Division of Facilities Development

With

Capital Planning & Budget

NEW RESIDENCE HALL FACILITY STUDY
&
BUILDING STANDARDS DEVELOPMENT
FOR
The University of Wisconsin Residence Halls

DFD # 12A3G

August 29th, 2012
Background and Purpose

The purpose of this study is to provide a comprehensive database of information and a set of recommendations for UW System and individual universities to use to help accurately plan for the type, size, cost and schedule for additional housing in response to student needs as approved by the Board of Regents. It is not the intent to this study to mandate a “one size fits all” residence hall plan configuration or procurement process for UW Campuses.

The majority (85%) of the current housing stock on University of Wisconsin four-year campuses is over 45 years old. Due to projected growth at several campus combined with a shortage of housing to adequately accommodate all freshman and sophomores as required by the UW System Board of Regents, there is a substantial need System-wide to quickly bring new residences halls on line.

Several campuses have looked to private developers to quickly construct residence halls. Reasons for this include:

1. Lack of available land either on campus or nearby for purchase; purchase costs may also be high, funding may not be available, and timeframes for approvals can be long.
2. The timing of the biennial budget cycle may not be aligned with the timing of need for beds, and the many steps required in the capital budget cycle and project implementation create delays in meeting needs.

This study will include information on non-traditionally delivered projects to provide Campuses information about how these types of delivery methods compare to “traditional” delivery methods, including cost and quality differences.
**Project Description**

This study is based on factual evaluation of:

1. Current Division of Facilities Development Master Specifications/Design Guidelines along with a broad range of potential alternatives as well as common upgrades requested by user groups to accommodate market conditions and improve operations, and
2. Design components and construction costs of recently-completed state, not-for-profit, and private residence halls in Wisconsin.

To facilitate informed planning and decision-making by agency representatives, this study addresses current trends in student housing, first cost versus long term durability/energy use, and project duration/schedules as related to a broad range of variables including construction delivery method, structural systems, MEP systems, construction details and specifications, materials and finishes, etc.

The process for this study involved representatives from DFD, UW, and the A/E working in a team format to refine an initial work plan and schedule. A/E then organized and facilitated workshops with the study leaders. A/E recorded decisions made in a summary document.

**Audience:** The audience for this document is Campus Housing Management, UW-System Administration Planners, Division of Facilities Development Architects & Engineers and selected A/E teams on future residence halls.

**Scope**

The scope of this study includes three distinct components:

**Part 1:** Compile information and statistics in a consistent format on all halls built in the past seven years for either the UW System four-year campuses or associated off line Foundation built process.

**Part 2:** Perform a comparison of cost/schedule/construction & MEP systems of a select cross section of residence halls as identified by the Study Leaders. Halls selected for inclusion were:

a. UWSA, Design/Build - UW Platteville - Southwest Hall (382 beds) 2006
b. UWSA/DFD - UW-La Crosse - Reuter Hall (382 beds) 2006
c. UWSA/DFD - UW-Madison - Ogg Hall (622 Beds) 2007
d. Viterbo University Clare Apartments - (118 beds) 2012
e. UW-Platteville Real Estate Foundation - Rountree Commons (600 beds) 2012

**Part 3:** Develop a “Specification Checklist” organized in CSI Masterformat, for all building systems, with identification of those systems acceptable to both Division of Facilities Development and the UWSA Capital Planning & Budget office, as well as other alternatives, with cautions and concerns identified for systems that are not endorsed by UWS/DFD. Interactive sessions were conducted with DFD and UWSA professional staff to review existing DFD building guidelines and identify reasons for recommending use of systems identified in guidelines, and provide reasons for concern about systems that do not comply with guidelines. The report format includes a simplified spreadsheet where for each
component a “Basic Code Compliant”, “Medium Quality”, “Recommended Quality”, and “Enhanced Option” are identified. “Recommended Quality” is the level of quality that is consistent with DFD Guidelines, based on DFD/UWSA/AE discussion during workshops. Commentary related to first-cost and total cost of ownership is identified where relevant.

**Report Components:**
Report Components are available in electronic formats that are automated where practical, updatable, printable, and useable by those entities planning future residence halls.

**Residence Hall Study Summary Document**
Executive Summary -- Introduction, Background, Synthesis, and Conclusions Related to Recommended Parameters for Future Residence Halls

**Section 1: Data Summary**

a. Identification of the Campus and Hall
b. Description of housing configuration (i.e. traditional, suite, apartment, etc)
c. Number of beds
d. Number of stories
e. Number of parking stalls (bike, moped and vehicular)
f. Description of non-residential uses developed in a tabular format by floor, and description of use (e.g. food service, central housing offices, etc.).
g. Description of major building systems (i.e. roof and envelope, structural, MEP, interiors, etc.)
h. Basic site and building plans
i. Cost breakdown: Information on soft costs, including A/E fees, DFD fees, Developer fees, borrowing costs, and furnishings, fixtures and equipment (FF&E). Use DOA Form 4265 to illustrate costs for General Construction, Mechanical, Electrical, Fire Protection, and Plumbing costs. Break out of size of major non-housing functions, i.e. food service, large meeting spaces, office space, etc. List utility types, Sustainable Design attributes, any unusual project conditions or challenges.
j. Square footage breakdown – total GSF, GSF/ASF per bed, ASF per unit, ASF of lounge spaces, SF of non-housing functions, area of overall building footprint, area of directly associated site, area of parking (structured and surface)
k. Project schedule including month and year of RFP or enumeration, approvals, AE selection, bidding or CMAR selection or negotiation, construction.
Section 2: Planning Document
   a. Space Planning commentary indicating commentary on typical arrangements illustrated in 5 representative projects
      i. Square footages and plan diagrams of representative typical dwelling unit arrangements like suites and doubles.
      ii. Square footages and plan diagrams of floor plan arrangements of typical arrangements illustrated in 5 representative projects for units, lounges, and circulation, and their associated efficiencies
   b. Construction and MEP Systems Planning
      i. Matrix comparing components meeting DFD guidelines, life spans, efficiencies and costs to other construction standards, life spans, efficiencies and costs. Costs are illustrated as cost per square foot, with escalation factor to today’s construction costs and scheduling factors.
   c. Schedule Planning
      i. Matrix comparing typical State of Wisconsin project schedule to Design Build and Foundation built schedules.

Section 3: Project Construction System and MEP System Component Planning Checklist
   a. “Specification Checklist” organized in CSI Masterformat

Study Leaders

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<th>Agency</th>
<th>Contact</th>
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<tr>
<td>DFD</td>
<td>Larry Earll</td>
<td>608-266-1290</td>
<td><a href="mailto:larry.earll@wisconsin.gov">larry.earll@wisconsin.gov</a></td>
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<tr>
<td>UWSA</td>
<td>Maura Donnelly</td>
<td>608-263-5742</td>
<td><a href="mailto:mdonnelly@uwsa.edu">mdonnelly@uwsa.edu</a></td>
</tr>
<tr>
<td>Eppstein Uhen Architects</td>
<td>Jonathan Parker</td>
<td>608-442-6681</td>
<td><a href="mailto:jonathanp@eua.com">jonathanp@eua.com</a></td>
</tr>
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<td>KJWW</td>
<td>Kris Cotharn</td>
<td>608-223-9600</td>
<td><a href="mailto:cotharnka@kjww.com">cotharnka@kjww.com</a></td>
</tr>
<tr>
<td>Graef</td>
<td>Fred Groth</td>
<td>608-245-1965</td>
<td><a href="mailto:fred.groth@graef-usa.com">fred.groth@graef-usa.com</a></td>
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Executive Summary

Introduction
The purpose of this study is to provide a comprehensive database of information and a set of recommendations for UW System and individual universities to use to help accurately plan for the type, size, cost and schedule for additional housing in response to student needs as approved by the Board of Regents. It is not the intent of this study to mandate a “one size fits all” residence hall plan configuration or procurement process for UW Campuses.

Background
The majority of the current housing stock on University of Wisconsin four-year campuses is over 45 years old. Due to projected growth at several campus combined with a shortage of housing to adequately accommodate all freshman and sophomores as required by the UW System Board of Regents, there is a substantial need System-wide to quickly bring new residences halls on line.

Several campuses have looked to private developers due to a perception that this is a faster way to construct new residence halls. This study provides timeline information for several representative projects which shows that project timeline opportunities for both Foundation led and DFD led projects can be similar when using certain implementation practices.

Synthesis
Data has been compiled and formatted to illustrate, in a consistent manner, the scope, cost, and schedule for 17 Residence Halls constructed in the past 7 years to house students attending UW Campuses, plus one project at a private university. The project team has analyzed this data to identify commonalities, anomalies, successes and challenges

Conclusions
1. There is no “one size fits all” solution to providing student housing at UW Campuses
2. There is great value in using this compiled data for initial general planning, and subsequent analysis of proposed designs created for Campuses.
3. While it is tempting to build project budgets around the lowest first cost of systems, experience has shown that investment in higher quality/higher efficiency critical items like superstructure, envelope, and MEP systems is a more efficient use of funds long term.
4. Sustainable Design is a topic that requires a great degree of discussion in conjunction with early project definition. DFD Sustainability guidelines are similar to LEED parameters, but not identical. If campuses are interested in renewable energy resources like domestic solar, photovoltaics, or geothermal, the first cost and payback of these systems should be thoroughly analyzed. It has been shown on previous projects that these systems have a very long payback in the Wisconsin climate, especially for residence halls that have little use during the summer months.
5. Project costs should be analyzed on a cost per bed and cost per unit basis in addition to traditional metrics such as cost per square foot and building efficiency. It is possible to have a low cost per square foot but a high cost per bed if a building design is not providing efficiently sized housing units and support space.

6. Selection of construction systems and MEP systems has the largest impact on overall project first cost and life cycle cost. The second major factor affecting project first cost, cost per bed and energy consumption, is the amount of program space provided in addition to bedroom space. This includes the size of common living space within units, the size of common space on resident floors, and the size of common space for building-wide use. This is an observation, not a condemnation of the provision of this type of space, which is necessary for building community, but on a tight budget project campuses should place a higher priority on providing sleeping, toileting, and study spaces. The third major factor affecting project cost and cost per bed is the inclusion of non-program space like full basements, parking, district food service venues, and/or office space. This study recognizes that for analysis purposes these types of elements need to be culled out, so the cost and efficiency of a project can also be viewed for just the housing portion.
Section 1: Data Summary

This section contains data on 17 Residence Halls completed in the past +/-7 years to house students attending UW Campuses. Data is formatted identically for each project, including scale, definition of spaces, definition of schedule, and cost for ease of cross comparison. Projects analyzed were delivered via the traditional DFD process, design/build turn key process, Foundation led process, and a private independent project. The projects are organized alphabetically by campus. The spreadsheets provided in this report are available as live electronic documents from UW System for use by UW System and User Agencies for planning purposes.

