



BSCI-4980 THESIS RULES & REGULATIONS

Effective for: Spring Semester - 2009

All thesis students are responsible for compliance with the requirements in this document. Specific requirements contained within this handout may not be omitted. Your thesis advisor must approve changes in the physical scope of the project in writing.

PRELIMINARY REQUIREMENTS

Project Approval

Prerequisites specified in the Auburn University Bulletin will be enforced. No course can be taken during the final term that conflicts with the scheduled Thesis course time: 1:00 PM to 5:00 PM MWF. The Thesis student is responsible for completing a “Graduation Check” and verifying that all of the required course work has been satisfactorily completed.

The student must submit Project Plans with a Thesis Approval Form to the School of BSCI Office **no later than the last class day of the preceding academic term. No Project Plans will be approved during semester break.** A copy of the Approval form is located in Appendix A. Written approval is required prior to starting any thesis work. The approval form must be included in the thesis submittal as noted in the Thesis Assembly section of this document. Any project scope changes must be approved and noted on the approval form by the thesis reviewer at time of submission. Only one set of plans will be approved for each student. A student may apply for approval of a project up to two academic terms before graduation.

GENERAL REQUIREMENTS

Course Administration

Thesis Lab is in session 1:00 to 5:00 PM, Monday, Wednesday and Friday; *attendance will be taken during that time period.* Three unexcused absences will be allowed without penalty. More than three will be reported to your thesis jury and will affect your thesis grade. Absences will be excused at the discretion of your thesis advisor only as stated in the Tiger Cub. The BSCI Thesis Laboratory is a space set aside for the use of the thesis students. The School of BSCI acknowledges the effort it takes to complete an exceptional thesis project. Thesis students will have access to the Thesis Laboratory 24 hours per day, seven days per week unless the University schedules otherwise.

A library atmosphere shall be maintained in the BSCI Thesis Laboratory. **Eating, drinking, smoking and spit cups are not permitted in Gorrie Center.** Radios without headsets are not permitted in the BSCI Thesis Laboratory. Persons not enrolled in Thesis are not allowed in BSCI Thesis Laboratory during normal working hours. A series of one-hour lectures relative to thesis will be conducted periodically and will be announced by e-mail. Attendance is mandatory for all thesis students at all lectures. The lectures cover the following topics: Estimating, Recap Sheets and Bid Forms, Scheduling, Contract Documents, Structural Assessments, Materials, Erosion Control and other related thesis topics as requested by the class. **Also, it is anticipated that during the term, seminars will be conducted by industry professionals on selected construction topics. Attendance is mandatory for all seminars. Failure to attend any of the seminars will result in a penalty of one letter grade on the thesis. Once again, such announcements will be made by e-mail.**

For most Thesis class sizes, each student is entitled to one desk to work on. Desks and computer equipment are to remain as arranged by the thesis faculty so that the rooms can be used for an occasional class or exam. The computers in the Thesis Laboratory are protected by a fiber optic security system. This system does not allow for rearrangement of furniture or computers.

Computing Support

The computer is a valuable tool in the preparation of the thesis. The McWhorter School of BSCI recognizes that the students rely on computing to complete their thesis. Computers, printers, and plotters are available in Gorrie Center. The Mc Whorter School of BSCI maintains this equipment and will respond as quickly as possible to any problems. ***However, it is the student's responsibility to complete the project in a timely manner.*** Any failure of computer equipment is not an acceptable excuse for a late or incomplete thesis project. ***Students must make periodic backups to protect their respective progress. Students are completely responsible for their backup strategies.***

The School will provide all printing and plotter supplies. Each student should exercise caution and print only when necessary. **The printer is not a copy machine.** The more it is used, the more likely it will crash. Each student will be allowed \$300 for printing. Once the student has reached that amount his/her account will be terminated. **Do not open the printer for any**

reason! The printers are monitored 24/7. The cost of repairs due to student damage will be charged to the student and will have to be paid to be cleared for graduation.

