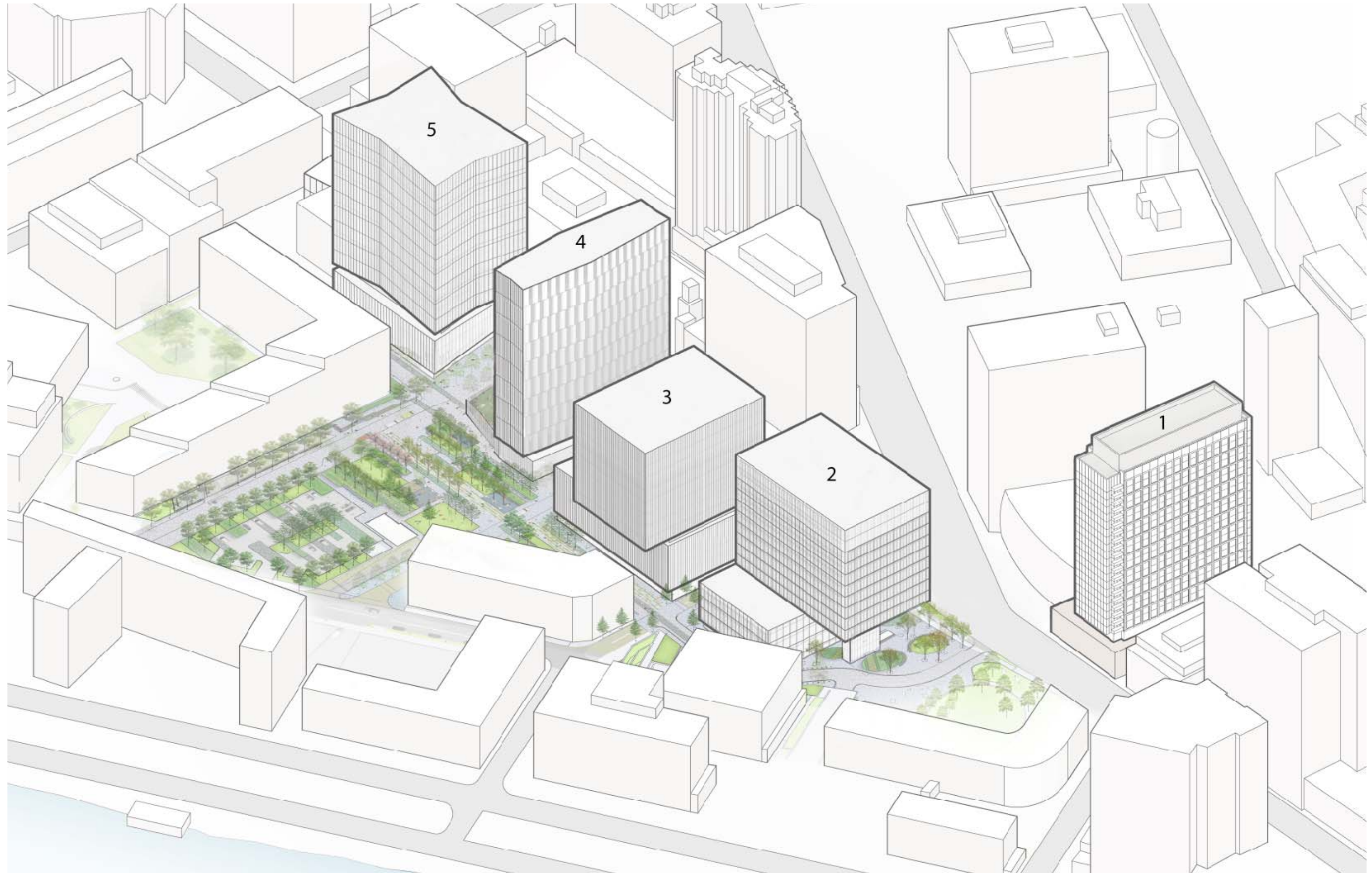
- **CONTEXT**

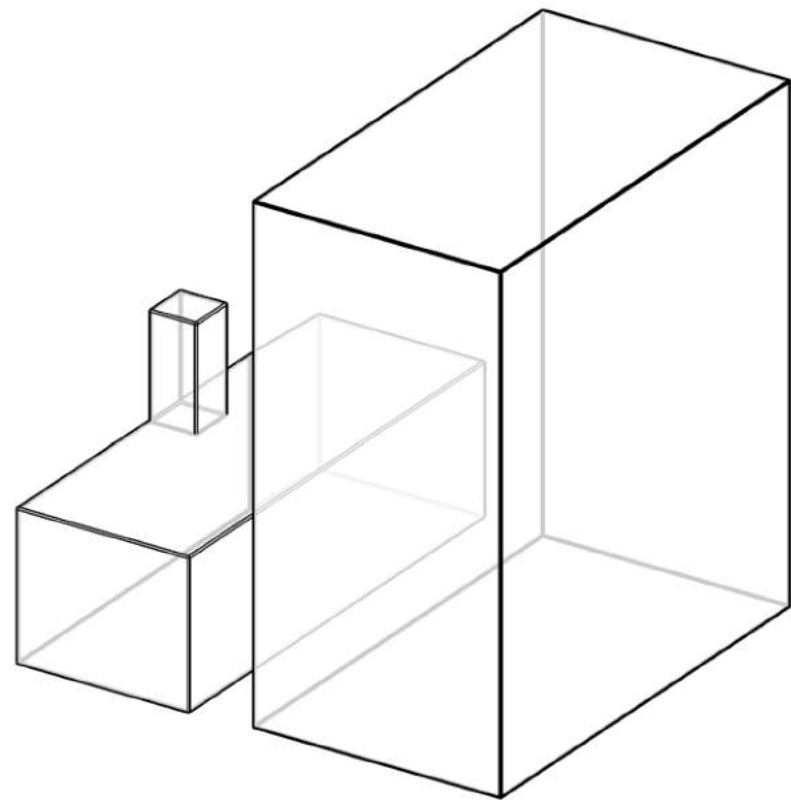
Examined colors, tonality and reflectivity to complement and celebrate existing and other new buildings.

Evaluated façade detail effect both close up and far away.

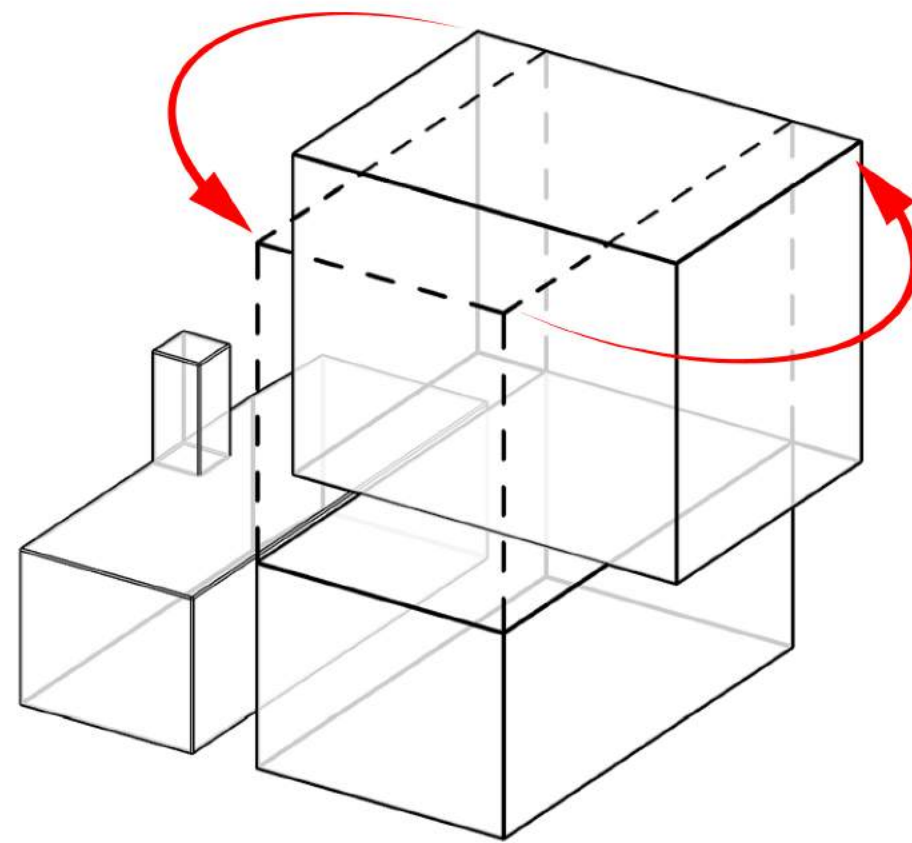
Evolved the landscape design to better coordinate with the building entrances and cantilever.

Advanced cantilever art process.