1. UW La Crosse Eagle Hall, 08B3M
2. UW La Crosse Reuter Hall, 02G3H
3. UW Madison Lakeshore Residence Hall Phase I, 04D1I
4. UW Madison Lakeshore Residence Hall Phase II, 10G3D
5. UW Madison Ogg Hall, 04D1I
6. UW Madison Smith Hall, turn key
7. UW Milwaukee Cambridge Commons, Real Estate Foundation led project
8. UW Milwaukee Riverview Residence Hall, Real Estate Foundation led project
9. UW Oshkosh New Residence Hall, 08K3J
10. UW Parkside Pike River Suites, 06K1G
11. UW Platteville Southwest Residence Hall, turn key
12. UW Platteville Rountree Commons, Real Estate Foundation led project
13. UW River Falls, South Forks Suites Addition, 09D2H, 99K4N
14. UW Stevens Point Residence Hall, 09D2H
15. UW Stout Red Cedar Hall, 02H2J
16. UW Whitewater Residence Hall, 06C1Q
17. Viterbo University Clare Apartments
18. Executive Data Summary of all of the residence halls listed above
**Project Location**

**Site Plan Diagram**

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**UW La Crosse - Eagle Hall**

**DSF Project # 0BB3M**

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**Building Data/Cost Report**

**Architect/Engineer:** Eppstein Uhen Architects

**Project Name:** Eagle Hall

**Agency/Location:** University of Wisconsin - La Crosse

**Today's Date:** 4/2/2012

**Project Number:** 0BB3M

**Budget Data: (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)**

- **Total Construction Cost:** $24,970,320
- **Pay Request 1:** $21,232,583
- **Pay Request 2:** $228,248
- **Pay Request 3:** $230,758
- **Pay Request 4:** $6,214

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**Functional Description: (List primary functional uses & percent of assigned area for each.)**

- Administration, 2.7%
- Basement Alt/Storage, 8.7%
- Circulation, 18.3%
- Mechanical, 4.8%
- Resident Suites, 40.4%
- Special Amenity, 3.6%
- Lounges, 10.8%

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**Architectural Specification: (Brief description of foundation, superstructure, exterior walls & roofing.)**

- The building superstructure consists of concrete topped 8 inch precast plank bearing on 8 inch CMU. Basement walls are 16 inch cast in place concrete while the foundations are conventional spread footings. The first and second floor framing above the central zone is structural steel transfer beams supported by steel wide flange columns. Likewise, the first floor framing in the south wing is supported by steel transfer beams, plate girders, and steel wide flange columns.

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**Mechanical & Electrical Specification: (Brief description of mechanical & electrical systems.)**

- Building is heated and cooled using campus steam and chilled water. Two energy recovery units provide ventilation and exhaust for the building with operable windows to provide ventilation to the resident rooms. Two air handling units serve the main floor office spaces and a gathered space in the basement.

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**Project Delivery Method: Traditional D-B-B**

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**Construction Complete:** Jul, 2011

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**Substantial Completion:** Aug, 2012

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**Special Construction/Equipment:**

- Elevator Work:
- General Conditions:
- Interior:
- Envelope:
- Structure:
- Mechanical & Electrical Spec:
- Plumbing Spec:
- Electrical Spec:
- General Conditions:
- Elevator Work:
- Roof Spec:
- HVAC:
- Site Preparation:
- Site Utilities:
- Site Development:
- Fire Protection:
- - Fire Alarm/Security:
- - Emergency Power:
- - HVAC:
- - Power/Lighting:
- - Office/Lab/Equipment:
- - Electrical Work:
- - Site Utilities:
- - Test & Balance:
- - Site Development:
- - Site Preparation:
- - Fire Protection:
- - HVAC:
- - Site Utilities:
- - Test & Balance:
- - Site Preparation:
- - Fire Protection:
- - HVAC:
- - Site Utilities:
- - Test & Balance:

---

**Special Features: (Brief description of special design, equipment, or retail features of significant cost.)**

- 100 hp fire pump, backup gas fired water heaters, 2 computer room units. Technology systems include voice, data and cable television. One telecom room is located on basement level and four telecom rooms are located on floors first, second, third, fourth and fifth floors.

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**Construction Complete:** Jul, 2011

---

**Substantial Completion:** Aug, 2012

---

**Project Delivery Method: Traditional D-B-B**

---

**Construction Complete:** Jul, 2011

---

**Substantial Completion:** Aug, 2012

---

**Special Construction/Equipment:**

- Elevator Work:
- General Conditions:
- Interior:
- Envelope:
- Structure:
- Mechanical & Electrical Spec:
- Plumbing Spec:
- Electrical Spec:
- General Conditions:
- Elevator Work:
- Roof Spec:
- HVAC:
- Site Preparation:
- Site Utilities:
- Site Development:
- Fire Protection:
- - Fire Alarm/Security:
- - Emergency Power:
- - HVAC:
- - Power/Lighting:
- - Office/Lab/Equipment:
- - Electrical Work:
- - Site Utilities:
- - Test & Balance:
- - Site Preparation:
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- - HVAC:
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- - Fire Protection:
- - HVAC:
- - Site Utilities:
- - Test & Balance:
- - Site Preparation:
- - Fire Protection:
- - HVAC:
- - Site Utilities:
- - Test & Balance:
### UW Madison - Lakeshore Residence Hall Phase I

**Project Location**

- **Campus Location Map**
- **Site Plan Diagram**

**UW Madison - Lakeshore Residence Hall Phase I**

**Division of Facilities Development**

**Building Data/Cost Report**

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**Budget Data: (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)**

| General Construction || Electrical Work || FF&E Cost* |
| --- | --- | --- |
| $26,137,357 | $4,327,851 | $4,988,000 |
| **- Structure:** | | |
| $26,137,357 | | |
| **- Power/Lighting:** | | |
| $9,597,378 | | |
| **- Interior:** | | |
| $13,970,584 | | |
| **- General Conditions:** | | |
| $2,430,102 | | |
| **- Elevator Work:** | | |
| $1,704,250 | | |
| **- FF&E Cost** | | |
| $1,634,000 | | |
| **Special Construction/Equipment:** | **Total Project Cost** | |
| $0 | $48,770,000 | |
| **- Site Development: Total SF from above**: | | |
| $205,464 | | |
| **- Site Development Costs:** | | |
| $228,519 | | |

**Functional Description:**

- **List primary functional uses & percent of assigned area for each:**
  - Administration, 1.6%; Basement Ald/Storage, 8.4%; Circulation, 19.6%; Mechanical, 12.2%; Resident Suites, 28.1%; Special Amenity, 3.2%; Lounges, 5.7%;inasculated/other, 11.0%; **'** FICM, Food Service is assignable for General Use Facilities (Code 635)
- **Architectural Specification:**
  - **Brief description of foundation, superstructure, exterior walls & roofing:**
  - **Foundations are conventional spread footings for both walls and columns. The superstructure is a post-tensioned concrete moment frame.**
  - **Campus steam and chilled water for heating/cooling. 2 energy recovery units and 3 air handling units. Four pipe fan coil to condition each resident room with operable windows for ventilation. Steam for domestic hot water along with solar. Duplex water softener for domestic hot water. Building is served from 15,800 V campus loop with a 2500 A main panel. Emergency power is provided by a 350 kW generator.**
- **Special Features:**
  - **Brief description of special design, equipment, orffeatures of significant cost:**
  - **150 hp, 1250 gpm fire pump. Wood ceiling with fpl above and below in dining area. 48 panel solar domestic water system. Kitchen and associated equipment.**

**Architect/Engineer:** Engebretson Anderson/Mackey Mitchell

**Budget Data: (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)**

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**Architect/Engineer:** Engberg Anderson/Mackey Mitchell

**Agency/Location:** UW Madison

**Project Number:** 06K2R

**Substantial Completion:** June 13

**Occuancy:** July 13

**Construction Complete:** November 2010

**Substantial Completion:** June 13

**Bid Date:** September 2009

**Bid Opening:** June 07

**A/E Selection:** September 07

**ROA/SRC Approval:** November 10

**LEED Achieved:** None

**Bid Opening:** June 07

**A/E Selection:** September 07

**ROA/SRC Approval:** November 10

**LEED Achieved:** None

**Total Construction Cost:** $1,811,467

**Total Project Cost:** $59,5M

**Enumeration Amount ††**

**Building Data: (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)**

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**Architect/Engineer:** Engberg Anderson/Mackey Mitchell

**Agency/Location:** UW Madison

**Project Number:** 06K2R

**Project Delivery Method:** Traditional D-B-B

**Site Plan Diagram**

- **N.T.S.**

**Food Service**

**Study/ Lounge**

**Public Bathroom**

**School, University**

**Vandalism/ Security**

**Structural Engineering**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**UW Madison - Lakeshore Residence Hall Phase I**

**Site Preparation**

**Site Work**

**Campus Location Map**

- **N.T.S.**

**Site Plan Diagram**

- **N.T.S.**
Double Occupancy Double Occupancy

Residence Room Gross Area 480 SF

Shared Bathroom Gross Area 510 SF

Typical Residence Room Plan Diagrams

Typical Bathroom Plan Diagrams

Residence Room Gross Area 480 SF

Shared Bathroom 255 sf

Shared Bathroom 255 sf
Representative South Wing South Elevation

Representative North Wing West Elevation
**UW Madison - Lakeshore Residence Hall Phase II**

**Project Location Map**

**Site Plan Diagram**

**SWENSON HOUSE**

**N.T.S.**

**CONOVER HOUSE**

**SHOWERMAN HOUSE**

**COLE HALL**

**HOLT COMMONS**

**KRONSHAGE HALL**

**DSF Project # 10G3D**

**UW Madison - Lakeshore Residence Hall Phase II**

**University of Wisconsin - Madison**

**Division of Facilities Development**

**BUILDING DATA/COST REPORT**

**Project Name:** Lakeshore Residence Hall - Phase II

**Project Number:** DFD # 10G3D

**Architect/Engineer:** Eppstein Uhen Architects

**Agency/Location:** University of Wisconsin

**Project Owner:** UW Madison + Lakeshore

**Project Delivery Method:** Traditional D-B-B

**Division of Facilities Development**

**Gross SF:** 61,503

**灸 Asigned SF:** 28,917

**No. of Beds (Resident/Staff):** 528

**No. of Bedrooms:** 207

**No. of Bathrooms:** 22

**No. of Elevator Stops:** 0

**Construction Complete:** 8/13/2012

**Submission Date:** 8/21/2012

**Targeted LEED:** Silver/Gold

**Budget Data:**

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<td>91</td>
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</table>

**Architectural Specification:**

- **Foundation:** Cast in place concrete foundations with normal spread footings, precast plank bearing on CMU. Interior partitions are painted CMU. Corridors receive a skim coat of plaster. Exterior walls are brick and manufactured stone with CMU backup and a typical DFD grade rain screen assembly. Windows are DFD grade single hung.
- **Superstructure:** Superstructure is cast in place concrete foundations with normal spread footings, precast plank bearing on CMU. Interior partitions are painted CMU. Corridors receive a skim coat of plaster. Exterior walls are brick and manufactured stone with CMU backup and a typical DFD grade rain screen assembly. Windows are DFD grade single hung.
- **Superstructure:** The building is supplied high-pressure steam and chilled water from the campus system. Student room are heated/cooled by a 4-pipe fan coil units with operable windows for natural ventilation. Total energy recovery wheel reduces total building energy usage. 33.5 KVAR feeder loop off the campus system. Separate panel boards are provided serving lighting, plug loads, and HVAC loads so each could be metered separately on each floor. Duplex water softer for domestic hot water. Building is served from 13,800 V campus loop with a 800 A main panel. Emergency power is provided by a 150 kW generator.
- **Mechanical & Electrical Specification:**
- **Special Features:** This project features a working greenhouse on a portion of its top floor, for use as a laboratory for the living/learning community that resides in this residence hall. Technology systems include voice, data, cable television, telecommunications grounding, overhead paging, audio video systems, digital signage, CCTV camera system and access control. One telecom room is located on basement level, second and fourth floors.

