WEBER STATE UNIVERSITY

DESIGN AND CONSTRUCTION STANDARDS
For
ARCHITECTS, ENGINEERS AND CONTRACTORS

Prepared By
FACILITIES MANAGEMENT

Revised
October, 2009
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 INTRODUCTION.</td>
<td>3</td>
</tr>
<tr>
<td>2.0 ORGANIZATIONS AFFECTING THE PROJECT.</td>
<td>3</td>
</tr>
<tr>
<td>2.1 Division of Facilities Construction and Management.</td>
<td>3</td>
</tr>
<tr>
<td>2.2 Weber State University.</td>
<td>4</td>
</tr>
<tr>
<td>2.3 Facilities Management.</td>
<td>4</td>
</tr>
<tr>
<td>2.4 Operations and Maintenance Personnel.</td>
<td>8</td>
</tr>
<tr>
<td>2.5 Academic Departments.</td>
<td>9</td>
</tr>
<tr>
<td>2.6 Purchasing Department.</td>
<td>9</td>
</tr>
<tr>
<td>3.0 UNIVERSITY PROCEDURES.</td>
<td>10</td>
</tr>
<tr>
<td>3.1 Architectural Design Program.</td>
<td>10</td>
</tr>
<tr>
<td>3.2 Submissions of Architect.</td>
<td>11</td>
</tr>
<tr>
<td>3.3 Review and Approval.</td>
<td>12</td>
</tr>
<tr>
<td>3.4 Design Development (Preliminary Design)</td>
<td>13</td>
</tr>
<tr>
<td>3.5 Construction Documents.</td>
<td>14</td>
</tr>
<tr>
<td>3.6 Bidding Procedure.</td>
<td>16</td>
</tr>
<tr>
<td>3.7 Change Order Procedure.</td>
<td>17</td>
</tr>
<tr>
<td>3.8 Campus Key Policy.</td>
<td>19</td>
</tr>
<tr>
<td>3.9 Submittals.</td>
<td>19</td>
</tr>
<tr>
<td>3.10 Inspection.</td>
<td>20</td>
</tr>
<tr>
<td>3.11 As Built Drawings &amp; Operations and Maintenance Manuals.</td>
<td>21</td>
</tr>
<tr>
<td>3.12 Payment for Services.</td>
<td>22</td>
</tr>
<tr>
<td>3.13 Punch List and Warranty Phase.</td>
<td>22</td>
</tr>
<tr>
<td>3.14 Notification.</td>
<td>22</td>
</tr>
<tr>
<td>4.0 GENERAL DESIGN REQUIREMENTS.</td>
<td>24</td>
</tr>
<tr>
<td>4.1 Campus Image.</td>
<td>24</td>
</tr>
<tr>
<td>4.2 Site Considerations.</td>
<td>24</td>
</tr>
<tr>
<td>4.3 Building Considerations.</td>
<td>26</td>
</tr>
<tr>
<td>4.4 Utility Considerations.</td>
<td>29</td>
</tr>
<tr>
<td>4.5 Special Considerations.</td>
<td>33</td>
</tr>
<tr>
<td>5.0 GUIDE SPECIFICATION STANDARDS.</td>
<td>35</td>
</tr>
<tr>
<td>Division 1 – General Requirements.</td>
<td>37</td>
</tr>
<tr>
<td>Division 2 – Site Work.</td>
<td>40</td>
</tr>
<tr>
<td>Division 3 – Concrete.</td>
<td>46</td>
</tr>
<tr>
<td>Division 4 – Masonry.</td>
<td>46</td>
</tr>
<tr>
<td>Division 5 – Metals: Structural and Miscellaneous.</td>
<td>47</td>
</tr>
<tr>
<td>Division 6 – Carpentry.</td>
<td>47</td>
</tr>
<tr>
<td>Division 7 – Moisture Protection.</td>
<td>48</td>
</tr>
<tr>
<td>Division 8 – Doors, Windows and Glass.</td>
<td>49</td>
</tr>
<tr>
<td>Division 9 – Finishes.</td>
<td>53</td>
</tr>
<tr>
<td>Division 10 – Specialties.</td>
<td>55</td>
</tr>
<tr>
<td>Division 11 – Equipment.</td>
<td>56</td>
</tr>
<tr>
<td>Division 12 – Furnishings.</td>
<td>57</td>
</tr>
<tr>
<td>Division 13 – Special Construction.</td>
<td>58</td>
</tr>
<tr>
<td>Division 14 – Conveying Systems.</td>
<td>59</td>
</tr>
<tr>
<td>Division 15 – Mechanical.</td>
<td>60</td>
</tr>
<tr>
<td>Division 16 – Electrical.</td>
<td>83</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION

The purpose of this guide is to acquaint the Architect and/or the Contractor with the functions and standards of Weber State University. It is felt that a basic knowledge in these areas is essential before the Architect can successfully carry out his contract responsibilities. Copies of this guide are available in various formats: hard copy, CD (.pdf format), e-mail and the Facilities Management website at www.weber.edu/fm. Hard copies and copies on CD are available on request.

References made the Utah State Division of Facilities Construction and Management (DFCM) throughout this document apply to those projects funded through monies administered by that agency. Normally, the dollar amount of these types of projects exceeds $100,000 unless delegation of authority has been granted to WSU for the duration of the project. For projects of less than that amount or when authority has been delegated by DFCM, all bidding, contract administration and project management is under the direction of the University.

With this in mind, this guide has been developed to transmit information on University policies, procedures and agents which will affect the design and construction of the project. General design considerations and a Specification Guide outlining some specific considerations and requests based on previous experiences of University personnel are included.

It is hoped that this guide will become a useful tool to the architect throughout each phase of his work.

Throughout this guide the term Architect is given to the organization responsible for the design of the project. In projects where the organization responsible for design is an engineer or engineering firm, please consider the term Architect and Engineer as interchangeable.

2.0 ORGANIZATIONS AFFECTING THE PROJECT

2.1 Division of Facilities Construction and Management (DFCM)

Weber State University is a State University; therefore, the State of Utah is the actual Owner of each building or project. The DFCM is the assigned representative of the State of Utah to administer the state building program. It is the responsibility of the DFCM to administer most contracts and all associated monetary matters concerning the project. Most contracts and payments for work are issued through the DFCM and are not dependent on University administrative action. In addition, most bid advertisement and openings are determined by the DFCM and all associated addenda are processed by them. The DFCM will assign a Program Director to each project to oversee all stages of the work.
2.2 **Weber State University**

Weber State University is the State institution which will occupy the new or remodeled facility. The administering body of that institution consists of the Board of Trustees who are appointed by the Governor (with the consent of the legislature) to govern all University functions, and the University Administration which includes the President, Vice Presidents and their staffs who are appointed by the Board of Trustees to carry out the actual day-to-day work. The administrator directly responsible for construction projects is the Assistant Vice President of Facilities Management. That position presents all formal project recommendations and actions to the Board of Trustees and the University Administration. It should be noted that all project design phases must receive approval by the Board of Trustees and the University Administration before final action will be made by the DFCM.

2.3 **Facilities Management Department**

By administrative appointment, the Facilities Management Department (FM) is the representative organization of the University Administration in all phases of the building program. All contact with the University concerning project development by the Architect and the DFCM will be directed to this department. For purposes of clarification, the term “Project Manager” and “Facilities Management” may be used synonymously.

2.3.1 **Campus Master Plan**
2.3.2 **Building Design Program**
2.3.3 **Building Design**
2.3.4 **Bidding**
2.3.5 **Construction Coordination**

2.3.1 **Campus Master Plan**

The Facilities Management Department, in direct cooperation with the University Administration, is responsible for the development of the Campus Master Plan.

This plan is a guide for all campus development. The plan has been developed through care consideration of the functional and visual aspects of the total campus including efficient student and public access, convenient pedestrian circulation and balance in the relationships of buildings to each other and to the total campus fabric. Utilities have been located as accurately as possible so that extensions and relocations will be kept to a minimum.
The Master Plan is intended to be creative and perceptive in concept by flexible enough to allow adjustment as needs vary and unforeseen requirements are recognized.

2.3.2 Building Design Program

After the need for a new building has been justified and approved, University efforts are directed towards developing an Architectural Design Program. This program is developed through joint efforts of an architectural firm hired by the DFCM, the department or departments to be housed in the new building and representatives of the Facilities Management Department. Every effort is made to assure the preparation of an informative well detailed program to present the needs and objectives of the new building. The success of the new building is greatly dependent upon this program.

2.3.3 Building Design

After the architectural design program has been developed, the Facilities Management Department, in conjunction with the DFCM, works with the appointed Architect in the development of the design of the building. The prime objectives of this phase of the work are: (1) the building must be highly functional; (2) the building must be well conceived structurally, mechanically and electrically; (3) the building must be aesthetically pleasing as an individual structure; (4) the building must be a contribution of harmony and dignity to the total campus; and (5) the building must be constructed within the assigned budget.

The design for the building is developed in three stages; first, Schematic Design; second, Design Development; and third, Construction Documents. A detailed explanation of these three stages is given in the section of this guide entitled “University Procedures”. It should be noted, however, that each stage requires approval by the Facilities Management Department, the University Board of Trustees, and the DFCM. Approval in each stage is required before the Architect is authorized to proceed to the next stage.

The Facilities Management Department obtains input from other departments on campus when specialized information is required. The Architect is instructed not to contact these other departments directly. All campus information must be channeled through the Project Manager so proper coordination can occur.

2.3.4 Bidding

After the approval of the contract documents mentioned above has been given, the project is ready for bidding. It is the responsibility of the
The Architect is directed to include sufficient alternates to assure the possibility of reducing the total cost of the project should the bids received be over the estimate. All alternates must be reviewed by the Facilities Management Department before inclusion in the contract documents. In many cases agency supplying grant monies have special requirements regarding alternates which must be complied with fully.

Copies of all addenda being issued during the bidding should be delivered to the Facilities Management Department at the University. One copy of the addenda should be provided for each set of contract documents received by the University.

A University representative will be at the bid opening and available to assist in the analysis of the bids with the DFCM and the Architect. After the bids have been analyzed, the Project Manager will participate in the recommendation of acceptance of bids. This recommendation must receive approval by the University administration, Board of Trustees and then the DFCM.

NOTE: Where special grants or gifts supply a portion of the project monies, special requirements on bidding, alternates and award of contract are often mandatory. In these cases, careful coordination is necessary with the Project Manager on all design submittals, contract document approvals, bid intentions and contract award. Failure to comply may jeopardize the project funding.

### 2.3.5 Construction Coordination

During the construction period of the project, the coordinating responsibilities of the Facilities Management Department are many and varied.

The Facilities Management Department is responsible to coordinate the efforts and wishes of the University administration and the academic department(s) for whom the building is being built. All action, including change order proposals, requested by the University, must be made through the Architect or DFCM Coordinator by the Project Manager.

The review of all change order proposals, requests for time extensions and any other matters requiring special University approvals, are handled by the Project Manager.

All decisions pertaining to construction, changes in construction and construction problems must be coordinated through the Project Manager as well as the DFCM. The Project Manager must be kept informed.
concerning all decisions and actions taken during the design and construction of the project because the Project Manager is the sole University representative responsible for keeping the University administration aware of the happenings and decisions made concerning the project.

It is strongly emphasized that the Project Manager is the sole point of contact with the University on items relative to the project for the Architect and the Contractor or his sub-contractors. All project matters requiring University contact for any reason must go through the Project Manager. The Architect and the Contractor are instructed to take no directions issued by University personnel other than the Project Manager. Any costs incurred for changes which are initiated by actions not approved by the Project Manager will be borne by the Architect or the Contractor and not the University or the DFCM.

Personnel of the Facilities Management Department who will be involved with the project include the following:

a. **Assistant Vice President of Facilities Management**

The Assistant Vice President of Facilities Management is assigned by the University Administration to manage the Facilities Management Department, and to be directly responsible for the development of all campus construction projects. The Asst. VP meets regularly with members of the administration to report on the progress of the project work, to give presentations on various project items, and to resolve any problems which require administrative attention.

During the design phases of the project, the Asst. VP meets regularly with the project Architect and the DFCM to give input into the design decisions of the project. The Project Manager acts as the University representative from the program preparation and design stages through project completion and project document closeout. The Project Manager shall attend all meetings related to design reviews and approvals.

During the construction phase of the project, the day-to-day coordination activity of the work is delegated to the Project Manager who keeps the Assistant Vice President of Facilities Management informed of all pertinent developments concerning the project. The Project Manager must approve all change orders and major design decisions during the construction phase of the work prior to their being formally initiated.
b. **The Project Manager**

The Project Manager is the official representative of the University and Facilities Management and is assigned to coordinate all the construction responsibilities of that department. The Project Manager is directly involved with the project from conception, through project document close-out. The Project Manager is the point of contact for the University who will provide information as requested by the DFCM, the Architect, and the Contractor during the construction phase of the work. The Project Manager will arrange necessary business meetings, transmit decisions and other project information between the various parties involved and, in general, directs and coordinate all project construction efforts which require University involvement. It should be emphasized that the Project Manager must be informed of all project information, problems, decisions, inquiries and other details affecting the project so that appropriate informed action can be taken. The Project Manager should be the first person contacted to initiate any action requiring campus approval or coordination on the project during the construction stage. The Project Manager is responsible for managed the project budget, including coordination of all purchases such as: furnishings, fixtures, equipment (FF&E), etc. All Purchase Requisitions and subsequent Purchase Orders shall be directed through the Project Manager so the costs can be tracked through the budget.

### 2.4 Operations and Maintenance Personnel

Operations and Maintenance Personnel have a variety of important responsibilities. Of vital concern to this department is the proper operation and efficient maintenance of campus buildings and grounds. Operations and Maintenance Personnel will contribute materially in the analysis of the building services, utilities and mechanical systems. Many of the directives or requests outlined in the “Guide Specification Standards” are based upon past experience of personnel from these departments and their comments are valuable sources of information in attempting to avoid past errors and unsatisfactory conditions. They are responsible for the operation and maintenance of all the utilities on the campus, such as the Heating Plant, distribution lines, pump houses, water lines, sprinkler lines, sewer and storm drain lines, electrical power stations, distribution lines and transformer vaults, etc. They are acquainted with the location and conditions of the different utility distributions systems and can therefore provide valuable information to the Architect in this particular area of the design.
Requests for information or instruction from Operations and Maintenance Personnel are to be directed to the Project Manager who will, in turn, arrange for the transmission of the necessary information. Only during emergencies such as fire or a broken or cut utility line should the Operations and Maintenance Personnel be contacted directly. In a pre-construction meeting names and numbers will be given for emergency reference.

Drawings and specifications on each phase of the design process (schematic, design development, and contract document) will be submitted to Operations and Maintenance Personnel by the Project Manager as a regular part of the review and approval process.

2.5. **Academic Department**

The academic departments are those for whom the specific building function is designed. The Architect will be concerned only with those departments which are scheduled to occupy the building being designed. The staff members of these departments are directly involved in the preparation of the Architectural Design Program.

During the design phases of the project, it is important to receive input from the academic personnel since they will be the ones who will occupy the building. It is their specific needs which must be satisfied and they are the ones most knowledgeable about the building functions which are intended. To satisfy this requirement the Project Manager will schedule meetings between the project Architect and personnel from the academic department(s) to discuss specific aspects of the building design. The Architect is cautioned not to meet with academic personnel unless the Project Manager is present to verify the instructions which are given. The Architect will be responsible for taking minutes at all meetings and providing a copy to the Project Manager. The Project Manager will, in turn, provide copies to those involved in the discussions.

Drawings and specifications on each phase of the design process (schematic, design development, and contract document) will be submitted to the academic department by the Project Manager as a regular part of the review and approval process.

2.6 **Purchasing Department**

The Purchasing Department is responsible to purchase departmental furnishings and supplies. In general, it will not be involved with the major project contracts issued by the DFCM. However, it may be involved in the issuing of contracts for furnishings and equipment for any size project.
Special purchases which utilize gifts or private funds not appropriated by legislative action may be coordinated through this department if the University Administration so decides.

2.7 Project Architect

The Project Architect is hired by DFCM. The Architect is totally responsible for all phases of the work and should extend every effort to meet time deadlines and assure the University that the highest standards of quality in materials and workmanship are met. The Architect will work closely with the Facilities Management Department and the academic department(s) who will give direction to the project through discussions and design reviews.

Individual, creative ideas by the Architect are highly encouraged, along with the functional and utilitarian aspects of the project.

2.8 Contractor

The contractor for the project is also hired by the DFCM either through the competitive bid, or Value-Bases Selection process. The contractor is an integral part of a successful project and is expected to provide the highest possible quality of materials and workmanship. The contractor will work closely with the Project Architect and the Project Manager to maintain open lines of communication through the completion of the project.

The contractor is in a unique position to provide on the job, value engineering with all of the details of the project and is strongly encouraged to do so.

3.0 UNIVERSITY PROCEDURES

The following pages describe the University’s policies and procedures for various steps of conception, design, construction and completion of the projects.

3.1 Architectural Design Program

The Architectural Design Program is compiled and written by an independent architectural firm hired by the DFCM with the direct assistance of the “Steering Committee” which is composed of faculty and staff members of the department(s) who will occupy the building and the Project Manager. The program has two major objectives:

- First, the program helps to clarify and crystallize the thinking of the department staff. This tends to unify the departmental position which enables them to make sound recommendations for the new building.
Second, the program is intended to express concepts and objectives to the Design Architect in a manner which will enable him to translate them into an imaginative, functional building.

The program contains general discussion sections designed to acquaint the architect with the total scope of departmental thinking regarding overall building relationships and developments which have culminated in the decision to build the new building. The major portion of the program consists of a detailed discussion of each room in the new building wherein specific space requirements, functional interrelationships, and architectural, mechanical and electrical features are outlined. A space summary and preliminary cost estimate developed by the independent architectural firm is also included in the program as a guide for the beginning of the project. In compiling the program, the departmental staff is encouraged to think in terms of the “ideal” space requirements to accommodate the activity or function needed rather than in terms of rooms or existing arrangements. It is felt that this approach gives the design architect an opportunity to consider concepts and objects of the academic department in the design rather than merely space requirements.

