UNIVERSITY OF ALASKA FAIRBANKS
ENGINEERING FACILITY

PROGRAMMING AND SITE SELECTION REPORT

FINAL
09 SEPTEMBER 2011

ECI / HYER
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September 8, 2011

Mr. Mike Schuetz, Project Manager
Design and Construction
The University of Alaska Fairbanks
PO Box 758160
Fairbanks, Alaska 99775-8160

Re: College of Engineering and Mines Program Report

Dear Mike,

On May 18, 2011, we began a journey to understand the opportunity to transform the College of Engineering and Mines (CEM) through expansion of its facilities made possible by the University System and the demand for Engineering graduates. Today, some 112 days later, and after considerable conferencing with various factions of the University and its consultants, we submit this report for your critical review. In it, in summary form, we present the sum total of the knowledge we have been able to gather in order to define and describe a project that we believe will create greatest value for the College and the University.

The new construction will contain a cross-section of spaces that position the College to move into its future with flexibility and confidence borne by a robust infrastructure and an integration of interdisciplinary, problem-based discovery and learning environments. The building will be built on a site adjacent to Duckering Building, enabling the engineering community to remain tight knit and offering future connectivity to nearby Bunnell Building, suggesting that meaningful programmatic relationships with other academic units may be developed over time.

Our work started with characterizing the total need for space by CEM so that we could understand which portion might best be served by the new building. That also means, though, that after decanting some activities out of Duckering Building and into the new building, spaces will be left behind for other uses. These spaces, and Duckering Building in general, must be addressed as a portion of the project with most focus on those areas where the two buildings connect.

It is clear to us the potential for CEM to continue to create great value for the University and the State as a whole. Its students, faculty and staff are addressing some of the most demanding and relevant issues we face today with the rigor and creativity that continue to sustain and grow their support base from within the State but also national agencies and companies as evidenced by the financial support they enjoy. It is also clear by a growing numbers of graduates that CEM has been able to generate a level of excitement about that work amongst the student body.
Our hope is that with this project, the value of CEM will be expressed not only to its own ranks but also across the University as a whole, creating an even stronger knowledge based community over time.

Sincerely,

Brad Leathley, AIA
Principal

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The University of Alaska Fairbanks responding to **the 100% increase in student enrollment and graduation of baccalaureate trained engineers** called for in the University of Alaska Statewide Engineering Expansion Initiative is proposing a new UAF Engineering Facility at the Fairbanks campus. The proposed new UAF Engineering Facility:

- Responds to the initiative to graduate more engineering students
- Enhances the student experience for engineering students and other students campus wide with a visible and interactive learning environment
- Integrates UAF's successful engineering research and graduate programs
- Addresses critical classroom needs.

The proposed facility of 116,900 gross square feet(gsf) is ideally situated adjacent to the existing Duckering Building currently houses the College of Engineering and Mines (CEM) and provides the opportunity to complete Cornerstone Plaza with an attractive and functional focal point at the far side of the UAF main campus. The proposed new facility will have five floors blending with surrounding buildings while standing out as a new and exciting campus destination. The proposed new facility maintains full connectivity to the existing Duckering building and programs and offers future connectivity to the nearby Bunnell Building. The proposed new facility plan will provide approximately 23,000 gsf of renovation to portions of Duckering to provide a functional connection with the proposed new building and to allow efficient use to better serve the needs of the engineering program.

Project Vision: The vision as described by the College of Engineering and Mines is "Innovation by Design."

Programmatic Goals of the Proposed New Building

- Facilitate interactive, collaborative, multi-disciplinary learning and research
- Enhance Teaching and Research through the extensive use of technology
- Focus on enhancing future making experiences
- Motivate students and faculty to move at the speed of their ideas
- Maximize Interconnectedness

Design Goals

- Make the learning process and products of engineering education and research more visible to students and faculty
- Unify the College of Engineering and Mines (CEM)
- Maximize transparency to the public and other students
- Enhance presence on the UAF campus, across Alaska and amongst the greater engineering community
- Promote sustainable design
- Create a permanent building on campus
- Create a design that enriches entrepreneurship

Program Distribution by Space Type:

- 27% Office and Conference
- 65% Classroom, Computer, Shops, and Research Laboratories
- 7% Existing and New Classrooms
- 1% Building Services

Comparisons of the UA Engineering Plan 2010 asf Need (UAEP 2010) and UAF CEM asf 2011 Program Need

• Academic (CEM):	UAEP 2010 = 72,906 asf	ECI Hyer/NBBJ 2011 = 73,212 asf
• Research (INE):	UAEP 2010 = 54,000 asf	ECI Hyer/NBBJ 2011 = 50,927 asf
• Existing Classrooms	UAEP 2010 = 6,900 asf	ECI Hyer/NBBJ 2011 = 6,900 asf
• Subtotal Comparison	UAEP 2010 =133,806 asf	ECI Hyer/NBBJ 2011 =131,039 asf

Program Additions Subsequent to UAEP 2010:

• New Classrooms	4,000 asf
Proposed New Building Shell Space	
• Computer Science	6,304 asf
• Advanced Materials Group	5,772 asf
• Subtotal Program Additions	16,076 asf

Proposed Project Program Assignable Square Feet Total

• Subtotal Comparison ECI/Hyer 2011	131,039 asf
• Subtotal Program Additions	16,076 asf
• Proposed Project Program Area Total	147,115 asf

Proposed Project Program Assignable Square Feet (asf) by Building:

- 69,005 asf Proposed New Building (80/20 (+/-) Split Proposed New Finished Space/ Proposed New Shell)(79% Proposed New Finished Space and 21% Proposed New Shell)
- 78,110 asf Existing Duckering Building
- 147,115 asf Total Need (See Section 4 Program)

Proposed Project Gross Square Feet (gsf) for Building Size and Cost Estimating:

- 116,900 gsf Proposed New Building-(69,005 asf/.59 Efficiency Factor)
- See Section 6.3.2 for information on assumption of.59 Efficiency Factor

Total Proposed Project Cost:

• $98.6M	Proposed New Building and Duckering Building Functional Connection
• $9.98M	UAF Bonding to provide shell space in the proposed new building structure

Project Schedule (See Appendix 3 for a complete draft project schedule)

• June 2012	Schematic Design Approval
• February 2013	Design Completed
• April 2013	Construction Starts
• August 2015	Proposed New Building & Duckering Functional Connection Complete

SECTION 2

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&
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SECTION 3

CODES & REGULATIONS

SUMMARY

The following Codes and Standards are provided for general reference, and are the basis for this document.

The basis for design will be the versions of all applicable codes and standards that will be in force at the time of the plan review submittal, as well as the then-current University standards. In particular, the State of Alaska building code, for plan review will be the edition in effect when Preliminary Drawings (design development drawings and specifications) are first submitted to the UAF Fire Chief's office.

CODES

- International Building Code, 2009
- International Existing Building Code, 2009
- International Fire Code, 2009 edition
- International Mechanical Code, 2009
- Uniform Plumbing Code, 2009
- National Electrical Code, 2008
- Accessible and Usable Buildings and Facilities, ICC/ANSI A117.1, 2003

- NFPA 10, National Fire Protection Association Standard for Portable Fire Extinguishers, 2007 edition

- NFPA 13, National Fire Protection Association Installation of Sprinkler Systems, 2007 edition

- NFPA 14, National Fire Protection Association Installation of Standpipe and Hose systems, 2007 edition

- NFPA 72, National Fire Protection Association National Fire Alarm Code, 2007 edition as amended.

REFERENCE STANDARDS AND REGULATIONS

- University of Alaska Fairbanks, Campus Standards and Design Criteria

- Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design

- Federal Standard 29 CFR Part 1910.1450 Occupational exposures to hazardous chemicals in laboratories

- American National Standards Institute Z358.1: Emergency Eyewash and Shower Equipment, 2009

- American National Standards Institute/American Industrial Hygienists Association Z9.5 Standard for Laboratory Ventilation, 2003

- NFPA 30, National Fire Protection Association Flammable and Combustible Liquids Code, 2008 edition

- NFPA 45, National Fire Protection Association Standard on Fire Protection for Laboratories Using Chemicals, 2000 edition

- NFPA 101, National Fire Protection Association Code for Safety to Life from Fire in Buildings and Structures, 2006 edition

- Underwriters Laboratory (U.L.)

- Illuminating Engineering Society of North America (IES)

- Sheet Metal and Air Conditioning Contractors National Affiliation (SMACMA)

- Institute of Electrical & Electronics Engineers (IEEE)

- National Electrical Manufacturers Affiliation (NEMA)

- Occupational Safety and Health Administration (OSHA)

- American National Standards Institute (ANSI)

- American Society of Testing Materials (ASTM)
- American Welding Society Code (AWSC)
- American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
  - Standard 62
  - Standard 90 A, B, C Energy Conservation in New Building Design
  - Standard 100 Energy Conservation in Existing Buildings
  - ASHRAE Fundamentals
  - ASHRAE Systems and Applications
  - ASHRAE Equipment

IBC SUMMARY

The existing Duckering Building was built in several phases. The most recent renovations indicate that the building has two building construction types:
Type II-A (Type II 1 hour)
Type V-B (Non-Rated)
The construction types are separated by 2 hour area separation walls.

The Bunnell building is type II-A (Type II 1 hour)

The new structure will have to be separated from the existing buildings with area separation walls making the new addition a separate building. The new building will comply with allowable areas and building height limitations. (Note: the IEBC chapter 1002 prohibits additions that would increase an existing building area and / or height beyond the allowable areas and heights under the applicable provisions of chapter 5 of the IBC).

Chapter 3
Building Occupancy:
A-3 ...... Large Classrooms > 50 occupants
B......... Classrooms, Laboratories and Offices
H-4* .... Laboratories and Storage*
S-1....... Storage
S-2....... Low hazard storage

*Rooms 241A, 241B, 241C and 241D were constructed as H-4 (indicated as H-7 in 1997UBC) Laboratories. UAF to confirm that these rooms need to remain as H-4 Laboratories or if they can be eliminated. H-4 occupancies are buildings that contain materials that are a health hazard (Corrosives, toxic materials, etc…).

Chapter 4
Special Detailed Requirements
Atriums – openings through floors will be limited to two stories. No smoke evacuation is required for Atriums that only connect two floors.

Chapter 5

General Building Heights and Areas
The existing Duckering Building is divided into two buildings. The two buildings are different construction types: Type II-A and Type V-B.

- The Type II-A building is a 5 story building.
- The Type V-B building is a 3 story building with a basement.
-

The building code allowable area and height are indicated in the tables below:

Type II-A		
Occupancy	Area**	Height (85 feet)*
A-3*	46,500 SF	N/A
B	112,500 SF	6 stories*
H-4	112,500 SF	N/A
S-1	78,000 SF	N/A
S-2	117,000 SF	N/A

Type V-B		
Occupancy	Area**	Height (50 feet)*
A-3*	18,000 SF	N/A
B	27,000 SF	3 stories*
H-4	19,500 SF	N/A
S-1	27,000 SF	N/A
S-2	40,500 SF	N/A

*Per table 503: allowable height for the Type II A construction is 65 feet (5 stories) and Type V-B is 30 feet (2 stories). The allowable height is increased by 20 feet and 1 story per Automatic sprinkler system increase, section 504.2.
**The areas from Table 503 have been increased per section 506.3, Automatic sprinkler system increase of 200%.

The largest floor in the existing Duckering Building is Level 1. The code floor areas of Level 1 in the existing building are:

- Type II-A = 9,807 SF
- Type V-B = 26,046 SF

These areas are less than the allowable areas indicated in the tables above. The areas indicated in the table above are the allowable area + the sprinkler increase. The Frontage Increase per section 506.2 has not been included. Mixed Occupancy calculations will be completed after the plans are defined.

Table 508.4

Occupancy Separation (Hours)				
Occupancy	B	H-4	S-1	S-2
A-3	1	2	1	N
B	-	1	N	1
H-4	-	-	1	2
S-1	-	-	-	1

Chapter 6

Types of Construction
Type II-A & V-B construction.

Table 601 – Fire-Resistance Rating Requirements for Building Elements

Type II-A:

Structural Frame	1 hour
Bearing Walls Interior and Exterior	1 hours
Nonbearing walls/partitions – Exterior	1 hours
Nonbearing walls/partitions – Interior	0 hours
Floor Construction	1 hour
Roof Construction	1 hour

Type V-B:

Structural Frame	0 hour
Bearing Walls Interior and Exterior	0 hours
Nonbearing walls/partitions – Exterior	0 hours
Nonbearing walls/partitions – Interior	0 hours
Floor Construction	0 hour
Roof Construction	0 hour

Table 602 – Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance:

Fire Separation	Rating for S-1 Occupancy	Rating for A-3, S-2 & B Occupancy
<5 feet	2 hours	1 hour
≥5 feet and < 10 feet	1 hour	1 hour
≥10 feet and < 30 feet	1 hours (II-A) 0 hours (V-B)	1 hours (II-A) 0 hours (V-B)
≥ 30 feet	0 hours	0 hours

Fire Separation	Rating for H-4 Occupancy
<5 feet	3 hours
≥5 feet and < 10 feet	2 hour
≥10 feet and < 30 feet	1 hours
≥ 30 feet	0 hours

Chapter 7

Fire-Resistance-Rated Construction

Table 705.8 – Maximum Area of Exterior Wall Openings

Section 706

Fire Walls – Sufficient structural stability to allow collapse of construction on either side without collapse of the wall for the duration of time indicated:

> At A-3, B, S-2 & H-4 the fire walls are 2 hour per table 706.4, see table note “a” for additional information, at S-1 the fire walls are 3 hour per table 706.4.

Section 706.6
Vertical Continuity. Exception 3 – walls shall be permitted to terminate at the underside of noncombustible roof deck where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet of the fire wall.

Section 706.8 – Openings – Exception 2: openings shall not be limited to 156 square feet where both buildings area equipped throughout with an automatic sprinkler system. The aggregate width on any floor shall not exceed 25% of the wall. Openings shall be protected 1 ½ hour doors in a 2 hour wall and 3 hour doors in a 3 hour wall.

Section 706.11 Ducts and air transfer openings. Exception: Penetrations by ducts and air transfer openings of fire walls that are not on a lot line shall be allowed provided they comply with sections 716. The size and aggregate width of all openings shall not exceed 706.8.

Section 708
Shaft Enclosures –
707.4 – 2 hour at more than 4 stories and 1 hour for shafts connecting less than 4 stories

Chapter 8

Interior Finishes

Table 803.9

Occupancy	Exit enclosures and exit passage-ways	corridors	Rooms and Enclosed spaces
A-3*	Class B	Class B	Class C
B	Class B	Class C	Class C
H-4	Class B	Class B	Class C
S-1	Class C	Class C	Class C
S-2	Class C	Class C	Class C

Chapter 9

Fire Protection Systems

Sprinklers provided per NFPA 13

Section 905
Class 1 Stand Pipes –required
Section 906 – Portable Fire Extinguishers – as per the International Fire Code

Section 907 – Fire Alarm and Detection Systems – provided per 907.2.1 through 907.2.23

Chapter 10

Means of Egress

Section 1004.1.1 – Occupant Load per table 1004.1.1:

Section 1016
Exit Access Travel Distance

Occupancy	Travel Distance
A-3	250 feet
B	300 feet
H-4	175 feet
S-1	250 feet
S-2	400 feet

Table 1018.1 – Corridor Fire Resistance Rating
Non rated corridors in A, B, and S occupancy (building is equipped with a sprinkler system)
1 hour rated for H-4 occupancy.

Chapter 11
Accessibility

This project is required to comply with ICC /ANSI 117.51 and ADA requirements.

REVIEWING AUTHORITIES

UAF Fire Chief will review the documents for Fire/Life Safety compliance. Documents may be reviewed with various campus agencies for compliance with the campus requirements / standards.

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SECTION 4

PROGRAM

PROGRAM SUMMARY

This section provides a list of the space needs of the College of Engineering and Mines (CEM), the Institute for Northern Engineering (INE) and general assignment Registrar classrooms. The list articulates all need without regard to financial strategies to achieve them. The process of developing this information heavily involved leadership faculty and staff of CEM and the University Administration working closely with the office of Kit Duke and their consultants.

Table 4.1 and Table 4.2 provide sorted summaries of the program list. Table 4.3 shows the complete space list for all assignable area in the Program. The space list accounts for the project's entire need. This total need contains the CEM and INE related space that was projected earlier in the 2010 Engineering Report but also contains newly identified space needs for Computer Science, the Advanced Materials Group and additional space for existing and new Registrar general assignment classrooms.

Table 4.1 is a summary of the assignable area by department. It also shows preliminary goals for locating the program spaces in the existing Duckering Building, in finished space in the new addition or in shell space in the new addition for future completion

TABLE 4.1 PROGRAM SORTED BY DEPARTMENT & BUILDING - SUMMARY

Department	Complete Program Total ASF	%Of Total ASF	Existing Duckering ASF	Proposed New Finished Space ASF	Proposed New Shell ASF
College Of Engineering & Mines	29,006	19.7%	15,860	10,968	2,178
Advanced Materials Group	5,772	3.9%	0	0	5,772
Chemical Engineering	1,089	0.7%	0	1,089	0
Civil & Environmental Engineering	16,618	11.3%	0	16,618	0
Computer Science	6,304	4.3%	0	0	6,304
Electrical & Computer Engineering	12,272	8.3%	10,092	2,180	0
Institute For Northern Engineering	18,224	12.4%	18,224	0	0
Mechanical Engineering	13,400	9.1%	1,784	11,616	0
Mining And Geological Engineering	9,892	6.7%	9,892	0	0
Mineral Industry Research Laboratory	3,106	2.1%	0	3,106	0
Petroleum Engineering	6,187	4.2%	3,528	2,659	0
Petroleum Development Lab	4,515	3.1%	0	4,515	0
Water & Environmental Research	9,830	6.7%	9,830	0	0
Registrar Classrooms	10,900	7.4%	8,900	2,000	0
Totals	**147,115**	**100.0%**	**78,110**	**54,751**	**14,254**

Table 4.2 is a summary of the spaces based on the category of space type. These space categories are in keeping with existing classification of space by the University.

TABLE 4.2 PROGRAM SORTED BY CATEGORY - SUMMARY

A detailed category sort of the program is available in Appendix 1.1.

Category	Assignable Sq, Ft.	% of total
Office and Conference		**27%**
Office & Office Services	35,188	23.9%
Conference & Conference Services	3,513	2.4%
Classroom, computer, Shops, and Research Laboratories		**65%**
Classroom Labs & Classroom Lab Services	33,210	22.6%
Computer Lab & Computer Lab Services	11,801	8.0%
Lobby	500	0.3%
Research Labs, Research Lab Services & Storage	45,174	30.7%
Seminar	726	0.5%
Shop & Shop Services	4,603	3.1%
Existing and New Classrooms		**7%**
Existing and New Classrooms	10,900	7.4%
Building Services & Receiving		**1%**
Building Services & Receiving	1,500	1.0%
Totals	**147,115**	100.0%

PEDAGOGY

The spaces in the Space List have been developed with a specific focus on the future directions CEM will be following. In particular, greater emphasis will be placed on connecting theory to practice by placing certain teaching spaces in direct proximity to shops, a high bay space and CAD labs. Space has been set aside for the display of ongoing student work and for meeting and working with business and industry representatives. Finally, consolidation has occurred across all of CEM so that an increasing number of spaces can be shared by many groups, growing the real world situations where engineers from different fields will be working together.

The ECI Hyer/NBBJ team met with both the CEM Project Leadership Team as well as with Department Chairs over several work sessions to understand the problems they face in delivering their pedagogy and the opportunities they see that will transform their fields of study. Through those meetings, a list of spaces emerged and was vetted at an initial level by the CEM Project Leadership team. Included in that list are some program elements that were not included in earlier studies, e.g., Computer Science, the Advanced Material Group, additional Registrar space and four interdisciplinary Flex Labs.

PROGRAMMING PROCESS

ECI Hyer/NBBJ have worked closely with the University of Alaska Fairbanks' Facilities Services Design and Construction Office and CEM and in close collaboration with Ira Fink representing the Statewide System Office.

Our approach has been to understand the overall approach CEM takes to educating their students and the facilities they require to address the demands of their diverse array of work. Based on that greater understanding, we have further evaluated how best to support these needs with space in both the new building and within their existing facilities in the Duckering Building. This makes sense because the field of Engineering as a whole is evolving at an accelerating pace and increasingly, graduates must be well versed in a variety of fields in order to create real value for their employers upon completion of their academic careers. This report presents the profile of space that has been determined to create the greatest value for CEM and UAF.

The effort to gather and synthesize this information has gained the benefit of perspectives from a wide cross-section of campus. While CEM and Facilities Services have been most involved, the Chancellor, the Vice Chancellor - Administrative Services, the Associate Vice Chancellor - Facilities Services, the University Planning Office and others have had an opportunity to weigh in as well. Ira Fink attended nearly every meeting, most often in person.

Our process began on May 18 – 19, 2011 with a Leadership Summit on campus. This kick-off series of meetings gave the design team the opportunity to immerse itself into the project and gave the campus the forum to begin an integrated discussion amongst the principal stakeholders of how to move the College forward with this project. It is important to note that the Programmatic and Design Goals have proven to be enormously helpful in subsequent meetings as one means of maintaining a proper focus for the project as the number of people involved in the project has expanded. They create the common ground upon which the project will continue to be developed.

MISSION

The College of Engineering and Mines at the University of Alaska Fairbanks advances and disseminates technical and scientific knowledge through innovative teaching, research and public service with an emphasis on Alaska and other high-latitude regions. The College promotes students' self-motivation to excel and guides them towards professional careers and entrepreneurship in an environment of life-long learning.

VISION

The vision of the College of Engineering and Mines (CEM) at the University of Alaska Fairbanks and its research arm, the Institute of Northern Engineering (INE), is to provide strong B.S., M.S. and Ph.D. degree programs, increase enrollments and graduates, and maintain and enhance research excellence and growth in extramural research funding. Vitality in scholarship is improved at all levels by recruiting and retaining the best and brightest faculty, staff, and undergraduate and graduate students. Instructional programs use the most current technologies and methods to provide students the knowledge and skills they need to develop to their full potential. CEM is dedicated to continuous improvement of its academic programs and to substantially increase the number of engineering graduates to meet the needs of the state and the nation.

Leadership Summit Summary May 18 – 19, 2011

Vision: Innovation by Design

Programmatic Goals

The building will facilitate interactive, collaborative, multi-disciplinary learning and research

- Build collaborative enterprise
- Building can be used as a teaching and research tool

Teaching and Research will be enhanced through the extensive use of technology

- Instruction technology, simulation and distance learning will be emphasized

The building will focus on enhancing future making experiences, allowing the students and faculty to move at the speed of their ideas

- Integrated approach to teaching and research
- Promote activities and actions that retain undergraduates and grow the graduate populations, enhance the continuum between the two
- Projects will be on display
- Education will be promoted as a life-long experience
- Add Core Curricular class to University
- Focus on cold regions
- Allow for program growth, perhaps Chem E

Maximize Interconnectedness

- Focus on Student Experience, including student collaboration in field based activities
- Promote spaces that will allow Presentations that are visible
- Connect with State Agencies
- Enhance donor opportunity
- Create Confidence in CEM

Maximize Flexibility

- Create spaces that can be adapted and/or reconfigured for new uses quickly and inexpensively

Design Goals

Make Engineering visible

- Real Time Display
- Pride of Ownership
- Celebrate successes

Unify CEM

- Promote interconnectedness between programmatic parts
- Bunnell and Duckering

Maximize Transparency

- Views to and from
- Shared public space

Enhance Presence

- Increase donor opportunities
- Create a building that teaches

Promote sustainable design

- Provide warmth and light

Create a design that enriches entrepreneurship

TABLE 4.3 COMPLETE SPACE LIST

Table 4.3 shows the complete space list for all assignable areas in the project program sorted by department. This total need contains the CEM and INE related space that was projected earlier in the 2010 Engineering Report but also contains newly identified space needs for Computer Science, Advanced Materials Group and additional space for existing and new Registrar general assignment classrooms.

Appendix 1.1 shows this same space list sorted by Category of space type per the Universities classifications.

Appendix 1.2 shows this same space list sorted by Departments with the addition of preliminary locations assignments of the individual spaces to 1.) the existing Duckering Building, or 2.) in finished space in the new proposed addition or 3.) in shell space in the new proposed addition with the intention of it to be finished out at a later date.

Table 4.3 UAF Engineering Facility Space List (08.29.11) Sorted By Department

-	-	-	-	-	-	-		Totals:	147,115
#	ID	Dept	Category	A / R	Room Description		No .	ASF Per	Program Total ASF
1	COLLEGE OF ENGINEERING & MINES								29,006
2			Office & Office Support						12,204
3	1.1.1	CEM	OFF	A	Office Entry				150
4	1.1.2	CEM	OFF	A	Academic Manager				150
5	1.1.3	CEM	OFF	A	Dean's Office				242
6	1.1.4	CEM	OFF	A	Fiscal Officer				121
7	1.1.5	CEM	OFF	A	Chief Fiscal Officer				150
8	1.1.6	CEM	OFF	A	Public Relations				121
9	1.1.7	CEM	OFF	A	Recruiter				150
10	1.1.8	CEM	OFF	A	Student Advisor				121
11	1.1.9	CEM	OFFSV	A	Office Supply & Secure File Storage				150
12	1.1.10	CEM	OFFSV	A	Copy Mail Fax				150
13	1.1.11	CEM	OFF	A	Engineering Student Support (Tutoring)				545
14	1.1.12	CEM	OFF	A	Student Projects Area				1,000
15	1.1.13.1-1.1.13.2	CEM	OFF	R	Visiting Faculty Office (Sabbatical)		2	121	242
16	1.1.14.1-1.1.14.19	CEM	OFF	R	Faculty Office (includes UAA office)		5	121	605
17	1.1.15.1-1.1.15.60	CEM	OFF	A	Graduate Office Space		60	60	3,600
18	1.1.16.1-1.1.16.60	CEM	OFF	A	PhD Office Space		60	60	3,600
19	1.1.17	CEM	OFF	A	Technical Services Office (w/ 3 workstations)				817
20	1.1.18	CEM	OFF	A	Technical Services Servers & Server Workrooom				290

#	ID	Dept	Category	A / R	Room Description	No .	ASF Per	Program Total ASF
21			Student Study Space					2,406
22	1.1.19.1-1.1.19.28	CEM	OFF	A	Student Informal Study Space	28	60	1,680
23	1.1.20.1-1.1.20.6	CEM	OFF	A	Collaborative Study Rooms	6	121	726
24			Classroom Lab & Classroom Lab Services					4,268
25	1.3.1	CEM	CLSLB	A	Flex Lab (Project Cluster)	2	1,089	2,178
26	1.3.2	CEM	CLSLB	A	Flex Lab Office Area (Project Cluster)	2	545	1,090
27	1.3.3	CEM	CLSLB	A	Engineering on Display			1,000
28			Computer Lab & Computer Lab Service					3,509
29	1.4.1.1-1.4.1.2	CEM	CMP-O	A	SOECAL Student Computer Lab	2	1,089	2,178
30	1.4.2.1-1.4.2.2	CEM	COMPSV-C	A	SOECAL Student Computer Lab Storage	2	121	242
31	1.4.3	CEM	CMP-O	A	Computer Aided Design / Rapid Prototyping		1,089	1,089
32			Conference Room					500
33	1.5.1	CEM	CONF	A	Industry / CEM Innovation Center Room			500
34			Lobby					500
35	1.6.1	CEM	LOBBY	A	Entry / Display Area			500
37			Receiving / Building Service Area					1,500
38	1.7.1	CEM	RCVG	A	Receiving / Tank Storage / Staging Area			1,000
39	1.7.2	CEM	BLDGSV	A	Building Secure Storage			500
40			Shop					4,119
41	1.10.1	CEM	SHOP	A	Student Shop			545
42	1.10.2	CEM	SHOP	A	Machine Shop			2,000
43	1.10.3	CEM	SHOP	A	Welding Shop			545
44	1.10.4	CEM	SHOPSV	A	Machine Shop Office			121
45	1.10.5	CEM	SHPSV	A	Shop Stock Storage			363
46	1.10.6	CEM	SHOP	A	Wood Shop			545
47								
48	ADVANCED MATERIALS GROUP							5,772
49			Office & Office Support					1,055
50	2.1.1	AMG	OFF	R	Group Lead's Office			121
52	2.1.2	AMG	OFF	R	Department Office - Admin			200
53	2.1.3	AMG	OFFSV	R	Copy / Mail / Fax			150
54	2.1.4	AMG	OFFSV	R	Office Supply Storage			100
55	2.1.5	AMG	OFF	R	Faculty Office 1			121
56	2.1.6	AMG	OFF	R	Visiting Faculty Office			121
62	2.1.8	AMG	OFF	R	Post Doc Office Space 1			121
63	2.1.9	AMG	OFF	R	Post Doc Office Space 2			121
64		AMG	OFF	R	Post Doc Office Space 3			0

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
65			Conference Room					300
66	2.5.1	AMG	CONF	R	Conference Room			300
67			Research Lab & Research Lab Service					4,417
68	2.8.1	AMG	RSLAB	R	Optical Characterization / Spectroscopy / AFM			363
69	2.8.2	AMG	RSLAB	R	Scanning Electron Microscopy Laboratory			242
70	2.8.3	AMG	RSLAB	R	Photolithography Lab (Cleanroom)			363
71	2.8.4	AMG	RSLAB	R	Wet Bench Chemistry Lab (Cleanroom)			242
72	2.8.5	AMG	RSLAB	R	Material Processing Laboratory			545
73	2.8.6	AMG	RSLAB	R	Furnace Laboratory			242
74	2.8.7	AMG	RSLAB	R	Thin Film Laboratory (Fume Hood)			242
75	2.8.8	AMG	RSLAB	R	Nanochemical Synthesis Lab (Fume Hood)			242
76	2.8.9	AMG	RSLAB	R	Anti-static Electrical Testing Lab			484
77	2.8.10	AMG	RSLAB	R	Electrical Testing Lab			484
78	2.8.11	AMG	RSLAB	R	Research Lab-Future Growth			363
79	2.8.12	AMG	RSSTG	R	Chemical Testing / Storage			121
80	2.8.13	AMG	RSSTG	R	Research Storage			242
83	2.8.14	AMG	RSLBOF	R	Student Office / Bench Set-up			242
84								
85	CHEMICAL ENGINEERING							1,089
86			Classroom Lab & Classroom Lab Service					1,089
87	3.3.1	CHEME	CLSLB	A	Chemical Engineering Teaching Laboratory			1,089
88								
89	CIVIL & ENVIRONMENTAL ENGINEERING							16,618
90			Office & Office Support					2,725
91	4.1.1	CEE	OFF	A	Department Office			360
92	4.1.2	CEE	OFF	A	Associate Director of AUTC			120
93	4.1.3	CEE	OFFSV	A	Copy / Mail / Fax			150
94	4.1.4	CEE	OFFSV	A	Office Supply Storage			100
95	4.1.5.1-4.1.5.3	CEE	OFF	A	Student Organization Office Space	3	60	180
100	4.1.6.1-4.1.6.15	CEE	OFF	A	Faculty Offices	15	121	1,815
104			Classroom Lab & Classroom Lab Service					6,614
105	4.3.1	CEE	CLSLB	A	Environmental Lab			726
106	4.3.2	CEE	CLSLB	A	Fluid Mechanics Lab			726
107	4.3.3	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			90
108	4.3.4	CEE	CLSLB	A	Materials Structure Test Lab,			1,089
109	4.3.5	CEE	CLSLB	A	Soils & Properties Lab			1,089
110	4.3.6	CEE	CLSLB	A	Environmental Lab			726
111	4.3.7	CEE	CLSLB	A	Design / Build Studio: Bridge & Structures			1,452

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
112	4.3.8	CEE	CLSLBSV	A	Bridge & Structures Welding Room			242
113	4.3.9	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			112
114	4.3.10	CEE	CLSLBSV	A	Surveying Lab			242
115	4.3.11	CEE	CLSLBSV	A	Humidity Control Lab 1; Structures			60
116	4.3.12	CEE	CLSLBSV	A	Humidity Control Lab 2: Soils			60
117			Computer Lab & Computer Lab Service					545
118	4.4.1	CEE	COMPLB	A	Senior Design Lab			545
119			Conference Room					300
120	4.5.1	CEE	CONF	A	Conference Room			300
121			Research Lab & Research Lab Service					6,434
122	4.8.1	CEE	RSLAB	R	Asphalt Lab			545
123	4.8.2	CEE	RSLAB	R	Frozen Soils Lab			545
124	4.8.3	CEE	RSLAB	R	Flume Room			726
125	4.8.4	CEE	RSLAB	R	Super Pave Lab			745
127	4.8.5	CEE	RSLAB	R	Soils Mixing/Service Lab			545
128	4.8.6	CEE	RSLAB	R	Concrete Mixing/Service Lab			545
129	4.8.7	CEE	RSLAB	R	Soils Materials Testing Lab			1,089
130	4.8.8	CEE	RSLAB	R	Advanced Materials Testing Lab			1,452
131	4.8.9	CEE	RSLBSV	R	Advanced Materials Testing Lab Hydraulic Pump Chiller Room			242
132								
133	COMPUTER SCIENCE							6,304
134			Office & Office Support					1,730
135	5.1.1	CS	OFF	A	Chair's Office			121
136	5.1.2	CS	OFF	A	Department Office - Admin			150
137	5.1.3	CS	OFFSV	A	Copy / Mail / Fax			150
138	5.1.4	CS	OFFSV	A	Office Supply Storage			100
139	5.1.5.1-5.1.5.9	CS	OFF	A	Faculty Office	9	121	1,089
140	5.1.6.1-5.1.6.2	CS	OFF	A	Adjunct Faculty Office Space	2	60	120
142			Classroom Lab & Classroom Lab Service					1,490
143	5.3.1	CS	CLSLB	A	Classroom Lab 1			745
144	5.3.2	CS	CLSLB	A	Classroom Lab 2			745
145			Computer Lab & Computer Lab Service					1,694
146	5.4.1	CS	CMP-C	A	Computer Teaching Lab			1,089
147	5.4.2	CS	CMP-C	A	Digital Forensics Lab			242
148	5.4.3	CS	CMPSV-C	A	Computer Teaching Lab Support			121
149	5.4.4	CS	CMPSV-C	A	Computer Server Room			242
150			Research Computer Lab & Computer Lab Service					1,090
151	5.4.5	CS	CMP-R	R	Power Wall Lab			545
152	5.4.6	CS	CMP-R	R	Computer Security Research Lab (ASSERT)			545
153			Conference Room					300
154	5.5.1	CS	CONF	A	Department Conference Room			300
155								

