

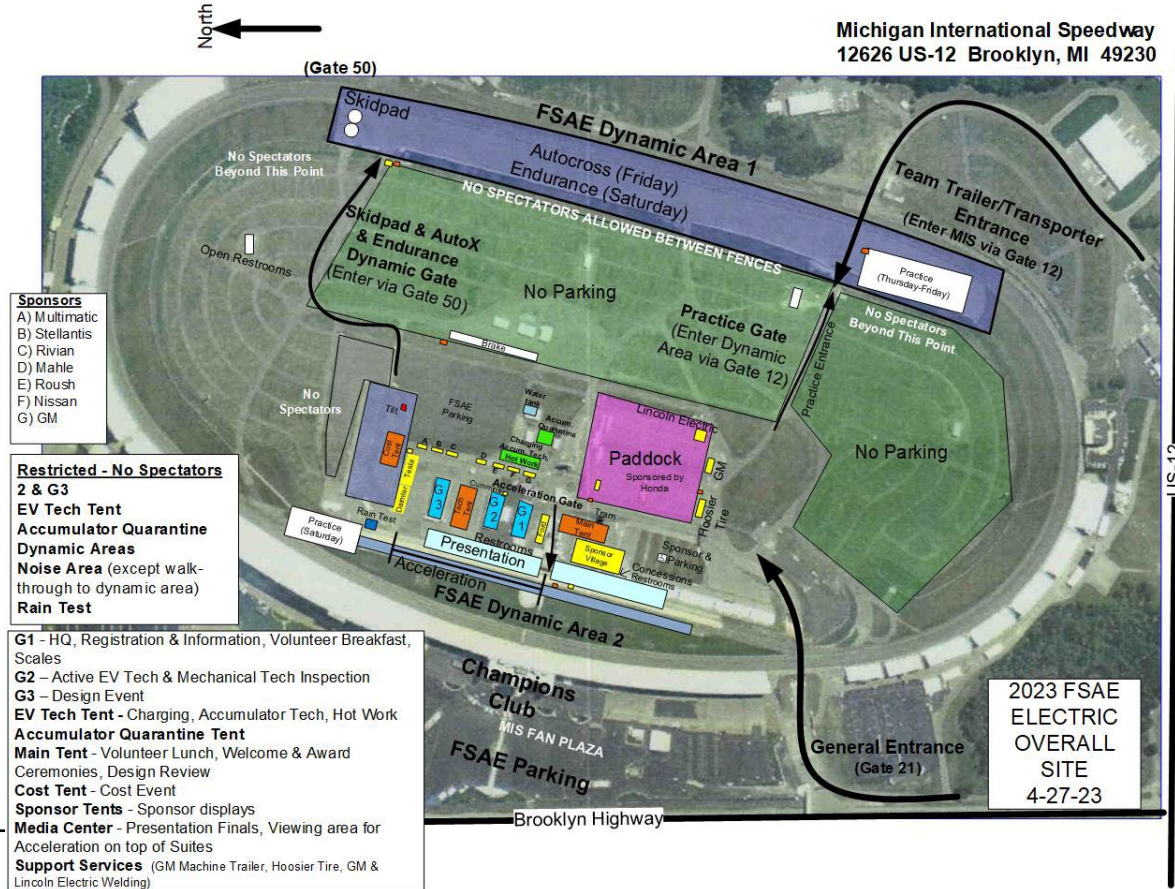
SAE INTERNATIONAL

# 2023 FORMULA SAE ELECTRIC Onsite Procedures

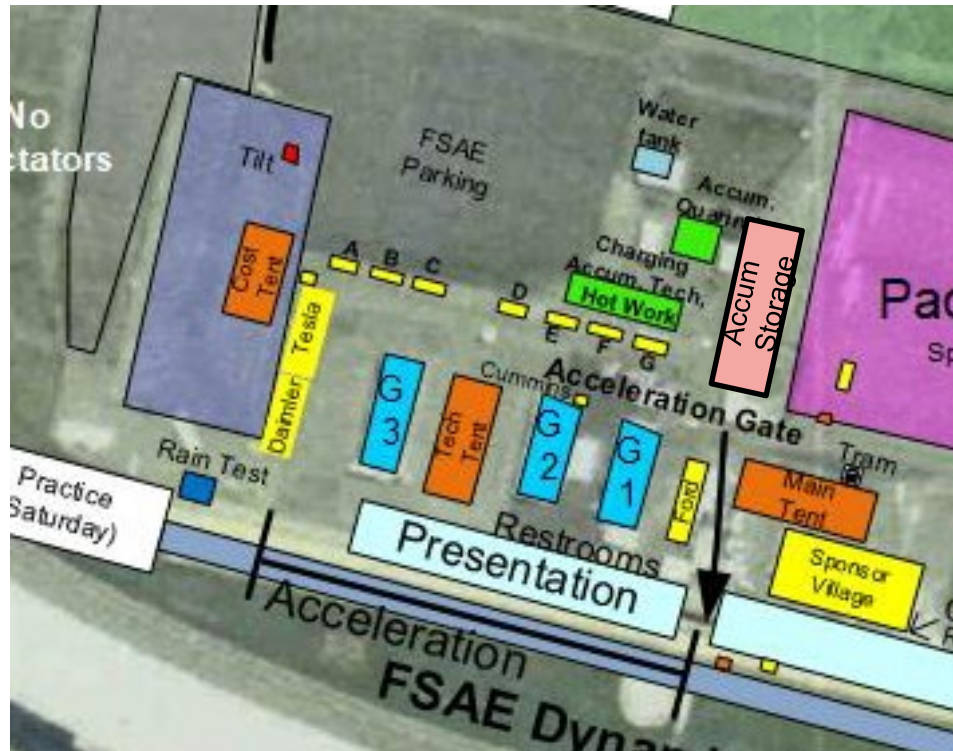
View Recorded Meeting Here  
<https://youtu.be/akk9semkzNQ>



# Site Layout



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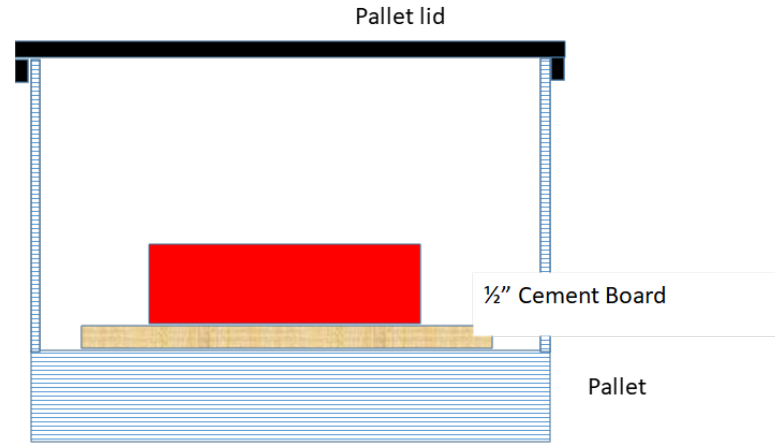


# Paddock Rules

- **No energized work can be done in the paddock area.**
  - **Any work in the accumulator when there are energized cells present**
  - **Still considered energized with maintenance plugs removed**
  - **All energized work must be done in designated hot work area**
- **Energizing TS in the paddock area**
  - **Must have passed EV Active**
  - **Car on adequate stand**
  - **Drive wheels > 4in off ground or removed**

# Accumulator Overnight Storage

- **Accumulator must be placed in accumulator storage tote in accumulator storage EVERY NIGHT.**
- **ONLY accumulator is allowed in storage tote.**
- **Pallet cover and band will be issues to each team. It is the team's responsibility to store/track cover and band.**



**Failure to store accumulator in accumulator tote in storage area overnight will result in removal from the competition.**

# Vehicle Movement Onsite

- **When moving vehicle around onsite**
  - **HVD must be removed**
  - **GLVMS and TSMS turned off**