**Special Features:** This project features a working greenhouse on a portion of its top floor, for use as a laboratory for the living/learning community that resides in this residence hall. Technology systems include voice, data, cable television, telecommunications grounding, overhead paging, audio video systems, digital signage, CCTV camera system and access control. One telecom room is located on basement level, second and fourth floors.
**DIVISION OF FACILITIES DEVELOPMENT**

**BUILDING DATA/COST REPORT**

**Architect/Engineer:** Zimmerman Architectural Studios

**Project Name:** UW Madison - Smith Hall

**Agency/Location:** UW Madison

**Project Number:** 8/13/2012

**Construction Start:** 06/08/12

**BOR/SBC Approval:** 06/08/12

**A/E Selection:** 06/08/12

**A/E advertisment:** 06/13/12

**Enumeration Date:** 06/13/12

**Enumeration amount:** $37,750

**Budget Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

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<td>- Special Construction/Equipment:</td>
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<td>F&amp;I Cost*</td>
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<td>- Elevator Work:</td>
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<td>- Special Construction/Equipment:</td>
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<td>F&amp;I Cost*</td>
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<table>
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<th>General Construction</th>
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</tr>
<tr>
<td>- Special Construction/Equipment:</td>
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<td>F&amp;I Cost*</td>
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</table>

**Total Project Cost:** $37,567,000

**Budget Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

- Plumbing: Site Preparation: Site Development:
- Power/Lighting: Mechanical: Electrical:
- Special Construction/Equipment: Structural Parking: Service: Mechanical:

**Functional Description:** (List primary functional uses & percent of assigned area for each.)

- Administrative, 1.5%; Basement Alt/Storage, 2.6%; Circulation, 19.2%; Mechanical, 3.4%; Resident Suites, 47.6%; Special Amenity, 4.1%; Lounges, 5.1%;

**Architectural Specification:** (Brief description of foundation, superstructure, exterior walls & roofing.)

- Substructure is conventional shallow concrete foundations. Superstructure is a 2-way concrete flat slab supported on concrete columns. Roof system is a 2-way concrete flat slab supported on concrete columns. Lateral system consists of various concrete shear walls.

**Mechanical & Electrical Specification:** (Brief description of mechanical & electrical systems.)

- Building is served from 13,800 V campus loop with a 2000A main panel. Emergency power is provided by two transfer switches that are connected to a generator in the adjacent office building. Campus steam and chilled water for heating/cooling. 1 air handling units. Four pipe fan coil to condition each resident room with ventilation air form operable windows. Plumbing system includes water softener, booster pumps, and steam and chilled water.

**Special Features:** (Brief description of special design, equipment, or Retail features of significant cost.)

- Technology systems include voice, data, cable television, telecommunications grounding, CCTV cameras and access control on exterior doors. One telecom room is located on basement level, first, second, third, fourth, fifth and sixth floors.

---

**Site Plan Diagram**

**Foundation Project**

**UW Madison - Smith Hall**

**Project Location**

**UW Madison - Smith Hall**

**Division of Facilities Development**

**Buildings & Grounds**

**UW Madison**

**Project Number:** 8/13/12

---

**Building Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

<table>
<thead>
<tr>
<th>Building Data:</th>
<th>(See DFD Policy &amp; Procedure for A/E-Section III.B.4 for Instructions)</th>
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</thead>
<tbody>
<tr>
<td>Budget Data:</td>
<td>(See DFD Policy &amp; Procedure for A/E-Section III.B.4 for Instructions)</td>
</tr>
</tbody>
</table>

**Building Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

- Plumbing: Site Preparation: Site Development:
- Power/Lighting: Mechanical: Electrical:
- Special Construction/Equipment: Structural Parking: Service: Mechanical:

**Functional Description:** (List primary functional uses & percent of assigned area for each.)

- Administrative, 1.5%; Basement Alt/Storage, 2.6%; Circulation, 19.2%; Mechanical, 3.4%; Resident Suites, 47.6%; Special Amenity, 4.1%; Lounges, 5.1%;

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- Substructure is conventional shallow concrete foundations. Superstructure is a 2-way concrete flat slab supported on concrete columns. Roof system is a 2-way concrete flat slab supported on concrete columns. Lateral system consists of various concrete shear walls.

**Mechanical & Electrical Specification:** (Brief description of mechanical & electrical systems.)

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**Special Features:** (Brief description of special design, equipment, or Retail features of significant cost.)

- Technology systems include voice, data, cable television, telecommunications grounding, CCTV cameras and access control on exterior doors. One telecom room is located on basement level, first, second, third, fourth, fifth and sixth floors.

---

**Site Plan Diagram**

**Foundation Project**

**UW Madison - Smith Hall**

**Project Location**

**UW Madison - Smith Hall**

**Division of Facilities Development**

**Buildings & Grounds**

**UW Madison**

**Project Number:** 8/13/12

---

**Building Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

- Plumbing: Site Preparation: Site Development:
- Power/Lighting: Mechanical: Electrical:
- Special Construction/Equipment: Structural Parking: Service: Mechanical:

**Functional Description:** (List primary functional uses & percent of assigned area for each.)

- Administrative, 1.5%; Basement Alt/Storage, 2.6%; Circulation, 19.2%; Mechanical, 3.4%; Resident Suites, 47.6%; Special Amenity, 4.1%; Lounges, 5.1%;
Building Data: (See DFD Policy & Procedure for A/E-Section III.B.4 for instructions)

- **Fire Protection:**
  - SF. Fire Protection: $15,946
  - Avg. dwelling unit SF: 1000

- **Audio/Visual:**
  - SF: Audio/Visual: $378,674
  - Jul-07
  - 5220 Mbh

- **Site Preparation:**
  - SF. Developed Site Area: $8,059
  - Jan-06

- **Emergency Power:**
  - SF. Roof Area: $16,395,272
  - 6/28/2007
  - 214,533

- **Site Utilities:**
  - Total utility cost: $121

- **Construction Complete:**
  - 1.0
  - Jul-04
  - 84,659
  - 315
  - 41,600
  - $497,239

- **Bid Date:**
  - 8/13/2012

- **Construction Cost:**
  - Total Project Cost*: $42,087

- **Total SF by Category:**
  - Total SF: 2,589

- **Type Construction:**
  - Unassigned/other, 12.5%
  - Administration, 1.2%; Basement Alt/Storage, 7.9%; Circulation, 19.4%; Mechanical, 3%; Resident Suites, 45.4%; Special Amenity, 4.9%; Lounges, 5.8%; Food Service, 4%

- **Building Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

- **Project Number:**
  - 04D11

- **Agency/Location:**
  - Madison

- **Building Standards Development, 8-29-12**

- **CCTV cameras covering entrances and access control on exterior doors. One telecom room is located on basement level and two telecom rooms per floor on second, third, fourth, fifth and sixth floors.**

- **Building envelope:**
  - Rainwater infiltration courtyard provided to minimize storm run-off.
  - Dry pipe fire protection system in parking area. A 1,000 gpm fire pump with 60 psi boost is provided.

- **Mechanical & Electrical Specification:**
  - Cable television, telecommunications grounding, audio video rough-in with cabling, overhead paging.

- **Mechanical & Electrical Systems:**
  - HVAC: 4-208/120 VAC 3-phase 3-wire 4-wire
  - Plumbing: 526,930
  - Electrical: 25,883,703

- **Overall Special Features:**
  - Fire alarm/security: 6,439
  - Audio/video rough-in with cabling: 349
  - Elevator work: 254
  - Interior: 244
  - Elevator work: 254

- **Total Project Cost:**
  - Total site development cost: 5,151,513

- **Renewable Energy:**
  - Greenhouse gas emissions:
  - Total energy saved:

- **Energy Management System:**
  - Total construction cost: $25,883,703

- **Building envelope:**
  - Rainwater infiltration courtyard provided to minimize storm run-off.
  - Dry pipe fire protection system in parking area. A 1,000 gpm fire pump with 60 psi boost is provided.

- **Building envelope:**
  - Rainwater infiltration courtyard provided to minimize storm run-off.
  - Dry pipe fire protection system in parking area. A 1,000 gpm fire pump with 60 psi boost is provided.

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  - Rainwater infiltration courtyard provided to minimize storm run-off.
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  - Rainwater infiltration courtyard provided to minimize storm run-off.
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  - Rainwater infiltration courtyard provided to minimize storm run-off.
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  - Rainwater infiltration courtyard provided to minimize storm run-off.
  - Dry pipe fire protection system in parking area. A 1,000 gpm fire pump with 60 psi boost is provided.

- **Building envelope:**
  - Rainwater infiltration courtyard provided to minimize storm run-off.
  - Dry pipe fire protection system in parking area. A 1,000 gpm fire pump with 60 psi boost is provided.
Typical Residence Rooms

- Double Occupancy
- 254 SF
- Shared Bathroom
- 188 SF
- Double Occupancy
- 253 SF
- Double Occupancy
- 254 SF
**Building Data/Cost Report**

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<td>HGA</td>
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<td>UW System/Milwaukee</td>
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| Site Preparation: | 4%
| EHV: | 2078 KVA |
| Site Work: | 1,000 |
| Site Utilities: | 1,000 |
| Special Energy: | 50 |
| Total Construction Cost*: | 8214 Mbh |
| Power/Lighting: | 33,745,000 |
| Energy Management: | 40 |
| Construction Complete: | 3,267 |
| Electrical Work: | 3,070 |
| No. of Floors Above Grade: | 6.0 |
| Fire Protection: | 228,652 |
| Functional Description: | List primary functional uses & percent of assigned area for each. |
| Mechanical & Electrical Specification: | Brief description of mechanical & electrical systems. |
| Administrative, 2.0%; Basement Alt/Storage, 1.5%; Circulation, 14.5%; Mechanical, 3.2%; Resident Suites, 39.9%; Special Amenity, 1.9%; Lounges, 3.8%; Structural Parking, 13.8%; Food Service, 2.6%; Retail, 1.2%; Unassigned/other, 18.8% |

**General Construction <<**

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<tr>
<td>Mechanical &amp; Electrical Specification:</td>
<td>Brief description of mechanical &amp; electrical systems.</td>
</tr>
<tr>
<td>Administrative, 2.0%; Basement Alt/Storage, 1.5%; Circulation, 14.5%; Mechanical, 3.2%; Resident Suites, 39.9%; Special Amenity, 1.9%; Lounges, 3.8%; Structural Parking, 13.8%; Food Service, 2.6%; Retail, 1.2%; Unassigned/other, 18.8%</td>
<td></td>
</tr>
<tr>
<td>Civil: Civil work included demolition, grading, erosion control concrete paving, sanitary, water, and storm sewer.</td>
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</tr>
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</table>
### UW Milwaukee - Riverview Residence Hall

#### Project Location

**Historical Context:**
- The Riverview Residence Hall project was initiated with the goal of enhancing student accommodation and facilities at UW River Falls.
- Construction activities involved various phases including site preparation, structural work, and commissioning of utilities.

#### Building Data/Cost Report

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Total Project Cost</strong></td>
<td>$2,080,000</td>
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</table>

**Architect/Engineer:** SDS Architects with ESG

**Project Name:** UW River Falls South Forks Suite Addition

**Agency/Location:** UW System/River Falls

**Project Number:** 002203 - 99K4N

**Budget Data:**
- **General Construction:** $9,442,490
- **Electrical Work:** $1,656,911
- **Mechanical Work:** $2,808,000
- **Plumbing:** $3,126,925
- **General Circulation:** $2,285,000
- **Mechanical:** $518,961
- **Elevator Work:** $149,000

**Special Construction/Equipment:**
- **Energy Management System:** $277,000
- **HVAC:** $1,372,150

**Special Features:**
- **Energy Recovery:**
- **International Fire Protection:**
- **Domestic Water Heating:**
- **Emergency Power:**
- **Audio/Visual:**

**Building Data:**
- **Total SF by Category**:
  - **Residence Rooms:** 329,000 SF
  - **Bathroom:** 11,000 SF
  - **Mechanical:** 44,000 SF
  - **Circulation:** 15,000 SF
  - **Resident Suites:** 145,000 SF
  - **Special Amenity:** 8,000 SF
  - **Lounges:** 11,300 SF

**Functional Description:**
- **Architectural Specification:**
- **Civil:**
  - Site preparation, grading, erosion control, concrete paving, curb and gutter, bike parking, sanitary, water, storm sewer, steam and chilled water.
  - Four pipe fan coils to condition resident rooms.
  - One energy recovery unit for ventilation and exhaust.
  - Operable windows for resident rooms.

**Mechanical & Electrical Specification:**
- **Mechanical:**
  - Chilled water and steam used for heating and cooling.
  - Four pipe fan coils to condition resident rooms.