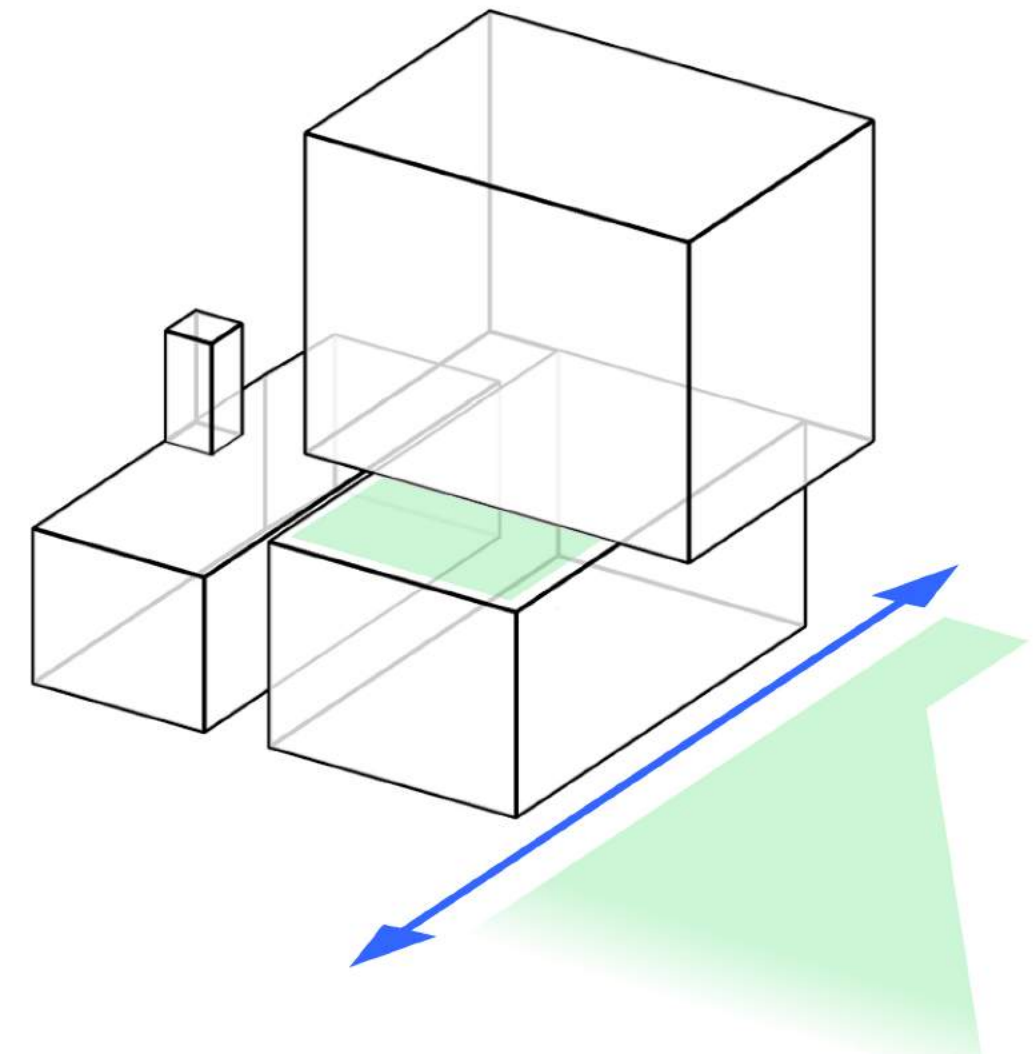




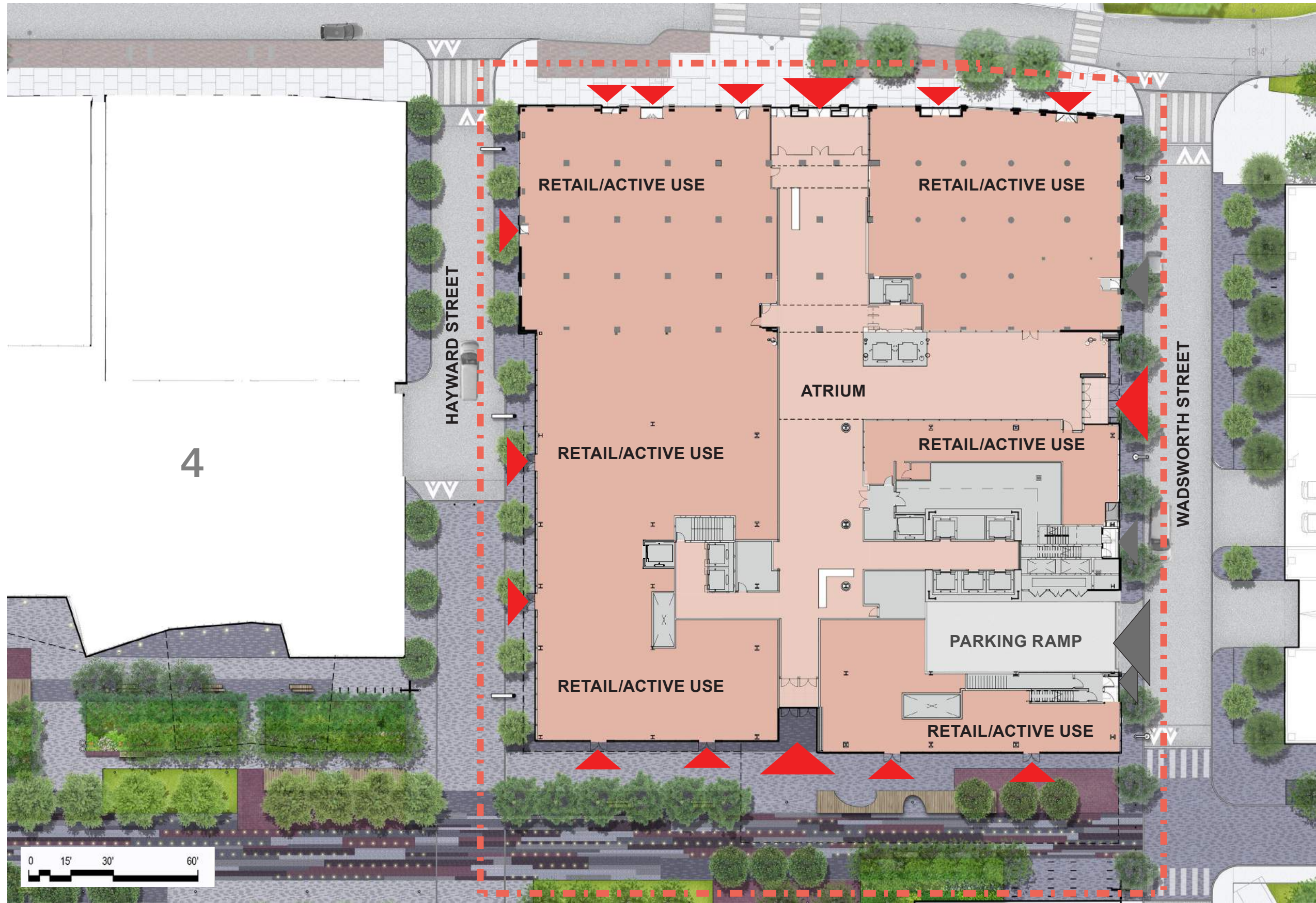
EFFICIENT FLOOR PLATE



ROTATE UPPER MASS

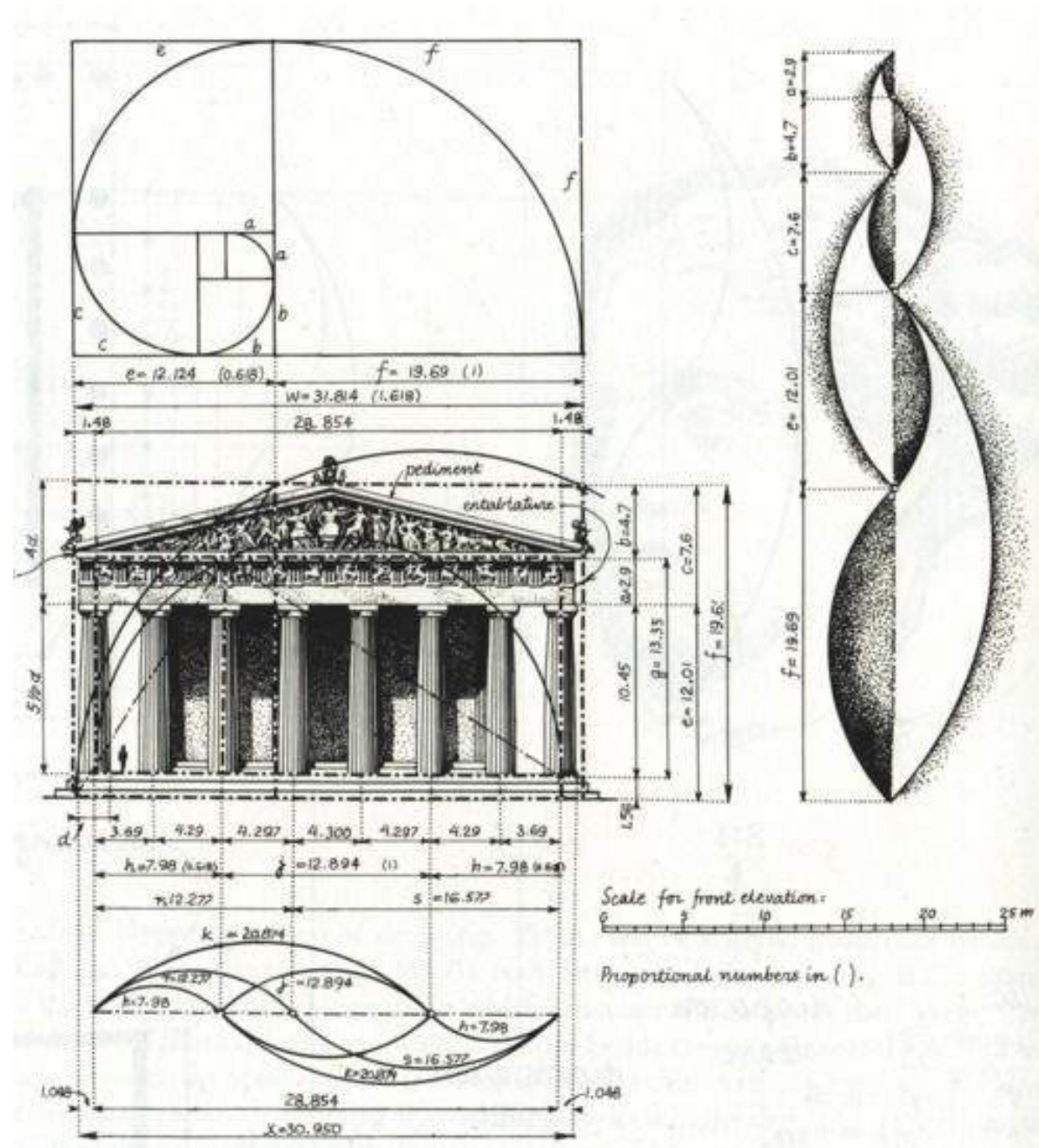


EXTEND INFINITE CORRIDOR



2. Facade Concept

Fibonacci Sequence



The façade of the building has been enriched by a pattern of vertical fins that are most dense on the South façade and least dense on the North façade in response to two very different solar conditions. The East and West facades respond to the morning and afternoon sun with a density of fins that gradually transitions between the more dense South façade and the less dense North façade.

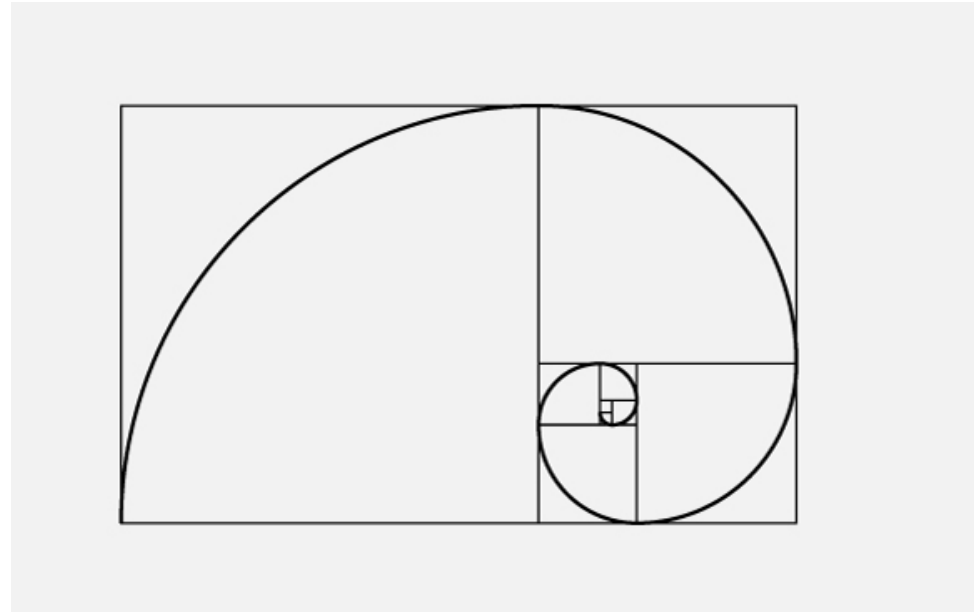
As we explored how to create a meaningful and beautiful pattern of fins we explored several mathematical equations and codes that could inform their arrangement. The pattern that we have incorporated is known as the Fibonacci Sequence.