# Hot Work

- **All hot work on the event site must happen in hot work area at accumulator tech tent.**
- **What To Bring:**
  - **Accumulator**
  - **PPE**
    - **Safety glasses**
    - **Electrical Gloves (tested in the last 12 months)**
  - **Necessary tools**

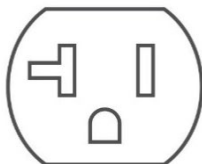


# Hot Work

- **Who To Bring:**
  - **ESO + Up to 3 team members**
- **What to Expect:**
  - **Workspace will be assigned by hot work steward on a first come first serve basis.**
  - **If there are teams waiting, a time limit may be imposed.**
  - **Team will need to explain work plan and procedures to hot work steward before work can begin.**

# Charging

- **Charging may only be done in charging area in accumulator tech tent**
- **Must pass accumulator tech**
- **Up to 4 team members allowed in charging area**
- **Must always have at least 1 team member present**
- **Charging must be done from organizer provided charging outlet**
  - **Level 1 – 120V, 20A NEMA5-20**
  - **Level 2 – 208V, 20A J1772**



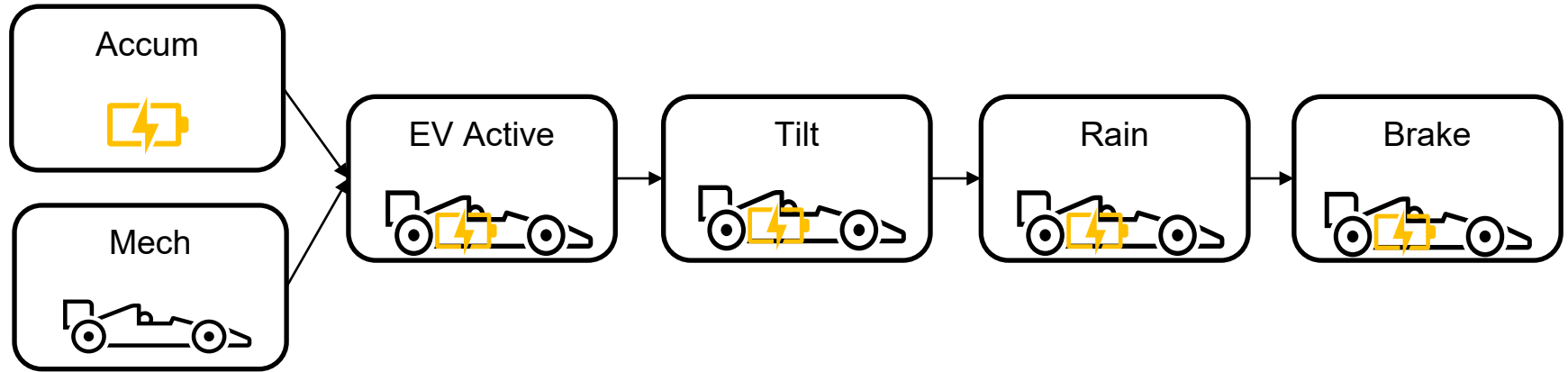
# Charging

- **Team is allowed a single outlet**
  - **HV charger, GLV power supply, laptop, etc may not use separate outlets**
- **Bring appropriate extension cord, outlet may be 10-15 feet away.**
- **Accumulator will be placed in accumulator quarantine after charging.**
  
- **Hours:**
  - **Wed: 7:30AM – 6:15PM**
  - **Thur: 7:30 AM – 6:15PM**
  - **Fri: 7:30AM – 6:15PM**
  - **Sat: by appointment only**

# Accumulator Quarantine

- **After charging, accumulator must be moved to quarantine area**
- **Only 120V power available**
- **Team must monitor/record min/max/average temperature every 5 minutes**
- **1 hour minimum**
- **After 1 hour, data reviewed with official for stable/falling temperatures**
  - **Quarantine may be extended**
- **Applies regardless of charge duration/energy.**

# Tech Inspection



# Tech Inspection - General

- **What to Bring:**
  - **Maximum 4 team members allowed in tech area**
  - **Relevant rules inquiry responses from the year**
  - **Relevant document submissions from the year**
- **What to Expect:**
  - **No working on vehicle will be allowed**

