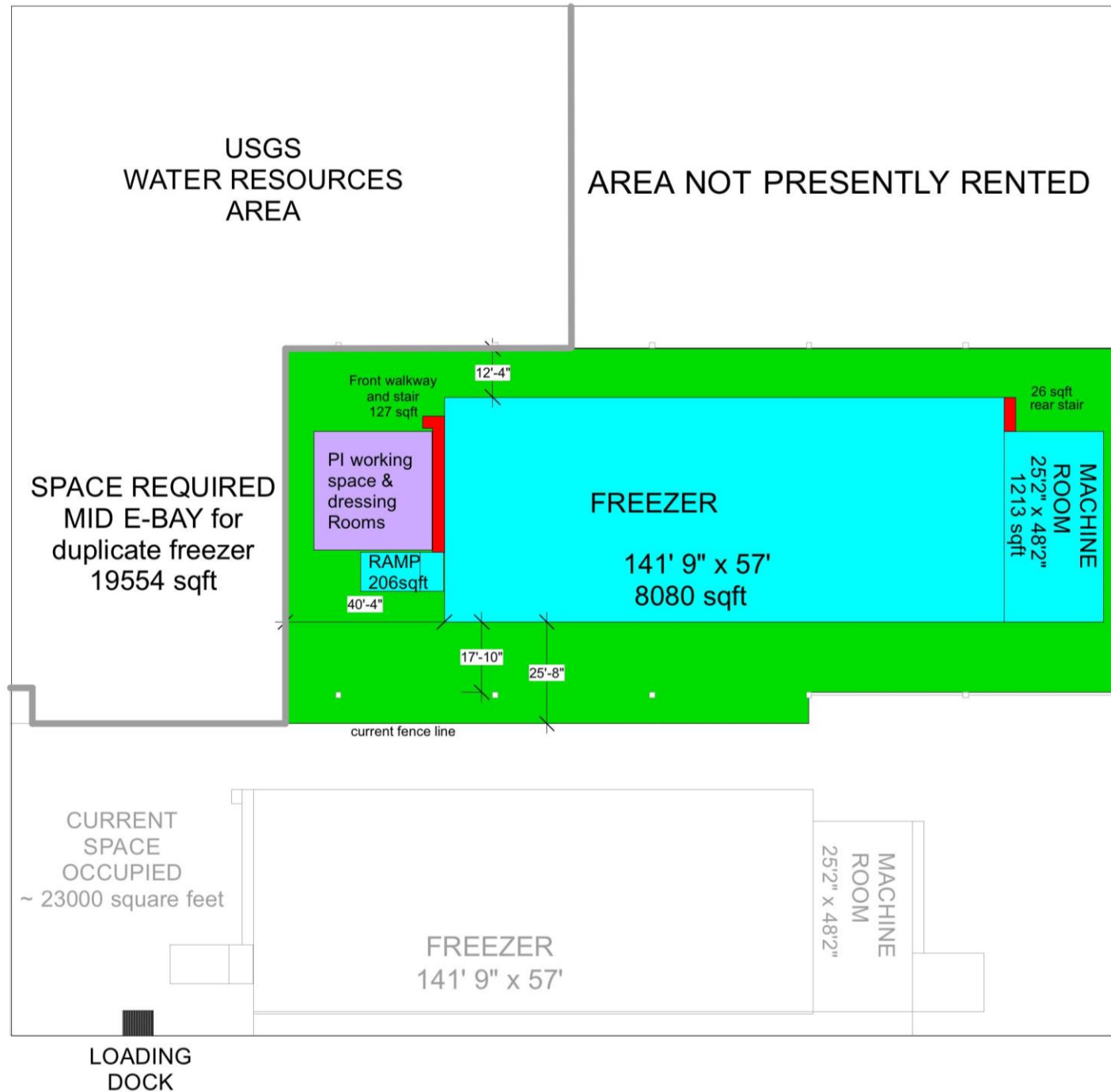




National Science Foundation Ice Core Facility Current Status and Future Plans

Lindsay Powers, PhD
