

ENERGY SYSTEMS INTEGRATION FACILITY



ESIF
USER
GUIDE

Photo by Dennis Schroeder / NREL 27527.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

WELCOME TO THE ENERGY SYSTEMS INTEGRATION FACILITY

We look forward to working with you and helping to make your time here as enjoyable, safe, and productive as possible.

The ESIF is a U.S. Department of Energy technology user facility that offers a unique set of technologies and state-of-the-art testing capabilities. Whether you need to validate equipment for commercial applications, test clean energy technologies at megawatt scale, or advance research and development with our R&D 100-winning high performance computer, the ESIF has the flexibility and capacity to adapt to your project's needs.

In this document, you'll find information about how to work safely in the ESIF labs, how to get around the NREL campus, what to do if there is an emergency, and much more. Please read through this carefully before you begin.

If you have any questions or suggestions, feel free to contact me directly.

Best regards,

A handwritten signature in black ink, appearing to read 'BH', with a long horizontal flourish extending to the right.

Bryan Hannegan

Associate Laboratory Director

Energy Systems Integration

303-275-3009

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www.nrel.gov/esi

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QUICK CONTACTS

Here's a list of the numbers you need to know, and when to use them.

Department	Contact person	Cell or direct number
ESIF User Program	Courtney Pailing	303-263-3493
ESIF Operations	Larry Brown (Facility Manager) Scott Walters (Safety Officer) Chad Blake (Operations Manager) Kyle Tangler (Shift Supervisor) Rob Russell (Building Area Engineer)	Brown: 720-338-1082 Walters: 303-349-6652 Blake: 303-619-5888 Tangler: 720-641-0378 Russell: 720-450-5311
Environment, Health, and Safety (EHS)	Phil Clark Michael Day Jen Wingard	Clark: 720-545-4024 Day: 720-537-9184 Wingard: 303-483-3329
NREL Security		303-384-6811 Red phones 1234 from NREL phones
NREL Weather Line		303-275-4001



Photo by Dennis Schroeder / NREL 32293.

Email	Contact if you
Courtney.Pailing@nrel.gov	<ul style="list-style-type: none"> • Have any questions or need help. • Would like to host a visitor.
Larry.Brown@nrel.gov Scott.Walters@nrel.gov Chad.Blake@nrel.gov Kyle.Tangler@nrel.gov Robert.Russell@nrel.gov	<ul style="list-style-type: none"> • Need a temporary parking pass. • Have a question about the ESIF.
Phil.Clark@nrel.gov Michael.Day@nrel.gov Jen.Wingard@nrel.gov	<ul style="list-style-type: none"> • Have concerns about the safety of a project or activity. • Need to report an emergency (Important: Call NREL Security first).
security@nrel.gov	<ul style="list-style-type: none"> • See or are experiencing an emergency (Important: Do not call 911; NREL Security will coordinate directly with emergency personnel). • Are in danger or feel threatened. • Have a traffic safety concern. • Witness or experience workplace violence. • Lose your badge. • Need to leave your car overnight.
	<ul style="list-style-type: none"> • Need to check laboratory closure status on days when adverse weather conditions may affect normal laboratory operations.

THE ESIF: A DOE TECHNOLOGY USER FACILITY

WHAT IS A TECHNOLOGY USER FACILITY?

U.S. Department of Energy (DOE) technology user facilities are connecting points where industry, academia, and government can work together on big problems, and new technologies can be tested using state-of-the-art equipment and resources.

Technology user facilities offer capabilities unmatched anywhere in the world, and beyond the resources of individual research institutions or companies. And the ESIF is the only one that's solely focused on research to transform our energy systems so they become cleaner, more secure, and more sustainable.

WHO CAN USE THE ESIF?

Access to the ESIF is open to all interested parties who wish to become users and partners, without regard to nationality or institutional affiliation. Allocation of facility resources is determined by the merit of the proposed work. The ESIF has been designated as a user facility for both proprietary and non-proprietary work to accommodate the needs of all of our users and partners.

STANDARDS AND CERTIFICATIONS

The ESIF is a world-class research, development, and demonstration facility that is certified to the following international standards recognizing green building leadership, quality management, environmental management, and occupational health and safety management.

LEED Platinum-certified

ISO 9001:2008-certified

ISO 14001:2004-certified

OHSAS 18001-certified



Photo by Dennis Schroeder / NREL 26385.

