STATE HOUSE HVAC ASSESSMENT AND RENOVATIONS
115 STATE STREET, MONTPELIER, VERMONT
CONSTRUCTION PHASES

Phase A – 2022 **Probable Cost: $2,711,835**

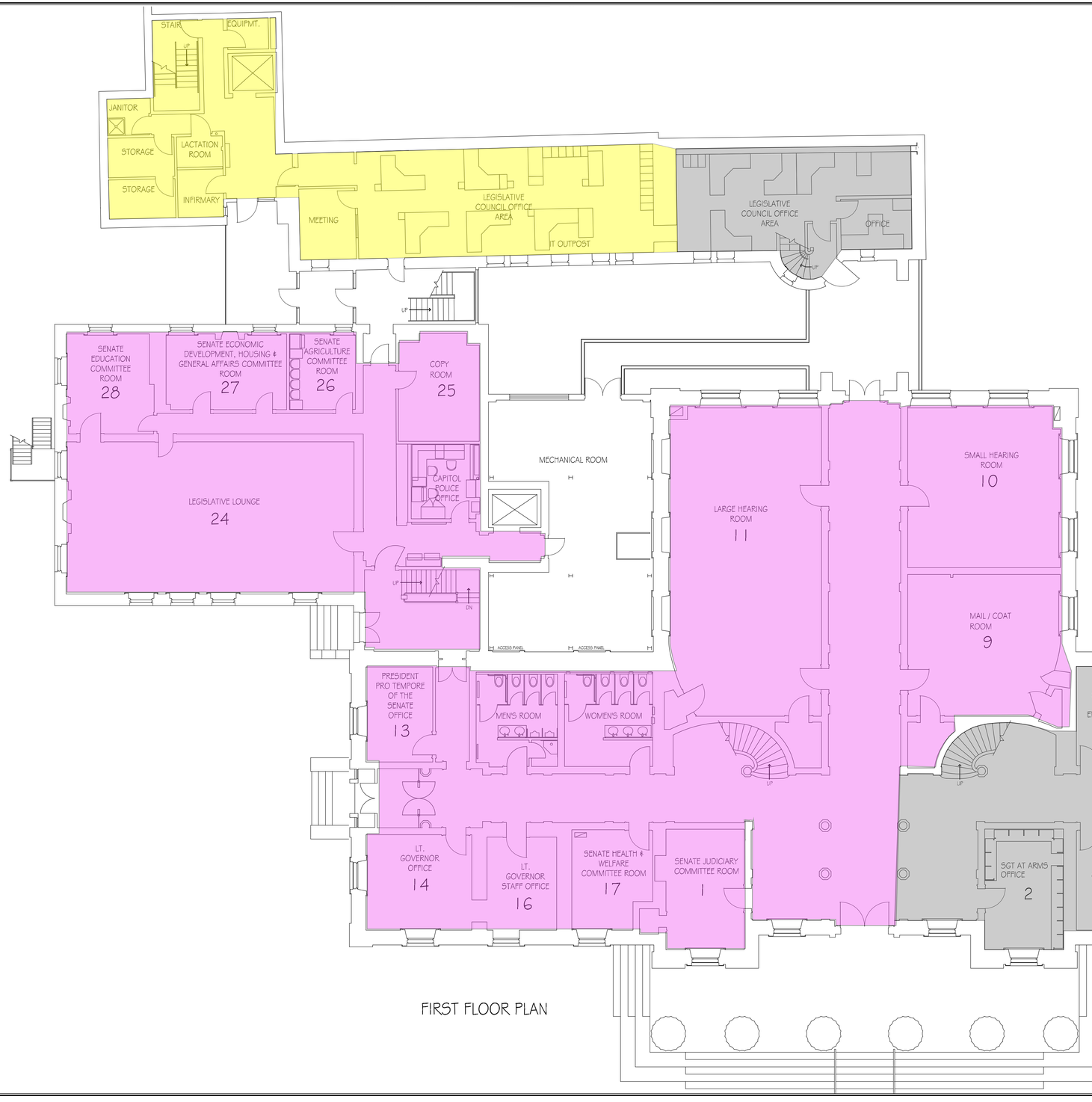
Installation of the summer boiler for humidity control, pumps, and controls. Replacement of the air handling unit (AHU) that serves the Senate committee rooms and offices on the east end of the first floor and second floors of the original 1858 building. Due to manufacturing delays and the short construction period, the Heating Ventilation and Air Conditioning (HVAC) equipment for Phase B will be preordered to have it on the construction site when the Legislature adjourns in the spring of 2023.

