

DESIGN NOTES:

1. REFER TO LANL FACILITY CONSTRUCTION SPECIFICATIONS SECTION 15885.
2. THE STANDARD DETAILS ILLUSTRATE ONLY A FEW OF THE POSSIBLE FILTER TRAIN COMBINATIONS THAT MAY BE REQUIRED FOR A SPECIFIC PROJECT. THE DESIGNER SHOULD REVIEW THE REQUIREMENTS AND MAKE THE DETAIL "PROJECT SPECIFIC."
3. FIRE SCREENS ARE REQUIRED UPSTREAM OF THE PREFILTER.
4. PREFILTERS ARE REQUIRED UPSTREAM OF THE FIRST HEPA FILTER BANK. WHEN MOISTURE SEPARATORS ARE INSTALLED, A FIRE SCREEN IS NOT REQUIRED.
5. MOISTURE SEPARATORS (DEMISTORS)
 - A. MOISTURE SEPARATORS ARE REQUIRED WHEN ENTRAINED WATER DROPLET CONCENTRATION MAY BE GREATER THAN 1 LB. OF WATER PER 1000 CFM OF AIRFLOW OR WHEN THE DUCTWORK IS SPRINKLED UPSTREAM OF THE FILTER TRAIN.
 - B. INSTALL UPSTREAM OF PREFILTER.
 - C. PROVIDE DRAINS IN THE MOISTURE SEPARATOR HOUSING. CONSULT WITH ESH-18 FOR DESIGN OF DRAINAGE PIPING AND THE METHOD OF DISPOSING OF LIQUID.
 - D. CONSULT WITH THE USER, ESH-5 AND ESH-18.
6. HEPA FILTERS
 - A. 24" X 24" X 11-1/2" NOMINAL SIZE HEPA FILTERS, WOOD OR STEEL FRAMES, FURNISHED AND INSTALLED BY THE LABORATORY.
 - B. BASE DESIGN ON AN AIR FLOW RATE OF 1000 CFM/FILTER OR 1250 CFM/FILTER; MINIMUM FLOW RATE 200 CFM/FILTER
 - C. CONSULT WITH ESH PERSONNEL FOR THE NUMBER OF HEPA FILTRATION STAGES REQUIRED.
7. CHEMICAL ADSORBERS
 - A. CHEMICAL ADSORBERS REMOVE GASEOUS EMISSIONS FROM RADIOACTIVE, BIOLOGICAL, AND/OR CHEMICAL PROCESS EXHAUST AIR.

- B. SPECIFY NUCLEAR GRADE CHEMICAL ADSORBERS USING VIRGIN COCONUT SHELL CARBON.
 - C. CONSULT WITH ESH PERSONNEL AND THE CHEMICAL ADSORBER MANUFACTURER'S TECHNICAL REPRESENTATIVE TO ASSURE PROPER SELECTION, RESIDENCE TIME CALCULATIONS AND SYSTEM CONFIGURATION.
 - D. INSTALL HEPA FILTERS UPSTREAM OF THE FIRST ADSORBER CELL AND DOWNSTREAM OF THE LAST ADSORBER CELL.
8. BASE FAN SELECTION ON THE FOLLOWING FILTER AIR FLOW RESISTANCE (INCHES W.G.), RATED AT 1000 CFM/FILTER.

	SEA LEVEL	
	CLEAN	DIRTY
FIRE SCREEN	.10	.60
MOISTURE SEPARATOR	.10	.60
PREFILTER	.20	1.20
HEPA FILTER (FIRST STAGE)	1.00	3.50
HEPA FILTER (SUBSEQUENT STAGES)	1.00	1.50
CHEMICAL ADSORBER	1.25	1.25

NO.	DATE	CLASS REV	REVISIONS	APP
FACILITY ENGINEERING MANUAL				
FILTER TRAIN				
DESIGN NOTES				
APPROVED: DISCIPLINE POC DANNY NGUYEN			DATE: 8-28-99	
Los Alamos			Los Alamos National Laboratory Los Alamos, New Mexico 87545	4 OF 5
CLASSIFICATION: U		REVIEWER: DANNY NGUYEN		DATE:
REFERENCE DOCUMENT: CHAPTER 6			DRAWING NUMBER: ST6700	REV