Phase I
Kittredge West Residence Hall Renovation

Phase II
Kittredge Central Residence Hall & Commons

Design-Build Technical Criteria

Housing & Dining Services
University of Colorado at Boulder

June 1, 2011
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**ATTACHMENTS: SEE DOCUMENTS POSTED ON THE CU "OPEN SUBMITTALS" WEBSITE**
ATTACHMENT I - CORA BIKE RACK INSTALLATION STANDARDS
ATTACHMENT II – ATTIC UNDER-ROOF INSULATION GUIDELINES
ATTACHMENT III – PROCESS IMPROVEMENT FOR BUILDING ENVELOPE
ATTACHMENT IV – MULTI-GENDER RESTROOM SIGN
ATTACHMENT V – SIGN AND BULLETIN BOARD GUIDELINES
ATTACHMENT VI – HDS SECURITY SYSTEMS STANDARDS AND DESIGN GUIDE REV B- May 2011
ATTACHMENT VII – LIGHT FIXTURE CUT SHEETS
Credits

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Steve Hecht, Manager, Projects Group
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John Fox, Associate Director, Residence Life
Marina Florian, Project Manager

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Thomas Goodhew, Architect, Facilities Planner

Residential Academic Program

Paula Bland, Director, Residence Life

Academic Liaison

Darna Dufour, Associate Dean, College of Arts & Sciences
INTRODUCTION AND OVERVIEW

GENERAL:

Residence halls today are much more than the dormitories of past generations. Current Residence Life programs offer a wide range of programs to support a student’s academic, social and physical wellness in addition to providing housing for students during their academic career. Residential facilities today are designed to promote social interaction, a sense of community, and provide a safe, secure environment for students to live in.

The academic courses that are taught in the RAP programs are “core courses,” which are conducted in the building throughout the day and evening. Approximately eight to nine courses are taught each semester. The program offers relatively small classes, with only 20-22 students per class for core curricula. As students pay extra for the program, they expect higher quality space for living, teaching, advising and administration. In order to attract more sophomores and upperclassmen, the residential options need to be greater than those found in other residence halls. This includes greater privacy for them, which will be facilitated by the provision of single rooms and double occupancy suites which will have shared baths.

CU Conference Services, a division of Housing and Dining Services, provides space for a variety of conferences and gatherings across campus, year-round. It provides conference related on-campus housing from end of the academic year in May through the first weekend in August each summer. Conferees consist of adults and youth groups, some of whom are housed in the residence halls where some meeting sessions also are held. The improvements to Kittredge West and new Kittredge Central will serve Conference Services in parallel with serving the students by creating a more comfortable and contemporary residential and learning environment.

PHASE I – Kittredge West:

Kittredge West is one of the five residence halls in the Kittredge Complex, which also includes the current Kittredge Commons. The building, located in the western edge of the complex, was constructed in 1982 and has seen only minor renovations and improvements since then. The renovation of Kittredge West is the fifth project in what will be a continuing program to improve and update all of the Kittredge facilities.

Kittredge West has approximately 74,000 SF divided into three wings of three to four stories each. There are no dining facilities within the building; dining for all for the residents in the complex currently takes place at the Center for the Community.

The purpose of this project is four-fold:
1. To make improvements due to the age of the building and its systems.
2. To expand and create a specialized living and academic environment for students in the Pre-Health Program that supports the Residential Campus 2020 Plan & Flagship 2030.
3. To increase and retain the population of sophomores, juniors and seniors living in the building.
4. To increase revenue from summer conferences.

Kittredge West is configured largely as it was the day that it opened and, with the exception of carpet replacement, it has most of its original finishes. Over the course of its 28 year existence, the interior of the building has become tired and shopworn. Further, the building has no air-conditioning, rendering it less than desirable for students during hot weather and for conferences.

Residents of Kittredge West will be members of the Pre-Health Program. Students apply to be participants in the program on a first come first serve basis, and they pay an additional fee to be a part of it, as well. They will not only live in the building but they will also take classes and study in it. The intention is to create a special place where students can easily interact with one another, with faculty and with staff.
The Pre-Health Program is administered by the College of Arts & Sciences and is a growing residential academic program on campus. The program is designed to serve all four years including freshman and sophomores, with the desire to attract more upper division students.

As described in the Program Plan, there is:

“…the broad campus initiative to move toward a residential campus model including the expansion of the current residential academic programs. These programs have been shown to increase the involvement, academic performance, and satisfaction of undergraduate students, transform the student culture; and the University is committed to providing this opportunity to all incoming students. Key to a successful residential campus strategy is attracting sophomores, juniors and seniors to living on campus in the residence halls. This will require adding amenities to some rooms to make them more attractive to these students.”

**PHASE II – Kittredge Central:**

Kittredge Central Residence Hall & Commons is intended to replace the existing Kittredge Commons building with a new building that includes: 1) A Commons facility supporting Residence Life and RAP programs for the Kittredge Complex and; 2) A new residence hall for the complex. This project plans to deconstruct the existing 40,586 GSF building and construct a new 97,117 GSF facility comprised of 67,863 GSF dedicated to the new residence hall and 29,254 GSF dedicated to the commons functions. The site is located in the heart of the Kittredge complex, between Kittredge West Residence Hall and the Kittredge ponds.

The Kittredge Commons building is no longer fully utilized with the decommissioning of the dining hall following the opening of the Center for Community. Reinvigorating the site as a central commons for the Kittredge residential community is a vital final piece in completing the vision for the complex outlined in the Residential Campus 2020 Plan. The development of central recreation, academic and other support spaces included in the program, in conjunction with the increase in density provided by the new residence hall, completes a vision for the new ‘residential campus’ model for the Boulder campus.

**SITE DESIGN:**

Program Plans for each phase of the project provide some description of the site conditions and issues with traffic patterns. By combining the two projects into a single design and construction project, it is the intent of the CU Boulder to leverage this opportunity to address circulation issues that have developed over time.

When the Kittredge Complex was originally developed, the site was at the far south end of campus and the Boulder community, only the central portion of the Fleming Building existed and Williams Village was in the early planning stages. The growth of the campus and Boulder around the complex has placed demands on the circulation through the site that could not be foreseen. Kittredge West was built over former road right-of-ways that continue to have underground utilities and have preserved circulation patterns that may no longer be logical. The site is highly visible from Broadway, a key entrance point to the City of Boulder and campus. The combined project is an opportunity to build on the success of the Center for Community and Regent Underpass projects and be an anchor point to the south edge of Main Campus and a gateway to the city south of campus.

**OVERALL GOALS:**

It is the intent of the University that the Design-Build Team delivers a fully functional and operational facility.

The renovation of Kittredge West and construction of Kittredge Central residence hall should result in an environment that facilitates a dynamic learning, interdisciplinary environment. The design should encourage students to spend time in the common spaces. These spaces should be multifunctional and
have a high utilization. It is the expectation that the success of the Kittredge residence Halls will create further interest among the students for similar facilities and encourage students to remain in residence halls for multiple years.

Kittredge Complex is intended to be a community where students and faculty alike can share in academic pursuits. It will be a place where casual conversations, interactions and the exchange of ideas occur naturally. It should be a place with the feeling of a neighborhood, where students feel “ownership” and that it is “their place”. Students will be able to customize their own academic experiences and learn from one another in a non-compartmentalized learning environment. The character of the new facility should transcend that of the residence halls of the past. It should be a place of inspiration and discovery.

DESIGN & CONSTRUCTION PARAMETERS:

The University provides a range of documents for the Design-Build Team to review and consider during the preparation of their proposal. Program Plans provide project specific information and are intended to describe the unique characteristics and program elements of the project. The Campus Master Plan, UCB Construction Standards and related reference documents provide details that provide consistency for the Campus image and operations. Planning Criteria and Space Data Sheet describe design parameters that are common to Housing & Dining Services Residence Life facilities on campus. Technical Criteria provide details and technical information specific to the project. Life Safety codes and other referenced documents will also need to be considered. In the event of conflicting information, the most stringent shall apply unless clarified in writing.
SCOPE OF WORK SUMMARY:

It is a fundamental and primary requirement of this project that the total number of beds and academic spaces shown in the use program(s) be provided, at a minimum. Additional beds, community spaces and/or academic spaces beyond the minimum may be included in the design and would be welcome, provided the buildings remain useful in all other aspects and the spaces do not compromise the quality of the overall environment. It is the goal of the University to achieve a bathroom fixture to occupant ratio of between 1:7 and 1:8. The information contained in the Program Plans, is complimentary to the information contained within the Design-Build Criteria. If there are conflicts in the information contained within these two documents then the owner shall be contacted to resolve the conflicts. The Program Plans can be found at the following websites:

Phase I – Kittredge West
http://fm.colorado.edu/planning/projects/documents/ProgramPlanfinaldocument01-5-11.pdf

Phase II – Kittredge Central

The completed buildings will have a variety of academic spaces from formal classroom settings to less formal ones for seminars, to informal spaces where students can study quietly, either alone or in small groups. There will be several options for relaxation and recreation that enhance the experience of the residents and contribute to their personal and academic goals.

The building envelope must be architecturally compatible with the existing Kittredge complex and the surrounding neighborhoods; and is anticipated to be stone masonry veneer with clay tile roofing. Building scale and pattern is expected to act as a transition between the adjacent Kittredge residence halls original construction and the neighboring Wolf Law and Center for Community buildings. Based on the program plans, the buildings are anticipated to be 3 to 5 stories, and will define a new ‘heart’ for the Kittredge residential complex. The Kittredge Central building will ideally become a major focal point for the area around the ponds.

Public spaces incorporated into this phase shall: allow for a central open space system, create axial relationships to existing and future building elements, provide a hierarchical system of courts and plazas, be oriented to sun and views, provide for common uses within buildings, and foster social interaction. Accessibility and circulation routes for pedestrians and bicycles within the site and those traveling through the site are to be improved.

Maintenance and durability have a high priority. Residence halls see a significant amount of wear and tear and the costs to maintain the facilities is substantial. The selection of materials should reflect this important fact.

All furniture and some electronic equipment will be furnished and installed by the Owner. The latter includes: televisions; digital video projectors; sound amplification, recording and playback equipment; and audio speakers. All power and data wiring, for connections by others, is to be included in the Design-Build scope. The Owner or one of its vendors will furnish washers and dryers for the laundry rooms, and such kitchen appliances as an electric oven/range, refrigerator and dishwasher, all for installation/final connection by the Design-Build Team. Refer to the section title “Room Programs” for specific information on Owner furnished items.

Way-finding in the new and renovated residence halls is a priority. It has been very difficult to find one’s location in some residential corridors because of “racetrack” or “figure 8” layout of the hallways and the repetitive nature of the residence hall building type. We request that the D/B Teams consider this issue in their design. We also request the D/B Team break up the common hallway corridors with architectural detailing to minimize long stretches of corridor. Colors and other finishes should be used to help identify wings and floors within each building.
STAGING:

The only portion of the site which may be used for staging, construction access or any other construction activities is that which immediately surrounds project. The other buildings in the complex will continue to be occupied throughout the course of construction and therefore must remain safely and conveniently accessible. The limits of the construction area must remain fenced throughout the duration of construction, though those limits of construction may be less than that which is shown on the diagram.