The Fibonacci Sequence was developed in the 11th century and is built upon the golden section, a proportional system used in the classical Roman era. Interestingly, evidence of this proportioning system can be found in the entry to MIT at 77 Massachusetts Avenue as well as the façade of MIT's Great Dome in Killian Court. The Fibonacci Sequence builds off the golden section and describes a gradient pattern that goes from greater density to lesser density as the number sequence progresses.

On Building 3 we are using the Fibonacci Sequence to locate the vertical fins on the building, beginning with the densest pattern on the South façade and then transitioning to the lightest at the north ends of the East and West facades.

As the pattern emerged, we were also pleased to see that the overall massing of the building form is proportioned very closely to the ratios of the Golden Section as well.

The following slides share our findings and the methodology we have used to create these rational yet beautiful patterns on the building.

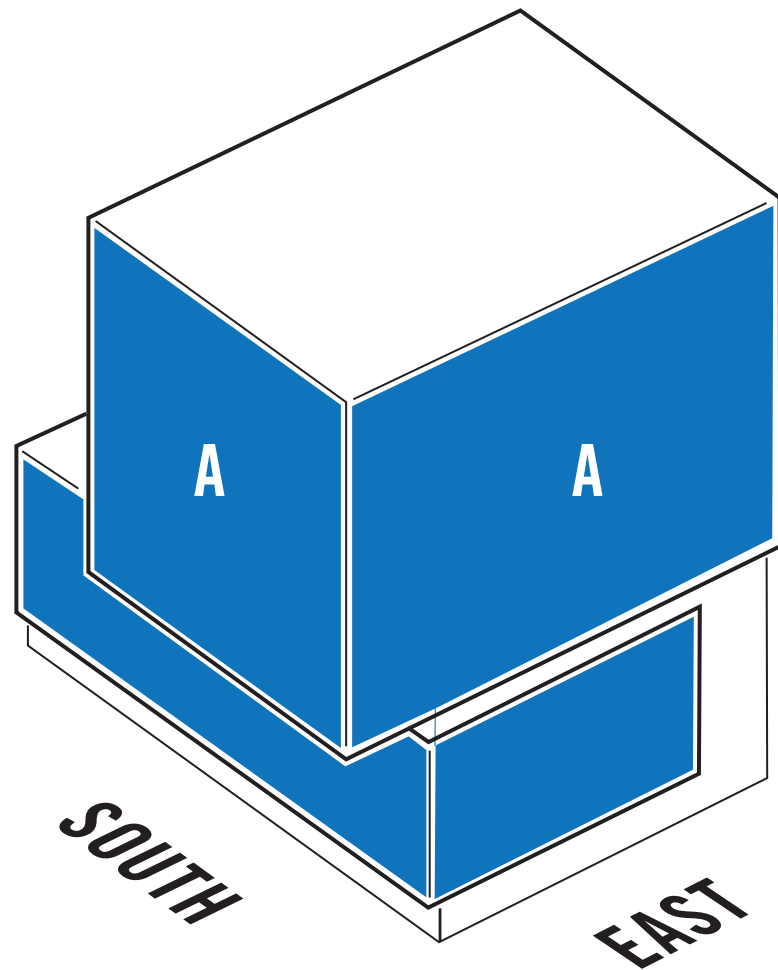


THE FIBONACCI SEQUENCE & THE GOLDEN SECTION

The Fibonacci Sequence is a simple mathematical equation that is found in nature as well as in a classical proportioning system of architecture referred to as the Golden Section.

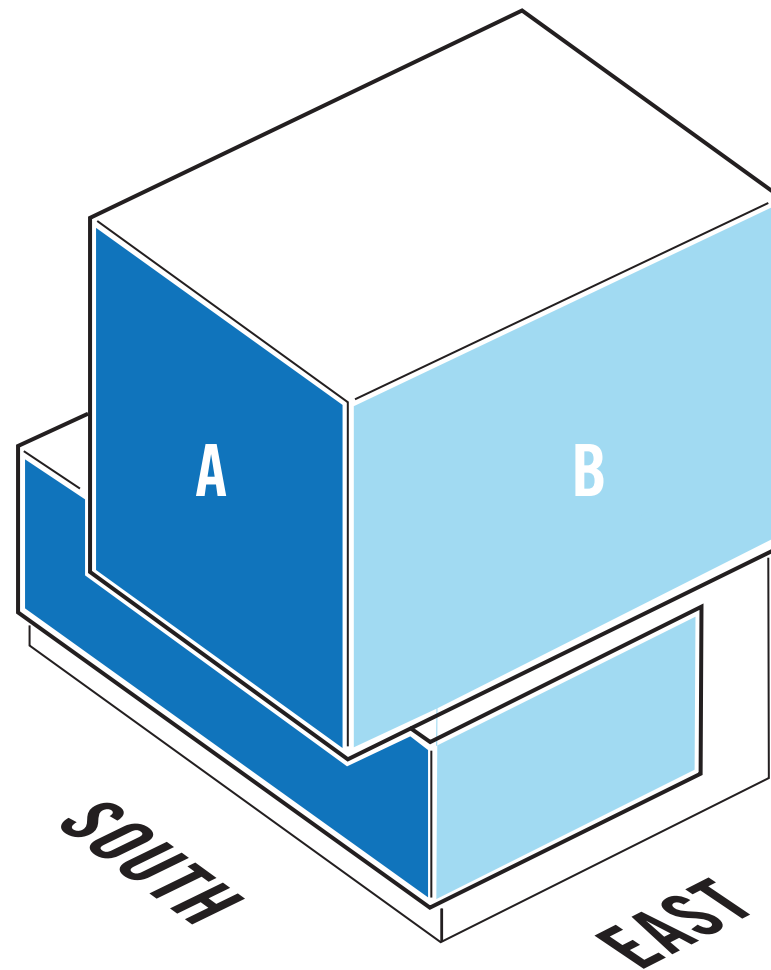
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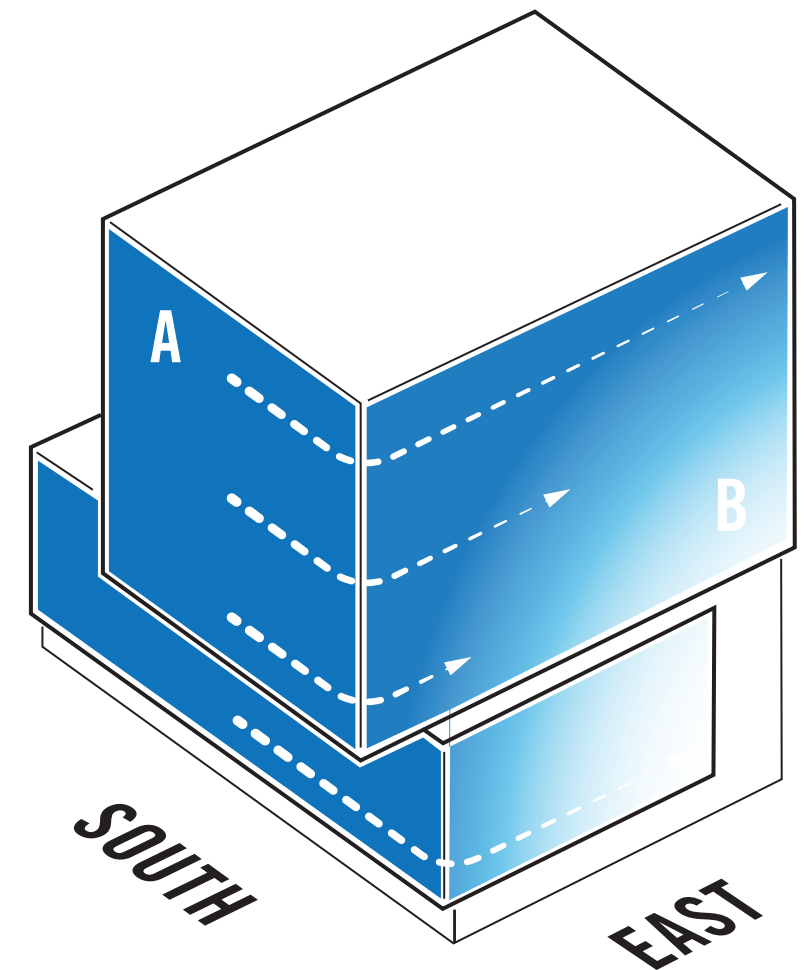
PREVIOUS CONCEPT

All facades are the same.



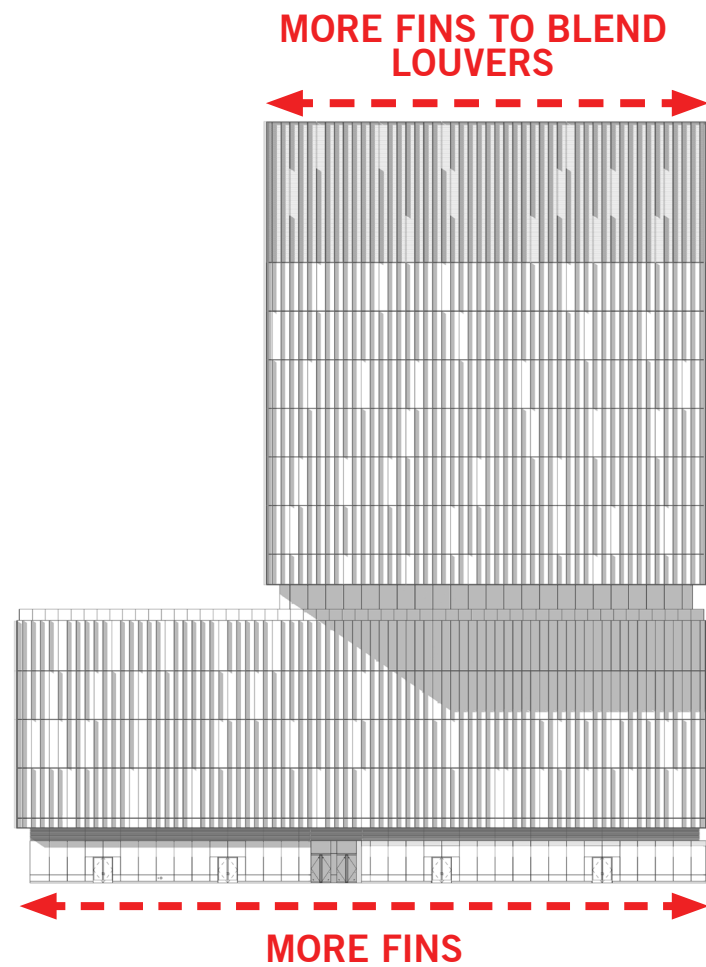
ALTERNATE CONCEPT

Facades change based on orientation (North, South, etc.)

