COMFORT MAPPING

GROUP #5

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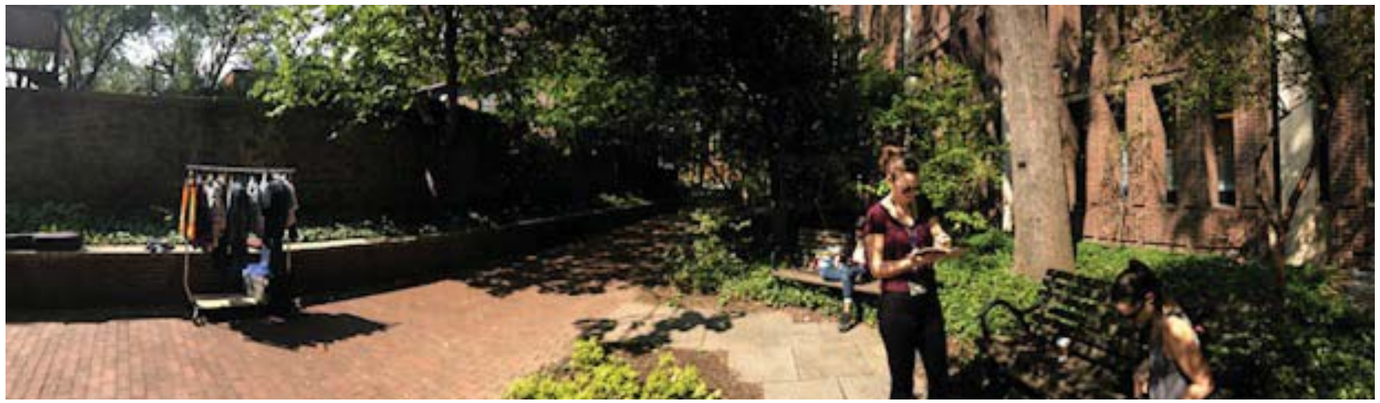
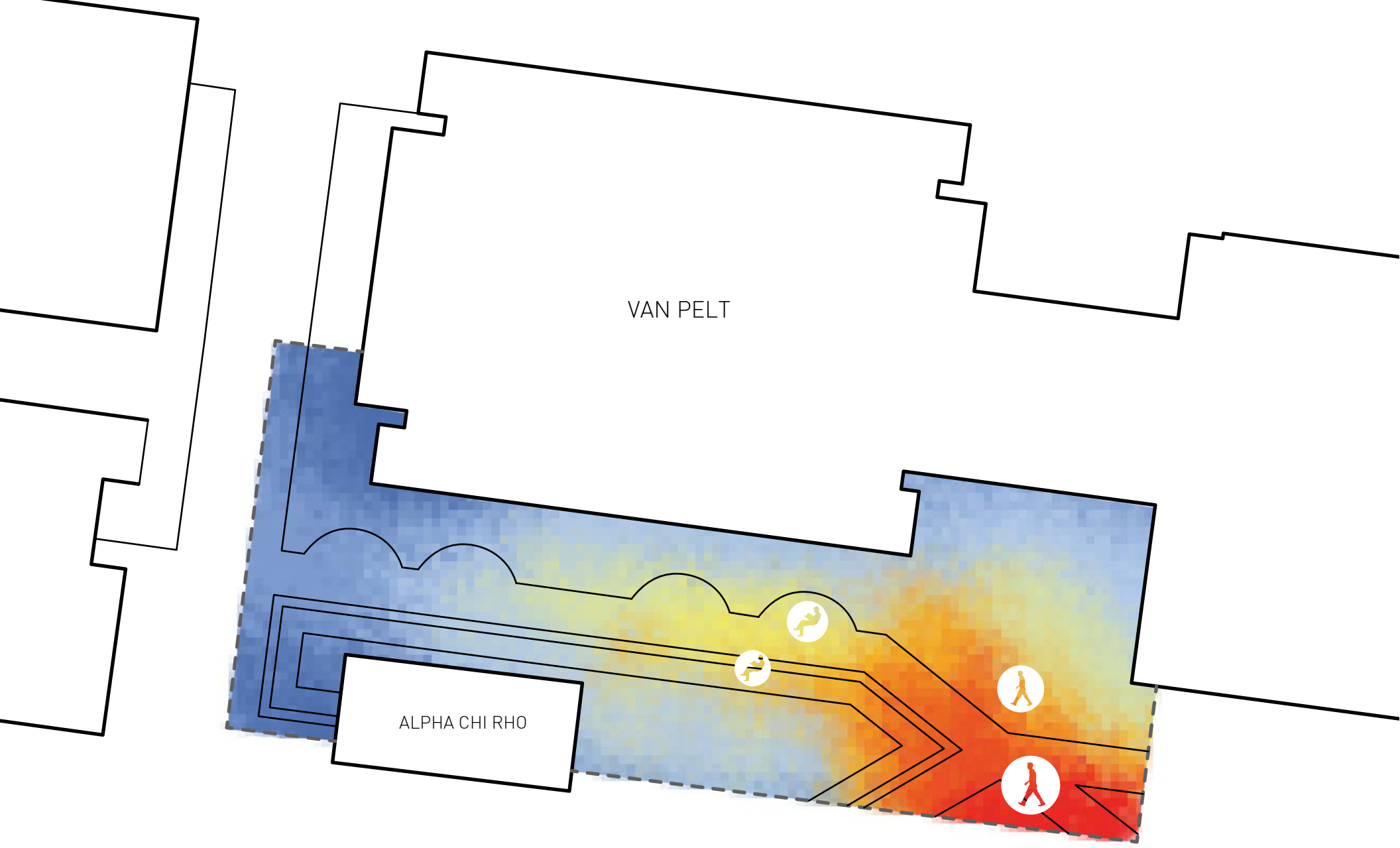
COMFORT MAPPING QUESTIONS+DISCUSSION

