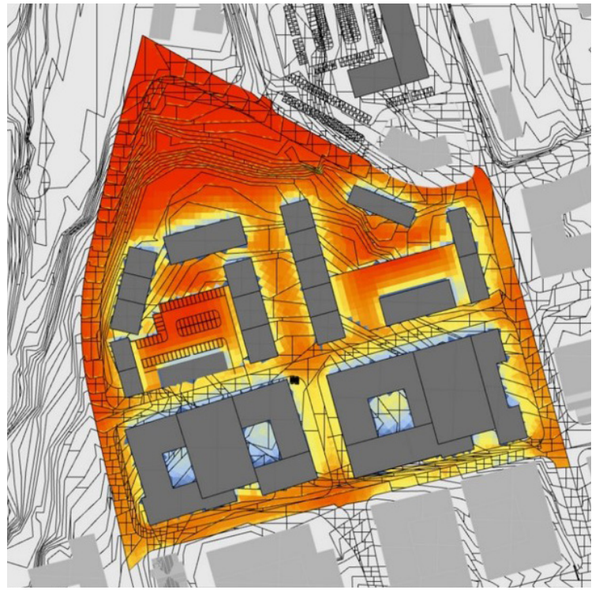
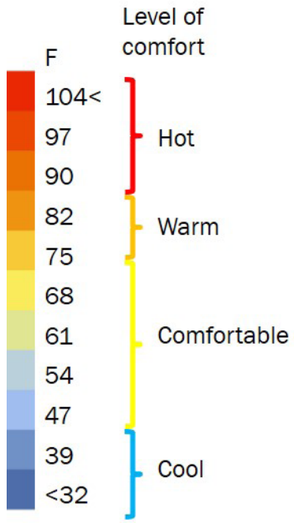
Chapter 6-3 Sustainability Analysis

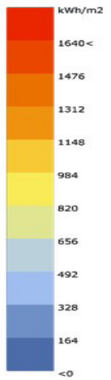
Solar Analysis- Yearly Total Radiation



The analysis is also carried out on building surfaces illustrating areas of solar heat gain stress, or solar access identifying preferred location of solar panels on roofs.

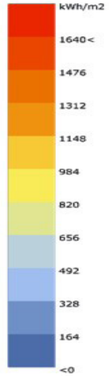
Accounting for climate and environmental conditions when designing for optimum outdoor thermal and visual comfort. This analysis could inform thermal comfort and vegetation growth, and selection and placement of outdoor amenities and activity areas.

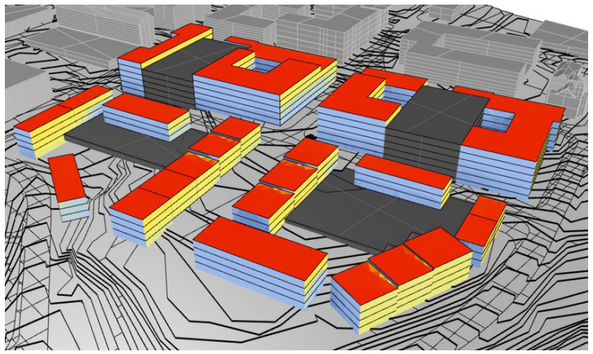


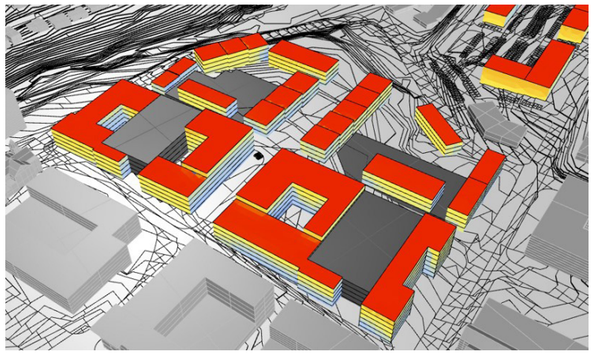


Solar Analysis

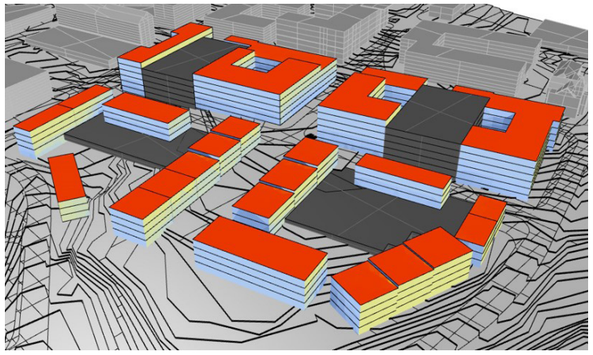
Building massing, orientation, programming and materials selections are developed taking into account yearly total solar radiation. Placement of windows, balconies, and wall finishes can have an effect in energy performance and occupant comfort.

