



CLASS A, B, C CLEAN ROOM DESIGN & CONSTRUCTION

PHARMA PLANT, SCHIMATARI

A PHARMACEUTICAL INDUSTRY BASED ON SCHIMATARI BOEOTIA DECIDED TO RENOVATE AND UPGRADE A STORAGE FACILITY TO A CLEAN ROOM. THE NEW CLEAN ROOM [220m²] HAD TO MET cGMP STANDARDS FOR A, B AND C CLASS MAXIMUM PARTICLES/M³.

A TURN KEY PROJECT INCLUDING ENGINEERING DESIGN, PROCUREMENT AND CONSTRUCTION CARRIED OUT BY EPD ENGINEERING SERVICES AND ERGOLINE.

CHALLENGE

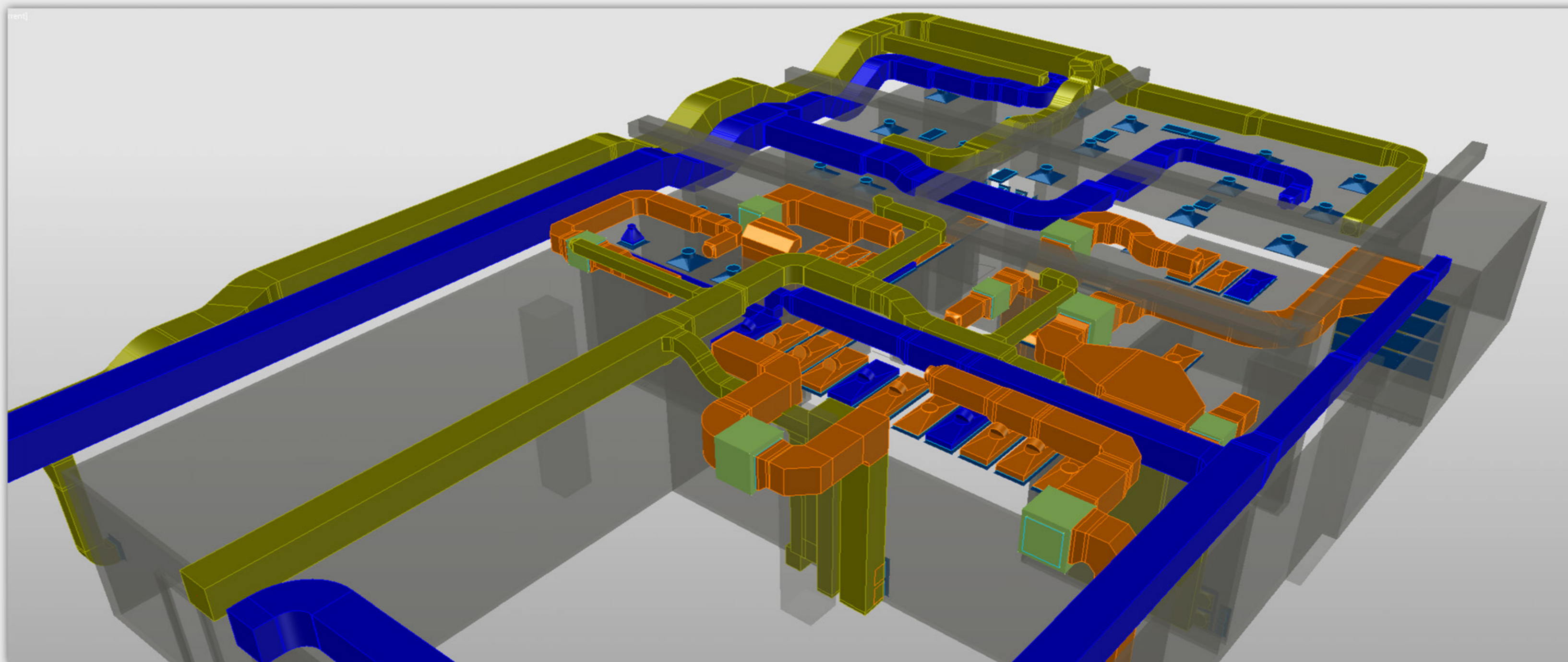
THE NEW PRODUCTION FACILITIES WERE PLANNED TO BE CONSTRUCTED IN AN EXISTING STORAGE AREA, WITH VERY LIMITED SPACE AND EXISTING STRUCTURAL COMPONENTS (BEAMS ETC.), FOR THE INSTALLATION OF THE NEW DUCT NETWORK AND CORRESPONDING EQUIPMENT.