1. **Is there any relationship between thermal comfort and behavior?**
    a. In the areas of direct sunlight, there were groups of people standing and sitting--however visits were limited to 30 min or less. The most activity was in the areas of partial shade, particularly the entrance to the corridor that runs alongside Van Pelt. No activity was seen in the areas of complete shade--the back end of the corridor. This area felt too cold and the winds seemed stronger.
2. **As a designer what would be your top 2 design proposals to make the space more comfortable for outdoor activities?**
    a. One: Towards the end of the corridor, we would suggest the removal of some trees. There is a significant amount of shade provided by the library and as a result, additional shading from trees is unnecessary. This area felt uncomfortably cold.
    b. Two: The second design change would be to add more useable landscape in the area of the corridor. The two seating surfaces were limited to a total of three wooden benches and a small retaining wall. There was no grass for visitors to sit on--the area was dominated by ground cover that you could not walk or sit on.
    c. Note: this seating area was extremely high in mosquitos, which we have not noticed anywhere else on campus. We speculate that the vegetation and excessive shading promotes mosquito breeding.
3. **Is there a difference between local weather data, weather file and the station weather data? How much is the difference?**
    a. Local weather data (data we recorded):
        i. 12 pm -- 25.9 °
        ii. 3 pm -- 22.9 °
        iii. 7:30 pm -- 20 °
    b. Weather file (EPW):
        i. 12 pm -- 23.9 °, NNE 8.2 mph
        ii. 3 pm -- 23.9 °, 6.2 mph
        iii. 7:30 pm -- 18.3°, 5.7 mph
    c. Station weather data (Weather.com):
        i. 12 pm -- 21 °, NNE 10 mph
        ii. 3 pm -- 23 °, NNE 9 mph
        iii. 7:30 pm -- 20°, N 6 mps
    d. The difference between the different sources of data were only by a few degrees in terms of temperature. The largest difference we noticed however was the wind speed between the station and the data we collected. We have deduced that the wind speed was higher in our location (open corridor next to the Van Pelt library and Alpha Kai Ro House) because of the wind tunnel created between the two tall buildings.
4. **Based on your observations can you predict the comfort map in a summer day and in a winter day?**
    a. Summer: see comfort charts
    b. Winter: see comfort charts