Phase B – 2023 **Probable Cost: $8,047,575**

Replacement of the AHUs that serve the remainder of the first floor of the original 1858 building, the balance of the second floor, and the 3rd floor. This phase also includes the replacement of the fin tube radiation under the window wells in the House and Senate Chambers.

Phase C – 2023 or 2024 **Probable Cost: $4,146,856**

Replacement of the AHUs that serves the Legislative Council, Mezzanine, Cafeteria, Speaker and Clerk of the House. The cost of this phase is less than the Alternate because the design and other soft costs that are based upon percentages of the construction budget at schematic design in 2022 are not included. If these items are cut from the project, then those soft costs are also reduced.



FIRST FLOOR PLAN

STATE OF VERMONT
Department of Buildings and General Services
Agency of Administration
Montpelier, Vermont

115 STATE ST. - STATEHOUSE
EXISTING FLOOR PLANS
MONTPELIER VERMONT

REVISIONS

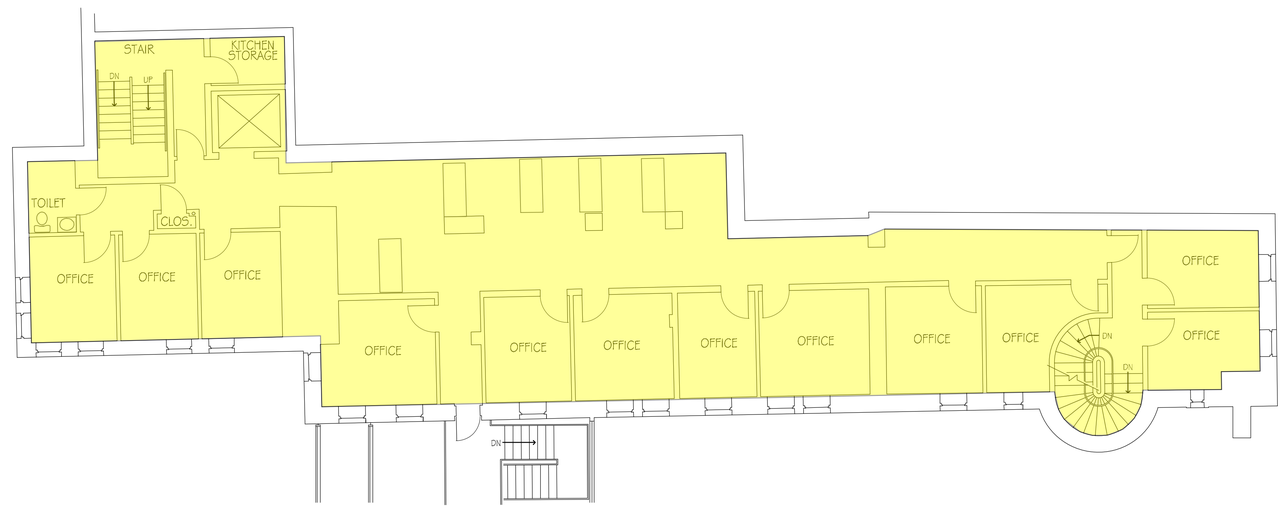
SCALE:
DATE: MAY 2011
DRAWN BY: S.K. Janawicz
APPR. BY: -

115 STATE STREET
STATEHOUSE

FLOOR PLANS

A1

2 OF 9



MEZZANINE PLAN

SENATE ECONOMIC | SENATE

STATE OF VERMONT
Department of Buildings
and General Services
Agency of Administration
Montpelier, Vermont