AROUND THE NREL CAMPUS

The NREL campus is a living laboratory that incorporates energy-saving technologies and renewable energy integration at all levels of research and operations. This includes a strong focus on reducing waste through recycling, composting, and repurposing materials.

Last year, NREL diverted more than 75% of its campus waste from the local landfill. You can help us achieve our goal of a near-zero-waste campus by using the recycle (blue) and compost (green) bins throughout the ESIF. Look for signs above each bin showing what materials are compostable and recyclable.

WHERE TO EAT ON CAMPUS

NREL Café

The NREL Café is the primary dining location for staff and visitors to grab onsite snacks and meals.

Open Monday – Friday, 7:30 a.m. to 2 p.m.

Breakfast: 7:30 a.m.–10 a.m.

Lunch: 11 a.m.–1:30 p.m.

The Golden Grounds

The Golden Grounds coffee shop is located in the RSF/A lobby next to the library. In addition to coffee, it serves a limited breakfast and lunch menu, including sandwiches, soups, and pizza.

Hours: are 7:00 a.m. to 3:00 p.m., Monday through Friday.

SHUTTLES

NREL shuttle services provide transportation options for staff to connect with local RTD hubs for commuting options and to get around the NREL campus.

The circulator shuttle provides service to and from the main parking garage and the ESIF, as well as other main buildings on campus from 6:00 a.m. to 6:30 p.m. See NREL Campus Map in the Maps section of this guide for shuttle stops.

For on-demand shuttle service between buildings on campus, call 303-275-3111 about 5 to 10 minutes before your desired departure time. The on-demand shuttle runs every work day, weather permitting, from 8:00 a.m. to 5:00 p.m.



WORKING SAFELY IN THE ESIF LABS

NREL is proud to be among the best in class for safety and sustainability. The commitment of staff and visiting partners is critical to maintaining the safe and responsible work environment we all enjoy.

Below is information on safety guidelines and training you need to work in the ESIF labs.

REQUIRED TRAINING

Anyone entering the ESIF lab area must have completed the ESIF orientation, or be hosted by someone who has completed this orientation.

Additional activity- and lab-specific training is also required. You are not authorized to enter the ESIF labs without a host or approach or use lab equipment, testing equipment, or tools until you have been properly trained and approved to operate that equipment.

For questions about required training, please contact Courtney Pailing at 303-275-3027 or Courtney.Pailing@nrel.gov.

POTENTIAL HAZARDS

The following hazards may be present in the ESIF labs:

- High pressure (hydraulics, compressed gas, cooling and heat exchange systems)
- Flammable and toxic gases
- Electrical shock up to 13,200 V
- Electrical arc flash
- Confined spaces and asphyxiation hazards
- Noise
- Toxic chemicals
- Burn and fire risks (overheating, welding, abrasive grinding, smoking)
- Cranes, suspended loads, hoisting and rigging
- Mechanical oscillating/rotating apparatuses and machinery shop and power tools
- R&D testing to anticipated failure (i.e., purposely pushing equipment to and above operating limits in accordance with test objectives), typically under safe work permits.



Photo by Dennis Schroeder / NREL 34514.

SAFE WORK NOTIFICATION

The monitor in front of the Power Systems Integration Laboratory control room on the third floor has up-to-date information on current activities in the ESIF, including:

- ESIF Plan of Day activities
- Hazards, area work supervisors, authorized personnel, and emergency contacts
- Approved activities, safe work permits, and safe operating procedures

WORKING ALONE

All work in the ESIF labs and test areas must be evaluated for the risk of working alone and will be addressed in a safe work permit, safe operating procedure, or other authorizing document. The ESIF or NREL EHS points of contact will perform this evaluation in advance. Approval from your technical monitor is also required.

LAB AREA ACCESS REQUIREMENTS AND RESTRICTIONS

When in the ESIF labs, it's important to adhere to the following basic rules, in addition to rules specifically indicated for your project. When in doubt, check the ESIF Laboratory Access Control Desk Procedure or ask a member of the ESIF staff.

- Do not enter any laboratories, shops, high bays, mechanical/electrical rooms, fenced-in areas, test bays, etc., for which you are not authorized.
- Do not assume that an open door means you can enter.
- Do not approach or operate equipment or test apparatuses for which you are not authorized.
- Never defeat physical or administrative hazard barricades (e.g., machine guards, yellow tape, rope, tarps). Be vigilant of warning signs—even handwritten warnings on paper.
- Do not approach other workers from behind or in any way that might be unexpected or cause them to be startled.

