The Northwest Quadrant Selective Facility Renewal project involves an infrastructure upgrade and limited remodeling. This is an outgrowth of recommendations outlined in the NWQ Redevelopment Plan. The components and outcomes of this project are outlined in this document.
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Preface

The Northwest Quadrant became part of the UWM campus in 2010, adding 10.9 acres and approximately 500,000 ASF/850,000 GSF. It was identified in the 2010 Master Plan as an opportunity site that could aid in addressing the projected space deficit. Unfortunately, it cannot be fully utilized due to code compliance. It was built as a hospital occupancy. Changing occupancy for use as higher education requires updating to current codes, including life safety systems of fire protection, egress lighting and elevator upgrades. It is essential to make the space useable due to the annual carrying cost of approximately $1.2 million.

From 2012-14, a Redevelopment Plan was completed to determine the scope and phasing of projects to make the space useable. It builds on the 2011 Northwest Quadrant Space Planning Study that identified the priority users of campus, and the 2010 Master Plan. It included a facility condition analysis, programmatic changes and projections analysis, and an implementation plan. The outcome of this process is the NWQ Redevelopment Plan, along with nine associated Program Statements/Pre-Designs which provide detail and substantiate the recommendations of the Redevelopment Plan. A Program Statement/Pre-Design for the Center for Healthcare Transformation and Simulation located in NWQ was completed concurrently by a separate consultant.

The Selective Facility Renewal is the first major phase of redevelopment in the NWQ. It addresses the code requirements so that NWQ-A, NWQ-B, NWQ-C, and NWQ-D can be fully occupied. It also provides adjustments/repairs/replacement of the mechanical, electrical, plumbing, and technology systems to make them functional. This first phase will provide infrastructure upgrades for approximately 787,000 GSF and make approximately 300,000 GSF in NWQ-A and NWQ-D useable for surge/interim program space without remodeling. In addition to this, approximately 136,000 GSF will be remodeled to support program decompression and growth. NWQ-A will not receive infrastructure improvements beyond life safety.
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Executive Summary

1. General Project Scope & Description
2. Specific Challenges or Objectives to be Resolved & Alignment with Academic Unit Strategic Plan
3. Relationship to Institution Master Plan Summary
4. Summarized Space Tabulation
5. Budget Summary
6. Schedule Summary
7. Institution & Building Site Plan
1.1. General Project Scope & Description

This project will upgrade infrastructure for approximately 787,000 GSF and selectively remodel approximately 163,058 GSF in the Northwest Quadrant on the University of Wisconsin-Milwaukee’s Kenwood Campus. Infrastructure upgrades will enable occupancy of the complex by providing critically needed life safety upgrades and other necessary code related changes. It will also upgrade building systems for long-term use – especially in NWQ-B - which will facilitate further redevelopment of the complex.

Specifically, these infrastructure upgrades include the following components:

- **Fire Protection Systems in NWQ-A through NWQ-D**
  - Install fire sprinklers and fire protection systems in NWQ-A through NWQ-D. Currently, 40% of these buildings are not protected, most of these spaces are in NWQ-A and NWQ-B. This would make the buildings safer for existing occupants and operationally more efficient.

- **HVAC Systems Upgrades and Horizontal IT Cabling in NWQ-C & NWQ-D**
  - Upgrades to HVAC, central hot water heating, information technology systems and elevators in NWQ-C and NWQ-D will allow for surge occupants and future build outs in these buildings.
  - Includes Air Handler Unit upgrades to existing equipment that serves NWQ-C and NWQ-D to allow for surge occupants and future build outs in these buildings.

- **Life Safety Upgrades in NWQ-A through NWQ-D**
  - Address life safety upgrades of NWQ-A-D required to change occupancy classification, allowing currently unoccupied spaces in the complex to be used as surge space until redevelopment can be completed. Includes decommissioning select elevators and the existing Engineered Smoke Controlled System, as well as upgrading exit and egress lighting systems.

- **Includes Air Handler Unit refurbishment in NWQ-A to allow for surge occupants.**

- **Core & Shell Upgrade and New Mechanical Penthouse NWQ-B**
  - Create new mechanical, electrical and plumbing infrastructure systems for future build outs in NWQ-B. This would require all existing NWQ-B occupants to vacate, and is recommended that this project occur prior or concurrent to any planned build outs for future programmatic users in NWQ-B.

- **Upgrade existing building envelope in NWQ-B including window replacement and building insulation upgrades at the exterior walls and roof.**

Building upon the infrastructure upgrades, this project also provides selective remodeling for the following uses:

- **Restaurant Operations Town Square (11K3C-03): a portion of NWQ-B Floor 1 and a small portion of NWQ-D Floor 1;**

- **College of Health Sciences (11K3C-09) / College of Nursing Center for Healthcare Transformation and Simulation (CHTS) (DFD#: 13D1J): NWQ-B & NWQ-C Floor 3;**

- **Surge Build-Out: NWQ-B Floors 4-5;**

- **School of Information Studies (11K3C-05): NWQ-B Floors 6-7.**

Besides creating occupiable space through selective remodeling, the selective infrastructure upgrades will permit users to surge into as-is space in areas of NWQ-A and NWQ-D. Additionally, upgrades will serve other existing and future users in the NWQ (Student Health Services, Central Kitchen, Children’s Learning Center, Greenhouse, and other users).

As an outgrowth of the overall NWQ Redevelopment Plan, the scope of work outlined here modifies the recommendations set forth in that document, and merges a Program Statement/Pre-Design (College of Nursing Center for Healthcare Transformation and Simulation (CHTS)) outside the scope of the original Redevelopment Plan.
Northwest Quadrant Selective Facility Renewal
Executive Summary

Figure 1.1.1. Proposed Infrastructure Upgrade Components

Figure 1.1.2. Proposed Selective Remodeling and Surge Use
1.2. **Specific Challenges or Objectives to be Resolved & Alignment with Academic Unit Strategic Plan**

The users chosen for the NWQ Selective Facility Renewal project have significant space constraints in existing UWM facilities which prohibit program growth, limit enrollment, and in some cases may lead to accreditation issues if not addressed. This project will allow these groups to meet existing and future demand for programs in these schools and colleges.

Additionally, this project will create a usable complex for surge/interim users and serve the overall decompression of existing campus facilities. As planned UWM projects in the Southwest Quadrant and the Union occur in the future, the NWQ will serve as necessary surge space. The infrastructure upgrades will change currently empty unused space to usable space for both long- and short-term users in the Northwest Quadrant.

1.3. **Relationship to Institution Master Plan Summary**

This study is an outgrowth of previous planning efforts which identified UWM’s substantial space deficit and the Northwest Quadrant as a potential site for relieving a portion of this deficit. Table 1.3.1 describes UWM’s overall space deficit, as documented by the UWM Campus Master Plan and updated here to account for projects that have been completed since the Master Plan was published. The table also updates the space needs for proposed NWQ users, as a number of these users have added programs or increased enrollment since the Master Plan was completed, and space needs have changed. The NWQ Selective Facility Renewal is projected to fulfill 252,798 ASF (97,798 ASF with selective remodeling and 155,000 ASF with surge “as-is” space) of the adjusted 978,058 ASF campus space deficit.

**Table 1.3.1. UWM Long Range Space Needs Summary (Including Adjustments / Fulfillment History + Projected IC-IRC and NWQ Selective Facility Renewal)**

<table>
<thead>
<tr>
<th>Projects</th>
<th>Total ASF</th>
<th>Summary of Surplus / Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MASTER PLAN EXISTING SPACE</td>
<td>2,564,353</td>
<td></td>
</tr>
<tr>
<td>MASTER PLAN SPACE NEED</td>
<td>3,729,347</td>
<td></td>
</tr>
<tr>
<td><strong>MASTER PLAN PROJECTED SURPLUS / DEFICIT</strong></td>
<td><strong>(1,164,994)</strong></td>
<td><strong>(1,164,994)</strong></td>
</tr>
<tr>
<td>2011 Children’s Learning Center Adjustment</td>
<td>(8,400)</td>
<td></td>
</tr>
<tr>
<td>2012 Classroom Station Size Adjustment to 25 ASF</td>
<td>(20,175)</td>
<td></td>
</tr>
<tr>
<td>2013 NWQ Redevelopment Plan Adjustment</td>
<td>(92,226)</td>
<td></td>
</tr>
<tr>
<td><strong>2013 SURPLUS / DEFICIT</strong></td>
<td><strong>(1,285,795)</strong></td>
<td><strong>(1,285,795)</strong></td>
</tr>
<tr>
<td><strong>2015 SURPLUS / DEFICIT</strong></td>
<td><strong>(1,062,058)</strong></td>
<td><strong>(1,062,058)</strong></td>
</tr>
<tr>
<td>15-17 Innovation Campus IRC</td>
<td>84,000</td>
<td></td>
</tr>
<tr>
<td>+ IC-IRC SURPLUS / DEFICIT</td>
<td>(978,058)</td>
<td>(978,058)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projects</th>
<th>Total ASF</th>
<th>Summary of Surplus / Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant Operations Town Square</td>
<td>14,175</td>
<td></td>
</tr>
<tr>
<td>General Health Center - (non-priority program)</td>
<td>18,750</td>
<td></td>
</tr>
<tr>
<td>College of Nursing Center for Healthcare Transformation and Simulation (CHTS)</td>
<td>16,849</td>
<td></td>
</tr>
<tr>
<td>School of Information Studies</td>
<td>22,524</td>
<td></td>
</tr>
<tr>
<td>Surge (Surge into NWQ-B Space)</td>
<td>46,188 GSF @ 55% Efficiency = approx. 25,500 ASF</td>
<td></td>
</tr>
<tr>
<td><strong>NWQ Selective Remodeling Subtotal</strong></td>
<td><strong>97,798</strong></td>
<td></td>
</tr>
<tr>
<td>College of Health Sciences Surge Space (Surge into NWQ-D Space as is)</td>
<td>46,000</td>
<td></td>
</tr>
<tr>
<td>Surge (Surge into NWQ-A Space)</td>
<td>109,000 GSF @ 50% Efficiency = approx. 55,000 ASF</td>
<td></td>
</tr>
<tr>
<td><strong>Surge into “as-is” space</strong></td>
<td><strong>155,000</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NWQ SELECTIVE FACILITY RENEWAL SUBTOTAL</strong></td>
<td><strong>252,798</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projects</th>
<th>Total ASF</th>
<th>Summary of Surplus / Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Health Services</td>
<td>19,208</td>
<td></td>
</tr>
<tr>
<td>Restaurant Operations Central Kitchen</td>
<td>14,235</td>
<td></td>
</tr>
<tr>
<td><strong>+ NWQ SURPLUS / DEFICIT</strong></td>
<td><strong>(691,817)</strong></td>
<td><strong>(691,817)</strong></td>
</tr>
<tr>
<td>TBD Enderis Hall Reassignments - CHS to HBSSW</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TBD Norris Health Center Reassignments</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>+ IC-IRC, NWQ, REASSIGNMENTS SURPLUS / DEFICIT</strong></td>
<td><strong>(691,817)</strong></td>
<td><strong>(691,817)</strong></td>
</tr>
</tbody>
</table>

**Notes:**
- Student Health Services and Restaurant Operations Central Kitchen are planned separately from the NWQ Selective Facility Renewal, but build on the Selective Facility Renewal infrastructure project. For this reason, these are included below the Selective Facility Renewal subtotal.
- Efficiency Factors and ASF figures for the NWQ-B surge build-out, College of Health Sciences interim surge into as-is NWQ-D, and surge into as-is NWQ-A are estimated based on existing conditions in these spaces. However, specific program for these spaces will determined at a later time.
- This is a snapshot in time and analysis based on 2012 data - projects undertaken at a later date will undergo analysis for the conditions at the time they are undertaken.
- Surplus/Deficit data provided by UWM
1.4. **Summarized Space Tabulation**

Table 1.4.1 summarizes the proposed program for the components that make up the NWQ Selective Facility Renewal project. ASF program needs are indicated, along with available GSF in the space assigned to each user. In the case of CHS and CON, there is 46,854 GSF on Floor 3 of NWQ-B and NWQ-C combined. The location of each College’s priority program items will be determined in later phases.

<table>
<thead>
<tr>
<th>General Purpose Revenue (GPR)</th>
<th>General Purpose Revenue (GPR) Selective Remodeling</th>
<th>As-Is Surge Space made occupiable by Selective Facility Renewal</th>
<th>Other Redevelopment projects that can move forward as a result of Selective Facility Renewal</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Information Studies</td>
<td>19,746</td>
<td>n/a</td>
<td>8,497</td>
<td>NWQ Classroom Renovation/Instruction Tech, Facilities, Greenhouse, UITS, Campus Storage, Children’s Learning Center, and Existing Space (NWQ-B-D) are NWQ users that are completed projects or existing space that has been assigned to users. Therefore, a Program Statement/Pre-Design is not needed. These users are impacted by the SFR infrastructure upgrade. Efficiency Factors and ASF figures for the NWQ-B surge build-out, College of Health Sciences interim surge into as-is NWQ-D, surge into as-is NWQ-A, and other existing spaces in NWQ-B are estimated based on existing conditions in these spaces. However, specific program for these spaces will determined at a later time. College of Health Sciences (Possible Priority Program) includes instructional labs for high growth programs of Occupational Science &amp; Technology and Physical Therapy. See the College of Health Sciences Program Statement/Pre-Design Appendix for detail. The program and location of these CHS spaces will be confirmed during the program verification phase. The GSF includes a new Penthouse enclosure for NWQ-B (included in Non-Assignable SF), as this will be part of the SFR Infrastructure upgrade.</td>
</tr>
<tr>
<td>Surge Space (NWQ-B Surge Build-out)</td>
<td>22,524</td>
<td>26,518</td>
<td>83,497</td>
<td>19,208</td>
</tr>
<tr>
<td>College of Nursing</td>
<td>n/a</td>
<td>25,500</td>
<td>12,235</td>
<td>14,235</td>
</tr>
<tr>
<td>College of Health Sciences</td>
<td>n/a</td>
<td>25,500</td>
<td>12,235</td>
<td>14,235</td>
</tr>
<tr>
<td>Center for Healthcare Transformation and Simulation (CHTS)</td>
<td>18,750</td>
<td>35,599</td>
<td>104,999</td>
<td>190,907</td>
</tr>
<tr>
<td>College of Health Sciences Surge Space (Surge into NWQ-D Space as is)</td>
<td>16,849</td>
<td>54,148</td>
<td>104,999</td>
<td>190,907</td>
</tr>
<tr>
<td>College of Health Sciences Surge Space</td>
<td>n/a</td>
<td>83,304</td>
<td>190,907</td>
<td>190,907</td>
</tr>
<tr>
<td>Surge Space</td>
<td>n/a</td>
<td>93,502</td>
<td>190,907</td>
<td>190,907</td>
</tr>
<tr>
<td>GPR Selective Remodeling Subtotal</td>
<td>83,623</td>
<td>86,717</td>
<td>159,146</td>
<td>274,211</td>
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<tr>
<td>PR Selective Remodeling Subtotal</td>
<td>97,798</td>
<td>101,815</td>
<td>274,211</td>
<td>163,058</td>
</tr>
<tr>
<td>As-Is Surge Space Subtotal</td>
<td>153,415</td>
<td>209,403</td>
<td>274,211</td>
<td>209,403</td>
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<tr>
<td>Other Existing Spaces Subtotal</td>
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<td></td>
<td>153,415</td>
<td>209,403</td>
</tr>
<tr>
<td>Other Redevelopment Projects Subtotal</td>
<td>33,443</td>
<td>33,744</td>
<td>55,761</td>
<td>55,761</td>
</tr>
<tr>
<td>NWQ-A through NWQ-D Building Non-Assignable SF</td>
<td>93,502</td>
<td>248,120</td>
<td>795,935</td>
<td>795,935</td>
</tr>
</tbody>
</table>

**Notes:**
- NWQ Classroom Renovation/Instruction Tech, Facilities, Greenhouse, UITS, Campus Storage, Children’s Learning Center, and Existing Space (NWQ-B-D) are NWQ users that are completed projects or existing space that has been assigned to users. Therefore, a Program Statement/Pre-Design is not needed. These users are impacted by the SFR infrastructure upgrade.
- Efficiency Factors and ASF figures for the NWQ-B surge build-out, College of Health Sciences interim surge into as-is NWQ-D, surge into as-is NWQ-A, and other existing spaces in NWQ-B are estimated based on existing conditions in these spaces. However, specific program for these spaces will determined at a later time.
- College of Health Sciences (Possible Priority Program) includes instructional labs for high growth programs of Occupational Science & Technology and Physical Therapy. See the College of Health Sciences Program Statement/Pre-Design Appendix for detail. The program and location of these CHS spaces will be confirmed during the program verification phase.
- The GSF includes a new Penthouse enclosure for NWQ-B (included in Non-Assignable SF), as this will be part of the SFR Infrastructure upgrade.

Northwest Quadrant Selective Facility Renewal
Executive Summary

5
1.5. **Budget Summary**

Table 1.5.1 summarizes the budgets for the components that make up the NWQ Selective Facility Renewal project. This budget is based on 2013 costs.

<table>
<thead>
<tr>
<th>Building($)</th>
<th>Floor($)</th>
<th>Construction Cost</th>
<th>GPR</th>
<th>PR</th>
<th>GG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure *</td>
<td>NWQ-A-D</td>
<td>(ALL)</td>
<td>$23,494,000</td>
<td>$26,314,943</td>
<td>$2,516,075</td>
<td>$28,831,000</td>
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<tr>
<td>School of Information Studies</td>
<td>NWQ-B</td>
<td>6 &amp; 7</td>
<td>$4,998,000</td>
<td>$7,705,000</td>
<td>$7,705,000</td>
<td>$7,705,000</td>
</tr>
<tr>
<td>Surge Build-Out</td>
<td>NWQ-B</td>
<td>4 &amp; 5</td>
<td>$3,088,000</td>
<td>$4,053,000</td>
<td>$4,053,000</td>
<td>$4,053,000</td>
</tr>
<tr>
<td>College of Health Sciences **</td>
<td>NWQ-B/NWQ-C</td>
<td>3</td>
<td>$8,144,000</td>
<td>$3,722,000</td>
<td>$6,231,000</td>
<td>$11,953,000</td>
</tr>
<tr>
<td>College of Nursing Center for Healthcare Transformation and Simulation (CHTS)**</td>
<td>NWQ-B/NWQ-D</td>
<td>1</td>
<td>$4,536,000</td>
<td>$7,321,000</td>
<td>$2,000,000</td>
<td>$7,321,000</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$44,260,000</td>
<td>$41,794,943</td>
<td>$16,068,075</td>
<td>$59,863,000</td>
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* Infrastructure Total Project Cost GPR-PR breakdown based off NWQ Redevelopment Plan Infrastructure project allocations.
** CHS/CON breakdown between General Purpose Revenue (GPR), Program Revenue (PR), and Gift Grants (GG) from UWM Campus Planning.
1.6. **Schedule Summary**

The following table shows the schedule summary for the NWQ Selective Facility Renewal project. This schedule reflects the DFD guidelines for the typical duration of Design, Bid and Construction. Selected A/E consultant should take into account the required phasing to complete the work in NWQ-A and NWQ-D, as they are currently unoccupied. Once the work in NWQ-A & NWQ-D is completed, current occupants of NWQ-B would need to be relocated to NWQ-A & NWQ-D so that work can be completed in NWQ-B. It is unknown who the occupants of NWQ-B surge space will be at the time of relocation - Campus will need to develop a strategy to assist future A/E team.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract for A/E Services</td>
<td>5 Months</td>
</tr>
<tr>
<td>Develop/Review Budget</td>
<td>4 Months</td>
</tr>
<tr>
<td>Develop Preliminary Plans</td>
<td>3 Months</td>
</tr>
<tr>
<td>Complete/Review Design Report</td>
<td>2 Months</td>
</tr>
<tr>
<td>Complete Bid Documents</td>
<td>4 Months</td>
</tr>
<tr>
<td>Review Bid Documents (DFD)</td>
<td>2 Months</td>
</tr>
<tr>
<td>Bidding and Contracting</td>
<td>3 Months</td>
</tr>
<tr>
<td>Complete Construction</td>
<td>24-34 Months</td>
</tr>
</tbody>
</table>

**Table 1.6.1. Schedule Summary**

Notes:
Based on DFD Guide for Determining Time Required to Design, Bid, and Construct ($10 M-$30 M Construction Cost) - standards do not define schedule for projects with construction costs that exceed $30M, as this project does Based on average conditions with no unusual delay in delivery of materials or time lost to poor weather or other conditions.
1.7. **Institution & Building Site Plan**

The following graphics describe the relationship between UWM's Main Kenwood Campus and the Northwest Quadrant site.
Figure 1.7.2. Existing NWQ Site - with NWQ-A through NWQ-D indicated as area of proposed work

NWQ-D indicated as area of proposed work
(This page intentionally left blank)
General Problem Statement

2.1. Description of Problem History, Programmatic Context, Scope, & Nature of Problem (Project Drivers/Problem Originators)
2.2. Major Goals and Objectives
2.3. Discussion of Budget or Schedule Limitations
2.1. **Description of Problem History, Programmatic Context, Scope, & Nature of Problem (Project Drivers/Problem Originators)**

The Northwest Quadrant Selective Facility Renewal is the first phase of the Northwest Quadrant Redevelopment Plan. Building upon the recommendations of earlier studies (the UWM Master Plan, the CSM Facilities Condition Report, and the NWQ Space Planning Study in particular, among others), the Redevelopment Plan analyzes both the infrastructure and space needs of various users for NWQ-A through NWQ-D as well as NWQ-F.

In terms of infrastructure, existing systems within the complex were analyzed during the Redevelopment Plan process, and an infrastructure project is recommended to facilitate logical future redevelopment and provide for immediate, long-term relief of space deficits in high growth schools and colleges. The infrastructure analysis and recommendations are presented in detail in this document.

In order to define users for the complex, a project scope, schedule, and budget for proposed users is defined in nine associated Program Statements/Pre-Designs. In turn, the information presented in the Program Statements/Pre-Designs informed the overall Redevelopment Plan. Those nine include:

- School of Education & General Assignment Classrooms
- Teaching Learning Studio
- Restaurant Operations Town Square*
- Student Health Services
- School of Information Studies*
- Helen Bader School of Social Welfare
- Restaurant Operations Central Kitchen
- College of Health Sciences**
- Honors College and Honors Living Learning Community

* Included as part of the NWQ Selective Facility Renewal
** Part of this program included in the NWQ Selective Facility Renewal

The proposed Redevelopment Plan “Stacking Diagram” is shown in Figure 2.1.1.

The NWQ Selective Facility Renewal differs from the NWQ Redevelopment Plan due to factors that arose during the planning process. Campus was made aware of possible external funding for the College of Nursing Center for Healthcare Transformation and Simulation (CHTS) during the course of the Redevelopment Plan. A separate Program Statement/Pre-Design was completed by a different consultant, which documents options for locating the CON on Floor 3 of NWQ-B or NWQ-C. The NWQ Redevelopment Plan and the College of Health Sciences Program Statement/Pre-Design designates Floor 3 of NWQ-B and NWQ-C as necessary space for the CHS program.

In contrast to the Redevelopment Plan, this document (the NWQ Selective Facility Renewal) outlines scope for CON/CHS instructional labs on Floor 3. Campus Planning responded to the institution’s desire to accommodate these high-growth programs in the near future.

Future funding realities, the immediate need to relieve UWM’s substantial space deficit, and demand on campus for quality, flexible surge space also led to the development of the first phase and its deviance from other recommendations. Whereas the Redevelopment Plan locates the School of Information Studies (SOIS) on Floors 4 and 5 and Helen Bader School of Social Welfare (HBSSW) on Floors 6 and 7 of NWQ-B, in this study SOIS is located on Floors 6 and 7 and Surge Build-Outs on Floors 4 and 5 of that building. The surge space build-out addresses anticipated planning efforts elsewhere on campus that will relocate programs and users into interim/surge space during renovations.
Figure 2.1.1. Northwest Quadrant Redevelopment Plan Stacking Diagram
The infrastructure upgrade outlined in this document corresponds with the infrastructure recommendations summarized in the NWQ Redevelopment Plan. This upgrade serves as the basis for logical redevelopment of the NWQ— including the selective remodeling outlined in this study.

The NWQ Selective Facility Renewal Project will remodel approximately 39,000 ASF/69,301 GSF of NWQ-B Floors 3, 6 and 7 and approximately 16,900 ASF/24,000 GSF of NWQ-C Floor 3 for:

• Instructional laboratories for the College of Nursing
• Instructional laboratories for the College of Health Sciences
• Academic space for the entire School of Information Sciences

This project will also remodel approximately 15,100 ASF/23,828 GSF of Floor 1 of NWQ-B and NWQ-D for:

• Food service/ retail for Auxiliary Services in a “Town Square”

Infrastructure renovations to the remainder of the complex will make possible long-term use of three additional building segments:

• NWQ-A (approximately 218,000 GSF) for surge space,
• Floors 2-8 of NWQ-D (approximately 83,500 GSF) for long term/interim use by the College of Health Sciences
• Two floors of NWQ-B (46,188 GSF) for surge space (Build-out).

The former hospital, NWQ has a main building that spans two and a half city blocks in an east-west direction and is composed of four main segments NWQ-A, -B, -C, and -D (789,932 GSF of total existing space). To enable occupancy and remodeling for higher education use, this project will provide critically needed Life Safety upgrades for NWQ-A, -B, -C, and -D providing the necessary code related changes. Among the needed changes are fire protection systems, egress lighting, elevator upgrades, related electrical, mechanical, plumbing, and architectural systems, and ADA improvements.

NWQ-B serves as the main entrance and central core of the complex and will remain as such long term. Existing HVAC equipment has reached the end of its useful life, is failure-prone, has very poor energy efficiency, and cannot be properly serviced. Additionally, the current system configuration of numerous complex systems that were added over time impedes logical phased development. The project will provide a core and shell upgrade. A new mechanical penthouse will be added to NWQ-B consolidating equipment in one location to allow for greater flexibility for renovation. Comprehensive electrical, plumbing, voice/data and related structural and architectural improvements, including energy related exterior envelope improvements, will also be provided throughout NWQ-B to ready it for long term use for current and future discrete projects.

In addition to the Life Safety improvements, existing mechanical, electrical, plumbing, voice/data equipment and systems will be adjusted and repaired or replaced to be functional. It will prepare NWQ-A for surge space and NWQ-D for interim space.

**INFRASTRUCTURE**

Essential renovation and partial replacement of the mechanical, electrical, plumbing and life safety systems in NWQ. Renovations of the building envelope will also be made to keep the building energy-efficient and water-tight.

Existing mechanical, electrical, plumbing and life safety systems are past their useful lives in NWQ-A and NWQ-B and are code-deficient in all buildings. The building envelope in NWQ-A and NWQ-B is not thermally adequate and not entirely water-tight. Structural systems and exiting are, for the most part, adequate. Need for substantial renovation is greatest in NWQ-B, with lesser needs at this time in NWQ-A. NWQ-C and NWQ-D require relatively modest renovations to their MEP systems to make them useable for the next 20-30 years. Infrastructure work is required before any renovations may be done to meet pressing academic needs and provide sorely needed facilities to serve UWM’s students and faculty.
Figure 2.1.2. Northwest Quadrant Selective Facility Renewal
Proposed Selective Remodeling and Surge Use
Figure 2.1.3. Infrastructure Project Components and Outcomes of the Selective Facility Renewal

### Infrastructure Upgrade

<table>
<thead>
<tr>
<th>Floor</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th</td>
<td>Existing Interior Partitions to Remain</td>
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</tr>
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<td>7th</td>
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<td>Existing Interior Partitions to Remain</td>
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<tr>
<td>5th</td>
<td>Existing Interior Partitions to Remain</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>Surve into Existing Space/Build-Out Ready</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>Surve into Existing Space/Build-Out Ready</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>Surve into Existing Space/Build-Out Ready</td>
<td></td>
</tr>
<tr>
<td>1st</td>
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<td>Children's Learning Center</td>
</tr>
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<td>Ground</td>
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<td>Children's Learning Center</td>
</tr>
<tr>
<td>Basement</td>
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### Additional Project Components and Outcomes

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<th>Component</th>
<th>Description</th>
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</thead>
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<td>Greenhouse</td>
</tr>
<tr>
<td>7th</td>
<td>Surge Build-Out</td>
<td>CHS/CON</td>
</tr>
<tr>
<td>6th</td>
<td>Surge Build-Out</td>
<td>Mechanical</td>
</tr>
<tr>
<td>5th</td>
<td>Surve into Existing Space/Build-Out Ready</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>TL Classrooms</td>
<td>Children's Learning Center</td>
</tr>
<tr>
<td>3rd</td>
<td>Chilren's Learning Center</td>
<td>Children's Learning Center</td>
</tr>
<tr>
<td>2nd</td>
<td>Existing Space</td>
<td>Surge into Existing Space/Build-Out Ready</td>
</tr>
</tbody>
</table>

**Key:**
- School of Information Studies (SOIS)
- Surge Build-Out
- College of Health Sciences (CHS)
- College of Nursing (CON)
- Restaurant Operations Town Square
- Surge into Existing *As-Is* Space
- Mechanical / Other Spaces
- Student Health Services & Rest Ops Central Kitchen Build-out Possible

Northwest Quadrant Selective Facility Renewal
General Problem Statement
COLLEGE OF HEALTH SCIENCES
Remodeled long term space and interim use space will be provided for the College of Health Sciences. Degrees offered by CHS are in high demand. The Wisconsin Bureau of Labor Statistics, for example, indicates job growth ranging from 3% to 28% in the health professions through 2020. Proposed programs respond to this demand with the student population rising 119% from 928 students in 2000 to 2037 students in 2012 (headcount). With new space, Health Sciences can implement a managed growth for new programs of Nutrition and Imaging and continue to increase enrollment in existing programs of Occupational Science Technology, Physical Therapy, and Communication Sciences and Disorders. This is an interim step for Health Sciences in “as is space”, with plans for remodeled space in the future.

SCHOOL OF INFORMATION STUDIES
Remodeled space will be provided for the School of Information Studies. It has experienced consistent growth in enrollment over the past decade, more than doubling from 179 FTE in 2003 to 473 FTE in 2012. In that same period, the school has been relocated and placed in spaces that are misaligned for their needs and spatial demands in an effort to accommodate the growth. It is currently a temporary surge user until a permanent location can be established. Building on its track record of innovation with the American Library Association-accredited online Master of Library and Information Science program, SOIS will continue to create and expand new programs. The MLIS program is ranked 15th among 56 programs by US News and World Report and was the first online master’s program in the UW-System. In 2008, the School launched a self-funded doctoral program that is currently fully enrolled and is in the process of planning for a new master’s degree in Information Science and Technology. This School-funded degree program will further meet the graduate academic and research needs of IT professionals in Wisconsin and beyond, through online and on-site delivery of courses. Finally, in collaboration with UW-Extension and UW Colleges, SOIS to be a campus and national leader in new modes of delivery with the development and implementation of the IST Flex degree option. Based on student assessment, the Flex model is the first of its kind at a four-year doctoral institution and opens academic and degree options beyond the traditional undergraduate and transfer pool of students. These two new programs along with the current academic array offered by SOIS will insure UWM is prepared for the challenges that face a changing higher education landscape.

RESTAURANT OPERATIONS TOWN SQUARE
The food service and retail of the Town Square will serve the students and staff of the colleges, schools, classrooms and children’s learning center located in NWQ. The current/future student enrollment range is 5,000/6,500 and faculty staff of 500/700 over the next ten years. This location is an intersection of horizontal and vertical movement within NWQ. Additionally, a 700 car parking structure is located in the northwest corner of NWQ and generates a substantial amount of foot traffic to destinations within NWQ and to other destinations on campus.

COLLEGE OF NURSING
A simulation lab will be provided offering collaborative teaching services for the College of Nursing and College of Health Sciences. Nursing will be the primary user of the space. Currently Nursing Simulation classes occur in the Learning Resource Center (NLRC) in Cunningham Hall located on the Floor 3. Built in 1974, it does not represent a simulation environment that is consistent with current trends in nursing practice and education. The College’s curriculum is undergoing a significant change in regards to the role of simulation to keep pace with the field of nursing education which will not be possible within the current NLRC facility. In an effort to address this reality, a study was completed in 2010 to upgrade Floor 3 space for current technologies. With the increasing need for change, another study was completed in 2013 which determined the needs could not be met in Cunningham Hall due to severely limited space. The changes in the program have come from two main sources – evolving curriculum, directly influenced by changes in the national health care needs, and a more thorough development of current best practices in Nursing Education nationally.
The College of Nursing continues to see enrollment growth even in these times of declining enrollment. In the current facility, this growth has been artificially capped as Cunningham Hall can only serve a limited number of students. The creation of the Simulation Center will allow for internal growth to occur for the first time in decades - freeing up Floor 3 and part of Floor 6 for instructional and research space for increased student capacity. Accreditation standards are also evolving to require standards and minimum requirements for Simulation learning, keeping ahead of these trends is important to attracting the best students locally, regionally and internationally to the college.

SURGE SPACE
Since it is cost prohibitive to remodel the entire complex, NWQ-A and NWQ-D will receive only Life Safety and repair/replacement of existing systems to make the space usable for surge space for planned renovation of other campus buildings. As part of this project, two floors of NWQ-B will be built out as surge space also.

2.2. Major Goals and Objectives

The NWQ Selective Facility Renewal project makes 14% of UWM’s campus space usable for both long- and short-term users. This meets UWM’s pressing academic facility needs and supports its high priorities and enrollment growth plans. Providing immediate relief for UWM high growth potential colleges and schools is an urgent need for UWM as these units are space-constrained for growth. Schools and Colleges – SOIS, CHS, and CON in particular, along with future surge users – will benefit immediately from utilization of NWQ even before other major projects outlined in the NWQ Redevelopment Plan are funded because of the decompression of the overall UWM campus. Benefits will accrue before projects are completed.

2.3. Discussion of Budget or Schedule Limitations

The infrastructure upgrade outlined in this report serves as the foundation for future redevelopment within NWQ-A through NWQ-D. For this reason, infrastructure work must be completed prior to – or alongside – any major projects moving forward in this space. Without this, high-growth potential programs will remain space constrained, and therefore unable to grow.

Figure 2.3.1. illustrates the need for infrastructure in the Northwest Quadrant and the essential campus benefits of completing this work.
Figure 2.3.1. NWQ Selective Facility Renewal Outcomes

IF NWQ Selective Facility Renewal

THEN 14% of campus space remains unusable

AND School of Information Studies
Restaurant Operations
Town Square
Student Health Services
College of Health Sciences
Other NWQ Projects

THEREFORE SURGE SPACE IN NWQ FOR Southwest Quadrant Union

A new NWQ starts with infrastructure funding and is integral to UWM moving forward

IF NWQ Infrastructure Project

THEN Immediate temporary relief of many space needs

AND School of Information Studies
Restaurant Operations
Town Square
Student Health Services
College of Health Sciences
Other NWQ Projects

THEREFORE SURGE SPACE IN NWQ FOR Southwest Quadrant Union

A new NWQ starts with infrastructure funding and is integral to UWM moving forward

(Diagram format from UWM Campus Planning)
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Analysis of Existing Physical Conditions

3.1. Infrastructure Analysis
3.2. ADA Compliance Review
3.3. Existing Conditions - Plans and Sections
3.4. Existing Site Conditions - Capacities and Deficiencies
   3.4.1. Site
   3.4.2. Civil - Utilities
   3.4.3. Civil - Storm Water Management
      (Storm Water Regulations Analysis)
   3.4.4. Transportation
3.5. Existing Building Conditions - Capacities and Deficiencies
   3.5.1. Architectural Systems
   3.5.2. Structural Systems
   3.5.3. Mechanical Systems
   3.5.4. Plumbing Systems
   3.5.5. Fire Protection Systems
   3.5.6. Electrical Systems
   3.5.7. Telecommunication / Security / Life Safety Systems
   3.5.8. Elevator Systems
### 3.1. Infrastructure Analysis

**INFORMATION GATHERING**
Review of existing design drawings, shop drawings, and on-site field investigations provided the primary sources of information for the Redevelopment Plan. On-site tours occurred with the A/E team and representatives of DFD, UW System, and UWM. The A/E team’s diagrams and matrix were developed based upon updating Columbia - St. Mary’s Hospital documentation by reviewing construction documents for various projects and field investigations.

**ANALYSIS**
The following sections describe existing conditions in the NWQ as well as overall recommendations for redevelopment. This analysis serves as the basis for the infrastructure upgrade project outlined in this document. For more information and drawings, see the NWQ Redevelopment Plan Appendix.

### 3.2. ADA Compliance Review

The following ADA Compliance Review includes NWQ-A through NWQ-G although the project scope of the Redevelopment Plan excluded NWQ-E (Energy Center) and NWQ-G (Parking Garage). The university, and colleges, schools, and other users involved during this process indicated their interest in promoting inclusiveness for all in the redevelopment of the Northwest Quadrant. Certain schools and colleges indicated a preference to exceed accessibility and inclusiveness guidelines, such as applying Universal Design and providing inclusive toilet rooms in the redeveloped spaces of the NWQ. More information is included in the individual Program Statements/Pre-Design documents.

#### NWQ-A ACCESSIBILITY REVIEW

**History and Function**
- NWQ-A (historically known as the East Wing) is comprised of the original 1917 hospital and numerous additions dating from 1923 to 1968. The diagram shown here illustrates the design dates of these additions and how they will be referenced in this report.) The original hospital was designed by Schmidt, Garden & Martin, with additions over the years designed by Eschweiler & Eschweiler. All buildings in NWQ-A have a sub-grade floor and range in height from one to five stories above grade. The width of the building masses extending south toward Hartford Avenue range from 40-55 feet. The basement floor was occupied by food service storage and locker rooms, dishwashing, mechanical rooms, maintenance shop and offices, and the morgue and is now vacant except for storage and IT use. The Floor 1 functions included medical records, the medical library, administrative offices, the kitchen, cafeteria, auditorium, gift shop, and chapel. Floor 1 of NWQ-A currently has The Grind Coffee shop and the east-west central corridor is the main circulation path from the east entry to the rest of the NWQ-A – D. Floor 2 was used for patient rooms, outpatient treatment, physicians’ overnight rooms, and hospital offices and is now vacant. Floor 3 had patient rooms, the sleep lab, hospital offices, and a gym and is now vacant. Floor 4 served patient rooms, physicians’ offices, physicians’ overnight rooms, and offices and is now vacant. Floor 5 functioned as labs and lab support and is now vacant.

**Path of Travel Circulation**
- Floor 1 is accessible to the public at grade from the original main entry off of Maryland, as well as at an entry between the dining room and the auditorium, and at the junction between NWQ-A and NWQ-B.
- NWQ-A shares a common level corridor running east to west at the center of the building on floors 1-5. While the ground floor is also connected by a common, level corridor, there is significant grade change between the various portions of the Wing.
Connection from all floors to the adjacent NWQ-B is level and accessible except for the link at the ground floor. The ramp at this juncture is steeper than 1:12.

Exit paths are accessible.

Elevators

- The White Elevators link all floors in this wing. The White elevator group met prevailing codes at the time of the last modernization in 1975, but do not meet current ADA requirements for signaling and fixture location or operation. The Blue Elevators link floors 1-5. The Blue elevator group met prevailing codes when it was last modernized in 1973, but does not meet current codes for signaling and fixture location or operation.

Accessibility

- Corridors and patient spaces are generally accessible due to the previous need to transport patients via gurney or wheelchair from one part of the hospital to another. Transitions to other parts of the hospital at each floor are accessible. Some points between additions in this wing have minor floor transitions. The ramp between NWQ-A and NWQ-B at the ground floor is not accessible.

- Most existing bathrooms in this wing were designed as patient room facilities prior to current accessibility standards and lack accessible door widths and/or adequate user space. A pair of accessible single-occupant toilet rooms is available on the main path of travel at the first floor in the G addition.

- Door hardware generally does not meet accessibility or egress requirements.

- Tread and riser dimensions within exit stairs of NWQ-A generally do not meet current code requirements. (Current building codes require a minimum tread dimension of 11 inches measured level from nosing to nosing, and a riser dimension less than 7 inches measured vertically.)

- An accessible elevator is required as an accessible means of egress in buildings with an accessible floor four or more stories above the level of exit discharge per IBC 1007.2.1. The White
and Blue elevators provide accessible access to the upper floors but do not meet prevailing codes for fireman’s operation.

- Area of rescue assistance is not available within stair enclosures. Areas of rescue are required in stairways in order to be considered a part of an accessible means of egress or the exit stairway needs to be at least 48 inches wide between handrails per IBC 1007.3. Many of the stairs in NWQ-D to not meet this minimum width requirement. If the entire building is sprinklered, an area of refuge is not required.

- Stair guardrails and handrails generally do not meet current code requirements for height and handrail extensions.

- Area G exit stair tower has tread and riser dimensions meet current building codes.

- Area E exit stair tower has tread dimensions that are 9-1/2 to 10 inches and riser dimensions that are about 7-1/2 inches. These do not meet current code requirements. Guardrails within this stair tower are vertical and satisfy current code requirements.

- Area A stair tower at the end of the corridor has 8 inch high risers and approximately 9-1/2 to 10 inch treads. These do not meet current code requirements. Guardrails and handrails within stair towers do not meet current code requirements. Upon entering the stair tower from the corridor, one must immediately navigate two risers that cut through the landing. This stair has several conditions that would not satisfy current building codes.

- Area D stair tower adjacent to the eastern-most elevators in the NWQ-B has treads and risers that are within current building code standards. Guardrails also are acceptable. Handrail extensions do not meet current code requirements.

Exterior Entry Doors on Path of Travel

- Accessible entry to NWQ-A is at three points, one off of Maryland Avenue into the main connecting corridor to NWQ-B, and two from the north at the cafeteria and at the gap between the East and West wings. A non-accessible entry point is found opposite the north gap entry, due to steps, which negotiate a grade transition.

- The majority of entrance/exit doors and frames are wood with glass, and are in poor or fair condition. Other than major patient entry points, door hardware generally does not satisfy current building and life-safety requirements, especially at remote exit locations. Repair or replacement is needed in some locations.

- A current (2013) DFD project to upgrade the fire alarm and telecommunications backbones in the NWQ-A through –D complex includes upgrades to the east entry doors off of Maryland and includes adding powered automatic operators at the exterior and interior vestibule doors to accommodate accessibility.

NWQ-B ACCESSIBILITY REVIEW

History and Function

- NWQ-B (previously called the West Wing) was built in two phases. The original building was constructed in 1966, designed by Eschweiler, Eschweiler & Sielaff, and included the Basement, Ground and Floors 1-6. Floors 6-8 and the helicopter pad (Floor 10) were added to NWQ-B in 1982 by Brust Zimmerman.
The basement floor had mechanical rooms, storage, locker rooms, the pharmacy, and offices associated with Linens, and Central Distribution. Current uses of the basement are mechanical and storage with some shop space. The ground floor had equipment-intense functions such as the Women’s Imaging Department to the north, and surgery suites to the south. The ground floor is currently used for surge space classrooms on the south side with some storage and IT uses. Floor 1 was occupied by public functions such as a gift shop, cashier’s offices, administrative offices, and bariatric and outpatient departments to the north. South of the main corridor was the Vascular Lab and Nuclear Medicine Departments and supporting offices. Floor 1 is currently used for surge space offices, conference rooms and student lounge. Floors 2-7 were occupied by patient rooms in a “T”-shaped tower. Patient rooms occupied the perimeter, with administrative function at the center. Floors 2-5 are identical; the Floor 6 was occupied by the Psychiatric Department, and Floor 7 by the Intensive Care Unit. Floors 2-7 are currently being used for office surge space for departments temporarily displaced from other buildings.

Path of Travel Circulation
- NWQ B is accessible at grade at the north east corner of the Floor 1, entering from a drop off curb into a lounge and corridor connecting to the main interior circulation spine. The Ground Floor through Floor 5 are accessible by level floor to NWQ-A as described in the East Wing section of this report. The basement, ground and Floor 1 also directly access by level floor NWQ-D and NWQ-C. Floors 2 and 3 of the NWQ-B also have direct level access to the NWQ-C. Floors 6, 7, the Roof and the Helicopter Pad are not accessible from other buildings.
- Exit paths are accessible. Areas of refuge are not provided in the exit stairs.

Elevators
- An accessible elevator is required as an accessible means of egress in buildings with an accessible floor four or more stories above the level of exit discharge per IBC 1007.2.1. Orange, Yellow and Red elevators provide accessible access to the upper floors but do not meet prevailing codes for fireman’s operation.
- The Orange and Yellow Elevators link floors basement through seventh in this wing. The Orange elevator group met prevailing codes at the time of the addition of car 7 in 1971, but do not completely meet current ADA requirements for signaling and fixture location or operation. New push buttons have been installed in the correct ADA locations; however, the type of button is not compliant. Infrared door screens have been installed in place of the older mechanical safety edges. The Yellow elevator group met prevailing codes when it was last modernized and car 10 added in 1971, but does not completely meet current codes for signaling and fixture location or operation. Infrared door screens have been installed in place of the older mechanical safety edges.
- The Black Elevator met prevailing codes when it was installed in 1964, but does not meet current codes for signaling and fixture location or operation. Infrared door screens have been installed in place of the older mechanical safety edges.
- The Red Elevator group at the west end of NWQ-B met prevailing codes when it was modernized in the 1980’s, but does not completely meet current ADA requirements for signaling and fixture location or operation. Infrared door screens have been installed in place of the older mechanical safety edges.
- Future elevator modifications to all NWQ-B elevators should include new fixtures and hands-free emergency communication intercoms.

Accessibility
- Corridors and most office spaces are accessible due to the previous hospital need to transport patients via gurney or wheelchair from one part of the hospital to another. Transitions to other parts of the hospital at each floor are accessible. A ramp between NWQ-A and NWQ-B at the ground floor is not accessible.
- Original toilet rooms are frequently not accessible with little to no opportunity to retrofit.
Life Safety

- Primary building egress on Floors 2 through 8 is through three rated exit stair enclosures that discharge to the exterior at grade. Horizontal exiting is provided through a rated separation at the Basement, Ground Floor and Floor 1 into adjacent fire zones and additional direct exterior discharge points. A stair tower within the center of the building provides circulation only and is clearly labeled “Not an Exit.”

- Tread and riser dimensions in all stair enclosures satisfy current building code requirements. Fire alarm pull stations are located adjacent to the stair access door but don’t necessarily meet current height requirements. Emergency exit alarm and security notification exists at remote exit discharge locations. Emergency telephone or intercom systems are not provided. Area of rescue assistance is not available within stair enclosures.

- Guardrails and handrails within stair towers do not meet current code requirements and typically do not have required handrail extensions. The north and south stairs have a diminished exit dimension upon entering the stair due to the configuration of the handrails and guardrails at the landing.

