



Manitowoc County High School Manufacturing Project



Project Mini-Chopper

2009 - 2010 Project Standards & Requirements

Note: The below are overall requirements. Technical Education instructors and/or Team Advisors at each school in conjunction with LTC should add detail to project requirements and standards to fit class and school curriculum requirements. Technical, budget and project questions should be directed the Technical Committee or Project Steering Committee Chairs. A components list, project committee specifications and contact list follow. Some details may change as the project is implemented.

1. At the start of the project, all teams will be provided a common mini-chopper components kit, including an engine, drive-train, wheels, and wiring harness. More specific information is provided in the attached project components document. The frame can be either purchased or fabricated.
2. High school teams may be encouraged to manufacture some of the components of the mini-chopper from scratch. This must be approved by the team sponsors and instructors/advisors. If a manufactured part replaces one of the kit components, it must be approved by project financial manager Tracy Benter of the EDC to accommodate the budget.
3. Each high school team can charge a maximum of \$2500 for mini-chopper components to the manufacturing project. The cost of the kit, estimated to be approximately \$1500 for each, is included in each team's charges, leaving about \$1000 in additional financing for each team.
4. Each high school team must develop a project design supported by CADD drawings and specifications. The project design must be approved by the team sponsor and instructor/advisor before manufacture can proceed.
5. The project design and completed mini-chopper must include and incorporate the brand of the company sponsoring the high school team. The project brand design must be approved by the sponsoring company.
6. Progress, plans and project design for each high school team must be recorded on a team developed webpage linked to a Manitowoc County Manufacturing website hosted by LTC. Pictures and examples of work for each team member should be included. The information will also be used for project marketing and will be available for future student portfolio use.
7. During the course of the build, the high school team must work with, consult, and give monthly progress reports to the sponsoring company and oversight committee.
8. Design modifications during the manufacturing phase of the project are encouraged, but must be added to the project CADD designs and approved by the team's sponsoring company and

instructor/advisor. However, avoid design changes that would endanger meeting the April 15, 2010 project deadline.

9. At least 30% of the completed mini-chopper must be manufactured, through modification or manufacture of the components. This must be planned in the project design. Compliance will be determined by the team instructor/advisor and judged by the project steering committee at project completion. Modifications will include, but are not limited to the following:
 - Bending and forming of the sheet metal
 - Modification, manufacture, bending, cutting and welding of the frame and/or fork assembly
 - Painting, manufacturing, modifying and adding to the frame, wheels, fork assembly and sheet metal.
10. The completed mini-chopper will be owned by the major high school team company sponsor.
11. Throughout, keep track of additional materials, service, etc. provided by the sponsoring company or any outside donor. A detailed invoice of estimated cost(s) of such contributions must be sought. This amount will not be charged to the team's expense account, but it will give the students an idea of the *actual* cost of production. It will also serve as a record of in-kind contributions, for which businesses will receive recognition.
12. **The project must be complete on April 15, 2010.**

Timeframe Detail

1. **September:**

Design Phase – brainstorming, sketching, revising, mechanical design, parts specifications, pricing/budgeting, etc.

- a. **Early September:** each high school team and its sponsor's technical and company advisors meet to discuss the types of assistance the sponsoring company is able to provide. This information will be necessary to begin the design phase.
- b. **By September 30th:** teams meet with their sponsor to discuss the revised design sketches, the incorporation of company logo/identification, the color schemes, the component selection, and the projected budget.
- c. **Sponsor's approval is required in order to proceed.**

2. **October:**

Complete CADD versions of design, paint scheme, determine final component choices, financial planning/budgeting, etc.

- a. **By October 29th:** teams meet with their sponsor to present final CADD version of their design proposal and create a production schedule (with the assistance of their technical advisors).
- b. **Sponsor's approval is required in order to proceed.**
- c. **Sometime in October:** Attend the monthly open house hosted on a rotating basis by one of the sponsoring companies. The rotating schedule will be provided in early October.

3. **November:**

- Procure Materials, begin fabrication, arrange for any custom manufacturing that will be outsourced.
- a. **Sometime in November:** Attend the monthly open house hosted on a rotating basis by one of the sponsoring companies.

4. **December through February:**

- a. **Continue fabrication**
- b. **Sometime in January:** Attend the monthly open house hosted on a rotating basis by one of the sponsoring companies.
- c. **Sometime in January:** Production update meeting to be scheduled with the sponsoring company and held at the mini-chopper building site.
- d. **Sometime in February:** Attend the monthly open house hosted on a rotating basis by one of the sponsoring companies.

5. **March:**

Production update meeting to be scheduled with the sponsoring company and held at the mini-chopper building site.

6. **April:**

Complete motorcycle mini-chopper by April 15 for the unveiling at the annual Ant Hill Mob Bike Show!

- a. **By April 8:** Production update meeting to be scheduled with the sponsoring company and held at the mini-chopper building site. Resolve any remaining issues with one week left for completion.