



National Science
Foundation Ice Core
Facility Current Status
and Future Plans

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USGS
United States Geological Survey



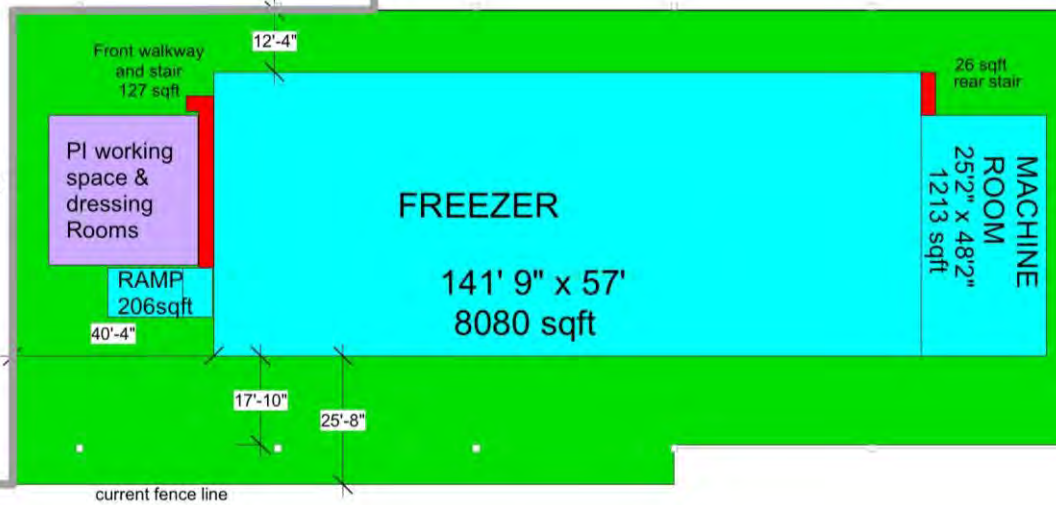
USGS