Job Placement Assistance

The industry recognition and appreciation of Auburn University Building Science is what attracts top construction firms to recruit. Your participation in the process is important to all of us. Companies will be making presentations and conducting interviews in Gorrie Center. Sign-up sheets will be posted and Thesis students have first choice for the time slots. Honor your job interview commitments or cancel well in advance. Broken commitments can result in problems with the contractors returning to campus in the future. For more information, see Cassandra Calloway on the first floor of Gorrie Center.

BSCI maintains an electronic job board cataloging jobs those firms that have job openings are available. Your communication with these firms should be professional and open. We also have current AGC and ABC national directories for your use. Contact Cassandra Calloway for further information regarding job placement and opportunities.

BSCI Graduate Exit Interview

All students are **REQUIRED** to complete the graduate survey and participate in the exit interview process. The purpose is to continue to improve our program in all aspects; the input of our "most recent alumni" is to ascertain their perspective on their experience in Building Science and to solicit their input and comments on the program and its future. A copy of the **graduate survey** must be completed on line.

THESIS SUBMITTAL REQUIREMENTS

General Requirements

Thesis projects will be accepted until 1:00 p.m. on Monday, April 13th, 2009. The thesis will be turned in to the thesis instructor in the Faculty Conference Room, where a drawing will be held to determine thesis juries. Thesis jury hearings will be completed on or before dead day of that academic term (Time & Location, TBA). Submit your approved drawings and specifications with your completed thesis for grading. Drawings and specifications will be returned after jury hearings. **Your name should be clearly marked and easily found on the outside of your documents.** Theses receiving a passing grade will be made available for pick-up on graduation day in the School of Building Science. All remaining theses will become property of the School of Building Science. The School reserves the right to retain copies of Theses for quality control and accreditation requirements. The jury is a formal presentation and defense of the student's work. The student should be dressed as if making a formal presentation to a major prospective client. **The student should take the Means BCCD used for pricing to the jury meeting.**

The Thesis presentation should be of professional quality, as if you were presenting your company to a prospective client. **Your thesis document shall be in 8½” x 11” page format submitted in a “D” ring binder.** Your work should be neat, thorough and original. Improper grammar and misspelled words will lower your grade. Although all thesis work is to be your own, you may exchange ideas and discuss problems with other students. The faculty is available to answer questions appropriate to the courses they teach. The faculty will not, however, take the time to re-teach course materials. Nor will the faculty “pre-grade” portions of your thesis to “check if it has been done correctly.” Refer to your class notes for any necessary review. You may also ask questions of contractors, architects, suppliers, and building industry officials, preferably those associated with your project.

THESIS ASSEMBLY

Assemble the thesis in logical order (i.e., chronological). Number all pages, **in ink**, including assumptions, worksheets and summary sheets, documents, and other information. A complete Table of Contents is required listing the sections, titles and page numbers. It should show all divisions of work contained in the worksheets and summary sheets. Worksheets and summary sheets will have a dual numbering system; one number system for the estimate itself and one for the thesis document. The typical work sheet and summary sheet heading areas should be complete.

Carefully plan sequencing and dating of all documents; i.e., Bid, Agreement, Bonds, Billing, etc., so that they are reasonable and consistent. You may assume any dates required to complete the thesis such as the bid date, project start date and company start date. A project time line is required.

Include your full name, as registered with the university, and thesis semester on both cover and title page. Anticipate binding room on each sheet of paper when copying or printing. Do not submit a machine copy of your thesis. **All documents must have original hand written signatures.**

Minimum Requirements/Assembly Model

The minimum requirements and recommended assembly for a complete thesis are as follows:

Preliminary

- Title Page
- A Complete Table of Contents w/ page numbers
- Plan Approval Request Form
- Assumptions
- Detailed Project Time Line
- List of Additional Work (“Extras”) w/ page numbers