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
156	ELECTRICAL & COMPUTER ENGINEERING							12,272
157			Office & Office Support					2,245
158	6.1.1	ECE	OFF	A	Department Office			242
159	6.1.2	ECE	OFFSV	A	Office Machines & Copy Room			150
160	6.1.3	ECE	OFFSV	A	Supply Storage			100
161	6.1.4	ECE	OFF	A	Alaska Space Grant Program Office			121
162	6.1.5.1-6.1.5.11	ECE	OFF	A	Faculty Offices	11	121	1,331
163	6.1.6.1-6.1.6.2	ECE	OFF	A	Adjunct Faculty Shared Office Space	2	60	121
164	6.1.7.1-6.1.7.3	ECE	OFF	A	Student Organization Office Space	3	60	180
165			Classroom Lab & Classroom Lab Service					5,880
166	6.3.1	ECE	CLSLB	A	Electric Machines and Power Lab			925
167	6.3.2	ECE	CLSLB	A	Etching Lab			115
168	6.3.3	ECE	CLSLB	A	Project Lab			531
169	6.3.4	ECE	CLSLB	A	Communications Lab			528
170	6.3.5	ECE	CLSLB	A	Digital Lab 1			534
171	6.3.6	ECE	CLSLB	A	Electromagnetics Lab			573
172	6.3.7	ECE	CLSLB	A	Instrumentation Lab			445
173	6.3.8	ECE	CLSLB	A	Microwave Lab			292
174	6.3.9	ECE	CLSLB	A	Electric Machines Lab			726
175	6.3.10	ECE	CLSLB	A	Rocket Payload Assembly Lab - Alaska Space Grant Program			545
176	6.3.11	ECE	CLSLB	A	Design/Build Studio: Alaska Space Grant Program Lab			545
177	6.3.12	ECE	CLSLBSV	A	Electric Machines Lab Equipment Storage			121
178			Computer Lab and Computer Lab Service					1,879
179	6.4.1	ECE	COMP-C	A	Power Computation Lab			475
180	6.4.2	ECE	COMP-C	A	Digital Computation Lab			481
181	6.4.3	ECE	COMP-C	A	Electronics Lab			923
182			Conference Room					348
183	6.5.1	ECE	CONF	A	Resource Library & Project Meeting Room			348
184			Research Lab & Research Lab Service					1,920
185	6.8.1	ECE	RSLAB	R	Electrical Analysis and Design Lab			206
186	6.8.2	ECE	RSLAB	R	Electric Power Research Lab			624
187	6.8.3	ECE	RSLAB	R	Design / Build Studio: Waves Lab			545
188	6.8.4	ECE	RSLAB	R	Wireless Sensor Network Lab / Remote Sensing Lab			545
189								

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
190	INSTITUTE FOR NORTHERN ENGINEERING							18,224
191			Office & Office Support					3,338
192	7.1.1	INE	OFF	R	INE Office -Admin Assistant			250
193	7.1.2	INE	OFF	R	INE Director			250
194	7.1.3	INE	OFF	R	Director, AUTC			120
195	7.1.4.1-7.1.4.5	INE	OFF	R	INE Faculty Offices	5	121	605
196	7.1.5	INE	OFF	R	INE Proposal Office			121
197	7.1.6	INE	OFF	R	INE Proposal & Publications			121
198	7.1.7	INE	OFF	R	INE Proposal Coordinator			121
199	7.1.8	INE	OFF	R	INE Business Office (Central Receiving, Purchasing, HR, Fiscal Techs)			726
200	7.1.9	INE	OFF	R	INE Business Office -Travel Coordinator			360
201	7.1.10	INE	OFF	R	INE IT Technician			121
202	7.1.11	INE	OFF	R	INE Project Tech			121
203	7.1.12	INE	OFF	R	INE Web Developer			121
204	7.1.13	INE	OFF	R	INE Publications Editor			121
205	7.1.14	INE	OFF	R	INE Secure Storage			180
206			Conference Room & Conference Service					865
207	7.5.1	INE	CONF	R	Project Review Room			265
208	7.5.2	INE	CONF	R	Conference Room			491
209	7.5.3	INE	CONFSV	R	Kitchenette			109
210			Research Lab & Research Lab Service					13,295
211	7.8.1.1-7.8.1.2	INE	RSLAB	R	Flex Lab (Project Cluster)	2	1,089	2,178
212	7.8.2.1-7.8.2.2	INE	RSLAB	R	Flex Lab Office Area (Project Cluster)	2	545	1,090
213	7.8.3	INE	RSLAB	R	High Bay			4,356
214	7.8.4	INE	RSLAB	R	Rock Shop Specimen Processing and Storage			726
215	7.8.5	INE	RSLAB	R	Rock Shop Specimen Characterization / Testing			1,089
216	7.8.6	INE	RSLAB	R	Advanced Computing Lab			405
217	7.8.7	INE	RSLAB	R	Rock Shop Cold Room Storage			182
218	7.8.8	INE	RSLBSV	R	Field Gear Storage			1,089
219	7.8.9	INE	RSLAB	R	Cold Room			545
220	7.8.10	INE	RSLAB	R	Freezer Room			545
221	7.8.11	INE	RSLAB	R	Coldroom Sample Prep Area			545
222	7.8.12	INE	RSLAB	R	Coldroom Equipment Storage			545
223			Seminar					726
224	7.9.1	INE	SEM	A	Seminar Room			726
225								

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
226	MECHANICAL ENGINEERING							13,400
227			Office & Office Support					2,363
228	8.1.1	ME	OFF	A	Department Office			360
229	8.1.2	ME	OFF	A	Department Chair			121
230	8.1.3	ME	OFFSV	A	Department Office Supply Storage			100
231	8.1.4	ME	OFFSV	A	Department Copy / Mail / Fax			150
232	8.1.5.1-8.1.5.12	ME	OFF	A	Faculty Offices	12	121	1,452
233		ME	OFF	A	Graduate Office Space	0	60	0
234		ME	OFF	A	PhD Office Space	0	60	0
235	8.1.6.1-8.1.6.3	ME	OFF	A	Student Organization Office Space (Mech, Auto, Aero)	3	60	180
237			Classroom Lab & Classroom Lab Service					5,170
238	8.3.1	ME	CLSLB	A	Mechanics of Materials Lab			545
239	8.3.2	ME	CLSLB	A	Thermal Systems Lab			726
240	8.3.3	ME	CLSLB	A	Materials Lab			545
241	8.3.4	ME	CLSLB	A	Heat Transfer and Fluids Lab			1,089
242	8.3.5	ME	CLSLB	A	Large Project Lab: Electric Vehicle Design & Fabrication			1,089
243	8.3.6	ME	CLSLB	A	Machine Design Lab			726
244	8.3.7	ME	CLLBSV	A	Machine Design Lab Storage			150
245	8.3.8	ME	CLLBSV	A	Processing Lab Storage			150
246	8.3.9	ME	CLLBSV	A	Tribology Lab Storage			150
247			Computer Lab and Computer Lab Service					545
248	8.4.1	ME	CMP-R	R	Research Computing Lab			545
249			Conference Room					300
250	8.5.1	ME	CONF	A	Conference / Seminar Room			300
251			Research Lab & Research Lab Service					5,022
252	8.8.1	ME	RSLAB	R	Extreme Environment Lab			545
253	8.8.2	ME	RSLAB	R	Tribology Lab - Faculty Research			726
254	8.8.3	ME	RSLAB	R	Processing Lab - Faculty Research			545
255	8.8.4	ME	RSLAB	R	Mechanics of Materials Lab			726
256	8.8.5	ME	RSLBSV	R	Mechanics of Materials Lab Storage			150
257	8.8.6	ME	RSLAB	R	Dynamics / Controls			545
258	8.8.7	ME	RSLAB	R	Energy Lab 1 (Wind, Turbine)			545
260	8.8.8	ME	RSLAB	R	Microfluidics			545
261	8.8.9	ME	RSLAB	R	Fluid Dynamics (nano fluids systems)			545
262	8.8.10	ME	RSLBSV	R	Storage			150
263								

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
264	MINING AND GEOLOGICAL ENGINEERING							9,892
265			Office & Office Support					1,943
266	9.1.1	MINGEO	OFF	A	Department Office			363
267	9.1.2	MINGEO	OFF	A	Department Chair			121
268	9.1.3	MINGEO	OFF	A	Mine Manager			121
269	9.1.4.1-9.1.4.8	MINGEO	OFF	A	Faculty Office	8	121	968
272	9.1.5.1-9.1.5.2	MINGEO	OFF	A	Student Organization Office Space	2	60	120
273	9.1.6	MINGEO	OFFSV	A	Office Supply Storage			100
274	9.1.7	MINGEO	OFFSV	A	Copy / Mail / Fax			150
275			Conference					300
276	9.5.1	MINGEO	CONF	A	Department Conference Room			300
277			Classroom Lab & Classroom Lab Service					6,381
278	9.3.1	MINGEO	CLSLB	A	Geological Materials Lab			363
279	9.3.2	MINGEO	CLSLB	A	Geology for Engineers Lab, Explorations/Geophysics Lab, Terrain Analysis Lab			746
280	9.3.3	MINGEO	CLSLB	A	Explorations/Geophysics Lab			745
281	9.3.4	MINGEO	CLSLB	A	Subsurface Hydrology Lab			745
282	9.3.5	MINGEO	CLSLB	A	Rock Cutting & Material Processing Labs			545
283	9.3.6	MINGEO	CLSLB	A	Rock Mechanics Lab			545
284	9.3.7	MINGEO	CLSLB	A	Mine Ventilation Lab			1,018
285	9.3.8	MINGEO	CLLBSV	A	Geological Materials Lab Storage			100
286	9.3.9	MINGEO	CLLBSV	A	Operations & Safety Lab			545
287	9.3.10	MINGEO	CLLBSV	A	Mine Surveying Storage			242
288	9.3.11	MINGEO	CLLBSV	A	Rock Specimens Lab			545
289	9.3.12	MINGEO	CLLBSV	A	Geology for Engineers Lab Support			121
290	9.3.13	MINGEO	CLLBSV	A	Rock Cutting Lab Support			121
291			Computer Lab and Computer Lab Service					1,268
292	9.4.1	MINGEO	COMPLB	A	Computer Lab			723
293	9.4.2	MINGEO	COMPLB	A	Design Lab			545
294								
295	MINERAL INDUSTRY RESEARCH LABORATORY (MIRL)							3,106
296			Office & Office Service					242
297	10.1.1	MIRL	OFF	R	Admin Office			0
298	10.1.2.1-10.1.2.2	MIRL	OFF	R	Faculty Offices	2	121	242

#	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF
299			Research Lab & Research Lab Service					2,864
300	10.8.1	MIRL	RSLAB	R	Wet Chemistry & Analytical Lab			1,049
301	10.8.2	MIRL	RSLAB	R	MIRL Lab			121
302	10.8.3	MIRL	RSLAB	R	Dry Sample Prep -Crusher Lab			484
303	10.8.4	MIRL	RSLAB	R	Wet Sample Prep -Grinding / Concentration			484
304	10.8.5	MIRL	RSLBSV	R	Dry & Wet Apparatus Storage			363
306	10.8.6	MIRL	RSLBSV	R	Lab Support			121
307	10.8.7	MIRL	RSLBSV	R	Lab Support			121
308	10.8.8	MIRL	RSLBSV	R	Lab Support			121
309								
310	PETROLEUM ENGINEERING							6,187
311			Office & Office Support					1,633
312	11.1.1	PETE	OFF	A	Department Office			365
313	11.1.2.1 - 11.1.2.8	PETE	OFF	A	Faculty Office	8	121	968
314	11.1.3.1 - 11.1.3.2	PETE	OFF	A	Adjunct Office Space	2	60	120
317	11.1.4.1 - 11.1.4.3	PETE	OFF	A	Student Organization Office Space (SPE, AADE)	3	60	180
319			Classroom Lab & Classroom Lab Service					2,318
320	11.3.1	PETE	CLSLB	A	Drilling Fluids Laboratory			745
321	11.3.2	PETE	CLLBSV	A	Prep Room -Drilling Fluids Laboratory			242
322	11.3.3	PETE	CLSLB	A	Reservoir Rock & Fluid Lab			1,089
323	11.3.4	PETE	CLLBSV	A	Prep Room -Reservoir Rock & Fluid Lab			242
324			Computer Lab and Computer Lab Service					726
325	11.4.1	PETE	COMPLB	A	Computer Lab			726
326			Conference					300
327	11.5.1	PETE	CONF	A	Department Conference Room			300
328			Research Lab & Research Lab Service					1,210
329	11.8.1	PETE	RSLAB	R	Reservoir Characterization Lab			1,089
330	11.8.2	PETE	RSLBSV	R	Reservoir Characterization Lab Support			121
331								
332	PETROLEUM DEVELOPMENT LAB (PDL)							4,515
333			Research Lab & Research Lab Service					4,515
334	12.1.1	PDL	RSLAB	R	PVT / GTL Research Lab			1,089
335	12.1.2	PDL	RSLAB	R	GTL Research Lab			745
336	12.1.3	PDL	RSLAB	R	Ceramic Membrane Lab			745
337	12.1.4	PDL	RSLAB	R	Gas Hydrate Research Lab			1,089
338	12.1.5	PDL	RSLAB	R	GC / MS Research Lab			363
339	12.1.6	PDL	RSLBSV	R	GTL Research Lab Support			121
340	12.1.7	PDL	RSLBSV	R	Gas Hydrate Research Lab Support			121
341	12.1.8	PDL	RSLBSV	R	PVT / GTL Research Lab Support			121
342	12.1.9	PDL	RSLBSV	R	Ceramic Membrane Lab Support			121
343								

#	ID	Dept	Category	A / R	Room Description	No .	ASF Per	Program Total ASF
344	WATER & ENVIRONMENTAL RESEARCH (WERC)							9,830
345			Office & Office Support					3,304
346	13.1.1	WERC	OFF	R	WERC Admin Office			398
347	13.1.2	WERC	OFF	R	WERC Director			121
348	13.1.3.1-13.1.3.12	WERC	OFF	R	WERC Staff Office	12	60	720
349	13.1.4	WERC	OFFSV	R	WERC Office Storage			100
350	13.1.5	WERC	OFFSV	R	WERC Copy / Mail / Fax			150
351	13.1.6.1-13.1.6.15	WERC	OFF	R	WERC Faculty Offices	15	121	1,815
355			Computer Lab and Computer Lab Service					545
356	13.4.1	WERC	CMP-R	R	WERC GIS / Imaging / Mapping Computer Room			545
357			Research Lab & Research Lab Service					5,497
358	13.8.1	WERC	RSLAB	R	Environmental Research Lab 1			185
359	13.8.2	WERC	RSLAB	R	Environmental Research Lab 2			569
360	13.8.3	WERC	RSLAB	R	Environmental Research Lab 3			572
361	13.8.4	WERC	RSLAB	R	WERC Lab (CT Scanner)			323
362	13.8.5	WERC	RSLAB	R	Radioactive Research Laboratory			141
363	13.8.6	WERC	RSLAB	R	WERC Lab			611
364	13.8.7	WERC	RSLAB	R	Costello Lab			611
365	13.8.8	WERC	RSLAB	R	Alaska Stable Isotope Facility			611
366	13.8.9	WERC	RSLAB	R	ASIF Multi-Collector Isotope Facility (future)			726
367	13.8.10	WERC	RSLBSV	R	ASIF Lab Support			164
368	13.8.11	WERC	RSLBSV	R	ASIF Lab Support			152
369	13.8.12	WERC	RSLBSV	R	WERC Field Gear Fabrication & Prep			0
370	13.8.13	WERC	RSLBSV	R	WERC Field Gear Storage (12 Lockable Cages)			0
371	13.8.14	WERC	RSLBSV	R	WERC Cold Room 1			91
372	13.8.15	WERC	RSLBSV	R	WERC Freezer Room 1			92
373	13.8.16	WERC	RSLBSV	R	WERC Freezer Room 2			43
374	13.8.17	WERC	RSLBSV	R	WERC Core / Sample Processing			242
375	13.8.18	WERC	RSLBSV	R	WERC Lab Support			122
376	13.8.19	WERC	RSLBSV	R	WERC Datalogger Testing / Calibration			121
377	13.8.20	WERC	RSLBSV	R	Pressure Transducer Calibration Area			121
378			Shop					484
379	13.10.1	WERC	SHOP	R	Electronics Workshop			363
380	13.10.2	WERC	SHOPSV	R	Electronics Workshop Support			121
381								

#	ID	Dept	Category	A / R	Room Description	No .	ASF Per	Program Total ASF
382	REGISTRAR CLASSROOMS							10,900
383			Registrar Classrooms					10,900
384	14.2.1	UAF	CLASS		38 Seat Classroom			726
385	14.2.2	UAF	CLASS		38 Seat Classroom			582
386	14.2.3	UAF	CLASS		16 Seat Classroom			528
387	14.2.4	UAF	CLASS		40 Seat Classroom			813
388	14.2.5	UAF	CLASS		40 Seat Classroom			828
389	14.2.6	UAF	CLASS		36 Seat Classroom			846
390	14.2.7	UAF	CLASS		25 Seat Classroom			519
391	14.2.8	UAF	CLASS		30 Seat Classroom			591
392	14.2.9	UAF	CLASS		30 Seat Classroom			607
393	14.2.10	UAF	CLASS		16 Seat Classroom			528
394	14.2.11	UAF	CLSVC		Classroom Support Room (adjustment per report projection)			332
395	14.2.12	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 40/40)			2,000
396	14.2.13	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 60/20)			2,000

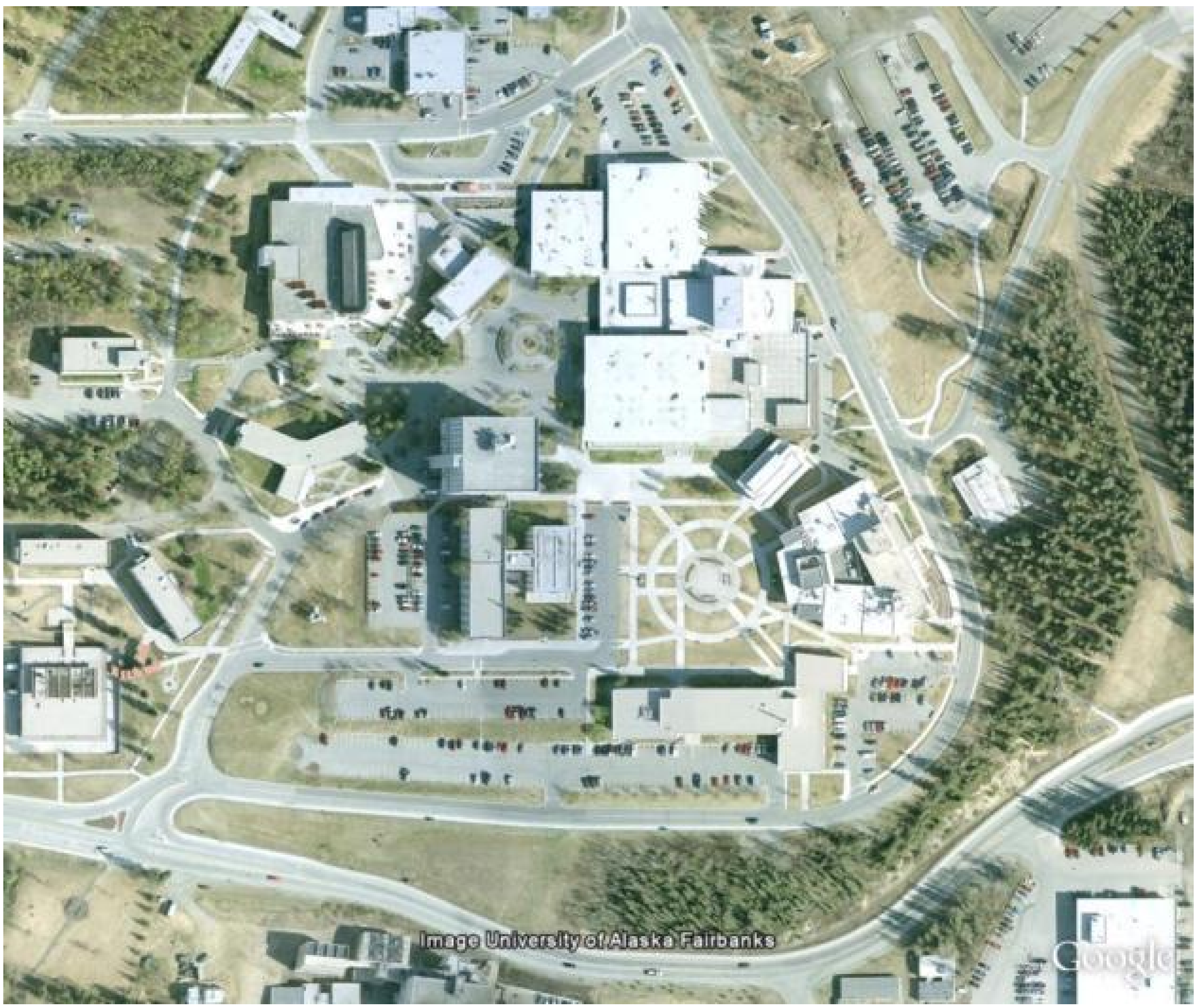
SECTION 5

SITE

5.1 SITE INTRODUCTION

EXPANSION OF THE COLLEGE OF ENGINEERING AND MINES

The University of Alaska Fairbanks is defined by its location. Situated on a hilltop overlooking the Alaska Range and the Tanana Valley, the campus is highly visible to the Fairbanks community. The site's topography, coupled with an administrative decision to locate the research facilities on West Ridge separate from the academic and administrative facilities on Lower Campus, led to the present east-west alignment of the campus.



Aerial view of Lower Campus

5.2 SITE VISION

COLLEGE OF ENGINEERING AND MINES

The proposed expansion of the College of Engineering and Mines (CEM) is conceived as an addition to The Duckering Building (current location of the College) and provides state-of-the-art teaching and learning spaces for the College in support of the Campus Master Plan vision for greater program and campus integration. The integration of teaching and research is a primary goal of the University.

The Proposed New CEM building with the functional connection to the Duckering Building will establish a campus precedent for connectivity between buildings. By exercising innovative campus planning and building design, the new engineering facility will enhance the campus experience and pedestrian circulation while specifically unifying building functions and exterior architecture. This proposed new building will create “neighborhood” spaces on lower campus for collaboration and interaction that integrate research, teaching, and student life through the interconnection of mixed-use buildings presenting a new unified face for the College of Engineering and Mines to Cornerstone Plaza, the University and the engineering world beyond.

View of Duckering and Bunnell Buildings from Cornerstone Plaza

5.3 SITE SELECTION PROCESS

The design team considered three locations near Duckering Building for the expansion of the College of Engineering and Mines.

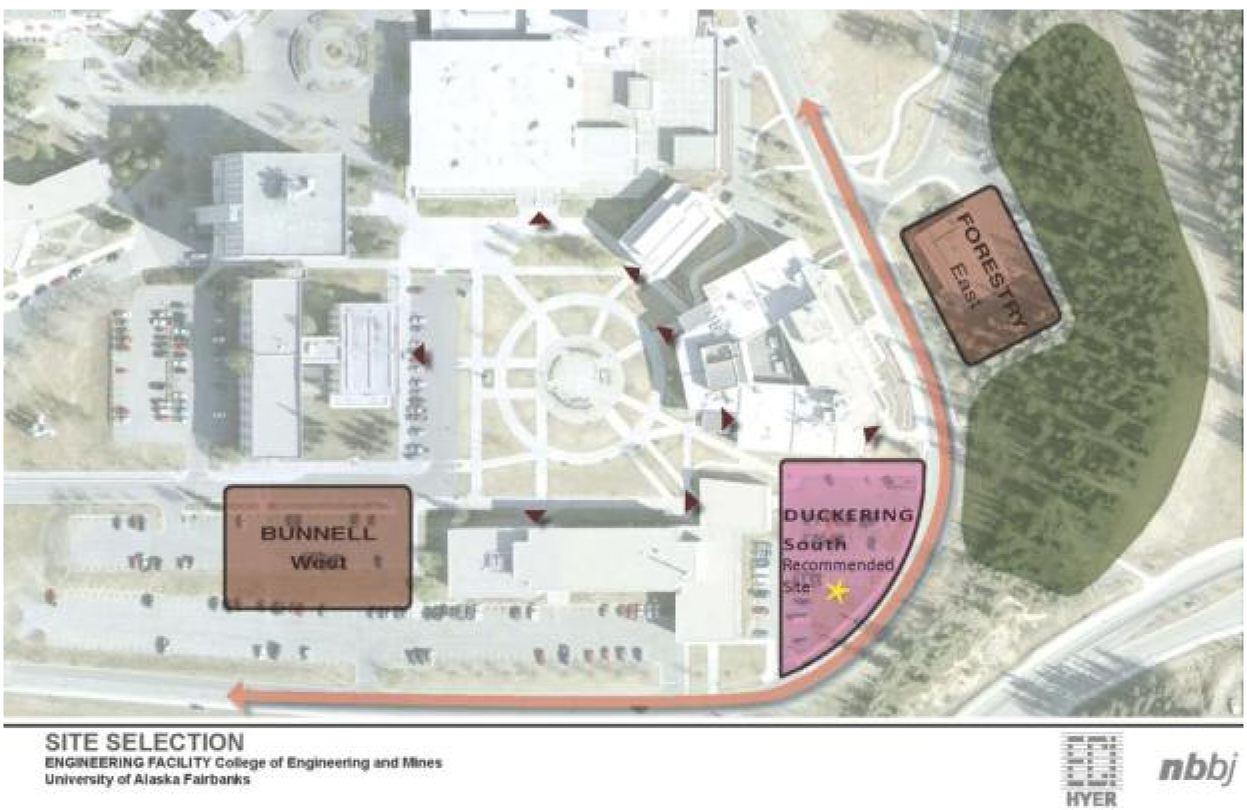
The Forestry East Site;
The location of the current Forestry Building east of Duckering Building.

The Duckering South Site;
The current parking lot south of Duckering Building.

The Bunnell West Site;
The parking lot off the west end of Bunnell Building.

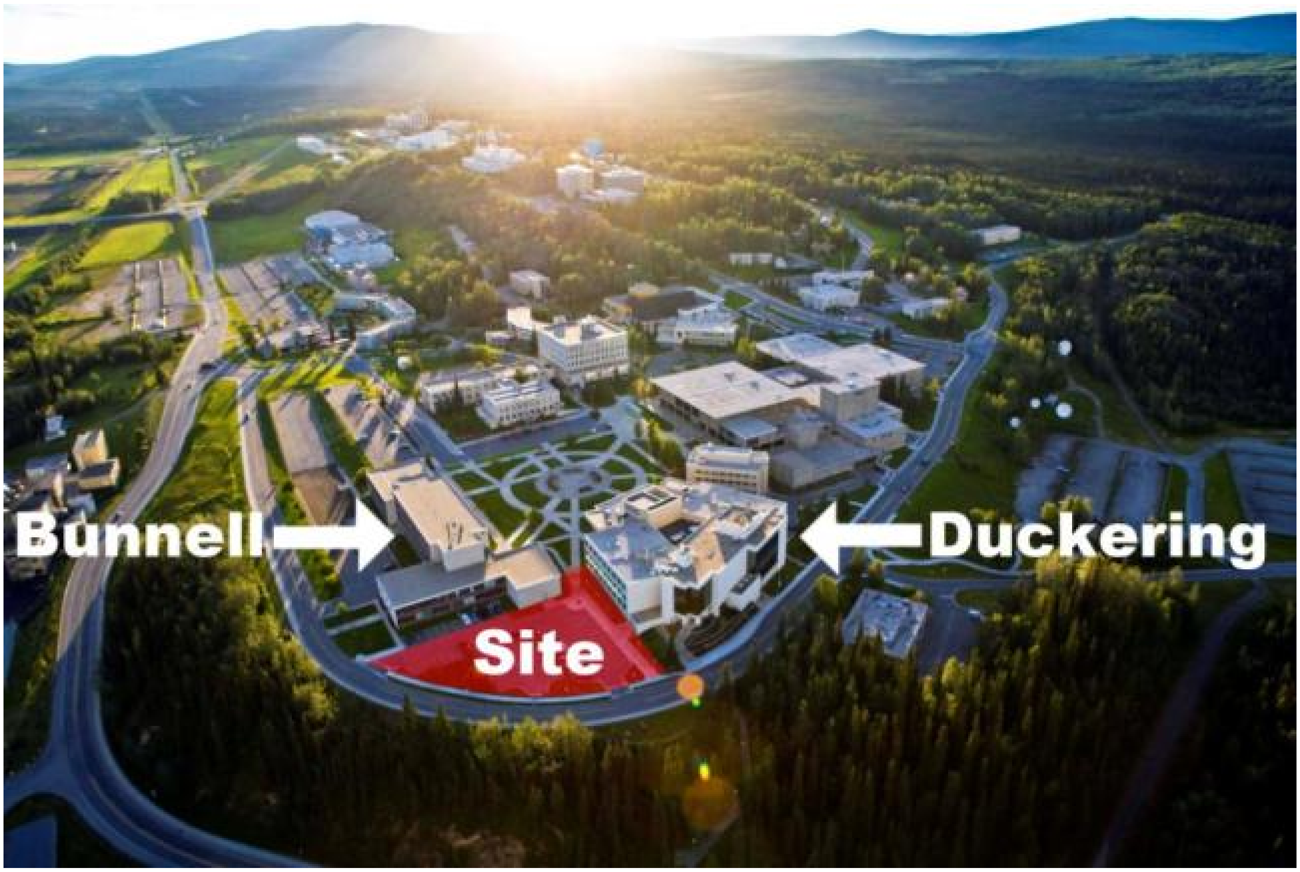
A test fit of the program and a conceptual building massing study was done for each site. To determine the recommended location for the proposed new engineering building, each site option was measured against a list of planning and design criteria, such as, the ultimate carrying capacity of the site, ability to meet the University's goals for integration of teaching and research, and adherence to the Campus Master Plan. The studies were reviewed by the Project Leadership Team and collectively graded against the list of criteria.

The Duckering South Site was selected and recommended as the site that best meets the University's and CEM's overall project goals.



5.4 RECOMMENDED SITE

The recommended Duckering South site lies on the lower campus in a parking lot between Duckering and Bunnell Buildings. Duckering Building houses the existing CEM programs and Bunnell Building is the home of The School of Management. This site will provide sweeping views to and from the building and holds an honorific position for the College of Engineering and Mines on Cornerstone Plaza. The proposed new building, by the interconnection of mixed-use buildings, will establish a strong integration of research, teaching, and student life and will present a new unified face for the College of Engineering and Mines to the University.



Aerial View of Campus

5.4.1 MASTER PLAN CONFORMANCE

The recommended Duckering South Site was identified in the 2002 UAF Master Plan as a "Future Building Site." However, this site was inadvertently excluded in the 2010 Master Plan. Upon review of the considered sites and the completed program for the addition to the College of Engineering and Mines, The University of Alaska Fairbanks Master Plan Committee

Views of Site

Site from North

Site from West

Site from South

Site from East

Site from Cornerstone Plaza

Site from Tanana Loop

Duckering Building from Tanana Loop

Bunnell Building from Tanana Loop

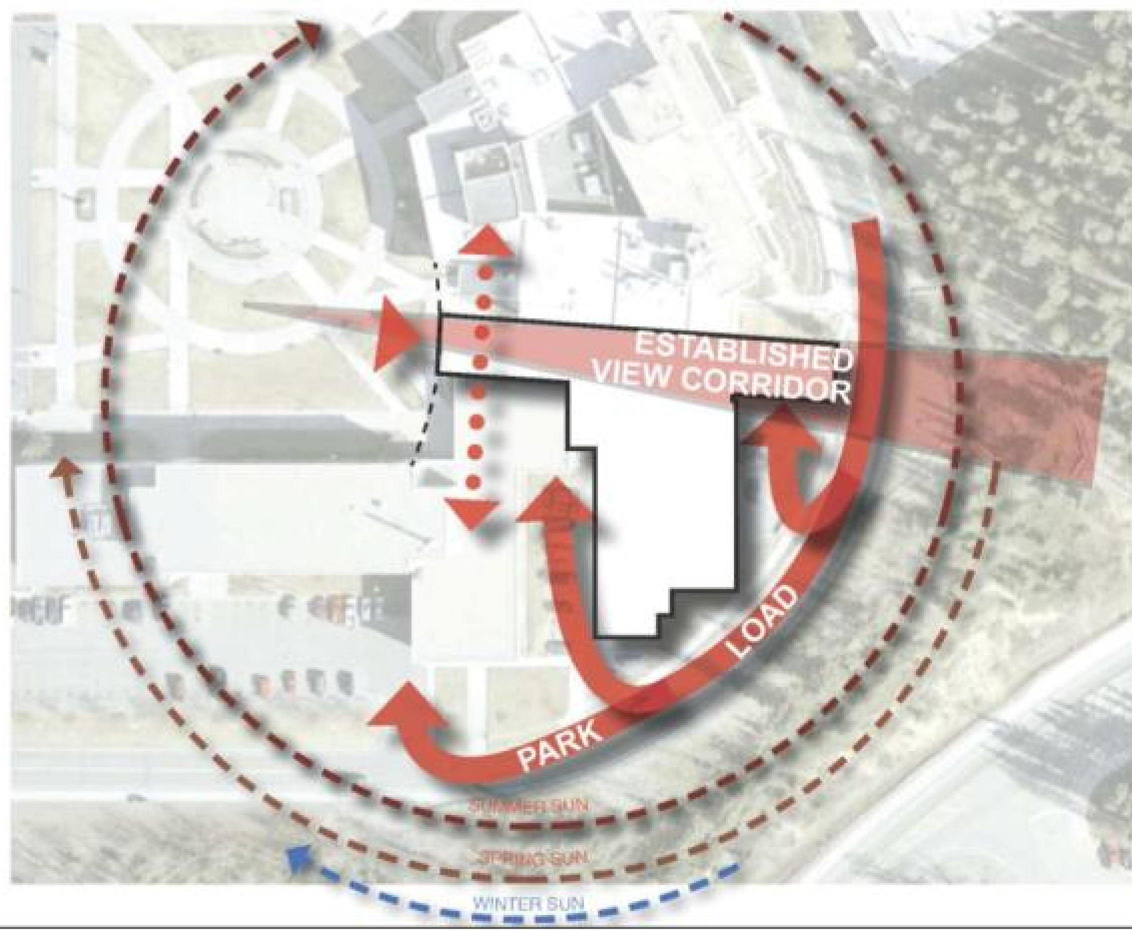
5.5 SITE ANALYSIS

5.5.1 Views

The Campus Master Plan recognizes an important existing view corridor from Cornerstone Plaza to the east. The design of the proposed addition will frame this view by providing significant transparency at each end of the high bay cluster to permit views through the building to the mountains to the east.

5.5.2 Service Access And Parking

All site service access occurs from Tanana Loop. Building loading access will be provided at grade at the east end of the high bay cluster and to the main loading dock positioned between the new CEM Building and Bunnell Building. A small amount of onsite parking for service vehicles will also be provided between Bunnell Building and CEM.