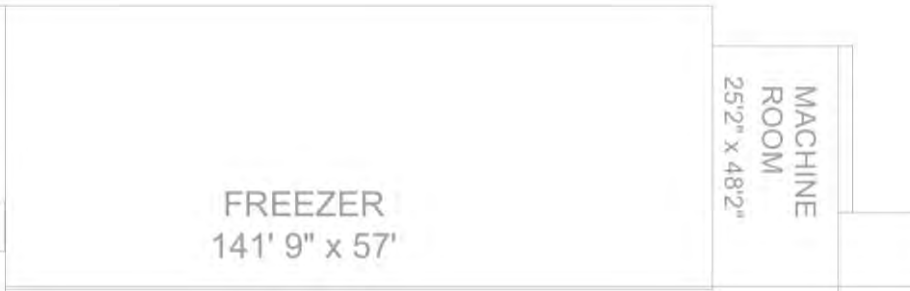
USGS
WATER RESOURCES
AREA

AREA NOT PRESENTLY RENTED

SPACE REQUIRED
MID E-BAY for
duplicate freezer
19554 sqft



CURRENT
SPACE
OCCUPIED
~ 23000 square feet



LOADING
DOCK





CLASS 100
CLEAN ROOM
NO OPEN CONTAINERS OR
WORK HERE

USGS



Latch

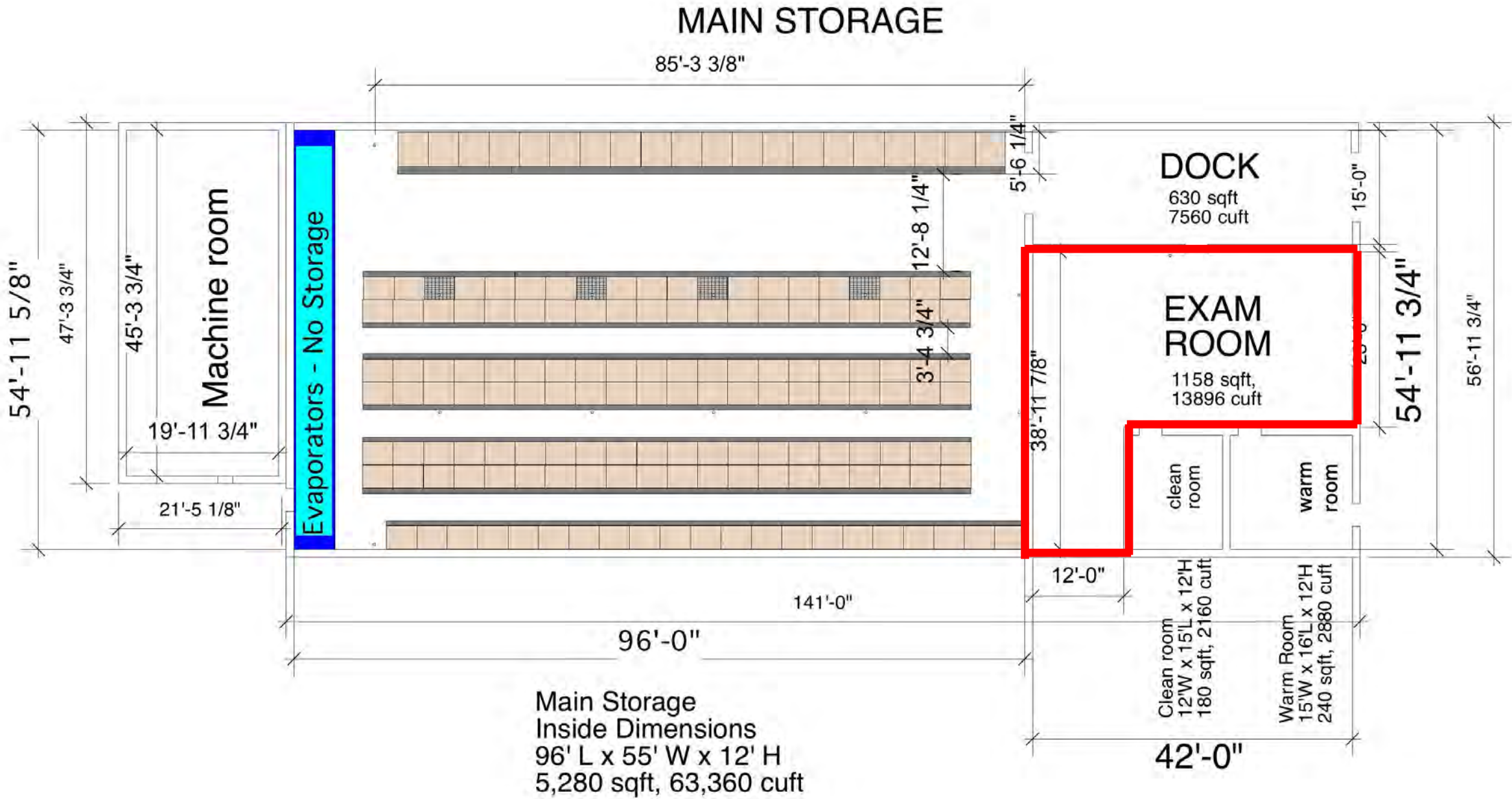
Release →



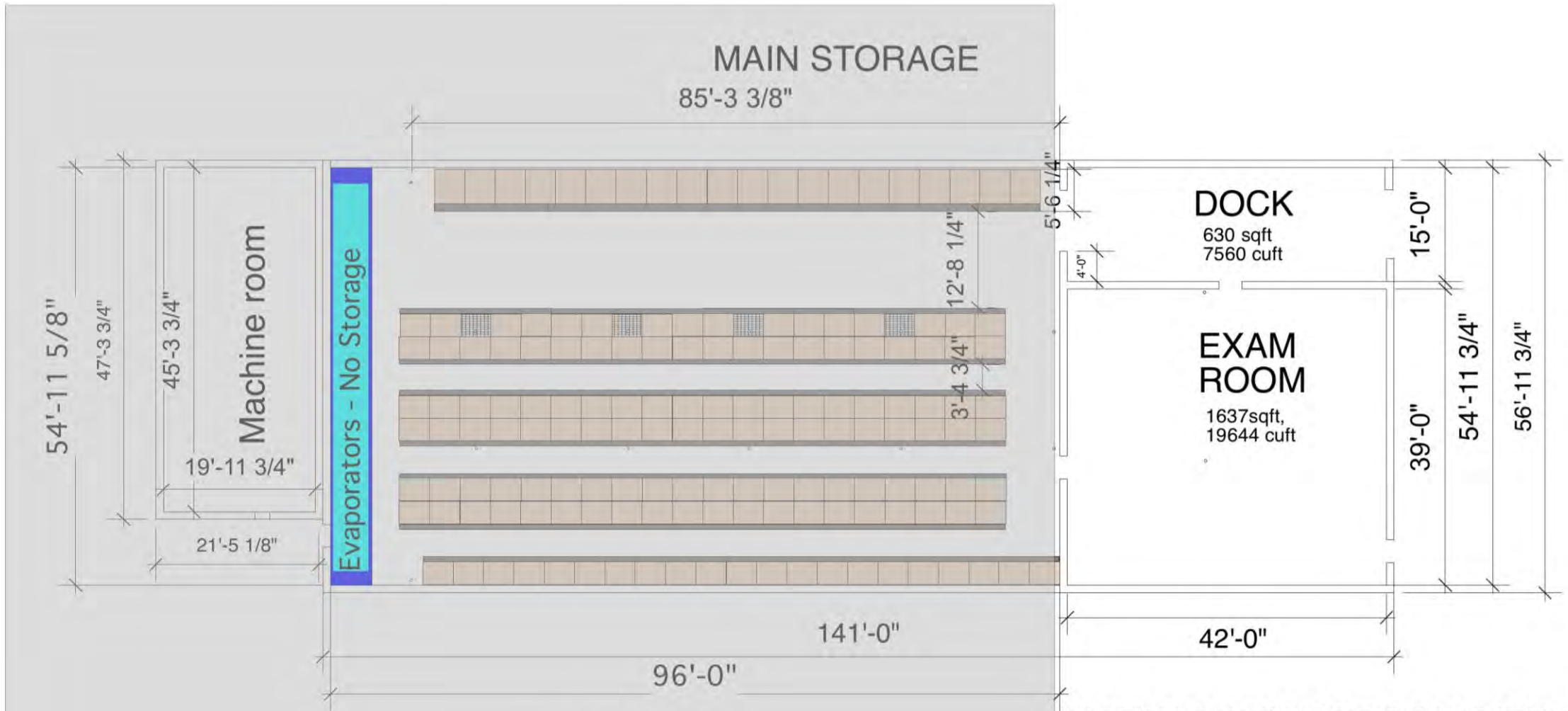


EXIT
EXAM ROOM

MAIN STORAGE



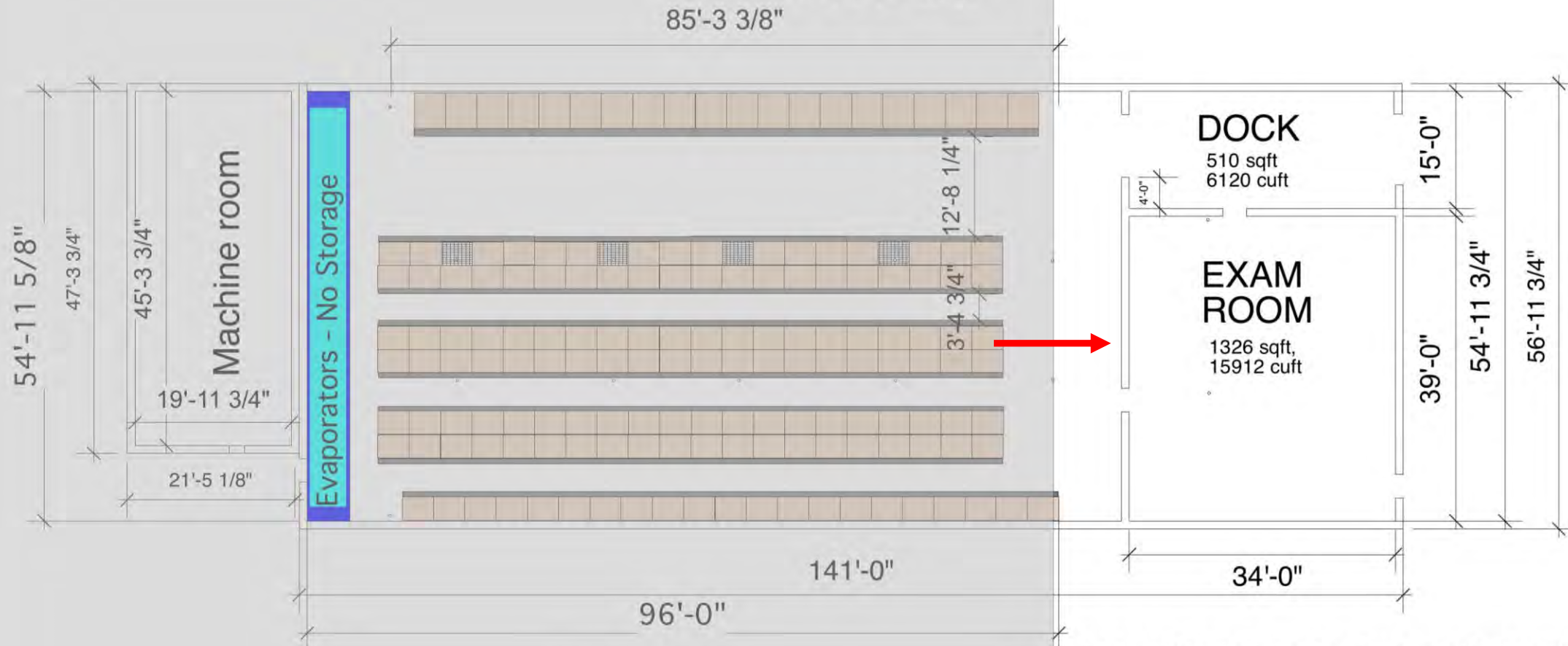