Company	<p>Company History, Philosophy and Goals Organizational Chart Duties of Key Personnel Contractor's Licenses Business Licenses (state and local)</p>
Financial	<p>Contractor's Qualification Statement Balance Sheet Income Statement - current and projected Financial Narrative including business position and strategies consistent with financial statements Financial Ratios and a thorough analysis of each: Net and Gross Margins, ROI, Current Ratio, Fixed Asset Newness, and Average Ages of Receivables and Payables Labor Burden Determination (home office and field) General Overhead Determination</p>
Project Estimate	<p>Spec Take-off QTO Worksheets <i>incl. Finish Hardware & Site Utilities</i> Pricing Sheets <i>incl. Finish Hardware, Site Utilities and unit prices (if required)</i> Job Site Overhead Recap Sheet Bid Calculation Worksheets (base bid, alternates and unit prices) Explanation/Analysis of MEP systems Subcontract Scope Statement for MEP systems</p>
Project Documents	<p>Master Surety Agreement Proposal Form with at least one alternate bid item Bid Bond Power of Attorney for Bond Agent Agreement Form (per your specs.) w/acceptance of one alternate Bond Application Form Performance and Payment Bonds Certificate of Insurance Project Specific Safety Plan Subcontract Agreement Short Form (AGC) w/ detailed scope of Work and listing of project documents as attachments. Building Permit (not the application) Project Cash Flow Projection Division 1 and Plan Notes Issues Submittal/shop Drawing Control Document CPM Activity Worksheets Schedule of Values Reports showing Period Costs for first three months, from which the pay applications are generated Change Order prompting, i.e. RFI, Architect's directive, etc.</p>

Change Order QTO, Pricing, Recap sheets, and cover
correspondence to Architect
Change Order (executed in first 3 months)
Payment Requests (for first 3 consecutive months)
Substantial Completion Documentation
Punch List
Consent of Surety to Release of Retainage (when appropriate)
Affidavit of Release of Liens
Affidavit of Payment of Debts & Claims
Consent of Surety to Final Payment
Certificate of Occupancy
List of all required Warranties and at least two actual Warranties

Structural

Structural Analysis

Project Schedule

Color plot of original Bar Chart (with logic arrows), cost loaded, clearly indicating a timeline, all appropriate activities, their durations, total float, and ALL logic/lag ties [front and end] for each activity.

Inclusion of Schedule Draft; to be returned to student upon submission of final project

Appendix References

Entry Door Finish Hardware Schedule & Submittal Package

Reference all sources used in Thesis

Attach a complete copy of the Thesis Instructions

Grading

Completing all the minimum requirements listed in the preceding section does not mean an automatic grade of “A”. If all items are included and most of the items are reasonably correct, then the student can expect a grade of “C”. If all items are included, most of the items are correct, and there are one or two “extras”; then the student can expect a grade in the “B” range. If all the items are included, nearly all the items are correct, and there are three or more “extras”; then the student can expect a grade in the “A” range. Significant omissions and/or errors will result in a grade in the “D” range or an “F”. “Extras” will not make up for errors and/or omissions. Additional copies of the items listed in minimum requirements will not be considered “extras”. Further information about “extras” can be found in the Additional Work section at the end of this document. Per the University’s definition, an “A” is for superior work.

Thesis projects will be presented to and defended before a faculty jury. The jury will evaluate the projects for:

1. Meeting the minimum requirements listed in the Thesis Instructions in a manner appropriate to the student’s thesis project.
2. The accuracy and applicability of extra work.
3. The integration of the minimum requirements and the extra work into a cohesive whole.

4. The professional quality of the thesis document.
5. The professional quality of the student's presentation and defense.
6. The student's ability to explain the reason and meaning of each part of his thesis. **(If you don't know what it is, how it was developed, why it's there, and what it means, it lowers your grade!)**

The jury will assign a letter grade based on this evaluation. Possible grades are A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F.

If the thesis is graded as an "F" (failure), the thesis will be retained. The School Head will determine whether the student is allowed to retake the course using another approved set of drawings and specifications. An "IN" (incomplete) will be assigned only if extenuating circumstances warrant and requires the School Head's approval and per University mandated criteria.

A thesis that is submitted on time but that is not complete, will be evaluated and given a grade appropriate to the degree of completion and the quality of the work submitted. A thesis that is submitted after the designated time, but prior to 3:00 PM on the due date, will be penalized by a letter grade reduction. Theses will not be accepted for grading after 3:00 PM on the date due and an "F" will be assigned.

Company and Project Documents

All documents are to be fully executed as if real, and dated, signed and notarized where appropriate. The student is required to comply with all requirements contained within the contract documents by:

- a. Compliance with the requirements, or
- b. Written assumption concerning the requirement approved by the Thesis Professor.

