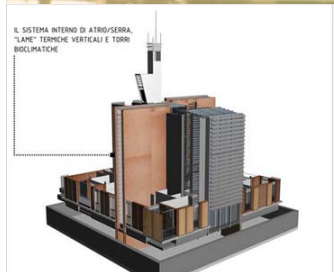




Firenze, 29 marzo 2014
CASA SPA, CasaClima Toscana

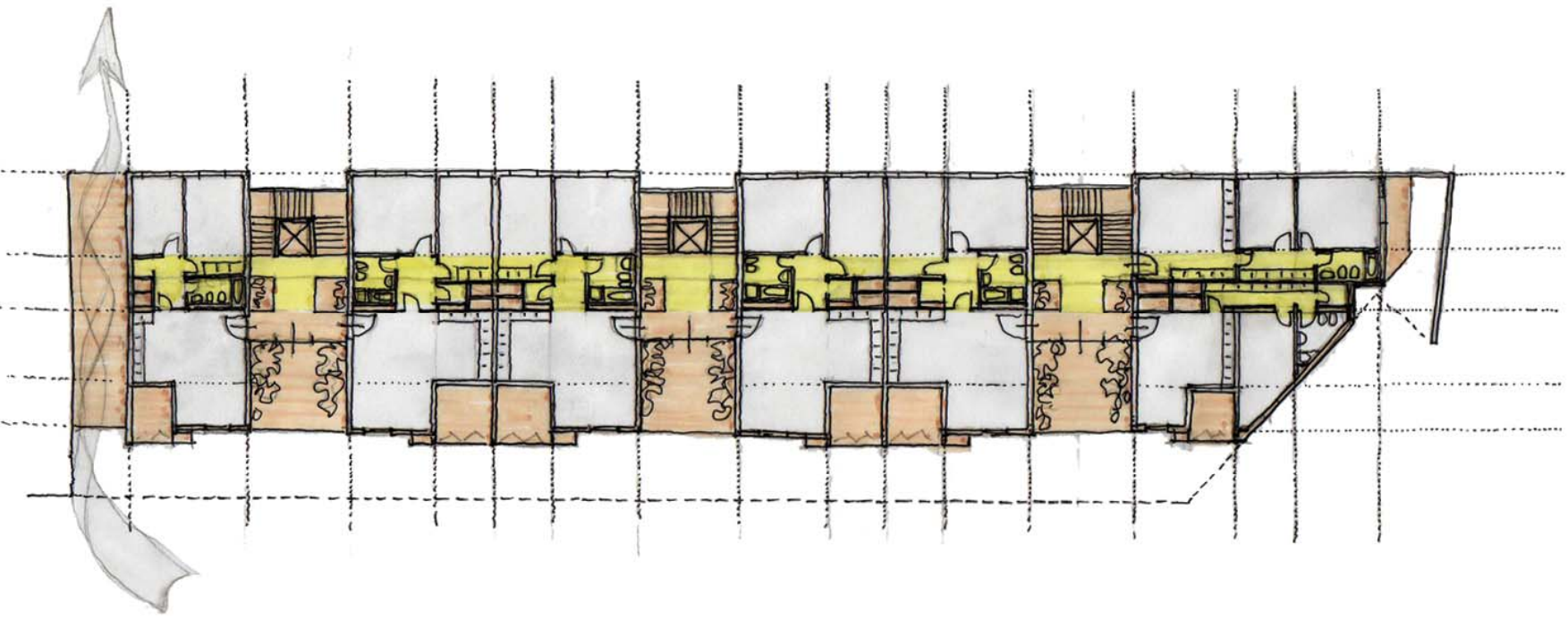
PROGETTARE HOUSING PUBBLICO “NZEB” CON STRATEGIE BIOCLIMATICHE

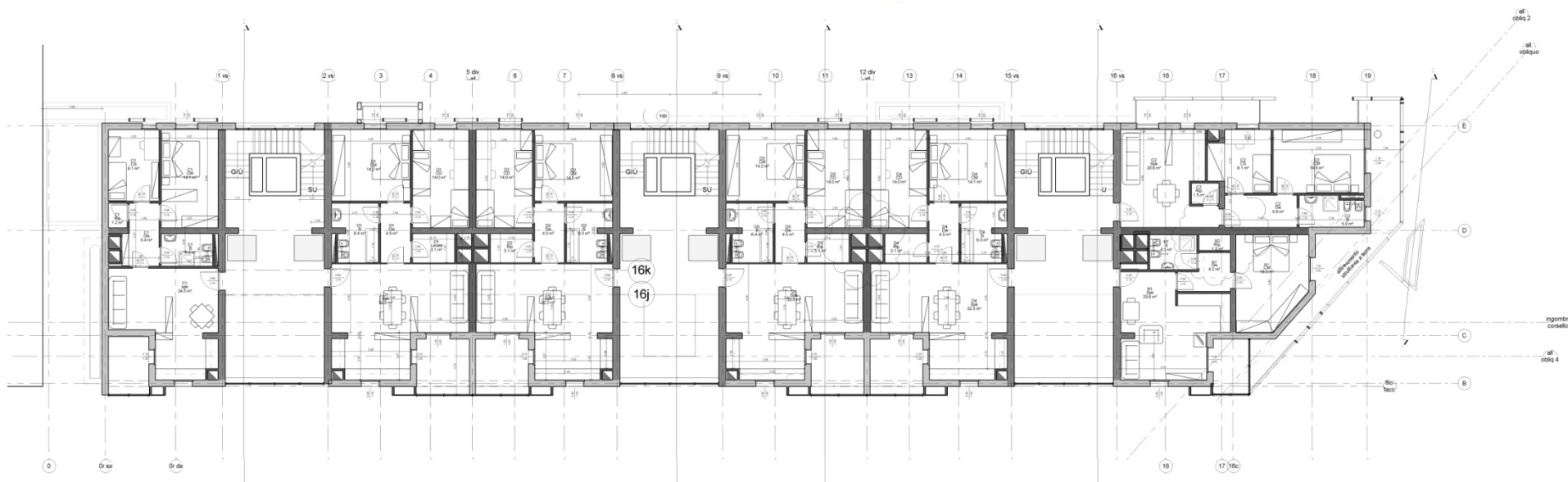
Alessandra Battisti, Fabrizio Tucci
Università degli Studi di Roma “La Sapienza”

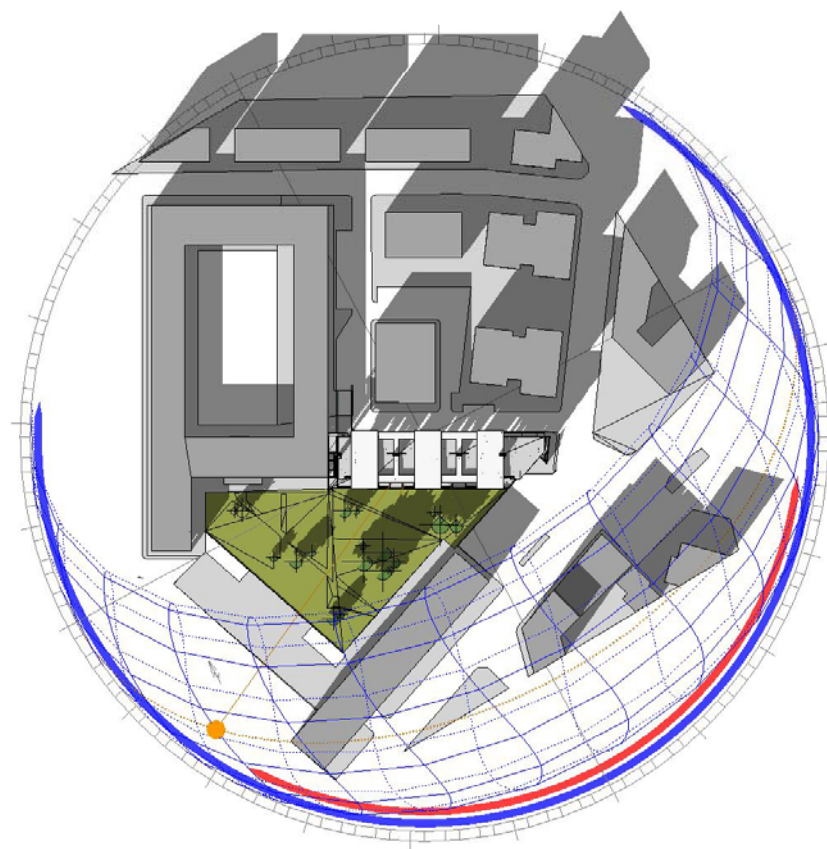
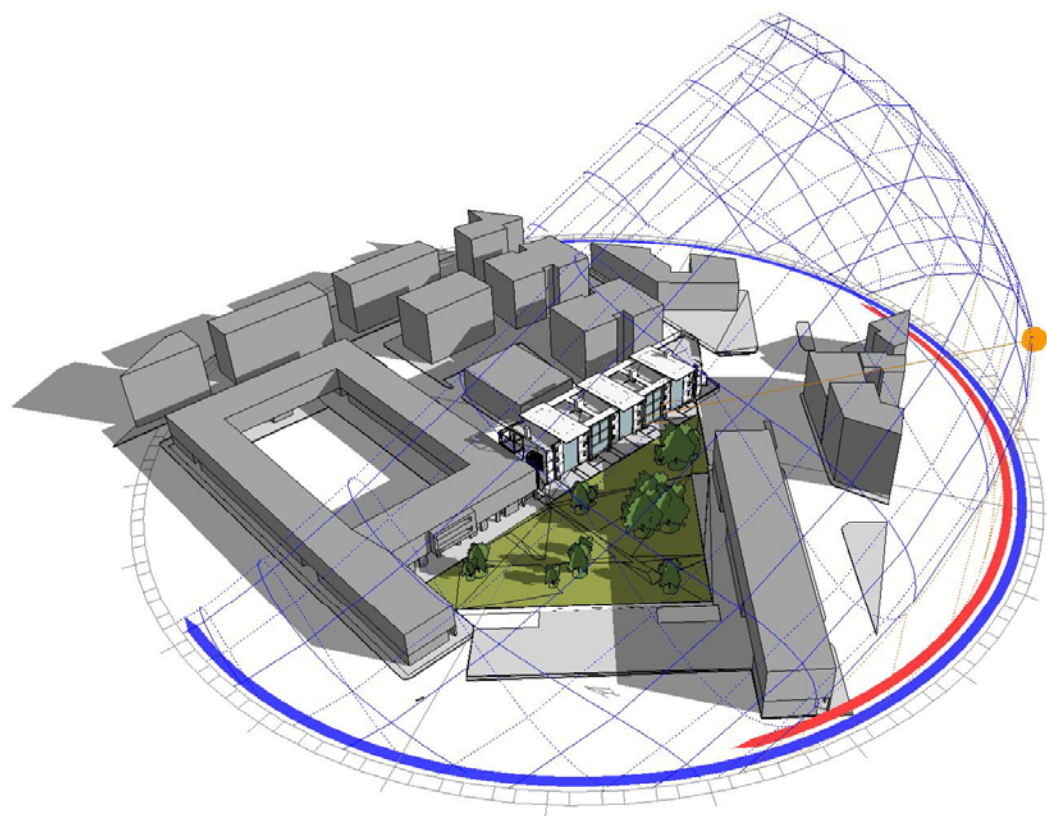