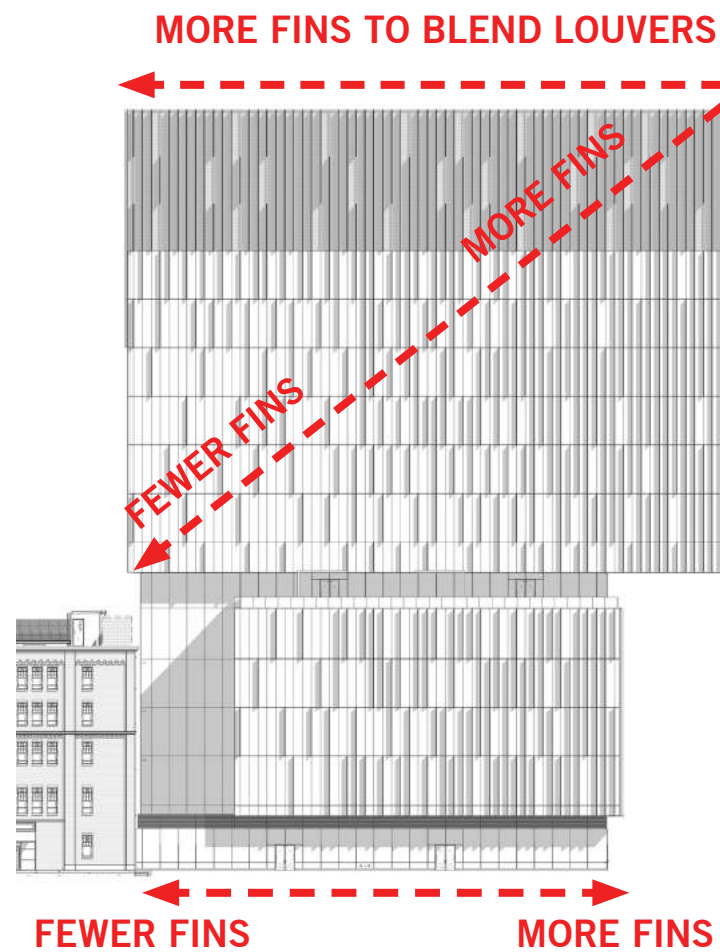


PROPOSED CONCEPT

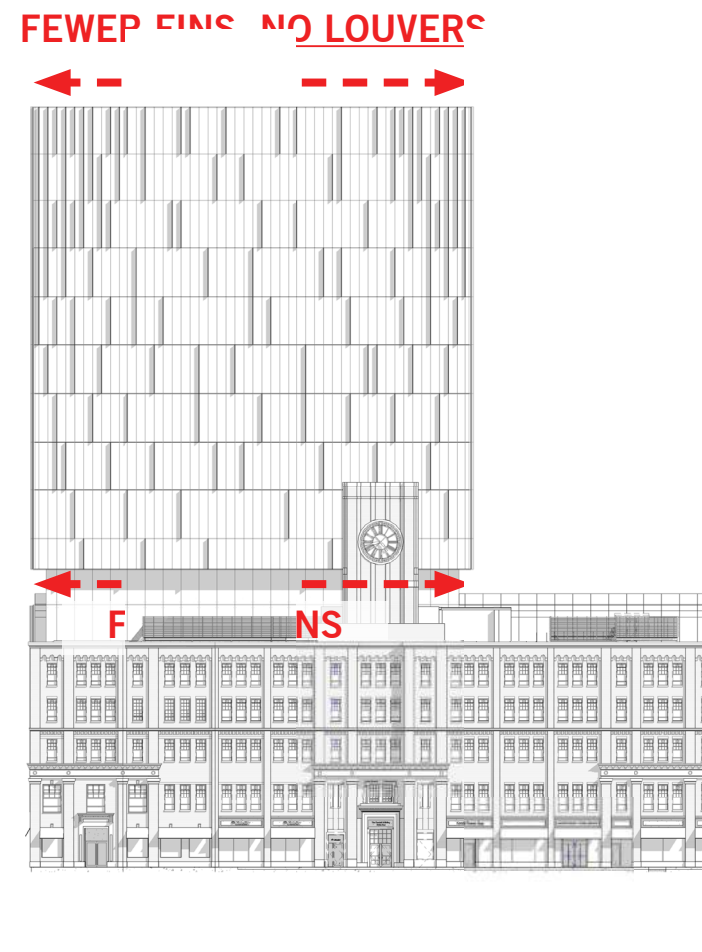
Facades change based on orientation, and transition gradually from one facade to another to emphasise singularity of form



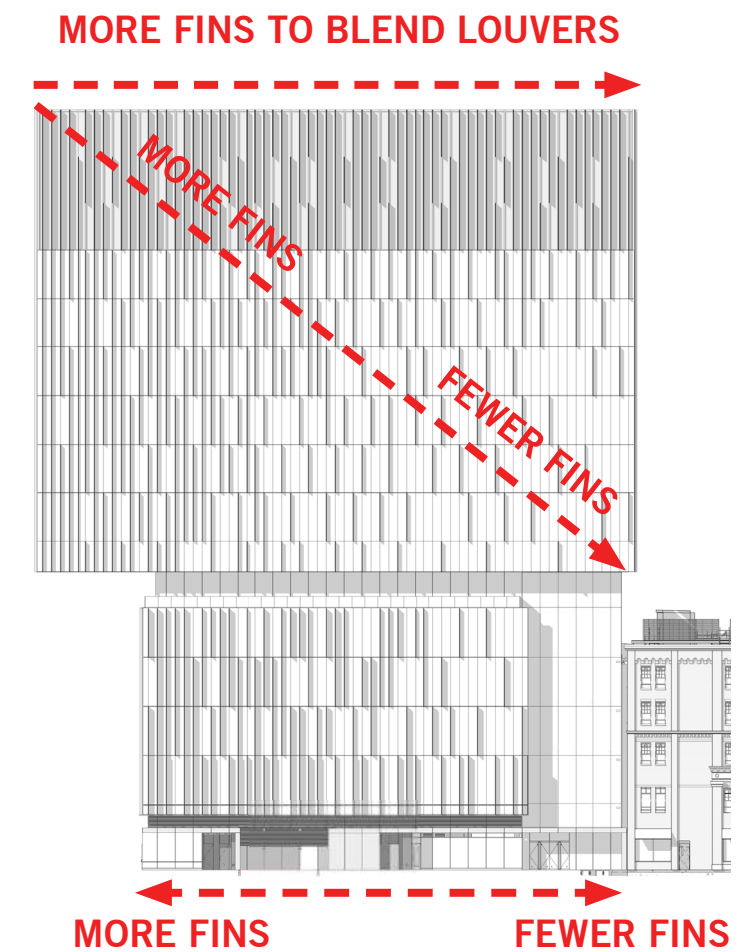
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



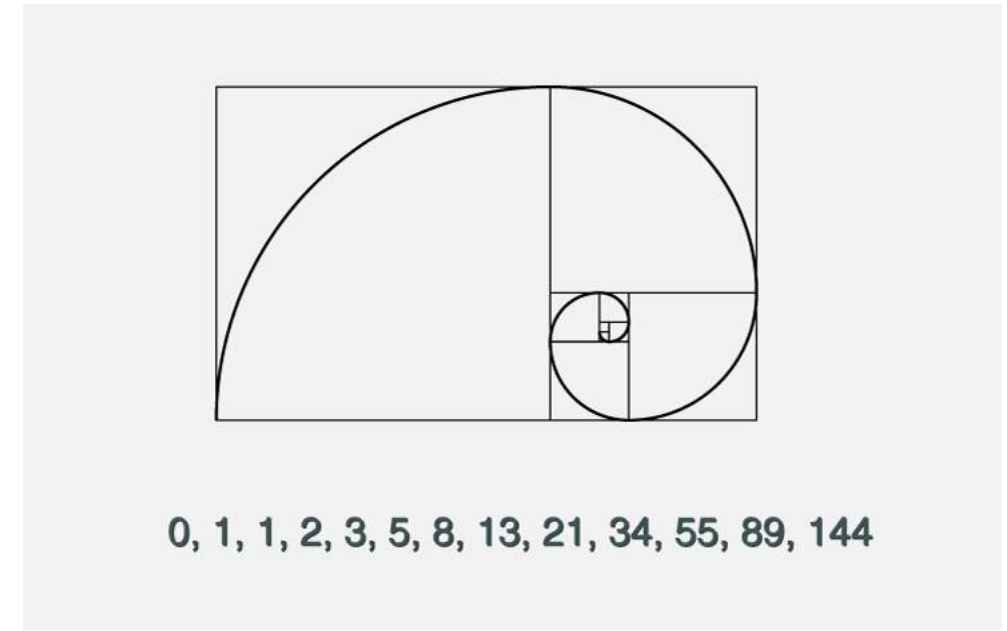
EAST ELEVATION

PROPOSED CONCEPT

- Fin pattern on facade transitions from most dense at south to least dense at north
- Dense fins at top of penthouse visually blend louver zone with facade below
- Fin density is reduced where shading is provided by adjacent buildings and on north side which receives least sun