Storage Racks







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

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

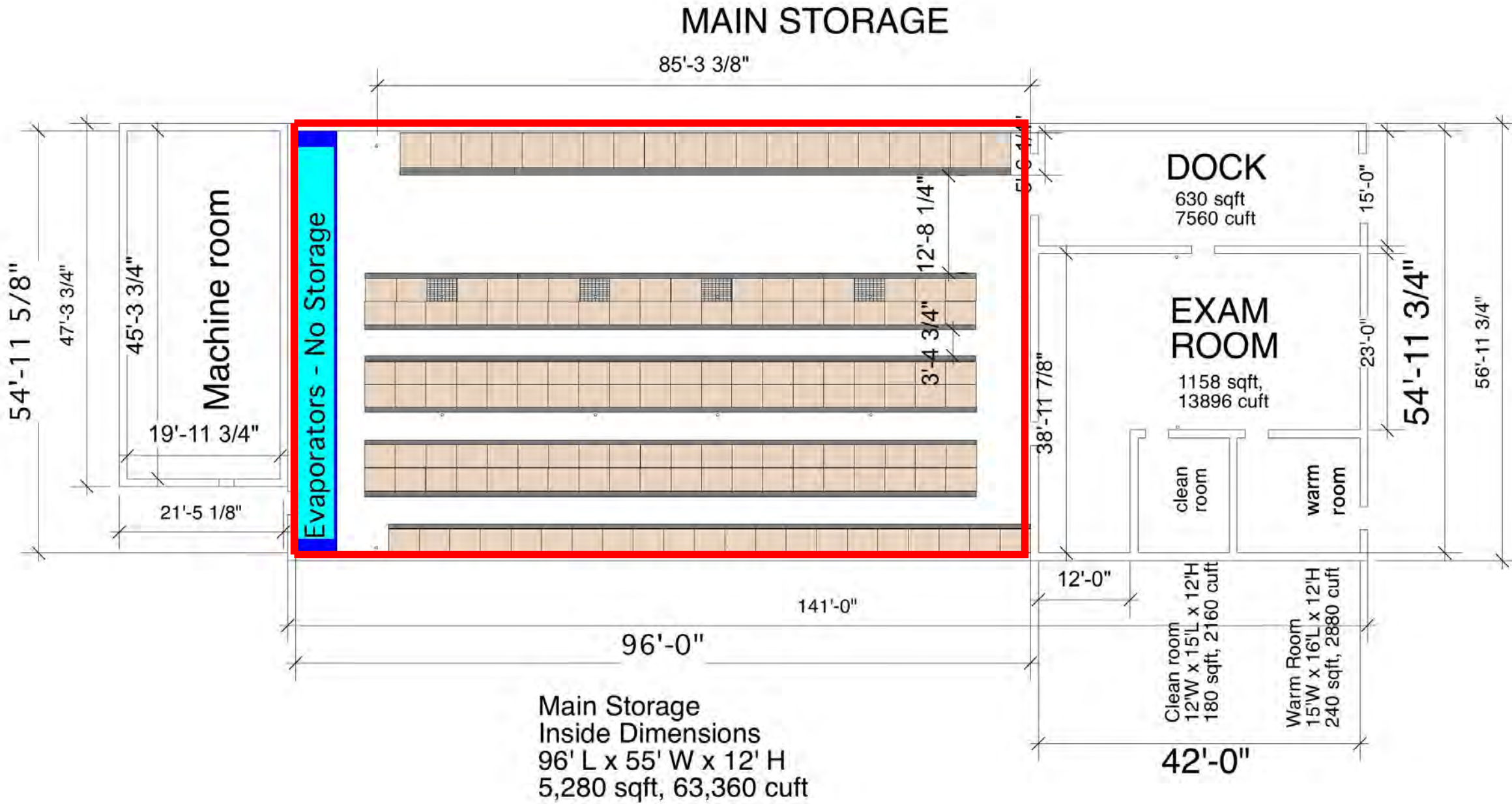
- = Storage Racks
- = Core Tubes
 over hang into aisle