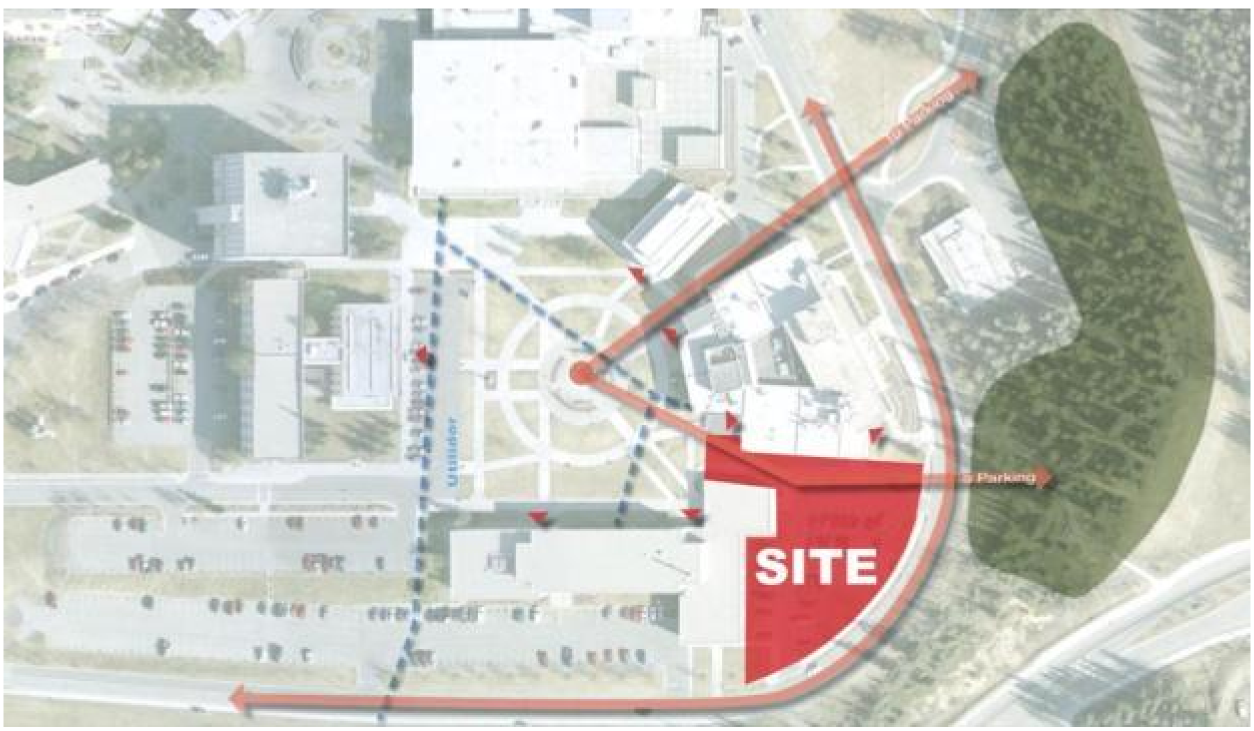


5.5.3 Pedestrian Routes

Cornerstone Plaza experiences significant pedestrian movement to the entries of the surrounding academic buildings. In addition, two heavily traveled pedestrian routes exist from central campus to lower student parking lots to the northeast and the southeast of the site. The potential exists in the design of the new CEM building to provide pedestrian circulation through the building to both bring greater exposure of the Engineering program and a sheltered route for students moving to the lower parking lots.

The campus utilidor (represented by the blue dotted line in the adjacent diagram), serves the adjacent Duckering and Bunnell Buildings and will require a short extension to the center of the recommended site to provide essential services to all utilities.

Site Plan

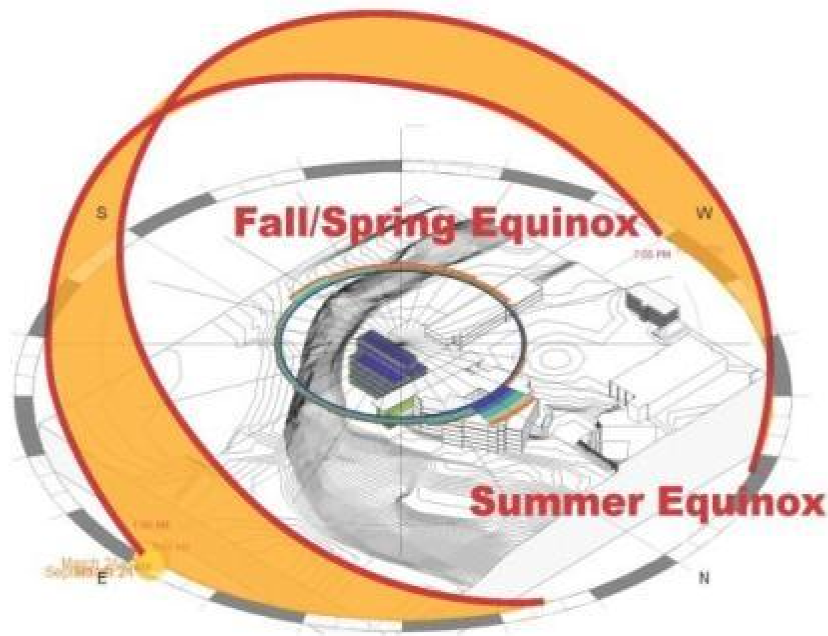


5.5.4 Solar Orientation

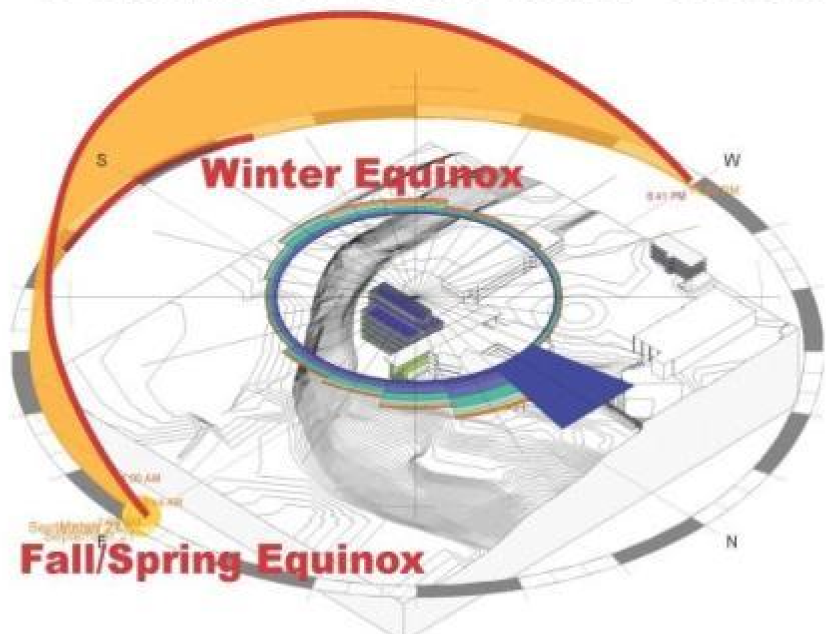
The extreme low sun angles at this latitude combined with the high exposure on the east and south sides of the building will require close attention to day lighting strategies. Significant energy savings are achievable through daylight harvesting for both lighting and Direct Solar Heat Gain, but glare and overheating must be balanced.

5.5.5 Prevailing Wind

The summer prevailing winds are relatively light and come predominantly from the north. As the University is not in session for the summer months and air cleanliness is questionable, capture of wind for natural cooling seems impractical. The winter prevailing winds are strong and from the north. Therefore, care will be taken in locating new building entries to maximize protection from this wind.



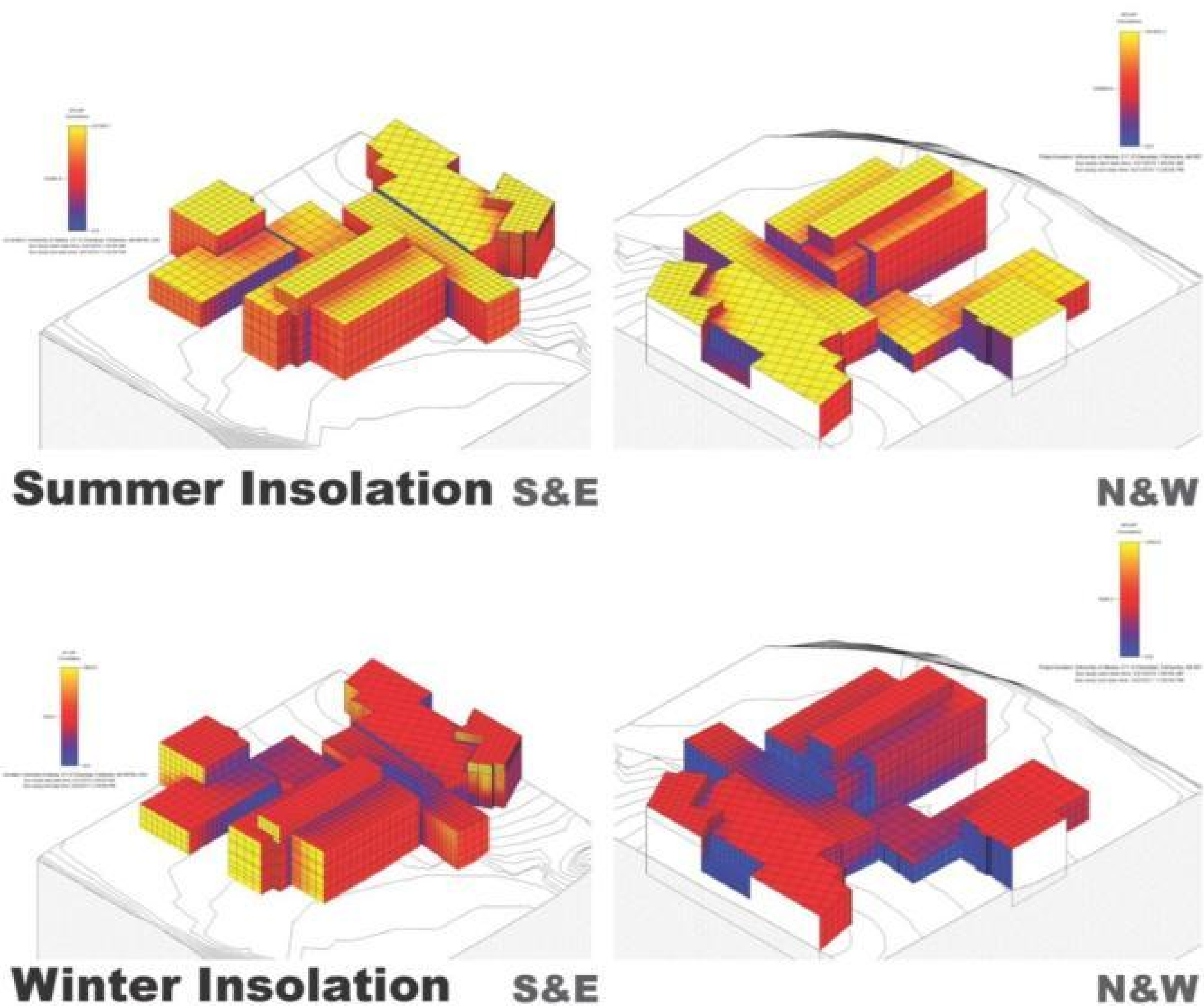
Summer Sun and Wind



Winter Sun and Wind

5.5.6 Insolation Studies

The insolation analysis combined with the low sun angles noted previously point to several possible opportunities for daylight harvesting. Significant heat gain especially on the south face of the building could exist and could be difficult to control due to the low sun angles. The east face has more solar exposure than the west and could be utilized for early harvest and preheat of the building in swing months. The west face does not have significant heat gain due to the low sun angles and the shading that the adjacent Bunnell Building provides. However, this face could also be a candidate for sunlight harvesting, if the issues of glare are addressed. Strategies for daylight harvesting and glare control of vision windows will be examined during the upcoming design phases.



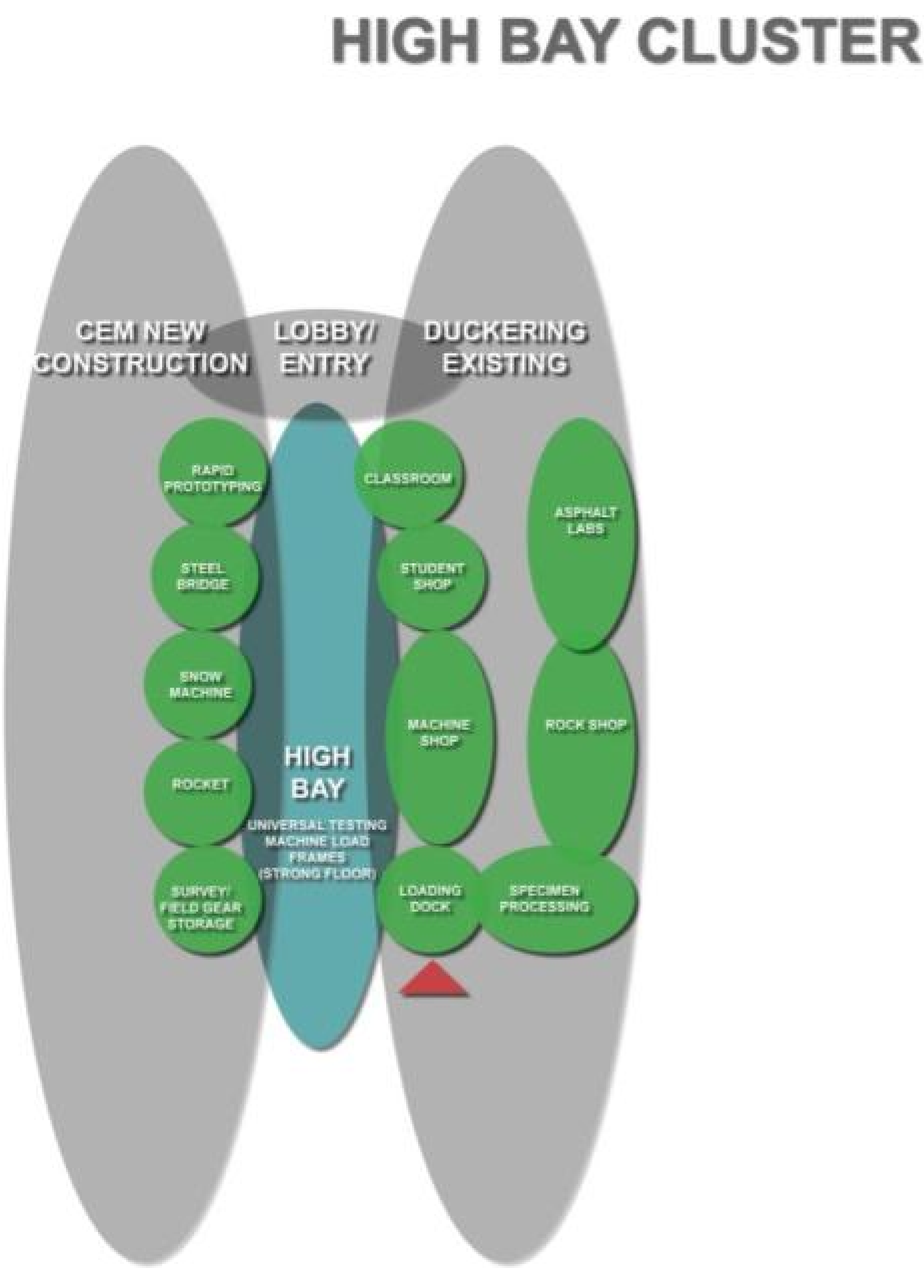
SECTION 6

PLAN ORGANIZATIONAL DIAGRAMS

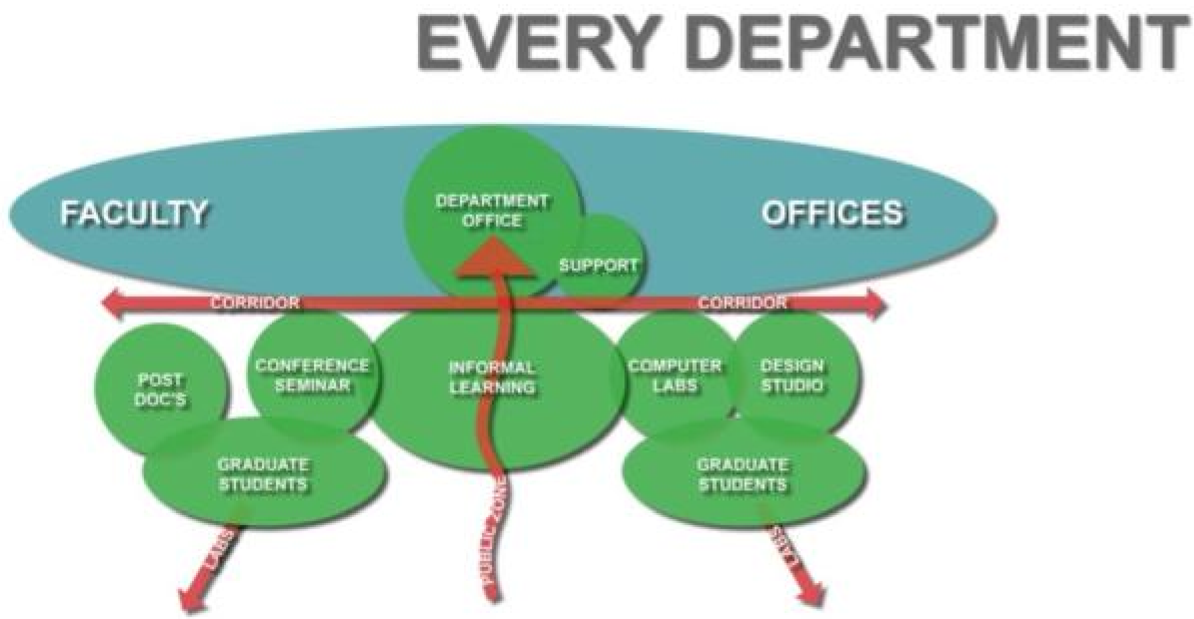
6.1 BUBBLE DIAGRAMS

6.1.1 High Bay Cluster

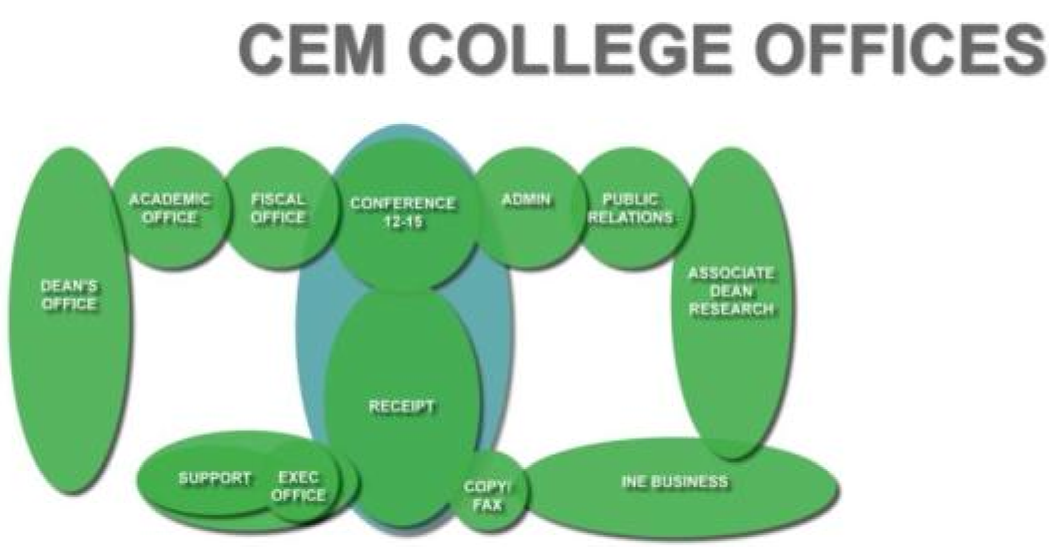
"Make Engineering Visible" is an over-arching design goal for the proposed new CEM Building. The successful design execution of the High Bay Cluster is central to reaching this important goal. Strategically positioned at the heart of the building and serving as a bridge between the existing Duckering Building and the proposed new building, the High Bay Cluster is envisioned as an active and high energy teaching and learning environment surrounded by student design labs.



6.1.2 All Departments



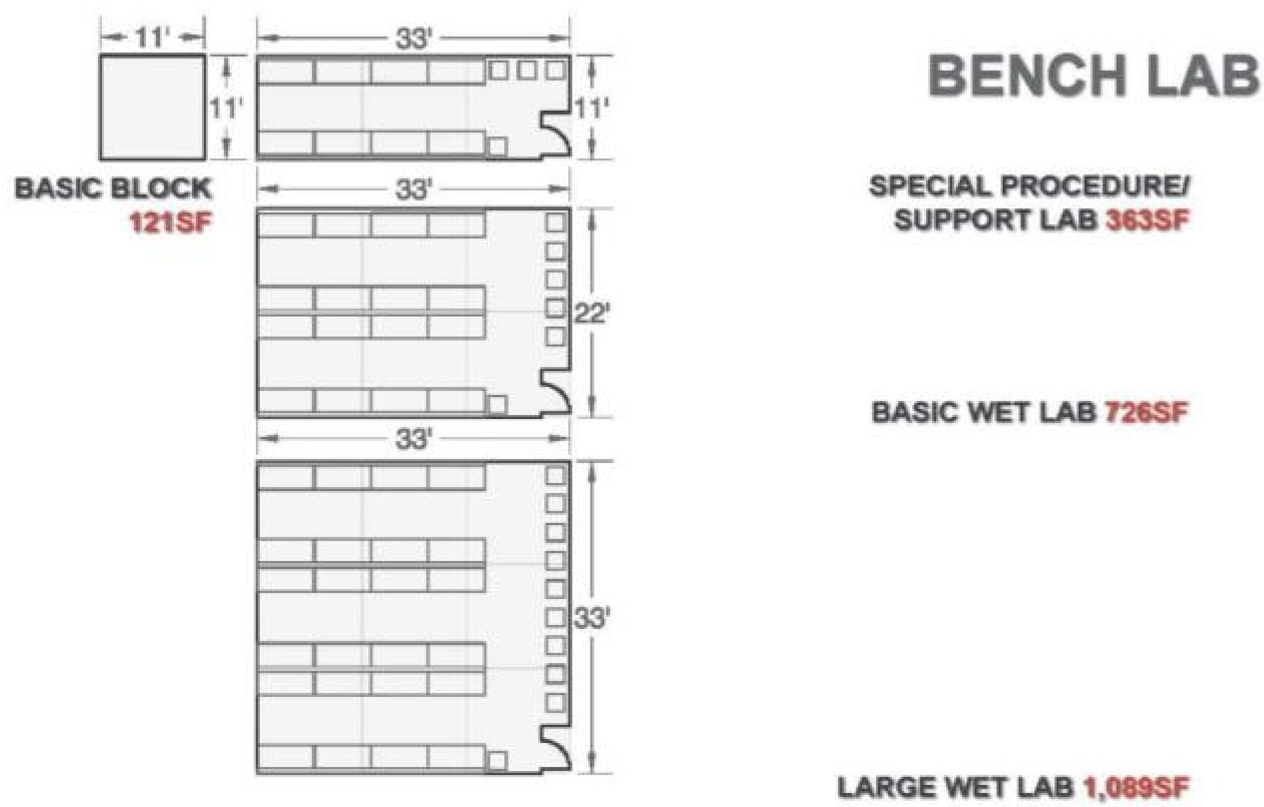
6.1.3 CEM College Offices



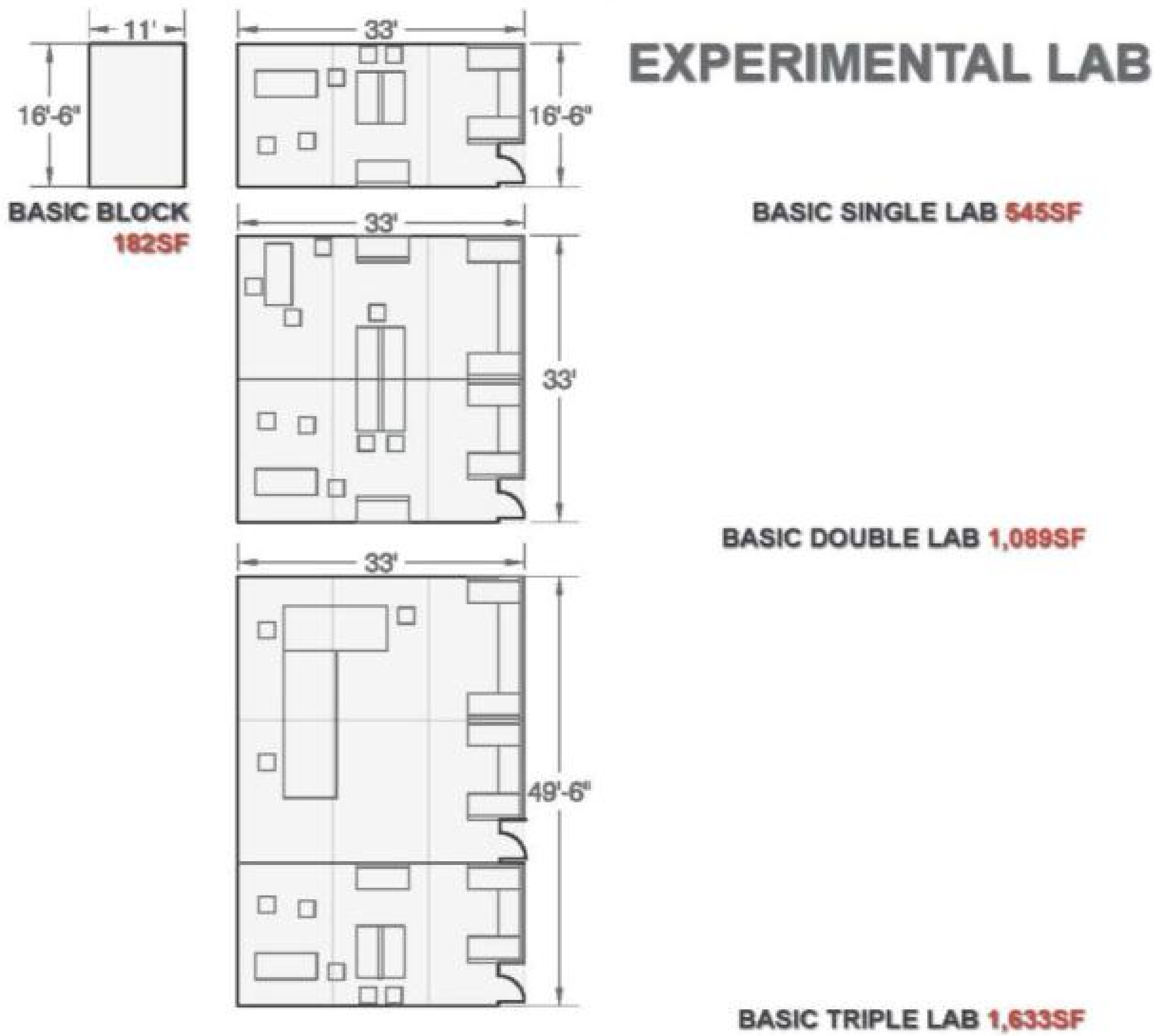
6.2 MODULE STUDIES

6.2.1 Lab Planning Module

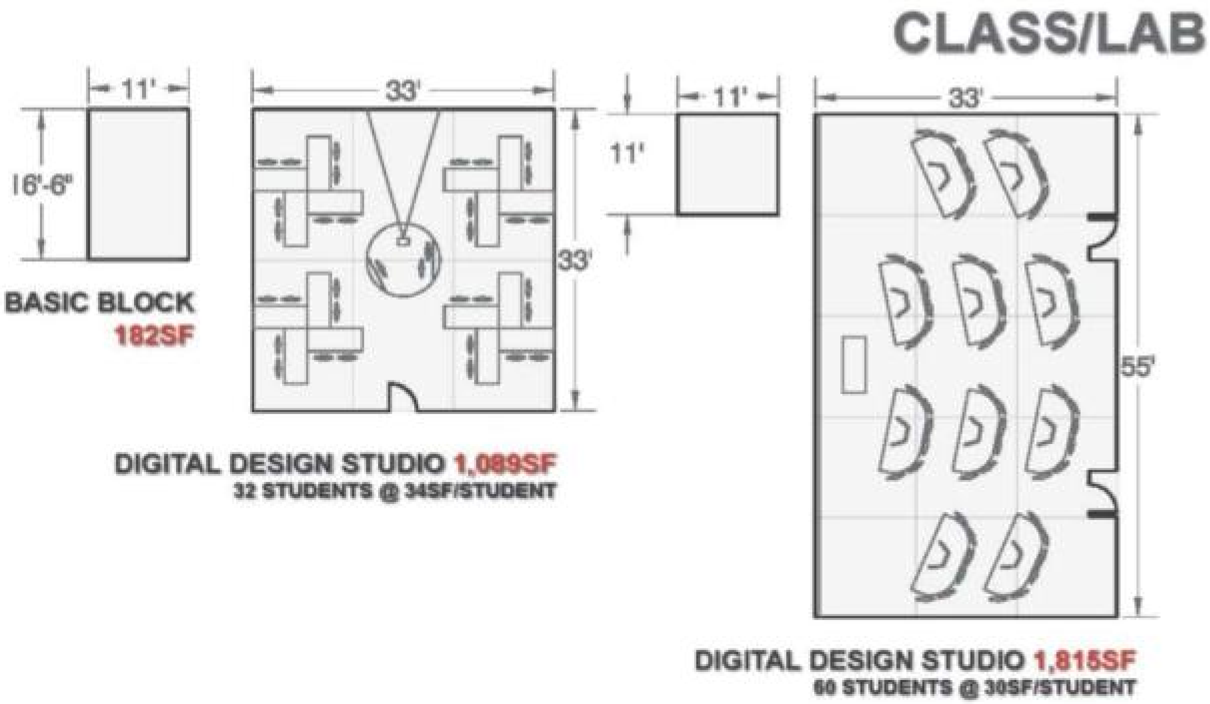
The program of spaces for the proposed new Engineering building was informed by employing a modular design strategy. The laboratory module is fundamental to planning a flexible laboratory building for both teaching and research. It provides for certain regularity and repetitiveness in the size, shape and arrangement of programmed spaces. The proposed 11’x33’ laboratory module is the basic building block, and it is properly sized so that assembling a number of modules will accommodate a variety of engineering laboratory functions. Modules are combined and divided into segments to satisfy programmatic space needs. They represent planned and identified locations for certain laboratory equipment, furniture, partitions, ceiling and lighting systems, HVAC and plumbing systems, electrical power and communications distribution, etc. The laboratory module enables the design team to select and arrange building systems in a rational manner. A laboratory planned with modules permits safe, cost effective modification of building systems when future alteration of the laboratory is required.



6.2.2 EXPERIMENTAL LAB MODULE



6.2.3 CLASS LAB MODULE



6.2.4 LAB MODULES

6.3 STACKING DIAGRAMS

6.3.1 Stacking Plans

During the site evaluation process, a test fit of the program and a conceptual building massing study was completed. The study measured against a list of planning and design criteria including the maximum carrying capacity of the site and its scale relationship to the adjacent academic buildings. It was determined that a maximum building height of 5 stories (including the mechanical penthouse) representing a mass of approximately 116,900 GSF was a most appropriate building in this campus location.

6.3.2 Predicted Assignable-to-Gross Area Efficiency Factor

In predesign, to predict the approximate gross area of a building it is necessary to estimate the gross area from the assignable areas identified in the space program. The means to do so is to utilize an efficiency factor to extrapolate assignable area to gross area.

Several definitions aid in the understanding of this concept:

"Assignable Area", unit of measure "Assignable Square Foot (ASF)" or **"Net Assignable Area"**, unit of measure" Net Assignable Square Foot (NASF**)",** are interchangeable terms when applied to an academic and research building. Assignable area is defined as comprising functional areas such as offices, classrooms and laboratories, excluding required building support spaces like exterior enclosure, circulation, mechanical and structural areas.

"**Gross Area",** unit of measure "Gross Square Foot" (GSF), is a measure often defined as the overall enclosed construction area of the building. It is generally measured to the outside face of the enclosure and includes structure, penetrations, penthouses, basements, etc.

"Efficiency Factor" or **"Net-to-Gross"** are interchangeable terms and are defined as the ratio between the total assignable area and the overall gross construction area of the building. By dividing Assignable Area by the Efficiency Factor the Gross Area is obtained.

The efficiency factor for a given building can vary over a fairly large range, but is typically from 50% to 70% for campus academic buildings. The efficiency is affected by the overall size of the project (with larger projects typically being more efficient) to the number, size and openness of the types of spaces in the program. The amount of circulation and openness decreases efficiency, as does the need to enclose all mechanical space due to a cold climate. Connecting to existing buildings tend to add some inefficiency when compared to a freestanding building. Some general ranges of efficiency include:

Mixed Lab & Office	50% to 60%
Wet Laboratory:	53% to 59%
Teaching Laboratory	56% to 62%
Private Offices:	60% to 70%
Open Office	67% to 72%

By way of example, the Duckering Building has an efficiency factor of 56% (82,330 ASF/147,575 GSF).

The UAF West Ridge Research Building (WRRB) is at 60% (36,727 ASF/60,917 GSF).

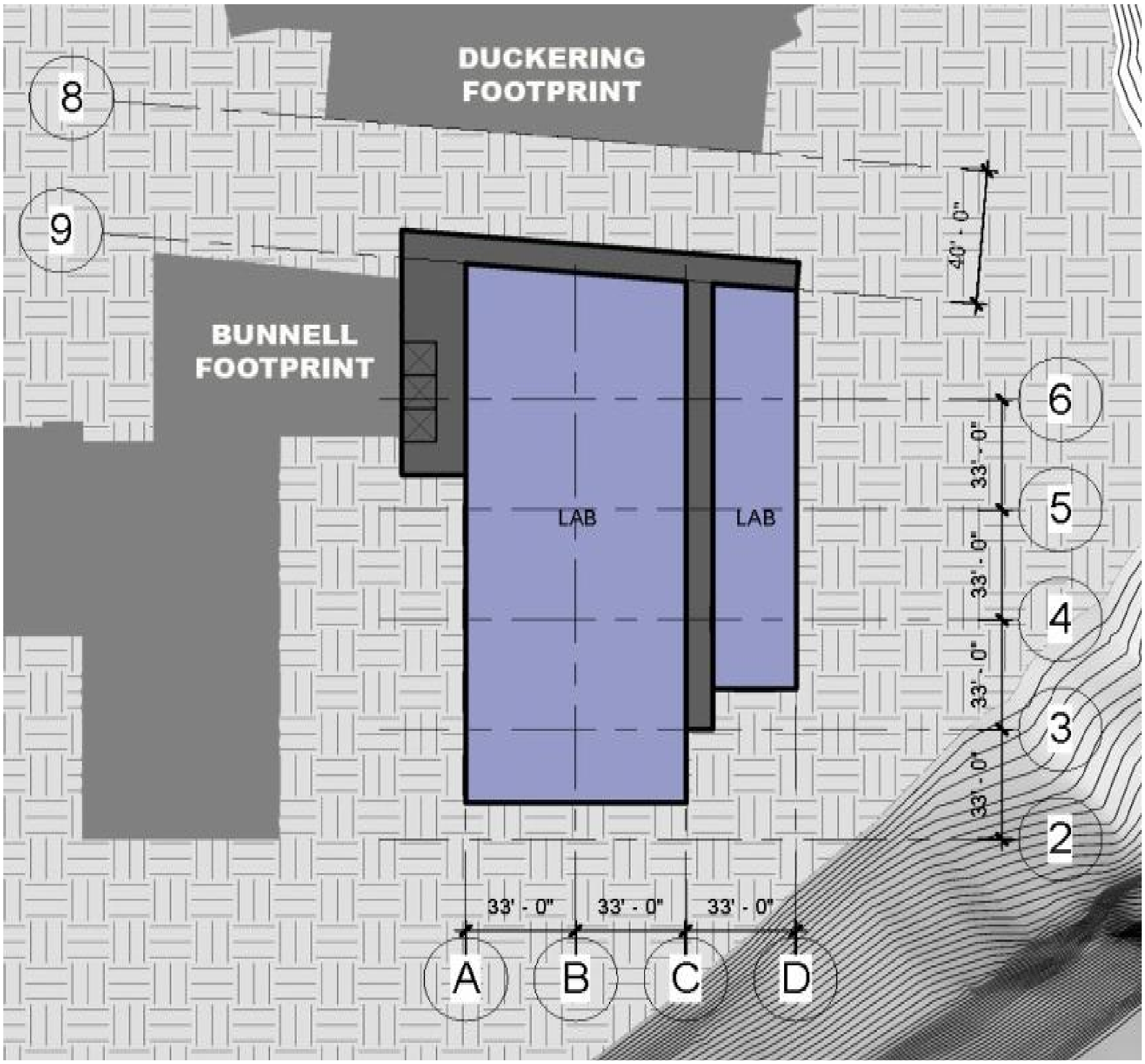
Some engineering building examples on other campuses include:

- UC Riverside Engineering Building Unit 2 at 59% (89,686 ASF/152,010 GSF);
- University of Maryland New Engineering & Aviation Sciences at 54% (88,610 ASF/163,350 GSF);
- UCSD Jacobs Hall at 54% (137,704 ASF/257,031 GSF);
- UCSD Calit2 at 62% (150,734 ASF/242,808 GSF).