401	400	399	398	397	396	395	394	393	392	391	390	389	388	387	386	385	384	383	382	381
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405	328	259	198	145	144	143	142	141	140	139	138	137	136	135	134	133	182	239	304	377
406	329	260	199	146	101	100	99	98	97	96	95	94	93	92	91	132	181	238	303	376
407	330	261	200	147	102	65	64	63	62	61	60	59	58	57	90	131	180	237	302	375
408	331	262	201	148	103	66	37	36	35	34	33	32	31	56	89	130	179	236	301	374
409	332	263	202	149	104	67	38	17	16	15	14	13	30	55	88	129	178	235	300	373
410	333	264	203	150	105	68	39	18	5	4	3	12	29	54	87	128	177	234	299	372
411	334	265	204	151	106	69	40	19	6	1	2	11	28	53	86	127	176	233	298	371
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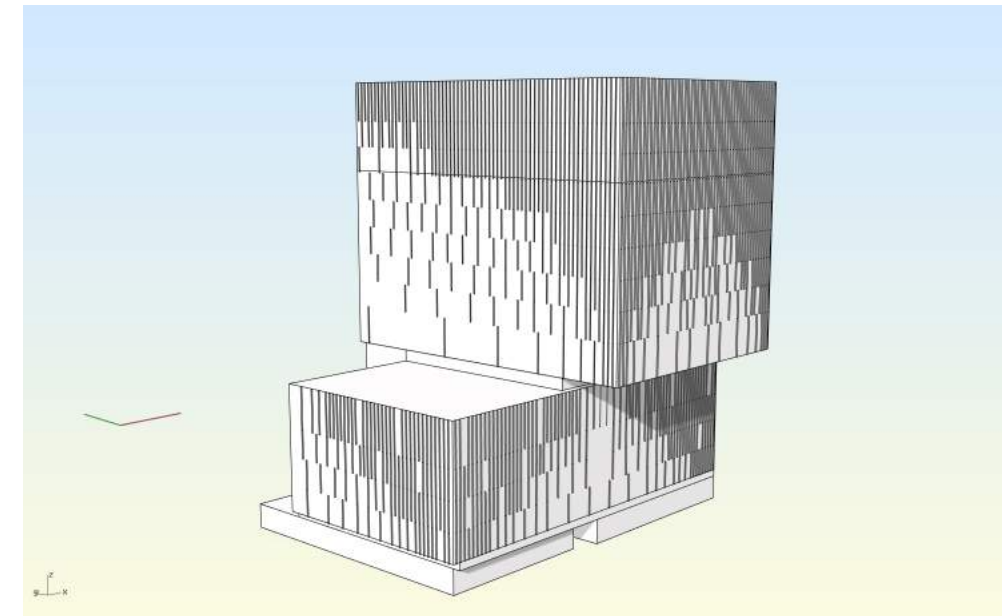
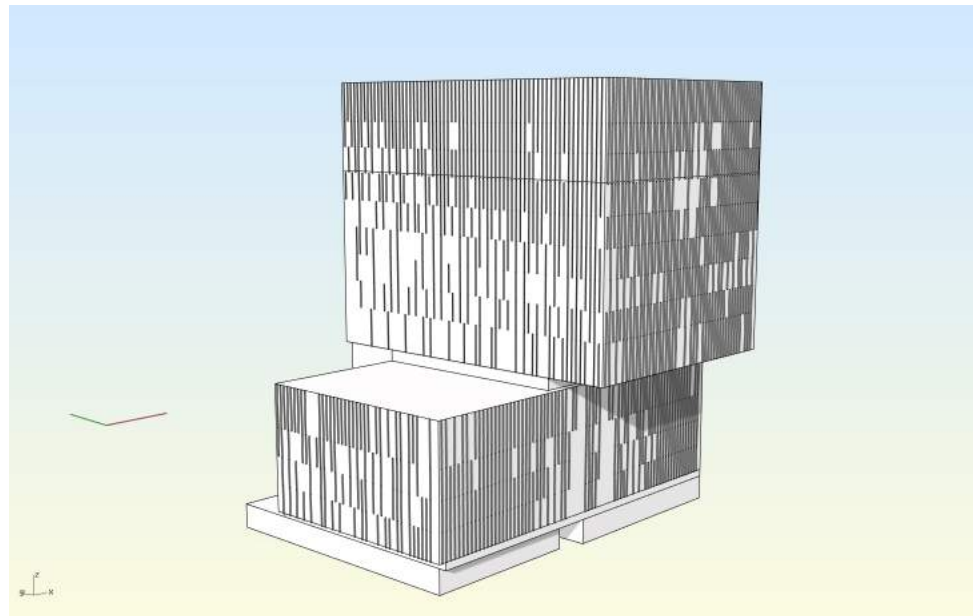
PRIME NUMBER SPIRAL



0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144

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C	—••—	P	•—•—•	3	•••—•—
D	—••	Q	—•—•—	4	••••—
E	•	R	•—••	5	•••••
F	••—••	S	••••	6	—•••••
G	—•—•	T	—	7	—•—•••
H	••••	U	••—	8	—•—•—••
I	••	V	•••—	9	—•—•—•••
J	•—•—•—	W	•—•—	0	—•—•—•—
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L	•••••	Y	•—•—•—		
M	—•—	Z	—••••		

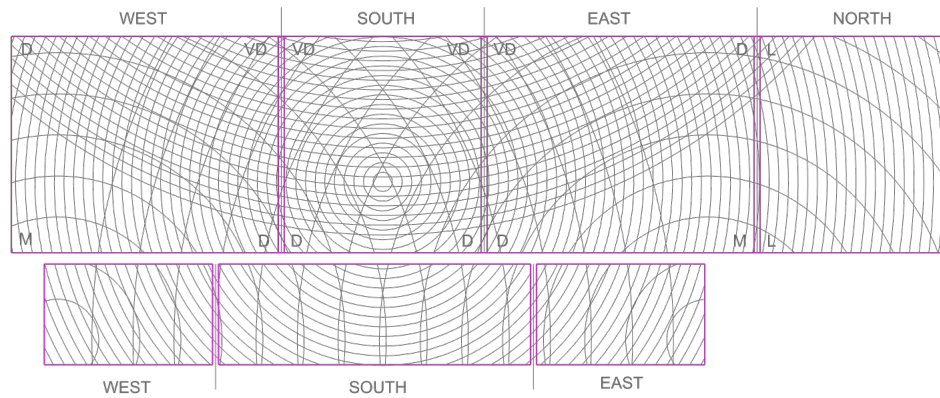
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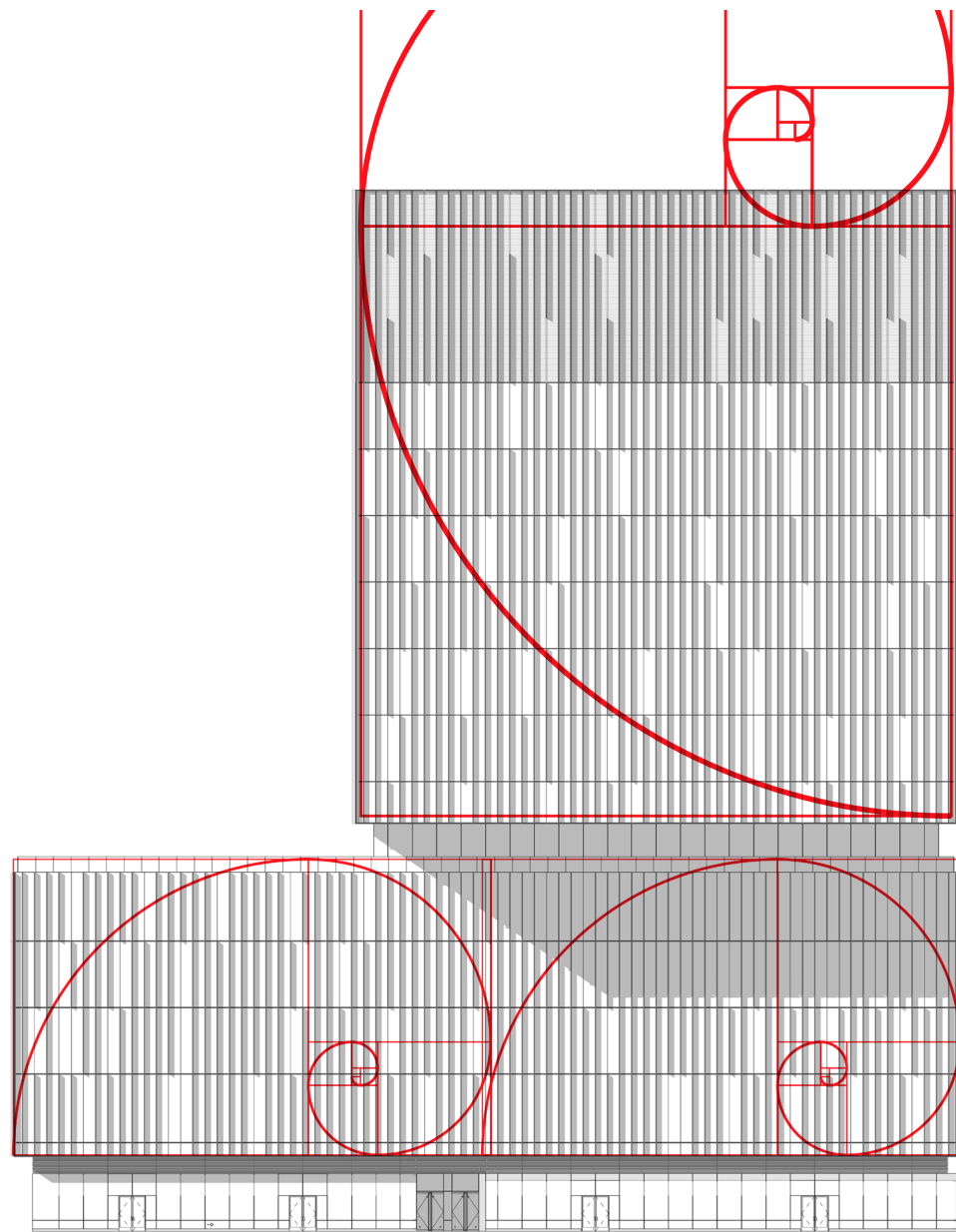
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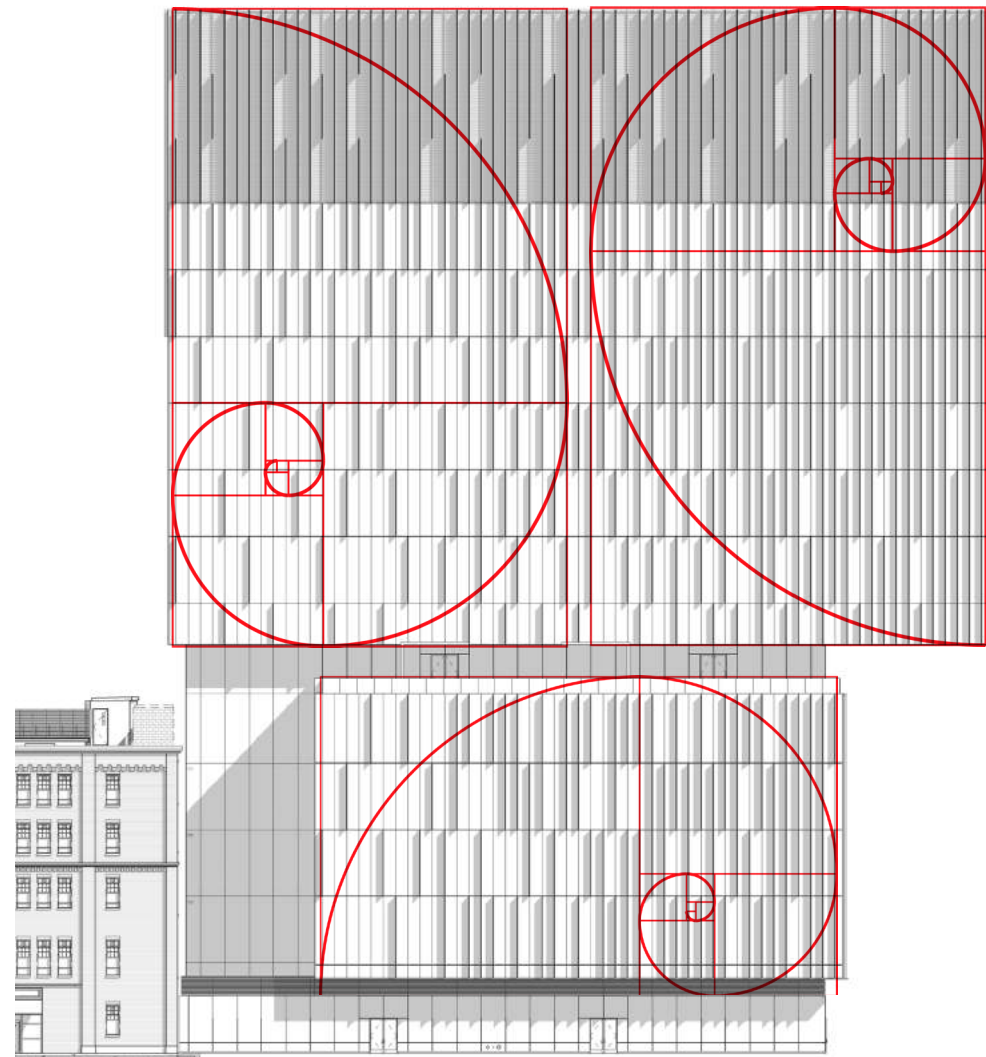
INTERFERENCE LOGIC