115 STATE ST. - STATEHOUSE
EXISTING FLOOR PLANS
MONTPELIER VERMONT

REVISIONS

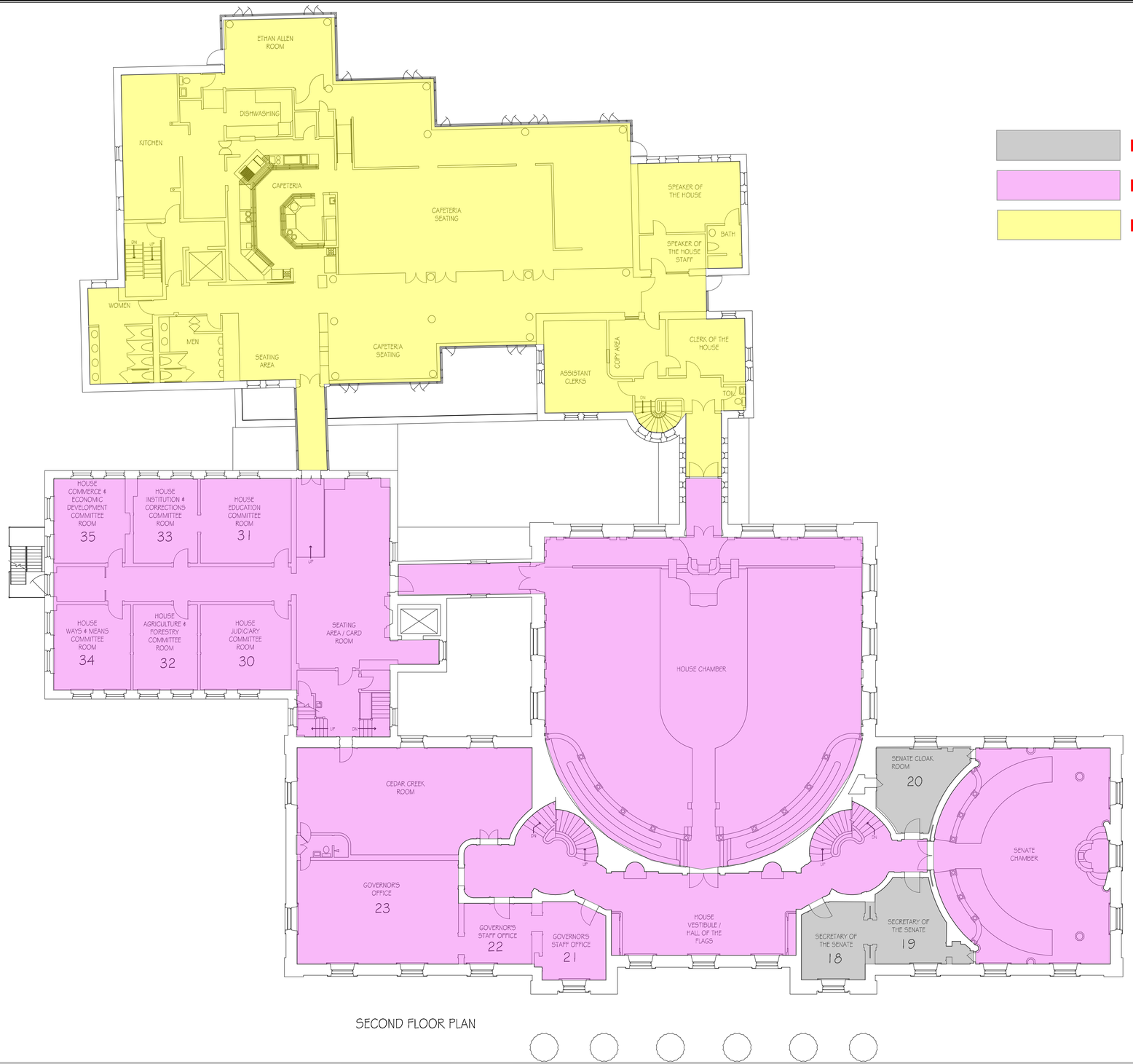
SCALE: 1/16" = 1'-0"
DATE: MAY 2011
DRAWN BY: S.K. Jaskwicz
APPR. BY: -

115 STATE STREET
STATEHOUSE

FLOOR
PLANS

A1-2

3 OF 9



Phase A

Phase B

Phase C

SECOND FLOOR PLAN

STATE OF VERMONT
Department of Buildings and General Services
Agency of Administration
Montpelier, Vermont