# Tech Inspection – Accumulator

- **What to Bring:**
  - **Accumulator (on accumulator hand cart)**
  - **Charger (must demonstrate charging)**
  - **All datasheets for TS components**
  - **Tools and PPE required to open accumulator, no large toolboxes/carts**

# Tech Inspection - Accumulator

- **What to Expect:**
  - **Inspectors will perform visual inspection of accumulator internals**
    - **Inspectors will want to see all electrical connections**
  - **Bring knowledgeable team members to answer questions**
  - **Charger will be demonstrated**
    - **Energized, current flowing**
    - **IMD will be tested while charging**
  - **Entrance based on tech number**
    - **Lowest number enters first**



# Tech Inspection – Mechanical

- **What to Bring:**
  - **All items shown in page 1 section “DRIVER'S EQUIPMENT“**
  - **Rain tires**
  - **The car (with dry tires)**
  - **Inspection Sheet - Fill in the information in the top section.**
  - **Push bar and fire extinguisher.**
  - **One driver with his/her full set of safety gear**
  - **The Driver Cockpit Checks form. Fill in the drivers' names.**
  - **Printed copy of your Impact Attenuator Report**
  - **The Impact Attenuator that you tested (if you are not using the standard attenuator).**
  - **Monocoque laminate test specimens (T.2.31), if applicable.**

# Tech Inspection – Mechanical

- **What to Expect:**
  - **Assembly line process (~ 10 minutes per station)**
  - **Only one driver will be checked (egress/clearance)**
- **Additional driver checks done Thursday/Friday**
- **Entrance based on tech number**
  - **Lowest number enters first**

# Tech Inspection – EV Active

- **What to Bring:**
  - **Car with accumulator installed**
  - **Tools/stands to remove driven wheels**
  - **Harness/tools to perform BSPD demonstration**
  - **Harness/tools to perform remove inertia switch**
  - **Harness/tools to perform APPS implausibility check**
  - **Harness to allow downloading energy meter**

# Tech Inspection – EV Active

- **What to Expect:**
  - **Vehicle will be energized multiple times**
  - **All safety systems will be tested**
  - **Driven wheels will spin**
- **Entrance based on first come first served**

# Tech Inspection – Re-inspection

- **If team did not pass a tech stage:**
  - **Inspectors will provide notes on issues to be resolved**
  - **Tech sheets stay with team/vehicle**
- **Once remedied:**
  - **Re-inspection line will be provided (separate from main tech line)**
  - **Availability for re-inspection limited on Wednesday**

# Tech Inspection – Rain Test

- **What to bring:**
  - **Tools/stands required to have driven wheels > 4” off the ground or removed**
- **What to Expect:**
  - **With TS energized**
  - **2 minutes of simulated rain spray**
  - **2 minutes of rest**
  - **IMD test**



# Tech Schedule Highlights

	Accumulator	Mechanical	EV Active	Tilt	Rain	Brake
<b>Tuesday</b>	3:30PM – 6:30 PM					
<b>Wednesday</b>	10:00 AM – 7:00 PM	11:00 AM – 7:00 PM	1:00 PM – 7:00 PM			
<b>Thursday</b>	9:00 AM – 5:00 PM	9:00 AM – 5:00 PM	9:00 AM – 5:00 PM	9:00 AM – 5:00 PM	9:30 AM – 5:00 PM	10:00 AM – 5:00 PM
<b>Friday</b>	9:00 AM – 5:00 PM by appointment			8:30AM – 5:00 PM	8:30AM – 5:00 PM	8:30AM – 5:00 PM
<b>Saturday</b>	9:00AM – 1:00 pm by appointment; re-tech only					

# Energy Meter

- **Installed prior to EV active**
- **Teams are responsible for bringing vehicle to EV active area to have energy meter downloaded after dynamic events**
- **Energy meter will log ~3.5 hours of data and then stop when full**
- **Logging when GLV power is present and  $TS > 50V$**
- **Lack of data will result in penalty**



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EVENT