TAKING INTO CONSIDERATION THE AMOUNT OF THE DUCT NETWORK AND HEPA FILTERS NEEDED TO BE INSTALLED FOR A CLASS AREAS, THE WHOLE PROJECT WAS MODELED IN 3D SOFTWARE TO ENSURE CORRECT IMPLEMENTATION ALONG WITH THE OPTIMUM PERFORMANCE.

THE FINAL RESULT WAS THAT THE ENGINEERING DESIGN WAS IMPLEMENTED BY 97%.

SERVICES

- RESEARCH
- DESIGN REQUIREMENTS
- CONCEPT GENERATION
- PRELIMINARY & DETAILED DESIGN
- EQUIPMENT SIZING
- CONSTRUCTION
- COMMISSIONING

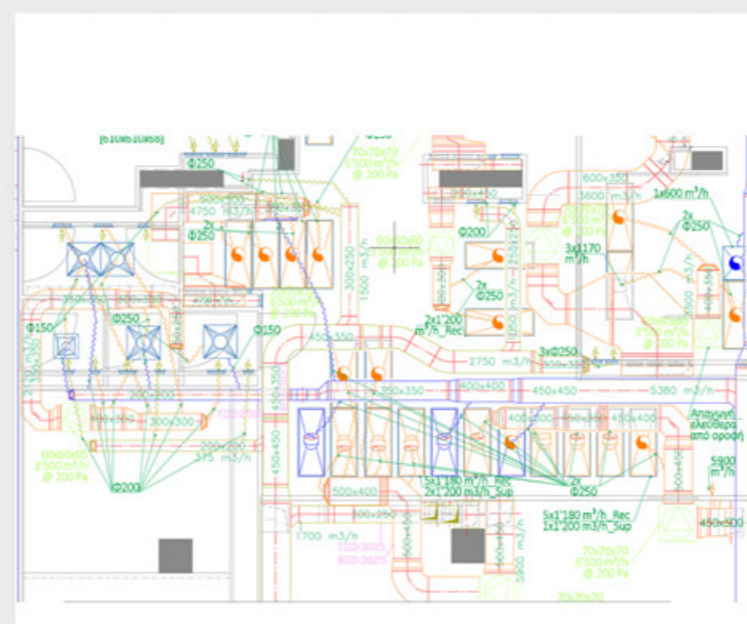


ROOM A							
AREA	CODE	GRADE	AREA [m ²]	SUPPLY [m ³ /h]	RECIRCULATION [m ³ /h]	RETURN [m ³ /h]	EXHAUST [m ³ /h]
01	76	GRADE C	55	7000	-	5120	2170
02	78	GRADE C	6	800	-	780	20
03	77	GRADE C	6	500	-	655	-45
04	19	GRADE C	28	2100	-	1950	-10
05	70	GRADE C	53	1700	-	2170	-70
06	84	GRADE C	5	260	-	235	25
				12710	-	11000	2170

ROOM B							
AREA	CODE	GRADE	AREA [m ²]	SUPPLY [m ³ /h]	RECIRCULATION [m ³ /h]	RETURN [m ³ /h]	EXHAUST [m ³ /h]
01	75	GRADE A	4	1700	1700	-	1700
02	75	GRADE B	20	650	4900	2715	-1165
03	14	GRADE B	43	1700	2715	4875	-4175
04	14	GRADE A	17	4900	1700	-	4900
05	80	GRADE B	4	290	970	235	-5
06	71	GRADE C	7	300	280	205	-5
07	72	GRADE B	7	300	280	95	-5
08	79	GRADE B	7	300	490	355	-5
				9490	31800	720	-

CLEAN ROOM CHARACTERISTICS									
AREA	CODE	GRADE	AREA [m ²]	SUPPLY [m ³ /h]	RECIRCULATION [m ³ /h]	FILTRATION [m ³ /h]	RETURN [m ³ /h]	EXHAUST [m ³ /h]	TOTAL AIRFLOW [m ³ /h]
01	76	GRADE C	55	7000	-	940	510	5100	7170
02	78	GRADE C	6	800	-	-	20	780	800
03	77	GRADE C	6	450	-	45	-	405	450
04	19	GRADE C	28	2100	-	50	20	2150	2100