115 STATE ST. - STATEHOUSE
MONTPELIER VERMONT

EXISTING FLOOR PLANS

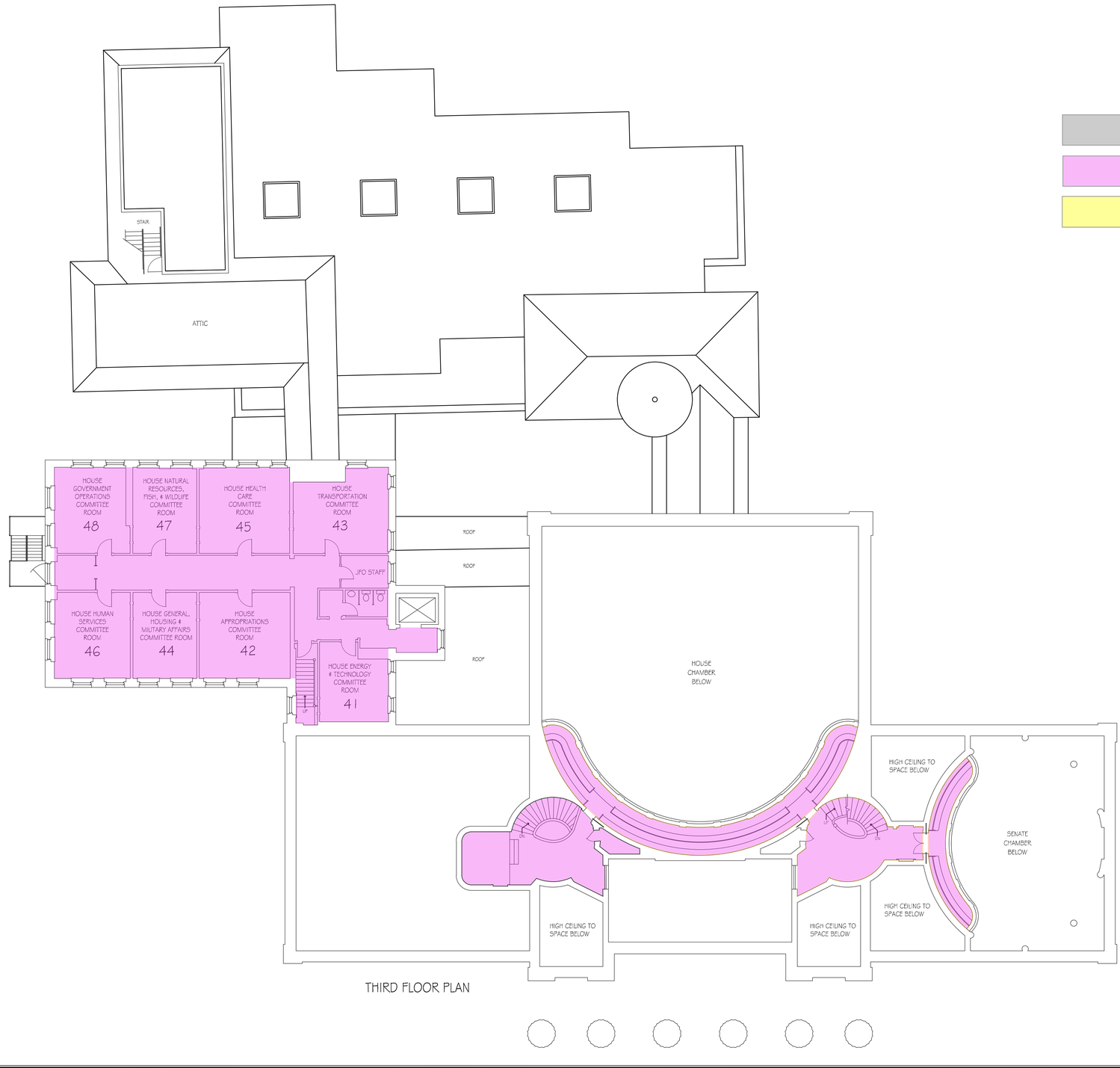
REVISIONS

SCALE: 1/16" = 1'-0"
DATE: MAY 2011
DRAWN BY: S.K. Janawicz
APPR. BY: -

115 STATE STREET
STATEHOUSE

FLOOR PLANS

A2



THIRD FLOOR PLAN

Phase A

Phase B

Phase C

STATE OF VERMONT
Department of Buildings and General Services
Agency of Administration
Montpelier, Vermont

115 STATE ST. - STATEHOUSE
MONTPELIER VERMONT

EXISTING FLOOR PLANS

REVISIONS

SCALE: 1/16" = 1'-0"
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115 STATE STREET
STATEHOUSE

FLOOR PLANS

A3

6 OF 9

STATE HOUSE HVAC ASSESSMENT AND RENOVATIONS
115 STATE STREET, MONTPELIER, VERMONT

The objective of this report is to present options for the replacement of the existing Air Conditioning, Heating, and Ventilation (HVAC) system at the State House. A design team was hired to provide planning and design services. During their initial investigation, they assessed several factors such as known system deficiencies, ventilation, humidify and temperature regulation, and corollary impacts.