12PM

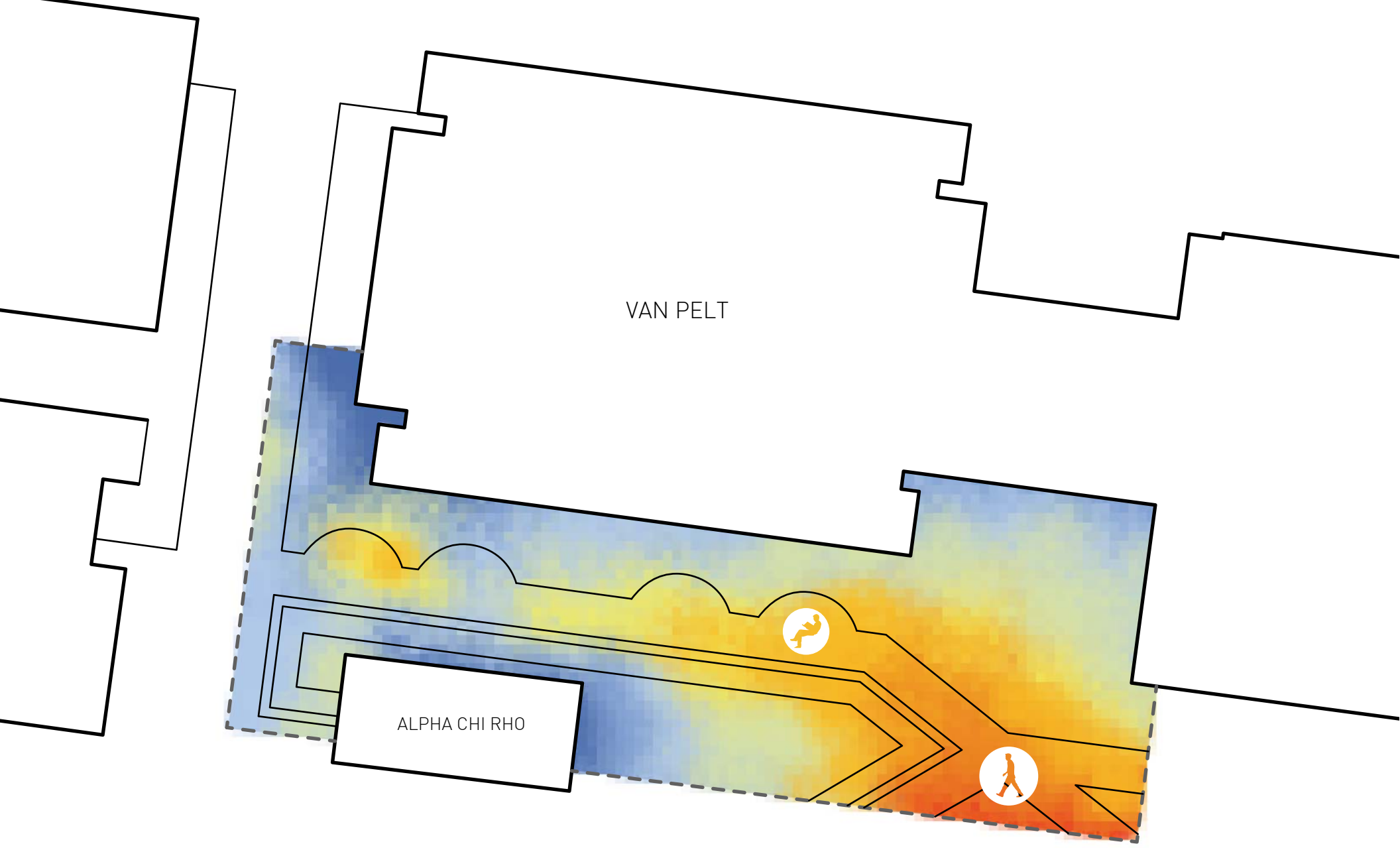

3 PM



UTCI
(deg C)

16	21	26	31	36
(too cold)		(ok)		(too hot)