Exterior Entry Doors on Path of Travel

- The main entrance doors located under the “blue” canopy on the north side are currently being replaced under the Fire Alarm & Telecommunication project (DFD#: 12B1R) and will be fully accessible with automatic door operators and card reader security. The southwest entry doors off of Hartford Avenue are also being replaced with new doors with accessible hardware, but will not have automatic operators as the exterior path to the doors from Hartford is currently too steep to be considered an accessible path of travel. Wood and glass exit doors and frames on the remainder of door locations are in poor or fair condition. Other than major patient entry points, door hardware generally does not satisfy current building and life safety requirements, especially at remote exit locations. Repair or replacement is needed in some locations.

NWQ-C ACCESSIBILITY REVIEW

History and Function

- NWQ-C (historically known as the Clinical Building) was constructed in two phases, beginning with a design by Henningston, Durham, & Richardson built in 1982 which established a basement and ground floor structure. Plunkett Raysich designed the addition to the Clinical Building, which included a Floors 1-3 in an addition to the original “ancillary addition” as well as a basement through Floor 3 addition adjacent at the west to the existing structure. The building was designed to accept additional floors at a later date. A 1” expansion joint separates the steel structure to the east, from the concrete structure to the west. The large amount of concrete to be poured at the linear accelerators in the basement of the west portion of the building made it economical to construct this entire portion in concrete; the steel structure at the east was a continuation of the existing structural system. The west end of the basement floor was occupied by the radiation department with two double height linear accelerator rooms and a center control room at the far west end. The east side of the basement housed mechanical rooms, Computer Information Systems department and the offices of Occupational Health and Safety. The Ground Floor

![Figure 3.2.4. NWQ-C with Site Context](image_url)
and Floor 1 are currently being built out to house the UWM Children’s Center and will be occupied by January of 2014. Floor 2 is primarily occupied by mechanical, with a small suite of offices in the northwest corner of the floor that are currently vacant and an IT room that is being constructed as part of the Fire Alarm and Telecommunication Room project. Floor 3 was occupied by Labor – Delivery – Recovery –Postpartum suites and the Birthing Center, but is currently unoccupied. A project was completed in 2013 that added an addition to the roof of NWQ-C to accommodate the UWM Greenhouse.

Circulation

• Grade access to NWQ-C is from the Floor 1 internal corridor connections to NWQ-B to the east and NWQ-D to the north. At grade access from the south and west is limited to fenced and secured playground access for the Children’s Center. The NWQ-B is linked to the West Wing at all floors in a level transition, except for at Floor 2, where there is a ramp up from the corridor in front of the Brown elevators to the mechanical room at a slope of 1:12. Level transition to NWQ-D is achieved at the ground and Floor 1 with the ground floor path to NWQ-D being and limited to internal use by the Children’s Center.

• Access to the Greenhouse addition is only from the NWQ-B. The Brown elevators to not extend to the Greenhouse (Floor 4) of NWQ-C. The Greenhouse has a platform lift to overcome the level change between the floor level and NWQ-B and the raised floor of the Greenhouse.

• Exit paths are accessible; however stair towers do not offer areas of refuge.

Elevators

• The Brown Elevators link the basement through Floor 3 in this wing. The Brown elevator group met prevailing codes at the time of installation in 1994 and complies with current ADA requirements for signaling and fixture location or operation. Infrared door screens have been installed in place of the older mechanical safety edges. The Purple Elevator at the west of NWQ C connects the basement, Ground Floor and Floor 1 only. The Purple Elevator has been internal use by the Children’s Center between the Ground Floor and Floor 1 and is no longer available for use by the general public. The Purple elevator meets current ADA requirements for signaling and fixture location or operation.

Accessibility

• Corridors and public spaces are accessible. Transitions to other parts of the hospital are level. Accessibility to toilet rooms varies. Patient room toilets at the vacated birthing center are not accessible. Many of the original toilet rooms lack proper hardware, fixture mounting heights and/or door and stall width clearances to meet current accessibility requirements.

• Toilet and shower facilities in the new Children’s Center area on Floor 1 meet current accessibility requirements.

Life Safety

• Primary building egress is through four rated exit stair enclosures that discharge to the exterior at grade. Horizontal exiting is provided through a rated separation at the Basement, Ground Floor and Floor 1 into adjacent NWQ-B and NWQ-D buildings.

• Tread and riser dimensions within all stair enclosures satisfy current building code requirements. Fire alarm pull stations are located adjacent to the stair access door. Emergency exit alarm and security notification exists at remote exterior exit discharge points. Emergency telephone or intercom systems are not provided. Area of rescue assistance is not available within stair enclosures. Guardrails within stair towers generally do not meet the current 42-inch height requirement, but are allowed to be maintained. Handrail extensions do not meet current code requirements. The entire building is protected by an automatic sprinkler system.

Exterior Entry Doors on Path of Travel

• All at-grade exterior entries to NWQ-C have been limited to entries from the secured Children’s Center playground area to the southwest.
• The doors located under the curved glass canopies and under the building overhang are new doors installed as part of the Children’s Center build out. They have compliant hardware and power-assist operators.

**NWQ-D ACCESSIBILITY REVIEW**

**History and Function**

• NWQ-D (historically known as the Medical Arts Tower) was built in two phases. The original building was constructed in 1976, designed by Kahler, Slater & Fitzhugh Scott, and included the basement through Floors 4 and a Floor 5 mechanical room. The addition to the building was constructed in 1990, designed by Kahler Slater Torphy, and enclosed the remainder of Floor 5 as an office floor, added floors 6-8 and an enclosed mechanical floor and mezzanine. The basement floor has mechanical rooms, storage and the shipping and receiving area. The west portion of the ground floor is currently being built-out to house a portion of the Children’s Center. The east portion of NWQ-D is vacated office space. Floor 1 serves as the main entry from the parking garage & circular drop-off drive to the north and has a large open area that is currently used as a public student lounge and study area. The remainder of the Floor 1 is vacated medical offices. Floors 2-8 are occupied with vacant offices and/or suites of offices in assorted configurations along a double loaded corridor, and are confined to “the tower” footprint.

**Circulation**

• Floor 1 is accessible to the garage via a skywalk. The Basement, Ground Floor and Floor 1 are also accessible to NWQ-B and NWQ-C at equal floor levels. Floors 2-8 do not provide access to any other part of the hospital. Exit paths are accessible, however stair towers do not offer areas of refuge.

**Elevators**

• The Green Elevator group links the Basement Floor through Floor 8 in this wing. The Green elevator group met prevailing codes at the time of the addition of car 20 in 1991 and complies with current ADA requirements for signaling and fixture location or operation. Infrared door screens have been installed in place of the older mechanical safety edges. A project to upgrade the green elevators is currently being undertaken.

**Accessibility**

• Corridors and public spaces are accessible. Transitions to other parts of the hospital are level. Most original toilet room configurations fail to meet accessibility guidelines, but space is generally available to renovate and/or re-fixture to meet code. Floors 5-8 typically have lever handles at suites, restrooms and stairs; Floors B-4 typically do not.

**Life Safety**

• Primary building egress on Floors 2 through 8 is through two rated exit stair towers that discharge to the exterior at grade. Horizontal exiting is provided through a rated separation at the Basement, Ground Floor and Floor 1 into NWQ-C and NWQ-D.

+ Tread dimensions within exit stair towers do not meet current building code requirements. Treads are 10 inches or less, and riser dimensions are greater than 7 inches. (Current building
codes require a minimum tread dimension of 11 inches measured level from nosing to nosing, and a riser dimension less than 7 inches measured vertically. Emergency telephones are located at Floors 4 & 8 within each stairwell. Areas of rescue assistance are not available with stair towers.

- Guardrails within stair towers meet current code requirements. Handrail extensions do not meet current code requirements.

**Exterior Entry Doors on Path of Travel**

- The NWQ-D ground floor lobby vestibule on the north side opposite the parking garage has interior and exterior doors that are in poor condition and have had the automatic door operators removed.
- All other grade level doors at the Ground Floor are part of the Children’s Center space and enter/exit only from the secured exterior playground. These doors and paths were made fully accessible as part of the Children’s Center project.
- At Floor 1, there are existing doors from the circular drop-off drive into the connector between NWQ-D and NWQ-G (parking garage). One of the three doors at that location has an automatic door operator that was recently installed and is being secured with a card reader as part of the Fire Alarm/Telecom project currently underway. There are also three interior storefront doors that separate the parking garage connector from the NWQ-D Floor 1 lounge. One of the three doors at that location has an automatic door operator that was recently installed and is being secured with a card reader as part of the Fire Alarm/Telecom project currently underway.

**NWQ-E (ENERGY CENTER) ACCESSIBILITY REVIEW**

**History**

- The Energy Center was built coincident with the first portion of the Clinical Building, designed by Brust Zimmerman and built in 1982.

**Function**

- The lower level is an open to above boiler room with adjacent switch gear and emergency generator rooms. The upper level has a mezzanine running the long east west length of the building, overlooking the boiler room, as well as office/control room space, and a toiler/shower/locker room.

**Circulation**

- The lower level connects via access tunnel to the ground floor of the main hospital, but this is not an accessible path. It can be reached by two internal open stairs or by an exterior stair from the chiller area above. The upper level is served by a loading dock off of Maryland Avenue and adjacent accessible man-door, or by a non-accessible entry at the south face of the building, between the chiller area and the main building. The exit paths to the exterior from the upper level are accessible.

**Elevators**

- None.

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![Figure 3.2.6. NWQ-E with Site Context](image)
Accessibility

- The building is generally accessible, although there is no accessible route between the two floors. The toilet room would require a retrofit to bring it up to code. As this building is currently a secured mechanical area and not open to the public, it does not require accessibility between levels.

Life Safety

- The entire building is protected by an automatic sprinkler system.

Exterior Entry Door on Accessible Path

- The east entry door is accessible per current codes and regulations.

Other Exterior Accessibility Components

- The walled exterior mechanical enclosure at the west end of the Energy Center is not required to be accessible.

NWQ ACCESSIBILITY SUMMARY

Accessible Parking

- Accessible parking spaces should be provided at the parking garage (NWQ-G) and at the surface lots to the north of the building. Based on an approximate total parking stall count of 850 stalls, 2 percent or (17) of the spaces should be accessible with at least (3) spaces being van accessible.

Accessible Path from Parking to Entries

- There is currently an accessible path from all levels of the parking garage to the north first floor level entry to NWQ-D through the skybridge connector ramp. The exterior ramp from the north surface parking lot must be reworked to make the ramp comply with current code standards.

Identified Accessible Building Entry Points

- The following existing building entry points have been identified as assessable public building entries (and exits):
  - NWQ-A East Floor 1 Entry: This entry will meet current code requirements at the conclusion of the NWQ Fire Alarm/Telecommunications project.
  - NWQ-B Floor 1 North Entry at “Blue” Canopy: This entry will meet current code requirements at the conclusion of the NWQ Fire Alarm/Telecommunications project.
  - NWQ-B Floor 1 North Entry at Drop-Off Drive and Skybridge Connector: This entry will meet current code requirements at the conclusion of the NWQ Fire Alarm/Telecommunications project.
  - NWQ-D Ground Floor North Entry at Green Elevator Lobby: This entry is at grade, but currently does not have door hardware that meets current code requirements.

Accessible Interior Path of Travel

- The NWQ-A through –D complex currently has a compliant path of travel to the occupied areas. As future build-out projects are designed, attention should be given to maintaining and improving the existing paths of travel.
- NWQ-F (Honors College) currently has areas that are not fully accessible. Refer to the Honors College Pre-Design Report for suggested accessibility upgrades.

Accessible Restroom Facilities

- Restrooms compliant with current code requirements should be designed as part of the individual tenant build-outs in each area. Where existing toilet rooms are reused, modifications to bring them up to current accessibility standards should be addressed where technically feasible.

Accessible Signals and Alarms

- Audible and visual alarms compliant with current code requirements should be designed as part of the individual tenant build-outs in each area.
3.3. Existing Conditions - Plans and Sections

The A/E team field measured the existing NWQ-A through NWQ-D and NWQ-F buildings utilizing tape measure and laser measuring devices with direct input AutoCAD while in the field. This allowed for better existing conditions and any discrepancies of measurements taken in the field could be worked out on site. Overall floor to floor heights were taken from existing drawings found on site. The A/E also did extensive investigation and gathered as many existing drawings from the former CSM plan room, City of Milwaukee Records and the Milwaukee Public Library. Those documents were collected and scanned to PDF for campus use for electronic archiving and reference for A/E teams use on future projects. The existing conditions drawings can be found as an appendix to the NWQ Redevelopment Plan.

The following chart summarizes existing drawings for the major building projects that created the NWQ-A through NWQ-F buildings.

<table>
<thead>
<tr>
<th>Building</th>
<th>Date of Construction</th>
<th>Architect</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWQ-A (East Wing)</td>
<td>1917 Original Building (&quot;A&quot;)</td>
<td>Richard F. Schmidt, Garden, &amp; Martin Architects</td>
</tr>
<tr>
<td></td>
<td>1923 Addition (&quot;B&quot;)</td>
<td>No drawings found</td>
</tr>
<tr>
<td></td>
<td>1923 Addition (&quot;C&quot;)</td>
<td>No drawings found</td>
</tr>
<tr>
<td></td>
<td>1931 Addition (&quot;D&quot;)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1968 Addition (&quot;E&quot;)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1956 Addition (&quot;F&quot;)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1950 Addition (&quot;G&quot; and &quot;K&quot; as well as a smaller addition)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1940 Addition (&quot;H&quot;)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1964 Addition (&quot;J&quot;)</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1944 Kitchen Addition</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td></td>
<td>1952 Addition</td>
<td>Eschweiler &amp; Eschweiler</td>
</tr>
<tr>
<td>NWQ-B (West Wing)</td>
<td>1963 Original Building</td>
<td>Eschweiler Eschweiler &amp; Sielaff</td>
</tr>
<tr>
<td></td>
<td>1982 Vertical Expansion</td>
<td>Henningson, Durham, &amp; Richardson</td>
</tr>
<tr>
<td>NWQ-C (Clinical Building)</td>
<td>1982 Original Building</td>
<td>Henningson, Durham, &amp; Richardson</td>
</tr>
<tr>
<td></td>
<td>1993 Addition and Vertical Expansion</td>
<td>Plunkett Raysich Architects</td>
</tr>
<tr>
<td>NWQ-D (Medical Arts Tower)</td>
<td>1976 Original Building</td>
<td>Kahler Slater and Fitzhugh Scott, Inc.</td>
</tr>
<tr>
<td></td>
<td>1990 Vertical Expansion</td>
<td>Kahler Slater Torphy</td>
</tr>
<tr>
<td>NWQ-E (Energy Center)</td>
<td>1982</td>
<td>Henningson, Durham, &amp; Richardson</td>
</tr>
<tr>
<td>NWQ-F (College of Nursing)</td>
<td>1917 Original Building</td>
<td>Schuchardt &amp; Judell</td>
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<tr>
<td></td>
<td>1924 Annex Addition (No Longer Exists)</td>
<td>Judell &amp; Bogner</td>
</tr>
<tr>
<td></td>
<td>1954 Addition</td>
<td>Schmidt, Garden &amp; Erikson</td>
</tr>
</tbody>
</table>
3.4. **Existing Site Conditions - Capacities and Deficiencies**

3.4.1. **Site**

The Northwest Quadrant, a 10.9 acre site located directly northwest of the East Hartford Avenue and North Maryland Avenue intersection on Kenwood Campus. Existing campus buildings are situated directly adjacent to the east, southeast, and south. A residential neighborhood surrounds the NWQ to the north and west.

While it was owned and operated by Columbia - St. Mary’s Hospital, the complex was oriented primarily towards patient healthcare delivery and hospital functions, not towards inviting campus users or fully connecting with its neighboring institution. Thus, its “front door” was located at the NWQ’s north side, away from the rest of UWM’s campus.

The Northwest Quadrant is composed of buildings that had been used by Columbia - St. Mary’s Hospital before the institution relocated. The complex is an agglomeration of different buildings constructed between 1919 and 1993 as the hospital developed and space needs changed. Building heights range from one to eight stories tall.

The oldest buildings are located on the east side of the site. The hospital added wings to the west, and eventually a parking structure and mechanical buildings.

The infrastructure project scope outlined in this document affects the entire NWQ-A through NWQ-D complex, but remodeling is limited to certain spaces within NWQ-B and NWQ-C, and a small portion of NWQ-D. The remaining spaces are affected by the infrastructure upgrade. The following graphics describe the relationship between the NWQ and the broader UWM institution.
Figure 3.4.1.1. Context: University of Wisconsin-Milwaukee Buildings and Facilities within Milwaukee County (source: uwm.edu)

Figure 3.4.1.2. Context: University of Wisconsin-Milwaukee Main Kenwood Campus and immediate context (source: uwm.edu)
Figure 3.4.1.3. University of Wisconsin-Milwaukee Kenwood Campus

Northwest Quadrant (NWQ)
Figure 3.4.1.4. Existing NWQ Site - with NWQ-A through NWQ-D indicated as area of proposed work
3.4.2. Civil – Utilities

The existing NWQ buildings area served by the City of Milwaukee municipal sewer and water mains located within the adjacent public right-of-ways. A City of Milwaukee water main also connects from Hartford Avenue to Newport Avenue, is located within an public water easement, and runs along the west side of NWQ-C and NWQ-D and then along the north side of NWQ-D and along the east side of NWQ-G. The sanitary and storm mains within NWQ are all property of the State of Wisconsin.

As part of the NWQ Redevelopment Plan, a Sewer Inspection was performed and a summary of those findings are included as an appendix.

3.4.3. Civil - Storm Water Management (Storm Water Regulations Analysis)

The NWQ did not contain any storm water management facilities at the time the parcel was acquired by the State of Wisconsin. An underground stone storage layer is being constructed below the south play area as part of the UWM Children’s Center project. The storage layer was sized to accommodate discharge from the roof areas of NWQ-A, NWQ-B, NWQ-C and NWQ-D as well as the surface parking area along the west property line.

As part of the NWQ Redevelopment Plan, a Storm Water Management Plan was completed and is included as an appendix.

3.4.4. Transportation

The NWQ is served by public transit and the UW-Milwaukee UPARK service. Parking within the NWQ is available to students, faculty, staff and visitors. The northwest garage is open to students with a valid ID during the Spring and Fall semesters. Public parking is available in all of the surface lots within the NWQ on a daily fee basis. The NWQ is connected to the adjacent campus pedestrian ways by public sidewalks.

As part of the NWQ Redevelopment Plan, a Traffic and Site Circulation Study was completed and is included as an appendix in Chapter 11.

3.5. Existing Building Conditions - Capacities and Deficiencies

3.5.1. Architectural Systems

INFORMATION GATHERING
Review of existing design and construction drawings, shop drawings, previously prepared facilities condition reports and on-site field investigations provided the primary sources of information for the Architectural Redevelopment Plan and Code Review.

HISTORY
The Northwest Quadrant buildings were originally constructed as a hospital – most recently owned by Columbia - St. Mary’s Hospital (CSM). The existing building structures were constructed in phases between 1919 and 1993. The complex was used continuously as a hospital until 2009. The NWQ-A – D building has been mostly vacant but heated since 2009. Portions of that building have been occupied by various campus departments as Surge Space while they are temporarily relocated from their own buildings due to renovation projects around campus. Areas of NWQ-C & NWQ-D are currently being built out as a permanent home for the UWM Children’s Center day care and school.

The structures that comprise the NWQ-A through-D complex range in height from one to eight stories. The structures are generally in good condition, due to an extensive maintenance program that was run by CSM when it owned the complex. When the complex was a hospital, plans for alterations, additions and operation where
reviewed by the old Wisconsin Department of Health & Family Services that oversaw construction in hospitals. Now that the buildings have been sold to UW System, oversight and plan review is done by the Wisconsin Department of Safety and Professional Services (DSPS).

**CLASSIFICATION AS HIGH-RISE**

Although the NWQ-A through NWQ-D portions of the complex were built as separate buildings with fire division walls ("fire barriers" as defined by the IBC), the building typically does not have "fire walls" as defined by the International Building Code (IBC) that have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall. Because of this fact, DSPS considers the NWQ-A through NWQ-D fire areas to be one, contiguous, high-rise building per IBC 403. As such, modifications in the lower rise portions of the complex must also meet the specialized code requirements related to high-rise construction such as automatic sprinklers, fire alarms, etc.

**Figure 3.5.1.1. Building Development History**

- **1919**
  - NWQ-A & F
  - Hospital and School of Nursing

- **1923**
  - NWQ-A "B & C" Addition

- **1931**
  - NWQ-A "D" Addition

- **1941**
  - NWQ-A "H" Addition

- **1944**
  - NWQ-A Kitchen Addition

- **1951**
  - NWQ-A "G, H & K" Addition
Northwest Quadrant Selective Facility Renewal
Analysis of Existing Physical Conditions

Figure 3.5.1.1. Building Development History (continued)

1957
- NWQ-A “F” Addition
- NWQ-F School of Nursing Dorms

1965
- NWQ-A “J” Addition

1966
- NWQ-B Floors B-5

1969
- NWQ-A “E” Addition

1975
- NWQ-G Parking Garage

1976
- NWQ-D Floors B-5

1982
- Energy Center
- NWQ-B Vertical Expansion Floors 6 & 7
- NWQ-C Ancillary Addition

1992
- NWQ-D Vertical Expansion Floors 6-8

1993
- Clinical Addition
CHAPTER 3.5.1.1.

Building Development History (continued)

2013
- Greenhouse Addition
- Children’s Learning Center

OCCUPANCY CLASSIFICATION
As a hospital, the complex was previously classified as a Group I-2 Hospital use under the current IBC. NWQ-B was reclassified as a Group B Business (Education higher than K-12) when portions of that structure were occupied as Surge Space. The portions of NWQ-C and NWQ-D that will be occupied by the Children’s Center have been reclassified as Group I-4 Child Day Care. The portions of NWQ-A, NWQ-C and NWQ-D that are vacant or were occupied as-is are still classified by the State as I-2 Hospital. Those areas will need to be reclassified as Group B (or other group based on appropriate use) when they are renovated or permanently occupied. The two ways of accomplishing this reclassification are as follows:

- Change the Use Group Classification of areas individually as they are reviewed for permits by specific tenant build-out project (i.e., Student Health Center, School of Information Sciences, etc.).
- Change the use group for the entire balance of the complex or larger portions of it as part of infrastructure improvements.

Because the Change of Occupancy classification requires additional work to be done beyond what is required for an Alteration Level 2 per the International Existing Building Code (IEBC), the timing of the application for a Change of Use has an effect on the specific costs and requirements of the individual project option versus the infrastructure option. Specifically, the Change of Occupancy requires a higher level of safety related to the following items, among others:

- Hourly fire-resistance rating of shafts
- Engineered Smoke Control System (ESCS - see additional information below)
- Smoke barriers
- Allowed uses
- Allowable exit distances and capacities
- Interior Finishes
- Protection of openings
- Minor alterations to allow temporary occupancy
- Fire-resistive construction
- Fire alarm device upgrades
- Egress & Exit Lighting
- Structural Systems

The Selective Facility Renewal Change of Occupancy classification will provide cost benefits to the later redevelopment projects.

FIRE RESISTANCE RATING OF SHAFTS
The existing building has many mechanical and piping shafts that run between floors. Over time, the fire-resistance of these shafts has been compromised as new ducts piping, and cabling have been added without patching the penetrations to maintain the integrity of the fire-resistive system. Additionally, the change in codes over the years has increased the requirements for dampers and protection of openings. By providing sprinklers at the portions of the building that are currently unsprinklered, the existing unprotected vertical openings in existing construction are allow to remain per IIEBC 703.2.1, Exception 5.2. The fire resistance rating of the building shafts and floor penetrations should be upgraded as renovation work progresses throughout the building, and these areas are opened up and made accessible.
ENGINEERED SMOKE CONTROL SYSTEM (ESCS)
An engineered smoke control system consisting of 77 zones serves the NWQ-A and NWQ-B along with the 1982 portion of NWQ-C. The ESCS was installed in the mid 1980’s as an authorized alternative to upgrading deficiencies in the integrity of existing fire rated shafts, fire separations and smoke separations. Authorization was given by the Department of Health and Family Services who was the governing authority for healthcare facilities. In 1990, the ESCS was upgraded by monitoring the smoke detection devices through the fire alarm system.

Now that the facility is no longer a healthcare facility, the Safety and Buildings Division of the Department of Safety and Professional Services is the governing authority for the building. DSPS has determined that - while not required by current building code – the ESCS provides an alternative level of protection that cannot be abandoned or removed until the entire building has automatic sprinkler coverage. The ESCS and associated devices such as smoke doors, smoke detectors, smoke-rated partitions and smoke dampers must be fully functional and maintained in working order until such time as the building is fully sprinkled. In review of existing conditions, it is apparent that some of the required smoke doors are no longer in place which would compromise the functional intent of the ESCS. Maintaining the ESCS in its current configuration also presents major problems of maintaining the integrity of system as redevelopment projects carve out new space and remove partitions. The solution to this problem is to provide sprinklers at unprotected areas of the building and decommission the smoke control system as part of the infrastructure upgrade.

ALLOWED USES
A space may be classified as a Group A-3 Assembly use if the total occupancy of the room is listed as accommodating 50 or more occupants. Current code would require that teaching or student meeting areas that can be classified as an assembly use have automatic sprinkler coverage if they are on a floor level other than a level of exit discharge.

Allowable Exit Distances and Separations: The size and depth of the existing NWQ-A – D structure has led to a maze-like configuration of corridors and cross corridors to meet the required maximum distance to an exit or exit stair. Additionally, the building is divided into four fire zones separated by fire barriers and 2-hour rated opening enclosures that create horizontals exits between each NWQ area. The doors separating fire areas in the main corridors must be kept closed or must be held open by a device linked to the smoke detection system so that they will automatically close when the fire alarm or smoke detections system goes off. Sprinklering of the entire building will allow for longer maximum exit distances and will allow more freedom as to where fire separations need to be maintained. It is suggested that the existing fire separations be maintained wherever possible even after the entire building is covered by an automatic sprinkler system in order to maintain a higher level of life and property safety.

TEMPORARY OCCUPANCY
Existing portions of the NWQ complex are currently vacant and may require some renovations to be used as temporary Surge Space. When alterations are done that move or add a wall or door, that alteration must be submitted to DSPS for review and issuance of a building permit. As part of that process, DSPS will be looking at how that space is occupied and may want office areas reclassified as Group B use. The sooner that the complex is fully sprinklered and reclassified to a Group B use, the sooner that the University will have freedom to reconfigure all available space in the NWQ- A – D building even for a short term period.

EGRESS & EXIT LIGHTING
For an Alteration Level 2, egress and exit lighting will be required to be upgraded to meet current code in rated exit enclosures (i.e. main corridors and stairwells) only within the work area per IEBC Section 705.7 & 705.8 unless the work area on that floor exceeds 50 percent of the area. In that case, the entire floor must have egress and exit lighting upgraded. For a Change of Occupancy alteration, egress and exit lighting will need to be upgraded to meet current code within rated exit enclosures within the work areas and from the highest work area floor to the level of exit discharge per IEBC 805.1.
Use of the existing NWQ-A through -D facility as-is for Surge Space and long term tenants may be limited without major alterations in most areas. Much of the current NWQ-A through D complex is still configured as patient rooms, medical suites, patient treatment areas, physician offices and medical support areas. Re-use of the existing patient rooms for office space may be inefficient as each room often has its own restroom and operating and treatment suites have lighting, flooring and equipment connections that do not lend themselves to use as offices or teaching areas.

REWDEVELOPMENT PRIORITIES/RECOMMENDATIONS:
NWQ redevelopment projects moving forward from this point in time should:

• Maintain or improve current levels of life safety/property protection as afforded by the current building systems.
  ○ Provide full sprinkler coverage in all areas.
  ○ Update existing fire alarm system.
  ○ Maintain current fire/smoke barriers and ESCS system until such time as building is fully sprinklered.
  ○ Maintain or upgrade existing egress/exit lighting systems.
  ○ Maintain or improve existing egress paths and exits.

• Allow for maximum flexibility with regards to future redevelopment plans. Temporary use of space can often become more permanent in nature once the occupants are in place, causing phasing and scheduling problems with planned development.

• Allow for updating mechanical, electrical and plumbing (MEP) systems at the time of initial occupancy. Once an area has been occupied – even on a temporary basis – it becomes difficult to rework major systems in that area without affecting the occupants.

• Allow for maintenance and improvement of the existing building envelope. The NWQ-A & -B areas require new windows and other envelope improvements to minimize future energy usage and demonstrate code compliant redevelopment (required energy calculations). (The NWQ Selective Facility Renewal would only replace the windows in NWQ-B).

• Minimize disturbance to current NWQ occupants. Future remodeling and construction projects will cause noise/dust/access issues to existing tenants. New occupants should be located in areas that will minimize exposure to major construction/remodeling.

• Minimize cost and budget impact of planned improvements: Significant cost savings are realized when systems are replaced or updated in a larger or unoccupied area. Additionally, temporary occupancies require expenditure on remodeling that may later be demolished to allow for more permanent tenants.

Figure 3.5.1.2 shows the Life Safety Decision Tree Matrix presented to and reviewed with UWM Campus Planning, UWM Facilities Services, DFD, and UW System. This group decided to pursue Option 2a, which serves as the basis of the infrastructure upgrade outlined in this document.

Table 3.5.1.1. summarizes the existing gross square footages for the different buildings that comprise the Northwest Quadrant.

Table 3.5.1.2. summarizes the existing floor to floor heights for the Northwest Quadrant.

Table 3.5.1.3. summarizes the potential floor to floor heights for the Northwest Quadrant.
Option 2a is the recommended approach. The Benefits:

1. Allows all spaces in NWQ-A and NWQ-B to be occupied until major remodeling projects are scheduled in the future.
2. Improves fire protection capabilities providing safer conditions for all occupants.
3. Allows the existing engineered smoke control system and its associated 77 smoke control zones to be de-commissioned and not maintained.
4. Allows present unprotected vertical openings in existing construction to remain per IEBC 703.2.1 Exception 5.2.
5. Eliminates smoke barriers required by I-2 occupancy requirements.
6. Eliminates the need to upgrade fire alarm devices in work areas of B occupancies. Adding Sprinklers is a Level 2 Alteration and
   Triggers the Following Additional Required

Upgrade Work:

Elevators:
- Upgrade of elevators in the work areas (Red, Brown, Purple, White, Blue and Black Elevators).
- Provide shunt trip circuit breaker, heat detector & fire fighter operation. If controller cannot be upgraded, a full elevator upgrade would be required.
- Decommissioning of any unused elevators.

Egress / Exit Lighting:
- Means of egress lighting upgrade only required in rated exit enclosures (i.e. stairwells) per IEBC section 705.7.2
- Exit lighting upgrade only required in common corridor and in rated exit enclosures (i.e. stairwells) per IEBC section 705.8.2

 Covered by Fire Sprinkler NWQ-A through NWQ-D
Life Safety Upgrades NWQ-A through NWQ-D
### Table 3.5.1.1. Existing NWQ Gross Square Footage by Building

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>NWQ-A</th>
<th>NWQ-B</th>
<th>NWQ-C</th>
<th>NWQ-D</th>
<th>NWQ A-D</th>
<th>NWQ-E</th>
<th>NWQ-F</th>
<th>NWQ-G</th>
<th>TOTAL A-D, F (GSF)</th>
<th>TOTAL A-E (GSF)</th>
<th>TOTAL A-G (GSF)</th>
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<tr>
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### Table 3.5.1.2. Existing NWQ Floor-to-Floor Heights by Building

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<th>NWQ-A</th>
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<th>NWQ-C</th>
<th>NWQ-D</th>
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<td>13'-1 3/8&quot;</td>
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<td>11'-5 7/8&quot;</td>
<td>11'-4&quot;</td>
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<td>Floor 3</td>
<td>12'-2 1/2&quot;</td>
<td>12'-2 1/2&quot;</td>
<td>12'-2 1/2&quot;</td>
<td>11'-4&quot;</td>
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<tr>
<td>Floor 4</td>
<td>12'-0&quot;</td>
<td>12'-0&quot;</td>
<td>---</td>
<td>11'-4&quot;</td>
</tr>
<tr>
<td>Floor 5</td>
<td>15'-4&quot;</td>
<td>12'-1&quot;</td>
<td>---</td>
<td>13'-7&quot;</td>
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<tr>
<td>Floor 6</td>
<td>---</td>
<td>14'-7&quot;</td>
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<td>12'-8&quot;</td>
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<tr>
<td>Floor 7</td>
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<td>12'-8&quot;</td>
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<td>HELIPAD</td>
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<td>16'-9 1/2&quot;</td>
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<td>FLOOR 2</td>
<td>9'-2&quot;</td>
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<td>9'-2&quot;</td>
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<tr>
<td>FLOOR 4</td>
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<td>FLOOR 4</td>
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<tr>
<td>Mechanical</td>
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</table>
### Table 3.5.1.3. NWQ Floor-to-Floor Heights and Potential New Ceiling Heights Using New VAV Reheat HVAC Systems

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>NWQ-A Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
<th>Maximum Ceiling Heights With Soffits</th>
<th>NWQ-B Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
<th>Maximum Ceiling Heights With Soffits</th>
<th>NWQ-C Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
<th>Maximum Ceiling Heights With Soffits</th>
<th>NWQ-D Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
<th>Maximum Ceiling Heights With Soffits</th>
<th>NWQ-F (1954) Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
<th>Maximum Ceiling Heights With Soffits</th>
<th>NWQ-F (1917) Existing Floor to Floor Heights</th>
<th>Maximum Ceiling Heights Without Soffits</th>
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</tr>
<tr>
<td>Floor 8</td>
<td>---</td>
<td>---</td>
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<td>18'-4.5&quot;</td>
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<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>Floor 7</td>
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<td>10'-0&quot;</td>
<td>12'-0&quot;</td>
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<td>12'-8&quot;</td>
<td>8'-4&quot;</td>
<td>10'-0&quot;</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Floor 6</td>
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<td>11'-6&quot;</td>
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<td>8'-4&quot;</td>
<td>10'-0&quot;</td>
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<td>---</td>
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<td>---</td>
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</tr>
<tr>
<td>Floor 5</td>
<td>15'-4&quot;</td>
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<td>9'-0&quot;</td>
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<td>10'-0&quot;</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Floor 4</td>
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<td>8'-0&quot;</td>
<td>9'-8&quot;</td>
<td>12'-0&quot;</td>
<td>8'-0&quot;</td>
<td>9'-0&quot;</td>
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<td>11'-0&quot;</td>
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<td>9'-0&quot;</td>
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</tr>
<tr>
<td>Basement</td>
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<td>8'-6&quot;</td>
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<td>10'-0&quot;</td>
<td>---</td>
<td>---</td>
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</tr>
</tbody>
</table>

**NOTES:**
1. NEW CEILING HEIGHTS IN HONORS COLLEGE WILL MATCH EXISTING.
2. FOR PORTIONS OF NWQ-C, MAXIMUM CEILING HEIGHTS ARE 4" BELOW THE BOTTOM OF THE VIERENDEEL STRUCTURAL GIRDER ON THE 1ST, 2ND AND 3RD FLOORS.
4. NWQ-B USES INDUCTION UNITS AT EXTERIOR AND VAV RE-HEAT AT INTERIOR SPACES.
3.5.2. **Structural Systems**

**AGE OF SYSTEMS:**
The Northwest Quadrant at the University of Wisconsin-Milwaukee is a portfolio of several buildings previously occupied by Columbia - St. Mary’s Hospital (CSM). These buildings were designed, constructed, and subjected to various additions, renovations, and vertical expansions over a period roughly between 1917 and 1993. Consistent with their original programming, the NWQ buildings previously housed office space, patient rooms, surgical suites, lobbies, corridors, and related functions.

**DESIGN LIVE LOADS:**
UWM has initiated the process of NWQ “redevelopment” planning, with the intent to convert significant portions of the existing facilities into university classrooms, offices, auditoriums, dining facilities, and other types of spaces as dictated by UWM’s needs. This process requires an understanding of the suitability of the existing floor framing systems to support the “Minimum Uniformly Distributed Live Loads” listed in Table 1607.1 of the International Building Code (IBC) for any of the proposed occupancies or uses. See the 11x17 Infrastructure Drawings Appendix in the NWQ Redevelopment Plan which includes floor plans that summarize live load capacities throughout the NWQ buildings.

**FLOOR FRAMING SYSTEMS:**
The existing floor framing systems at the NWQ facilities include a broad range of types; moreover, within any one particular building several different systems may be found. In general, reinforced concrete framing is more common for the older areas and steel framing is more typical in the newer areas. See Appendix which includes floor plans that summarize floor framing system types capacities throughout the NWQ buildings.

**LATERAL SYSTEMS:**
This study identified the systems used by each NWQ building to resist horizontal (wind and seismic) forces. See the Redevelopment Plan Appendix for building isometric drawings showing lateral systems at NWQ-B, NWQ-C, and NWQ-D. For buildings NWQ-A and NWQ-F, it is believed that the exterior masonry walls and interior masonry bearing walls provide the lateral resistance.

**STRUCTURAL SYSTEM UPGRADES:**
See the Structural Systems Narrative for possible methods of upgrading the various existing structural systems for increased floor load or lateral load capacity. Floor system upgrades would be required where new occupancies have design live load requirements that significantly exceed what the floor systems are capable of supporting. For lateral loads, upgrades would be required only when certain provisions of the current edition of the International Existing Building Code (IEBC) are triggered.

**CONDITION ASSESSMENT:**
Site visits were conducted in August and September 2012 to assess the condition of structural systems at the NWQ buildings. See the Appendix for the Structural Systems Narrative which reported all items of concern noted during this assessment. No major obvious deficiencies were noted for the floor framing at any of the buildings; most items surveyed were noted in the Structural Systems Narrative as being either in “good” or “fair” condition. Exterior brickwork showed signs of deterioration consistent with the age(s) of the facilities.

For a more detailed analysis of structural systems, see the Structural Systems Narrative Appendix in the NWQ Redevelopment Plan.
3.5.3. Mechanical Systems

INFORMATION GATHERING
Review of existing design drawings, shop drawings, and on-site field investigations provided the primary sources of information for the Mechanical Redevelopment Plan. On-site tours occurred with the A/E team and representatives of DFD, UW-System, and Campus Engineers.

Air handling units, steam, and chilled water diagrams and matrix were developed based upon updating Columbia - St. Mary’s Hospital documentation by reviewing of construction documents for various projects and field investigations.

AGE OF EQUIPMENT
Existing mechanical systems serving most areas of the NWQ are older than their expected useful life expectancy and are not suitable for reuse moving forward serving major remodeling projects. Goals expressed by the Campus Project Core Team include using systems within the building having 30 to 40 years of useful life after major remodeling is completed. On this basis, replacement of all mechanical equipment installed prior to 1983 is recommended. Major remodeling should include demolition of all existing mechanical equipment, ductwork, piping, and controls.

HIGH RISE CONSTRUCTION
Since there are no fire walls presently constructed separating the NWQ-A, NWQ-B, NWQ-C and NWQ-D portions of the building, the Department of Safety and Professional Services considers these areas as one high rise building. Existing stairs in NWQ-B and NWQ-D have pressurization ventilation systems for keeping smoke out of the stairwells during a fire condition. The International Existing Building Code does not require adding similar systems for NWQ-A and NWQ-C.

BUILDING ENVELOPE UPGRADES
Thermal performance of the existing building construction in NWQ-A, NWQ-B, and NWQ-F does not meet current energy conservation guidelines. Replacement of existing windows and upgrading wall/roof insulation for these portions of the building is recommended in order to reduce operating costs moving forward and improving space comfort. (Building envelope upgrades would be limited to NWQ-B in the NWQ Selective Facility Renewal project scope). Consideration of window replacement should be given to those in poor condition, and a life cycle cost analysis should be utilized for the justification for both wall insulation upgrades and window replacement.

EXISTING ENGINEERED SMOKE CONTROL SYSTEM (ESCS)
An engineered smoke control system consisting of 77 zones serves NWQ-A and NWQ-B along with the 1982 portion of NWQ-C. The ESCS was installed in the mid 1980’s as an authorized alternative to upgrading deficiencies in the integrity of existing fire rated shafts, (vertical openings) fire separations and smoke separations. Authorization was given by the Department of Health and Family Services which was the governing authority for healthcare facilities. The A/E team contacted DHFS and asked for copies of the written waiver, but it is not available.

In 1990, the ESCS was upgraded by monitoring the smoke detection devices through the Notifier IFC-2020 fire alarm system installed by Johnson Controls. The A/E team contacted Johnson Controls and asked for copies of the IFC-2020 shop drawings, but was unable to obtain this documentation. At the time of this writing, this system is being replaced under DFD project 12B1R.

ESCS diagrams and matrix included in this study were developed from documentation provided by Columbia - St. Mary’s Hospital and UWM showing the various locations of the 77 zones and their associated fire alarm addresses.

Control shop drawings from Johnson Controls show detailed information about the system such as the following:

• Four electro-pneumatic valve control panels located in the first floor of the energy center which send pneumatic control signals to the 77 smoke zones.
• Identification of actuators serving smoke dampers associated with the system.
• Identification of pneumatic-electric switches serving door hold open devices.
• Identification of pneumatic-electric switches for fan shut-down during a smoke condition.

Until wet sprinklers are added to provide full sprinkler protection of the building, the existing ESCS must remain a fully functioning system and be routinely tested for proper operation. Further occupancy in unsprinklered areas of the building is discouraged until the ESCS is proven to be fully functional or until the building is fully sprinklered.

In lieu of maintaining this system in force under future remodeling projects, phasing out this system in the near future is recommended. The International Existing Building Code allows removal of the ESCS without upgrading existing vertical openings if the building is fully sprinklered and the occupancy is changed to “B” classification.

TEMPERATURE CONTROL SYSTEM:
The existing mechanical equipment at NWQ is mostly served by pneumatic controls with pneumatic actuation. For mechanical systems installed or upgraded after 1990, direct digital controls (DDC) are installed using Johnson Controls N2 communication protocol with pneumatic actuation. UW-Milwaukee is phasing out DDC controls using N2 control architecture campus wide.

In 1986, the first generation building automation system was installed in the facility which gave building operators the ability to turn on and off each air handling unit from a central monitoring station. It also monitored the operating status of each air handling unit.

Copies of existing temperature control shop drawings were obtained from Columbia - St. Mary's Hospital's records for all major HVAC systems, but could not be found for all remodeling projects. Table 3.5.3.1 contains a list of control projects obtained from Johnson Controls with notations regarding the status of documentation found.

<table>
<thead>
<tr>
<th>Control Shop Drawing Description</th>
<th>JCI Number</th>
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<th>Quantity of Drawings</th>
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<td>No name</td>
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Table 3.5.3.1. Control Shop Drawing Documentation (continued)

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<td>Surgery</td>
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**RECOMMENDATIONS FOR SHORT TERM SURGE PROJECTS WITH MINOR REMODELING**

**Mechanical Upgrades for Surge Projects:**
- The following existing mechanical equipment must be inspected and repaired as needed to make sure that it is fully functional in each room for all anticipated surge spaces:
  - Pneumatic room thermostats.
  - Pneumatic control valves serving heating and cooling terminal units.
  - Steam traps serving steam heating terminal units.
  - VAV box controls and dampers.
  - Circulating fans located in heating and cooling terminal units.
  - Controls and operational condition of associated air handling unit serving the spaces.

**RECOMMENDATIONS FOR REDEVELOPMENT PROJECTS:**

**Phasing of Mechanical Upgrades:**
- The amount of construction work necessary for upgrading the mechanical systems is extensive and will be disruptive to building occupants. For this reason, scheduling major infrastructure upgrade projects in phases is recommended prior to occupying major portions of the building.

**De-Commissioning of Existing Engineered Smoke Control System (ESCS):**
- After the building is fully sprinklered and the occupancy is changed to “B” classification, de-commissioning of the existing ESCS serving NWQ-A and NWQ-B should include the following scope of work:
  - Remove the four electro-pneumatic valve control panels located in the first floor of the energy center which send pneumatic control signals to the 77 smoke zones.
  - Remove associated pneumatic tubing.
  - Remove actuators from all smoke dampers associated with the system and lock dampers in the wide open position.
  - Remove PE switches and door hold open devices.
  - Remove PE switches for fan shut down during a smoke condition.
  - Remove PE switches for fan start-up during a smoke condition.

**Air Handling Units**
- For areas of the building with adequate floor to floor height, conventional VAV reheat are proposed. In those portions of the building with relatively low floor to floor heights, such as NWQ-F, space saving systems such as fan coil units should be considered. There are large portions of NWQ-B served by air handling units operating with 100% outside. New systems will have return air capability to reduce operating costs. In general, new air handling systems should replace all existing air handling units which are older than 30 years.
• Components for new air handling systems consist of the following:
  ○ Airflow Measuring Stations for outside air, return air and supply air
  ○ Inlet Plenum with Air Blender
  ○ Pre-Filter (MERV 7)
  ○ Final-Filter (MERV 14)
  ○ Pumped Hot Water Heating Coil or VIFB steam coil
  ○ Chilled Water Cooling Coil
  ○ Plenum Supply and Return Fans controlled by VFDs
  ○ Duct Mounted Sound Attenuators
  ○ Intake Air and Relief Air Louvers.
  ○ Outside Air/Return Air/Relief Air Control Dampers
• For existing air handling units with built-up housings in good condition, re-build the air handling units in place by replacing the following:
  ○ Replace controls with new direct digital controls.
  ○ Add pumped hot water preheat coils.
  ○ Replace existing chilled water cooling coil and chilled water control valve.
  ○ Replace filter racks.
  ○ Replace supply and return fans (vane axial variable pitch only; centrifugal fans may be reused and refurbished with new bearings if they are of the proper size and capacity)
  ○ Replace or add variable frequency drives for fans.

Humidification Systems
• The majority of existing mechanical systems include space humidification provided by steam grid humidifiers mounted in the supply ductwork or air handling unit. In order to conserve energy and reduce operating costs, humidification of the building will not be provided on future major remodeling projects.

Main Air Distribution Systems:
• Air distribution systems include the following:
  ○ New sheet metal ductwork.
  ○ Ceiling plenum returns.
  ○ New VAV air terminals with hot water heating coils, modulating 2-way control valves with electric actuators, room temperature sensors and DDC controls.