The University’s Standards for protecting the site during construction and restoring it afterwards will be strictly enforced. The trees on and adjacent to the site are mature and are highly valued, and all trees that are to remain within the area of the limits of construction must be protected with fencing at their drip-lines. All trees must be watered at regular intervals to ensure their continued viability and growth during construction. Mature vegetation is difficult to replace on campus and mature trees planned for removal should be confirmed with the campus Landscape Architect. Plantings that are to be removed for construction should be considered for relocation to other areas on campus and any which are damaged will be required to be replaced at their assessed value. Adhere to current University standards for tree protection and site restoration.

Limited Contractor parking spaces may be included in the staging area for the use by the Design-Build Team without charge. If needed, crew parking may be able to be arranged through CU. Cost of parking to be borne by the Contractor.

Contractor shall maintain access to existing adjacent facilities at all times. These facilities include, but are not limited to: parking areas and Kittredge Loop Road, Fleming Building, residence halls, and the adjacent bike/pedestrian underpasses.

COMMUNITY AWARENESS:

During the construction, the Design-Build construction team must be aware that there are students living adjacent to the construction area and offices in Fleming Hall. The contractor must be sensitive to noise issues and any other activities that may affect the students. There are specific hours of construction on campus and these hours may be limited during certain periods, for example, during final exams, move-out, etc. The D/B team may be asked to provide tours of the site during construction.

ACCESSIBILITY:

It is the University’s policy to exceed the requirements of the Americans with Disabilities Act wherever possible.

It is the intent of the University for any common areas of the buildings to be as accessible to the disabled as possible. All public and academic areas shall be made accessible by the installation of elevators or lifts. Site design shall consider accessible routes through the site, to building entrances and adjacent facilities.

SUSTAINABILITY:

In support of the University’s commitment to sustainability, the work will meet the United States Green Building Council’s points for a LEED Gold certified building (LEED Gold certification is required.) The successful design-build entity will have the obligation to meet all the requirements of design, documentation, and construction to achieve this goal. The design team is expected to deliver a facility that should exceed the minimum requirements of the LEED Gold, with special emphasis in the areas of energy and environment. Design-Build Entity is required to have team members that are directly associated with the project to have working knowledge of the LEED process. Adhere to the sustainability/LEED requirements in the “University of Colorado Building and Construction Standards,” 2011 Edition.
For purposes of evaluation, the building will be categorized as LEED-NC (New Construction). The LEED scorecard indicates the credits which are expected to be achieved. There will be a formal submittal for certification to the US Green Building Council, consequently, the successful Design-Build Team will be obligated to maintain records, provide all methodologies and submissions that are required to substantiate the compliance with the identified credits and points. CU Boulder will contract with a LEED consultant separately from the design-build contract. The LEED consultant will be responsible for uploading submittals to the USGBC website.

HAZARDOUS MATERIALS:

The existing buildings contain hazardous materials which must be abated under the Design-Build contract. Refer to the Environmental Site Assessment and University of Colorado at Boulder Asbestos Specification (http://www.colorado.edu/ehs/managers/managersandcontractors.html) for requirements and procedures. Specifically, Refer to the Comprehensive Hazardous Materials Building Inspection, the scope of work, and the abatement specification, which is currently in progress, included by reference and separate from this one. All existing piping that serves other buildings or facilities than Kittredge West and Kittredge Central will be left in place after abatement. All abated piping shall be reinsulated per the CU construction standards. The owner will contract for testing and inspection services. The Design/Build Team will select from pre-qualified abatement contractors from the CU Boulder Approved List.

MOCK-UPS:

Exterior Materials and Details:
A mock-up for all exterior building materials and installation details shall be provide on-site for owner approval prior to order of exterior finish materials. Mock-up may not be part of the finish work and shall remain in place for reference during the building construction. See UCB Standards for specific mock-up requirements. Coordinate requirements with Planning Phase Manager.

Interior Building Systems, Materials and Finishes:
A mock-up of typical interior details and finishes is encouraged prior to full execution of the work. Selection of a typical student room for mock-up purposes allows verification of design details and troubleshoots installation and maintenance issues. Mock-up shall include fan-coil unit, location of power, data, and related fixtures. Provide graphic representation of typical furniture layout as part of mock-up. Work may be part of the finish product with Project Manager approval.

MISCELLANEOUS:
Provide a detailed cost estimate in the CSI format as an attachment to the Cost Proposal Form. A cost estimate shall be provided for each phase of the project. Cost detail should include costs related to profit, overhead, home office staff, home office expenses, accounting and/or legal fees, insurance (exclusive of on-site staff payroll related insurance). Provide a separate line item amount for abatement.
STAGING DIAGRAM
Diagram is intended to indicate overall site boundary of the construction area. Sub-areas within the boundary will require protection from construction access to preserve and protect established landscaping. Construction staging areas will consider impacts of landscape restoration following construction.

A pedestrian access route shall be provided between Kittredge Ponds and Kittredge Loop Road along the west side of Andrews Hall throughout the construction period. Pedestrian access along the western edge of Kittredge Ponds is strongly encouraged during academic sessions.

**Participants in Step III – Technical Proposal are to submit Staging Diagram for review prior to the Schematic Design pricing submittal.**
LEED Scorecard

The LEED scorecard is provide to indicate campus priorities for sustainability design and provide an indication to teams of points available to the projects due to standard practices of the campus. LEED Gold certification is considered a minimum standard.

Phase I – Kittredge West Residence Hall (Renovation)

### LEED 2009 for New Construction and Major Renovations

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<tr>
<th>Sustainable Sites</th>
<th>Possible Points: 26</th>
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<tbody>
<tr>
<td><strong>Y</strong> Prime 2</td>
<td>Construction Activity Pollution Prevention 1</td>
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<tr>
<td>Credits 3</td>
<td>Development Density and Community Connectivity 5</td>
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<td>Credits 4</td>
<td>Brownfield Redevelopment 1</td>
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<td>Credits 6</td>
<td>Alternative Transportation—Public Transportation Access 6</td>
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<td>Credits 7</td>
<td>Alternative Transportation—Bicycle Storage and Changing Rooms 1</td>
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<td>Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles 3</td>
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<td>Alternative Transportation—Parking Capacity 2</td>
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<td>Site Development—Protect or Restore Habitat 1</td>
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<td>Site Development—Increase Open Space 1</td>
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<td>Credits 14</td>
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<td>Heat Island Effect—Roof 1</td>
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<td>Light Pollution Reduction 1</td>
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<td>Innovative Wastewater Technologies 2</td>
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<td>Measurement and Verification 3</td>
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<td>Green Power 2</td>
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<td>Storage and Collection of Recyclables 1</td>
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<td>Building Renovate—Maintain Existing Walls, Floors, Roof 1 to 3</td>
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<td>Building Reuse—Maintain 50% of Interior Non-Structural Elements 1</td>
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Certified 40 to 49 points Silver 50 to 79 points Gold 80 to 99 points Platinum 100 to 110
Phase II – Kittredge Central Residence Hall & Commons (New Construction)
TECHNICAL CRITERIA:

Technical Criteria for the project are intended to provide project specific information and clarifications to the UCB Building Standards. If information within the UCB Standards, Technical Drawings, Appendices and/or Technical Criteria conflict, the more stringent requirements shall apply unless otherwise clarified in writing by the CU Boulder Project Representative.

DIVISION 1 – General Requirements

CU Boulder encourages the use of electronic media for product data and drawing submittals. Contact Project Manager for clarification.

Coordinate with the CU CAD office for building room numbers. Contact the Project Manager to help with coordination during the schematic and design development phases.

CU Boulder intends to utilize a comprehensive photo documentation system throughout the construction process. The D/B team is requested to share the cost of an independent contractor equally with the owner. Cost sharing is intended to provide equal access and usage rights to each party. An Allowance of $10,000 per phase is to be included in the Cost proposal of the STEP III participants.

CU Boulder typically has multiple construction projects on the campus. The D/B team will be required to coordinate construction activities through campus staff with other campus projects. Attendance of a member of the construction team may be desired at campus wide coordination meetings.

DIVISION 2 – Sitework, General

The general site boundary is indicated in the project staging diagram. Construction site boundary may change depending on approved project design. Construction phasing and campus activities may dictate requirements for changing the construction boundary during the construction process. Site design shall consider pedestrian and traffic flows, utility infrastructure and drainage patterns for the broader campus area.

Landscape

A. Site design for the project area shall consider the context of the Kittredge Complex within the CU Boulder campus and the Boulder community. Site elements shall be consistent with the historic fabric of the complex. Pathways, plantings, site furnishings and other elements shall respect the original design concepts and intent and be similar in design. Improved pedestrian access between the C4C and the Fleming & Wolf Law buildings is critical to the success of the site design.

B. Any new or reconstruction site walls must match the existing site walls, clad in sandstone and provided with new wall caps with CU Standard anti-skateboard joints.

C. Tuck-point existing masonry cheek-walls and site walls adjacent to the buildings. All site walls shall be evaluated for visible structural defects or damage and shall be restored.

D. All ramps must comply with ADA requirements.

E. Bike Racks/Covered Bike Parking:
   1. Bike racks shall be provided at .75 spaces per bed using the campus standard Cora Bike Racks. CU will provide bike racks. Provide a permeable hardscape surface under bike racks. (See Attachment I - Cora Bike Rack Installation Standards).
2. Bike racks to be placed in close proximity to main entrances and exits, at landscape periphery. Large ‘gang’ bicycle parking configurations are discouraged. CU to approve bike rack locations.

3. Covered bike parking required as per LEED requirements.

F. Provide a pest control strip of 18” around the entire perimeter of each building. This strip shall be ¾” Wyoming red rock to the depth of 6” over weed barrier with 6” polyboard edger as per CU Standards.

G. Site plan to include snow storage areas

H. Provide minimum two (2) waterproof duplex receptacles at all entry terraces.

I. Provide screened recycling and trash area to accommodate CU standard recycling bins and dumpsters for both buildings.

J. Provide exterior lighting at all terraces that provides a suitable amount of light for informal gatherings of small groups and contributes to the security of the space. It shall be of architectural character appropriate for the purpose and be in compliance with CU Standards.

K. Provide exterior lighting in the soffits under all bridges at new and existing buildings.

L. Site lighting to comply with CU standards for exterior lighting. Provide LED fixtures for eave lighting with owner approval.

M. Exterior lighting shall consider the impact to the Sommer-Bausch Observatory north of the site. Low-pressure sodium lighting should be considered in some areas to limit the impact of site lighting on night skies.

N. Landscape areas shall be in accordance with current CU standards. Staging and construction areas shall consider impact of soil compaction and be restored including excavation and removal of compacted soil.

O. Remove all existing sod and replace with new throughout the entire project site to adjacent curb lines. This area of sod replacement shall be required regardless of the area of the site actually used and fenced by the Design-Build Team.