Director of NSF-ICF
U.S. Geological Survey



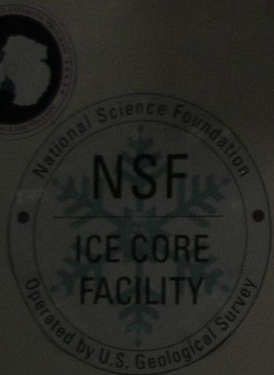






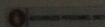
CLASS 100
CLEAN ROOM
NO ENTRY WITHOUT PROPER
DECONTAMINATION

USGS



Latch

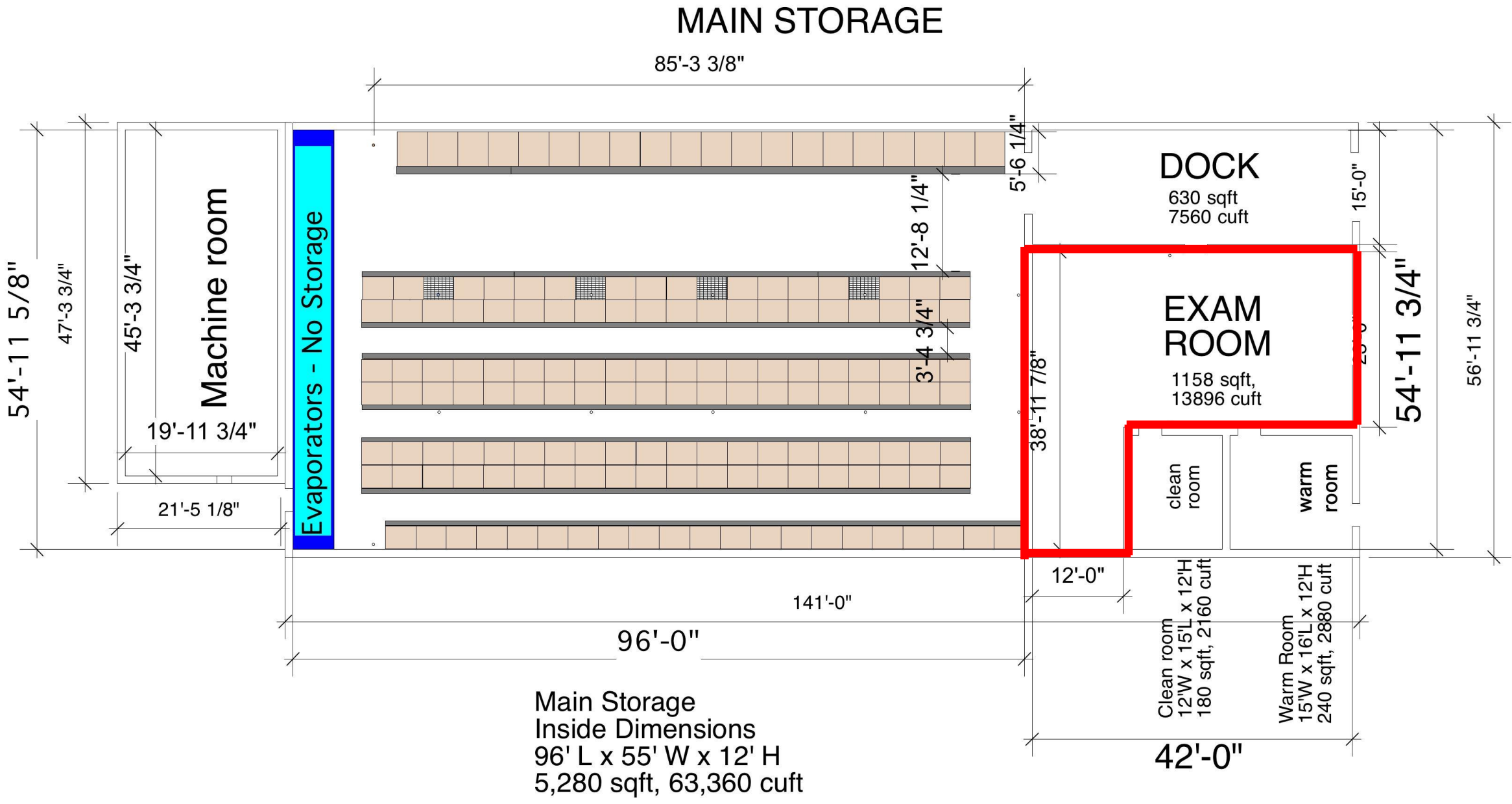
Release →



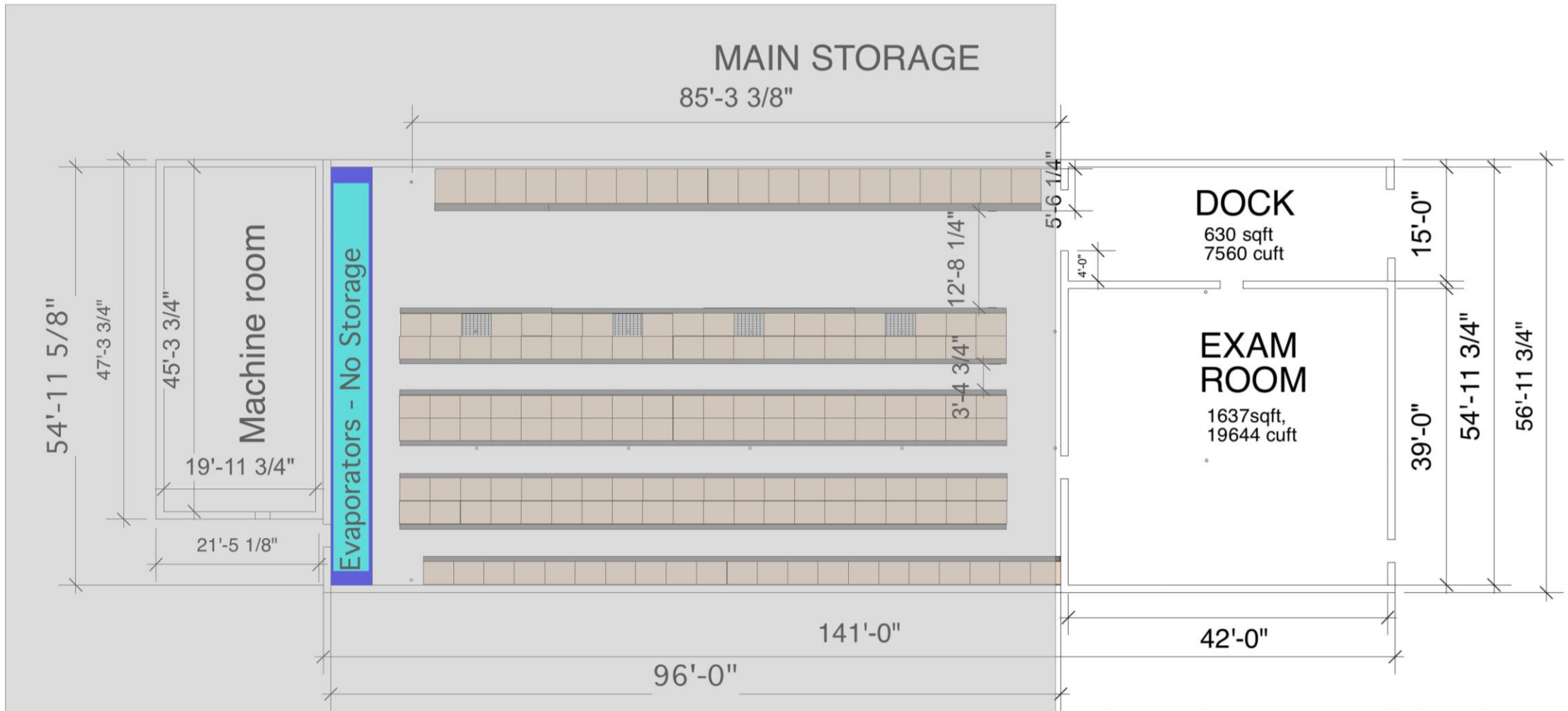


EXIT
EXAM
