National Science Foundation Ice Core Facility Current Status and Future Plans

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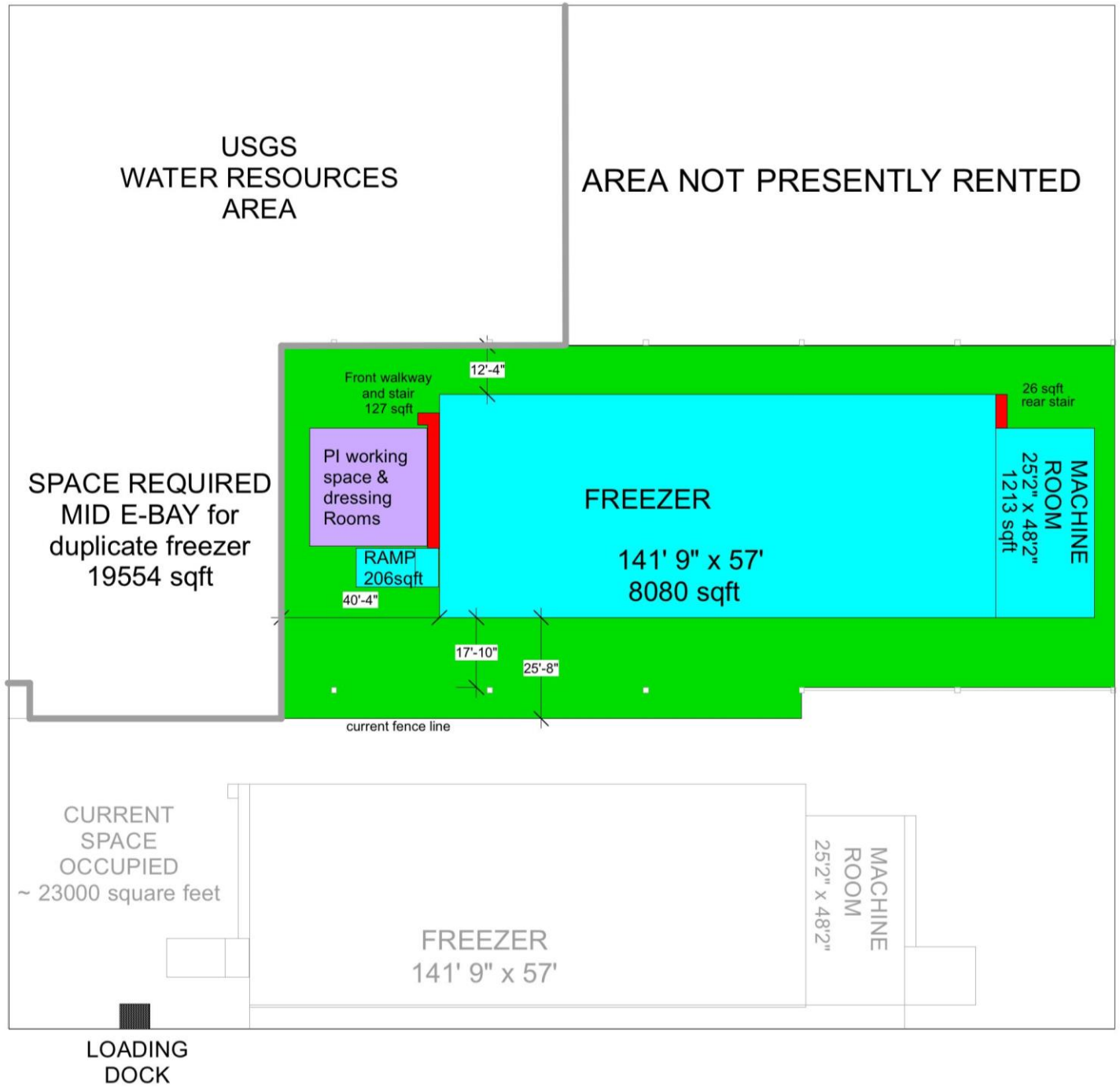
U.S. Geological Survey


