LAB VENTILATION PROJECT
Ford ES&T and UA Whitaker Buildings

Town Hall Meeting
January 9, 2020

Agenda

• Goals
• ABM Introduction & Similar Lab Ventilation Projects
• Roles & Responsibilities / Points of Contact
• Project Overview / Scope of Work
• Project Benefits
• Project Construction Flow & Schedule Update
• Lab Preparation Requirements
• Post-Construction Follow-Up
• Additional Researcher Resources and Communication Process
• Q & A
Overall Goals

• Gain Input and Feedback
• Identify Concerns
• Construction Progress to Date and Schedule General Overview
• Schedule Commitments
• Q & A
Roles & Responsibilities / Points of Contact

<table>
<thead>
<tr>
<th>Roles</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>GT Facilities Design &amp; Construction Key Contact</td>
<td>Kynthia Gaines</td>
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<tr>
<td>School of Biological Sciences Designee</td>
<td>Frank Stewart</td>
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<tr>
<td>School of Chemical &amp; Biomolecular Eng. Designee</td>
<td>Ben Galfond</td>
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<tr>
<td>School of Chemistry &amp; Biochemistry Designee</td>
<td>Angus Wilkinson</td>
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<tr>
<td>School of Civil &amp; Environmental Eng. Designee</td>
<td>Guangxuan Zhu</td>
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<tr>
<td>School of Earth &amp; Atmospheric Sciences Designee</td>
<td>Jean Lynch-Stieglitz</td>
</tr>
<tr>
<td>School of Biomedical Engineering Designee</td>
<td>Michelle LaPlaca</td>
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<tr>
<td>Advanced Technology Development Center (ATDC)</td>
<td>Rashida Mickens</td>
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<tr>
<td>Environmental Health &amp; Safety (EHS)</td>
<td>Nazia Zakir, Ryan Lisk</td>
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<tr>
<td>Building Operations team</td>
<td>Rachel Arnold (UAW), Dewayne Roberson (UAW), Todd Clarkson (EST), and Curtis Burnett (EST)</td>
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<td>GT Facilities Assoc. Director Analytics and Comm.</td>
<td>Jessica Rose</td>
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<td>ABM Building Solutions Key Contacts</td>
<td>Robert Daw</td>
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Lab Ventilation Project Overview

- Ford ES&T and U.A. Whitaker Buildings
- 13-month construction period (started 8/12/2019)
- Construction will impact 150 labs
Lab Ventilation Project – ES&T

Convert Labs with TSI controls to TEL controls

• General Lab Space Changes:
  • New TEL Room Controller
  • Purge Button
  • Area Motion Sensor(s)
  • Lab Supply Valve Actuator Change-out (new fast-acting actuator)
  • New Lab Supply Differential Pressure Sensors and Probes
  • General Exhaust Valve Actuator Change-out (new fast-acting actuator)
  • New General Exhaust Differential Pressure Sensors and Probes

• Fume Hoods Changes (when applicable):
  • TEL Fume Hood Controller
  • TEL Auto-Sash Closer with Occupancy Sensor
  • Lab Exhaust Valve Actuator Change-out (new fast-acting actuator)
  • New Lab Exhaust Differential Pressure Sensors and Probes

• Snorkels (Task Exhaust) Changes (when applicable):
  • New Fast-Acting Actuator
  • On/Off Wall Switch

TEL Controls (ES&T)
Lab Ventilation Project – U A Whitaker

Upgrade Labs with Triatek controls

• General Lab Space Changes:
  • New/Upgraded Triatek Room Controller
  • Area Motion Sensor(s)
  • Lab Supply Valve Actuator Change-out (new fast-acting actuator)
  • New Lab Supply Differential Pressure Sensors and Probes
  • General Exhaust Valve Actuator Change-out (new fast-acting actuator)
  • New General Exhaust Differential Pressure Sensors and Probes

• Fume Hoods Changes (when applicable):
  • New/Upgraded Triatek Fume Hood Controller
  • TEL Auto-Sash Closer with Occupancy Sensor
  • Lab Exhaust Valve Actuator Change-out (new fast-acting actuator)
  • New Lab Exhaust Differential Pressure Sensors and Probes

• Snorkels (Task Exhaust) Changes (when applicable):
  • New Fast-Acting Actuator
  • On/Off Wall Switch