3.2 Submissions of Architect

The design for the building is developed in three stages, each of which requires approval by the University and the DFCM before the Architect is authorized to proceed to the next state. An explanation of these three stages is as follows:

3.2.1 Schematic Design Requirements

The schematic design for the building is started after the Architect has familiarized himself with the Architectural Design Program, has met the building programming committee, and has become conversant with the needs of the academic staff for the new building. The schematic design establishes a basic concept of the building, and articulates the major decisions concerning the disposition of spaces, the organization of functions and the relationship of individual parts of the building to the whole. This schematic design is generally done as a single line type drawing showing the type of construction, materials to be used and the visual organization of the total building. This phase of the design should include the site plan, floor plans, building cross sections and elevations. A cost estimate base upon square feet and building volume should be submitted. The Architect is instructed not to proceed if the cost estimate is not well within the budget. Every effort must be expended in this development to assure the
establishment of a perceptive, stimulating, and creative building concept.

At this stage of development there is a need for a careful quantitative analysis of the various building systems before the Architect has integrated them into the program design. Therefore, the Architect shall submit, to the Project Manager of the University and the DFCM, for review and approval a formal report which outlines these considerations. The report should be prepared by the Architect jointly with his/her consultants. The report should accomplish the following:

a) Explain the alternative systems possible for the following:

(1) Structural system
(2) Mechanical Systems
   • Heating
   • Air Conditioning
   • Plumbing (if specialized)
(3) Electrical system
(4) Acoustical system (if specialized)

b) Provide the following information for the subject headings above:

(1) An evaluation “pro and con” of the various systems possible as they related to the program requirements for the building and existing campus systems. This evaluation should include a brief analysis of first costs, operations costs and maintenance costs.

(2) The architects' and/or consultants' recommendation of which system should be included and why.

NOTE: To coordinate with existing university storage facilities, it is requested that drawing sizes not exceed 35" X 48".

3.3 Review and Approval

The Architect’s sketches and proposals are first reviewed by the Project Manager. At this point, concepts and details of the Architect’s design are carefully considered. The mechanical and electrical reviews will be
coordinated with the Operations and Maintenance Personnel. Oftentimes further study is necessary before submission to the academic staff, so the Architect is encouraged at first to bring sketches and not finished drawings.

Next, these studies are reviewed and carefully considered by the academic departments and their staff. When the building design is considered acceptable to all of these parties, it is ready for presentation to the DFCM. They review the design and make recommendations and suggestions as deemed necessary or appropriate.

After this review and approval, the design is submitted to the University Administration and the University Board of Trustees. The approval by these people and a letter of recommendation to the DFCM completes the schematic design.

3.4 Design Development (Preliminary Design)

1) Requirements

The design development of the building requires a more detailed presentation of the concept of the building.

After the Architect is given authority to proceed with this phase, numerous meetings are held with the academic staff and the Facilities Management Department. The general building concept is refined and details are developed for the building along with all considerations pertinent to the total building and campus development. As a more detailed work of the design development phase progresses, it is sometimes necessary to revise parts of the approved schematic design when it is found that certain essential arrangements have been overlooked. Every effort will be made to keep these changes to a minimum, but the Architect is expected to be cooperative under these circumstances.

The design development drawings should consist of a more detailed site plan, floor plans, cross sections and elevations, including an explanation of the structural, mechanical and electrical systems intended to be used. These plans should be drawn with enough detail and at a scale large enough to show furnishings, equipment, and all elements necessary to assure the proper function of the building and the spaces within the building.

In addition to the drawings, the Architect is required to submit an outline specification and a detailed cost estimate. The outline specification should explain the Architect’s recommendations concerning the general type, quality and character of materials to be included in the building. The
Architect’s design development cost estimate must include all categories established by the cost estimate included in the Architectural Design Program, and must be of sufficient detail to assure that the proposed design of the building can be built within the budget established. The Architect is hereby instructed not to proceed with the construction documents until the cost estimate is well within the project budget.

NOTE: To coordinate with existing university storage facilities, it is requested that drawing sizes not exceed 30” X 42” (standard “E-size”).

2) Review and Approval

A similar review to that explained for schematics is performed by the same people concerned. The approval of the design development work of the building constitutes the last step necessary to be taken before the Architect starts preparing construction documents. Reviews are required at the 25%, 60% & 90% completion phases.

3.5 Construction Documents

3.5.1 Requirements

a. The Architect is responsible for preparing drawings and specifications to carefully define the complete requirements of the building. A detailed cost estimate is also required.

b. During the process of developing these documents the Project Manager will be in constant contact with the Architect for consultation and to assist where required on specifications and material selections. Here again it is realized that some minor revision may be necessary and the Project Manager will always be available for discussion in preliminaries will require approval by the University and the DFCM.

c. At the halfway point in the contract document preparation phase, as determined by the Architect, a review of the mechanical and electrical systems of the project is required. These reviews (at 25%, 60% & 90%) will be conducted by the Project Manager as well as Operations and Maintenance Personnel.

d. The purpose of this review is to check for conformance to standards and procedures of the University; so, incongruities are called to the attention of the Architect and his consultants before the documents are too far along for economical or reasonable revision. It is also hoped that this review will prompt the mechanical and electrical work to keep pace with the architectural
work to alleviate some problems experienced in the past. At this
time, Campus room numbers will be assigned to the spaces and
the architect will incorporate the Campus numbering scheme into
the project plans to be sued as the final numbering layout.

e. The Architect is requested to maintain close contact with the
Project Manager as functional details of the building are being
resolved. After the contract documents are completed, a detailed
cost estimate should be prepared. This estimate should include a
careful take-off and breakdown of trades, quantities, labor, material,
profit, overhead, contingencies, architect’s fees, escalation, and
should include every expense which has been and will be incurred
in the project. This includes the costs of fabricating and installing
all necessary room and/or name plaques to be used. The Architect
is instructed no to proceed with the bidding unless the project cost
estimate is within the budget. He is also asked to provide
alternates in the contract documents to permit flexibility in contract
price. With this accomplished, the Architect is ready to submit
these documents for checking and final approval before the project
is put out for competitive bidding.

f. Space should be provided on the title sheets of the final working
drawings and specifications for signatures by: (1) Director, DFCM,
and (2) Assistant Vice President of Facilities Management.

NOTE: To coordinate with existing University storage facilities, it is
requested that drawing sizes not exceed 30” X 42”.

g. The working drawings are to be on the type of material and of size
dimensions as required by the DFCM.

3.5.1 Review and Approval

After the contract documents have been prepared, they are submitted
along with the detailed cost estimate to the Project Manager and the
DFCM for final review before bidding. These documents are checked for
conformity to the preliminary design and for the assurance that the
intentions of the program and directions given by all parties concerned are
carried out as nearly as possible. A minimum of four (4) sets of contract
documents are submitted to the University: One set is retained for review
by the Project Manager; one set is reviewed by Operations and
Maintenance Personnel so that coordination of mechanical and electrical
systems and campus utilities can be accomplished; one set is reviewed by
the Assistant Vice President of Facilities Management; and the fourth set
is submitted to the academic staff for their final review. The academic
review is to give the entire staff a last look at what the building includes so as to eliminate misunderstandings.

After each of the above has reviewed the contract documents, all suggestions and criticisms are delivered to the Architect.

The review by the DFCM is independent of the University review. However, it is recommended that the University Project Manager accompany the Architect during these presentations and discuss with the DFCM to aid in any coordination decisions.

NOTE: The Architect will be held responsible to incorporate all review comments into the contract documents prior to bidding. Should the architect or his consultants disagree with a review request, a conclusion satisfactory to all concerned parties must be reached prior to completing the documents. Written justifications by the architect and/or his engineers are sometimes required to resolve the issues.

After the Architect has made the final corrections requested by the University and DFCM, the project is then ready to be bid.

3.6 Bidding Procedures

3.6.1 Requirements

After the approvals mentioned above have been given, the project is ready for bidding. The dates for both the advertising and bid opening are set by the DFCM. At the time of bid advertisement at least one set of final corrected contract documents shall be issued to the Faculties Management Department for coordination purposes.

3.6.2 Addenda Procedure

When the addendum is required, it is compiled and issued by the Architect. The proposed addendum should be submitted for review to the Project Manager and the DFCM before being issued. The Project Manager will coordinate its review with Operations and Maintenance Personnel or other departments which are affected. At least five copies of the proposed addendum should be submitted to the Project Manager to expedite this coordination process.

Each final addendum should include any points of clarification which the Facilities Management Department of the DFCM feels should be brought to the attention of bidders. Copies of all addenda
should be forwarded to the bidders in sufficient time to allow for any necessary adjustment in the bids. At least five copies of each final corrected addendum should be issued to the Project Manager as a record copy.

3.6.3 Bid Opening

The bid opening is supervised by the DCFM. The Project Manager shall be at the bid opening and available to assist in the analysis of bids with the DFCM. In cases where the University is the source of funding, after the bids have been analyzed and recommended for approval by the Project Manager, the Vice President of Facilities Management of the University will send a letter of recommendation on the acceptance of bids to the DFCM. Upon receipt of this recommendation, a formal contract and notice to proceed will be issued by the DFCM to the successful bidder.

3.7 Change Order Procedure

The University complies with the change order policy of the DFCM.

3.7.1 Proposal Initiation

Whenever the Architect, the Contractor, Project Manager or DFCM personnel feel that the possibility of a “change order” should be investigated, the following procedure shall be followed:

1) A “Change Order Proposal” will first be requested from the general Contractor. (Complete explanation given below). The Contractor shall not entertain a request for a “Change Order Proposal” which is initiated by anyone except the Architect, DFCM representatives or the Project Manager. All such requests to the Contractor must be made through the Architect.

2) The Architect shall submit a written request for a “Change Order Proposal” to the general Contractor stating who originated the request. This request should include copies of any supplementary drawings and specifications that are necessary to completely explain the request, and any further information that the Architect feels should be presented.

3.7.2 “Change Order Proposal Format”

Upon receiving the request from the Architect, the general Contractor shall prepare or have prepared the following:
1) A cost breakdown of all material and labor required to do the work in question.

   a) Material breakdown shall include an itemized list of all material to be used in the change. This shall include quantity costs, a per unit cost, per square foot or per lineal foot of material cost or any other detailed information that may be necessary to fully explain all of the material to be used and the cost of that material.

   b) Labor breakdown shall include the number of workmen required to do the work; itemize the anticipated hours of labor for each workman and his hourly wage (including workman’s compensation, insurance, etc.)

3) Credits shall be shown for all labor and material to be eliminated and shall be itemized as indicated above. All deletions of material or labor must be indicated in the “Change Order Proposal” regardless of whether or not there is a credit due the State. Where no change in contract price will be incurred, it shall so be indicated.

4) Extension of time. If an extension of the contract time is justified and is felt necessary by the Contractor, the number of day’s extension requested must be indicated as part of the “Change Order Proposal.”

3.7.3 Submittal of “Change Order Proposal”

After the “Change Order Proposal” has been prepared by the Contractor, the following procedure shall be followed:

1) The Contractor is to deliver four (4) copies (or as otherwise directed) of the proposal to the Architect.

2) The Architect is to review and check the proposal, to justify the prices submitted and the completeness of the submittal.

3) After the Architect is satisfied that the prices are justified and the form of the proposal is correct, the architect shall prepare a final change order using AIA document forms. The contractor and the architect both sign the final change order. The architect then delivers copies, with the contractor’s change order proposal breakdowns attached, first to the Director of the Project Manager of the University, and then to
the Project Manager of the DFCM for approval and signature.

### 3.7.4 Decision on “Change Order”

If funds are available and if the proposal cost figures and terms are acceptable, then the above mentioned parties sign and approve the change order.

Upon receipt of these approvals, the Architect is authorized to give the Contractor authorization to proceed immediately with the change(s). NOTE. Every attempt must be made by the parties concerned to see that all requests are properly submitted, properly prepared and documented and approvals give.

### 3.7.5 Formal Change Order

After the previous steps have been taken, the DFCM will formally issue the “Change Order” to legally make it a part of the contract. This authority lies solely with the DFCM and cannot be superceded by any other party.

When federal agencies are involved, their regulations must also be adhered to. Instructions thereto will be given at the preconstruction meeting.

### 3.7.6 Construction Change Directive (CCD)

A Construction Change Directive may be executed in lieu of a formal Change Order, by either the DFCM, or the Project Manager when the need arises to perform work immediately in order to keep the project on schedule. After the work is complete, or during performance of the work, the contractor will then submit a formal Change Order Request.

### 3.8 Campus Key Policy

Contractor shall comply with the Campus Key Policy

### 3.9 Submittals

3.9.1 **ALL** submittals will be provided to the Project Manager for approval prior to the start of ANY work. Allow two weeks for initial review by the Project Manager, and two weeks for reprocessing of rejected submittals.
3.9.2 Submittals shall be submitted on either a standard AIA form, or via a transmittal letter. The document shall include the title of the product being submitted as well as the appropriate Division numeral designator. When feasible, sample products shall be submitted with the document. The Project Manager may, at their discretion either return, or retain the product sample.

3.9.3 The contractor shall take note to NOT purchase, nor order ANY items being submitted until approval from the Project Manager in writing.

3.10 Inspections

The Architect is required to make frequent inspection tours of the project during construction to check compliance with proper construction methods and conformity to the intent of the design. All matters requiring improvement, change or some other form of attention by the Contractor shall be handled by the Architect and coordinated with the Project Manager, and as appropriate DFCM. The Project Manager shall be kept informed of all decisions, requests and actions.

Weekly inspection reports are to be sent to the Project Manager in the same week that the inspection occurs.

Inspection procedures other than standard inspections required by the Architect under the terms of his contract will be handled as follows:

A) Regular project visits are conducted by the Program Director for the DFCM.

B) Periodic project visits are conducted by the special inspectors employed by the DFCM.

C) The University may choose to employ the service of a special inspector for: structural, plumbing, electrical, concrete, etc. The University will assume the financial responsibility for those inspections. However, if a test should fail an inspection, the cost of repairs or replacement of the item(s) failing the inspection, and the cost of re-inspection will be the responsibility of the contractor.

D) All of the above people are involved in the project final inspection. Representatives of the appropriate Facilities Management functions will also be invited to attend the final inspection(s) which may be conducted separately.
3.11 **As-Built Drawings & Operations and Maintenance Manuals (O&M’s)**

Upon completion of construction, the Architect or Contractor shall provide an “As-built” set of original drawings for the building or project. This shall be a set of the working drawings which have been revised to incorporate all changes which were required or completed during the construction phase of the project. Two sets of these drawings on bond paper are required. One set shall be bound, and one set shall be unbound and provided to the Project Manager of the University.

Additionally, all documents are required to be provided in computer format. Submit on disk(s) (Compact disk, DVD or latest format currently useable by the University) to Facilities Management in electronic format. The campus uses AUTOCAD (typically, the latest version). The electronic files shall **NOT** contain Xref files, but shall be bound and all layers shall be capable of being manipulated (i.e., turned-on or off, change layer number, name, colors, etc.) All electronic drawings shall be viewed on-screen as they appear on the hard copy in “What you See is What you Get (WYSIWYG)” format. All electronic drawings shall be submitted, contained in electronic folders, named by each discipline (i.e., Civil, Architectural, Mechanical, Electrical, etc.) Each individual drawing filed shall be named exactly as is read on the hard copy (i.e., AE 102-Floor Plan Level Two, PE 103-Plumbing Plan Lower Level, etc.) ALL Contractors, regardless of project scope shall be responsible for providing AS-builts as per directed above, in both hard copy and electronic formant before final payment is authorized. These documents will be the property of Weber State University and can be used in the future as needed and at the discretion of WSU.

In addition to the “As-Built Drawings” and computer disks, four complete sets of Maintenance Manuals, final Design Calculations (structural, mechanical and electrical) and Mechanical Balancing information shall be provided as a permanent reference file. One set will be retained by the DFCM, one set will be retained by Facilities Management, two sets will be retained by the Heating, Ventilation, Air Conditioning/Refrigeration (HVAC/R) shop on campus.

As-Built record drawings shall be completed by each subcontractor and/or supplier, and submitted to the Architect or general Contractor as appropriate. All utility and infrastructure information will provide locations of underground installations by exact dimensions \((6\pm")\) from static objects such as buildings, fire hydrants, catch basins, light poles, etc. Measurements shall include depth dimensions \((4\pm")\) for ever 25 L.F. of installation. The A&E or Contractor shall be responsible for providing on-site instruction in the use of CAD drawings if the submitted format or instruction set is not acceptable to the end-user. The University prefers
that the O&M Manuals be provided in electronic format, indexed by section and on CD. The Project Manager will provide a sample format. Provide a minimum (4) four complete sets of Operational and Maintenance (O&M) manuals. Manuals and all supporting documentation shall be bound (three-ring binder, three-post binder, etc.) so as to be capable of easily being disassembled for purposes of making copies by the end-users. Manuals shall be coordinated with an indexing system to allow the user to quickly, logically and reasonably locate any document contained within. Each binder shall be labeled both on the spine and on the front cover.

3.12 Payment for Services

Depending on the project scope or type, payments for the service of the Architect may be made by the DFCM. All requests for payment should be made directly to that office but with require the prior approval of the Project Manager.

3.13 Punch List and Warranty Phase

3.13.1 Punch List All contractors and subcontractors shall be responsible to coordinate with the Project Manager or general contractor’s superintendent or authorized representative when performing Punch List and Warranty List item resolution throughout the project and/or warranty phase. Work shall be coordinated so as to not interfere with normal day-to-day operations or class schedules unless an emergency has been declared. The general contractor shall be responsible for generating a log of work performed, who performed the work and degree of completion. The Contractor shall provide a copy of the log to the Project Manager upon completion of the project.