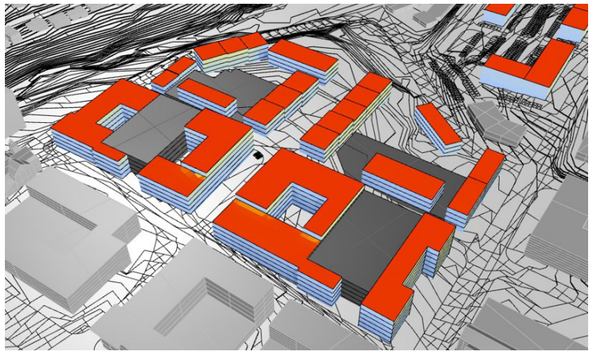




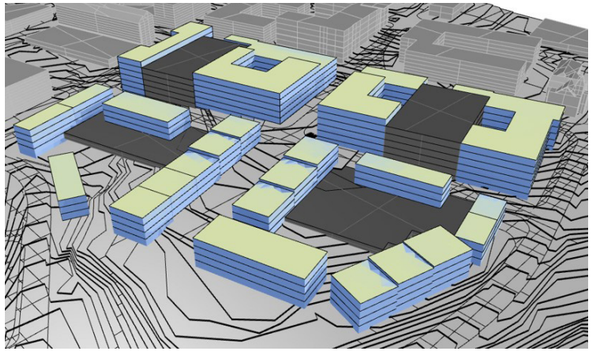


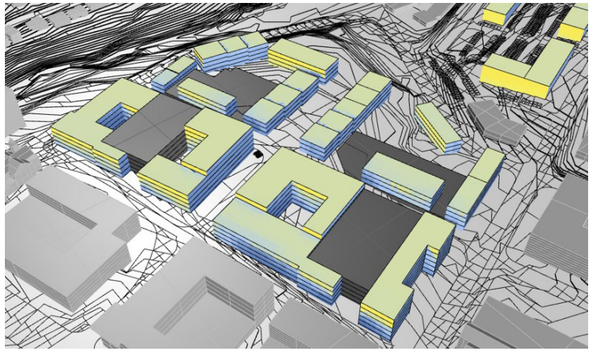
Yearly Total Radiation





June

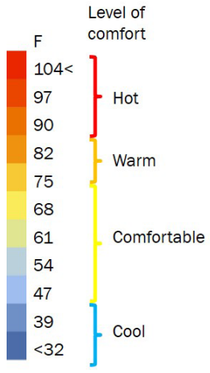


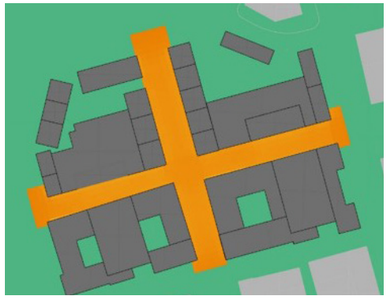


December

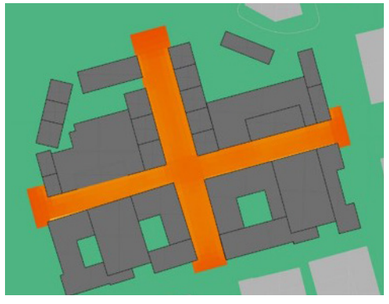
Outdoor Comfort Maps

The outdoor thermal comfort maps are calculated using the UTCI methodology. It represents the general “thermal sensation” a person will experiment at a given time. The Universal Thermal Climate Index (UTCI) is similar to the temperature given during weather reports and “feels like” values. UTCI takes into account radiant temperature (usually including solar radiation), relative humidity, wind speed and uses them in a human energy balance model to give a temperature value that is indicative of the heat stress or cold stress felt by the human body.