Temperature Control System:
• All existing pneumatic controls should be upgraded to new digital controls using -BacNet open protocol, not JCI N2 architecture. All primary mechanical systems and components should be integrated with the direct digital controls system.
• Where it makes sense, reuse of existing pneumatic actuation in mechanical equipment rooms only could be considered.
• The following equipment should be replaced prior to long term occupants moving into the spaces:
  ○ Replace pneumatic room thermostats with electronic room temperature sensors.
  ○ Replace VAV boxes, hot water coils, and control valves upgraded to direct digital controls.
  ○ Replace pneumatic hot water control valves serving fin radiation with electric control valves.
  ○ Provide occupancy sensors for indexing mechanical temperature zones to the unoccupied mode when occupants are not present. When spaces are unoccupied, do not supply air to the space.
  ○ Provide space carbon dioxide sensors for demand ventilation control to reduce outside air ventilation supplied to the occupied spaces when there are reduced occupancy rates.
Central Hot Water Heating System:
- Six (6) new central hot water heating systems are recommended for the following locations:
  - NWQ-A
  - NWQ-B
  - NWQ-C
  - NWQ-D
  - NWQ-E
  - NWQ-F
- Each hot water heating system consists of the following equipment:
  - Steam to water shell and tube heat exchangers. The heating hot water is used for terminal heating units (i.e., unit heaters, cabinet unit heaters, convectors, fin radiation, reheat coils).
  - Two (2) variable speed circulating pumps, reheat coils, finned tube radiation units, unit heaters, distribution piping, valves, and system accessories. Hot water fin radiation installed in all exterior spaces to offset the building envelope heat loss.
  - Low pressure steam piping connected to campus steam.
  - Duplex steam condensate pumps for returning steam condensate to the campus central plant.
- Two way control valves are included for all heating coils and heating terminals. New hot water cabinet unit heaters will be provided for all areas with high heat loss rates.

Campus Chilled Water System:
- UWM campus chilled water was connected to the NWQ under DFD project 11A3M. Extend new chilled water piping to all new air handling units and terminals requiring chilled water. All chilled water terminal units are provided with modulating 2-way control valves with electric actuators, room temperature sensors and DDC controls.
- Chilled water is not available year round.

Utilities:
- The existing steam boilers located in NWQ-E and various centrifugal chillers in NWQ-B, NWQ-C and NWQ-D were decommissioned because steam and chilled water utilities are were brought to the NWQ from the campus central plants under DFD project 11A3M.
- Since steam is no longer produced in the NWQ-E Energy Center, any future remodeling projects for student or campus use requires full MEP upgrades for the building.
- If portions of the Ground Floor and Floor 1 of NWQ-A are demolished, the following new utility work is required:
  - Extend the following underground utilities in box conduit from the Energy Center to the basement Mechanical room in NWQ-B:
    - Compressed Air Piping.
    - Pumped Condensate Piping.
    - Low Pressure Steam Piping.
  - Relocate steam pressure reducing valves and steam condensate meter from NWQ-A to the Energy Center or NWQ-B.
  - Provide new direct buried underground chilled water piping to replace existing chilled water main piping located in the existing tunnel of NWQ-A.
  - Provide new box conduit for underground low pressure steam piping to replace existing steam piping located in the existing tunnel of NWQ-A.

Emergency Power for Mechanical Equipment:
- Emergency power is recommended for the following:
  - Temperature control system
  - Hot water heating systems.
  - Ductless split cooling systems
  - Lab fume exhaust systems and associated air handling systems
Mechanical Systems Serving Rooms Requiring Supplemental Cooling:
- For rooms with high internal heat gains such as server rooms and telecom rooms, provide ductless split cooling systems.

Anticipated Maximum Ceiling Heights for Future Projects:
- A goal of 10’-0” minimum ceiling heights for large classrooms is desired. Based on the existing floor to floor heights at NWQ, the following areas in the facility can have 10’-0” ceilings without using soffits for sidewall air distribution supply:
  - NWQ-A, Floor 5
  - NWQ-B, Floor 7
  - NWQ-D, Ground floor
- If soffits are installed within the spaces to allow for sidewall air distribution, the following areas of the building can have rooms with raised ceilings in the center of the rooms for meeting the 10’-0” ceiling height goal:
  - NWQ-A, Floor 5
  - NWQ-A, Floor 2
  - NWQ-B, Floor 7
  - NWQ-B, Floor 6
  - NWQ-B, Floor 2
  - NWQ-B, Ground floor
  - NWQ-B, Basement
  - NWQ-C, Floor 1
  - NWQ-C, Ground Floor
  - NWQ-C, Basement
  - NWQ-D, All Floors

Table 3.5.3.2. describes the proposed project assignment for replacement, removal, or refurbishment of all existing air handler units (AHUs) in the Northwest Quadrant. Refer to the Infrastructure Drawings Appendix in the NWQ Redevelopment Plan for color diagrams and more detail.
### Table 3.5.3.2. NWQ Selective Facility Renewal - Air Handler System Chart

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<th>NWQ Area</th>
<th>Area Served</th>
<th>Unit Location</th>
<th>Unit Type</th>
<th>Install Date</th>
<th>AHU CFM</th>
<th>UWM Rm. No.</th>
<th>Redevelopment Project Assignment for Upgrade or Replacement</th>
<th>Proposed Scope of Work</th>
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<td>A</td>
<td>4th Floor West Offices</td>
<td>Nursery Penthouse</td>
<td>100% O.A. with A.C. Expansion Coil</td>
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<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S11</td>
<td>A</td>
<td>Patient Dishwashing</td>
<td>2nd Flr. Penthouse</td>
<td>C.V.</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S12</td>
<td>A</td>
<td>Cafeteria Dishwashing</td>
<td>2nd Flr. Penthouse</td>
<td>C.V.</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S13</td>
<td>A</td>
<td>Morgue + Maintenance</td>
<td>2nd Flr. Penthouse</td>
<td>C.V. with Reheat</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S14</td>
<td>A</td>
<td>Dietary Office</td>
<td>2nd Flr. Penthouse</td>
<td>C.V. with Reheat</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S15</td>
<td>A</td>
<td>Kitchen</td>
<td>2nd Flr. Penthouse</td>
<td>C.V. with Reheat</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S16</td>
<td>A</td>
<td>Café, Vending + Terrace</td>
<td>2nd Flr. Penthouse</td>
<td>C.V. with Reheat</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>SF17</td>
<td>A</td>
<td>Sleep Labs + PT/OT Area</td>
<td>2nd Flr. Penthouse</td>
<td>C.V. with Reheat (VAV 3rd Floor)</td>
<td>2189</td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S18</td>
<td>A</td>
<td>1st Floor Laundry</td>
<td>1st Floor Laundry</td>
<td>Out of Service</td>
<td></td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>SF19</td>
<td>A</td>
<td>Serves Induction Units</td>
<td>Ground Flr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S20</td>
<td>A</td>
<td>Auditorium &amp; Housekeeping</td>
<td>Ground Flr.</td>
<td>C.V.</td>
<td></td>
<td></td>
<td></td>
<td>Teaching and Learning</td>
<td>Replace with new 8,000 CFM unit in same location</td>
</tr>
<tr>
<td>S21</td>
<td>A</td>
<td>Library</td>
<td>Ground Flr. (H45E)</td>
<td>C.V.</td>
<td></td>
<td></td>
<td></td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S22</td>
<td>B</td>
<td>Interior - Dual Duct Unit</td>
<td>B1 MER</td>
<td>Dual Duct</td>
<td>1966</td>
<td>57,450</td>
<td>B410 NWQ Selective Facility Renewal Project</td>
<td>Replace with new 240,000 CFM central system located in new penthouse.</td>
<td></td>
</tr>
<tr>
<td>S23</td>
<td>B</td>
<td>Surgery (except Heart + Ortho)</td>
<td>B1 MER</td>
<td>C.V. with Reheat, 100% OA</td>
<td>1966</td>
<td>18,755</td>
<td>B410 NWQ Selective Facility Renewal Project</td>
<td>Replace with new 240,000 CFM central system located in new penthouse.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.5.3.2. NWQ Selective Facility Renewal - Air Handler System Chart (continued)

<table>
<thead>
<tr>
<th>AHU No.</th>
<th>NWQ Area</th>
<th>Area Served</th>
<th>Unit Location</th>
<th>Unit Type</th>
<th>Install Date</th>
<th>AHU CFM</th>
<th>UWM Rm. No.</th>
<th>Redevelopment Project Assignment for Upgrade or Replacement</th>
<th>Proposed Scope of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>S26</td>
<td>B</td>
<td>Pharmacy</td>
<td>NWQ B Bsmt. (26E)</td>
<td>VAV with Reheat</td>
<td>2013</td>
<td>33,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 240,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S29</td>
<td>D</td>
<td>2nd, 3rd, 4th, and 5th</td>
<td>NWQ D 5th Floor</td>
<td>VAV with Reheat</td>
<td>1977</td>
<td>38,340</td>
<td>B525</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 240,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S30</td>
<td>D</td>
<td>Old Incinerator Room</td>
<td>B57 Storage Room</td>
<td>VAV with Reheat</td>
<td>1977</td>
<td>6,000</td>
<td>B370</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 240,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S31</td>
<td>D</td>
<td>MER B51 Ventilation</td>
<td>B51 MER</td>
<td>VAV with Reheat</td>
<td>1977</td>
<td>4,500</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 240,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S32</td>
<td>D</td>
<td>Skywalk</td>
<td>101C MER</td>
<td>C.V., Steam, Ch.Wtr.</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 4,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S33</td>
<td>F</td>
<td>College of Nursing Old Library</td>
<td>NWQ F Basement</td>
<td>C.V.</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S34</td>
<td>A</td>
<td>Cafeteria</td>
<td>Cafeteria</td>
<td>Unit Ventilators</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S35</td>
<td>F</td>
<td>College of Nursing Classrooms</td>
<td>NWQ F Classrooms</td>
<td>Unit Ventilators</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S37</td>
<td>A</td>
<td>Linen Room</td>
<td>Attic</td>
<td>C.V. with Reheat (DX Cooling)</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S38</td>
<td>A</td>
<td>Old Boiler Room</td>
<td>H17 MER</td>
<td>Out of Service</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S39</td>
<td>A</td>
<td>Old Boiler Room</td>
<td>H17 MER</td>
<td>Out of Service</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
<tr>
<td>S40</td>
<td>A</td>
<td>Old Boiler Room</td>
<td>H17 MER</td>
<td>Out of Service</td>
<td>1977</td>
<td>3,600</td>
<td>B315</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Redeplace with new 174,000 CFM central system located in new penthouse.</td>
</tr>
</tbody>
</table>
### Table 3.5.3.2. NWQ Selective Facility Renewal - Air Handler System Chart (continued)

<table>
<thead>
<tr>
<th>AHU No.</th>
<th>NWQ Area</th>
<th>Area Served</th>
<th>Unit Location</th>
<th>Unit Location Area</th>
<th>Unit Type</th>
<th>Install Date</th>
<th>AHU CFM</th>
<th>UWM Rm. No.</th>
<th>Redevelopment Project Assignment for Upgrade or Replacement</th>
<th>Proposed Scope of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>S44</td>
<td>C</td>
<td>Original NWQ-C Basement</td>
<td>B77 MER</td>
<td>C.V./R.A./Stm H.C./Humid.</td>
<td>1982</td>
<td>9,000</td>
<td>B685</td>
<td>Restaurant Operations, UITS, Facilities</td>
<td>Unit was phased out as part of Children's Center Project - Shifted Load to Air Handling Unit 554</td>
<td></td>
</tr>
<tr>
<td>S45</td>
<td>C</td>
<td>Original NWQ-C Ground Floor</td>
<td>B77 MER</td>
<td>C.V./R.A./Stm H.C./Humid.</td>
<td>1982</td>
<td>14,000</td>
<td>B685</td>
<td>11C2L Children's Center Project</td>
<td>Replace units S33, S46 and S47 with one new 10,500 CFM Air Handling Unit</td>
<td></td>
</tr>
<tr>
<td>S46</td>
<td>F</td>
<td>College of Nursing Library</td>
<td>C.V. with Reheat</td>
<td>1989</td>
<td></td>
<td></td>
<td></td>
<td>Honors College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S47</td>
<td>F</td>
<td>Annex Reception Area</td>
<td>C.V. with Reheat</td>
<td>1989</td>
<td></td>
<td></td>
<td>Honors College</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S48</td>
<td>B</td>
<td>Surgery - Heart</td>
<td>Surgery Penthouse</td>
<td>1986</td>
<td>14,000</td>
<td>1599</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Replace with new 240,000 CFM central system located in new penthouse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S49</td>
<td>A</td>
<td>Prof. Office Center</td>
<td>MER 128A</td>
<td>C.V., Ch.Wtr., RF (Cooling Only)</td>
<td>1989</td>
<td>8,500</td>
<td>1399</td>
<td>School of Education</td>
<td>Replace with new 174,000 CFM central system located in new penthouse.</td>
<td></td>
</tr>
<tr>
<td>S51</td>
<td>B</td>
<td>G.I Lab</td>
<td>272</td>
<td>C.V. with Reheat/Stm H.C.</td>
<td>1993</td>
<td>1,900</td>
<td>2595</td>
<td>NWQ Selective Facility Renewal Project</td>
<td>Replace with new 240,000 CFM central system located in new penthouse.</td>
<td></td>
</tr>
<tr>
<td>S54</td>
<td>C</td>
<td>1993 Addition - Ground Floor, 1st Floor &amp; 2nd Floor</td>
<td>NWQ C 2nd Flr MER</td>
<td>C.V. with Reheat/Stm H.C./Humid.</td>
<td>1993</td>
<td>60,000</td>
<td>2750</td>
<td>Children's Center, Greenhouse, 2nd Floor Student Health Center located in NWQ-C</td>
<td>Unit was refurbished as part of the Children's Center Project 11C2L</td>
<td></td>
</tr>
<tr>
<td>S55</td>
<td>C</td>
<td>1993 Addition - 3rd Floor</td>
<td>NWQ C 2nd Flr MER</td>
<td>C.V. with Reheat/Stm H.C./Humid.</td>
<td>1993</td>
<td>23,000</td>
<td>2750</td>
<td>College of Health Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTAC-1</td>
<td>C</td>
<td>Clinical Building Elev. Equip. Rm.</td>
<td>NWQ C Roof</td>
<td>Cooling Only</td>
<td>2013</td>
<td>1,600</td>
<td></td>
<td>10D2Q-01 Greenhouse</td>
<td>Unit was removed as part of the Greenhouse Project</td>
<td></td>
</tr>
<tr>
<td>RTU-1</td>
<td>F</td>
<td>CON Classroom + Offices</td>
<td>NWQ F Lower Roof</td>
<td>Cooling Only w/ Economizer Mode</td>
<td>1999</td>
<td>5,000</td>
<td></td>
<td>Honors College</td>
<td>Replace units RTU-1, RTU-2, and Ventilators with one new outdoor 15,000 CFM Air Handling Unit</td>
<td></td>
</tr>
<tr>
<td>RTU-2</td>
<td>F</td>
<td>College of Nursing</td>
<td>NWQ F Lower Roof</td>
<td>Cooling Only w/ Economizer Mode</td>
<td></td>
<td></td>
<td></td>
<td>Honors College</td>
<td>Replace units RTU-1, RTU-2, and Ventilators with one new outdoor 15,000 CFM Air Handling Unit</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** All existing air handling units located in NWQ-A should be refurbished as part of the NWQ Selective Facility Renewal project to allow surge occupancy in NWQ-A for the years prior to the start of the School of Education major project.
### Plumbing Systems

**NWQ-A THROUGH D**

**Main Domestic Water Systems**

- There are three locations where domestic water enters the building:
  - From Hartford Ave a 6” into Room G396A in NWQ-A has a capacity of 600 GPM
  - From Newport Ave an 8” into Room B815A in NWQ-D has a capacity of 900 GPM
  - From Maryland Ave a 3” into Room G110 in NWQ-A has a capacity of 180 GPM
- All of the services are inner connected.
- The domestic hot water is supplied from the following locations:
  - NWQ-A - a horizontal steam-fed tank type unit in Room G205 (dated 1969, 48” x 132” – 1000 Gallons) (serves the east side of this section)
  - NWQ-A - a vertical steam-fed semi-instantaneous unit in Room G110 (dated 1980) (serves the dishwashing area)
  - NWQ-A – a horizontal steam-fed tank type unit in Room G307 (dated 1950, 42” x 156” 810 Gallons) (serves the west portion of this section)
  - NWQ-B – Two storage horizontal steam-fed tank type units in Room G399 (2 units, dated 1964, 60” x 168” 1905 Gallons each and EWH 2012 A0 Smith DRE 120 100 18kw) which serves the basement through Floor 5.
  - NWQ-B – A set of vertical steam-fed tank type units (2 units, dated 1980, and EWH 2012 A0 Smith DRE 52 100 24kw) which serves the west portion of the section
  - NWQ-C - A vertical steam-fed tank type unit in the room B685 (RECO # Q9778-10, 1983, 24” x 72” 135 Gallons) which serves the east portion of the section
  - NWQ-C - A vertical steam-fed semi-instantaneous unit in Room B815 (dated 1993, PK # 233290 and EWH 2012 A0 Smith DRE 52 100 24kw) which serves the west portion of this section.
  - NWQ-D - A horizontal steam-fed tank type unit in the room B815 (dated 1977 72” x 144” 2820 Gallons)

**Main Sanitary Building Drainage**

- NWQ-A - is discharged by gravity, except the basement and sub-basement floors which have duplex sanitary sumps, to the east and the north.
- NWQ-B - is discharged by gravity, except the sub-basement level which has a duplex sanitary sump, to the north and south.
- NWQ-C - is discharged by gravity. There are duplex sanitary sumps for the Basement. The east portion of the section discharges to the north and the west portion of the section discharges to the south.
- NWQ-D - is discharged by gravity, except for the sub-basement which has a duplex sanitary sump. This section discharges to the north.

**Sewerage Ejector Sumps**

- NWQ-A - the basement and sub-basement levels have duplex sanitary sumps locate in three rooms G121, G110 and G205. The sump cover at all three locations are in need of repair.
- NWQ-B - the sub-basement level has a duplex sanitary sump located in room B410. The sump cover is in need of repair.
- NWQ-C - There are duplex sanitary sumps located in two areas room B685 and room B726A. The sump covers in both of these areas are ok.
- NWQ-D - There is a duplex sanitary sump located in room B870. The sump cover is in need of repair.

**Main Storm Building Drainage**

- NWQ-A - is discharged by gravity, except for one storm duplex sump, to the north.
- NWQ-B - is discharged by gravity, except for two duplex storm sumps, to the north and south.
• NWQ-C - is discharged by gravity, except for a duplex storm sump, to the south.
• NWQ-D - is discharged by gravity, except for duplex storm sumps, to the south.

Storm/Clearwater Sumps
• NWQ-A - storm duplex sump located in room G205. The sump cover is in need of repair.
• NWQ-B - two duplex storm sumps, one located in room B597 and another in room B410. The sump cover in B410 is in need of repair.
• NWQ-C - duplex storm sumps located in four areas room B685, room B726A, room B755D, and simplex in room B610. The sump covers in these areas are ok.
• NWQ-D - duplex storm sump located in room B870. The cover is in need of repair.

RECOMMENDATIONS:
Main Domestic Water Systems
• Remove the 3” water service from Room G110 in NWQ-A – the other two will meet requirements

Water Heaters
• Remove all existing water heaters and storage tanks
• In NWQ-B – Provide two (2) boiler water fed water heaters and storage tanks to handle the loads of NWQ-A and NWQ-B in Room G399
• IN NWQ-D – Provide two (2) boiler water fed water heaters and storage tanks to handle the loads of NWQ-C and NWQ-D in Room B815

Main Sanitary Building Drainage
• Combine where feasible and reduce number of locations where it leaves the building.

Sewerage Ejectors
• The ejectors in NWQ-A, NWQ-B, and NWQ-D need to have pumps replaced, control panels added and sump covers replaced
• The ejectors in NWQ-C are ok at this time.

Main Storm Building Drainage
• Combine where feasible and reduce number of locations where it leaves the building. And direct some of the areas as requested by Civil for storm management/retention.

Storm/Clearwater Sumps
• The Clearwater sump pumps in NWQ-A, NWQ-B, and NWQ-D need to have pumps replaced, control panels added and sump covers replaced
• The Clearwater sump pumps in NWQ-C are functional at this time. The ones located in Rooms B726A, room B755D, and simplex in room B610 need control panels.

3.5.5. Fire Protection Systems

NWQ-A
• The fire protection water is fed from Hartford Ave by a 6” into Room G396A and this is cross-connected with the service from Newport Ave that is in NWQ-D section, near the Orange Elevators.
• The majority of NWQ-A does not have sprinklers.

NWQ-B
• The fire protection water is fed from the 8” from Newport Ave in Room B815A in NWQ-D section this is cross-connected with the service from Hartford Ave that is in NWQ-A section, near the Orange Elevators.
• The majority of NWQ-B does not have sprinklers.
NWQ–C

- The fire protection water is fed from the 8” from Newport Ave in Room B815A in NWQ-D section this is cross-connected with the service from Hartford Ave that is in NWQ-A section, near the Orange Elevators.
- The majority of NWQ-C does have sprinklers.

NWQ–D

- The fire protection water is fed from the 8” from Newport Ave in Room B815A this is cross-connected with the service from Hartford Ave that is in NWQ-A section, near the Orange Elevators.
- The fire pump is located in Room B815A; it is a 75HP pump, 1500 GPM, with 135psi discharge pressure and includes a transfer switch that is connected to the emergency generator. The jockey pump is a 3hp unit. Fire Pump and Jockey Pump were installed in 1977.
- There is concern of the pressure rating of the fittings and couplings especially at the lower floors when the fire pump is tested at 150% load at churn (no flow). Based on the observed pressure readings in the basement, the 150% test would exceed 225 psi, which is beyond the design capability of the Victaulic 75 lightweight coupling. There have been no recorded problems to date with this system.
- The majority of NWQ-D does have sprinklers.
- The system is designed to a light hazard classification.
- The standpipes are divided into Class I, 2-1/2” valve cabinets in the fire rated stair enclosures with 1-1/2” Class II first aid fire hose cabinets in the corridors. The valve cabinets and hoses are in excellent condition.

RECOMMENDATIONS:
NWQ–A

- Replace all the piping and sprinkler heads in this area – due to the age and arrangement of the items.
- Provide new piping, standpipes, zone valves and sprinkler heads for this area.

NWQ–B

- Extend sprinkler piping and heads to area that do not have coverage

NWQ-C & NWQ-D

- The only areas that are not sprinklered are the electrical rooms and is they meet the requirement of a 2 hour rated room then they do not need sprinklers.
- Changeover to 2-1/2” interior hose valves may be a modification to the system that the Local Authority Having Jurisdiction may require.

INFORMATION GATHERING

Review of existing design drawings, shop drawings, and on-site field investigations provided the primary sources of information for the Mechanical Redevelopment Plan.

3.5.6. Electrical Systems

INFORMATION GATHERING

Review of existing design drawings, shop drawings, and on-site field investigations provided the primary sources of information for the Electrical Redevelopment Plan. On-site tours occurred with the A/E team and representatives of DFD, UW System, and Campus Engineers.

Drawings and matrices included in the study are as follows

- Existing one-line and riser diagrams: These were compiled from existing drawings of various vintages. These drawings have not been field-verified.
- Floor plans indicating location of distribution equipment: These were compiled from existing drawings of various vintages as well as field verification. Equipment positively confirmed to exist is located and shown with tags. Equipment which exists in some records, but was not found, is shown as a note with a leader pointing to the general area it is thought to reside.
• Life safety drawings – These drawings indicated exit sign locations and fire alarm devices. These were compiled from existing drawings of various vintages as well as field verification.
  ○ The exit signs have indication whether they are Fluorescent (F) or LED (L) technology. Generally the fluorescent technology is legacy equipment and the LED was added by UWM. Emergency egress was not indicated as it was not possible to verify which fixtures are served by life safety versus critical power. Also, all fixtures should be removed and replaced with any renovations.
  ○ The fire alarm devices indicated are what was found from field-verification. All devices in the facility are not indicated as many devices such as duct smoke detectors and monitor/control modules are located above ceilings, which were not removed and verified.
  ○ The Engineered Smoke Control System (ESCS) system devices are located on these plans as well. Generally, these are ceiling and duct smoke detectors located in NWQ-A and NWQ-B. It was not possible to positively verify which devices are connected directly to the ESCS. Smoke zone boundaries are indicated on the drawings. Additional information on the ESCS and zoning is in the Mechanical section.

• Schematic drawings – These drawings were compiled based upon existing drawings and on-site field verification.
  ○ Existing distribution - These drawings indicate general locations of existing 4,160V, emergency and NWQ-E (former Energy Center) equipment as a high-level reference.
  ○ Potential location of 4,160V system – These drawings indicate potential locations of new 4,160V equipment if the NWQ was to be connected to the UWM primary distribution system or if the gear was to be relocated. The attached matrix indicates the advantages and disadvantages of each Option.
  ○ Potential location of Emergency system – These drawings indicated potential locations of new generators and associated distribution equipment if UWM decides to acquire new generators. The attached matrix indicates the advantages and disadvantages of each Option.

DISTRIBUTION EQUIPMENT
Existing Systems
• The facility is served by two 26.4kV, 3-phase, 3-wire, WE Energies feeders which originate from the northwest end of the NWQ. These lines serve two 26.4kV-4.16kV, 5MVA, liquid-filled step down transformers which in turn feed two 4.16kV substations in the NWQ-E. This switchgear feeds (4) 4.16kV substations in NWQ-B and C in addition to various 480V substations in all buildings via ductbanks and tunnels. The existing 25kV-5kV transformers have at least 10-15 years of life remaining and are in good condition.

• UWM owns the medium voltage transformers and all downstream distribution equipment.

• An empty primary ductbank system has been installed to allow connection of the normal power system to the campus system. The last manhole is located at the NE corner of NWQ-A.

• Branch level distribution of normal power throughout the facility is generally low density due to high emergency power requirements of Healthcare. Branch panelboards are located throughout the facility both in electrical rooms and in corridor walls.

• The existing distribution system is aged as follows:
  ○ NWQ-A
    - Distribution equipment is old and dated to the 1960’s. All distribution equipment is recommended to be replaced as renovations occur.
  ○ NWQ-B
    - Distribution equipment is old and dated to the 1960-mid 1970’s. All distribution equipment is recommended to be replaced as renovations occur.
  ○ NWQ-C
    - Basement distribution equipment is dated to the 1980’s. Suggest replacing equipment, but not an immediate requirement.
    - Ground Floor and Floor 1 are being remodeled as part of the Child Care project. It will receive new panelboards and reuse the newer panelboards.
- Floors 2 and 3 equipment dates to the 1990’s. Equipment can be reused.
  ○ NWQ-D
    - Basement to Floor 4 distribution equipment is dated to the 1970’s. All distribution equipment is recommended to be replaced as renovations occur.
    - Floors 5-8 equipment dates to the mid 1990’s

EMERGENCY POWER SYSTEM
Existing Systems
• The facility is served by (3) 600kW, 480V diesel generators located in NWQ-F. The generators are paralleled via synchronizing switchgear located in the same building. The emergency system is distributed to NWQ-A, B, C, D, F and G via ductbanks and tunnels.
• The distribution system is currently configured to meet a healthcare facility requirement of NEC Article 517; Life Safety, Critical Care, and Equipment branches of power. The system must be reconfigured to meet NEC Articles 700/701/702.
• Transfer switches are in good condition. Most transfer switches are maintenance bypass with analog controls. Transfer switches are located throughout all buildings.
• Branch level distribution of emergency power throughout the clinical areas is dense due to Healthcare requirements. Branch and isolation panelboards are located throughout the facility.

Recommendations (note: these recommendations are not part of the Selective Facility Renewal project, but rather document future intent)
• UWM has stated a desire to eventually remove the paralleling capabilities of the generators. This would require a significant reconfiguration of the existing emergency distribution system.
• The quantity of emergency generator can like be reduced from the current 1.8MW. Preliminary calculations indicate 800-1000kW would be needed to serve egress lighting and elevators. As a result, a number of the transfer switches can be removed from the distribution system. Generally, these should be primarily in NWQ-A and NWQ-B, as these are the oldest devices.
• The existing distribution system has a high level of load mixing specifically the life safety and critical branches. Segregation of loads to 700/701/702 branches must occur with renovations.

LIGHTING SYSTEMS:
Existing Systems
• Light fixtures throughout the facility are in various states of functionality, damage and disrepair. Fixtures generally utilize magnetic fluorescent ballasts, an obsolete technology. These were originally utilized due to the low interference of the ballasts with medical devices.
• Lighting controls are manual switches in non-corridor areas and a relay system in the corridors and for the site lighting. Automatic shut-off controls are generally non-existent due to the facility being 24/7 and constructed prior to energy codes.
• Exit signs are primarily older fluorescent type, with some new LED types added by UWM at various places.

Recommendations
• Any future renovations shall remove all light fixtures and controls and provide all new lighting equipment.

SITE LIGHTING
Existing Systems
• Existing site lighting consists of High Pressure Sodium and Metal Halide HID sources controlled by the campus relay system. Poles and heads are generally in good condition. Building mounted lighting is aged and in moderate condition.

Recommendations
• Any site renovations are recommended to replace the poles and heads as the fixtures likely utilize obsolete Metal Halide probe start technology. New lighting shall follow campus standard, however, utilization of LED technology should be investigated.
• Building mounted lighting should be replaced as renovations occur. Existing lighting levels likely are not adequate to provide code required emergency egress lighting. Again, new lighting shall follow campus standard, but LED technology should be investigated for energy efficiency and instant-on capabilities.

3.5.7. **Telecommunication / Security / Life Safety Systems**

**INFORMATION GATHERING**

Review of existing design drawings, shop drawings, and on-site field investigations provided the primary sources of information for the Electrical Redevelopment Plan. On-site tours occurred with the A/E team and representatives of DFD, UW System, and Campus Engineers.

Drawings and matrices included in the study are as follows:

- **Existing one-line and riser diagrams:** These were compiled from existing drawings of various vintages. These drawings have not been field-verified.

- **Floor plans indicating location of distribution equipment:** These were compiled from existing drawings of various vintages as well as field verification. Equipment positively confirmed to exist is located and shown with tags. Equipment which exists in some records, but was not found, is shown as a note with a leader pointing to the general area it is thought to reside.

- **Life safety drawings –** These drawings indicated exit sign locations and fire alarm devices. These were compiled from existing drawings of various vintages as well as field verification.
  - The exit signs have indication whether they are Fluorescent (F) or LED (L) technology. Generally the fluorescent technology is legacy equipment and the LED was added by UWM. Emergency egress was not indicated as it was not possible to verify which fixtures are served by life safety versus critical power. Also, all fixtures should be removed and replaced with any renovations.

- **The fire alarm devices indicated are what was found from field-verification. All devices in the facility are not indicated as many devices such as duct smoke detectors and monitor/control modules are located above ceilings, which were not removed and verified.

- **The Engineered Smoke Control System (ESCS) system devices are located on these plans as well. Generally, these are ceiling and duct smoke detectors located in NWQ-A and NWQ-B. It was not possible to positively verify which devices are connected directly to the ESCS. Smoke zone boundaries are indicated on the drawings. Additional information on the ESCS and zoning is in the Mechanical section.

- **Schematic drawings –** These drawings were compiled based upon existing drawings and on-site field verification.
  - **Existing distribution -** These drawings indicate general locations of existing 4,160V, emergency and NWQ-E (former Energy Center) equipment as a high-level reference. In
  - **Potential location of 4,160V system –** These drawings indicate potential locations of new 4,160V equipment if the NWQ was to be connected to the UWM primary distribution system or if the gear was to be relocated. The attached matrix indicates the advantages and disadvantages of each Option.
  - **Potential location of Emergency system –** These drawings indicated potential locations of new generators and associated distribution equipment if UWM decides to acquire new generators. The attached matrix indicates the advantages and disadvantages of each Option.

**FIRE ALARM:**

**Existing Systems**

• The current system is a JCI 3030 intelligent addressable two-way voice system. All buildings are currently protected by the fire alarm system, however the system was designed to older codes and coverage is sparse.
• Voice and visual notification device coverage does not meet current codes except in the Childrens Learning Center area (NWQ-C Floor 1, NWQ-D Ground Floor)
• Project 12B1R created a Fire Command Center in NWQ-B, Room 1470. This room shall be equipped as a true Fire Command Center as the renovations progress.
• Project 12B1R replaced the existing JCI 2020 system with a new JCI 3030 system. All existing devices will backfeed into the new system. Generally all devices are to remain except for the following:
  ○ Monitoring modules will be added to existing water flow and tamper switches.
  ○ The existing ADT sprinkler monitoring system will be replaced.
  ○ Most of the pull station in NWQ-C and NWQ-D will be replaced with new devices and lowered to code required heights.
• Elevator recall
  ○ The White, Blue and Black elevator banks have 120V lobby smoke detectors and basic recall functions.
  ○ The Red and Purple elevator banks appear to have addressable smoke detectors and basic recall functions.
  ○ A current project is upgrading the Green, Yellow and Orange elevator banks with addressable smoke detectors and current code required recall and fire fighter functionality.
• Fire fighter communications
  ○ Because NWQ-A, B, C, D and possibly E and G (dependent upon DSPS interpretation) are considered a single high-rise building, fire fighter phone communications is required for all stairwells and elevator lobbies per code.
  ○ Existing fire fighter phones are located in the stairwells of NWQ-D.
• Smoke control system (ESCS)
  ○ See the Mechanical for background information on the ESCS.
  ○ The information below is based upon discussions with JCI, existing drawing and field observation. Actual functionality may differ from current understanding.
  ○ The ESCS is intended on remaining as existing. A future project may remove the system.
  ○ Function of the ESCS:
    - The ESCS consists of 120V JCI ceiling mounted smoke detectors located at returns to sense smoke entering the return air. All detectors for each zone tie together to a single control signal point, indicated on the attached Drawings by an SFA or SFM (acronym derived from existing drawings, meaning unknown). This signal then feeds back to a JCI control panel.
    - Upon receipt of the signal, the control panel shuts down the respective AHU, activates an exhaust fan, and closes all dampers and doors to the respective area, all via pneumatics.
    - Originally, the signal did not tie into the fire alarm system. Subsequent modifications added a monitoring module located in a transponder in NWQ-E, for each zone to allow monitoring of the ESCS.
    - Upon field survey, it appears there have been undocumented modifications of the ESCS and smoke compartments prior to UWM acquisition of Columbia - St. Mary's Hospital.
    - Discovered modifications appear to be the removal of some smoke detectors, replacement of existing 120V with new addressable, and removal of doors and door hold-opens.

Recommendations
• Any renovations shall remove all existing fire alarm devices and provide all new devices to meet current codes.
• Any renovations which modify the ESCS shall maintain the integrity of the smoke compartments and ESCS.
• Investigation into a Distributed Audio System has been initiated by UWM for use as a cellular distribution system in the lower floors of the facility. This could potentially be utilized as a fire fighter communications system as well, supplementing or replacing some fire equipment.

TELECOMMUNICATIONS SYSTEM:
Existing Systems
• The existing hospital telecommunications vertical and horizontal wiring is obsolete and unusable for current equipment. It is generally defunct and much of the wiring is already removed. Subsequent renovations of spaces shall remove all telecommunications wiring within the area.
• The primary fiber connection to the NW Quad is a 24-strand OS2 single mode cable connecting Architecture and Urban Planning to the NWQ-C. Four of these strands are fusion spliced through to Engineering and Mathematical Sciences on the campus legacy 10-strand OS1 single mode cable. All these strands are in use supporting the AGG layer in the NWQ. All the other single mode fiber in Architecture and Urban Planning is terminated on bulkheads with ST & ST connectors. This fiber enters the south side of the center wing of NWQ-A.
• A backup fiber backbone is routed from Enderis Hall to the NE corner of NWQ-A. This backbone consists of 96-strands OS2 single mode cable. However, the actual capacity of the line must be coordinated with UITS. Three of the core nodes were removed in Enderis recently. The system can only patch through to the Golda Meier Library on legacy 10-strand OS1 single mode fiber with four of the strands in use to support the AGG later for the Enderis Quadrant. There are two other OMa Multiple cables (24 and 36-strand) connecting the Golda Meier Library with Enderis.
• NWQ-A has a partial vertical riser constructed to accommodate future renovations. The existing copper riser for Floors 2, 3 and 4 can be reused; 300 pairs to Floors 2 and 4, 200 pairs to Floor 3. The copper riser to Floor 5 has been abandoned. Because there is little to no slack in the Telecom Rooms, relocating the riser without creating a second level backbone is not practical. All existing fiber risers in the NWQ have been abandoned; a new OS2 fiber riser will have to be installed in the NWQ-A.
• NWQ-B has been updated with new telecommunications rooms and branch wiring for the Surge Spaces.
• A project is currently being designed to create new telecommunications rooms with copper fiber backbones in NWQ-C and NWQ-D (DFD Project #: 12B1R).

Recommendations
• Any renovations shall remove all existing horizontal cable and provide all new horizontal cabling to existing racks in telecommunications rooms.
• Investigation into a Distributed Audio System has been initiated by UWM for use as a cellular distribution system in the lower floors of the facility. This investigation should be continued and expanded to the fire alarm system (see above).

SECURITY SYSTEM:
Existing Systems
• No NWQ buildings have a functioning security system.
• A number of doors have existing strikes and there are security cameras on the exterior of various buildings. These all do not function.
• A current project is adding access control to a number of exterior doors and security cameras around the major entry areas. (DFD Project #: 12B1R)

Recommendations
• Any renovations shall remove all existing security devices and provide new devices as required for the occupancy and match the new Andover system.
**AUDIO/VISUAL SYSTEM:**

**Existing Conditions**
- There are no significant audio/visual systems in the NWQ other than the auditorium. Any existing systems are non-functional or obsolete.

**Recommendations**
- Any renovations shall remove existing audio/visual devices and provide new devices as required for the occupancy.

### 3.5.8. Elevator Systems

**BLUE ELEVATORS (#1-2) AND WHITE ELEVATORS (#3-4) NWQ-A:**
Blue elevators #1-2 are Westinghouse geared traction elevators installed in 1957 and upgraded to some extent in approximately 1973. The Blue elevators serve floors 1-5 with a 3000 lb rated load and 200 FPM rated speed.

The White elevators, also Westinghouse geared traction, were installed in 1941 (#3) and 1951 (#4). They were designed with service from B-1 to 5, rated capacity of 3500 lbs, and rated speed of 200-250 FPM.

Both the Blue and White elevators, which each have obsolete Westinghouse REL relay logic controls, are presently not being used due to their antiquated condition, poor performance, lack of reliability, and failure to consistently stop level with the floors.

**ORANGE ELEVATORS (#5-6 & 7) NWQ-B:**
Full Modernization under existing DFD project 12A1A

**YELLOW ELEVATORS (#8-9 & 10) NWQ-B:**
Full Modernization under existing DFD project 12A1A

**BLACK ELEVATOR (#11) (NWQ-B):**
Black elevator #11 is a 1965 vintage Otis geared electrical passenger. It operates from floors B, G, and 1-5 with 4500 lb capacity at 200 FPM.

The elevator is equipped with obsolete 21UCL relay logic controls, a tape driven mechanical floor selector, and an older form of Firefighters’ Operation. Elevator #11 is generally non-compliant with current accessibility standards. Presently there is public access to floors G-1 with keyed access to the other floors.

**RED ELEVATORS (#12, 13 & 14) NWQ-B:**
Red elevators #12-13-14 were installed in 1982 and extended three floors in approximately 1993. The Red elevators #12-13-14 presently operate as a 3 car group, serving 10 landings from the B-G-1 to Floor 8. The elevators have a rated load of 5500 lbs and rated speed of 350 FPM. The elevator controls are Otis 30AUV relay logic with generator field motor control utilizing motor generators and 60 HP DC drive motors. Access to the B and 8 floors is presently restricted by means of a keypad or key switch.

**BROWN ELEVATORS (#15 – 16) NWQ-C:**
The Brown elevators #15-16 are duplex Otis geared traction elevators installed in 1994. The Brown elevators serve floors B-G-1-2-3 with a 4500 lb rated load and 350 FPM rated speed and are equipped with Otis 211 controls and SCR DC drives.

**PURPLE ELEVATOR (#17) NWQ-C:**
This is an Otis hydraulic passenger elevator servicing the B-G-1 landings with 100 FPM rated speed and 4500 lb capacity. Elevator #17 was installed in 1994 at the same time as the Brown elevators.

Limited upgrades under Children’s Center project 11C2L include keyed security for the B car call and car enclosure upgrades.

**GREEN ELEVATORS (#18, 19 & 20) (NWQ-D):**
Full Modernization under existing DFD project 12A1A
Changes and Projections

4.1. Major Project Needs
4.1. Major Project Needs

This project addresses UWM’s substantial space deficit by making an approximately 780,000 GSF building on campus usable for both long-term users and surge/interim occupants. As a result of completing the infrastructure upgrade, high-growth programs can be accommodated in the NWQ, allowing these programs to grow their enrollment. The enrollment growth projections illustrated in Table 4.1.1. reflect real demand for the programs accommodated in this study. These enrollment projections (as documented in the NWQ Redevelopment Plan and in their respective Program Statements/Pre-Designs) also account for new programs that depend on new, expanded space in the NWQ in order to grow enrollment. These were validated by UWM’s Provost Office during the planning process, and this growth is essential to Campus’ Strategic Enrollment Plan.

Table 4.1.1. Proposed NWQ Selective Facility Renewal Academic Users Enrollment Projections

<table>
<thead>
<tr>
<th>College of Health Sciences (FTE)</th>
<th>School of Information Studies (FTE)</th>
<th>College of Nursing (FTE)</th>
</tr>
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<tr>
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<tr>
<td>ENROLLMENT (FTE)</td>
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<tr>
<td>Undergraduate</td>
<td>2003</td>
<td>2003</td>
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<tr>
<td>Graduation</td>
<td>2007 (Master Plan)</td>
<td>2007 (Master Plan)</td>
</tr>
<tr>
<td></td>
<td>2012 (Master Plan)</td>
<td>2012 (Master Plan)</td>
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<tr>
<td></td>
<td>2017 (Master Plan)</td>
<td>2017 (Master Plan)</td>
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<tr>
<td></td>
<td>2022 (Master Plan)</td>
<td>2022 (Master Plan)</td>
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<tr>
<td></td>
<td>(2012 to 2022 Projection)</td>
<td>(2012 to 2022 Projection)</td>
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<tr>
<td>Total Enrollment (FTE)</td>
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<td>1,545</td>
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<td>1,562</td>
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<td>1,701</td>
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<td>775.5</td>
<td>610.0</td>
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<tr>
<td>Growth/Decline</td>
<td>776</td>
<td>575</td>
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<tr>
<td>2012-22 (FTE)</td>
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<tr>
<td>Growth/Decline</td>
<td>44%</td>
<td>122%</td>
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<tr>
<td>2012-22 (%)</td>
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<tr>
<td>Ratio of Headcount : FTE</td>
<td>1.186</td>
<td>1.575</td>
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<td></td>
<td>1.112</td>
<td>1.978</td>
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</table>

Notes:
- CHS and SOIS made projections based on headcount
- FTE projections for CHS & SOIS are based on 2012 Headcount : FTE Ratios applied to 2022
- 2003, 2007, and 2012 Data Provided by UWM Master Plan and UWM Office of Assessment and Institutional Research Data based on October Payroll report in each year
- College of Nursing FTE data & projections provided by UWM Campus Planning
- CHS: This Program Statement/Pre-Design (SFR) creates surge space for CHS programs (NWQ-D Floors 2-8) and new instruction labs (NWQ-C/B Floor 3) allowing high grow programs to increase enrollment. The surge space allows the CHS to decompress as departments are currently space constrained; data displayed represents entire College based on the programs identified as candidates for NWQ in the Program Statement / Pre-Design. This does not take into account the impact of CON proceeding.
Programs chosen for the Selective Facility Renewal project – as well as other proposed NWQ users outlined in the Redevelopment Plan – have inadequate space assignments in current UWM facilities. In many cases these deficiencies are extreme, and will cause accreditation problems if ignored (e.g., Student Health Services, College of Health Sciences new degree programs). The Selective Facility Renewal project allows these programs, schools, and colleges to grow in renovated space with building systems that meet DFD Standards and have a 40 year life. This renovation will equal the expected life of new construction, making a long-lasting contribution to UWM’s Kenwood Campus.

In addition to providing remodeled space for long-term occupants, the NWQ Selective Facility Renewal provides surge/interim space on Kenwood Campus. The surge space created in NWQ-B - as well as existing, as-is space in NWQ-A and NWQ-D made occupiable by the infrastructure project – can serve campus as groups elsewhere on campus are displaced during future campus renovations.