Warranty Unless specified for a longer period, the minimum warranty period for warranty shall be one year from the date of Substantial Completion. The Contractor shall perform all warranty work as directed by the Architect or Project Manager, who will provide a list of warranty-related deficiencies, in an expeditious manner. The Contractor will have been provided with the keys and necessary means of access to the project as outlined in the Campus Key Policy.

3.14 Notification

3.14.1 Notification Procedures A request for any utility marking as may be required, will be submitted to the Project Manager a
minimum of five (5) working days prior to either arrival on the job site, or to any excavation, or other activity which may, in any way damage or disrupt utilities. The Project Manager will coordinate with the appropriate Facilities Management department for marking services. In some cases, the contractor may be required to contact and coordinate with Blue Stakes for marking.

A minimum of three (3) working days will be given to the Project Manager prior to scheduling the following activities:

1) Mobilization
2) Construction Start-up
3) All required inspections involving FM Shop personnel
4) Workers arriving on-site for completion of Punch List work.

A minimum of two (2) working days notice will be given the Facilities Management Business Center prior to arrival on the job site for warranty work. The Business Center will in turn, notify and make arrangements with the appropriate personnel.

Failure to follow these notification procedures may result in delays in completing the construction and project close-out process.

3.14.2 Lock-Out, Tag-Out Procedures Contractors performing work on Campus will be required to follow OSHA-approved lock-out, tag-out procedures. Such procedures will be applied but not limited to: All electrical main and distribution systems, motor disconnects, high and low pressure steam valves, potable water distribution system valves and irrigation system main line valves. A minimum of seven (7) working days will be given to the Project Manager prior to shutting down any campus utility.

3.14.3 Emergency Response During the construction phase of a project, the Contractor will be held responsible for immediate response to emergency situations caused by work associated with the project, or negligence and/or oversight on his part. Situations requiring emergency response by FM personnel for the protection of the University will be billed at the rate of $50.00 per hour, plus parts and materials. A two hour minimum charge will apply to all response calls after normal business hours. Requests
for other assistance from FM personnel in dealing with situations encountered as part of the contract documents will be billed at $50.00 per hour.

4.0 GENERAL DESIGN REQUIREMENTS

4.1 Campus Image

It is intended that all new developments on the campus should harmonize with the generally established campus image. A quiet, interesting environment conducive to learning is intended. Harmony of materials and design features throughout the campus lends itself to the feeling of a unified campus design rather than a series of unrelated buildings or objects which fight each other for design dominance. Imagination and innovation on the part of the Architect is encouraged but only within the established parameters of the overall general campus image. Facilities Management retains the right to approve or reject all design concepts.

4.2 Site Considerations

4.2.1 Roads and Parking

1) Master Plan Concepts

The campus has been designed with a peripheral road system and peripheral parking lots. In general, no vehicle traffic is allowed in the central campus area, which is pedestrian oriented. Where possible, a direct crossing of vehicle and pedestrian access paths has been and should be avoided. The main service access to buildings should be provided via service roadways which are separated from pedestrian walkways. Some limited vehicle traffic is allowed on pedestrian walks for service and emergency purposes only. The strength of the walks should be designed with this in mind.

2) Specific Requirements

a) Main roads (Edvalson & Dixon Drive, 4100 S, 4600 S) are designated as State Highways and all construction work which involves these roadways must comply with State Highway Department standards.

b) Service vehicle parking and access must be included as a part of every building project and so designated on the project drawings. Provide a service area for a minimum of
two trucks adjacent to the building. Provide space for trash containers which will be picked up by a truck lift. The trash containers must be visually screened from view and away from any fresh air intakes. Coordinate all parking stall sizes with Project Manager.

c) Parking lot lights shall match the campus standard light fixture.

4.2.2 Walks and Malls

1) Master Plan Concepts

The campus has been designed with two major pedestrian axes which intersect near the Bell Tower. One runs east and west between the Administration Building and the Social Science Building on the west to the Stadium area on the east. The second one runs north and south from Building #2 on the north, under the Union Building, to the dormitories on the south. In general, the walks of these major pedestrian axes have been designed as double concrete ribbons with a central planted median strip. A loop walk system is also part of the campus master plan. Secondary walks feed off these major walk patterns. Plazas are developed at major walk hubs and in the center of related building complexes.

2) Specific Requirements

a) Campus plazas should contain some pattern of brick pavers which conform to the campus brick color.

b) Exterior railings must conform to the campus standard railing type. All handrails and guardrails, etc. to be 304 stainless steel, with a #4 (brushed satin) finish.

c) Main walk lights shall match the campus standard light fixture. Install exterior lights around building at all walks, stairs and entrances.

d) Benches shall match the campus standard bench or be specifically approved otherwise. (Wabash Valley Products).

4.2.3 Landscaping

1) Development
The site confines from a new building are generally as shown on the Campus Master Plan and as such will be determined in consultation with Facilities Management. Topography, orientation, public access, service access and existing underground utilities in the area must be carefully considered and acknowledged. Specific information concerning these subjects is to be received from the Project Manager.

2) **Topographic Information**

a) The Project Manager will provide all topographic information available concerning the project site.

b) If it is determined by the Architect that an independent engineering survey should be provided, he/she will request a proposal to accomplish this work from a qualified, registered civil engineer. This proposal should then be sent to the DFCM with a request that the topographic survey be prepared.

c) The civil engineer hired to do the survey will prepare a topographic drawing which will become a part of the contract documents of the project. This drawing shall contain the engineer’s seal and certification of accuracy which the Contractor can assume this drawing will provide. The drawing must include the full area of the contract limits and, if necessary, approved areas outside the contract limits.

d) The civil engineer hired to do the survey shall provide both a certified reproducible and an electronic drawing file (AUTOCAD format) which can be used by the Architect in developing his contract documents. The engineer will also submit two separate reproducibles and two prints of the topographic drawings to the Architect for transmittal purposes. The Architect will transmit one reproducible and one print each to the DFCM and the Project Manager.

3) **Subsurface Exploration**

A subsurface exploration survey should be made for each new building. A copy of the report should be filed with the Project Manager. Digging coordination instructions for each such subsurface exploration shall be obtained from Facilities Management.

4.3 **Building Consideration**
4.3.1 Master Plan Concept
For design unity on the Campus, all buildings are required to be designed with the use of the Campus “golden-buff” brick. Brick pavers for courts or plazas are also required to be of the “golden-buff” color. In general, the Architect will also be allowed considerable design freedom so long as he complies with the standard brick requirement.

Exterior window and door mullions shall be dark anodized aluminum. Exceptions to this policy must be individually approved for special design reason.

In most cases, academic buildings have been sited inside the University peripheral road and service buildings have been sited outside the peripheral road. This policy will continue.

Future building expansion must be considered in all building designs.

4.3.2 General Outlines
It is intended that all new buildings built on the Weber State University campus be compatible with each other and with the permanent buildings already in existence on campus. This is not meant to imply that they should be similar in design, but rather that they recognize the characteristics of their environment and become an integral and complimentary part of the campus fabric and the master plan.

The overall building character should express and typify the function it houses. The concept should be bold and exciting; however, a timeless, dignified character is essential. Materials and textures should be tastefully selected. The new building should be an imposing yet dignified structure and a complimentary expression of the progressive institution it will serve.

4.3.3 Materials
Al materials should be of a high quality, of lasting nature and should require minimum maintenance. They should be of a type that will convey the dignity and importance of the building and institution.

All material and color samples should be submitted to Facilities Management for approval. They must be compatible with the overall campus character.
4.3.4 **Interior Colors**

Some standardization of campus interior color schemes is necessary to simplify maintenance procedures while giving some flexibility of choice to the individual building occupants. It has been determined that the best way to accomplish this goal is to establish a policy that the colors of fazed building materials should be neutral. This allows different occupants of the space to change the color scheme of their area by bringing in personal or furniture items of any color combination which fits their particular color taste without the maintenance expense of repainting or refinishing walls and cabinet work each time a new person moves into the space.

Selection of color schemes to fit the whims of individual occupants should be avoided since it is a foregone conclusion that others will occupy their space at some future date. Compliance to this policy does not mandate that every area must be totally neutral in color however. With the approval of Facilities Management accent colors and imaginative concepts are acceptable for special design reasons.

As a general guideline, the following policy should be followed:

1) **Walls** – Colors to be neutral. Preference is a warm tone, off-white.

2) **Ceilings** – Neutral. Preference is white.

3) **Floors** -
   
   a) Color to be neutral.

   b) Resilient floors to be mid-tome; dark colors to be avoided because they show dust; very light colors to be avoided because they show scuffing.

   c) Carpet color to comply with general color scheme of building. Earth tones are preferred. Very light colors should be avoided. Carpet shall be selected on the basis of that which is the current Campus standard. Carpet must comply with fire code. Short pile, commercial carpet is recommended.

4) **Cabinet Work** – Use natural woods or high pressure laminates.
5) **Doors and Frames** – Use solid corewood for doors to match existing wood in building. Rubbed oil finishes are not acceptable. Frames to be painted hollow metal.

6) **Window Treatments** – All window treatments shall be approved by the Project Manager.

7) **Color Accents** – To be accomplished by upholstery of furniture, pictures, etc. (movable, non-fixed items).

### 4.3.5 Codes

The building must be designed to meet all local, state and regional building codes, and shall meet the Fire Underwriter’s code for fire resistant construction. Codes applicable to the various trades, such as electrical, plumbing, and mechanical shall be those currently in effect in the State of Utah.

The Architect is cautioned that many state codes required by the DFCM are more stringent than the National code standards. The building design must be in compliance with the most stringent code requirements.

### 4.3.6 Quality of Workmanship

Workmanship must be of the highest quality. Inferior workmanship and methods of construction will not be acceptable. The importance of this project, to the many people it will serve for years to come, requires that it be built with conscientious effort toward obtaining the best results possible.

### 4.4 Utility Considerations

#### 4.4.1 Master Plan Concepts

The campus has a central boiler plant which provides steam to most campus buildings for heating purposes.

The campus has a central chilled water plant which provides chilled water to most campus buildings for cooling purposes. NOTE: The chilled water plant is shut down during the winter months.

The campus has its own electrical substation which serves only University facilities.

The campus has an underground tunnel system which interconnects most of the campus buildings. Many of the campus
utilities are run through the tunnel system. Wherever practical it is the desire of the University to extend the tunnel system to new buildings. The campus has a centralized automation control system for monitoring and operating mechanical systems in each building. All new buildings should be connected into this system.

4.4.2 General Guidelines

1) Facilities Management and the DFCM will provide all utility information available concerning the project work. Request for this information should be made first to the Facilities Management Department of the University. If additional information is required, the DFCM will become involved.

2) The Project Manager shall evaluate the utility information available against the project needs.

3) The Project Manager shall be consulted concerning utility connection points, capacities, etc. The Project Manager will accomplish all coordination necessary with the appropriate campus departments.

4) Where possible and/or economically feasible, systems should be designed with future expansion or usage changes in mind.

4.4.3 Heating

Heating systems for all new buildings shall be designated to be tied into the high pressure steam system of the campus unless otherwise instructed. The connection to the heating system will be coordinated with the Project Manager of the University. High pressure steam supply from the Heating Plant is 100 psi. However, designers shall be solely responsible for determining the operating pressure to each building and determining the proper system design, and shall be documented.

4.4.4 Air Conditioning

All new buildings shall be air conditioned unless otherwise instructed. Cooling systems shall be designed to be tied into the campus central chilled water system unless otherwise instructed. Special features or room considerations will be expressed in the building design program and/or discussed as the building design progresses. Designers shall be solely responsible for researching
the existing operating pressure and flow rate for the project, and determining the proper system design and shall be documented. Window units are discouraged

4.4.5 Electrical

1) General

The electrical system shall be tied into the electrical distribution system of the campus. The electrical distribution system within the building must be flexible enough that partitions can be relocated without complication. An under floor duct or other special system will be essential in all heavily used technical areas. Equipment containing PCB must be avoided. The primary campus electrical distribution system is 12,470 volts.

2) Emergency Lighting

Emergency lighting should be provided on all floors below grade or where light must be provided in evacuating rooms with over 150 person occupancy and the entire building in case of emergency.

3) Outdoor Lighting

Adequate outdoor lighting must be provided in all landscaped areas which are under the jurisdiction of the Architect’s contract.

Fixture placement and lighting patterns must conform to the criteria established for the particular area involved by the Master Plan of the campus. Harmony with the surrounding established features is emphasized. Install lights at all walks, stairs and entrances around new buildings.

4) Incentive Program

Weber State University participates in Rocky Mountain Power’s energy efficiency incentive program. The General Contractor and/or his subcontractors will be required to furnish all necessary documentation, prior to project close-out to comply with RMP stipulations.

4.4.6 Water
Source of potable water is the Ogden City distribution system. Source of landscape irrigation water for the main campus is Ogden River Water Users Association (Pineview Water) and for the Dee Event Center, and University Village properties, it is Weber Basin Water.

4.4.7 Sewer

The University sewer drains into the Ogden City Sanitary Sewer System; therefore codes applicable to that system must be followed. Consultation with Faculties Management is necessary before any changes in sewer can be made.

4.4.8 Natural Gas

Underground piping is available on the campus. The normal pressure is 5 psi, but shall be verified and documented by the designer.

4.4.9 Area Drainage (Storm Sewer)

The area drainage system should be coordinated with the campus drainage system which empties into the Ogden City storm drainage system via the retention basin on the west side of campus.

4.4.10 Telephone

The building telephone system will tie into the underground cable system and University switchboard center now serving campus.

4.4.11 T.V.

Distribution spaces, conduits and duct systems must be included in all buildings to allow for future developments in television and other means of communication. It is anticipated that the use of television as a teaching medium will constantly increase in importance as the University expands. It is therefore essential that all new classroom facilities be designed to incorporate the necessary equipment and hookup to accomplish this end.

4.4.12 Data Network Connections

Connection to the campus data network is essential to University operations, and provision must be made for such connections as appropriate for the planned uses of the building and the spaces therein. These provisions must include wall jacks, boxes, pathways, and wiring conforming to the EIA/TIA 569-A
specification, with these connections facilitated to the telecommunication rooms and closets as described in Sections 13 D and 16 H. The length of the runs back to the telecommunications room must not exceed the EIA/TIA 569-A standard of 90 meters (290'). The Contractor shall be responsible to install empty conduit and boxes. The conduit is to have pull cords. Installation of wiring and equipment may be done by the Contractor or by University personnel. Assignment of the wiring and equipment work will be made during the programming/design process.

4.4.13 Automation Systems

All new buildings must have provisions to tie into, and be 100% compatible with the central automation control system of the campus. The main control center is located in the Automation Center and is tied to the various campus buildings via cables which are run through the tunnels. Monitoring and control of the mechanical and electrical systems in each building is considered an essential energy conservation procedure for the entire campus as well as maintenance-saving device. At a minimum the control system shall:

1. All controls should be able to monitor, control, and adjust all set points and control points.
2. All DDC controls and PLC’s should interface with the current Automation system.
3. We currently use the campus data network system to communicate with the supervisory controllers. The supervisory controllers communicate with the individual DDC and PLC.
4. Critical PLC’s should be stand alone operational if they are disconnected from the Head-end.
5. DDC and PLC should be N2 compatible.

4.4.14 Fire Protection

It is the responsibility of the Architect to determine adequate fire protection provisions consistent with recommendations of the National Fire Protection Association and other applicable agencies. Special consideration shall be given to comply with insurance coverage and rates.
The campus has a central fire alarm system into which all new buildings must tie. Under this system signals are transmitted from the building alarm panel to a central panel located in the Heating Plant. This panel in turn is connected via direct line into the Ogden City Fire Department.

The Ogden City Fire Department serves the campus with access routes over roads, service drives, or pedestrian walks.

It is recommended that serious consideration be given to the installation of fire sprinkling systems in all new buildings to provide maximum protection to the buildings and their contents.

Where necessary, new fire hydrants should be installed as part of utilities development of the site to provide the protection which is required by the fire code.

### 4.5 Special Considerations

#### 4.5.1 Provisions for Handicapped Persons

Compliance with all provisions of the State and Federal Handicap Codes is required for all building and site development work on the campus.

#### 4.5.2 Vending Machines

Each building should include an out-of-the-way area for vending machines. Connections for water, power and drains must be provided. See the Project Manager for number and type of machines to be installed. Space for containers for handling empty bottles and refuse should also be provided. Provide data outlet for future card purchasing system adjacent to the power outlet for each vending machine.

#### 4.5.3 Signs

1) **Exterior Signs**

   All outdoor/exterior signs shall be approved by the Project Manager in accordance with the current Campus sign policy.

2) **Indoor Signs**
As a general rule, indoor signs are provided by the University. An allowance to cover these costs may be included in the project budget. See the Project Manager for instructions.

4.5.4 Custodial Room

Provide at least one custodial room on each floor of the building to eliminate carrying heavy equipment from floor to floor. Room to be large enough to contain a sink, shelves, mop and broom racks and shelves for supplies. Minimum size to be 79 sq. ft. At one location in each building the custodial room should be increased in size to house a locker, desk and chair in addition to the items above.

4.5.5 General Design Criteria

1) Design for minimum wind load of 90 MPH. This velocity has occurred on the campus in the past.

2) Snow load 40 lbs.

3) Seismic shall govern over wind.

4.5.6 Maintenance Accessibility

All systems (Lighting, HVAC Components, Plumbing, etc.) must be readily accessible for repair and/or maintenance. Examples of things to avoid include light fixtures in locations where safe access is a concern, heating and cooling coils in cramped locations, “stacked” fan systems and buried valves, drains, and clean-outs. Pipe chases shall be designed to allow for individual access to the piping and reasonable room to work.

4.5.7 Energy Conservation

Design to meet or exceed state mandated energy reduction requirements and ASHRAE 90.1-2001.

4.5.8 Compatibility

All new building systems must be compatible with existing campus systems. Of special concern are locks and items related to the central campus automation system.