USGS
USGS

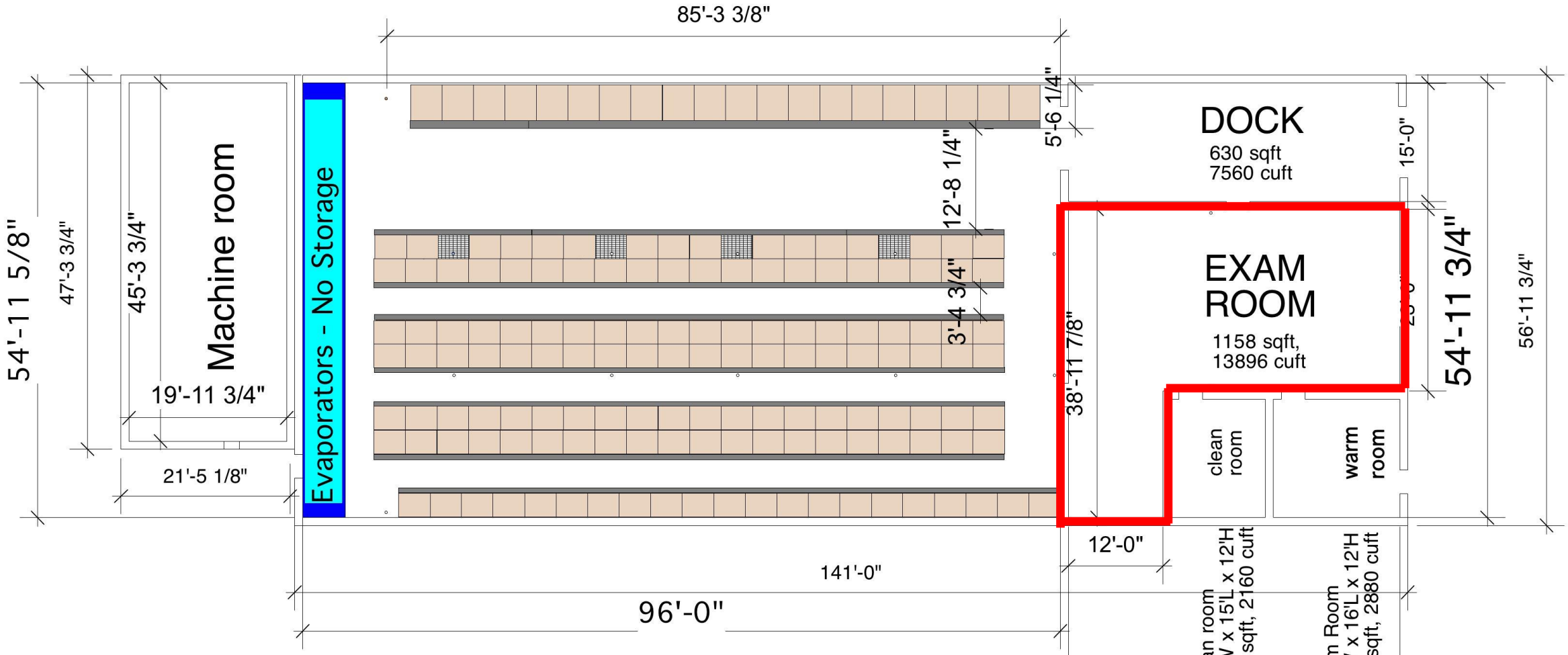

USGS
WATER RESOURCES
AREA
AREA NOT PRESENTLY RENTED
SPACE REQUIRED
MID E-BAY for
duplicate freezer
19554 sqft
12'-4"
Front walkway
and stair
127 sqft
26 sqft
rear stair
PI working
space &
dressing
Rooms
FREEZER
141' 9" x 57'
8080 sqft
MACHINE
ROOM
25'2" x 48'2"
1213 sqft
RAMP
206sqft
40'-4"
17'-10"
25'-8"
current fence line
CURRENT
SPACE
OCCUPIED
~ 23000 square feet
FREEZER
141' 9" x 57'
MACHINE
ROOM
25'2" x 48'2"
LOADING
DOCK


CLASS 100
CLEAN ROOM
USGS


National Science Foundation
NSF
ICE CORE FACILITY
Operated by U.S. Geological Survey
Latch
Release
KEEP FROZEN