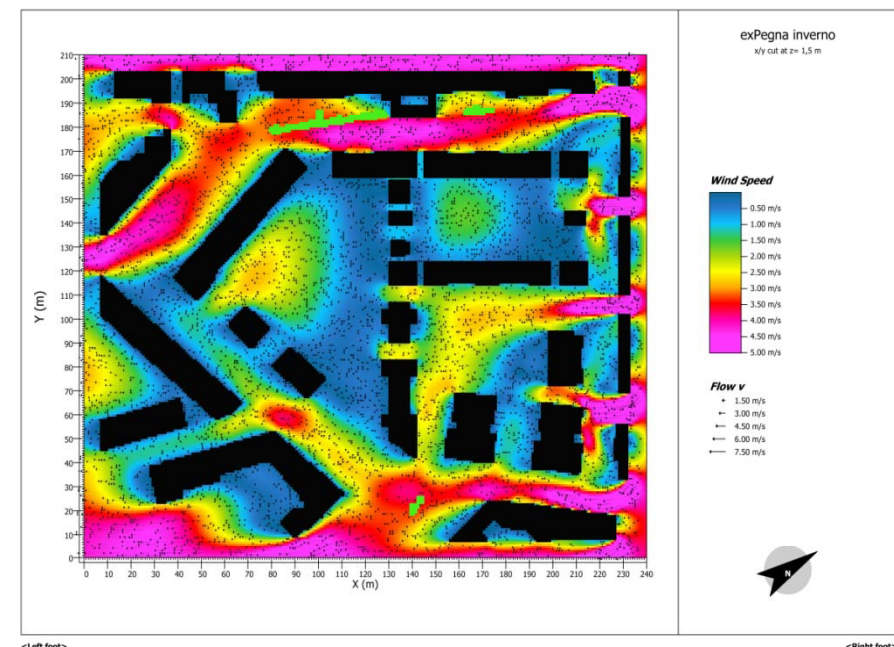
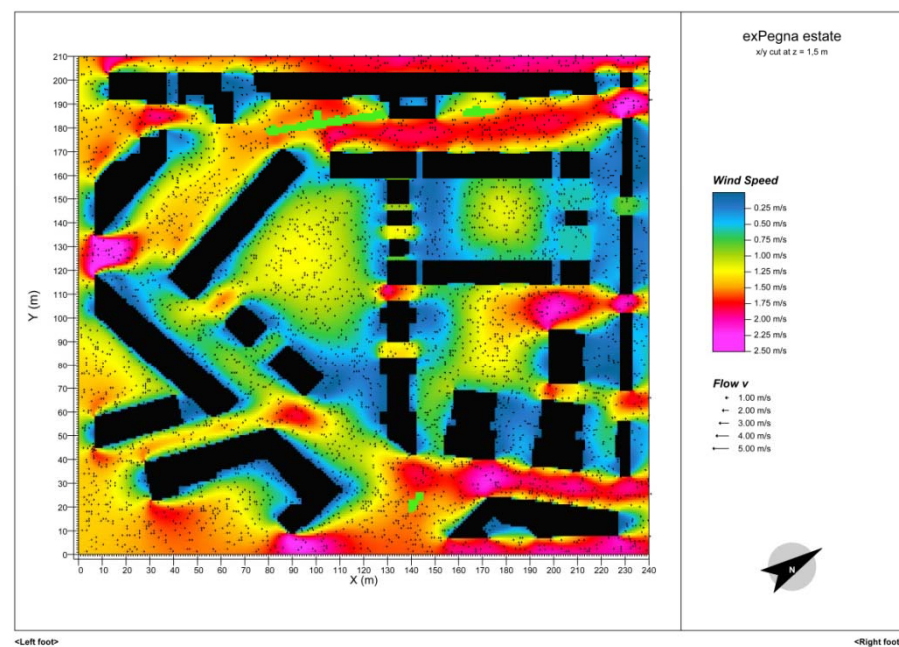
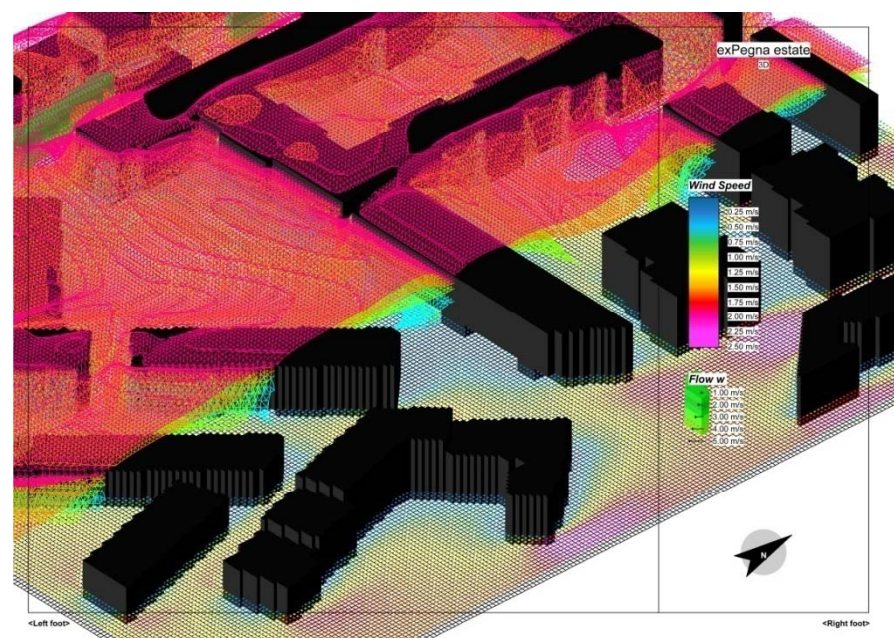
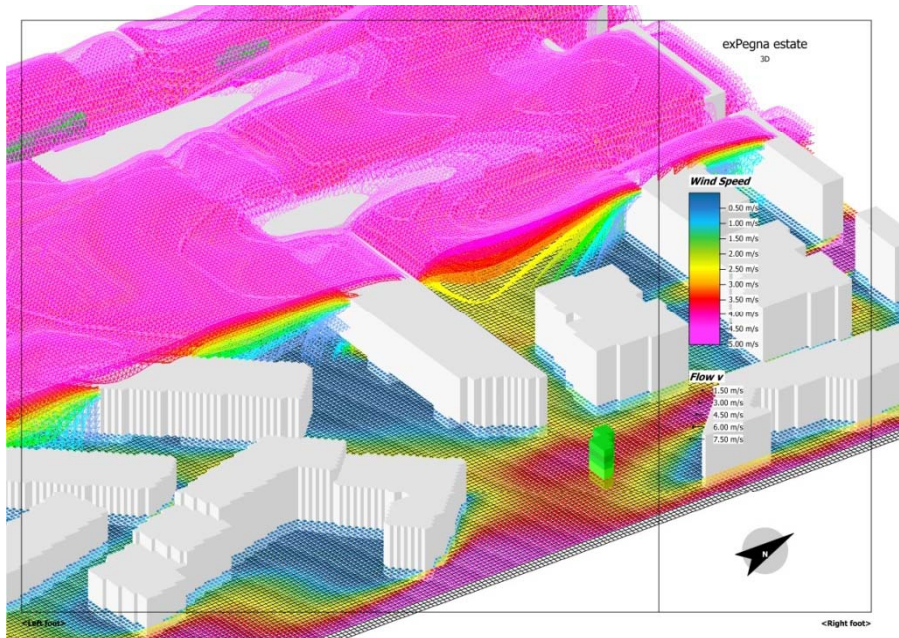
**CONSULENZA AL PROGETTO PER 21 ALLOGGI PUBBLICI A COMPORTAMENTO BIOCLIMATICO E BASSO CONSUMO ENERGETICO NELL'AREA PUC
(PROGETTO UNITARIO CONVENZIONATO) "PEGNA EX BENELLI", CASA SPA, COMUNE DI FIRENZE (2011-2013)**