Table 4.1.2. describes UWM’s overall space deficit, as documented by the UWM Campus Master Plan and updated here to account for projects that have been completed since the Master Plan was published. The table also updates the space needs for proposed NWQ users, as a number of these users have added programs or increased enrollment since the Master Plan was completed. The NWQ Selective Facility Renewal is projected to fulfill 252,798 ASF (97,798 ASF with selective remodeling and 155,000 ASF with surge “as-is” space) of the adjusted 978,058 ASF campus space deficit.
### Table 4.1.2. UWM Long Range Space Needs
(Including Adjustments / Fulfillment History + Projected IC-IRC and NWQ Selective Facility Renewal)

<table>
<thead>
<tr>
<th>Projects</th>
<th>Classrooms 100</th>
<th>Teach Labs 210/215</th>
<th>Open Labs 220/225</th>
<th>Research Labs 250/255</th>
<th>Office 300</th>
<th>Study 400</th>
<th>Special 500</th>
<th>General 600</th>
<th>Support 700</th>
<th>Health 800</th>
<th>Total ASF</th>
<th>Summary of Surplus / Deficit</th>
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</thead>
<tbody>
<tr>
<td><strong>MASTER PLAN EXISTING SPACE</strong></td>
<td>164,156</td>
<td>162,319</td>
<td>215,420</td>
<td>331,363</td>
<td>634,077</td>
<td>202,691</td>
<td>358,914</td>
<td>299,178</td>
<td>190,843</td>
<td>5,392</td>
<td>2,564,353</td>
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<tr>
<td><strong>MASTER PLAN SPACE NEED</strong></td>
<td>195,030</td>
<td>156,426</td>
<td>259,866</td>
<td>686,222</td>
<td>839,600</td>
<td>362,837</td>
<td>389,055</td>
<td>618,332</td>
<td>213,207</td>
<td>8,772</td>
<td>3,729,347</td>
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<tr>
<td><strong>MASTER PLAN PROJECTED SURPLUS / DEFICIT</strong></td>
<td>(39,874)</td>
<td>5,893</td>
<td>(44,446)</td>
<td>(354,859)</td>
<td>(205,523)</td>
<td>(160,146)</td>
<td>(30,141)</td>
<td>(319,154)</td>
<td>(22,364)</td>
<td>(3,380)</td>
<td>(1,164,994)</td>
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<td>2011 Children's Learning Center Adjustment</td>
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<td></td>
<td></td>
<td>(6,100)</td>
<td>(2,300)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>(4,840)</td>
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<td>2012 Classroom Station Size Adjustment to 25 ASF</td>
<td>(20,175)</td>
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<td></td>
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<td>(20,175)</td>
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<td>2013 NWQ Redevelopment Plan Adjustment</td>
<td>(4,293)</td>
<td>(55,183)</td>
<td>17,670</td>
<td>(11,166)</td>
<td>(36,758)</td>
<td>(756)</td>
<td>(1,583)</td>
<td>(2,644)</td>
<td>(1,806)</td>
<td></td>
<td>(92,226)</td>
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<tr>
<td>2011-2015 Approved Changes: Honors, ZSPH, Innov Accelerator, GWC, Cozzens-Cudahy, Greenhouse, Childrens, 2015 Classroom, SWS, KIRC, PHY reassign</td>
<td>14,121</td>
<td>14,430</td>
<td>11,000</td>
<td>71,000</td>
<td>54,300</td>
<td>16,069</td>
<td>37,517</td>
<td>5,300</td>
<td>223,737</td>
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<td><strong>2015 SURPLUS / DEFICIT</strong></td>
<td>(41,221)</td>
<td>(34,860)</td>
<td>(15,776)</td>
<td>(296,025)</td>
<td>(187,981)</td>
<td>(160,146)</td>
<td>(14,828)</td>
<td>(289,320)</td>
<td>(22,008)</td>
<td>(5,186)</td>
<td>(1,062,058)</td>
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<tr>
<td>15-17 Innovation Campus IRC</td>
<td>2,000</td>
<td>49,000</td>
<td>19,000</td>
<td>10,000</td>
<td>3,000</td>
<td>1,000</td>
<td></td>
<td></td>
<td>84,000</td>
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<tr>
<td><strong>NWQ Selective Remodeling Subtotal</strong></td>
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<td>31,280</td>
<td>0</td>
<td>22,032</td>
<td>0</td>
<td>1,860</td>
<td>15,250</td>
<td>1,896</td>
<td>97,798</td>
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<tr>
<td><strong>Surge into &quot;as-is&quot; space</strong></td>
<td>TBD</td>
<td>TBD</td>
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<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<td>155,000</td>
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<td>0</td>
<td>22,032</td>
<td>0</td>
<td>1,860</td>
<td>15,250</td>
<td>1,896</td>
<td>252,798</td>
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<tr>
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<td>8,630</td>
<td>10,578</td>
<td>19,208</td>
<td>14,235</td>
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<td>Restaurant Operations Central Kitchen</td>
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<td></td>
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<td>10,965</td>
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<td></td>
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<tr>
<td><strong>+ NWQ SURPLUS / DEFICIT</strong></td>
<td>(39,221)</td>
<td>(3,600)</td>
<td>(13,576)</td>
<td>(246,025)</td>
<td>(137,249)</td>
<td>(160,146)</td>
<td>(2,968)</td>
<td>(260,105)</td>
<td>(19,112)</td>
<td>5,392</td>
<td>(691,817)</td>
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<td>TBD Norris Health Center Reassignments</td>
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<td></td>
<td>(5,620)</td>
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<tr>
<td><strong>+ IC-IRC, NWQ, REASSIGNMENTS SURPLUS / DEFICIT</strong></td>
<td>(39,221)</td>
<td>(3,600)</td>
<td>(13,576)</td>
<td>(246,025)</td>
<td>(131,629)</td>
<td>(160,146)</td>
<td>(2,968)</td>
<td>(260,105)</td>
<td>(19,112)</td>
<td>(228)</td>
<td>(691,817)</td>
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</tr>
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</table>

**Notes:**
- Student Health Services and Restaurant Operations Central Kitchen are planned separately from the NWQ Selective Facility Renewal, but build on the Selective Facility Renewal infrastructure project. For this reason, these are included below the Selective Facility Renewal subtotal.
- Efficiency Factors and ASF figures for the NWQ-B surge build-out, College of Health Sciences interim surge into as-is NWQ-D, and surge into as-is NWQ-A are estimated based on existing conditions in these spaces. However, specific program spaces will be determined at a later time.
- This is a snapshot in time and analysis based on 2012 data - projects undertaken at a later date will undergo analysis for the conditions at the time they are undertaken.
- Surplus/Deficit data provided by UWM.
5 Space Description

5.1. Space Type Narrative
5.2. Space Program
5.1. **Space Type Narrative**

Remodeled space for the following users is proposed as part of this study:

- School of Information Studies
- College of Health Sciences Instructional Labs
- College of Nursing Center for Healthcare Transformation and Simulation (CHTS)
- Restaurant Operations Town Square
- Surge Build-Out Space

These remodeled spaces are proposed for Floors 1 and 3-7 of NWQ-B, part of Floor 1 of NWQ-D, and Floor 3 of NWQ-C. The scope of work for the NWQ Selective Facility Renewal project includes these remodeled spaces in addition to infrastructure upgrades. While the intent of these upgrades is to allow the remaining space in the NWQ to be occupied, this project does not remodel space in NWQ-A, nor on the remaining floors of NWQ-B, NWQ-C, or NWQ-D. UWM plans to use these areas for surge users in “as-is” space in the near future.

This document references the Northwest Quadrant Redevelopment Plan and its associated Program Statements/Pre-Designs. The School of Information Studies, the College of Nursing Center for Healthcare Transformation and Simulation (CHTS), and the Restaurant Operations Town Square will be completed as part of this project.

Both the College of Nursing CHTS’ and College of Health Sciences’ proposed location is on Floor 3 of NWQ-B and NWQ-C – the exact program location for each College’s space is to be determined during later phases. The NWQ Redevelopment Plan and the College of Health Sciences Program Statement/Pre-Design outline a program for accommodating a larger portion of the College in the NWQ. In those documents, this larger program indicates CHS will be located on Floor 3 of both NWQ-B and NWQ-C. The selective Facility Renewal project will review and confirm program and location for CHS in the Northwest Quadrant in the program verification phase. Possible priorities are noted in Table 5.2.2.

5.2. **Space Program**

Table 5.2.1 describes the program for the NWQ Selective Facility Renewal components.
Table 5.2.1. Space Tabulation

<table>
<thead>
<tr>
<th>Space Designation (GPR or PR)</th>
<th>General Purpose Revenue (GPR) Selective Remodeling</th>
<th>Program Revenue (PR) Selective Remodeling</th>
<th>As-Is Surge Space made occupiable by Selective Facility Renewal</th>
<th>Other existing spaces affected by Selective Facility Renewal</th>
<th>Other Redevelopment projects that can move forward as a result of Selective Facility Renewal</th>
<th>NWQ-A through NWQ-D Building Non-Assignable SF</th>
<th>Space Total</th>
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<td>General Purpose Revenue (GPR)</td>
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<tr>
<td>NWQ-B</td>
<td>NWQ-B/NWQ-D</td>
<td>NWQ-B</td>
<td>NWQ-B/NWQ-D</td>
<td>NWQ-B</td>
<td>NWQ-B/NWQ-D</td>
<td>NWQ-B</td>
<td>NWQ-B/NWQ-D</td>
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<td>College of Health Sciences</td>
<td>Surge Space (Surge into NWQ-D Space as is) Assumes 65% Efficiency</td>
<td>54,148</td>
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<td>NWQ-D</td>
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<td></td>
<td>College of Nursing</td>
<td>10,499</td>
<td>190,907</td>
<td>NWQ-A</td>
<td>G.5</td>
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<td></td>
<td>Facilities Assignable</td>
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<td></td>
<td>Greenhouse (10D2Q)</td>
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<td></td>
<td>Children's Learning Center</td>
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<td>14,673</td>
<td>NWQ-B</td>
<td>B</td>
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<tr>
<td></td>
<td>Existing Space (Ground Floor NWQ-B, parts of NWQ-C &amp; -D) Assumes 60% Efficiency</td>
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<td>70,380</td>
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<td>54,925</td>
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<tr>
<td>PR</td>
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<td>Student Health Services</td>
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<td>19,208</td>
<td>NWQ-B, C</td>
<td>1-2</td>
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<td></td>
<td>Restaurant Operations Central Kitchen</td>
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<td>34,587</td>
<td>NWQ-B, C</td>
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<td>34,587</td>
<td>34,587</td>
<td>NWQ-D</td>
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<td>795,935</td>
<td>NWQ-D</td>
<td>2.8</td>
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</tbody>
</table>

Notes:
- NWQ Classroom Renovation/Instruct Tech, Facilities, Greenhouse, U.I.T.S, Campus Storage, Children's Learning Center, and Existing Space (NWQ-B-D) are NWQ users that are completed projects or existing space that has been assigned to users. Therefore, a Program Statement/Pre-Design is not needed. These users are impacted by the SFR infrastructure upgrade.
- Efficiency Factors and ASF figures for the NWQ-B surge build-out, College of Health Sciences interim surge into as-is NWQ-D, surge into as-is NWQ-A, and other existing spaces in NWQ-B are estimated based on existing conditions in these spaces. However, specific program for these spaces will be determined at a later time.
- College of Health Sciences (Possible Priority Program) includes instructional labs for high growth programs of Occupational Science & Technology and Physical Therapy. See the College of Health Sciences Program Statement/Pre-Design Appendix for detail. The program and location of these CHS spaces will be confirmed during the program verification phase.
- The GSF includes a new Penthouse enclosure for NWQ-B (included in Non-Assignable SF), as this will be part of the SFR Infrastructure upgrade.
## Table 5.2.2. College of Health Sciences Possible Priorities

<table>
<thead>
<tr>
<th>Room Type (FICM Codes)</th>
<th>Description</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
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<tbody>
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<td>210/250</td>
<td>Pediatrics &amp; Occupations Lab</td>
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<td>1,014</td>
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<td>55</td>
<td>1,980</td>
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<td>210/250</td>
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<tr>
<td>210/250</td>
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<td>1</td>
<td>1,014</td>
<td>36</td>
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<td>1,980</td>
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### Occupational Science & Technology Teaching, Research, & Support Space

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<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
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<th>ASF / OCC</th>
<th>ASF / SPACE</th>
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<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
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<th>TOTAL ASF</th>
<th>NO. OF OCCUPANTS</th>
<th>ASF / OCC</th>
<th>ASF / SPACE</th>
<th>TOTAL ASF</th>
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<td>215</td>
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### Doctor of Physical Therapy Teaching, Research, & Support Space

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<th>ASF / OCC</th>
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<th>TOTAL ASF</th>
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<td>55</td>
<td>2,640</td>
<td>2</td>
<td>5,280</td>
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<tr>
<td>210/250</td>
<td>Teaching Lab, Neuromotor</td>
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<td>1,494</td>
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<td>1,980</td>
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<td>n/a</td>
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<td>215</td>
<td>Student Locker / Changing Room (Shared with OST)</td>
<td>0</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>(Shared)</td>
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Existing Priority Program Total: 8,222
Proposed Priority Program Total: 18,750
Planning Recommendations

6.1. Conceptual Site and Fit Plan
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6.6. Building/Systems Summary (SOIS - $7.7M Total Project Cost)
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6.8. Building/Systems Summary (CHS/CON - $11.95M Total Project Cost)
6.1. Conceptual Site and Fit Plan

This project will upgrade infrastructure for approximately 787,000 GSF and selectively remodel approximately 163,058 GSF in the Northwest Quadrant on the University of Wisconsin-Milwaukee’s Kenwood Campus. The infrastructure project scope outlined in this document affects the entire NWQ-A through NWQ-D complex (see Figure 6.1.1.).

Building on the infrastructure upgrades, this project also remodels a portion of Floor 1 and Floors 3-7 of NWQ-B, Floor 3 of NWQ-C, and a small portion of NWQ-D Floor 1 for the School of Information Studies, the College of Health Sciences, the College of Nursing Center for Healthcare Transformation and Simulation (CHTS), and Restaurant Operations Town Square, as well as a build-out for future surge users. Figure 6.1.2. describes this conceptual remodeling work.

Figure 6.1.1. Existing NWQ Site - with NWQ-A through NWQ-D indicated as area of proposed work
Figure 6.1.2. Northwest Quadrant Selective Facility Renewal
Proposed Selective Remodeling and Surge Use
6.2. Site/Civil/Utilities Description

General:

- The existing site infrastructure and utility systems serving the NWQ-B, C & D buildings are suitable for reuse moving forward as academic and institutional support spaces.

Water Distribution Systems:

- The existing public water mains in Hartford Avenue and in public water easement #393 are adequate to serve the long term needs of the NWQ-B, C & D buildings for potable water supply and fire protection purposes. Replacement of the Milwaukee Water Works mains is not anticipated.
- Existing fire protection and potable water service laterals presently entering the north side of NWQ-B are anticipated to remain in service and are adequately sized to serve the NWQ-B, C & D buildings.

Sanitary Sewer Systems:

- The existing 12" combined sewer located in Hartford Avenue is adequate to serve the long term needs of the NWQ-B users for sanitary and storm sewer purposes. The main was replaced by the City of Milwaukee during the winter of 2013-2014.
- The 12" combined sewer north of NWQ-B collects sanitary and storm effluent from the NWQ-A, B & D buildings and discharges by way of a 24" combined sewer running north under the parking structure to the combined sewer that continues north in the N. Murray Avenue right-of-way. The combined sewer is adequately sized and replacement is not anticipated.
- Multiple sanitary sewer service laterals presently serve the NWQ-B, C & D buildings. Consolidation and replacement of laterals is anticipated as part of this project. Two new 8" sanitary laterals are anticipated to serve NWQ-B and one new 8" sanitary lateral to serve NWQ-D are anticipated along the north side of the buildings.

Storm Sewer Systems:

- Storm sewer service laterals presently serve the NWQ-B, C & D buildings and are collocated adjacent to the sanitary laterals. Consolidation and replacement of laterals is anticipated as part of this project. New storm sewer mains and laterals are anticipated to capture the roof runoff and sump discharges within the building and convey them to storm water management devices to the maximum extent practicable is encouraged.

Storm Water Management Systems:

- No existing storm water management systems presently serve the NWQ-B & D buildings.
- The Children’s Learning Center (11C2L) created a stone storage layer beneath the south play area to reduce storm water runoff release rates from NWQ-C. Connecting NWQ-B roof drainage laterals to the stone storage layer is encouraged.
- The NWQ will be required to comply with the City of Milwaukee and Wisconsin Department of Natural Resources runoff release rate reduction requirements for redevelopment sites once cumulative disturbance as a result of the site work that has occurred since 2002 reaches 1 acre or more than 0.5 acres of additional impervious area are added to the site. To comply with the long term redevelopment goals for the NWQ, a 20% reduction in storm water volume discharged during the critical time period from the site should be used as a minimum project goal based on the MMSD Chapter 13 rules and Chapter 120 of the City of Milwaukee Code of Ordinances.
- Water Quality improvements are not required for the NWQ due to the site being located within the Combined Sewer Service Area of the City of Milwaukee. However, a Total Suspended Solids reduction of 40% should be the project goal based on the campus and DFD sustainability guidelines.
6.3. Relationship to Institution Master Plan

This study is an outgrowth of previous planning efforts which identified UWM’s substantial space deficit and the Northwest Quadrant as a potential site for relieving a portion of this deficit. The Campus Master Plan (2010) documented this deficit and also identified the former Columbia - St. Mary’s (CSM) Hospital as an opportunity site for development (at the time of that study, the complex was not yet purchased by the state on behalf of UWM). In addition, the Master Plan identified the northwest corner of campus as the Health, Education, and Social Welfare “academic neighborhood” on UWM’s Kenwood Campus. Proposed users follow these recommendations by collocating schools, colleges, and other users to establish programmatic synergies and further define this academic neighborhood.

Following the purchase of the former Columbia - St. Mary’s hospital in 2010, the complex became known as the Northwest Quadrant (NWQ), and additional studies were undertaken to determine future use of the site. The CSM Facility Condition Report began to evaluate the existing infrastructure on the site, while the NWQ Space Planning Study analyzed the potential for using the existing buildings on the site for academic, campus life, and support spaces. A ‘Preferred Option’ for potential users of the complex was defined, and the conclusions of that study guided the planning effort for the NWQ Redevelopment Plan and its 9 associated Program Statements/Pre-Designs. This document – the NWQ Selective Facility Renewal – is an outgrowth of the NWQ Redevelopment Plan. Tables 1.3.1. and 4.1.2. describe UWM’s overall space deficit, as documented by the UWM Campus Master Plan and updated here to account for projects that have been completed since the Master Plan was published.

The following outlines specific direction of previous planning efforts, and how these affected the selection of users proposed in the NWQ Selective Facility Renewal Project.

SCHOOL OF INFORMATION STUDIES (SOIS) (DFD#: 11K3C-05)
The Northwest Quadrant Space Planning Study identified the School of Information Studies as a long term core user of the NWQ. The basis of this recommendation was not only expressed by the school’s need and interest in the location, but ability to collaborate with other core users that would relocate to the NWQ (School of Education, Teaching/Learning, University Information Technology Services). The document also recognized that the move to the NWQ would allow SOIS to increase their level of collaboration and thus promote further growth for their expanding program.

COLLEGE OF HEALTH SCIENCES (CHS) (DFD#: 11K3C-09)
The Northwest Quadrant Planning Study identified the College of Health Sciences as a variable/miscellaneous user. CHS’s strong program growth and lack of existing space were cited as reasons for relocation within the NWQ. Additionally, Biomedical Health Informatics, as defined by that study, was suggested as a variable/miscellaneous user for its potential collaboration with other designated long-term users within the Northwest Quadrant.

Although the purchase of the Columbia - St. Mary’s Hospital complex (which has since become the NWQ) was not final when it was published, the UWM Campus Master Plan established “Academic Neighborhoods,” and established a Health, Education, and Social Welfare neighborhood in the northwest corner of the Kenwood campus. The Master Plan designated the College of Health Sciences as a vital presence in this academic neighborhood.

STUDENT HEALTH SERVICES (SHS) (DFD#: 11K3C-01)
Though not part of this project, SHS’ scope of work will build on the infrastructure upgrade proposed here. The NWQ Space Planning Study identified Student Health Services as an urgent, preferred Long-Term User of the NWQ site for a number of reasons. The study found that the current Norris Health Center is grossly undersized and unable to handle its approximately 30,000 yearly visits. Additionally, the Northwest Quadrant site was identified as a viable option for relocation because of some existing building features on the site that could accommodate healthcare services
(the site formerly accommodated a hospital). Further back, the 2010 Campus Master Plan also emphasized growth in counseling and mental health programs and the strong need for additional health and wellness space. The Master Plan indicated a need of an additional 10,000 ASF/20,000 GSF, citing model space guidelines for university clinics.

RESTAURANT OPERATIONS TOWN SQUARE (DFD#: 11K3C-03)
The Northwest Quadrant Space Planning Study identified Restaurant Operations, which operates food service venues, as a long term core user of the NWQ and Revenue Generators was designated as a “variable” user as specifics about venue types and market power was not provided. The document also recognized that the move to the NWQ would generate a need to provide food service and retail amenities to students and faculty within the NWQ. Further, the study outlines that a public “main street” should be generated to consolidate common activities and student services activities.

COLLEGE OF NURSING (CHTS) (DFD#: 13D1J)
The Northwest Quadrant Space Planning Study identified Clinical Services as a variable/miscellaneous needs user for the NWQ. The College of Nursing was included under this umbrella category, as its students are involved in practicum education along with other schools/colleges that prepare students for the health and social welfare professions. The Master Plan indicated that the College of Nursing be central to the Health, Education, and Social Welfare Academic Neighborhood - designated for the northwest corner of campus.

6.4. Building/Systems Description (Overall Infrastructure Upgrade - $28.8M Total Project Cost)
The following sections outline project scope for a major infrastructure upgrade in the Northwest Quadrant. It is the outcome of the infrastructure analysis prepared by the AE team and decisions made by the NWQ Core Team during the NWQ Redevelopment Plan process (as presented in Section 3). Fire protection and life safety upgrades to NWQ-A through NWQ-D will allow occupancy of the entire complex in the short term and facilitate longer-term redevelopment as projects outlined in the NWQ Redevelopment Plan to go forward. Additional upgrades to allow long-term surge and/or build-outs in NWQ-C and NWQ-D are also included. NWQ-B receives a substantial upgrade under this project in order to allow long-term use of this building.

Outcomes of the fire protection and life safety components of this project include the following:
- Allows Redevelopment to proceed freely
  - Fire protection systems allow greater flexibility for redevelopment
  - Engineered Smoke Control System zones no longer limit redevelopment
  - Change of use from I-2 to a B use allows unprotected vertical openings in existing construction to remain.
  - Eliminates smoke barriers required by I-2 occupancy
- Safer conditions for all occupants
- Improves fire protection capabilities
Sprinklering the building allows existing engineered smoke control systems to be de-commissioned. The installation of the fire protection system will need to be completed before the smoke control system can be decommissioned and the balance of the project started. This would require either a separate project or project phase and must be considered in the overall schedule.

- Triggers upgrade of elevators in work area
- Allows NWQ-A to be occupied
- Change existing I-2 Institutional use to group B Business use as part of this project is recommended for NWQ-A through NWQ-D

Reasons for upgrading the infrastructure in NWQ-B - core and shell upgrades plus a new mechanical penthouse for the NWQ-B - include the following:

- Sets up building to accommodate future floor by floor interior build-outs (e.g. SOIS, Surge Build-out, etc., which are included in this project)
- Creates a new public toilet room on the first floor of NWQ-B
- Allows greater flexibility for future renovations
- Creates new vertical mechanical, electrical and plumbing systems to support future interior build-outs.
- Consolidates all air handling equipment in one location using the fewest number of air handling units
- Lowest maintenance cost
- Offers partial redundancy for entire NWQ-B by using manifold duct systems
- Preferred type of HVAC system by DFD, UW System, and UWM
- All vertical openings are protected in accordance with current code if occupancy is changed from a I-2 Institution use to a B Business Use as part of this project.
- New ductwork and piping is provided throughout the entire NWQ-B

- Potentially save $330,000 annually by converting from 100% outside air to return air operation. This option could generate interest for third party performance based contracting. (Based on previous GAS 2004 Energy Study with current utility rates)

This upgrade to NWQ-B requires all occupants to vacate during construction.

The scope included in this infrastructure upgrade can be summarized as containing four major components:

- Fire Protection NWQ-A through NWQ-D
- Select HVAC Systems Upgrades, Horizontal IT Cabling NWQ-C and NWQ-D
- Life Safety Upgrades NWQ-A through NWQ-D
- Core and Shell Upgrade and New Mechanical Penthouse NWQ-B

6.4.1. Architectural/General Construction Systems

ARCHITECTURAL SYSTEMS

Hazardous material abatement:

- Abatement to comply with DFD Design Guidelines for:
  - Guideline for Asbestos Affected by Building Renovation and Demolition
- Remove all asbestos containing material per WALMS report
  - Flooring and floor adhesive, miscellaneous fittings
- Remove all lead containing items per WALMS report
  - Paint
Northwest Quadrant Selective Facility Renewal
Planning Recommendations

**NWQ-B Selective Demolition:**
- Evaluate removal of the Black Elevator and/or the adjacent interior circulating stair to create a fire rated shaft for use by Mechanical, Electrical and Plumbing Systems to connect the new NWQ-B Penthouse to the floors in NWQ-B.
- In order to create new spaces that serve and accommodate the future user needs, interior non-bearing walls and partitions should be removed to allow for flexible spaces:
  - Remove all interior non-load bearing walls and doors
  - Remove existing interior side finishes (furring, plaster / gypsum board) to masonry to allow for envelope upgrade
  - Remove all interior ceilings as required to access and install sprinkler mains and heads. Replace existing ceiling tiles once work above the ceiling is complete.
  - Remove all dumb-waiters and supply conveyance equipment.
  - Remove all interior ceilings
  - Remove all interior flooring
  - Remove millwork and other equipment
  - Remove all exterior windows
  - Remove all HVAC, Fire Protection and Plumbing fixtures
  - Remove all interior light fixtures, wiring and associated panels.
  - Remove all hospital equipment or medical gases / pneumatic tubing
  - Evaluate Removal of interior circulating stair near black elevator for use as a vertical MEP chase if needed.
  - Remove existing penthouse enclosure and helipad.

**NWQ-A, C & D Selective Demolition**
- Remove and salvage ceiling tiles for re-installation during fire protection upgrades.

**Site Cast Concrete**
- Infill existing dumb-waiter openings with concrete to level of existing floor structure.
Architectural Systems – Interior

- **Gypsum Board Assemblies:**
  - Patch and paint and surfaces damaged due to installation of the sprinkler system or removal of ESCS
  - Non-load bearing partitions to be gypsum board assemblies. Typical gypsum board is to be 5/8” thick (type X where required for fire resistance rating).
  - Moisture resistant gypsum or cement board underlayment will be used at wet areas.
  - 2-hour fire resistance rated shaft wall construction and infill at shaft.
  - Construct new vertical shafts to serve new Mechanical/Electrical and Plumbing Systems – see MEP sections.

- **Painting:**
  - Paints and coatings shall be Low VOC and contribute to good indoor air quality to meet project sustainability goals.

- **Signage:**
  - Provide code required exit and way finding signage.

- **Fire Extinguishers:**
  - Provide code required Fire Extinguishers.

- **Metal Doors and Frames:**
  - Hollow metal doors frames shall be used throughout the project for all door types.

- **Wood Doors:**
  - All interior doors shall be solid core wood doors with wood veneer and campus standard hardware. All door glazing, where scheduled, is to be tempered safety glazing.

- **Porcelain Tile:**
  - Through-body porcelain tile flooring is preferred in restrooms and janitorial closets. Include cove tile base. Porcelain tile in janitorial closets to continue to four feet above the floor on wet wall.

- **Flooring:**
  - Patch and level floors as required creating a level floor conditions.

- **Ceiling Systems:**
  - Vinyl faced gypsum ceiling tiles will be used at the new toilet rooms.
  - 2’ X 2’ acoustical ceiling tiles in general spaces. Areas of moisture to be 2’ X 2’ lay-in vinyl faced ceiling tiles. Acoustical Ceilings will contribute to recycled content materials (post-consumer + ½ post-industrial) to meet project sustainability goals.
  - Minimum Ceiling Height: 9'-0”.
  - Re-install existing ceiling tiles in NWQ-A, C and D once fire protection upgrade is completed.

- **Toilet Partitions:**
  - Toilet partitions to be ¾” solid color reinforced composite (SCRC) and will be floor mounted and overhead braced. Toilet partitions are graffiti resistant and contribute to recycled content materials to meet project sustainability goals.

**NWQ-B NEW PENTHOUSE**

- A new penthouse enclosure on the roof of NWQ-B will be constructed to house new mechanical equipment which will serve NWQ-B. The the penthouse to be constructed of new steel columns, with a braced steel frame, metal walls panels, with a metal roof deck. Roofing to be per DFD requirements and specification. Floors to be sealed concrete.

- One cab of the existing Red elevator currently serves the penthouse. This elevator will continue to serve the new mechanical penthouse.

- Expand existing 2400 S.F. penthouse by 9,000 S.F. creating a new 18 foot high penthouse addition with overall size of 11,400 S.F. Elevator access to the penthouse from the red elevators is maintained. Helipad structure is to remain as
is. A structural analysis performed as part of this study limits the overall height of the new penthouse to 18 feet above the current Floor 7 roof elevation.

NWQ-B BUILDING ENVELOPE UPGRADE RECOMMENDATIONS:

• Improve building envelope thermal performance by installing new windows and additional roof/wall insulation.
• Replace all existing windows with new aluminum, thermally broken, fixed, double-pane, argon filled, low E tinted glazing.
  ○ Single Hung Operable Windows
• Replace all existing exterior doors with new heavy duty aluminum doors, with full vision light, safety glazing and panic devices.
• Add wall insulation with a minimum target R-value of 15 to exterior walls.
• Replace existing roof system(s), with new roofing system(s).
• Add roof insulation with minimum R-value of 20.
• Repair damaged masonry or limestone detailing. Tuck-point masonry at severely eroded joints.
• Exterior building envelope should comply with International Energy Conservation Code (IECC) and DFD Design Guidelines for the following:
  ○ Minimum Requirements and Guidelines for the Exterior Building Envelope
  ○ Minimum Requirements and Guidelines for Fenestration in the Exterior Building Envelope
  ○ Minimum Design Standards for Roofing Systems
  ○ Building Envelope-Masonry
• Consideration of window replacement should be given to those in poor condition, and a life cycle cost analysis should be utilized for the justification for both wall insulation upgrades and window replacement. The current budget includes window replacement and building envelope insulation upgrades. A Life-Cycle Analysis should be completed during the Preliminary Design Phase by the future A/E consultant and reviewed with DFD for justification.

NWQ-B SMOKE CONTROL ELEVATORS DOORS
(Architectural Comments - also see elevator)

• Provide fire/smoke protection at the Orange and Yellow elevator banks.

NWQ-B MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS
(Architectural Comments - also see mechanical, electrical, and plumbing and information technology systems):

• Provide rated enclosures for the new vertical MEP/IT Systems as required (For Example: Construction of new duct shafts serving all floors in NWQ-B (basement, ground floor, and floors 1 thru 7)).
• Construct new a new vertical common wet wall(s) core to support new restrooms that will serve all floors in NWQ-B. These installed systems to be stubbed out for future build-outs.
• Construct new public restrooms on first floor adjacent to the Town Square.

NWQ-C & NWQ-D MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS

• The Children’s Learning Center (11C2L) is located in NWQ-C and NWQ-D, and must be kept operational during any construction. If outages to NWQ-C and NWQ-D during construction are required, it would need to be coordinated.
6.4.2. Structural Systems

The Northwest Quadrant “Selective Facility Renewal” (SFR) project will include several components requiring consideration of the structural capacities of the existing buildings, including the addition of a new mechanical penthouse on top of NWQ-B, completion of a “Town Square” project on Floor 1 of NWQ-B, remodeling the Third Floor of NWQ-B as well as Floor 3 of NWQ-C to create space for the College of Health Sciences (CHS) and/or College of Nursing (CON), conversion of Floors 4-5 of NWQ-B to “surge” space, and utilization of Floors 6-7 of NWQ-B by the School of Information Studies (SOIS).

Adding a new mechanical penthouse at NWQ-B will require upgrades to existing steel framing including most of the braced frames between the Floor 7 and Floor 8 (current roof) of NWQ-B, upgrades at specific bracing locations between Floor 6 and Floor 7, the addition of new columns and/or strengthening of existing columns, and the replacement of steel roof joists with new steel beams. Upgrades to the circa-1963 reinforced concrete levels of NWQ-B should be minimal.

PRE-DESIGN DOCUMENTATION
All comments within this document are based on schematic diagrams provided by Quorum Architects, as well as the description of the penthouse construction presented herein.

EXISTING CONSTRUCTION DOCUMENTS USED FOR REFERENCE
The following construction documents were utilized for reference:


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Figure 6.4.2.1. Section I and Section II of NWQ-B
Figure 6.4.2.2. Typical Upper Floor Wind Bracing
Figure 6.4.2.3. Typical Upper Floor Wind Bracing
DISCLAIMER FOR ALL PRE-DESIGN COMMENTS: These pre-design comments are intended to identify the major challenges that would need to be addressed in order for the referenced project to proceed through further design development, creation of construction documents, and into construction. The available structural and architectural drawings for the NWQ buildings are the primary references utilized to develop these comments. An attempt has been made to identify any significant remaining “unknowns” that may require further investigation.

NEW PENTHOUSE ON NWQ-B
It is assumed that the new penthouse would be approximately 18 feet tall, constructed of steel beam framing (beams in order to accommodate the anticipated equipment hung from the penthouse roof), with metal panels or similar siding. New steel columns for the penthouse will need to attach to the structure below. The impact of the new penthouse on the existing structure was reviewed as part of this work.

NEW PENTHOUSE: LATERAL LOADS
NWQ-B is divided into two structurally independent sections on the upper floors. This is shown in Figure 6.4.2.1. A typical example of the braced frame construction used to resist wind loads on the upper floors (see Sheets S3-4 and S3-5 of the 1982 drawings by HDR) is illustrated in Figures 6.4.2.2. and 6.4.2.3. Diagonal braces were typically arranged in the inverted chevron configuration depicted in Figure 6.4.2.2.

Sheet S1-1 of the 1982 construction documents prepared by HDR indicates that the lateral system of braced frames was designed based on a uniform wind pressure of 20 pounds per square foot (psf) on the first 50 feet of the building’s overall height above grade, 25 psf for heights from 50 feet to 100 ft above grade, and 30 psf for elevations of 100 feet to 150 feet above grade. These wind pressures are depicted on the left side of Figure 6.4.2.4. For current analysis, wind loading was reviewed based on current methods, specifically the “Directional Procedure” (applicable to buildings of all heights) within the most recent edition of the American Society of Civil Engineers Standard #7 (ASCE 7-10), where loads are uniform only for the first 15 feet above grade, and then increase non-linearly above that point, similar to what is shown on the right side of Figure 6.4.2.4.

In evaluating existing bracing at NWQ-B, brace forces resulting from the following two conditions were examined:
- NWQ-B with penthouse addition, analyzed with current wind design criteria
- NWQ-B as presently constructed, analyzed with circa-1982 wind design criteria

Analysis indicates that required modifications to the existing lateral system could likely be limited to the braced frames at the circa-1982 vertical expansion, assuming that bracing for the new addition is located directly above the existing braced frames. For the frames that were analyzed, calculations indicated a potential increase in brace forces after the addition of a penthouse on the order of about 40% for bracing between Floors 7 and 8. For some of the frames between Floors 6 and 7, analysis shows brace forces resulting from the addition subjected to current wind design criteria would be about 20% higher than brace forces calculated using the existing roof height and circa-1982 provisions. In other “typical” cases considered, brace forces between Floors 6 and 7

Figure 6.4.2.4. Wind Load Design Assumptions, 1982 (Left) Versus Present (Right)
Figure 6.4.2.5. shows schematically how new braced frames for the penthouse (shown in green) could be located below existing braced frames (in blue) for Floors 7 and 8. Strengthening the braces could take the form of welding or bolting additional plates, angles, or other members to stiffen the braces, but welding may be impractical or unsafe given that the bracing is located within the walls of the existing building, and bolting may also be difficult due to existing construction. The recommendation would be to give consideration to replacing the diagonal braces with larger, stiffer members. Modification of the brace-to-gusset, gusset-to-beam and gusset-to-column connections may still be necessary, and could include replacement of the gusset plate, replacing bolts with larger and/or higher-strength bolts, and/or adding stiffener plates, additional bolts, plates, etc.

6.4.3. Elevator Systems

Brown Elevator (#15 & 16) scope of work NWQ-C:

- This narrative describes the changes necessary for the addition of fire sprinklers in the machine room and/or top of the hoistways due to a life safety upgrade in the NWQ.
- General:
  - The Brown elevators #15-16 are duplex Otis geared traction elevators installed in 1994. The Brown elevators serve floors B-G-1-2-3 with a 4500 lb rated load and 350 FPM rated speed and are equipped with Otis 211 controls and SCR DC drives.
  - The SPS 318 elevator code in Wisconsin requires Firefighters’ Operation per the current ASME A17.1-2007 Safety Code for Elevators and Escalators upon the addition of sprinklers in the machine room or top of hoistways.
  - The Brown elevators currently have an earlier edition of Firefighters’ Operation, most likely compliant with the...
ASME A17.1-1990 code. The Firefighters’ Operation can be upgraded to comply with the present code. Otis likely can provide the necessary wiring materials and software to make the changes to the existing controls. Other elevator contractors would likely circumvent the existing Firefighters’ Operation circuitry and install a separate Firefighters’ Operation controller manufactured by Electrodyn Systems containing the necessary circuitry.

- As part of the upgrades, the 2007 code requires the installation of a dedicated Fire Cabinet in each car containing the new Firefighters’ Operation devices including key switch using the new FEO-K1 national standard key. Per the State of Wisconsin DSPS, the Fire Cabinet and standard key switch would not be enforced, and providing them would be optional.

- However given that several of the elevator groups in the Northwest Quadrant will be modernized to include the FEO-K1 switch, typically Firefighters’ Operation on all elevators in the same building must be rekeyed. If the intent is to provide a consistent design of Firefighters’ Operation devices throughout the NW Quadrant, new car operating stations can be provided containing the new Firefighters’ Operation operating devices, however this is optional.

Blue Elevators (#1-2) and White Elevators (#3-4) scope of work NWQ-A:

- This narrative describes the deactivation of both groups of elevators.

- General:
  - Blue elevators #1-2 are Westinghouse geared traction elevators installed in 1957 and upgraded to some extent in approximately 1973. The Blue elevators serve floors 1-5 with a 3000 lb rated load and 200 FPM rated speed.
  - The White elevators, also Westinghouse geared traction, were installed in 1941 (#3) and 1951 (#4). They were designed with service from B-1 to 5, rated capacity of 3500 lbs, and rated speed of 200-250 FPM.
  - The Blue and White elevators are presently not being used due to their antiquated condition, poor performance, and lack of reliability.

- Scope:
  - Both the Blue and White elevators will be decommissioned.
  - The minimum standard to decommission is to: 1) suspend the car and counterweights in the hoistway, 2) fasten all hoistway doors closed from inside the hoistway, and 3) remove power feeders from disconnect to controller (by an electrician).
  - Item #1 can be accomplished by removing the cables and lowering both car and counterweight onto the pit floor or by landing the counterweights in the pit and suspending the car in the overhead. Suspending the car will allow future use of the elevators later for demolition during a potential replacement.

Black Elevator (#11) scope of work NWQ-B:

- Black elevator #11 will be evaluated for continued use or for use as a ventilation shaft.

- If removed, the scope would consist of:
  - The complete elevator is to be removed. Since a new elevator will not be installed in the same hoistway, removal of elevator #11 by an elevator company is NOT REQUIRED.
  - Removal will include all penthouse equipment including traction machine, controller, and overspeed governor.
  - The complete hoistway will be stripped including car frame and platform, overhead deflector sheave, counterweight, car and counterweight guide rails, hoistway doors, hangars, and entrance frames, signal fixtures etc. Block up the hoistway openings and minor electrical work to remove feeders will be required. A general contractor can be utilized for the removal process.
Red Elevators (#12, 13 & 14) scope of work NWQ-B:

- This narrative describes the Red elevator scope of work:
  - General:
    ○ Age of Equipment: The elevators were installed in 1982 and were extended approximately three floors in 1993.
    ○ Duty: Red elevators #12-13-14 presently operate as a 3 car group, serving the B-G-1 to Floor 8. Access to the B and 8 floors is presently restricted by means of a keypad or key switch. The elevators have a rated load of 5500 lbs and rated speed of 350 FPM. The elevator controls are Otis 30 AUV relay logic with generator field motor control utilizing motor generators and 60 HP DC drive motors.
  - Scope:
    ○ Fully upgrade Red elevators #12-13-14 with changes to the 3-car group configuration.
    ○ The South elevator #14 and Center elevator #13 would operate as a 2-car group, with public access to the Student Health Center floors 1-2. Secure access will be provided to floors B-G and 3-8 by key switches or via an access control system provided by others. This will enable restricted access to the Greenhouse and new Penthouse floors.
    ○ North elevator #12 would be removed from the present 3-car group and altered to operate independently from elevators #13-14 as a simplex elevator serving all floors from B-G-1 to 8. A wall would be constructed by others between existing elevators #13 and #12, and a new riser of corridor call stations installed on the elevator #12 side of the partition.
  - Required alterations for the current scope of work:
    ○ In conjunction with the addition of fire sprinklers in the machine room and hoistway, the elevators will be upgraded with new microprocessor controls including the current edition of Firefighters’ Operation. Other components include the potential reuse of the existing robust Otis traction machines, new solid state motor control, all new signal fixtures containing accessible audible and visual signals, new car door operator equipment and a combination of new and reconditioned hoistway operator equipment, and new car enclosure finishes. Keyed security is included. A proximity type access control system can be provided by others instead.
    ○ Elevator #12 only: A new hall station riser will be provided on the #12 side of the wall separating elevators #12-13 since only one riser currently exists for the Red group, and it is located between elevators #13-14.

6.4.4. Plumbing and Fire Protection Systems

PLUMBING UPGRADES

- Upgrades includes:
  ○ Remove water heaters room B685 (NWQ-C) and in Room B815 (NWQ-D).
  ○ Install 2 new boiler water fed water heaters in room B815 sized to handle entire NWQ C and NWQ D Buildings.
  ○ Replace sanitary sump pumps and basin covers
- NWQ-A-Building
  ○ No Plumbing work is identified as part of this project.
- NWQ-B-Building
  ○ Upgrades includes:
    - Remove all existing waste, cold water, hot water, and hot water return piping back to water heaters in room G399. Remove waste, cold water, hot water, and hot water return piping back to water heaters in room 8520.
    - Remove all plumbing fixtures.
    - Remove all medical gas piping from the building.
    - Install 2 new boiler water fed water heaters in room G399 sized to handle entire NWQ-B and NWQ-A Buildings.
    - Run new waste, cold water, hot water, and hot water...
return piping to Floor 7 from the basement and leave taps on the piping for extended to areas (Minimum 2 locations)
- Provide for multi-fixture toilet rooms on the Floor 1 near the Town Square
- Combine sanitary waste piping to reduce number of places it exits the building.
- Replace sanitary sump pumps and basin covers
- Provide for Town Square on Floor 1
- Provide for Student Health Center on Floor 1
- Provide for Student Health Center on Floor 2
- Provide for CON/CHS on Floor 3
- Provide for Surge Build-Out on Floor 4-5
- Provide for SOIS on Floor 6-7
- Revise roof conductor piping routing to facilitate the collection for storm retention

FIRE PROTECTION SYSTEM UPGRADES

- NWQ-A-Building
  - Requires vacating the entire NWQ-A during construction.
  - Upgrades includes:
    - Provide complete sprinkler coverage in the entire building.
    - G level of NWQ-A Sprinkler piping back to service in Room G396A and sprinkler heads need to be replaced due to age and condition
    - At the stair well remove standpipes and fire hoses from cabinets and install standpipes with fire department valves.
- NWQ-B-Building
  - Requires vacating the entire NWQ-B during construction
  - Upgrades includes:
    - Provide complete sprinkler coverage in the entire building. (Floors 6 and 7 have complete coverage now)
    - At the stair well standpipes remove fire hoses from cabinets and install fire department valves in their place.
    - Zone valves, flow switches and tampers need to be addressed on each level.

6.4.5. Mechanical Systems

GENERAL

- High Rise Construction
  - Since there are no fire walls presently constructed separating the NWQ-A, NWQ-B, NWQ-C and NWQ-D portions of the building, the Department of Safety and Professional Services considers these areas as one high rise building. Existing stairs in NWQ-B and NWQ-D have pressurization ventilation systems for keeping smoke out of the stairwells during a fire condition. The International Existing Building Code does not require adding similar systems for NWQ-A and NWQ-C. Current budgeting does not include adding stairwell pressurization for these existing stairs but should be further reviewed with DFD and campus during in the preliminary engineering design phase. The addition of stairwell pressurization to existing stairs would provide consistent life safety protection throughout the entire facility.
- Existing Engineered Smoke Control System (ESCS)
  - An engineered smoke control system consisting of 77 zones serves NWQ-A and NWQ-B along with the 1982 portion of NWQ-C. The ESCS was installed in the mid 1980’s as an authorized alternative to upgrading deficiencies in the integrity of existing vertical openings such as fire rated shafts, fire separations and smoke separations. In lieu of maintaining this system in force, remove the ESCS under this project. Include the following life safety upgrades:
    - Add wet sprinklers to all spaces presently not protected
    - Elevator upgrades
- Upgrade fire alarm, IT, telecom, and security systems
- Upgrade exit and egress lighting systems
- Add fire extinguishers throughout the facility
- De-commission the ESCS
- Change occupancy classification from “I-2” to “B”
  ○ The International Existing Building Code allows removal of the ESCS without upgrading existing vertical openings if the building is fully sprinkled and the occupancy is changed to “B” classification. All new vertical openings shall be protected in accordance with current IBC requirements.

**Equipment Sizing**
  ○ All sizes and capacities listed in this narrative are approximate values used for cost budgetary purposes only.

**SPACE DESIGN TEMPERATURES:**
- Indoor design temperature and humidity criteria for all occupied spaces:
  ○ Winter: 70°F and 25% RH during occupied mode and 60°F during unoccupied mode.
  ○ Summer: 75°F and 50-55% RH during occupied mode; 85°F during unoccupied mode.

**MECHANICAL UPGRADES FOR SURGE SPACES IN NWQ-A AND NWQ-D:**
Surge spaces represent 166,000 GSF in NWQ-A and 86,000 GSF in NWQ-D of existing unoccupied space. Minor remodeling is planned by campus in the future to allow these spaces to be fully occupied on a temporary basis until major redevelopment projects are implemented.

As part of the Selective Facility Renewal Project, the following existing mechanical equipment in NWQ-A and NWQ-D must be inspected, calibrated, cleaned, repaired and commissioned as needed to make sure that it is fully functional in each room for all anticipated surge spaces:
- Pneumatic room thermostats.
- Pneumatic control valves serving heating and cooling terminal units.
- Steam traps serving steam heating terminal units.
- VAV box controls and dampers.
- Circulating fans located in heating and cooling terminal units.
- Controls and operational condition of associated air handling unit serving the spaces.
- Filter replacements in fan coil units unit ventilators, and air handling units.
- Clean all air terminals, heating terminals, and air handling units.
- Clean all existing ductwork and coils.
- Replace all fan belts for HVAC equipment.
- Lubricate all motors serving HVAC equipment.
- Repair and replace defective components for inoperable air handling units and HVAC equipment.
- Test, balance, and commission the existing air handling systems.

Existing air handling units serving spaces in NWQ-A and NWQ-D are tabulated on the “NWQ Selective Facility Renewal – Air Handler System Chart”.

Testing of all existing HVAC equipment serving surge spaces is recommended, early in the preliminary engineering phase, in order to identify all defective system components.