P. Extend existing raw water main line at west and northwest of site to complete loop at the Kittredge area. Plans will be provided by CU irrigation consultant.

Q. New landscape irrigation systems shall be included for the entire project site. Irrigation systems shall be connected to the campus raw water irrigation system.

R. Site Furnishings: All exterior open spaces shall include a variety of site furnishings including site walls, benches, tables/shelters, trash and recycle receptacles in accordance with current CU standards.

S. Design of open spaces shall focus on water conservation wherever possible. Design team shall take care to consider design of passive and recreation spaces to include careful selection of pervious paving, plant materials, and irrigation products.
T. Mitigate stormwater runoff by providing pervious surfaces for plazas, walks or parking.

U. The intent is to screen new and existing transformers; coordinate with Owner for specific requirements.

V. Protect all trees and existing landscaping. Prior to design/construction, existing trees may be required to be appraised by an outside consultant. Fence all trees to 6" beyond the drip line of each tree; ensure proper watering of each tree during the life of the project. CU to provide watering instructions. Tree protection shall comply with CU Construction Standards Section 02111 – Tree and Plant Protection.

W. Replace all paving in staging area after construction to match adjacent paving. Provide signage per CU standards to re-route pedestrian, bicycle and automobile traffic during and at the completion of the project as indicated by Project Manager.

X. Staging
   Please follow Division 1 – General Requirements for all parking and staging needs for the project.

   **Civil**

   A. Vehicle parking and service access may be reconfigured as part of the overall site design and may be desirable. All changes to parking areas and services drives are to be coordinated with Parking Services and meet or exceed CU Boulder standards. No net loss of parking spaces is allowable. Minor increase in parking spaces may be desirable. Locations of handicap accessible parking shall be coordinated with Parking Services and considered in access to all buildings in the vicinity.

   B. The Kittredge Ponds are an integral part for the Kittredge complex character, aesthetic and storm drainage system. As part of the Phase II - Kittredge Central, dredging and restoration of the ponds has been included. CU Boulder is continuing study on the scope of pond restoration. For the purposes of the STEP III -Technical (Design/Cost competition), Teams shall consider the impact pond restoration may have on their project. Each team shall include an allowance of $500,000 for the design and construction of the pond restoration in their cost submittal.

   C. Campus Chilled water is not currently provided to the Kittredge Complex. Project design is to plan for connection to a future chilled water supply system in the area. A separate project is planned to provide chilled water to the Kittredge Complex. Design and installation of the chilled water distribution for the complex is anticipated to be in parallel with this project. Direct bury chilled water lines are anticipated to be installed within the project area. Coordination of location and installation of chilled water lines will be required and part of the project.

[DIVISION 3 – Concrete]

(No project specific criteria identified)
DIVISION 4- Masonry

Stone masonry patterns for the Kittredge residence halls do not follow horizontal random ashlar patterns typical of the Klauder campus image. The Kittredge West building utilizes a stone mix and pattern unique to the campus. Design teams will need to carefully consider appropriate masonry pattern and materials for the new and renovated buildings.

The following stone mix was used as a basis for the recent Smith Hall Addition and can be considered for stonework that is intended to match the original Kittredge Complex residence hall buildings. Final stone selection, sizes and patterns shall be confirmed with the Campus Architect prior to start of work.

Approved sample panel Smith Hall as follows:

<table>
<thead>
<tr>
<th>Stone Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Natural</td>
<td>10%</td>
</tr>
<tr>
<td>Lyons Red Natural</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>40%</td>
</tr>
<tr>
<td>Berthoud Pink</td>
<td>(more buff, less pink)</td>
</tr>
<tr>
<td>Pink Natural</td>
<td>10%</td>
</tr>
<tr>
<td>Berthoud Pink Natural</td>
<td></td>
</tr>
<tr>
<td>Variegated Bacon Stripe</td>
<td>40%</td>
</tr>
<tr>
<td>Mortar Mix Color</td>
<td>22A SGS mortar color</td>
</tr>
</tbody>
</table>

[END OF SECTION]

DIVISION 5 – Metals

(No project specific criteria identified)

[END OF SECTION]

DIVISION 6 – Wood and Plastics

A. MILLWORK

1. General: All millwork is to have LEED MRc7 certified wood products.

2. Cabinets
   a. All cabinets are to be clad with plastic laminate (except Faculty and Hall Director’s Apartments). Refer to the Criteria for Room Types for countertop materials.
   b. Provide minimum one adjustable melamine-clad shelf in each base cabinet.
   c. Provide one adjustable melamine-clad shelf in each wall cabinet up to 24” in height, and two shelves for all others.
   d. Provide locks as indicated in the Criteria for Room Types.

3. Countertops: Self-edged, square profile; provide full height backsplash at Sink Niches and full height at Kitchen/Break Rooms at each abutting wall.
   a. Materials: Provide ½” thick solid-polymer surfacing material.

4. Window Sills: Provide ½” thick solid-polymer surfacing material at all window sills.

[END OF SECTION]
DIVISION 7 – Thermal and Moisture Protection

A. INSULATE THE BUILDING ENVELOPE

1. Foundation: Provide closed-cell polystyrene insulation around the perimeter of the foundation with minimum R-value of 11, from slab elevations to 30” below grade.

   Exterior walls: Provide insulation on all exterior walls to achieve an overall minimum wall R-value of 19. Insulation may be closed-cell spray foam or at least 1” thick exterior board insulation (or that required to meet ASHRAE Standard 90 analysis required by IECC and LEED). Fill voids left in the rigid insulation if used. Insulation must comply with “flame spread” and “smoke developed” limitations of the IBC and tested per ASTM E84. Enclose and protect the insulation with studs and drywall.

2. Roof: Provide insulation to achieve a minimum assembly rating of R-40. The insulation must be enclosed with metal studs and drywall unless otherwise directed by Owner (attic spaces – typical). If insulation is existing, remove and add new insulation. See Attachment II for guidelines for installation of attic under-roof insulation.

3. Fold and staple seams to insure the continuity of the vapor barrier on all batt insulation.

4. Provide Building Envelope Design Review and Commissioning (see Attachment III).

5. Provide Ludowici roof tiles on new Kittredge Central building. Replace and repair existing tiles on Kittredge West. Color mix to match adjacent roofing and comply with LEED requirements. Provide snow guards over entry points and other pedestrian pathways.

6. Provide full gutter system & downspout roof drainage system for building. Internal drain pipes are preferred to surface mount downspouts. Consider using roof drainage for landscape irrigation where possible.

7. Replace existing heat trace system and gutters at Kittredge West. Provide new gutters and heat trace at Kittredge Central as per CU standards.

8. Clad the Wood Fascia at Kittredge West

   a. Clad the surface of the existing wood fascia of all existing roofs with pre-finished metal.
   b. Mock-up: Prepare a mock-up, for the Owner’s review of appearance and craftsmanship. The mock-up shall be 10’-0” long and installed in a final location. If acceptable, the mock-up may become a part of the finished work.
   d. Installation: Install metal with over-lapped, sealed butt or mitered joints and concealed fasteners. Wrap all corners so as to prevent any corner butt joints.
   e. Replace dry rot wood as necessary.

[END OF SECTION]
DIVISION 8 – Doors & Windows

A. DOORS, DOORFRAMES AND HARDWARE

1. Doors
   a. All rooms and closets are to be enclosed by at least one door, except where specifically noted otherwise in this document.
   b. All doors are to swing into rooms except those serving mechanical/electrical/IT rooms and closets, custodial closets and storage rooms, or doors otherwise required by building and life-safety codes to swing outward.
   c. All doors are to be solid-core wood, with plastic laminate faces and edges. Laminate to match previous Kittredge renovations (Formica Latte Walnut #6931-NT Naturelle Finish). All doors are to have LEED MRc7 certified wood products.
   d. Door sizes:
      1. All room entry doors are to be 3'-0" x 6'-8" x 1¾".
      2. All bedroom closet doors are to be 2'-8" x 6'-8" x 1¾".
   e. Manufacturers:
      1. Marshfield Door Systems, Inc. or Approved Substitute (prior to bidding).
   f. Vision Panels: Provide vision panels (of the largest size permitted by code) in doors into the RAP Reception, Stairways and Floor/Study Lounges. Other glass treatments, such as glass block are encouraged for the Floor/Study Lounges.
   g. Side Lights: Provide side lights for Classrooms. Provide side lights or opaque door lights for Offices. Coordinate with Project Manager.

2. Windows (typical, student rooms and offices)
   a. Operation: Sliding, with locks.
   b. Grade: Heavy Duty Commercial.
   c. Material: Aluminum or fiberglass, thermal break frames.
   d. Finish: Black anodized.
   e. Glazing: 1” insulating units, argon filled (each lite: 1/4” minimum, 3/16” preferred)
      1. Indoor light: 1/4” clear.
      2. Outdoor light: 1/4”, with low-E coating; provide glass with gray tint on east, south and west exposures, and clear glass on north as per CU Standards. Verify glazing with building energy and daylighting modeling. Glass thickness dependent on wind loading requirements.
   f. Provide screens on all windows, removable from the inside.
   g. Provide stop to restrict window opening at areas over roofs or other projections to discourage students from climbing onto exterior projection areas.
   h. Manufacturers:
      1. EFCO Corporation
      2. Graham Architectural Products
      3. Kawneer
      4. Wausau Window and Wall Systems
      5. Approved Substitute prior to bidding

3. Doors: Provide new hollow metal doors and frames at all exterior locations.
   a. Glazing: 1” insulating units.
      1. Indoor light: 1/4” clear.
      2. Outdoor light: 1/4”, with low-E coating; provide clear glass on north exposures and glass with gray tint on south exposures.
   b. Provide continuous geared hinges on all exterior doors.
4. Storefront:
   a. Materials
      2. Finish: Black anodized.
      3. Storefront Glazing: 1” insulating units (each lite: 1/4”)
         a. Indoor light: 1/4” clear.
         b. Outdoor light: 1/4”, with low-E coating; provide clear glass on north exposure and
glass with gray tint on east, south and west exposures.
         c. For storefront glazing at grade level, consider insulated aluminum spandrel panels in
lieu of glass.
      4. Door Type: Full-lite with medium stiles.
      5. Door Glazing:
         a. Indoor light: 1/4” clear.
         b. Outdoor light: 1/4”, with low-E coating; provide clear glass on north exposures and
glass with gray tint on south exposures.
      6. Provide continuous geared hinges on all doors.

[END OF SECTION]

DIVISION 9 – Finishes

The Design-Build Team will make recommendations of materials and colors for all finishes and
components to enable the Owner to make decisions about them in the context of an entire palette.