**Site Plan Diagram**

---

**Acknowledgments:**
- Eppstein Uhen Architects, Inc.
- UW System/ River Falls

---

**References:**
- EUA #0708
- AIA-G703
- **Operable partitioned Multi-purpose space and two Seminar**
Below Grade Parking Plan Diagram

- Resident Room
- House Fellow
- Student Lounge
- Special Amenity
- Bathroom, Public
- Bathroom, Student
- Circulation, Vertical
- Circulation, Horizontal
- Administration
- Retail
- Building Support
- Structured Parking
- Mechanical
- Food Service

© Eppstein Uhen Architects, Inc.
University of Wisconsin Residence Hall Comparison and Building Standards
EUA #12082
Milwaukee, WI
06/08/12

Foundation Project
UW Milwaukee - Riverview Residence Hall
Milwaukee, WI

12A3G New Residence Hall Facility Study & Building Standards Development, 8-29-12
58 of 167
Typical Residence Suite A

Suite A Gross Area 581 SF

Typical Residence Suite B

Suite B Gross Area 522 SF
ENTRY FLOOR
100'90"

SECOND FLOOR
112'92"

THIRD FLOOR
122'92"

FOURTH FLOOR
132'92"

FIFTH FLOOR
142'92"

ROOF BEARING
153'98"

TERRACE FLOOR
88'94"

GARAGE FLOOR
77'910"

SCALE: 1" = 40'

Representative West Elevation

Representative East Elevation
New Residence Hall

Project Location

© Eppstein Uhen Architects, Inc.

University of Wisconsin Residence Hall Comparison and Building Standards

EUA #12082

Oshkosh, WI

06/08/12

UW Oshkosh - New Residence Hall

DIVISION OF STATE FACILITIES

BUILDING DATA/COST REPORT

Architect/Engineer: Berners-Schober with VOA assoc.

Project Name: UW Oshkosh Residence Hall

Agency/Locality: UW Oshkosh

Project Number: 08K3J

LEED Achieved: Gold

Building Date: 7/27/2012

Today's Date: 12/4/2012

Bid Date: September, 2010

Budget Date: See DSP Policy & Procedure for A/E-Section III B.4 for Instructions

System Project Request

Enforcement request

Budget Number: 08K3J

A/E advertisement

No.

Project

No. Elevator Stairs

No. Plumbing Fixtures

MBH Heating Capacity

MBH Cooling Capacity

SF. Fire Protection

VKA Electrical Capacity

Dom Water Heating

Project Delivery Method

Cost per SF

Cost per bed

Cost per bed

Avg. tub/bed

Bed/Bathroom Ratio

Total SF by space category

Administrative

Student Bathrooms

Public Bathroom

970

4,293

23,347

5,420

12,566

66,966

7,081

8,275

6,273

N/A

890

N/A

N/A

50

N/A

108,927

154,354

85%
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**Building Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)

- **Cost Data from UW System**
- **Site Plan Diagram**
- **Campus Location Plan**
- **DSF Project # 06K1G**

**Budget Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions) DOA-4261

- **General Construction:**
  - **Structural:**
    - $4,680,000
  - **General Circulation:**
    - $2,584,050
  - **Interior:**
    - $1,268,000
  - **Mechanical:**
    - $483,000
  - **Elevator Work:**
    - $150,000

- **Electrical Work:**
  - $1,047,755

- **Special Construction/Equipment:**
  - $513,000

- **Total Project Cost:**
  - $17,740,000

**Mechanical Work:**
- **Plumbing:**
  - $718,075
- **HVAC:**
  - $249,990
- **Test & Balance:**
  - $55,000
- **Energy Management Syst:**
  - $81,175

**Total Construction Cost:**
- $14,978,975

**Building Data:**
- **No of Dwelling Units:**
  - 49
- **Net SF (total from above):**
  - 82,154
- **No. Floors Above Grade:**
  - 5
- **No. Floors Below Grade:**
  - 1
- **SF. Roof Area:**
  - 1,205,240
- **SF. Developed Site Area:**
  - 4,521
- **SF. Roof Area:**
  - 1,205,240
- **SF. Floor Area:**
  - 2,269
- **No. Plumbing Fixtures:**
  - 71
- **Assign SF:**
  - 58,381
- **No. Elevator Stops:**
  - 5
- **No. Plumbing Fixtures:**
  - 257
- **MBH Heating Capacity:**
  - 4400
- **MBH Cooling Capacity:**
  - 174

**Functional Description:**
- **Study/ Lounge:**
  - T
- **Residence Rooms:**
  - 745
- **Resident Bathrooms:**
  - 257
- **Resident Bathrooms:**
  - 257
- **Site Preparation:**
  - 5,899
- **Fire Alarm/Security:**
  - 5
- **Test & Balance:**
  - 96,683
- **Electrical Work/ Structural Engineering:**
  - 9,969

**Construction Complete:**
- May, 2008

**Occupancy:**
- 250

**Cost per bed:**
- $5,000

**Cost per SF:**
- $87,175

**Cost per SF:**
- $87,175

**Site Plan Diagram**
- N.T.S.

**Campus Location Plan**
- N.T.S.
Suite Gross Area 1189 SF

Typical Residence Suite
UW River Falls - South Forks Suites Addition

Project Location

Campus Location Map

Site Plan Diagram

UW River Falls - South Forks Suites Addition

River Falls, WI

DSF Project # 09D2H

UW NEW RESIDENCE HALLS - FACILITY STUDY & BUILDING STANDARDS DEVELOPMENT, 6-29-12

06/29/12

EUA 08020
**UW Stevens Point - Residence Hall**

**DSF Project # 07K2R**

**UW Stevens Point - Residence Hall**

**Stevens Point, WI**

**DIVISION of FACILITIES DEVELOPMENT**

**Building Data/Cost Report**

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### Project Information

- **Architect/Engineer:** Engberg Anderson/Mackey Mitchell
- **Total Project Cost:** $340,000
- **Completion Date:** 8/13/12

### Building Details

#### General Construction

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<td>- Reduction, utility extension</td>
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<td>- Site Preparation</td>
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<tr>
<td>- Energy Management System</td>
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</table>

#### Site Preparation

- **Site Preparation**
  - Cost: 5,867,881
  - Purpose Space: Site Preparation

#### Site Utilities

- **Site Utilities**
  - Cost: 5,875,857
  - Purpose Space: Energy Management System

#### General Circulation

- **General Circulation**
  - Cost: 5,829,881
  - Purpose Space: Plumbing

#### Plumbing

- **Plumbing**
  - Cost: 5,875,857
  - Purpose Space: General Circulation

#### Fire Protection

- **Fire Protection**
  - Cost: 5,789,857
  - Purpose Space: Vertical Circulation

#### Vertical Circulation

- **Vertical Circulation**
  - Cost: 5,782,881
  - Purpose Space: Fire Protection

#### HVAC

- **HVAC**
  - Cost: 5,775,857
  - Purpose Space: Vertical Circulation

#### Test & Balance

- **Test & Balance**
  - Cost: 5,767,857
  - Purpose Space: Test & Balance

#### FF&E Cost

- **FF&E Cost**
  - Cost: 5,867,881
  - Purpose Space: FF&E Cost

#### Project Delivery Method

- **Project Delivery Method**
  - Cost: 5,875,857
  - Purpose Space: Project Delivery Method

#### Building Data

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<td>- Civil: Concrete Paving</td>
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<td>- Distribution: N/A</td>
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#### Functional Description

The building is designed for student residence purposes. It includes various spaces such as resident rooms, lounges, study areas, and administrative offices. The building also features amenities like kitchenettes, study rooms, and common areas.

#### Architectural Specification

- **Architectural Specification:**
  - Foundation: Aggregate ribbons, runnels, and infiltration around the project.
  - Superstructure: Masonry bearing wall with precast plank floor.
  - Exterior Veneer: Decorative CMU.

#### Mechanical & Electrical Specification

- **Mechanical & Electrical Specification:**
  - HVAC System: 5-story tower with conventional spread & strip footings with slab-on-grade. Exterior veneer is decorative CMU over CMU back-up, insulated aluminum metal panels over cold formed metal stud framing. Aluminum operable windows, storefront, and curtain wall.
  - Plumbing System: Includes water softeners, booster pump, and solar heating. Plumbing system meets fire codes and energy efficiency standards.
  - Electrical System: Meets local codes and provides adequate power for all spaces.

#### Vertical Circulation

- **Vertical Circulation**
  - Purpose Space: Fire Protection

#### Special Features

- **Special Features:**
  - Storm water management control system. The building is designed to handle storm water efficiently.

---

**Notes:**

- **Stevens Point, WI**
- **UW Stevens Point - Residence Hall**
- **DSF Project # 07K2R**
- **UW Stevens Point - Residence Hall**
- **Stevens Point, WI**
- **DSF Project # 07K2R**
Building Data:
- **Type Construction:** 15,000 sq ft, 3 floors, 371 units
- **Gross SF:** 131,513
- **Available SF:** 12,224
- **MBH Cooling Capacity:** 18,979
- **MBH Heating Capacity:** 33,890
- **Electrical Work Total Cost:** $250,152
- **Electrical Work Cost per bed:** $58,680
- **Electrical Work SF:** 596
- **Mechanical Work Cost per bed:** 532
- **Electrical Work Total KVA:** 831
- **General Work Total Cost:** $1,515,200
- **General Work SF:** 196
- **Mechanical Work Total SF:** 1,100
- **Mechanical Work Total Cost per SF:** $768,341
- **Plumbing Work Total Cost:** $102,000
- **Plumbing Work Total SF:** 379
- **Interior Work Total Cost:** $2,621,841
- **Interior Work Total SF:** 913
- **Interior Work Total Cost per SF:** $2,233,677
- **Equipment Work:**
  - **Site Work:** $783,608
  - **Fire Alarm/Security:** $899,021
  - **Electrical Work:** $6,077,547
  - **Mechanical Work:** $3,187,247
  - **Plumbing Work:** $1,945,220
  - **Structural Work:** $1,037,500
  - **Interior Work:** $2,070,000
  - **Other:** $1,700,000

Budget Data:
- **Total Project Cost:** $29,710,165
- **Gross SF:** 381,434
- **# of Dwelling Units:** 371
- **# of Beds (Resident/Staff):** 13,649
- **# of Floors Under Ground:** 3
- **# of Floors Above Grade:** 5
- **SF. Roof Area:** 37,940
- **KVA Electrical Capacity:** 831
- **SF. Developed Site Area:** 145,012
- **SF. Fire Protection:** 728
- **Emergency Power:** $29,710,165
- **Power/Lighting:** $6,077,547
- **Site Utilities:** $5,199,125
- **Site Development:** $0
- **Site Preparation:** $0
- **Site Work:** $783,608
- **Fire Alarm/Security:** $899,021
- **Site Preparation:** $0
- **Plumbing Fixtures:** 720
- **Total SF by Category:
  - Resident Room: 94,913
  - Resident Bathroom: 12,224
  - Administration: 913
  - House Fellow: 573
  - Pavilion: 3,945
  - Basement At/Storage: 12,848

