

ENES 220 - Spring 2003
Project Final Report Guidelines

Title Page:

- Project name and team members
- Academic information (i.e. class, section, semester, etc.)

Introduction:

- Define project and give overview of crane design
- Engineering drawings of entire crane – front, top, side, and perspective views
- Summary of important details – total crane weight, weights of individual subsystems, overall dimensions, lifting capacity, speeds, room dimensions, etc.

Design of Crane Span Beams:

- Drawing of span beams, including overall dimensions, cross section, and designation (if applicable)
- Material specifications and properties
- Analysis of beams – V/M diagrams, maximum stress and deflection (magnitude and location)
- Calculate safety factors for stresses, and compare deflections to limiting values

Design of Trolley Hoist Unit:

- Drawings of entire trolley hoist and individual components/substructures
- Material specifications and properties for all components
- Analysis of structural beams – V/M diagrams, maximum stress and deflection (magnitude and location)
- Analysis of cable and pulley system – configuration, stress
- Analysis of hoist:
 - Stresses and deformations in drum and motor shaft(s)
 - Gear train details (if applicable)
 - Required power input for motor
- Calculate safety factors for stresses and limits for deflections

Design of Room Support Structure:

- Drawings of railway beams and support columns, including overall dimensions, cross section, and designation (if applicable)
- Material specifications and properties
- Analysis of railway beams – V/M diagrams, maximum stress and deflection, safety factors
- Analysis of columns – buckling and yielding calculations, deflection, safety factors

Analysis of Model Crane and Testing:

- Drawings of model crane showing locations of strain gages and cross sectional properties of members
- List instrumentation (name, model #, serial #) used, and include block diagrams
- Describe testing procedures, results, and experimental observations
- Compare data from strain gages with predictions from hand calculations and explain differences (if any)
- Which data do you trust most and why?

Conclusion:

- Was the project successful? How might the design be improved?
- Final comments and/or recommendations

NOTES:

- All text sections of report MUST be prepared by computer (or typewriter)
- Hand calculations and drawings can be computer-generated or NEATLY prepared by hand
- Final report is due on the last day of recitation class – **Friday, May 9, 2003** by the end of class
- Reports submitted late will be penalized 10% for each day past the due date and time
- Include completed questionnaires from all group members (to be distributed)