

# DARTMOUTH

## Tiny Research Station Site Safety Plan

Directions: What you'll see below is the template site safety plan for the Ice Sculpture Build, so not every entry will be appropriate for the Tiny House. Please take a look at each section, and edit as needed to make it accurate for the Tiny House project. If there's something that you think might be missing, please add it! We can discuss what belongs in each section as we review this document on Wednesday.

### General Information

#### Site Access

1. Only authorized personnel shall be allowed to enter the build site.

#### Safety Supervision

1. At least two students and one instructor must be on site at any time work is being done.
2. College employees shall regularly visit the site for safety inspections.

#### Personal Protective Equipment

1. All persons who enter the site shall wear at a minimum:
  - a. Enclosed "sturdy" footwear
  - b. Long pants
  - c. Long sleeves
  - d. Safety glasses if using hand or power tools
  - e. Hard Hat
  - f. Mask
  - g. Hearing protection when working with loud power tools
  - h. Work gloves
    - i. Shouldn't be worn while handling power tools

#### COVID-19 Requirements

1. No more than 9 people shall ever be at the construction site
2. All present must wear masks at all times
3. All present must have filled out a TSA before coming on site
  - a. If any person feels sick or shows any symptoms of COVID-19 they will not come to the site

4. There will be a heated office room in the warehouse for our use, and a separate bathroom
  - a. These spaces will be cleaned and maintained by FO&M (double check this?)
  - b. The same COVID-19 requirements as on site will be followed here.
  - c. A sink for handwashing will be available here
5. Hand sanitizer will be available on site
6. Everyone will social distance to the extent possible while on site
  - a. The goal is to maintain a distance of 6 ft from all others, but for some tasks this will be dangerous or impossible, in which case workers may be closer than 6 ft
7. All tools will be sanitized at the end of each shift and between users, if used by more than one person in a single shift

## Housekeeping

1. The site shall be kept free from material that could cause slips, trips, and falls.
2. At the end of each shift, all tools and unused materials will be put back into the storage cage, which will be kept locked when no one is present.
3. After each shift, a brief update will be posted on the group's slack page to ensure that the entire group is aware of the current state of the construction and anything they need to be aware of for future work

## Training

1. All persons who enter the site shall have received the following minimum training:
  - a. Tool-specific safety training, as required, given by Professor Vicki May
  - b. Ladder Training, given by Mark C Ewing III the week of January 26, 2021
  - c. Scaffolding Training, given by Mark C Ewing III the week of January 26, 2021
    - i. Additionally, scaffolding will be checked by a qualified staff or faculty member each day it is used up and each time it is moved (double check this it may have just been for >10 ft)

## Job Specific Requirements

1. Additional tools, materials and equipment that will be required at the site are:
  - a. Scaffolding for exterior siding and possibly solar panel installation (requires supervision)
  - b. Extension cords
  - c. Door fan for testing (box fan)
  - d. Electric Heater
  - e. Circular saw (requires supervision)
  - f. Jigsaw (requires supervision)
  - g. Chop saw (requires supervision)
  - h. Reciprocating saw (requires supervision)
  - i. Drills
  - j. Hammers
  - k. Saw horses

- l. Measuring tape
  - m. 10 ft ladder
  - n. 5 ft ladder
2. Before leaving site, workers will ensure that:
- a. All tools are cleaned and put away
  - b. The heater is turned off and unplugged
  - c. All materials have been put away and are not in danger of falling
  - d. The space is left in good condition

## Tool Use

1. List out safe tool use practices.
- a. Only use tools that you are qualified and comfortable using
  - b. Wear proper PPE, including safety glasses
  - c. At the end of the shift, sanitize tools and place them in their proper place for storage
  - d. If a tool is broken or damaged, place it away from the immediate area marked with "do not use"
  - e. Disconnect power tools when not in use
  - f. Do not carry power tools by the cord
  - g. If possible, secure work with clamps or a vise
  - h. Keep cords away from heat and sharp edges/objects
  - i. Keep fingers away from the switch/power button when not in immediate use
  - j. Do not use headphones while using tools or at all on site; speakers are allowed