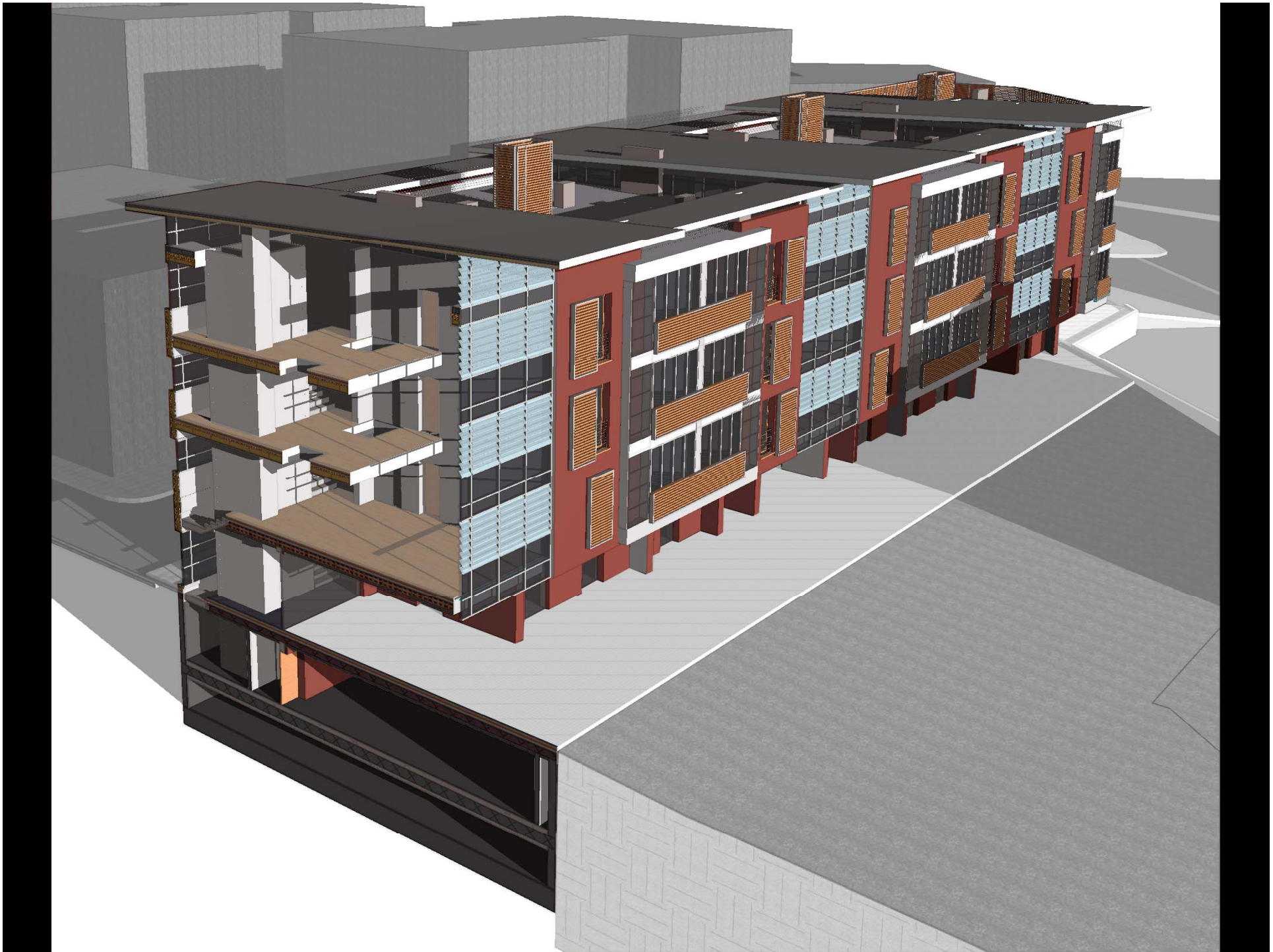




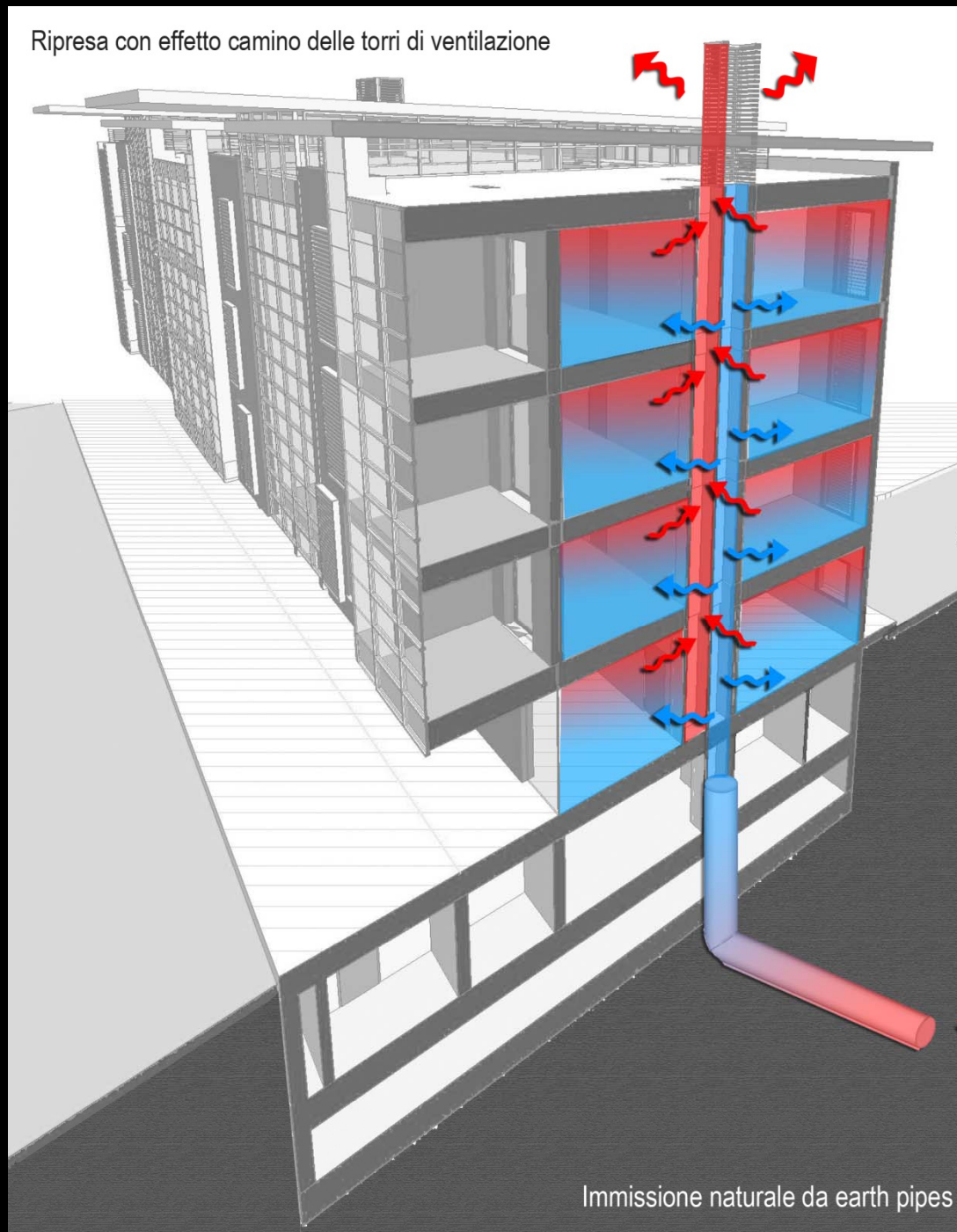








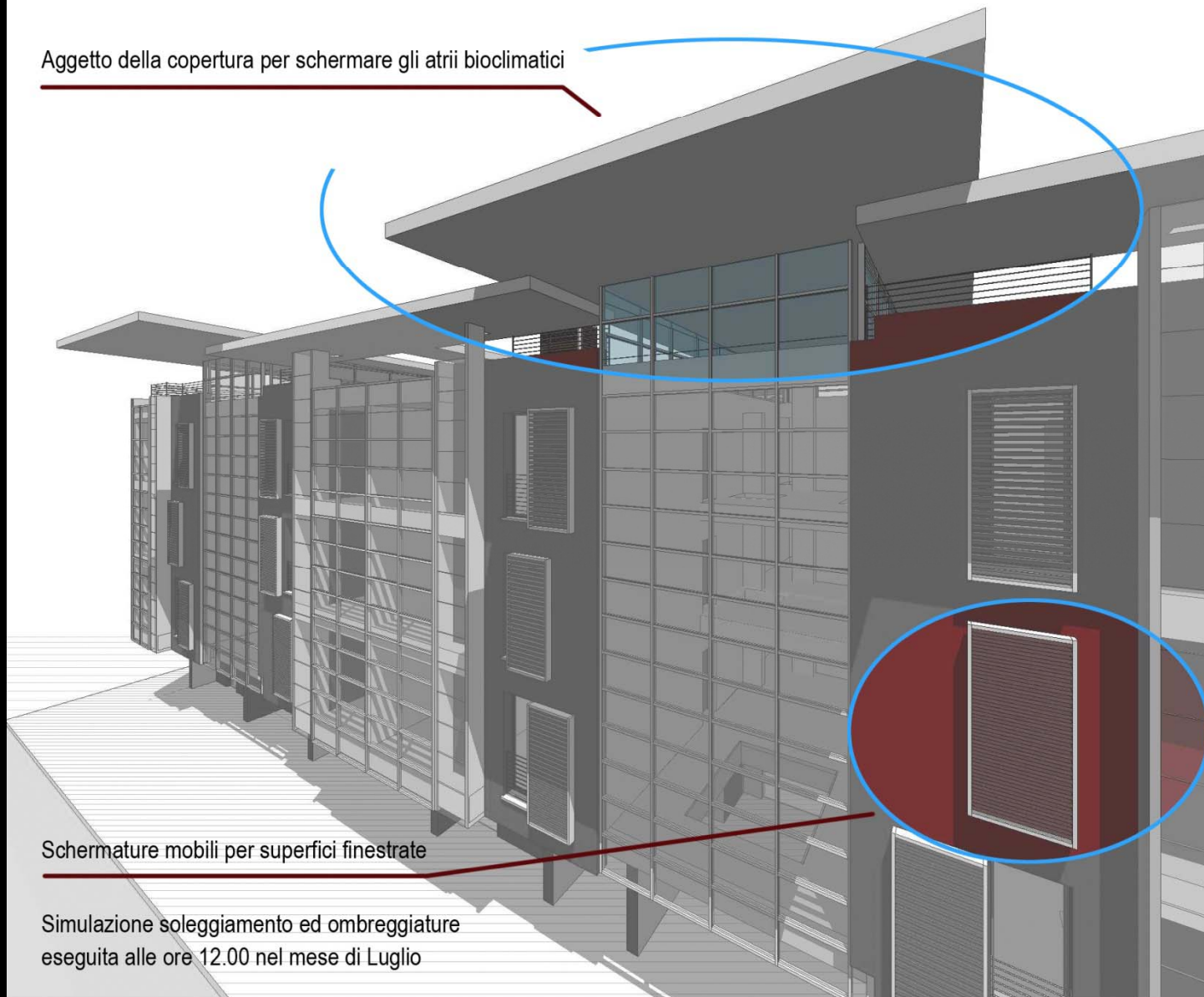
Ripresa con effetto camino delle torri di ventilazione



Immissione naturale da earth pipes

SCHEMA FUNZIONAMENTO VENTILAZIONE
NATURALE CON EARTH PIPES (estate)

Aggetto della copertura per schermare gli atrii bioclimatici