**DE-COMMISSIONING OF EXISTING ENGINEERED SMOKE CONTROL SYSTEM (ESCS)**
After the life safety and fire protection upgrades have been made to the building and the occupancy is changed to “B” classification, de-commission the existing ESCS serving NWQ-A and NWQ-B. This includes the following scope of work:
- Remove the four electro-pneumatic valve control panels located in the first floor of the energy center which send pneumatic control signals to the 77 smoke zones.
**Table 6.4.5.1. Existing Air Handling Systems to be Removed**

<table>
<thead>
<tr>
<th>AHU No.</th>
<th>Floors Served</th>
<th>Unit Type - Constant Volume</th>
<th>Install Date</th>
<th>AHU CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>S22</td>
<td>B thru 5</td>
<td>Dual Duct, 100% Outside Air</td>
<td>1966</td>
<td>57,450</td>
</tr>
<tr>
<td>S23</td>
<td>Partial Ground</td>
<td>Hot Water Reheat, 100% Outside Air</td>
<td>1966</td>
<td>18,755</td>
</tr>
<tr>
<td>S24</td>
<td>1 thru 5</td>
<td>100% Outside Air Serves Induction Units</td>
<td>1966</td>
<td>11,330</td>
</tr>
<tr>
<td>S25</td>
<td>1 South</td>
<td>Hot Water Reheat, 100% Outside Air</td>
<td>1966</td>
<td>4,110</td>
</tr>
<tr>
<td>S26</td>
<td>Basement SE</td>
<td>VAV Hot Water Reheat</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>S41</td>
<td>6 &amp; 7 Interior</td>
<td>Hot Water Reheat</td>
<td>1982</td>
<td>13,500</td>
</tr>
<tr>
<td>S42</td>
<td>6 &amp; 7 Exterior</td>
<td>Serves Induction Units</td>
<td>1982</td>
<td>3,800</td>
</tr>
<tr>
<td>S43</td>
<td>7 South</td>
<td>Hot Water Reheat</td>
<td>1982</td>
<td>5,100</td>
</tr>
<tr>
<td>S48</td>
<td>Partial Ground</td>
<td>Hot Water Reheat</td>
<td>1986</td>
<td>14,000</td>
</tr>
<tr>
<td>S51</td>
<td>2 South</td>
<td>Hot Water Reheat</td>
<td>1993</td>
<td>1,900</td>
</tr>
<tr>
<td>S52</td>
<td>Partial B &amp; G</td>
<td>Hot Water Reheat</td>
<td>1993</td>
<td>4,800</td>
</tr>
</tbody>
</table>

- Remove associated pneumatic tubing.
- Remove actuators from all smoke dampers associated with the system and lock dampers in the wide open position.
- Evaluate and review removal of PE switches and door hold open devices with DFD and campus for selective removal.
- Remove PE switches for fan shut down during a smoke condition.
- Remove PE switches for fan start-up during a smoke condition.

**CORE AND SHELL UPGRADES FOR NWQ-B**

- **General**
  - All spaces within NWQ-B will be vacated during the construction period to facilitate remodeling work. Portions of NWQ-A, NWQ-C and NWQ-D will remain occupied during construction.
  - See Architectural Section (6.4.1.) for:
    - Proposed building envelope thermal performance improvements.
    - Proposed new penthouse

- Demolition of Existing Equipment in NWQ-B
  - Include demolition of all existing mechanical equipment, ductwork, piping, air terminal units, heating terminal units, and controls presently serving NWQ-B. Include removal of the existing air handling systems (Table 6.4.5.1.)

**DESCRIPTION OF NEW HVAC WORK IN NWQ-B**

- **Air Handling Systems**
  - Provide new air handling units in the penthouse connected in a manifold duct arrangement providing 240,000 CFM supply air capability to all spaces in NWQ-B. One or more units will operate continuously providing cooling and ventilation for spaces requiring 24/7/365 occupancy.
  - Typical unit sizes:
    - AH-1: 54,000 CFM total with 16,000 CFM outside air
    - AH-2: 54,000 CFM total with 16,000 CFM outside air
    - AH-3: 41,000 CFM total with 13,000 CFM outside air
    - AH-4: 41,000 CFM total with 13,000 CFM outside air
    - AH-5: 50,000 CFM total with 14,000 CFM outside air
Features of each unit:
- MERV-14 final filters
- Supply fan with fan array using direct drive plenum fans with variable speed drives
- UV Lights
- Chilled water coil
- Filter rack
- MERV-7 pre-filters
- Section for future glycol heat reclaim coil to accommodate heat recovery from future wet-lab fume exhaust system
- Pumped hot water pre-heat coil
- Outside air, return air, and relief air control dampers
- Hot water and chilled water control valves
- Air flow measuring stations for outside air, supply air, and return air streams
- Air blenders in mixed air stream to reduce stratification
- Access sections
- Inlet plenum
- Return fan with variable speed drive
- Duct mounted supply and return sound attenuators
- Intake and discharge isolation dampers

**Exhaust Systems**
- Include the following new exhaust systems serving NWQ-B:
  - Two general exhaust fans located in the penthouse providing the capability of 16,000 CFM general exhaust each for NWQ-B (32,000 CFM total). Include the following features:
    - Centrifugal fan controlled by variable speed drive.
    - Duct mounted sound attenuator.
- If wet-labs are included as part of the future Teaching and Learning redevelopment project, the future project will include a roof mounted 30,000 CFM lab exhaust dilution fan system,
- **Air Terminals**
  - Other portions of the narratives include finish-out of all spaces with new variable air volume reheat air terminals, associated ductwork, hot water piping, modulating 2-way control valves with electric actuators, room temperature sensors and DDC controls.
- **Heating Terminals**
  - Other portions of the narratives include finish-out of all exterior spaces with perimeter hot water fin radiation with two way modulating control valves for zone temperature control.
- **Stairwell Pressurization Fans**
  - Replace five existing stairwell pressurization fans with new fans controlled by variable speed drives. Each fan has a capacity of approximately 5,000 CFM. Replace all existing associated controls.
  - Provide tempered make-up air heating for each fan system.
- **Pressurization Fan for Red Elevator Lobbies**
  - Replace one existing pressurization fan located on the roof of the red elevator machine rooms which provides positive or negative air pressure in the red elevator lobbies. Replace existing control dampers and provide new DDC controls. Provide new variable speed drive for controlling the fan speed. Fan has a capacity of 5,100 CFM. Replace all existing associated controls.
  - Provide tempered make-up air heating for each fan system.
- **New HVAC Main Risers in NWQ-B**
  - The extent of lab fume exhaust will be confirmed in the design phase.
  - Shaft No. 1:
    - Ductwork installed to accommodate future Lab Fume Exhaust: 28,000 CFM
      - 60” x 36” (Ground Floor to Roof of Penthouse)
o Ductwork installed to accommodate future Lab Fume Exhaust: 1,000 CFM
  - 14” diameter (Second Floor to Roof of Penthouse)

o Ductwork installed to accommodate future Lab Fume Exhaust: 1,000 CFM
  - 14” diameter (Third Floor to Roof of Penthouse)

o Shaft No. 2:
  - Supply Ductwork – 108,000 CFM – 84” x 78” (Basement to Penthouse)
  - Return Ductwork – 100,000 CFM – 84” x 78” (Basement to Penthouse)
  - Hot Water Supply & Return Piping: - 900 GPM – Size 8” (Basement to Penthouse)
  - Chilled Water Supply & Return Piping: - 1800 GPM – Size 10” (Basement to Penthouse)

o Shaft No. 3:
  - Supply Ductwork – 82,000 CFM – 84” x 60” (Basement to Penthouse)
  - Return Ductwork – 76,000 CFM – 84” x 60” (Basement to Penthouse)

o Shaft No. 4:
  - Supply Ductwork – 50,000 CFM – 84” x 36” (Basement to Penthouse)
  - Return Ductwork – 43,000 CFM – 60” x 48” (Basement to Penthouse)

o Shaft No. 5:
  - General Exhaust – 16,000 CFM – 36” x 36” (Basement to Penthouse)

o Shaft No. 6:
  - General Exhaust – 16,000 CFM – 36” x 36” (Basement to Penthouse)

• Main Air Distribution Systems in NWQ-B:
  o Air distribution systems include the following:
    - New sheet metal ductwork.
    - Corrosion resistant fume exhaust ductwork.
    - Ceiling plenum returns.
    - Provide fire/smoke dampers at each branch duct on each floor (except for lab fume exhausts). Cap main duct branches. Future projects will extend ductwork to future finished spaces. All existing spaces to remain will be backfed.
    - Provide 3” capped hot water branch valves serving each floor.
    - Provide 2-hour fire rated insulation covering each lab fume exhaust riser ductwork (creating an independent fire rated enclosure for the riser).
    - Other portions of the narratives indicate extending ductwork piping and controls to finished spaces.
    - For horizontal distribution, see mechanical narratives in Surge Build-out (6.5.4.), School of Information Studies Program Statement/Pre-Design, College of Health Sciences Program Statement/Pre-Design, College of Nursing CHTS Program Statement/Pre-Design, and Restaurant Operations Town Square Program Statement/Pre-Design.

**AIR HANDLING UNIT UPGRADES IN NWQ-C AND D:**
• Air Handling Unit S29
  o Floors 2 through 5 in NWQ-D are served by air handling unit S29 located in Floor 5 equipment room. S29 was installed in 1977 and is in fair condition. It is a built up air handling unit with VAV supply and return fans using vane axial variable pitch in motion fans having a capacity of 38,340 CFM. S29 does not have a preheat coil because it was designed using shut-off type VAV boxes serving the conditioned spaces which was a common design strategy in the late 1970’s. The VAV boxes are allowed to fully close when the room thermostat does not call for cooling.
  o The following HVAC upgrades are necessary for existing air handling unit S29:
- Replace controls with new direct digital controls.
- Add hot water preheat coil.
- Replace existing chilled water cooling coil and chilled water control valve.
- Replace supply and return fans (vane axial variable pitch only; centrifugal fans may be reused and refurbished with new bearings if they are of the proper size and capacity).
- Add variable frequency drives for fans.
- Replace filter housing and filters.
- Increase capacity to 45,000 CFM.

**Air Handling Unit S30**
- The old incinerator/boiler room in the basement of NWQ-D is ventilated by a 6,000 CFM heating only air handling unit and return/relief fan suspended from the ceiling structure. S30 was installed in 1977 and is in poor condition. Replacement of this system is needed because the new central hot water heating system is planned for this room.

**Air Handling Unit S31**
- The main mechanical room in the basement of NWQ-D is ventilated by a 4,500 CFM heating only air handling unit suspended from the ceiling structure. S31 was installed in 1977 and is in poor to fair condition. Replacement of this system is needed because it is over 35 years old and has exceeded its useful life expectancy. An exhaust fan serving the main electrical room with 5,400 CFM capacity also needs replacement.

**New Air Handling Unit Serving the Basement of NWQ-D**
- Under project 12C2U, air handling unit S28 located on the ground floor will be removed. It presently serves portions of the ground floor and first floor. The airflow load will be shifted to new air handling unit S27. The majority of the spaces in the basement presently served by air handling unit S27 need to shift to a new air handling unit serving the basement storage areas which will also ventilate the mechanical and electrical rooms by transfer air. This new unit replaces existing units S30 and S31 and includes the following features:
  - Variable air volume application with VAV reheat air terminals
  - 10,500 CFM system capacity
  - Supply and return fans with variable speed drives
  - Transfer fans for mechanical rooms
  - New exhaust fan for electrical room
  - Chilled water coil
  - Filter rack
  - MERV-7 pre-filters and MERV-14 filters
  - Pumped hot water pre-heat coil
  - Outside air, return air, and relief air control dampers
  - Hot water and chilled water control valves
  - Air blenders in mixed air stream to reduce stratification
  - Access sections
  - Inlet plenum

**Air Handling Unit S32**
- The skywalk from the parking structure to the main entry of NWQ-D is heated, cooled, and ventilated by a 3,600 CFM air handling unit located in a small mechanical room adjacent to the skywalk. S32 was installed in 1977 and is in poor to fair condition. Replacement of this system is needed for surge occupancy moving forward.
- Features of the new air handling unit include:
  - Single zone variable air volume application
  - 4,000 CFM system capacity
  - Supply fan with variable speed drive
  - Relief fan with variable speed drive
  - Chilled water coil
  - Filter rack
- MERV-7 pre-filters and MERV-14 filters
- Pumped hot water pre-heat coil
- Outside air, return air, and relief air control dampers
- Hot water and chilled water control valves
- Air blenders in mixed air stream to reduce stratification
- Access sections
- Inlet plenum

• Air Handling Unit S50
  ○ Floors 6, 7, and 8 of NWQ-D are served by air handling unit S50, installed in 1991, located in the penthouse equipment room. The unit is presently not running, but in general it is in good condition. It is a built up air handling unit with 50,000 CFM VAV supply and return fans using variable frequency drives for speed control of the fans. A hot water preheat coil is located upstream of the chilled water cooling coil.
  ○ The following HVAC upgrades are necessary for existing air handling unit S50:
    - Replace controls with new direct digital controls.
    - Replace existing variable frequency drives serving the supply and return fans.

• Air Handling Unit S55
  ○ The third floor of NWQ-C is presently served by a dedicated air handling AHU-S55, installed in 1993, located in the second floor mechanical room with a 23,000 CFM air flow capacity. Existing AHU-S55 will be used and upgraded as follows:
    - Replace controls with new direct digital controls.
    - Replace existing variable frequency drives serving the supply and return fans.

ROOMS REQUIRING SUPPLEMENTAL COOLING
For rooms in NWQ-A, NWQ-B, NWQ-C and NWQ-D with high internal heat gains such as server rooms and telecom rooms, provide ductless split cooling systems.

LOW PRESSURE STEAM SYSTEM
- Extend low pressure steam piping to the following equipment:
  ○ New steam heat exchanger
  ○ New domestic water heaters

CENTRAL HOT WATER HEATING SYSTEMS:
- Provide a new central hot water heating system serving NWQ-D consisting of the following equipment:
  ○ Steam to water shell and tube heat exchangers. The heating hot water is used for terminal heating units (i.e.- unit heaters, cabinet unit heaters, convectors, fin radiation, reheat coils). Size heat exchanger for 8,000,000 BTU/Hour.
  ○ Two (2) variable speed circulating pumps, reheat coils, finned tube radiation units, unit heaters, distribution piping, valves, and system accessories. Size each pump for 550 GPM.
  ○ Low pressure steam piping connected to campus steam.
  ○ Duplex steam condensate pumps for returning steam condensate to the campus central plant.
- Locate the new equipment in the existing mechanical room in the basement where the old incinerator and boiler is located. Remove all existing work associated with the incinerator and boiler including its 21” diameter flue stack breaching, gas piping and condensate pumps.
- Remove the three existing hot water heating systems installed in NWQ-D located in mechanical rooms in the basement, fifth floor, and penthouse. Extend new riser piping from the new system to back-feed the three existing systems. After removing the incinerator flue stack, use this shaft for running hot water riser piping throughout the building.
- Provide a new central hot water heating system serving NWQ-B consisting of the following equipment:
  ○ Steam to water shell and tube heat exchanger. The heating hot water is used for terminal heating units (i.e.- unit heaters, cabinet unit heaters, convectors, fin radiation, reheat coils). Size heat exchanger for 13,000,000 BTU/Hour.
  ○ Two (2) variable speed circulating pumps, reheat coils,
finned tube radiation units, unit heaters, distribution piping, valves, and system accessories. Size each pump for 900 GPM.
- Low pressure steam piping connected to campus steam.
- Duplex steam condensate pumps for returning steam condensate to the campus central plant.

- Locate the new equipment in the existing main mechanical room in the basement room B410.
- Provide two way control valves for all new heating coils and heating terminals. Provide new hot water cabinet unit heaters for all areas with high heat loss rates.
- Other redevelopment projects will include new central hot water heating systems for the following areas of the building:
  - NWQ-A - School of Education
  - NWQ-C - Restaurant Operations Central Kitchen

**CAMPUS CHILLED WATER SYSTEM**
UWM campus chilled water was connected to the NWQ under DFD project 11A3M. Extend new chilled water piping to all new air handling units and terminals requiring chilled water. All chilled water terminal units are provided with modulating 2-way control valves with electric actuators, room temperature sensors and DDC controls. Campus chilled water is not available during winter months.

**TEMPERATURE CONTROL SYSTEM**
The existing NWQ is served from a combination of pneumatic and direct digital control (DDC) system. Reuse existing pneumatic controls for surge spaces. Where new controls are called for in the narrative, provide DDC controls with open-protocol (BAC net) communication, not JCI N2. All new equipment and systems will be equipped with compatible devices and fully integrated into the existing campus JCI building automation system (BAS).

**EMERGENCY POWER FOR HVAC EQUIPMENT:**
- Serve the following HVAC equipment from the emergency power system:
  - Temperature control system
  - New hot water heating pumps
  - Duplex condensate pumps
  - Ductless Split Cooling Systems
  - Stairwell and elevator lobby pressurization systems

### 6.4.6. Electrical Systems

**High Rise Construction**
- Since there are no fire walls presently constructed separating the NWQ-A, NWQ-B, NWQ-C and NWQ-D portions of the building, the Department of Safety and Professional Services considers these areas as one high rise building. Existing stairs in NWQ-B and NWQ-D have pressurization ventilation systems for keeping smoke out of the stairwells during a fire condition. The International Existing Building Code does not require adding similar systems for NWQ-A and NWQ-C.

**Existing Engineered Smoke Control System (ESCS)**
- An engineered smoke control system consisting of 77 zones serves NWQ-A and NWQ-B along with the 1982 portion of NWQ-C. The ESCS was installed in the mid 1980’s as an authorized alternative to upgrading deficiencies in the integrity of existing vertical openings such as fire rated shafts, fire separations and smoke separations. In lieu of maintaining this system in force, remove the ESCS under this infrastructure upgrade. Include the following life safety upgrades:
  - Add wet sprinklers to all spaces presently not protected
  - Elevator upgrades
  - Upgrade fire alarm, IT, telecom, and security systems
  - Upgrade exit and egress lighting systems
  - Add fire extinguishers throughout the facility
  - De-commission the ESCS
  - Change occupancy classification from “I-2” to “B”
- The International Existing Building Code allows removal of the ESCS without upgrading the vertical openings if the
building is fully sprinkled and the occupancy is changed to “B” classification.

Equipment Sizing Criteria:

- **Secondary Design Voltages**
  - Motors 1/2 hp and larger 480V, 3 phase, 3 wire
  - General Lighting 277V, 1 phase, 2 wire
  - Receptacles, Motors less than 1/2 hp and Specialty Lighting 120V, 1 phase, 2 wire

- **Equipment Sizing Criteria**
  - **Branch Circuit Load Calculations**
    - Lighting Actual Installed VA
    - General Purpose Receptacles 180 VA per outlet
    - Multiple Outlet Assemblies 180 VA per 2'-0"
    - Special Outlets Actual Installed VA of Equipment Served
    - Motors 100% of Motor Full Load Amps
  - **Demand Factors**
    - Demand factors below are NEC calculation. Historical data of similar facilities shall be considered during design.
    - Lighting 100% of Installed VA
    - Receptacles 100% of First 10 kVA Installed plus 50% of Balance
    - Motors 100% of Total Motor Full Load Amps
    - Dedicated Receptacles 100% of Total VA and Fixed Equipment Installed
  - **Minimum Bus Sizes**
    - 480Y/277V Equipment / Lighting Panels -100A
    - 208Y/120V General Receptacle Panels -100A

Distribution Equipment Nomenclature:

- Provide new nameplates for all existing Low Voltage distribution equipment including all distribution circuit breakers which receive nameplates. Provide information per DFD standards and utilize new NWQ room numbers.
- Provide temporary printed labels for all existing equipment indicating old Columbia - St. Mary’s Hospital designations to help UWM personnel identify equipment as the system is upgraded and replaced.
- Nomenclature shall be Floor, Building / Branch of Power, Voltage, Sequence. An example of panel nameplates are as follows:
  - GC/NLA – Branch Panelboard, Ground, NWQ-C, Normal Power, 208Y/120V, 3P, 4W, First Panel. A subsequent panel would be GC/NLB.
  - 9B/QHB – Branch Panelboard, Floor 9, NWQ-B, Equipment Power, 480Y/277V, 3P, 4W, Second Panel. There would be a panel 9B/QHA on the floor already.
  - MSB/GDNLA – Main Switchboard, Ground, NWQ-D, Normal Power, 208Y/120V, 3P, 4W, First Switchboard. A subsequent switchboard would be MSB/GDNLB.
  - T/GCNLA – Transformer serving GC/NLA.

Nomenclature definitions are as follows:

- **Floor Designations:**
  - Basement – B
  - Ground – G
  - Floor 1 – 1
  - Floor 2 – 2
  - Floor 3 – 3
  - Floor 4 – 4
- Floor 5 – 5
- Floor 6 – 6
- Floor 7 – 7
- Floor 8 – 8
- Floor 9 – 9
- Penthouse – P

○ Building Designations
  - NWQ-A – A
  - NWQ-B – B
  - NWQ-C – C
  - NWQ-D – D
  - NWQ-E – E
  - NWQ-F – F
  - NWQ-G – G

○ Branches of Power:
  - Normal – N
  - Emergency, Generator – G
  - Emergency, Article 700 – E
  - Emergency, Article 701/702 – Q

○ Voltages:
  - 480V, 3 Phase, 3 Wire – H
  - 480Y/277V, 3 Phase, 4 Wire – H
  - 208Y/120V, 3 Phase, 4 Wire – L

○ Sequence:
  - A, B, C, D, etc. as required to provide unique identifier.

General:
- All spaces within NWQ-B will be vacated during the construction period to facilitate remodeling work. Portions of NWQ-A, NWQ-C and NWQ-D will remain occupied during construction.

Normal Power Service and Distribution:
- Demolition – NWQ-B Core and Shell Upgrade
  ○ The scope of the NWQ-B upgrade is to remove all 480V and 208V, normal and emergency distribution located within the NWQ-B. The intent is to create distinct segregation between the various NWQ building areas for both normal and emergency power. New substations are intended to be provided for each building with future construction project using their respective substation.
  ○ The area currently known as the NWQ-B generally occupies the area formerly known as the West Wing of Columbia - St. Mary’s Hospital. NWQ-B was constructed in two phases, Floors B-5 and 6-9. The distribution equipment in NWQ-B, Room G399A served Floors B-5, and parts of Floors 6-9. The majority of the loads on Floors 6-9 are served from the 2nd floor substations of NWQ-C, or the former Columbia - St. Mary's Ancillary / Clinical Building. Demolition of the NWQ-B distribution will require removal of the feeders originating in NWQ-C as well as NWQ-B.
  ○ There are likely loads which are geographically in other NWQ areas but are fed from NWQ-B equipment. This equipment is to be either fed from alternate sources or temporarily fed from the new NWQ-B distribution equipment, to be fed from respective building equipment at a future time. These crossover areas are most likely along the South West area adjacent to NWQ-C, or the former Clinical / Ancillary Building of Columbia - St. Mary’s Hospital.

- System Description – NWQ-B Core and Shell Upgrade
  ○ Provide a new normal power primary, emergency power and signal ductbank system from West side of NWQ-E to Basement of NWQ-B, at approximate location of Storage Room B495. Refer to attached site plan.
  ○ Provide two new rooms in Storage B495 at North exterior wall, telecommunications and emergency power. Terminate signal and emergency ductbanks at respective rooms. Primary ductbank shall stop at manhole.
  ○ Room G399A.
- Subsequent to demolition, substation SG/FKEA will be the only equipment remaining in the room. Clean and test SG/FKEA.

- Provide a new 3000A, 480Y/277V, 3P, 4W substation USS/BGNHA. Substation shall have a 2000kVA liquid filled transformer (biodegradable oil), solid state circuit breakers, front and rear access. Feed from SG/FKEA. Switchboard shall have (2) levels of Ground Fault, main and any circuit breakers over 250A.

- Provide a new 1200A, 480Y/277V, 3P, 4W bus duct fed from USS/BGNHA to serve Floors G-8. The Basement will not utilize bus duct.

- Basement Substation Room
  - Substation SG/FKWA shall remain. Clean and test SG/FKWA.

- Basement Distribution
  - Provide (2) electrical rooms in the Basement. Rooms shall contain lighting and receptacle panelboards as required to serve the Basement.
  - Provide new panelboards and feeders to mechanical equipment as required.

- Electrical Rooms Floors G-8
  - Provide a core electrical room on Floors G-8 to create a riser stack in the NWQ-B.
  - Size of core electrical shall be a minimum 10’x12’. Equipment in electrical room would ultimately be a Normal Power 480Y/277V, 3P, 4W bus duct riser, an Article 700 Emergency 480Y/277V, 3P, 4W bus duct riser, (1) 480V, 3P, 3W -208Y/120V, 3P, 4W transformer, (1) 208Y/120V, 3P, 4W distribution panel, (3) 208Y/120V, 3P, 4W panelboards, and (1) 480Y/277V, 3P, 4W Article 700 Emergency panelboard. See sketch below.
  - Utilize Normal bus duct to feed transformer and Emergency bus duct to feed Emergency panelboard.
  - Future renovations shall utilize provided panelboards.
  - Note that work on individual floors may be performed in phases to accommodate occupancy of upper floors. Provide bus duct up to highest floor of renovation. Future renovations shall then connect new length of bus duct to serve remainder of floors.

- Penthouse
  - Provide an 800A, 480Y/277V, 3P, 4W normal power distribution panel to serve mechanical equipment. Serve from USS/BGNHA.
  - Provide a 600A, 480Y/277V, 3P, 4W Article 701/702 power distribution panel to serve mechanical

Figure 6.4.6.1. Typical NWQ-B Core Electrical Room
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- Provide 208Y/120V, 3P, 4W transformer and branch panelboards as required for Normal and Equipment power.

- System Description – NWQ-A, NWQ-C, NWQ-D Life Safety / Mechanical Upgrades
  - Provide connections to mechanical equipment as required. Serve from existing distribution equipment.
  - Existing distribution equipment and receptacles shall be reused for NWQ-A Surge occupancy.

- Equipment and Material
  - Switchboards shall be front access only, deadfront construction utilizing electronic solid state circuit breakers and copper bus bars. All switchboards shall be fully rated for the available short circuit current. All equipment shall be provided with copper ground busses. The capacity of the equipment shall be sufficient for an additional 25% future connected load.
  - Power distribution panelboards shall be deadfront construction utilizing thermal magnetic circuit breakers and copper bus bars. All panels shall be fully rated for the available short circuit current. All trims shall be door in door type. All panels shall be provided with copper ground busses. The capacity of the panels shall be sufficient for an additional 10% future connected load. Feeder circuit breaker space shall be provided for the addition of 10% future circuit breakers.
  - Branch circuit and lighting panelboards shall be deadfront construction utilizing thermal magnetic circuit breakers and copper bus bars. All panels shall be fully rated for the available short circuit current. All trims shall be door in door type. The panelboard connected load shall be limited to provide an additional 10% future connected load. The panelboards shall contain 10% spare 20A branch circuit breakers, and space for the addition of 10% future circuit breakers.

- Distribution
  - Raceway for feeders and branch circuits less than 600V shall be metallic, electrical metallic tubing (EMT) subject to the restrictions of the National Electrical Code, minimum size 1/2”. EMT shall not be used in concrete construction or where subjected to mechanical damage.
  - 600-volt feeders shall be single conductor, aluminum or copper 600-volt rated with XHHW, XHHW 2, or THHW insulation, feeders shall be color coded using color type at all connections and in all pull and junction boxes.
  - Aluminum feeder conductors shall be allowed per DFD Guidelines. Only where compression termination can be used. No mechanical lugs will be accepted. All distribution equipment enclosures shall be sized to accommodate these compression lugs. If compression lugs cannot be used, then copper conductors are only allowed.
  - All feeders shall be installed in conduit.
  - Branch circuit conductors shall be single conductor copper 600-volt rated with THWN or THHN insulation with continuous color-coding. Branch circuits shall utilize dedicated neutrals.
  - Point-of-use power connection devices shall include power receptacles, furniture connections, and other equipment connections as required.
  - Elevators, machine rooms and shafts are receiving full modernization upgrades. Scope of work shall be as follows:
    - Add shunt trip capability by adding an elevator power module panelboards.
    - Add receptacles to machine rooms and hoistway shafts.
    - Correct elevator feeders as required to have proper sizing and grounding.
    - Add panelboards serving elevator related loads.
    - Provide power connections to new HVAC and plumbing equipment.
    - All elevators and related equipment shall be served from Emergency Equipment branch.
Emergency Service and Distribution:
- **System Description – NWQ-B Core and Shell Upgrade**
  - Create new Emergency Electrical Room in Storage B495 adjacent to the existing Substation room. Provide the following equipment:
    - (1) 800A, 480Y/277V, 3P, 4W closed transition transfer switch to create the NWQ-B Article 701/702 Branch. Feed emergency side DP/BBGHA. Feed normal side from USS/BGNHA.
    - (1) 800A, 480Y/277V, 3P, 4W distribution panelboard DP/BBQHA for Article 701/702 distribution.
    - (1) 400A, 480Y/277V, 3P, 4W closed transition transfer switch to create the NWQ-B Article 700 Branch. Feed emergency side DP/BBGHA. Feed normal side from new USS/BGNHA.
    - (1) 400A, 480Y/277V, 3P, 4W distribution panelboard DP/BBEHA for Article 700 distribution.
    - (1) 600A, 480V, 3P, 3W closed transition transfer switch to create a NWQ-B Article 701 Elevator Branch. Feed emergency side DP/BBGHA. Feed normal side from USS/BGNHA. Re-feed existing panelboard 8B/ELEVDP.
  - Provide room for future installation of Emergency Distribution Equipment to serve NWQ-D. Equipment shall be identical to equipment listed above in addition to a 150kVA, Article 700, transformer.
  - Provide a 400A bus duct from new 480Y/277V, 3P, 4W Article 700 panelboard routed up to new electrical rooms on Floors G-8.
  - See Normal Power System description for additional panelboard requirements within specific rooms.
- **System Description – NWQ-A, NWQ-C, NWQ-D Life Safety / Mechanical Upgrades**
  - Provide connections to mechanical equipment as required. Serve from existing distribution equipment.
  - Existing distribution equipment and receptacles shall be reused for NWQ-A Surge occupancy.
- **Equipment and Material**
  - See normal power system description for additional information on equipment construction.
- **Distribution**
  - The entire emergency power distribution system shall consist of conduit and wire. See normal power system description for additional information.
  - Feeders and branch circuit wiring to emergency loads shall be in a dedicated raceway for each branch of the emergency system.

Grounding System
- **System Description**
  - A complete equipment grounding system shall be provided such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and all other conductive items operate continuously at ground potential and provide a low impedance path to ground for possible fault currents. All grounding system connections shall be made using compression, mechanical, or exothermic welds.
  - Bonding jumpers shall be provided as required across pipe connections to water meters, dielectric couplings in a metallic cold water system, and across expansion/deflection couplings in conduit and piping systems.
  - A separate insulated green grounding conductor shall be provided for each single and 3 phase feeder and branch circuit. Grounding conductor shall be run with the related phase and neutral conductors. Panel feeders installed
in more than (1) raceway shall have individual, full sized, green grounding conductor in each raceway. The equipment grounding system shall not rely on the metallic raceways for grounding continuity.

• Equipment and Material
  ○ An existing wall-mounted copper ground bus exists in Room G399A. Increase size of ground bus by a minimum of 48”.

• Distribution
  ○ Provide a 24” ground bar in each new electrical room. A separate, insulated #4/0 AWG ground wire shall be provided from the main electrical room ground bus to each floor’s electrical room ground bus.
  ○ The main service entrance neutral shall be bonded to the system ground bar within the switchboard by a removable bus bar link.
  ○ A code-sized, unbroken bond leader shall connect the electrical room ground bar to the XO terminal of local transformers.
  ○ A bare copper, grounding electrode conductor shall be extended to all existing voice/data room ground bars.

Lightning Protection System – Franklin System

• System Description – NWQ-B Core and Shell
  ○ Provide a UL master labeled class II lightning protection system consisting of dedicated lightning protection ground rods, down conductors, air terminals, and all interconnecting conductors on the NWQ-B.

• Design Criteria
  ○ Lightning protection system shall be installed in compliance with NFPA 780 – Installation of Lightning Protection Systems.

• Air Terminals
  ○ Provide air terminals spaced a maximum of 20’ apart along the perimeter of the protected structure.
  ○ Provide intermediate air terminals with air terminal point protectors and spring mounted bases to protect flat sections of roof.
  ○ Interconnect all metal protrusions through roof, including exhaust fans, ductwork/AHUs, and plumbing vents.

• Down Conductors
  ○ Provide a minimum of two down conductors. Provide additional down conductors such that the distance following the perimeter of the NWQ-B does not exceed 100’ between down conductors.
  ○ Provide concealed, continuous down conductors installed in schedule 40 PVC conduit through the interior of the building.

• Grounding connections
  ○ Each down conductor shall have at least one dedicated ground rod installed.
  ○ The lightning protection system shall be bonded to the each electrical room ground bar at a minimum of two locations each.

• Equipment and Material
  ○ All equipment shall be copper, and equivalent to class II products manufactured by National Lightning Protection or equal.

Lightning Systems

• System Description – NWQ-B Core and Shell
  ○ Provide light fixtures in spaces to meet minimum levels. Fixtures shall be controlled via ceiling mounted occupancy sensors.
  ○ Provide egress lighting and exit signs to meet minimum requirements.
  ○ Basement will not have all walls removed as part of the demolition, only certain areas. Entire Basement will likely have all ceilings removed where ceilings existing. Intent is to remove all existing lighting and controls, and replace

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with new light fixtures and controls to meet code. Paths of egress shall have code required illumination levels and exit signage.

**System Description – NWQ-A, NWQ-C, NWQ-D Life Safety / Mechanical Upgrades**

- A change of occupancy requires the upgrade existing egress lighting and exit signs in all existing interior and exterior paths of egress to meet Code requirements. No work is required in NWQ-D as it is not changing occupancy, it is currently “B” occupancy classification. The remainder of the NWQ-C which is not Child Care will be changed to “B” occupancy classification. This requires all the remaining existing paths of egress including the entire NWQ-A to be upgraded.

- Replace and / or provide new exit signs as required per Code.

- Re-feed existing interior and exterior normal power light fixtures from adjacent emergency circuits as required to achieve Code required egress lighting levels.

- Elevators, machine rooms and shafts are receiving full modernization upgrades. Add/upgrade lighting in shaft, machine rooms, and corridor outside elevator doors.

**Design Criteria**

- All new lighting shall be hung from the building structure independently of ceiling support system including all grind mounted fixtures. All lighting fixtures shall be complete with T8, T5, or T5HO lamps, electronic ballasts, hangers, lenses, etc. 8′ 0″ fluorescent lamps will not be allowed.

- Lighting shall be 277V fluorescent or LED. Incandescent lighting will not be used.

- The style of light fixtures shall be as follows:
  - Fixtures in utility spaces shall be lensed type recessed fluorescent fixtures where a ceiling is present and industrial type suspended fluorescent fixtures where a ceiling is not present.
  - All lighting levels will conform with the Illuminating Engineering Society’s recommendations and in general, shall be as follows in footcandles (FC). Actual ambient levels may be adjusted due to power density considerations and supplemented with task lighting. This will be determined as the project progresses and surface finishes are selected.
    - Support areas (toilet, corridor, stair, storage, mechanical / electrical room): 15 to 20 FC

- Controls will be provided as follows:
  - All areas shall be provided with ceiling-mounted occupancy sensors to automatically control lighting. Sensor shall be provided as follows:
    - Janitor’s closets, small storage rooms, single-occupant toilet rooms: Wall-mounted infrared.
    - Large storage rooms / Shell spaces: Ceiling-mounted infrared.
    - Corridors: Ceiling-mounted dual technology infrared / ultrasonic or microphonic.
  - Mechanical and electrical rooms will controlled via line voltage switches for safety.

6.4.7. Technology Systems

Voice/Data System:

- **System Description – NWQ-B Core and Shell**
  - Provide horizontal voice and data wiring, racks and terminations per DFD and UWM requirements. Generally data outlets will be required for HVAC and plumbing equipment only.
  - All horizontal cabling shall be terminated to existing local Telecommunication Room in the NWQ-B. Provide patch panels and cross connects within existing racks.

- **System Description – NWQ-C and NWQ-D Life Safety / Mechanical Upgrades**
  - Provide horizontal voice and data wiring, racks and terminations per DFD and UWM requirements. Generally
data outlets will be required for HVAC and plumbing equipment only.
- All horizontal cabling shall be terminated to existing local Telecommunication Room in the NWQ-C and NWQ-D. Provide patch panels and cross connects within existing racks.

- Design Criteria
  - Existing Telecommunications Room Risers
    - UWM has created a Telecommunications Room riser in NWQ-B.
    - Project 12B1R has created Telecommunications Room risers in NWQ-C and NWQ-D.
    - The respective floors shall be served from the following rooms as follows:
      - NWQ-B, Basement MDF #B647 – NWQ-A (fiber), NWQ-B (fiber), NWQ-C (fiber), NWQ-D (fiber), NWQ-F (fiber), NWQ-G (fiber)
      - NWQ-B, Ground Floor IDF #G530 – NWQ-B, Floors B, G, 1 (copper)
      - NWQ-B, Floor 3 IDF #3522 – NWQ-B, Floors 2, 3, 4 (copper)
      - NWQ-B, Floor 6 IDF #6415 – NWQ-B, Floors 5, 6, 7 (copper)
      - NWQ-C, Ground Floor IDF #G614 – NWQ-C, Floors B, G, 1 (copper)
      - NWQ-C, Floor 2 IDF #2645A – NWQ-C, Floors 2, 3, 4 (copper)
      - NWQ-D, Basement IDF #B890 – NWQ-D, Floors B, G (copper)
      - NWQ-D, Floor 2 IDF #2999 – NWQ-D, Floors 1, 2 (copper)
      - NWQ-D, Floor 4 IDF #4939 – NWQ-D, Floors 3, 4, 5 (copper)
      - NWQ-D, Floor 7 IDF #7950 – NWQ-D, Floors 6, 7, 8, 9 (copper)
- Raceways and cable tray shall be provided for a complete system within the area of renovation.
- Wire mesh / basket tray shall be provided in all areas designed to have 50 or more cables. Sizing shall plan for an initial maximum calculated fill ratio of 25%. Minimum size shall be 4"x12". Tray design and installation shall be provided in accordance with ANSI/TIA 569-C.
- Minimum raceway size shall be 1" conduit with end bushings and metallic grounding clamps to terminate conduit to accessible ceiling spaces. Conduit pathway design and installation shall be provided in accordance with ANSI/TIA 569-C.
- A flush, two-gang box with plaster ring shall be provided at each voice/data outlet location where located in walls. Wall plates shall be provided.
- Elevators, machine rooms and shafts receiving full modernization upgrades shall receive (1) Cat6 voice line to each elevator controller. Cable shall be routed in conduit. Data conduit pathway design and installation shall be provided in accordance with ANSI/TIA 569-C.

Fire Alarm System:
- General
  - Project 12B1R replaced the existing JCI 2020 system with a new JCI 3030 system. Most existing devices remained and need to be replaced within the respective area of work.
  - Project 12B1R created a Fire Command Center in NWQ-B, Room 1470. This room shall be equipped as a true Fire Command Center as the renovations progress. Coordinate system requirements with all other trades.
  - The existing JCI 3030, two -way voice communication addressable fire alarm system shall be expanded to serve the project area.
  - All devices in project shall be new and compatible with JCI 3030 system.
  - Provide new amplifiers and NAC panels as required under this renovation to serve all new audio/visual devices.
The installation of new devices shall comply with DFD standards as well as all applicable codes listed above.

System shall be integrated into UW Milwaukee Campus Mass Notification system.

**System Description – NWQ-B Core and Shell**
- Provide audio/visual coverage for all finished spaces.
- Provide all new fire alarm devices for Basement and as required for mechanical system upgrades.
- Dual-action manual pull stations shall be installed adjacent to all exit doors, each elevator lobby, and at floor exit stairwells. Pull stations shall have covers.
- Fire fighter phones shall be installed in each elevator lobby.
- Fire fighter phones are not required in the stairwells per the Milwaukee Fire Department (MFD) as the MFD utilizes wireless communications. However, the coverage of the system within the scope of work should be tested. The previously mentioned DAS system would alleviate coverage gaps, but it may not be installed at the time of this project. Coordinate this item with the MFD.

**System Description – NWQ-C and NWQ-D Life Safety / Mechanical Upgrades**
- Provide new fire alarm interface devices as required for mechanical and fire protection systems.
- Elevators, machine rooms and shafts receiving full modernization upgrades shall receive new fire alarm interface modules, smoke and heat detectors as required.

**Design Criteria**
- The fire alarm system shall comply with requirements of NFPA 72, Life Safety Codes and State Building Code.
- Audio/visual devices shall be installed in accordance with the NFPA and ADA guidelines. All areas covered by audible device coverage shall be installed in as required by NFPA 72 and the International Building Code as adopted in Wisconsin. Visual devices shall be installed in those public and common areas as recognized by ADA such as corridors, bathrooms, classroom, laboratories, conference rooms, waiting rooms, break areas, and lobbies. Visual devices shall also be provided in mechanical areas as a supplement to the audible devices.
- Smoke detectors shall be installed as required by the National Fire Protection Association and the International Building Code. Smoke detectors shall be installed in, but not limited to, the following locations: air handling units, elevator shafts, elevator lobbies, elevator machine rooms, and electrical equipment rooms.
- Heat detectors shall be installed in areas that are not suitable for smoke detectors.

**Equipment and Material**
- Remote transponder panels shall be used to provide supervised amplifiers and signal circuits for audio/visual devices and magnetic door holders.
- The system shall utilize individual addressable, photoelectric smoke detectors, heat detectors, addressable manual pull stations, and addressable monitor and control modules. The system shall monitor all sprinkler supervisory and water flow switches and shall interface with elevators, HVAC smoke control, and smoke fire dampers.

**Distribution**
- All initiating and signaling devices shall operate at 24VDC and shall be installed in accordance with manufacturer’s specifications.
- All wiring shall be installed in conduit per DFD Standards.

**Security System:**
- **System Description - NWQ-B Core and Shell**
  - Project 12B1R installed the basic Andover head-end infrastructure for the NW Quad-C and D. This project shall provide the system to serve the areas of renovation and all new interior and exterior doors requiring access control.
  - Wiring, head end equipment and complete security system shall be provided that shall consist of the following items:
- CCTV (Closed Circuit Television)
- Card Readers
- Door Contacts
- Passive Infrared Motion Detectors
- Digital Keypad/Annunciators
- Control/Communicator
- Auxiliary Power Supplies
- Wiring
  ○ System shall be compatible with existing Andover system.

System Description – NWQ-C and NWQ-D Life Safety / Mechanical Upgrades
  ○ Not applicable.

Design Criteria
  ○ Exact configuration of security systems to be determined by UWM. The electrical drawings will reference the security drawings or reproduce device locations. Exact method to be determined.

Audio/Visual System:
  • Not applicable.

6.5. Building/Systems Description (Surge - $4 M project)

This project includes a Surge Build-Out on Floors 4 and 5 of NWQ-B. This build-out utilizes the infrastructure upgrades. The space designated here for surge or interim users will be further defined in later stages. For conceptual purposes, the scope presented here assumes a build-out on each floor that loosely resembles the diagram presented here.

Figure 6.5.1. Conceptual NWQ-B Floor 4 & 5 Surge Build-Out Configuration
ARCHITECTURAL SYSTEMS

Hazardous material abatement
- See section 6.4.1, which should be completed prior to or in conjunction with the interior build-outs

Existing Building Envelope Upgrades
- See section 6.4.1, which should be completed prior to or in conjunction with the interior build-outs

Architectural Systems – Interior
- Interior Partitions – General:
  - 5/8” gypsum board on 3-5/8” metal studs, reinforced as required to support wall hung devices. Walls to be built from deck to deck.
  - Sound attenuating insulation required for all walls.
  - All gypsum board to be held ½” off floor.
  - Wall outlets/boxes to be offset to prevent sound transfer.
  - High traffic corridors to have impact-resistant drywall.
  - Fire ratings are to be determined during code review.
  - Achieve NC-20-25 for all classrooms and laboratories.
- Wall Protection
  - Corridors and other locations as required per anticipated equipment use, to have aluminum corner guards with PVC-free polymer covers at all exposed corners.
  - Classrooms, seminar and conference rooms with movable seating to have PVC-free wall guard type chair rails to protect wall surfaces as required.
  - See campus design standards for acceptable models and color schemes.
- Plastic Laminate Face Architectural Cabinets
  - Provide plastic laminate lower and upper cabinets at kitchenettes, copy rooms.
    - Upper cabinets to be at least 14” deep to accommodate binder storage, with two adjustable shelves each.
  - Base cabinets to be at least 24” deep or as required for function or equipment.
  - Shelving shall be adjustable height, heavy weight laminate finish.
  - Sinks to have a height of 34” at all public access and break room environments.
- Composite Wood
  - Composite wood and agrifiber products must contain no added urea-formaldehyde resins.
- Solid Surface Countertops
  - Provide solid surface counter tops at restrooms, and all counters attached to Plastic Laminate Faced Architectural Cabinets.
  - Provide solid surface computer shelf in student lounge/tutoring space.
- Adhesives and Sealants
  - The VOC content of all adhesives used in the project must be less than the current VOC content limits of the South Coast Air Quality Management Rule #1168, AND all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation #8, Rule 51.
- Rubber wall base
  - Rubber base to be used in major corridors to a height of 6” to protect walls from cleaning equipment.
  - Offices and classroom spaces to have vinyl base to a height of 4”.
  - See campus standard for approved colors and process for approving alternate color schemes.
- Porcelain Tile:
  - Porcelain through-body mosaic floor tile 3” x 3” with coved base will be used at restroom floors and full height porcelain wall tile 3” x 3” at wet wall surfaces.
• Wood Doors/Frames/Interior Glazing
  ○ Stained solid core wood doors with hollow metal doors frames shall be used throughout the project for typical door types. Side lights and interior glass windows will be used extensively to allow for transparency into the all areas. Where interior glazing is used, it is to be tempered safety glazing.

• Hollow Metal Doors
  ○ Minimum Width: Doors are to be 3'-0” in width.
  ○ Minimum Height: 7 feet
  ○ A double egress door will be provided at the Orange elevator to create a new elevator enclosure.
  ○ Double doors on electronic hold open will be provided at the Yellow elevators to create a new elevator enclosure.

• Hollow Metal Frames
  ○ Door frames to be painted hollow metal.
  ○ At interior offices, suites and work spaces provide 12” wide tempered glazing side-lite to full height of door.

• Gypsum Board
  ○ Non-load bearing partitions to be gypsum board assemblies. Typical gypsum board is to be 5/8” thick (type X where required for fire resistance rating).
  ○ Moisture resistant gypsum or cement board underlayment will be used at wet areas.

• Ceilings
  ○ Minimum Ceiling Height: 9'-0”.
  ○ Ceiling Type: 2’ X 2’ acoustical ceiling tiles in general spaces. Areas of moisture to be 2’ X 2’ lay-in vinyl faced ceiling tiles. Acoustical Ceilings will contribute to recycled content materials (post-consumer + ½ post-industrial) to meet project sustainability goals.

• Porcelain Tile
  ○ Through-body porcelain tile flooring is preferred in restrooms and janitorial closets. Include cove tile base. Porcelain tile in janitorial closets to continue to four feet above the floor on wet wall.
  ○ Restroom walls to be full-height through-body porcelain tile on wet walls.
  ○ See campus standards for approved colors schemes and acceptable products.