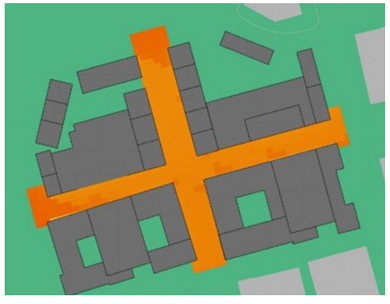




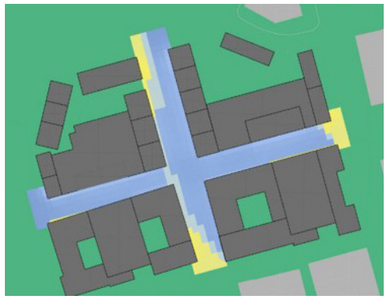
June 11th
9am - 10am



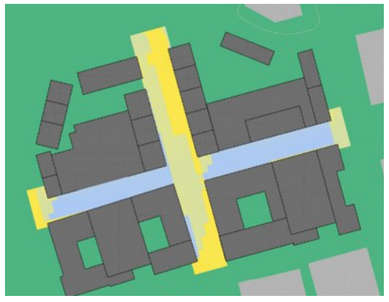
June 11th
11am - 1am



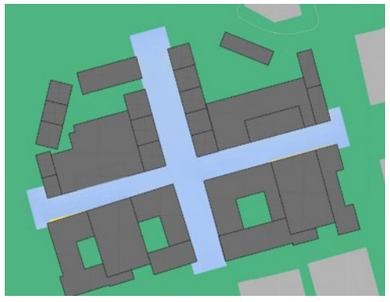
June 11th
11am - 1am



December 11th
9am - 10am



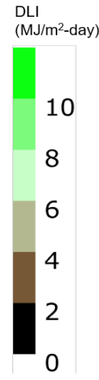
December 11th
9am - 10am



December 11th
9am - 10am

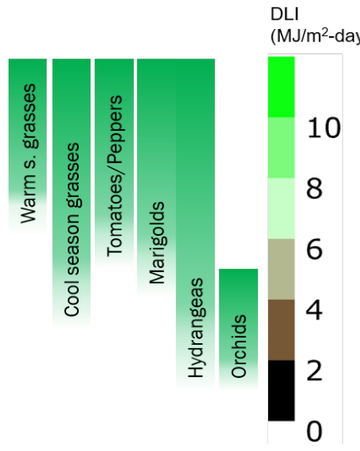
PAR Study

Photosynthetically Active Radiation (PAR) defines the light spectrum range where plants can grow optimally. It is evaluated by establishing the DLI (Daily Light Integral) value. Each plant species has its own optimal DLI range, which will influence growth level & life expectancy.



Plant	Minimum DLI (MJ/m2/day)	Good Quality DLI (MJ/m2/day)	High Quality DLI (MJ/m2/day)
Orchids	1	2	3-5
Dutch Irises	2	3-4	5-11
Hydrangeas	3	4-5	6 or more
Gerbera (African) Daisies	3-4	5-6	7 or more
Marigolds	4-5	6-8	9 or more
Tomatoes / Peppers	5-6	7-10	11 or more
‘Cool Season’ Grasses (Kentucky Blue Grass / Perennial Ryegrass)	3	5.5	10-20
‘Warm Season’ Grasses (Bermudagrass / Zysiagrass)	6	12	16

Common plants and their associated DLI ranges (Source: McCree, K.J. 1972)