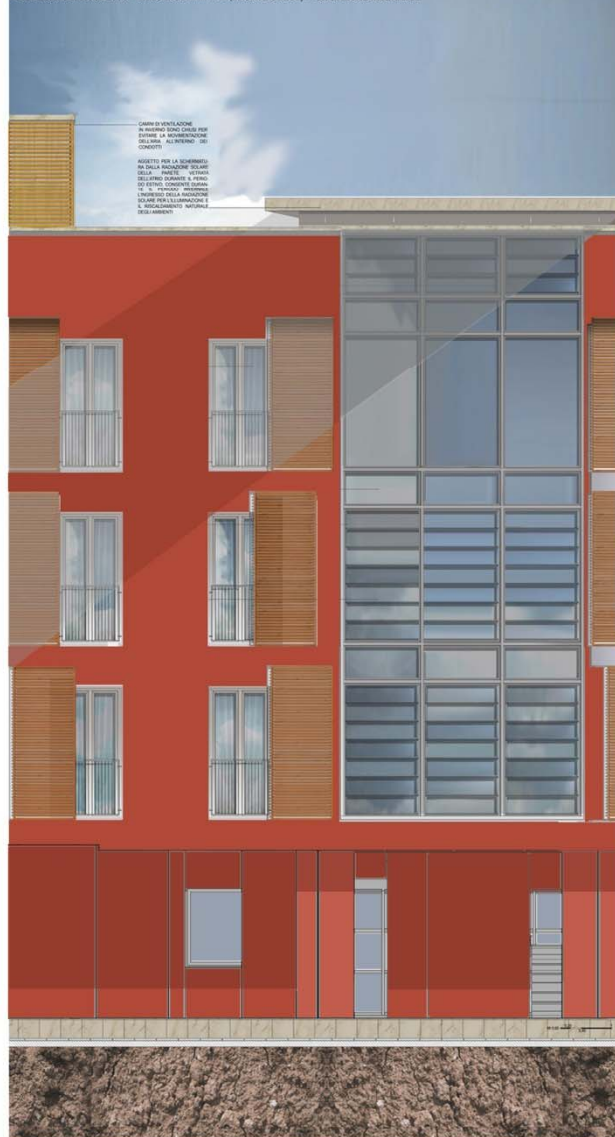


Schermature mobili per superfici finestate

Simulazione soleggiamento ed ombreggiature
eseguita alle ore 12.00 nel mese di Luglio

SISTEMI SCHERMANTI ESTERNI
(contenimento fabbisogni energetici estivi)

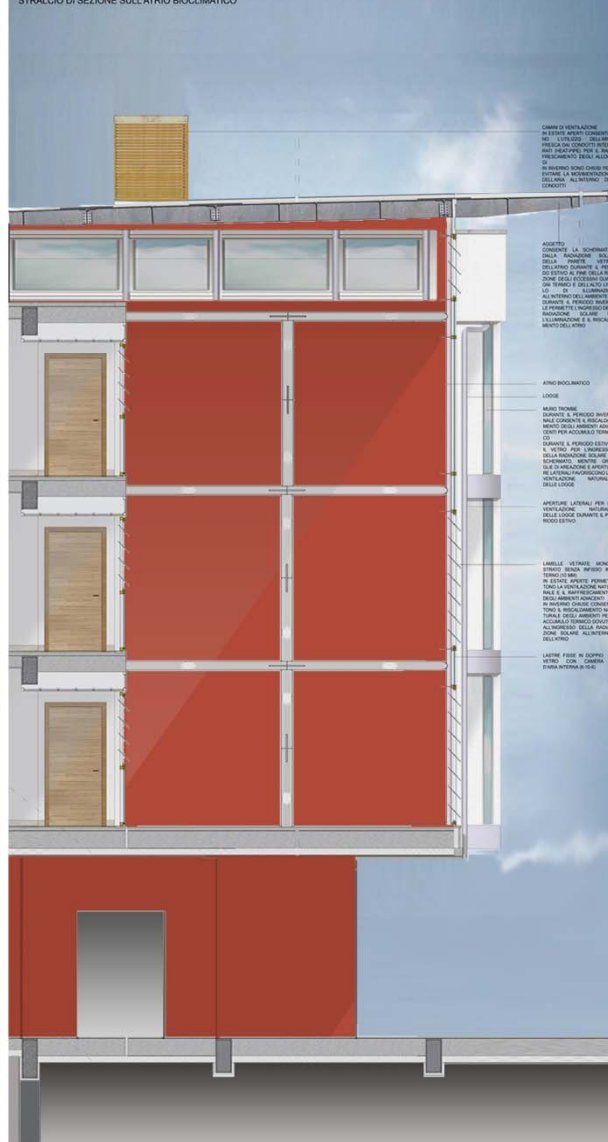
STRALCIO DI PROSPETTO - ATRIO BIOCLIMATICO (FRONTE OVEST) - SITUAZIONE INVERNALE