• Flooring
  ○ Flooring in all offices, conference rooms, to be carpet (tile or broadloom to depend upon project requirements) with Type 6 nylon, durable backing and recycled content to meet sustainability goals.
    - All carpet systems must meet or exceed the requirements of the Carpet and Rug institute’s Green Label Indoor Air Quality Test Program.
  ○ Flooring in major corridors, copy areas and kitchenette to be resilient sheet or tile flooring that will meet durability, cleanability and with recycled content or rapidly renewable materials to meet sustainability goals of campus.
  ○ Flooring in electrically sensitive spaces such as server rooms and I.T. workrooms to be static dissipative type.
  ○ VCT may be used as an alternate in storage and other back of house environments.

• Interior Paints and Coatings
  ○ In general, wall paint is a satisfactory material for the majority of spaces with an egg shell, satin, or other low-sheen finish that is highly cleanable.
  ○ To meet DFD Sustainability Goals, only Low/No-VOC paints and coatings are to be used.
  ○ Special finishes are to be used for architectural design considerations or to satisfy program needs.
  ○ Waiting and Public areas may require special finishes.
  ○ Waiting and public areas/corridors may utilize vinyl (or similar) wall-covering for added wall protection. Wall-coverings must be Class-A fire rated. Wall-coverings must be low emitting to comply with DFD sustainability goals.
Wall-coverings should have recycled content, be recyclable or have rapidly renewable materials to comply with DFD sustainability goals.

- Epoxy wall paint is to be used in areas of moisture.

**Window Coverings**
- Campus standard window treatments at all windows to be provided consistent with adjacent occupants. This applies to both interior and exterior glazing.
- Conference, seminar and instructional spaces with audiovisual presentation equipment are to have room darkening shades per campus direction.

**Panel Signage Interior**
- Provide standard flat-panel interior signage at locations dictated by code as well as all offices, janitorial closets, storage spaces and classrooms.
- Signage to conform to UW System and UWM standards.

**Hardware / Accessories**
- Coordinate paper towel and soap dispensers with campus.
- All mirrors, coat hooks, toilet tissue dispensers and other miscellaneous hardware to be provided and installed by general contractor, unless otherwise directed by owner.
- All hardware/accessories to be installed per code requirements.
- All grommet locations to be field located by owner and installed by general contractor.

**Toilet Partitions**
- Toilet partitions to be ¾” solid color reinforced composite (SCRC) and will be floor mounted and overhead braced. Toilet partitions are graffiti resistant and contribute to recycled content materials to meet project sustainability goals.

**NWQ-B MECHANICAL AND ELECTRICAL SYSTEMS:**
(Architectural Comments - also see mechanical and electrical)
- Create new horizontal distribution systems.

**NWQ-B LIGHTING:**
(Architectural comments - also see electrical)
- Direct/Indirect lighting fixtures will be appropriate in most areas.
- Task lighting is required at all workstations and locations where work requires immediate lighting; light level range from 20-50 fc at desk level.
- The introduction of natural light into interior spaces provides an opportunity for visual relief and is important in creating a comfortable work environment. Whenever possible, staff work spaces and offices are to be located to maximize natural daylight or borrowing light by use of clerestories or interior windows.
- Care should be given to ensure that excessive glare does not result from natural daylight.
- Fluorescent fixtures shall be wired for two level light at all exterior rooms.
- Meeting, Multi-Purpose and Conference rooms should provide flexibility in lighting; general room illumination and dimmable lighting should be provided allowing for appropriate levels of lighting during presentations, etc.

**NWQ-B PLUMBING SYSTEMS:**
(Architectural comments - also see plumbing)
- Provide plumbing for new restrooms on floors 4-5 in NWQ-B.
6.5.2. Structural Systems

The Northwest Quadrant “Selective Facility Renewal” (SFR) project includes several components requiring consideration of the structural capacities of the existing buildings, including the addition of a new mechanical penthouse on top of NWQ-B, completion of a “Town Square” project on Floor 1 of NWQ-B, remodeling Floor 3 of NWQ-B as well as Floor 3 of NWQ-C to create space for the College of Health Sciences (CHS) and/or College of Nursing (CON), conversion of Floors 4 and 5 of NWQ-B to “surge” space, and utilization of Floors 6 and 7 of NWQ-B by the School of Information Studies (SOIS).

With respect to creation of new “surge” space on Floors 4 and 5 of NWQ-B, these floors were previously evaluated for potential use by the School of Information Studies (SOIS), using a fit plan that mainly consisted of office space. These floors were found to generally be suitable for those occupancies. The proposed “surge” space would also be mainly used for offices.

PRE-DESIGN DOCUMENTATION
All comments are based on the room names and general layout as shown on schematic diagrams provided by Quorum Architects.

DESIGN LIVE LOADS – EXISTING SPACE
The design live loads in pounds per square foot (psf) originally assumed for the affected floors are shown on Sheets S104 and S105, included as part of the 11x17 “Infrastructure Drawings” in the Appendix of the Northwest Quadrant Redevelopment Plan.

FLOOR FRAMING SYSTEMS
The floor framing systems for the affected floors were shown on Sheets S204 and S205, included as part of the 11x17 “Infrastructure Drawings” in the Appendix of the Northwest Quadrant Redevelopment Plan. Those sheets indicate that reinforced cast-in-place concrete pan joists were used on NWQ-B Floors 4 and 5.

EXISTING CONSTRUCTION DOCUMENTS USED FOR REFERENCE
NWQ-B structural plans by Eschweiler Eschweiler & Sielaff dated 9/25/1963, with revisions dated 9/12/1964 and 10/26/1964, were utilized for reference for information regarding the circa-1963 lower floors.

DISCLAIMER FOR ALL PRE-DESIGN COMMENTS: These pre-design comments are intended to identify the major challenges that would need to be addressed in order for the referenced project to proceed through further design development, creation of construction documents, and into construction. The available structural and architectural drawings for the NWQ buildings are the primary references utilized to develop these comments. An attempt has been made to identify any significant remaining “unknowns” that may require further investigation.

DESIGN LIVE LOADS – REDEVELOPED SPACE
The following pages contain tables listing occupancy classifications and corresponding required minimum uniform design live loads for each of the rooms shown in the pre-design drawings. In the tables, please note that all occupancy classifications shall be subject to review and approval by the local building code officials. Additionally, occupancy classifications shown in these tables are based on our judgment alone and are intended for initial discussion purposes; in actual practice, the occupancy classification for any given space will be subject to review and approval by the local building code officials.

The first column of each table lists the Room Name as given by Quorum Architects. The second column lists the Occupancy or Use per IBC 2012 Table 1607.1 that best aligns with the proposed function of the individual room. There are many common occupancies that are not directly addressed within the IBC. The 2005 and 2010 editions of the American Society of Civil Engineers (ASCE) Standard #7 “Minimum Design Loads for Buildings and Other Structures” include Table C4-1 in their commentary section; this table gives design live loads for many categories not included in IBC. However, because this table appears in the commentary
section to the standard, it is offered “as a guide in the exercise of” the authority of the local officials, and does not have the full force of provisions that are given within the code itself. ASCE 7 Table C4-1 has been cited in certain specific cases in the tables on the following pages to give an idea of the required design live loads for individual rooms within the proposed space.

The required design live load from IBC or suggested live load from ASCE 7 (subject to approval by the building code official) is listed in the third column of each table, next to the design live load originally used for those spaces, as shown on the reference drawing indicated. The last two columns of each table state whether or not the underlying structure appears to be suitable to support the design live loads indicated (in which case the phrase “Acceptable As-Is” appears in that column). If there appears to be a possibility that further analysis or structural upgrades may be required, a more detailed explanation is provided in the final column of the table.

<table>
<thead>
<tr>
<th>Room / Area Name</th>
<th>Occupancy or Use (IBC 2012 Table 1607.1 or ASCE 7-10, Table C4-1)</th>
<th>Required Design Live Load (psf)</th>
<th>Existing Design Live Load (psf)</th>
<th>Reference</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWQ-B Fourth Floor, 1963 Construction</td>
<td>Corridors</td>
<td>Office Buildings - Corridors above First Floor</td>
<td>80</td>
<td>80</td>
<td>S104</td>
<td>See Comments</td>
</tr>
<tr>
<td></td>
<td>Offices</td>
<td>Office Buildings - Offices</td>
<td>50</td>
<td>50</td>
<td>S104</td>
<td>Acceptable As-Is</td>
</tr>
</tbody>
</table>

Table 6.5.2.1. Surge Space Occupancy / Use Summary for NWQ-B Floor 4

<table>
<thead>
<tr>
<th>Room / Area Name</th>
<th>Occupancy or Use (IBC 2012 Table 1607.1 or ASCE 7-10, Table C4-1)</th>
<th>Required Design Live Load (psf)</th>
<th>Existing Design Live Load (psf)</th>
<th>Reference</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWQ-B Fifth Floor, 1963 Construction</td>
<td>Corridors</td>
<td>Office Buildings - Corridors above First Floor</td>
<td>80</td>
<td>80</td>
<td>S105</td>
<td>See Comments</td>
</tr>
<tr>
<td></td>
<td>Offices</td>
<td>Office Buildings - Offices</td>
<td>50</td>
<td>50</td>
<td>S105</td>
<td>Acceptable As-Is</td>
</tr>
</tbody>
</table>

Table 6.5.2.2. Surge Space Occupancy / Use Summary for NWQ-B Floor 5
6.5.3. Plumbing and Fire Protection Systems

PLUMBING SYSTEM DESCRIPTION
Interior sanitary drainage systems will include:
• Waste and vent piping system are existing and will be modified as needed for the renovations of new rooms. Above ground waste and vent piping to be cast iron no hub w/ heavy duty couplings and hard type M copper piping.
• All nonactive existing piping should be removed.

Interior storm & clearwater drainage systems will include:
• Storm & Clearwater drain, waste, and vent system is existing, any connections required by the remodel will connect to this system. Above ground piping to be cast iron no hub w/ heavy duty couplings and hard type M hard copper pipe. All horizontal above ground piping will be insulated.

Interior water systems will include:
• Potable water riser system that is existing, supplied from the City of Milwaukee Water Utility. Cold, hot and circulated water will be supplied to all water closets, urinals, lavatories, sinks, mop basins, electric water coolers, and HVAC equipment if required. Piping will be insulated, hard type L copper. Hot water is supplied from the units in Mechanical Room G399.

Plumbing Specialties to include:
• Floor drains will be installed, in all toilet rooms larger than two fixtures, and in all Janitors’ Closets.
• Mop basins will be located in janitor closets.
• Carriers will be supplied for all wall-hung fixtures.

Fixtures:
• Commercial grade wall hung, low flow, plumbing fixtures will be provided in public areas for ease of cleanup. Low flow wall hung water closets will be 1.28GPF. Lavatory aerators will be 0.5 GPM. Sink aerators will be 1 GPM. Urinal flush valves will be 0.125 GPF.

FIRE PROTECTION SYSTEM DESCRIPTION
The system will be modified as needed for new room layouts.

Concealed sprinkler heads will be used in acoustical and gypsum board ceilings.

Wet sprinkler system engineered in accordance with NFPA 13.

6.5.4. Mechanical Systems

General
• Included in the NWQ Selective Facility Renewal project is the replacement of all major existing mechanical systems serving NWQ-B. Remove all existing HVAC systems and equipment presently serving all surge area spaces. For all remodeled surge spaces located in NWQ-B, extend new branch HVAC work to the following new vertical riser systems:
  ○ Supply and return air ductwork
  ○ General exhaust ductwork
  ○ Hot water heating supply and return piping
  ○ DDC temperature controls

Main Air Distribution Systems
• For all remodeled surge spaces in NWQ-B, include the following new air distribution systems:
  ○ New sheet metal ductwork.
  ○ Ceiling plenum returns.

Air Terminals
• Provide all remodeled surge spaces with variable air volume reheat air terminals, associated ductwork, hot water piping, modulating 2-way control valves with electric actuators, room temperature sensors and DDC controls. Use soffits for sidewall distribution to maximize ceiling heights.
Heating Terminals
• For all remodeled surge spaces with exterior walls, provide perimeter hot water fin radiation with two way modulating electric control valves for zone temperature control.

Rooms Requiring Supplemental Cooling
• For rooms in with high internal heat gains such as server rooms and telecom rooms, provide ductless split cooling systems.

Temperature Control System
• The new temperature control system serving remodeled surge spaces will be direct digital control (DDC) type system. All new equipment and systems will be equipped with compatible devices and fully integrated into the existing campus JCI building automation system (BAS).

Emergency Power for HVAC Equipment:
• Serve the following HVAC equipment from the emergency power system:
  ○ Temperature control system
  ○ Ductless split cooling systems

6.5.5. Electrical Systems

High Rise Construction
• Since there are no fire walls presently constructed separating the NWQ-A, NWQ-B, NWQ-C and NWQ-D portions of the building, the Department of Safety and Professional Services considers these areas as one high rise building.

Load Calculation Criteria:
• Maximum Design Connected Watts Per Square Foot
  ○ Office:
    - Lighting - 0.9
    - Receptacle - 4.0
  ○ Classroom:
    - Lighting - 1.1
    - Receptacle - 4.0
  ○ Conference Room:
    - Lighting - 1.0
    - Power - 4.0
  ○ Toilet:
    - Lighting - 0.8
    - Receptacle - 0.5
  ○ Reception Area / Lobby:
    - Lighting - 1.0
    - Receptacle - 1.0
  ○ Utility Spaces:
    - Lighting - 0.6
    - Corridor / Stair: - 0.4
  ○ Lighting
    - Receptacle - 0.5
    - Egress Lighting - 0.2
  ○ Mechanical Areas:
    - Lighting - 0.6
    - Power - Actual Motor Full Load Amps

Equipment Sizing Criteria:
• Secondary Design Voltages
  ○ Motors 1/2 hp and larger 480V, 3 phase, 3 wire
  ○ General Lighting 277V, 1 phase, 2 wire
  ○ Receptacles, Motors less than 1/2 hp and Specialty Lighting 120V, 1 phase, 2 wire
• Equipment Sizing Criteria
  ○ Branch Circuit Load Calculations
- Lighting
  - Actual Installed VA
- General Purpose Receptacles
  - 180 VA per outlet
- Multiple Outlet Assemblies
  - 180 VA per 2'-0"
- Special Outlets
  - Actual Installed VA of Equipment Served
- Motors
  - 100% of Motor Full Load Amps

• Demand Factors
  - Demand factors below are NEC calculation. Historical data of similar facilities shall be considered during design.
  - Lighting
    - 100% of Installed VA
  - Receptacles
    - 100% of First 10 kVA Installed plus 50% of Balance
  - Motors
    - 100% of Total Motor Full Load Amps
  - Dedicated Receptacles
    - 100% of Total VA and Fixed Equipment Installed

• Minimum Bus Sizes
  - 480Y/277V Equipment / Lighting Panels
    - 100A
  - 208Y/120V Equipment Panels
    - 100A
  - 208Y/120V General Receptacle Panels
    - 100A

Distribution Equipment Nomenclature:
- Provide new nameplates for all existing Low Voltage distribution equipment including all distribution circuit breakers which receive nameplates. Provide information per DFD standards and utilize new NWQ room numbers.
- Provide temporary printed labels for all existing equipment indicating old Columbia - St. Mary’s Hospital designations to help UWM personnel identify equipment as the system is upgraded and replaced.

• Nomenclature shall be Floor, Building / Branch of Power, Voltage, Sequence. An example of panel nameplates are as follows:
  - GC/NLA – Branch Panelboard, Ground, NWQ-C, Normal Power, 208Y/120V, 3P, 4W, First Panel. A subsequent panel would be GC/NLB.
  - 9B/QHB – Branch Panelboard, Floor 9, NWQ-B, Equipment Power, 480Y/277V, 3P, 4W, Second Panel. There would be a panel 9B/QHA on the floor already.
  - MSB/GDNLA – Main Switchboard, Ground, NWQ-D, Normal Power, 208Y/120V, 3P, 4W, First Switchboard. A subsequent switchboard would be MSB/GDNLB.
  - T/GCNLA – Transformer serving GC/NLA.

• Nomenclature definitions are as follows:
  - Floor Designations:
    - Basement – B
    - Ground – G
    - Floor 1 – 1
    - Floor 2 – 2
    - Floor 3 – 3
    - Floor 4 – 4
    - Floor 5 – 5
    - Floor 6 – 6
    - Floor 7 – 7
    - Floor 8 – 8
    - Floor 9 – 9
    - Penthouse – P
  - Building Designations
    - NWQ-A – A
    - NWQ-B – B
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- NWQ-C – C
- NWQ-D – D
- NWQ-E – E
- NWQ-F – F
- NWQ-G – G

○ Branches of Power:
  - Normal – N
  - Emergency, Generator – G
  - Emergency, Article 700 – E
  - Emergency, Article 701/702 – Q

○ Voltages:
  - 480V, 3 Phase, 3 Wire – H
  - 480Y/277V, 3 Phase, 4 Wire – H
  - 208Y/120V, 3 Phase, 4 Wire – L

○ Sequence:
  - A, B, C, D, etc. as required to provide unique identifier.

Normal Power Service and Distribution:

• System Description
  ○ An infrastructure project will be replacing all the vintage Columbia - St. Mary’s Hospital equipment on the floors with new Electrical Rooms.
  ○ Utilize existing branch panelboards located in the existing electrical room.
  ○ Utilize existing circuit breakers or provide new as required.
  ○ Provide new panelboards as required, feed from existing bus duct located in core electrical room.

• Equipment and Material
  ○ Power distribution panelboards shall be deadfront construction utilizing thermal magnetic circuit breakers and copper bus bars. All panels shall be fully rated for the available short circuit current. All trims shall be door in door type. All panels shall be provided with copper ground busses. The capacity of the panels shall be sufficient for an additional 10% future connected load. Feeder circuit breaker space shall be provided for the addition of 10% future circuit breakers.
  ○ Branch circuit and lighting panelboards shall be deadfront construction utilizing thermal magnetic circuit breakers and copper bus bars. All panels shall be fully rated for the available short circuit current. All trims shall be door in door type. The panelboard connected load shall be limited to provide an additional 10% future connected load. The panelboards shall contain 10% spare 20A branch circuit breakers, and space for the addition of 10% future circuit breakers.
  ○ Point-of-use power connection devices shall include power receptacles, furniture connections, and other equipment connections as required.

• Distribution
  ○ Raceway for feeders and branch circuits less than 600V shall be metallic, electrical metallic tubing (EMT) subject to the restrictions of the National Electrical Code, minimum size 1/2”. EMT shall not be used in concrete construction or where subjected to mechanical damage.
  ○ 600-volt feeders shall be single conductor, aluminum or copper 600-volt rated with XHHW, XHHW 2, or THHW insulation, feeders shall be color coded using color type at all connections and in all pull and junction boxes.
  ○ Aluminum feeder conductors shall be allowed per DSF Guidelines. Only where compression termination can be used. No mechanical lugs shall be accepted. All distribution equipment enclosures shall be sized to accommodate these compression lugs. If compression lugs cannot be used, then copper conductors are only allowed.
  ○ All feeders shall be installed in conduit.
  ○ Branch circuit conductors shall be single conductor copper 600-volt rated with THWN or THHN insulation with continuous color-coding. Branch circuits shall utilize dedicated neutrals.
Emergency Service and Distribution:

- **System Description**
  - Utilize existing branch panelboards located in the existing electrical room.
  - Utilize existing circuit breakers or provide new as required.
- **Emergency branch loads include emergency egress lighting, exit signs, the fire alarm system, and the sprinkler bell.**

- **Equipment and Material**
  - See normal power system description for additional information on equipment construction.
- **Distribution**
  - The entire emergency power distribution system shall consist of conduit and wire. See normal power system description for additional information.
  - Feeders and branch circuit wiring to emergency loads shall be in a dedicated raceway for each branch of the emergency system.

Grounding System:

- **System Description**
  - A complete equipment grounding system shall be provided such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and all other conductive items operate continuously at ground potential and provide a low impedance path to ground for possible fault currents. All grounding system connections shall be made using compression, mechanical, or exothermic welds.
  - Bonding jumpers shall be provided as required across pipe connections to water meters, dielectric couplings in a metallic cold water system, and across expansion/deflection couplings in conduit and piping systems.
  - A separate insulated green grounding conductor shall be provided for each single and 3 phase feeder and branch circuit. Grounding conductor shall be run with the related phase and neutral conductors. Panel feeders installed in more than (1) raceway shall have individual, full sized, green grounding conductor in each raceway. The equipment grounding system shall not rely on the metallic raceways for grounding continuity.
- **Equipment and Material**
  - Wall-mounted copper ground bus shall be located in the main electrical room, floor electrical rooms, and voice/data rooms. The main electrical room ground bus shall be connected to the grounding system.
- **Distribution**
  - A separate, insulated #4/0 AWG ground wire shall be provided from the main electrical room ground bus to each floor’s electrical room ground bus.
  - The main service entrance neutral shall be bonded to the system ground bar within the switchboard by a removable bus bar link.
  - A code-sized, unbroken bond leader shall connect the electrical room ground bar to the XO terminal of local transformers.
  - A bare copper, grounding electrode conductor shall be extended to all voice/data room ground.

Lighting Systems:

- All new lighting shall be hung from the building structure independently of ceiling support system including all grind mounted fixtures. All lighting fixtures shall be complete with T8, T5, or T5HO lamps, electronic ballasts, hangers, lenses, etc. 8’ 0” fluorescent lamps shall not be allowed.
- Lighting shall be fluorescent or LED. Incandescent lighting shall not be used.
- The style of light fixtures shall be as follows:
  - Fixtures in classrooms shall be high efficiency direct/indirect linear pendant mounted luminaires (example: Focal Point Verve).
  - High efficiency volumetric type recessed troffers shall be utilized in private offices and conference rooms (example: Focal Point Equation).
- Fixtures in corridors shall be 2’x2’ high efficiency volumetric type recessed troffers (example: Focal Point Equation).
- Fixtures in the lobby and other special areas shall consist of LED downlights and LED accent lighting.
- Fixtures in utility spaces shall be lensed type recessed fluorescent fixtures where a ceiling is present and industrial type suspended fluorescent fixtures with wire guards where a ceiling is not present.

- All lighting levels shall conform to the Illuminating Engineering Society’s recommendations and in general, shall be as follows in footcandles (FC). Actual ambient levels may be adjusted due to power density considerations and supplemented with task lighting. This shall be determined as the project progresses and surface finishes are selected.
  - Office: 30 to 40 FC
  - Conference room: 30 to 40 FC
  - Classroom at desk height: 30 to 50 FC
  - Support areas (toilet, corridor, stair, storage, mechanical / electrical room): 15 to 20 FC
  - Lobby / Foyer: 15 to 20 FC
  - Pedestrian Walkways: .5 to 1 FC

- Provide interior emergency egress lighting levels to meet IBC requirements. All interior egress lighting shall be controlled and shut off with other lighting in the respective zone when unoccupied utilizing UL 924 emergency power control devices with automatic diagnostics (for example, LVS EPC-A-1). Locate devices adjacent to respective panelboards.

- Provide exterior emergency egress lighting levels to meet IBC requirements. All exterior lighting shall be controlled via low voltage relay and shall shut off during daylight hours utilizing UL 924 emergency power control devices with automatic diagnostics or relay panel transfer capabilities. Locate UL 924 devices adjacent to respective panelboards.

- Controls shall be provided as follows:
  - All areas shall be provided with ceiling-mounted occupancy sensors to automatically control lighting. Sensors shall be provided as follows:
    - Janitor’s closets, small storage rooms, single-occupant toilet rooms: Wall-mounted infrared.
    - Multi-occupant toilet rooms: Ceiling-mounted dual technology infrared / microphonic.
    - Large storage rooms: Ceiling-mounted infrared.
    - Individual office, conference rooms, classrooms, laboratories, corridors, lobbies: Ceiling-mounted dual technology infrared / ultrasonic or microphonic.
    - All ceiling mounted occupancy sensors shall be provided with power packs capable of interfacing with the HVAC for system setback.
    - All rooms with occupancy sensors shall have manual override to positively shutoff light fixtures as needed.
  - Local dual-level switching shall be provided in classrooms, offices and conference room areas to allow occupant selection of lighting level.
  - Mechanical and electrical rooms shall controlled via line voltage switches for safety.
  - Exterior lighting (if applicable) shall be controlled by a microprocessor-based lighting control panel consisting of line-voltage relays controlled through the microprocessor based on remote low-voltage switch station, photocell and astronomical time clock input.
6.5.6. Technology Systems

Voice/Data System:
- Provide horizontal voice and data wiring, racks and terminations per DFD and UWM requirements.
- Provide horizontal data wiring to wireless access points per UWM spacing requirements.
- All horizontal cable shall be terminated in respective existing Telecommunications Room serving the area of renovation. Provide patch panels and cross connects within existing racks.
- Existing Telecommunications Room Risers
  - A Telecommunications Room riser in NWQ-A will be created in an Infrastructure Project, the intent is for it be completed prior to the build-out of NWQ-A.
  - UWM has created a Telecommunications Room riser in NWQ-B.
  - Project 12B1R has created Telecommunications Room risers in NWQ-C and NWQ-D.
  - NWQ-E shall be served by NWQ-B.
  - A telecommunications room in NWQ-F was created by UWM
  - NWQ-G shall be served by NWQ-D.
  - The respective floors shall be served from the following rooms as follows:
    - NWQ-A, Ground Floor IDF #G235 – NWQ-A, Floor G, NWQ-G (copper)
    - NWQ-A, Floor 2 IDF - NWQ-A, Floors 1, 2 (copper)
    - NWQ-A, Floor 4 IDF – NWQ-A, Floors 3, 4, 5 (copper)
    - NWQ-B, Basement MDF #B647 – NWQ-A (fiber), NWQ-B (fiber), NWQ-C (fiber), NWQ-D (fiber), NWQ-F (fiber), NWQ-G (fiber)
    - NWQ-B, Ground Floor IDF #G530 – NWQ-B, Floors B, G, 1 (copper)
    - NWQ-B, Floor 3 IDF #3522 – NWQ-B, Floors 2, 3, 4 (copper)
    - NWQ-B, Floor 6 IDF #6415 – NWQ-B, Floors 5, 6, 7 (copper)
    - NWQ-C, Ground Floor IDF #G614 – NWQ-C, Floors B, G, 1 (copper)
    - NWQ-C, Floor 2 IDF #2645A – NWQ-C, Floors 2, 3, 4 (copper)
    - NWQ-D, Basement IDF #B890 – NWQ-D, Floors B, G (copper)
    - NWQ-D, Floor 2 IDF #2999 – NWQ-D, Floors 1, 2 (copper)
    - NWQ-D, Floor 4 IDF #4939 – NWQ-D, Floors 3, 4, 5 (copper)
    - NWQ-D, Floor 7 IDF #7950 – NWQ-D, Floors 6, 7, 8, 9 (copper)
    - NWQ-F, Basement IDF – NWQ-E, Floor 1 (copper)
  - Raceways shall be provided for a complete system within the area of renovation.
  - Wire mesh / basket tray shall be provided in all areas designed to have 50 or more cables. Sizing shall plan for an initial maximum calculated fill ratio of 25%. Minimum size shall be 4”x12”. Tray design and installation shall be provided in accordance with ANSI/TIA 569-C.
  - Minimum raceway size shall be 1” conduit with end bushings and metallic grounding clamps to terminate conduit to accessible ceiling spaces. Conduit pathway design and installation shall be provided in accordance with ANSI/TIA 569-C.
  - A flush, two-gang box with plaster ring shall be provided at each voice/data outlet location where located in walls. Wall plates shall be provided.
  - Slab-on-grade floor outlets shall be flush on slab style with carpet flange on floors scheduled for carpeting.

Distributed Antenna System (DAS):
- A DAS system unique to this project is not desired. Implementation of a large scale DAS system in the NWQ is
being considered by UWM. This project shall discuss the need for DAS antenna system distribution within this area of work. Consideration should be given to Milwaukee Fire Department wireless coverage (discussed further below), UWM’s needs as well as cellular phone coverage.

Fire Alarm System:
• System Description
  ○ Project 12B1R replaced the existing JCI 2020 system with a new JCI 3030 system. Most existing devices remained and need to be replaced within the respective area of work.
  ○ Project 12B1R created a Fire Command Center in NWQ-B, Room 1470. This room shall be equipped as a true Fire Command Center as the renovations progress. Coordinate system requirements with all other trades.
  ○ The existing JCI 3030, two-way voice communication addressable fire alarm system shall be expanded to serve the project area.
  ○ All devices in project shall be new and compatible with JCI 3030 system.
  ○ Provide new transponder panel in existing Telecommunications Room serving the area as required for project in NWQ-B.
  ○ Provide new amplifiers and NAC panels as required under this renovation to serve all new audio/visual devices.
  ○ The installation of new devices shall comply with DFD standards as well as all applicable codes listed above.
  ○ System shall be integrated into UW Milwaukee Campus Mass Notification system.
• Design Criteria
  ○ The fire alarm system shall comply with requirements of NFPA 72, Life Safety Codes and State Building Code.
  ○ Audio/visual devices shall be installed in all areas of the building in accordance with the NFPA and ADA guidelines. All areas of the building shall be covered by audible device coverage as required by NFPA 72 and the International Building Code as adopted in Wisconsin. Visual devices shall be installed in those public and common areas as recognized by ADA such as corridors, bathrooms, classroom, laboratories, conference rooms, waiting rooms, break areas, and lobbies. Visual devices shall also be provided in mechanical areas as a supplement to the audible devices.
  ○ Smoke detectors shall be installed as required by the National Fire Protection Association and the International Building Code. Smoke detectors shall be installed in, but not limited to, the following locations: air handling units, elevator shafts, elevator lobbies, elevator machine rooms, and electrical equipment rooms.
  ○ Heat detectors shall be installed in areas that are not suitable for smoke detectors.
  ○ Dual-action manual pull stations shall be installed adjacent to all exit doors, each elevator lobby, and at floor exit stairwells. Pull stations shall have covers.
  ○ Fire fighter phones shall be installed in each elevator lobby.
  ○ Fire fighter phones are not required in the stairwells per the Milwaukee Fire Department (MFD) as the MFD utilizes wireless communications. However, the coverage of the system within the scope of work should be tested. The previously mentioned DAS system would alleviate coverage gaps, but it may not be installed at the time of this project. Coordinate this item with the MFD.
• Equipment and Material
  ○ Remote transponder panels shall be used to provide supervised amplifiers and signal circuits for audio/visual devices and magnetic door holders.
  ○ The system shall utilize individual addressable, photoelectric smoke detectors, heat detectors, addressable manual pull stations, and addressable monitor and control modules. The system shall monitor all sprinkler supervisory and water flow switches and shall interface with elevators, HVAC smoke control, and smoke fire dampers.
• Distribution
  ○ All initiating and signaling devices shall operate at 24VDC and shall be installed in accordance with manufacturer’s specifications.
All wiring shall be installed in conduit per DFD Standards.

Security System:
- System Description
  - Project 12B1R installed the basic Andover infrastructure for the NWQ-C and NWQ-D. This project shall expand the system to serve the areas of renovation.
  - Wiring, head end equipment and rough-in shall for a security system shall be provided that shall consist of the following items:
    - CCTV (Closed Circuit Television)
    - Card Readers
    - Door Contacts
    - Passive Infrared Motion Detectors
    - Digital Keypad/Annunciators
    - Control/Communicator
    - Auxiliary Power Supplies
    - Wiring
  - System shall be compatible with existing Andover system.
- Design Criteria
  - Exact configuration of security systems to be determined by UWM. The electrical drawings shall reference the security drawings or reproduce device locations. Exact method to be determined.

Clock System:
- The NWQ is served by a Primex XR Series Transmitter located in NWQ-B. Provide a clock compatible with system in each room as required by User.

Audio/Visual System:
- Power and empty raceway shall be provided as required by the audio/visual consultant. The electrical drawings shall reference the audio/visual drawings for coordination purposes.

6.6. Building/Systems Summary (School of Information Studies - $7.7M Total Project Cost)

The School of Information Studies Program Statement/Pre-Design includes a detailed scope description for building out the school's programmatic needs on Floors 4-5 of NWQ-B. That scope detail assumes that the infrastructure upgrade outlined in this document occurs before or concurrently with the School of Information Studies project. That document, which also includes more information regarding the SOIS program and other details, is included in the Selective Facility Renewal.

The NWQ Selective Facility Renewal project locates SOIS on Floors 6-7 of NWQ-B, with the same scope of work presented in the SOIS Program Statement/Pre-Design. An appendix is included in that document to describe structural conditions for Floors 6-7 and its impact on the School's proposed build-out.

6.7. Building/Systems Summary (Restaurant Operations Town Square - $7.3M Total Project Cost)

The Restaurant Operations Town Square Program Statement/Pre-Design includes a scope description for constructing food service venues and student life areas on Floor 1 of NWQ-B and a portion of NWQ-D. That scope detail assumes that the infrastructure upgrade outlined in this document occurs before or concurrently with the Restaurant Operations Town Square project. That document, which also includes more information regarding the Town Square program and other details, is included in the Selective Facility Renewal.
6.8. **Building/Systems Summary**
(College of Health Sciences/College of Nursing - $11.95M Total Project Cost)

Both the College of Nursing CHTS’ and College of Health Sciences’ proposed location is on Floor 3 of NWQ-B and NWQ-C – the exact program location for each College’s space is to be determined during later phases. The NWQ Redevelopment Plan and the College of Health Sciences Program Statement/Pre-Design outline a program for accommodating a larger portion of CHS in the NWQ. In those documents, this larger program indicates CHS will be located on Floor 3 of both NWQ-B and NWQ-C, and includes a detailed scope description for constructing instructional and research labs, offices, and collaboration areas on Floor 3 of each of these buildings. Scope for additional space in NWQ-D is also included in that Program Statement/Pre-Design, which is not a part of this Selective Facility Renewal project. That document, which also includes more information regarding the CHS program and other details, should be consulted during later phases in determining which program will be accommodated in the NWQ-B/NWQ-C Floor 3 build-out. A “possible priority” program for the buildout in this space - instructional labs for high growth programs - is outlined in Table 5.2.2, and in an Appendix in the CHS Program Statement/Pre-Design.

The College of Nursing Center for Healthcare Transformation and Simulation (CHTS) Study: Architectural Program and Conceptual Design also includes a detailed scope description for constructing its program on Floor 3 of NWQ-B and NWQ-C. That document should also be consulted during later phases.
Design Criteria and Facility Metrics to Ensure Project Success

7.1. Summarized Decisions (Design Principles and Objectives)
7.2. Applicable Codes, Regulations, & Design Guidelines
   7.2.1. Zoning
   7.2.2. Wisconsin Environmental Policy Act (WEPA) / Environmental Criteria
   7.2.3. Applicable Codes and Regulations
   7.2.4. DFD Design Standards
   7.2.5. UW System Facilities Planning Guidelines
   7.2.6. UWM Design Guidelines
   7.2.7. Universal Design
7.3. DFD Sustainability Standards Checklist
7.1. **Summarized Decisions (Design Principles and Objectives)**

This project will upgrade infrastructure for approximately 787,000 GSF and selectively remodel approximately 163,058 GSF in the Northwest Quadrant on the University of Wisconsin-Milwaukee’s Kenwood Campus. Infrastructure upgrades will enable occupancy of the complex by providing critically needed life safety upgrades and other necessary code related changes. It will also upgrade building systems for long-term use – especially in NWQ-B - which will facilitate further redevelopment of the complex.

Building on the infrastructure upgrades, this project also remodels a portion of Floor 1 and Floors 3-7 of NWQ-B, Floor 3 of NWQ-C, and a small portion of NWQ-D Floor 1 for the School of Information Studies (11K3C-05), the College of Health Sciences (11K3C-09), the College of Nursing Center for Healthcare Transformation and Simulation (CHTS) (DFD#: 13D1J), and Restaurant Operations Town Square (11K3C-03), as well as a build-out for future surge users.

7.2. **Applicable Codes, Regulations, & Design Guidelines**

7.2.1. **Zoning**

The property is currently zoned Institutional District (TL). The institutional district is established to accommodate largely institutional and institutional/residential uses, along with supporting uses that occupy multiple buildings, often in a campus-like setting.

Allowed uses in a TL district are schools (elementary & secondary), colleges, specialty instruction schools, libraries, cultural institutions, dormitories, religious facilities, public safety facilities, general and government offices, artist studios, medical research laboratories, medical offices, accessory use parking lots, among others.

7.2.2. **Wisconsin Environmental Policy Act (WEPA) / Environmental Criteria**

To conform to WEPA, all state agency projects are to prepare environmental impact statements (EIS) with major activities that will significantly affect the human environment. An EIS was completed for the Northwest Quadrant in 2012 for DFD#11C2L and DFD#11A3M.

7.2.3. **Applicable Codes and Regulations**

The NWQ redevelopment must comply with all federal, state and local laws and regulations governing materials, installation, health, safety, fire, HVAC and electrical requirements within the applicable jurisdiction.

In addition to State/DOA/DFD requirements, guidelines and standards, the below entities may be the Authority Having Jurisdiction (AHJ) over the project design and construction. All agencies and the facilities that are owned and operated by the State of Wisconsin are subject to following the currently adopted Wisconsin Administrative Code and model codes listed below:
STATE GOVERNMENT AGENCIES
- Department of Safety and Professional Services (DSPS - Plan Review & Permits)
- Division of Facilities Development (DFD)

INSTITUTION
- UW System Facilities Planning Guidelines
- Physical Environment Committee
- UWM Campus Design Standards
- UW-Milwaukee Facilities, Planning, and Management (UW-Milwaukee Construction Project Design Information)

NATIONAL ACCREDITATION, PHYSICAL ENVIRONMENT REQUIREMENTS
- As required by individual projects and identified in the Pre-Designs.

LOCAL GOVERNMENTAL AUTHORITIES
- Local Zoning Office: Zoning Ordinance - City of Milwaukee
- Local Fire Department or Fire Marshall
- City of Milwaukee Public Works Standard Specification
- Local Historic Preservation Commission
- City of Milwaukee Water & Sewer Departments
- Local Health Department – City of Milwaukee

BUILDING CODES AND STANDARDS
- Safety and Health: NFPA Standards as adopted by WI Administrative Code, Chapters SPS 330 & 332.
- Elevator Code: WI Commercial Building Code, Chapter SPS 318.
- Mechanical Code: International Mechanical Code, as adopted by WI Administrative Code, Chapters SPS 364.
- Plumbing Code: WI Commercial Building Code, Chapters SPS 381-384.
- ACGIH Industrial Ventilation – A manual of recommended practice.
- ANSI/AIHA Z9.5-2012 – Laboratory Ventilation Standard.
- NFPA 90A – Standard for the Installation of Air Conditioning.
- NFPA 780 – Standard for Installation of Lightning Protection.
- ASHRAE Standard 62.1- Ventilation for Acceptable Indoor Air Quality
PLAN REVIEW
The Department of Safety and Professional Services, Safety and Buildings Division is responsible for the administration of the Wisconsin Commercial Building code. Administration and applicability of the code is detailed under SPS 361. All commercial buildings must comply with all applicable administrative codes, whether or not plan review is specifically required. The code requires submission of building, HVAC and fire protection systems plans. Authority for approval is as follows: For all commercial buildings, except nursing homes and hospitals, the Department of Safety and Professional Services, Division of Safety and Buildings is responsible for reviewing plans.* It is highly suggested that a preliminary plan consultation be scheduled when a schematic plan has been prepared to address code issues.

* Dave Wallace, P.E., DSPS Integrated Services Building Plan Reviewer in Madison (phone: 608-261-6540; david.wallace@wisconsin.com) has been reviewing all plans related to the NWQ site.

Note: The City of Milwaukee Fire Marshall also has jurisdiction for fire and life safety issues. While not a required plan review, it is highly suggested that a preliminary review be conducted with the Milwaukee Fire Marshal for gaining their conditional approval as that entity will be responsible for on-going on-site fire inspections.

7.2.4. DFD Design Standards
The State of Wisconsin Department of Administration’s Division of Facilities Development (DFD) administers all construction projects for the UW-Milwaukee campus. DFD maintains design standards for all State facilities.

The project must be designed and documented according to the most current DFD Policy and Procedure Manual for Architects/Engineers and Consultants.

Also refer to DFD Master Specification Templates and Guidelines

Commissioning shall be part of the design phases and construction phases. DFD shall determine the level of commissioning based on the size and complexity of the project.
7.2.5. **UW System Facilities Planning Guidelines**

The project must be designed and documented according to the most current UW System Facilities Planning guidelines.

- http://www.uwsa.edu/capbud/facplan.htm

7.2.6. **UWM Design Guidelines**

The University of Wisconsin-Milwaukee maintains design standards and construction project design information specific to development in the Northwest Quadrant. Information is available from UWM Campus Planning. A copy of the most current version of the design guidelines is available from Campus Planning.

7.2.7. **Universal Design**

Applicable Laws, regulations, and codes include:
- Department of Justice (DOJ) 28 CFR Parts 35 and 36
- Americans with Disabilities Act (ADA)
- Wisconsin SPS 362
- ADAAG (2004)
- DFD Accessibility Guidelines

The Agency is required to perform a self-evaluation and have a plan for achieving accessibility, remove architectural barriers and operate facilities so that they are accessible.

For renovation and alterations, up to 20% of the construction budget shall be used to achieve accessibility per applicable laws, regulations, codes, and guidelines with priority given to accessible route to the building and to primary function spaces within the building. Many user groups expressed a desire for increased accessibility beyond code compliance. The university mandates inclusiveness of all users.

Universal Design is a design concept in which all aspects of the built environment are to be usable to the greatest extents possible by all, regardless of ability or age. These principles are broader than those of accessible design and barrier-free design. Sample concepts include:

- Smooth, ground level entrances without stairs
- Surface textures that require low force to traverse on level, less than 5 pounds force per 120 pounds rolling force
- Surfaces that are stable, firm, and slip resistant per ASTM 2047
- Wide interior doors, hallways, and alcoves with 60” × 60” turning space at doors and dead-ends
- Functional clearances for approach and use of elements and components
- Lever handles for opening doors rather than twisting knobs
- Single-hand operation with closed fist for operable components including fire alarm pull stations
- Components that do not require tight grasping, pinching or twisting of the wrist
- Components that require less than 5 pounds of force to operate
- Light switches with large flat panels rather than small toggle switches
- Buttons and other controls that can be distinguished by touch
- Bright and appropriate lighting, particularly task lighting
- Auditory output redundant with information on visual displays
- Visual output redundant with information in auditory output
- Contrast controls on visual output
- Use of meaningful icons with text labels
- Clear lines of sight to reduce dependence on sound
- Volume controls on auditory output
- Speed controls on auditory output
• Choice of language on speech output
• Signs with light-on-dark visual contrast
• Instruction that presents material both orally and visually
• Labels on equipment control buttons that is large print

Design teams involved in projects in the Northwest Quadrant are to incorporate appropriate Universal Design concepts. Refer to project-specific issues discussed in the preliminary plan review comments in other project Program Statement/Pre-Design reports.