1. Walls
   a. Typical: Type X drywall, with Level 4 finish.
   b. Corridors: Type X abuse-resistant drywall, with Level 4 finish. Soffits in the corridors shall
have Type X abuse-resistant drywall on vertical surfaces only. Provide 2 layers of Type X
drywall on horizontal surfaces at soffit with slip-joint at strike side of door.
   c. Private Bathrooms:
      1. 4” X 4” ceramic tile wainscot to 4’-0” above floor. Use sanded grout and sealer.
      2. Moisture-resistant drywall with Level 5 finish above ceramic tile wainscot.
   d. Common Bathrooms and Toilet Rooms: 4” x 4” ceramic tile, full height with accent pattern
design. Use sanded grout and sealer.

2. Flooring and Bases
   a. Carpet:
      1. Carpet: Shaw Contract Group, style: “Captivate,” Color: Trenchcoat #59554, or
Approved Substitute prior to bidding. Base: 4” high carpet base with bound edge:
Shaw Contract Group, style “Space Matters,” Color: Any Event, or Approved Substitute
prior to bidding.
      2. Walk-off Matt: Atlas Tile, color “Charcoal,” 10 feet minimum length at all entries.
         a. Base: Match adjacent base.
      3. Provide Carpet tile with pad to meet current IIC code requirements in all rooms above
Faculty and Hall Director Apartments.
      4 Carpet for Apartments: Shaw Contract Group, style: “Buckhead Place”#ZU114 or
Approved Substitute prior to bidding. Provide Fairmont 30 oz. pad. Provide wood
molding, 5/8”x3-3/8” min., paint-grade, verify profile shape.
   b. VCT:
      1. Flooring materials in accordance with CU Standards.
      2. Base: 4” high rubber.
c. Ceramic Tile:
   1. Bathrooms and Toilet Room Floors: 1” x 1” (common bathrooms) or 12” x 12” (all others) ceramic tile, with dark colored epoxy grout (use same grout in adjacent corridor tile area as appropriate).
      a. Base: 4” high ceramic tile cove.
   2. Bathroom, Private Bathroom and Toilet Room Walls: 4” x 4” ceramic tile with sanded grout and sealer.

d. Porcelain Tile:
   1. Main Lobby, Private Bathroom and Sink niche: 12” x 12” or 6” x 24” porcelain tile with epoxy grout.
      a. Base: 4” high porcelain tile cove.

e. Amtico Tile or approved substitute. Provide skim coat for proper installation:
   1. Student bedrooms.
      a. Base: 4” high rubber

f. Vinyl Transition Strips: Provide between ceramic floor tile and Amtico and/or VCT and between ceramic floor tile and carpet.
   1. Corridors and Student Room Suites
      a. Vinyl transition strip to be approved by Project Manager

3. Ceilings and Soffits:
   a. Type X drywall, typical, except in corridors as noted above.
   b. Suspended Acoustic Ceiling (where indicated under Criteria for Room Types).
      1. Armstrong 2’ x 4’ “Armatuff” medium texture, #860 suspended ceiling system or Approved Substitute, prior to bidding.
      2. Provide 10% extra ceiling panel materials.
   c. Solid wood slat ceiling with black scrim and acoustical batt above in Community Room.
   d. No new ceiling is required in the following spaces:
      1. Mechanical Rooms.
      2. Electrical Rooms.
      3. IT Rooms.
      4. Custodial Rooms.

4. Exterior Painting at Kittredge West:
   a. Prep and paint existing balcony railings, exterior columns and underside of bridge at entries.
   b. Paint front doors and exit doors with DTM oil-based paint, VOC paint not required.

5. Interior Painting of Handrails
   a. Paint all handrails DTM oil-based paint, VOC paint not required.

[END OF SECTION]

DIVISION 10 – Specialties

1. Visual Display
   b. Tackboards: Provide Tack Boards - Fabricmate Systems Interactive Panel System with square edge profile, reCore substrate, 2100 FR701 fabric or alternate color as selected by RES LIFE. Student room tack boards cannot be prefabricated, but must be constructed in the field as per Housing Maintenance standards.
      1. Thickness: 5/8”.
      2. Edges: Resin-hardened with square edge.
2. Water Closet Compartments/Drying Compartments at Showers in Common Bathrooms:
   a. Zero sight-line/gap-free privacy door and stile partitions required for privacy. 72” panel height, 4 ½” ± floor clearance. Panels to be scratch, dent and graffiti resistant, solid color phenolic or reinforced composite material. Provide coat hooks on doors with bumper pads or wall-mounted stops as necessary.

3. Corner guards: Provide two-piece extruded rigid plastic corner guards, with aluminum retainers, at all exterior corners in corridors, all public areas and “as-needed” to a height of 4’-0”. Submit sample and locations to Project Manager for review.

4. Signage:
   b. Every sign is to have the room number. No name slot.
   c. Except for Single Bedrooms, Double Bedrooms, Suites and the Faculty Residence Apartment, every sign is to have the room name.
   d. Provide signs at Common Bathrooms with removable/interchangeable rooms names (provide “Men” and “Women” for each bathroom). Provide also at Common Bathrooms room number sign mounted on the corridor-side face of door frame header.
   e. Provide signs on Multi Gender Restrooms (see Attachment IV).
   g. Provide fire evacuation maps on inside of face of each door per CU Standards. Coordinate with Project Manager.
   h. Provide tactile signage for floor identification and at exit passageways per IBC.
   i. Provide tack boards and other signage requirements as per the Signage and Bulletin Board Guidelines in the Resident Halls (see Attachment V).

5. Fire Extinguishers/Cabinets
   a. Provide extinguisher types and quantities as required by Code requirements.
   b. Cabinets
      1. Semi- recessed.
      2. Flat-trim.
      4. Vandal resistant lock.

6. Toilet and Bath Accessories
   a. Provide the following toilet and bath accessories manufactured by American Specialties Inc. (ASI) or comparable products by one of the manufacturers listed in the “University of Colorado Building and Construction Standards.”
      1. Toilet Tissue Holder; No. 7402.
      2. Washcloth Hook, Surface-Mounted Robe Hook, Bobrick B -76717
      3. Towel Bars; No. 7355.
      4. Shower Curtain Rods; No. 1204. Coordinate mounting height with Owner.
      5. Robe Hook; No. 0751.
      7. Mop Rack; No. 8215 (26” long).

7. Dyson Hand Dryers:
   a. Provide Dyson AB02 hand dryers at all public restrooms. Provide rough-in including dedicated circuit, conduit and junction box for future Dyson hand dryers at Community restrooms.

8. Access Panels: Access panels must be provided with a lockable panel keyed alike per CU Housing specifications. Key number to match other Kittredge buildings. Provide factory finish.
9. Shower Enclosures:
   a. Walls: ¼” thick solid-polymer surfacing material.
   b. Shower Pan: ½” thick solid-polymer surfacing material.

10. Window Sills: Provide ½” thick solid-polymer surfacing material at all window sills.

11. Sink Niches: Provide ¼” thick solid-polymer surface counter at all sink niches.

12. Provide ADA compliant triple-filtered bottle filling water stations in the public areas at Kittredge Central Commons, Kittredge Central Residence Hall and Kittredge West.

[END OF SECTION]

DIVISION 11 - Equipment

A. EQUIPMENT

   a. Pull-down as indicated under Criteria for Room Types.

[END OF SECTION]

DIVISION 12 – Furnishings

1. Window coverings: PVC horizontal blinds with 2” slats.
   a. Product: “3 Day Blinds” Solaire, Smooth Alabaster with cord tilt, or Approved Substitute prior to bidding.

2. Blackout shades at Great Room and Classrooms on all windows: Provide Thermoveil, 1000 Series, medium vertical weave by Mecho Shade Systems, Inc.

3. Black mini-blinds on all windows and doors at Great Room and Classrooms.

[END OF SECTION]
DIVISION 13 - Special Construction

See Div. 28 of UCB Standards for Detection and Alarms systems.

A. ACOUSTICS

1. Provide the Sound Transmission Class (STC) indicated for the space adjacencies shown on the table below.

<table>
<thead>
<tr>
<th>ROOM TO ROOM STC</th>
<th>Bathrooms/Toilet Rooms* and Bedroom to Bedroom</th>
<th>Classrooms</th>
<th>Offices</th>
<th>Seminar/Study Rooms</th>
<th>Lounges</th>
<th>Corridors</th>
<th>Laundry Rooms</th>
<th>Mechanical Rms.</th>
<th>Faculty/HD Apartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedroom</td>
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</tbody>
</table>

*The STC does not apply between private baths and the bedrooms they serve. Bedroom doors to corridors are to be rated at an STC 32 minimum.

[END OF SECTION]

DIVISION 14 – Conveying Systems

A. ELEVATORS

1. New and existing elevators, elevator shafts and elevator equipment rooms shall be in compliance with all applicable codes including but not limited to suppression, detection, shunt trips, recall and ADA.

2. The elevator shafts are to be fully fire rated shafts.

[END OF SECTION]
DIVISION 15 – Mechanical

I. GENERAL

A. Mechanical systems shall be designed in accordance with UCB Mechanical Standards Version 2008. The Standards include design criteria, guidelines and acceptable products. The Standards include minimum performance criteria for specific materials and equipment.

B. For Kittredge West, the existing mechanical systems consist of a baseboard heating system, exhaust systems, general plumbing systems and fire protection systems. The intent of this project is to completely replace all of the mechanical systems within the building. This includes new heating, air conditioning, ventilation, plumbing and fire protection systems, and replacement of all existing piping, except where particular components are specifically indicated to remain or be re-used. Any insulation removed for abatement shall be replaced.

C. The Hall Director Apartment and Faculty Residence Apartment shall be zoned so as to remain functional when the remainder of the building may be off-line.

D. Meters: Provide meters and necessary electrical and data connections as per CU Standards as referenced below:
   a. Section 15511 - CHW
   b. Section 15521 - Steam
   c. Section 15430 - Domestic Water
   d. Section 16430 – Electric

Provide separate electrical metering as follows:
   a. Hall Director Apartment
   b. Faculty in Residence Apartment
   c. Each building entity – i.e., for Kittredge West, Kittredge Central Commons and Kittredge Central Residence Hall.

II. HVAC SYSTEMS: GENERAL

A. Locate the central chilled water pumping system, central heating water system and the central domestic hot water system in a mechanical room. From this mechanical room, distribute piping throughout the building to serve terminal devices.

B. The campus high-pressure steam service exists and shall be used. Provide a new chilled water distribution piping from 5 feet outside each building to the new or existing mechanical room, through a pumping system and distributed within the building to serve terminal devices.

C. Utilize pre-insulated steel piping for steam and un-insulated plastic piping for chilled water as described below, installed below the frost line. Maintain 6’ minimum separation between chilled water lines and steam lines installed below grade. Install expansion loops and anchors as needed to allow piping expansion.

D. Conceal all pipes, ducts, and devices within wall or ceiling construction in occupied spaces.

E. Provide lead and lag sequence for hot water and chilled water pumps.
III. CAMPUS STEAM SYSTEM

A. Kittredge residence halls are supplied by the campus underground high pressure steam system which will be utilized for this project. Provide all new devices within the mechanical room (i.e., pressure relief valve (PRV) stations, condensate pumps and steam meters, installed in the central mechanical room and tied into the BAS system). Provide a PRV system to regulate the high pressure steam to 10 psig (maximum) steam serving the heating water heat exchangers and domestic water heat exchangers. Condensate return pumps shall be powered by compressed air system. New compressors to provide air shall be included in these projects.