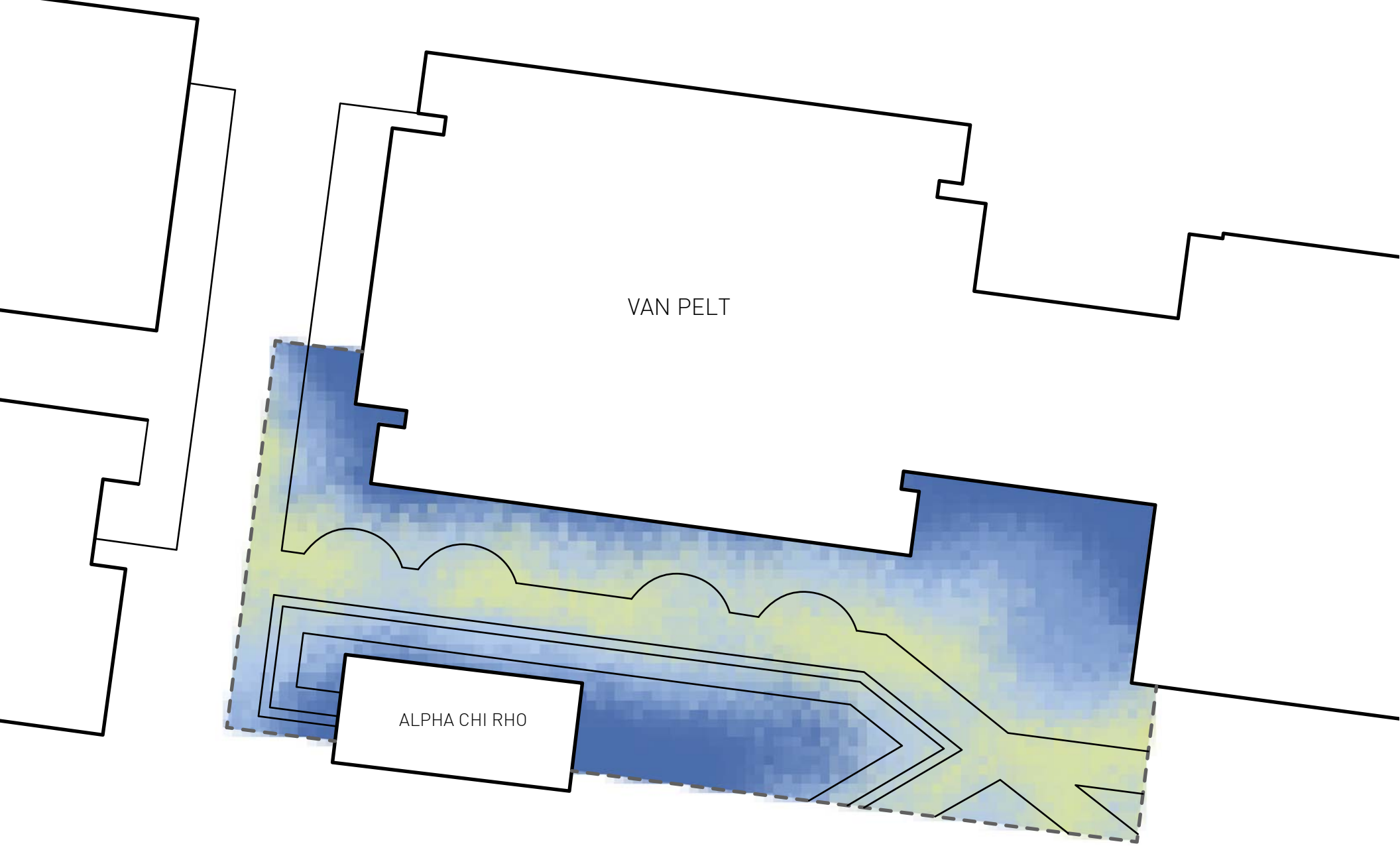
Date: 09/10/2017
Time: 12:00 PM



UTCI
(deg C)

16	21	26	31	36
(too cold)		(ok)		(too hot)