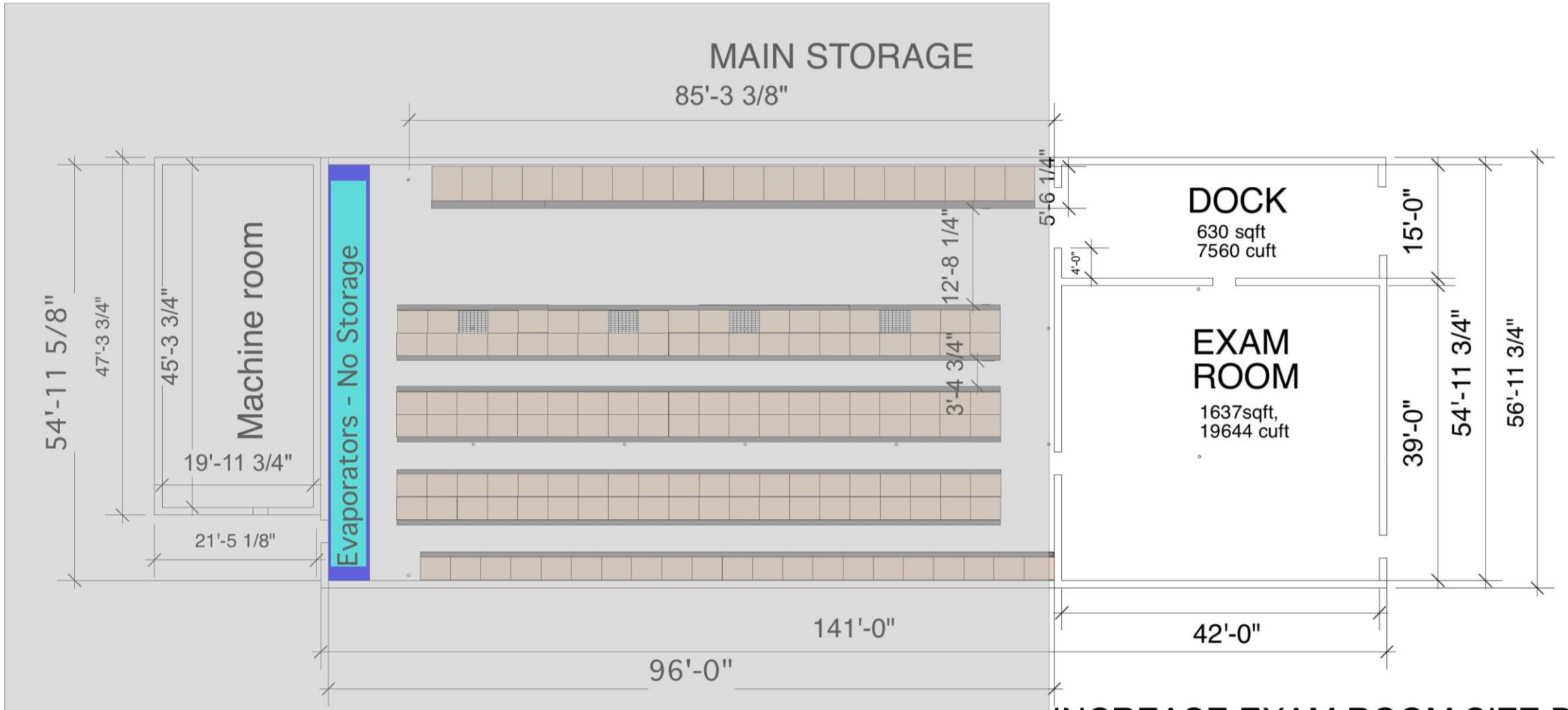

EXIT
EXAM ROOM
PANIC BUTTON
MAIN STORAGE
KIMTECH

MAIN STORAGE



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

Storage Racks

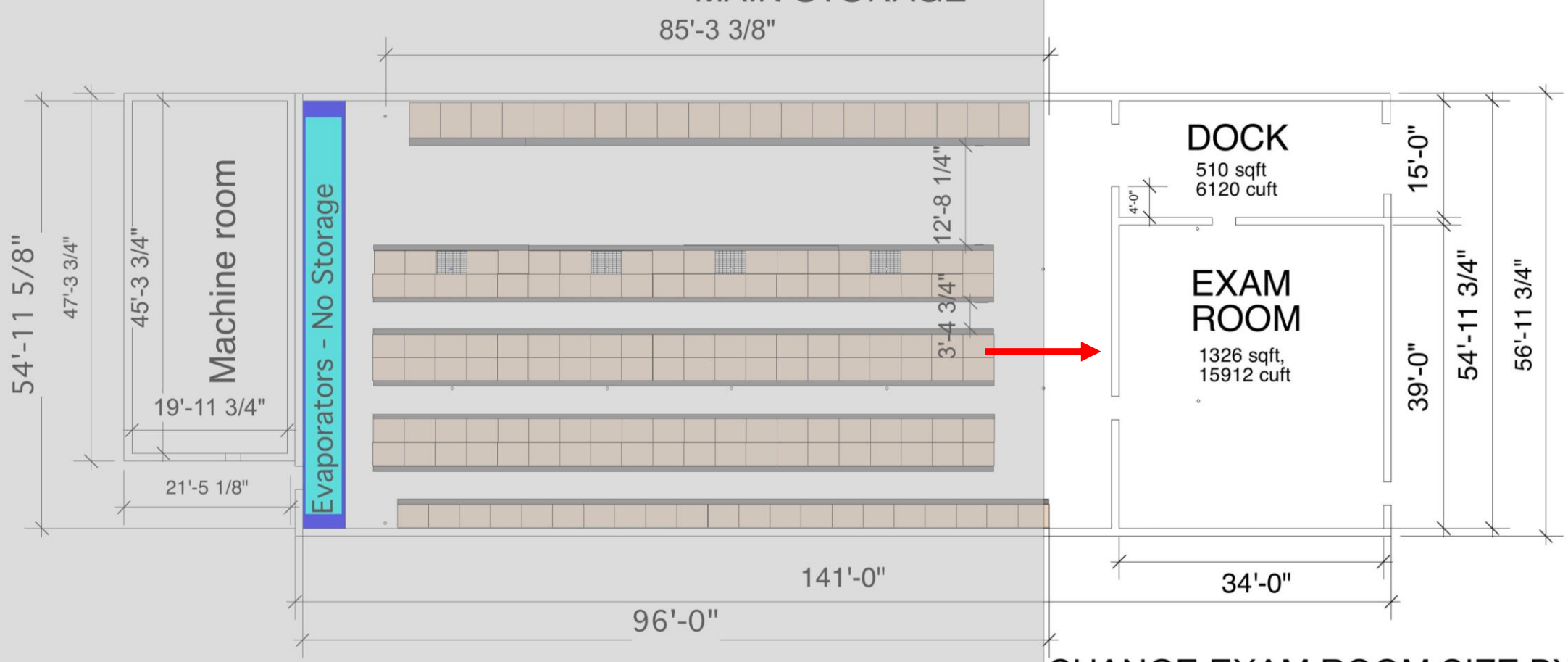


Main Storage
Inside Dimensions
96' L x 55' W x 12' H
5,280 sqft, 63,360 cuft

