



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

Senior Design Project Description

Company Name	<i>MiTek-USA, Inc.</i>	Date Submitted	<i>11/13/2018</i>
Project Title	<i>Exterior Deck Ledger Attachment Details for Residential Construction (MITEK_DECK)</i>	Planned Starting Semester	<i>Spring 2019</i>

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

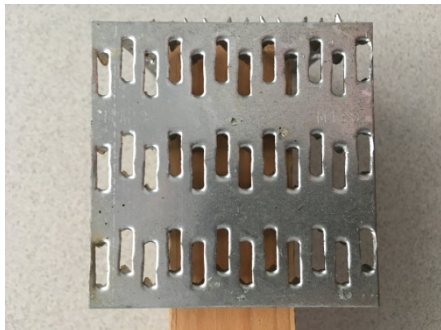
Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

Discipline	Number	Discipline	Number
Mechanical		Electrical	
Computer		Systems	
Other (Civil)	4		

Company and Project Overview:

MiTek-USA, Inc. is a part of MiTek Industries Inc. one of the Berkshire Hathaway companies.

We are the leading supplier of metal connector plates, software applications and machinery used in the wood truss industry. We are also a major supplier of construction hardware used in residential and light commercial structures. Our corporate office is located in Chesterfield, MO. This project will be coordinated out of our affiliate company, Truss Engineering Company, based in Edenton, NC. In supporting our clients both in and out of the wood truss industry we have six engineering offices and three research facilities throughout the U.S.



Photos of standard connector plate.

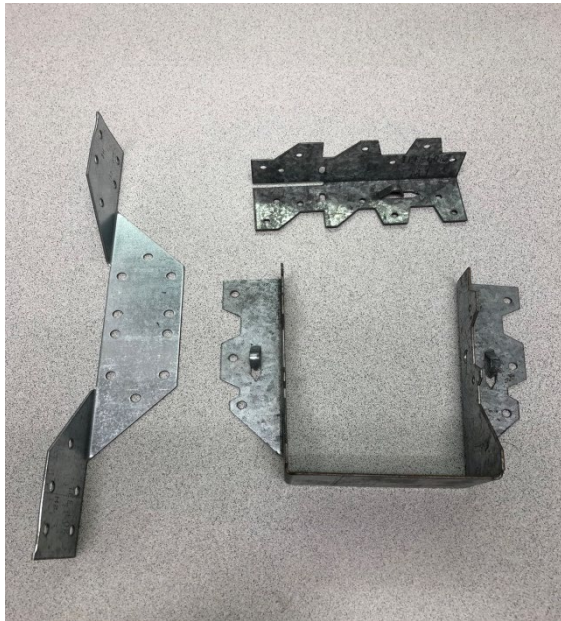


Photo Miscellaneous Construction Hardware

This project will consist of understanding the importance of the connection of an exterior deck to the structure. A sound understanding of the many connections that are a part this system will be developed. Also included will be to consider the effects of the deck to the structure and any requirements this may warrant. Then develop details that show the connection of an exterior deck ledger to the structure to support the joist framing of the deck.

Project Requirements:

The students will gain an understanding of wood as a building product and residential construction, in particular in the area of the floor framing at exterior walls. This will include learning about the three types of wood framed floor systems; dimensional lumber, wood floor truss and engineered i-joist that will be a part of this project. The basis for this work will be the International Code Council (ICC) International Residential Code (IRC) the 2015 edition in particular section R507. In addition the American Wood Council's National Design Specification (NDS) for Wood Construction the 2015 edition will be used.

Also a part of the research will be any "standard" details that may be available from any industry organization or from a specific manufacture. From the wood truss industry, the research reports available from the Structural Building Components Association (sbcindustry.com) shall be reviewed.



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Considerations:

- The direction of the floor “joist” to the exterior wall. Details will be required for both the joist parallel and perpendicular to the exterior wall.
- The interior framing system shall be checked for any effects of the deck loads to the floor framing. Currently the code requires tension connections from the deck to the structure. One option is two connection points capable of 1500 lbs of tension the second option is four points of connection each capable of 750 lbs. Details shall include our construction hardware that is used in these connections.
- Depth of the floor framing, dimensional lumber and I-joist both come in standard depths, although different. Floor trusses are available in a much greater variety of depths. What, if any affects this has on the connection.
- Lumber specie, these details will include the four major wood species used today in residential construction, Southern Pine, Spruce Pine Fir, Douglas Fir and Hem-Fir.
- The fastener used for the ledger connection. In addition to the code specified lag screw and or bolt, our engineered wood screw will be added to the details.

Expected Deliverables/Results:

- Based on 8-1/2”X 11” page and in dwg format provide the details required to provide the necessary information that a contractor/framer and building official would need to construct or inspect the ledger board connection to a structure. Every attempt should be made to keep each detail to the fewest number of pages possible.
- If work sheets or spreadsheets are developed to add in any calculations, have these available in MS Word or Excel.
- A list of the manufacturers and organizations that were used within the research. Include copies of any documents used as supporting the results.

Disposition of Deliverables at the End of the Project:

Project results can be delivered at end of Expo.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Basic knowledge of construction would be helpful, not required.
- Course work completed: Statics, Strength of Materials, Dynamics