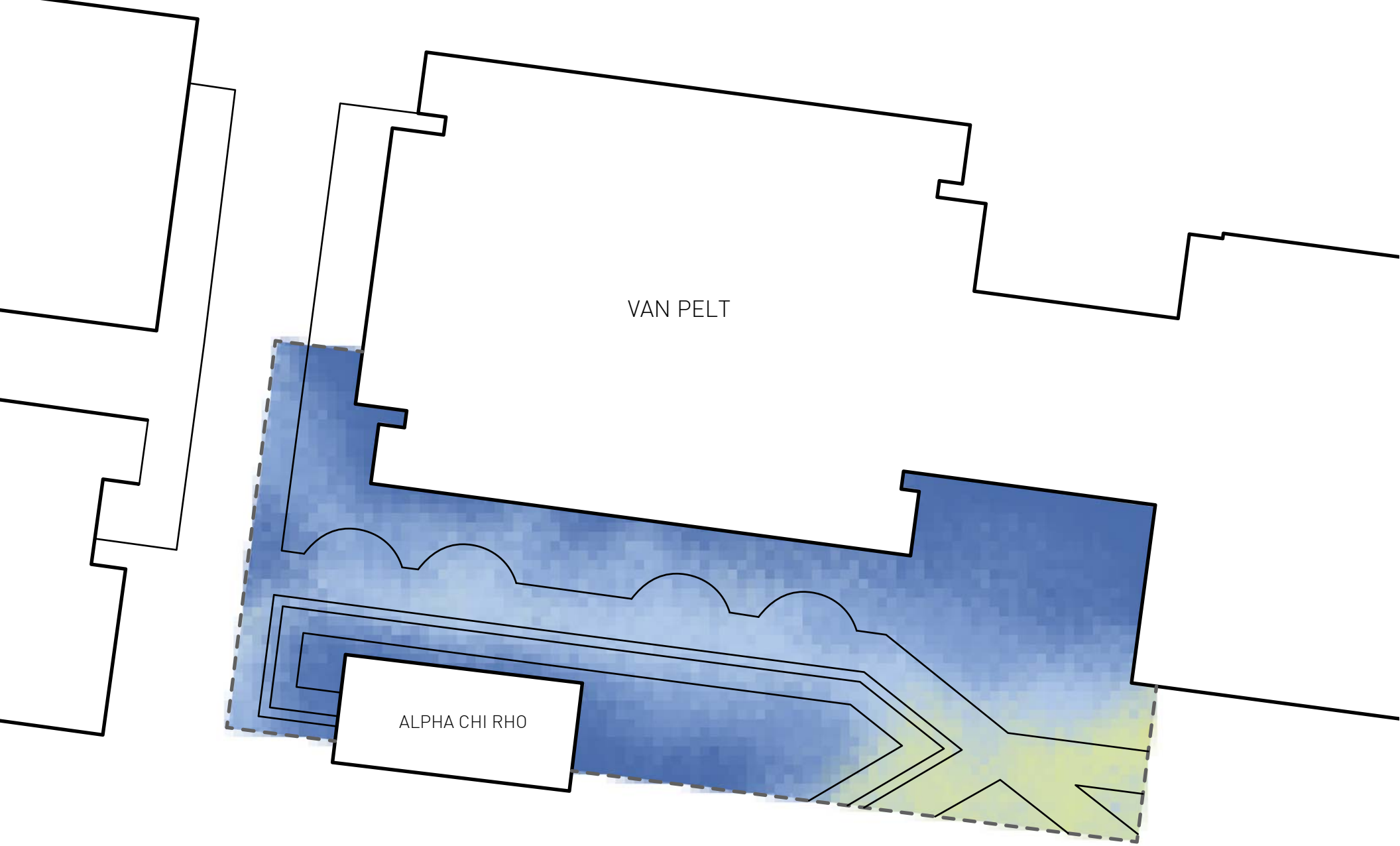
Date: 09/10/2017
Time: 3:00 PM



UTCI
(deg C)

16	21	26	31	36
(too cold)		(ok)		(too hot)