5.0 GUIDE SPECIFICATION STANDARDS – WEBER STATE UNIVERSITY
The C.S.I. Specification Format is the outline upon which this Guide Specification is based. It is suggested that all specifications for University projects should follow the same major division outline; however, subject arrangement under each major division is left to the discretion of the Architect.

Comments in the Guide Specification relating to specific subjects are intended to express University feelings, decisions or previous directives only. They are based upon past experiences of University personnel in construction and maintenance. It is felt that the statements herein will aid the Architect to design and specify a project which will avoid the errors of previous projects and comply more fully with University criteria.

These Guide Specifications are not intended to dictate specification content or to interfere with the individual decisions of the Architect. Equal or higher quality items will be accepted and the Architect’s advice and discussion are requested.

**GUIDE SPECIFICATION INDEX**

(Outline of major division headings suggested to be followed by all specifications on University projects.)

Bidding Requirements
Contract Forms
General Conditions (and Supplementary General Conditions)
Specifications

Division 1 – General Requirements
Division 2 – Site Work
Division 3 – Concrete
Division 4 – Masonry
Division 5 – Metals: Structural and Miscellaneous
Division 6 – Carpentry
Division 7 – Moisture Protection
Division 8 – Doors, Windows and Glass
Division 9 – Finishes
Division 10 – Specialties
Division 11 – Equipment
Division 12 – Furnishings
Division 13 – Special Construction
Division 14 – Conveying Systems
Division 15 – Mechanical
Division 16 – Electrical

**STANDARDS**

**Bidding Requirements**
Dates and times are established by the DFCM or the University just prior to bidding.

**Contract Forms**

Standard State of Utah forms to be used.

**General Conditions (and Supplementary General Conditions)**

**Section GC. 1 – Fire Insurance**

Owner (State of Utah) to maintain fire insurance on structure during construction, including coverage of materials on site.

**NOTE:** All insurance of contractors must name Weber State University as being “insured.”

**Section GC. 2 – Substitutions**

Submit requests for any substitutions to the Project Manager.

**Section GC. 3 – Samples and Submittals**

At least two weeks shall be allowed for review and approval of samples and submittals by Facilities Management.

**DIVISION 1: GENERAL REQUIREMENTS**

**Section 1A – Site Examination and Access**

1A-01. Discuss site conditions and locations of utilities with the Project Manager at the early stage of plan development.

1A-02. Describe access routes to job site, through the campus, of concrete trucks, delivery trucks and other vehicles concerned with the project. Coordinate staging areas (if needed) with the Project Manager. In some cases, staging areas are not available, and the contractor will have to make other arrangements for staging. Consult with the Project Manager who will coordinate this matter with the University Public Safety Department. The Contractor is required to clean roads of all spillage or debris associated with his hauling work.
1A-03. The Project Manager will acquaint the Architect with available survey bench marks. Architect will establish building location and elevations from these points.

1A-04. Elevations of survey monuments on University maps and drawings are based upon Ogden City surveys.

Section 1B – Campus Restrictions

1B-01. Contractor to abide by all campus regulations in regard to traffic, parking, smoking, safety, etc.

1B-02. All trash to be hauled from campus – no burning is allowed. Contractors are not allowed to use campus dumpsters. Failure to comply with this policy will result in the contractor being charged for the dump fee(s).

1B-03. Class schedules will be observed (and in many situations, dictate availability and access to the work), to avoid undue disruption.

Section 1C – Permits

1C-01. No city permits required or paid for on projects inside University property lines. Permits are required, however, for utility extensions which extend beyond these boundaries. City Engineer’s office must be notified before sewer and water connections are made. Copies of such requests to be sent to the Project Manager.

Section 1D – Codes

1D-01. IBC, State and local code requirements.

1D-02. Ogden City Building Code (Uniform Building Code,) as applicable.

Section 1E – Temporary Facilities

1E-01. Enclose construction area with fence at least 6"0" high. Gates will be installed and closed and locked when the site is not occupied by construction personnel. The general contract shall assume full responsibility for securing the work site within construction limits.
1E-02. Construction office(s) and sanitation facilities will be provided by the Contractor unless conditions warrant other specific arrangements with the University.

1E-03. Project signs are not required on smaller projects, however, when required, shall be provided by the General Contractor, including a project information sign which shall include the following: Name of Project, DFCM logo, Weber State University Logo, Contractor’s name (subcontractors may also be listed if practical), and design team names.

1E-04. Contractor shall make arrangements with the Project Manager for temporary utility connections and bear all costs for these utilities. Contractor to install meters for measuring use of utilities purchased from Weber State University. Meters to include power, water, steam and gas. Meter readings to be given to the Project Manager at the beginning of project. When the project is complete, or when the need to no longer meter utility usage has been determined by the Project Manager, the contractor shall take ending meter readings in the presence of the Project Manager. The Project Manager will then determine the values of utility usage and make the necessary arrangements to initiate a deductive change order for reimbursement.

1E-05. Provide dust separations in all work areas, as per State regulations for dust and fugitive dust control.

Section 1F – Contractor Use of Building Equipment

1F-01. The Contractor may use equipment such as electric motors, blowers, heat exchangers, filters, lighting fixtures, etc., with the written permission of the University. As each piece of equipment is used (such as electric motors and blowers) maintenance procedures approved by the manufacturer are to be followed. A careful record is to be kept of the time used, maintenance procedure, and of any difficulty experienced with the equipment. These Contractors’ records on the equipment are to be submitted to the Project Manager upon acceptance. Depending on the length of time used, it may be required that the Contractor replace in a new condition certain expendables of the equipment, such as belts, filter media, fluorescent tubes and/or incandescent globes. Wearing surfaces (such as bearings) shall be carefully inspected just prior to acceptance. Any excessive wear noted shall require replacement. The Contractor will
still be charged for utilities services, as mentioned above. The guarantee period for the equipment shall begin with final acceptance by the University, and not at the time the Contractor starts using the equipment.

Section 1G – Transferring Items from Contractor to University

1G-01. All items transferred directly to the Project Manager by the Contractor shall be accompanied by a letter of transmittal document the item or items. This letter shall be signed by the Project Manager and a copy of the signed letter delivered to the Project Manager as a record copy. Keys, salvaged equipment, extra or service parts or other similar type items shall be handled in this way to avoid misunderstanding of what has been transferred and when.

Section 1H – Hazardous Materials

1H-01. To insure the safety of its own employees, as well as those of the contractor. Weber State University requires all contractors to comply with OSHA provisions. Prior to operating on the campus, contractors will submit (through the Project Manager) written notification of chemicals or other materials which will be brought to or used on the project which are classified under Federal/State regulations as hazardous. This written notification shall include labels, MSDS’s, and operational procedures.

1H-02. In the interest of contractor employee safety, the campus Safety Office of the University will brief contractor supervisors on pre-existing chemical hazards in the contractor’s work area(s), labeling systems, location of MODS books and other appropriate matters.

1H-03. The campus Safety Office of the University, in cooperation with the Project Manager, will inspect the work area at the completion of contractor operations to insure that all contractor-owned chemicals are removed from the campus. The contractor will be held responsible for this removal.

Section 1I – Special Requirements

1I-01. The state energy code must be followed and careful consideration must be given to life-cycle costs.

Section 1J – Maintenance Needs
1J-01. The needs and space requirements for custodial staff and for storage of special equipment required for maintenance must be incorporated into the initial stages of the design.

DIVISION 2 – SITE WORK

Section 2A – Excavation, Cutting, Backfilling, Grading and Cleanup

2A-01. Site Preparation: Strip site area topsoil and stockpiles in designated area.

2A-02. Site Finishing: Grade site to contour and redistribute topsoil.

2A-03. Excess Earth:

b) Check with the Project Manager to see if campus sites may be available to deposit excess soil not needed for site grading.

c) Contractor to move trucks and equipment on prescribed roads. Keep roads free from mud, dust and spillage at all times.

Dust control measures shall be taken to keep dust from blowing onto adjacent property and through the community. These measures shall be taken whenever dust threatens, including Saturday, Sunday and holidays. The Contractor will comply with Federal and State regulations regarding fugitive dust.

d) Contractor to spread and level dirt in designated fill areas with heavy equipment.

e) Mechanical compaction is required in all fill areas around buildings and trenches. Obtain optimum compaction in all soils. Past experience dictates soil compaction tests should be included plus a good strong mechanical compaction specification.

f) Grade stakes to be furnished by Contractors surveyor.

g) No cleated track vehicles will be allowed on campus roads.
h) Contractors will keep the project site neat and clean at all times to the satisfaction of the Project Manager.

i) Disposal of concrete (clean-outs), grout, mortar, etc., will only be permitted by using approved mobile, dump-type containers, approved by the Project Manager.

j) The Contractor will comply with the latest requirement of Storm Water Phase II.

**Section 2B – Landscaping**

2B-01. Use of cobble rocks is discouraged unless soil beneath is sterilized.

2B-02. Trees and shrubs shall be spaced far enough away from buildings and other trees and shrubs to accommodate future growth.

2B-03. Preservation of existing trees is required if possible; coordinate with the Project Manager prior to removing any existing trees.

2B-04. Eliminate grass planted slopes steeper than a 15% grade. Hillsides must be of a low enough slope to allow for safe mowing by machines under damp conditions.

2B-05. Handrails for outside steps and ramps are required.

2B-06. Use of concrete or wood mowing strips around buildings, planting beds, retaining walls and trees is desirable.

2B-07. Use mulch materials, matting or ground cover plants on steep terrain and in planting beds.

2B-08. Sharp corners of lawn areas should be avoided. Informal lines and gentle curves provide easier maintenance.

2B-09. Use plant materials adapted to soil and climate of planting site. Drought resistant, deer resistant plants are preferred over high maintenance ornamental types. Consult with Project Manager for approval, at a combined meeting prior to specifying and purchasing said materials.
2B-10. Grading should be designated so that water drains away from buildings under all circumstances.

2B-11. No trees shall be planted in shipping containers.

2B-12. Contractors to be responsible for all watering and maintenance until landscaping is formally inspected and accepted. Lawn areas must be maintained by the contractor until a growing, thickly covered, totally weed-free surface can be demonstrated. Maintenance by the Contractor includes watering, cutting, weeding and fertilizing. Substantial completion will not be declared until this condition exists even if it takes until the following spring or summer.

All trees and shrubs must be healthy and growing, and all damaged items replaced before substantial completion is declared. The Contractor is responsible for all maintenance of these items until this condition occurs. Maintenance by the Contractor includes watering, pruning, weeding and fertilizing.

The entire landscape package will be accepted or rejected as a whole.

The Contractor will be held responsible to replace all plant materials and law areas which do not remain healthy and growing after one year from the substantial completion date.

The Contractor will be held responsible for the maintenance and watering of all landscape areas adjacent to the project. EXAMPLE: Often the sprinkler system which covers the construction project area also waters adjacent landscape areas. If the contractor shuts this system off, the adjacent areas die as well as the project area. The Contractor may use one of the following solutions:

1) The Contractor may modify these systems on a temporary basis; so that the campus Landscaping Department can continue to water/maintain the adjacent areas.

2) The Contractor can replace all adjacent areas which are damaged when the rest of the landscape work is done. In this case, all guarantees and maintenance/watering requirements of this specification would apply to the adjacent work also.
The University will not be responsible for water damage which occurs on the construction project which relates to landscape watering procedures. Landscape water necessarily produces water. The University intends to keep adjacent areas green. It is unreasonable for the contractor to request reduced watering schedules, or other special procedures, to accommodate his needs. It should be the primary responsibility of the contractor to protect his work against any possible water damage.

The Contractor will perform replacement of adjacent sprinkler heads; remove ruts in the adjacent laws, etc. which occur as a result of his work or equipment. These items must be repaired immediately to avoid disruption of campus functions.

2B-13. Provide adequate water draining from all tree and shrub areas. Campus soil conditions retain water in clay pockets which kills trees and shrubs. Special details must be accomplished to avoid this problem.

Section 2C – Sprinkling Systems

2C-01. PVC Schedule 40 piping is required minimum for distribution systems. Use Schedule 80 PVC, vertical stems.

2C-02. Shrubbery, flower beds and grass on separate control valves.

2C-03. Control valves to be globe type.

2C-04. Hose bibs – at least every 100 feet around buildings – anti-freeze type. Bibs should be on building system and not on the sprinkler valve. Provide inside shut-off valve to facilitate repair or replacement without shut-down of entire building.

2C-05. Loop systems for steady pressures. Eliminate dead end lines.

2C-06. Automatic operation of systems is required. Irrigation controllers to be Rainbird IHC “Independent Station Computer Controllers.” All irrigation pumps, controllers and/or valve actuation systems shall be fully integrated with and tied into the Johnson “Metasys” at the Ogden Campus.
automation system and the STAEFA system at the Davis Campus.

2C-07. Keep sprinklers away from buildings.

2C-08. Use manual valves for drains rather than automatic drains.

2C-09. Design permanent systems with triangular spacing whenever practical.

**Section 2D – Walks**

2D-01. Lay out walks with idea in mind that they may serve as access service roads for fire trucks, snow plows, garbage trucks and other service vehicles. Design major walks to support the weight of the above vehicles. If stairs are necessary for student travel, allow other ramp access for service vehicles. Allow an addition 3 feet of width for clearance where walks are adjacent to automobile parking lots. Provide a turn around space for any dead ended walks to accommodate service vehicles.

2D-02. Permanent walks to be concrete.

2D-03. Temporary walks to be asphalted concrete.

2D-04. Use of brick walks is discouraged. However, brick in terraces and plazas is encouraged.

2D-05. Minimum width of walks to be 5'-0" to accommodate snow plows.

2D-06. Avoid streams of water draining over walks.

2D-07. Gratings in walks and terraces must have opening sizes which consider wheelchairs, canes, normal foot wear, etc.

**Section 2E – Asphalted Concrete Pavement**

2E-01. Sterilize soil under pavement with appropriate compound(s) prior to placing new pavement.

2E-02. Walks: 4" of road base 2" asphalted concrete.

2E-03. Roads: 8" of road base 3" minimum asphalted concrete.
2E-04. Walks and roads to have ample slope for drainage – 1/4” per foot minimum.

2E-05. Parking curbs for cars to be set so the fronts of cars do not hang over walks or lawns. Consideration should be given to the provision of tire blocks where required. Maintenance access for lawn cutting and snow removal equipment must not be impaired.

2E-06. Use flush paving area around obstructions such as poles, fire plugs, vents, etc.

2E-07. Avoid the use of “Hammer-head” ends on parking lot islands. These interfere with snow removal.

2E-08. All parking lots to be designed with snow removal in mind. This includes not only the easy use of snow plows but also a place to store the snow. Islands should be clearly marked with uprights so they can be found when covered with a heavy snow layer.

Section 2F – Cleanup and Repair

2F-01. Replace roads, walks, landscaping, sprinkling systems, utility systems and other existing facilities disturbed by construction.

2F-02. Remove all debris generated by the work from the site. Disposal on the campus is not permitted. Contractor shall obtain acceptance of clean-up efforts from the Project Manager.

DIVISION 3: CONCRETE

Section 3A – Walls

3A-01. Walls below grade to be placed continuously: i.e., no horizontal joints.

3A-02. Proper vibrating equipment to be used with emergency standby vibrators on job during pours.

3A-03. Concrete walls below grade should have a moisture proof barrier which will allow for expansion.
**Section 3B – Slabs and Other Flat Work**

3B-01. Screeds to be at proper levels.

3B-02. Concrete to be struck off at proper levels.

3B-03. Air entraining admixture to comply with (ASTM C-260). All exterior slabs and flat work shall be 4,000 psi, compressive strength, and shall contain fibermesh (1 ½” length, virgin polypropylene, non-fibrillated), at 4.7 lbs. Per Cubic Yard. Microfiber is not allowed. All exterior slabs and flatwork shall be properly cured and sealed using a penetrating sealer such as Ashford’s formula, etc., and placed according to the manufacturer’s recommendations. Minimum slab thickness shall be 4”.

**Section 3C – Building Floors**

3C-01. Building Floors shall be placed level, with no more than 1/8” deviation from the design elevation within 25’ in any direction, unless otherwise specified.

**DIVISION 4: MASONRY**

**Section 4A – Campus Face Brick**

4A-01. Hard burned fire clay brick shall substantially match the campus standard brick for coloring and texture. Color is Golden Buff. Color of mortar must also match existing.

**Section 4B – Precast Stone (Walls)**

4B-01. Caulking and sealants: See Section 7E

4B-02. Design joints so that insects cannot enter building.

**Section 4C – Samples**

4C-01. Sample panels to be approved by the Project Manager.

**DIVISION 5: METALS – STRUCTURAL and MISCELLANEOUS**

**Section 5A – Special Loadings**

5A-01. In laboratory spaces, where steel framing is exposed, make provision for addition loading for traveling cranes, etc.
**Section 5B – Floor Decking**

5B-01. Provide ducts for communication systems in all classrooms; consult Facilities Management.

**Section 5C – Stair Components**

5C-01. Railings: Design railings with bars close enough so children cannot fall through.

5C-02. Nosings: Non-slip type.

5C-03. Treads: Corrugated treads not recommended in any public space.

**DIVISION 6: CARPENTRY**

**Section 6A – Doors**

6A-01. Doors fitted for cylinder locks should provide for a two and one-eight inch (2-1/8") diameter hole with a two and three-fourths inch (2-3/4") basket.

6B-02. Double doors without a central mullion have caused security and maintenance problems. Avoid this type of installation wherever possible. When required, make the central mullion removable.

6B-03. Fire doors should not have asbestos core filler.

**DIVISION 7: MOISTURE PROTECTION**

**Section 7A – Roofing**

7A-01. Roofs shall be single-ply membrane (60 minimum thickness).

7A-02. Flat roofs: Roofing to be equal or better than a 20 year bond type.

7A-03. Roof color to be red to match existing main Campus roof colors. Coordinate material types with the Project Manager.