= Storage Racks

= Core Tubes
over hang into aisle

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



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

= Storage Racks

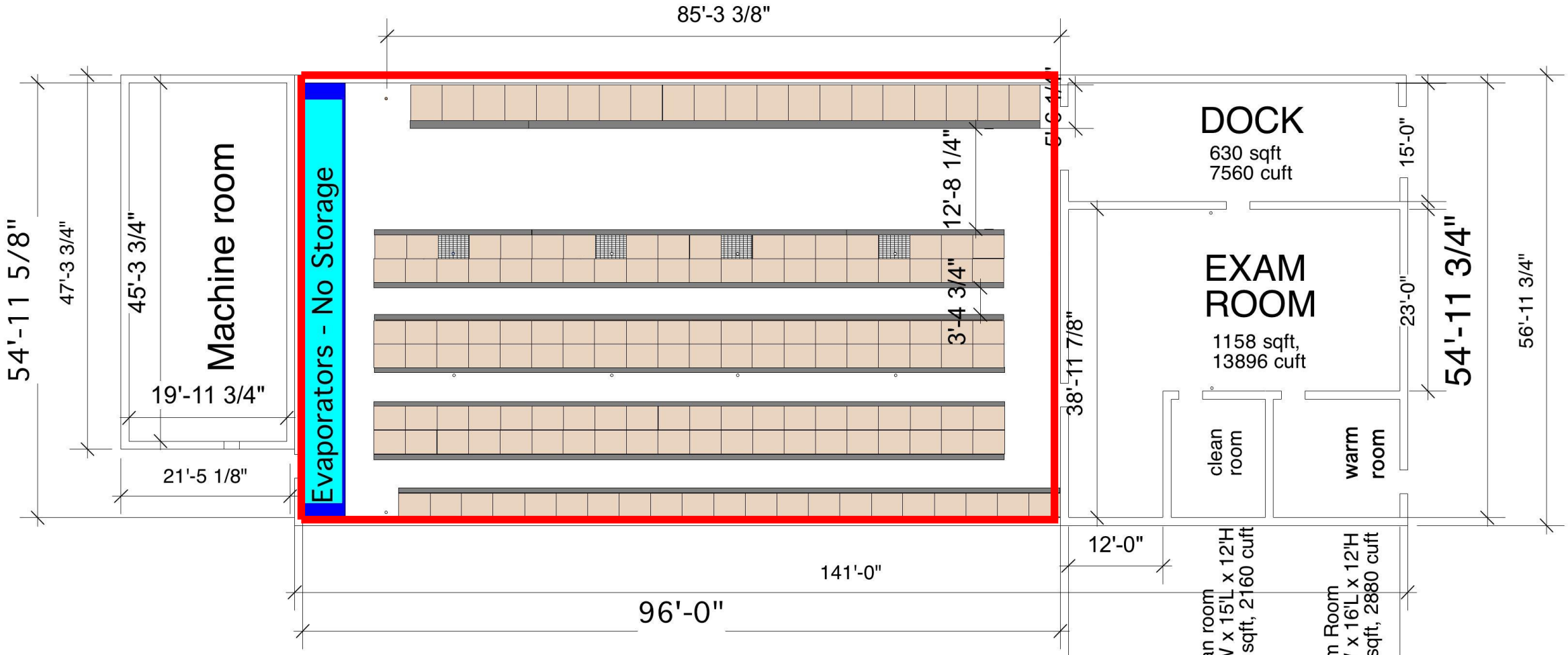
= Core Tubes
over hang into aisle

= 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'.