STRALCIO PROSPETTO - ATRIO BIOCLIMATICO (FRONTE OVEST) - SITUAZIONE ESTIVA



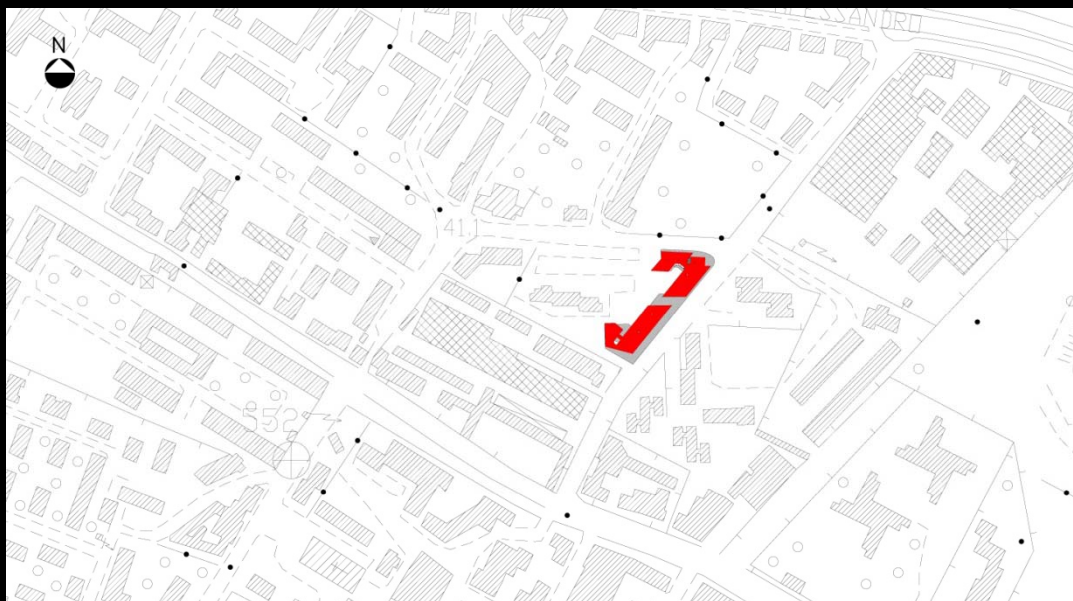
STRALCIO DI SEZIONE SULL'ATRIO BIOCLIMATICO





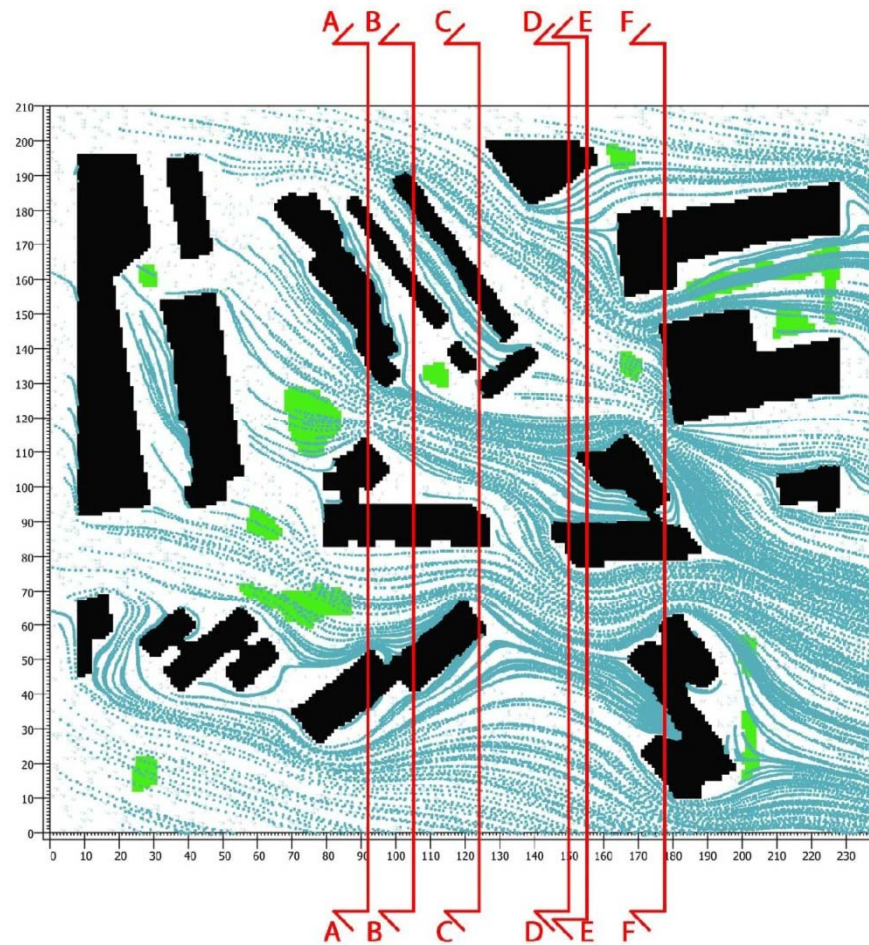
**CONSULENZA AL PROGETTO PER 88 ALLOGGI PUBBLICI A COMPORTAMENTO BIOCLIMATICO E BASSO CONSUMO ENERGETICO A TORRE DEGLI AGLI
NELL'AMBITO DEL PROGRAMMA DI "INTERVENTI SPECIALI DI RECUPERO E INCREMENTO DEL PATRIMONIO E.R.P.", CASA SPA, FIRENZE (2011-2014)**