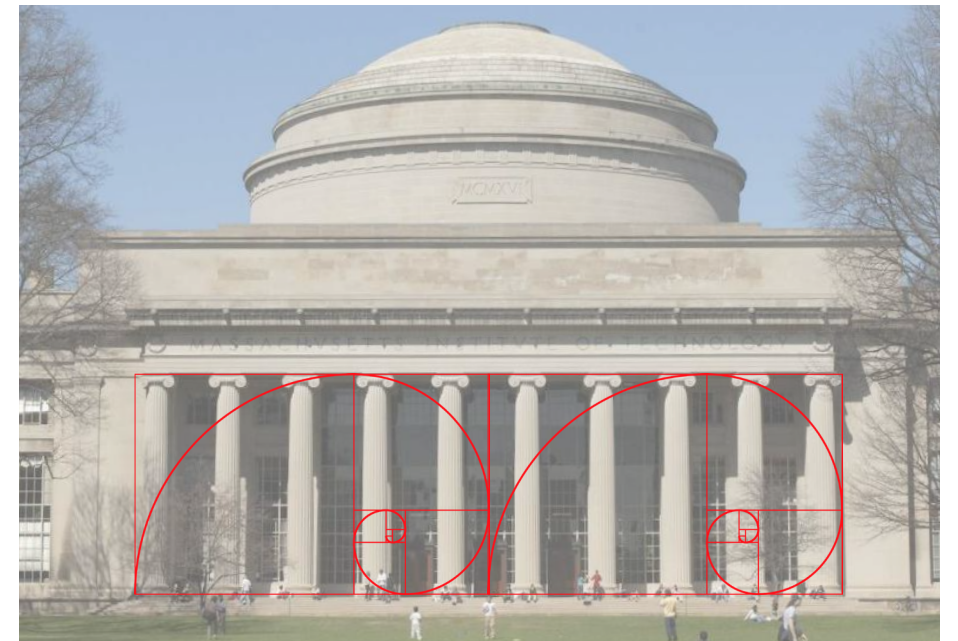
FIBONACCI SEQUENCE



SOUTH ELEVATION WITH GOLDEN SECTION OVERLAY



WEST ELEVATION WITH GOLDEN SECTION OVERLAY

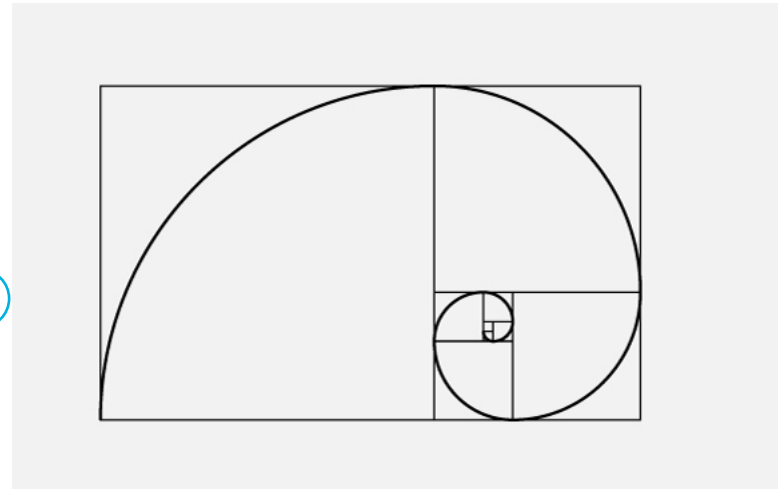
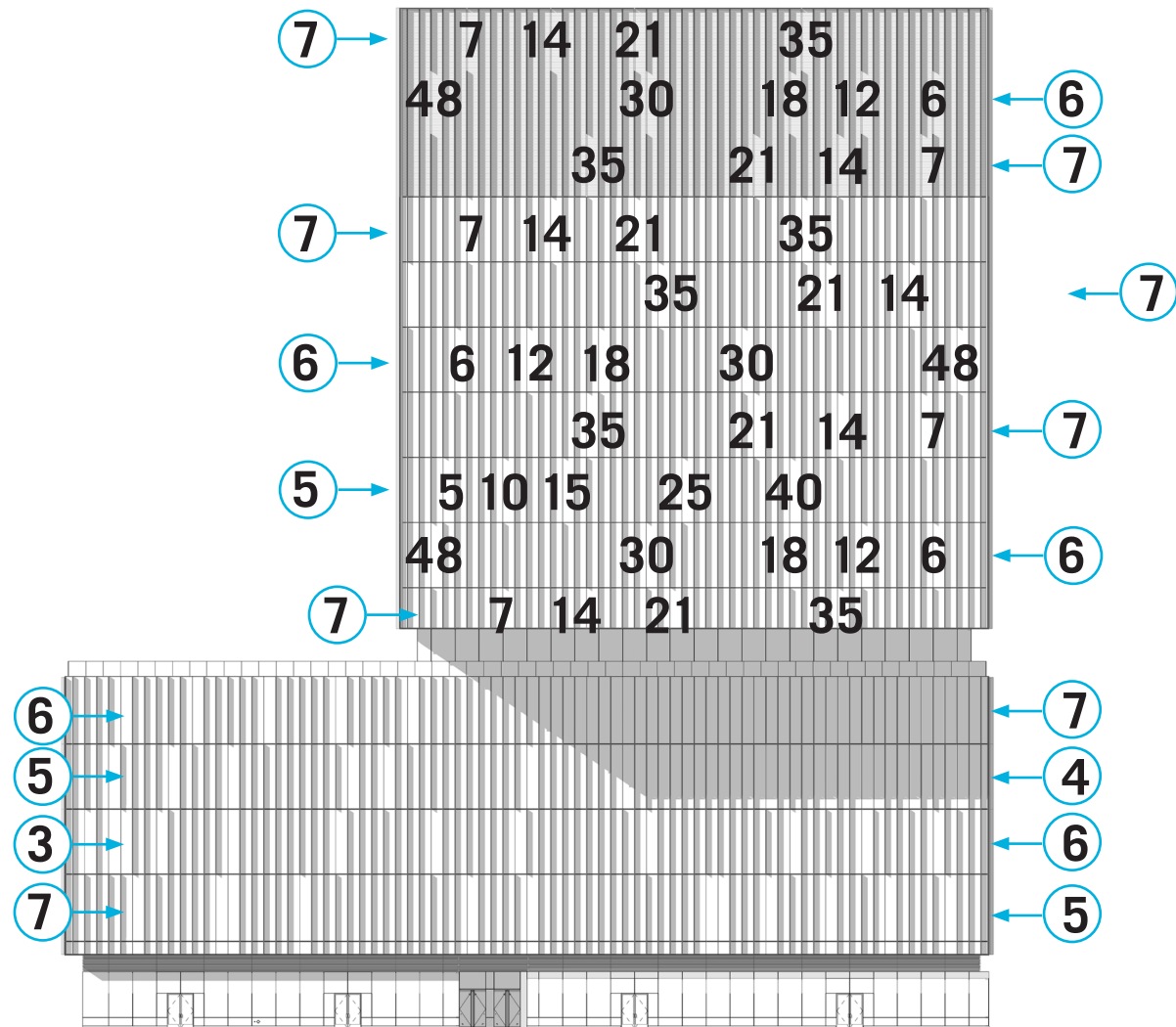