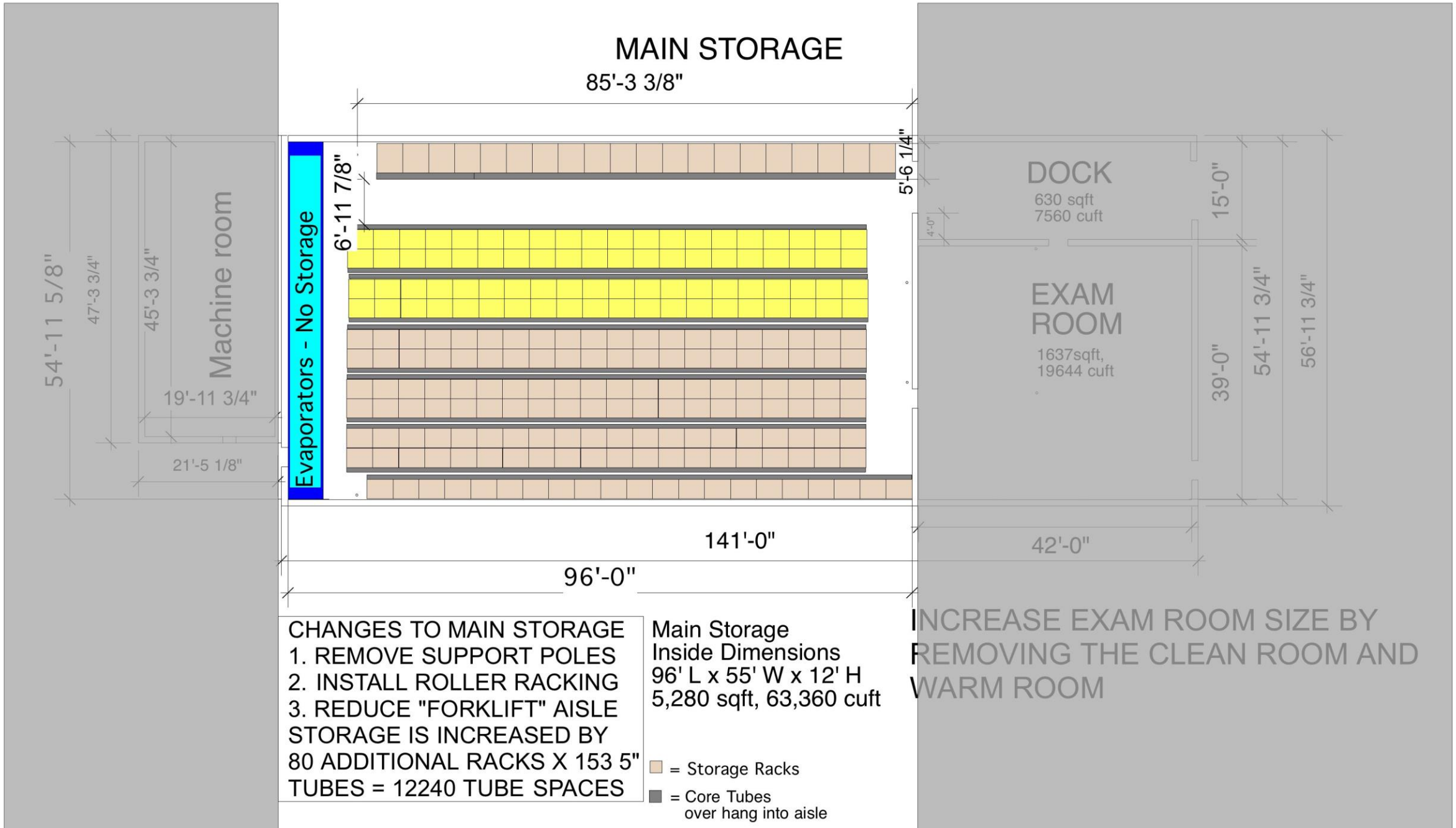
MAIN STORAGE



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

Storage Racks


I-184
I-184
SP
VESSEL



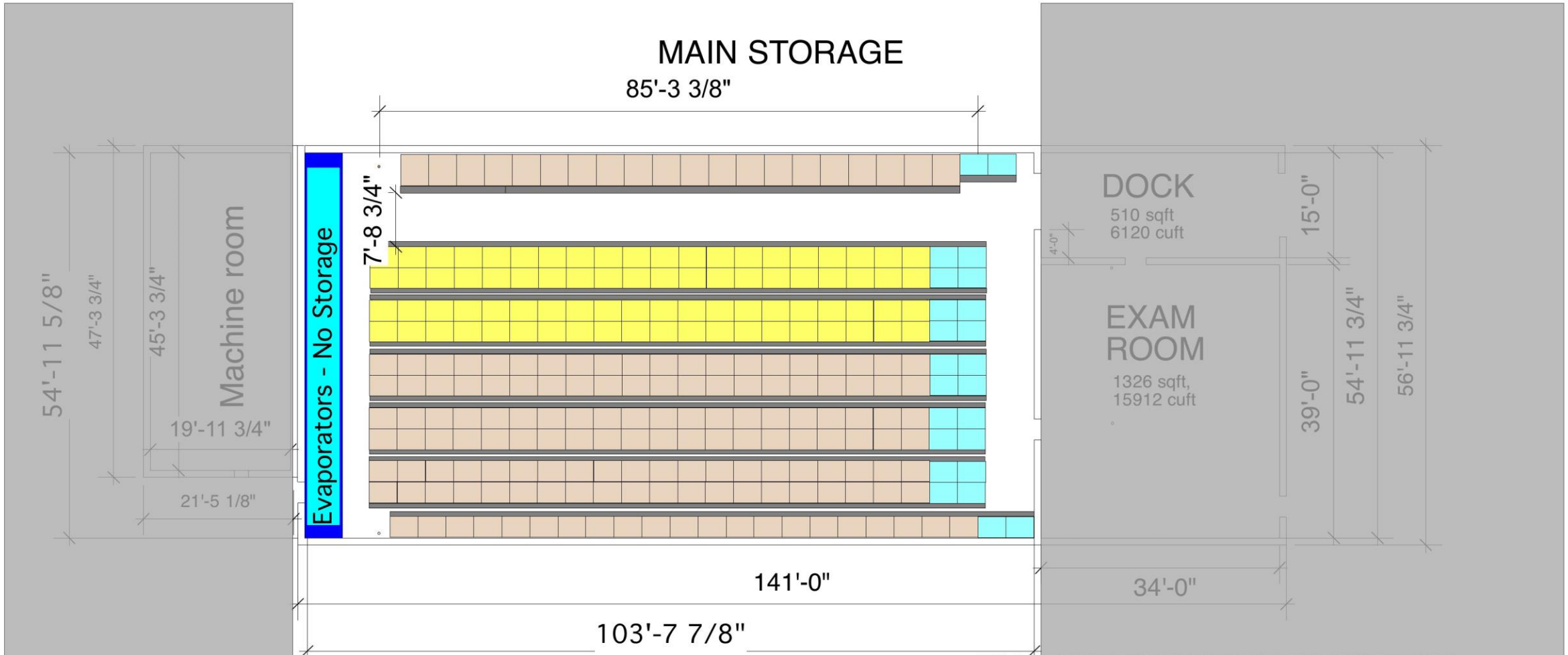
CHANGES TO MAIN STORAGE
1. REMOVE SUPPORT POLES
2. INSTALL ROLLER RACKING
3. REDUCE "FORKLIFT" AISLE
STORAGE IS INCREASED BY
80 ADDITIONAL RACKS X 153 5"
TUBES = 12240 TUBE SPACES