Important note on hosting visitors to the lab: Because of the potential hazards present in the ESIF laboratories, general tours in laboratory areas are discouraged. The tour corridor is set up to accommodate general tours and is accessible to any NREL employee who has badge access to the ESIF building.

SAFETY POINTS TO REMEMBER

The ESIF lab spaces contain many different pieces of equipment, each with hazards and associated training. So before you act, please:

- **Be trained, qualified, and approved.** If you aren't trained, qualified, and approved to operate equipment, don't approach it.
- **Stay within authorized areas.** Only enter lab areas that you are authorized to access.
- **Respect others' work.** If laboratory test articles and setups are custom-configured for R&D and testing, owners assume that their equipment will not be touched or disrupted.
- **Stay alert.** It's possible to become too comfortable when conducting potentially hazardous activities on a daily basis. Always be aware of what you are doing and the associated risks.
- **Put safety first.** Research and results are important, but don't allow work goals to shortchange safety considerations.

SAFETY IN ACTION

Being proactive about safety is a requirement of working at the ESIF. If you see something unsafe, don't ignore it! You should:

- **IMMEDIATELY** question or request others to stop any activities perceived to be unsafe. If this is not possible, or if you have any doubt or concern, notify an EHS contact person or your manager as soon as possible.
- Comply in a professional and courteous manner with stop work requests or questions from anyone concerned about the safety of activities under way.
- Identify the unsafe activity and collaborate with EHS to develop a safer process.

Photo by Dennis Schroeder / NREL 27739.



WHAT TO DO IF THERE IS AN EMERGENCY OR A NATURAL DISASTER

IF THERE IS AN EMERGENCY, YOU SHOULD:

1. Exit the area, shutting down and/or de-energizing equipment if it can be done safely.
2. Contact NREL Security. Call 1234 from any NREL phone or pick up any red phone (it will dial automatically). From a cell phone, call 303-384-6811. State the nature of the emergency and actions already taken. Important: Please do not call 911 while at NREL. NREL Security coordinates directly with emergency personnel to provide the fastest response for on-campus emergencies.
3. Initiate first aid or render assistance if it's safe to do so. In the C Wing, defibrillators are located across from the elevators on each floor. In the A and B Wings, defibrillators are located across from the restrooms. First aid kits are located at the entrance to the restrooms in all wings of the building.
4. Wait for emergency responders—do not rush an injured person to the hospital yourself.
5. Report the emergency as soon as possible, following the ESIF notification chain below.

ESIF NOTIFICATION CHAIN

Scott Walters, cell: 303-349-6652

Phil Clark, cell: 720-545-4024

Jen Wingard, cell: 303-483-3329

Michael Day, cell: 720-537-9184

Line Manager

ESIF Operations

WHAT TO DO IF THERE IS A NATURAL DISASTER

Listen for a notification that will come over the building intercom. If no instruction is provided, go to the nearest Building Protective Area and wait for instructions to be communicated over the intercom.

Do NOT pull the fire alarm if you see a tornado or a wildfire. Wildfire spreads rapidly through grasslands (especially if it's windy), and wind speeds during tornados turn common debris into extremely hazardous projectiles. Building Protective Areas are designed to withstand these hazardous events.

You can help in an emergency situation by being prepared:

- Familiarize yourself with your buildings and lab spaces.
- Know at least two exits from your building.
- Know the location of the ESIF Evacuation Assembly Area.
- Know the location of your Building Protective Areas.



WHERE IS MY BUILDING EVACUATION ASSEMBLY AREA?

No matter where you exit the ESIF, everyone will assemble on the sidewalk adjacent to the bus stop on the southwest corner of the ESIF.

WHERE ARE MY BUILDING PROTECTIVE AREAS?

Check the emergency information maps at the end of this guide to find your closest Building Protective Areas.

Photo by Dennis Schroeder / NREL 26585.



TYPES OF ALARMS

EMERGENCY GAS ALARM (BLUE)

What you'll see and hear: A steady blue light on the tricolor alarm and a steady horn sound.

What it means: There is a high-level concentration of gas in the lab. All power to the lab will be shut off, except for lights and ventilation, and flow from house gases will be stopped and purged.

What you should do: Exit the laboratory and proceed to the nearest red phone to report the incident. Do NOT return to the lab until authorized to do so.