MIT KILLIAN COURT FACADE

MIT 77 MASSACHUSETTS AVENUE



FIBONACCI SEQUENCE



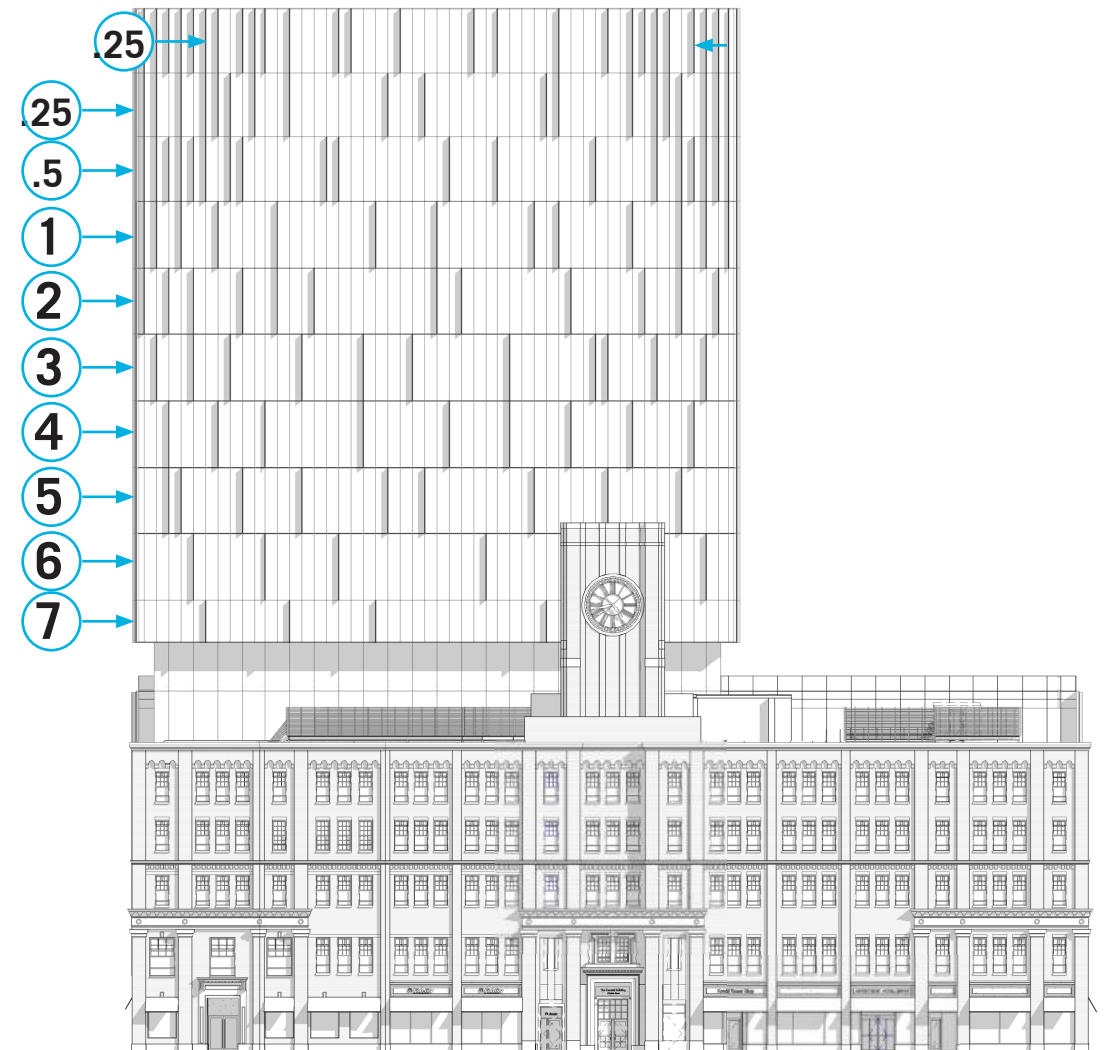
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 144

The mathematical formula that generates the Fibonacci Sequence creates a specific numeric progression and form.

By varying the starting number in the sequence, the same proportional relationship is created at a different scale:

- 0, 2, 2, 4, 6, 10, 16, 26, 42, 68, 110
- 0, 3, 3, 6, 9, 15, 24, 39, 63, 102, 165
- 0, 4, 4, 8, 12, 20, 32, 52, 84, 136, 220
- 0, 5, 5, 10, 15, 25, 40, 65, 105, 170
- 0, 6, 6, 12, 18, 30, 48, 78, 126, 204
- 0, 7, 7, 14, 21, 35, 56, 91, 147, 238

The sequence of numbers generated by this equation was used to create the pattern of fins on the North and South facades.



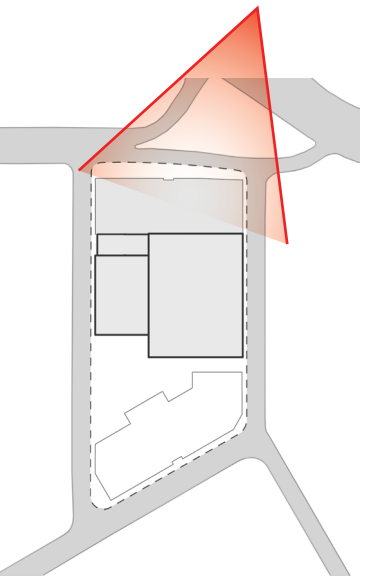
PROPOSED CONCEPT - NORTH FACADE

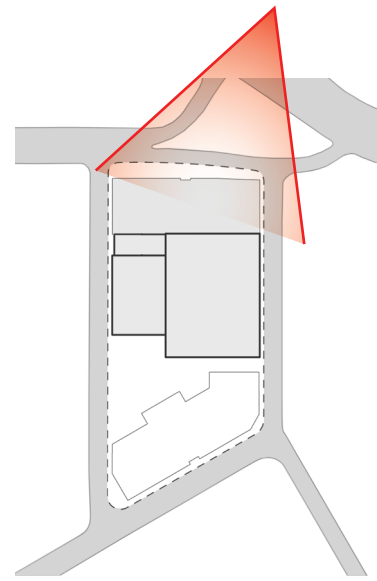
The North facade inverts the approach of the South- the pattern begins with no fins at every mullion, and then fins are added based on the numbers of the Fibonacci Sequence.

PROPOSED CONCEPT - SOUTH FACADE

On the South facade, the pattern begins with fins at every mullion, and then fins are subtracted based on the numbers of the Fibonacci Sequence.

3. Design Evolution Relationship to Main Street

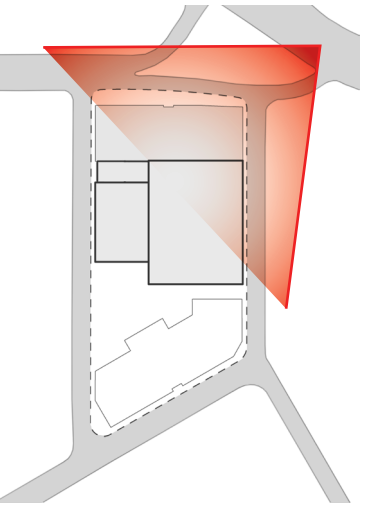




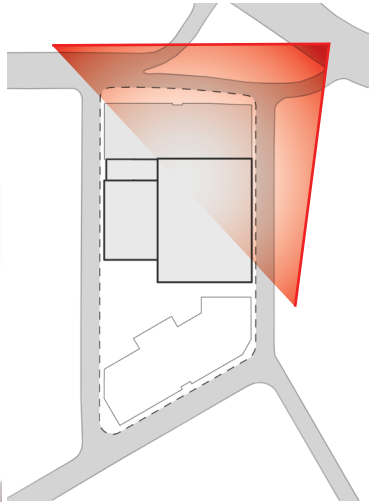
REMOVED ALL VENTILATION LOUVERS AT NORTH SIDE OF PENTHOUSE TO PRODUCE A UNIFIED, NORTH FACADE WITH A VERTICAL PROPORTION

INTRODUCED GRADIENT OF VERTICAL FIN DENSITY IN A STAGGERED PATTERN, RESULTING IN MORE ANIMATION OF THE FACADE





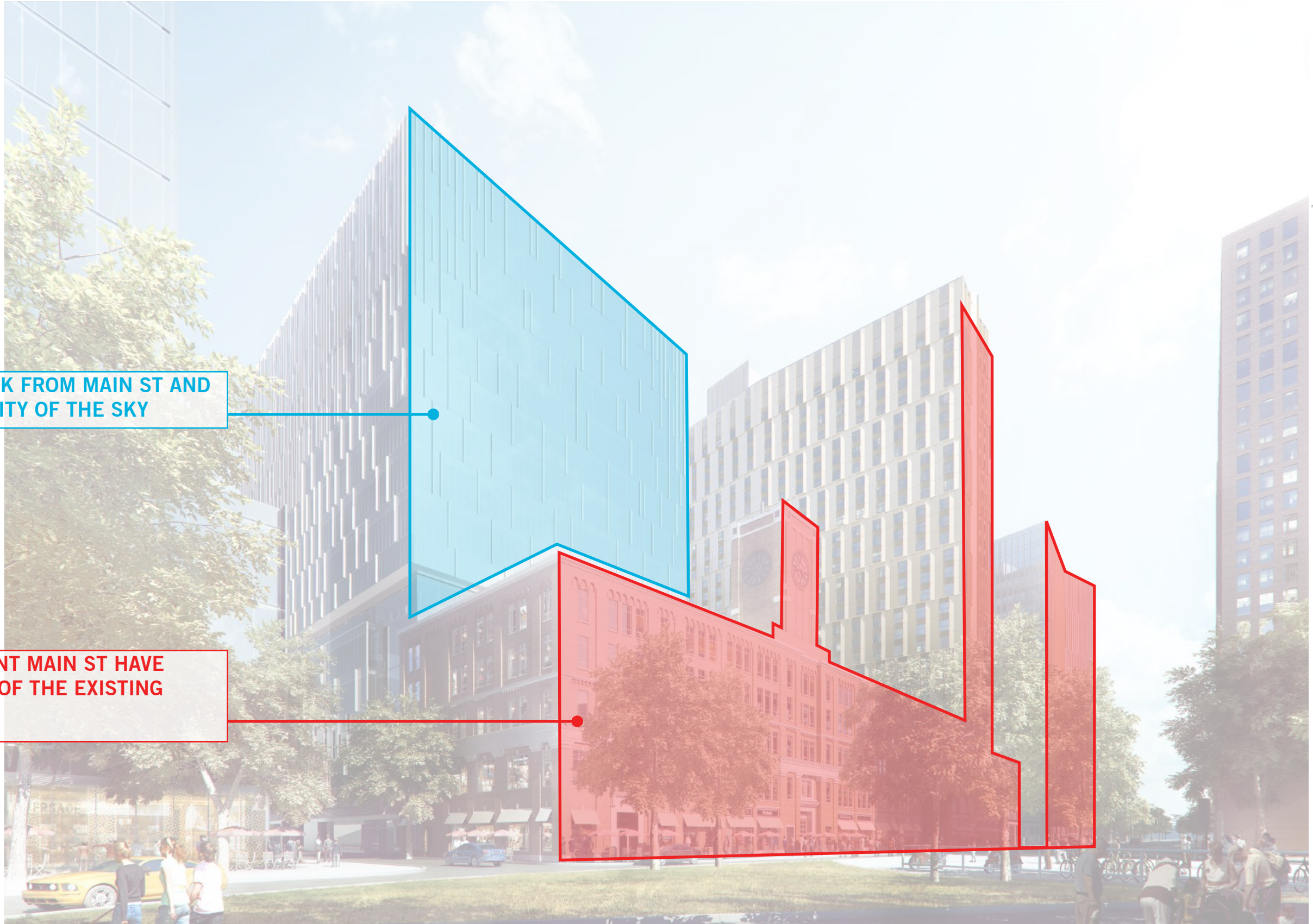
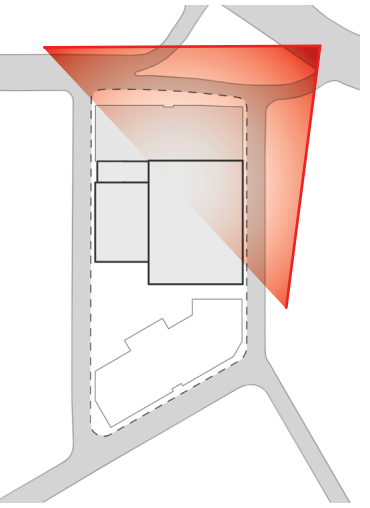
REMOVED ALL VENTILATION LOUVERS AT NORTH SIDE OF PENTHOUSE TO PRODUCE A UNIFIED, NORTH FACADE WITH A VERTICAL PROPORTION