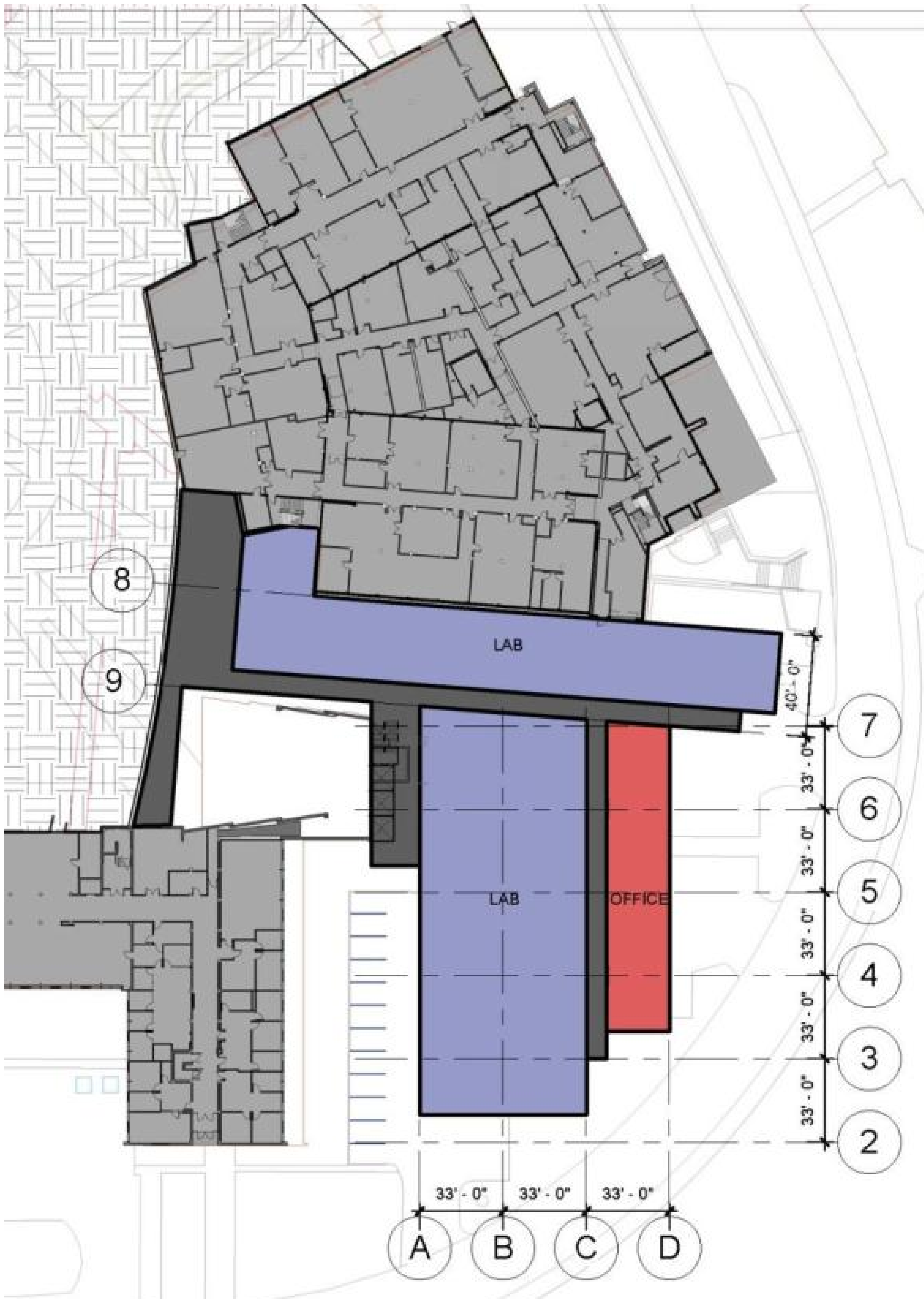
For the purposes of predicting the gross area of the new addition, an efficiency of 59% was assumed, based on the likely program types, need for connections to existing buildings and significant mechanical equipment to be enclosed.

A test fit of the program was then accomplished to confirm that the distribution, number of floors and floor plate dimensions met the program requirements on the site.

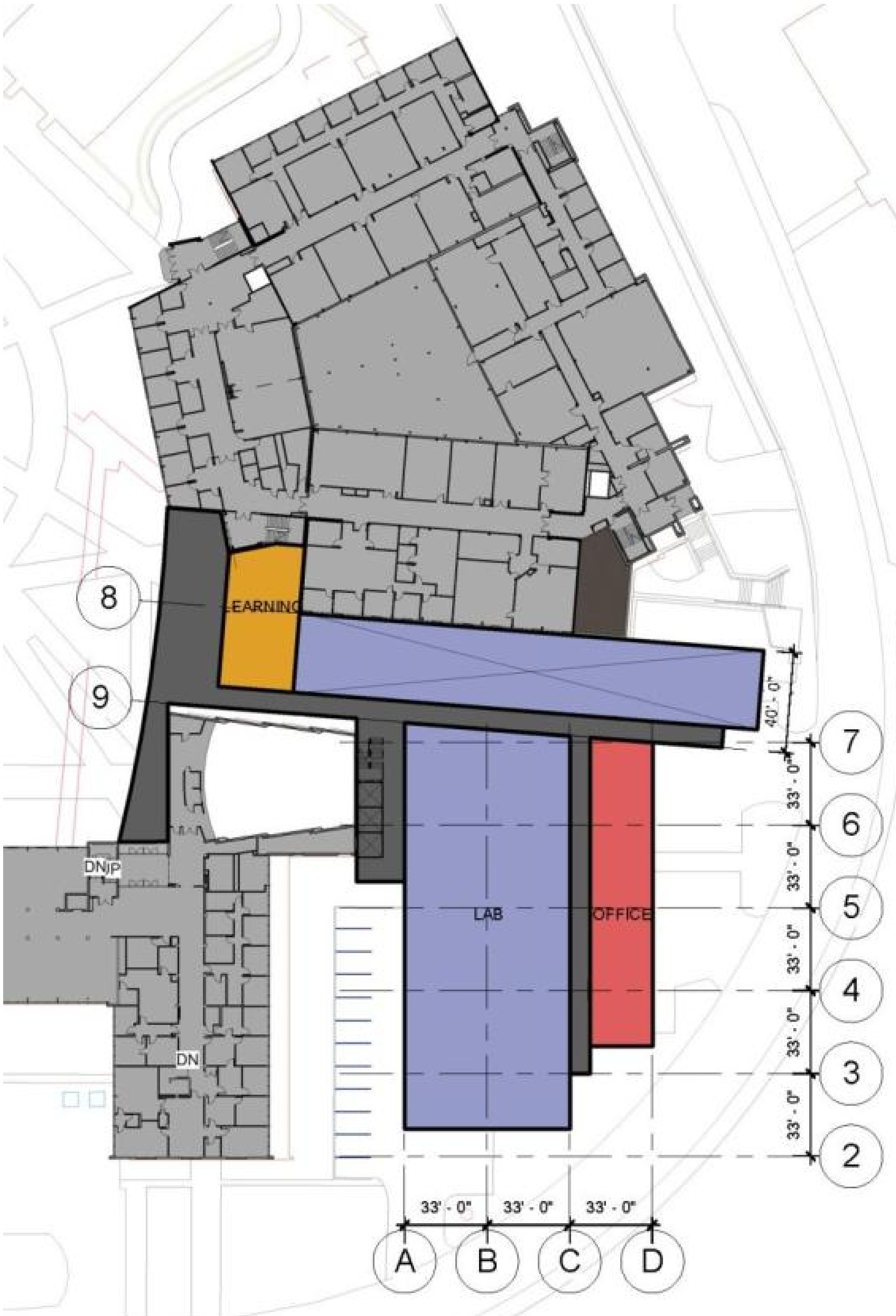
6.3.3 LEVEL B



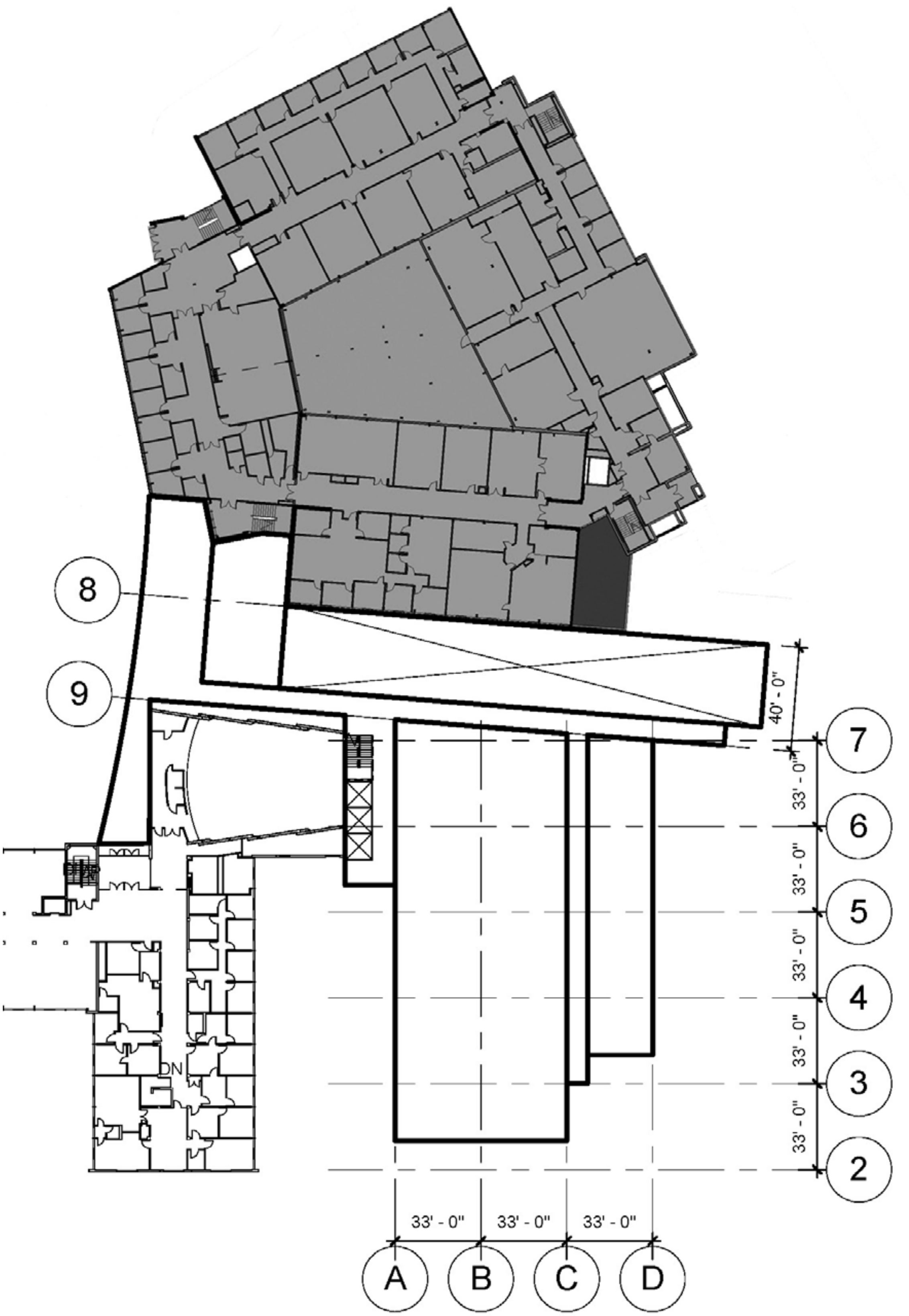
6.3.4 PROPOSED LEVEL 01, DUCKERING LEVEL 01



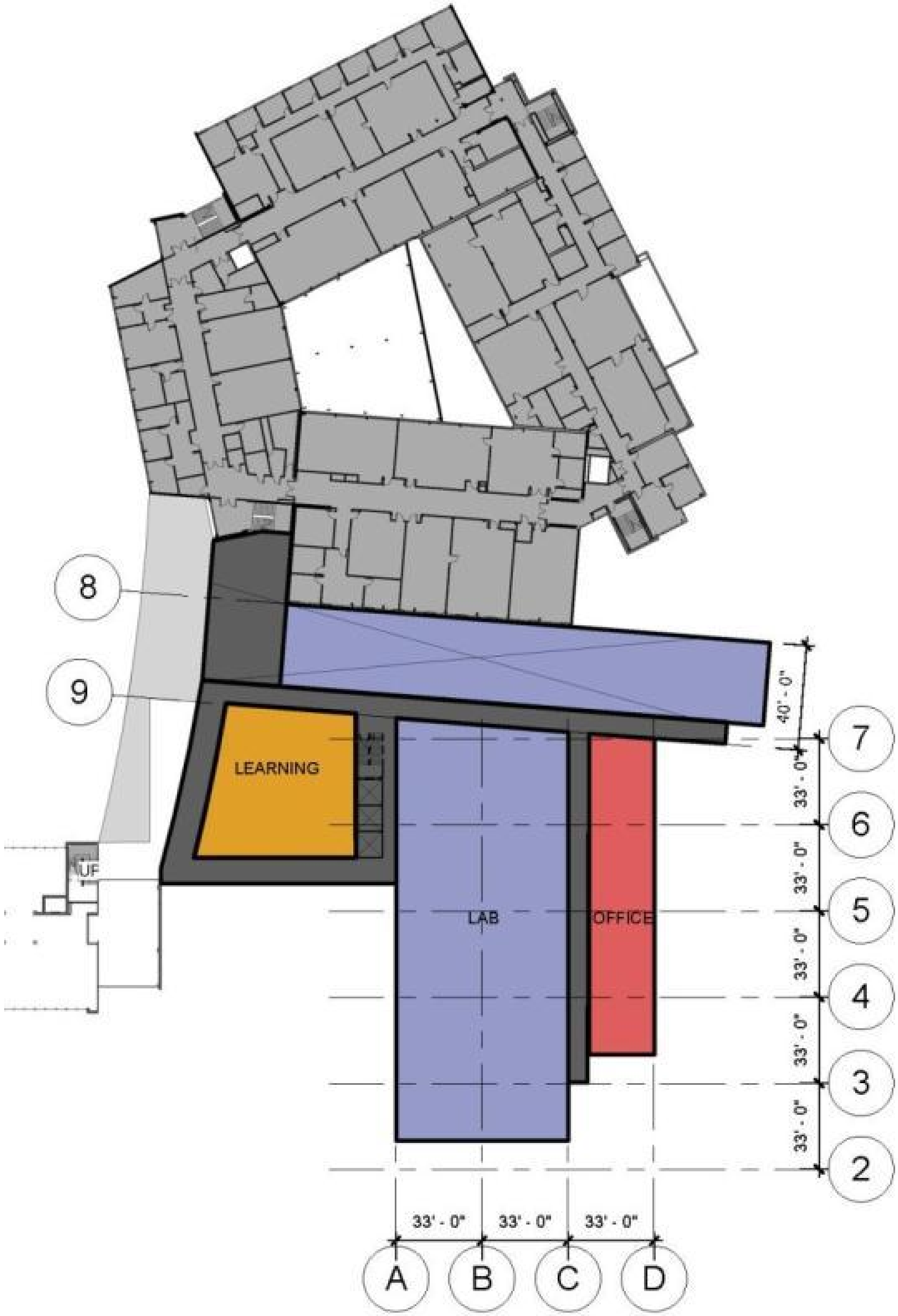
6.3.5 PROPOSED LEVEL 02, DUCKERING LEVEL 02



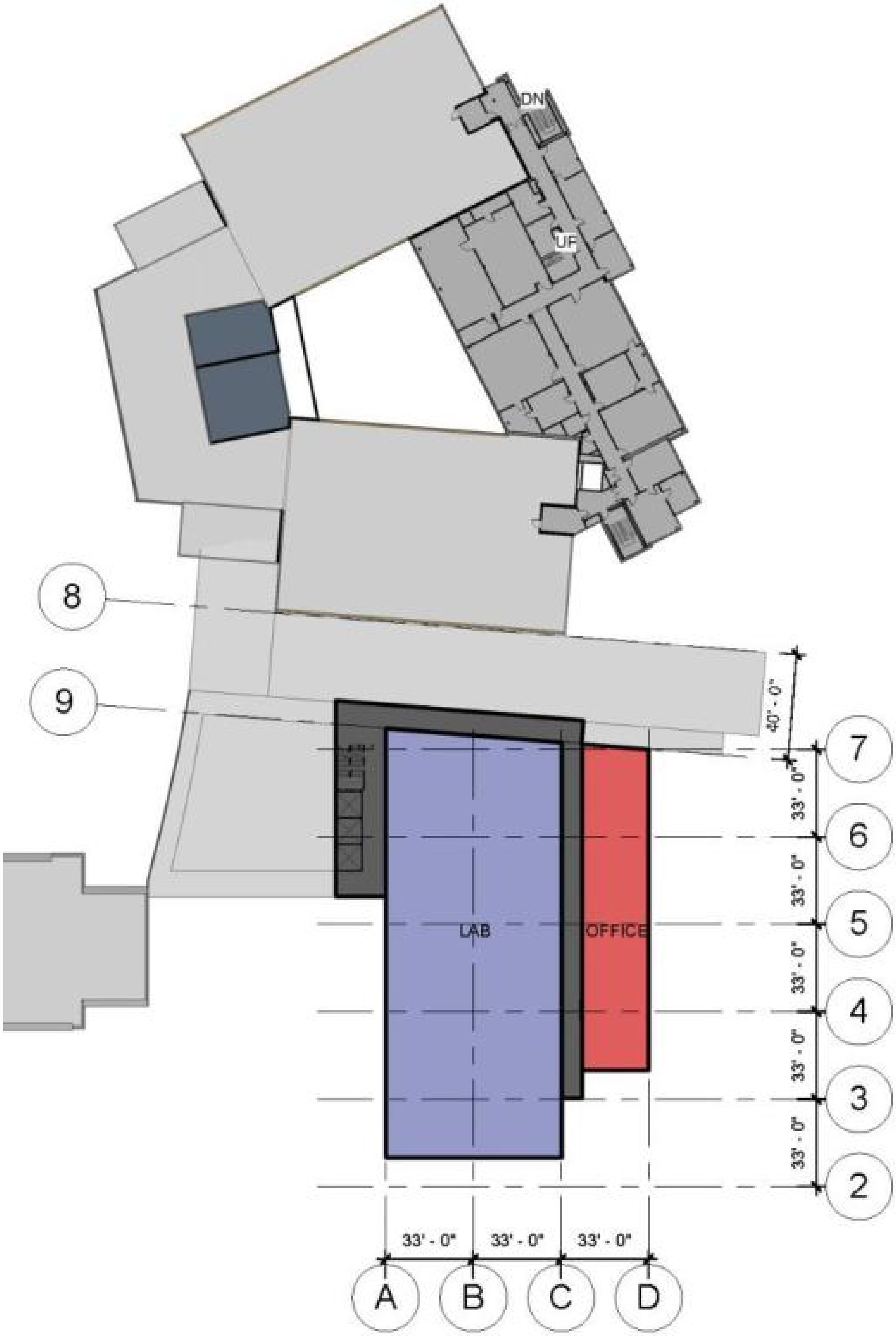
6.3.6 Duckering LEVEL 03



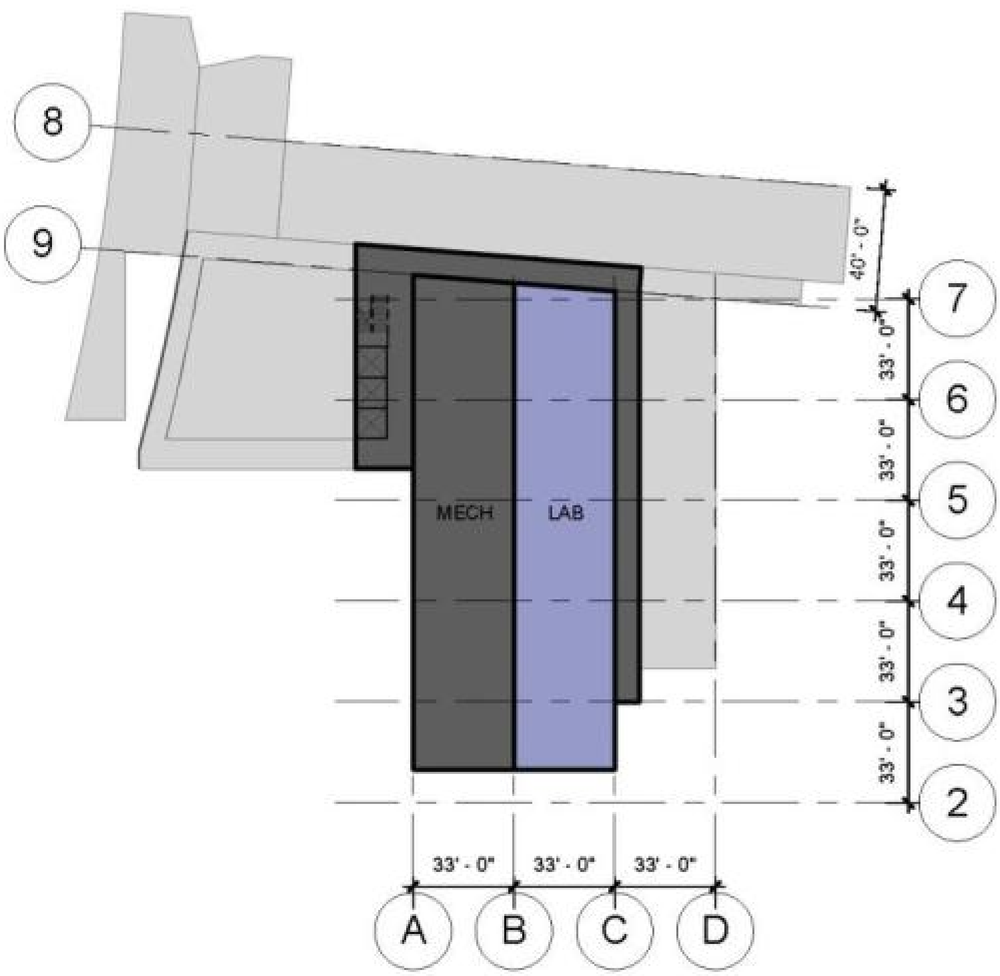
6.3.7 Proposed LEVEL 03, Duckering Level 04



6.3.8 Proposed LEVEL 04, Duckering Level 05



6.3.9 PROPOSED LEVEL 05



SECTION 7

CIVIL ENGINEERING

CIVIL

Existing Utilities
Existing utilities available to serve the proposed building include a direct buried sanitary sewer main and a direct buried chilled water line, with the remaining water, steam, and condensate lines located within utilidors.

The existing sewer main located in the Tanana Loop area is 8-inch cast iron pipe. The sewer line flows south along Tanana Loop Road and is buried approximately 14 feet below grade.

Utilidor G is a 5’ by 7’ utilidor that runs through the plaza and serves the Brooks, Bunnell, and Duckering Buildings via service utilidors. Available utilities located within Utilidor G include a 12-inch steam line, a 6-inch condensate line, a looped 6-inch chilled water line, and an 8-inch domestic water line. The direct buried 12-inch chilled water line is located west of Utilidor H.

Proposed Utilities
Sanitary sewer service can be run to the Tanana Loop sewer main. Due to the depth of the sewer main, the new service could potentially connect to a basement floor while providing gravity service to the proposed building. The sewer service line will likely be 6- to 8-inch diameter, dependent upon building requirements and final fixture counts. Due to the location of the proposed building relative to the existing sewer main, the service line will likely be less than 50 feet long.

A new 5’ by 7’ service utilidor would bisect the existing service utilidor serving the Bunnell Building. The new utilidor could run between the Bunnell and Duckering Buildings, serving the proposed building with steam, water, condensate, and chilled water. A new blister would be constructed on the existing service utilidor serving the Bunnell Building to connect to the proposed utilidor routing towards the new building. It is likely that the existing lines serving the Bunnell Building would have to be upsized between Utilidor G and the proposed blister to accommodate the new building service. The new building will likely require a 6-inch domestic water service line. Typical service sizes for steam and condensate lines for buildings of this size are 8-inch and 4-inch diameter, respectively. Approximately 175 feet of service utilidor and associated piping will be required to serve the new building.

SECTION 8

STRUCTURAL SYSTEMS

STRUCTURAL SYSTEMS

Design Criteria
Design and construction of the structural elements of the University of Alaska Fairbanks, Engineering Facility will be in accordance with the provisions of the International Building Code (IBC) 2006. Design loads will come from the ASCE 7-05 Standard. Steel will be designed in accordance with AISC Construction Manual, as well as the Seismic Design Manual as appropriate.

Design Loads
Design loads as described below will be combined in accordance with the code to determine the governing combinations for various structural elements.

Dead loads include the actual weight of building materials as constructed, including the weight of fixed equipment.

Live loads are the maximum expected superimposed loads as determined by use, as noted in the table below. Live load reductions will be included where allowed by code.

Use	Uniform Load (PSF)
Office/Classroom	50 + 20 partitions
Laboratory	100
Corridors	100
Access Floors	100
Mechanical	150 or actual equipment weight

Snow loads are based on a ground snow load of 60 psf with a minimum roof load of 50 psf. Snow drift loads will be accounted for where drifting conditions warrant.

Wind loads are based on a wind speed of 90 mph with exposure condition C. Topographic effects on design wind pressures are expected to be applicable at this site.

Earthquake loads are based on design spectral response accelerations, SD1 = 0.36 g for 1 second periods and SDS = 0.81 g for 0.2 second periods. These design accelerations are for site class D, which is based on extrapolation of soils data from nearby projects.

Foundation Systems
A geotechnical investigation at the building site will be required to develop foundation design criteria for this facility. Based on soil information from other projects on campus, it is expected that the soils will consist of dense to medium dense silts or deteriorated schist. Groundwater is not expected at this site. Permafrost is discontinuous throughout the campus, but is not expected at this site.

The type of foundations will consist of conventional spread footings that tie into a basement area. The perimeter will consist of stem walls or basement walls over strip footings. Basement walls will be reinforced concrete. Slabs on grade will be reinforced concrete. Typically, geotechnical foundation recommendations for this area include 1 to 2 feet of over-excavation of the in-place silt and replacement with compacted granular fill.

A “Strong Floor” laboratory area would be constructed on a large monolithic concrete matt. This matt foundation would also support a bridge crane and would be integrated to support the surrounding building columns.

Structural Systems
The gravity load resisting structural system will consist of steel beams and columns with composite metal deck and concrete floors. The anticipated spatial arrangement for this building is based on a modular arrangement to provide for maximum flexibility. In order to accommodate this system, structural bay spacing, column and beam sizes, and framing layout will be standardized to the extent possible, given design loads.

The lateral load resisting system is the most challenging aspect of the structural design for this type of facility. Seismic loads will govern the design of the primary systems, although wind loads can govern the design of secondary structural elements such as exterior wall studs. Concrete

Shear walls will be used to resist lateral loads in the basement. A combination of Steel moment frames and Buckling Restrained Braced Frames (BRBF) will be used to resist lateral motion in each orthogonal direction.

Existing Duckering and Bunnell

The new Engineering Facility will connect with existing buildings including Duckering and Bunnell. The new Engineering Facility will be seismically separated from the existing buildings, and any remodeling of the existing buildings will not modify existing structural components. By maintaining this separation, these existing lateral force resisting systems will not need to be retrofitted to comply with current seismic codes.

SECTION 9

MECHANICAL SYSTEMS

MECHANICAL SYSTEMS

9.1 General

The design of the mechanical systems to support the new UAF Engineering Building and the associated remodel of the existing Duckering and Bunnell Buildings will focus on providing comfortable, healthy and safe environments to support an effective educational environment.

Mechanical systems will include centralized heating, ventilating and air conditioning systems, plumbing, fire protection and building automation systems. Specialty mechanical laboratory ventilation and plumbing systems will be provided where appropriate. The design will be based on standard quality commercial grade components and both custom and packaged systems. Systems will be designed to be safe, comfortable and efficient, using proven techniques and modern technology. Special consideration will be given to incorporating energy saving devices where feasible. Mechanical system designs will focus on logical equipment placement, ease of operation and accessibility for both preventative and corrective maintenance.

The design team will work closely with UAF to solicit further design input regarding interpretation of UAF guidelines and design standards. Input by UAF faculty and staff will be vital for design of appropriate mechanical systems that directly support specific learning environments, such as laboratory spaces.

System requirements and device sizes and locations will be firmly fixed at the end of Design Development. Changes in scope or design approach during the Contract Documents phase are not anticipated.

9.2 Applicable Codes and Standards

Applicable Codes include, but are not limited to the following:

- International Building Code (IBC)
- International Mechanical Code (IMC)
- Uniform Plumbing Code (UPC)
- International Fire Code (IFC)
- National Electric Code (NEC)

Applicable Standards include, but are not limited to the following:

- American National Standards Institute, ANSI
- American Society for Testing and Materials, ASTM
- Underwriters Laboratory, UL
- National Fire Codes and Standards, NFPA
- American Society of Heating, Refrigerating and Air Conditioning Engineers, ASHRAE
- Duct Construction Standards, SMACNA

Owner Furnished Standards:

- University of Alaska Fairbanks (UAF) Facilities Services Design Standards

9.3 UAF Central Plant and Utilidor System

The new UAF Engineering Building central hydronic heating and cooling systems will receive their energy from the central UAF campus low pressure steam and chilled water systems through an existing utilidor. A new branch connection point (blister) will be added to the existing utilidor located to the west of the new building. We will work directly with UAF central plant engineers to design the new system connections. A new utilidor branch will extend from the new blister to the east and tie into the new UAF Engineering Building mechanical room.

Once inside the mechanical room, central steam heat will be converted to hydronic heat through one (1) steam-to-glycol, shell and tube heat exchanger. It is our understanding that redundant heat exchangers are not desired by UAF. The heat exchanger will be sized for 100 percent heating demand. Central steam will also be used to heat domestic hot water. A packaged condensate return pumping system with duplex pumps and flow metering will be provided to return condensate back to the central steam plant through the utilidor.

Similarly, chilled water (glycol solution) that is piped from the UAF central plant through the utilidor system will be piped from the utilidor to the mechanical room and to the new buildings central air handling system cooling coils to provide building cooling.

It is understood that the UAF central plant is capable of supplying uninterrupted steam and chilled water to the facility; therefore no stand-alone backup central heating and cooling systems will be provided.

9.4 Heating System

Load Estimate

Conceptual heating load calculations estimate a gross building heating requirement of **8,000 Mbh** under design heating day conditions. This includes outside air ventilation for indoor air quality requirements estimated in accordance with current ASHRAE guidelines.

The facility will be heated with hydronic heat generated from the low pressure steam from the UAF central plant.

Heating System Arrangement

The heat exchanger will be located in the mechanical room. Dual hydronic circulator pumps will be provided. The designer preference is vertical inline pumps, but base mounted will be specifed if desired by UAF. The pumps will be sized for a 30° F differential temperature differential across the heat exchanger at rated output to save pumping costs. The pumps will be capable of providing 120% design flow to their respective zones and equipped with variable speed drive (VSD) controllers. Basis of design for hydronic pumps will be Bell and Gossett, Taco or Armstrong. Pumps for use with VSDs will be specified with premium efficiency motors.

Building heating loop supply temperature will vary following an adjustable reset schedule from 100° F to 190° F based on outside air temperature. Supply temperature will be set at 100°F when outside temperature falls to 60°F (Heating system start-up temperature). The reset temperature will ramp up linearly to 190° F and remain constant at outdoor temperatures less than or equal to 0°F.

The hydronic system heating fluid will be 50 percent propylene glycol/RO water with NALCO 2837 inhibitor additive.

Small diameter hydronic piping (2-1/2" and smaller) will be Type M copper with 95-5 tin-antimony or 430 silver solder. Larger diameter piping (3" and larger) will be schedule 40 welded black steel. Equipment will be connected with be flanged fittings to minimize leakage.

Each zone will include a single duct variable air volume (VAV) terminal unit with hydronic reheat coil to temper supply air temperature. Perimeter zone baseboard auxiliary heating will be provided to control drafts. The use of radiant floor heating will be explored in areas where practical.

Vestibules will be heated using ceiling mounted ducted cabinet fans to avoid coil freeze-up. Mechanical and electrical rooms and storage spaces will be heated with hydronic unit heaters.

9.5 Cooling System

Conceptual cooling load calculations estimate a gross building heating requirement of 300 Tons under cooling design day conditions. This estimate includes outside air ventilation requirements in accordance with current ASHRAE guidelines.

The facility HVAC loads will be mechanically cooled using chilled water (glycol mixture) from the UAF central plant during cooling season when economizer cooling is not practical.

Computer/Server rooms will be cooling utilizing dedicated DX cooling systems with humidification. Critical rooms will have redundant cooling units. Units will each include a wall mounted evaporator section and split remote condenser unit. An indirect floor drain will be provided for condensate drainage.

9.6 Ventilation System

General

Preliminary analysis indicates appropriate building ventilation systems would consist of four (4) separate and independent central air handling units (AHUs) which will supply conditioned air to different building zones. AHU-1 will serve the Office and Support areas. AHU-2 will service the Circulation areas. AHU-3 will serve the large open Engineering Bay area and AHU-4 will serve the Engineering Laboratories. The air handlers will be located in the fifth floor penthouse mechanical room.

Ventilation system supply and return ductwork will generally be round galvanized steel with all transverse and longitudinal seals sealed to allow gas decontamination (SMACNA Seal Class A (4 in WC)). Ventilation chases will be required to transport air from the penthouse mechanical room to the remote areas of the building.

Laboratory exhaust ductwork will be Type 316 welded stainless steel ((SMACNA Seal Class A (4 in WC)). Duct materials and seam sealant methods will be re-evaluated throughout design as potential effluent types and concentrations and decontamination methods are further defined.
Laboratory exhaust fan units will discharge through vertical, pre-engineered double-walled, insulated chimney stacks (Type 316 stainless steel liner, 2 inch insulation and aluminum outer jacket) (Selkirk-Metalbestos Type IPS-2 or approved equal).

Office and Support Ventilation System (AHU-1/RFU-1)

Air Handler **AHU-1 (35,000 CFM)** will serve the general office and support areas of the facility. The unit will be arranged in a draw through arrangement to include a mixing box, removable summer filter, pre-heat coil, heat recovery coil, 30/30 "Vee" filter (Merv 7)(summer and winter positions), glycol heating coil, glycol cooling coil, space for optional humidification dispersion panel (only if required), fan inlet plenum, plenum fan, silencer bank and discharge plenum sections. Additional access plenums will be placed between specific sections to allow proper maintenance/cleaning. Fans will be equipped with variable speed drive (VSD) controllers. Basis of design for central air handling units will be Haakon, Scott Springfield or approved equal.