WARNING ALARM (YELLOW)

What you'll see and hear: A steady yellow light on the tricolor alarm and a steady horn sound.

What it means: There is a low-level concern within the lab (e.g., a low-level concentration of gas in the lab, a communications issue).

What you should do: Exit the laboratory and notify the ESIF Operations Manager and the EHS point of contact to initiate an investigation into the cause of the alarm. After notification, authorized personnel may investigate the cause, following safe operating procedure guidelines.

EMERGENCY POWER OFF (RED)

What you'll see: A steady red light on the tricolor alarm.

What it means: There is an emergency in the lab. All equipment, gases, and power will be shut off, except for lights and ventilation.

What you should do: Exit the laboratory and proceed to the nearest red phone to report the incident. Do NOT return to the lab until authorized to do so.

FIRE ALARM (WHITE)

What you'll see and hear: A flashing white strobe light and siren.

What it means: There is a fire in the building.

What you should do: Use the nearest laboratory exit, and go to the identified outdoor Evacuation Assembly Area.

Please note: In the event of a drill, everyone in the ESIF is required to participate.

SECURITY & NREL CAMPUS POLICIES

Office of Security and Emergency Preparedness

303-384-6811

security@nrel.gov

<http://thesource.nrel.gov/security>

The Office of Security and Emergency Preparedness (NREL Security) helps with emergencies and works to protect people and property against security threats at NREL facilities. If you see a potential threat to NREL or the U.S. Department of Energy, please contact NREL Security immediately.

The following articles are prohibited on NREL sites:

- Alcoholic beverages
- Drugs or controlled substances
- Firearms (including concealed carry)
- Explosives
- Dangerous weapons or materials
- Cameras, unless permission has been given by the research program

All vehicles, persons, and packages are subject to search upon entering NREL sites.

WORKPLACE VIOLENCE

Respect for the rights, differences, and dignity of others are the cornerstones of a safe and supportive work environment and integral to NREL's mission and values. It is prohibited to engage in harassment based on race, color, religion, gender, gender identity, national origin, age, marital status, ancestry, sexual orientation, disability, veteran status, or other legally protected status. It is also prohibited to retaliate against workers who file harassment complaints or assist in investigations.

The early identification and assessment of potential threats is the best defense. Do not hesitate to report threats of violence, unusual or erratic behaviors, and/or derogatory or demeaning references.

To report workplace violence, please contact one or more of the following:

Security: 303-384-6811 or 1234 from any NREL phone

Human Resources: 7580

Nurse's Office: 6522

Hotline: 303-275-3700

FRAUD, WASTE, AND ABUSE

Do not do anything that can be construed as wasteful, fraudulent, or abusive. This includes careless wastefulness, subcontract bribery, or the misuse of government equipment.

Quick contacts to reach security 24/7:

Call 1234 from any NREL phone

Call 303-384-6811 from a cell phone

Red phones, located throughout NREL, will automatically dial 1234 when you pick up the handset.

NREL CAMPUS ACCESS & PARKING

BADGES

NREL facilities are accessible only to authorized staff and badged users. Everyone must wear an NREL badge or NREL visitor badge while on the premises. NREL security personnel are authorized to challenge anyone for their badges. If you don't have yours, you may be asked to leave the site.

A few important things to remember:

- Please display your badge prominently over your outermost garment.
- If you lose your badge, immediately notify NREL Security so it can be deactivated.
- If you forget your badge at home, please report to the Site Entrance Building to obtain a one-day temporary badge.

BUILDING ENTRY

NREL buildings are locked at all times, so you'll need to "badge in" at each card reader prior to entering. You're granted access to buildings and areas based on your job requirements.

After-hours access requires the approval of your line manager or host, and you'll need to enter the four-digit pin number supplied with your badge. Please memorize your pin number and do not write it on your badge.

PARKING

Parking for the ESIF is located in the main parking garage. Please observe the signs and park only in designated spots. Remember to display your parking placard at all times while parked on NREL property. If you need to leave your vehicle overnight, please contact NREL Security.

Temporary parking next to the ESIF is available to unload tools, lab supplies, or equipment. These spaces are limited, and to use one you must request a temporary parking placard from a member of the ESIF Operations team before parking in the spot. Vehicles parked in ESIF areas without a temporary parking placard will be reported to security.

If a vendor or contractor needs temporary parking, the request should be made by the NREL host for that activity. In rare cases when advanced notice is not possible, an ESIF Operations team member must be notified within 15 minutes of vehicle arrival.