ROOM

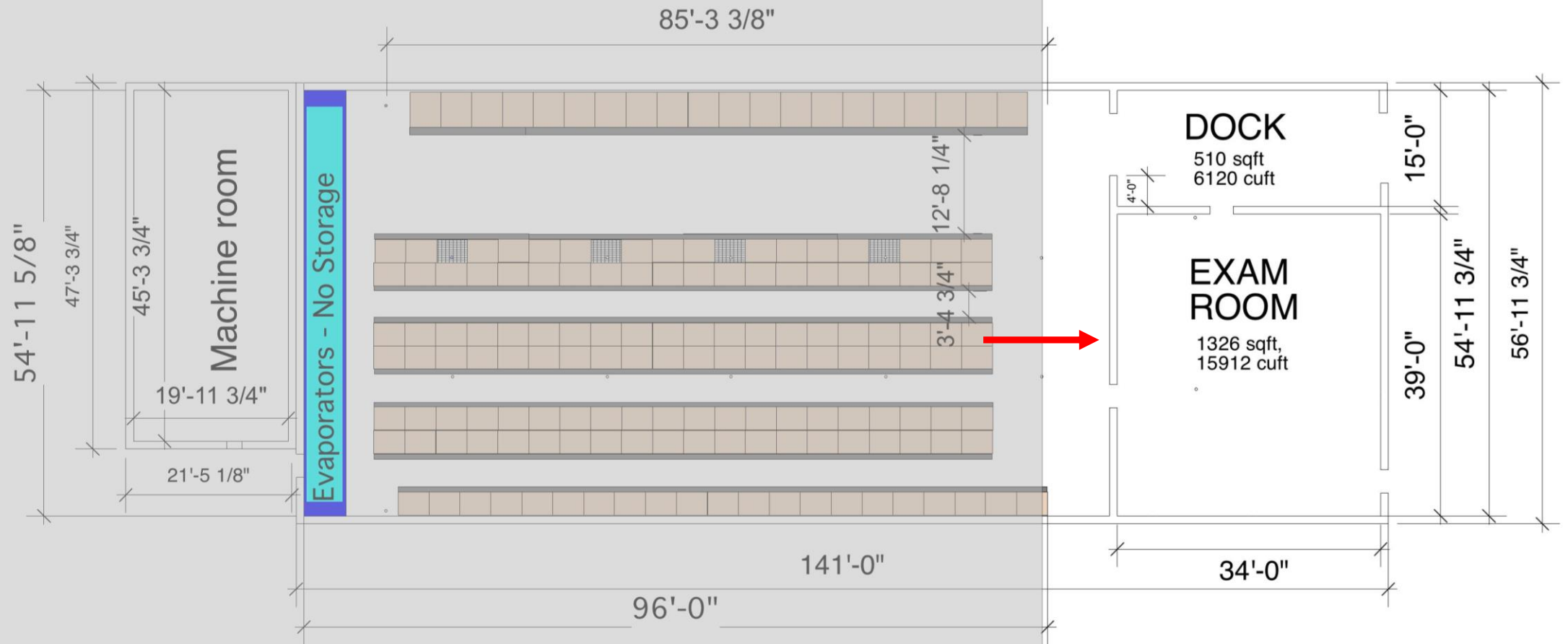
MAIN
STORAGE



Storage Racks



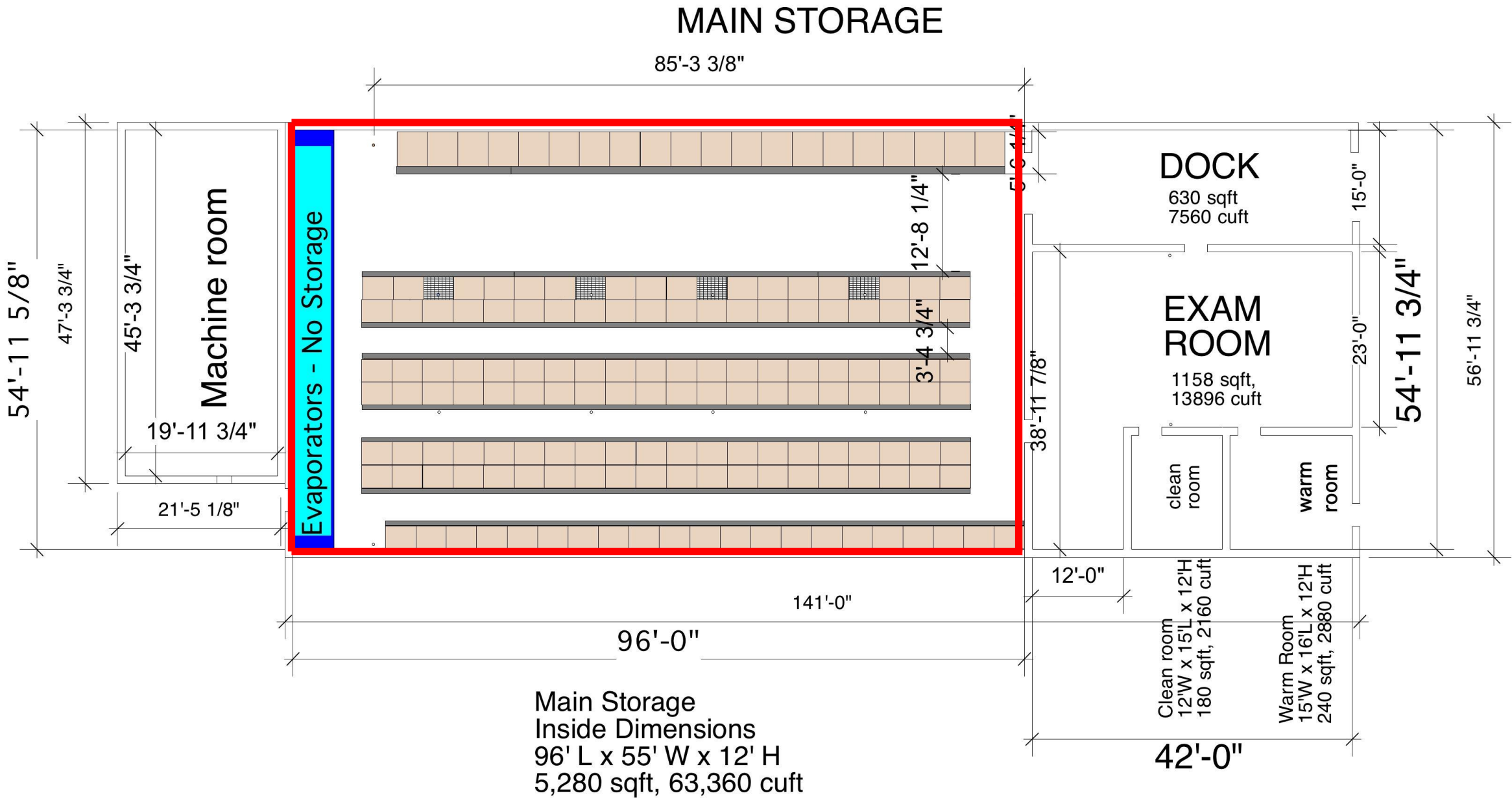
INCREASE EXAM ROOM SIZE BY
