

FOREWORD	iii
COMMITTEE	iv
NOTICE TO USERS OF THIS PUBLICATION	v
TABLE OF CONTENTS	vii
PHASE I – FUNDAMENTALS OF INDOOR AIR QUALITY	
CHAPTER 1 INTRODUCTION TO INDOOR AIR QUALITY	1.1
1.1 INDOOR AIR QUALITY	1.1
1.2 IAQ STANDARDS	1.2
1.3 ENERGY CONSERVATION VS. IAQ	1.3
1.4 OCCUPANT RESPONSES	1.3
1.5 LIABILITY CONCERNS	1.4
1.6 IAQ POLICY	1.5
1.7 IAQ OPPORTUNITIES	1.5
CHAPTER 2 INDOOR ENVIRONMENTAL CONDITIONS	2.1
2.1 INTRODUCTION	2.1
2.2 THERMAL ENVIRONMENT	2.1
2.3 LIGHTING	2.2
2.4 NOISE	2.3
2.5 ODORS	2.3
CHAPTER 3 SYSTEMS AND CONTAMINANTS	3.1
3.1 INTRODUCTION	3.1
3.2 HVAC DESIGN	3.1
3.3 MICROBIAL CONTAMINATION	3.7
3.4 CHEMICAL CONTAMINANTS	3.8
CHAPTER 4 SOURCES OF INDOOR AIR QUALITY PROBLEMS	4.1
4.1 EXTERNAL FACTORS AND CONDITIONS	4.1
4.2 BUILDING MATERIALS AND FURNISHINGS	4.1
4.3 MECHANICAL SYSTEMS	4.2
4.4 OCCUPANT SOURCES	4.4
CHAPTER 5 TESTING AND SAMPLING	5.1
5.1 INTRODUCTION	5.1
5.2 GASEOUS PRODUCTS	5.1
5.3 ORGANIC	5.1
5.4 PARTICULATES	5.3
PHASE II – IDENTIFICATION, EVALUATION, AND RESOLUTION OF IAQ ISSUES	
CHAPTER 6 EVALUATION AND PROBLEM STATEMENT	6.1
6.1 MAGNITUDE OF THE SYMPTOMS	6.1
6.2 IDENTIFYING SYMPTOMS AND AUDIT PROCEDURES	6.2
6.3 LOCATION OF SYMPTOMS	6.7
6.4 TIMING	6.11
6.5 SUMMARY OF SITUATION AND FUNCTION BASED CONTAMINATION	6.11
CHAPTER 7 CLASSIFICATION OF PROBABLE CAUSES	7.1
7.1 INADEQUATE VENTILATION	7.1
7.2 CHEMICAL CONTAMINATION	7.2
7.3 MICROBIAL CONTAMINATION	7.2



CHAPTER 8	TESTING AND IDENTIFICATION FOR PROBABLE CAUSES	8.1
8.1	SAMPLING	8.1
8.2	INSPECTIONS AND INTERVIEWS	8.1
8.3	VENTILATION READINGS	8.6
CHAPTER 9	DEVIATION STATEMENT	9.1
9.1	AVOIDANCE OF PROBLEMS	9.1
9.2	DESIRED CONDITIONS AFTER REMEDIATION	9.2
9.3	CRITERIA FOR SUCCESS	9.3
CHAPTER 10	SOLUTION IDENTIFICATION	10.1
10.1	SOLUTION ELIMINATION	10.1
10.2	SOURCE MITIGATION & DUCT CLEANING	10.3
10.3	SOURCE CONTROL	10.11
	CARPETS	10.11
	WALL DIVIDERS — PANELS	10.11
	FURNISHINGS	10.11
	OFFICE EQUIPMENT	10.12
	STORAGE	10.12
CHAPTER 11	PROPOSAL DEVELOPMENT AND IMPLEMENTATION	11.1
11.1	HOW TO WRITE A PROPOSAL	11.1
11.2	IMPLEMENTING AN IAQ TEST PLAN	11.4
CHAPTER 12	TESTING AND MONITORING FOR COMPLIANCE	12.1
12.1	OWNER RESPONSIBILITIES	12.1
12.2	IMPORTANCE OF REGULAR, PERIODIC TESTING & SAMPLING	12.3
APPENDIX A	INDOOR AIR QUALITY TRACKING FORMS	A.1
APPENDIX B	CONVERSIONS AND CHARTS	B.1
APPENDIX C	DATA TABLES	C.1
APPENDIX D	INFORMATION SOURCES (AGENCIES, ASSOCIATIONS, ORGANIZATIONS)	D.1
APPENDIX E	POLLUTANT INDEX (SOURCES, SYMPTOMS, LIMITS)	E.1
APPENDIX F	ILLNESSES AND SYMPTOMS	F.1
APPENDIX G	BIBLIOGRAPHY AND REFERENCES	G.1
APPENDIX H	GLOSSARY	H.1
	INDEX	I.1



TABLES

Table 1-1	Energy Management Strategies and Environmental Impact	1.6
Table 2-1	Factors Affecting Occupant Perceptions of Building Environment	2.2
Table 2-2	Odor Thresholds for Selected Contaminants Found in Buildings	2.4
Table 3-1	Atmospheric Particles in Intake Air (from ASHRAE HVAC Systems & Equipment)	3.4
Table 5-1	Air Sampling Methods for Microbial Contaminations	5.3
Table 5-2	Categories of Airborne Particulates	5.4
Table 6-1	Air Pollution Effects on Materials	6.2
Table 6-2	Building Walkthrough Checklist	6.4
Table 6-3	IAQ Policy Development Steps	6.8
Table 8-1	Sampling Protocol and Selection for Indoor Contaminants	8.2
Table 8-2	Sampling, Tools, Methods and Processes	8.4
Table 10-1	Identification of Standing Water or Wet Areas Problems	10.2
Table 10-2	Human Carbon Dioxide Exhalation Rates	10.4
Table 12-1	Operation and Maintenance Procedures	12.2