Reference:

<https://ohsonline.com/articles/2010/03/19/power-tool-safety-tips-from-osha.aspx#:~:text=Never%20carry%20a%20tool%20by,blades%2C%20bits%2C%20and%20cutters.>

## Ladder Use

1. A ladder should be inspected before each use to ensure that it is in good condition, that all components are undamaged and don't show signs of excessive wear, and that all moving components operate freely and as they should.
  - a. If the inspector determines that the ladder is not in good condition for any reason, it should be tagged as defective and the supervisor should be notified so that it may be removed from site.
2. Select ladders of adequate length and load limits
3. Use the ladder only for its intended purpose
  - a. Don't use a step ladder as a straight ladder
4. Set the ladder on a firm, solid surface
  - a. Don't set the ladder on scaffolding, boxes, blocks, or a wet, icy, or otherwise slippery surface
5. Ensure that the areas at the base and top of the ladder are clear
6. Step ladders must be fully opened with the spreaders locked to keep the ladder stable
7. Ladders shall not be placed in front of doors unless the door is blocked open, guarded or locked

8. Step ladders
  - a. Stay off of the top 2 steps of a stepladder
  - b. Stay off the back section of a stepladder
9. Set up your straight ladder using the 4 to 1 rule (1 foot from the wall for each 4 feet of ladder length) and so the rails are supported equally at the top
10. Ladders used to gain access to a roof must extend at least 3 feet above the point of support, at eave, gutter, or roofline
11. Use your extension ladder so the upper section overlaps the lower section, and the overlap is on the climbing side with the rungs locked in place
12. Face the ladder when ascending or descending and use both hands to grip the side rails whenever possible
13. Always have three points of contact with the ladder and ground when ascending or descending a ladder

## Fall Protection

1. Fall protection will not be required for this project because we will not be using ladders taller than 20 ft, nor scaffolding taller than 10 ft