7.3. **DFD Sustainability Standards Checklist**

The following DFD Checklist is to be followed during the next phases of the NWQ Selective Facility Renewal project.
### Table 7.3.1. DFD Sustainability Standards Checklist

<table>
<thead>
<tr>
<th>Applicable?</th>
<th>Requirements</th>
<th>Primary Responsibility</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note any:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reason if Unknown or Not Applicable,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any goals beyond Min. Req'ts.,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other comments</td>
</tr>
</tbody>
</table>

#### 1. Portfolio Management & Assessment of Need
- Yes
- ** Portfolio Management & Assessment of Need
- A

#### 2. Program Development
- Yes
- ** Program Development
- A

#### 3. Integrated Design
- Yes
- ** Integrated Design
- D, DSF

#### 4. Sustainable Site Requirements
- SS W1/P1  * Construction Site Erosion & Sedimentation Control
- D/C
- SS C1  Site Selection
- A
- SS C2  Development Density & Community Connectivity
- A
- SS C3  Brownfield Redevelopment
- A
- SS C4.1  Alternative Transportation
- Public Transportation Access
- A
- SS C4.2  * Alternative Transportation
- Bicycle Storage & Changing Rooms
- D
- SS C4.3  * Alternative Transportation
- Low Emitting & Fuel Efficient Vehicles
- D
- SS C4.4  Alternative Transportation
- Parking Capacity
- A
- SS C5.1  Site Development, Protect or Restore Habitat
- A/D
- SS C5.2  Reduced Site Disturbance
- Development Footprint
- A/D
- SS C6.1  Permanent Stormwater Management
- (Discharge Rate & Vol - DNR 151)
- D
- SS C6.2  * Permanent Stormwater Management
- (Quality Treatment - DNR 151)
- D
- SS C7.1  Heat Island Effect:
- Non-Roof
- D
- SS C7.2  LEED Credit Not Used
- D
- SS C8  Light Pollution Reduction
- D
### 5. Water Efficiency Requirements

<table>
<thead>
<tr>
<th>WE C1.1</th>
<th>Incorporated into WE C1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>WE C1.2</td>
<td>Water Efficient Landscaping</td>
</tr>
<tr>
<td>WE C2</td>
<td>LEED Credit Not Used</td>
</tr>
<tr>
<td>WE C3.1</td>
<td>Water Use Reduction, 20% Reduction</td>
</tr>
<tr>
<td>WE C3.2</td>
<td>LEED Credit Not Used</td>
</tr>
</tbody>
</table>

### 6. Energy & Atmosphere Requirements

<table>
<thead>
<tr>
<th>EA P1</th>
<th>* Commissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA P2</td>
<td>Minimum Energy Performance</td>
</tr>
<tr>
<td>EA P3</td>
<td>* CFC Reduction in HVAC&amp;R Equipment</td>
</tr>
<tr>
<td>EA C1</td>
<td>* Optimize Energy Performance for Projects &gt; $2 million</td>
</tr>
<tr>
<td>EA C2</td>
<td>* Renewable Energy</td>
</tr>
<tr>
<td>EA C3</td>
<td>Incorporated into EA P1</td>
</tr>
<tr>
<td>EA C4</td>
<td>LEED Credit Not Used</td>
</tr>
<tr>
<td>EA C5</td>
<td>* Measurement &amp; Verification</td>
</tr>
<tr>
<td>EA C6</td>
<td>Green Power</td>
</tr>
</tbody>
</table>

#### DSF Requirement / LEED Credit Comparison

<table>
<thead>
<tr>
<th>DSF Division of State Facilities</th>
<th>Architect/Engineer</th>
<th>Agency - Planning, Budget Analyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as LEED 2.1 or 2.2 Credit</td>
<td>D</td>
<td>A</td>
</tr>
<tr>
<td>* DSF variation of LEED 2.1 or 2.2 Credit</td>
<td>DSF</td>
<td></td>
</tr>
<tr>
<td>** DSF only Standard</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>LEED Credit Not Used, Incorporated into another Standard or not supported</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

#### Primary Responsibility

| Agency - Operation & Maintenance |
|----------------------------------|-----------------------------|
| A                                | D                           |
|                                 | Architect/Engineer          |
|                                 | Agency - Planning, Budget Analyst |
|                                 | Division of State Facilities |
|                                 | Contractor                  |

---

Table 7.3.1. DFD Sustainability Standards Checklist (continued)
<table>
<thead>
<tr>
<th>Applicable?</th>
<th>Requirements</th>
<th>Primary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>7. Materials &amp; Resources Requirements</strong></td>
<td></td>
</tr>
<tr>
<td>MR P1</td>
<td>Storage &amp; Collection of Recyclables</td>
<td>D</td>
</tr>
<tr>
<td>MR C1.1</td>
<td>Building Reuse</td>
<td>A</td>
</tr>
<tr>
<td>MR C1.2</td>
<td>Incorporated into MR C1.1</td>
<td></td>
</tr>
<tr>
<td>MR C1.3</td>
<td>LEED Credit Not Used</td>
<td></td>
</tr>
<tr>
<td>MR C2.1</td>
<td>Construction Waste Management</td>
<td>C</td>
</tr>
<tr>
<td>MR C2.2</td>
<td>Incorporated into MR C2.1</td>
<td></td>
</tr>
<tr>
<td>MR C3.1</td>
<td>Resource Reuse</td>
<td>D</td>
</tr>
<tr>
<td>MR C3.2</td>
<td>Incorporated into MR C3.1</td>
<td></td>
</tr>
<tr>
<td>MR C4.1</td>
<td>Recycled Content</td>
<td>D</td>
</tr>
<tr>
<td>MR C4.2</td>
<td>Incorporated into MR C4.1</td>
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<tr>
<td>MR C5.1</td>
<td>Local/Regional Materials</td>
<td>D</td>
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<tr>
<td>MR C5.2</td>
<td>LEED Credit Not Used</td>
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</tr>
<tr>
<td>MR C6</td>
<td>Rapidly Renewable Materials</td>
<td>D</td>
</tr>
<tr>
<td>MR C7</td>
<td>* Certified Wood</td>
<td>D</td>
</tr>
<tr>
<td>MR W1</td>
<td>** Durable Buildings</td>
<td>D</td>
</tr>
</tbody>
</table>

|            | **8. Indoor Environmental Quality Requirements**                |                        |
| EQ P1      | Minimum IAQ Performance                                        | D                      |
| EQ P2      | * Environmental Tobacco Smoke (ETS) Control                   | O                      |
| EQ C1      | LEED Credit Not Used                                           |                        |
| EQ C2      | LEED Credit Not Used                                           |                        |
| EQ C3.1    | Construction IAQ Management Plan During Construction            | C                      |
| EQ C3.2    | Construction IAQ Management Plan Before Occupancy              | C                      |
| EQ C4.1    | Low-Emitting Materials Adhesives & Sealants                    | D                      |
| EQ C4.2    | Low-Emitting Materials Paints                                  | D                      |
| EQ C4.3    | Low-Emitting Materials Carpet                                  | D                      |
| EQ C4.4    | Low-Emitting Materials Composite Wood                           | D                      |
| EQ C5      | Indoor Chemical & Pollutant Source Control                     | D                      |
| EQ C6.1    | LEED Credit Not Used                                           |                        |
| EQ C6.2    | LEED Credit Not Used                                           |                        |
| EQ C7.1    | LEED Credit Not Used                                           |                        |
| EQ C7.2    | LEED Credit Not Used                                           |                        |
| EQ C8.1    | * Daylight & Views                                             | D                      |
| EQ C8.2    | LEED Credit Not Used                                           |                        |
### Table 7.3.1. DFD Sustainability Standards Checklist (continued)

#### 9. Operation & Maintenance Requirements

| **Operation & Maintenance** | O |

#### 10. Purchasing of Furniture, Fixtures and Equipment Requirements

| **Purchasing of Furniture, Fixtures and Equipment** | A |

#### 11. Accountability, Verification, and Reporting Requirements

| AR 1 **Accountability for Sustainability** | DSF |
| AR 2 **Verification during Project Design** | DSF |
| AR 3 **Verification during Project Construction** | DSF |
| AR 4 **Verification following Construction** | DSF |
| AR 5 **Reporting on Construction Results** | DSF |

### LEED Goals

- **Seeking LEED Certification**
- **Yes LEED EB (Agency Operations Equal to LEED Existing Building)**

#### DSF Requirement / LEED Credit Comparison

<table>
<thead>
<tr>
<th>DSF Requirement / LEED Credit Comparison</th>
<th>Primary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as LEED 2.1 or 2.2 Credit</td>
<td>A Agency - Planning, Budget Analyst</td>
</tr>
<tr>
<td>* DSF variation of LEED 2.1 or 2.2 Credit</td>
<td>D Architect/Engineer</td>
</tr>
<tr>
<td>** DSF only Standard</td>
<td>DSF Division of State Facilities</td>
</tr>
<tr>
<td><strong>LEED Credit Not Used. Incorporated into another Standard or not supported</strong></td>
<td>O Agency - Operation &amp; Maintenance</td>
</tr>
</tbody>
</table>
Budget

8.1. Budget Summary
8.2. DFD Budget Worksheet
### 8.1. Budget Summary

Table 8.1.1 summarizes the budgets for the components that make up the NWQ Selective Facility Renewal project. This budget is based on 2013 costs.

<table>
<thead>
<tr>
<th>BUILDING(S)</th>
<th>FLOOR(S)</th>
<th>CONSTRUCTION COST</th>
<th>GPR</th>
<th>PR</th>
<th>GG</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure *</td>
<td>NWQ-A-D</td>
<td>(ALL)</td>
<td>$23,494,000</td>
<td>$26,314,943</td>
<td>$2,516,075</td>
<td>$28,831,000</td>
</tr>
<tr>
<td>School of Information Studies</td>
<td>NWQ-B</td>
<td>6 &amp; 7</td>
<td>$4,998,000</td>
<td>$7,705,000</td>
<td></td>
<td>$7,705,000</td>
</tr>
<tr>
<td>Surge Build-Out</td>
<td>NWQ-B</td>
<td>4 &amp; 5</td>
<td>$3,088,000</td>
<td>$4,053,000</td>
<td></td>
<td>$4,053,000</td>
</tr>
<tr>
<td>College of Health Sciences **</td>
<td>NWQ-B/NWQ-C</td>
<td>3</td>
<td>$8,144,000</td>
<td></td>
<td></td>
<td>$11,953,000</td>
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<tr>
<td>College of Nursing Center for Healthcare Transformation and Simulation (CHTS)**</td>
<td>NWQ-B/NWQ-D</td>
<td>1</td>
<td>$4,536,000</td>
<td></td>
<td></td>
<td>$7,321,000</td>
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<tr>
<td>Restaurant Operations Town Square</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$59,863,000</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
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<td>$44,260,000</td>
<td>$41,794,943</td>
<td>$16,068,075</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>

* Infrastructure Total Project Cost GPR-PR breakdown based off NWQ Redevelopment Plan Infrastructure project allocations.

** CHS/CON breakdown between General Purpose Revenue (GPR), Program Revenue (PR), and Gift Grants (GG) from UWM Campus Planning.
8.2. DFD Budget Worksheet

The following Major Project Budget worksheet shows the proposed budget summary for the Northwest Quadrant Selective Facility Renewal project. Because of its complexity and multiple components (Infrastructure Project, School of Information Studies, NWQ-B Surge Build-Outs, College of Health Sciences / College of Nursing Center for Healthcare Transformation and Simulation (CHTS), Restaurant Operations Town Square), the Selective Facility Renewal project is only summarized in this section. For full State Forms and Budget Details for each component, see 10.4. Budget Detail. This budget is based on 2013 cost due to uncertainty at the time of this study as to when funds would be available and when the project would be put forward as a Campus priority. The final budget needs to be verified and appropriate escalation factors applied once these factors are determined.

### Table 8.2.1. SFR Project Major Project Budget Summary

<table>
<thead>
<tr>
<th>THE UNIVERSITY OF WISCONSIN SYSTEM</th>
<th>MAJOR PROJECT BUDGET SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT TITLE: NWQ Selective Facility Renewal - Total Project</td>
<td>Date Prepared : 05/07/14</td>
</tr>
<tr>
<td>LOCATION : University of Wisconsin Milwaukee Northwest Quadrant</td>
<td>Prepared By : XXX</td>
</tr>
<tr>
<td>OPTION NO. : 0</td>
<td>Revised By: XXX</td>
</tr>
<tr>
<td>TOT PROJ COST EST: 59863000</td>
<td>TOT PROJ COST EST: 59863000</td>
</tr>
</tbody>
</table>

**NEW BUILDING AREA**

- ASF New Const: 0
- GSF New Const: 9,003 (0.00% Efficiency)
  - Base Date: 07/2014
  - Base Index: 5697
  - Projected Bid Date: 07/2014
  - Projected Bid Index: 5697

**REMODELING AREA**

- GSF Remodeling: 786,932
- GSF Total Bldg: 786,932 (100.00% Remodeling)
  - Est. Occup. Date : 09/2016

- $56 /ASF: Construction Cost (building & site)
- $56 /GSF: Construction Cost (building & site)
- $76 /ASF: Total Project Cost
- $75 /GSF: Total Project Cost
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW CONSTRUCTION</td>
<td>2,400,000</td>
</tr>
<tr>
<td>REMODELING</td>
<td>35,684,000</td>
</tr>
<tr>
<td>DEMOLITION</td>
<td>0</td>
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<tr>
<td>HAZMAT ABATEMENT</td>
<td>496,500</td>
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<tr>
<td>SPECIAL CONSTRUCTION</td>
<td>1,654,800</td>
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<td><strong>TOTAL CONSTRUCTION COST</strong></td>
<td>40,235,000</td>
</tr>
<tr>
<td>DESIGN CONTINGENCY</td>
<td>10.0%</td>
</tr>
<tr>
<td><strong>SUBTOTAL UN-ESCALATED CONSTRUCTION COST</strong></td>
<td>44,259,000</td>
</tr>
<tr>
<td>ESCALATION FACTOR</td>
<td>1.00</td>
</tr>
<tr>
<td>TOTAL CONSTRUCTION COST</td>
<td>&gt;&gt;&gt;&gt; $44,259,000</td>
</tr>
<tr>
<td>A/E BASIC SERVICES</td>
<td>8.2%</td>
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<tr>
<td>A/E ADDITIONAL SERVICES</td>
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<td>PROJECT CONTINGENCY</td>
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<tr>
<td>DFD MANAGEMENT FEE</td>
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<tr>
<td><strong>TOTAL FEES</strong></td>
<td>&gt;&gt;&gt;&gt; $10,238,000</td>
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<tr>
<td>SPECIAL &amp; MOVABLE EQUIPMENT</td>
<td>&gt;&gt;&gt;&gt; $5,365,000</td>
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<tr>
<td><strong>TOTAL PROJECT BUDGET ESTIMATE</strong></td>
<td>&gt;&gt;&gt;&gt;&gt; $59,863,000</td>
</tr>
</tbody>
</table>
### THE UNIVERSITY OF WISCONSIN SYSTEM

#### MAJOR PROJECT BUDGET WORKSHEET

**PROJECT TITLE:** NWQ Selective Facility Renewal - Total Project  
**LOCATION:** University of Wisconsin Milwaukee Northwest Quadrant  
**Date Prepared:** 05/07/14  
**Prepared By:** XXX  
**Revised By:** XXX  
**TOT PROJ COST EST:** $59,863,000

#### NEW BUILDING AREA

| ASF New Const | Base Date: 07/2014 | Base Index: 5697 |
| GSF New Const | 9,003 | 0.00% Efficiency |

#### REMODELING AREA

| GSF Remodeling | Projected Bid Date: 07/2014 |
| GSF Total Bldg | 786,932 | 100.00% Remodeling |

#### NEW CONSTRUCTION BY SPACE TYPE

<table>
<thead>
<tr>
<th>Space Category</th>
<th>ASF</th>
<th>Eff</th>
<th>GSF</th>
<th>$/GSF</th>
<th>Category Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core &amp; Shell Upgrade &amp; New Mechanical Penthouse NWQ-B</td>
<td>0</td>
<td>0.00</td>
<td>9,003</td>
<td>267</td>
<td>2,400,000</td>
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#### REMODELING BY SPACE TYPE

<table>
<thead>
<tr>
<th>Trade Category</th>
<th>GSF $/GSF Trade Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Surface Treatment</td>
<td>$0.00 0</td>
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<tr>
<td>Plumbing Minor</td>
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<td>$0.00 0</td>
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<tr>
<td>Complete</td>
<td>$0.00 0</td>
</tr>
<tr>
<td>Heat/Vent/Air Cond Minor</td>
<td>$0.00 0</td>
</tr>
<tr>
<td>Partial</td>
<td>$0.00 0</td>
</tr>
<tr>
<td>Complete</td>
<td>$0.00 0</td>
</tr>
<tr>
<td>Electric Minor</td>
<td>$0.00 0</td>
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<tr>
<td>Partial</td>
<td>$0.00 0</td>
</tr>
<tr>
<td>Complete</td>
<td>$0.00 0</td>
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</table>

**Subtotal:** $76,313  
**Subtotal Remodeling Cost:** $35,684,000  
**Subtotal Building / Remodeling Cost:** $38,084,000

**Est. Occup. Date:** 09/2015
### REMODELING BY SPACE TYPE

<table>
<thead>
<tr>
<th>Space Category</th>
<th>ASF</th>
<th>Eff</th>
<th>GSF</th>
<th>$/GSF</th>
<th>Category Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWQ-A Fire Sprinkler</td>
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<td>0.00</td>
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<td>6</td>
<td>1,015,500</td>
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<td>NWQ-B Fire Sprinkler</td>
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<td>0.00</td>
<td>128,713</td>
<td>4</td>
<td>507,500</td>
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<tr>
<td>NWQ-C &amp; D HVAC &amp; IT Upgrades</td>
<td>0</td>
<td>0.00</td>
<td>299,623</td>
<td>7</td>
<td>2,071,000</td>
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<tr>
<td>NWQ-C &amp; D Lifesafety Upgrades</td>
<td>0</td>
<td>0.00</td>
<td>299,623</td>
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<td>NWQ-A Lifesafety Upgrades</td>
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<td>7</td>
<td>1,404,300</td>
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<td>0.00</td>
<td>268,119</td>
<td>50</td>
<td>13,502,000</td>
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<td>NWQ-B Surge 4th &amp; 5th Floor</td>
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<td>0.00</td>
<td>46,188</td>
<td>61</td>
<td>2,807,000</td>
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<tr>
<td>Town Square</td>
<td>15,098</td>
<td>0.63</td>
<td>23,826</td>
<td>171</td>
<td>4,083,000</td>
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<td>School of Information Studies</td>
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<td>0.55</td>
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<tr>
<td>Clinical Simulation Lab</td>
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<td>23,760</td>
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Subtotal: $35,684,000

### REMODELING BY TRADE

<table>
<thead>
<tr>
<th>Trade Category</th>
<th>GSF</th>
<th>$/GSF</th>
<th>Trade Cost</th>
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<tbody>
<tr>
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<tr>
<td>- Surface Treatment</td>
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<td>- Partial</td>
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</tr>
<tr>
<td>- Complete</td>
<td>0</td>
<td>$0.00</td>
<td>0</td>
</tr>
<tr>
<td>Plumbing</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- Minor</td>
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<td>- Partial</td>
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<td>0</td>
</tr>
<tr>
<td>- Special Laboratory Needs</td>
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<td>$0.00</td>
<td>0</td>
</tr>
<tr>
<td>Heat/Vent/Air Cond</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Minor</td>
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<td>$0.00</td>
<td>0</td>
</tr>
<tr>
<td>- Partial</td>
<td>0</td>
<td>$0.00</td>
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<td>- Complete</td>
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<td>- Minor</td>
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<tr>
<td>- Partial</td>
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<td>0</td>
</tr>
<tr>
<td>- Complete</td>
<td>0</td>
<td>$0.00</td>
<td>0</td>
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</tbody>
</table>

Subtotal: $35,684,000

### SUBTOTAL REMODELING COST

$35,684,000

### SUBTOTAL BUILDING / REMODELING COST

$38,084,000
### Table 8.2.1. SFR Major Project Budget Worksheet - Page 2

<table>
<thead>
<tr>
<th>ADDITIONAL CONSTRUCTION / REMODELING COSTS:</th>
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<tbody>
<tr>
<td>1. Demolition</td>
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<tr>
<td>- Building Demolition</td>
<td>0</td>
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<tr>
<td>- Selective Demolition</td>
<td>BY REMODEL</td>
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<tr>
<td>2. Hazardous Materials Remediation</td>
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<tr>
<td>- Asbestos Abatement</td>
<td>0</td>
</tr>
<tr>
<td>- 5% of Construction Cost NWQ-A &amp; NWQ-B Fire Sprinkler</td>
<td>76,150</td>
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<tr>
<td>- 5% of Construction Cost HVAC - IT Upgrades</td>
<td>103,550</td>
</tr>
<tr>
<td>- 1% of Construction Cost Lifesafety Upgrades</td>
<td>15,070</td>
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<tr>
<td>- 1% of Construction Cost NWQ-B Core &amp; Shell Upgrades &amp; New Mechanical Penthouse</td>
<td>159,020</td>
</tr>
<tr>
<td>- 1% of Construction Cost - Town Square</td>
<td>40,830</td>
</tr>
<tr>
<td>- 1% of Construction Cost - SOIS</td>
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</tr>
<tr>
<td>- 1% of Construction Cost - CHS/CON Simulation</td>
<td>56,920</td>
</tr>
<tr>
<td>3. Additional Site Costs</td>
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</tr>
<tr>
<td>- Specify</td>
<td>0</td>
</tr>
<tr>
<td>4. Special Construction</td>
<td>0</td>
</tr>
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<td>- Specify</td>
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</tr>
<tr>
<td>- Specify</td>
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<td>- Specify</td>
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</tr>
<tr>
<td>- Specify</td>
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</tr>
<tr>
<td>- Specify</td>
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### Table 8.2.1. SFR Major Project Budget Worksheet - Page 2 (continued)

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Amount</th>
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<td>5. Utility Extensions</td>
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<td>- Specify</td>
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<td>- Specify</td>
<td>0</td>
</tr>
<tr>
<td>- Specify</td>
<td>0</td>
</tr>
<tr>
<td>6. Special Mechanical / Electrical Systems</td>
<td>0</td>
</tr>
<tr>
<td>- Specify</td>
<td>0</td>
</tr>
<tr>
<td>- Specify</td>
<td>0</td>
</tr>
<tr>
<td>7. Fixed Furnishings and Equipment</td>
<td>1,654,800</td>
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<tr>
<td>- Medical Equipment</td>
<td>576,756</td>
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<tr>
<td>- Simulation Equipment &amp; Software</td>
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</tr>
<tr>
<td>SUBTOTAL CONSTRUCTION/REMODELING COST</td>
<td>$40,235,000</td>
</tr>
<tr>
<td>DESIGN CONTINGENCY</td>
<td>10.0%</td>
</tr>
<tr>
<td>SUBTOTAL UN-ESCALATED CONSTRUCTION COST</td>
<td>$44,259,000</td>
</tr>
<tr>
<td>ESCALATION FACTOR</td>
<td>1.00</td>
</tr>
<tr>
<td>TOTAL CONSTRUCTION COST</td>
<td>$44,259,000</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>1. Architect/Engineer Basic Services</td>
<td>- Basic Services</td>
</tr>
<tr>
<td></td>
<td>- Reimbursable costs</td>
</tr>
<tr>
<td>2. Additional Design Services</td>
<td>- Pre-planning</td>
</tr>
<tr>
<td></td>
<td>- LEED™ certification</td>
</tr>
<tr>
<td></td>
<td>- Systems Furniture design</td>
</tr>
<tr>
<td></td>
<td>- Commissioning (specify level)</td>
</tr>
<tr>
<td></td>
<td>- EIS/EIA consultant</td>
</tr>
<tr>
<td></td>
<td>- Construction Testing</td>
</tr>
<tr>
<td></td>
<td>- Testing &amp; Balancing</td>
</tr>
<tr>
<td></td>
<td>- Specify</td>
</tr>
<tr>
<td>3. Project Contingency</td>
<td></td>
</tr>
<tr>
<td>4. DFD Project Management</td>
<td></td>
</tr>
<tr>
<td>5. Movable Equip. Allowance</td>
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</tr>
<tr>
<td>6. Special Equipment</td>
<td>- Audio-Visual</td>
</tr>
<tr>
<td></td>
<td>- Equipment</td>
</tr>
<tr>
<td></td>
<td>- Systems Furniture</td>
</tr>
<tr>
<td></td>
<td>- Food Service</td>
</tr>
<tr>
<td></td>
<td>- Waste Management Equipment</td>
</tr>
<tr>
<td><strong>TOTAL PROJECT BUDGET ESTIMATE</strong></td>
<td></td>
</tr>
</tbody>
</table>

- ASF: Construction Cost (building & site)
- GSF: Construction Cost (building & site)

NOTES:

_pbw_MPR_56

7/29/2014

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Table 8.2.1. SFR Major Project Budget Worksheet - Page 3
Schedule/Phasing

9.1. Schedule/Phasing Detail
9.1. **Schedule/Phasing Detail**

The following table shows the schedule summary for the NWQ Selective Facility Renewal project. This schedule reflects the DFD guidelines for the typical duration of Design, Bid and Construction. Selected A/E consultant should take into account the required phasing to complete the work in NWQ-A and NWQ-D, as they are currently unoccupied. Once the work in NWQ-A & NWQ-D is completed, current occupants of NWQ-B would need to be relocated to NWQ-A & NWQ-D so that work can be completed in NWQ-B. It is unknown who the occupants of NWQ-B surge space will be at the time of relocation - Campus will need to develop a strategy to assist future A/E team.

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract for A/E Services</td>
<td>5 Months</td>
</tr>
<tr>
<td>Develop/Review Budget</td>
<td>4 Months</td>
</tr>
<tr>
<td>Develop Preliminary Plans</td>
<td>3 Months</td>
</tr>
<tr>
<td>Complete/Review Design Report</td>
<td>2 Months</td>
</tr>
<tr>
<td>Complete Bid Documents</td>
<td>4 Months</td>
</tr>
<tr>
<td>Review Bid Documents (DFD)</td>
<td>2 Months</td>
</tr>
<tr>
<td>Bidding and Contracting</td>
<td>3 Months</td>
</tr>
<tr>
<td>Estimated Construction</td>
<td>24-34 Months</td>
</tr>
</tbody>
</table>

### Table 9.1.1. Schedule Summary

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract for A/E Services</td>
<td>5 Months</td>
</tr>
<tr>
<td>Develop/Review Budget</td>
<td>4 Months</td>
</tr>
<tr>
<td>Develop Preliminary Plans</td>
<td>3 Months</td>
</tr>
<tr>
<td>Complete/Review Design Report</td>
<td>2 Months</td>
</tr>
<tr>
<td>Complete Bid Documents</td>
<td>4 Months</td>
</tr>
<tr>
<td>Review Bid Documents (DFD)</td>
<td>2 Months</td>
</tr>
<tr>
<td>Bidding and Contracting</td>
<td>3 Months</td>
</tr>
<tr>
<td>Estimated Construction</td>
<td>24-34 Months</td>
</tr>
</tbody>
</table>

**Notes:**
Based on DFD Guide for Determining Time Required to Design, Bid, and Construct ($10 M-$30 M Construction Cost) - standards do not define schedule for projects with construction costs that exceed $30M, as this project does.

Based on average conditions with no unusual delay in delivery of materials or time lost to poor weather or other conditions.
Appendix

10.1. NWQ Buildings Code Review Detail
10.2. Code Memos
10.3. Reference Documents
10.4. Budget Detail
10.1. NWQ Buildings Code Review Detail

**GENERAL**
All state facilities must be constructed in compliance with all applicable state and federal laws, rules, codes and regulations. State facilities are exempted from local codes and regulations including county and municipal codes with 2 exceptions:

- County and municipal land-use zoning regulations apply to state facilities.
- County or municipal officials are the state’s enforcement agents: example – county land water agents enforce the Department of Agriculture and Consumer Protection animal waste regulations. *From DFD Policy and Procedure Manual (Nov. 17, 2008), Section 4.D.1*

The purpose of this code review document is to help identify existing code or life-safety non-conformities of the existing NWQ A-D areas that could impact the lease, use and development of the UW- Milwaukee Northwest Quadrant facility as academic space for the University. This review was based on a preliminary walk-thru visual inspection of the facility, review of prints of original construction drawings, the schematic design building and site plans, the current Wisconsin adopted 2009 International Building Code (IBC), 2009 International Existing Building Code (IEBC) and City of Milwaukee Zoning Code. This review is preliminary and should not be construed as a final and complete document. Code interpretation is subjective and the interpretations presented are based on past experience using the codes, previous acknowledged interpretations and industry standard practices. State of Wisconsin Plan Examiner and Building Inspector interpretations may differ. A preliminary meeting with an official from the Wisconsin State Department of Safety and Professional Services (DSPS) is suggested during schematic design and development of construction documents for individual projects in order to minimize conflicting interpretations.

General Note: Items and passages within this report that are in quotation marks or in italicized font are typically verbatim references lifted from the indicated code or regulation section.

**BUILDING HISTORY**
The Northwest Quadrant buildings were originally constructed as a hospital – most recently owned by Columbia - St. Mary’s Hospital (CSM) – and are located at the northwest intersection of Hartford and Maryland Avenues in Milwaukee, Wisconsin. The site is bordered on the south and east sides by the University of Wisconsin-Milwaukee and on the north and west sides by residential neighborhood.

The existing building structures were constructed in phases between 1919 and 1993. The complex was used continuously as a hospital until 2009. The building has been mostly vacant but heated since 2009. The buildings range in height from one to eight stories. The buildings are generally in good condition, due to an extensive maintenance program that was run by CSM when it owned the complex.

All of the structures on the south half of the Northwest Quadrant (NWQ) campus are physically connected and linked by a common corridor running the length of the complex from east to west. In addition, it is linked to the parking structure by a skywalk. This complex of buildings served as the main hospital and was built incrementally over the years. The oldest portion of the building (NWQ A) stands at the southeast corner of the NWQ campus. Subsequent additions (NWQ B, C & D) were made to the west. The hospital operated an emergency room, clinics, medical labs, physicians’ & administrative offices, and a pharmacy. Other functions included a nursing school (NWQ F), physical plant (NWQ E), kitchen & cafeteria, and an auditorium. A 700+ car parking structure (NWQ G) at the northwest corner of the complex and surface parking lots serviced the complex. The old School of Nursing (NWQ F) has recently been occupied as the home of UWM Honors House.
The main complex (NWQ A-D) is of Type IA construction per the International Building Code and was classified as a Group I-2 (Hospital) use at the time the NWQ was purchased by the University from Columbia - St. Marys. Since acquiring the facility, renovations by UWM have changed the use group of certain portions of the building (see the Building Information summary below). NWQ A-D is separated by 2-hour minimum fire-resistance rated fire barriers into four separate fire zones – roughly demised by demarcations between the building areas. It is protected by a partial sprinkler system (see chart below for breakdown by fire area and graphic diagrams in the Appendix). There is also a smoke evacuation system from the 1980’s that has 77 zones separated by 1-hour rated walls that was installed to address non-compliant shaft and floor penetrations. The smoke evacuation system was agreed to by the old Department of Health & Family Services that oversaw construction in hospitals and was not been reviewed by the Department of Commerce/Safety & Buildings (formerly DIHLR – now DSPS).

**BUILDING INFORMATION**

**Existing Building**

- (Sources: NWQ Surge Space Occupancy Submission 02/21/2011 and NWQ Children’s Center Plan Review Submission)

**Construction**

- Fire Area 1 – NWQ-A (East Wing): Type 1A (NC)
- Fire Area 2 – NWQ-B (West Wing): Type 1A (NC)
- Fire Area 3 – NWQ-C (Clinical Bldg): Type 1A (DIHLR Type A No. 1)
- Fire Area 4 – NWQ-D (MAB): Type 1A (DIHLR Type A No. 1)

**Height and Area**

- Building Footprint Area: 142,163 SF
- Total Building Area: 760,967 SF UL (Unlimited) for Type IA per IBC Table 503
- Number of Stories: 8 STORIES UL for Type IA per IBC Table 503
- Height: 127’-8” UL for Type IA per IBC Table 503
- Building Perimeter: 3,110 FEET
- Automatic Sprinkler System: PARTIAL (see below for breakdown by Fire Area)
- Increase in area and height allowed if sprinklered: No change for unlimited area.

**Existing Building Areas & Sprinkler Coverage**

- FIRE AREA 1 - NWQ-A (East Wing): Occupancy Group I-2 (Partial Sprinkler System)
- DSPS Facility No. 722491 219,190 Gross Sq. Ft.
- FIRE AREA 2 - NWQ-B (West Wing): Occupancy Group B (Partial Sprinkler System)
- DSPS Facility No. 720505 268,119 Gross Sq. Ft.
• FIRE AREA 3 - NWQ-C (Clinical Bldg.): Occupancy Group I-2 & I-4 (Complete Sprinkler System)
  DSPS Facility No. 720506 146,896 Gross Sq. Ft.
• FIRE AREA 4 - NWQ-D (Med. Arts): Occupancy Group B at Recently Improved Areas under separate projects and Occupancy Group I-2 at un-remodeled areas (Complete Sprinkler System)
  DSPS Facility No. 720508 152,727 Gross Sq. Ft
• Main NWQ Complex Total Sq. Ft.: 786,932 Gross Square Feet
• NOTE: DSPS considers the NWQ-A through NWQ-D fire areas as one, high-rise building per IBC 403. See additional clarification under the discussion of automatic sprinklers below.

USE & OCCUPANCY CLASSIFICATION
The Use Group classification of different areas of the NWQ complex have been changed from the original I-2 hospital use over time as portions of the complex have been remodeled to accommodate Surge Space and other capital projects. Current and proposed use group classifications are as follows:

NWQ A-D
• Group B, Business per IBC 304.1.
• Existing I-2, Hospital per IBC 308.3 (Until such time as all areas are renovated or undergo changed occupancy for use).
• Group I-4, Day Care Facilities (Child) per IBC 308.5.2.
• Group A-3, Lecture halls where not meeting the exceptions for being classified as an accessory area to a Group B use (limit of 750 square feet or 50 persons or more) per IBC 303.1.
• Group F-1, Moderate-hazard Baking and Food Processing per IBC 306.2.
• Group S-2, Low Hazard Food Products & Frozen Foods per IBC 311.3.

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY
IBC 202 Definitions: HIGH-RISE BUILDING. A building with an occupied floor located more than 75 feet above the lower level of fire department vehicle access. The NWQ-A through NWQ-D portion of the complex has been ruled by DSPS to be one high-rise building.

IBC 403 – High-Rise Buildings: Detailed requirements under 403 do not necessarily need to be followed unless invoked by the IEBC requirements. The designing architect should review the requirements to verify applicability.

HEIGHTS AND AREAS
Type of Construction
• All portions of the NWQ are construction Type IA with the exception of the Energy Center which is listed as Type IIB. Refer to NWQ Code Analysis Matrix.
Maximum Height Allowed
• Unlimited for Type IA construction per IBC table 503. Increase in area and height allowed if sprinklered: No change for unlimited area
• 2 stories and 15,500 square feet for Type IIB construction per IBC table 503. Increase in area and height allowed if sprinklered: 200 percent area increase + one additional floor.

NWQ-A thru D Mixed Occupancy Separation
• The existing complex has been separated into four fire areas with fire separation walls and opening protectives. This separation is left over from the previous hospital use and is not required for a Type IA building (unlimited area). The NWQ Redevelopment Plan suggests that the existing fire separations be maintained wherever possible as the building is redeveloped to maintain the current level of protection. Required separation between use group occupancies on adjacent floors is based on the fire-resistance rating requirements for building elements as given in IBC Table 601.

CONSTRUCTION AND PROTECTION
Fire-resistive rating reqmt’s for building elements (IBC table 601):

<table>
<thead>
<tr>
<th>BUILDING ELEMENT</th>
<th>TYPE IA FIRE RESISTIVE RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Frame</td>
<td>3 hour</td>
</tr>
<tr>
<td>Bearing Walls (Exterior)</td>
<td>3 hours</td>
</tr>
<tr>
<td>Bearing Walls (Interior)</td>
<td>3 hours</td>
</tr>
<tr>
<td>Nonbearing Walls (Ext.)</td>
<td>0 hours where separation is 30’ or greater</td>
</tr>
<tr>
<td>Nonbearing Walls (Int.)</td>
<td>0 hours</td>
</tr>
<tr>
<td>Floor Construction</td>
<td>2 hours</td>
</tr>
<tr>
<td>Roof Construction</td>
<td>1-1/2 hours (0 were roof is 20 ft. or more above floor)</td>
</tr>
</tbody>
</table>

GOVERNING CHAPTERS OF IEBC:
Individual redevelopment projects will typically be classified as Level 2 Alterations, Level 3 Alterations, Change of Use or Additions per the International Existing Building Code (IEBC) as adopted by the State of Wisconsin. Refer to individual project Pre-Designs for specific occupancy requirements related to those projects.

The infrastructure project components are as follows:
• Upgrade horizontal cable runs and mechanical/electrical upgrades to prepare NWQ-C and NWQ-D as Surge Space: Alteration Level 2
• Upgrade of Life Safety in NWQ-A, B, C & D (add sprinklers; upgrade water heaters, storm & sanitary, elevator work): Alteration Level 2 or Change of Occupancy/Alteration Level 3 if the work area Use Group Classification is being changed from I-2 to B or other use group.
• Infrastructure development at NWQ-B including new mechanical penthouse and central AHU systems, new core plumbing facilities, upgrade electrical switchgear/electrical core and exterior envelope upgrades: Alteration Level 2 and Addition.
<table>
<thead>
<tr>
<th>CODE ITEM</th>
<th>COMBINED COMPLEX</th>
<th>STAND-ALONE STRUCTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NWQ-A</td>
<td>NWQ-B</td>
</tr>
<tr>
<td>DOA/ UWSA / CAMPUS INVENTORY ID NO.</td>
<td>1932A</td>
<td>1932B</td>
</tr>
<tr>
<td>DSPS FACILITY NO.</td>
<td>722491</td>
<td>720506</td>
</tr>
<tr>
<td>DSPS REGULATED OBJECT ID</td>
<td>1374323</td>
<td>1374320</td>
</tr>
<tr>
<td>ADDRESS</td>
<td>3321 N MARYLAND</td>
<td>2025 E NEWPORT</td>
</tr>
<tr>
<td>FIRE AREA NO.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>SIZE (Total Gross Square Feet)</td>
<td>219,190 SF</td>
<td>268,119 SF</td>
</tr>
<tr>
<td>STORIES</td>
<td>5 + BSMT + MECH PENT</td>
<td>8 + 2 BSMT + HELIPAD</td>
</tr>
<tr>
<td>HEIGHT (APPROXIMATE)</td>
<td>70'</td>
<td>130'</td>
</tr>
<tr>
<td>BLDG CONSTRUCTION TYPE</td>
<td>IA</td>
<td>IA</td>
</tr>
<tr>
<td>SPRINKLERED?</td>
<td>PARTIAL</td>
<td>PARTIAL</td>
</tr>
<tr>
<td>FIRE ALARM</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>ON STATE OR CITY HISTORICAL REGISTER?</td>
<td>NO (ELIGIBLE)</td>
<td>NO</td>
</tr>
<tr>
<td>ACCESSIBLE PATH UPDATES REQUIRED</td>
<td>Ground Floor Ramp &amp; Toilets</td>
<td>Ground Floor Ramp &amp; Toilets</td>
</tr>
<tr>
<td>MAJOR IBC NONCONFORMITIES</td>
<td>Shafts/Smoke Control</td>
<td>Shafts/Smoke Control, Sprinklers</td>
</tr>
<tr>
<td>FIRE DIVISION WALL SEPARATION BETWEEN BUILDINGS?</td>
<td>2- HOUR FIRE BARRIER</td>
<td>2- HOUR FIRE BARRIER</td>
</tr>
<tr>
<td>OCCUPANTS</td>
<td>Roof</td>
<td>P-Greenhouse</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>T- Surge Users</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>P-Child Care</td>
</tr>
</tbody>
</table>
IEBC Chapter 7 – Alterations-Level 2
Per IEBC 404.1: Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment ... where the work area is less than 50 percent of the aggregate area of the building.

Portions of the building undergoing alterations (less than 50% of the aggregate area of the building) without an accompanying Change of Use would be reviewed as an Alteration – Level 2 per the International Existing Building Code (IEBC 2009), with comparison to the International Building Code (IBC 2009) for what would currently be required. Note that “work area” as defined by the IEBC is that portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by that code.

IEBC Chapter 8 – Alterations-Level 3
Per IEBC 405.1: Level 3 alterations apply where the work area exceeds 50 percent of the aggregate area of the building. Level 3 alterations shall comply with the provisions of Chapters 6 and 7 for Level 1 and 2 alterations, respectively, as well as the provisions of the Chapter 8.

IEBC Chapter 9 – Change of Occupancy
The change of the existing use Group I-2 to Group B at portions of NWQ A-D will trigger the provisions of IEBC Chapter 9, per IEBC 901.3: Where the occupancy classification of a building changes, the provisions of Section 902 through 912 shall apply. This includes a change of occupancy classification within a group as well as a change of occupancy classification from one group to a different group. Per IEBC 901.3.1: Where a portion of an existing building is changed to a new occupancy classification, Section 912 shall apply.

A portion of the NWQ-C has changed from Hospital I-2 to Child Day Care Group I-4 and NWQ-B has already been changed to Business Group B. The balance of the structure is eventually undergoing or has already undergone a change of use to Group B – Business. Any new projects in NWQ-A, C, or D should follow the requirements of IEBC Sections 902 through 912 when they undergo reclassification.

IEBC Chapter 10 – Additions
The redevelopment plan proposes an addition to the existing NWQ-B building at the 7th floor to house new mechanical units.

IEBC 1001.1 Scope. An addition to a building or structure shall comply with the International Codes as adopted for new construction without requiring the existing building or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an addition impacts the existing building or structure, that portion shall comply with this code.

Section 1003.1 Compliance with the International Building Code. Additions to existing buildings or structures are new construction and shall comply with the International Building Code.
Section 1003.2 Additional gravity loads. Existing structural elements supporting any additional gravity loads as a result of additions shall comply with the IBC.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.

Specific IEBC Chapter 7 Level 2 Alteration Code Requirements:

IEBC 703.2.1: All Existing interior vertical openings connecting two or more floors shall be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protective.

Exception: 5. In Group B occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 703.2.1, shall not be required in the following locations:

IEBC 704.2 Buildings protected throughout by an approved automatic fire sprinkler system (see discussion of fire sprinkler system).

IEBC 703.2.2 Supplemental shaft and floor opening enclosure requirements. Where the work area on any floor exceeds 50 percent of that floor area, the enclosure requirements of Section 703.2 shall apply to vertical openings other than stairways throughout the floor.

IEBC 703.2.3 Supplemental stairway enclosure requirements. Where the work area on any floor exceeds 50 percent of that floor area, stairways that are part of the means of egress serving the work area shall, at a minimum, be enclosed with smoke-tight construction on the highest work floor and all floors below.

IEBC 703.4 Interior Finish: The interior finish of walls and ceiling in exits and corridor in any work area shall comply with the requirements of the IBC.

Exception: Existing interior finish materials that do not comply with the interior finish requirements of the IBC shall be permitted to be treated with an approved fire-retardant coating in accordance with the manufacturer’s instructions to achieve the required rating.

IBC Table 803.9 requires the following interior wall and ceiling finish requirements by occupancy:

Sprinklered - Group B
Exit enclosures and exit passageways: Class B
Corridors: Class C
Rooms and enclosed spaces: Class C

IEBC 704.1.1 Corridor ratings. Where an approved automatic sprinkler system is installed throughout the story, the required fire-resistance rating for any corridor located on the story shall be permitted to be reduced in accordance with the IBC.

IEBC 704.2.1 High Rise Buildings. In high-rise buildings, work areas that have exits or corridors share by more than one tenant or that have
exits or corridors serving an occupant load greater than 3- shall be provided with automatic sprinkler protection in the entire work area where the work area is located on a floor that has a sufficient sprinkler water supply system from an existing standpipe or a sprinkler riser serving that floor.

1.1.1.1 Supplemental automatic sprinkler system requirements. Where the work area on any floor exceeds 50 percent of that floor area, Section 704.2.1 shall apply to the entire floor on which the work area is located.

It is a stated goal of the NWQ Redevelopment Plan that the entire NWQ-A through –D building be sprinklered in its entirety. Any areas that are not currently covered by automatic sprinklers should have them installed as part of the infrastructure projects or individual user projects.

IEBC 704.4 Fire alarm and detection: An approved fire alarm system shall be installed in accordance with Sections 704.4.1 through 704.4.3. Where automatic sprinkler protection is provided in accordance with Section 704.2 and is connected to the building fire alarm system, automatic heat detection shall not be required.

A separate capital expenditures project was undertaken in 2013 by DFD to address installing a new fire alarm backbone that areas undergoing upgrading of systems can be tied into. Alarms in existing areas will need to be maintained until such time as they are upgraded or replaced to communicate with the new system.

MEANS OF EGRESS
IEBC 705.4.1 Two egress doorways required. Work areas shall be provided with two egress doorways in accordance with the requirements of Sections 705.4.1.1 and 705.4.1.2.

705.4.1.1 Occasional use load and travel distance. In any work area, all room and spaces having an occupant load greater than 50 or in which the travel distance to an exit exceeds 75 feet shall have a minimum of two egress doorways.

IEBC 705.4.2 Door swing. In the work area and in the egress path from any work area to the exit discharge, all egress doors serving an occupant load greater than 50 shall swing in the direction of egress.

705.4.2.1 Supplemental requirements for door swing. Where the work area exceeds 50 percent of the floor area, door swing shall comply with Section 705.4.2 throughout the floor.

IEBC 705.4.4 Panic hardware. In any work area, and in the egress path from any work area to the exit discharge, in buildings or portions thereof of Group A assembly occupancies with an occupant load greater than 100, all required exit doors equipped with latching devices shall be equipped with approved panic hardware.
IEBC 705.6 Dead end corridors. Dead end corridors in any work area shall not exceed 35 feet.

Exceptions:
2. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 50 feet. In buildings equipped throughout with an automatic fire alarm system installed in accordance with the IBC.
3. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 70 feet. In buildings equipped throughout with an automatic fire sprinkler system installed in accordance with the IBC.
4. In other than Group A and H occupancies, the maximum length of an existing, newly constructed, or extended dead-end corridor shall not exceed 50 feet on floors equipped with an automatic fire alarm system installed in accordance with the IBC.

IEBC 705.6 Means-of-egress lighting. Provide artificial means-of-egress lighting throughout the floor where the work are on any floor exceeds 50 percent of the floor area.

IEBC 705.8 Exit signs. Means of egress in all work areas shall be provided by exit signs. Where the work area on a floor exceeds 50 percent, all means-of-egress exit signage on that floor must comply with the IBC.

IEBC 705.9 Handrails. As a minimum requirement, every required exit stairway that is part of the means of egress for any work area and that has three or more risers and is not provided with a least one handrail, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails for the full length of the run of steps on at least one side.

IEBC 705.10 Guards. At stairs from the work area to, and including, the level of exit discharge that are on the egress path from the work area should have guards per the IBC. Verify with the AHJ whether the existing guards at the egress stairs need to be raised to 42 inches.

STRUCTURAL
IEBC 707. New structural elements in alterations, including connections and anchorage, shall comply with the IBC. The minimum design loads on existing elements of a structure that do not support additional loads as a result of an alteration shall be the loads applicable at the time the building was constructed. Alterations shall not reduce the capacity of existing gravity load-carrying structural elements unless it is demonstrated that the elements have the capacity to carry the applicable design gravity loads required by the IBC. Existing structural elements supporting any additional gravity loads as a result of the alterations shall comply with the IBC, unless the stress on the structural elements is not increased by more than 5 percent.

ELECTRICAL
IEBC 708.1 New installations. All newly installed electrical equipment and wiring relating to work done in any work areas shall comply with the materials and methods requirements of (IBC) Chapter 6.

Exception: Electrical equipment and wiring in newly installed partitions and ceiling shall comply with all applicable requirements of NFPA 70.
MECHANICAL
IEBC 709.1 reconfigured or converted spaces. All reconfigured spaces intended for occupancy and all spaces converted to habitable or occupiable space in any work area shall be provided with natural or mechanical ventilation in accordance with the IBC.

Exception: Existing mechanical ventilation systems shall comply with the requirements of Section 709.2.

Altered existing systems must provide not less than 5 cubic feet per minute (cfm) per person of outdoor air and not less than 15 cfm of ventilation air per person. Additionally, all newly introduced devices or operations that produce fumes, vapors, etc, shall be provided with local exhaust.

SPECIFIC IEBC CHAPTER 8 LEVEL 3 ALTERATION CODE REQUIREMENTS:
IEBC 802.2 Boiler and furnace equipment rooms. Boiler and furnace equipment rooms adjacent to or within the following facilities shall be enclosed by 1-hour fire-resistance-rated construction: ... rooming and boarding houses, hotels, and multiple dwellings.

Exceptions:
1. Furnace rooms protected with automatic sprinkler protection.

IEBC 803.1 Existing shafts and vertical openings. Existing stairways that are part of the means of egress shall be enclosed in accordance with Section 703.2.1 from the highest work area floor to, and including, the level of exit discharge and all floors below.

IEBC 803.3 Interior finish. Interior finish in exits serving the work area shall comply with Section 703.4 between the highest floor on which there is a work area to the floor of exit discharge.

IEBC 804.1 Automatic sprinkler systems. Automatic sprinkler systems shall be provided in all work area when required by Section 704.2 or this section.

804.1.2 Rubbish and linen chutes. Rubbish and linen chutes located in the work area shall be provided with sprinklered protection or an approved fire suppression system where protection of the rubbish and linen chute would be required under the provisions of the IBC for new construction.

IEBC 704.2.2: In buildings with occupancies in Groups A, B, ... R-2, ... work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where all of the following conditions occur:
1. The work area is required to be provided with automatic sprinkler protection in accordance with the IBC as applicable to new construction;
2. The work area exceeds 50 percent of the floor area; and
3. The building has sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump.
IEBC 704.2.3 Windowless stories. Work located in a windowless story, as determined in accordance with the IBC, shall be sprinklered where the work area is required to be sprinklered under the provisions of the IBC for newly constructed buildings and the building has sufficient municipal water supply without installation of a new fire pump.

Section 805.1 General. The means of egress shall comply with the requirements of Section 705 except as specifically required in Sections 805.2 and 805.3.