If you have questions about parking, please refer to the ESIF Parking Desk Procedure, or ask a member of the ESIF Operations team. If you have a traffic safety concern, please call Security at 303-384-6811.

TRAFFIC SAFETY

Helmets are required when riding a motorcycle, bicycle, or scooter on NREL property and/or while conducting NREL business. The use of personal electronic devices is not allowed while operating a vehicle on NREL property and/or while conducting NREL business. If a violation of traffic safety is witnessed, security staff has the authority to conduct traffic stops.

VISITORS

Only authorized visitors are allowed on NREL's campus. If you are a badged partner and would like to host a visitor, contact the ESIF user program coordinator at 303-275-3027 or Courtney.Pailing@nrel.gov. She will give you detailed information on how to request access for a visitor and let you know about your responsibilities. Please note that partners and facility users are not permitted to host foreign nationals.

Please start this process several weeks in advance of the visitor's anticipated arrival date to allow time for the request to be processed.

PROTECTING INFORMATION

INTELLECTUAL PROPERTY

Intellectual property requirements on industry work-for-others projects and associated test articles require you to keep customers' tests confidential and protected. Please remember the open windows in the tour corridor when working on sensitive material. Some test setups may be restricted or under cover for this reason.

EXPORT CONTROL

Most technology at NREL is considered fundamental research, is publically available, and is not subject to export control regulation. You can freely discuss anything related to nonproprietary (fundamental) research, marketing and communication materials, and published technical data and information, as long as the Alliance for Sustainable Energy, LLC, or the U.S. Department of Energy has no vested interest in licensing the technology or applying for a patent.

Some information, however, is protected by U.S. export rules and regulations. This can include technology partnership agreements, cooperative research and development agreements, work-for-others agreements, and technical service agreements.

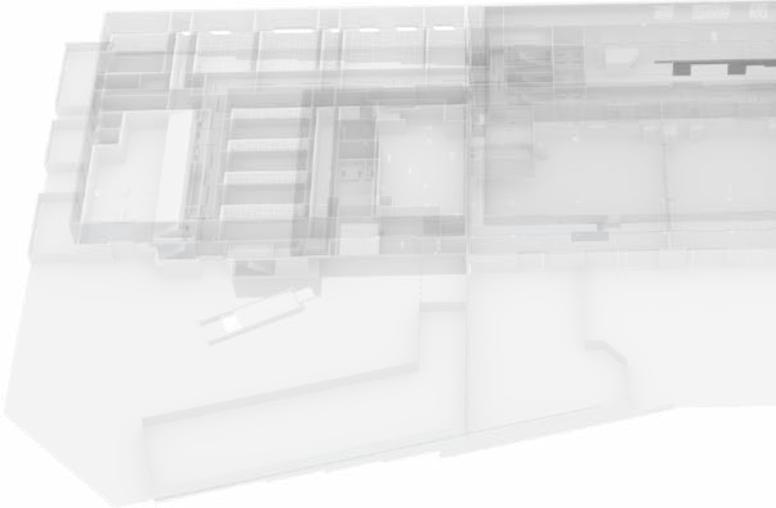
NREL identifies and protects information and commodities to prevent unauthorized export. Please be aware of the two types of exports:

- Tangible exports: The export of tangible items outside the United States via international shipments, mail, or travel.
- Deemed exports: Sharing information, technical data, technology, or software with a foreign national, within the United States or abroad, in which the export involves proprietary, restricted, or classified information, or information, technical data, technology, or software that does not otherwise fall under an exclusion.

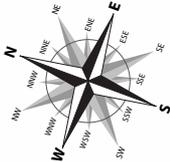
If you have questions about what information is protected by export control, or concerns about the protection of information, please contact the export control compliance officer at 303-275-4269.