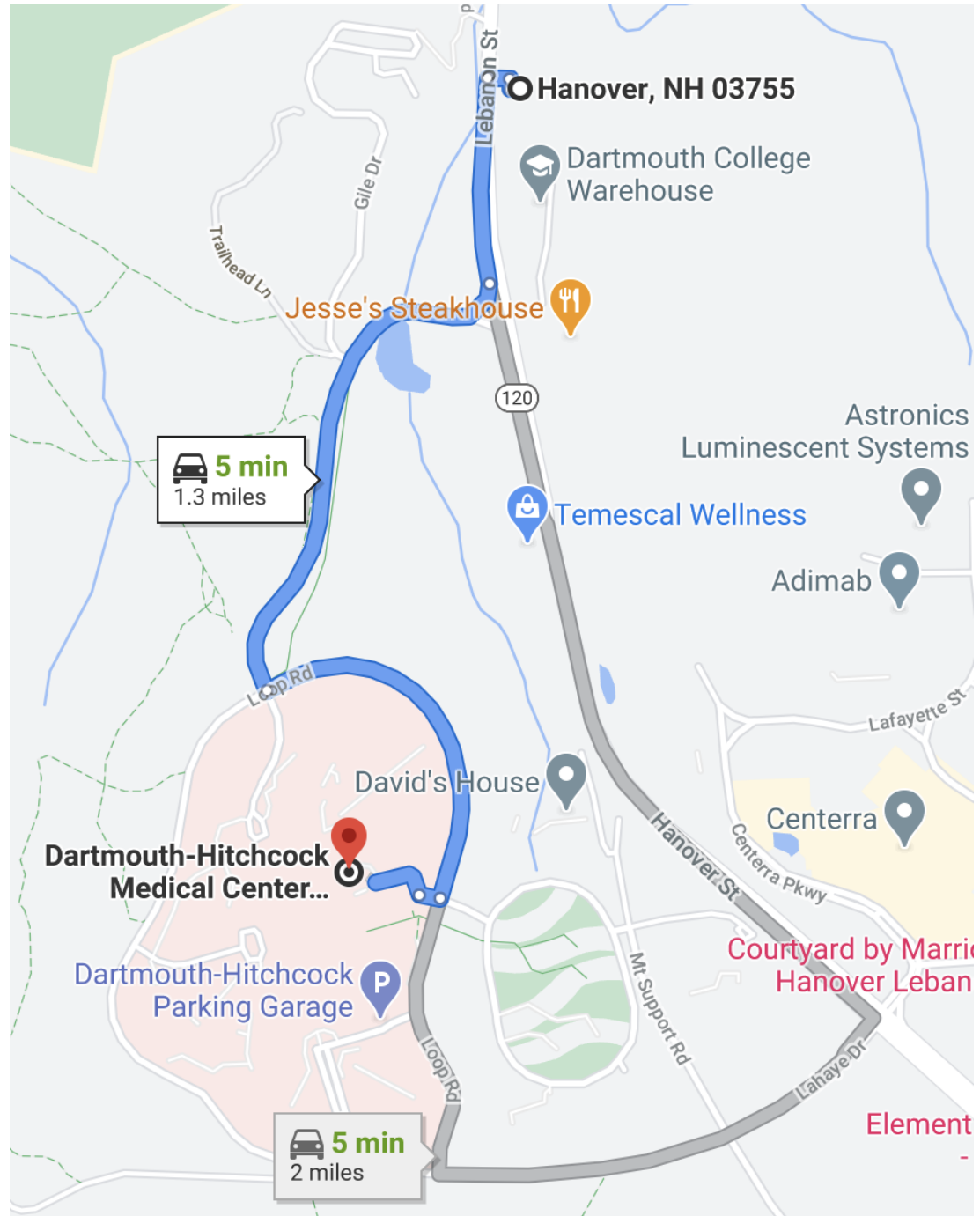
## Scaffold Safety

1. Only trained persons shall be authorized to utilize the scaffolding
  - a. Training shall be provided and recorded by EHS
2. Required PPE:
  - a. All PPE described in Section 2
  - b. Hard hat
3. Setup, alteration, and dismantling
  - a. Only persons who are supervised by a Competent Person may set up, alter, or dismantle scaffolding.
  - b. A Competent Person must inspect the scaffolding prior to use after the initial setup and after any alterations are made
    - i. Competent Person means a Dartmouth staff member who has taken EHS-approved scaffolding training and is authorized to make decisions regarding scaffolding safety
      1. Matthew Dunn, EHS
      2. Mark Ewing, EHS
4. Technical Requirements - General:
  - a. Scaffold components are in good condition
  - b. Scaffold is set on a firm, stable, and level base
  - c. Sills and base plates are solid and substantial
  - d. Scaffold is plumb and level
  - e. Base width to height ratio must not exceed 1:4 (unit with a 5' base must not exceed 20')
  - f. Cross braces are in place
  - g. Top rails, mid rails, and toe boards are in place and secure
  - h. Planking is scaffold grade or equal
  - i. Scaffolding levels in use must be fully planked

- j. Max load per plank must be no greater than 250 lbs.
- k. Plank overhangs are correct: Less than 10' – 6-12", More than 10' – 6-18" unless secured
- l. Plank overlap must be more than 12" unless secured to frame
- m. Platforms must be less than 14" from structure
- n. Distance from power lines must be a minimum of 10'
- o. Safe access must be provided, with ladders or stairs installed for access for height differences >2'
- p. Guardrails or PFAS must be used above 10'
- q. Scaffolding should not be accessed in windy conditions