REMOVING THE CLEAN ROOM AND
WARM ROOM



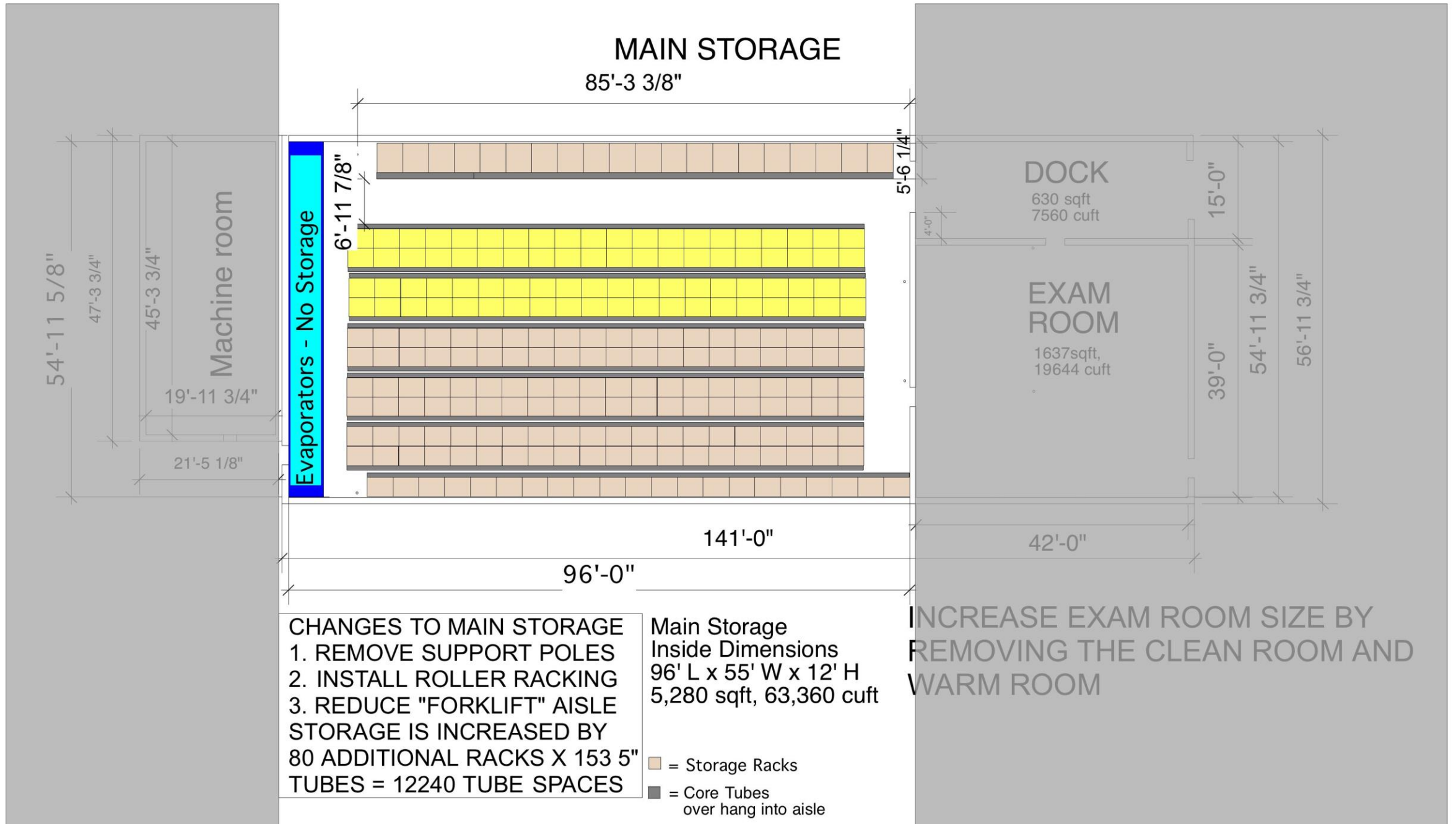
Main Storage
Inside Dimensions
96' L x 55' W x 12' H
5,280 sqft, 63,360 cuft