The student may have to provide additional documents to meet the minimum requirements depending on their project.

The student is required to set up an organization that is capable of constructing their project. Be realistic in relating organization and overhead to annual construction volume, and use good management principles in staffing your organization.

An analysis and determination of the unique annual overhead, fee objectives, and labor burden for field and office employees must be clearly demonstrated and explained for the most recent complete year as well as the projected values for the duration of the thesis project.

The faculty strongly requests that multiple copies of forms or reports such as subcontracts and state licenses should be omitted. All information included should have a purpose and only one example of an executed document is required. However, pay requests are required for three months. Any additional pay requests are not considered extras and should not be included.

Students are encouraged to be creative and original in the development of forms, letterheads and other documentation. However, the creation of these items can have a negative impact if they cause excessive paper use or do not add to the overall appearance of the document. Remember, "Fluff is not a substitute for substance."

COST ESTIMATE - All scope changes must be approved by the thesis faculty and noted on the plans. Verbal approvals are not acceptable.

Each thesis will include a comprehensive, detailed cost estimate for the selected thesis project. Generally, the project will be taken-off manually and priced manually using the "productivity" pricing method (the normal Pricing Sheet pricing method).

Takeoff

You may design your own worksheets, summary sheets, and recap sheets as long as they are similar to those used in Project Controls. **Site work is a required item** and must be estimated and priced in a detailed manner. In addition, it should be noted that site utilities and erosion control are to be taken off and priced as Site Work "subcontract" work. Proper analysis of the site work requirements is critical to the successful completion of a project. The student should understand the grading operations and the effects of shrinkage and swell. Using a cut/fill program is acceptable. However, the appropriate reports showing existing layers and volumes, proposed layers and volumes, structures, total cut and fill, existing elevation data and proposed elevation data must be included and incorporated in the thesis in an organized manner.

Do not take off demolition work, trees and shrubs in landscaping, lawn sprinkler systems, fire alarm and/or sprinkler systems, or any low voltage wiring. Include these items in the bid amount by estimating a lump sum price for each item. The thesis faculty will provide limited guidance in this area. Do not assume this work will not be accomplished. Be prepared to explain your approach to these lump sum prices.

Worksheets, Summary Sheets, Job Overhead Sheets and Recap Sheets may be completed in pencil, but must be neat and legible. All estimating work should be self-explanatory to a reviewer and demonstrate an **easy-to-follow audit trail** throughout the estimate. Be sure to highlight totals on worksheets which are carried forward to summary sheets and totals on summary and job overhead sheets which are carried to the recap sheet indicating the page number of the destination in the appropriate manner. You will be required to justify your methodology, waste and conversion factors, and all computation in your estimate

You must take-off and price the finish hardware for the entry doors for your project. If you project does not have a hardware schedule, generate one appropriate for project type.

Pricing

You may use spreadsheet software to price all items in a format similar to the pricing sheets. Provide the pricing guide page number and line number after each item priced on the summary

sheet. The reference column is for the work sheet number and should be provided for all items on the pricing sheets.

On-Screen Take-off may be used to take-off and price all sections except **Divisions 3, 4 and 5, which must be done by hand (on Excel)**. All computer estimate reports should be produced in a manner to easily review the information. If On-Screen is utilized to perform takeoff, plan sheets which include takeoff must be printed out and include the image legend on each plan sheet. The use of On-Screen alone will still require the student to produce quantity sheets in Excel format similar to how Earthworks is utilized. The student's documentation **shall include take-off, pricing and sub-contractor's recap**. It will be the student's responsibility to clearly present the information in a format that shows the accuracy of the take-off (listing each entry), audit trail, crew designations and makeup, systems/work groups procedures, the pricing according to the current Means being used, and proper calculation of unit prices and subcontractor mark-ups. Timberline may be used but it is discouraged since it is difficult to produce an audit trail similar to those produced in PC1. If it is desired to use Timberline please see the Thesis instructor individually so that we may collectively develop the audit trail.