7A-04. Minimum of ¼" per foot slope. The roof deck structure should be designed to provide free flow of water to drains and to prevent “ponds”.

48
Section 7B – Scuttles

7B-01. Must be leak proof. Stainless steel is preferred.

7B-02. Provide hasps for locking.

Section 7C – Skylights

7C-01. Must be leak proof.

Section 7D – Waterproofing

7D-01. With concrete walls below grade; the use of antihydron or equal admixture plus pouring concrete continuously is recommended.

7D-02. Where ground water is evident or where outside grading allows water to accumulate on exterior of buildings or where there is planting against building, use membrane waterproofing on exterior surface of wall in addition to item 7D-01.

7D-03. Extreme underground water conditions have been experienced all over the campus. Gravel backfill against walls and footing drains should be seriously considered on all building projects. Provide filter fabric protection over gravel backfill to prevent them from filling with fine sand which is prevalent on campus.

Section 7E – Caulking and Sealants

7E-01. Precast stone, metal window walls (curtain wall), and metal windows: Silicone Rubber equal to Dow Corning #78 or a Polysulfide equal to Thiokol Base, Federal Specification TT-S-00227, Sikaflex, Hornflex or other suitable materials may be submitted to the Project Manager for approval.

Section 7F – Curbs

7F-01. All roof-mounted equipment shall be mounted on a curb.

DIVISION 8: DOORS, WINDOWNS AND GLASS

Section 8A – Doors
8A-01. Metal door frames with solid core wood doors, wherever possible, are preferred. A wood core (not a particle board core) should be used whenever door accessories are to be fastened to the door.

8A-02. Frames: Anchored every 16" or less vertically in masonry.

8A-03. Metal Doors:
   a) Interior – 18 gauge minimum
   b) Exterior – 16 gauge

8A-04. Wood Doors: Solid wood core doors faced with minimum of 1/16" veneer finish are recommended. No wood veneer doors to be used as exterior doors.

8A-05. Sliding doors to have overhead tracks.

8A-06. Kick plates for doors in heavy traffic areas (This to include classroom doors).

8A-07. Fire doors should not have asbestos core filler.

Section 8B – Finish Hardware

8B-01. Use restricted keyways. With some exceptions (to be approved by the Project Manager), “ASSA” is the keying system used on the campus. “Best” is used in the Residence Halls and Union Building. Owing to long lead times for obtaining lock cylinders, it is important the ordering of same be coordinated with the Campus Lock and Key Department as soon as possible after the contract has been issued.

8B-02. Key control is handled by Facilities Management.

8B-03. Keying:
   a) General Criteria
      1) Great grand master for entire campus. New key must match existing campus ASSA system.
      2) Great grand master for each related complex of buildings (where applicable). Coordinate with existing ASSA key system.
3) Master for each building. Each building to be set up on a two-key master system:
   a) Key for outside doors.
   b) Key for interior spaces (offices & classrooms)
   c) Custodial, Electrical and Mechanical rooms, keyed specific.

4) One sub-master for each department.

5) Change keys for individual rooms.

6) Each building to have different key way (ASSA-restricted where new locks are required.)

7) Separate master key for all campus Mechanical Rooms, Electrical Vaults and Custodial Closets. Match existing DO NOT key to great grand master, grand masters or any other campus key system.

8) All new keying shall be coordinated with the Project Manager.
   b) Outside doors to be keyed alike. Outside doors to be keyed to the campus great grand master, the building complex grand master (if applicable), and the building master.
   c) Inside doors to be keyed to the campus great grand master (if applicable), and the building master (offices and classrooms only).
   d) Individual office keys to open that office plus all interior doors necessary to get to the office or areas needed for special access. (Coordinate with Project Manager). DO NOT key to the outside doors.
   e) Custodial closets in each building to be keyed to Campus ASSA (AA1 keyway).

8B-04. Key blanks to be stamped “WSU-Do Not Duplicate” (except one cutting key).

8B-05. Furnish 2 cut keys and 3 blank keys with each lock per change key. Balance shall be delivered in key blanks (100 additional blanks per building).
8B-06. All major construction should be keyed with temporary construction master system. This system should be used until all work is completed and Contractor is out of building. Change keys should be submitted with original door. Provide a set of keys necessary to gain access to all areas of the facility to the Project Manager.

8B-07. All keys and blanks, with the exception of the construction masters, should be delivered directly to the Project Manager.

8B-08. The Project Manager must review and approve all keying and hardware lists prior to initiation with the Contractor.

8B-09. Locks:
Mortise Locks are preferred. Russwin, Corbin or Sargent are approved for the main campus. Best is used on the Union Building and Residence Halls. Extra Heavy Duty.

8B-10. Closers:
Use surface mounted non-handed door closers. Concealed closers or floor closers created maintenance problems. LCN or Russwin closers preferred. Closers shall be designated to withstand exceptionally heavy traffic normal in school buildings.

8B-11. Hinges shall be ball bearing butt hinges.

8B-13. Panic hardware shall match other hardware in building. Use on all areas required by Code. Inside operation on cross bar. Outside operation by knob or thumb piece. Key disengages knob or thumb piece. Avoid rod type panic hardware. Latch type preferred.

8B-14. Door bumpers and stops should have solid backing for durability under severe use.

8B-15. Cabinet locks which have proven to be successful are:

a) Door Locks:
National C8123 or equal
Mortise type, pin tumbler, brass, surface mounted

b) Drawer Locks:
National C8138 or equal
Mortise type, pin tumbler, brass, surface mounted.
Section 8C – Windows

8C-01. No ventilated windows to be operated with crank mechanisms unless windows are in tandem and heavy industrial crank mechanisms are used.

8C-02. Provisions made to facilitate easy washing of windows from inside building.

8C-03. Weatherstrip all operating windows.

8C-04. Operable windows to allow natural ventilation are required. Avoid a sealed building which is totally dependent on mechanical ventilation.

Section 8D – Glass, Glazing and Mirrors

8D-01. Glass to be cleaned by Contractor at job completion.

8D-02. Tinted glass guarantees to provide for perpetual inventory of stock of matching glass for replacements.

8D-03. Use tempered plate glass or wire plate glass in exterior and interior glazed doors.

8D-04. Considerable difficulty has been experienced with water leaking through the caulking or gaskets around window glass and frames. Specifications should provide for either a water leak test at a pressure equal to 50 MPH winds or provide a 10 year guarantee against leakage through the caulking or gaskets.

8D-05. Type of glass and thickness to be in accordance with the IBC.

8D-06. For any glass which has to be fabricated to size and is not normally in stock in Northern Utah (such as tempered or spandrel glass), the specifications should call for two pieces or 2% of the total quantity used, whichever is more, of each glass size to be delivered to the University in crates.

8D-07. Architects of projects using tempered or spandrel glass should coordinate their glass sizes currently used on the campus. It is desirable that these special glass types be limited to sizes currently in use in order to reduce the
number of sizes which must be carried in maintenance stock by the University.

**Section 8E – Curtain Wall**

8E-01. Curtain wall coefficient of heat transfer to meet State Energy Code requirements.

8E-02. Guarantees against “oil panning” on metal curtain walls.

8E-03. Caulking and Sealants: See Section 7E.

**DIVISION 9: FINISHES**

**Section 9A – Terrazo and Cast Stone**

9A-01. Colors of stairs and floors should be if intermediate shades in color.


9A-03. Design treads to facilitate sweeping.

9A-04. Corrugated treads not recommended in any public space.

9A-05. Aggregate to be clean and free from shavings, etc.

**Section 9B – Resilient Floor Coverings**

9B-01. Use intermediate color shades where traffic is heavy. 12” X 12” vinyl tile, 1/8” thick is preferred.

9B-02. Clean floors before turning building over to the University for occupancy. Cleaning to be done according to the manufacturer’s recommendations. Concrete floors to be sealed with the approved concrete sealer.

9B-03. Recommended minimum height of base is 4”.

9B-04. Supply 5% extra floor tile for each type for future maintenance purposes.

**Section 9C – Acoustical Treatments**

9C-01. General:
a) Check noise separations between rooms and floor to floor.

b) Materials with high absorption values for halls and lobbies.

c) Acoustical engineer and consultants for special use halls, classrooms, and lecture spaces recommended. Obtain services before shape of space is fixed.

9C-02. Ceilings:

a) Suspension Systems. Prevent possibility of physical or sound access from room to room or halls to room.

b) Supply 5% extra ceiling tile of each type for future maintenance purposes.

Section 9D – Painting and Wall Coverings

9D-01. No varnish to be used on surface of interior brick. If sealant is desired, the Architect shall submit a recommendation with manufacturer’s data to the Project Manager for approval.

9D-02. Remove hardware before painting doors, windows, frames, etc.

9D-03. Color samples are to be approved by the Project Manager before instructions are given to the Contractor.

9D-04. Piping, walls, ceilings and floors in Mechanical Rooms are to be painted light durable colors. Use National Standard color coding for pipes.

9D-05. A standard paint color scheme for most interior walls has been selected by Facilities Management. It is the desire of the University that this color be used wherever possible to reduce maintenance problems and costs. The Architect and/or the Contractor shall coordinate with the Project Manager prior to specifying or purchasing ANY paint.

9D-06. Three coats of paint (including primer) required on all surfaces unless approved otherwise in writing.

9D-07 Textured, two-tone and spattered paint finishes are discouraged. Architects and contractors are directed to
coordinate with the WSU Project Manager BEFORE including in design, or actual application.

DIVISION 10: SPECIALTIES

Section 10A – Toilet Room Accessories

10A-01. Soap dispensers for liquid soap to be supplied and installed by the University. They should not be included in the construction contract.

10A-02. Toilet tissue dispensers for roll type paper to be supplied and installed by the University. They should not be included in the construction contract.

10A-03. Towel dispensers to be supplied and installed by the University. They should not be included in the construction contract.

10A-04. Sanitary napkin disposal containers – provide one for each women’s toilet stall. Bobrick or equal.

10A-05. Waste disposal containers – one in each rest room, submit for approval.

10A-06. Book and purse shelves – under mirrors or near fixtures.

10A-07. Urinal divider screens shall be floor and wall mounted.

10A-08. Mirror required over each lavatory.

Section 10B – Display Boards

10B-01. Display Boards:
   a) Acceptable boards: Lemco or other boards with ten year warranties.

Section 10C – Miscellaneous

10C-01. Vinyl or nylon floor mats recessed at each entrance should be provided. 4’ X 6’ size.

10C-02. Provide dedication plaque.

10C-03. Provide building directories.
10C-04. When required by the contract documents, provide metal letters for building name to be mounted on one or more exterior building walls. Letters to be ribbon type in Helvetica medium style.

10C-05. As required, provide main building outdoor sign mounted in landscape area.

10C-06. As a general rule indoor signs are provided by the University. An allowance for door numbering plaques and appropriate room names shall be provided for in the project budget. Architect to work with the Project Manager in Facilities Management to establish numbering system of rooms inside the building. This is normally done during the project design period. Approval of the numbering system and room names must be obtained from the Project Manager.

DIVISION 11: EQUIPMENT

Section 11A – Laboratory Equipment

11A-01. The purposes of the University would best be served by the use of wood laboratory equipment unless metal is specifically requested for a limited use. Acceptable manufacturers would be Sheldon, Hamilton and Kewanee or equal. The Granite line plastic clad equipment as manufactured by the Granite Mill and J&R Mill are also considered satisfactory sources laboratory furniture.

11A-02. All laboratory bench top materials presently available have limitations. The Architect is requested to consult with the Project Manager regarding the use to which the various top materials are to be subjected before making a final selection.

11A-03. Laboratory sinks should in general be of two types:

   a) Where chemical corrosion is a problem, the material known as “Durcon” is considered most satisfactory at the present time.

   b) Where radioactive isotopes are to be used in any quantity, stainless steel sinks should be supplied.

11A-04. Laboratory waste and drain lines. The Architect is required to design and specify the under-sink fittings in appropriate
lab waste piping. However, “Durcon” will be an acceptable substitute.

11A-05. Laboratory benches shall be designed and installed to facilitate maintenance on all utilities serving the bench. This will require the provision of removable panels so that all fittings can be reached without disassembling the bench.

DIVISION 12: FURNISHINGS

Section 12A – Appliances

12A-01. Coordinate appliance installation with electrical consultant and Project Manager. All appliances must be installed to Manufacturers specifications and recommendations.

Section 12B – Carpet

12B-01. Consult American Carpet Institute for recommendations, but approval is at the discretion of the Project Manager.

12B-02. Carpeting to be of a type easily vacuumed and shampooed. Color to be one that does not readily show daily walked in soil. Nap to be short, which will not show wheel marks of vacuums and foot prints.

12B-03. Minimum face weights are 28 oz. nylon or 42 oz. acrylic.

12B-04. Fire Marshal Requirements for Carpet

Floor passes ASTM E-648 Critical Radiant Flux Panel Test with the following rating:

- Class 2 = All areas on campus except class 1 areas noted below which would be very specialized in usage. Must be .22 Watts per Sq. Centimeter rating.

- Class 1 = Institutional such as hospitals and nursing homes at .45 Watts per Sq. Centimeter rating.

Walls and Ceilings passes ASTEM E-84 flame test with a rating of less than 75.

Section 12C – Blinds
12C-01. Careful consideration should be made before using Venetian blinds in areas other than offices due to excessive maintenance and cleaning problems. Submit for approval.

**Section 12D – Cabinets**

12D-01. All major cabinets to be anchored for seismic.

**DIVISION 13: SPECIAL CONSTRUCTION**

**Section 13A – Custodial Closets (See drawings in Appendix)**

13A-01. Ample size. It is desirable to install a wider than average door to accommodate easy moving of equipment. Provide space to accommodate a 12 foot ladder where ceiling heights permit.

13A-02. Low profile mop sink with air gap or vacuum breaker.

13A-03. Broom hangers.

13A-04. Locate closets near service entrances and at least 1 on each floor.

13A-05. Locked cabinet for pilferable supplies.

13A-06. Keep transformers, electrical junction boxes, switch panels and other equipment controls out of closets. Utility access doors will be kept separate from the custodial closets.

**Section 13B – Vending Machine Areas**

13B-01. Provide adequate drains to sewer.

13B-02. Provide adequate electrical and plumbing service. Provide data outlet to accommodate future card purchasing system.

13B-03. Space for refuse and empty bottle containers should be provided.

13B-04. Floor and walls must be constructed of washable materials. Ceramic tile preferred.

**Section 13C – Animal Rooms**
13C-01. Epoxy treatment of walls and floors has proven advantageous in some areas on previous projects.

13C-02. A monolithic type flooring similar to Sex-O-Tex produced by Crossfield Products, with its own elastic membrane and the necessary coves at walls and corners appears advisable in areas where a waterproof, washable floors is mandatory.

13C-03. Plain, sealed concrete has proven unsatisfactory. Floor cracking creates serious problems.

Section 13D – Telecommunication and Data Network Rooms

13D-01. Each building must have a separate telecommunication distribution room which connects the building to the main campus system. See Division 16.

13D-02. Provide other telecommunication rooms as required for system distribution. Division 16.

13D-03. Do not mount telecommunication equipment in custodial closets, or in electrical rooms.

13D-04 Each room should be designed with a means of adequately cooling the equipment that is designed for the space.

DIVISION 14: CONVEYING SYSTEMS

Section 14A – Elevators and Dumbwaiters

14A-01. Codes


14A-02. Interior dimensions of elevators at least 4’ X 5” to accommodate cleaning equipment and furniture.

14A-03. Provide removable full height bumper blankets for wall protection in elevators (three walls).

14A-04. A 100% service contract to run for one year after acceptance shall be furnished by the Contractor. This shall call for routine monthly inspection, emergency calls and all parts and labors required to maintain elevator in first class condition. A written contract shall be delivered to the Project Manager.
14A-05. Lighting fixtures and lamps in elevators shall be of a standard size which are easily obtained from local distributors.

14A-06. Provide elevator handicap access in all multi-story buildings. Install special key control system. Comply with all standards regarding controls, signs, etc.

14A-07. Provide emergency telephone in each elevator with hookup to monitoring panel located at the campus Automation Center in the Heating Plant.

**DIVISION 15: MECHANICAL**

**Section 15A – General Requirements**

NOTE: Mechanical danger shall be wholly responsible for thoroughly researching the existing mechanical system and determining pressures, flow rates, etc., of the existing steam and chilled water supplied from the Central Plant. The mechanical designer shall then be wholly responsible for designing the correct equipment for the intended use based upon that research. WSU assumes NO responsibility for any information provided verbally to the mechanical designer. The University will not consider making changes to the present method of operation (i.e., steam pressure, chill water pressure and operational temperature, etc.) The design team shall be responsible for design which properly consider the building envelope with regard to infiltration and exfiltration.

15A-01. Codes and Standards

Weber State University adheres to compliance with the most recent issues of the following codes and standards:

a) Codes

   2) ASME Boiler Construction Code for Low Pressure Heating Boilers

   3) ASME Boiler and Pressure Vessel Code
4) Unfired Pressure Vessels – ASME Boiler and Pressure Vessels Codes, including Sec. VIII.


6) Building Materials and Structures (BMS).

8) International Plumbing Code (IPC).


10) Ogden City Codes and Regulations as applicable.


12) International Mechanical Code.


b) Standards


2) Standards for the Installation for Air Conditioning and Ventilating Systems other than Residence Type-National Board of Underwriters (NBFU) and National Fire Protection Assoc. (NFPA) Pamphlet No. 90A.

3) NBFU Sprinkler Equipment Standards

4) American Society of Heating, Refrigerating and Air Conditioning Engineers standards.

5) American Welding Society Standards

6) Copper Development

7) Cast Iron Soil Pipe Institute
Design Procedures:

a) Check with the Project Manager for the heating media available for building.

b) Selection of the heating and ventilating system will require discussion between the Architect, his mechanical engineer, and the Director of Operations, appropriate shop managers, and the Project Manager.