Mechanical & Electrical Specification:
- **Architectural Specification:** (Brief description of foundation, superstructure, exterior walls & roofing.)
- **Mechanical Specification:** (Brief description of mechanical & electrical systems.)
- **Architectural Precautionary Measures:**
  - Ballasted EPDM roof
  - Hydraulic passenger elevator and recirculating conveyor
  - Infiltration control, concrete paving, asphalt paving, traditional curb and gutter, sand volleyball court, sanitary, water, steam, chilled water, storm sewer, and sanitary services were provided from adjacent public right of way.
- **Mechanical & Electrical Features:**
  - University steam and chilled water are used to heat and cool building. Four pipe fan coils are used in the resident rooms. The building has 2 energy recovery units for ventilation and 2 air handlers to serve common areas. Ventilation was provided to each room by ducting to the return of the fan coil unit. Steam domestic water heaters and two small gas fired water heaters. Duplex water softeners for domestic hot water. Building is served from 4160 V campus loop.
  - **CIVIL:**
    - Architectural precast wall panels
    - Ballasted EPDM roof
    - Hydraulic passenger elevator and recirculating conveyor
    - Infiltration control, concrete paving, asphalt paving, traditional curb and gutter, sand volleyball court, sanitary, water, steam, chilled water, storm sewer, and sanitary services were provided from adjacent public right of way.
  - **MECHANICAL & ELECTRICAL SPECIFICATION:**
    - University steam and chilled water are used to heat and cool building. Four pipe fan coils are used in the resident rooms. The building has 2 energy recovery units for ventilation and 2 air handlers to serve common areas. Ventilation was provided to each room by ducting to the return of the fan coil unit. Steam domestic water heaters and two small gas fired water heaters. Duplex water softeners for domestic hot water. Building is served from 4160 V campus loop.
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      - Ballasted EPDM roof
      - Hydraulic passenger elevator and recirculating conveyor
      - Infiltration control, concrete paving, asphalt paving, traditional curb and gutter, sand volleyball court, sanitary, water, steam, chilled water, storm sewer, and sanitary services were provided from adjacent public right of way.
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    - Ballasted EPDM roof
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    - **CIVIL:**
      - Architectural precast wall panels
      - Ballasted EPDM roof
      - Hydraulic passenger elevator and recirculating conveyor
      - Infiltration control, concrete paving, asphalt paving, traditional curb and gutter, sand volleyball court, sanitary, water, steam, chilled water, storm sewer, and sanitary services were provided from adjacent public right of way.
**Architect/Engineer:** Eppstein Uhen Architects  
**Project Location:** Viterbo - La Crosse, WI  
**Date of Document:** 8/25/12

## Building Data/Cost Report

**Type Construction:** I-B over I-A  
**Gross SF:** 74,972  
**Assignable SF:** 44,628  
**No. Floors Below Grade:** 1.0  
**Cu. Ft. Bldg. Volume:** 705,716  
**No. Floors Above Grade:** 4.0  
**No. Elevator Stops:** 6  
**MBH Heating Capacity:** 1,128  
**MBH Cooling Capacity:** 59.5%  
**GSF per bed:** 635  
**No. Plumbing Fixtures:** 331  
**Bed/Bathroom Ratio:** 2 to 1  
**No of Beds:** 118  
**No. Elevator Lifts:** 6  
**no. of Dwelling Units:** 38  
**Project Name:** Viterbo - Claire Apartments  
**No. Elevator Lifts:** 6  
**Construction Complete:** Jul-12  
**Substantial Completion:** Jul-13  
**LEED Achieved:** N/A  
**Occupancy:** N/A  
**A/E Selection:** N/A  
**Bid Date:** Aug-11  
**Bid Opening:** Aug-11  
**Agency/Location:** N/A  
**Contractor:** CM bid  
**Site Work:** $253,000  
**Site Preparation:** $165,000  
**Site Utilities:** $0  
**Special Amenity:** N/A  
**FF&E Cost:** $15,000  
**Total Construction Cost:** $7,643,895  
**Budget Data:** (See DFD Policy & Procedure for A/E-Section III.B.4 for Instructions)  
**AIA 703**  
**General Construction:** $4,870,725  
**Mechanical Work:** $1,834,820  
**General Conditions:** $373,558  
**Electrical Work:** $685,350  
**Plumbing:** $355,540  
**Audio/Visual:** N/A  
**Energy Management Syst:** N/A  
**General Circulation:** $2,089,800  
**Fire Alarm/Security:** $117,690  
**Interior:** $2,089,800  
**Elevator Work:** $86,050  
**Voice/Data:** N/A  
**Test & Balance:** N/A  
**System Architectural Specification:** (Brief description of foundation, superstructure, exterior walls & roofing.)  
Metal stud bearing walls with bar joists, metal deck and concrete floors. Narrow profile composite deck system at central corridor to maximize interstitial space for mechanicals. Spray foam insulation in stud cavities, fluid applied air barrier, 1" rigid insulation and masonry veneer. Adhered EPDM roofing system.  

## Division of Facilities Development

**Architectural Specification:** (Brief description of mechanical & electrical systems.)

**Mechanical & Electrical Specification:** (Brief description of mechanical & electrical systems.)

**Special Features:** (Brief description of special design, equipment, or retail features of significant cost.)

**Administrative:** N/A  
**Food Service:** N/A  
**Retail:** N/A

**Function Description:** (List primary functional uses & percent of assigned area for each.)

- **Administration:** 0.1%  
- **Basement Alt/Storage:** 3.1%  
- **Circulation:** 13.2%  
- **Mechanical:** 1.5%  
- **Resident Suites:** 53.8%  
- **Lounges:** 2.5%  
- **Unassigned/other:** 2.4%

**Architectural Features:**

- Metal stud bearing walls with bar joists, metal deck and concrete floors. Narrow profile composite deck system at central corridor to maximize interstitial space for mechanicals. Spray foam insulation in stud cavities, fluid applied air barrier, 1" rigid insulation and masonry veneer. Adhered EPDM roofing system.

**Special Features:**

- System Architectural Specification: (Brief description of foundation, superstructure, exterior walls & roofing.)
- Mechanical & Electrical Specification: (Brief description of mechanical & electrical systems.)
- Special Features: (Brief description of special design, equipment, or retail features of significant cost.)
Typical Floor Plan Diagram

- Resident Room
- House Fellow
- Student Lounge
- Special Amenity
- Food Service
- Bathroom, Public
- Bathroom, Student
- Circulation, Vertical
- Circulation, Horizontal
- Administration
- Building Support
- Mechanical

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University of Wisconsin Residence Hall Comparison and Building Standards

La Crosse, WI

709482-01

Viterbo University - Clare Apartments

La Crosse, WI

EUA #12082

07/25/12

119 of 167
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<td>Residence Hall</td>
<td>Type 4</td>
<td>243</td>
<td>5.5</td>
<td>$5,094,044</td>
<td>$194</td>
<td>$55,146</td>
<td>4 to 1</td>
<td>84,288</td>
<td>1980 Mbh</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 2</td>
<td>332</td>
<td>4.0</td>
<td>$5,094,044</td>
<td>$140</td>
<td>$47,111</td>
<td>4 to 1</td>
<td>140,755</td>
<td>6100 Mbh</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 1</td>
<td>448</td>
<td>6.0</td>
<td>$5,094,044</td>
<td>$146</td>
<td>$66,317</td>
<td>5 to 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 1</td>
<td>425</td>
<td>6.0</td>
<td>$5,094,044</td>
<td>$189</td>
<td>$48,070</td>
<td>4 to 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 2</td>
<td>702</td>
<td>5.5</td>
<td>$5,094,044</td>
<td>$139</td>
<td>$26,402</td>
<td>4 to 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 3</td>
<td>488</td>
<td>6.0</td>
<td>$5,094,044</td>
<td>$107</td>
<td>$138</td>
<td>4 to 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Residence Hall</td>
<td>Type 4</td>
<td>622</td>
<td>4.0</td>
<td>$5,094,044</td>
<td>$102</td>
<td>$114</td>
<td>4 to 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

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Section 2: Planning Document

The following chart provides a simple comparison of the sizes and costs of 5 representative housing projects.

<table>
<thead>
<tr>
<th>Residence Hall</th>
<th>Date Decision Made to Build</th>
<th>Month - Year Bid</th>
<th>Agency &amp; Method Used</th>
<th>Date of Occupancy</th>
<th>Gross Square Feet</th>
<th>Overall Project Cost</th>
<th>Construction Cost</th>
<th>Const Cost per Square Foot</th>
<th>Const Cost per Bed</th>
<th>Const Cost per Bed 2013</th>
<th>Number of Beds</th>
<th>Average Unit Size</th>
<th>Bed Bath Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>UW Platteville - Rountree Commons</td>
<td>Dec-09</td>
<td>Jun-11</td>
<td>Foundation Led</td>
<td>Aug-12</td>
<td>153,068</td>
<td>$18,615,629</td>
<td>$16,422,312</td>
<td>$107</td>
<td>$26,402</td>
<td>$26,666</td>
<td>622</td>
<td>600</td>
<td>4 to 1</td>
</tr>
<tr>
<td>UW Madison - Ogg Hall</td>
<td>Jul-04</td>
<td>Sep-05</td>
<td>Traditional D-B-B</td>
<td>Jul-07</td>
<td>214,533</td>
<td>$35,900,000</td>
<td>$25,883,703</td>
<td>$121</td>
<td>$42,087</td>
<td>$51,178</td>
<td>615</td>
<td>254</td>
<td>8 to 1</td>
</tr>
<tr>
<td>UW La Crosse - Reuter Hall</td>
<td>Sep-02</td>
<td>Dec-04</td>
<td>Traditional D-B-B</td>
<td>Jul-06</td>
<td>164,583</td>
<td>$22,359,000</td>
<td>$18,504,155</td>
<td>$112</td>
<td>$48,440</td>
<td>$58,903</td>
<td>382</td>
<td>1,020</td>
<td>4 to 1</td>
</tr>
<tr>
<td>UW Platteville - Southwest Hall</td>
<td>May-04</td>
<td>Mar-05</td>
<td>DB-LP</td>
<td>Aug-06</td>
<td>154,157</td>
<td>$21,100,000</td>
<td>$17,500,000</td>
<td>$114</td>
<td>$45,812</td>
<td>$55,707</td>
<td>382</td>
<td>1,110</td>
<td>4 to 1</td>
</tr>
<tr>
<td>Viterbo University Clare Apartments</td>
<td>Mar-10</td>
<td>May-11</td>
<td>Negotiated GMP</td>
<td>Jul-12</td>
<td>74,972</td>
<td>$8,056,895</td>
<td>$7,643,895</td>
<td>$102</td>
<td>$64,779</td>
<td>$65,427</td>
<td>118</td>
<td>1,065</td>
<td>2 to 1</td>
</tr>
</tbody>
</table>

Space planning commentary:

**Demand Analysis:** It is strongly recommended that each campus conduct a thorough and accurate assessment of their current housing stock compared to future housing demand in order to identify demand, options, construction costs, and operational costs. This assessment should include an analysis to determine whether or not to remodel, replace, add new, or some combination of these options to address housing needs.

**Dwelling Unit Configuration:** It is recommended that User Agencies review their current mix of housing types, review their current and future demand, and then focus their planning efforts on a unit type that meets demand. Unit types and support space types recommended for freshmen, sophomores, and upper division students all differ. Additionally, the choice of size and location of lounge spaces and other support spaces will have an impact on the student experience in the hall, but also the first cost and operating cost of the hall, and should be considered carefully. The trends over the past 7 years show a user agency preference to have suite style units for freshmen and sophomores with a two occupant bedroom and 4 to 5 occupants sharing a bathroom with in the suite, and apartment style units for upper division students. Apartment style units constructed at UW campuses over the past 7 years are almost universally configured as 4 single occupant bedrooms, one bathroom (split into separate rooms for toilet, shower and lavatories), a fully functional kitchen, and a living room.

**Bathroom configuration:** All but one UW institution are building residence halls that have bathrooms accessed from within the suites. Bathrooms designed to have separate enclosure of showers, toilets and lavatories have an efficiency that minimizes the quantity of fixtures while maximizing the ability of occupants to use them concurrently with privacy. This applies to both suite style units and apartment style units. Another bathroom planning issue that is commonly debated is how many bathrooms to provide for a 4 bedroom apartment style unit.
apartment style units designed for UW institutions have 2 bathrooms, and five have “one” bathroom with fixtures in separate enclosures. Privately developed projects are providing up to 4 bathrooms in a 4 bedroom unit, but rent received is commensurate with this added feature.

**Lounge Configuration:** Lounge space provided in the suite style buildings is generally provided in proximity to a “house” of 30 to 40 students, with the intent of having it be a gathering space outside of the suite where students can form a sense of community, and provide intra-house academic and social support. In the apartment style units, lounge space is far smaller, and is generally provided on the first floor, where it is used by all residents, with no sub-group of a “house” community, since upper division students are typically interested in more independence, and need less direct social and academic support.