LEED FOR COMMUNITIES- PILOT VERSION 4.1

Project name: North Development Athens

Updated: 12/01/2020
Created by: Thornton Tomasetti

P/C	Title	Available Points	Y	?+	?-	N	Note/ Question for Design Team and/ or City of Athens issued 11/3/2020	Question point of contact	Precertification Documentation Included in Feasibility Scope? (Phase I)
Integrative Process									
P	Integrative Planning + Design Process	N/A	X				~~1) Have sustainability / green strategies been a topic for any of the community workshops yet? If so, kindly provide minutes.~~ Ian provided 11/17/20 2) Please provide any documents that indicate the Vision and Mission Statements for North Development Athens project (or should the team use Envision Athens documents?)	City of Athens	YES
C	Green Building Policy + Incentives	5	1	1		3	Achieved if buildings within the development over 5000 SF are certified to LEED or an equivalent green building rating system. 51%-75% (1 point) 75%+ (2 points). ~~Are there any incentives for nonpublic buildings to pursue LEED or other green building certifications?~~ No, per Andrew Saunders 11/20/20	Columbia Residential ~~Mike Wharton, Athens Chief Sustainability Officer.~~	YES- if applicable
Natural Systems and Ecology									
P	Ecosystem Assessment	N/A	X						YES
P	Construction Activity Pollution Prevention	N/A	X						NO
P	Green Spaces	N/A	X				~~1) Will the development be able to design for at least 121 SF open space / resident?~~ Approximately 2 acres wihtin development- need roughly 7. See nearby pulaski creek, lay park, etc. 2) What are the project goals for street furnishings ~~/ shade trees~~? Trees every 30 feet.	Dix Hite advise re: street furnishings.	YES
C	Natural Resources Conservation and Restoration	5		5			Is there an inventory of existing natural areas and open space? A rough area for the proposed design? Buck Bacon to forward CAD of Existing site conditions.	Buck Bacon	YES- if applicable
C	Light Pollution Reduction	2	1				What are the guidelines for street/ site lighting? Could the project follow ANSI / IESNA RP-8-14 for Roadway Lighting?	Buck Bacon	NO
C	Resilience Planning	6	3	3			~~Is there a Risk Assessment for the City of Athens?~~ Yes	JW Thaxton, interim emergency Mgmt Coordinator	NO
Transportation and Land Use									
C	Compact, Mixed Use and Transit Oriented Development	6	4	2			~~Please provide any studies of public transportation / commuter patterns~~ Provided 11/24	Butch McDuffie, ACC Transit Director Victor Pope, ACC Transit Planner	NO
C	Walkability and Bikeability	4		4			~~1) Are there speed limits for the new development roads? Does the team have any opportunity to influence those?~~ Yes, 25 mph per law. ~~2) Will the site include continuous sidewalks?~~ Yes		YES- if applicable
C	Access to Quality Transit	2	2				~~Are there any planned transit stops within the project boundary?~~ Ian provided 11/17/20 *Tentative- Lumpkin extension @ Madison extension – combined ACC Transit/School bus stop*		YES
C	Alternative Fuel Vehicles	2	2				~~What is the EV plan for the parking garage?~~ Columbia confirmed 6% capacity will be included.		YES
C	Smart Mobility and Transportation Policy	2	2						NO
C	High Priority Site	2	2						YES
Water Efficiency									
P	Integrated Water Management	N/A	X						YES
P	Water Access and Quality	N/A	X						YES
C	Stormwater Management	5	3	1	1		Project will meet or exceed Georgia stormwater requirements and Athens NPDES. Detain 25 year design storm, treat first inch of rainfall, and reduce the 1 year storm to predevelopment volume. Strategies will include detention pond/ park and bioswales.	Buck Bacon	NO
C	Wastewater Management	5				5			NO
C	Smart Water Systems	2	2						NO
Energy and Greenhouse Gas Emissions									
P	Power Access, Reliability and Resiliency								NO
P	Energy and Greenhouse Gas Emissions Management	19	2		17		~~Does the City of Athens have a Greenhouse gas Inventory?~~ Yes, from 2010 though it is only for City buildings and we have been forewarned about some of the values used by Andrew Saunders.	Mike Wharton, Athens Chief Sustainability Officer.	YES- with available information
C	Energy Efficiency	4	2	2					YES- if applicable
C	Renewable Energy	6	2		4				NO
C	Low Carbon Economy	4				X			N/A
C	Grid Harmonization	2	2						NO
Materials and Resources									
P	Construction and Demolition Waste Management	N/A	X						NO
P	Solid Waste Management	N/A	X				Does the City of Athens have a municipal waste study/ inventory?	Suki Janssen, Athens Solid Waste Director	YES
C	Organic Waste Treatment	2	2						YES- if applicable
C	Recycling Infrastructure	5	5						NO
C	Responsible Sourcing for Infrastructure	2			2				NO
C	Smart Waste Management Systems	2		2					YES- if applicable
Quality of Life									
P	Demographic Assessment	N/A	X				Do you have a demographic and housing assessment which includes NDA area?	Hayley Banerjee, ACC	NO
P	Social Infrastructure	N/A	X						NO
P	Economic Growth	N/A	X						NO
C	Affordable Housing	2	2						NO
C	Public Health	6	3		3				NO
C	Emergency Management and Response	2	2						NO
Innovation									
C	Exemplary Performance	1				X			NO
C	Innovation in Design	1	5				To be determined in next phase		NO
C	LEED AP	1	1				Casey maintains her LEED AP credentials		YES
Regional Priority									
C	TBC	1	1				To be determined in next phase		NO
C		1	1				To be determined in next phase		NO
C		1	1				To be determined in next phase		NO
C		1	1				To be determined in next phase		NO
C		X				X			
C		X				X			
	TOTAL		54	20	30	8			

Chapter 6-4 LEED