MAPS

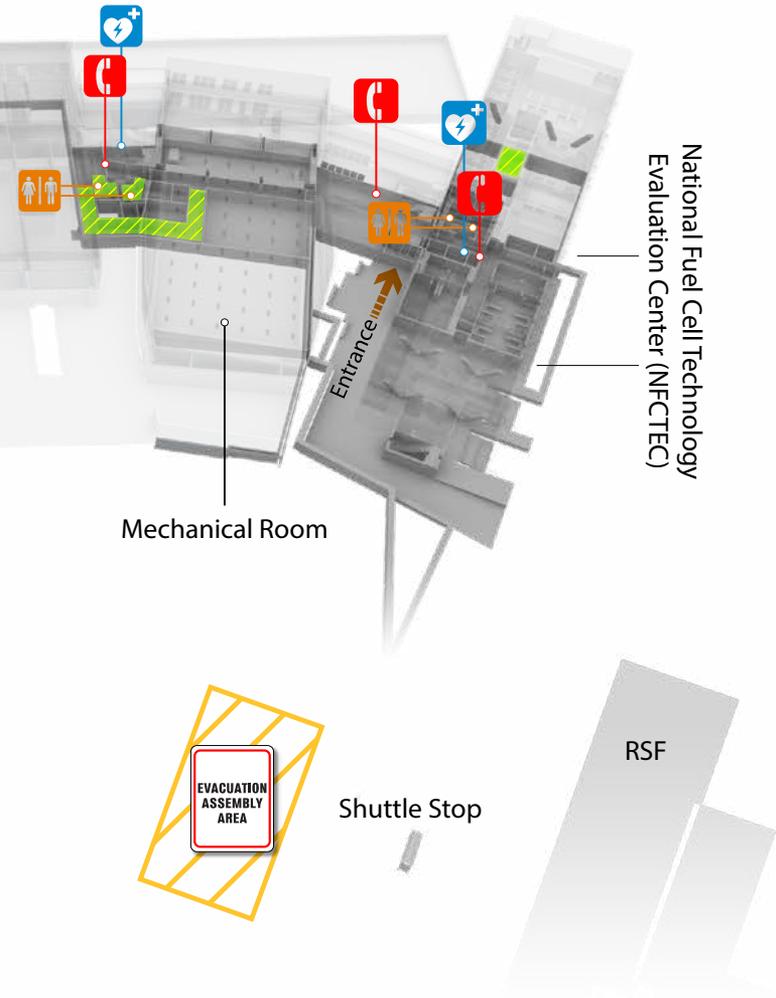


-  Building Protective Area
-  Red Emergency Phone
-  Automated External Defibrillator (AED)



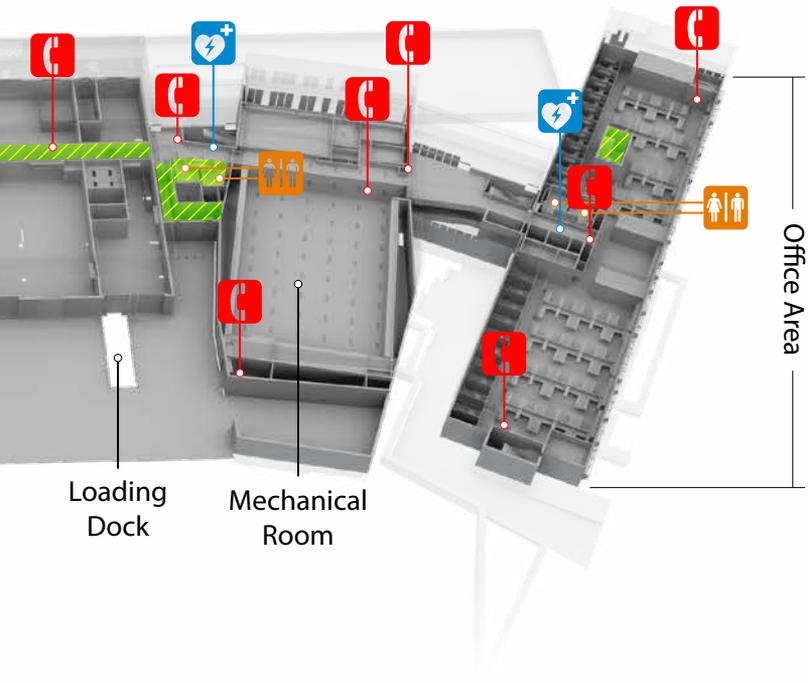
Emergency Information Map
Energy Systems Integration Facility (ESIF)