Develop "raw" (raw means no general contractor markup) prices for all work done at the project site including subcontracted work other than roofing. Use reference production rates, crew sizes, with local wage rates to determine work that is self-performed. You may estimate each subcontractor's total markup at 22% to 32% if the work is totally subcontracted; the mark-up is 40% and 45% if only labor and equipment are subcontracted. *While these markup rates are somewhat arbitrary for this exercise, you have to show in some form (and be prepared to defend) what factors are included in the markup.* Show subcontractor markup on the final summary sheet of all subdivisions. Highlight the subcontractor quote (including markup) and carry to Recap sheet.

The student must price out finish hardware for the entry doors.

The bid must include at least **two** alternates with the estimate and on the proposal form. If no alternates are listed, the student is required to submit an addendum to the bid documents that creates the alternates. **One (1) alternate must be accepted in the agreement with the owner.**

Use the proposal form and the Bid Bond form from the project specifications.

As in industry, the alternate is accepted after bid day and before the contract is written. The student must prepare the prices for these items separately for the owner to select. The student can select which will be accepted.

You are required to show the calculations of any unit prices required on your bid for additive or deductive work. These unit prices should include markup. Also, show the calculations for contract change orders and alternate bid items including markup.

Special Pricing Considerations

Price all concrete by the cubic yard, brick by thousands, block by each, and rebar and structural

steel by the ton. The only exception is that the square foot/square yard pricing can be used for sidewalks and paving.

Connections for steel, wood, etc., may be estimated on the summary sheet as an adjustment to the quantity (additional materials). Use proper judgment by interpolating or adjusting Means line items.

Determine the quantity and type of all wood and light gage metal roof trusses. Use the Means pricing data for your truss pricing or an actual truss manufacturer quote. The contractor/subcontractor will still need additional material for bracing and labor to erect the trusses.

PROJECT SCHEDULE

The work plan and project schedule must correspond to the project's cost estimate. You must include CPM Activity Worksheets to justify activity costs. A single page schedule with 6-10 activities is recommended (but not required) to be complete prior to beginning your estimate.

A detailed, project schedule shall be submitted no later than 2:00 PM February 13, 2009. It should contain a calendar timeline, and milestone activities with durations for the complete project including construction. The schedule should be represented in a clear, legible, organized manner, and it should follow standard CPM drawing conventions, contain a title block, date and legend, and not exceed a sheet size of 36"x 48". It will be submitted in a 9" x 12" manila envelope with the student's name, project name, and thesis semester neatly and legibly written on the cover. This schedule will be inserted into the thesis when the thesis is submitted. **While this submission should be complete, it should be a draft that demonstrates your understanding of how the building will be assembled, and its relativity to your pricing of equipment, crews, and overhead. The draft should be in bar-chart form, should include a time scale plus all activities and logic ties. Obviously, your final Primavera schedule may (and likely should) reflect refinements to this draft. Make sure you retain or make a copy of the draft, as you will not be allowed to reference it after it has been submitted.** Time-based items in the estimate must agree with the scheduled time frame of the project. The pay requests are derived from the cost loaded CPM schedule and are representative of the planned progress of the work.

Each category of work must be planned and scheduled. The schedule should contain a sufficient number of activities (100 activities +/-, excluding procurement activities) for the Project Manager to coordinate the work on a weekly basis. The sequence of activities should represent the Project Manager's plan and follow standard construction practices. In addition, the schedule should show procurement activities including fabrication and delivery of critical and other time-sensitive materials to the jobsite in time not to delay the project.

Each activity must be assigned an earned value in order to produce an anticipated "Early Start Earned Value Curve." The student must include on this diagram an anticipated "Income Curve" based on the Early Start Earned Value Curve, as well as an anticipated "Actual Costs Curve". The student will then produce and include a report showing the cash flow projection of the

project based on the plotted curves.

The student will assign a "Schedule of Value" code to each activity and produce a SOV report. The codes in this report will correspond with the G703 pay request cost items and agree with the pay request amounts. Therefore, if the schedule is updated, the earned value should equal the pay request amount without the stored material.

The student is required to update the schedule for the first three months of the project and produce a SOV report that verifies the pay request amounts based on "costs this period" as well as "costs to date."