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

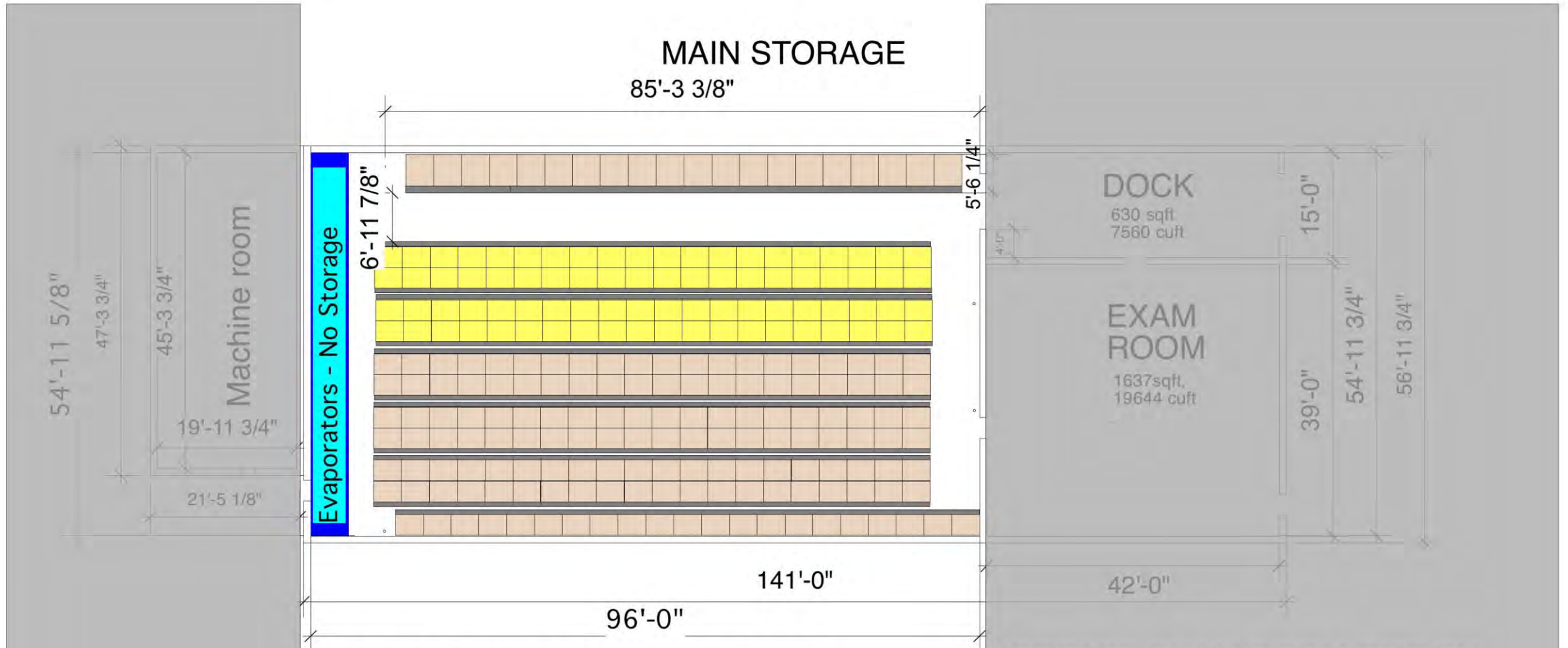
-  = Storage Racks
-  = Core Tubes
over hang into aisle
-  = Wire mesh shelving around
roof support poles
-  = Roof support poles