AREA SPECIFICATIONS

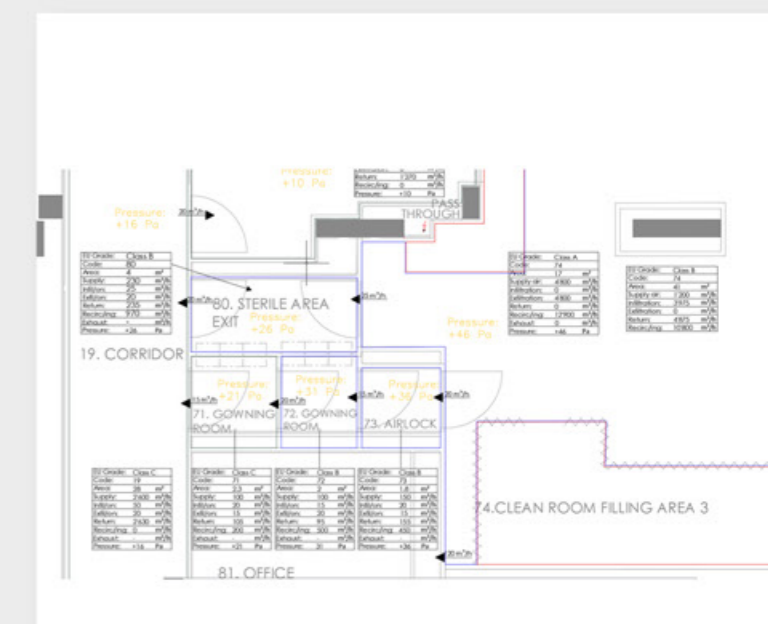


HVAC & DUCTING

Point Alpha: $Q = C \cdot A \cdot \frac{2 \cdot \Delta P}{\rho}$

AREA	CLASS	Doors / Section	Width [m]	Crosssection	A [m ²]	ρ	C	ΔP [Pa]	Q' [m ³ /h]	PROΣ ΧΩΡΟ
78 STORAGE	C	1	1.1	0.0005	0.00055	1.2	0.65	6	4.07	77
76 WASHING & STERILIZATION AREA	C	1	1	0.002	0.002	1.2	0.65	6	14.80	77 (μόρτα)
		1	4	0.0005	0.002	1.2	0.65	16	24.17	30
		1	8	0.0005	0.004	1.2	0.65	16	48.33	08
19 CORRIDOR	C	1	5	0.0005	0.0025	1.2	0.65	12	26.16	70
		1	3	0.0005	0.0015	1.2	0.65	12	15.70	19
		1	1	0.002	0.002	1.2	0.65	6	14.80	19 (μόρτα)
71 GOWNING ROOM	C	1	1.5	0.0005	0.00075	1.2	0.65	6	5.55	70
71 GOWNING ROOM	C	1	1	0.002	0.002	1.2	0.65	6	14.80	71 (μόρτα)
80 STERILE AREA/EXIT	B	1	1	0.002	0.002	1.2	0.65	10	19.11	19 (μόρτα)
72 GOWNING ROOM	B	1	1	0.002	0.002	1.2	0.65	10	19.11	71 (μόρτα)
73 AIRLOCK	B	1	1	0.002	0.002	1.2	0.65	5	13.51	72 (μόρτα)
74 CLEAN ROOM FILLING AREA 3	A/B	1	2.3	0.0005	0.00115	1.2	0.65	36	20.84	70
		1	1	0.002	0.002	1.2	0.65	20	27.02	80 (μόρτα)
		1	1	0.002	0.002	1.2	0.65	10	19.11	73 (μόρτα)
		1	3	0.0005	0.0015	1.2	0.65	24	22.20	76
81 OFFICE	B	1	0.35	0.25	0.06199	1.2	0.65	24	917.34	76 (άνομιμα ποτς)
		1	12	0.0005	0.006	1.2	0.65	46	122.93	76 (μόρτα)

REPORTS



AIR BALANCE CALCULATIONS