.

Supply Air

The ventilation system will supply 55° F (+/-) air to each VAV terminal unit with duct mounted reheat coil. For zones requiring heat, reheat coil control valves will be modulated open to control supply air discharge temperature to between 55° F and 92° F. Supplying air at 55° F will allow different zones serviced by the same air handler to be in either cooling mode or heating mode at the same time.

Variable Speed Fan Control

Fan speed will be modulated by its VSD controller based on duct static pressure. As average VAV terminal air demand decreases, VAV dampers are modulated closed and duct static pressure increases above set point. Fan speed is reduced until duct static pressure set point is reestablished. During periods of reduced heating and cooling demand, a reduction in fan speed reduces horsepower requirements and conserves energy.

Zone Control

As zone temperature rises above set point, the VAV terminal unit dampers modulate open to provide the necessary cooling air volume. As zone temperature decreases, the VAV box damper throttles back the airflow to maintain set point. A minimum air flow for the terminal unit is established based on indoor air quality requirements. In most cases, the minimum position may be more than 50% of the maximum terminal unit capacity, assuring continuous and comfortable ventilation. As zone temperature decreases further, the zone thermostat will cause the VAV box reheat coil control valve to modulate open, raising supply air temperature and heating the zone to regain set point temperature. For perimeter zones with auxiliary baseboard heating, the baseboard hydronic control valves will operate in parallel with the VAV reheat coil control valve. During "Unoccupied Mode," zone set point temperature is reduced (night setback) and cooling temperature set point is increased to further conserve energy.

Return/Relief Air

Return air from AHU-1 will transfer back to the penthouse fan room through a partially ducted return air system to return/relief fan unit **RFU-1 (28,000 CFM)**. RFU-1 unit will include return duct silencers, fan inlet plenum, fan section with VSD and diverting box with return and building relief dampers. Outside air, return and relief dampers will be electronically interlocked and will modulate to control general building pressure.

General Exhaust Air

Toilet rooms will have exhaust systems sized to provide between 8 and 12 air changes per hour. Fans will operate continuously during the day and will be turned off at night.

Janitor closets with be exhausted at approximately 8 air changes per hour with continuously operating exhaust fans.

Local exhaust air will be provided for rooms with copier machines which ties into other area exhaust systems which operate during occupied times.

General exhaust fans will be equipped with economical solid state speed controllers which allow required exhaust flow rates to be precisely "dialed in" to provide the proper exhaust flow rates.

<u>Circulation Ventilation System (AHU-2/RFU-2)</u>

Air Handler **AHU-2 (31,000 CFM)** will serve the general entry and circulation halls of the building. The air handler and its operation will be similar to the AHU-1/RFU-1 system.

<u>High Bay Engineering Lab Ventilation System (AHU-3)</u>

Air Handler **AHU-3 (14,000 CFM)** will serve the large open engineering bay area. The ventilation system will utilize a displacement ventilation strategy. Supply air will enter the space near the floor at low velocity, rise by natural convection and return to the central air handling unit from the top of the space. The AHU-3 will be configured similar to AHU-1. A return fan unit appears to be not required.

<u>Engineering Labs Ventilation System (AHU-4/EFU-4)</u>

Supply Air Unit

Air Handler **AHU-4 (43,000 CFM)** will serve the general engineering labs. The unit will be arranged in a draw through arrangement to include an outside air intake duct mounted pre-heat coil and summer filter, "mixing box," heat recovery coil, 30% Vee filter, 60/65 final bag filter, glycol heating coil, glycol cooling coil, space for optional humidification dispersion panel, fan inlet plenum, fan, silencer bank and discharge plenum sections. Additional access plenums will be placed between specific sections to allow proper maintenance/cleaning access. The fan will be equipped with a variable speed drive (VSD) controller. Basis of design for central air handling units will be Haakon, Scott Springfield or approved equal.

Exhaust Air Unit

Exhaust air will transfer back to an exhaust fan unit through a fully ducted exhaust air system. EFU-4 will include both 65% filter banks, a heat recovery coil and exhaust fan with VSD controller contained in an integral pre-manufactured cabinet.

The fan exhaust will extend through the top of the cabinet fan section and vertically out of the mechanical penthouse through the roof. A roof stack will be provided to disburse building exhaust.

Laboratory HVAC Control

When required to contain airborne contaminates, engineering laboratories will be controlled utilizing dedicated DDC room controllers. The room controller will control zone pressure, ventilation flow rate (air changes per hour) and temperature. Zone pressure will be controlled using the "air flow tracking method." Differential pressure between the suit and adjacent spaces will be monitored and the zone pressure adjusted to maintain necessary pressure differentials.

Exhaust flow rate from each engineering laboratory may be adjusted, utilizing the dedicated room controller and exhaust duct mounted exhaust air valves, to provide between 6 and 12 air changes per hour (ACH) as required to support laboratory ventilation requirements. The room controller then provides the necessary supply (make-up air) utilizing the variable air volume terminal units to control laboratory pressure.

Laboratory temperature is controlled to 72 Degrees F (adjustable) utilizing the radiant floor heating system to achieve baseline heating requirements with supply air modulated to control zone set point temperature.

Should laboratory cooling be required, the radiant floor heating system is idled and supply air temperature is reduced to a minimum of 55 Degrees F to maintain zone set point. Depending on zone location, radiant floor idle temperature will vary.

Variable Speed Fan Control

Fan speed for AHU-4 will be modulated by its VSD controller based on positive duct static pressure similar to AHU-1.

The exhaust fan speed for EFU-4 will also be modulated by its VSD controller based on negative exhaust duct static pressure. As average exhaust air valve demand decreases, exhaust air valve dampers are modulated closed and duct static pressure increases above set point. Fan speed is reduced until duct static pressure set point is reestablished. During periods of reduced heating and cooling demand or usage, a reduction in fan speed reduces horsepower requirements and conserves energy.

<u>Acoustical Control</u>

Mechanical systems will be designed and specified to keep mechanical noise levels to NC-35 or below. Achievement of noise levels below NC-30 can quickly become expensive, so the implications of sound control will be explored more fully during Design Development.

Sound attenuation will be provided at the air handling units to control minimize sound power levels at noise source. Fans will be spring isolated to reduce transmission of equipment vibration. Attention will be paid to breakout transmissions and transmission radiated through the structure. Thickened floor slabs and/or housekeeping pads will be provided to reduce vibration transmissions.

9.7 Mechanical and Electrical Rooms

Mechanical Room

The mechanical room (1,500 SF) will be located in the basement in the vicinity of the utilidor. Direct access to the building exterior will be provided for maintenance.

The mechanical room will be ventilated with a small cabinet fan (SCF-1) Air from the mechanical room will not be recirculated to other parts of the building. Note that the mechanical room will not house any fuel fired equipment.

Fan Room

The fan room penthouse will be centrally located above the fourth floor and house the buildings four central air handling systems. The fan room will be used as a return air plenum. Total fan room area is estimated at 6,400 SF. The fan room may include hydronic unit heaters and small cabinet type cooling fans for after hour use if heating is needed during those times.

Electrical Rooms

The electrical room will be ventilated and heated/cooled as required using a small cabinet fan located immediately outside the electrical room.

Where possible, small transfer fans will be utilized to remove heat from the electrical rooms to the general building return air plenum to control electrical room temperature.

9.8 Building Automation System

The heating, ventilating and air-conditioning systems will be controlled using a direct digital control (DDC) building automation system (BAS) provided by Siemens Industries, Inc. (SII). No Substitutions.

Laboratory zones will each be controlled using dedicated room controllers to maintain proper pressure differentials.

9.9 Engineering Design Parameters

General

Location: Fairbanks, Alaska: 64.82 N Latitude, 147.87 W Longitude
Elevation: 453 FT

Design Parameters

Outside Ambient Temperatures:

- Winter: -50°F (exceed 99.6% Design)
- Summer (0.4% DB/MWB Design): 82/62°F (exceeds 0.4% DB/MWB Design)

Inside Design Temperatures:

- Winter: 72°F ± 2°F
- Spring/Fall: 72°F ± 2°F

Ventilation Rates:

- In accordance with the latest ASHRAE recommendations for indoor air quality standards and the International Building Code

Minimum ventilation rates:

- General Office: 4 ACH
  Laboratories: 6 to 12 ACH

Minimum outside air (OSA) requirement (IMC Table 403.3):

- Laboratories: 20 CFM/person
- Locker Rooms: 0.50 CFM/SF
- Corridors: 0.10 CFM/SF
- Reception Areas: 15 CFM/person
- Offices: 20 CFM/person
- Conference Rooms: 20 CFM/person
- Toilet Rooms: 75 CFM exhaust/water closet or urinal

SECTION 10

PLUMBING SYSTEMS

PLUMBING SYSTEMS

10.1 DOMESTIC WATER

Domestic water will be provided from the campus water system through the extended utilidor. Water treatment will not be required. As supply water pressure is in excess of 80 psig, pressure regulators will be used to reduce domestic water pressure to below 80 psig.

10.2 DEIONIZED (DI) WATER

Deionized water will be provided from the campus water system through the extended utilidor. DI water will be used for heating system make-up and will also be distributed to the laboratory suites. Laboratories may be equipped with point of use water polishers where required.

10.3 NON-POTABLE WATER

Hot, cold and deionized water supplying the science laboratories will be back flow protected with reduced pressure principal backflow preventers at the suite level. Additional backflow prevention will be provided at the fixture level as required.

10.4 TEMPERED WATER SYSTEM

A dedicated tempered water system (85 Degrees F (adjustable)) will be proved to serve the facilities combination emergency shower/eyewashes. Water temperature will be controlled using a hydronically heated hot water maker and a single tempering valve designed for multi-emergency shower usage. Tempered water recirculation will be provided utilizing Grundfos inline circulator pumps to continuously provide tempered water to each combination emergency shower/eyewash.

10.5 PLUMBING PIPING

1. Domestic water piping will be type L copper. Solder will be 95-5 tin-antimony or 430 silver solder. Lead-tin (50-50) solder will not be accepted.
2. Vent piping aboveground will be DWV copper or cast iron.
3. Sanitary and Storm drain piping will be cast iron. Below ground piping will use no-hub fittings. No-hub fittings are also acceptable for aboveground piping.
4. Drainage piping above ground may be DWV copper at the Contractor's option.
5. All plumbing fixture groups will be provided with isolation valves to facilitate maintenance. Valves two inches and smaller will be quarter-turn ball valves.

10.6 GENERAL PLUMBING FIXTURES

1. Plumbing Fixtures will be vitreous china and stainless steel as applicable.
2. Wall hung toilets, urinals and lavatories will be specified based on American Standard or as approved.
3. Toilet and urinal flush valves shall be Sloan Royal or Zurn Aquaflush. Flush valves will be manual type. Automatic infrared flush valves will be considered during Design Development.
4. Drinking fountains with push-bar type faucet operators will be specified for handicapped operation.
5. Floor drains will be provided for all restrooms and mechanical rooms, as well as, janitor closets equipped with mop sinks.
6. Exterior hose bibbs will be non-freeze, automatic draining will be provided at a minimum of 100 FT intervals. Each hose bibb will include an indoor seasonal shut-off ball valve above the ceiling.

10.7 LABORATORY PLUMBING FIXTURES

1. Laboratory sinks and counters will be integral units specified by the Architect.
2. Laboratory faucets will be institutional grade equipped with foot operators.
3. Drain, waste and vent piping will be standard DVW piping. An acid resistant DWV system and solids interceptor / acid dilution traps will not be required.
4. Emergency shower and eyewash station designs will be based on HAWS or Guardian and supported by a central tempered water system.

5. Centralized gas, compressed air and vacuum services will not be provided. These systems will be provided point of use by the Owner.

10.8 DRAIN WASTE AND VENT SYSTEM

The facility will include a standard commercial grade DWV system. Waste will be discharged to the UAF sewer main by gravity outside the utilidor.

10.9 FIRE PROTECTION

General
The facility will generally be protected by a full coverage, wet type, fire sprinkler protection system with fast reaction sprinkler heads in accordance with the latest requirements of NFPA 13. Fire hose standpipes will be provided. The main sprinkler risers will be located in the mechanical room. Sprinkler mains will not be routed above areas containing high value property, areas susceptible to water damage or areas subject to freezing. A dry system will be provided for areas of the building subject to freezing.

Water Source
The facility will receive its water from the UAF campus water system connected at the extended utilidor. Backflow prevention will be provided at the connection point.

Special Fire Suppression Systems
Other forms of fire suppression will be provided (such as preaction wet pipe sprinklers and inert gas) for critical areas of the building where water suppression is not acceptable.

SECTION 11

ELECTRICAL SYSTEMS

ELECTRICAL SYSTEMS

11.1 General

The design of the electrical systems to support the UAF Engineering Building and associated remodel in the existing Duckering and Bunnell Buildings will focus on providing appropriate indoor spaces to create a safe and efficient educational environment.

Throughout the occupancy of the Engineering Building it is likely that there will be many renovations—some minor in nature and others more significant. The electrical infrastructure will be designed to be flexible and adaptable to accommodate these renovations.

From a power perspective, the power density will be quite high in some areas and more like an office space or standard classroom space in many others. The main challenge that presents itself is these power dense areas can be moved to a space that was originally less power dense. Therefore, the power distribution system will be designed with ample capacity and flexibility to accommodate moving these power dense areas without causing disruptions in other areas of the building.

Typically, in lab spaces, there is a large quantity of receptacle devices and power connections to accommodate the laboratory equipment power needs. Labs also require a strong communication infrastructure and high telecommunication jack count to support the program requirements of the facility. The electrical design will provide power and communications support of the owner furnished equipment and the equipment and systems specified by other Divisions.

The communications and other electrical systems will be designed to take advantage of the most current technology with an eye for future advancements.

Electrical systems will include:

- Normal power distribution
- Alternate source backed-up power distribution (UAF Priority feeder)
- Generator power distribution provisions
- Primary power distribution
- Pad mounted service transformer
- Telecom infrastructure
- SPD protection
- Power monitoring system
- Grounding system and Lightning Protection system
- TV distribution
- Telecom copper distribution (Cat 6)
- Telecom optical fiber distribution
- Telephone system (VoIP)
- Lighting systems and control
- Emergency lighting system
- Emergency phone (UAF)
- Access control system
- Security system
- Paging system
- Fire alarm system
- Conference room and Lecture Hall A/V sound reinforcement system
- Wireless clock system
- Provision for satellite dish

11.2 Applicable Codes and Standards

REFERENCES

NFPA 70	National Electrical Code (NEC)
NESC	National Electrical Safety Code
IBC	International Building Code
IFC	International Fire Code
IMC	International Mechanical Code
NFPA 72	National Fire Alarm Code
NFPA 110	Emergency and Standby Power Systems
NFPA 780	Installation of Lightning Protection Systems
NEMA	National Electrical Manufacturers' Association
NECA	National Electrical Installation Standards
UL	Underwriters' Laboratories

FM	Factory Mutual
IES	Illuminating Engineering Society
IEEE	Institute of Electrical and Electronic Engineers
EIA/TIA	Electronic Industries Association/Telephonic Industries Association
BiCSi	Telecommunications Distribution Methods Manual
ADAAG	Americans with Disabilities Act, Accessibility Guidelines

Local Codes and Regulations

11.3 Utilidor Extension

An existing utilidor system runs across the plaza and serves the Duckering Building and the Bunnell Building. A new blister will need to be incorporated into the utilidor run between the Bunnell Building and the Duckering Building and a new utilidor extension provided to serve the Engineering Building. The blister will require significant rework of the mechanical systems in the utilidor that serve the Bunnell Building. UAF's standard utilidor design will be used as the basis of the utilidor extension.

11.4 Site Considerations

Relocate Pad Mounted Transformer Serving Duckering Building

The existing exterior 750 kVA, 4,160V: 480Y/277 volt, pad mounted service transformer (TX-116) serving the Duckering Building is installed near the southwest corner of building. The new building is going to be built over the existing transformer location and therefore the transformer will need to be relocated. The anticipated new location is on the west side of the Duckering Building just south of the new high bay lab space (approximately 160 linear feet).

Transformer, TX-116, serves a 1,200 amp, 480Y/277 volt distribution switchboard located in room 100U6B on level 1 in the southwest corner of the Duckering building near the southwest stair.

The primary MV cables serving the transformer will need to be reworked and extended to the new transformer location. The 1,200 amp secondary will need to be reworked and extended to the new transformer location. UAF has also requested a 4-inch conduit connection between the existing MDP served by transformer TX-116 and the new MDP for the Engineering Building.

Other Site Items

The proposed site for the Engineering Building currently has a parking lot, pedestrian pathway and landscaped areas. There are parking lot luminaires, pedestrian luminaires, illuminated bollards and headbolt heaters that will need to be demolished.

11.5 Electrical Service and Power Distribution

Incoming Service

The building will be served at 480Y/277 volts, 3 phase, 4 wires by UAF. UAF owns and operates a 4,160 volt primary distribution system with plans to upgrade to a 12,470 volt system. The medium voltage system is distributed around the campus via utilidors. The university anticipates that the voltage upgrade on the main feeder in this area will occur prior to the construction on the new building. The existing feeder is significantly loaded at 4,160 volts but the upgrade to the 12,470 volt system will alleviate the loading concerns.

The primary medium voltage feeders will be routed through a utilidor extension in power cable tray and then run underground in conduit to pad mounted, dual-voltage (12,470/4,160) transformers—one normal power transformer and one alternate (standby) transformer. The normal power transformer is estimated at 2500 kVA and the alternate (standby) transformer is estimated at 300 kVA.

From the transformers the service will run underground in conduit to a service entrance rated main disconnect breaker with shunt trip capability located in the main distribution switchgear located in the main electrical room. A shunt trip pushbutton in a lockable enclosure will be provided on the exterior of the building so that power to the building can be shut off without entering the building. The main transformers will be provided as part of this project per UAF standards.

Preliminary calculations estimate the size the main distribution switchgear to be a 4,000 amp 480Y/277 volt, double-ended switchgear with a main tie-breaker. See power one-line diagram for further equipment sizes and configuration. The main distribution switchboard will be located in the main electrical room at grade level.

Portable Generator, Emergency and Standby Power

Provisions will be made for a portable standby power generation system to be connected to the building power distribution system via a manual transfer switch to power the building loads. The fuel source for the generator will be fuel oil. The generator will be located in a portable weatherproof housing with a base mounted fuel tank. An area will be provided on the site to allow the generator to be delivered and connect with relative ease.

Preliminary estimates are targeting a 350kW generator that would provide backup to key loads. Equipment that provides loading safeguards would be employed to prevent overloading. Utilizing the building automation system and limiting some of the loads such as air handlers, fans, pumps, etc., will be evaluated during the design process so that the generator size can be optimized. This may allow near normal operations with reduced air exchanges and somewhat limited temperature control.

The existing Duckering building standby load will be re-fed from the new Engineering Building in lieu of being fed from the Library.

An emergency lighting system will be provided for emergency egress lighting.

Electrical Distribution and Branch Circuit Panels

Branch circuit distribution panels will be provided throughout the building as required by the load density and to minimize branch circuit run lengths. The satellite panelboards will be located in dedicated electric rooms and will be surface mounted on the walls. Panels that are not located in dedicated electric rooms will be mounted in or on walls accessible to the work spaces.

Dry type step down transformers will be provided to derive 208Y/120 volt power.

480Y/277V power will typically be utilized for:

- 3 phase motors/compressors
- Equipment requiring 480V or 277V power
- Elevators
- Lighting (277V)

208Y/120V power will typically be utilized for:

- Receptacles
- Equipment requiring 208V or 120V power
- Utilization equipment

Motor control centers will be provided in the main mechanical space at grade level and at the mechanical penthouse.
A headbolt heater system will be provided and controlled for parking areas.

Surge Protective Devices (SPDs)

A surge protective device (SPD) is a device that attenuates (reduces in magnitude) random, high energy, short duration electrical power anomalies caused by utilities, atmospheric phenomena, or inductive loads such as motors. Such anomalies occur in the form of voltage and current spikes with durations of less than half an AC cycle. These high energy power spikes can damage sensitive electronic equipment, such as computers, instrumentation, and process controllers.

SPDs will be provided on the Main Distribution Switchboard and on all 208Y/120V branch circuit panelboards.

Power Monitoring and Energy Usage Education Center:

The facility will be equipped with a digital energy circuit monitor to measure the entire building electrical usage (normal power and standby power will be monitored separately) and a digital BTU/fuel oil monitor to measure the oil consumption. Motors, 10 horsepower and larger (i.e. AHUs and Pumps with variable speed drives), will be monitored individually using the VSD's integral current transformers. Energy from the measurement equipment will be monitored hourly and compiled in the building automation's database. The building automation software will use the database to create graphical and tabular output of the buildings combined electrical and fuel oil energy usage.

The energy measurement systems will allow the owner to compare the projected building energy model with the actual energy consumed by building use. The systems will provide monthly reports so that inconsistencies between the projected and actual usage can be identified. Once identified, the inconsistency will be investigated and action taken to resolve the inconsistency which will promote a more sustainable facility. The action will either be to update the model to match actual required use of the facility or to adjust the use of the facility to reduce the overall energy used.

A measurement and verification plan will ensure that energy is used effectively and that the building systems continue to function as intended. The plan provides a methodology that will quickly identify unintended changes of operation so that they can be remedied in a timely manner to prevent long term excessive energy usage.

An educational center is being contemplated that would be located in a public space to provide real-time energy usage feedback to the building occupants and the general public. The education center would also provide opportunity to display materials to promote renewable energy sources and other environmentally friendly practices. The displays would receive their building usage information from the building automation system.

11.6 Lightning Protection System

The lightning protection system will be designed in accordance with NFPA 780—Installation of Lightning Protection Systems. The configuration of the protection system will vary depending on the height and shape of the building and with the height and relative location of the nearby buildings. The system will consist of air terminals located on the high points of the roof connected by roof conductors. The roof conductors will interconnect to the cross-run (main) conductors. Down conductors will be used to conduct the current down to an appropriate grounding system. The grounding system will be designed to match the soils conditions on site but will likely consist of a ground ring and ground rods.

For cost estimating purposes: Assume 20 air terminals and 8 down conductors; assume the cross-run conductor will run around the perimeter of the roof and that the ground ring will run around the perimeter of the building (10 foot offset). Assume 16 ground rods.

11.7 Lighting Systems

General

Lighting will be furnished in accordance with the IES Lighting Handbook, 10th Edition. Design lighting levels will be coordinated with the recommendations of the IES and the requirements of the lab spaces and activities conducted within the spaces. Daylighting will be used where practicable and desirable. The lighting design will take advantage of natural light while providing a smooth transition from daylight to electric light.

Lighting Concepts

Lighting concepts will be developed with the architect and interior designer during the subsequent design phases. Lighting will be conducive to the building architecture and will enhance the visitor's experience and interest. Fixture types and geometric layout patterns will compliment room shapes, functions and operational goals.

The most prevalent light source will be high efficiency fluorescent lighting which will be employed throughout the interior spaces. A variety of fixture types will be used to distribute light in a controlled way that will be efficient, flexible and will complement the architecture in their respective spaces. Medium bi-pin programmed rapid-start fluorescent lamps will be long life T8, T5 or T5HO, RE841 type with a high color-rendering index and a 4100 degree K color temperature (GE, Osram/Sylvania, or Philips). Higher color rendering index sources will be investigated during the design for use in critical work areas. Lamps will be low mercury type and will meet the requirements for classification as non-hazardous waste when subjected to the Toxic Characteristic Leaching Procedure (TCLP) prescribed by the Environmental Protection Agency.

A combination of other lamp sources will be utilized where the function, maintenance, or control scheme require their use. These lamp sources will include solid state (LED), incandescent, or as coordinated with UAF facilities during the design process. Efforts will be made to consolidate lamp types and reduce future maintenance costs.

The IES handbook designates the laboratory rooms as an illuminance category "E" space. The footcandle range for this category is from 50 to 100 footcandles on the reference work plane. The lighting will be designed to meet an average 85 footcandle level. Multi-level switching will be utilized.

Selected fluorescent fixtures in each laboratory will be connected to the generator/standby power to allow safe cessation of projects during power outage conditions. Under normal circumstances the fixtures will be switched along with the other room fixtures, but during a power failure the standby fixtures will fail "ON".

Lecture halls will be provided with multiple zones of lighting including step lights and a lighting control system suitable to the room size.

Emergency lighting, standby lighting fixtures will be provided in mechanical rooms, electrical rooms, restrooms, egress pathways, conference areas, and other areas as determined during design.

Lenses for recessed fluorescent fixtures will be 100 percent virgin acrylic with a nominal thickness of 0.125".

General lighting control in public areas will be accomplished with manual and automatic control via lighting contactors located in electrical rooms. Automatic control will be actuated by Building Automation System output signals. Manual control will be via switches.

In individual work areas occupant control will be specified to support optimum productivity and comfort. Occupancy sensors will be provided to maximize energy savings.

Occupancy sensors will be utilized in select areas such as bathrooms, lockers, restrooms, equipment rooms, corridors and storage rooms. Toggle switches will be provided for all lab spaces.

Exit signs will be LED type for long life and will be connected to the emergency lighting unit.

The exterior lighting will be designed to support the site configuration.

Exterior fixtures, supports and pole assemblies will be specified to be capable of withstanding 110 mph winds with 143 mph gusts with no damage.

Exterior fixtures will be vandal resistant.

11.8 Telephone Service and Telecommunication Distribution

Incoming Service

The building data/phone systems will tie-in to the existing UAF telecommunication distribution system. It is anticipated that UAF will provide the infrastructure to serve the new facility and that this project will provide a pathway only system to the existing utilidor via the new utilidor extension.

The telecommunications infrastructure (backbone) will be routed from the Rasmuson Library Satellite Hub Room (SHR) through the new section of utilidor being constructed as part of this project. One 4" GRC conduit with three 1-1/4" innerducts will be provided for the 24 strand optical fiber cable (2 spare innerducts). Once in the utilidor system the cables will be run in the existing cable tray system.

It is anticipated that UAF will also have two 4" conduits identical to the ones described in the paragraph above for their use with connection between the UAF SHR and the utilidor system.

Standards

A Structured Cabling System will be provided for telecommunications and data services. The building will be prewired to EIA/TIA Category 6 level of network performance using unshielded, twisted pair products. The system will be in accordance with the latest currently adopted EIA/TIA standards for telecommunication. Conduit from the data outlets in rooms/offices will be stubbed to the accessible ceiling space where J-hooks will be used to train the cabling to the nearest cable tray. The cable tray will run in the accessible ceiling space to the nearest telecommunications room. The cable tray will also run between the Main Telecom Room (MTR) and any subsequent Telecom Room (TR) needed to support the configuration of the building.

Overview: The system will include outlets, conduit, J-hooks, cable trays, cables, terminations, specifying test documentation and other "passive" components. A partial system description includes:

a) Telecommunication outlets in the labs/classrooms/offices/miscellaneous areas, including accessible ceiling space for owner provided Wireless Access Points (WAP).
b) Horizontal cabling from the outlets to the modular patch panels in the MTR.
c) Patch cables in the MTR.
d) Backbone cabling (fiber) between the MTR the library MTR.
e) Phone Switch/Service and associated cabling (owner provided).
f) Fiber link between Building Management System and satellite equipment room.

Telecommunication cabling will be run in conduit, J-hooks or cable tray.

Main Telecom Room: The MTR will serve as the main hub for the communications systems for the facility and will contain the following:

a) Head-end equipment for the TV system
b) Data and Voice modular patch panels
c) Fiber Optic Data Network distribution panels
d) Data Network switches (owner provided)
e) Data Network equipment (owner provided)

The MTR will be the homerun location for all telecommunication cabling on its level. It will also be the homerun location for all of the TV cabling.

Cable Tray: A cable tray system will be provided for the telecommunication and low voltage systems cabling. Cable tray will be provided to serve the various areas of the facility and provide pathway back to the MTR and dividers will be provided to separate systems.

Conduit will be provided from the devices (telecommunication outlets, television outlets, etc.) to the accessible ceiling space where J-hooks will take it to the nearest cable tray.

11.9 Video Surveillance (CCTV)

Video surveillance or closed circuit TV (CCTV) will be provided that provides video recording and archival storage. The system will consist of the following features:

- All cameras will be "fixed" only (no pan/tilt/zoom capabilities). The cameras will be an IP network camera. Or alternatively, analog cameras with the use of a digital video recorder (DVR) will be considered.
- A limited number of CCTV cameras in key indoor locations (laboratories or entrances) where justifiable due to high incidences of theft, violence and/or vandalism. These cameras would be connected back to a monitor and recording device in an office or electrical room (the system will be capable of providing images via the internet or intranet). All security access keypads will be in sight of a camera to observe persons accessing and securing the building (or failing to do so properly).
- Selected outdoor CCTV camera locations will be coordinated during the design process and will be housed in heated weatherproof enclosures.
- CCTV storage system will be coordinated with the UAF Office of Information Technology and a CCTV system server will be provided to record the camera images at frame rates and storage capacity as coordinated during the design.
- An “alarm” output from the security system to the CCTV system to command the system to increase the frame-recording rate during alarms (during times when the security system is armed).

CCTV monitoring will only be provided as specifically directed by UAF. The desired level of video surveillance to be implemented for this project will be confirmed by UAF before proceeding with design development.

11.10 Fire Alarm System

An electrically operated, electrically supervised analog addressable fire alarm system will be provided, including control unit, power supplies, alarm initiating and indicating devices, conduit, wire, fittings and all accessories required to provide a complete operating system.

The system will comply with the applicable provisions of the current NFPA Standard 72 National Fire Alarm Code, local building codes, and meet all requirements by Underwriters Laboratories Inc. and/or the Factory Mutual System.

All wiring will be in accordance with Article 760 of the National Electrical Code and local electrical codes. All wiring will be in raceways.

The system will operate as a low voltage, non-coded general evacuation fire alarm system. Initiating circuits will be wired as two-wire, Class B.

In addition to Code required actions, alarms will signal the security system. Common area lights and site lighting will be energized (unless prohibited by photocell) upon alarm.

Alarms will be annunciated at the fire alarm annunciator panel located in the main entry. A complete building floor plan showing all alarm zones oriented to the physical location of the panel including "You Are Here" notation will be provided at the annunciator location.

Manual pull stations will be provided at every exit from every level.

Both audible and visual alarms will be provided throughout the building to meet the requirements of the International Fire Code and Authority Having Jurisdiction (AHJ) requirements. Audio-visual horn/strobe units with combination horn and flashing alarm strobe will be used.

Smoke and heat detection will not be provided except as noted below:

a) Smoke detectors will be installed in mechanical return air systems in accordance with International Mechanical Code (IMC) requirements.

b) Smoke detection in the corridors and rooms (unless heat detection is more prudent).

c) Heat detection in appropriate rooms and locations.

Sprinkler Switches: Sprinkler flow and tamper switches will be monitored to indicate flow in any part of the system or a partial or complete shutdown of the system at the gate valves.

Air handling units will be shut down and smoke/fire dampers will close upon alarm.

Fire Alarm system will be a Siemens Pyrotronics Fire Alarm Control and Annunciator System, MXL model, as required by the UAF design standards. The system will be connected to the UAF Emergency Communications Center. The project will provide additional receiver equipment (hardware and software) required to expand the Communications Center system.

11.11 Security System

A remote reporting security system will be provided. The system will be based on a Napco 3000 system.

Detection: Door contacts will be provided on all exterior doors. Passive infrared motion detectors will be provided in corridors and other areas determined during design to detect entry into building. Glass break detectors will be provided at grade-level accessible glazing locations.

The Security system will be intertied with lighting via the DDC/BAS to turn on building common area lights and site lighting whenever an alarm is received.

The system will be zoned based on input from UAF.

11.12 Access Control System

An access control system will be a "turn-key" system and will be provided to control access to the building entrances and to corridor entrances to lab spaces. The system will be capable of providing different levels of access. The system will be manufactured by Lenel Systems International, Inc. and will use proximity readers in interior spaces and possibly magnetic strip cards in exterior locations. The exact placement and types will be coordinated during the design process.

11.13 TV System

Cabling for an electrically powered TV system will be provided. The cabling will be suitable for use with a system that will include amplifiers, mixers splitters, baluns, conduit, cable, fittings, etc. The TV service is proposed to be served from a local cable TV provider with provisions for a future satellite dish. The TV will be distributed over the Category 6 telecommunications cabling and will utilize baluns to convert the signal from coax cable to Category 6 cable. This method of distribution allows flexibility on the TV locations as any data jack is capable of being used for TV.

11.14 Paging System

A paging system will be provided in the administration area with speaker distribution to the corridors and hallways. The labs will utilize the phone system for paging functions. The intercom system will amplify and distribute: AM/FM/Tuner; microphones and auxiliary inputs such as MP3 players. The system will be setup with paging zones as coordinated during the design phase.

11.15 Conference Rooms and Lecture Hall A/V Systems

A complete local audio/video system will be provided in the conference rooms and lecture halls to allow distribution of multiple program sources (Stereo, computer, DVD player) and allow flexible use of the space for presentations, teaching, movies, etc. The system will include high quality sound system, microphones (including wireless), overhead projector(s), powered projection screens, projector interface, ceiling mounted document camera, A/V control system and an interactive whiteboard. A local A/V sound reinforcement system with hearing impaired assistance equipment will be coordinated with the UAF Office of Disability Services.

Teleconference/video conference/distance learning capabilities will be provided as determined during the design phase.

11.16 Wireless Clock

A wireless clock system will be provided throughout the building utilizing a centralized GPS receiver (if required) and antenna/transmitter setup. A recessed 120V AC outlet will be installed behind each clock where practical; otherwise the clock will utilize a battery.

11.17 Basic Materials and Methods

Conduit approved for use on this project will be of the following types:

a) Galvanized rigid steel conduit - GRC
b) Intermediate metal conduit - IMC
c) Rigid copper-free aluminum conduit
d) Electrical metallic tubing - EMT
e) Schedule 40, polyvinyl chloride conduit - PVC (underslab only)
f) Flexible metallic conduit
g) Liquid-tight flexible metallic conduit - LT
h) Types specifically identified on the drawings or in the specifications

All conductors will be copper. Indoor conductors will have Type THHN/THWN insulation. Outdoor conductors will have Type XHHW insulation.

Panelboard assemblies will be enclosed in steel cabinets. The panelboard interior assembly will be dead front with panelboard front removed.

Spare conduits will be stubbed into accessible ceiling space from all flush mounted panels.

Molded case circuit breakers will be suitable for individual as well as panelboard mounting. Bolt-in type only. No breakers designated "plug-on" type.

All motors will conform to the governing NEMA Standards and ASA Form C-50 for rotating machinery. High efficiency electric motors will be specified for energy conservation. Solid-state or variable-speed motor starters will be examined during the design and included where we feel it is appropriate with consideration of the requirements noted in the UAF "Motor Monitoring Protocol".

H.O.A. switches and pilot lights will be provided for all starters for interface to the building automation system.

All device faceplates will be stainless steel.

All power wiring will be in raceways.

Homeruns will be a minimum of 3/4-inch conduit.

All service, feeder and branch circuit conductors throughout the project secondary electrical system will be color coded per NEC and UAF standards.

Equipment identification will be provided per UAF standards.