Triatek Controls (U A Whitaker)
**Consistent Temperature Setpoint**

- 72.5 degrees Fahrenheit with +/- 2.5 degree deadband
- Subject to lab requirements, determined by Questionnaire
- 3 degrees Fahrenheit of user adjustability
- Unoccupied setback, wider deadband (+/- 5 degree F)

**Space Ventilation**

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<tr>
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<th>Occupied Room</th>
<th>Unoccupied Room</th>
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<tr>
<td>Air Changes Per Hour</td>
<td>6</td>
<td>4</td>
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**Occupancy**

- Lab/Space General Hours of Operation: 7AM to 10PM (Mon.-Fri.)
- Installed area motion sensors will detect occupancy and adjust the space to "occupied", thereby increasing the ventilation rate and adjusting the temperature deadband back to 2.5 degrees F

**Lab/Space and Task Equipment Ventilation**

*GA Tech EHS Lab Safety Manual*

<table>
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<tr>
<th>General Rules Regarding Laboratory Fume Hoods</th>
<th>Current</th>
<th>Revised</th>
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<tbody>
<tr>
<td>“General purpose hoods shall operate at 100 linear feet per minute (LFPM) +/- 20%”</td>
<td>“General purpose hoods shall operate at 80 linear feet per minute (LFPM) +/- 20%”</td>
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- Tested to failure @ 40 FPM during pilot case
Project Benefits

- Consistent pressure and temperature controls
  - Enable better working conditions
- Safer, better functioning lab
  - Consistent environmental conditions
- Install purge button for release of chemicals to increase ventilation rate
- ABM onsite technical support for 10 years to deal with various issues & preventative maintenance
- Reduced carbon footprint for the Institute

Construction Flow

- Bound to a **strict** 13-month construction period
  - Approx. 3 to 5 labs will be in construction simultaneously at any given time during the 13-month period
- Intent is to concentrate construction efforts on a single floor or wing of the building at a time
  - Work will move through building floor by floor
- 35 labs in ES&T completed to date (primarily on the floors 2 and L1)
- U A Whitaker construction scheduled to start on January 20, 2020 (ground floor)
Construction Flow

Pre-planning & Scheduling Logistics
(approximately 30 days prior to lab construction)

• A pre-construction lab visit will be required for each lab
  • May include representatives from Facilities and EHS
• Identify critical information:
  • Research that is sensitive to vibration
  • Hazardous chemical which need special storage
  • Access to experiment during construction
  • Experiments that cannot be interrupted

Construction Flow

Pre-planning & Scheduling Logistics
(approximately 30 days prior to lab construction)

• Preliminary air flow readings
  • Contractor in lab for approximately two hours, primarily before 10:00 AM
  • The research teams will not need to be present
  • The research teams do not need to halt any experiments
  • The contractor will be opening up each fume hood to the 18” sash height position.
Construction Schedule

Lab Preparation Requirements

- All labs with fume hoods and/or task exhaust (snorkels) will be retrofitted
- Lab operations will be interrupted for 7 days
  - Construction above the ceiling
  - “Day 2” walk-through with research team representative
  - Equipment Commissioning
  - Controls training for research teams (typically Friday prior to turnover)
- Be Construction Ready: Time for Equipment and Chemical removal is not included in the 7 days
Lab Preparation Requirements

• Hoods must be vacated; as well counters on either side (see photograph)
• Storage under does not have to be vacated
• Remove all chemicals, equipment and tools from inside fume hood - **Must be empty**
• Remove equipment and chemicals from benchtop on either side of fume hoods - **Need to access side panels of the fume hood**
• Lab benches and equipment will be physically covered by ABM
• ABM can allow occasional visits to lab to check on things, if arranged in advance
ES&T Lab

Post-Construction Follow Up

- Post-Construction interviews to be held with research teams
  - Evaluate conditions of the lab after construction is completed
  - Validate projected energy savings
  - Feedback on the overall construction process
Researcher Resources During Construction and Communication

- Follow up after Town Hall Meetings
- School-Wide Meetings
- Town Hall/Q & A Meetings
- Website Communication:
  - Project Overview & Facts
  - Meeting Minutes
  - Updated Construction Schedule

facilities.gatech.edu/lab-vent

Q & A