**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'.**



Storage Bays



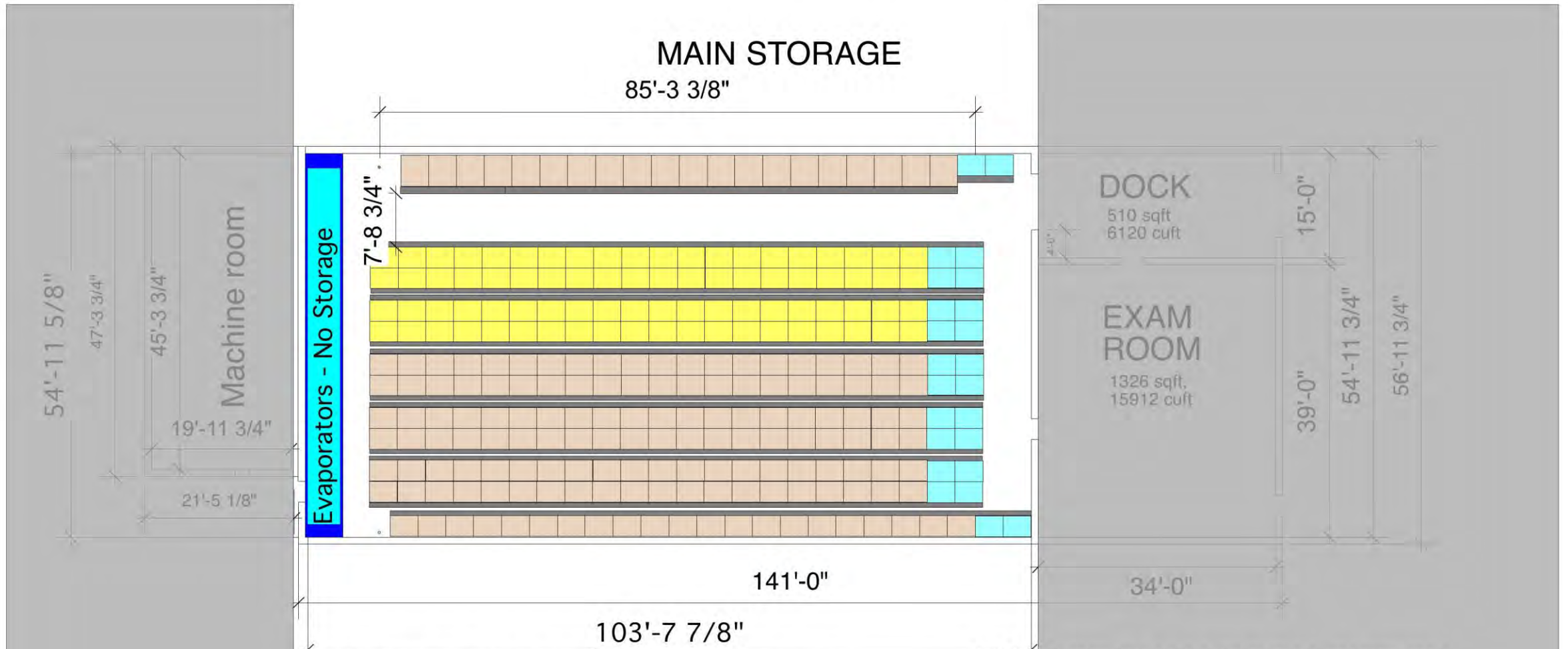


CHANGES TO MAIN STORAGE
 1. REMOVE SUPPORT POLES
 2. INSTALL ROLLER RACKING
 3. REDUCE "FORKLIFT" AISLE
 STORAGE IS INCREASED BY
 80 ADDITIONAL RACKS X 153 5"
 TUBES = 12240 TUBE SPACES