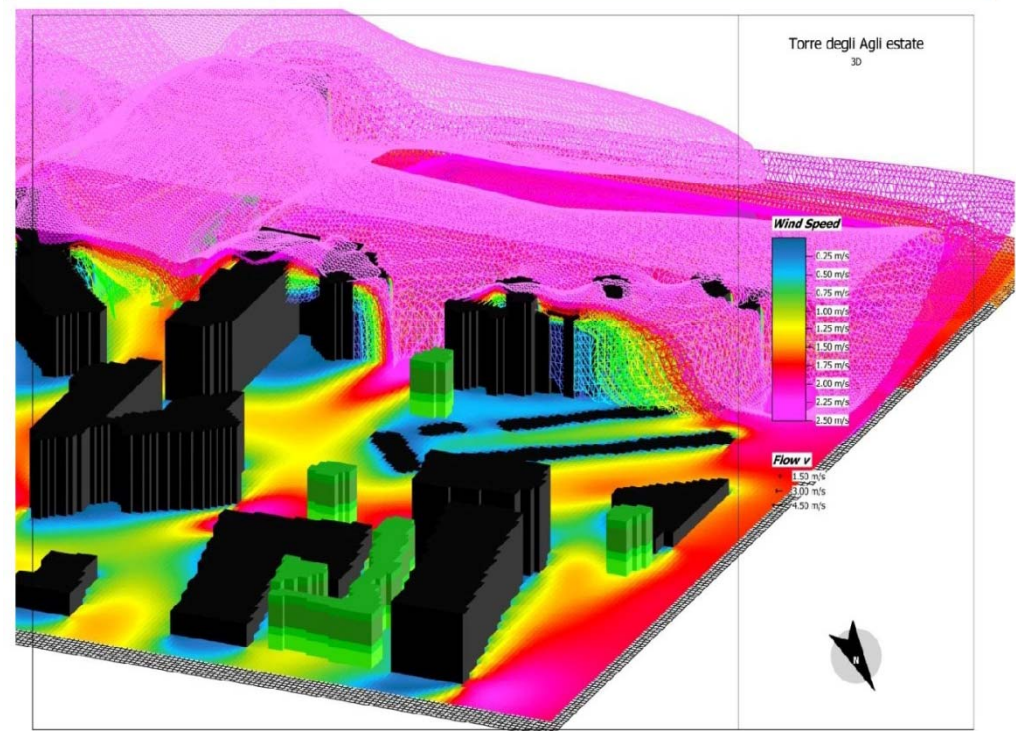


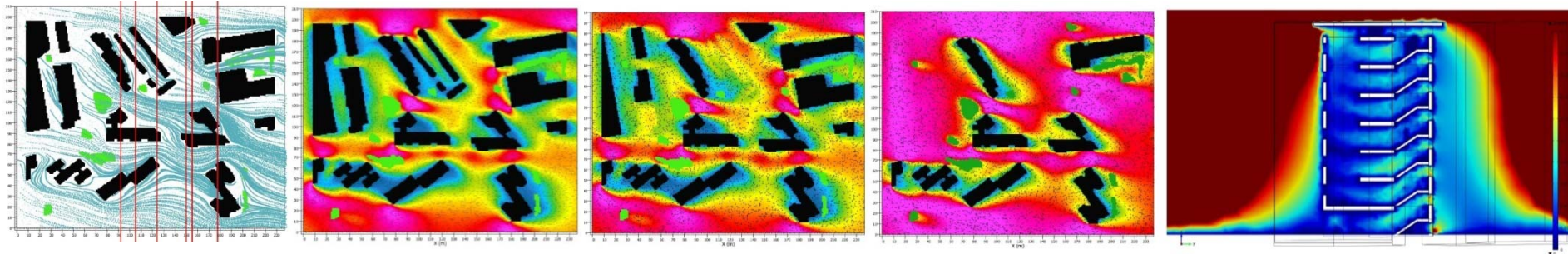


VENTILAZIONE NATURALE E SISTEMI DI RAFFRESCAMENTO PASSIVO

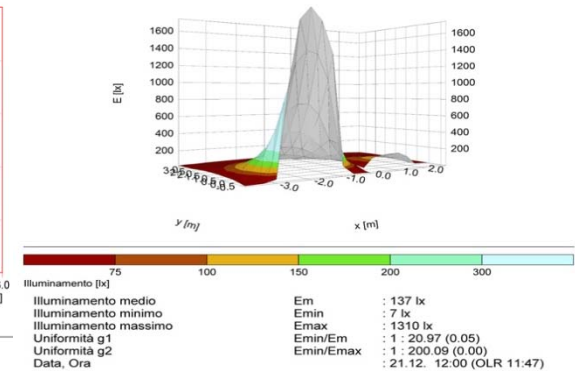
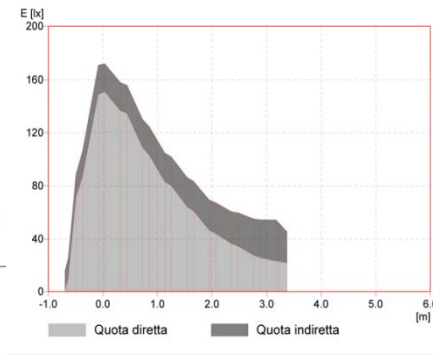
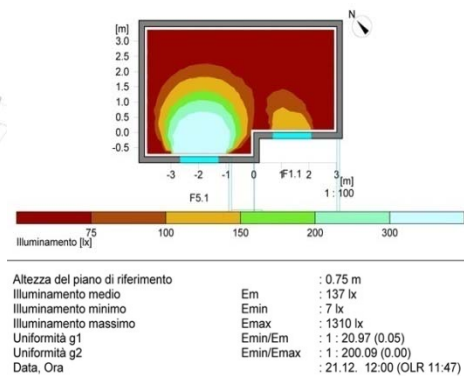
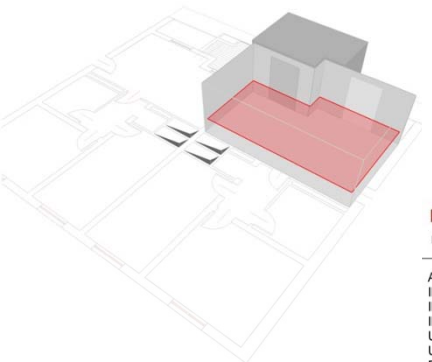
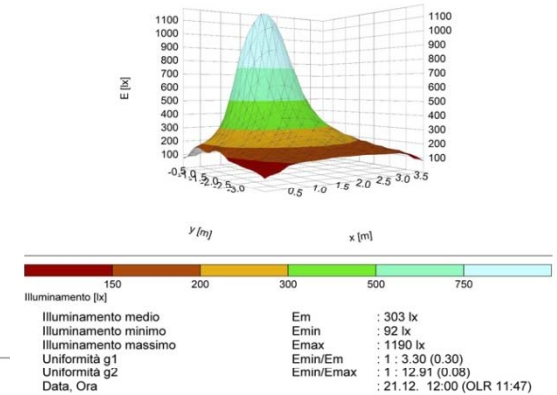
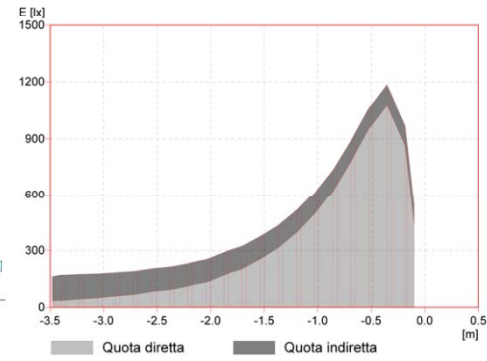
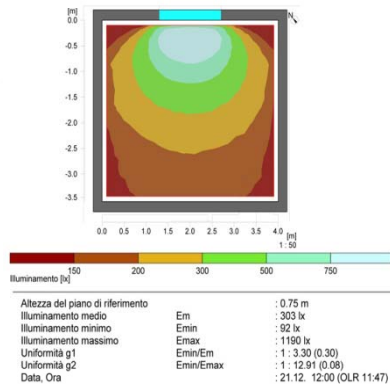
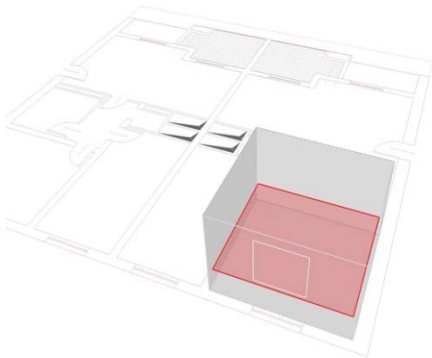
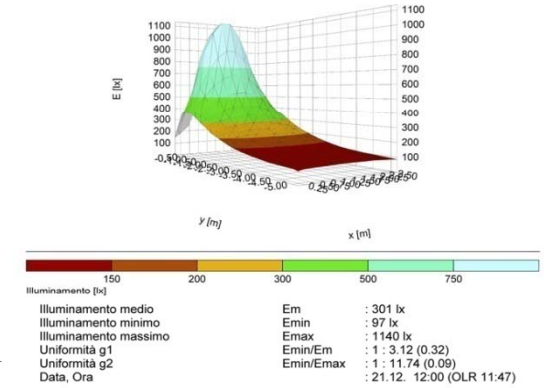
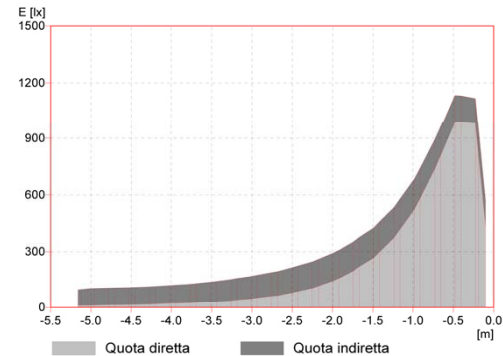
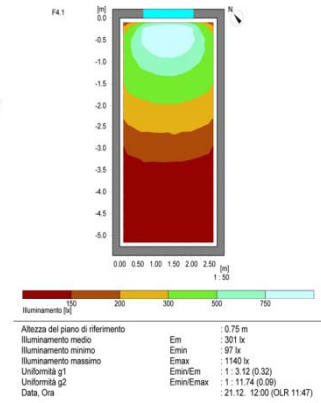
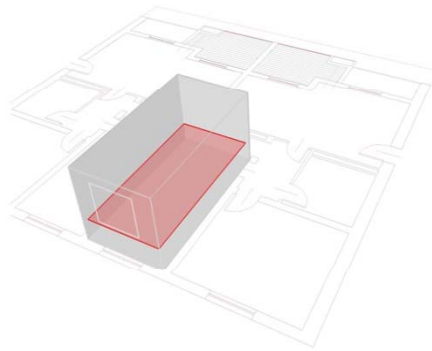


Condizioni estive - Situazione generale 3D



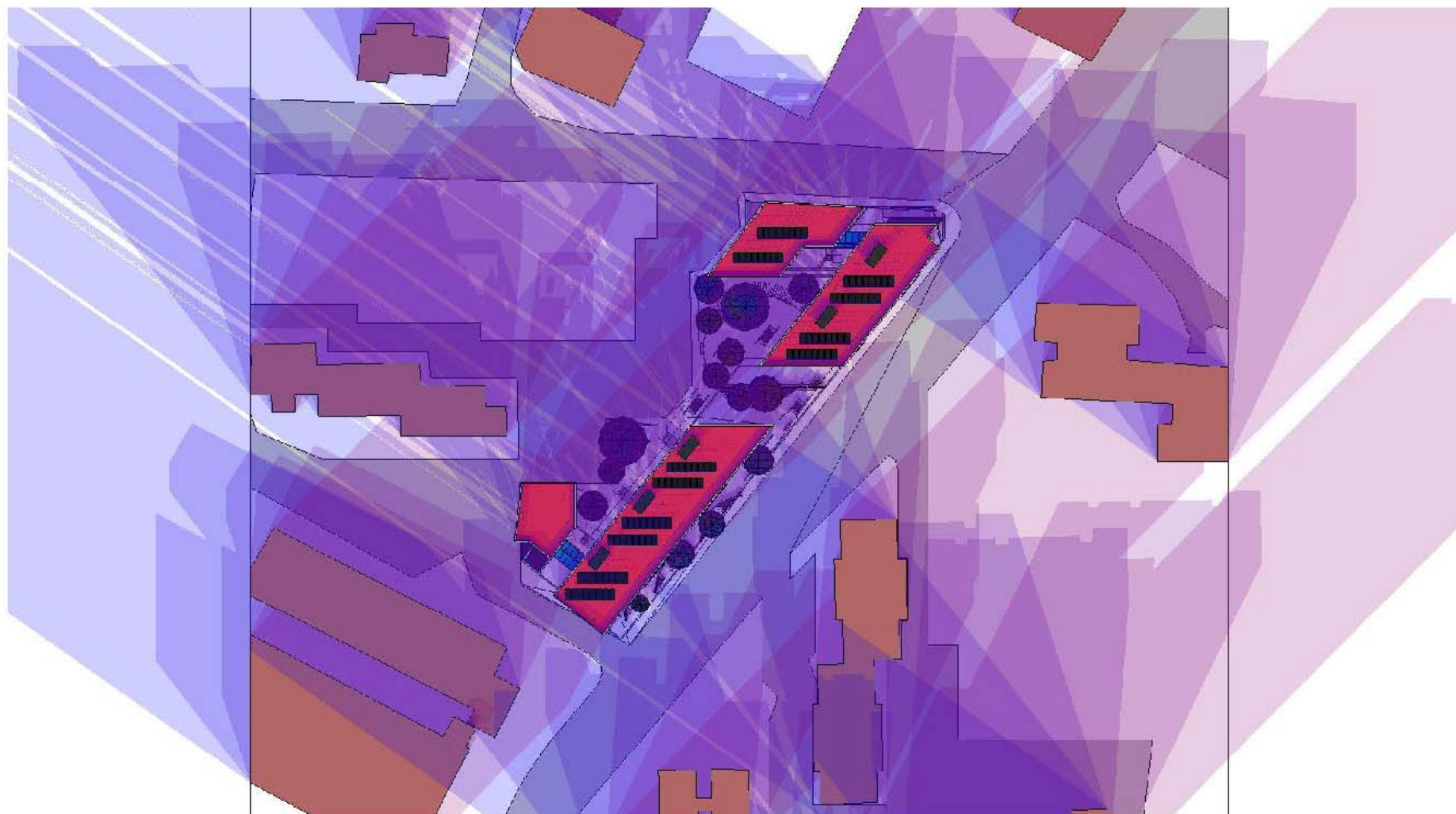


3. DISTRIBUZIONE VERTICALE DELL'ARIA NELLE TORRI DI VENTILAZIONE



SOLEGGIAMENTO E SISTEMI SOLARI PASSIVI

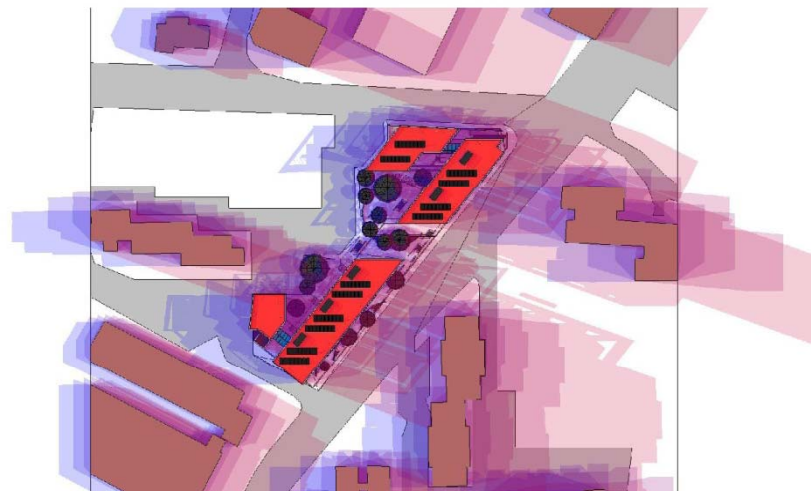
Gamma di ombreggiamento, planimetria - 21 Dicembre dalle ore 9.00 alle ore 15.00