For scheduling-related reports, the student shall include **only** the following: 1.) a Classic Schedule Report and a Detailed SOV Report for the initial, as-planned schedule, 2.) an updated Detailed SOV Report for each of the three updates.

Schedule Activity Worksheets should be sorted by activity and include totals for each activity as well as an overall total. A list of items not assigned to activities and included in the markup must be included as part of the schedule activity worksheets. The individual and total \$ value of these items must be shown on the list.

PROJECT MANAGEMENT

Use the forms (Proposal, Bond, Contract, Pay Request, etc.) furnished with the specifications. If none are provided, use the latest version of AIA forms.

It is required to complete the pay request documents for the first three months of the project. Show stored materials on each request. It is not realistic for a job not to have stored materials in the early months.

The "Schedule of Values" for the pay request is a breakdown of the work for the owner to approve payments. The breakdown should identify the major subcontractors and/or work areas. SOVs limited to the 16 CSI Divisions are not acceptable.

Execute all documents (fill in all blank spaces including correct signature, stamps and seals). Clearly identify the drawings and specifications in the contract agreement. Do not include any documents that are not required by your project. Use the AGC subcontract agreement form rather than the AIA document for your required subcontract.

The thesis is to include a list of submittals and shop drawings for the project with identification of the vendor/party responsible for originating each and the scheduled/required delivery date for each submittal. This list is to be developed from the submittal requirements given in the project specifications. Major procurement items (+/- 10 each) should be included in the schedule.

The student is required to execute a change order during the first three months of the project. This change order will be reflected in the pay request(s) as is appropriate. The change order amount and scope of work will be at the student's discretion. The actual work required in the

change order does not have to be accomplished during the first three months. The scope of the change order must be such that the contract duration and/or the contract sum is/are changed. Worksheets and Summary Sheets showing the changes are required.

STRUCTURAL ASSESSMENT

Structural System:

Include a conceptual assessment of the structural systems of the building. The assessment must provide a detailed explanation and identify:

- a. The basic structural system for carrying vertical loads. Include diagrams that trace the path of vertical loads in the structure from roof to ground.
- b. The basic structural system for carrying lateral loads (wind). Include diagrams that trace the path of lateral loads applied to the structure.

Building Stability:

The student is required to determine the measures to be taken to insure stability of a structural component during a critical stage in the construction process. Include a sketch of sufficient detail that a foreman could construct the stabilizing mechanism. Examples are items such as the roof truss bracing, trench excavation bracing and/or masonry wall bracing. Safety during the erection process is a key consideration. The student is also required to provide a list of temporary structures assemblies required for their project.

MECHANICAL, ELECTRICAL AND PLUMBING

Provide a complete scope of work for HVAC, Plumbing, and Electrical contracts.

Provide descriptions of the HVAC, Plumbing, and Electrical systems shown in your project. Include the following as a minimum:

HVAC System:

- (1) Describe the components of the system or systems (AH, VAV, RTU, Chiller, cooling tower, piping, pumps, type of duct, etc.).
 - A. The purpose of each component.
 - B. How the component works.
 - C. How the components work together.
- (2) Discuss the controls of the system and who installs the controls.
- (3) Discuss the process of the cooling cycle through the system.
- (4) Discuss the process of the heating cycle through the system.
- (5) Discuss the energy conservation measures, if any, for the building.
- (6) Why was this system used as compared to another?
- (7) Discuss the impact of the HVAC system on the schedule.

PLUMBING System:

- (1) Potable water supply source, waste discharge point for sanitary and storm.
- (2) Type and location of water pipes.
- (3) Type and location of sanitary sewer pipes.
- (4) Discuss the pumps in the systems.
- (5) Discuss any controls in the system.
- (6) Discuss the hot water source and distribution (re-circulation or non-re-circulation)
- (7) Discuss the impact of the plumbing system on the schedule.

ELECTRICAL System:

- (1) List service amperages and voltage to the MDP.
- (2) List operating voltage(s).
- (3) Describe the control systems.
- (4) Describe the electrical from the entrance, meter, and/or MDP through the sub-panels.
- (5) Describe the building equipment needs other than lights and receptacles (pumps, AH, Chiller, RTU, elevators, etc.).
- (6) Describe the types and locations of conduit.
- (7) Describe the emergency power system.
- (8) Discuss the impact of the electrical system on the schedule.