**Other spaces** included in the analyzed Residence Halls are the following. User Agencies should thoroughly study campus needs and student demands, and carefully consider which of these support spaces are needed for their particular campus. These spaces have a large impact on first cost, operational cost and functionality:

1. Residence Hall Director Apartments
2. Staff Offices
3. Laundries
4. Entry lobbies
5. Service areas, storage, and loading docks
6. Full basements
7. Dining Facilities
8. Academic classrooms
9. Computer labs
10. Study rooms
11. Large meeting spaces capable of accommodating all hall meetings
12. Enclosed bike parking
13. Enclosed scooter parking
14. Enclosed automobile parking

The following illustrations provide information on the building floor plans and dwelling unit plans for the 5 representative projects studied in this section:
Typical Residence Floor Plan Diagram

Resident Room
House Fellow
Student Lounge
Special Amenity
Bathroom, Public
Bathroom, Student
Circulation, Vertical
Circulation, Horizontal
Administration
Retail
Building Support
Mechanical

Foundation Project
UW Platteville - Rountree Commons
Platteville, WI

SCALE: 1" = 40'
Residence Room Gross Area 606 SF

Typical Residence Room

SCALE: 1/8" = 1'-0"
Construction and MEP Systems Planning
The following matrix provides a simplified overview of recommended construction standards, life spans, efficiencies and costs, and compares them to other construction standards, life spans, efficiencies and costs. Costs and lifespans are provided to illustrate order of magnitude differences for planning purposes. Actual costs and lifespans will vary based on actual elements included in projects. Recommended systems are rooted in the philosophy that you should prioritize funds for quality systems in those areas that are hardest to fix and/or provide the best payback on efficiency.
<table>
<thead>
<tr>
<th>Design Component</th>
<th>Basic Code Compliant</th>
<th>Medium Quality</th>
<th>Recommended Quality</th>
<th>Enhanced Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration</td>
<td>Owner Choice based on market demand and exit strategy, typically apartment style. Common &amp; Support areas provided at minimum amount demanded by market. Indoor parking provided</td>
<td>User Agency Choice based on market demand. Common &amp; Support areas provided as determined to be necessary by Owner/User Agency</td>
<td>User Agency Choice based on market demand. Common &amp; Support areas provided as determined to be necessary by User Agency</td>
<td>Add large group gathering spaces, full basements, classrooms, dining facilities, and/or indoor parking</td>
</tr>
<tr>
<td>superstructure</td>
<td>Can range from wood frame to metal studs, depending on size &amp; height of building</td>
<td>Metal Stud, Steel, CMU or concrete</td>
<td>CMU or Concrete</td>
<td>Concrete column and mild steel flat plate, configured to allow for complete interior reconfiguration in the distant future</td>
</tr>
<tr>
<td>floor to floor heights, ceiling heights</td>
<td>10' floor to floor, 8' high ceilings in corridors, bathrooms and kitchens, 9' high ceilings in bedrooms and living rooms</td>
<td>10' floor to floor, 8' high ceilings in corridors, bathrooms and kitchens, 9' high ceilings in bedrooms and living rooms</td>
<td>12'-8&quot; floor to floor, 9' high ceilings in corridors and bathrooms, 11' high ceilings in kitchens, bedrooms and living rooms</td>
<td>Higher floor to floor between first and second floor to accommodate higher ceilings in large meeting rooms</td>
</tr>
<tr>
<td>envelope</td>
<td>Can range from wood siding to brick. Exterior walls insulated with batt insulation. Minimal window size and quality. Pitched roof with asphalt shingles</td>
<td>Brick, metal panel. Exterior wall with rain screen air space, rigid and/or sprayed closed cell foam insulation. Larger window sizes to increase views and daylight. Medium range window quality and performance. Ballasted EPDM roofing</td>
<td>Brick, metal panel. Exterior wall with rain screen air space, rigid and/or sprayed closed cell foam insulation. Larger window sizes to increase views and daylight. High quality and performance windows. 30 year EDPM adhered roofing</td>
<td>Add stone, window shading devices, green roof, etc.</td>
</tr>
<tr>
<td>vertical circulation</td>
<td>One elevator, two exit stairs</td>
<td>One elevator, two exit stairs</td>
<td>One elevator, two exit stairs</td>
<td>Add another elevator, add central communicating stair</td>
</tr>
<tr>
<td>interior construction</td>
<td>Gyp board on wood or metal studs. Gyp board ceilings.</td>
<td>Gyp board on metal studs. Gyp board ceilings.</td>
<td>CMU in common areas, gyp board on metal studs inside dwelling units. Painted concrete ceilings in bedrooms and living rooms, moisture resistant gyp board ceilings in bathrooms and kitchens, ACT in corridors</td>
<td>Add skim coat plaster to CMU partitions, in common areas and/or inside dwelling units</td>
</tr>
<tr>
<td>Design Component</td>
<td>Basic Code Compliant</td>
<td>Medium Quality</td>
<td>Recommended Quality</td>
<td>Enhanced Option</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Interior finishes</td>
<td>Painted walls and ceilings, carpet in corridors, bedrooms, and living rooms. Sheet vinyl in bathrooms and kitchens</td>
<td>Painted walls and ceilings, carpet in corridors, bedrooms, and living rooms. Ceramic tile in bathrooms and kitchens</td>
<td>Painted walls and ceilings, carpet in corridors, bedrooms, and living rooms. Porcelain tile in bathrooms and kitchens</td>
<td>Terrazzo or stone flooring in main lobbies, wood look vinyl plank flooring in kitchens and living rooms</td>
</tr>
<tr>
<td>HVAC</td>
<td>&quot;MagicPak&quot; thru wall heating and cooling units</td>
<td>Central hot water heating unit, chilled water cooling unit, piped to individual 4 pipe fan coil units serving each dwelling unit</td>
<td>Campus Utility system feeding steam and chilled water from a central plant to a building conversion system. Hot water and chilled water piped to individual 4 pipe fan coil units serving each dwelling unit</td>
<td>Added zones to provide individual room control instead of just overall dwelling unit control. Added fin pipe heating at outside walls to reduce chill effect. Add humidity control in basement storage spaces. Add mechanical ventilation of dwelling units. Add renewable energy sources</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>PEX flexible piping, conventional pendant heads</td>
<td>CPVC piping, concealed heads in dwelling units</td>
<td>Black steel main piping, CPVC branch piping, concealed heads throughout</td>
<td>Fire Pumps only if mandated by AHJ</td>
</tr>
<tr>
<td>Fire Alarm</td>
<td>Manual pull stations, individual smoke detectors</td>
<td>Manual pull stations, centrally monitored smoke/fire detectors</td>
<td>Manual pull stations, centrally monitored smoke/fire detectors, addressable paging</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td>Residential grade devices and fixtures, non-metallic cable distribution.</td>
<td>Commercial grade devices and fixtures, metallic flexible cable distribution</td>
<td>Commercial grade devices and fixtures, metallic conduit distribution. Emergency Generator</td>
<td>Emergency Generator that can power more than life safety systems. Higher outlet density.</td>
</tr>
<tr>
<td>IT</td>
<td>Cat 6 and coax free air wired to each room</td>
<td>Cat 6 and coax free air wired to each room. Building-wide wireless internet access</td>
<td>Cat 6 and coax wired in conduit to each room. Building-wide wireless internet access</td>
<td>Additional IT outlets per pillow, fiber optic backbone, dense provision of wireless access points, ultra high speed internet service, paging system</td>
</tr>
<tr>
<td>Typical GSF per bed</td>
<td>665</td>
<td>320</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td>Typical cost per sf 2012</td>
<td>$103</td>
<td>$172</td>
<td>$153</td>
<td></td>
</tr>
<tr>
<td>Typical cost per bed 2012</td>
<td>$68,500</td>
<td>$55,190</td>
<td>$63,275</td>
<td></td>
</tr>
<tr>
<td>Anecdotal Lifespan Assumption</td>
<td>20 - 25</td>
<td>20 - 30</td>
<td>40 +</td>
<td></td>
</tr>
</tbody>
</table>
Schedule Planning
The following matrix compares typical State of Wisconsin project tasks and timelines to tasks and timelines for other project delivery methods. Tasks and timelines are provided to illustrate order of magnitude differences between project delivery method. Actual project timeline will vary by user Agency and specific approach and task.
Section 3: Project Construction System and MEP System Component Planning Checklist