INTRODUCED GRADIENT OF VERTICAL FIN DENSITY IN A STAGGERED PATTERN, RESULTING IN MORE ANIMATION OF THE FACADE



INTRODUCED GRADIENT OF VERTICAL FIN DENSITY IN A STAGGERED PATTERN, RESULTING IN MORE ANIMATION OF THE FACADE AND THE MOST TRANSPARENCY AT THE NORTH FACADE



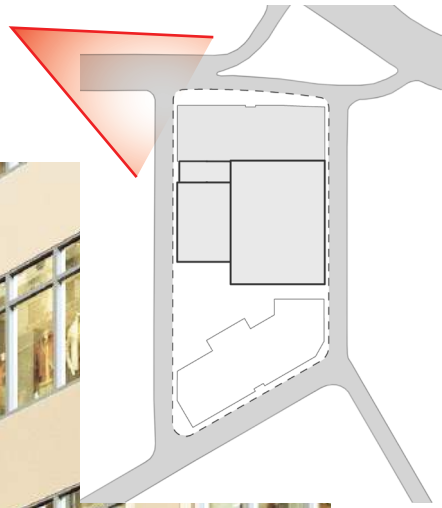
BUILDING 3 SETS BACK FROM MAIN ST AND TAKES ON THE TONALITY OF THE SKY

BUILDINGS THAT FRONT MAIN ST HAVE THE WARM TONALITY OF THE EXISTING BUILDINGS



BUILDING 3

BUILDING 4





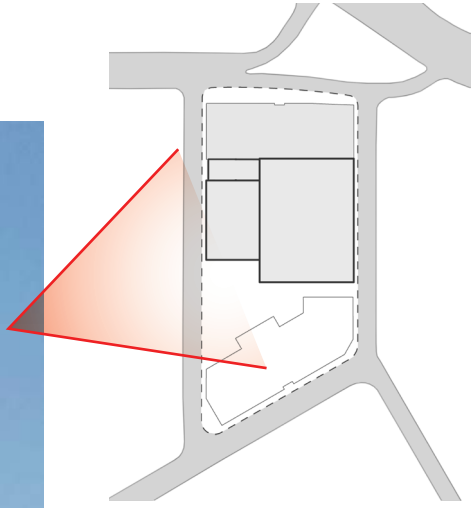
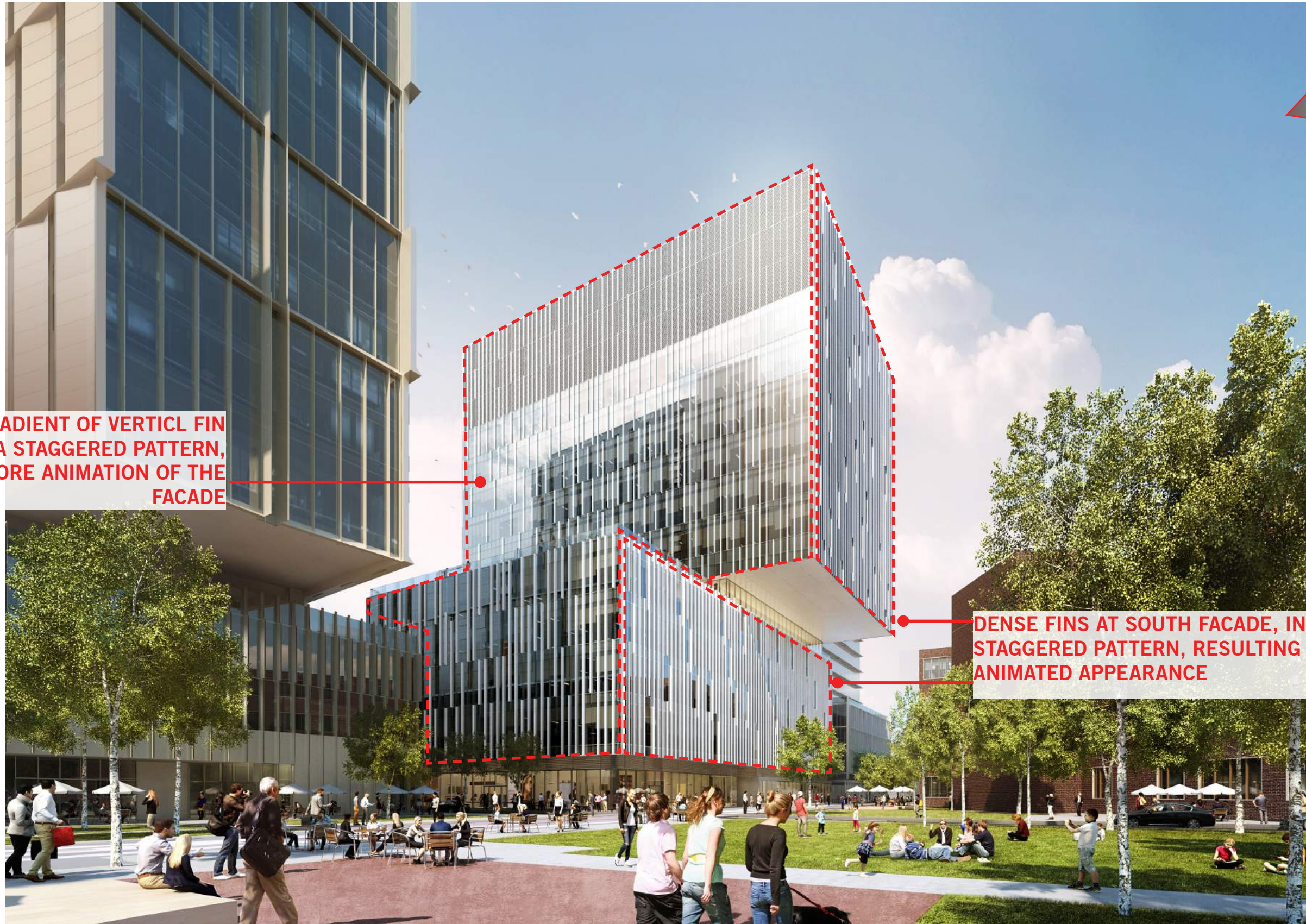


4. Design Evolution Relationship to Open Space & Side Streets





* NOTE: Some trees in landscape have been removed to increase visibility of building facade.



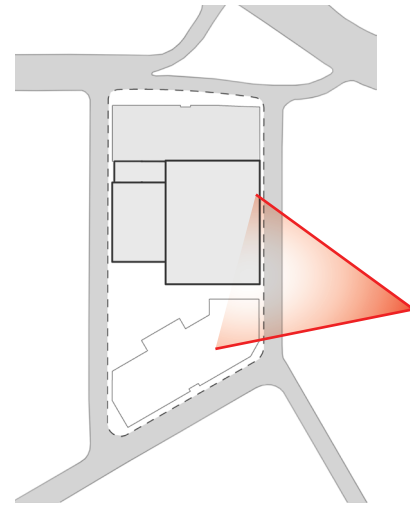
INTRODUCED GRADIENT OF VERTICAL FIN DENSITY IN A STAGGERED PATTERN, RESULTING IN MORE ANIMATION OF THE FACADE

DENSE FINS AT SOUTH FACADE, INTRODUCED STAGGERED PATTERN, RESULTING IN A MORE ANIMATED APPEARANCE

* NOTE: Some trees in landscape have been removed to increase visibility of building facade.



* NOTE: Some trees in landscape have been removed to increase visibility of building facade.





JENNIFER STEINKAMP



LEO VILLAREAL



PIPILOTTI RIST



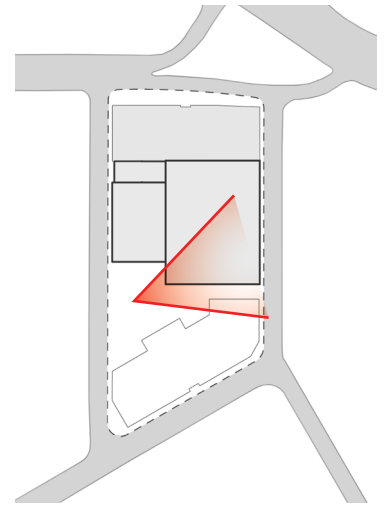
TARA DONOVAN

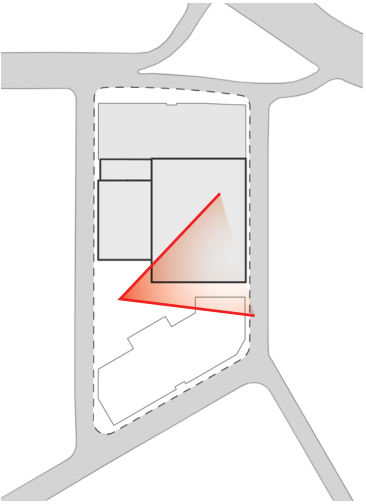


PIPILOTTI RIST



SARAH MORRIS





**DENSE FINS AT SOUTH FACADE,
INTRODUCED STAGGERED PATTERN,
RESULTING IN A MORE ANIMATED**

**RAISED SEATING ELEMENT
ADDED UNDER CANTILEVER**

**INFINITE CORRIDOR SHIFTED
SOUTH TO CREATE A MORE
GENEROUS LAYER OF SPACE FOR
SEATING ADJACENT TO BUILDINGS**

**PAVING HIGHLIGHT ADDED TO
REINFORCE SOUTH ENTRY**





**ACCENT PAVING
LEADING TO SOUTH
ENTRY**

**SPILL-OUT SEATING
ZONE**

BENCH

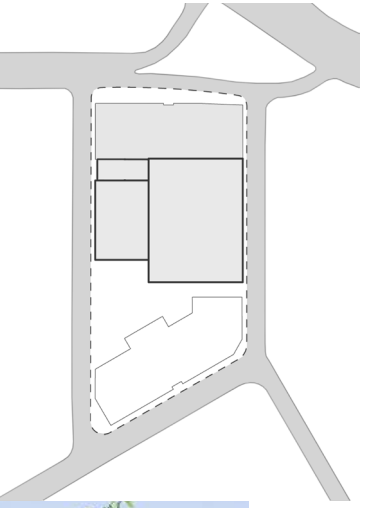
**INFINITE CORRIDOR
HAS BEEN SHIFTED
SOUTH TO CREATE
A MORE GENEROUS
SPILL-OUT SEATING
ZONE**

INFINITE CORRIDOR

**LINE OF CANTILEVER
ABOVE**

**NEW RAISED
SEATING PLATFORM**





* NOTE: Some trees in landscape have been removed to allow greater visibility of building facade.