805.2 Means-of-egress lighting. Means of egress from the highest work area floor to the floor of exit discharge shall be provided with artificial lighting within the exit enclosure in accordance with the requirements of the IBC.

805.3 Exit signs. Mean of egress from the highest work area floor to the floor of exit discharge shall be provided with exit signs in accordance with the requirements of the IBC.

806.1 (Accessibility) General. A building that is altered shall comply with sections 605 and 706. See discussion of accessibility below.

Section 807 Structural: Where buildings are undergoing Level 3 alterations including structural alterations, the provisions of under this section pertaining to new structural elements, existing structural elements carrying gravity loads and structural alterations must be evaluated and analyzed by a registered engineers.

Section 808.1 (Energy Conservation) Minimum requirements. Level 3 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the IECC. The alterations shall conform to the energy requirements of the IECC as they relate to new construction only.

SPECIFIC IEBC CHAPTER 9 CHANGE OF USE CODE REQUIREMENTS:
Building Elements and Materials (IEBC 903.1): Building elements and materials in portions of building undergoing a change of occupancy classification shall comply with Section 912. See commentary under IEBC 912.

Comm 66.0901 Change of occupancy.
Comm 66.0901(2)(2) CHANGE OF OCCUPANCY CLASSIFICATION. This is a department rule in addition to the requirements in IEBC section 901.3: Buildings undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with IECC. Randy Dahman at DSPS has ruled that existing mechanical units, if unchanged, do not need to meet the more stringent energy standards.

Fire Protection (IEBC 904.1): Fire protection requirements of Section 912 shall apply where a building or portions thereof undergo a change of Occupancy classification. See commentary under IEBC 912.
Means of Egress (IEBC 905.1): Means of egress in portions of building undergoing a change of occupancy classification shall comply with Section 912. See commentary under IEBC 912.

Accessibility (IEBC 906.1): Accessibility in portions of buildings undergoing a change of occupancy classification shall comply with Section 912.8. See commentary under IEBC 912.

Structural (IEBC 907):
IEBC 907.1 Gravity Loads: Buildings or portions thereof subject to a change of occupancy where such change in the nature of occupancy results in higher uniform or concentrated loads based on Tables 1607.1 and 1607.6 of the IBC shall comply with the gravity load provisions of the IBC. Exception: Structural elements whose stress is not increase by more than 5 percent.

IEBC 907.3 Seismic Loads: Existing buildings with a change of occupancy shall comply with the seismic provisions of Sections 907.1 and 907.3.2.

Refer to Structural Analysis of Existing Buildings in Section 3.6.2.

Electrical (IEBC 908):
IEBC 908.1 Special Occupancies: Where the occupancy of an existing building or part of an existing building is changed to a [place of assembly] as described in NFPA 70, the electrical wiring and equipment of the building or portion thereof that contains the proposed occupancy shall comply with the applicable requirements of NFPA 70 whether or not a change of occupancy is involved. Some areas of other Program Statements/Pre-Designs may be classified as assembly use.

IEBC 908.2 Unsafe Conditions: All unsafe conditions shall be corrected without requiring that all parts of the electrical system comply with NFPA 70.

IEBC 908.4 Number of Electrical Outlets: Where the occupancy of an existing building or part of an existing building is changed, the number of electrical outlets shall comply with NFPA 70 for the new occupancy.

All newly installed electrical equipment and wiring relating to work done in the work area shall comply with the requirements of IEBC Chapter 5. Electrical equipment and wiring in newly installed partitions and ceiling shall comply with all applicable requirements of the National Electrical Code (NEC).

Refer to Electrical System Analysis of Existing Buildings in Section 3.6.6.

Mechanical (IEBC 909.1): Where the occupancy of an existing building or part of an existing building is changed such that the new occupancy is subject to different kitchen exhaust requirements or to increased mechanical ventilation requirements in accordance with the International Mechanical Code, the new occupancy shall comply with the intent of the respective IMC provisions.

The change of use to offices should not trigger a requirement for additional ventilation. However, other uses may require that the mechanical system will need to meet current IMC requirements.

Refer to Mechanical System Analysis of Existing Buildings in Section 3.6.3.
ADDITIONAL MECHANICAL CODE ITEMS RELATED TO NWQ PROJECTS:
Engineered Smoke Control System: From Ring & DuChateau’s Project Memo of May 9, 2012:

An engineered smoke control system consisting of 77 zones serves the NWQ-A and NWQ-B along with the 1982 portion of NWQ-C. The ESCS was installed in the mid 1980's as an authorized alternative to upgrading deficiencies in the integrity of existing fire rated shafts, fire separations and smoke separations. Authorization was given by the Department of Health and Family Services who was the governing authority for healthcare facilities. In 1990, the ESCS was upgraded by monitoring the smoke detection devices thru the fire alarm system.

Now that the facility is no longer a healthcare facility, the Safety and Buildings Division of the Department of Safety and Professional Services is the governing authority for the building. A preliminary code consultation meeting was held with Dave Wallace, DSPS plan reviewer on May 30, 2012 in Madison to clarify specific code requirements related to renovation of portions of the NWQ. At that meeting, “Dave Wallace indicated that the existing smoke control system should be kept operation to the best of its ability until passive upgrades are applied. Sprinklering the entire building would be viewed as an equivalency that would allow for abandonment of the smoke control system” (from meeting follow-up letter prepared by Quorum Architects and dated June 5, 2012). The Infrastructure project included in the NWQ Redevelopment Plan proposes adding automatic sprinklers to those areas of the building not currently covered and would allow for abandonment of the ESCS system.

Maintenance of the current ESCS system and infrastructure is the responsibility of Campus Facilities. The A/E team for this project is responsible for verifying with Campus Facilities the operational status of the ESCS. If the balance of the NWQ A-D complex has been sprinklered by the time of this project, no work is required to maintain the ESCS, however some removal of abandoned equipment/construction related to the ESCS may need to be included in the demolition phase. If the Infrastructure project intended to sprinkler the rest of the NWQ is not funded or has not been completed at by the time the design development of an NWQ alteration project is completed, accommodations will need to be made within the proposed alteration work area to keep the existing ESCS system intact and operational including insureing that all associated devices such as smoke doors, smoke detectors, and smoke dampers in the area of work remain functional.

Plumbing (IEBC 910):
Comm 66.0912 Plumbing. Substitute the following wording for the requirements in IEBC section 910: Where the occupant load of a story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified in the IBC based on the increased occupant load.

Different plumbing requirements and fixture locations will require that those areas renovated meet current IPC provisions.

IEBC 910.2 Food-handling Occupancies: If planning for future kitchen/food preparation/serving area, all existing sanitary waste lines above food or drink preparation or storage areas shall be panned or otherwise protected to prevent leaking pipes or condensation on pipes from contaminating food or drink. New drainage lines shall not be installed above such areas and shall be protected in accordance with the IPC.

IEBC 910.3 Interceptor Required: If the new occupancy will produce grease or oil-laden wastes, interceptors shall be provided as required in the IPC.

Light and Ventilation (IEBC 911): Light and ventilation shall comply with the requirements of the IBC for the new occupancy.
Change of Occupancy Classification (IEBC 912): Provisions of this section apply to buildings or portions thereof undergoing a change of occupancy classification. Per IEBC 912.1.1, the requirements of Chapter 8 shall be applicable throughout the building for the new occupancy classification based on the separation conditions set forth in Sections 912.1.1.1 and 912.1.1.2.

IEBC 912.1.1.1 Change of Occupancy Classification without Separation: Where a portion of an existing building is changed to a new occupancy classification and that portion is not separated from the remainder of the building with fire barriers having a fire-resistance rating as required in the IBC for the separate occupancy, the entire building shall comply with all of the requirements of Chapter 8 applied throughout the building for the most restrictive occupancy classification in the building and with the requirements of this chapter.

IEBC 912.1.1.2 Change of Occupancy Classification with Separation: Where a portion of an existing building that is changed to a new occupancy is separated from the remainder of the building with fire barriers having a fire-resistance-rating as required by the IBC for the separate occupancy, that portion shall comply with all the requirements of Chapter 8 and this chapter.

IEBC 912.4 Accessibility: All buildings undergoing a change of occupancy classification shall comply with Section 912.8. IEBC 912.8.1 requires that only the portion of the building where the occupancy classification changes need comply with the accessibility provisions of IEBC 695 and 706. However, because the whole complex will eventually go through a change of occupancy and because this project should stand alone, this project should approach accessibility per IEBC 912.8.2 and require:

- At least one accessible building entrance.
- At least one accessible route from an accessible building entrance to primary function area.
- Signage complying with Section 1110 of the IBC.
- Accessible parking.
- At least one accessible passenger loading zone, where loading zones are provided.
- At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

IEBC 912.2.1 Fire Protection Systems: The existing fire protection sprinkler system will remain and be re-engineered in accordance with chapter 9 of the IBC throughout the area where the change of occupancy occurs.

IEBC 912.2.2 Fire Alarm and Detection System: The existing fire alarm and detection system will remain interconnected to the existing building-wide system and modified in accordance with Chapter 9 of the IBC throughout the area where the change of occupancy occurs. A separate capital expenditures project by DFD to install a new fire alarm backbone in NWQ-A - D is currently being constructed. Alarms in existing areas will need to be maintained until such time as they are upgraded or replaced to communicate with the new system.

IEBC 912.3 Interior Finish: Finishes in the area where the change of occupancy occurs shall comply with the requirements of the IBC. IBC Table 803.9 requires the following interior wall and ceiling finish requirements by occupancy (Group B, sprinklered & unsprinklered):
IEBC 912.4.2 Means of Egress for change of Use to Equal or Lower Hazard Category: Existing elements of the means of egress shall comply with requirements of IEBC Sections 805 and 705 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the IBC.

IEBC 912.4.3 Egress Capacity: Egress capacity shall meet or exceed the occupant load as specified in the IBC for the new occupancy. The existing building currently meets occupancy loading for the existing I-2 use. A review of egress and exit capacity will be done on the individual Pre-Design plans.

EXITING AND EGRESS:
Means of Egress: The following are maximum floor area allowances per occupant by Occupancy Classification from IBC Table 1004.1:

- Assembly – Unconcentrated (Tables & Chairs): 15 sq ft net
- Assembly – Standing space: 5 sq ft net
- Assembly – Fixed Seating: by actual count
- Business Areas: 100 sq ft gross
- Educational – Classroom: 20 sq ft net
- Educational – Shops & Labs: 50 sq ft net
- Library: 50 sq ft net
- Accessory Storage Areas: 300 sq ft gross
- Stages and Platforms: 15 sq ft net

Egress widths shall be calculated per IBC 1005.1:

- Stairways: 0.3 inches per occupant
- Other egress components: 0.2 inches per occupant

IBC EXITING REQUIREMENTS SUMMARY

- Exit access travel distance is restricted to 200 feet maximum unless the entire building is sprinklered. The exit access travel distance is then extended to 300 feet maximum.
- Corridors in Group B must be 44 inches in width – minimum.
- Every floor level shall have at least 2 exits. All exits must lead directly to a street, alley or open court, which is connected to a street or alley.
- Common path of egress travel shall not exceed 75 feet except that common path of egress shall not exceed 100 feet in Group B, F, or S provided the building is equipped throughout with automatic sprinklers.
- In any work area, all rooms and spaces having an occupant load 50 or greater or which the travel distance exceeds 75 feet shall have a minimum of 2 egress doorways.
• Where the work area exceeds 50 percent of the floor area, door swing shall be in the direction of exit for rooms or spaces serving an occupant load of 50 or greater.

• In any work area, all doors opening onto an exit passageway at grade or an exit stair shall be self-closing or automatically closing by listed closing devices.

• In any work area, and in the egress path from any work area to the exit discharge, in buildings or portions thereof of Group A assembly occupancies with an occupant load greater than 100, all required exit doors equipped with latching devices shall be equipped with approved panic hardware.

• Dead end corridors in Group B areas shall not exceed 70 feet for existing corridors and 50 feet for newly constructed or reconfigured corridors in sprinklered buildings.

• Walls separating classrooms from corridors do not need to have an hourly rating if they are a B use in a sprinkled building.

• Both floors of the proposed Surge space are in the NWQ-B portion of the building which is “T” shaped with existing exit stair enclosures at each arm and base of the “T”. All three of these exit stairs are enclosed from the floors in question to exterior exits at grade.

• The existing stairwell at the junction of the “T” in NWQ-B is not a required exit stair and does not exit to the exterior. It will remain as an enclosed communicating stair between floors.

IEBC 912.4.4 Handrails: Per IEBC 705.9, existing stair handrail required both sides.

IEBC 912.4.5 Guards: Existing guards shall comply with 705.10 in the area of change of occupancy. Per 705.10, existing guards need to be only 30 inches above floor. In general, the existing stairs currently have only a 30” high guard and have openings larger than 4” diameter.

IEBC 912.7.3 Other Vertical Shafts: Interior shafts other than stairways, including but not limited to elevator hoistways and service and utility shafts, shall be enclosed as required by the IBC when there is a change of use to a higher category.

   Exception 1. Existing 1-hour interior shaft enclosures shall be accepted where a higher rating is required.

IEBC 912.7.4 Openings: All openings into existing vertical shaft enclosures shall be protected by fire assemblies having a fire-protection rating of not less than 1 hour and shall be maintained self-closing or shall be automatic closing by actuation of a smoke detector. All other openings shall be fire protected in an approved manner. Existing fusible link-type automatic door-closing devices shall be permitted in shafts except stairways if the fusible link rating does not exceed 135°F.

Existing Vertical Openings (IEBC 703.2.1): All existing interior vertical openings connecting two or more floors shall be enclosed with approved assemblies having a fire-resistance rating of not less than 1-hour with approved opening protectives.

Vertical Separation of Exterior Openings (IBC 704.9): Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the building where the openings are within 5 feet of each other horizontally and the opening in the lower story is not a protected opening. Such openings shall be vertically separated by at least three feet of spandrel or other assembly having a 1-hour rating or by flame barriers that extend horizontally at least 30 inches beyond the exterior wall. The existing vertical separation meets code.
Exit Discharge (IBC 1027): The existing stairwell by the Green Elevators on the ground floor of the NWQ D currently exits through a lobby area before discharging to grade at the exterior of the building on the north side. That exit path also includes an elevator lobby.

IBC 1027.1, Exception 1 allows for a maximum of 50 percent of the number and capacity of the exit enclosures to egress through area on the level of discharge provided that all of the following are met:

1.1 Such exit enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure. The exit doors are located around a corner. The code commentary states “it should not be required that a person must turn completely around or go around a corner to be able to see the way out”. The doors are not set back very far from the corner. With proper egress and exit lighting, I feel that we would meet the readily visible and identifiable requirement. This was discussed with Dave Wallace at a preliminary consultation for the Children’s Center. He felt that the current exiting would be allowed to remain.

1.2 The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure. OK.

1.3 The egress path from the exit enclosure on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits. The NWQ-D structure is protected by an automatic sprinkler system. Therefore, the wall separating the adjacent office areas from the lobby does not need to have fire-resistive protected openings.

The existing northwest exit stair in NWQ B currently exits into an interior exit corridor at the first floor. While there is an exit to the exterior of the building on the north side within 35 feet of the stair enclosure exit, the 1st floor corridor is not a dedicated exit corridor and is not separated from other corridors and rooms by fire-resistive construction and opening protectives. This 1st floor exit corridor is should be enclosed to the exterior exit with 2-hour fire-resistive construction as part of this scheduled project.

Additionally, the 2-hour fire-resistance rated fire barriers currently in place between the four fire areas of the building have dual egress doors that should close upon notification from the fire alarm. These separations create horizontal exits that allow additional exit distance to and exit enclosure or exit as long as the vertical separations are maintained.

The existing southwest exit stair in NWQ-B exits directly to exterior grade at the landing between the Ground Floor and Floor 1. The existing east stair in NWQ-B exits directly to exterior grade on the south side of the building at Floor 1.

Additionally, there is a horizontal exit from NWQ-B through a 2-hour fire-resistance rated fire barrier on both Floors 3-7 and Floor 5 past the Orange Elevators into the NWQ-A portion of the building.

Exit Enclosures (IBC 1022): Existing exit stair enclosures are of at least 2-hour fire-resistance rated construction. As noted above, the exit path of the northwest stairwell on Floor 1 of the NWQ-B is currently not completely separated from other areas on Floor 1. If not addressed by another project, the exit corridor at the ground floor should be separated from adjacent areas by 2-hour fire resistant rated construction.
IBC 1022.3 states that Elevators shall not open into an exit enclosure.

Elevator Lobbies (IBC 708.14.1): An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as require for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1.

Many of the existing elevator banks open directly into the main connecting corridors without smoke rated enclosures. The 2009 IBC Code Commentary for Section 708.14.1 Elevator Lobby clarifies that elevator lobbies must have at least one means of exit and must allow two separate directions for egress once you have left the elevator lobby enclosure. The commentary goes on to clarify the following:

- Egress through elevator lobbies from corridors on both sides is allowed.
- A space can have its only exit access path through an elevator lobby if it meets all the other egress requirements.
- An exit enclosure (such as a stair) can open into an elevator lobby, but hoistway doors cannot open into an exit enclosure (stair or horizontal exit).

In the case of a through corridor passing in front of an elevator bank such as what happens at the Yellow and Orange elevators, you would have the following options for creating the elevator lobby:

1. Install dual egress doors on magnetic hold opens across the corridor at each end of the elevator lobby.
2. Install side-acting automatic closing partitions such as a Won Door across the corridor to define the elevator lobby.
3. Install automatically closing doors or roll-down smoke screens directly at the elevator hoistway entrances: this in effect creates a miniature elevator lobby in the area between the hoistway doors and the self-closing smoke containment opening protective.

The fit plans propose that the Yellow elevator lobby be separated from the rest of the floor by a side-acting automatic closing partition with a man-door exit due to space considerations. The Orange elevator lobby will be separated off from the NWQ-B floor area to the west by a pair of dual-egress doors with hold-opens on automatic release tied to the fire alarm system. The Red elevator lobby will keep the existing pair of double doors as separation with hold-opens tied to the fire alarm system. The condition and rating of these doors at the Red elevator lobby will need to be reviewed during design development.

ADA ACCESSIBILITY
ADA Accessibility (IEBC 706):
Per IEBC Section 706, a building, facility or element that is altered shall comply with Section 605 of the IEBC. In alterations where a stair is added where none existed previously, an accessible route shall be provided in accordance with Sections 1104.4 and 1104.5 of the IBC.

Per Section IEBC Section 605, a building, facility or element that is altered shall comply with the applicable
Entrances (IEBC 605.1.1): Where an alteration includes alterations to an entrance, and the building or facility has an accessible entrance on an accessible route, the altered entrance is not required to be accessible unless required by Section 605.2. Signs complying with Section 1110 of the IBC shall be provided. Refer to the ADA Compliance Review in Section 3.3 for review of existing accessibility and specific recommendations.

Alterations and Additions:
For alterations, other than repairs, what you touch must meet current code.
If over 50% altered or added on, then the whole building shall comply with current code.
If <50% altered or added on, then the altered space shall meet the current code.
Alteration percentages are cumulative. If previous alterations (within the previous three years) did not trigger ADA upgrades based on “disproportionality”, then their 20% requirements are added on to the current 20% until they are spent.
Change of use does not trigger code, unless remodeling takes place.
Not retroactive to existing buildings, unless physically altered or added on to.
Change of ownership does not trigger the code.
Also, the following items “along the path of travel” serving alterations involving a “primary function” must meet current code, unless “disproportionality” (maximum 20% of project hard costs) can be shown: accessible entrances, exits, toilets, drinking facilities, and public telephones. (Existing stairs may remain).

Accessibility of Other Features and Facilities (IBC 1109): Accessible building features and facilities shall be provided in accordance with Sections 1109.2 through 1109.14.

IBC 1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.

IBC 1109.2.1 Family or assisted-use toilet and bathing rooms. In assembly occupancies, an accessible family or assisted-use toilet room shall be provided where an aggregate of six or more male and female water closets is required. In building of mixed occupancy, only those water closets required for the assembly occupancy shall be used to determine the family or assisted-use toilet room requirement. At least one family or assisted-use toilet room will need to be provided to cover the requirements related to assembly use room(s). This toilet room should be located in the area of the assembly use, but can also be used as a general unisex accessible toilet room.

WATER CLOSETS AND TOILET COMPARTMENTS (ANSI 117.1 2003 – 604.10 AND DEPARTMENT OF JUSTICE (DOJ) 2010 STANDARDS FOR ACCESSIBLE DESIGN – 604.9 (APPLICABLE AS OF MARCH 15, 2012));

ANSI 117.1 604.10.2 /DOJ 604.9.1 Location: The water closet shall be located with a wall or partition to the rear and to one side. The centerline of the water closet shall be 12 inches minimum to 18 inches maximum from the side wall or partition.
ANSI 117.1 604.10.4 /DOJ 604.9.2 Clearance: A clearance around a water closet complying with Section 604.3 shall be provided (60” from sidewall and 59 inches from rear wall). The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, paper dispensers, sanitary napkin receptacles, coat hooks, shelves, accessible routes, clear floor space at other fixtures and turning space. No other fixtures or obstructions (including the lavatory) shall be within the required water closet clearance.

ANSI 117.1 604.10.4/DOJ 604.9.3 Height: The height of water closet seats shall be 11 inches minimum and 17 inches maximum above the floor, measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

ANSI 117.1 604.10.6/DOJ 604.9.5 Flush Controls: Flush controls shall be hand operated or automatic. Hand operated flush controls shall be installed 36 inches maximum above the finish floor. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments.

ANSI 117.1 604.10.7/DOJ 604.9.6 Dispensers: Toilet paper dispensers shall comply with 309.4 and shall be 7 inches minimum and 9 inches maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 14 inches minimum and 19 inches maximum above the finish floor. There shall be a clearance of 1-1/2 inches minimum below the grab bar. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

ANSI 117.1 604.10.8/DOJ 604.9.7 Toilet Compartments: Toilet compartments shall comply with Sections 604.8 and 604.9, as applicable. The minimum area of a wheelchair accessible compartment shall be 60 inches minimum in width from sidewall and 56 inches minimum in depth for wall hung water closets and 59 inches in depth for floor mounted water closets measured perpendicular to the rear wall.

PLUMBING (IEBC 710, IBC CHAPTER 29, ANSI A117.1):

IBC Chapter 29

Use Group B requires the following minimum number of plumbing fixtures per Table 2902.1:

<table>
<thead>
<tr>
<th>Fixture Type</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>Water Closets:</td>
<td>1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50</td>
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<tr>
<td>Lavatories:</td>
<td>1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80</td>
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<tr>
<td>Bathtubs or Showers</td>
<td>None Required</td>
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<tr>
<td>Drinking Fountains</td>
<td>1 per 100</td>
</tr>
<tr>
<td>Other:</td>
<td>1 service sink</td>
</tr>
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</table>

Plumbing fixture requirements are to be verified based on final proposed occupant loads stated in the Pre-Design reports for the individual colleges.

IBC Section 2902 Toilet Facilities:

[P] IBC 2902.2 Separate Facilities. Where plumbing fixtures are require, separate facilities shall be provided for each sex.

[P] IBC 2902.3.2 Location of toilet facilities in occupancies other than covered mall buildings. In occupancies other than covered mall building, the required public and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities and the path of travel to such facilities shall not exceed a distance of 500 feet.
<table>
<thead>
<tr>
<th>Date</th>
<th>June 5, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>Dave Wallace</td>
</tr>
<tr>
<td>Transmitting To</td>
<td>Department of Safety and Professional Services (DSPS)</td>
</tr>
<tr>
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<td>Safety and Buildings Division</td>
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<td></td>
<td>Plan Review, Inspection and Other Services:</td>
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<tr>
<td></td>
<td>201 W. Washington Ave.</td>
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<td></td>
<td>Madison, WI 53703</td>
</tr>
<tr>
<td>Subject</td>
<td>UW–Milwaukee NWQ Renovation Preliminary Consultation Follow-Up</td>
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<td>University of Wisconsin – Milwaukee</td>
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<td>DSF Project No. 11K3C</td>
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<td></td>
<td>Quorum Architect’s Project Number: 12012.00</td>
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<td>For</td>
<td>Previous Transaction ID No. 2052999 Site ID No. 682545</td>
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<tr>
<td>Facility</td>
<td>722491 UW MILWAUKEE BLDG NWQ-A 3321 N MARYLAND AVE MILW 53211</td>
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<td>Object Type: Building ICC Regulated Object ID No.: 1374323</td>
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<tr>
<td></td>
<td>Preliminary Consultation: Change of Use/Alteration Level 3; Major Occupancy: Business; Type IA Fire Resistant class of construction: Alteration plan; 212,233 project sq. ft.; Partially Sprinklered; Occupancy: B Business (currently I-2); Sprinkler Design: NFPA-13 Sprinkler; Allowable area determined by: Separated Use, Fire Barrier</td>
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<tr>
<td>Facility</td>
<td>720505 UW MILWAUKEE BLDG NWQ-B 2025 E NEWPORT AVE MILW 53211</td>
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<td>Object Type: Building ICC Regulated Object ID No.: 1374320</td>
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<tr>
<td></td>
<td>Preliminary Consultation: Alteration Level 2; Major Occupancy: Business; Type IA Fire Resistant class of construction: Alteration plan; 260,717 project sq. ft.; Partially Sprinklered; Occupancy: B Business; Sprinkler Design: NFPA-13 Sprinkler; Allowable area determined by: Separated Use, Fire Barrier</td>
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</tbody>
</table>
Facility: 720506 UW MILWAUKEE BLDG NWQ-C 1930 E HARTFORD AVE MILW 53211
Object Type: Building ICC Regulated Object ID No.: 1374321
Preliminary Consultation: Change of Use/Alteration Level 3; Major Occupancy: Business;
Type IA Fire Resistive class of construction: Alteration plan; 138,509 project sq. ft.;
Partially Sprinklered (fully sprinklered in this area); Occupancy: B Business, I-4 Adult &
Child Day Care, U Utility - Greenhouse; Sprinkler Design: NFPA-13 Sprinkler; Allowable
area determined by: Separated Use, Fire Barrier

Facility: 720506 UW MILWAUKEE BLDG NWQ-D 2001 E NEWPORT AVE MILW 53211
Object Type: Building ICC Regulated Object ID No.: 1374322
Preliminary Consultation: Change of Use/Alteration Level 3; Major Occupancy: Business;
Type IA Fire Resistive class of construction: Alteration plan; 149,547 project sq. ft.;
Partially Sprinklered (fully sprinklered in this fire area); Occupancy: B Business;
Sprinkler Design: NFPA-13 Sprinkler; Allowable area determined by: Separated Use, Fire
Barrier

Purpose: Preliminary Consultation with the Wisconsin Department of Safety and Professional
Services to review code implications for a Change of Use and renovations of portions of
the UWM Northwest Quadrant as temporary Surge Space and future permanent tenant
space.

Meeting Date: Wednesday, May 30, 2012 Time: 10:00am
Location: 201 West Washington Ave., Madison, WI

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Overview:
The purpose of this Preliminary Code Consultation is to clarify specific code requirements concerning the renovation of portions of the NWQ-A, -B, -C and -D buildings. The NWQ-B had already undergone a change of use from Institutional Group I-2 (hospital) to Group B (business) and has been partially occupied as surge space by temporary tenants from other areas of the campus. Other projects currently in document preparation will move the UWM Children's Center into the NWQ-C & -D changing portions of those buildings from Institutional Group I-2 (hospital) to Institutional Group I-4 (child day care) and a Group U greenhouse addition will be built on the roof of the NWQ-C. The campus is also looking at changing NWQ-A and the balance of NWQ-D to Group B (business) so that temporary or longer term occupants can occupy portions of the building. Depending on usage and class size, portions of the future Surge Spaces and future permanent occupancies could be classified as A-3 if they exceed 49 occupants.

Existing Building Summary:

1. **Type of Construction**: The existing NWQ-A thru -D complex was originally constructed as a hospital equivalent to Type IA construction under the current IBC code. The building is currently divided into four (4) fire areas separated by minimum 2-hour fire barriers. The fire barriers generally follow the demising lines between the different NWQ areas A thru D.

2. **Building Height**: Height and Stories are Unlimited for Type IA construction for all use groups except Group H per IBC Table 503. NWQ-B and NWQ-D are both classified as high-rise structures.

3. **Building Area**: Building area is Unlimited for all use groups except Group H per Table 503.

4. **Non-separated mixed occupancies**: Permitted per IBC 508.3 without required separation because the construction type permits unlimited area.

5. **Sprinklers**: The existing NWQ-C and -D fire areas are fully sprinklered. Portions of NWQ-A and -B are sprinklered.

6. **Fire Alarm**: The building is currently fully alarmed, but does not meet current code requirements. The existing system has different zones of varying ages as the system was added to or re-worked over time as building additions were done. DSF has planned a project for later this year which will create a new fire alarm system backbone that future remodeled areas will connect to. The campus currently has a standing fire watch in the NWQ and reports weekly back to the Milwaukee Fire Marshall.

7. **Accessibility**: The NWQ-A – D has accessible entrances and parking as it was used as a hospital until recently. Elevator access is available to all public levels and areas. Some elevator groups require upgrades to comply with prevailing codes for fireman’s service and ADA accessibility.

Discussion Items:

1. **Engineered Smoke Control System (ESCS)**: An engineered smoke control system consisting of 77 zones serves the A and B buildings along with the 1982 portion of the C building. The ESCS...
was installed in the mid 1980’s as an authorized alternative to upgrading deficiencies in the integrity of existing fire rated shafts, fire separations and smoke separations. Authorization was given by the Department of Health and Family Services which was the governing authority for healthcare facilities. In 1990, the ESCS was upgraded by monitoring the smoke detection devices through the fire alarm system.

**Question:** As future project carve up the existing spaces, it will become increasingly difficult to maintain the ESCS in its current form. Modification of the ESCS will also require modification of the fire alarm system since the two are interconnected. Because the complex is changing from a hospital use to a business use, the primary emergency response changes from defending in place to having occupants exit the building quickly. Would it be acceptable to abandon the existing smoke control system at this time? The existing fire barriers would be maintained.

**Response:** The smoke control system was part of an approved variance granted by the old DHFS to make up for shortcomings in the rated shafts required by the hospital usage. If possible, a copy of the original variance should be reviewed to determine what the listed code equivalencies being petitioned were (DHFS has indicated that they purged paperwork related to that Columbia St. Mary’s Hospital site when the building was sold to the University). While not required specifically for a Group B use, abandonment of the smoke control system would have the overall effect of decreasing safety in the complex. Dave Wallace indicated that the existing smoke control system should be kept operational to the best of its ability until passive upgrades are applied. Sprinklering the entire building would be viewed as an equivalency that would allow for abandonment of the smoke control system.

2. **Clarification of Classification of the NWQ A thru D fire areas as one building:** It is our understanding that - while they are separate fire zones separated by 2-hour rated fire barriers – the NWQ-A thru -D complex is classified as one building and not four separate buildings which would require fire walls per IBC 706.

**Question:** Is this a correct interpretation?

**Response:** Yes. NWQ-A thru NWQ-D are viewed as one building. Because parts of the building are defined as high-rise structures per the IBC, that entire complex will be viewed as a high-rise.
3. **Automatic Sprinklers:**
   a. The campus would like to change the use of NWQ-A to a Group B and use a portion of the structure for Surge Space similar to what was done in NWQ-B. They would like to occupy areas that currently do not have fire sprinkler protection. The IA construction type allows the building to not require automatic sprinklers for a Group B. However, classification of a portion of the building as a high-rise or a Group I-4 Day Care use could trigger the requirement to add sprinklers throughout the alteration work area dependent upon how the word “throughout” is interpreted in IBC Section 403 and Section 903.2.6. A follow-up letter to the NWQ-B Surge Space Occupancy Submittal letter of conditional approval from David Noelck at HGA Architects on March 08, 2011 and addressed to Dave Wallace clarified that the sprinkler system needed to be added only at work areas and not throughout the remainder of the change of use area.

**Question:** Is this interpretation still in force? It is our interpretation that IEBC 912.2.1 would allow a Change of Use to a Group B without requiring the area to have sprinklers added.

**Response:** Level 1 Alterations per the IBC (limited to finishes and replacement in kind) are allowed without having to sprinkle. Unsprinklered areas could be occupied as-is if left under the old I-2 Hospital classification and no modifications are made (no change in walls, doors, etc.). Dave Wallace indicated that Incremental Change of Use occupancies could be made only in areas that are currently sprinklered.

b. Change of use to a lecture hall or large classroom that falls under a Group A-3 use would require automatic sprinklers in the area of work if the area or occupant load triggers of IBC 903.2.1.3 are met.

**Question:** Is this a correct interpretation?

**Response:** Yes. Change of use to Group A-3 Assembly is triggered if a room or space used for assembly purposes has an occupant load of 50 persons or more or is 750.

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Northwest Quadrant Selective Facility Renewal Appendix 169
scale feet or greater in room area. A-3 occupancies must be sprinklered if the fire area exceeds 12,000 square feet, has an occupant load of 300 or more, or is located on a floor other than a level of exit discharge per IBC 903.2.1.3. The NWQ-A thru -D fire areas would all exceed the sprinkler triggers listed above.

c. In portions of the NWQ-A and -B where there are partial sprinklers, many of the common corridors are not sprinklered. IEBC 912.4.1, Exception 4 allows existing corridor walls of plaster terminating at similar structure above in lieu of sprinklers.

**Question:** Can similar 1-hour construction of block walls also use this exception? If an area is altered to allow for a Group A-3 classroom use, do the corridors that serve as exit access also need to be sprinklered?

**Response:** Yes, the 1-hour corridor construction exception can be used. If altered for higher hazard category use, corridors need to be 1-hour or sprinklered as required by use.

4. **Fire Alarm and Detection System:** The existing fire alarm system does not meet current code. The new fire alarm backbone is planned for 2013. It is our understanding that existing and new required devices will be reconnected to the new backbone as areas are modified.

**Question:** Can portions of the NWQ-A & -D be occupied without modifications to the existing fire alarm system as long as we are not increasing the hazard level?

**Response:** Yes. Existing detectors must be in working order and able to communicate with the new system. Additional detectors to meet current use and code requirements would need to be added in reconfigured work areas.
5. **Means of Egress:**
   
   a. Planned Change of Use in the NWQ complex would typically be from a higher (I-2) to lower or equal hazard category (B). The existing stairwells in NWQ-A do not meet current rise and run requirements for stairways, but can remain in use per the Exception to IEBC 912.4.2. Handrails and guards in existing stairs need to be brought up to current code requirements from the work area floor to, and including the level of exit discharge only if being modified or required by IEBC 705.9.1 for handrails and 705.10.1 for guards.
   
   **Question:** Is this interpretation correct?
   
   **Response:** Yes. Handrails and guards will still need to be analyzed for structural stability.
   
   b. If future renovation changes the use in an area from a B to an A-3 or other higher hazard category use, the existing stairways could remain in use without modifications per IEBC 912.4.1, Exceptions 2 & 3 as long as the code official approves the handrails and guards.
   
   **Question:** Is this interpretation correct?
   
   **Response:** Yes. Note that a Group B to Group A use could require replacement of existing stairwell door hardware with panic hardware.
   
   c. Existing Dead End Corridors: any existing dead end corridors shall not exceed 35 feet in existing unsprinklered buildings per IEBC 705.6 and 70 feet in buildings fully sprinklered throughout per IEBC 705.6, Exception 3. The maximum length of an existing, newly constructed, or extended dead-end corridor shall not exceed 50 feet on floors equipped with an automatic sprinkler.
   
   **Question:** Would this hold true for dead ends in corridors where the corridor is unsprinklered, but the rest of the floor is?
   
   **Response:** Partially sprinklered is viewed the same as unsprinklered. **Existing dead ends are limited to 35 feet. New dead ends are limited to 20 feet unless the entire floor is sprinklered.**
   
   d. Luminous Exit Path Markings: the 2009 IBC Section 1024 has added requirements for luminous path markings in buildings with occupied floors over 75 ft. above the level of exit discharge.
   
   **Question:** It does not appear that the IEBC requires the luminous path markings to be added in high-rise stairs when the Change of Occupancy is to an equal or lower hazard category use, the existing stairways could remain in use without modifications per IEBC 912.4.1, Exceptions 2 & 3 as long as the code official approves the handrails and guards.
   
   **Question:** Is this interpretation correct?
   
   **Response:** Yes. Handrails and guards will still need to be analyzed for structural stability.

category. Would we be required to add luminous markings at the high-rise stairs from the work area level to the level of exit discharge?
Response: No, the requirements of IBC Section 1024 are not retroactive.

6. Opening Protectives:
   a. Per IBC 912.7.2, Exception 3; as long as a change of occupancy is not being made to a higher hazard category, existing penetrations of stairway enclosures shall be accepted if they are protected in accordance with the IBC. We interpret this to mean that existing non-shaft related penetrations by conduit, ducts or piping will be allowed to remain as long as they are properly firestopped.
   Question: Is this a correct interpretation?
   Response: Yes.

   b. Per IBC 912.7.3, Exception 1; existing 1-hour interior shaft enclosures shall be accepted where a higher rating is required, even if moving to a higher hazard category.
   Per IBC 912.7.3, Exception 2; vertical openings (shafts) other than stairways, in other than Group I occupancy and connecting less than six stories shall not be required to be enclosed if the entire building is provided with an approved automatic sprinkler.
   Question: Would existing shafts that do not meet current code requirements for protection be allowed to remain in fire areas that are completely protected by a sprinkler system?
   Response: Yes.
c. The work in the Children’s Center area is being done under two separate bid packages: a demolition Bid Package #1 that clears out the area to a grey box and a new construction Bid Package #2 that builds the space out. Some removal and replacement of HVAC equipment is included in Bid Package #1. As part of bid package #1, we would like to remove a mechanical shaft that connects three floors so that we can see how existing piping to remain is routed within the shaft and then fill in the floor and rebuild the shaft in a smaller footprint as part of Bid Package #2.

**Question:** How long can an existing rated shaft area be left open between demo and reconstruction?

**Response:** As long as the area is unoccupied, the shaft may be left open after demolition activities for up to 1 year.

7. **Accessibility:**
   a. The complex has accessible parking, entrances and routes to areas that will be altered. Some of the elevators do not meet current ADA requirements for signaling and fixture location.

**Question:** Do elevator signal and fixture modifications only need to be done as required by disproportionality?

**Response:** Yes.

**Question:** Can the addition of tactile exit signs and replacement of existing door hardware cost be used to meet the 20% cost of general construction ADA upgrades?

**Response:** Yes, but the intent of the accessibility code requirements is to deal with parking, building entry and accessible path to the altered areas first as afforded under disproportionality.

**Question:** Can we bank money spent on stand-alone accessibility projects (i.e., elevator control upgrades and alarm system device upgrades) to be used for disproportional costs on future projects?
8. Structural:
   a. Per IEBC 807.4.3, regarding lateral load adequacy, it states “Limited structural alteration. Where not more than 30 percent of the total floor and roof areas of the building are involved in structural alteration within a 12-month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time of the original construction or of the most recent substantial structural alteration as defined by Section 807.4.2.
   
   Question: This assumes that existing drawings defining the existing building are available for use or that lateral load system can be determined without demolition of structural system (as would be the case for a cast-in-place concrete system). What options/requirements are there if drawings do not exist keeping in mind that building(s) may be deemed historic? How do you quantify lateral load?
   
   Response: Theoretical analysis by a professional engineer is best method to assess compliance. The analysis should demonstrate the load path.

9. Electrical:
   a. SPS 363.0505 – This section deals with Lighting Systems and the application of the 2009 International Energy Conservation Code / 2007 ASHRAE 90.1 and requires general lighting and controls in the area of occupancy if the lighting is modified. The lighting and controls are required to be upgraded if wattage is added or 50% of the fixtures are replaced. Response: Yes.
   
   b. IEBC 705.7, 705.8, and 402.1 – If spaces to be used as Surge Spaces receive a Level 2 alteration, the entire means of egress from the altered spaces would have to be upgraded within the work area. If the work area exceeds 50% of the floor area, then the means of egress lighting and exit signs for the whole floor shall comply with current requirements of the IBC.
   
   Question: Is the 50% trigger consider entire building floor area, or floor area within a given fire area?
   
   Response: The 50% trigger is only within the work area. Areas outside the work area identified don’t need to be upgraded.
10. **Mechanical:**
   a. Elevator Lobbies: In the high rise B-Building, there are not presently elevator lobbies at the orange and yellow elevators.
   
   **Question:** Do elevator lobbies need to be added?
   
   **Response:** No, elevator lobbies are not required to be upgraded. Existing elevator lobbies need to be maintained.
   
   b. Existing Smoke Barrier Walls: As a follow-up to the information included in discussion item #1, Engineered Smoke Control System, there are 77 defined existing smoke barrier zones.
   
   **Question:** By changing from an I-2 to a B occupancy, can existing smoke barrier walls be omitted?
   
   **Response:** No, but we can move to simplifying the barriers down to the four main fire area divisions as smaller projects go forward. Note that the smoke barrier walls need to remain in place until the entire facility is covered by automatic sprinklers.

11. **Plumbing:**
   a. The campus would like to use some existing areas as-is for Surge Space. Some of these areas are former patient rooms that will be converted to office space.
   
   **Question:** Can the existing toilet facilities connected to the rooms be used to offset required number of total fixtures?
12. Specific Exiting and Dead End Corridor Questions:
   a. Security concerns for the Children’s Center require blocking the west end of the Brown
      Elevator lobby on the ground floor of NWQ C creating a 50 foot dead end corridor. Note:
      this level is the level where the elevators automatically return during an alarmed event.
      Question: Is this permissible per IEBC 705.6, Exception 4 that the maximum length of
      an existing, newly constructed, or extended dead-end corridor shall not exceed 50 feet
      on floors equipped with an automatic sprinkler (also IBC 708.14.1)?
      Response: Yes.

   b. Security concerns for the Children’s Center require blocking the west end of the Brown
      Elevator lobby on the 1st floor of NWQ C creating a 60 foot dead end corridor because
      we need to maintain access to the existing women’s toilet.
      Question: Would it be permissible to install a wall with a door creating a lounge
      vestibule to the Women’s Toilet and thereby reduce the dead end at the elevator lobby
      to 50 feet in order to meet IEBC 705.6, Exception 4?.
      Response: Yes.

   c. Stairwell G800P in the NWQ D exits through the building lobby which is open to the
      ground floor elevator lobby for the Green Elevators.
      Question: Do we need to separate the elevator lobby from the exit path in the building
      lobby per IBC 1022.3 – Elevators shall not open into an exit enclosure (also, IBC 1018.6
      Commentary)?
      Response: The elevator lobby should be separated, unless allowed by an exception.
13. **DSPS Plan Review Process Questions:**

   a. The NWQ Children's Center alteration project is being done in two phases: Bid Package BP-01 which demos walls and finishes in the alteration area and replaces some existing mechanical units and BP-02 which includes the build-out.

   **Question:** Do we need to submit the demolition package BP-01 for review (only new construction is a housekeeping pad for a new mechanical unit)? Does the mechanical work need to be submitted for review?

   **Response:** Yes, submit BP-01 as a Level 2 Alteration because of the wall removal at the lower level required for removal and installation of air handling units. The mechanical work in BP-01 should be submitted. Submit BP-02 (tenant build-out) as a separate project.


d. Plans call for a glazed opening between the Children's Center area (Group I-4) and the north NWQ D building lobby (Group B). Stairwell G800P in the NWQ D exits through the building lobby.

   **Question:** Is it permissible for the glazed opening to not be a 2-hour fire rated frame/glazing assembly per IBC 1027.1, Exception 1?

   **Response:** Yes.


e. Many of the existing elevator lobbies at the different floor levels are separated from the remainder of the corridor with pairs of dual egress doors with hold open releases tied to the fire/smoke alarm system because the building was formerly an I-2 Use.

   **Question:** Is it permissible to remove these doors in the sprinklered fire areas where not part of a fire barrier separation between fire areas or located in a high-rise portion per IBC 708.14.1, Exception 4? Note: Specific to omitting double acting doors at north end of red Elevator lobby on 1st floor of NWQ C; also relates to omission of smoke containment barriers.

   **Response:** No. Existing elevator lobbies should maintain current separations because the entire building is classified as a high rise. Existing elevator lobbies not currently separated may remain as is. Current opening protective and fire rated doors maintain an equivalency previously agreed to for the building.
The above Responses and summaries are based on our written notes taken during the meeting. If you do not agree with the responses stated, please contact me with clarifications and comments.

Respectfully submitted,

Mark Knapp
Quorum Architects, Inc
3112 W. Highland Blvd., Milwaukee, WI 53208
P: (414) 265-9265 F: (414) 265-9465
mark@quorumarchitects.com

Attached: NWQ Code Analysis Matrix
<table>
<thead>
<tr>
<th>CODE ITEM</th>
<th>NWQ-A</th>
<th>NWQ-B</th>
<th>NWQ-C</th>
<th>NWQ-D</th>
<th>NWQ-E ENERGY CENTER</th>
<th>NWQ-F HONORS HOUSE</th>
<th>NWQ-G PARKING GARAGE</th>
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<td>4 + BSMT (+ 1 FUTURE)</td>
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<td>No access to older floors &amp; Toilets</td>
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<td>SEPARATION &gt; 10’ – 1-HOUR EXT WALL</td>
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Northwest Quadrant Selective Facility Renewal
Appendix
10.3. **Reference Documents**

The NWQ Selective Facility Renewal project builds on a number of other studies and references these documents for use in future phases. The following is a list of the referenced documents, all available from UWM Campus Planning:

- **University of Wisconsin-Milwaukee Northwest Quadrant Redevelopment Plan**  
  Quorum Architects, Inc. Team – DFD #: 11K3C

- **University of Wisconsin-Milwaukee Northwest Quadrant Redevelopment Plan Appendix**  
  Quorum Architects, Inc. Team – DFD #: 11K3C

- **University of Wisconsin-Milwaukee School of Information Studies Program Statement/Pre-Design**  
  Quorum Architects, Inc. Team – DFD #: 11K3C-05

- **University of Wisconsin-Milwaukee College of Health Sciences Program Statement/Pre-Design**  
  Quorum Architects, Inc. Team – DFD #: 11K3C-09

- **University of Wisconsin-Milwaukee Restaurant Operations Town Square Program Statement/Pre-Design**  
  Quorum Architects, Inc. Team – DFD #: 11K3C-03

- **University of Wisconsin-Milwaukee Student Health Services Program Statement/Pre-Design**  
  Quorum Architects, Inc. Team – DFD #: 11K3C-01

- **University of Wisconsin-Milwaukee College of Nursing – Center for Healthcare Transformation and Simulation College of Nursing Architectural Program Statement & Conceptual Design**  
  Kahler Slater Team – DFD #: 13D1J