B. Steam pressure from the Campus system is approximately 100 psig.

C. Steam pressure reliefs shall extend to the roof or other pre-approved safe discharge point.

IV. CHILLED WATER SYSTEMS

A. Include a minimum of two pumps in the pumping design (100% redundancy) for the chilled water systems. Arrange the building pumping system as a variable speed “secondary” tier pumping system from the district chilled water system.

B. Provide a minimum 14 degree temperature differential between chilled supply and return water temperature in the design of the system.

C. Provide the building interface (UCB Standard) piping and pressure-independent control valve within the chilled water pumping rooms and extend chilled water piping to 5 feet outside the building wall for connection to future chilled water system. Provide a chilled water meters per UCB Design and Construction Standards. The chilled water pipes for the future connections will be routed through the foundation wall of the buildings’ mechanical room and extend 5 feet beyond the wall, where they will be capped with flanges and blind flanges on the end. Coordinate stub-out location with CU PM. The pipes will transition from carbon steel to PVC-80 with butterfly valves and flanges before penetrating the foundation wall and will continue to be PVC-80 to the end. The PVC-80 lines will be insulated per UCB specifications in the mechanical room and will not be insulated through the foundation wall or outside of the building. The insulation at the foundation wall will be sealed to prevent condensation. The penetration of the foundation wall will be sealed using Link-Seal. The exterior piping will be bedded with a minimum of 6" of pea-gravel on undisturbed soil. The sides and top will be surrounded with pea gravel, with a minimum of 6" on top. Backfill will be free of large stones.

D. Provide bypass and shut off valves inside the building for the supply and return lines to provide for pressure testing and balancing of the interior system.

E. Areas and rooms requiring cooling prior to the connection of the campus chilled water system, including but not limited to Hall Director apartment and Faculty Apartment shall substitute a hot water/DX cooling fan coil unit in lieu of the standard hot water/chilled water fan coil unit. The DX coil will be connected via refrigeration piping using R-410a refrigerant to a grade mounted remote condensing unit. The equipment shall be sized according to the usage and requirements of the space being served. Verify areas and rooms to receive such cooling with Owner.
V. HEATING WATER AND AIR-HANDLING SYSTEMS

A. GENERAL

1. Provide two steam/hot water heat exchanger, each sized at 75% of total load, from the Campus system. Size this system for 20% excess capacity.

2. Provide heating water that is pumped to coils located in each air-handling unit, air terminal heating coils, cabinet heaters, unit heaters and fan coil units.

3. Provide a pumping system with two pumps, each sized at 75% of total load and controlled with variable speed drives.

4. Provide a dedicated heating water system for all Make-up Air Units. Each MUA unit shall have a dedicated water-to-water heat exchanger and shall use Dowfrost HD propylene glycol solution (approximately 35%). Provide a coupon rack. Provide connection point to BAS system.

B. BEDROOM AND SUITE APARTMENT HVAC SYSTEMS.

1. In each bedroom include a single four pipe heating/cooling fan coil unit located in a ceiling soffit. All fan coils are to include a throw-away type filter, a remote mounted speed selector switch, window proximity switch to disable the fan coil with an open window, and a single wall mounted Andover SmartStat (or approved substitute) (+/- 4 degree F occupant adjustment) connected to DDC panels within the building connected to the Housing and Dining Services network. Pipe chilled water, heating and condensate piping branches from each fan-coil unit (FCU) to nearby vertical risers. Locate these FCU’s such that they are readily and easily accessible for maintenance. All rooms shall have tempered ventilation air from the central make-up air handling units. All FCU’s shall have isolation valves on all supply and return lines and a capped ball-valve with hose connector to allow for complete system ‘blow down’. Isolation valves on all supply and return lines shall be easily accessed and serviced by CU maintenance staff. Provide FCU mock-up for Campus AHJ approval prior to ordering. Provide Andover Smart Sensor for all thermostats. Provide Andover I2866 controllers and tie into BAS.

   The specified FCU’s must:
   • Allow for accessible control valves. They must not be stacked vertically but installed horizontally.
   • Have all the electrical connections configured to allow easy and quick motor replacement or coil cleaning.
   • Have heating valves that fail open.
   • Include filter frames to prevent air bypass of filters.
   • Have window switches that are above residential grade and cannot be easily disabled with tape or a toothpick. Provide magnetic switch.
   • Include tamper proof screws (SS No. 10 Spanner) for all FCU access panels.

2. In each Community bathroom, include an exhaust grille located above each water closet and shower areas connected to a central exhaust system. Ventilation air quantities for the bathrooms shall be sized in excess of 10 air changes per hour. No heating or air conditioning is to be provided to interior bathrooms. For suite bathrooms, provide one exhaust grille.
C. GREAT ROOM HVAC SYSTEM
   1. Provide HVAC for the Great Room from the central air-handling unit serving public areas and/or
      individual fan coil units. Provide separate temperature zones for Great Room.

D. FLOOR/STUDY LOUNGES HVAC SYSTEMS
   1. Depending on the final location of Floor/Study Lounges, provide heating and air conditioning from
      individual fan coil units. Provide a separate temperature zone for each lounge.

E. RAP CLASSROOMS AND OFFICES
   1. Design and install a temporary, removable DX cooling for large RAP classrooms until such time
      the chilled water is available. Provide operable windows for natural ventilation in all RAP
      classrooms and provide ceiling fans for classrooms. Provide operable windows at all offices.
      CU will provide further direction on what is required for the individual spaces.

F. AIR HANDLING SYSTEMS SERVING PUBLIC AREAS
   1. Provide make-up air from the central system for public areas. Public areas include such spaces as
      main corridors, lounges, support spaces and other spaces without exterior exposures.
   2. Each wing shall have a single make-up air unit located in the attic mechanical room of that wing or
      above the corridor for the common area with access to the unit. Make-up air units shall have (1)
      coil changeover type provided 40% Ethylene Glycol fluid. Changeover piping shall consist of two
      heat exchangers – (1) for chilled water and (1) for heating water and a changeover control valve.
      Chilled and heating piping branches from make-up air unit heat exchangers to be piped to nearby
      vertical risers. Condensate drain from mechanical room make-up air units shall be piped to floor
      drains in mechanical rooms. Condensate drain from common area make-up air units shall be
      piped to nearby condensate drain vertical riser.
   3. Arrange each air-handling unit to provide additional outside air ventilation to provide positive
      building pressure relative to the outdoors. These units may be utilized for complete conditioning of
      these spaces or in conjunction with four pipe fan coils to provide the required conditioning,
      ventilation air requirements and positive building pressurization. These units shall also provide
      ventilation to the student rooms.
   4. Provide the kitchen/student break area with a non re-circulating residential exhaust hood.
      Washers and dryers in laundry rooms will be furnished and installed by the Owner’s vendor.
      Provide venting to the exterior for all dryers. Provide conditioned outside air for make-up air in the
      laundry rooms, and provide a separate temperature zone (i.e. dedicated thermostat) in each
      laundry room. Provide filter system and easily maintainable, accessible collection box for dryer
      ductwork. Provide power-assist as appropriate for length of ductwork.

G. INFORMATION TECHNOLOGY (IT) EQUIPMENT ROOMS HVAC SYSTEMS
   1. Provide exhaust or other ventilation systems to maintain appropriate equipment operating
      temperatures. Where necessary, provide air conditioning equipment per TIAEIA 560 standards
      and UCB Telecommunications Standards, to maintain a temperature range up to 85 degrees F.
      Connect to the Andover Building Automation Control System (BAS system) for room temperature
      alarm.
H. MISCELLANEOUS HVAC SYSTEMS

1. Provide all elevator equipment rooms with a HVAC system for cooling. For hydraulic installations, provide ventilation exhaust and make-up air.

2. Install exhaust fans and duct risers to serve as toilet exhaust for each building. Fans are to run continuously and each fan shall include a 10% excess capacity. Provide back draft dampers at the exhaust grille.

3. Design all exhaust systems and ventilation systems to eliminate “cross-talk” through the duct system.

4. Provide all small sub-electrical rooms with thermostatically-controlled ceiling ventilation fans. Provide main electrical room with thermostatically-controlled exhaust fan. Electrical rooms with transformers or other heat-generating equipment require cooling or exhaust fans.

5. Provide a hot water cabinet heater at all building entries.

6. For ventilation, provide with fresh air from overhead air handling unit system to meet outside air minimum requirements. The tempered fresh air system shall be directly connected to the return air duct of the fan coil.

7. For ductwork serving dryer-vent exhaust, provide new aluminum ductwork. Ductwork shall be of a thickness to resist impact damage or the ductwork will have to be protected from such damage. Provide lint trap and access for cleaning.

8. Provide gravity drains for condensate drains. Non-gravity sump pumps for cooling condensate should be installed only if strictly necessary due to design considerations. If used, connect sump alarms into the Andover system.

9. Provide water makeup line to heating system including 2 gages, one on the system side and one on the domestic water side, reduced pressure back flow preventer and pressure reducing valve. Makeup piping shall be installed to the heating system upstream, or before the air separator in the systems direction of flow. It shall also be installed to the system piping independent of any other part of the system other than an expansion tank. Any expansion tank installed on any hydronic system shall have a ball valve used to isolate the tank from the system. This valve shall be installed in the piping no further than 48” (line of sight) away from the tank.

10. All ductwork shall be pressure tested to eliminate leakage.

II. BUILDING CONTROLS SYSTEMS

G. Provide a DDC “Andover” automated controls system (BAS) as per UCB standards and the present system that exists on the UC Boulder campus for all HVAC equipment and devices. Tie all building utility meters into Andover system. Coordinate additional for additional monitor points with other building systems.
III. PLUMBING SYSTEMS

G. GENERAL

1. Fire and Domestic Water Entry: New fire and domestic water mains will be required for Kittredge Central. Existing fire and domestic water mains for Kittredge West will remain. Create water entry rooms that have a large floor drain or shutoff with secondary containment for the backflow preventers in the event of a major discharge. Provide the domestic water system with two reduced pressure type backflow preventers, each capable of handling the building demand.

2. All insulated pipes in wet areas are to be sleeved.

H. DOMESTIC WATER HEATING SYSTEM

1. Provide a domestic water heating system with two feed forward steam to heat exchangers (Armstrong Flo-Rite or approved substitute). Locate generators located in the central mechanical room. Each water heater shall be capable of handling two-thirds of the total project demands. The water from the heaters shall be routed through a master thermostatic mixing station reducing the temperature to 120 degrees F. before being routed to plumbing fixtures. The domestic hot water system shall have a pumped return circulation system.

2. The domestic water distribution system shall have a duplex variable frequency drive booster pump package located in the central mechanical room with an expansion tank and remote pressure sensing switch. The domestic water will be routed through risers and serve each floor. The booster pump system shall be monitored by the BAS.