Test and Balancing of Systems:

a) Testing and Balancing of systems is required by competent engineers, with a minimum of five (5) years experience and will be included as part of the specifications. A report of such balancing shall be included as part of the operating manual for the building or project.

Operating and Maintenance Manuals:

a) Manuals shall be delivered to the owner NO LATER THAN Substantial Completion and distributed as follows: Three sets to the Project Manager of the University, and one set to the DFCM. If O&M Manuals are not delivered at Substantial Completion the General Contractor will assume 100% responsibility for all maintenance until the manuals are delivered to the Project Manager’s satisfaction.

b) Manuals must include system design and setting criteria, equipment descriptions, installation, operation and control instructions, lubrication and maintenance instructions plus parts lists, name of vendor, and name of service organization, if any, for all equipment. This shall include equipment furnished by sub-contractors other than mechanical. The manual should also include updated design calculations and the final balancing report.

c) Manuals and all supporting documentation shall be bound (three-ring binder, three-post binder, etc.) so as to be capable of easily being disassembled for purposes of making copies by the end users.
d) Manuals must be checked for completeness and accuracy by Architect and project engineers before submission. Improperly assembled manuals or manuals with insufficient information will be returned to the Architect until satisfactorily completed.

e) The manuals will be reviewed by the Project Manager in coordination with Operations and Maintenance Personnel for completeness. If the manuals are not complete, they will be returned to the architect for resolution. The requirements of item #a, above apply. Any late changes/updates shall not be delivered to the Project Manager with the expectation that the Project Manager will insert those changes into the manuals. The Architect or the Contractor shall be responsible for installing the changes/updates.

15A-05. Piping Identification:

a) All piping shall be color coded and identified in accordance with industry standards.

15A-06. Installation:

a) All valves and equipment shall be installed with appropriate clearances inside and around so as to permit normal disassembly for maintenance purposes.

15A-07. Shutdowns:

a) Notice of a necessary shutdown to any existing system must be given to the Project Manager not less than 7 (seven) days prior to the proposed shutdown. This will then be coordinated with the Project Manager.

15A-08. Cleaning Procedures:

a) Water treatment equipment and initial treatment shall be a part of the construction contract. The equipment and chemicals must be compatible with those used by our campus water treatment consultant since that firm will take over the maintenance of the system when it is turned over to the University. The water treatment consultant presently employed by the University is:

West Water and Energy Systems Technology, Inc.
All cleaning and boil-out procedures shall be in accordance with their recommendations.

Cleaning is required on the following:

1) Heat Exchanges and Piping System
   a) After cleaning, drain the system, fill with fresh water and thoroughly flush.

2) Cooling Systems of Internal Combustion Engines and Other Closed Cooling Systems
   a) After cleaning, drain and flush with at least 2 volumes of water

3) Boiler Boil-Out
   a) Thoroughly inspect the boiler to insure the removal of debris, tools, etc.
   b) Replace the regular gauge glass with a temporary gauge glass that can be discarded after the boiling out.
   c) During the entire boiling out, blowdown from all valves at least once every 8 hours; blowing first from the surface or continuous blow and progressing to other blowdown point lower on the boiler. The total amount of water blown from all points each time should be ½ to ¾ of gauge glass. Replenish blowdown lost each time with treated water to maintain desired concentration of cleaner in the boiler.
   d) At the end of the boil-out, cool the boiler slowly; drain the flush with a high pressure hose. Inspect all parts for cleanliness and freedom from oil and grease. If initial condition was extremely bad and surface are not entirely clean, the boiling out process will have to be repeated.

15A-09. Mechanical Rooms and Tunnels:
a. Mechanical rooms and tunnels to be well lighted, painted where practical, ventilated or cooled where needed and have adequate GFCI electrical outlets and floor drains. Temperatures in these spaces must not exceed 85\(^\circ\) F. Tunnels shall also have a cable tray installed for campus communication lines. Coordinate all requirements with the Project Manager prior to design.

b. Tunnels must be designed for 7 (Minimum-clear area after utilities are installed) foot walking height after all utilities have been installed and should allow adequate working space any maintenance procedures required.

c. Mechanical rooms and spaces should allow adequate space for removal and replacement of equipment that may be required in the future. Space and facilities for the necessary maintenance and operation procedures should be provided. Safety should be considered in all cases.

d. All equipment which has to be located in, suspended from or anchored to shafts, penthouses, etc shall be provided with suitable and adequate access for maintenance, repair or replacement.

15A-10. "As Built" Drawings:

a. The Architect or his mechanical engineer should obtain all details of changes from the Contractor on the final "As Built" drawings. The Architect and his mechanical engineer shall make the necessary drawing revisions and submit the same on mylar. The requirement for As-Built drawings apply as per 3.11 above. An additional copy of the "As Built" temperature control drawings for each temperature control system shall be placed in the control cabinet associated with the drawing.

15A-011. Testing and Guarantee:

a. Representatives of the University and of the State shall be present when tests on **all plumbing and HVAC systems** are conducted, contact the Project Manager for scheduling.
15A-12. Recording Charts:
   a. Under mechanical general requirements a one year supply of recording charts shall be furnished for any recording equipment.

15A-13. Equipment Salvage:
   a. Equipment which is removed and turned over to the University must be put back together by the Contractor with all parts, bolts, nuts, etc., included and properly attached to make the item complete and reusable.

15A-14. Special Items
   a. Special order or one of a kind items are not to be incorporated into any HVAC design.

15A-15. Energy Metering:
   a. Provide BTU building metering instrumentation on steam condensate line with local pen recording and capabilities of providing 4-20MA Signal to Central Automation system for remote readout.
   b. Provide electrical building metering with local meter and capabilities of remote readout at Central Automation Center.
   c. Every chiller exceeding 50 tons shall have an electric meter capable of remote readout at Central Automation Center. The expectation is to be able to read Kw/ton.
   d. Provide a plumbing temperature, pressure and flow meter in automation system

15A-16. Rooftop Units
   a. Every rooftop mechanical unit shall have a 120 v., 20 amp. GFCI duplex receptacle installed within 25' of
the unit and the installer will supply power to the outlet when disconnect to the unit is turned off.

b. All units must have enough clearance for air filters to be removed and installed.

c. The unit shall be accessible by a (stainless steel preferred) lockable rooftop access door with a steel ladder attached to the wall to comply with OSHA standards.

15A-17 Training

a. There should be adequate on-site introduction training for all mechanical equipment.

b. Provide a minimum of 80 hour of off-site control technician training for each new facility or major renovation.

Section 15B – Heating

15B-01. Steam and Low Temperature Hot Water

1) Low temperature hot water heating and low pressure steam (below 15 PSI) shall be ASTM A-120 schedule 40 black steel with screwed malleable iron fittings up to 2” in size and forged steel welding fittings for pipe 2-1/2” and larger. Union joints shall be flanged on lines 2-1/2” and larger and ground joint unions shall be used on lines 2” and smaller.

2) High pressure steam piping (above 15 PSI) and chemical feed lines shall be ASTM A-53 grade A or B seamless or welded black steel, 2” and smaller schedule 80, 2-1/2” and larger schedule 40. Fittings shall be seamless black steel ASTM A-234, ASA B16.9, ASA B-10 of grade and schedule of pipe to which connected.

3) Condensate piping 2-1/2” and larger be ASTAM-72 schedule 80 genuine black wrought iron with genuine black wrought iron fittings. All such piping 2” and
smaller shall be threaded and coupled, with genuine wrought iron nipples and 125# cast iron fittings.

4) Pipe for heating shall be hung with Ring and Rod type hangers or equal. Hangers for pipe 1” or smaller shall be spaced not more than six feet apart; hangers for pipe 1-1/4” and larger shall be spaced not more than 10 feet apart.

5) Piping shall all be either in tunnels or crawl space large enough for workmen to make necessary repairs. No pipe shall be buried in split tile under flooring, and access doors will be left in ceilings where pipes are run between floors.

6) All steam mains shall be graded upward in the direction of flow 1” in 15’.

7) Pipe Sleeves – All pipe passing through walls, ceilings, floors, etc., shall be provided with sleeves. All sleeves shall be 1” larger, clear dimension, than the outside diameter of the pipe. Sleeves for insulated piping shall be large enough to allow the covering to pass through the sleeve. Caulk or seal as required to make sure water does not penetrate through sleeve.

8) Valves:
   a) Where steam piping enters building, provide service entrance gate valve and electric motor operated control valve.
   
   b) All branch lines on the heating system shall have hand-operated valves so that any one zone or heating system can be turned off separately without interruption of the entire system. Also, provide hand valves on system side of balance locks or stops.

9) Traps:
   a) Traps shall be installed with isolating gate valves, by-pass globe valve and test connections.

10) Strainers:
a) All strainers shall include drain valve and full line size blow-down valve.

11) Gauges:

a) All gauges should be sized so that the normal operating range is in the middle of the gauge.

b) The gauges should be readable by a person standing on the floor and not straining around equipment to see.

b. Insulation

1) All steam lines, condensate lines, receivers, flash tanks, valve bodies, etc. shall be insulated.

2) Gilsulate insulation for steam piping is not satisfactory.

15B-02. Equipment

a. Pumps:

1) Condensate pumps shall be steam pressure powered wherever it is possible.

2) Each pump shall be piped so it can be disconnected and removed wherever it is possible.

3) For in-line pumps, Bell and Gossett or a pump which is interchangeable with Bell and Gossett without modification to the system, is preferable. Approximately 90% of the existing in-line pumps on the campus are Bell and Gosset.

b. Convectors:

1) On all convectors there shall be access doors at the valve end and also at the trap end of steam convectors so work can be done on either without removing the casing.
2) There shall be no cabinets, shelves, partitions, installed around or over convectors or radiators to interfere with free access to valves or traps.

c. Water Heaters:

1) Piping, wiring and equipment shall be installed so that it will not interfere with the removal of heating coils for periodic cleaning.

2) Unions shall be installed in supply and in return lines to facilitate the removal of piping.

3) Semi instantaneous or plate and frame heat exchangers for domestic hot water are preferred. Spirax/Sarco or owner approved equal will be specified. Any system that requires the installation of a water softener or domestic hot water storage tank is not acceptable.

3) Water heaters to include combination temperature and pressure relief valve sized to ASME requirements and piped to adequate drain.

d. Air Compressors:

1) Oil-less type.

2) All air compressor tanks shall be ASME certified and have automatic electronic drains, piped to floor drains where available.

3) Provide duplex compressors with alternators on all control systems. Electronic programmable.

4) Refrigerated air dryers with automatic drain required on all control air systems. Particulate coalescing and charcoal filters shall be installed with the dryer.

e. Coils & Tubes:

1) Coils to be a type that can be drained completely by gravity flow.
2) Tube wall thickness to be .035” minimum in all cases/

3) Coils shall have a ½” drain valve (ball), run to drain.

f. Direct Expansion AC Equipment

1) Any new Air conditioning, Refrigeration system or appliance installed can use only the following Refrigerants: R-22, R-134A, R-123, R-404A, and R-410A

2) All Refrigeration and Air Conditioning Systems that have the Condensers located outside, must be equipped to operate in zero degree low ambient conditions. The equipment needs to be installed with manufactures parts and accessories and follow manufactures recommendations first. Then as a minimum the Condenser unit needs to have a fan cycling pressure switch connected to the high side of the refrigeration system to maintain proper operating head pressure, a crankcase heater installed on the compressor and a receiver tank installed on the refrigerant circuit to hold the additional refrigerant during low ambient operation.

15B-03. Sheet Metal Work:

a. Ducts:

1) All deflector dampers or adjustable dampers in concealed ducts shall have access doors installed in the ceiling or wall panels and in the ducts.

2) All new duct work shall be protected at openings during construction, to prevent the introduction of dust and debris generated by sanding, painting, general construction dust, etc. Ducts shall be protected until they have been connected and/or terminated. If duct openings are not properly protected, the contractor shall be responsible for having the ducts cleaned as directed by the Project Manager, at the expense of the Contractor.
All existing ducts, registers, diffusers, grilles, etc. shall be cleaned by a certified duct cleaning contractor before being placed back into service.

15B-04. Controls

a. General

**NOTE:** When and where feasible, DDC controls shall be installed instead of pneumatic controls.

1) Remote indicators and controls shall be fully integratable with, and tied in from each individual building to the Johnson “Metasys” control system located in the Ogden Campus Automation Center, and the STAEFA system at the Davis Campus.

2) Controls shall be of the full modulating type, whether pneumatic or electric.

3) Preferably, the control system shall provide individual control to each room.

4) All control or regulator valves and traps shall be installed so they can readily be removed without disturbing piping connections or the service involved.

5) All pneumatic controllers to be mounted in cabinets.

6) Provide well anchored drip pans of size large enough to catch all runoff. Pan drains should be large to prevent blockage as per IMC 307.2.3.

b. Pressure Regulator Stations:

Where pressure reducing stations are used, the E.D. Spence or Spirax Sarco type pilot-operated valve, or equal, is preferred. A “two-valve” 1/3, 2/3 system shall be installed at all reducing stations, with ample clearance to permit normal maintenance and inspection.

c. Safety and Relief Valves.

1) Safety relief valves shall be placed on the low pressure side of regulator stations and shall be piped to the outside of the building. Safety Relief Valves to
be installed on heat exchangers per current ASME Boiler standards, and piped to drain.

2) Pressure gauges shall be installed on both the high pressure and low pressure sides of all regulator stations.
   a) All pressure gauge lines to be ½" with ball valves.
   b) All pressure gauges on heating and cooling pumping stations to be heavy duty liquid filled.

4) Automatic blow-downs will be hard piped to a drain and routed in such a way as to not cause an obstruction or tripping hazard.

d. Thermometers and Thermostatic Sensing Elements:
   All controllers and thermometers for heating water shall be of the insertion type with separable socket connections.

e. Control Air Piping:

   1) The Contractor shall provide and install a complete piping system, including underground control lines, for the pneumatic control equipment. Piping in general shall be installed using Type L hard copper tubing with sweat fittings. Piping in Equipment Rooms shall be installed exposed, securely attached to the structure or to the equipment and run parallel or at right angles to the structure. Piping installed to all equipment outside of the Equipment rooms shall be installed in the walls or ceiling construction and this piping shall be placed in these locations as required by the progress of the structure.

   NOTE: Should project cost become a factor, plastic tubing with special protection features may be used upon approval by the Project Manager.

   2) Piping in masonry walls shall be run in metal conduit to a point accessible in a ceiling or below a floor so that no solder connections are buried in masonry walls. Soft coiled tubing in conduit is acceptable for this work, but must be connected to hard copper by sweat fittings where tube leaves masonry wall. Where piping is
installed in the furred ceilings, this shall be attached to the ceiling construction members in an approved manner. If possible, piping shall not be embedded in concrete or masonry, but where it is necessary to run through concrete or masonry, sleeves shall be used to protect the air piping. Where it is necessary to run tubing in concrete slabs, it shall be soft coiled with a minimum of buried connections.

3) All piping shall be supported using hangers of the clamp type with these being securely attached to the structure or equipment. Where piping is installed exposed it shall be offset around all beams, girders, etc. Piping shall not be installed through the sheet metal ducts or in fresh air intakes. The use of plastic tubing (high density black “P” tubing -60’ to 220’) may only be used as a final hook-up inside control panels and adjacent to high velocity mixing boxes. Plastic shall be protected from any hot surfaces.

4) The use of metal or plastic covered tray adequately supported and run parallel or at right angles to the structure may be used in exposed areas to house tubing hereinbefore specified. As tubing in tray leaves tray, transition with be as hereinbefore specified. All connectors between plastic and copper tubing will be of the compression or barbed type. Connectors shall be suitable and manufactured specifically for this application.

5) The entire air piping system shall be tested by placing it under 30 pounds air pressure for 24 hours. During this period, the pressure drop shall not exceed 1 pound.

f. Control Air Compressors:

1) Control air compressors shall have refrigerated moisture separators with automatic, electronic programmable blow-down drains.

15B-05. Water Treatment

a. Water treatment shall be coordinated with the firm currently employed by the University to do the water treatment for the entire campus. All equipment and chemicals must be
compatible with existing campus systems. Currently the Campus uses West Water and Energy Systems Technology, Inc. The contact is Frank Leaver. Phone (801) 546-4031.

b. Costs for furnishing “chemical” and “services” for water treatment should be avoided, as those “chemicals” and “services” are currently being contracted by the University. Coordinate any special needs with the Project Manager.

c. Contractors are to be responsible for installation, check-out, clean-out, start-up and guarantee of equipment which should be compatible with our existing water-conditioning program.

**Section 15C – Air Handling and Conditioning Systems**

15C-01. Pipe Systems:

a. 2-pipe systems are not permitted.

b. No Victualic or other groove-piped manufactured fittings are permitted on CHW piping which are not continuously filled with chilled water, unless the manufacturer provides documentation stating the use is permitted for that particular project.

15C-02. Building Design:

a. Buildings are to be designed for summer occupancy.

15C-03. Controls

a. Controls should allow for outside air to be used when available. When outside air exceeds 75’ dampers should reset to minimum air requirements.

b. Each classroom or office should have its own temperature control.

c. Controls shall conform to requirements set forth in Division 15, Section B, and in Appendix A. Johnson, Honeywell of Staefa.

15C-04. Filters:
a. Filters are to be replaceable media; polyester bag as final filter and cartridge filter as pre-filter to increase filter efficiency to 65%. Preferred size 24X24X2 cartridge and 24X24X23 bags.
b. No fan system is to be operated without required air filters at any time or clean of system ducts by person at fault.

15C-05. Coils:

a. Heating and cooling coils must be designed to eliminate freezing.

b. All heating and cooling coils shall have air and drain valves, top and bottom, to facilitate completely draining of coils by gravity flow.

c. The wall thickness shall be .035” minimum.

d. Coil drains will be hard piped to a drain and routed in such a way as to not cause an obstruction or tripping hazard.

e. Coils must have minimum of 18” between coils and have access doors to each side of coils for cleaning and repairs.