An equipotential plane for the grounding system at the service entrance equipment will be specified. The raceway system will be bonded in conformity with NEC requirements to provide a continuous ground path. A grounding conductor will be provided in each power wiring raceway in conformity with Table 250-122 of NEC.

Low-voltage wiring for communications and/or control wiring will be run in conduit stubs, j-hooks and cable tray. Cable will be plenum rated in all plenum spaces.

DIAGRAM E1 POWER ONE-LINE DIAGRAM- MAIN SERVICE DETAILS

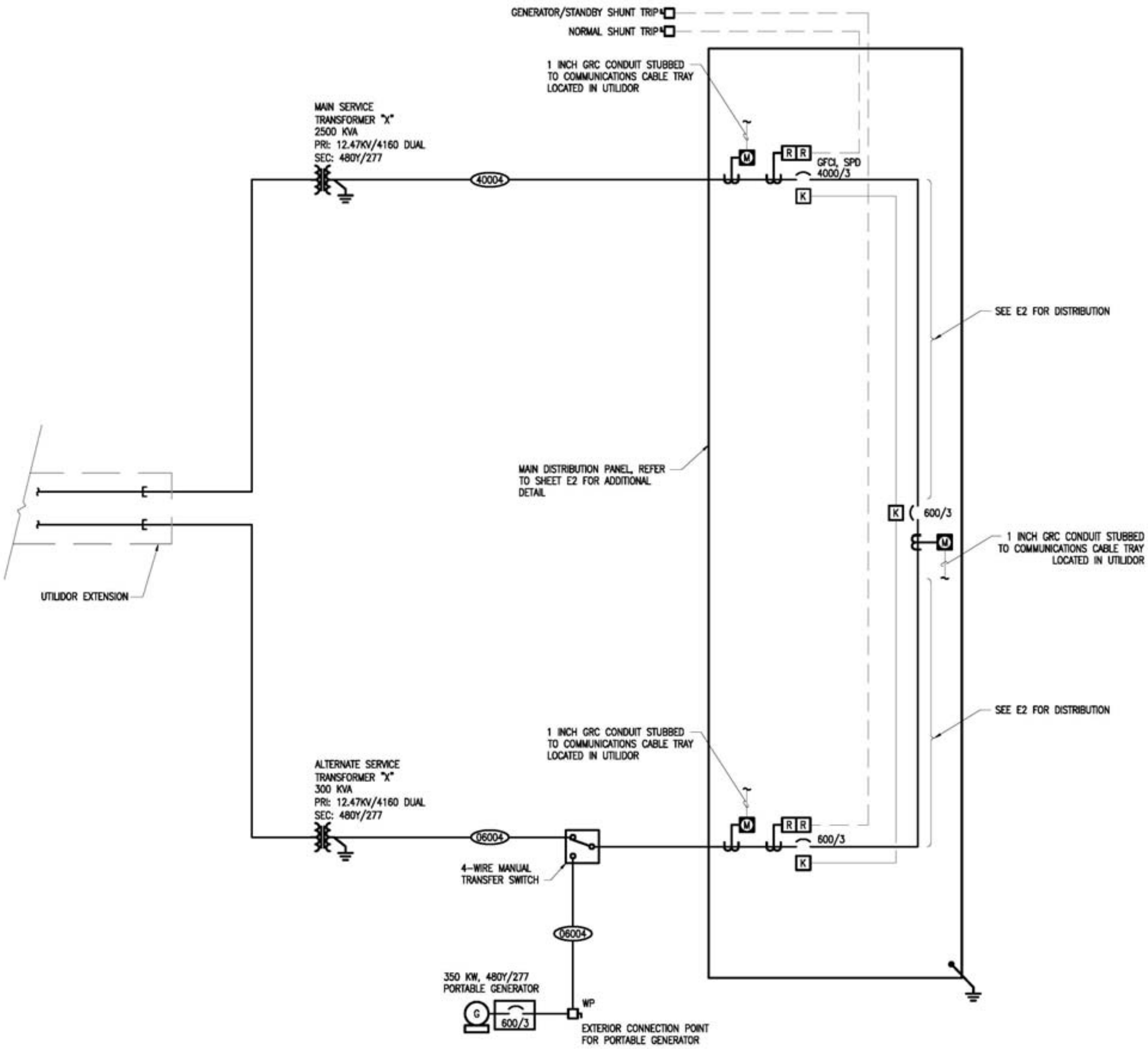
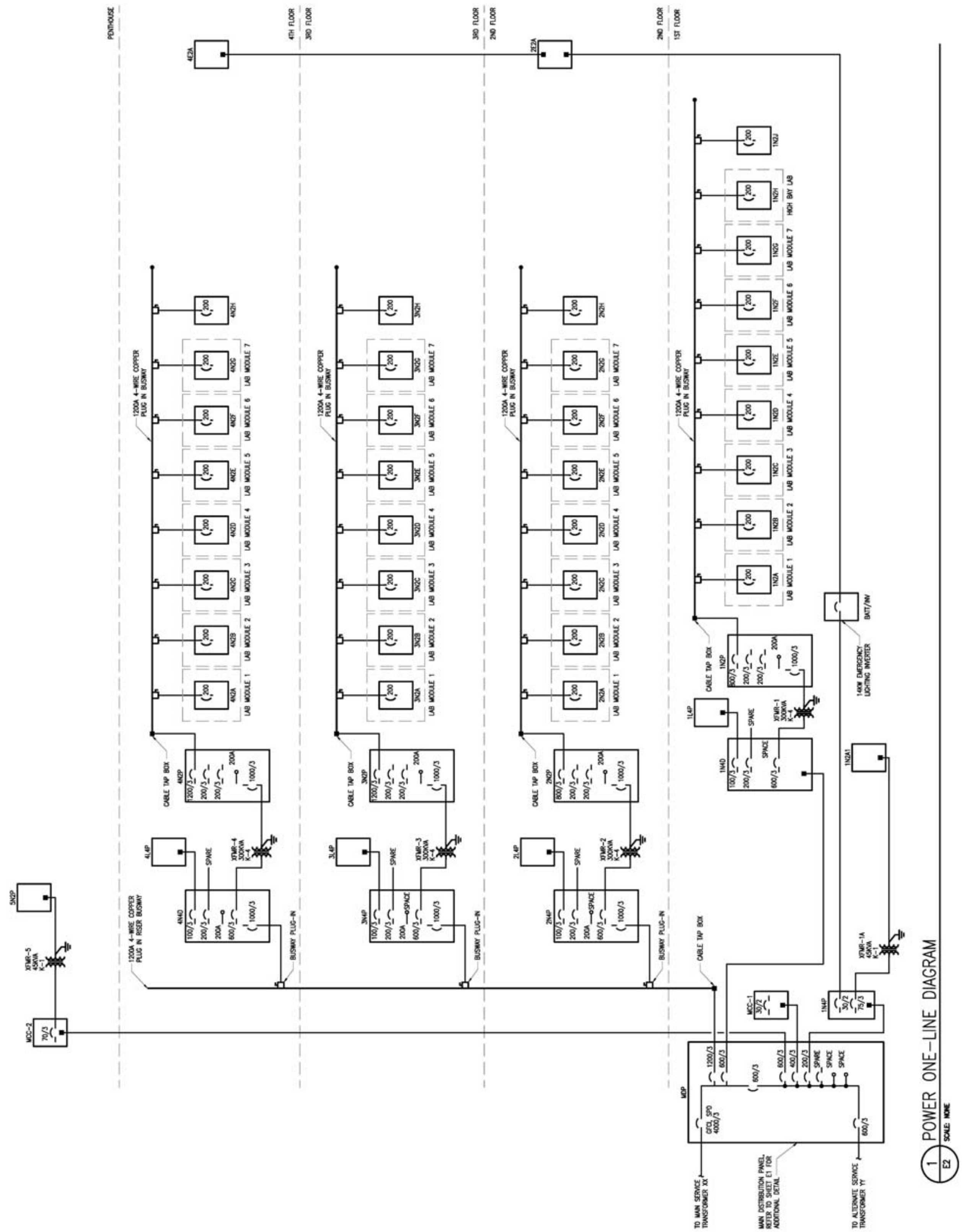


DIAGRAM E2 POWER ONE-LINE DIAGRAM



SECTION 12

COST PLAN

PROJECTION OF PROBABLE COST

The information presented here has been generated by the design team in collaboration with the Anchorage based cost estimating firm HMS.

The following spreadsheets record preliminary program based projections of cost at the Order of Magnitude phase of cost estimating

Construction Cost

The ***probable construction cost*** of the project is based primarily on the profile of space uses listed in the program as applied to the site chosen for the project. The probable costs stated have been escalated to the projected time of bid.

Project Cost

Per the University's direction, the estimated ***project cost*** adds an additional 30% to cover design fees, administrative costs and contingencies typically held by the University for a project of this size. The construction cost of the new building takes into consideration the size and shape of the recommended site and the appropriate design quality for a university building. This is in keeping with both the scale of the surrounding buildings and is complementary to the requirements of the Campus Master Plan.

The Duckering Functional connection is a lump sum cost as there is not a detailed scope of work defined at this phase of Pre-design.

Notes and Assumptions:

The general contract will be competitively bid with a minimum of 3 qualified main subcontractors. The contractor will be required to pay prevailing wages. The costs stated have been escalated through 2015, the projected time of construction. Per the University's direction, the estimated ***total project cost*** is based upon the estimated construction cost plus 30% new (35% renovation) to cover design fees, administrative costs and contingencies typically held by the University for any project of this size.

Exclusions:

- Hazardous Materials Removal
- Construction Contingency
- Sales Tax
- Major Equipment
- Furniture & Furnishings
- Owners Administration
- Project Management
- Items listed as NIC
- Market Studies
- Performance & Payment Bonds
- Professional Design Fees
- Testing, Inspection & Balancing
- Surveys
- Soils
- General Owners Contingency
- Insurance & Permits
- Artwork
- Appraisal Fees
- Moving Expenses
- Leasing Commissions
- Property Taxes During Construction
- Interim Financing
- Permanent Financing Placement
- Legal Fees

Table 12.1 is a summary of the cost components. Backup cost projection exhibit work sheets follow, below.

TABLE 12.1 CEM PROJECT COST ESTIMATE SUMMARY

	Area	U/M	CC/ SF	Construction Cost	TPC/ SF	Total Project Cost
Exhibit A Proposed New Building (Excluding 24,000 +/- GSF Shelled Space)	92,900	GSF	$561	$65,625,000	$922	**$85,628,500**
Exhibit B Duckering Functional Connection * see Notes 1 & 2 below	23,000 Estimated	LS	$419	$9,629,637	$565	**$13,000,000**
Proposed New Building & Duckering Functional Connection (Exhibit A + B excluding 24,000 GSF Shelled Space) Capital Funding Request	92,900 new 23,000 connection	GSF GSF	$561 $419	$75,254,637	$922 $565	**$98,628,500**
New Building Shelled Space (24,000 +/- GSF) - UAF Bond Request	24,000 new	GSF	$330	$7,920,000	$416	**$9,980,000**
Proposed Total Project Cost	**<u>139,900</u>**	**<u>GSF</u>**	**<u>$595</u>**	**<u>83,174,637</u>**	**<u>$776</u>**	**<u>$108,608,500</u>**

FUTURE DUCKERING BUILDING R &R CONSIDERATIONS

	Area	U/M	CC/ SF	Construction Cost	TPC/ SF	Total Project Cost
Exhibit C – Duckering Midlevel Option (Recommended renovation in addition to the functional connection) * see Note 1 below	40,700	GSF	$319	$12,998,000	$415	$16,897,400
Exhibit D – Duckering Complete Renewal Option (Complete renovation) * see Note 1 below	147,000	GSF	$423	$62,191,000	$550	$80,848,300

Notes:

1. The indoor environment, classroom and laboratory configurations in the Existing Duckering Building do not meet the current standards. Some areas have been upgraded, by earlier projects, to provide improved research and teaching environments. But there are many deficiencies in the existing building which will not be addressed by the proposed Duckering Functional Connection. Exhibit C and Exhibit D identify two additional levels of renovation to address some of the Existing Duckering Building deficiencies. These two numbers are additions to the $13 million project cost for the Duckering Functional Connection.

2. There is not a detailed scope of work defined for the Duckering Functional Connection at this phase of Pre-design The Duckering Functional Connection is a lump sum cost based on several assumptions: 1) the exterior wall of the existing building will have to be modified to address code required separation between the new and existing buildings, 2) about 23,000 SF of the existing building will be modified (about 15,100 SF of level 1 renovation + the existing stair and adjacent corridor will be modified to create a connection between the Existing Duckering Building and the new entry lobby).

EXHIBIT A.1 RECOMMENDED NEW BUILDING CONSTRUCTION

(116,900 GSF PROPOSED NEW BUILDING WITH 92,900GSF PROPOSED NEW FINISHED SPACE AND 24,000 GSF NEW SHELL)

- DRAFT -

nbbj 223 Yale Avenue North
Seattle, Washington 98109, 206 223 5555

Job Name: **UAF - Engineering Facility**
Fairbanks, Alaska

■ Order of Magnitude ☐ Schematic Design Current Date: **22-Aug-11**

☐ Design Development ☐ Construction Documents

	Start Date	Area	U/M	$/SF	Construction Cost (Escalated)	Project Cost (Escalated)
New Building:	May-2013					
Shell & Core		92,900	GSF	$330	$30,656,000	$40,168,500
Tenant Improvements		92,900	GSF	$350	$32,552,000	$42,318,000
Site Work	May-2013		LS		$2,417,000	$3,142,000
Duckering Renovation	May-2015		LS			$13,000,000
SUBTOTAL						$98,628,500
Bond Funded Shell & Core		24,000	GSF	$330	$7,920,000	$9,980,000
TOTAL						$108,608,500

Notes and Assumptions:

Project Costs are based on soft cost multipliers of 1.30 for new construction and 1.35 for renovation to be verified by owner.
The general contract will be competitively bid with a minimum of 3 qualified main subcontractors.
The contractor will be required to pay prevailing wages.

Exclusions:

Hazardous Materials Removal
Construction Contingency
Sales Tax
Major Equipment
Furniture & Furnishings
Owners Administration
Project Management
Items listed as NIC
Market Studies
Performance & Payment Bonds
Professional Design Fees
Testing, Inspection & Balancing
Surveys
Soils
General Owners Contingency
Insurance & Permits
Artwork
Appraisal Fees
Moving Expenses
Leasing Commissions
Property Taxes During Construction
Interim Financing
Permanent Financing Placement
Legal Fees

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EXHIBIT A.2 RECOMMENDED NEW BUILDING CONSTRUCTION

(116,900 GSF PROPOSED NEW BUILDING WITH 92,900GSF PROPOSED NEW FINISHED SPACE AND 24,000 GSF NEW SHELL

■ Order of Magnitude	☐ Schematic Design	Prepared By:	**Whorton**
☐ Design Development	☐ Construction Documents	Date:	16-Aug-11
Area GSF: **116,900**		Start Date:	

A Construction	**New Construction - Shell & Core**					
	116,900	SF	Shell & Core	$292	$34,135,000	
	5,600	SF	Premium for High Bay Space - Allowanc	$200	$1,120,000	
	New Construction - Tenant Improvments					
	28,450	SF	Admininistration /Conference	$200	$5,690,000	
	3,854	SF	Computer Lab	$315	$1,214,000	
	19,698	SF	Classroom Lab	$390	$7,682,000	
	32,405	SF	Research Lab	$415	$13,448,000	
	5,226	SF	Classroom	$225	$1,176,000	
	3,266	SF	Support Services	$165	$539,000	
	24,000	SF	Bond Funded Area - Unfinished	NIC		
	Site Work					
	47,392	SF	Site Preparation	$5	$237,000	
	22,392	SF	Site Improvements	$30	$672,000	
		LS	Site Utilities		$750,000	
	100	LF	Utilidor extension - 7' x 8'	$5,500	$550,000	
	116,900	**SF**	**SUBTOTAL**		**$67,213,000**	
			Design/Estimating Contingency - included above			
			Escalation to Start	9.4%	$6,332,000	
	116,900	**SF**	**SUBTOTAL - At Start**		**$73,545,000**	
Total Probable Construction Cost (at start)						**$73,545,000**
			Construction Contingency	NIC		
			Sales Tax	NIC		
Total Probable Final Cost (A)						
B Furniture & Equipment			Major Equipment	NIC		
			Furniture & Furnishings	NIC		
Total Probable Final Cost - Including FF&E (B)						
C Design & Management			Professional Design Fees	NIC		
			Special Consultants & Reimbursables	NIC		
			Project Management	NIC		
			Testing, Inspection & Balancing	NIC		
			Market Studies	NIC		
			Owners Administration	NIC		
			Surveys	NIC		
			Soils	NIC		
D Contingencies			General Owners Contingency	NIC		
E Miscellaneous Project Cost			Insurance & Permits	NIC		
			Artwork	NIC		
F Other			Hazardous Materials Removal	NIC		
Total Probable Final Project Cost (A-F)						
G Site Acquisition			Land Cost	NIC		
			Legal Fees	NIC		
			Surveys for Purchase	NIC		
			Appraisal Fees	NIC		
			Off-Site Work	NIC		
H Leasing/Occupancy			Moving Expenses	NIC		
			Leasing Commissions	NIC		
			Tenant Inducements	NIC		
			Property Taxes During Construction	NIC		
I Financing			Interim Financing	NIC		
			Permanent Financing Placement	NIC		
Total Probable Capital Cost (A-I)						

EXHIBIT B DUCKERING BUILDING FUNCTIONAL CONNECTION

(23,000 GSF OF DUCKERING BUILDING RENOVATION)

■ Order of Magnitude	☐ Schematic Design	Prepared By:	Whorton
☐ Design Development	☐ Construction Documents	Date:	2-Sep-11
Area GSF: 23,000		Start Date:	May-2015

A Construction	**Renovation**					
	13,200 PSF	2 hour fire rated wall	$70	$927,000	
	23,000 SF	Interior Demolition - Excludes Abatement	$12	$276,000	
	7,500 SF	Stair/Connections Remodel - Levels 1-5	$350	$2,625,000	
	15,500 SF	Level 1 Renovation	$275	$4,263,000	
		New Exterior Windows - Not Included			
	23,000 SF	**SUBTOTAL**	**$352**	**$8,091,000**	
		Design/Estimating Contingency - included above			
		Escalation to Start	19.0%	$1,537,000	
	23,000 SF	**SUBTOTAL - At Start**	**$419**	**$9,628,000**	
Total Probable Construction Cost (at start)					**$9,628,000**
	Construction Contingency		NIC		
	Sales Tax		NIC		
Total Probable Final Cost (A)					
B Furniture & Equipment	Major Equipment		NIC		
	Furniture & Furnishings		NIC		
Total Probable Final Cost - Including FF&E (B)					
C Design & Management	Professional Design Fees		NIC		
	Special Consultants & Reimbursables		NIC		
	Project Management		NIC		
	Testing, Inspection & Balancing		NIC		
	Market Studies		NIC		
	Owners Administration		NIC		
	Surveys		NIC		
	Soils		NIC		
D Contingencies	General Owners Contingency		NIC		
E Miscellaneous Project Cost	Insurance & Permits		NIC		
	Artwork		NIC		
F Other	Hazardous Materials Removal - **Not Included**		NIC		
Total Probable Final Project Cost (A-F)					
G Site Acquisition	Land Cost		NIC		
	Legal Fees		NIC		
	Surveys for Purchase		NIC		
	Appraisal Fees		NIC		
	Off-Site Work		NIC		
H Leasing/Occupancy	Moving Expenses		NIC		
	Leasing Commissions		NIC		
	Tenant Inducements		NIC		
	Property Taxes During Construction		NIC		
I Financing	Interim Financing		NIC		
	Permanent Financing Placement		NIC		
Total Probable Capital Cost (A-I)					

EXHIBIT C DUCKERING BUILDING RECOMMENDED RENOVATION

(40,700 GSF OF DUCKERING BUILDING RENOVATION)

■ Order of Magnitude	☐ Schematic Design	Prepared By:	**Whorton**
☐ Design Development	☐ Construction Documents	Date:	25-Jul-11
Area GSF: **40,700**		Start Date:	May-2013

A Construction	**Renovation**					
	40,700	SF	Interior Demolition - Excludes Abatement	$12	$488,000	
	10,122	SF	Rock and Field Lab - Level 1	$255	$2,581,000	
	4,307	SF	Shops - Level 1	$255	$1,098,000	
	10,829	SF	Civil Offices - Level 2	$285	$3,086,000	
	4,969	SF	Faculty Office - Level 3	$285	$1,416,000	
	3,465	SF	Faculty Office - Level 4	$285	$988,000	
	7,008	SF	CEM/INE Office - Level 5	$285	$1,997,000	
	1,500	SF	New Exterior Windows at Level 5	$150	$225,000	
	40,700	**SF**	**SUBTOTAL**	**$292**	**$11,879,000**	
			Design/Estimating Contingency - included above			
			Escalation to Start	9.4%	$1,119,000	
	40,700	**SF**	**SUBTOTAL - At Start**	**$319**	**$12,998,000**	
Total Probable Construction Cost (at start)						**$12,998,000**
	Construction Contingency			NIC		
	Sales Tax			NIC		
Total Probable Final Cost (A)						
B Furniture & Equipment	Major Equipment			NIC		
	Furniture & Furnishings			NIC		
Total Probable Final Cost - Including FF&E (B)						
C Design & Management	Professional Design Fees			NIC		
	Special Consultants & Reimbursables			NIC		
	Project Management			NIC		
	Testing, Inspection & Balancing			NIC		
	Market Studies			NIC		
	Owners Administration			NIC		
	Surveys			NIC		
	Soils			NIC		
D Contingencies	General Owners Contingency			NIC		
E Miscellaneous Project Cost	Insurance & Permits			NIC		
	Artwork			NIC		
F Other	Hazardous Materials Removal - **Not Included**			NIC		
Total Probable Final Project Cost (A-F)						
G Site Acquisition	Land Cost			NIC		
	Legal Fees			NIC		
	Surveys for Purchase			NIC		
	Appraisal Fees			NIC		
	Off-Site Work			NIC		
H Leasing/Occupancy	Moving Expenses			NIC		
	Leasing Commissions			NIC		
	Tenant Inducements			NIC		
	Property Taxes During Construction			NIC		
I Financing	Interim Financing			NIC		
	Permanent Financing Placement			NIC		
Total Probable Capital Cost (A-I)						

EXHIBIT D DUCKERING BUILDING FULL RENOVATION

(147,000 GSF OF DUCKERING BUILDING RENOVATION)

■ Order of Magnitude ☐ Schematic Design ☐ Design Development ☐ Construction Documents

Prepared By: **Whorton**
Date: 22-Jul-11
Start Date: May-2013

Area GSF: **147,000**

A Construction	**Renovation**					
	147,000	SF	Interior Demolition - Excludes Abatement	$12	$1,764,000	
	40,422	SF	Office and Office Services	$295	$11,924,000	
	4,741	SF	Conference and Seminar	$285	$1,351,000	
	11,534	SF	Classroom	$310	$3,575,000	
	38,571	SF	Classroom Lab & Services	$415	$16,007,000	
	9,844	SF	Computer Lab & Services	$390	$3,839,000	
	36,002	SF	Research Lab & Services	$450	$16,201,000	
	5,886	SF	Shop & Services	$255	$1,501,000	
	4,500	SF	New Exterior Windows at 3 levels - Allow	$150	$675,000	
	147,000	**SF**	**SUBTOTAL**	**$387**	**$56,837,000**	
			Design/Estimating Contingency - included above			
			Escalation to Start	9.4%	$5,354,000	
	147,000	**SF**	**SUBTOTAL - At Start**	**$423**	**$62,191,000**	
Total Probable Construction Cost (at start)						**$62,191,000**
	Construction Contingency			NIC		
	Sales Tax			NIC		
Total Probable Final Cost (A)						
B Furniture & Equipment	Major Equipment			NIC		
	Furniture & Furnishings			NIC		
Total Probable Final Cost - Including FF&E (B)						
C Design & Management	Professional Design Fees			NIC		
	Special Consultants & Reimbursables			NIC		
	Project Management			NIC		
	Testing, Inspection & Balancing			NIC		
	Market Studies			NIC		
	Owners Administration			NIC		
	Surveys			NIC		
	Soils			NIC		
D Contingencies	General Owners Contingency			NIC		
E Miscellaneous Project Cost	Insurance & Permits			NIC		
	Artwork			NIC		
F Other	Hazardous Materials Removal - **Not Included**			NIC		
Total Probable Final Project Cost (A-F)						
G Site Acquisition	Land Cost			NIC		
	Legal Fees			NIC		
	Surveys for Purchase			NIC		
	Appraisal Fees			NIC		

APPENDICES

UAF Engineering Facility Space List - Sorted By Category (08.29.11)

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
							Total ASF:	147,115
	BUILDING SERVICES AND RECEIVING							**1,500**
39	1.7.2	CEM	BLDGSV	A	Building Secure Storage			500
38	1.7.1	CEM	RCVG	A	Receiving / Tank Storage / Staging Area			1,000
	CLASSROOM & CLASSROOM LAB SERVICES							**10,900**
384	14.2.1	UAF	CLASS		38 Seat Classroom			726
385	14.2.2	UAF	CLASS		38 Seat Classroom			582
386	14.2.3	UAF	CLASS		16 Seat Classroom			528
387	14.2.4	UAF	CLASS		40 Seat Classroom			813
388	14.2.5	UAF	CLASS		40 Seat Classroom			828
389	14.2.6	UAF	CLASS		36 Seat Classroom			846
390	14.2.7	UAF	CLASS		25 Seat Classroom			519
391	14.2.8	UAF	CLASS		30 Seat Classroom			591
392	14.2.9	UAF	CLASS		30 Seat Classroom			607
393	14.2.10	UAF	CLASS		16 Seat Classroom			528
395	14.2.12	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 40/40)			2,000
396	14.2.13	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 60/20)			2,000
394	14.2.11	UAF	CLSVC		Classroom Support Room (adjustment per 2010 Report projection)			332
	CLASSROOM LAB & CLASSROOM LAB SERVICES							**33,210**
244	8.3.7	ME	CLLBSV	A	Machine Design Lab Storage			150
245	8.3.8	ME	CLLBSV	A	Processing Lab Storage			150
246	8.3.9	ME	CLLBSV	A	Tribology Lab Storage			150
285	9.3.8	MINGEO	CLLBSV	A	Geological Materials Lab Storage			100
286	9.3.9	MINGEO	CLLBSV	A	Operations & Safety Lab			545
287	9.3.10	MINGEO	CLLBSV	A	Mine Surveying Storage			242
288	9.3.11	MINGEO	CLLBSV	A	Rock Specimens Lab			545
289	9.3.12	MINGEO	CLLBSV	A	Geology for Engineers Lab Support			121
290	9.3.13	MINGEO	CLLBSV	A	Rock Cutting Lab Support			121
321	11.3.2	PETE	CLLBSV	A	Prep Room -Drilling Fluids Laboratory			242
323	11.3.4	PETE	CLLBSV	A	Prep Room -Reservoir Rock & Fluid Lab			242
25	1.3.1	CEM	CLSLB	A	Flex Lab (Project Cluster)	2	1,089	2,178
26	1.3.2	CEM	CLSLB	A	Flex Lab Office Area (Project Cluster)	2	545	1,090
27	1.3.3	CEM	CLSLB	A	Engineering on Display			1,000
87	3.3.1	CHEME	CLSLB	A	Chemical Engineering Teaching Laboratory			1,089
105	4.3.1	CEE	CLSLB	A	Environmental Lab			726
106	4.3.2	CEE	CLSLB	A	Fluid Mechanics Lab			726
108	4.3.4	CEE	CLSLB	A	Materials Structure Test Lab,			1,089
109	4.3.5	CEE	CLSLB	A	Soils & Properties Lab			1,089
110	4.3.6	CEE	CLSLB	A	Environmental Lab			726
111	4.3.7	CEE	CLSLB	A	Design / Build Studio: Bridge & Structures			1,452

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
143	5.3.1	CS	CLSLB	A	Classroom Lab 1			745
144	5.3.2	CS	CLSLB	A	Classroom Lab 2			745
166	6.3.1	ECE	CLSLB	A	Electric Machines and Power Lab			925
167	6.3.2	ECE	CLSLB	A	Etching Lab			115
168	6.3.3	ECE	CLSLB	A	Project Lab			531
169	6.3.4	ECE	CLSLB	A	Communications Lab			528
170	6.3.5	ECE	CLSLB	A	Digital Lab 1			534
171	6.3.6	ECE	CLSLB	A	Electromagnetics Lab			573
172	6.3.7	ECE	CLSLB	A	Instrumentation Lab			445
173	6.3.8	ECE	CLSLB	A	Microwave Lab			292
174	6.3.9	ECE	CLSLB	A	Electric Machines Lab			726
175	6.3.10	ECE	CLSLB	A	Rocket Payload Assembly Lab - Alaska Space Grant			545
176	6.3.11	ECE	CLSLB	A	Design/Build Studio: Alaska Space Grant Program Lab			545
238	8.3.1	ME	CLSLB	A	Mechanics of Materials Lab			545
239	8.3.2	ME	CLSLB	A	Thermal Systems Lab			726
240	8.3.3	ME	CLSLB	A	Materials Lab			545
241	8.3.4	ME	CLSLB	A	Heat Transfer and Fluids Lab			1,089
242	8.3.5	ME	CLSLB	A	Large Project Lab: Electric Vehicle Design & Fabrication			1,089
243	8.3.6	ME	CLSLB	A	Machine Design Lab			726
278	9.3.1	MINGEO	CLSLB	A	Geological Materials Lab			363
279	9.3.2	MINGEO	CLSLB	A	Geology for Engineers Lab, Explorations/Geophysics Lab, Terrain Analysis Lab			746
280	9.3.3	MINGEO	CLSLB	A	Explorations/Geophysics Lab			745
281	9.3.4	MINGEO	CLSLB	A	Subsurface Hydrology Lab			745
282	9.3.5	MINGEO	CLSLB	A	Rock Cutting & Material Processing Labs			545
283	9.3.6	MINGEO	CLSLB	A	Rock Mechanics Lab			545
284	9.3.7	MINGEO	CLSLB	A	Mine Ventilation Lab			1,018
320	11.3.1	PETE	CLSLB	A	Drilling Fluids Laboratory			745
322	11.3.3	PETE	CLSLB	A	Reservoir Rock & Fluid Lab			1,089
177	6.3.12	ECE	CLSLBSV	A	Electric Machines Lab Equipment Storage			121
112	4.3.8	CEE	CLSLBSV	A	Bridge & Structures Welding Room			242
107	4.3.3	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			90
113	4.3.9	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			112
114	4.3.10	CEE	CLSLBSV	A	Surveying Lab			242
115	4.3.11	CEE	CLSLBSV	A	Humidity Control Lab 1; Structures			60
116	4.3.12	CEE	CLSLBSV	A	Humidity Control Lab 2: Soils			60
	COMPUTER LAB & COMPUTER LAB SERVICES							**11,801**
146	5.4.1	CS	CMP-C	A	Computer Teaching Lab			1,089
147	5.4.2	CS	CMP-C	A	Digital Forensics Lab			242
29	1.4.1.1-1.4.1.2	CEM	CMP-O	A	SOECAL Student Computer Lab	2	1,089	2,178
31	1.4.3	CEM	CMP-O	A	Computer Aided Design / Rapid Prototyping		1,089	1,089
151	5.4.5	CS	CMP-R	R	Power Wall Lab			545
152	5.4.6	CS	CMP-R	R	Computer Security Research Lab (ASSERT)			545
248	8.4.1	ME	CMP-R	R	Research Computing Lab			545
356	13.4.1	WERC	CMP-R	R	WERC GIS / Imaging / Mapping Computer Room			545

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
149	5.4.4	CS	CMPSV-C	A	Computer Server Room			242
179	6.4.1	ECE	COMP-C	A	Power Computation Lab			475
180	6.4.2	ECE	COMP-C	A	Digital Computation Lab			481
181	6.4.3	ECE	COMP-C	A	Electronics Lab			923
118	4.4.1	CEE	COMPLB	A	Senior Design Lab			545
292	9.4.1	MINGEO	COMPLB	A	Computer Lab			723
293	9.4.2	MINGEO	COMPLB	A	Design Lab			545
325	11.4.1	PETE	COMPLB	A	Computer Lab			726
30	1.4.2.1-1.4.2.2	CEM	COMPSV-C	A	SOECAL Student Computer Lab Storage	2	121	242
	CONFERENCE & CONFERENCE SERVICES							**3,513**
33	1.5.1	CEM	CONF	A	Industry / CEM Innovation Center Room			500
66	2.5.1	AMG	CONF	R	Conference Room			300
120	4.5.1	CEE	CONF	A	Conference Room			300
154	5.5.1	CS	CONF	A	Department Conference Room			300
183	6.5.1	ECE	CONF	A	Resource Library & Project Meeting Room			348
207	7.5.1	INE	CONF	R	Project Review Room			265
208	7.5.2	INE	CONF	R	Conference Room			491
250	8.5.1	ME	CONF	A	Conference / Seminar Room			300
276	9.5.1	MINGEO	CONF	A	Department Conference Room			300
327	11.5.1	PETE	CONF	A	Department Conference Room			300
209	7.5.3	INE	CONFSV	R	Kitchenette			109
	LOBBY							**500**
35	1.6.1	CEM	LOBBY	A	Entry / Display Area			500
	OFFICE & OFFICE SERVICES							**35,188**
3	1.1.1	CEM	OFF	A	Office Entry			150
4	1.1.2	CEM	OFF	A	Academic Manager			150
5	1.1.3	CEM	OFF	A	Dean's Office			242
6	1.1.4	CEM	OFF	A	Fiscal Officer			121
7	1.1.5	CEM	OFF	A	Chief Fiscal Officer			150
8	1.1.6	CEM	OFF	A	Public Relations			121
9	1.1.7	CEM	OFF	A	Recruiter			150
10	1.1.8	CEM	OFF	A	Student Advisor			121
13	1.1.11	CEM	OFF	A	Engineering Student Support (Tutoring)			545
14	1.1.12	CEM	OFF	A	Student Projects Area			1,000
15	1.1.13.1-1.1.13.2	CEM	OFF	R	Visiting Faculty Office (Sabatical)	2	121	242
16	1.1.14.1-1.1.14.19	CEM	OFF	R	Faculty Office (includes UAA office)	5	121	605
17	1.1.15.1-1.1.15.60	CEM	OFF	A	Graduate Office Space	60	60	3,600
18	1.1.16.1-1.1.16.60	CEM	OFF	A	PhD Office Space	60	60	3,600
19	1.1.17	CEM	OFF	A	Technical Services Office (w/ 3 workstations)			817
20	1.1.18	CEM	OFF	A	Technical Services Servers & Server Workrooom			290
22	1.1.19.1-1.1.19.28	CEM	OFF	A	Student Informal Study Space	28	60	1,680
23	1.1.20.1-	CEM	OFF	A	Collaborative Study Rooms	6	121	726