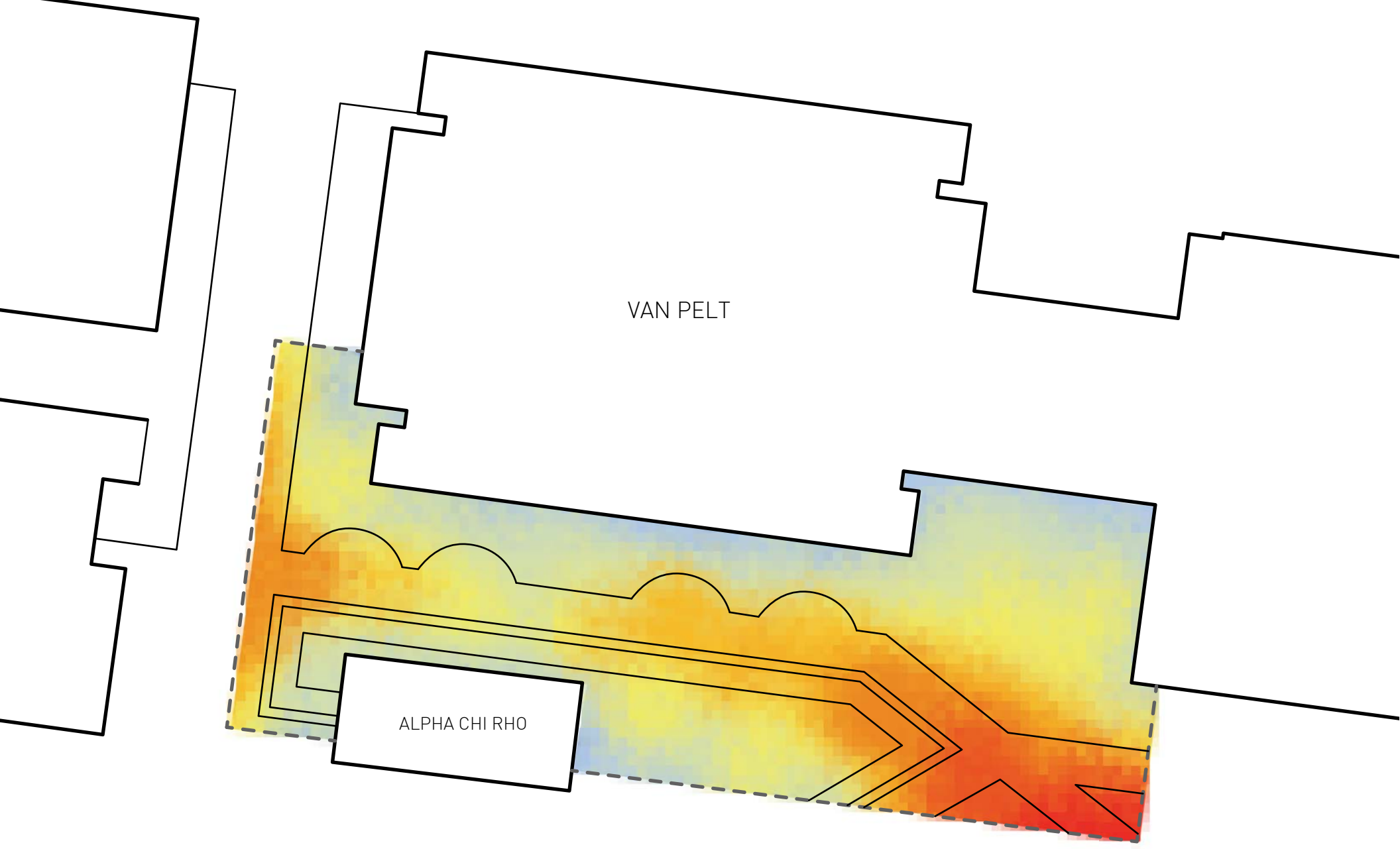
Date: 09/10/2017
Time: 7:30 PM



UTCI

(too cold) (ok) (too hot)

Winter Comfort Map



UTCI

(too cold) (ok) (too hot)