3. Provide individual electric domestic hot water heaters for the faculty apartment and hall director apartment as a back-up to steam generated domestic hot water. Provide flow through the water heaters.

4. Provide additional Andover temperature probe between hot water heater head and three-way mixing valve as an anti-scald measure.

I. SANITARY DRAINAGE SYSTEM

1. Provide a standard cast iron pipe sanitary waste and vent system to serve all plumbing fixtures, public and private toilet rooms, janitor’s closets, break rooms and mechanical room floor drains. Route this cast iron system below grade to the exterior of the building.

2. Mechanical rooms are to have two floor drains.

3. Sanitary waste piping is to exit the building and pass through a cleanout and connect to the site sewer system to the site main.

4. Replace existing sanitary lines at Kittredge West.

5. Provide 3” floor drain lines at all showers and floor drains.

G. SEWAGE EJECTOR AND SUMP PUMP SYSTEMS

1. Kittredge West - The basement level presently has a pumped sanitary sewage ejector system. Mechanical contractor shall evaluate the existing sewage ejector pump system and provide CU a written report of deficiencies noted during the design phase of the work. Current piping needs to
be replaced as it is plugged with minerals. Due to the depth of the sewage pit at least a slide rail system should be installed. The system shall be monitored by the BAS.

2. Ground water at Kittredge West is believed to be pumped to another sump that finally pumps to the ponds. Ground water sumps on the between Kittredge West and Kittredge Commons do not need to be maintained, but suitable ground water remediation should be developed. This system should be looked at to make this not only more efficient but more mechanical friendly.

3. The floor drains in the Mechanical rooms should be sized to accommodate a full discharge of the domestic water backflow preventer.

H. STORM DRAINAGE SYSTEM
1. The storm drain system is a system surface channels and below grade piping. Any new storm drainage required as a result of any and all site work shall be provided and connected to existing drainage systems.

J. FIRE PROTECTION SYSTEM
1. Connect to the campus water main. Provide an automatic fire sprinkler system with full coverage for the entire building.

2. The sprinkler system shall comply with NFPA 13 for common areas and NFPA 13R for sleeping rooms if allowed by code.


4. Utilize semi recessed and sidewall heads.

5. Fire protection system control equipment may not be located in custodial closets.

6. Provide sprinkler guards (cages) on heads in student rooms, public areas accessible to students, mechanical rooms and electrical rooms.
K. PLUMBING FIXTURES

1. Except as required by UCB Building and Construction Standards, provide fixtures described or specified below.

2. Faucets, general: Provide only Delta faucets (no substitutes).

3. Faucets, public restrooms: Provide infrared sensor faucet with temperature control.

4. Faucets, common bathrooms: For each common bathroom or bathrooms with more than one faucet, provide one ADA lever faucet. All other faucets are to be infrared sensor faucets with temperature control.

5. Low-flow Aerators
   a. Provide the following Niagara Conservation Corp. aerators on all faucets, as indicated:
      1. Lavatories: No. N3205FTP laminar flow 0.5-gpm FIP aerator.
   b. Provide Niagara Conservation Corp. No. N3117 aerator adapters (55/64"M x 15/16"M) as required to convert to male threads for faucets.

6. Water closets
   a. Wall mounted flush valve type.
   b. Flush Valves: Dual mode flush valves.
   c. Toilet seats and lids: Provide closed-front toilet seats with lids in all private bathrooms, and open-front toilet seats with no lid in Common Bathrooms and Public Toilets. All toilet seats are to be white.
   d. Products
      1. Water Closets: Toto CT705; Color: Cotton.

7. Lavatories
   a. Under-counter mounted vitreous china, white.
      1. Product
         b. Infrared Sensor Faucets with above deck temperature control:
            i. Delta 596-LGHGMHDF

8. Garbage Disposals
   a. Provide a disposer in the Kitchen sink, the sinks in Sink Niches, and in the Custodial Breakroom (when used).
   b. Product: In-Sink-Erator Evolution PRO Essential Food - PRO ES or Approved Substitute prior to bidding.
   c. Duty: ½ HP.

9. Showers
   a. Shower Pans and Enclosures: Refer to Criteria for Specialties.
   b. Product: Solid polymer surfacing material
   c. Mount shower heads on soffits, adjacent to the wall with the shower controls.
   d. Provide hand held showers with slide bars at disabled-accessible showers.
   e. Provide solid brass body strainer for all shower pans.

10. Water Fountains
    a. Provide one set of water fountains per floor, per wing with gooseneck to fill water bottles.
    b. Provide disabled-accessible, high-low models with equipment recessed in wall.
11. Service Sinks and Basins
a. Mop Service Basins
   1. Terrazzo composition, 36” x 36”, with 18” high stainless steel rim guards on 2 sides.
   b. Provide a check valve in the water supply piping to each mop service basin and spouts with vacuum-breakers.

12. Miscellaneous Sinks
a. Kitchen Sink and sink in (optional) Custodial Breakroom: Provide one double stainless steel sink with two 13½” x 16” x 7½” deep (approximate) compartments, with gooseneck faucet and mixing valve, sprayer, and disposer.
   b. Sinks in Sink Niches and Classroom: In each, provide one stainless steel sink with single 22” x 19” x 5½” deep compartment (approximate), with gooseneck faucet and mixing valves. Provide a disposer in each sink niche.

13. Fixtures in Mechanical Rooms
a. In mechanical rooms with chemical treatment stations, provide an emergency shower/eye wash.
   b. Provide a cold water hose bib in each mechanical room.
   c. There should be a minimum of two floor drains in each mechanical room.

14. Floor Drains
a. Provide a floor drain in all Public Toilets, Common Bathrooms, and Laundry Rooms. Minimum size 3” at showers and floor drains. Floor surfaces in these rooms shall slope to the floor drain. Provide a 3 foot diameter depression around floor drains in Common Bathrooms in existing building for drainage. Build-up floors as necessary for proper drainage and to prevent ponding.

15. Clothes Washer connections: Recessed in wall box with shut off valves and waste fitting.

16. Hose bibs shall meet UCB standards. Provide exterior hose bibs at each wing of each building, adjacent to outdoor terraces and at service areas. Provide hose bib in mechanical rooms and at each custodial mop sink. Coordinate locations with Project Manager.

L. PUMPS
a. All pumps to be Grundfos or approved substitute as per CU Housing Standards.

[END OF SECTION]
DIVISION 16 - Electrical

I. POWER DISTRIBUTION

A. GENERAL

1. Conceal all conduits, wire-ways and junction boxes within the building construction except in unoccupied or utility spaces.

2. The Design-Build Team is responsible for removing the existing connectivity/cabling and ensuring no loss of service is experienced by the University.

B. PRIMARY POWER DISTRIBUTION

1. Provide new or reuse existing pad-mounted transformers to serve Kittredge West and Kittredge Central. Size transformers per project requirements with aluminum windings. Connect pad-mounted transformer to the existing underground 13.2kV loop feeder. Information on existing transformers is below:
   a. Kittredge West XFMR was manufactured in is a 1981 and is rated 300KVA (13.2kV to 120/208V).
   b. Kittredge Commons XFMR was manufactured in is a 2008 and is rated 500KVA (13.2kV to 120/208V).

2. The Design-Build Team shall provide the pad-mounted transformers, 13.2kV wiring, duct bank, terminations, etc.

3. Relocation of existing transformers, increase in transformer capacity and/or changes the electrical infrastructure from 120/208V to 277/480V shall be paid for by the Design Build team, including 13.2kV wiring, duct bank, terminations, etc.

4. Design for the transformer location must comply with electrical codes. The Design-Build Team must propose several alternatives looking at all the issues, e.g. open windows, trees and vegetation, proximity to the building, egress and building access, to accomplish this without relocating the transformer, if possible, if the current location does not comply. Relocation may be unavoidable. Campus AHJs will review and comment on the issues & alternatives. Screen the transformer with materials matching adjacent materials if in visible location.

C. MAIN POWER DISTRIBUTION

1. The Main Distribution equipment for the Kittredge projects is required to be 1000A, 120/208V, 3P, 4W, fed by the new pad-mounted transformers or as Engineer determines necessary.

2. Provide the main breaker with zero sequence type ground-fault protection and solid-state trip.

3. The Distribution Breakers shall be insulated or molded-case type breakers.

4. Switchgear
   a. Provide front accessible switchgear only with fully rated copper bussing for both vertical and horizontal bussing.
b. The switchgear shall contain a minimum of 2 sections with each section being a minimum of 38" Wide by 24" Deep. The switchgear shall also be provided with Transient Voltage Surge Protection (TVSS).

c. Locate the switchgear in a dedicated Main Electrical Room near the pad-mounted transformer.

D. SECONDARY DISTRIBUTION

1. Provide 120/208V, 3P, 4W panels located to serve the convenience receptacle loads, etc.
2. Locate panels in electrical rooms with lockable doors.
3. Provide a 100 amp panel in the MDF Room.

E. EMERGENCY GENERATOR – Emergency generator may be required dependent on final code review.

II. LIGHTING

F. LUMINAIRES

1. All lighting inside the existing building and at exterior balconies is to be replaced.
2. All luminaires are to be surface mounted with the exception of those in spaces specifically identified to receive fixtures recessed in new ceilings. MC cable may be used for the resident rooms only with a maximum of 18 feet of MC cable in any one residence room.
   1. Light fixtures in student rooms to be mounted on the ceilings (no wall-mounted fixtures) and must be located so that they will not interfere with the potential lofting of the beds.
   2. Incandescent or halogen light sources are permitted only in the apartments for the bedroom fan lights.
3. A target of less than 1.0 watts/SF for Lighting Power Density (LPD) has been established.
4. Refer to the Luminaire Standards at the end of this section and in Attachment VII for types of luminaires required in each space. The products shown are not intended to be the only fixtures which may be considered or used. Rather, they illustrate a level of quality, performance and appearance which must be met. In some cases more than one product is shown for a particular luminaire, to further illustrate the standard. The design for lighting levels shall be at the recommended minimum levels.
5. Exit Signs throughout the facility shall be LED Type. Use vandalism resistant housings and mountings in all corridors; coordinate with Owner. Exit signs are per CU Standards except where vandal resistance is needed. See Luminaire Standards for specifications.
6. Exterior Lighting
   1. Replace the exterior lighting at Kittredge West and provide exterior lighting at Kittredge Central at the balconies, underneath the bridges and at the building eaves as per specifications in the Luminaire Standards.
   2. Provide battery backup lighting at all egress doors as illustrated in the Luminaire Standards.
   3. Provide exterior lighting at terraces and building entries except no new step lights. This lighting shall be designed to provide general area illumination for informal, night-time gatherings in the space. Select types and quantity of luminaires which provide a suitable light level for such activities, minimize glare, are in character with the building and which comply with CU Standards. All exterior lighting shall be controlled by a master building lighting control system. Exterior lighting at balconies shall be locally switched inside the building. Exterior lighting mounted to eaves shall be Kim LED fixture CFL 1/45 LED 120. Outside the exterior doors shall be a LSI battery backup fixture EURM EB 26 CFL W UE BLK. Exterior pedestrian fixtures shall be Beta edge fixture.
7. Interior Lighting
   a. Provide LED lights for all corridor lighting.
   b. Provide LED lights for all common bathrooms.
c. Provide phantom load receptacles with manual switch for all outlets in student rooms except for dedicated outlet for micro fridge.

d. Provide Hubbell IWS-ZPM-W vacancy switches at all student rooms.