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
50	2.1.1	AMG	OFF	R	Group Lead's Office			121
52	2.1.2	AMG	OFF	R	Department Office - Admin			200
55	2.1.5	AMG	OFF	R	Faculty Office 1			121
56	2.1.6	AMG	OFF	R	Visiting Faculty Office			121
62	2.1.8	AMG	OFF	R	Post Doc Office Space 1			121
63	2.1.9	AMG	OFF	R	Post Doc Office Space 2			121
91	4.1.1	CEE	OFF	A	Department Office			360
92	4.1.2	CEE	OFF	A	Associate Director of AUTC			120
95	4.1.5.1-4.1.5.3	CEE	OFF	A	Student Organization Office Space	3	60	180
100	4.1.6.1-4.1.6.15	CEE	OFF	A	Faculty Offices	15	121	1,815
135	5.1.1	CS	OFF	A	Chair's Office			121
136	5.1.2	CS	OFF	A	Department Office - Admin			150
139	5.1.5.1-5.1.5.9	CS	OFF	A	Faculty Office	9	121	1,089
140	5.1.6.1-5.1.6.2	CS	OFF	A	Adjunct Faculty Office Space	2	60	120
158	6.1.1	ECE	OFF	A	Department Office			242
161	6.1.4	ECE	OFF	A	Alaska Space Grant Program Office			121
162	6.1.5.1-6.1.5.11	ECE	OFF	A	Faculty Offices	11	121	1,331
163	6.1.6.1-6.1.6.2	ECE	OFF	A	Adjunct Faculty Shared Office Space	2	60	121
164	6.1.7.1-6.1.7.3	ECE	OFF	A	Student Organization Office Space	3	60	180
192	7.1.1	INE	OFF	R	INE Office -Admin Assistant			250
193	7.1.2	INE	OFF	R	INE Director			250
194	7.1.3	**INE**	OFF	R	Director, AUTC			120
195	7.1.4.1-7.1.4.5	INE	OFF	R	INE Faculty Offices	5	121	605
196	7.1.5	INE	OFF	R	INE Proposal Office			121
197	7.1.6	INE	OFF	R	INE Proposal & Publications			121
198	7.1.7	INE	OFF	R	INE Proposal Coordinator			121
199	7.1.8	INE	OFF	R	INE Business Office (Central Receiving, Purchasing, HR, Fiscal Techs)			726
200	7.1.9	INE	OFF	R	INE Business Office -Travel Coordiinator			360
201	7.1.10	INE	OFF	R	INE IT Technician			121
202	7.1.11	INE	OFF	R	INE Project Tech			121
203	7.1.12	INE	OFF	R	INE Web Developer			121
204	7.1.13	INE	OFF	R	INE Publications Editor			121
205	7.1.14	INE	OFF	R	INE Secure Storage			180
228	8.1.1	ME	OFF	A	Department Office			360
229	8.1.2	ME	OFF	A	Department Chair			121
232	8.1.5.1-8.1.5.12	ME	OFF	A	Faculty Offices	12	121	1,452
235	8.1.6.1-8.1.6.3	ME	OFF	A	Student Organization Office Space (Mech, Auto, Aero)	3	60	180
266	9.1.1	MINGEO	OFF	A	Department Office			363
267	9.1.2	MINGEO	OFF	A	Department Chair			121

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
269	9.1.4.1-9.1.4.8	MINGEO	OFF	A	Faculty Office	8	121	968
272	9.1.5.1-9.1.5.2	MINGEO	OFF	A	Student Organization Office Space	2	60	120
297	10.1.1	MIRL	OFF	R	Admin Office			0
298	10.1.2.1-10.1.2.2	MIRL	OFF	R	Faculty Offices	2	121	242
312	11.1.1	PETE	OFF	A	Department Office			365
313	11.1.2.1 - 11.1.2.8	PETE	OFF	A	Faculty Office	8	121	968
314	11.1.3.1 - 11.1.3.2	PETE	OFF	A	Adjunct Office Space	2	60	120
317	11.1.4.1 - 11.1.4.3	PETE	OFF	A	Student Organization Office Space (SPE, AADE)	3	60	180
346	13.1.1	WERC	OFF	R	WERC Admin Office			398
347	13.1.2	WERC	OFF	R	WERC Director			121
348	13.1.3.1-13.1.3.12	WERC	OFF	R	WERC Staff Office	12	60	720
351	13.1.6.1-13.1.6.15	WERC	OFF	R	WERC Faculty Offices	15	121	1,815
11	1.1.9	CEM	OFFSV	A	Office Supply & Secure File Storage			150
12	1.1.10	CEM	OFFSV	A	Copy Mail Fax			150
53	2.1.3	AMG	OFFSV	R	Copy / Mail / Fax			150
54	2.1.4	AMG	OFFSV	R	Office Supply Storage			100
93	4.1.3	CEE	OFFSV	A	Copy / Mail / Fax			150
94	4.1.4	CEE	OFFSV	A	Office Supply Storage			100
137	5.1.3	CS	OFFSV	A	Copy / Mail / Fax			150
138	5.1.4	CS	OFFSV	A	Office Supply Storage			100
159	6.1.2	ECE	OFFSV	A	Office Machines & Copy Room			150
160	6.1.3	ECE	OFFSV	A	Supply Storage			100
230	8.1.3	ME	OFFSV	A	Department Office Supply Storage			100
231	8.1.4	ME	OFFSV	A	Department Copy / Mail / Fax			150
273	9.1.6	MINGEO	OFFSV	A	Office Supply Storage			100
274	9.1.7	MINGEO	OFFSV	A	Copy / Mail / Fax			150
349	13.1.4	WERC	OFFSV	R	WERC Office Storage			100
350	13.1.5	WERC	OFFSV	R	WERC Copy / Mail / Fax			150
	RESEARCH LABS, RESEARCH LAB SERVICES & STORAGE							**45,174**
68	2.8.1	AMG	RSLAB	R	Optical Characterization / Spectroscopy / AFM			363
69	2.8.2	AMG	RSLAB	R	Scanning Electron Microscopy Laboratory			242
70	2.8.3	AMG	RSLAB	R	Photolithography Lab (Cleanroom)			363
71	2.8.4	AMG	RSLAB	R	Wet Bench Chemistry Lab (Cleanroom)			242
72	2.8.5	AMG	RSLAB	R	Material Processing Laboratory			545
73	2.8.6	AMG	RSLAB	R	Furnace Laboratory			242
74	2.8.7	AMG	RSLAB	R	Thin Film Laboratory (Fume Hood)			242
75	2.8.8	AMG	RSLAB	R	Nanochemical Synthesis Lab (Fume Hood)			242
76	2.8.9	AMG	RSLAB	R	Anti-static Electrical Testing Lab			484
77	2.8.10	AMG	RSLAB	R	Electrical Testing Lab			484
78	2.8.11	AMG	RSLAB	R	Research Lab-Future Growth			363
122	4.8.1	CEE	RSLAB	R	Asphalt Lab			545
123	4.8.2	CEE	RSLAB	R	Frozen Soils Lab			545

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
124	4.8.3	CEE	RSLAB	R	Flume Room			726
125	4.8.4	CEE	RSLAB	R	Super Pave Lab			745
127	4.8.5	CEE	RSLAB	R	Soils Mixing/Service Lab			545
128	4.8.6	CEE	RSLAB	R	Concrete Mixing/Service Lab			545
129	4.8.7	CEE	RSLAB	R	Soils Materials Testing Lab			1,089
130	4.8.8	CEE	RSLAB	R	Advanced Materials Testing Lab			1,452
185	6.8.1	ECE	RSLAB	R	Electrical Analysis and Design Lab			206
186	6.8.2	ECE	RSLAB	R	Electric Power Research Lab			624
187	6.8.3	ECE	RSLAB	R	Design / Build Studio: Waves Lab			545
188	6.8.4	ECE	RSLAB	R	Wireless Sensor Network Lab / Remote Sensing Lab			545
211	7.8.1.1-7.8.1.2	INE	RSLAB	R	Flex Lab (Project Cluster)	2	1,089	2,178
212	7.8.2.1-7.8.2.2	INE	RSLAB	R	Flex Lab Office Area (Project Cluster)	2	545	1,090
213	7.8.3	INE	RSLAB	R	High Bay			4,356
214	7.8.4	INE	RSLAB	R	Rock Shop Specimen Processing and Storage			726
215	7.8.5	INE	RSLAB	R	Rock Shop Specimen Characterization / Testing			1,089
216	7.8.6	INE	RSLAB	R	Advanced Computing Lab			405
217	7.8.7	INE	RSLAB	R	Rock Shop Cold Room Storage			182
219	7.8.9	INE	RSLAB	R	Cold Room			545
220	7.8.10	INE	RSLAB	R	Freezer Room			545
221	7.8.11	INE	RSLAB	R	Coldroom Sample Prep Area			545
222	7.8.12	INE	RSLAB	R	Coldroom Equipment Storage			545
252	8.8.1	ME	RSLAB	R	Extreme Environment Lab			545
253	8.8.2	ME	RSLAB	R	Tribology Lab - Faculty Research			726
254	8.8.3	ME	RSLAB	R	Processing Lab - Faculty Research			545
255	8.8.4	ME	RSLAB	R	Mechanics of Materials Lab			726
257	8.8.6	ME	RSLAB	R	Dynamics / Controls			545
258	8.8.7	ME	RSLAB	R	Energy Lab 1 (Wind, Turbine)			545
260	8.8.8	ME	RSLAB	R	Microfluidics			545
261	8.8.9	ME	RSLAB	R	Fluid Dynamics (nano fluids systems)			545
300	10.8.1	MIRL	RSLAB	R	Wet Chemistry & Analytical Lab			1,049
301	10.8.2	MIRL	RSLAB	R	MIRL Lab			121
302	10.8.3	MIRL	RSLAB	R	Dry Sample Prep -Crusher Lab			484
303	10.8.4	MIRL	RSLAB	R	Wet Sample Prep -Grinding / Concentration			484
329	11.8.1	PETE	RSLAB	R	Reservoir Characterization Lab			1,089
334	12.1.1	PDL	RSLAB	R	PVT / GTL Research Lab			1,089
335	12.1.2	PDL	RSLAB	R	GTL Research Lab			745
336	12.1.3	PDL	RSLAB	R	Ceramic Membrane Lab			745
337	12.1.4	PDL	RSLAB	R	Gas Hydrate Research Lab			1,089
338	12.1.5	PDL	RSLAB	R	GC / MS Research Lab			363
358	13.8.1	WERC	RSLAB	R	Environmental Research Lab 1			185
359	13.8.2	WERC	RSLAB	R	Environmental Research Lab 2			569
360	13.8.3	WERC	RSLAB	R	Environmental Research Lab 3			572
361	13.8.4	WERC	RSLAB	R	WERC Lab (CT Scanner)			323
362	13.8.5	WERC	RSLAB	R	Radioactive Research Laboratory			141
363	13.8.6	WERC	RSLAB	R	WERC Lab			611

Line	ID	Dept	Category	A/R	Room Description	No.	ASF Per	Area Subtotals ASF
364	13.8.7	WERC	RSLAB	R	Costello Lab			611
365	13.8.8	WERC	RSLAB	R	Alaska Stable Isotope Facility			611
366	13.8.9	WERC	RSLAB	R	ASIF Multi-Collector Isotope Facility (future)			726
83	2.8.14	AMG	RSLBOF	R	Student Office / Bench Set-up			242
131	4.8.9	CEE	RSLBSV	R	Advanced Materials Testing Lab Hydraulic Pump Chiller			242
218	7.8.8	INE	RSLBSV	R	Field Gear Storage			1,089
256	8.8.5	ME	RSLBSV	R	Mechanics of Materials Lab Storage			150
262	8.8.10	ME	RSLBSV	R	Storage			150
304	10.8.5	MIRL	RSLBSV	R	Dry & Wet Apparatus Storage			363
306	10.8.6	MIRL	RSLBSV	R	Lab Support			121
307	10.8.7	MIRL	RSLBSV	R	Lab Support			121
308	10.8.8	MIRL	RSLBSV	R	Lab Support			121
330	11.8.2	PETE	RSLBSV	R	Reservoir Characterization Lab Support			121
339	12.1.6	PDL	RSLBSV	R	GTL Research Lab Support			121
340	12.1.7	PDL	RSLBSV	R	Gas Hydrate Research Lab Support			121
341	12.1.8	PDL	RSLBSV	R	PVT / GTL Research Lab Support			121
342	12.1.9	PDL	RSLBSV	R	Ceramic Membrane Lab Support			121
367	13.8.10	WERC	RSLBSV	R	ASIF Lab Support			164
368	13.8.11	WERC	RSLBSV	R	ASIF Lab Support			152
369	13.8.12	WERC	RSLBSV	R	WERC Field Gear Fabrication & Prep			0
370	13.8.13	WERC	RSLBSV	R	WERC Field Gear Storage (12 Lockable Cages)			0
371	13.8.14	WERC	RSLBSV	R	WERC Cold Room 1			91
372	13.8.15	WERC	RSLBSV	R	WERC Freezer Room 1			92
373	13.8.16	WERC	RSLBSV	R	WERC Freezer Room 2			43
374	13.8.17	WERC	RSLBSV	R	WERC Core / Sample Processing			242
375	13.8.18	WERC	RSLBSV	R	WERC Lab Support			122
376	13.8.19	WERC	RSLBSV	R	WERC Datalogger Testing / Calibration			121
377	13.8.20	WERC	RSLBSV	R	Pressure Transducer Calibration Area			121
79	2.8.12	AMG	RSSTG	R	Chemical Testing / Storage			121
80	2.8.13	AMG	RSSTG	R	Research Storage			242
	SEMINAR							**726**
224	7.9.1	INE	SEM	A	Seminar Room			726
	SHOP & SHOP SERVICES							**4,603**
41	1.10.1	CEM	SHOP	A	Student Shop			545
42	1.10.2	CEM	SHOP	A	Machine Shop			2,000
43	1.10.3	CEM	SHOP	A	Welding Shop			545
46	1.10.6	CEM	SHOP	A	Wood Shop			545
379	13.10.1	WERC	SHOP	R	Electronics Workshop			363
44	1.10.4	CEM	SHOPSV	A	Machine Shop Office			121
380	13.10.2	WERC	SHOPSV	R	Electronics Workshop Support			121
45	1.10.5	CEM	SHPSV	A	Shop Stock Storage			363

UAF Engineering Facility Space List (08.29.11) Sorted By Department

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
							Totals:	147,115	78,110	54,751	14,254
1	COLLEGE OF ENGINEERING & MINES							29,006	15,860	10,968	2,178
2			Office & Office Support					12,204	10,659	1,545	0
3	1.1.1	CEM	OFF	A	Office Entry			150	150		
4	1.1.2	CEM	OFF	A	Academic Manager			150	150		
5	1.1.3	CEM	OFF	A	Dean's Office			242	242		
6	1.1.4	CEM	OFF	A	Fiscal Officer			121	121		
7	1.1.5	CEM	OFF	A	Chief Fiscal Officer			150	150		
8	1.1.6	CEM	OFF	A	Public Relations			121	121		
9	1.1.7	CEM	OFF	A	Recruiter			150	150		
10	1.1.8	CEM	OFF	A	Student Advisor			121	121		
11	1.1.9	CEM	OFFSV	A	Office Supply & Secure File Storage			150	150		
12	1.1.10	CEM	OFFSV	A	Copy Mail Fax			150	150		
13	1.1.11	CEM	OFF	A	Engineering Student Support (Tutoring)			545		545	
14	1.1.12	CEM	OFF	A	Student Projects Area			1,000		1,000	
15	1.1.13.1-1.1.13.2	CEM	OFF	R	Visiting Faculty Office (Sabatical)	2	121	242	242		
16	1.1.14.1-1.1.14.19	CEM	OFF	R	Faculty Office (includes UAA office)	5	121	605	605		
17	1.1.15.1-1.1.15.60	CEM	OFF	A	Graduate Office Space	60	60	3,600	3,600		
18	1.1.16.1-1.1.16.60	CEM	OFF	A	PhD Office Space	60	60	3,600	3,600		
19	1.1.17	CEM	OFF	A	Technical Services Office (w/ 3 workstations)			817	817		
20	1.1.18	CEM	OFF	A	Technical Services Servers & Server Workrooom			290	290		
21			Student Study Space					2,406	1,082	1,324	0
22	1.1.19.1-1.1.19.28	CEM	OFF	A	Student Informal Study Space	28	60	1,680	840	840	
23	1.1.20.1-1.1.20.6	CEM	OFF	A	Collaborative Study Rooms	6	121	726	242	484	
24			Classroom Lab & Classroom Lab Services					4,268	0	2,090	2,178
25	1.3.1	CEM	CLSLB	A	Flex Lab (Project Cluster)	2	1,089	2,178			2178
26	1.3.2	CEM	CLSLB	A	Flex Lab Office Area (Project Cluster)	2	545	1,090		1090	
27	1.3.3	CEM	CLSLB	A	Engineering on Display			1,000		1000	
28			Computer Lab & Computer Lab Service					3,509	0	3,509	0
29	1.4.1.1-1.4.1.2	CEM	CMP-O	A	SOECAL Student Computer Lab	2	1,089	2,178		**2178**	
30	1.4.2.1-1.4.2.2	CEM	COMPSV-C	A	SOECAL Student Computer Lab Storage	2	121	242		242	
31	1.4.3	CEM	CMP-O	A	Computer Aided Design / Rapid Prototyping		1,089	1,089		1089	
32			Conference Room					500	0	500	0
33	1.5.1	CEM	CONF	A	Industry / CEM Innovation Center Room			500		500	

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
34			**Lobby**					500	0	500	0
35	1.6.1	CEM	LOBBY	A	Entry / Display Area			500		500	
37			**Receiving / Building Service Area**					1,500	0	1,500	0
38	1.7.1	CEM	RCVG	A	Receiving / Tank Storage / Staging Area			1,000		1,000	
39	1.7.2	CEM	BLDGSV	A	Building Secure Storage			500		500	
40			**Shop**					4,119	4,119	0	0
41	1.10.1	CEM	SHOP	A	Student Shop			545	545		
42	1.10.2	CEM	SHOP	A	Machine Shop			2,000	2,000		
43	1.10.3	CEM	SHOP	A	Welding Shop			545	545		
44	1.10.4	CEM	SHOPSV	A	Machine Shop Office			121	121		
45	1.10.5	CEM	SHPSV	A	Shop Stock Storage			363	363		
46	1.10.6	CEM	SHOP	A	Wood Shop			545	545		
47											
48	**ADVANCED MATERIALS GROUP**							5,772	0	0	5,772
49			**Office & Office Support**					1,055	0	0	1,055
50	2.1.1	AMG	OFF	R	Group Lead's Office			121			121
52	2.1.2	AMG	OFF	R	Department Office - Admin			200			200
53	2.1.3	AMG	OFFSV	R	Copy / Mail / Fax			150			150
54	2.1.4	AMG	OFFSV	R	Office Supply Storage			100			100
55	2.1.5	AMG	OFF	R	Faculty Office 1			121			121
56	2.1.6	AMG	OFF	R	Visiting Faculty Office			121			121
62	2.1.8	AMG	OFF	R	Post Doc Office Space 1			121			121
63	2.1.9	AMG	OFF	R	Post Doc Office Space 2			121			121
64		AMG	OFF	R	Post Doc Office Space 3			0	0	0	
65			**Conference Room**					300	0	0	300
66	2.5.1	AMG	CONF	R	Conference Room			300			300
67			**Research Lab & Research Lab Service**					4,417	0	0	4,417
68	2.8.1	AMG	RSLAB	R	Optical Characterization / Spectroscopy / AFM			363			363
69	2.8.2	AMG	RSLAB	R	Scanning Electron Microscopy Laboratory			242			242
70	2.8.3	AMG	RSLAB	R	Photolithography Lab (Cleanroom)			363			363
71	2.8.4	AMG	RSLAB	R	Wet Bench Chemistry Lab (Cleanroom)			242			242
72	2.8.5	AMG	RSLAB	R	Material Processing Laboratory			545			545
73	2.8.6	AMG	RSLAB	R	Furnace Laboratory			242			242
74	2.8.7	AMG	RSLAB	R	Thin Film Laboratory (Fume Hood)			242			242
75	2.8.8	AMG	RSLAB	R	Nanochemical Synthesis Lab (Fume Hood)			242			242
76	2.8.9	AMG	RSLAB	R	Anti-static Electrical Testing Lab			484			484
77	2.8.10	AMG	RSLAB	R	Electrical Testing Lab			484			484
78	2.8.11	AMG	RSLAB	R	Research Lab-Future Growth			363			363
79	2.8.12	AMG	RSSTG	R	Chemical Testing / Storage			121			121
80	2.8.13	AMG	RSSTG	R	Research Storage			242			242
83	2.8.14	AMG	RSLBOF	R	Student Office / Bench Set-up			242			242
84											
85	**CHEMICAL ENGINEERING**							1,089	0	1,089	0
86			**Classroom Lab & Classroom Lab Service**					1,089	0	1,089	0
87	3.3.1	CHEME	CLSLB	A	Chemical Engineering Teaching Laboratory			1,089		1,089	
88											

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Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
89	**CIVIL & ENVIRONMENTAL ENGINEERING**							16,618	0	16,618	0
90			**Office & Office Support**					2,725	0	2,725	0
91	4.1.1	CEE	OFF	A	Department Office			360		360	
92	4.1.2	CEE	OFF	A	Associate Director of AUTC			120		120	
93	4.1.3	CEE	OFFSV	A	Copy / Mail / Fax			150		150	
94	4.1.4	CEE	OFFSV	A	Office Supply Storage			100		100	
95	4.1.5.1-4.1.5.3	CEE	OFF	A	Student Organization Office Space	3	60	180		180	
100	4.1.6.1-4.1.6.15	CEE	OFF	A	Faculty Offices	15	121	1,815		1,815	
104			**Classroom Lab & Classroom Lab Service**					6,614	0	6,614	0
105	4.3.1	CEE	CLSLB	A	Environmental Lab			726		726	
106	4.3.2	CEE	CLSLB	A	Fluid Mechanics Lab			726		726	
107	4.3.3	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			90		90	
108	4.3.4	CEE	CLSLB	A	Materials Structure Test Lab,			1,089		1,089	
109	4.3.5	CEE	CLSLB	A	Soils & Properties Lab			1,089		1,089	
110	4.3.6	CEE	CLSLB	A	Environmental Lab			726		726	
111	4.3.7	CEE	CLSLB	A	Design / Build Studio: Bridge & Structures			1,452		1,452	
112	4.3.8	CEE	CLSLBSV	A	Bridge & Structures Welding Room			242		242	
113	4.3.9	CEE	CLSLBSV	A	Fluid Mechanics Lab Storage			112		112	
114	4.3.10	CEE	CLSLBSV	A	Surveying Lab			242		242	
115	4.3.11	CEE	CLSLBSV	A	Humidity Control Lab 1; Structures			60		60	
116	4.3.12	CEE	CLSLBSV	A	Humidity Control Lab 2: Soils			60		60	
117			**Computer Lab & Computer Lab Service**					545	0	545	0
118	4.4.1	CEE	COMPLB	A	Senior Design Lab			545		545	
119			**Conference Room**					300	0	300	0
120	4.5.1	CEE	CONF	A	Conference Room			300		300	
121			**Research Lab & Research Lab Service**					6,434	0	6,434	0
122	4.8.1	CEE	RSLAB	R	Asphalt Lab			545		545	
123	4.8.2	CEE	RSLAB	R	Frozen Soils Lab			545		545	
124	4.8.3	CEE	RSLAB	R	Flume Room			726		726	
125	4.8.4	CEE	RSLAB	R	Super Pave Lab			745		745	
127	4.8.5	CEE	RSLAB	R	Soils Mixing/Service Lab			545		545	
128	4.8.6	CEE	RSLAB	R	Concrete Mixing/Service Lab			545		545	
129	4.8.7	CEE	RSLAB	R	Soils Materials Testing Lab			1,089		1,089	
130	4.8.8	CEE	RSLAB	R	Advanced Materials Testing Lab			1,452		1,452	
131	4.8.9	CEE	RSLBSV	R	Advanced Materials Testing Lab Hydraulic Pump Chiller Room			242		242	
132											
133	**COMPUTER SCIENCE**							6,304	0	0	6,304
134			**Office & Office Support**					1,730	0	0	1,730
135	5.1.1	CS	OFF	A	Chair's Office			121			121
136	5.1.2	CS	OFF	A	Department Office - Admin			150			150
137	5.1.3	CS	OFFSV	A	Copy / Mail / Fax			150			150
138	5.1.4	CS	OFFSV	A	Office Supply Storage			100			100
139	5.1.5.1-5.1.5.9	CS	OFF	A	Faculty Office	9	121	1,089			1,089
140	5.1.6.1-5.1.6.2	CS	OFF	A	Adjunct Faculty Office Space	2	60	120			120
142			**Classroom Lab & Classroom Lab Service**					1,490	0	0	1,490
143	5.3.1	CS	CLSLB	A	Classroom Lab 1			745			745
144	5.3.2	CS	CLSLB	A	Classroom Lab 2			745			745

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
145			**Computer Lab & Computer Lab Service**					1,694	0	0	1,694
146	5.4.1	CS	CMP-C	A	Computer Teaching Lab			1,089			1,089
147	5.4.2	CS	CMP-C	A	Digital Forensics Lab			242			242
148	5.4.3	CS	CMPSV-C	A	Computer Teaching Lab Support			121			121
149	5.4.4	CS	CMPSV-C	A	Computer Server Room			242			242
150			**Research Computer Lab & Computer Lab Service**					1,090	0	0	1,090
151	5.4.5	CS	CMP-R	R	Power Wall Lab			545			545
152	5.4.6	CS	CMP-R	R	Computer Security Research Lab (ASSERT)			545			545
153			**Conference Room**					300	0	0	300
154	5.5.1	CS	CONF	A	Department Conference Room			300			300
155											
156	**ELECTRICAL & COMPUTER ENGINEERING**							**12,272**	**10,092**	**2,180**	**0**
157			**Office & Office Support**					2,245	2,245	0	0
158	6.1.1	ECE	OFF	A	Department Office			242	242		
159	6.1.2	ECE	OFFSV	A	Office Machines & Copy Room			150	150		
160	6.1.3	ECE	OFFSV	A	Supply Storage			100	100		
161	6.1.4	ECE	OFF	A	Alaska Space Grant Program Office			121	121		
162	6.1.5.1-6.1.5.11	ECE	OFF	A	Faculty Offices	11	121	1,331	1,331		
163	6.1.6.1-6.1.6.2	ECE	OFF	A	Adjunct Faculty Shared Office Space	2	60	121	121		
164	6.1.7.1-6.1.7.3	ECE	OFF	A	Student Organization Office Space	3	60	180	180		
165			**Classroom Lab & Classroom Lab Service**					5,880	4,790	1,090	0
166	6.3.1	ECE	CLSLB	A	Electric Machines and Power Lab			925	925		
167	6.3.2	ECE	CLSLB	A	Etching Lab			115	115		
168	6.3.3	ECE	CLSLB	A	Project Lab			531	531		
169	6.3.4	ECE	CLSLB	A	Communications Lab			528	528		
170	6.3.5	ECE	CLSLB	A	Digital Lab 1			534	534		
171	6.3.6	ECE	CLSLB	A	Electromagnetics Lab			573	573		
172	6.3.7	ECE	CLSLB	A	Instrumentation Lab			445	445		
173	6.3.8	ECE	CLSLB	A	Microwave Lab			292	292		
174	6.3.9	ECE	CLSLB	A	Electric Machines Lab			726	726		
175	6.3.10	ECE	CLSLB	A	Rocket Payload Assembly Lab - Alaska Space Grant Program			545		545	
176	6.3.11	ECE	CLSLB	A	Design/Build Studio: Alaska Space Grant Program Lab			545		545	
177	6.3.12	ECE	CLSLBSV	A	Electric Machines Lab Equipment Storage			121	121		
178			**Computer Lab and Computer Lab Service**					1,879	1,879	0	0
179	6.4.1	ECE	COMP-C	A	Power Computation Lab			475	475		
180	6.4.2	ECE	COMP-C	A	Digital Computation Lab			481	481		
181	6.4.3	ECE	COMP-C	A	Electronics Lab			923	923		
182			**Conference Room**					348	348	0	0
183	6.5.1	ECE	CONF	A	Resource Library & Project Meeting Room			348	348		
184			**Research Lab & Research Lab Service**					1,920	830	1,090	0
185	6.8.1	ECE	RSLAB	R	Electrical Analysis and Design Lab			206	206		
186	6.8.2	ECE	RSLAB	R	Electric Power Research Lab			624	624		
187	6.8.3	ECE	RSLAB	R	Design / Build Studio: Waves Lab			545		545	
188	6.8.4	ECE	RSLAB	R	Wireless Sensor Network Lab / Remote Sensing Lab			545		545	
189											

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
190	**INSTITUTE FOR NORTHERN ENGINEERING**							**18,224**	**18,224**	**0**	**0**
191			**Office & Office Support**					**3,338**	**3,338**	**0**	**0**
192	7.1.1	INE	OFF	R	INE Office - Admin Assistant			250	250		
193	7.1.2	INE	OFF	R	INE Director			250	250		
194	7.1.3	INE	OFF	R	Director, AUTC			120	120		
195	7.1.4.1-7.1.4.5	INE	OFF	R	INE Faculty Offices	5	121	605	605		
196	7.1.5	INE	OFF	R	INE Proposal Office			121	121		
197	7.1.6	INE	OFF	R	INE Proposal & Publications			121	121		
198	7.1.7	INE	OFF	R	INE Proposal Coordinator			121	121		
199	7.1.8	INE	OFF	R	INE Business Office (Central Receiving, Purchasing, HR, Fiscal Techs)			726	726		
200	7.1.9	INE	OFF	R	INE Business Office - Travel Coordiinator			360	360		
201	7.1.10	INE	OFF	R	INE IT Technician			121	121		
202	7.1.11	INE	OFF	R	INE Project Tech			121	121		
203	7.1.12	INE	OFF	R	INE Web Developer			121	121		
204	7.1.13	INE	OFF	R	INE Publications Editor			121	121		
205	7.1.14	INE	OFF	R	INE Secure Storage			180	180		
206			**Conference Room & Conference Service**					**865**	**865**	**0**	**0**
207	7.5.1	INE	CONF	R	Project Review Room			265	265		
208	7.5.2	INE	CONF	R	Conference Room			491	491		
209	7.5.3	INE	CONFSV	R	Kitchenette			109	109		
210			**Research Lab & Research Lab Service**					**13,295**	**13,295**	**0**	**0**
211	7.8.1.1-7.8.1.2	INE	RSLAB	R	Flex Lab (Project Cluster)	2	1,089	2,178	2,178		
212	7.8.2.1-7.8.2.2	INE	RSLAB	R	Flex Lab Office Area (Project Cluster)	2	545	1,090	1,090		
213	7.8.3	INE	RSLAB	R	High Bay			4,356	4,356		
214	7.8.4	INE	RSLAB	R	Rock Shop Specimen Processing and Storage			726	726		
215	7.8.5	INE	RSLAB	R	Rock Shop Specimen Characterization / Testing			1,089	1,089		
216	7.8.6	INE	RSLAB	R	Advanced Computing Lab			405	405		
217	7.8.7	INE	RSLAB	R	Rock Shop Cold Room Storage			182	182		
218	7.8.8	INE	RSLBSV	R	Field Gear Storage			1,089	1,089		
219	7.8.9	INE	RSLAB	R	Cold Room			545	545		
220	7.8.10	INE	RSLAB	R	Freezer Room			545	545		
221	7.8.11	INE	RSLAB	R	Coldroom Sample Prep Area			545	545		
222	7.8.12	INE	RSLAB	R	Coldroom Equipment Storage			545	545		
223			**Seminar**					**726**	**726**	**0**	**0**
224	7.9.1	INE	SEM	A	Seminar Room			726	726		
225											
226	**MECHANICAL ENGINEERING**							**13,400**	**1,784**	**11,616**	**0**
227			**Office & Office Support**					**2,363**	**0**	**2,363**	**0**
228	8.1.1	ME	OFF	A	Department Office			360		360	
229	8.1.2	ME	OFF	A	Department Chair			121		121	
230	8.1.3	ME	OFFSV	A	Department Office Supply Storage			100		100	
231	8.1.4	ME	OFFSV	A	Department Copy / Mail / Fax			150		150	
232	8.1.5.1-8.1.5.12	ME	OFF	A	Faculty Offices	12	121	1,452		1,452	
233		ME	OFF	A	Graduate Office Space	0	60	0		0	
234		ME	OFF	A	PhD Office Space	0	60	0		0	
235	8.1.6.1-8.1.6.3	ME	OFF	A	Student Organization Office Space (Mech, Auto, Aero)	3	60	180		180	

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
237			**Classroom Lab & Classroom Lab Service**					5,170	1,089	4,081	0
238	8.3.1	ME	CLSLB	A	Mechanics of Materials Lab			545		545	
239	8.3.2	ME	CLSLB	A	Thermal Systems Lab			726		726	
240	8.3.3	ME	CLSLB	A	Materials Lab			545		545	
241	8.3.4	ME	CLSLB	A	Heat Transfer and Fluids Lab			1,089		1,089	
242	8.3.5	ME	CLSLB	A	Large Project Lab: Electric Vehicle Design & Fabrication			1,089	1,089		
243	8.3.6	ME	CLSLB	A	Machine Design Lab			726		726	
244	8.3.7	ME	CLLBSV	A	Machine Design Lab Storage			150		150	
245	8.3.8	ME	CLLBSV	A	Processing Lab Storage			150		150	
246	8.3.9	ME	CLLBSV	A	Tribology Lab Storage			150		150	
247			**Computer Lab and Computer Lab Service**					545	0	545	0
248	8.4.1	ME	CMP-R	R	Research Computing Lab			545		545	
249			**Conference Room**					300	0	300	0
250	8.5.1	ME	CONF	A	Conference / Seminar Room			300		300	
251			**Research Lab & Research Lab Service**					5,022	695	4,327	0
252	8.8.1	ME	RSLAB	R	Extreme Environment Lab			545		545	
253	8.8.2	ME	RSLAB	R	Tribology Lab - Faculty Research			726		726	
254	8.8.3	ME	RSLAB	R	Processing Lab - Faculty Research			545		545	
255	8.8.4	ME	RSLAB	R	Mechanics of Materials Lab			726		726	
256	8.8.5	ME	RSLBSV	R	Mechanics of Materials Lab Storage			150		150	
257	8.8.6	ME	RSLAB	R	Dynamics / Controls			545		545	
258	8.8.7	ME	RSLAB	R	Energy Lab 1 (Wind, Turbine)			545		545	
260	8.8.8	ME	RSLAB	R	Microfluidics			545		545	
261	8.8.9	ME	RSLAB	R	Fluid Dynamics (nano fluids systems)			545	545		
262	8.8.10	ME	RSLBSV	R	Storage			150	150		
263											
264	**MINING AND GEOLOGICAL ENGINEERING**							9,892	9,892	0	0
265			**Office & Office Support**					1,943	1,943	0	0
266	9.1.1	MINGEO	OFF	A	Department Office			363	363		
267	9.1.2	MINGEO	OFF	A	Department Chair			121	121		
268	9.1.3	MINGEO	OFF	A	Mine Manager			121	121		
269	9.1.4.1-9.1.4.8	MINGEO	OFF	A	Faculty Office	8	121	968	968		
272	9.1.5.1-9.1.5.2	MINGEO	OFF	A	Student Organization Office Space	2	60	120	120		
273	9.1.6	MINGEO	OFFSV	A	Office Supply Storage			100	100		
274	9.1.7	MINGEO	OFFSV	A	Copy / Mail / Fax			150	150		
275			**Conference**					300	300	0	0
276	9.5.1	MINGEO	CONF	A	Department Conference Room			300	300		
277			**Classroom Lab & Classroom Lab Service**					6,381	6,381	0	0
278	9.3.1	MINGEO	CLSLB	A	Geological Materials Lab			363	363		
279	9.3.2	MINGEO	CLSLB	A	Geology for Engineers Lab, Explorations/Geophysics Lab, Terrain Analysis Lab			746	746		
280	9.3.3	MINGEO	CLSLB	A	Explorations/Geophysics Lab			745	745		
281	9.3.4	MINGEO	CLSLB	A	Subsurface Hydrology Lab			745	745		
282	9.3.5	MINGEO	CLSLB	A	Rock Cutting & Material Processing Labs			545	545		
283	9.3.6	MINGEO	CLSLB	A	Rock Mechanics Lab			545	545		
284	9.3.7	MINGEO	CLSLB	A	Mine Ventilation Lab			1,018	1,018		
285	9.3.8	MINGEO	CLLBSV	A	Geological Materials Lab Storage			100	100		
286	9.3.9	MINGEO	CLLBSV	A	Operations & Safety Lab			545	545		
287	9.3.10	MINGEO	CLLBSV	A	Mine Surveying Storage			242	242		
288	9.3.11	MINGEO	CLLBSV	A	Rock Specimens Lab			545	545		
289	9.3.12	MINGEO	CLLBSV	A	Geology for Engineers Lab Support			121	121		
290	9.3.13	MINGEO	CLLBSV	A	Rock Cutting Lab Support			121	121		
291			**Computer Lab and Computer Lab Service**					1,268	1,268	0	0
292	9.4.1	MINGEO	COMPLB	A	Computer Lab			723	723		
293	9.4.2	MINGEO	COMPLB	A	Design Lab			545	545		
294											