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

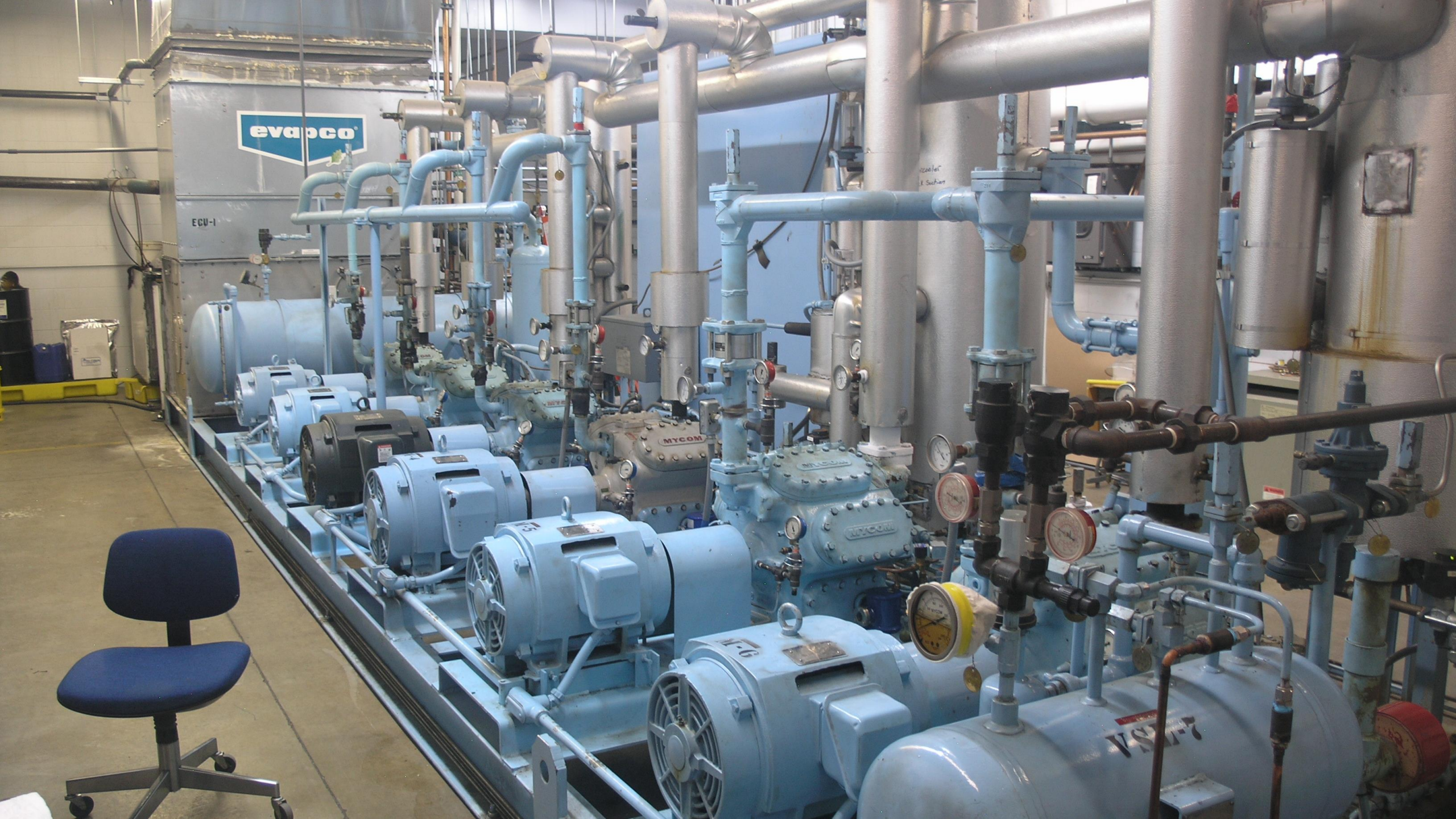
= Core Tubes
over hang into aisle

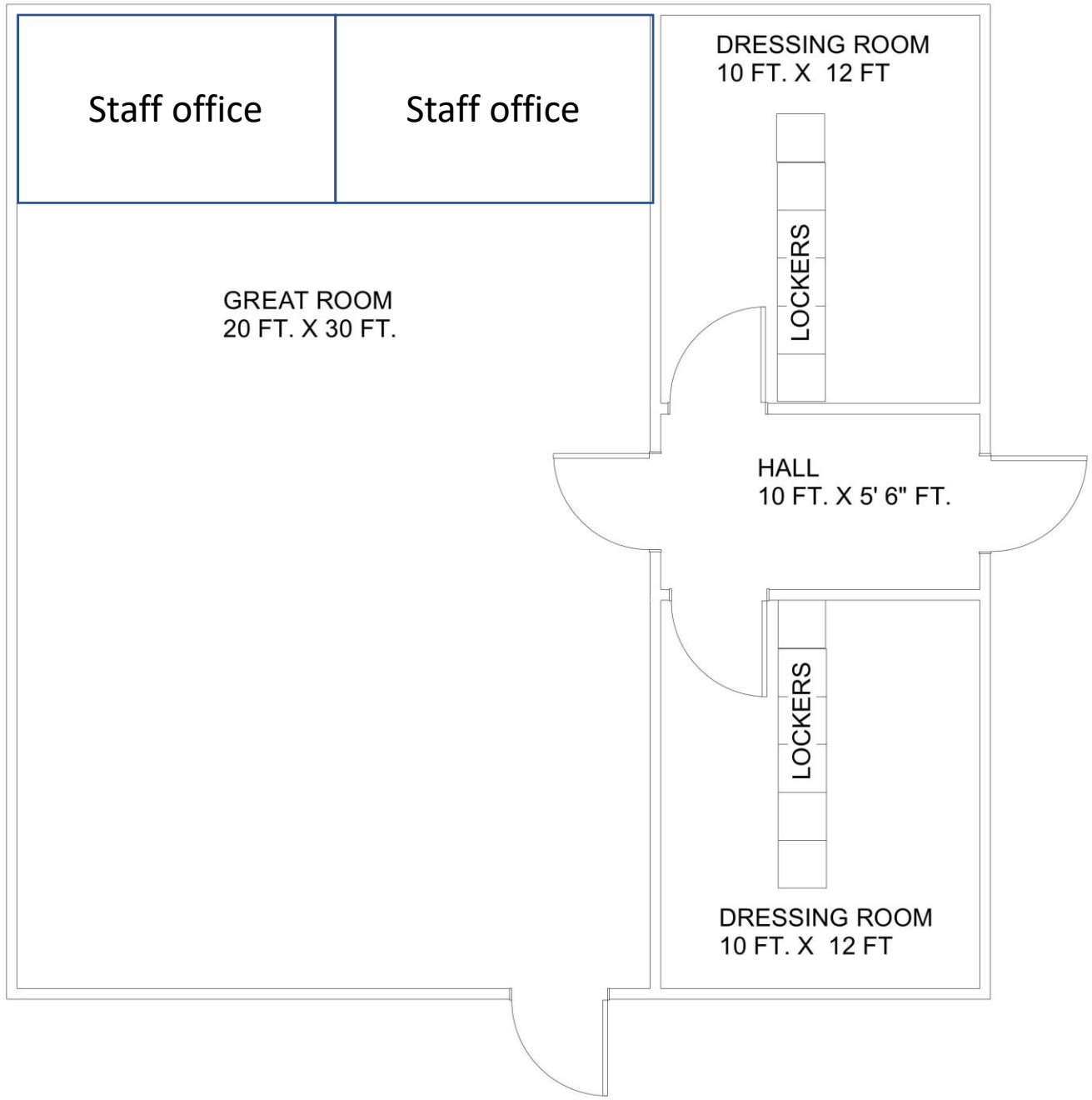
CHANGE EXAM ROOM SIZE BY
REMOVING THE CLEAN ROOM AND
WARM ROOM AND INCREASING
MAIN STORAGE SIZE BY MOVING
MAIN STORAGE WALL TOWARDS
EXAM RM AND DOCK 8'.

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.


CAUTION


evapco
ECU-1
MYCOM
MYCOM
MYCOM
VSD


Staff office
Staff office
DRESSING ROOM
10 FT. X 12 FT
LOCKERS
GREAT ROOM
20 FT. X 30 FT.
HALL
10 FT. X 5' 6" FT.
LOCKERS
DRESSING ROOM
10 FT. X 12 FT

Requirements

- CO_2 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 CO_2, if refrigerant gas is CO_2, also monitor O_2 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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ICE CORE
FACILITY
Operated by U.S. Geological Survey

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