## Injuries and Accidents

1. In case of injury, the following parties should be notified:
  - a. 911 should be called immediately if the severity of the injury appears to justify this
  - b. Dr. Vicki May, Project Advisor and Sponsor, Professor, Thayer School of Engineering: [Vicki.V.May@dartmouth.edu](mailto:Vicki.V.May@dartmouth.edu)
  - c. Dr. Stephen Doig, Project Advisor and Sponsor, Director of Research, Irving Institute for Energy and Society: [Stephen.J.Doig@dartmouth.edu](mailto:Stephen.J.Doig@dartmouth.edu)
  - d. Bree Carlson, P.E., ASP, Dartmouth Office of Environmental Health & Safety: [Bree.E.Carlson@dartmouth.edu](mailto:Bree.E.Carlson@dartmouth.edu)
  - e. Jonathan Stark, Thayer School Director of Facilities Planning and Operations: [jonathan.h.stark@dartmouth.edu](mailto:jonathan.h.stark@dartmouth.edu)
2. In case of injury requiring medical attention, the injured person should be brought to the Dartmouth-Hitchcock Medical Center Emergency Department, located at 1 Medical Center Dr, Lebanon, NH 03766
  - a. Map of route from construction site to nearest emergency department:



- b. Directions from the Construction Site Parking Lot:
  - i. Turn left onto Lebanon St (0.2 mi)
  - ii. Turn right onto Medical Center Dr (0.5 mi)
  - iii. Turn left onto Hitchcock Loop Rd/Loop Rd/Medical Center Dr (0.4 mi)
  - iv. Turn right onto DHMC E (115 ft)
  - v. Turn right (315 ft)
  - vi. Arrive: **Dartmouth-Hitchcock Medical Center Emergency Dept, 1 Medical Center Dr, Lebanon, NH 03766**

3. In the case of inclement weather:

- a. If the National Weather Service issues a local blizzard, winter storm, or snow squall warning, or a winter weather advisory, then any shifts during that time will be cancelled immediately until the warning or advisory is lifted
- b. If weather conditions make any driver uncomfortable with driving to the site, then they should alert the group and work shifts will be cancelled
- c. Alternatively, if conditions appear to be worsening throughout a shift, such that driving home from the site will be uncomfortable for any driver, the shift should be ended early to allow everyone to get home safely
- d. In the case that it is cold enough that spending a shift working is dangerous, shifts should be cancelled
  - i. The risk of cold weather will be judged based on National Weather Service advisories and warnings, and on College warnings

## Job Hazard Analysis

List out the tasks associated with this project. For example: see what I've written for "install siding" below. There may be a few additional hazards when installing siding; if so, add them to the table. The idea here is to think through the risks, and then to decide how to manage them safely.

This is a living document, don't have to do all of the tasks as the beginning

| Task Description | Tools  | Hazard Description                              | Hazard Controls   |
|------------------|--|---|---|
| Install siding   | Hammer, nails, ladder                              | Fall from ladder                                | Make sure the ladder is properly positioned. Use three points of contact when ascending and descending the ladder. Have a helper if working with something unwieldy. Don't lean out over the ladder; reposition the ladder from the ground. |
| Install Windows  | Reciprocating saw, drills, hammer, possibly ladder | Laceration, fall from ladder, falling sheathing | All persons using the reciprocating saw will be properly trained in safe use. Eye protection will be worn and the safety features of the saw will be used. The area will be cleared and people will be ready to support the                 |

|                       |                                |                                   |  |
|-----------------------|--------------------------------|-----------------------------------|--|
|                       |                                |                                   | cut-out section of wall. Ladder hazard control the same as above.  |
| Install solar panels  | Drills, scaffolding            | Fall from height, dropping things | All persons will be trained in scaffolding use, and scaffolding will be checked by a Certified Person from the College; tools and materials will be secured and kept away from edges |
| Building Stud Walls   | Chop saw, circular saw, drills | Lacerations                       | All persons will be trained in saw use and be wearing proper PPE while sawing  |
| Flooring installation | circular saw, drills           | lacerations                       | All persons will be trained in saw use and be wearing proper PPE while sawing and drilling   |

Signatures

Everyone participating in the build must read this health and safety plan. Their signature below indicates that they agree to follow these minimum standards while working on site.