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
295	**MINERAL INDUSTRY RESEARCH LABORATORY (MIRL)**							**3,106**	**0**	**3,106**	**0**
296			**Office & Office Service**					**242**	**0**	**242**	**0**
297	10.1.1	MIRL	OFF	R	Admin Office			0		0	
298	10.1.2.1-10.1.2.2	MIRL	OFF	R	Faculty Offices	2	121	242		242	
299			**Research Lab & Research Lab Service**					**2,864**	**0**	**2,864**	**0**
300	10.8.1	MIRL	RSLAB	R	Wet Chemistry & Analytical Lab			1,049		1,049	
301	10.8.2	MIRL	RSLAB	R	MIRL Lab			121		121	
302	10.8.3	MIRL	RSLAB	R	Dry Sample Prep -Crusher Lab			484		484	
303	10.8.4	MIRL	RSLAB	R	Wet Sample Prep -Grinding / Concentration			484		484	
304	10.8.5	MIRL	RSLBSV	R	Dry & Wet Apparatus Storage			363		363	
306	10.8.6	MIRL	RSLBSV	R	Lab Support			121		121	
307	10.8.7	MIRL	RSLBSV	R	Lab Support			121		121	
308	10.8.8	MIRL	RSLBSV	R	Lab Support			121		121	
309											
310	**PETROLEUM ENGINEERING**							**6,187**	**3,528**	**2,659**	**0**
311			**Office & Office Support**					**1,633**	**0**	**1,633**	**0**
312	11.1.1	PETE	OFF	A	Department Office			365		365	
313	11.1.2.1 - 11.1.2.8	PETE	OFF	A	Faculty Office	8	121	968		968	
314	11.1.3.1 - 11.1.3.2	PETE	OFF	A	Adjunct Office Space	2	60	120		120	
317	11.1.4.1 - 11.1.4.3	PETE	OFF	A	Student Organization Office Space (SPE, AADE)	3	60	180		180	
319			**Classroom Lab & Classroom Lab Service**					**2,318**	**2,318**	**0**	**0**
320	11.3.1	PETE	CLSLB	A	Drilling Fluids Laboratory			745	745		
321	11.3.2	PETE	CLLBSV	A	Prep Room -Drilling Fluids Laboratory			242	242		
322	11.3.3	PETE	CLSLB	A	Reservoir Rock & Fluid Lab			1,089	1,089		
323	11.3.4	PETE	CLLBSV	A	Prep Room -Reservoir Rock & Fluid Lab			242	242		
324			**Computer Lab and Computer Lab Service**					**726**	**0**	**726**	**0**
325	11.4.1	PETE	COMPLB	A	Computer Lab			726		726	
326			**Conference**					**300**	**0**	**300**	**0**
327	11.5.1	PETE	CONF	A	Department Conference Room			300		300	
328			**Research Lab & Research Lab Service**					**1,210**	**1,210**	**0**	**0**
329	11.8.1	PETE	RSLAB	R	Reservoir Characterization Lab			1,089	1,089		
330	11.8.2	PETE	RSLBSV	R	Reservoir Characterization Lab Support			121	121		
331											
332	**PETROLEUM DEVELOPMENT LAB (PDL)**							**4,515**	**0**	**4,515**	**0**
333			**Research Lab & Research Lab Service**					**4,515**	**0**	**4,515**	**0**
334	12.1.1	PDL	RSLAB	R	PVT / GTL Research Lab			1,089		1,089	
335	12.1.2	PDL	RSLAB	R	GTL Research Lab			745		745	
336	12.1.3	PDL	RSLAB	R	Ceramic Membrane Lab			745		745	
337	12.1.4	PDL	RSLAB	R	Gas Hydrate Research Lab			1,089		1,089	
338	12.1.5	PDL	RSLAB	R	GC / MS Research Lab			363		363	
339	12.1.6	PDL	RSLBSV	R	GTL Research Lab Support			121		121	
340	12.1.7	PDL	RSLBSV	R	Gas Hydrate Research Lab Support			121		121	
341	12.1.8	PDL	RSLBSV	R	PVT / GTL Research Lab Support			121		121	
342	12.1.9	PDL	RSLBSV	R	Ceramic Membrane Lab Support			121		121	
343											

Line	ID	Dept	Category	A / R	Room Description	No.	ASF Per	Program Total ASF	Exist. Duck. ASF	New Finished ASF	New Shell ASF
344	**WATER & ENVIRONMENTAL RESEARCH (WERC)**							**9,830**	**9,830**	**0**	**0**
345			**Office & Office Support**					**3,304**	**3,304**	**0**	**0**
346	13.1.1	WERC	OFF	R	WERC Admin Office			398	398		
347	13.1.2	WERC	OFF	R	WERC Director			121	121		
348	13.1.3.1-13.1.3.12	WERC	OFF	R	WERC Staff Office	12	60	720	720		
349	13.1.4	WERC	OFFSV	R	WERC Office Storage			100	100		
350	13.1.5	WERC	OFFSV	R	WERC Copy / Mail / Fax			150	150		
351	13.1.6.1-13.1.6.15	WERC	OFF	R	WERC Faculty Offices	15	121	1,815	1,815		
355			**Computer Lab and Computer Lab Service**					**545**	**545**	**0**	**0**
356	13.4.1	WERC	CMP-R	R	WERC GIS / Imaging / Mapping Computer Room			545	545		
357			**Research Lab & Research Lab Service**					**5,497**	**5,497**	**0**	**0**
358	13.8.1	WERC	RSLAB	R	Environmental Research Lab 1			185	185		
359	13.8.2	WERC	RSLAB	R	Environmental Research Lab 2			569	569		
360	13.8.3	WERC	RSLAB	R	Environmental Research Lab 3			572	572		
361	13.8.4	WERC	RSLAB	R	WERC Lab (CT Scanner)			323	323		
362	13.8.5	WERC	RSLAB	R	Radioactive Research Laboratory			141	141		
363	13.8.6	WERC	RSLAB	R	WERC Lab			611	611		
364	13.8.7	WERC	RSLAB	R	Costello Lab			611	611		
365	13.8.8	WERC	RSLAB	R	Alaska Stable Isotope Facility			611	611		
366	13.8.9	WERC	RSLAB	R	ASIF Multi-Collector Isotope Facility (future)			726	726		
367	13.8.10	WERC	RSLBSV	R	ASIF Lab Support			164	164		
368	13.8.11	WERC	RSLBSV	R	ASIF Lab Support			152	152		
369	13.8.12	WERC	RSLBSV	R	WERC Field Gear Fabrication & Prep			0	0		
370	13.8.13	WERC	RSLBSV	R	WERC Field Gear Storage (12 Lockable Cages)			0	0		
371	13.8.14	WERC	RSLBSV	R	WERC Cold Room 1			91	91		
372	13.8.15	WERC	RSLBSV	R	WERC Freezer Room 1			92	92		
373	13.8.16	WERC	RSLBSV	R	WERC Freezer Room 2			43	43		
374	13.8.17	WERC	RSLBSV	R	WERC Core / Sample Processing			242	242		
375	13.8.18	WERC	RSLBSV	R	WERC Lab Support			122	122		
376	13.8.19	WERC	RSLBSV	R	WERC Datalogger Testing / Calibration			121	121		
377	13.8.20	WERC	RSLBSV	R	Pressure Transducer Calibration Area			121	121		
378			**Shop**					**484**	**484**	**0**	**0**
379	13.10.1	WERC	SHOP	R	Electronics Workshop			363	363		
380	13.10.2	WERC	SHOPSV	R	Electronics Workshop Support			121	121		
381											
382	**REGISTRAR CLASSROOMS**							**10,900**	**8,900**	**2,000**	**0**
383			**Registrar Classrooms**					**10,900**	**8,900**	**2,000**	**0**
384	14.2.1	UAF	CLASS		38 Seat Classroom			726	726		
385	14.2.2	UAF	CLASS		38 Seat Classroom			582	582		
386	14.2.3	UAF	CLASS		16 Seat Classroom			528	528		
387	14.2.4	UAF	CLASS		40 Seat Classroom			813	813		
388	14.2.5	UAF	CLASS		40 Seat Classroom			828	828		
389	14.2.6	UAF	CLASS		36 Seat Classroom			846	846		
390	14.2.7	UAF	CLASS		25 Seat Classroom			519	519		
391	14.2.8	UAF	CLASS		30 Seat Classroom			591	591		
392	14.2.9	UAF	CLASS		30 Seat Classroom			607	607		
393	14.2.10	UAF	CLASS		16 Seat Classroom			528	528		
394	14.2.11	UAF	CLSVC		Classroom Support Room (adjustment per report projection)			332	332		
395	14.2.12	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 40/40)			2,000		2,000	
396	14.2.13	UAF	CLASS		80 Seat Student Centered Learning Classroom (Divisible 60/20)			2,000	2,000		

5.6 SITE SELECTION PROCESS

The design team considered three locations near The Duckering Building for the expansion of the College of Engineering and Mines.

The Forestry East Site;
The location of the current Forestry Building east of Duckering Building.

The Duckering South Site;
the current parking lot south of Duckering Building.

The Bunnell West Site;
the parking lot off the west end of Bunnell Building.

A test fit of the program and a conceptual building massing study was done for each site to determine the recommended location for the proposed new engineering building. Each site option was measured against a list of planning and design criteria, such as, the ultimate carrying capacity of the site, ability to meet the University's goals for integration of teaching and research, and adherence to the Campus Master Plan. The studies were reviewed by the Project Leadership Team and collectively graded against the list of criteria.

The Duckering South Site was selected and recommended as the site that best meets the University's and CEM's overall project goals**.**

UAF ENGINEERING FACILITY SITE EVALUATION MATRIX

COLLEGE OF ENGINEERING AND MINES

CAMPUS

rank 1-5 (5 being best)

	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
Response to Campus Pedestrian Circulation	1	5	3
Response to Vehicular And Service Access	3	1	5
Supports Established Campus Open Spaces	1	5	3
Supports Interconnectedness of Buildings	1	5	3
Supports Goal for Multi-Disciplinary Design	1	5	3
Scale Relationship to Adjacent Buildings	3	4	5
	10	25	22

SITE

rank 1-5 (5 being best)

	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
Topography/Soils That Accomodates Construction	1	4	5
Response to Existing Landscape	1	5	3
Access to Utilities	1	4	5
Response to Established View Corridors	5	3	2
Site Sized to accommodate Expansion, Design, and Construction	3	1	5
Preserves Existing Parking	5	1	2
	16	18	22

BUILDING

rank 1-5 (5 being best)

	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
Supports Goals for Establishing Campus Presence	1	5	3
Supports Goals of Making Engineering Visible to public	1	5	4
Supports Goals for Architectural Integration	1	5	3
Allows for Energy Efficient Building Orientation	4	5	2
Accommodates Access for Emergency Vehicles	3	4	5
Minimizes Code Required Costs	4	2	5
	14	26	22

INTERIOR

rank 1-5 (5 being best)

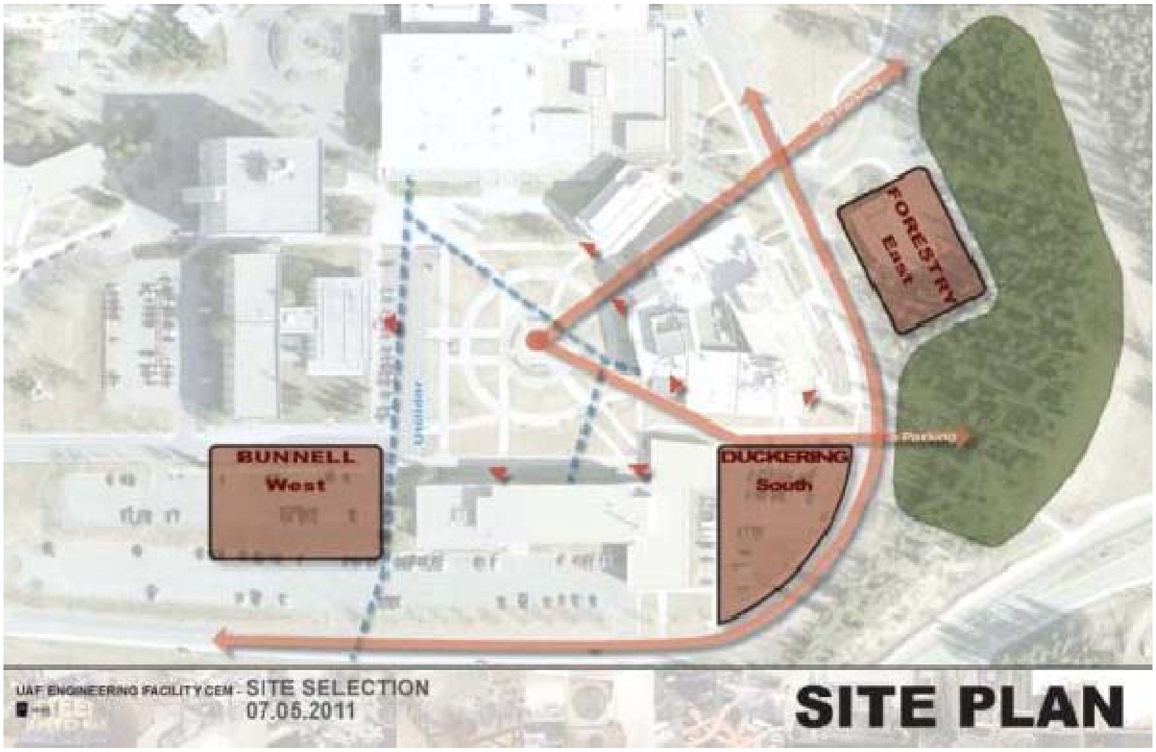
	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
Accommodates Desired Adjacencies within Addition	3	5	1
Accommodates Desired Relationships to Duckering (and Bunnell)	3	5	1
Allows for Flexibility in Planning	3	4	5
Allows for Efficient in its Internal Circulation	3	4	5
Allows for Daylighting of Spaces	4	3	5
Allows for Distant and Close views	4	3	5
	20	24	22

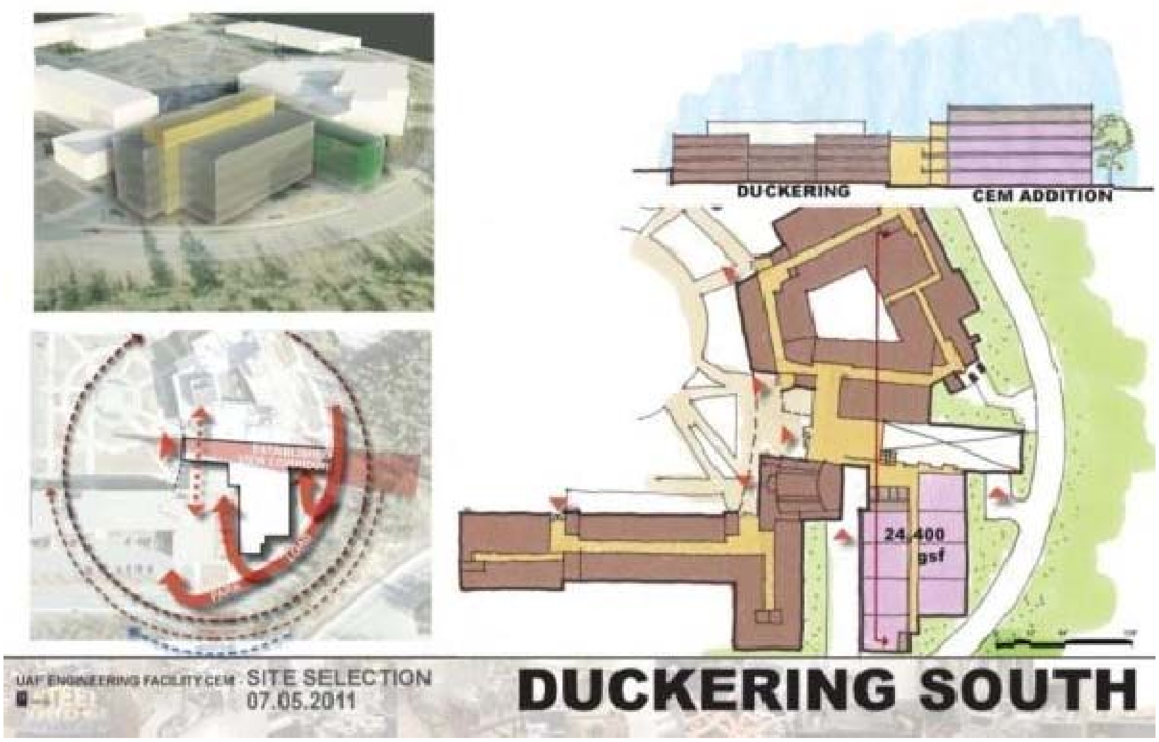
COST

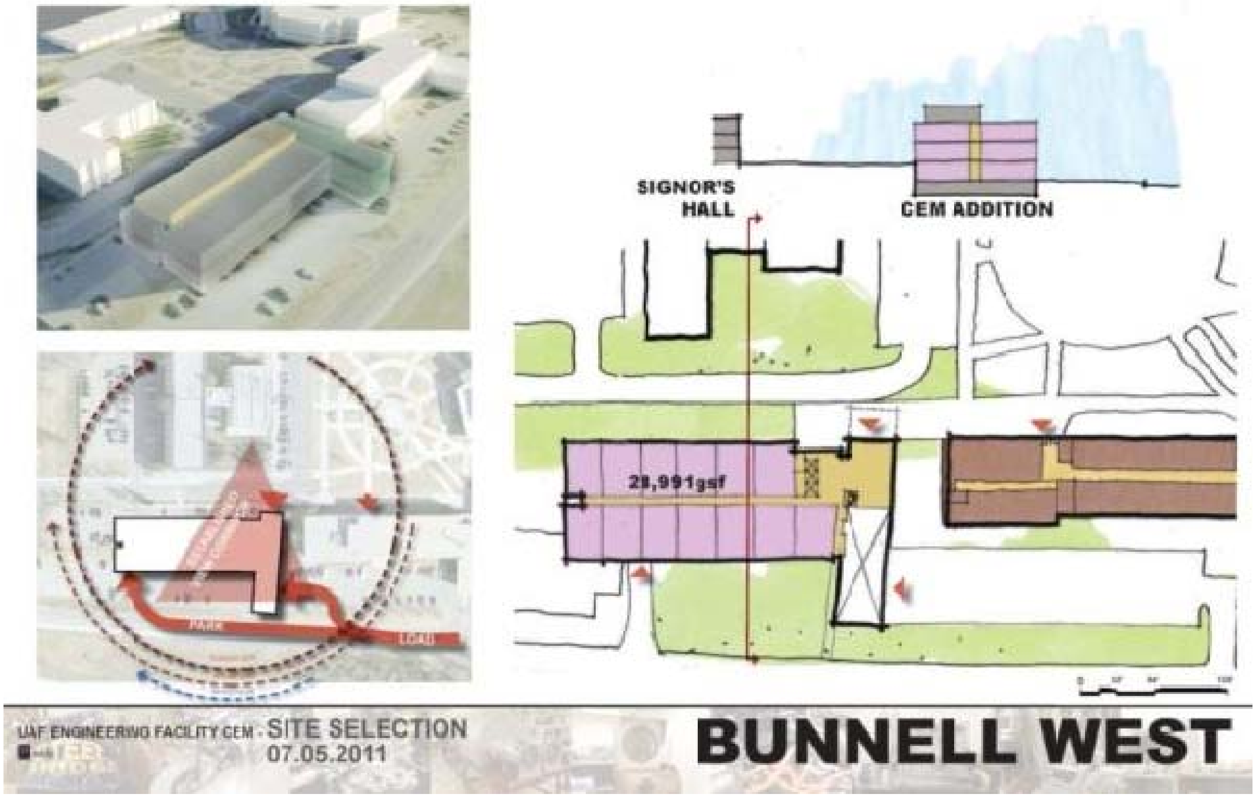
rank 1-10 (10 being lowest cost)

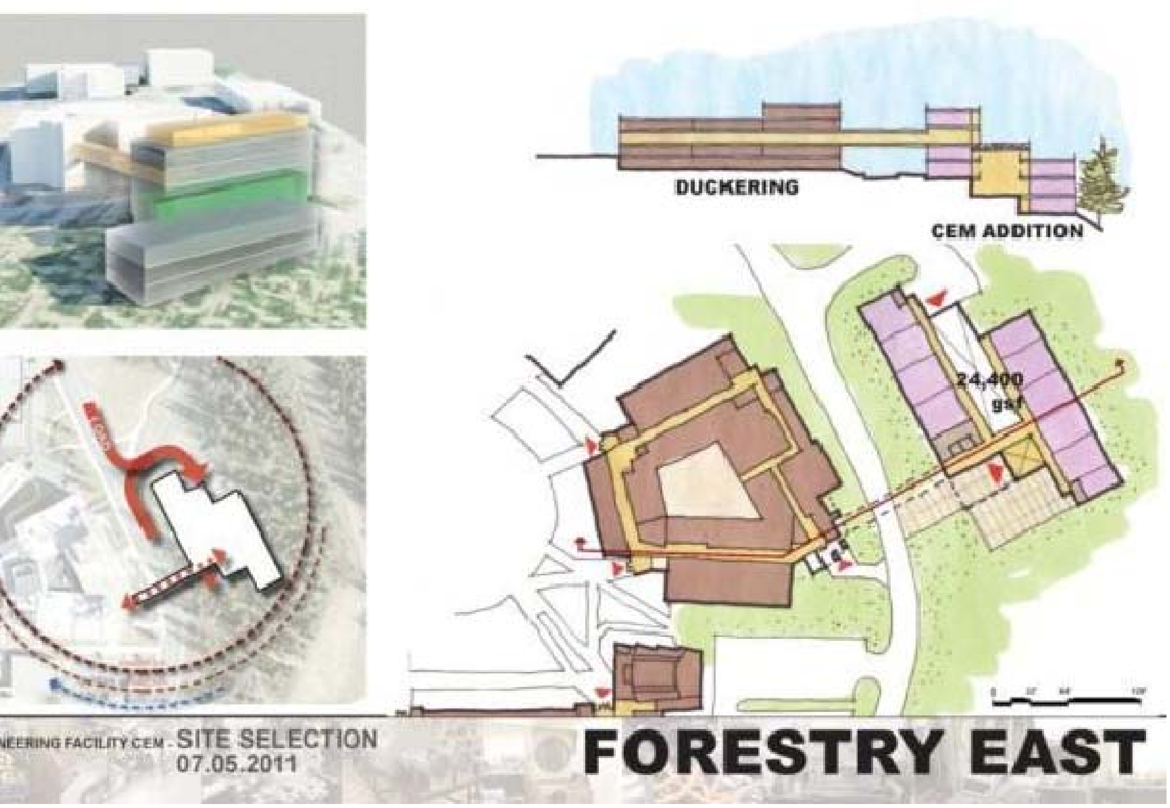
	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
Utility Costs	1 (2)	4 (8)	5 (10)
Site Costs	1 (2)	5 (10)	3 (6)
Design Cost	3 (6)	4 (8)	5 (10)
	10	26	26

	FORESTRY EAST	DUCKERING SOUTH	BUNNELL WEST
TOTAL	70	119	114


FORESTRY
East
BUNNELL
West
DUCKERING
South
Parking
UAF ENGINEERING FACILITY CEM - SITE SELECTION
07.05.2011
SITE PLAN


DUCKERING
CEM ADDITION
24,400
gsf
UAF ENGINEERING FACILITY CEM - SITE SELECTION
07.05.2011
DUCKERING SOUTH


SIGNOR'S HALL
CEM ADDITION
28,991gsf
PARK
LOAD
UAF ENGINEERING FACILITY CEM - SITE SELECTION
07.05.2011
BUNNELL WEST


DUCKERING
CEM ADDITION
24,400 gsf
EERING FACILITY CEM - SITE SELECTION
07.05.2011
FORESTRY EAST

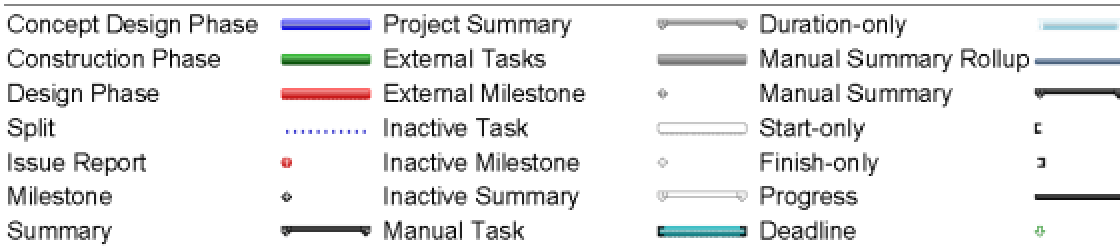
DRAFT PROJECT SCHEDULE

The following Gantt Chart Project Schedule records a preliminary scenario for the design and construction of the project.

The schedule is shown with individual tasks on the next two pages.

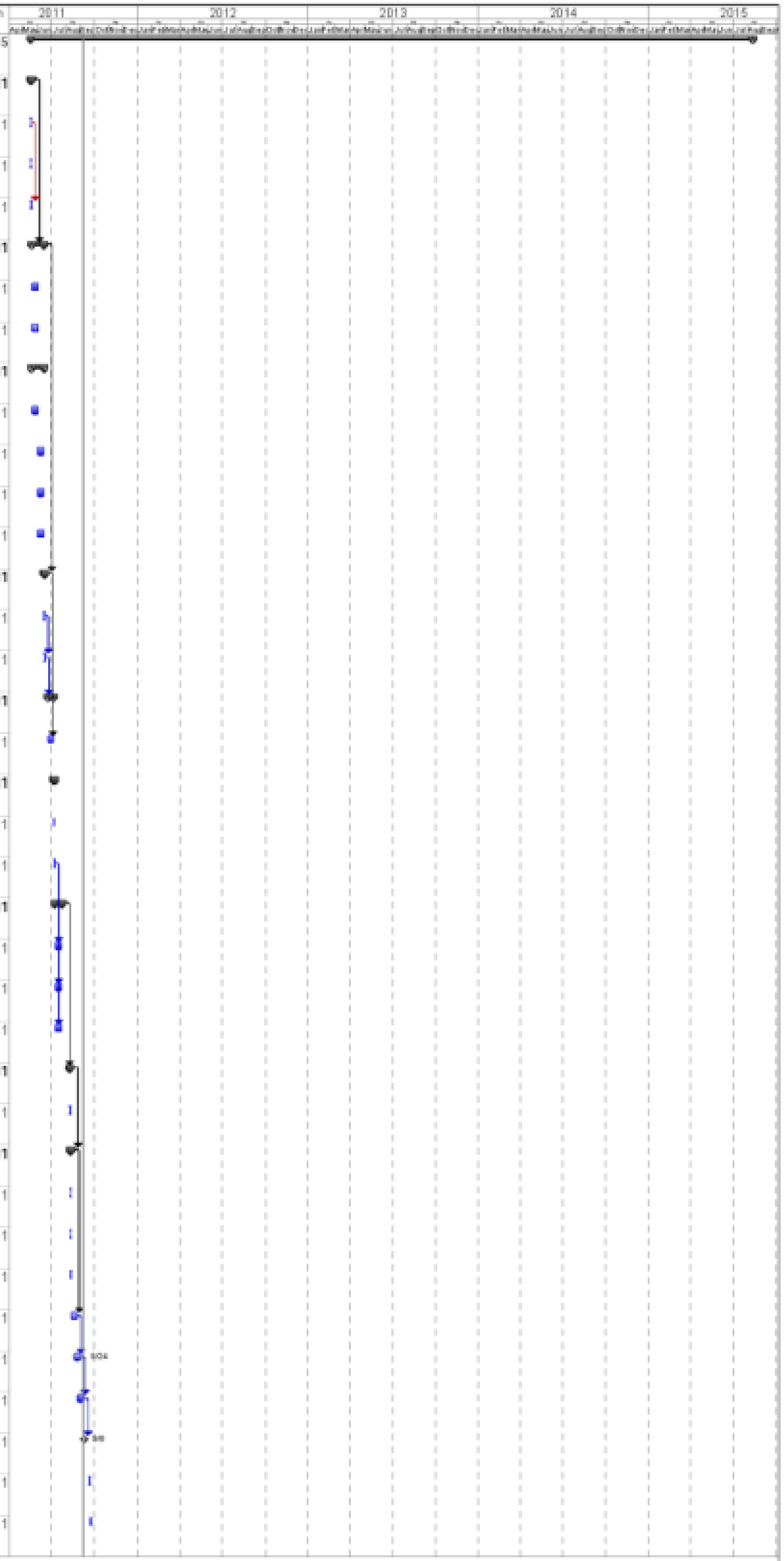
The legend for the Gantt bars is shown directly below

LEGEND FOR PROJECT SCHEDULE GANTT BARS



DRAFT PROJECT SCHEDULE (PAGE 1 OF 2)

ID	Task Name	Duration	Start	Finish
1	**UAF Engineering Facility**	1106 days	5/17/11	9/11/15
2	**Project Kick Off Summit**	2 days	5/17/11	5/18/11
3	Administrative Summit	1 day	5/17/11	5/17/11
4	Leadership Summit	1 day	5/17/11	5/17/11
5	User Group Summit	1 day	5/18/11	5/18/11
6	**Design Process**	19 days	5/19/11	6/14/11
7	Review & Refine Program Requiren	11 days	5/19/11	6/2/11
8	Building Perfomance Criteria	11 days	5/19/11	6/2/11
9	**Existing Facility Inventory Plan**	19 days	5/19/11	6/14/11
10	Existing Building Audit	11 days	5/19/11	6/2/11
11	Existing Program Audit	11 days	5/31/11	6/14/11
12	Site Analysis	11 days	5/31/11	6/14/11
13	Project Cost Model	11 days	5/31/11	6/14/11
14	**Balancing Session**	2 days	6/15/11	6/16/11
15	Refine Space List / Program	1 day	6/15/11	6/15/11
16	Select Site	1 day	6/16/11	6/16/11
17	**Functional Space Program Draft**	8 days	6/23/11	7/4/11
18	Draft Program	8 days	6/23/11	7/4/11
19	**Balancing Session**	3 days	7/5/11	7/7/11
20	Refine Program and Site Selection	2 days	7/5/11	7/6/11
21	Design Team Mech. / Elec. Survey	2 days	7/6/11	7/7/11
22	**Prepare Draft Report**	11 days	7/8/11	7/22/11
23	Refine Space List	11 days	7/8/11	7/22/11
24	Develop Concept Plan	11 days	7/8/11	7/22/11
25	Refine Cost Analysis	11 days	7/8/11	7/22/11
26	**Issue Draft Report & Budget Numb**	1 day	8/9/11	8/9/11
27	Refine Report	1 day	8/9/11	8/9/11
28	**Project Team Summit in Fairbanks**	2 days	8/10/11	8/11/11
29	Administrative Summit	1 day	8/10/11	8/10/11
30	Leadership Summit	1 day	8/10/11	8/10/11
31	Evaluate Space List and Project Co	1 day	8/11/11	8/11/11
32	**Prepare Abridged Report**	9 days	8/12/11	8/24/11
33	**Issue Abridged Report**	0 days	8/24/11	8/24/11
34	Update Final Report	11 days	8/25/11	9/8/11
35	**Issue Final Report**	0 days	9/8/11	9/8/11
36	Board of Regents Meeting in Anchora	1 day	9/20/11	9/20/11
37	Board of Regents Meeting in Juneau	2 days	9/22/11	9/23/11



DRAFT PROJECT SCHEDULE (PAGE 2 OF 2)

ID	Task Name	Duration	Start	Finish
38	NTP - Schematic Design	0 days	10/19/...	10/19/...
39	Develop plans and elevations	87 days	10/19/...	2/16/12
40	Outline Specifications	87 days	10/20/...	2/17/12
41	Issue Draft to Cost Estimator	0 days	1/6/12	1/6/12
42	Update Cost Estimate	41 days	1/6/12	3/2/12
43	Issue Schematic Design	0 days	2/17/12	2/17/12
44	NTP Design Development	0 days	2/17/12	2/17/12
45	SD Review	10 days	2/20/12	3/2/12
46	SD Review Meeting	1 day	3/5/12	3/5/12
47				
48	Develop plans and elevations	108 days	2/20/12	7/18/12
49	Short Form Specifications	108 days	2/20/12	7/18/12
50	Issue Draft to Cost Estimator	1 day	7/9/12	7/9/12
51	Update Cost Estimate	14 days	7/10/12	7/27/12
52	Issue Design Development Documen	0 days	7/18/12	7/18/12
53	NTP Construction Documents	0 days	7/18/12	7/18/12
54	DD Review	10 days	7/19/12	8/1/12
55	DD Review Meeting	1 day	8/2/12	8/2/12
56				
57	Develop plans and elevations	135 days	7/19/12	1/23/13
58	Complete Specifications	135 days	7/19/12	1/23/13
59	Issue Draft to Cost Estimator	0 days	1/11/13	1/11/13
60	Update Cost Estimate	16 days	1/11/13	2/1/13
61	Issue Construction Documents	0 days	1/23/13	1/23/13
62	CD Review	10 days	1/24/13	2/6/13
63	CD Review Meeting	0 days	2/6/13	2/6/13
64	Revise Documents	12 days	2/7/13	2/22/13
65	Issue Documents for Bidding	0 days	2/22/13	2/22/13
66	Bidding Period	20 days	2/25/13	3/22/13
67	Bid Opening	0 days	3/22/13	3/22/13
68	Protest Period	10 days	3/25/13	4/5/13
69	NTP to Contractor	0 days	4/5/13	4/5/13
70				
71	**Construction**	**612 days**	**4/8/13**	**8/11/15**
72	New Building	410 days	4/8/13	10/31/...
73	Duckering Connection	410 days	4/8/13	10/31/...
74	Substantial Completion New Buildin	2 days	11/3/14	11/4/14
75	Duckering Renovations	200 days	11/3/14	8/7/15
76	Substantial Completion	2 days	8/10/15	8/11/15