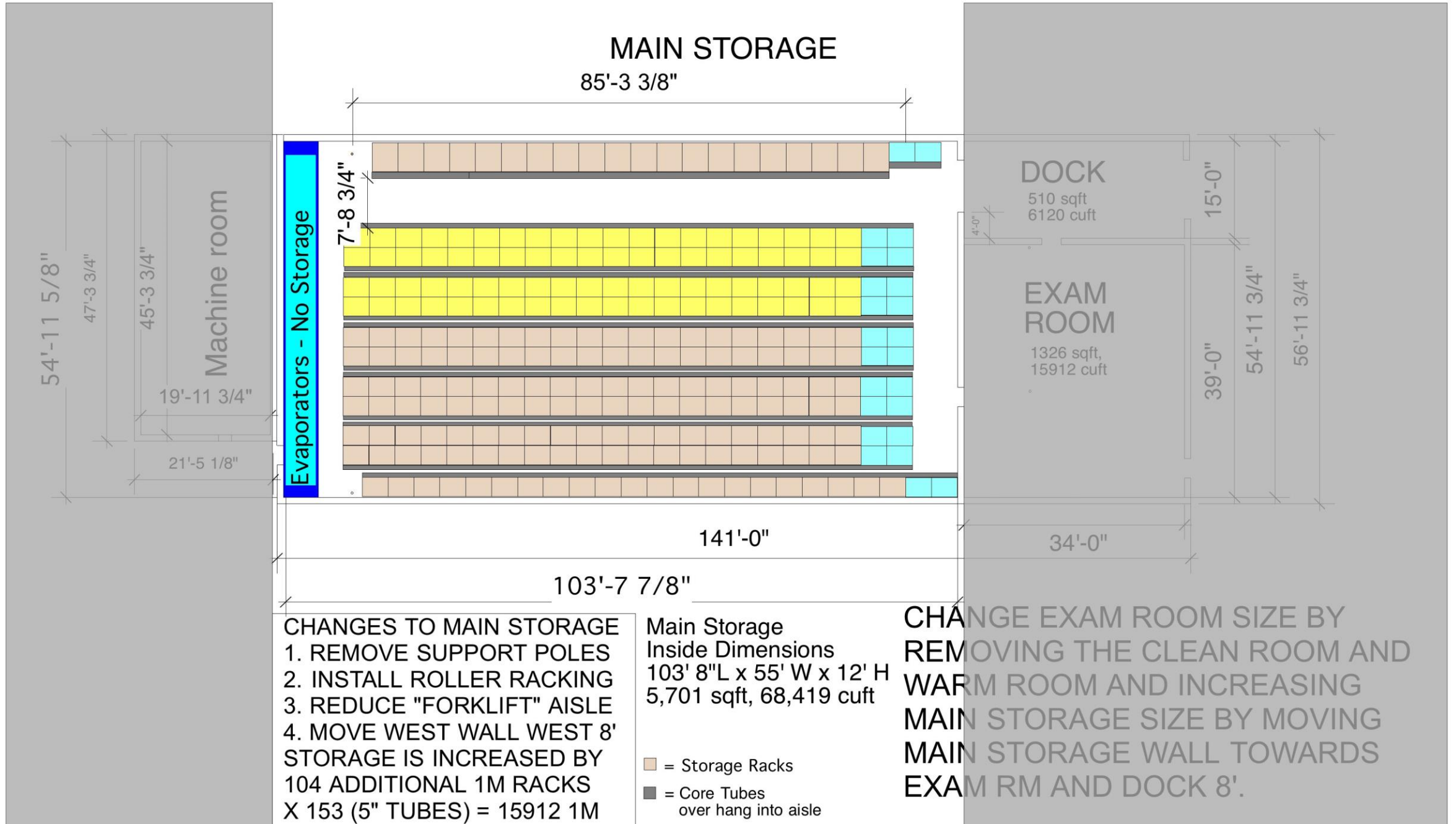
- = Storage Racks
- = Core Tubes
over hang into aisle
- = Wire mesh shelving around
roof support poles
- = Roof support poles

**CHANGE EXAM ROOM SIZE BY
REMOVING THE CLEAN ROOM AND
WARM ROOM AND INCREASING
MAIN STORAGE SIZE BY MOVING
MAIN STORAGE WALL TOWARDS
EXAM RM AND DOCK 8'.**