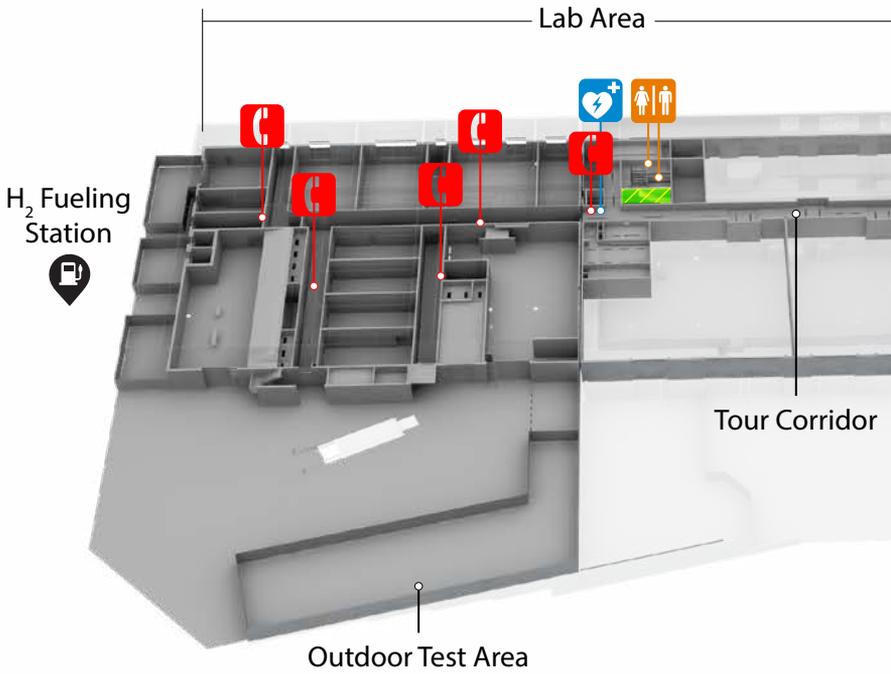
First Floor



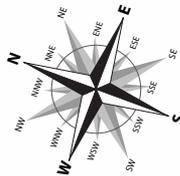
Emergency Information Map
Energy Systems Integration Facility (ESIF)

Second Floor



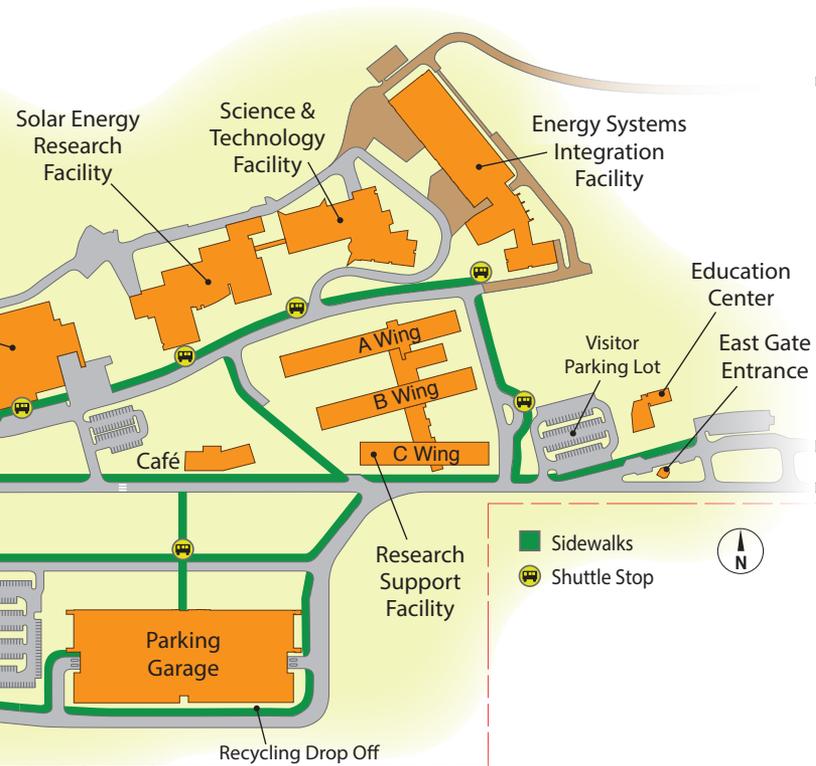


-  Building Protective Area
-  Red Emergency Phone
-  Automated External Defibrillator (AED)



NREL CAMPUS MAP





EVACUATION ASSEMBLY AREAS



ESIF



ALL EXITS - Assemble on the SIDEWALK section (dark bricks) of the road in front of the RSF A-wing.



EXIT POINTS



POINT OF ASSEMBLY

National Renewable Energy Laboratory

15013 Denver West Parkway
Golden, CO 80401

303-275-3000 • www.nrel.gov

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

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