G. INTERIOR LIGHTING CONTROLS

1. Provide a stand-alone lighting control system for the building (Douglas or approved substitute). Tie into Andover BAS.

2. Occupancy Sensors

   1. Provide Hubbell occupancy sensor controls for lighting as shown on the Luminaire Schedule.
   2. Provide Cooper extreme temperature/moisture-resistant occupancy sensors for all bathroom locations.
   3. Lighting in Mechanical Rooms, Electrical Rooms, IT Rooms, Custodial Closets, Offices and Floor Study/Lounges shall be controlled by a ceiling mounted dual technology occupancy sensor and a wall mounted override switch.

3. Provide switches controlled by the building lighting control for all non-emergency lights in corridors.

4. Program hallway corridor lighting so that it is reduced to ½ of the fixtures lit in the period from 12:00 AM (midnight) to 6:00 AM.

II. POWER

A. All receptacles shall be 20A unless otherwise noted.

B. Provide each room throughout the facility with at least one receptacle, as a minimum.

C. All Receptacles within 6’ of water (sinks, showers, etc.) shall be provided with GFI Protection.

D. Refer to the Power, IT and CATV Systems Schedule for quantities and types of receptacles in each space category.

III. GROUNDING

A. All conduits throughout the facility shall be provided with an equipment-grounding conductor. Equipment needing Isolated Ground (IG) Power shall be provided with (1) Equipment Ground Conductor and (1) Isolated Ground Conductor.

B. The grounding for the Main Distribution Switchgear and the Secondary Panels and Gear shall be provided in accordance to NEC Article 250.

C. Each Electrical Room and Telecomm Room throughout the facility shall be provided with one 12”x4”x1/4”D Copper Ground Bar. These Ground Bars shall be tied together with a #4/0 AWG Stranded Copper Conductor in a grounding riser configuration. The Main Electrical Room Ground Bar shall be tied to the Ground Bus in the Main Electrical Switchgear with a 250kcmil Stranded Copper Conductor.
Luminaire Standards
Luminaires are indicated for design intent. Halogen/incandescent lights are not allowed. (See Attachment VII for Light Fixture Cut Sheets)

1. General Residence Hall/Commons Fixtures:

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<th>Luminaire Type</th>
<th>Mounting Type</th>
<th>Fixture Type(s)</th>
<th>Lighting Level</th>
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<td></td>
</tr>
<tr>
<td>Exterior/Balconies</td>
<td>Ceiling</td>
<td></td>
<td>Q, R</td>
<td>20 fc</td>
<td></td>
</tr>
<tr>
<td>Exterior: Under bridges</td>
<td>Ceiling</td>
<td></td>
<td>Q</td>
<td>20 fc</td>
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<tr>
<td>Exterior: Eaves</td>
<td>Ceiling</td>
<td></td>
<td>FL</td>
<td></td>
<td></td>
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<tr>
<td>Exterior: Doors</td>
<td>Wall</td>
<td></td>
<td>R</td>
<td></td>
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<tr>
<td>Elevator Pit</td>
<td>Ceiling/Wall</td>
<td></td>
<td>J, J1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exit Signs</td>
<td>Ceiling/Wall</td>
<td></td>
<td>XV, X, XDBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior Pole Light</td>
<td>Pole Light</td>
<td></td>
<td>W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Provide ceiling mounted luminaires at vanities and recessed luminaires at soffits over showers and water closets (as necessary).
2. Provide recessed LED downlights (Type N1-ALT) in all common bathrooms: provide LED downlights with lens at wet/shower areas (N-ALT).
3. Provide dual-level switching for all luminaires.
4. Provide ceiling mounted luminaires for general lighting, and under-cabinet luminaires for the full width of wall cabinets.
5. Provide occupancy sensors.
6. Provide dual switched lighting in student bedrooms, lighting levels are measured at the center of the room.
7. Provide occupancy sensor with wall-mounted override switch.
8. Provide plastic cover & wire guard.
10. Provide “vacancy switch” for all student room lighting.
2. Hall Director and Faculty-in-Residence Lighting Fixtures:

<table>
<thead>
<tr>
<th>Space</th>
<th>Luminaire Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mounting</td>
<td>Fixture Type(s)</td>
</tr>
<tr>
<td>Master Bedroom</td>
<td>Ceiling</td>
<td>F, N1</td>
</tr>
<tr>
<td>2nd or 3rd Bedrooms</td>
<td>Ceiling</td>
<td>F1, N1</td>
</tr>
<tr>
<td>Master Bathroom</td>
<td>Wall and Ceiling</td>
<td>B, N, N1</td>
</tr>
<tr>
<td>2nd or 3rd Bathrooms</td>
<td>Wall and Ceiling</td>
<td>B, N, N1</td>
</tr>
<tr>
<td>Kitchen</td>
<td>Ceiling, Under Cabinet &amp; Work Island</td>
<td>A, K, L, N, N1</td>
</tr>
<tr>
<td>Dining Area</td>
<td>Ceiling @ 6'2&quot; Aff</td>
<td>T, P</td>
</tr>
<tr>
<td>Living Area</td>
<td>Wall</td>
<td>N, N1, P</td>
</tr>
<tr>
<td>Closets</td>
<td>Ceiling</td>
<td>N1</td>
</tr>
<tr>
<td>Laundry</td>
<td>Ceiling</td>
<td>N1</td>
</tr>
<tr>
<td>Storage Rooms</td>
<td>Ceiling</td>
<td>M</td>
</tr>
<tr>
<td>Hallways</td>
<td>Ceiling</td>
<td>H1, H1E, N1</td>
</tr>
</tbody>
</table>

Notes:
1. Provide 2 wall mounted switches, 1 for Fan and 1 for Light.
2. Provide ceiling mounted luminaires for general lighting, and under-cabinet luminaires for the full width of wall cabinets.
3. Provide Wall Mounted Dimmer Switch

[END OF SECTION]
DIVISION 27 – Communications

I. TELEPHONE SYSTEMS

A. Wiring and wall terminations for telephone systems are NOT to be provided to student rooms.

B. Backbone capacity and pathways for potential future provision of telephone systems to student rooms shall be provided.

II. CABLE TV

A. The cable TV system is to be installed by the Contractor as a turn-key installation. Design-Build Team will install all wiring, raceways and trunk system to nearest tie-in point in the Utility Tunnels.

B. Refer to the Power, IT and CATV Systems Schedule at the end of this section for quantities and locations of devices in each space category.

III. LAUNDRY CARD READER

A. Provide dedicated data jack and 120V outlet for each laundry card reader. Owner to provide one laundry card reader for each laundry room. Mount card reader at ADA height and semi-recess in wall. Provide daisy chain wiring to each washer and dryer from card reader in ¾ inch conduit. Owner to approve location of card reader in each laundry room prior to installation. The dedicated data jack cabling shall be CAT-5E ORANGE-jacketed cable.

IV. KRONOS TIME CLOCK

A. Provide one CAT-5E for Kronos time clock at Kittredge Central at 42” to 54” above finished floor. Coordinate with Project Manager.

V. INFORMATION TECHNOLOGY

A. The Design-Build Team will be responsible for a turn-key installation. The Design-Build Team will provide all system design, conduit infrastructure and boxes, wiring, fiber, devices, racks, patch panels, termination, system testing and system certification in accordance with UCB and HDS Data and Telecomm Specifications. UCB will provide all head-end equipment (routers, servers, etc.).

1. Provide both a cabled system and a wireless system throughout the building.
2. Provide for wireless accommodation of “A, B, G and N” radio frequencies.

B. The Design-Build Team shall include an RCDD-certified consulting firm (i.e., not an RCDD-certified individual within the electrical engineer’s office).

1. Provide as-built drawings for all audiovisual systems.
2. Follow UCB ITS classroom equipment standards.

C. All wiring for both phone and data shall be CAT-5E BLUE jacketed cable, unless another color is specified in the HDS section of the Campus Data and Telecomm Standards or listed in this list of criteria.

D. Elevator Machine Room should be wired for access control, IP security video cameras and future information technology connections. Elevator Machine Room should be wired for future information technology connections. See CU HDS Security Guidelines (Attachment VI) for additional requirements.
E. IT Rooms and Closets

1. Provide one MDF Room for each building and one IDF Room per wing, centrally located to serve each floor. The rooms to be 10’ x 10’. Ideally, the MDF Room should be maintained in its current location in the existing building to maintain the present entrance location of the fiber.

2. Do not locate the rooms/closets adjacent to any bathroom or toilet room or laundry rooms (in any dimension).

3. There shall be no wet pipes in or above any MDF/IDF rooms, as per CU standards.

4. The MDF room must remain a separate, enclosed room.

5. Appropriate cooling must be provided to support the equipment loads in all IT rooms.

6. The closets should accommodate the following:
   a. Resnet
   b. Data
   c. Voice
   d. CATV
   e. CCure head-in equipment (in MDF room)

7. Provide UPS for MDF and IDF rooms large enough to supply sufficient power for two-hour run time.

8. From the MDF Room to each IDF Room provide: From the MDF Room to each IDF Room provide two (2) Category 3 cables, a 200-pair cable, two (2) 24-Strand (50/125) Multi-mode Fiber Optic cable and two (2) 24-Strand Single-mode fiber optic cable.

9. If an MDF is used as an IDF with horizontal cables, provide riser voice and utility to the racks.

10. Each MDF and IDF rack location shall have a dedicated outlet from one panel in the MDF and be connected to one UPS and generator.

F. Provide one CAT-6 RED cable for each interior and exterior security door (CCure) for security cameras. Provide security cameras as specified by CU Access Services Department. See CU HDS Security Guidelines (Attachment VI) for additional requirements.

G. Provide one data jack and power for a C-cure card reader at each lockable, non-bedroom interior security door between public and residential areas, exterior entrances and classroom doors. See also Security Standards?

H. Provided with one 62.5 multi-mode 24-strand fiber, and one single-mode 24-strand fiber cable. The main copper cables serving the building are a 200-pair for Qwest plus a 200-pair for campus voice.

I. Refer to the Power, IT and CATV Systems Schedule at the end of this section for quantities and types of voice and/or data jacks in each space category. All wiring for both phone and data shall be Category 5E.