15C-06. Fresh Air Intakes:

a. No piping containing water or steam is to be located in fresh air intake, including drains.

b. Fresh air intakes should be above ground to avoid dust and should be located on cool side of building. Avoid locations new service entries where they can pick up vehicle fumes or garbage container odors. Bird screens are required and must be accessible from both sides of the grille.

c. Outside fresh air dampers are to be 100% shut-of type.

d. All building fan systems shall have mixed air. No 100% outside systems

15C-07. Ventilation of Mechanical Rooms:

a. Mechanical Rooms should have adequate ventilation, and/or cooling to maintain a temperature not to exceed 85° F.
b. Heat should be provided if the space temperature is likely to drop below 60° F.

15C-08. Air Vents:

a. Air vents on water piping (hot or chilled) should be piped to drain with the drain valve at ground or working level.

15C-09. Smoke Detectors:

a. Smoke detectors shall be installed in return air systems with a design capacity of great than 2,000 CFM, as per IMC 606.2.1.

Section 15D – Chiller Equipment

15D-01. Gauges and Meters:

a. The following gauges and meters are to be provided on all chillers.

1) Evaporator
   a. Water temperature in and out.
   b. Water pressure in and out.
   c. Refrigerant temperature in sump.
   d. Liquid level indicator or sight glass
   e. Water meter

2) Condenser
   a. Water temperature in and out.
   b. Water pressure in and out
   c. Refrigerant temperature in sump.
   d. Condense sight glass.
   e. Water meter.

3) Instrument Panel
   a. Evaporator gauge.
   b. Condenser gauge.
   c. Lube oil gauge.
   d. Purge gauge.

4) Motor
   a. Amps
   b. Discharge water temperature.
   c. Oil temperature.
      1) Sump
      2) Both motor bearings
d. Lube oil sight glass.

5) All necessary Safety Controls
   a. Oil pressure control.
   b. Oil temperature control.
   c. Motor temperature control.
   d. Low temperature control.
   e. High pressure control.
   f. Oil low level control with shut-off valves on each for control testing purposes.

6) Purge drum piping to have unions at drum for easy removal.

7) Strainers
   a. Strainers shall be installed on the inlet of the condenser and chilled water piping of the chiller.

8) Sequence of Operation
   a. Contractor shall provide a sequence of operation for all systems at the initial familiarization training session.

15D-02 Cooling Towers

   a. Cooling Towers shall have:
      1) Adequate sump to catch all spray and overflow.
      2) No obstruction on bottom to interfere with cleaning.
      3) Hose bibs with vacuum breakers for washing tower.
      4) Provisions for draining tower, sump, supply and return lines. Sump floor shall be sloped to drain.
      5) Water supply adequate to handle evaporation and bleed-off with reserve capacity.

   b. Water treatment shall be coordinated with the firm currently employed by the University to do the water treatment for the entire campus. All equipment and chemicals must be compatible with existing campus systems. Currently the Campus uses West Water and Energy Systems Technology, Inc. The contact is Frank Leaver. Phone (801) 546-4031.

15D-03. Additional Requirements:

   a. Hot and cold water bibs with vacuum breakers to be provided near chiller.
b. Install a hose bib with a R.P. backflow preventer on the suction side of the recirculating chilled water pump as a means of adding chemicals to the chilled water system.

c. Provisions shall be made for space and equipment for removing the condenser heads for maintenance and inspection.

Section 15E – Plumbing

15E-01. Disinfection:

a. New water lines to be disinfected in accordance with Utah State Department of Health requirements.

15E-02. Storm Drainage:

a. Serious water problems which have been encountered all over campus make it mandatory that area drains be installed along all foundations.

b. All area drains to tie into storm drainage system.

c. No storm drainage lines shall be less than 12” in diameter.

15E-03. Roof Drains:

a. Roof drains to be not less than 3”.

b. Provide heat tape on drain lines if exposed to weather.

15E-04. Burial:

a. No utilities (other than sewer drains, conduits) to be buried under slabs.

b. Depth of bury of services shall be:

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>48”</td>
<td>48”</td>
</tr>
<tr>
<td>Gas</td>
<td>24”</td>
<td>36”</td>
</tr>
<tr>
<td>Elect. Duct</td>
<td>24”</td>
<td>36”</td>
</tr>
</tbody>
</table>

c. All buried piping shall be fitted with a tracer cable for purposes of locating with electronic equipment, and with a
locator tape to aid in limiting damage to the utilities during future excavation. The locator tape shall be placed 12" above the buried utility.

15E-05. Water Service:

a. Water service to buildings to be provided with a valve and valve box outside the building close to the main line.

b. Lead solder and flux prohibited.

c. Galvanized piping and fittings are not allowed.

15E-06. Fire Lines, Sprinklers, Hydrants, Cabinets and Extinguishers:

a. Fire Lines:
   1) Fire lines are to be valved separately.

b. Fire Sprinkler Systems:
   1) It is recommended that serious consideration be given to the installation of fire "sprinkler" systems in all new buildings to provide maximum protection to the building and their contents.
   2) Fire sprinkler systems to be tied into fire alarm system with flow device.

c. Hydrants:
   1) Fire hydrants are to have 4-1/2" pumper and 2-1/2" hose connections and to be provided with auxiliary shut-off valves. Hydrants and FDC's shall be fitted with stainless steel NOX FDC caps and the keys turned over to the Project Manager.
   2) All new hydrants are to have “National Standard” thread.
   3) Placement of hydrants in locations which are accessible to service walks and drives while still being able to reach all major portions of the building is essential.
   4) There should be sufficient hydrants to protect all of the buildings with no hose exceeding 300 feet in length. Hydrants should not have smaller than 6” connection with the main.

d. Fire Extinguishers:
   1) Fire extinguishers should be stored pressurized. Unless special conditions prevail, the extinguishers should be ABC type.
2) Extinguishers should be included in the specifications for all laboratories.

15E-07. Settling and Compaction:
   a. Where utility lines enter a building or where earth has been disturbed, provision shall be made to preclude damage due to settling. Steps involving adequate compaction, providing flexibility or providing special supports should be specified.

15E-08. Pressure Reducing Stations (Water):
   a. Pressure reducing stations shall be provided where needed. Due to sloping terrain of University campus, this will be necessary in most cases. Such stations shall include a bypass with a reducing valve; strainers before each reducing valve combination, a valve on each strainer for clean-out and pressure gauges before and after the station. The maximum pressure on campus is 140 lbs. The maximum pressure within any building should be 80 lbs.

15E-09. Transformer Vaults:
   a. No utility lines other than electrical power are to run through or in transformer vaults or rooms set aside for only electrical items.
   b. If vaults are to be below grade, sump pumps or other means of removing water must be supplied.
   c. Vaults should be heated and/or ventilated to keep down condensation.

15E-10. Piping Identification:
   a. It is desired that all piping in mechanical spaces be painted. However, should funding problems occur, color coding only may be used with special permission of the Project Manager.
   b. All piping to be coded and/or identified in accordance with ASME A13.1-1996.
   d. Valves to be tagged and identified by type of service and area served. A valve index shall be supplied.

15E-11. Back Flow Preventers:
a. Provide and install back flow preventers as required by code.

15E-12; Hose Bibs:

a. All hose bibs will be provided with vacuum breakers.
b. Freeze-proof hose bibs shall be installed outside building to provide water for window washing, walk and areaway wash down and winter watering of covered planter boxes.
c. Provide isolation valves ahead of hose bibs and access to valves for service.

15E-13. Valves:

a. Valves are to be installed on branches and main feeds to permit isolating reasonably small areas for repairs.

15E-14. Drinking Water Fountains:

a. Chilled drinking water fountains, wall hung, are to be specified. Where feasible, more than one fountain should be served by one chiller.
b. Provide fountain(s) for handicapped as required by Code.

15E-15. Toilet Room Fixtures:

a. Toilet room fixtures shall be wall hung, except for utility sinks and urinals for handicapped. Utility sinks shall be floor type. Urinals for handicapped may be stall type.
b. Flush meters shall be exposed and not concealed. Automated systems are encouraged for toilets, urinals and lavatories.
c. Toilet rooms and utility rooms to have floor drains.
d. Provide (1) set hose bibs with vacuum breakers under wash basin in each rest room.
e. Provide fixture for handicapped as required by Code.

15E-16. Pumping of Drain Lines:
a. No sanitary or storm drainage shall be pumped except as a last resort and then only with permission of the Project Manager.

15E-17. Vending Machine Areas:

a. Water and drain to be installed in food vending machine area for coffee and beverage machines.

15E-18. Corrosive Waste Lines:

a. Corrosive waste lines to be Pyrex, Corrosion above ground. Fusseel or Orion plastic acid lines.

15E-19. Insulation:

a. All water piping to be insulated.

15E-20. Lawn Sprinkling Systems:

a. Lawn sprinkling systems to have 1” minimum pipe size, no automatic drains, no dead ends, control valves to be screwed bonnet.

b. Piping to be schedule 40 PVC with schedule 80 PVC risers.

c. Automatic controls are required.

d. There is a considerable amount of sediment in our present lawn sprinkling water supply. Design system to eliminate or function with this condition. Verify need for pressure regulators on sprinkler mains. Pressure is high at lower campus elevations.

15E-21. Access:

a. Access to maintenance chases to be adequately sized, 3'0” width minimum.

15E-22. Type of Fixtures:

a. Fixtures to be all of one type in any building.

15E-23. Maintenance Space:
a. Adequate space to be allowed for valve and equipment maintenance. We must have easy access to any piece of equipment which requires maintenance.

15E-24. Installation of Equipment:

a. Provision to be made to remove and install major equipment items.
DIVISION 16: ELECTRICAL

NOTE: Electrical designer shall be wholly responsible for thoroughly researching the existing electrical system and determining the existing available power. The electrical designer shall then be wholly responsible for designing the correct equipment for the intended use based upon that research. WSU assumes NO responsibility for any information provided verbally to the electrical designer. The University will not consider making changes to the present method of operation.

Section 16 – General

16A-01. Codes:

a. Codes
   1) National Electric Code (current)
   2) State (as applicable)
   3) City (as applicable)

NOTE: In a number of areas the State DFCM requirements are more stringent than required by the above codes. Compliance to the State requirement is mandatory.

b. Refer to section 210-5 in the National Electric Code for the following wire colors:

   1) 277/480 Volt 120/208 Volt
      A Phase- Brown A Phase- Black
      B Phase- Orange B Phase- Red
      C Phase- Yellow C Phase- Blue
      Neutral- Gray Neutral- White
      Ground- Green Ground- Green

In addition, the University requires that the same color be used for the same phase throughout the building.

16A-02. Primary System:

a. The primary system of the campus is 12,470 volt power.

16A-03. Secondary System:

a. Secondary system will normally be 120/208 3-phase, 4-wire, and/or 277/480 volt 3-phase 4-wire.
16A-04. Points of Connection:
   a. The point of connection and switching for 12,470 volt service must be selected in consultation with Facilities Management.

16A-05. Transformers:
   a. Transformers should be installed in accordance with the current NFPA 70 NEC.
   b. Transformers shall have 2 to 2-1/2% taps above and 2 to 2-1/2% taps below normal voltage.
   c. Primary transformer vaults shall be located outside the building. Pad mounted enclosed transformers are specified.
   d. Transformers and associated switch gear must be selected so that they can be used on a 12,470 volt distribution system and give 277/480 volt secondary voltage.
   e. Provide written oil test information on all new transformers.

16A-06. Grounding:
   a. Grounding to be tested in presence of the WSU electrical manager. The resistance measured should be recorded, dated, and submitted to WSU.
   b. Ground systems must be installed which are of high quality in order to satisfy the requirements of sophisticated computer equipment. Provide special ground wire throughout for computers. All conduits shall have a ground in the conduit.
   c. To avoid electrolytic problems, don’t ground electrical items to pipes which run directly to boilers.
   d. Ground to conduit is not acceptable.

16A-07. Metering:
   a. Metering shall be provided for all buildings. This should be a watt hour meter with maximum demand indicator.

16A-08. Switchboards and Panels:
a. Switchboards and Panels should be molded case bolt on circuit breaker type, enclosed, with a minimum of 25% spare capacity.

b. All panels to be labeled.

1) All sub-panels are to be labeled, to identify the main panel from which their power is obtained as well as the location of the main panel, using Weber State University room numbers.

2) All main circuit breakers are to be labeled as to the sub-panel or major piece of equipment that they feed as well as the location of the sub-panel for equipment. All circuit breakers in sub-panels shall be labeled as to the outlets, lights, etc., giving the location, using Weber State University room numbers.

3) Labeling shall be neatly typed, not hand written. Dynotype is not acceptable. Labels to be based on final room numbers in buildings not room numbers on the Architect’s drawings.

c. Individual panels in labs to have sufficient capacity to accommodate current design usage, and 40% future expansion without adding-on to the panel.

d. Placing panels in custodial rooms is not permitted.

e. Keep outlet panels and breakers separate from light panels and breakers.

f. All other new panels shall be sized for minimum 25% future growth potential.

16A-09. Outlets:

NOTE: All outlets shall be 20 amp, spec grade w/ss.

a. Outlets in class and lecture rooms for projectors.

b. Outlets are to be provided in hallways so that 120v 20 amp scrubbing or vacuum machines may be used, with a 50’ cord (25’ radius, minimum, in any direction).
c. Outlets to be grounded type, 20 amp, and marked as to panel and circuit number on face of cover. Handwriting is not acceptable.

d. Where food vending areas are specified, allow outlets for machines to be installed: coffee, milk, other refrigerated item, lights. Also, provide a (RJ-45 type) data outlet for future card purchasing system, adjacent to the electrical outlet.

16A-10. Switches and Disconnects:

a. Breakers should not be used as switches. Provide switches on all lighting, even with key type for service occupancy sensors.

b. All machinery to have disconnects at or near machine. Comply with N.E.C. (current edition.)

c. It is recommended that true RMS type over current devices be used in the system when adding or replacing feeder circuit breakers. This type of trip unit will sense current accurately with waveform distortion having little or no effect on protection. This will also provide a more reliable level of protection. They are available from most major breaker manufacturers.

16A-11. Conductors:

a. No conductors less than #12, thhn or thwn-stranded.

b. Conductors to be properly color coded. Any conductor smaller than #6 AWG need not be tape color-coded.

c. Copper-only conductors are required.

16A-12. Lighting:

a. Exterior lighting should avoid low fixtures due to vandalism. Accessibility for lamp changing must be considered. All exterior lighting to be controlled by the Johnson “METASYS” control system at the Ogden Campus, and the STAEFA system at the Davis Campus. Atmospheric light contamination shall be kept to a minimum.

b. Exterior light posts must be mounted above ground level to prevent water from entering. Make fixture closures water
tight. If fixture is mounted in lawn area, provide concrete mow strip around base. All ballasts shall be noise-free and meet NEMA specifications.

c. Fluorescent fixtures in all rooms shall have class A electronic ballast, CSA rated. All ballasts shall be noise free, and meet NEMA specifications. Fluorescent Lamps shall be 32 Watt T-8 Cool White 4100K, 2950 Lumen. T-5 H.O. Lamps are acceptable for “High Bay” Applications.

d. Remote ballasts must be marked as to which fixtures they attach plus a plan provided which documents this information, with permanent marking.

e. Use energy-saver T-8 lamps, cool white.

f. All light fixtures and covers to be easily removable and accessible for maintenance.

g. All Projects to be designed with light fixtures which are compatible with lamps available which are from the State Energy Contract.

h. Incandescent lighting should not be used when a compatible fluorescent system is available.

16A-13. Maintenance Accessibility:

a. Maintenance accessibility should be considered in selecting fixtures and locating same in lobbies, stairways, and large lecture rooms.

16A-14. Spare Fuses:

a. Spare fuses shall be provided for all 12,470 volt switches. Two fuses required for each switch. Provide metal storage box with labels.

b. Spare fuses for secondary voltage fused switches shall be provided in a storage box and shall be labeled.

16A-15. Equipment Salvage:

a. Equipment which is removed and turned over to the University must be reassembled by the Contractor with all parts, bolts, nuts, etc.
16A-16. Shutdowns:
   a. Notice of a necessary shutdown to any existing system must be requested in writing to the Project Manager not less than 7 (seven) days prior to the proposed shutdown. This will then be coordinated with the campus areas involved. Contractor shall be responsible to supply temporary power to critical equipment such as refrigerators, incubators, etc., in those areas affected by the shutdown.

16A-17. As Built Drawings:
   a. The Architect and the design team shall obtain all detail of changes from the Contractor on the final "As-Built" drawings. The Architect and design team shall make the necessary drawing revisions and submit to the Project Manager.
   b. As-built record drawings shall be completed by each subcontractor and/or supplier and submitted to the Architect or General Contractor as per 3.11 above.

16A-18. Operation and Maintenance Manuals:
   a. The Architect and his Electrical Engineer should obtain details from the Contractor and prepare and submit final Operations and Maintenance Manuals and design calculations on the work. Four copies are required.

16A-19. Special Items:
   a. Special order or one of a kind items are not to be incorporated into the electrical design (i.e., light fixtures containing expensive lamps which are unavailable from the State Energy Contract.)
   b. Do not mount electrical equipment (including, but not limited to: panels, contactors for lighting, motor starters, etc.) in custodial closets.

Section 16B – Emergency Light Circuits

16B-01. Emergency light circuits should be provided for exit lights, stairs, auditoriums, exit areas, fire alarm system and general emergency navigation through buildings.
16B-02. Emergency power circuits should be fully automatic. Generators are preferred. Battery packs are not desired. Specify that Contractor is responsible to provide full tank of fuel for all new generators at the time they are turned over to the University.

Section 16C – Clocks and Bells

16C-01. All new installed clocks shall be compatible with existing bell and clock correction system on the campus.