At the end of the schematic design phase, the first of three phases of design, the design team recommends:

1. Replacing all eight air handling units (AHU),
2. Providing a summer boiler for humidity control,
3. Replacing the Direct Digital Controls (DDC) system,
4. Replacing all the fan powered Variable Air Volume (VAV) boxes with non-powered boxes so the mechanical rooms are not used as return air plenums,
5. Upgrading and replacing the air distribution within the Annex (House Committee rooms and Legislative Lounge), and,
6. Increasing the capacity of the baseboard radiation under the windows of the House and Senate Chambers.

Probable Project Cost ($1,095,644 Design and $14,095,802 Construction) $15,191,466

The following are probable costs of construction for three alternates to reduce the cost of the project by postponing phases of the project to be completed later. It is important to note that due to inflation, workforce shortages, and supply chain irregularities, these estimates are subject to change based on market conditions. Due to how the costs are calculated, the savings are not additive.

Savings of Alternate combinations:

1. Alternate 1 and 2: $5,248,130
2. Alternate 1 and 3: $2,656,218
3. Alternate 2 and 3: $6,401,160
4. All three alternates: $6,781,981

Alternate 1: Eliminate increasing the capacity of the radiation in the window seats (House and Senate Chambers) -$1,047,368

- This alternative is intended to help resolve the cold drafts near the windows. The single row of fin-tube radiation in the window seats would be replaced with a double row of fin-tube radiation. It will provide a better path for the air entering the window seat to be heated by the radiation, allowing the convective air currents to lift the warm air, countering the cold draft settling from the windows.
- Until this work is performed, no change in the drafts will be accomplished, although a future window restoration project may improve the draft condition, the combination of increased heat and window restoration is the best hope for eliminating this condition.
- This work can be completed in the future if funding is provided. It can be accomplished as an independent standalone project.

Alternate 2: Postpone upgrading the HVAC in Legislative Council, Cafeteria, and Speaker's Office -$4,867,310

- This alternative will replace AHU-7 and AHU-8 with new energy recovery units that will provide 100% outside air ventilation and dehumidification for the cafeteria, speakers office, and the first and second floors of this wing. Individual room temperature control will be by the installation of fan coils.
- It will require reprogramming the first floor and mezzanine occupancies to meet the currently available ventilation that the existing system provides.
- The cafeteria will still experience carbon dioxide spikes when fully occupied, but since these are typically short-term occupancy's, it may be acceptable.
- The existing AHU's do not have the capability to dehumidify as configured, this may be less of a problem in this wing as high humidity in the summer has not been as noticeable as the other parts of the building, and if we control the humidity in the rest of the building, because of interconnections to this wing, the humidity will be more like the rest of the building.
- Currently AHU-7 provides the HVAC for the first floor and mezzanine at a common temperature, the only room by room control is with the baseboard radiation since installation in 1987 there have been no issues with this operation. The new system includes individual room control of the entire HVAC system.
- This work can be completed in the future if funding is provided. It can be accomplished as an independent standalone project.

Alternate 3: Postpone the ductwork, piping, and terminal devices in the Annex (House committee rooms and legislative lounge) -$2,200,398

- This alternative will replace AHU-6 with a new AHU that has the proper ventilation for the current occupancies of the spaces, it will have the ability to dehumidify, it includes all the necessary upgrades to the mechanical room pumps, piping, and controls.
- This alternative will use the existing ductwork for air distribution and the induction units that sit on the floor in each room.
    - Since we will be moving more air through the system, there is the possibility of increased air noise from the distribution system.
    - Increased air delivery through the existing induction units, will mean the cool drafts that are created by objects above the induction units redirecting the airflow toward people will be increased.
    - The undersized return air system may not be able to move enough air back to the unit, so air will have to find its own path, much as it does now.
    - While the AHU will be properly sized for ventilation, humidity and temperature control, because we will be using the existing distribution system, actual air volumes may be limited to something less than design.
- To install larger supply and return ducts and replace the induction units with VAV boxes with an overhead distribution, the wall between rooms 21 & 22, 33 & 34 and 47 & 49 needs to be widened, relocated or another location for the return ductwork needs to be found. Although space will be gained by the removal of the induction unit, a full floor to ceiling boxout or expansion of a wall will be required. This work can be completed in the future if funding is provided. It can be accomplished as an independent standalone project.