J. Provide a discrete WiFi system based on Cisco infrastructure. Owner will provide all electronics (switches and access points). Owner will physically install all electronics in the MDF and IDF rooms (rack-mount) and AP’s in GC installed ceiling access boxes. Owner will configure the electronics and commission the WiFi system. Access points (APs) will be located on site by HDS IT after an approved AP wireless heat map survey has been completed. All APs will be housed in secure access boxes that are approved by ITS and HDS. The Design-Build Team will install locked ceiling access boxes at AP locations identified by HDS and ITS. Owner will provide ceiling access boxes which must be secured to the ceiling at four (4) points. Do not use antenna holes for mounting – drill mounting holes when necessary. The D.B team will install, terminate and test a single CAT-5E cable from each AP location to the serving IDF room in that wing. The length of that CAT-5E cable shall be within the distance standard defined in the UCB Telecom Specification. Provide 1” conduit (homerun) to all wireless AP boxes for CAT-5E YELLOW cabling and to accommodate future DAS cabling. Follow the CU standards for pulling CAT-5E cable and all runs. Design-Build Team is
required to review ceiling box locations with HDS representative on site for approval prior to installation. Design-Build Team is responsible for installation of a WiFi system providing 100% coverage of wireless per ITS and Owner’s design requirements.

K. Provide a CAT-5E YELLOW cable for the wireless network system. Run cable in 1” conduit to access point/antenna locations in hallways.

L. Prior to locating any wireless AP equipment, the Design-Build Team must have an ITS approved AP wireless signal heat map survey completed by an ITS-approved third party vendor.

M. The Owner requires IT pathways located above all corridor ceilings. Provide dedicated wire racks. Where there is no access above the ceilings (i.e., hard lid ceilings), provide 2” to 2-1/2” conduit pathways. The selected team must present IT pathway design options for approval prior to construction.

N. The Design/Build Team is responsible for removing the existing connectivity/cabling to ensure no loss of service is experienced within the University.

O. Completed MDF, including terminated and tested fiber used for network connectivity fiber, must be turned over to owner 8 weeks prior to end of construction to allow for testing other systems.

P. Completed IDFs, including terminated and tested fiber used for network connectivity fiber, must be turned over to owner 6 weeks prior to end of construction allow for Andover testing and final network activation.

Q. Provide separate conduit pathways to support an approved third party designed Distributed Antenna System (DAS) meant to enhance both cell phone and two-way radio communication to the building. Owner will provide and install system and wiring utilizing the GC provided conduits.

R. Provide one (1) 4 pair copper CAT-5E BLUE cable for Andover communication line.
### POWER, IT AND CATV SYSTEMS SCHEDULE

<table>
<thead>
<tr>
<th>Space Category</th>
<th>Power Receptacles</th>
<th>Information Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Duplex</td>
<td>Quadruple</td>
</tr>
<tr>
<td>Bedrooms</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Private bathrooms</td>
<td>1 per lav.</td>
<td>-</td>
</tr>
<tr>
<td>Reception</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Community Room</td>
<td>4+1</td>
<td>-</td>
</tr>
<tr>
<td>Floor/Study Lounges</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Offices</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Laundry</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Vending</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Kitchen</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Common Bathrooms</td>
<td>1 per lav.</td>
<td>-</td>
</tr>
<tr>
<td>Public Toilets</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Storage Rooms</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Work Rooms</td>
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<td>2</td>
</tr>
<tr>
<td>Classroom - each</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>Custodial Closets</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Custodial Storage Closets</td>
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<td>-</td>
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<tr>
<td>Custodial Break Room</td>
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<tr>
<td>Mechanical Rooms</td>
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<tr>
<td>Electrical Rooms</td>
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<td>-</td>
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<tr>
<td>Elevator Machine Rooms</td>
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<tr>
<td>IT MDF Room</td>
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<tr>
<td>IT IDF Rooms</td>
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<tr>
<td>Corridors</td>
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<tr>
<td>Elevator Cab</td>
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<td>-</td>
</tr>
<tr>
<td>LCD Digital Station – Reception Area</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Locate one receptacle or jack on each wall
2. Locate above vanity at each lavatory
3. Locate quadruple receptacle at reception desk or receptionist work-station under desk or work-station
4. Provide one dedicated receptacle for coffee-maker or other equipment
5. These receptacles are in addition to the dedicated ones required for washers and dryers
6. This receptacle is in addition to the dedicated ones required for vending machines
7. Provide two dedicated receptacles above counter
8. NOT USED
9. Provide two quadruple dedicated receptacles above counter
10. Provide voice and data ports above counter
11. Refer to UCB Standards, Appendix 9 for information pertaining to data and power requirements for “smart-to-every-seat” classroom technology, in addition to the requirements shown here
12. In addition to duplex receptacle in each mechanical room, provide one welding outlet (NEMA 10-30R)
13. Each power receptacle is to be a dedicated 20 amp device
14. Provide one wall jack per floor in each wing for emergency telephone
15. Provide in-floor receptacles for maximum flexibility
16. One coax on top of cab and one at the car station
17. Locate voice/data outlet for laundry card reader per owner direction
18. Two quads required for front of reception desk area – coordinate with Owner
19. One data jack for each C-Cure panel and one data jack for general use
20. One data jack for general use
21. Place duplex on top of cab

[END OF SECTION]
DIVISION 28 – Electronic Safety & Security

I. FIRE ALARM SYSTEM

A. The Fire Alarm System shall be a totally addressable intelligent system per UCB Standards.

B. The Fire Alarm Control Panel shall be per UCB Standards.

C. Notification appliances shall be speakers, Wheelock Multitune MTWP-2475W-FR-UL/ULC, 128420, 0704 or approved substitute. UCB Standard approved pull stations are to be provided with Stopper II tamper resistant cover.

D. All fire alarm system wiring shall be installed in conduit.

E. Locate the FACP in Reception if approved by campus AHJ’s and BFD (as an alternative, the FACP may be located in a closet if an annunciator is located in Reception).

F. The Fire Alarm System shall have an integrated Public Address system included allowing for room notification, corridor notification; by wing, by floor and all call modes of notification. Follow the UCB Standards which can be found on the CU website under Current Electrical Standards, Section 16720, Fire Alarm and Detection Systems. Smoke detectors in individual student rooms shall cause a local alarm only. Sounder bases in all rooms are to be used for general alarm when any sprinkler is activated or when pull stations or detectors (other than those in student rooms) are activated.

G. Provide multimode fiber from MDF room to fire alarm control panel.

H. Provide Screen Shots (color graphics) at all campus Graphic Command Centers with CU/Boulder Fire Dept. interface.

I. There should be no pipes running directly over the FACP room.

J. Adequate emergency vehicle access must be maintained per applicable codes and Boulder Fire department requirements.

K. Provide fire hydrant spacing and numbers to comply with applicable codes and Boulder Fire Department requirements.

L. The following language is to be modified by the project engineer of record based on project specifics, and provided in the fire alarm specifications:

1. Fire Alarm Voice Communication panels shall be capable of accepting a dry contact input from an Emergency Communication System (ECS) to alert the fire alarm panel that an ECS message is forthcoming.

2. The Fire Alarm Panel shall be capable of being programmed so that while this input is active (contact closed) the fire alarm panel shall route audio provided by the ECS interface directly to all connected fire alarm speakers.

3. The system shall be capable of being programmed so this external audio input will receive the highest priority and override all fire alarm notification so long as the input is active. When the input goes inactive (contact open) the external audio routing will cease and the fire alarm panel shall automatically return to the prior notification program that was active before the ECS message.
II. SECURITY SYSTEMS - See Attachment VI: HDS Security Systems Standards and Design Guide for requirements for Online Access Control System and Offline Card Key Access Control System.

[END OF SECTION]

TECHNICAL CRITERIA: GENERAL

Except as modified in this document, all work in all disciplines is governed by and must comply with:

1. "University of Colorado Building and Construction Standards," 2011 Edition (or most recent addition), including sustainability/LEED requirements (indicated in red), and all of its Appendices;

2. "Instructions: UCB Standards for Construction Component Performance, Preference and Selection

3. "University of Colorado Construction/Life-Safety Handbook" (Revised: January 2005).

4. It shall be a requirement of this project that all mechanical, electrical and IT/security system components shall be fully integrated and coordinated with one another, with the building structure and with all architectural elements to achieve the following:

   a. There are no physical conflicts between the components/elements of the systems.

   b. There is easy access to all components for maintenance and replacement.

   c. All mechanical, electrical and IT/security components are fully concealed as required elsewhere in this document.

These documents may be found at the following websites:
http://colorado.edu/facilitiesmanagement/pdc/construction/standards/index.html
http://colorado.edu/facilitiesmanagement/pdc/safety/index.html

5. City of Boulder Fire Department access shall be maintained at all times to existing Kittredge Complex facilities. Should a temporary detour be required, it shall be coordinated with and approved by City of Boulder Fire Department.

[END OF SECTION]
CODE REVIEW

Please refer to the preliminary code review contained in the Program Plan. Comply with all applicable CU-Boulder Standards and Code Requirement (most recent editions. It shall be the responsibility of each Design-Build Team to perform its own review and analyses of the codes to ensure full compliance with them.

I. CODE REVIEW

The code review system and format is described in Section 3 of the Construction / Life Safety Handbook which can be accessed via the web at:

II. APPLICABLE CODES

The following links identify the most current code editions for UCB projects.

Approved State Building Codes
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/index.html

Adopted Codes and Standards
http://www.sos.state.co.us/CCR/Rule.do?deptID=17&deptName=1507%20Department%20of%20Public%20Safety&agencyID=43&agencyName=1507%20Division%20of%20Fire%20Safety&ccrDocID=2792&ccrDocName=8%20CCR%201507-11%20FIRE%20SUPPRESSION%20PROGRAM&subDocID=27895&subDocName=SECTION%20%20CODES%20AND%20STANDARDS%20ADOPTED&version=5

City of Boulder Amendments to the IFC
http://www.bouldercolorado.gov/files/PDS/codes/dcs/ch05.pdf

END OF SECTION]
REFERENCE DOCUMENTS

UCB Architectural Standards
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/arch.html

UCB Mechanical Standards
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/mechanical.html

UCB Electrical Standards
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/electrical.html

UCB Civil Standards
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/civil.html

UCB Appendices
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/appendices.html

UCB Commissioning
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/commissioning.html

UCB CAD Standards

UCB Telecommunications Standards
http://www.colorado.edu/facilitiesmanagement/pdc/construction/standards/documents/Division27CommunicationsSpecifications.pdf

State Codes and Standards
http://www.colorado.gov/dpa/dfp/sbrep/forms/sb/buildingcodes.doc

[END OF SECTION]
CITY OF BOULDER STANDARDS

Wetland Protection Ordinance
http://www.colocode.com/boulder2/chapter9-3.htm#section9_3_9

Comprehensive Flood and Stormwater Master Plan Update

City of Boulder Design and Construction Standards
http://ci.boulder.co.us/index.php?option=com_content&task=view&id=209&Itemid=482

[END OF SECTION]
ENVIRONMENTAL HEALTH & SAFETY

For contractor information regarding asbestos and lead based building materials and other environmental hazards on the CU Boulder campus, please reference:

http://www.colorado.edu/ehs/managers/managersandcontractors.html

[END OF SECTION]