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

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



CHANGES TO MAIN STORAGE

1. REMOVE SUPPORT POLES
2. INSTALL ROLLER RACKING
3. REDUCE "FORKLIFT" AISLE
4. MOVE WEST WALL WEST 8'

STORAGE IS INCREASED BY 104 ADDITIONAL 1M RACKS X 153 (5" TUBES) = 15912 1M

Main Storage
 Inside Dimensions
 103' 8"L x 55' W x 12' H
 5,701 sqft, 68,419 cuft

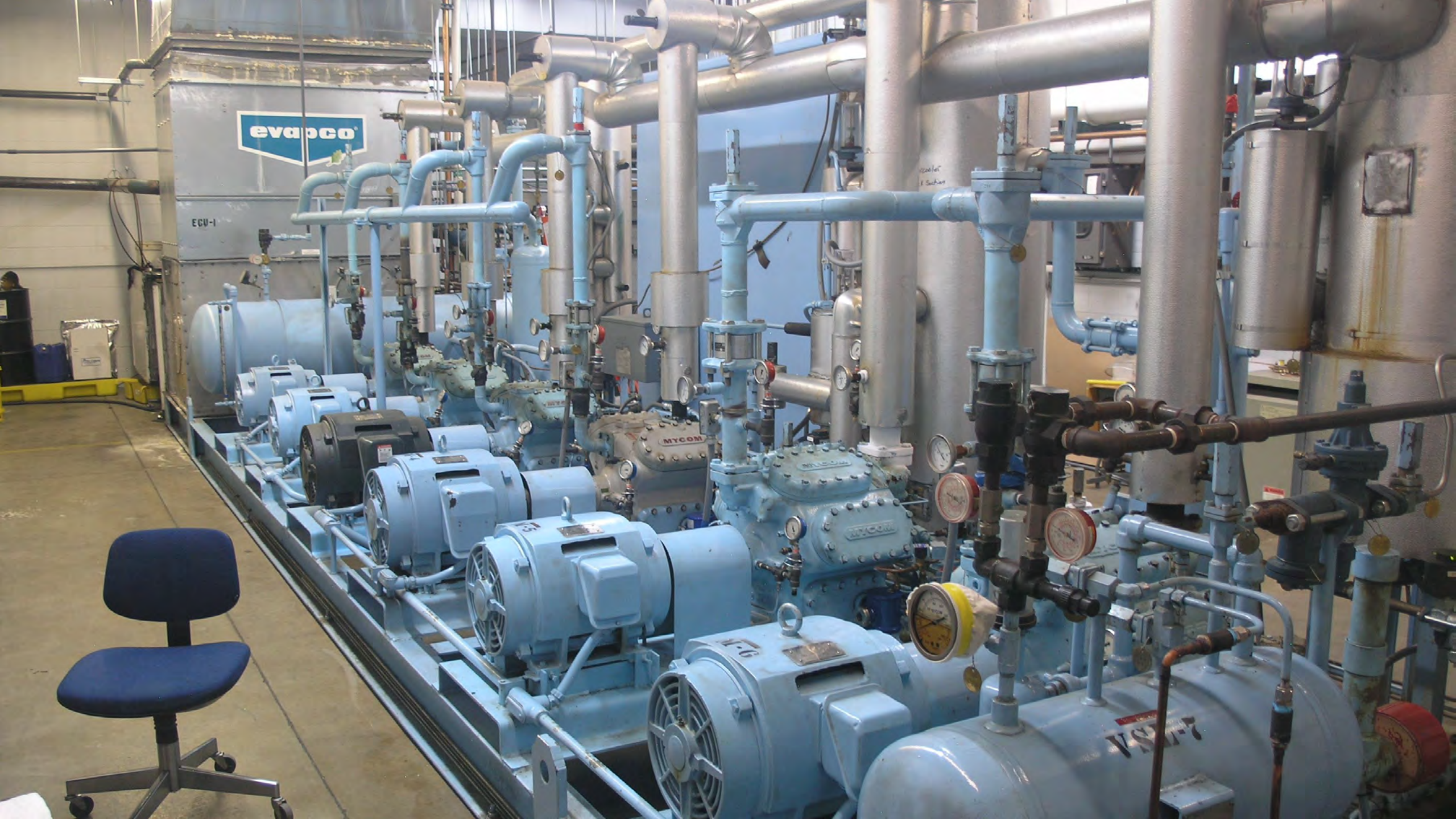
■ = Storage Racks
 ■ = Core Tubes over hang into aisle