The following matrix provides a simplified narrative of options for construction components and mechanical, electrical, plumbing fire protection and information technology systems. This narrative is intended to provide a simplified overview of systems that are being constructed in the private sector for “basic code compliant” buildings, up to buildings compliant with DFD and UW System guidelines. In addition to this, there is a section that notes project enhancements that agencies could consider during their project scope definition process. Information provided herein is intended to encourage discussion about the functional necessity, first cost and operations cost of a variety of components that a user agency could include in a building. Each building will be different as it addresses the specific needs of the user agency, and the synergistic interrelationship of all of the components should also be considered along with the performance of the individual components.
<table>
<thead>
<tr>
<th>Design Component</th>
<th>Basic Code Compliant</th>
<th>Medium Quality</th>
<th>Recommended Quality</th>
<th>Enhanced Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Configuration</td>
<td>Owner Choice based on market demand and exit strategy, typically apartment style. Common &amp; Support areas provided at minimum amount demanded by market. Indoor parking provided</td>
<td>User Agency Choice based on market demand. Common &amp; Support areas provided as determined to be necessary by Owner/User Agency</td>
<td>User Agency Choice based on market demand. Common &amp; Support areas provided as determined to be necessary by User Agency</td>
<td>Add large group gathering spaces, full basements, classrooms, dining facilities, and/or indoor parking</td>
</tr>
<tr>
<td>Project Delivery</td>
<td>Owner choice</td>
<td>User Agency and UW System Driven</td>
<td>User Agency, UW System, DSF, BOR, SBC Driven</td>
<td></td>
</tr>
<tr>
<td>Construction Delivery</td>
<td>Negotiated GMP, one general contractor, MEP Delivered design/build, early start packages</td>
<td>Negotiated, hard bid or GMP. Single Prime. MEP could be delivered design/build. Could have early start packages</td>
<td>Hard Bid. Multiple Prime Contractors</td>
<td>CM on board at beginning of project for cost &amp; constructability input, all subcontracts hard bid, early start packages</td>
</tr>
<tr>
<td>Financing</td>
<td>Private</td>
<td>Private or Public Bonds</td>
<td>Public Bonds</td>
<td></td>
</tr>
<tr>
<td>Debt Retirement/Depreciation</td>
<td>20 years</td>
<td>30 years</td>
<td>30 years</td>
<td></td>
</tr>
<tr>
<td>Sustainability</td>
<td>Driven by Cost Savings, Market Perception</td>
<td>Driven by Parameters Determined to be appropriate by User Agency</td>
<td>Driven by DSF Sustainability Guidelines and Governor’s Energy Conservation Policy</td>
<td>LEED or Green Globe Certified</td>
</tr>
<tr>
<td>Accessibility</td>
<td>ADAAG, ANSI, IBC</td>
<td>ADAAG, ANSI, IBC</td>
<td>ADAAG, ANSI, IBC, DSF Guidelines</td>
<td>Universal Design</td>
</tr>
<tr>
<td>Commissioning</td>
<td>Not done</td>
<td>User Agency Choice</td>
<td>DSF Guidelines</td>
<td>DSF Enhanced Commissioning</td>
</tr>
<tr>
<td>Daylighting</td>
<td>Not Done</td>
<td>User Agency Choice</td>
<td>DSF Guidelines</td>
<td>LEED or Green Globe Certified</td>
</tr>
<tr>
<td>Design Component</td>
<td>Basic Code Compliant</td>
<td>Medium Quality</td>
<td>Recommended Quality</td>
<td>Enhanced Option</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Site</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Purchase</td>
<td>Land Purchased at Market Rate</td>
<td>Land Purchased at Market Rate</td>
<td>Existing Campus Land Utilized</td>
<td></td>
</tr>
<tr>
<td>Zoning Compliance</td>
<td>Compliance with local zoning required</td>
<td>Compliance with local zoning required</td>
<td>Compliance with local zoning not required but usually complied with</td>
<td></td>
</tr>
<tr>
<td>Demolition</td>
<td>Will leave below grade elements in place</td>
<td>Might leave below grade elements in place</td>
<td>Won’t leave below grade elements in place</td>
<td>Don’t leave below grade elements in place</td>
</tr>
<tr>
<td>Environmental Cleanup</td>
<td>EPA Compliant, encapsulation</td>
<td>EPA Compliant, encapsulation</td>
<td>EPA Compliant, complete remediation</td>
<td></td>
</tr>
<tr>
<td>Utility Extensions</td>
<td>Minimum required for project functionality. Connection to public utilities</td>
<td>Minimum required for project functionality. Connection to public utilities</td>
<td>DSF compliant higher quality materials and installation. Connection to campus and public utilities</td>
<td></td>
</tr>
<tr>
<td>Stormwater Management</td>
<td>Minimum required by local code, if any</td>
<td>As required by local code</td>
<td>As required by User Agency and DSF Guidelines</td>
<td>Rain Gardens, Green Roofs, Detention, and/or Retention</td>
</tr>
<tr>
<td>Irrigation</td>
<td>not provided</td>
<td>User Agency Choice</td>
<td>DSF Guidelines limit irrigation to playing fields</td>
<td>Full irrigation of all landscaping</td>
</tr>
<tr>
<td>Vehicular Parking</td>
<td>Provided as required by zoning and market demand</td>
<td>Provided as required by zoning and market demand</td>
<td>Usually consolidated with other parking on campus</td>
<td>Provide surface or structured parking for residents</td>
</tr>
<tr>
<td>Bicycle Parking</td>
<td>Provided as required by zoning and market demand</td>
<td>Provided as required by zoning and market demand</td>
<td>Usually provided per campus interpretation of occupant demand</td>
<td>Indoor bike parking</td>
</tr>
<tr>
<td>Paving</td>
<td>Asphalt &amp; concrete curb</td>
<td>Asphalt &amp; concrete curb</td>
<td>Asphalt or concrete, concrete curb &amp; gutter</td>
<td>Pervious paving</td>
</tr>
<tr>
<td>Landscaping</td>
<td>Seeded grass turf, minimal ground plantings</td>
<td>Seeded grass turf, minimal ground plantings</td>
<td>Seeded grass turf &amp; ground plantings consistent with campus standards</td>
<td>Sodded turf &amp; ground plantings consistent with campus standards, plus outdoor gathering spaces</td>
</tr>
<tr>
<td>Recreational Facilities</td>
<td>not provided</td>
<td>Might be provided</td>
<td>As determined to be needed by user agency</td>
<td></td>
</tr>
<tr>
<td>Site Lighting</td>
<td>minimum industry standard</td>
<td>provided to address safety concerns</td>
<td>provided to address safety concerns, compliant with campus standards and DSF standards</td>
<td>provided to address safety concerns, high efficiency LED fixtures, dark sky compliant</td>
</tr>
<tr>
<td>Emergency Phones</td>
<td>not provided</td>
<td>provided per campus standards</td>
<td>provided per campus standards</td>
<td>Provided</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Design Component</th>
<th>Basic Code Compliant</th>
<th>Medium Quality</th>
<th>Recommended Quality</th>
<th>Enhanced Option</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Superstructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footings</td>
<td>Reinforced concrete, in type as required for soil conditions</td>
<td>Reinforced concrete, in type as required for soil conditions</td>
<td>Reinforced concrete, in type as required for soil conditions</td>
<td>Design for future expansion</td>
</tr>
<tr>
<td>Foundations</td>
<td>CMU</td>
<td>Reinforced Concrete</td>
<td>Reinforced Concrete</td>
<td>Design for future expansion</td>
</tr>
<tr>
<td>Above Grade Structural System</td>
<td>Wood or Metal Stud, bearing walls</td>
<td>Metal Stud bearing walls</td>
<td>CMU bearing walls with precast plank, Mild Steel Reinforced Concrete, Post Tensioned Concrete</td>
<td>Mild Steel Reinforced Concrete to provide flexibility in future remodeling</td>
</tr>
<tr>
<td>Floor to Floor Heights</td>
<td>10’ floor to floor, 9’ ceilings in living spaces, 8’ ceilings in bathrooms and corridors</td>
<td>10’ floor to floor, 9’ ceilings in living spaces, 8’ ceilings in bathrooms and corridors</td>
<td>12'-8” floor to floor, 11’ ceilings in living spaces, 9’ ceilings in bathrooms and corridors</td>
<td></td>
</tr>
<tr>
<td><strong>Exterior Envelope</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall System</td>
<td>Batt insulated stud cavity, gypsum sheathing, fabric air barrier</td>
<td>Foam insulated stud cavity, gypsum sheathing, liquid applied air barrier</td>
<td>CMU, rigid insulation, liquid applied air barrier (or insulated precast panel [caution regarding long term re-caulk cost])</td>
<td></td>
</tr>
<tr>
<td>Exterior Cladding</td>
<td>Wood, vinyl, CMU, concrete brick, or brick</td>
<td>concrete brick or brick, metal wall panel</td>
<td>Brick, stone, architectural precast, or metal wall panel</td>
<td>brick and stone</td>
</tr>
<tr>
<td>Windows &amp; Doors</td>
<td>clad wood, thermal pane</td>
<td>prefinished aluminum, thermal pane</td>
<td>thermally broken high performance prefinished aluminum, tinted, insulated, low E glass</td>
<td></td>
</tr>
<tr>
<td>Roofing</td>
<td>Shingles or fully adhered EPDM</td>
<td>Fully adhered EPDM</td>
<td>Fully adhered EPDM</td>
<td>Hot Mopped Built Up Roof; slate tile; clay tile; full depth green roof (not trays)</td>
</tr>
<tr>
<td>Thermal Performance</td>
<td>code compliant</td>
<td>code compliant</td>
<td>10% better than code per Governor’s Energy Conservation Policy</td>
<td>LEED or Green Globe Certified</td>
</tr>
<tr>
<td>Design Component</td>
<td>Basic Code Compliant</td>
<td>Medium Quality</td>
<td>Recommended Quality</td>
<td>Enhanced Option</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>HVAC</td>
<td>Design Component Basic Code Compliant</td>
<td>Medium Quality Recommended Quality Enhanced Option</td>
<td>Code compliant intermittent bathroom exhaust for individual bathrooms and continuous bathroom exhaust for multiple fixture bathrooms</td>
<td>Continuous bathroom exhaust</td>
</tr>
<tr>
<td>Residence Room Toilet Exhaust</td>
<td>Code compliant intermittent bathroom exhaust</td>
<td>Code compliant intermittent bathroom exhaust</td>
<td>Code compliant intermittent bathroom exhaust for individual bathrooms and continuous bathroom exhaust for multiple fixture bathrooms</td>
<td>Continuous bathroom exhaust</td>
</tr>
<tr>
<td>Residence Room Ventilation</td>
<td>Natural ventilation with use of operable windows for sleeping room and residence units.</td>
<td>Natural ventilation with use of operable windows for sleeping rooms and residence units.</td>
<td>Natural ventilation with use of operable windows for sleeping rooms and mechanical ventilation to corridor</td>
<td>Mechanical ventilation ducted to residence room.</td>
</tr>
<tr>
<td>Residence Room Conditioning</td>
<td>PTAC</td>
<td>2-pipe change over system</td>
<td>4-pipe fan coil unit or heat pump in room or ducted to room.</td>
<td>Variable speed 4-pipe fan coil unit or heat pump with ducted air to room</td>
</tr>
<tr>
<td>General Space Conditioning</td>
<td>Roof-top units or fan coil units with ducted ventilation air to units</td>
<td>Variable air volume (VAV) air handling unit with ducted ventilation air to unit</td>
<td>VAV air handling unit with ducted ventilation air to unit and CO2 ventilation control for spaces with variable occupancy.</td>
<td>VAV AHU with dedicated outside air system (DOAS) for ventilation and CO2 ventilation control for spaces with variable occupancy.</td>
</tr>
<tr>
<td>Storage Room Conditioning</td>
<td>No conditioning</td>
<td>Heating only</td>
<td>Heating and dehumidification for lower level storage</td>
<td>Heating, ventilating, and dehumidification for lower level storage</td>
</tr>
<tr>
<td>Telecommunications/Security Room Conditioning</td>
<td>Units may need to operate 24hr/day. Consider stand alone unit. PTAC</td>
<td>PTAC on Emergency Power</td>
<td>Computer room unit.</td>
<td>Computer room unit on emergency power.</td>
</tr>
<tr>
<td>Kitchenettes</td>
<td>Recirculating hood</td>
<td>Recirculating hood</td>
<td>Ducted hood with recirculating hood used only in limited applications</td>
<td>Ducted hood</td>
</tr>
<tr>
<td>Stand Alone Heating System</td>
<td>Standard efficiency hot water boilers</td>
<td>High efficiency non-condensing hot water boilers</td>
<td>High efficiency non-condensing hot water boilers</td>
<td>High efficiency condensing hot water boilers with year round low heating water temperatures to gain maximum efficiency</td>
</tr>
<tr>
<td>Stand Alone Cooling System</td>
<td>Direct expansion (D/X)</td>
<td>Air cooled chiller</td>
<td>Water cooled or Air-cooled chiller</td>
<td>Variable primary flow water cooled chiller</td>
</tr>
<tr>
<td>Heat Pump - Stand Alone Heating/Cooling System</td>
<td>Boiler/cooling tower heat pump loop serving individual heat pumps</td>
<td>Ground source heat pump loop with supplemental boiler heating serving individual heat pumps</td>
<td>Ground source heat pump loop with supplemental boiler heating serving individual heat pumps</td>
<td>Ground source heat pump loop with central geothermal unit creating chilled water and heating water</td>
</tr>
<tr>
<td>Temperature Controls</td>
<td>Stand alone controls for everything</td>
<td>Stand alone controls for residence rooms and network controls for major equipment such as AHU, ERU, heating system, cooling system.</td>
<td>Network controls for major equipment and individual units serving residence rooms.</td>
<td>Network controls for major equipment, fan coils, energy metering of electric, gas, water, steam, chilled water, etc.</td>
</tr>
</tbody>
</table>

12A3G New Residence Hall Facility Study & Building Standards Development, 8-29-12
<table>
<thead>
<tr>
<th>Design Component</th>
<th>Basic Code Compliant</th>
<th>Medium Quality</th>
<th>Recommended Quality</th>
<th>Enhanced Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Recovery Unit</td>
<td>No energy recovery, unless required by code</td>
<td>Energy recovery with heating coil</td>
<td>Energy recovery with heating coil sized based on energy wheel failure</td>
<td>Energy recovery with heating coil sized based on energy recovery failure</td>
</tr>
<tr>
<td>Air Handling Unit Filtration</td>
<td>1&quot; Panel filter</td>
<td>MERV 7 - 2&quot; pleated filter</td>
<td>MERV 11 bag or cartridge type filter with MERV 7 pre-filters</td>
<td>MERV 13 bag or cartridge type filter with MERV 7 pre-filters</td>
</tr>
<tr>
<td>100% Non Mixed Air Outside Air Intake Louvers</td>
<td>Standard drainable blade intake louvers sized at 700-900 fpm free area</td>
<td>Standard drainable blade intake louvers sized at 500-600 fpm free area</td>
<td>Standard, drainable style louver sized at 350 fpm free area with ductwork layout to minimize snow intake</td>
<td>Vertical, hurricane style louver sized at 350 fpm free area with ductwork layout to minimize snow intake</td>
</tr>
<tr>
<td>Ductwork</td>
<td>Ductboard and unlimited flexible duct lengths</td>
<td>SMACNA standards G60 galvanized, seal class B for low pressure duct and unlimited flexible duct lengths</td>
<td>SMACNA standards G90 galvanized, seal class A for low pressure ductwork and limited 5'-0&quot; flexible duct lengths</td>
<td>SMACNA standards G90 galvanized, seal class A for low pressure ductwork and limited 5'-0&quot; flexible duct lengths</td>
</tr>
<tr>
<td>Chilled/heating water piping</td>
<td>Mechanical press connection copper, grooved couplings for steel</td>
<td>Soldered connection copper, grooved couplings for steel</td>
<td>Soldered connection copper, grooved couplings for steel in accessible areas, or welded for steel</td>
<td>Soldered connection copper, welded for steel</td>
</tr>
<tr>
<td>Insulation - Ductwork and Piping</td>
<td>Code compliant, internal duct lining possible</td>
<td>Code compliant, limited internal duct lining</td>
<td>Code compliant, limited internal duct lining, polyisocyanurate for chilled water piping</td>
<td>Code compliant, limited internal duct lining, polyisocyanurate for chilled water piping</td>
</tr>
</tbody>
</table>