Gamma di ombreggiamento, prospettiva - 21 Dicembre mattina



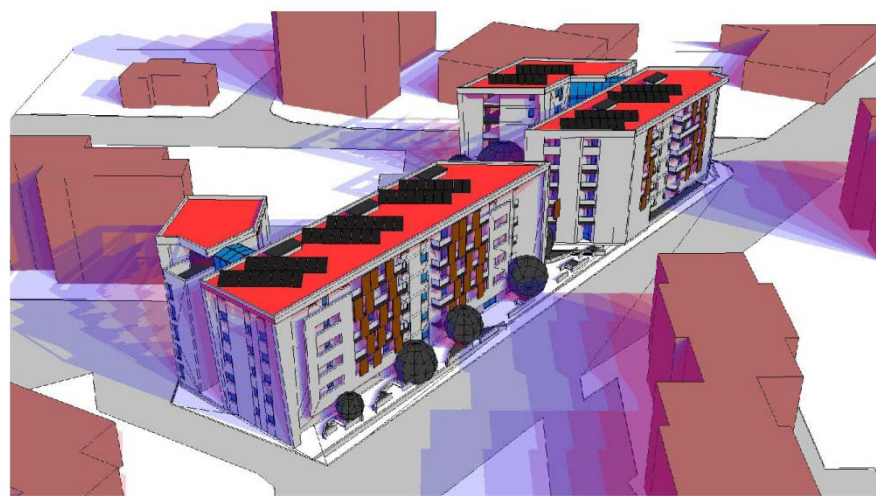
Gamma di ombreggiamento, planimetria - 21 Giugno dalle ore 9.00 alle ore 15.00



Gamma di ombreggiamento, prospettiva - 21 Dicembre pomeriggio



Gamma di ombreggiamento, prospettiva - 21 Giugno mattina



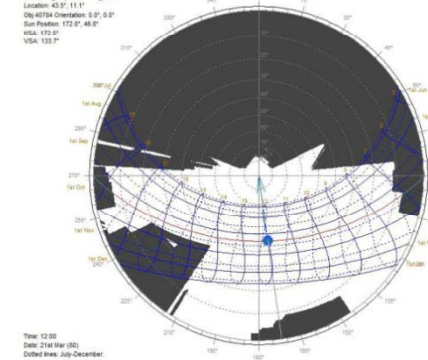
Keyplan punti di rilevazione e calcolo del Diagramma Solare



Diagramma Solare – Punto 3

Stereographic Diagram

Location: 43.9°; 11.1°
Obj: 40764 Orientation: 0.0°; 0.0°
Sun Position: 172.0°; 48.0°
HSA: 172.0°
VSA: 133.3°

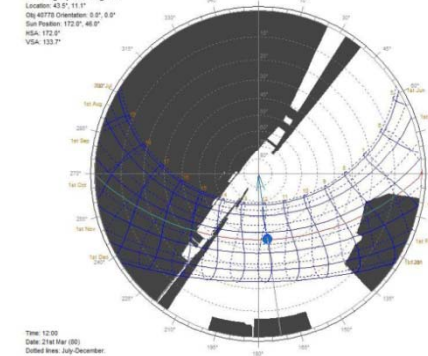


Time: 12:00
Date: 21st Mar (00)
Dotted line: July-December

Diagramma Solare – Punto 1

Stereographic Diagram

Location: 43.9°; 11.1°
Obj: 40778 Orientation: 0.0°; 0.0°
Sun Position: 172.0°; 48.0°
HSA: 172.0°
VSA: 133.3°

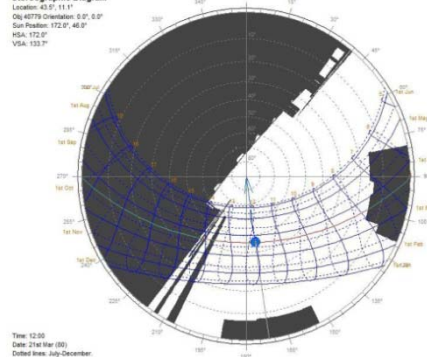


Time: 12:00
Date: 21st Mar (00)
Dotted line: July-December

Diagramma Solare – Punto 2

Stereographic Diagram

Location: 43.9°; 11.1°
Obj: 40778 Orientation: 0.0°; 0.0°
Sun Position: 172.0°; 48.0°
HSA: 172.0°
VSA: 133.3°

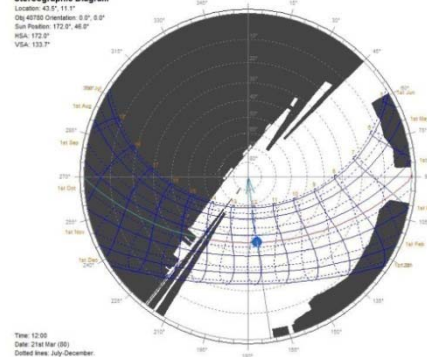


Time: 12:00
Date: 21st Mar (00)
Dotted line: July-December

Diagramma Solare – Punto 4

Stereographic Diagram

Location: 43.9°; 11.1°
Obj: 40768 Orientation: 0.0°; 0.0°
Sun Position: 172.0°; 48.0°
HSA: 172.0°
VSA: 133.3°

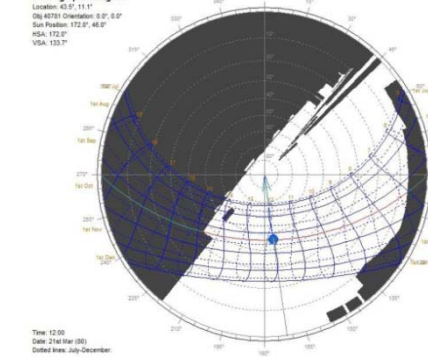


Time: 12:00
Date: 21st Mar (00)
Dotted line: July-December

Diagramma Solare – Punto 5

Stereographic Diagram

Location: 43.9°; 11.1°
Obj: 40778 Orientation: 0.0°; 0.0°
Sun Position: 172.0°; 48.0°
HSA: 172.0°
VSA: 133.3°



Time: 12:00
Date: 21st Mar (00)
Dotted line: July-December

Immagine 1: irraggiamento solare invernale sulle facciate del quadrante sud

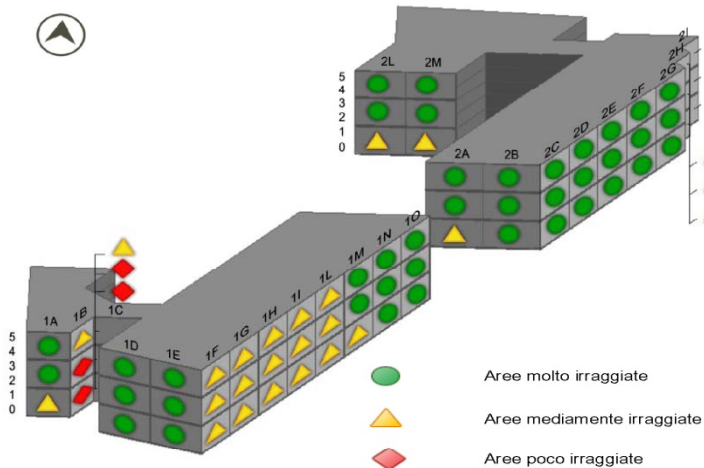
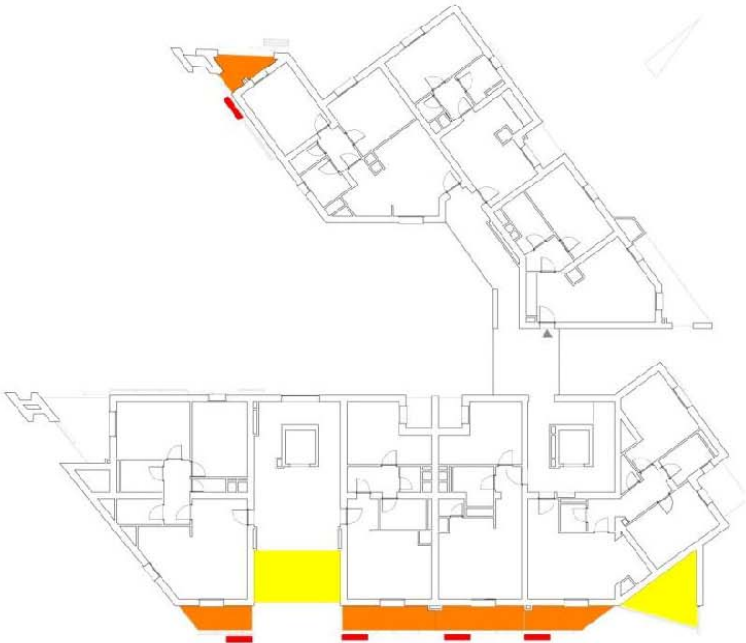
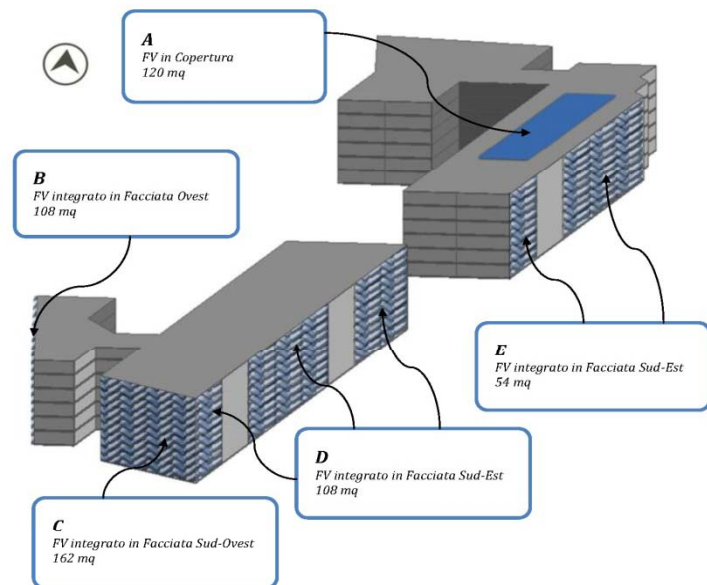