Section 16D – Telephone Raceway Systems

16D-01. Provide a cable tray distribution network throughout each floor (as applicable) and into each IDF closet. Extend the cable tray around the inside perimeter of the IDF closet to allow for cable distribution within the room. Consider ease of access to the tray system when the building is in full operation. Limit cable tray routing to be above corridors, common and similar areas. Where ceilings are exposed or inaccessible, provide a conduit to bridge to the connecting cable trays in the ceiling areas. It is the designer’s responsibility to size the cable tray and raceway system for the intended cabling installation, plus 25% growth. Allow for maximum raceway distance from each station outlet not to exceed 50’ to the cable tray. Allow one voice/data box per 80 square feet for areas that are not specifically defined. Perform all design and work in accordance with NFPA 70.

16D-02. Provide control diagrams for specialized installations.

16D-03. Telephone must be supplied in elevators by Contractor. Meet ADA requirements.

16E – Fire Alarm Systems

16E-01. General, all systems to be:

a. In accordance with National Board Fire Underwriters #72.

b. A proprietary system.

c. Class A horn/strobe and detector systems.
d. Compatible with existing central panel system. Under this system signals are transmitted from the building fire alarm panel to the central panel located in the Heating Plant. This panel in turn is connected via a direct line into the Ogden Fire Department.

e. Equipment is to be standardized. “Notifier” equipment is to be used.

16D-02. Coverage

Complete fire detection coverage is to be provided with combination rate-of-rise and fixed temperature automatic detectors installed according to Utah Fire Rating Bureau standards. These standards will specify the spacing and location of detectors and the zoning of the system.

16D-03. Manual Stations

Manual break glass stations are to be installed in accordance with National Board Fire Underwriters #72. They should, however, be minimized inasmuch as 16E-02 above provides complete coverage. Where these stations are not in areas normally attended, use “Notifier” fire alarm pull box number BNG-1” to minimize false alarms.

16D-04. Annunciator-Control Panel

a. Fire alarm control panels and the annunciators should be located on the fire department’s normal approach path to the building or group of buildings. This will have to be determined for each installation in accordance with the design of the building, driveways, fire hydrants, service entrances, etc.

b. If the annuciator and control panels are separate, the control panel should be located in the main vestibule or hallway so that it is readily accessible without the necessity of going into offices or equipment rooms. This will mean that is should be located in a locked cabinet that is suitably designed to match the architecture.

c. Annunciators can consist of:
1) A control panel with lights indicating trouble, fire or operating conditions with suitable printed legends underneath the lights to indicate the zone.

2) A back-lighted annunciator panel with approximately 1” X 3” panels containing a legend describing the zone.

3) External annunciator panel to be located at normal approach path on all buildings.

d. Systems diagrams should be provided in addition to standard print normally provided in panels.

e. In the matter of deciding whether to utilize one central station circuit for an individual building or a group of buildings, the number of zones as well as the approaches should be considered. At the moment, no hard and fast rule can be stated on the limits to the number of zones to be applied to one central station circuit, but anything above 15 should be examined carefully, particularly if a group of buildings is under consideration.

16E-05. Alarm Signals

Fire alarm audio signaling devices must consist of horns arranged to sound on a pulsating signal of approximately 100 interruptions per minute. This will differentiate fire alarms from class bells.

16E-06. Emergency Power

1) Emergency generators shall be diesel fuel powered. Contractor required to test system and then fill the tank with fuel before turning system over to the University.

2) Do NOT locate emergency generators near fresh air intakes, operable windows, doors, etc. Direct exhaust away from buildings to reduce noise and fume pollution.

3) Where emergency power for the fire alarm system uses wet cell batteries, provide manually controlled trickle chargers. The batteries shall be sufficient to operate the system and all of its functions a minimum of 24 hours, and shall be charged from an emergency power outlet source.
16E-07. Installation

Recessed boxes and conduit systems required by the fire alarm system will be installed by the electrical contractor. Raceways shall consist of minimum, ¾” conduit and junction boxes shall be painted red and marked “Fire Alarm System.” Hand lettering is not permitted. Wiring, detector and alarm devices and control equipment is to be installed by a fire alarm contractor who is regularly engaged in business.

16E-08. Fire Fighting Systems

Any automatic fire fighting system shall be supervised by the fire alarm system with flow or pressure sensing devices.

Section 16F – Intercommunication, Public Address, TV Systems

16F-01. Designated classrooms will be “A/V Technology” equipped. Include data outlets of sufficient quantities to provide a data outlet for each student. For classrooms with flat floors, group the data outlets at the end of rows seating so the furniture with wire management can be installed against the wall for this purpose and the extension cables can be installed from each student computer to the wall outlet. Include dedicated duplex IG outlets at the end of each row so that there is a four-plex with a dedicated circuit for up to 6 students (i.e., if there are 8 students to be served from the end of the row, provide 2 each four plex outlets on 2 each dedicated circuits for that row). For tiered classroom, include data outlet with 2 RJ45 devices between 2 adjacent seats. Include a duplex for 2 adjacent seats or a simplex outlet in the seating.

Include ceiling video projector system, monitors, motorized screen, sound reinforcement systems, audio and video switching and processing/scaling equipment, computer connection, internet connection and fully integrated CPU based control systems with an active matrix color touch screen interface for control of all room audio, video and room lighting functions. Control system will operate using an IP based protocol, with individual room control system central processors connected to the campus wide area network. Locate touch screen interface at all teaching positions. Include a 3000 ANSI lumen projector with wiring to the zone outlet adjacent to the instructor’s station. Size projection screens so that the furthest viewings distance is no more
than 5 times the screen height, and that the nearest viewing
distance is no less than 2 times the screen height. Include
outlet for ceiling mounted projector. Include ceiling power
outlet for projector and screen and power outlets with
isolated ground and dedicated neutrals at the instructor’s
station.

Include SVHS video player, DVD player, digital document
camera and universal analog computer-video interface
electronics. Include video/data monitors sized appropriately
for monitoring positions. Include a zone outlet at each
instructor’s location. A telephone set will be located at the
instructor’s podium and connected to the campus-wide
telephone system, for communication to the help desk.

Design to a background noise level not exceeding NC-35.
All potential noise sources must be considered, which
include HVAC machinery and airflow, activities in adjacent
spaces and intrusions through doors, windows, etc. Wall
construction must be selected to provide for appropriate STC
ratings. Internal acoustical: Reverberation time (Rt 60),
appropriate to room volume. Adequate diffusion to control
specular reflections.

Include a fixed podium, custom millwork furniture and façade
front walls to house electronic equipment and display
devices in a way which is conducive to the room learning
environment, adequately houses and positions to the audio
and video equipment for optimal use and site line conditions
in the room. Allow 14’ minimum clearance below the
ceilings. Include 3 each voice/data outlets at front of
classroom with IG duplex outlet and normal duplex outlet
adjacent to each.

16F-02. When directed by the Project Architect, a 100 amp, 208 V. 3-
phase outlet will be provided outside the building at a point
where a TV truck can approach the building. It is sometimes
necessary to supply temporary power to a TV vehicle so that
it can relay a television pickup from within the building. See
the Project Manager for determination on this matter. There
shall also be a ground lug provided so the system can be
fully grounded.

Section 16G – Electrical Motors
16G-01. Where motors are to be connected to 208 volt sources, the motors shall be rated to handle 208 volts plus or minus 5%. Too often in the past, the motors furnished have been rated 208-220 but the percentage limitation applied only to the 220 connection.

16G-02. In specifying large equipment, the engineer is requested to select premium efficiency equipment with minimum starting currents.

Section 16H – Telecommunication and Data Network Rooms

16H-01. 1. Provide stacked telecommunications closets to serve each floor of the building. Comply with EIA/TIA 569-A standard (10’ X 7’) and campus requirements in the sizing and locating of these rooms. Increase room size for A/V, TV and other systems that may be located in these rooms. Coordinate equipment layout and wall space with the Campus. Locate closets such that when cabling is routed through the raceway system provided, the distance will not exceed (90 meters) 290 feet to the furthest outlet. Provide a minimum of four 4” conduits from the MDF to the IDF locations and four 4” sleeves between floors. If possible, stack the MDF below the IDF’s (preferred but not required.) Provide both normal and emergency circuits to each IDF, 3 each, with one four plex per circuit. Twenty-four hour HVAC is required in each closet and shall be supplied with emergency power with a minimum of one air change per hour. Connect MDF and IDF’s with 100 pair copper phone cable and 24 multimedia and 12 single mode fiber cables. Phone cable to be terminated on 110 blocks and fiber in wall mount rack. Install an additional wall mount rack for electronic equipment. The copper and fiber optic cable (size to be determined by the scope of the project) will need to connect the building to the campus communication utilities (location to be determined by the Project Manager.)

Provide a cable tray distribution network throughout each floor and into the IDF closets. Extend the cable tray around inside of the IDF closet to allow cables to be routed within the room. Consider ease of access to the tray system when the building is in full
**operation.** Limit cable tray routing to be above corridors, common and similar areas. Where ceilings are exposed or inaccessible, and then provide a bridge of equivalent conduit connecting the cable trays in the accessible ceiling areas. It will be the designer’s responsibility to size the cable tray and raceway system to more than 50% of what is allowed by cable fill requirements of NFPA 70. Each voice/data outlet location shall consist of a 4” square box with single-gang mud ring and two 1” conduits stubbed to within 1’ or less of the nearest cable tray with a bend radius toward the IDF closet (all conduits shall be capped with protective rings with a pull string in place.)

Design fire treated ¾” plywood full height on all walls of communication rooms. Provide ground bus in the main communications equipment room at the MDF and at each IDF. Provide 50 foot candles of lighting.

a. Telecommunications closets shall have a minimum of two ISA 110 v. outlets on separate circuits. Provide duplex convenience outlets at 6’ intervals at baseboard level. Two circuits minimum. Ground bus shall also be included running directly to the back of the building ground.

2. Size of telecommunications closets are to be determined as follows:

<table>
<thead>
<tr>
<th>Serving Area (sq. ft)</th>
<th>Closet Size (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000</td>
<td>10 X 11</td>
</tr>
<tr>
<td>8,000</td>
<td>10 X 9</td>
</tr>
<tr>
<td>5,000</td>
<td>10 X 7</td>
</tr>
</tbody>
</table>

3. Equipment not related to telecommunications or the data network shall not be installed in, pass through, or enter the closet. Where feasible, rooms will be re-sized to accommodate telecommunications support systems.

16H-02. Follow TIA/EIA-569-A Standards (i.e., UPS and HVAC systems to allow for equipment size & servicing spaces.
16H-03. Underground entrance facilities shall have a 6' X 4' 6' maintenance hole with a minimum of three 4 inch conduits and one quad terminating in the MDF. There shall be no more than two 90 degree bends with a bend radius of 10 times the internal conduit diameter. No conduit run shall be longer than 100 feet without a properly sized pull box. Drain slop of no less than 4" per 100 feet is desirable.

16H-04. The Contractor is to provide 2 each, 1” empty conduits and boxes at all computer locations. Boxes may not be linked together unless center box is being used as a pull box only, then that box must be positioned for easy access. Provide pull cords in all conduits. Wiring and equipment may be provided and installed by the Contractor and/or University personnel. Assignment of the wiring and equipment work will be made during the programming/design process. Attention must be given to facilitating the connection back to the telecommunications closet(s).

1. Data Communications:
   All voice and data terminations in the IDF’s shall be terminated on 110 blocks on a wall field, not in a rack. Faceplate will match electrical outlets in color. RJ45 voice will match color of faceplate, data RJ45 is to be red, copper data cable is to jacket color red.

   Weber State University will install new servers (furnished by Weber State University) in main communication room in enclosed racks furnished in construction contract. In addition, design 1 open rack for fiber patch panels, 1 each enclosed rack for the hubs and routers. At a minimum, the complete channel performance of the system shall work in the following applications 250 Mb/sec, including but not limited to 155/622MB/sec ATM, 100 Mb/sec TP-PMD (100 meters over UTP, per ANSI X3T9.5), 1 Gigabit Ethernet, 16MB/sec token ring, 10 base T and 5 MB/sec token ring (the University standard is the Avaya GIGASpeed solution.) Provide 1 each 6 IG outlet wiremold with dedicated circuit from UPS for each vertical rack, except provide 3 each for each server rack from UPS.

2. Typical Voice Data Outlet:
   Design each typical voice/data outlet with 2 each RJ45 data outlets (voice color of faceplate, data color
red.) Plate shall be 1 gang plate with provisions for up to 6 devices and labeled to comply with Weber State University standards. Match color of electrical devices. Cable each RJ45 data outlet with a 4 pair Level 7 cable. Install devices in a 4 square 2.125" deep box with 1G plaster ring and 2 each 1"C to the nearest cable tray. Install pull string in spare conduit for future installation of cabling. Include 1G outlet adjacent to each voice/data outlet. If systems furniture is installed coordinate location of 2 each RJ45 outlets with cabling for each workstation.

3. Typical Data Outlet:
Design each typical data outlet with the number of RJ45 data outlets to service computers with cabling managed suitable for the applications. Data outlets shall not be located so that cables are installed across student aisles which would create a tripping hazard whether protected or not. From each data outlet provide minimum 4 square 2.125" deep box with 2G 1G plaster ring with a minimum of 2 each 1"C Design 1 gang plate with provisions for up to 6 devices and label to comply with Weber State University standards. Match color of plate with electrical devices, RJ45 jacks color red. Install quantity of Level 7 cables from each RJ45 outlet as determined by the maximum number of computers to be served from the location.

4. Zone Outlet:
Include a zone outlet adjacent to each instructor's location in rooms which are A/V ready and in rooms which are prepped for future A/V. Design with a universal computer-video device plate and interface electronics along with 6 each RJ45 outlets with Level 7 cable per each RJ45 outlet. Include cabling 2 each 1.5"C as required from the projector location device plate to zone outlet adjacent to instructor station. Include 1 each 1.5"C, 3 each 1"C from each zone outlet to a cable tray system. In each communication room coordinate ladder trays with the rack layout. Zone outlet shall be 6" X 6" box or similar enclosure matched to analog universal computer-video device plate along with structured cabling devices. Include 2 IG duplex outlets and 1 each duplex outlet on dedicated circuits by each zone outlet.
5. Building Wireless Network System:
Weber State University desires that the building include a wireless LAN. Provide data outlets at University designated locations for wireless access points. Include 1 IG duplex outlet on dedicated circuits by each wireless access point data outlet.

16H-05. Provide data connection at all vending areas, exterior entrances, turnstiles, controlled access areas such as labs, clothes washers, point of sale machines and etc. It is the intent of the University to eventually go to a centrally controlled card system and this must be accommodated in all new construction projects. Facilitate connection back to telecommunications closets.
APPENDICES
WEBER STATE UNIVERSITY

DESIGN AND CONSTRUCTION STANDARDS
FOR
ARCHITECTS, ENGINEERS and CONTRACTORS

APPENDIX A

CENTRAL AUTOMATION CONTROL SYSTEM
APPENDIX A CENTRAL AUTOMATION CONTROL SYSTEM

1. General

A. The central consol is a Johnson Controls Co. METASYS System which is located on the Ogden Campus, located in the control room of the Automation Center and the STAEFS system, located at the Davis Campus.

B. These systems have the capability of monitoring and controlling the mechanical and electrical functions of each building or building complex. New building control systems shall tie to the central console. New buildings and building complexes are not to have individual supervisory control centers. Only those additional thermometers, pressure gauges and other instrumentation necessary for initial balance and adjusting of the building systems are to be provided at the buildings or building complexes.

C. The Johnson Control system is a proprietary system and other companies cannot add to or modify it. To obtain some reasonable competition in the control system bidding the following procedure shall be followed:

1) Prior to completion of the general project contract documents, a special set of contact documents just for Johnson Controls automation shall be prepared by the project architect/engineer. These will be submitted to the Project Manager of the University for checking and approval. Upon receiving approval, the documents will be forwarded to the Johnson Controls Company local office for price quotation. The Johnson Control Company shall be required to submit a detailed breakdown of items and costs included in their price quotation. The price quotation will be thoroughly verified by the architect/engineer as to accuracy and reasonable price. This price quotation will be used as an “automation allowance” in the general project contract documents.

2) The building temperature control system will be bid using open competition. Each bidder will include, as a part of his bid, the “automation allowance” quoted in the contract documents and will be required to hire the Johnson Controls Company to complete this portion of the work.
2. **Basic Requirements**

A. At a minimum, each building must have basic monitoring and control functions installed which coordinate with the requirements of the system being designed. Each project may dictate the need for more specific monitoring and controls. The architect/engineer shall be responsible to insure that the required functions necessary for this particular system are included for each building.

B. From the viewpoint of overall campus requirements, the following essential functions must be accommodated for each building.

1) Start/Stop Manual  
2) Start/Stop Programmed, individual points  
3) Optimized Start  
4) Control point adjustment (manual)  
5) Individual alarms (group alarms are not desirable)  
6) Temperature indication  
7) Pressure indication  
8) Humidity indication  
9) Status indication  
10) Printer – input/output device  
11) Trend logging  
12) All points logging  
13) Alarm points logging  
14) Run Time totalization  
15) English language communication  
16) Peak load shaving  
17) Power management load shedding

C. All interconnection devices, wire, cable, conduit, encoders, decoders and other related equipment shall be included as a part of the project to make the system complete and operational.

D. All required conduit (except in mechanical rooms) shall be concealed in walls, ceilings, etc. The automation control contractor shall coordinate his work throughout the project with other trades in insure access for interconnection devices. Do not allow the automation control contractor to come on the job late and run exposed conduit.

E. Automation control system equipment panels shall be shown on the mechanical drawings as to size and location.
3. **Special Requirements**

   A. Train the University HVAC/R personnel in the proper operation and maintenance of the system.
WEBER STATE UNIVERSITY

DESIGN AND CONSTRUCTION STANDARDS
FOR
ARCHITECTS AND ENGINEERS

APPENDIX B
CAMPUS STANDARDS
DRAWINGS
EXTERIOR SIGNS

NOTE: The requirements for Exterior Signs is currently under development. Please contact your Project Manager for the most recent information.