**PLUMBING**

<table>
<thead>
<tr>
<th>Design Component</th>
<th>Basic Code Compliant</th>
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<th>Enhanced Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Hot Water</td>
<td>Standard efficiency, atmospheric glass-lined gas-fired or electric water heater, typically one water heater with storage tank</td>
<td>Standard efficiency, sealed combustion, glass-lined gas-fired or electric water heater may have multiple units with storage tank</td>
<td>High efficiency, sealed combustion stainless steel tank, gas-fired for primary and back-up if using steam. If campus steam is available, steam semi-instantaneous water heater. Gas backup water heater if using steam. Recommended a minimum of two water heaters for redundancy</td>
<td>High efficiency, sealed combustion gas-fired for primary and back-up if using steam. If campus steam is available, steam semi-instantaneous water heater. Gas backup water heater if using steam. Installation would have multiple water heaters with storage tank for redundancy. Solar panels could be provided to provide some system load as a renewable.</td>
</tr>
<tr>
<td>Softener</td>
<td>None</td>
<td>Hot water only with timer regeneration control</td>
<td>Hot water only with metered or on demand regeneration control</td>
<td>All hot water and non-drinking cold water with metered or on demand regeneration</td>
</tr>
<tr>
<td>Booster pump (if required)</td>
<td>Single pump</td>
<td>Duplex booster pump</td>
<td>Duplex booster pump on VFD</td>
<td>Duplex booster pump on VFD</td>
</tr>
<tr>
<td>Plumbing fixtures</td>
<td>Standard flow, residential grade fixtures</td>
<td>Low flow residential grade fixtures in residence areas and light commercial in public</td>
<td>Low flow light commercial fixtures.</td>
<td>Low flow light commercial fixtures. Water closets may be dual flush.</td>
</tr>
<tr>
<td>Design Component</td>
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<td>Medium Quality</td>
<td>Recommended Quality</td>
<td>Enhanced Option</td>
</tr>
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<td>-------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Water Closets</td>
<td>Floor mounted, residential grade tank style, gravity fed without insulating tank liner - Any brand</td>
<td>Floor mounted, light commercial tank style, siphon jet without insulating tank liner - American Standard, Crane, Eljer, Gerber, Kohler, Toto or Zurn</td>
<td>Floor mounted tank style, siphon jet with insulating tank liner - American Standard, Kohler, or Zurn</td>
<td>Floor mounted tank style, pressure assist flush with insulating tank liner - American Standard, Kohler, or Zurn</td>
</tr>
<tr>
<td>Showers</td>
<td>One piece fiberglass construction with pressure balanced mixing faucet, brass or bronze contraction with polished chrome finish - Any brand</td>
<td>One piece fiberglass or acrylic construction with pressure balanced mixing faucet, brass or bronze contraction with polished chrome finish</td>
<td>One piece acrylic construction or terrazzo base with acrylic wall panels and pressure balanced mixing faucet, brass or bronze contraction with polished chrome finish - Leonard, Powers, Speakman, or Symmons valves</td>
<td>Terrazzo base with tile encloser or one piece swanstone constructions. Pressure balanced mixing faucet, brass or bronze contraction with polished chrome finish.</td>
</tr>
<tr>
<td>Trim</td>
<td></td>
<td>Solid brass with ceramic inserts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plumbing piping</td>
<td>PVC sanitary/vent, CPVC, pex or copper for domestic water</td>
<td>PVC sanitary/vent, CPVC, mechanical press connection copper or soldered copper for domestic water</td>
<td>PVC or Cast iron sanitary/vent, CPVC or soldered copper for domestic water</td>
<td>Cast iron sanitary/vent, soldered copper for domestic water</td>
</tr>
<tr>
<td>FIRE PROTECTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprinklers</td>
<td>Exposed, pendent style sprinklers</td>
<td>Semi-recessed style sprinklers</td>
<td>Concealed, security style sprinklers</td>
<td>Concealed, security style sprinklers</td>
</tr>
<tr>
<td>Sprinkler piping</td>
<td>CPVC or Schedule 10 steel</td>
<td>CVPC or Combination of schedule 40 and 10 steel, roll/cut grooved and threaded</td>
<td>CVPC for branch pipe and schedule 40 steel, roll/cut grooved and threaded</td>
<td>All schedule 40 steel, roll/cut grooved and threaded</td>
</tr>
<tr>
<td>ELECTRICAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident Room Lighting</td>
<td>Switched outlets for user fixtures</td>
<td>Single overhead switched fixture</td>
<td>Multiple fixtures per room, (1) fixture per person</td>
<td>Vandal resistant fixtures, (1) per person</td>
</tr>
<tr>
<td>Building Service</td>
<td>Utility feed (2)</td>
<td>Campus distribution - radial feed</td>
<td>Campus distribution - loop feed with exterior equipment</td>
<td>Campus distribution - loop feed with interior equipment</td>
</tr>
<tr>
<td>Power Distribution</td>
<td>Common panels for all loads per floor</td>
<td>Split loads per area per floor (4)</td>
<td>Segregate loads for lighting, recepts, and mech - common panels per floor (4)</td>
<td>Segregate loads for lighting, recepts, and mech - panels per area per floor (4)</td>
</tr>
<tr>
<td>Emergency Power Source</td>
<td>Battery back-up for lifesafety loads (6)</td>
<td>Battery back-up for life safety loads (6)</td>
<td>Battery back-up (distributed or centralized) for lifesafety loads (6)</td>
<td>Generator back-up for lifesafety loads, elevator, heating system, and other loads such as MDF</td>
</tr>
<tr>
<td>Design Component</td>
<td>Basic Code Compliant</td>
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<td>Recommended Quality</td>
<td>Enhanced Option</td>
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<td>---------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>Lighting and Receptacle Wiring Method</td>
<td>Non-metallic, insulated cable for non-high rise applications</td>
<td>Conduit with wire for distribution and branch homeruns, MC cable for distribution and branch</td>
<td>Conduit with wire for distribution and branch homeruns, MC cable from junction box to device</td>
<td>Conduit with wire for distribution and branch</td>
</tr>
<tr>
<td>Resident Room Circuiting</td>
<td>One 20 amp circuit per room</td>
<td>Two 20 amp circuits per room</td>
<td>Two 20 amp circuits per room for resident devices plus one 20 amp circuit for appliance use</td>
<td>Two 20 amp circuits per room for resident devices plus one 20 amp circuit for appliance use</td>
</tr>
<tr>
<td>Resident Room Receptacles</td>
<td>Three duplex receptacles - one on each of three walls (3)</td>
<td>Four duplex receptacles - two on each of two walls (3)</td>
<td>Three duplex receptacles on two walls plus one duplex receptacle on window wall (3)</td>
<td>Three double duplex receptacles on two walls plus two duplex receptacles on window wall (3)</td>
</tr>
<tr>
<td>Fire Alarm Notification</td>
<td>Horn notification with visual (5)</td>
<td>Horn notification with visual (5)</td>
<td>Voice notification with visual (5)</td>
<td>Voice notification with visuals, two-way firefighter communications</td>
</tr>
<tr>
<td>Fire Alarm Wiring</td>
<td>Free air wiring (5)</td>
<td>Free air wiring (5)</td>
<td>Free air or wiring in conduit optional recommend conduit</td>
<td>Wiring in conduit</td>
</tr>
<tr>
<td>Fire Alarm Detection</td>
<td>120 volt resident room smoke detectors, no common corridor smoke detectors</td>
<td>120V system resident room smoke detectors, common corridor smoke detectors</td>
<td>System programmable resident room smoke detectors, common corridor smoke detectors</td>
<td>System programmable resident room smoke detectors, common corridor smoke detectors</td>
</tr>
<tr>
<td>Fire alarm reporting capability</td>
<td>None</td>
<td>Outside party</td>
<td>Campus security</td>
<td>Campus security</td>
</tr>
<tr>
<td>Mass Notification</td>
<td>None (7)</td>
<td>Interior separate system (7)</td>
<td>Interior and exterior separate system (7)</td>
<td>Interior and exterior system integrated with fire alarm (7)</td>
</tr>
</tbody>
</table>

(1) dependent upon furniture layout  
(2) location of building on campus factors into whether this is an option - building would need to be on the perimeter of campus  
(3) actual quantity would depend on room configuration and wall lengths  
(4) multiple area building - area could be a wing, a multi-person suite, or other as desired  
(5) building not classified as high rise  
(6) building not more than 4 stories above level of egress, therefore elevator is not required to be on generator  
(7) depends on when projects occur as NFPA is changing to address mass notification

TECHNOLOGY

<p>| Structured Cabling System       | Category 5e cabling system meeting TIA/EIA standards     | Category 6 cabling meeting TIA/EIA Standards                | Mid grade category 6 cable exceeding TIA/EIA standards to provide small performance margins ensuring better quality cabling and connecting components. | High grade category 6 cable exceeding TIA/EIA Standards to provide larger performance margins ensuring better quality cabling and connecting components. |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>Resident Room Port Count</td>
<td>One data connection per student and one coaxial TV connection per two students</td>
<td>One data connection per student and one coaxial TV connection per student</td>
<td>Two data connections per student and one coaxial TV connection per two students</td>
<td>Two data connections per student and one coaxial TV per student</td>
</tr>
<tr>
<td>Access Control</td>
<td>No system</td>
<td>Offline card readers (no central monitoring)</td>
<td>Online card readers with local monitoring</td>
<td>Online card readers with campus wide central monitoring</td>
</tr>
<tr>
<td>Access Control Layout</td>
<td>Entrance doors only</td>
<td>All exterior doors</td>
<td>All exterior doors and select interior doors</td>
<td>All exterior doors, elevators and select interior doors</td>
</tr>
<tr>
<td>CCTV</td>
<td>No system</td>
<td>No monitoring of system with local recording for review</td>
<td>Local monitoring and recording with a central workstation at security or reception area</td>
<td>Campus wide central monitoring of system with local and networked recording</td>
</tr>
<tr>
<td>Wireless</td>
<td>Network Infrastructure to provide coverage in all areas</td>
<td>Network Infrastructure to provide coverage in all areas and Distribution Antena System (DAS) - Cabling only</td>
<td>Network Infrastructure to provide coverage in all areas and DAS</td>
<td>Expanded network infrastructure to provide coverage in all areas and increased capacity in select areas where higher-speed and/or number of users are to be accommodated and DAS</td>
</tr>
<tr>
<td>Raceway and Path-ways</td>
<td>J- Hooks</td>
<td>J-Hooks</td>
<td>Cable tray with 25-50% growth capacity</td>
<td>Cable tray with 50-100% growth capacity</td>
</tr>
<tr>
<td>Telecommunication and Security Rooms</td>
<td>TIA 569 and DFD standard room sizes allocated for service entrance, MDF and remote telecom rooms. Consolidated low voltage systems.</td>
<td>TIA 569 and DFD standard room sizes allocated for service entrance, MDF and remote telecom rooms. Consolidated low voltage systems.</td>
<td>TIA 569 and DFD standard room sizes allocated for service entrance, MDF and remote telecom rooms. Consolidated low voltage systems. Separate service entrance room to house service provider equipment.</td>
<td></td>
</tr>
</tbody>
</table>