Summer Comfort Map

Site Visit #1: 11:50am-12:15pm				
ENVIRONMENT				
	Air Temp.	**Wind Speed**		**Description of Comfort / Environment**
Region A	25.9 C	0.8 m/s		*Comfortable, Bright Sun, Light Wind* *Space being used as a rehearsal space or backstage area* *Private, few people walking through it or sitting in the seats*
Region B	25.1 C	0.7 m/s		*Comfortable, Partial Shade, slightly cooler feeling.* *Trees blocked the sun from the south side of Van Pelt in many areas, but was shining on the pavement and benches*
Region C	26.7 C	0 m/s		*Full Shade, covered by tree canopy* *Coolest region of the three, felt a dramatic temperature change.* *Slight discomfort from temperature drop*
MATERIALS	**Material Temp.**	**Sun or Shade**		
Materials at Location A				
South Facing Van Pelt Brick Wall	21.2 C	*In Shade*		
Brick Pavement Walkway	31.7 C	*In Sun*		
North Facing High Retaining Wall	20.6 C	*In Shade*		
Materials at Location B				
South Facing Van Pelt Brick Wall	25 C	*In Sun*		
Brick Pavement Walkway	31.7 C	*In Sun*		
North Facing High Retaining Wall	19.5 C	*In Shade*		
Materials At Location C				
South Facing Van Pelt Brick Wall	20.3 C	*In Shade*		
Brick Pavement Walkway	19.7 C	*In Shade*		
North Facing High Retaining Wall	17.8 C	*In Shade*		

Site Visit #2: 3:00pm-3:15pm				
ENVIRONMENT				
	Air Temp.	**Wind Speed**		**Description of Comfort / Environment**
Region A	21.7 C	0.1 m/s		*Out of the 9 regions thorugout the day that we surveyed, this specific instance was the hottest. The sun was higher overhead, and was brightly shining down on the pavement, with very little wind. This created an almost uncomfortably hot space to occupy.*
Region B	23.3 C	0.4 m/s		*This area was interesting, because even though the temperature was warmer than in Region A, we all agreed it felt colder. We attributed this to a combination of the shade and slightly increased wind speed. This area was still within our comfort range though.*
Region C	23.8 C	.8m/s		*This area was in full shade by this time. The dense tree cover and structures which enclosed the area made it feel the coolest. It was almost sligtly uncomfortable, especially when having just exited the very hot Region A area.*
MATERIALS	**Material Temp.**	**Sun or Shade**		
Materials at Location A				
South Facing Van Pelt Brick Wall	27.4 C	*Partial Shade*		
Brick Pavement Walkway	39.4 C	*In Sun*		
North Facing High Retaining Wall	23.6 C	*In Shade*		
Materials at Location B				
South Facing Van Pelt Brick Wall	20.6 C	*In Shade*		
Brick Pavement Walkway	38.7 C	*In Sun*		
North Facing High Retaining Wall	23.4 C	*In Shade*		
Materials At Location C				
South Facing Van Pelt Brick Wall	23.5 C	*In Shade*		
Brick Pavement Walkway	22.8 C	*In Shade*		
North Facing High Retaining Wall	21.6 C	*In Shade*		

Site Visit #3: 7:30pm-7:50pm					
ENVIRONMENT					
	Air Temp.	**Wind Speed**		**Description of Comfort / Environment**	
Region A	20.2 C	0 m/s		*These measurements were taken after sundown. We found that the initial differences between the three regions became far less noticiable after radiation no longer became a factor.*	
Region B	20 C	0.6 m/s		*The three regions were both colder than we had experienced earlier, but we all still felt very comfortable. This was probably due to the lack of contrast between indoors and outdoors, with the exterior no longer being significantly hotter than air-conditioned space.*	
Region C	19.9 C	0.2 m/s		*The materials of the walls and pavers were retaining heat being significantly warmer than the air temperature*	
MATERIALS	**Material Temp.**	**Sun or Shade**			
Materials at Location A					
South Facing Van Pelt Brick Wall	22.3 C	*Sun Down*			
Brick Pavement Walkway	24.8 C	*Sun Down*			
North Facing High Retaining Wall	21.5 C	*Sun Down*			
Materials at Location B					
South Facing Van Pelt Brick Wall	21.3 C	*Sun Down*			
Brick Pavement Walkway	21.3 C	*Sun Down*			
North Facing High Retaining Wall	21.3 C	*Sun Down*			
Materials At Location C					
South Facing Van Pelt Brick Wall	23.3 C	*Sun Down*			
Brick Pavement Walkway	20.8 C	*Sun Down*			
North Facing High Retaining Wall	20.2 C	*Sun Down*			
Reported Weather Data: Apple Weather App					
Temperature	23 C / 12 C				
Precipitation	0%				
Humidity	60%				
Wind	NE 2mph				
Clear and Sunny					