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.





evaaco

ECU-1

MYCOM

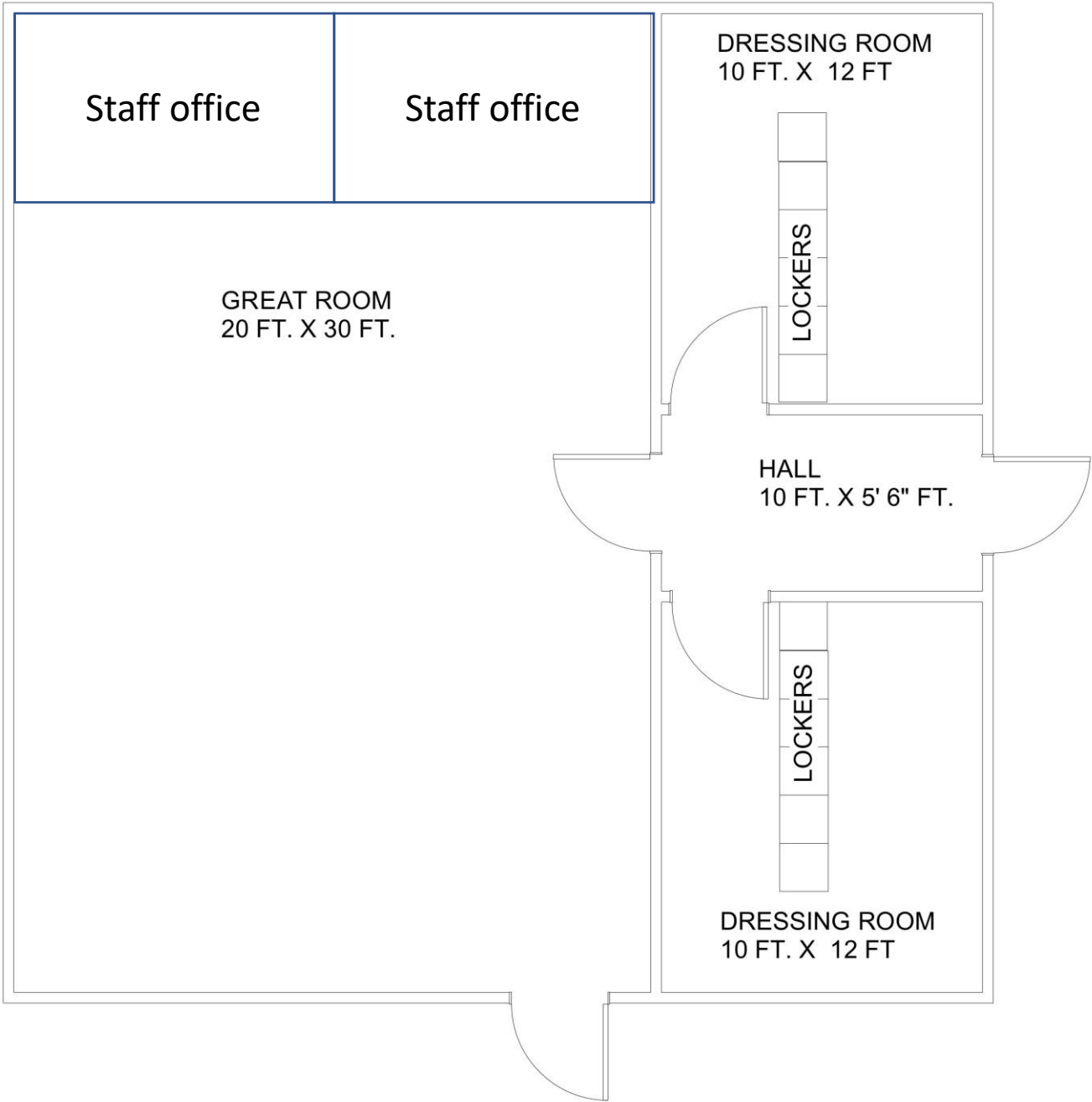
MYCOM

V76

V76









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