The estimate for the MEP portion of the project may be completed with a cost per square foot price (from Means) for the MEP subcontracts.

SAFETY

The student should provide a safety assessment that is **specific to the site and building of the student's project**. This assessment should include a list of specific safety concerns for your thesis project and the specific steps to ensure worker safety for each item. Do NOT attach your general "company safety plan".

DIVISION 1 AND PLAN NOTES ISSUES

The student shall provide an analysis of all items that impact time, money, or other risks that are associated with, but not be limited to, supplemental conditions, general notes on drawings, and relevant Division I specifications. The analysis shall be presented in the form of an internal memorandum direct toward company employees affiliated with this project.

ADDITIONAL ITEMS

Students are encouraged to add relevant information into their thesis document. The information should be insightful and provide the faculty with additional understanding concerning the project or the construction process as seen by the student. You may also enhance your thesis by taking photos, including extra work on related items that interests you, and adding originality where it enhances your total project. Examples of "Extra Work".

Cost Analysis:

The student can identify a component of the building and do a value analysis to determine which system may be better to use. The analysis needs to address the cost of the item, its effect on the schedule and the life cycle cost. The important thing to remember is to identify and analyze various systems. The project can remain the same.

Temporary Structures:

In addition to the information required in the Building Stability section, the student could do in-depth investigations of several areas. Trenching, bracing wood trusses, bracing masonry walls, structural steel bracing and shoring could all be studied as they relate to your specific project. The complete design could include sketches, citations from applicable codes or OSHA sections, connection details, construction sequencing and other relevant information.

Scheduling:

Project planning is an area that the student could explore. Creating a detailed Work Breakdown Structure which represents the organization of the project is acceptable. This plan should be reflected in the actual schedule that is required.

Creating a detailed Two-week Schedule that deals with a specific operation or area of the project could also enhance the thesis. This schedule could be used by the superintendent to direct field personnel or coordinate subcontractors. This could also represent a project meeting schedule where the actions of the last week and the next two weeks would be discussed. This schedule would be more detailed than the overall project schedule, but represent the activities that need to be completed during the time period.

Appendix A - Plan Approval Request

BSCI - 4980 PLAN APPROVAL REQUEST

This form is to be submitted along with plans and **SEPARATELY BOUND SPECIFICATIONS**. The student is encouraged to submit the plans and specs on cd in pdf format. The approving professor will make notations on this sheet as to their approval and any special requirements. If disapproved, the plans/cd and form will be returned to you. After the project has been approved, BSCI will return a copy of this form and the plans/spec/cd to you and retain a copy of this form for filing. **** Complete in ink – no pencil, please! ****

TODAY'S DATE _____ TERM & YEAR YOU WILL TAKE THESIS _____

EXACT TITLE ON PLANS/SPECS _____

NAME OF ARCHITECT _____

DATE OF PLANS _____

LOCATION OF BUILDING: CITY _____ STATE _____

NAME OF STUDENT SUBMITTING PLANS _____

AU E-MAIL ADDRESS _____

COST OF PROJECT (Should be between \$750,000 and \$2,000,000 if possible. Use actual bid figures or A/E's or G.C.B. estimate.) _____

BUILDING FLOOR AREA (should be approximately 9,000 - 12,000 sf) _____

In general, pre-engineered roof and wall systems - Butler type - or pre-cast walls and roofs do not lend themselves to good Thesis projects. Detailed dimensions and weights of members are usually not available to a student. For these reasons, such buildings will be rejected. Likewise, Wal-Mart or supermarket type buildings do not make good projects. No less than 5,000 sf of the area must have finished floors, partitions, walls and ceilings. And, most Drug Store projects (CVS, Walgreens, ect.) are merely site adaptations of standard plans. Therefore, Drug Store projects will also be rejected.

IS THERE ANY FORM WORK DESIGN REQUIRED? _____

IS THERE MUCH EARTH CUT AND FILL ON SITE? _____

HAVE YOU INCLUDED MECHANICAL AND ELECTRICAL DRAWINGS? _____

OTHER REMARKS _____

APPROVED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____