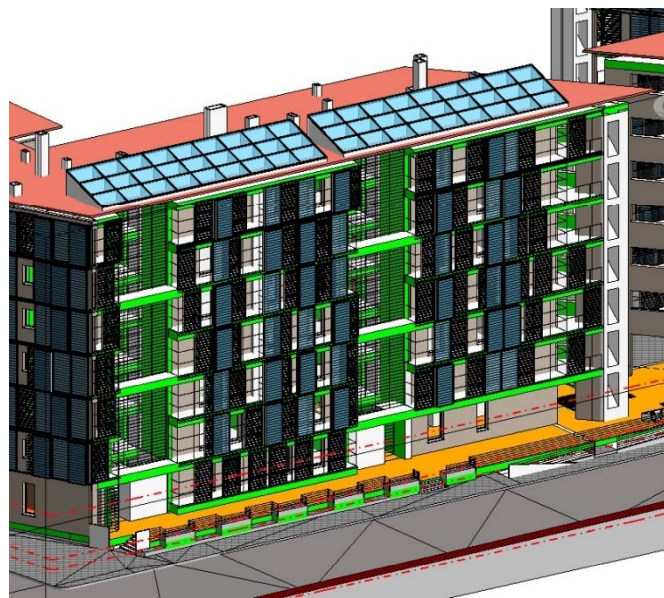
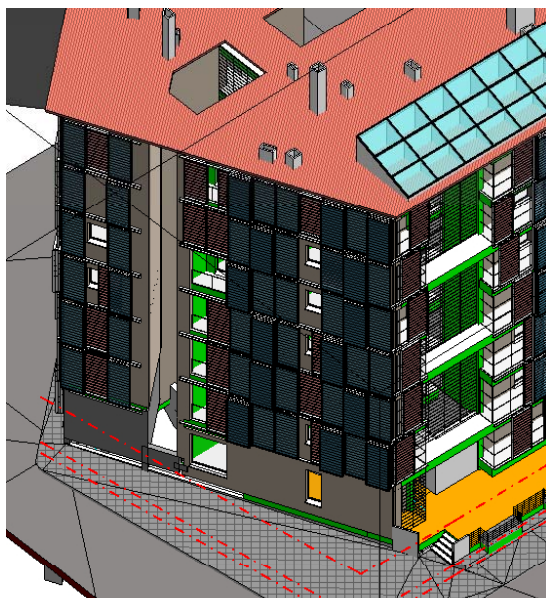
Tabella 1: irraggiamento medio sulle facciate dell'edificio 1 (W/mq)

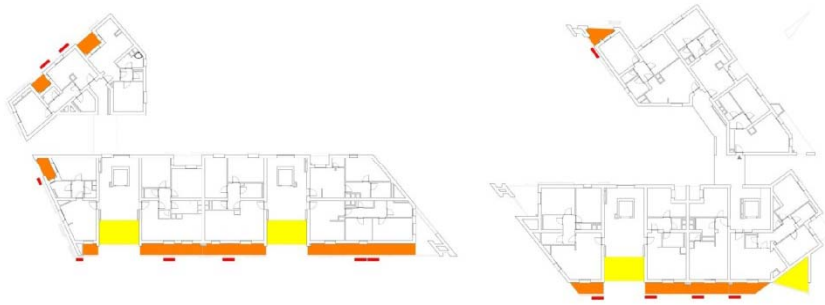
	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic	Ir
1A-01	23	36	63	85	84	79	89	94	89	58	26	17	
1A-23	36	57	77	94	91	86	96	100	103	80	40	27	
1A-45	52	72	88	107	107	101	113	116	117	93	54	43	
1B-01	17	25	34	39	40	40	43	42	43	35	18	14	
1B-23	22	31	37	43	50	53	56	49	46	39	24	18	
1B-45	30	41	58	78	93	96	103	93	78	56	32	25	
1C-01	6	12	28	38	40	40	43	42	40	24	8	5	
1C-23	13	22	33	42	48	49	53	49	43	32	15	9	
1C-45	25	38	54	71	77	75	83	82	75	53	27	20	
1D-01	33	45	64	88	95	91	101	101	90	62	35	26	
1E-01	40	54	69	91	97	93	103	104	94	70	42	31	
1D-23	39	57	79	99	101	97	107	109	106	80	42	31	
1E-23	44	60	80	99	102	97	108	110	107	82	46	37	
1D-45	50	70	88	108	112	107	119	119	117	92	52	41	
1E-45	51	70	89	109	113	109	120	121	118	92	53	42	
1F-01	33	47	67	88	100	103	110	101	90	66	37	25	
1G-01	33	47	68	87	101	104	111	102	90	66	37	27	
1H-01	32	45	65	84	99	102	109	99	86	64	35	26	
1I-01	31	45	65	85	102	104	112	102	87	64	35	26	
1L-01	31	44	63	85	101	102	110	102	85	61	34	25	
1M-01	30	42	63	86	100	102	110	102	86	59	33	24	
1N-01	29	41	65	90	102	104	112	104	90	60	32	24	
1O-01	28	41	69	92	104	106	115	106	95	63	32	23	
1F-23	37	51	71	92	105	106	114	106	95	70	40	30	
1G-23	37	52	72	93	107	108	116	108	96	71	40	30	
1H-23	36	51	71	92	105	106	115	107	94	70	39	30	
1I-23	36	51	71	93	107	108	117	109	95	70	40	30	
1L-23	36	50	72	94	108	109	117	109	96	70	39	30	
1M-23	35	49	72	95	108	109	118	110	97	69	39	29	
1N-23	34	49	74	96	108	110	118	110	99	71	38	28	
1O-23	34	51	75	96	109	111	120	111	99	73	38	27	
1F-45	41	58	80	104	119	119	129	120	106	79	45	34	
1G-45	41	57	80	103	118	119	129	120	106	78	44	34	
1H-45	41	57	80	103	118	119	129	119	106	78	44	34	
1I-45	41	57	79	103	118	119	128	119	106	78	44	34	
1M-45	41	57	79	103	117	118	128	119	105	78	44	34	
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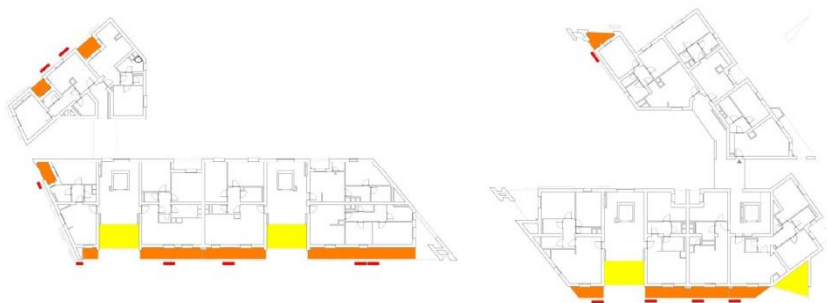




	A	B	C	D	E	Tot.
Superficie utilizzata (mq)	120	108	162	108	54	552
Potenza nominale (kWp)	18,0	16,2	24,3	16,2	8,1	82,8
Efficienza (%)	15	15	15	15	15	15
Produzione annua (MWh)	15,28	7,36	14,34	11,24	5,40	75
Produzione/Potenza (MWh/kWp)	0,85	0,45	0,59	0,69	0,67	0,65









CONSULENZA BIOCLIMATICA
STUDIO ARCHITETTI ASSOCIATI BATTISTI TUCCI
PROF. ARCH. ALESSANDRA BATTISTI
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fabrizio.tucci@fastwebnet.it