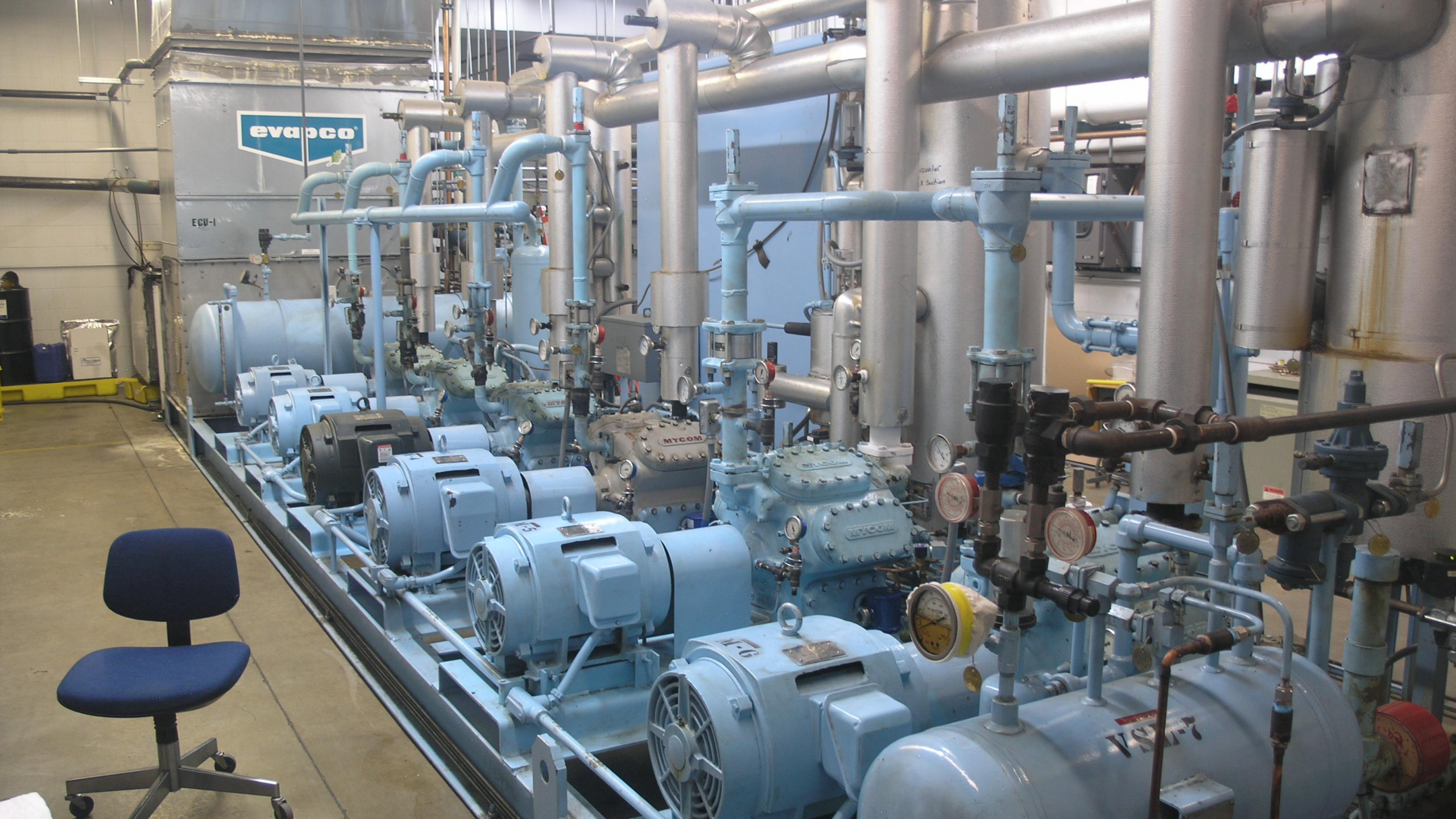




Mechanical System

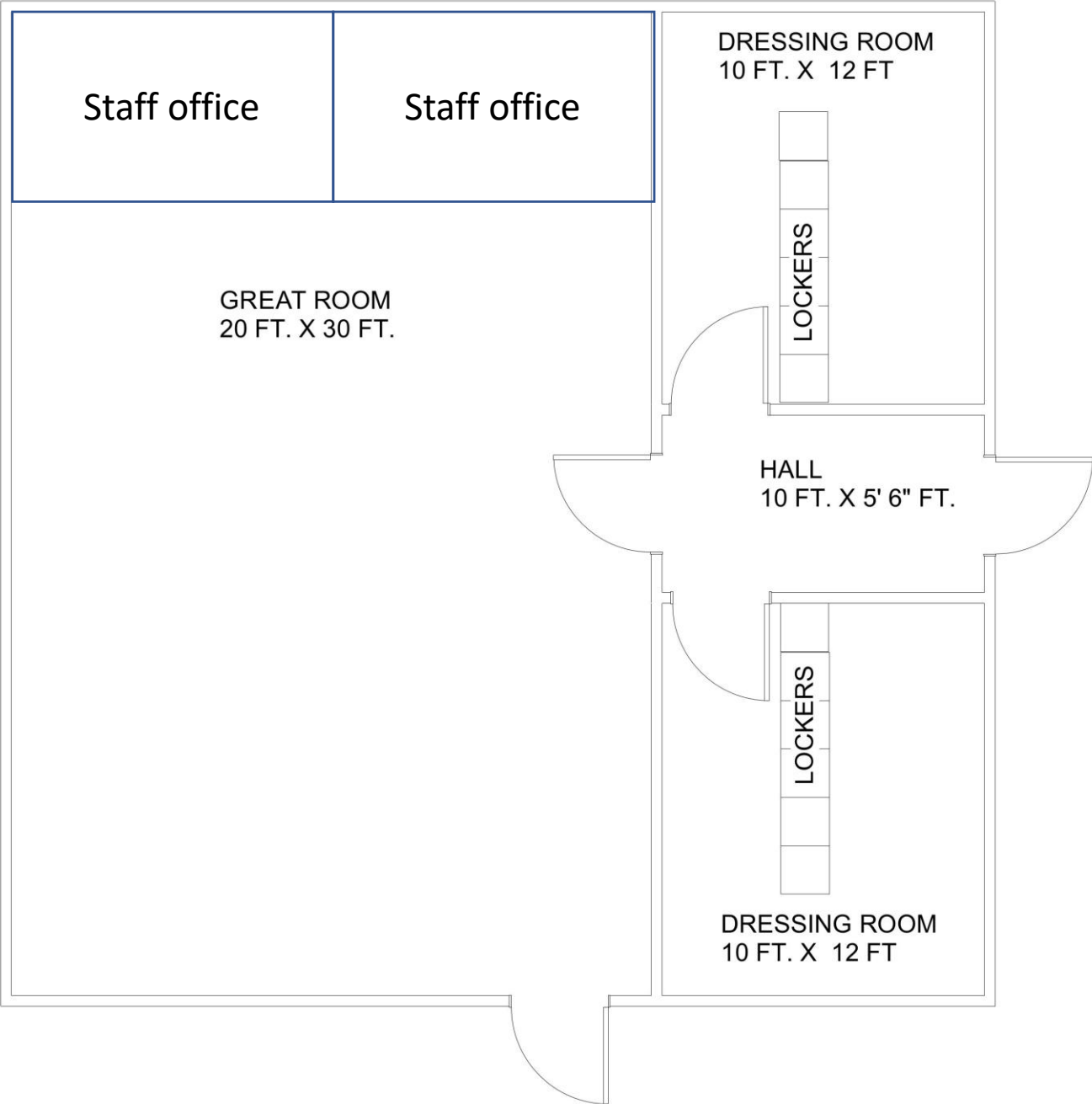
- The current mechanical system is run by 6 reciprocating compressors utilizing R22 (HCFC-22) refrigerant which must be replaced per the Montreal Protocol.
- The new mechanical system is expected to be a CO2 based system, with a likely smaller footprint.
- Overall expecting a more efficient and environmentally friendly system.













Requirements

- CO2 refrigerant system
- 100% redundancy on all critical systems
- Replace trailer with staff offices, scientist work area and dressing rooms
- Common area for meetings and tours with A/V
- WiFi and ethernet connectivity throughout common area
- Wireless connectivity in freezer for workstations to communicate to Database server
- Windows into all cold rooms (for safety)
- Entry vestibule external to the freezer envelope
- More power circuits in exam room
- 4 Power cord drops on their own circuits in center of exam room
- Incorporate present gas monitor or install new gas monitor for monitoring refrigerant gas and CO2, if refrigerant gas is CO2, also monitor O2 levels.
- Clean agent fire suppression system
- Clothing and Boot storage area



High Priority Requests

- NON-proprietary master refrigeration control system, PREFERABLY OPEN SOURCE
- Cold makeup air for exam room
- Greater than R50 insulation, the greater R value = lower operating costs
- Pressure venting of air inside the freezer envelope
- No roof support columns in the main storage to allow greater flexibility with rolling storage racks
- LED Lighting with commercially available replaceable components.



Desired Improvements

- Reduced noise levels in exam room
- Use waste heat for subfloor heating to prevent frost heave of warehouse floor
- Use the refrigeration plant to heat and cool "office/common use" area
- Do not include "deli" doors between exam room and main storage
- Shop area for minor fabrication and maintenance

Questions



RACK INFORMATION

141 racks for 1m core

48" wide x 36" deep x 10 feet tall

20 racks for 1.5m core:

48" wide x 54" deep x 10 feet high

Capacity per rack varies by tube diameter.

6" tubes = 14 tubes per shelf x 7 shelves = 98 tubes per rack

5.5" tubes = 16 tubes per shelf x 8 shelves = 120 tubes per rack

5" tubes = 18 tubes per shelf x 8 shelves = 153 tubes per rack

4" tubes = 22 tubes per shelf x 11 shelves = 231 tubes per rack